

Hydrogeologic Assessment of the Anderson Valley

Clinton County, Indiana



January 2023

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January 3, 2023

Prepared for Indiana Finance Authority

Prepared by



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Executive Summary

This report presents an assessment of the water-supply potential of the Anderson Valley in southwest Clinton County. The Anderson Valley is a large pre-glacial valley carved into the bedrock in central Indiana. The valley, relatively unexplored for water-supply potential, was identified in the Central Indiana Water Study as a potential regional water source for an area of the state where new sources of water will likely be needed to meet future demand (INTERA, 2021).

The goal of the project was to characterize the occurrence, geometry, and hydraulic properties of permeable sediments within the Valley, and to assess the potential for a high-capacity groundwater supply. To accomplish this, an exploratory boring and aquifer testing program was conducted in a portion of the Anderson Valley southwest of the City of Frankfort. The data gathered from the testing program was used to create a 3D conceptual geologic model (CGM) of the area which was, in turn, used to develop a conceptual groundwater model. A transient groundwater model was then used to estimate yields of hypothetical well fields in the study area.

The focus of this study was an approximately 20 square mile area located along the I-65 corridor between Indianapolis and Lafayette, southwest of Frankfort and northeast of Colfax in Clinton County. This area is a strategic geographic location for a regional well field. Within the study area, the thickness of the unconsolidated deposits range from approximately 250 to 400 feet and consists of clay and silt-rich till interbedded with locally discontinuous but regionally extensive layers of sand and gravel. In general, the aquifer system can be separated into a shallow and a deep aquifer.

A sonic rig drilled twenty-two (22) exploratory boreholes on seven (7) sites, named: A6, C1, C2, D3, J3, N1, and M1. Lithologic core samples at all sites were logged and characterized. Eleven (11) of the boreholes were converted into monitoring wells to deploy data logging probes and collect water-quality samples. Additionally, two 8-inch diameter production wells were constructed and each tested with a 72-hour aquifer test at site J3. Water-quality sampling and analysis was conducted at monitoring wells and the two test wells to identify potential treatment concerns.

The overall goal of the project was to quantify potential yields from development of the aquifer within the study area. However, after the aquifer testing at site J3 was complete, this project was discontinued due to the relatively high price of transmission of water from the sites. It was concluded that, due to the geographic spread of the potential well fields, an extensive network of transmission mains would be necessary to develop the aquifer. The high infrastructure costs of the transmission mains made well field development impractical at this time.

The drilling and testing that occurred before project termination provided valuable geologic and hydrogeologic data. The results from the field investigation and data analysis show the following:

1. Groundwater modeling scenarios indicate that the site that was tested (J3) could produce approximately 2.0 million gallons per day [MGD] with 3 properly spaced wells. It is expected that other sites would produce similar yields, however, further field testing would be required.
2. Water-quality results show high iron and manganese in all the wells that were sampled. In addition, two of the deeper samples show high arsenic concentrations. These water-quality results are consistent with the quality found in other regional wells such as the City of Frankfort Wells. Groundwater produced in this area will require treatment.
3. On a regional scale, the Anderson Valley consists of a shallow and deep aquifer, however, the geologic model indicates, and the exploratory drilling and pumping data confirm that locally, there is spatial variability in the presence and continuity of the two regionally extensive aquifer layers.
4. The results of the study show that, within the study area, the Anderson Valley has potential for high-capacity well field development to accommodate growth in the region. Water resource development would be of tremendous value to Clinton County and it's residents.

1 Introduction

The Anderson Valley is a large pre-glacial valley carved into the bedrock through central Indiana. The bedrock valley was identified in the Central Indiana Water Study as a potential regional water source for an area of the state where new sources of water may be needed to meet future demand (INTERA, 2021). Many of the highest yielding aquifers in Indiana are buried valley aquifers, formed when glacial deposits filled in previously exposed bedrock valleys. This report presents the results of an assessment of the water supply potential of the Anderson Valley as a source of water in Clinton County.

The scope of the assessment was focused on test borings, water-quality sampling, hydraulic testing, 3D geologic modeling, and groundwater flow modeling. The objective of the project was to collect high-resolution data in order to characterize the occurrence and geometry of aquifer layers and the potential to sustainably produce raw water for public supply.

1.1 Central Indiana Water Study

The Indiana Finance Authority (IFA) recently completed the Central Indiana Water Study as part of the authority's directive to identify regional water infrastructure needs and solutions within the state (INTERA, 2021). The objective of the study was to better understand the current and future demand for water and the ability of the resource to support growth in a nine county region in the central part of the state. Areas within the nine county region where future demand may exceed available local supplies were identified. A key finding of the study was that an additional 50 million gallons per day (MGD) of water will be needed by 2070 for public water systems, with growth expected to be the highest in Hamilton County and the north side of Marion County. Demand may exceed available supplies by 2070 on the north side of the nine-county region, especially in Boone and Hamilton Counties. The section of the Anderson Valley that traverses Clinton County just north of Boone County was identified in the study as a relatively unexplored buried valley aquifer with the potential to be developed as a regional source.

1.2 The Anderson Bedrock Valley

The Anderson Bedrock Valley is the remnants of an ancient pre-glacial tributary of the Teays River. The Anderson Valley begins as a deep and narrow channel east of Madison County where it meanders west, through the center of Madison County to the north edge of Hamilton County. The bedrock valley drastically broadens on the north edge of Boone County as it traverses Clinton County, eventually connecting to the Teays Bedrock Valley a few miles west of Lafayette, IN (Figure 1). This broad, lower section of the valley in Clinton County has been referred to as the Frankfort Lowland Section, due to the proximity of Frankfort, Indiana (Bleuer, 1991). The high energy environment in the the broad lower section of the Anderson Valley conveyed glacial outwash material, resulting in permeable layers of sand and gravel

(Wayne, 1956).

1.3 Study Area

The focus of this study was an approximate 20 square mile area located along the I-65 corridor between Indianapolis and Lafayette, southwest of Frankfort in Clinton County (Figure 1). This area sits within the footprint of the Anderson Bedrock Valley and is a strategic geographic location for a regional well field. Within the Study Area, the thickness of the unconsolidated deposits range in thickness from 425 to 179 ft, and consists predominately of clay and silt-rich till interbedded with regionally discontinuous zones of sand and gravel.

2 City of Frankfort Municipal Wells

The City of Frankfort's Municipal Utility operates a well field within the Anderson Valley, located on the west side of the city, with seven production wells registered as a high-capacity wells with the Indiana Department of Natural Resources (IDNR) Significant Water Withdrawal Database (SWWF) (IDNR, 2022).

The production wells pump from two distinct confined layers of sand and gravel separated by a significant layer of glacial till. Production Wells 16, 22, and 23 are screened within a relatively shallow zone (Shallow Aquifer), have rated capacities ranging from 600-1200 gallons per minute (gpm), are 10 to 24 inches in diameter, and range from 93 to 105 ft deep. Production Wells 17, 19, 20, and 21 are screened within a deeper layer (Deep Aquifer), have rated capacities ranging from 500 to 1200 gpm, are 12 to 20 inches in diameter, and are 276 to 302 ft deep. Reported annual pumpage from the wells averaged approximately 3.3 MGD between 2019-2021 (IDNR, 2022).

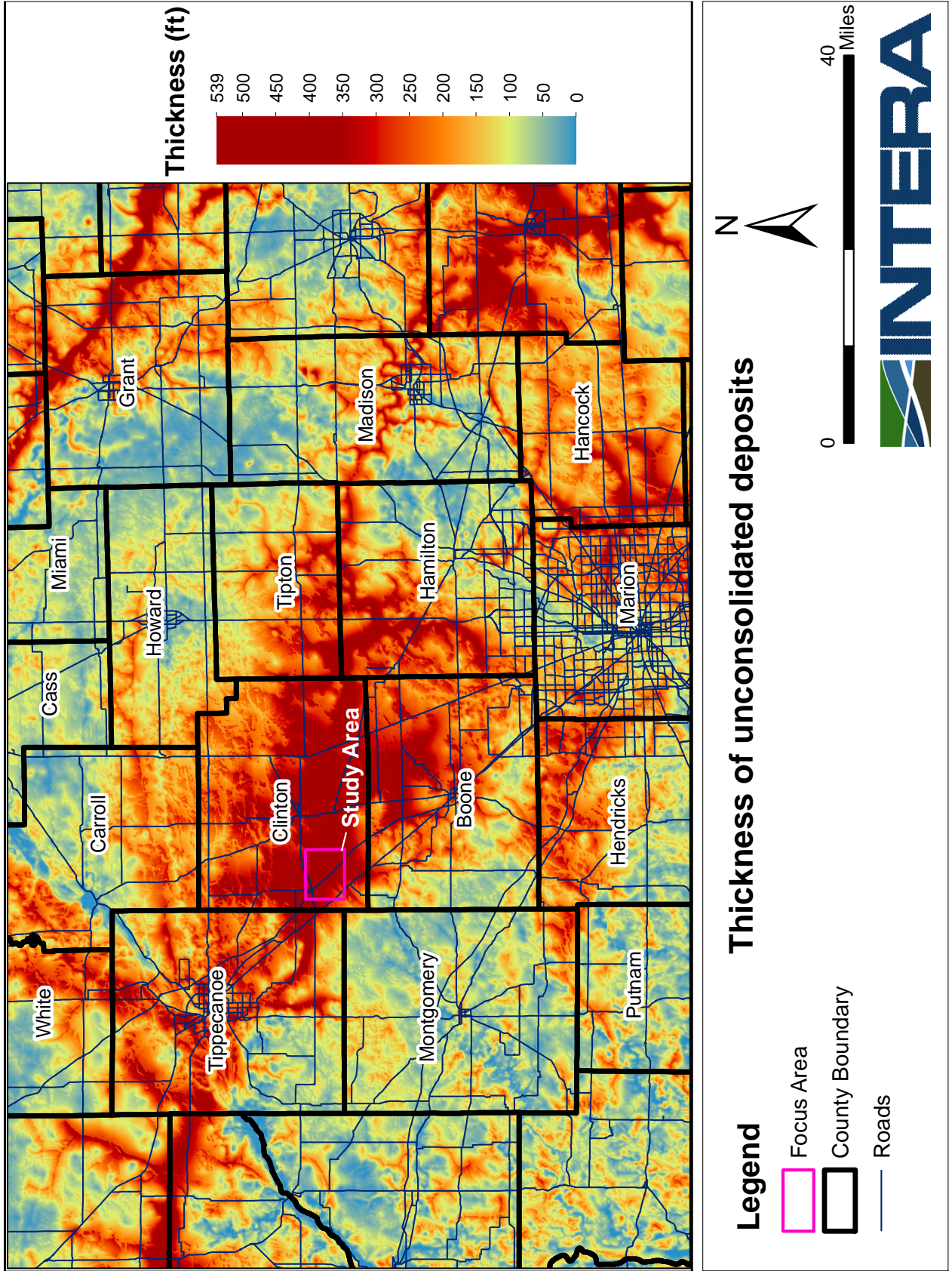


Figure 1: Thickness of the unconsolidated deposits, showing the Study Area within the Anderson Bedrock Valley.

3 Test Drilling

Access to drill sites was facilitated by written agreements with landowners, procured by a real estate team. Access was negotiated for five primary parcels on the east side of I-65, sized with the intention to locate two production wells at each while maintaining setback requirements for public supply wells (Figure 2) (A6, C1, C2, D3, J3). Access was negotiated for two smaller parcels (M1, N1) (approximately 0.5 acre each) on the west side of I-65 (secondary sites). The parcels were sized with the intention to drill a single test boring and complete as a monitoring well, if warranted. Additional access was obtained for one of the primary sites to construct test production wells and conduct hydraulic tests (J3).

All exploratory boreholes were drilled with a sonic drill rig by Cascade Drilling. Sonic drilling employs the use of high-frequency, resonant energy to advance a core barrel and casing into the subsurface. When the core barrel is retrieved from the subsurface, it produces a relatively undisturbed sample with near 100% core recovery. All borings were initially drilled with a 6 inch diameter core barrel. The recovered core samples were classified and logged according to the unified soil classification system (USCS).

3.1 Test Borings and Monitoring Wells

At each primary and secondary site, initial test borings were drilled to bedrock to characterize the entire unconsolidated section of valley fill and further define the elevation of the bedrock surface. Few existing well logs in the IDNR database extend to bedrock because sufficient yields for domestic wells are encountered within the shallow unconsolidated glacial deposits. Additional borings were drilled at the primary sites to collect soil samples for potential well design. At both primary and secondary sites, monitoring wells were constructed based on the lithology that was encountered (summarized in Table 1). The layout of test drilling activities for the primary sites is shown in Figures 3 - 4. Layouts for the two secondary sites are shown in Figure 5.

Distinct shallow and deep formations were found simultaneously at two Sites (A6, C2). The Shallow Aquifer was encountered without the Deep Aquifer at two Sites (D3, C1). The Deep Aquifer was without the Shallow Aquifer at one Site (N3). The initial borings at Site J3 encountered only the deep formation. However, subsequent borings at Site J3 to prepare for aquifer testing showed that the presence of the shallow and deep formations were highly variable across the Site.

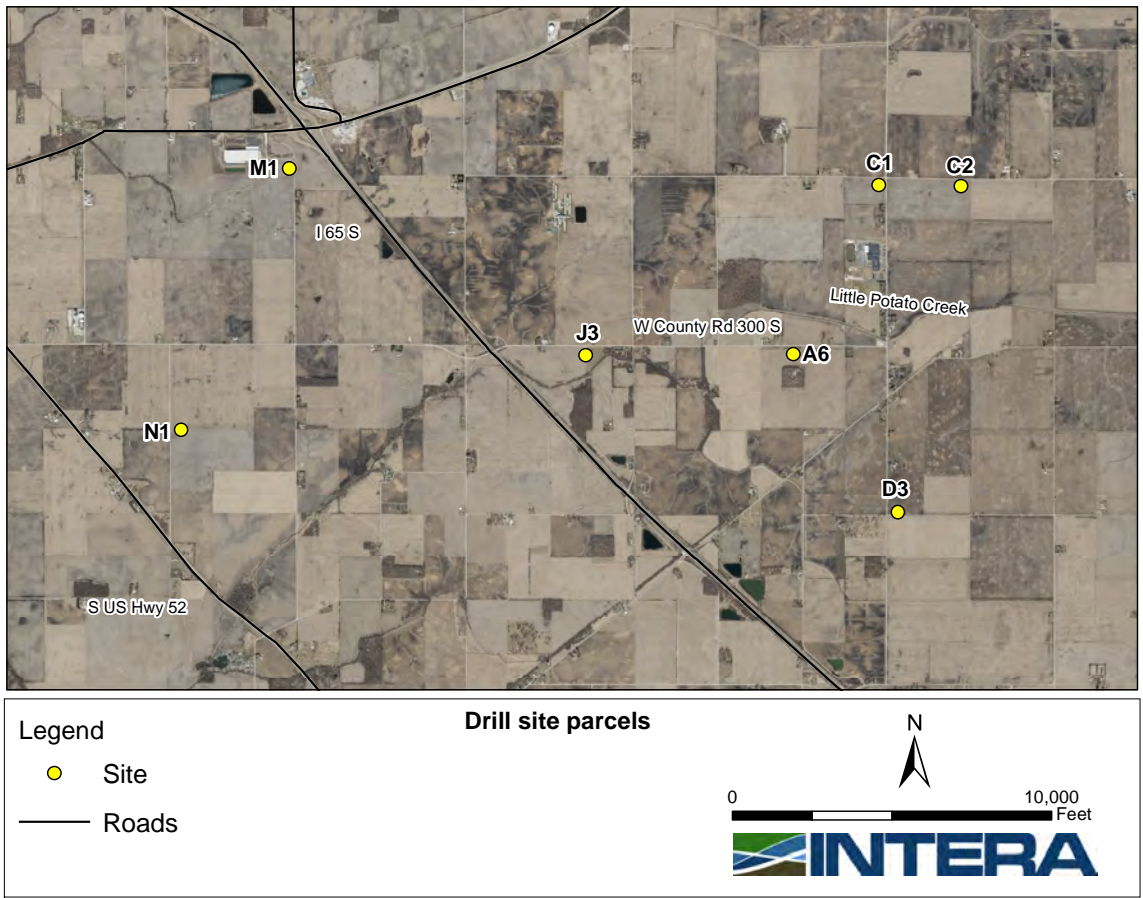


Figure 2: Drill site locations.

Table 1: Monitoring well characteristics.

Well ID	Latitude	Longitude	Diameter [inches]	Screen interval [ft bgs]	Stickup [ft ags]
D3-MW-1	40.228460°	-86.588920°	2.0	76-116	3.65
C1-MW-1	40.257251°	-86.591300°	2.0	60-85	3.20
A6-MW-1S	40.242829°	-86.600752°	2.0	59-89	2.80
A6-MW-1D	40.242829°	-86.600752°	2.5	200-255	3.00
C2-MW-1S	40.257102°	-86.581662°	2.0	37-87	3.25
C2-MW-1D	40.257102°	-86.581662°	2.5	189-199	3.26
J3-MW-1	40.242913°	-86.625094°	2.0	131-191	3.20
J3-MW-2S	40.241696°	-86.261800°	2.0	146-176	3.90
J3-MW-2D	40.241696°	-86.261800°	2.5	197-222	3.85
J3-MW-3	40.240460°	-86.626180°	2.0	200-250	3.90
J3-MW-4	40.241887°	-86.623037°	2.0	100-140	3.10

ft = feet; bgs = below ground surface; ags = above ground surface

Table 2: Test production well characteristics.

ID	Latitude	Longitude	Diameter [inches]	Screen interval [ft bgs]	Stickup [ft ags]
TW-1	40.241696°	-86.623200°	8	212-232	3.10
TW-2	40.241900°	-86.653300°	8	107-137	3.00

ft = feet; bgs = below ground surface; abg = above ground surface

3.2 Test Wells

Two test production wells were constructed at Site J3 to conduct aquifer testing (Figure 2). The test wells were installed with a sonic rig by over-reaming the initial core to a borehole diameter of 12 inches. The test wells were constructed with 8 inch diameter stainless steel screen and steel casing (Table 2).

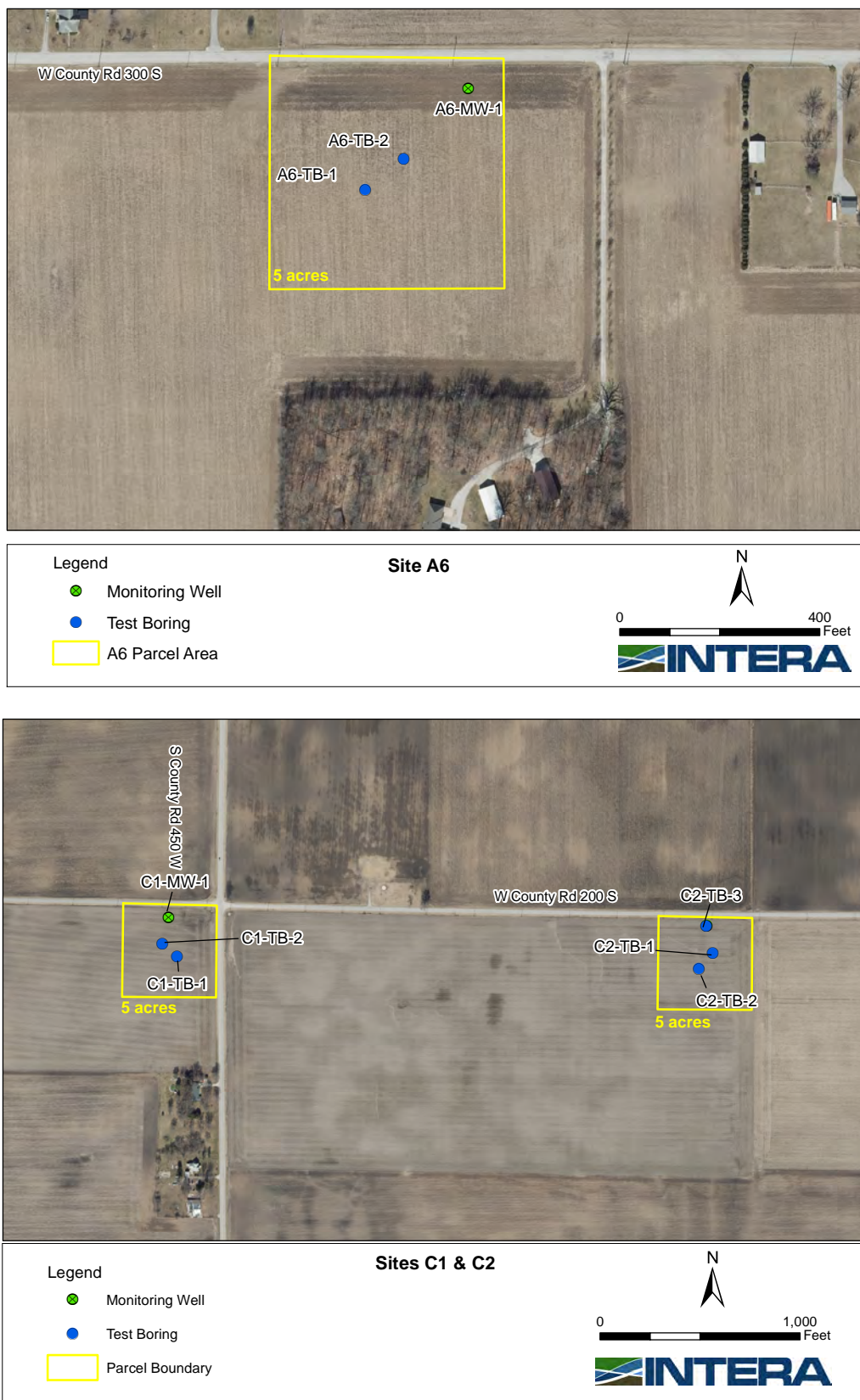


Figure 3: Layout of test drilling at Site A6 (top) and Sites C1 and C2 (bottom) .

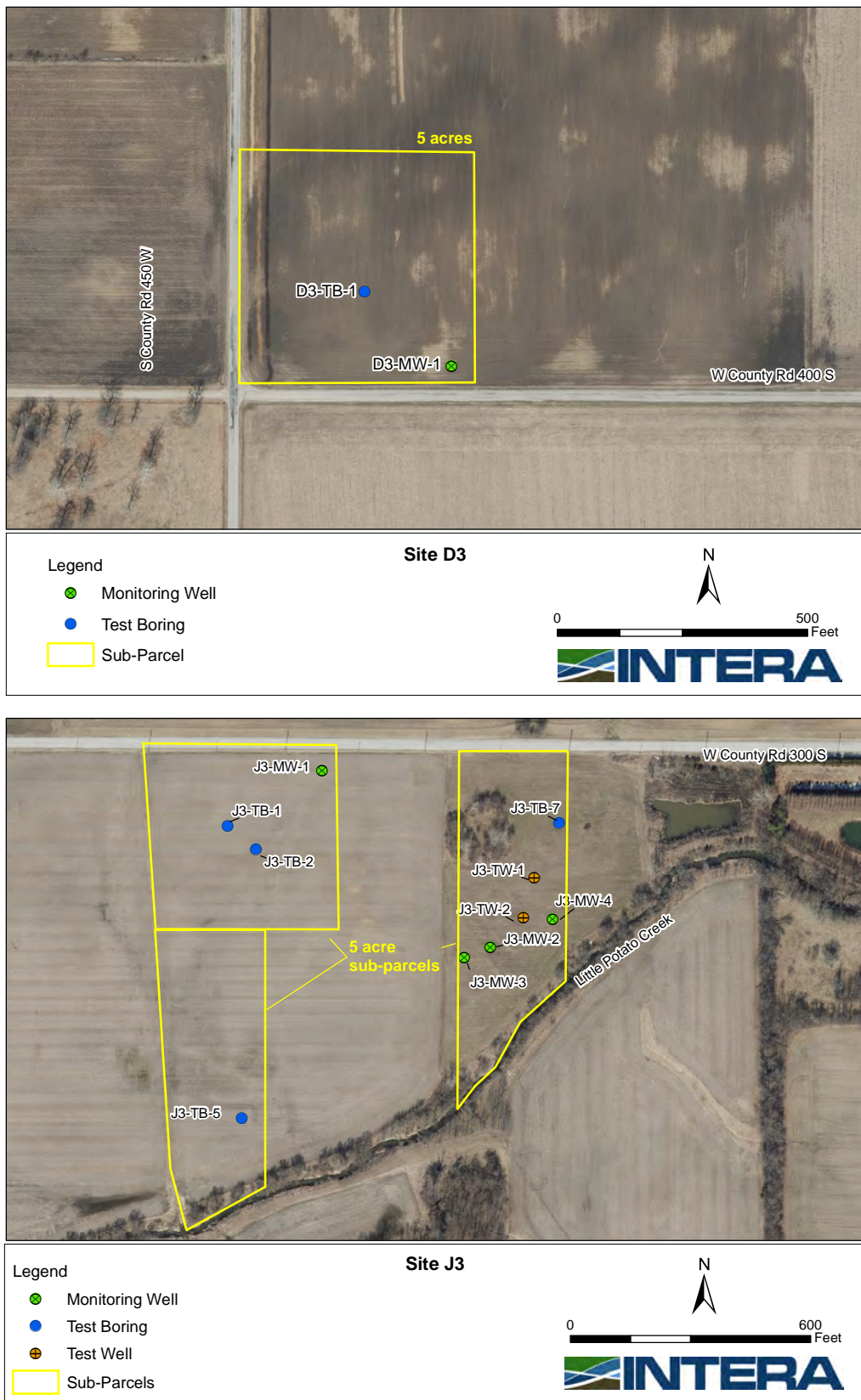
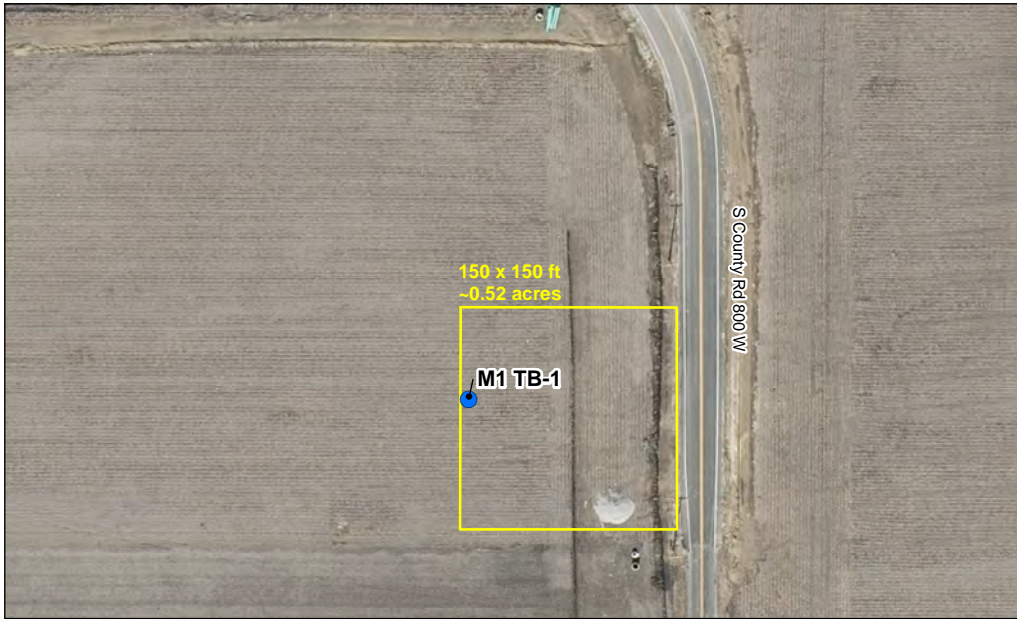


Figure 4: Layout of test drilling at Site D3 (top) and Site J3 (bottom).



Legend

- Test Boring
- M1_Parcel_Area

Site M1

0 200 Feet

INTERA



Legend

- Test Boring
- N1_Parcel_Area

Site N1

0 300 Feet

INTERA

Figure 5: Layout of test drilling Site M1 (top) and Site N1 (bottom).

4 3D Geologic Model

A 3D Conceptual Geological Model (CGM) was constructed to better visualize and define the shape of the bedrock surface and unconsolidated lithology within the model domain. The model was constructed using Leapfrog Works version 2.4 software (Leapfrog). Leapfrog enables fast, detailed visualization and analysis of geologic features. This model was built using lithologic borehole data collected during drilling along with publicly available data gathered from various state and federal agencies including: the Indiana Department of Natural Resources (IDNR), the Indiana Geological Water Survey (IGWS), and the United States Geological Survey (USGS). These data sets include surficial and bedrock maps from the IGWS, a bedrock elevation model from the IGWS, a data set of well logs and associated lithologies from the IGWS iLITH database, and topography derived from digital elevation models (DEM) from the USGS.

4.1 Model Domain and Inputs

The domain of the CGM was selected to encompass drilling sites as well as the Frankfort Well Field. The extent of the domain is shown in Figure 6. The model covers 65.8 square miles in southwestern Clinton County; extending to: State Road 28 to the north, W Co Rd 700 S to the south, S Co Rd 200 E to the east, and S Co Rd 100 W to the west.

4.2 Topography

Topography in the 3D CGM was imported from USGS 1/3 arc-second DEM files (USGS, 2019). The topography represents the land surface and is also the top bounding surface for the CGM. The topography in the Study Area is mostly flat, gently sloping from northeast to the southwest. Within the study area, the elevation ranges from 892 to 806 ft amsl, with a total relief of 86 ft. An image of the entire Leapfrog model domain showing the topography is shown in Figure 7.

4.3 Bedrock Elevation

Preliminary bedrock elevation data was imported into the model from the IGWS Bedrock Topography 100-M DEM data set (Naylor, 2015). This data was refined and enhanced, particularly at each drilling site that encountered bedrock, as well as at locations of previously collected passive seismic surveys. The final bedrock topography shows the shape and extent of the bedrock surface, which lies primarily within the Anderson Bedrock Valley. Bedrock elevations range from 637 to 435 ft amsl for a total bedrock topographic relief of 202 ft (Figure 8).

Within the study area, the Anderson Bedrock Valley is a broad valley that was incised into the bedrock surface during several glacial advances and retreats since the late Pennsylvanian period (~300 million years ago). The glacial action eroded the area's bedrock and covered it with unconsolidated material through the last two hundred thousand years, when at least

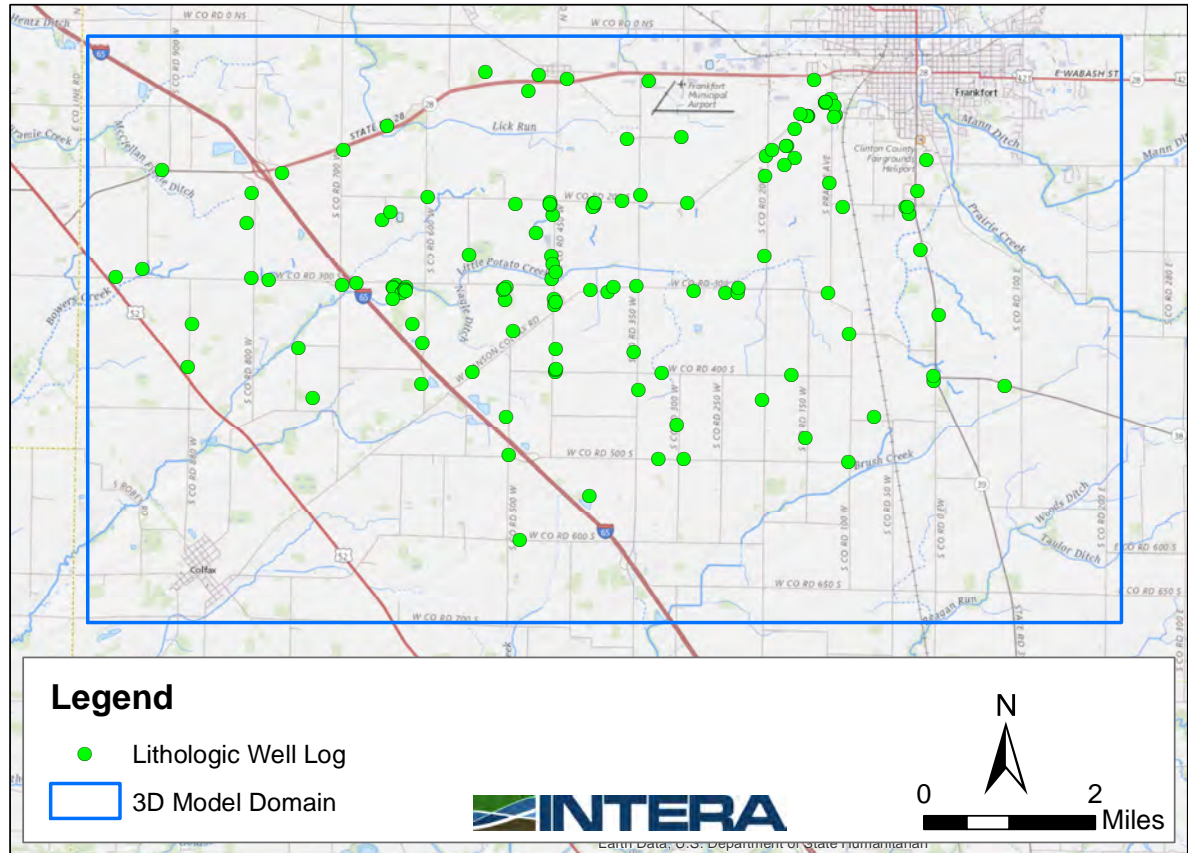


Figure 6: Model domain of the 3D geologic model and well log locations.

two glacial advances and retreats (referred to as the Illinoian and the Wisconsin) crossed into the state from the north (Gray, 2000). The current bedrock surface is more elevated in the northeastern side of the county, then dips into a valley system in the southwest. The Anderson Bedrock Valley traverses through the southern side of the county. This valley was a major drainageway for the massive amount of glacial meltwater produced by the retreat of the Illinoian and Wisconsin events. The Anderson valley has since filled with unconsolidated clay and silt-rich till interbedded with sand and gravel deposits ranging in thickness from 425 to 179 ft within the study area.

4.4 Well Logs

Along with lithologic data from the 22 new sonic boreholes drilled within the study area, 103 well logs were added to the CGM from the IDNR water well database. Only boreholes with verifiable locations were used in the model. Final locations of well logs are shown in Figure 6. All of the borings, including well logs from the IDNR are listed in Appendix B. Lithologic data from each log was grouped into three main categories based on their aquifer characteristics: Clay/Silt, Sand/Gravel, and Bedrock. Fine-grained materials such as clay, silt, or till were

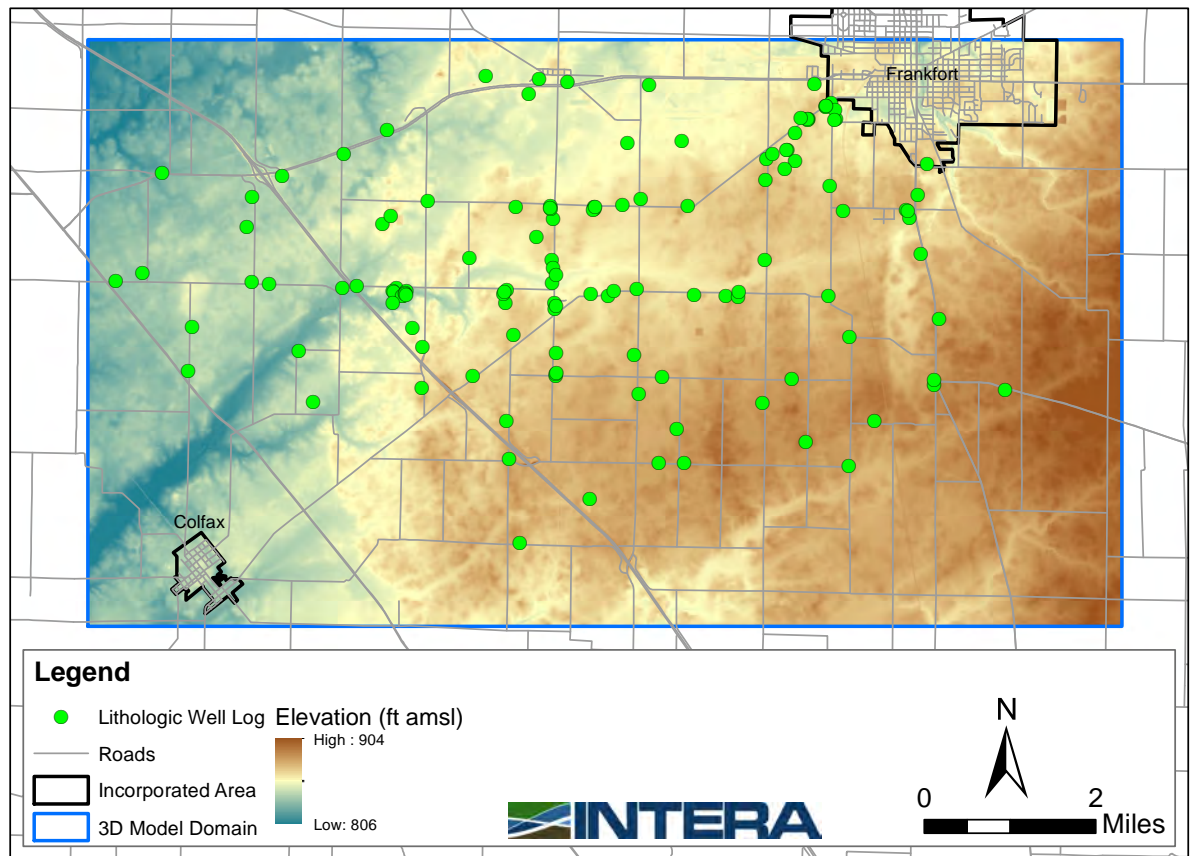


Figure 7: Topography within the 3D geologic model domain.

grouped into the Clay category, coarse grained material such as sand, gravel, or cobbles were grouped into the Sand and Gravel category, and hard bedrock material were grouped into the Bedrock category.

4.5 Model Development

The 3D CGM was in large part developed to delineate in detail the size, extent, and geometry of various lithologic layers throughout the Study Area that greatly affect how water moves through the system. Geologic formations were subdivided to illustrate hydrologic properties. The lithologic information was subdivided into two main categories, bedrock and unconsolidated. The bedrock category covers lithified rock material located at depth below the unconsolidated materials. For this model, the bedrock is subdivided into units based on previous mapping. The bedrock units within this model include: the Borden Group, the New Albany Shale, the Muscatatuck formation, and the Bainbridge formation. The unconsolidated category includes all material that is on top of the bedrock. These are mainly loose sediment deposits such as clays, silts, sands, gravels, and boulders. These unconsolidated materials were grouped into two main categories based on permeability. The more permeable layers of sand and gravel were grouped together, and less permeable layers of clay and silt were grouped together. The resulting model illustrates sand/gravel as blue and clay/silt as yellow as shown in Figure 9.

4.6 Geologic Cross-Sections

Ten geologic cross-sections were created using the 3D CGM to illustrate variations in the generalized lithologies across the study area. Five cross-sections were drawn west-to-east (A-A', B-B', C-C', D-D', and E-E') and five north-to-south (F-F', G-G', H-H', I-I', and J-J'). The location of each cross-section is shown in Figure 10. The cross-sections are shown as Figures 11-20.

4.7 Discussion

This model defines four discontinuous layers of sand and gravel, separated by thick layers of silt and clay. The model shows the bottom sand and gravel layer (Deep Aquifer) as regionally continuous and thicker in most sections than the sand and gravel layers above. The model also shows the upper most sand and gravel layer (Shallow Aquifer) as relatively continuous throughout the study area, but generally thinner than the Deep Aquifer. The model also illustrates two discontinuous layers of sand and gravel between the Shallow and Deep Aquifers. These middle layers are shown with higher variability, showing relatively thick sections in some areas that pinch out in other areas. In general, the model shows the high local variability in extent and geometry of unconsolidated deposits, at the same time as the regionally continuous nature of the Shallow and Deep aquifers.

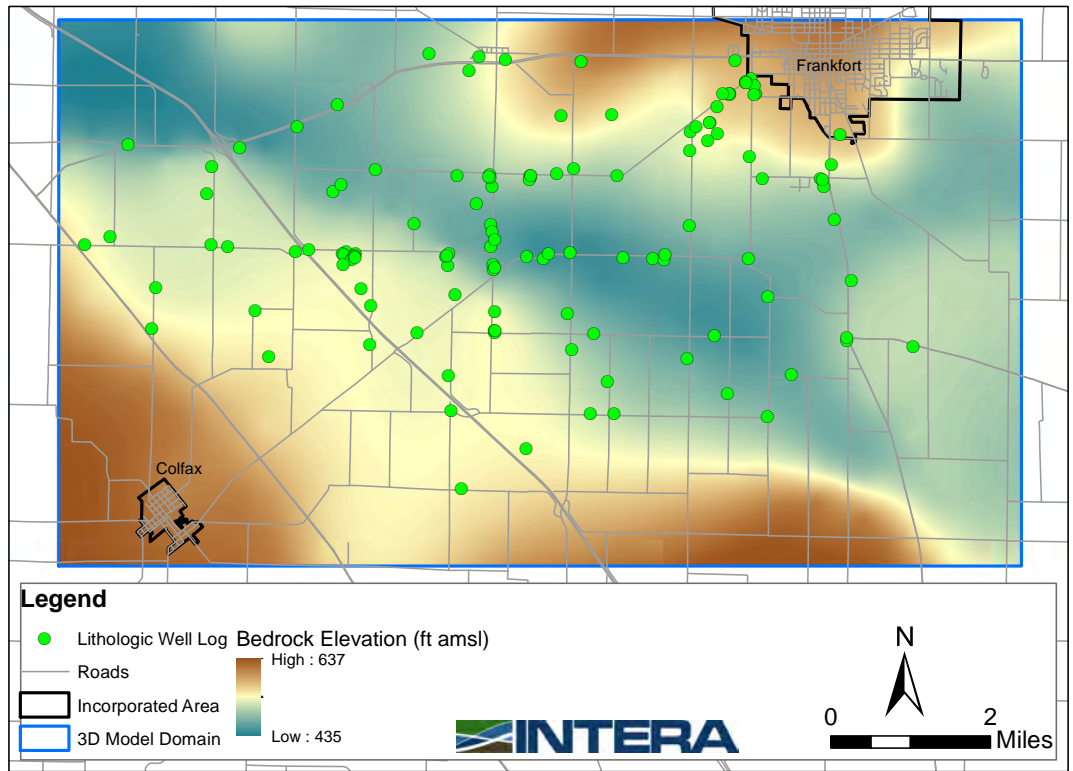


Figure 8: Bedrock elevation in the model domain.

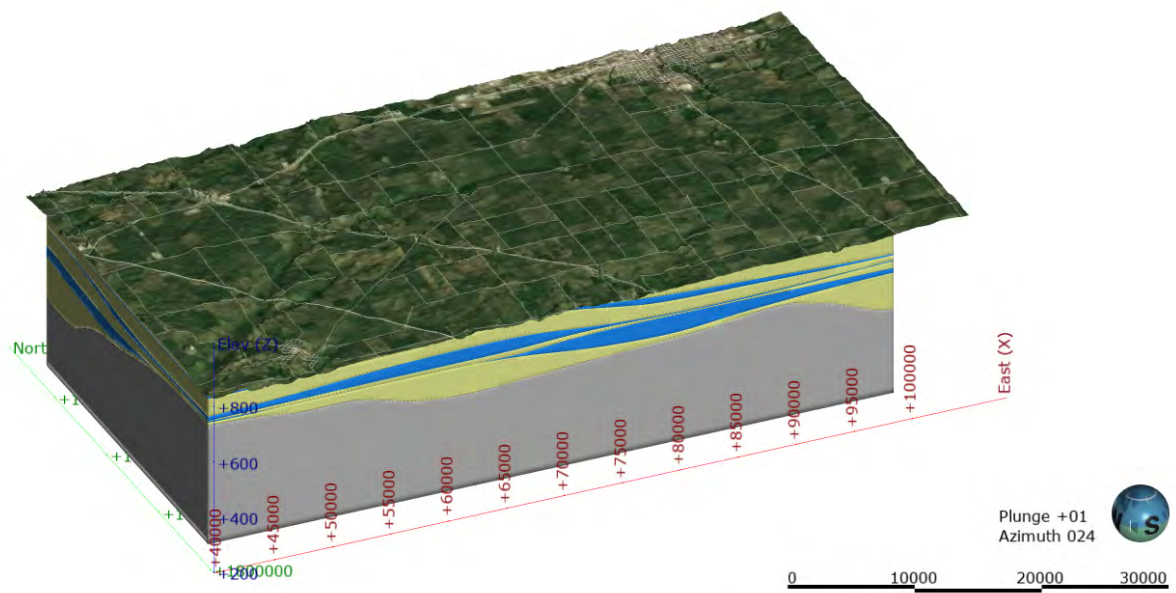


Figure 9: Example image of the entire 3D geologic model.

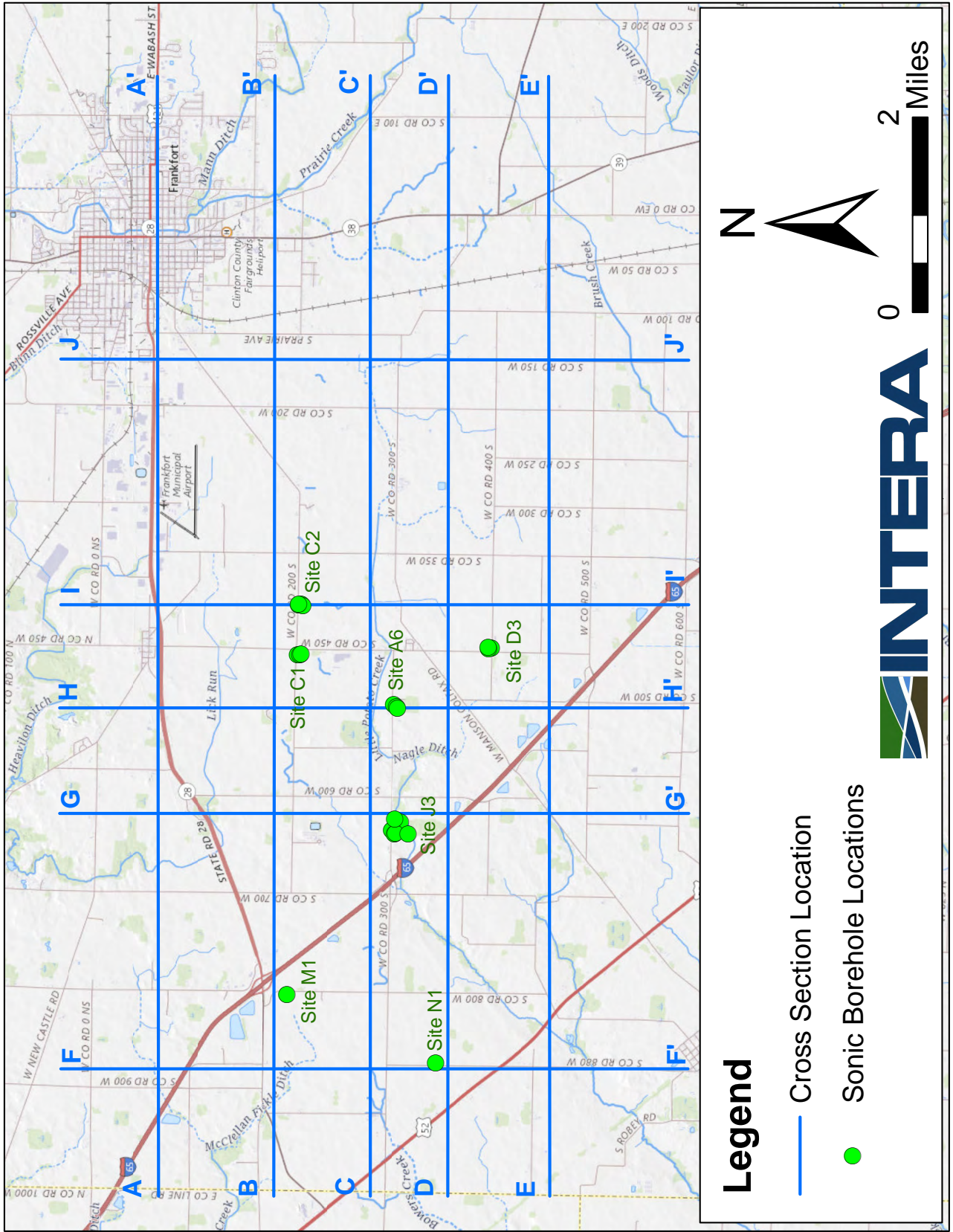
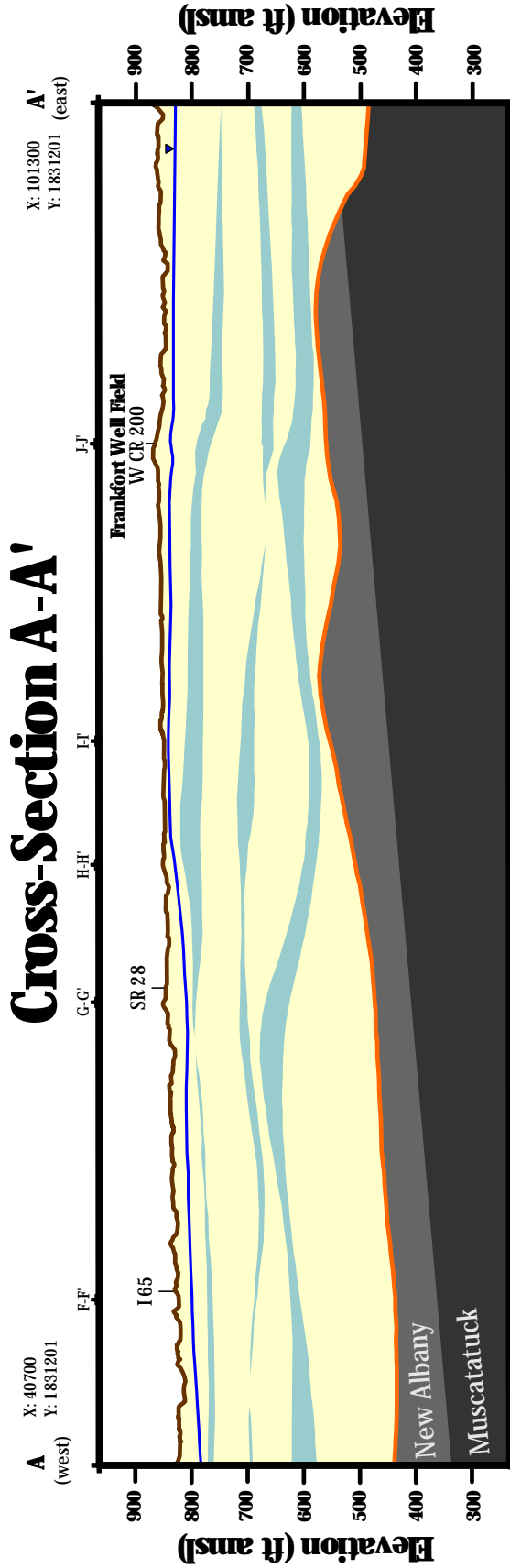


Figure 10: Cross section locations.



Legend

Bedrock

- New Albany
- Muscatatuck

Surfaces

- Water Table
- Bedrock Surface

Unconsolidated

- Sand and/or Gravel
- Clay/Fines

Surfaces

- Topographic Surface

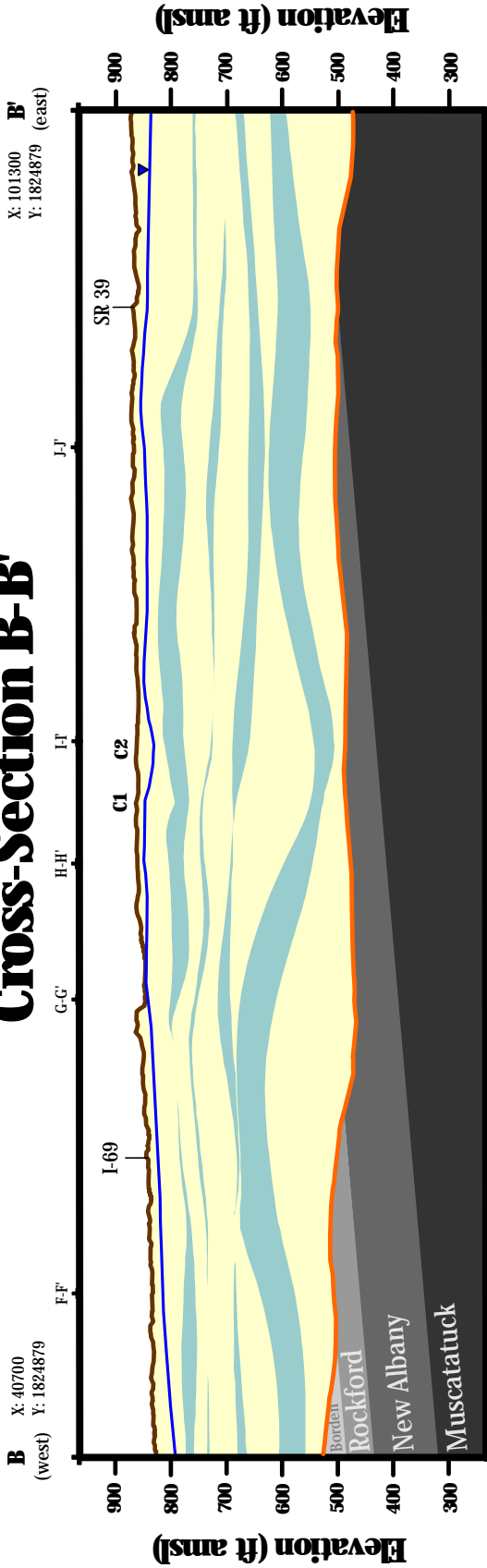
0 1 2 Miles

Horizontal Scale

Vertical Exaggeration: 25x Projection: Indiana State Plane (US Feet) NAD83

Figure 11: Cross sections A-A'.

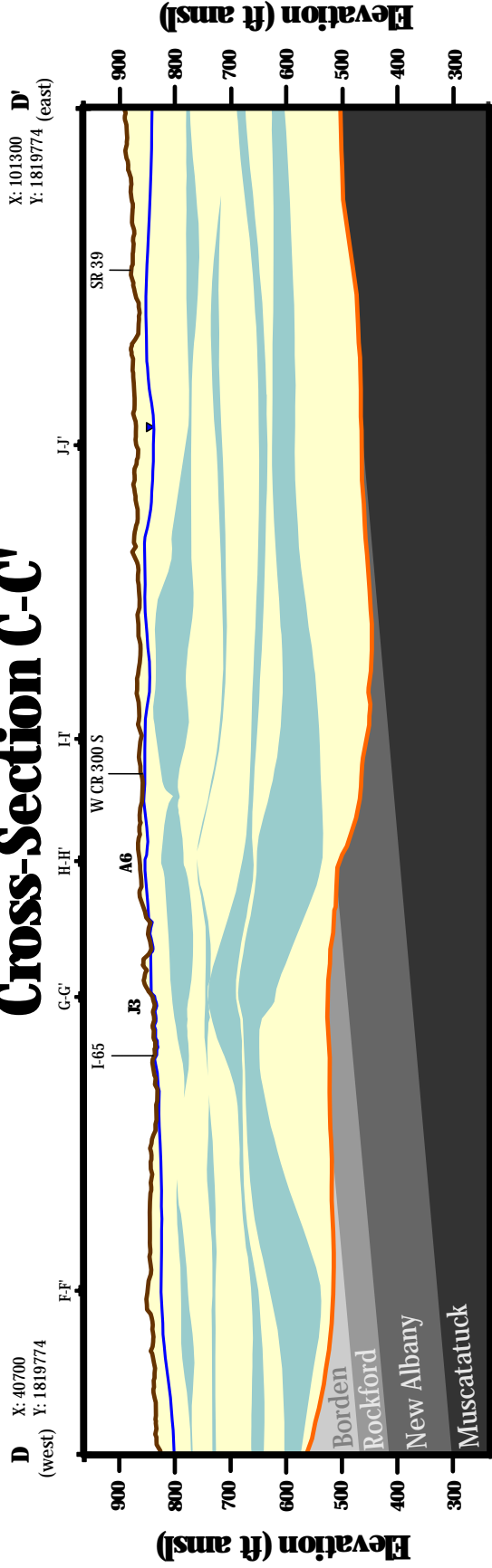
Cross-Section B-B'



Vertical Exaggeration: 25x Projection: Indiana State Plane (US Feet) NAD83

Figure 12: Cross sections B-B'.

Cross-Section C-C'



Legend

Bedrock

- Borden
- Rockford
- New Albany
- Muscatatuck

Surfaces

- Water Table
- Bedrock Surface

Unconsolidated

- Sand and/or Gravel
- Clay/Fines

Surfaces

- Topographic Surface

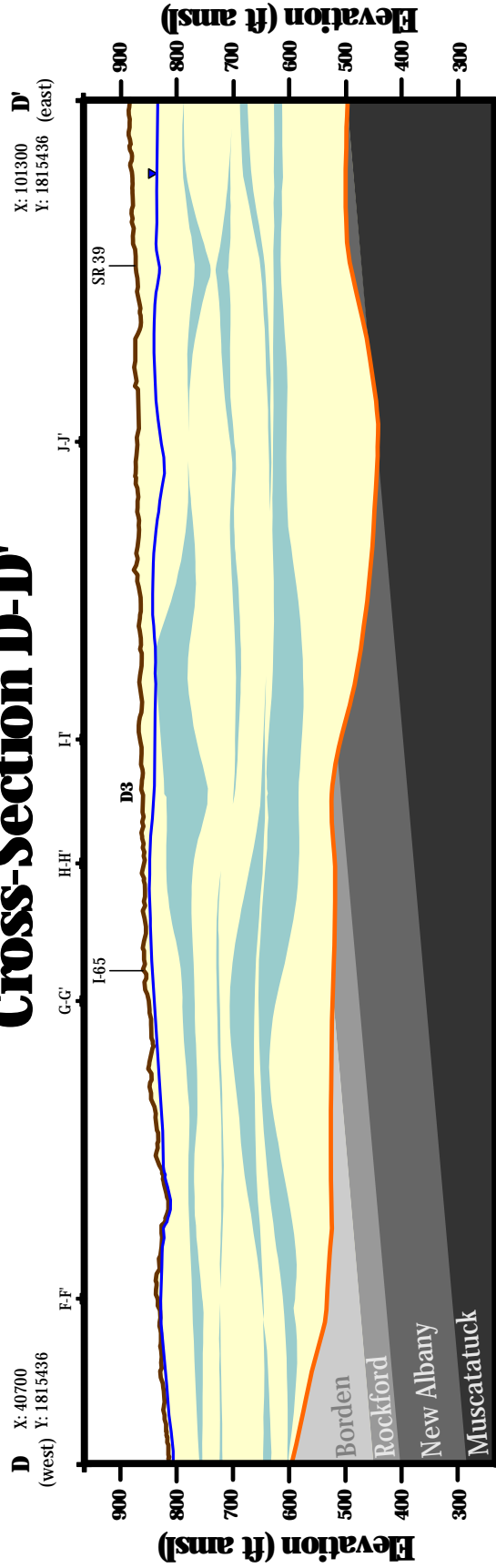
0 1 2 Miles

Horizontal Scale

Vertical Exaggeration: 25x Projection: Indiana State Plane (US Feet) NAD83

Figure 13: Cross section C-C'

Cross-Section D-D'



Legend

Bedrock

- Borden
- Rockford
- New Albany
- Muscatatuck

Surfaces

- Water Table
- Bedrock Surface

Unconsolidated

- Sand and/or Gravel
- Clay/Fines

Surfaces

- Topographic Surface

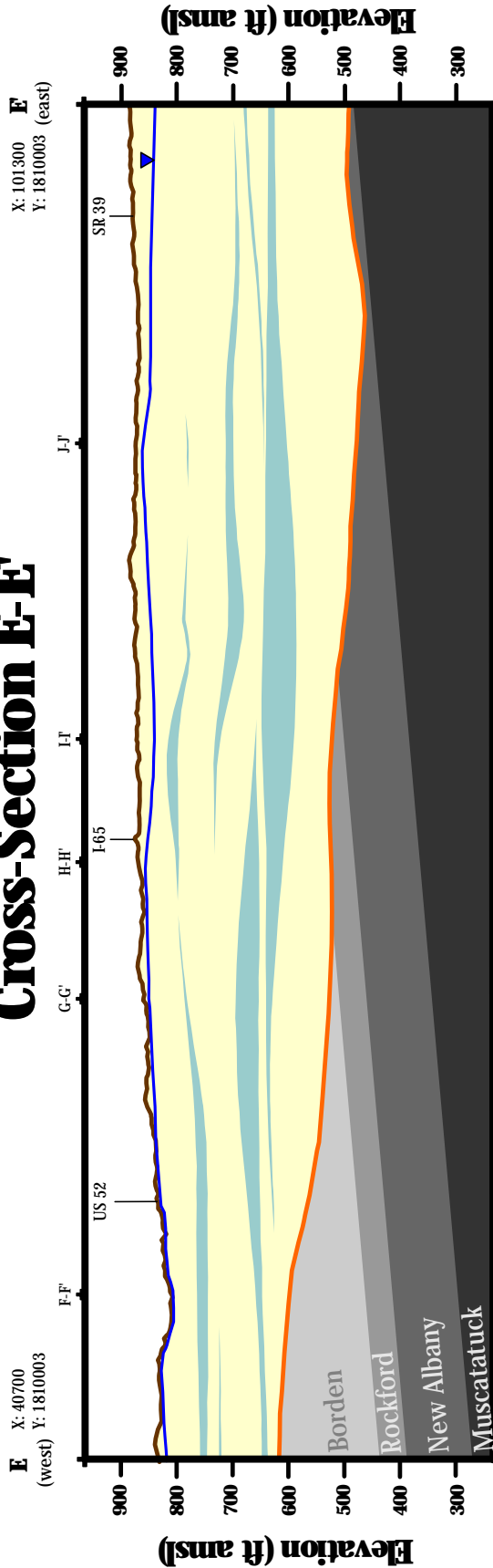
0 1 2 Miles

Horizontal Scale

Vertical Exaggeration: 25x Projection: Indiana State Plane (US Feet) NAD83

Figure 14: Cross section D-D'

Cross-Section E-E



Legend

Bedrock

- Borden
- Rockford
- New Albany
- Muscatatuck

Unconsolidated

- Sand and/or Gravel
- Clay/Fines

Surfaces

- Water Table
- Bedrock Surface
- Topographic Surface

0 1 2 Miles

Horizontal Scale

Vertical Exaggeration: 25x Projection: Indiana State Plane (US Feet) NAD83

Figure 15: Cross sections E-E'.

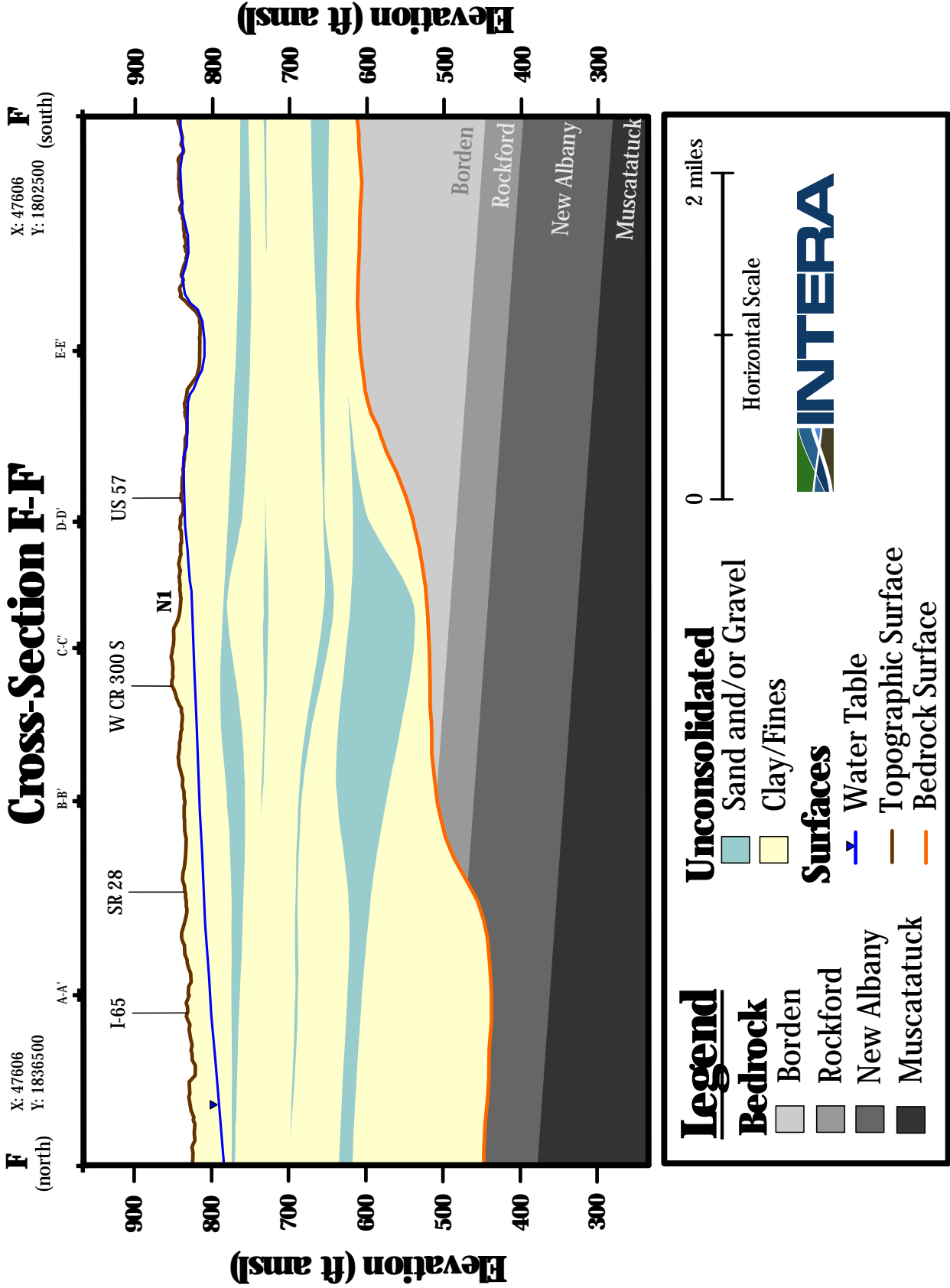


Figure 16: Cross section F-F'

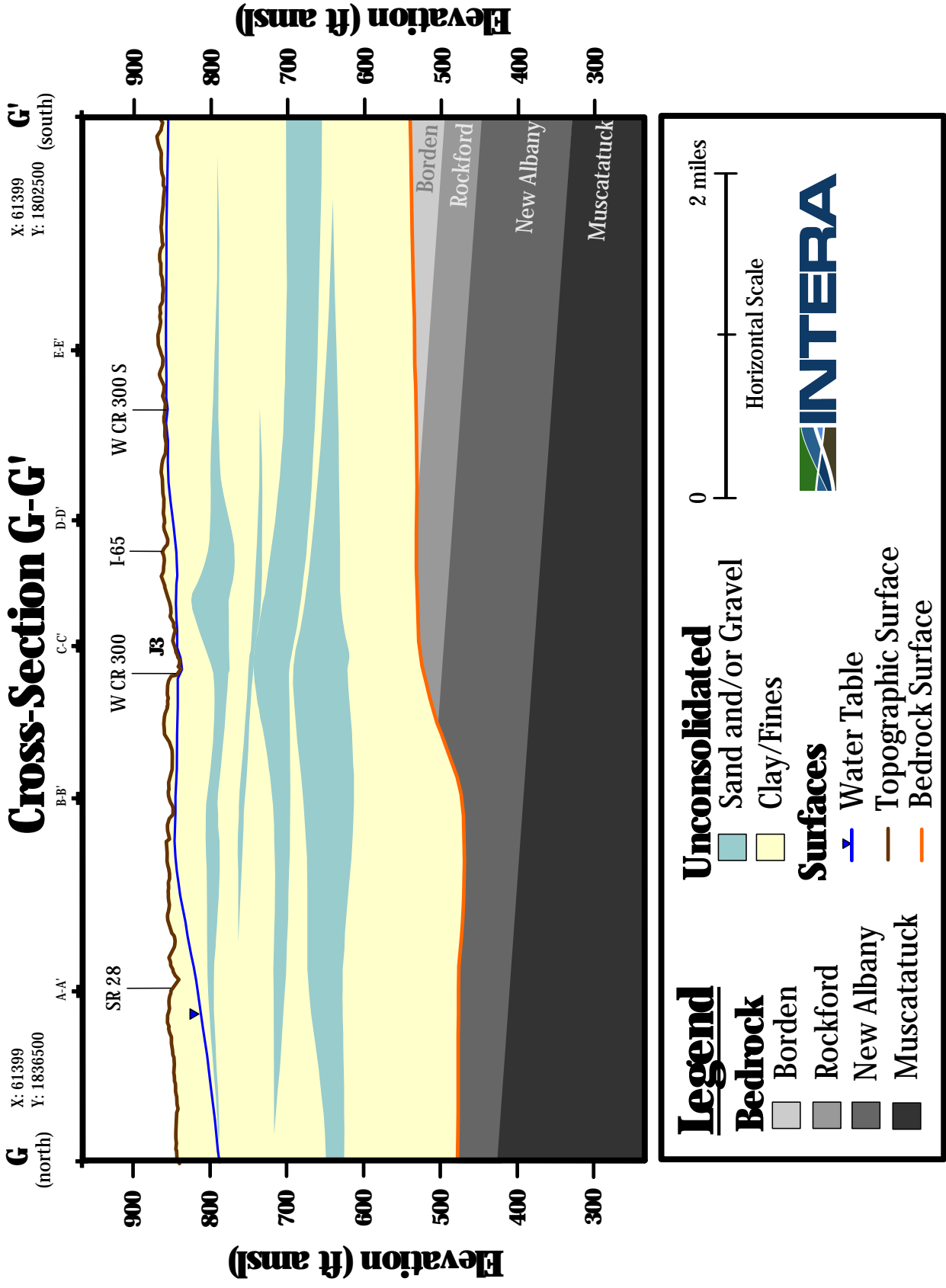


Figure 17: Cross section G-G'.

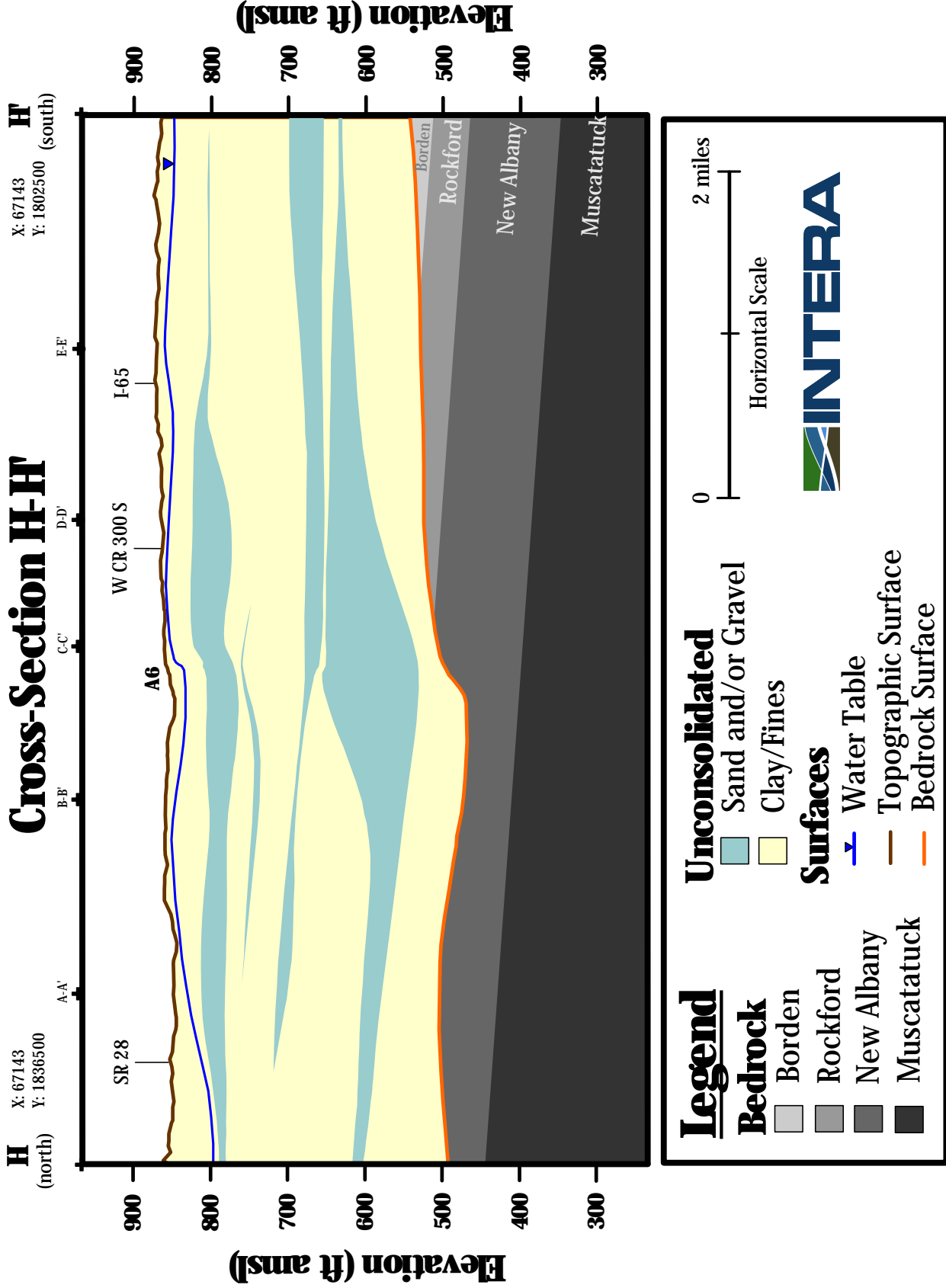
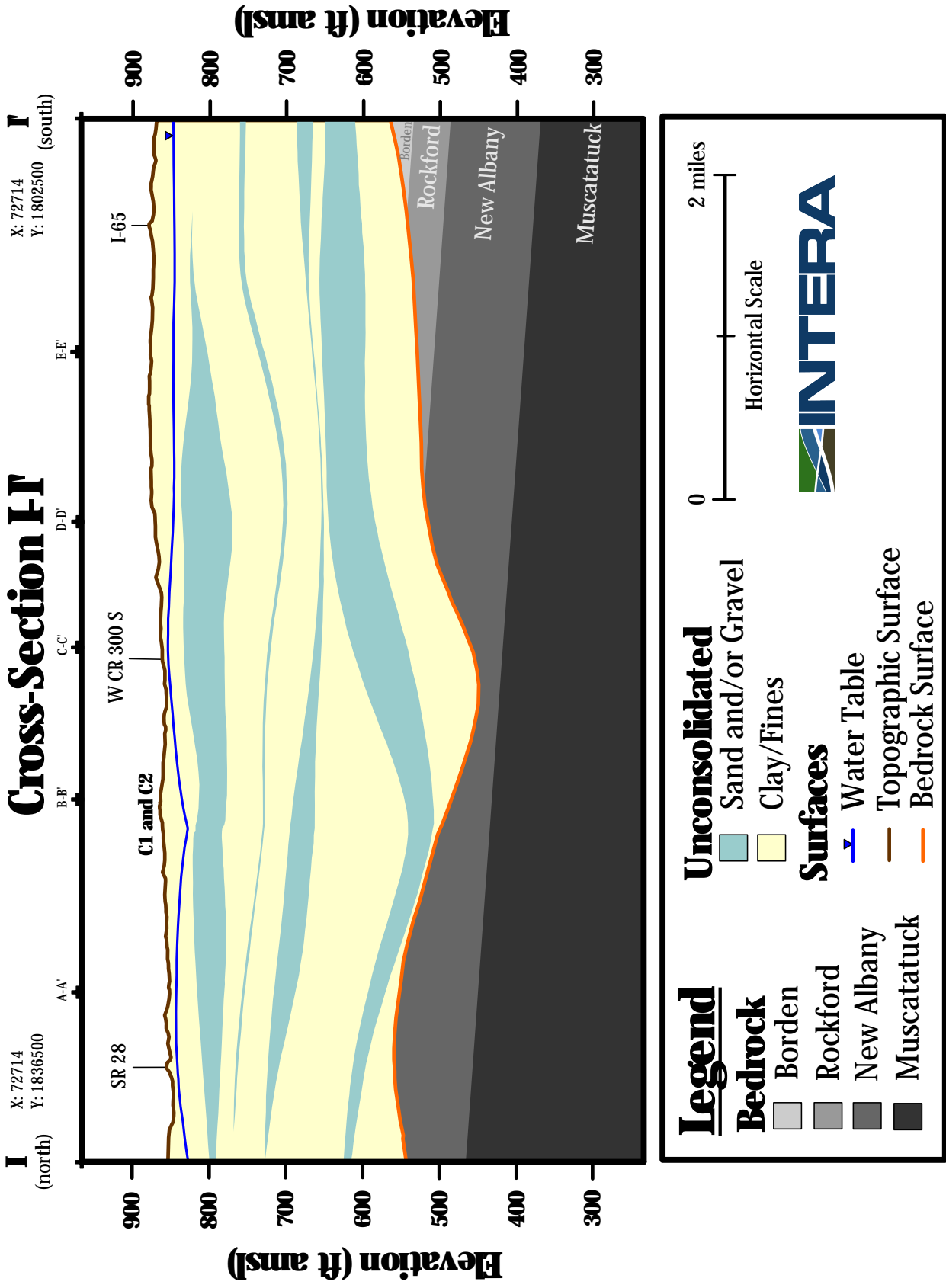


Figure 18: Cross section H-H'.

Cross-Section I-I



X: 72714
 Y: 1802500 (south)

X: 72714
 Y: 1836500 (north)

Figure 19: Cross sections I-I.

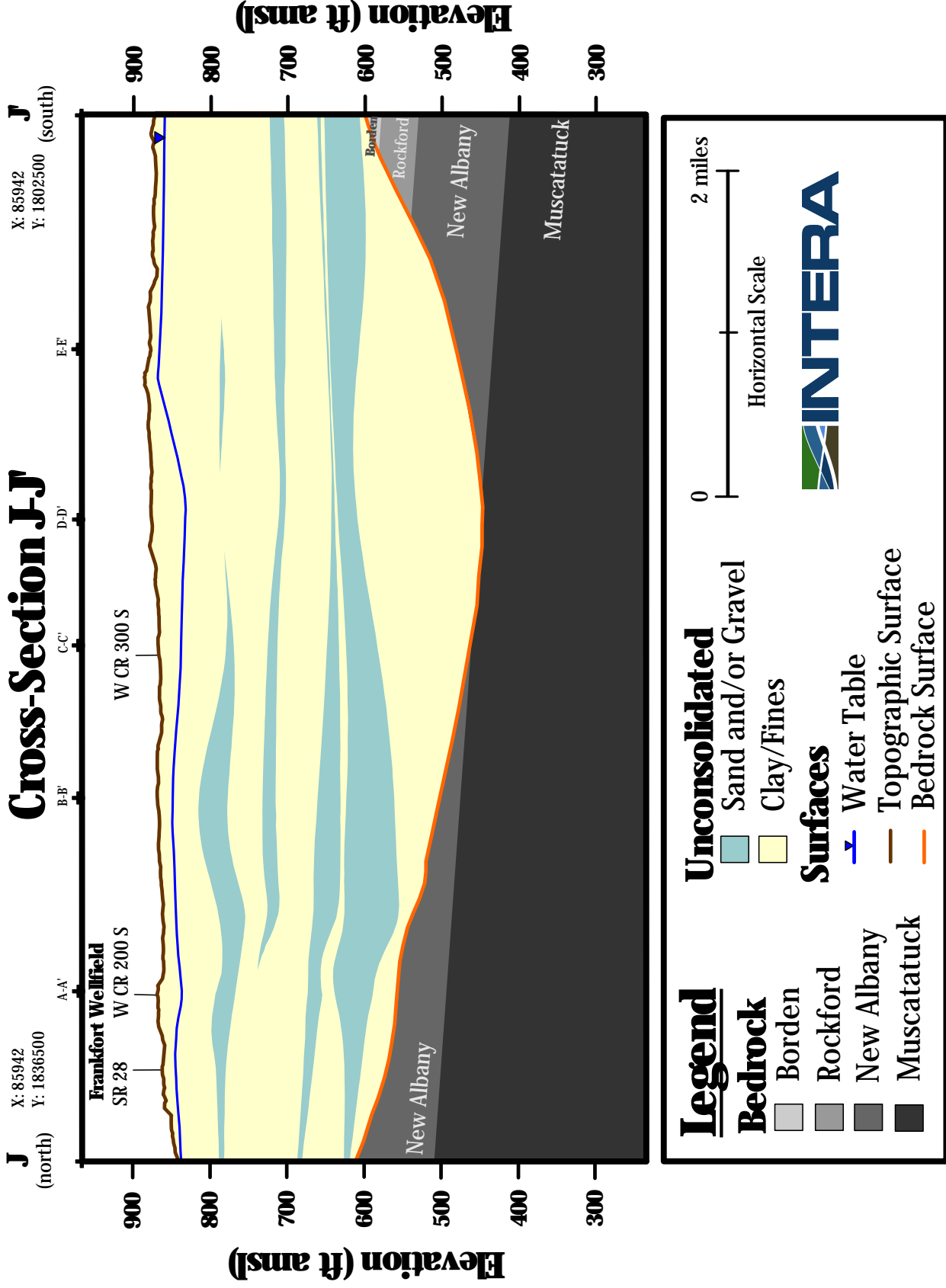


Figure 20: Cross section J-J.

5 Hydraulic Testing

In September 2022, two extended aquifer pumping tests were conducted at Site J-3 utilizing Test Wells TW-1 and TW-2. The objective of the aquifer pumping tests was to characterize the hydraulic properties of the unconsolidated aquifer. Tables 1 and 2 summarize the well construction details of TW-1 and TW-2 and the monitoring well network. TW-1 was constructed in the deeper zone of the unconsolidated aquifer (screen interval 212 to 232 feet bgs), and TW-2 was screened in the upper zone (screen interval 107 to 137 feet bgs). TW-2 was pumped at an average pumping rate of approximately 391 gpm for seventy-two hours from September 9th to September 12th, 2022. TW-1 was pumped at an average pumping rate of approximately 76 gpm for 72 hours from September 19th to 22nd, 2022.

For each aquifer pumping test, the pump discharge rate was measured with an inline digital flowmeter. Water was pumped through flexible hose and then discharged onto plastic sheeting and silt fencing to minimize erosion, which eventually flowed into Little Potato Creek south of TW-1 and TW-2 (Figure 21). During each aquifer test (including drawdown and recovery periods), water levels were measured and recorded in the pumping well and monitoring well network with In-Situ Inc. brand down-hole pressure transducers and digital data loggers. Site cross sections are presented in Figures 22 - 25.

5.1 Results

The drawdown and recovery data from the TW-1 aquifer test are shown as a hydrograph in Figure 26. The TW-1 aquifer test hydrographs illustrate that TW-1 experienced over 145 feet of drawdown (at an average pumping rate of 76 gpm) during the course of the test, whereas monitoring wells MW-1, MW-3, and MW-4 experienced less than 1 foot of drawdown. Although TW-1 was hydraulically developed after construction with airlifting and dual surge blocks, the extensive drawdown suggests that the well either had a very low efficiency or the aquifer in the direct vicinity had a low transmissivity value. The drawdown data for MW-1, MW-3, and MW-4 was highly erratic likely due to fluctuations in the TW-1 pumping rate. Overall, the data collected from the TW-1 aquifer test did not have sufficient resolution to calculate aquifer hydraulic parameters using analytic aquifer curve matching techniques.

TW-1, MW-1, MW-3, and MW-4 were also monitored during the TW-2 aquifer test, and the data were analyzed to estimate aquifer hydraulic parameters. The drawdown and recovery data from the TW-2 aquifer test are shown as a hydrograph in Figure 27. Overall, the data from the TW-2 aquifer test is higher quality as compared to the TW-1 data and is suitable for calculating aquifer hydraulic parameters using analytical type curve matching techniques. After seventy-two hours of continuously pumping at approximately 391 gpm, TW-2 experienced approximately 22 feet of drawdown, which equates to a final specific capacity of 18 gpm/ft. The relatively high specific capacity value suggests that the aquifer in the vicinity of TW-2 has a relatively high transmissivity value.

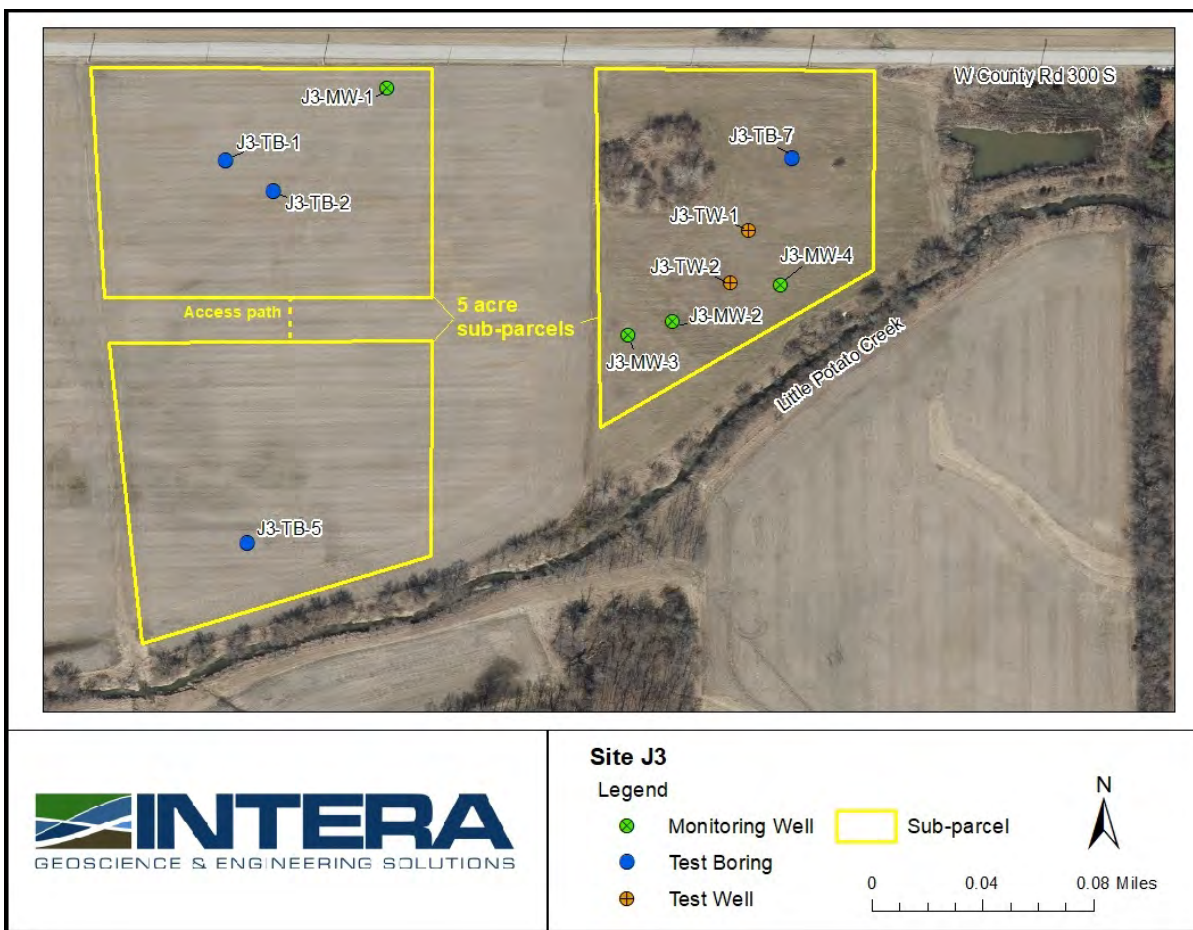


Figure 21: Test well and monitoring well locations at Site J3.



Figure 22: Map of geologic sections through Site J3.

5.2 Analysis

The drawdown and recovery data from TW-2 and the monitoring well network were analyzed with AQTESOLV for Windows Aquifer Analysis Program version 4.5 (Hydrosolve Inc., 1996-2007) to provide estimates of the hydraulic properties of the unconsolidated aquifer. The Hantush semi-confined/leaky aquifer analytical technique (Hantush, 1960) was used to calculate the hydraulic parameters for all of the wells monitored during the TW-2 aquifer test. Partial penetration was incorporated into the analysis to account for the different well screen intervals and depths of the test wells and monitoring wells (Tables 1 and 2). The Hantush semi-confined/leaky aquifer solution is consistent with the conceptual geologic model of the study area which illustrates the presence of an upper low permeability confining layer overlying the permeable sand and gravel formation. The results of the analysis are included in Figures 28 through 31.

The calculated aquifer hydraulic parameters from TW-2 aquifer test are summarized in Table 3. There is a wide range in calculated hydraulic parameters from the TW-2 aquifer test. The range in calculated aquifer hydraulic parameters is likely related to the large lateral and vertical variation in lithology encountered in the test borings, which is consistent with the depositional environment associated with buried bedrock valley aquifers. Note that the aquifer hydraulic parameters calculated from analyzing TW-1, MW-1, MW-3, MW-4 and A6-MW-1D simultaneously likely provide a good average approximation of the overall unconsolidated

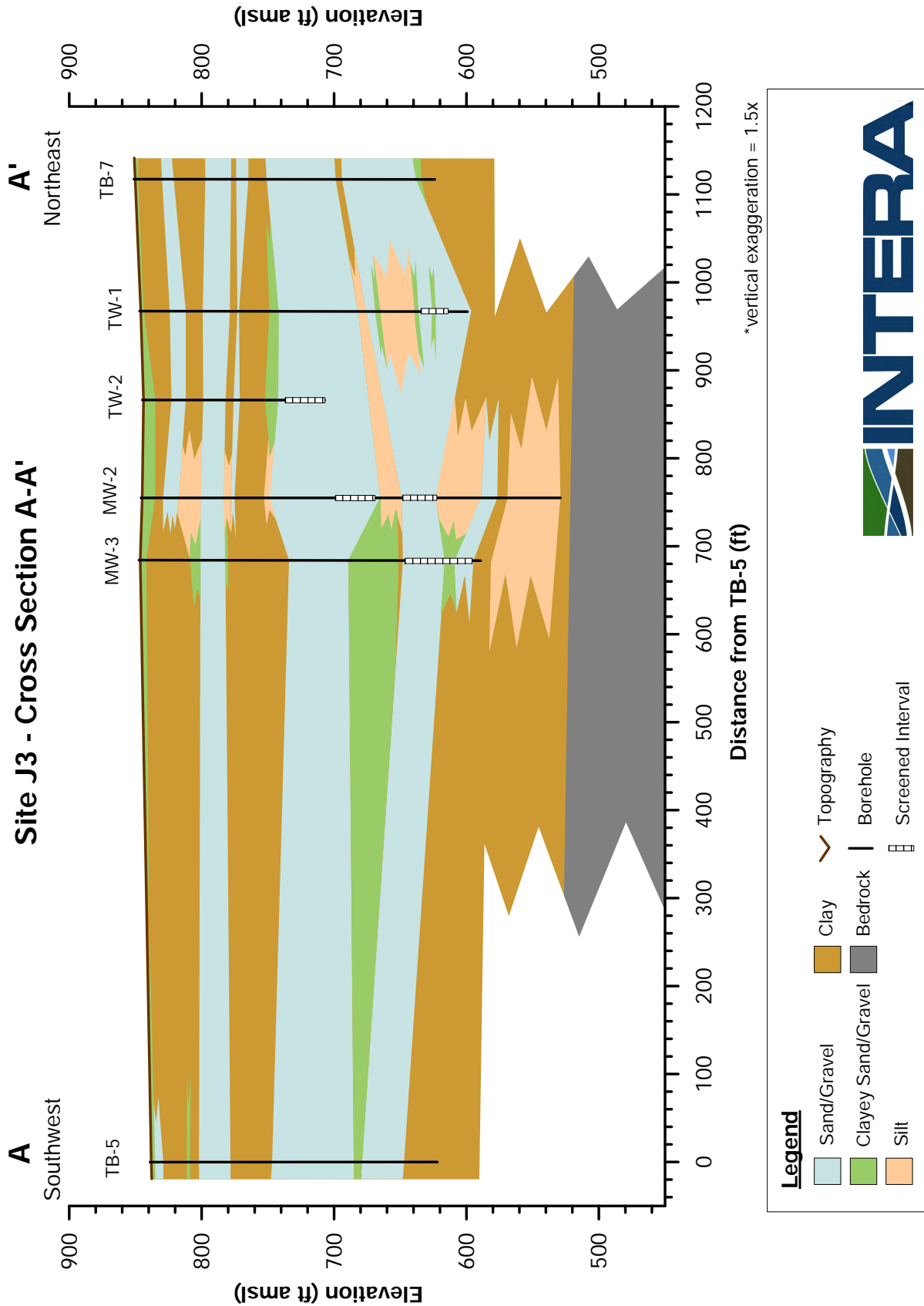


Figure 23: Geologic sections through Site J3A-J3A'.

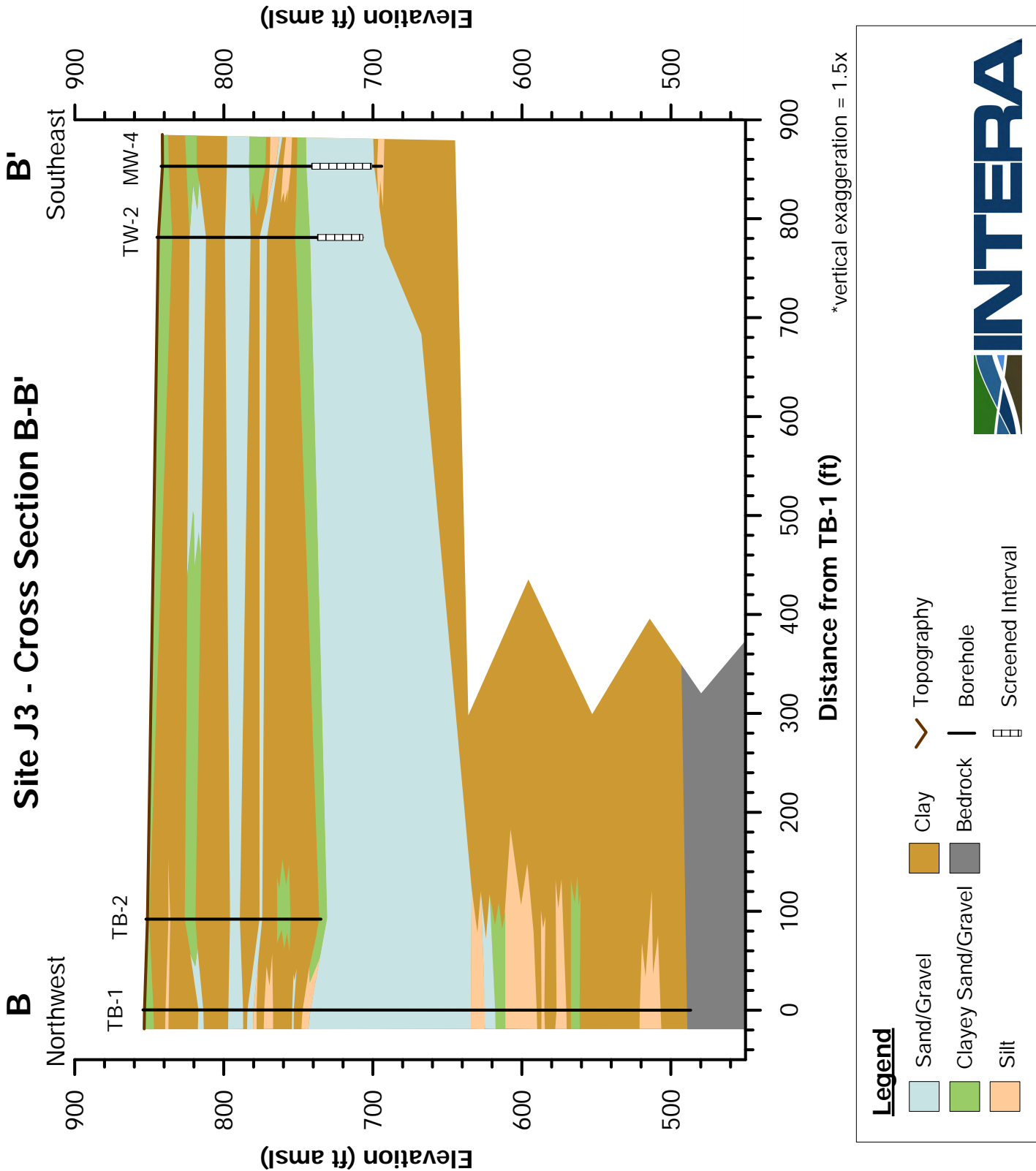


Figure 24: Geologic sections through Site J3B-J3B'.

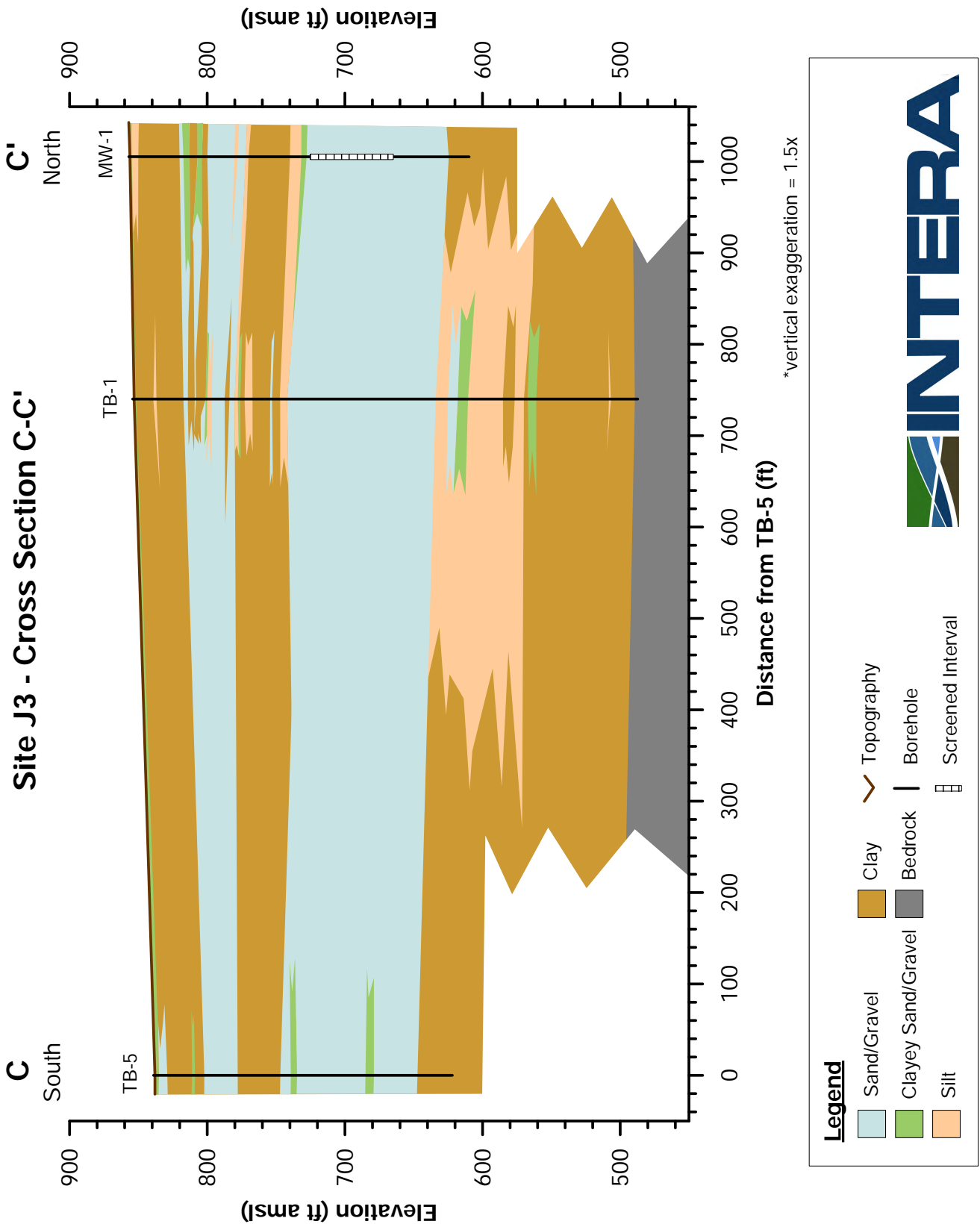


Figure 25: Geologic sections through Site J3C-J3C'.

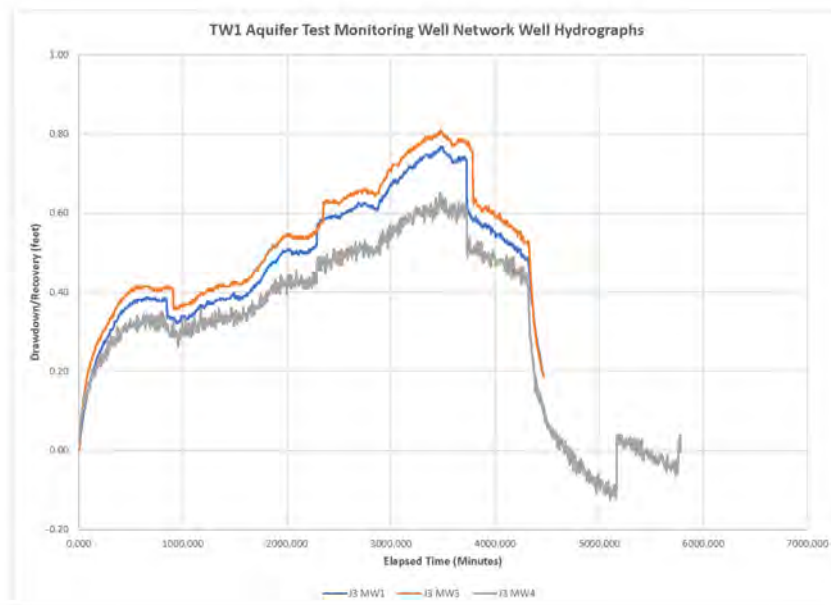
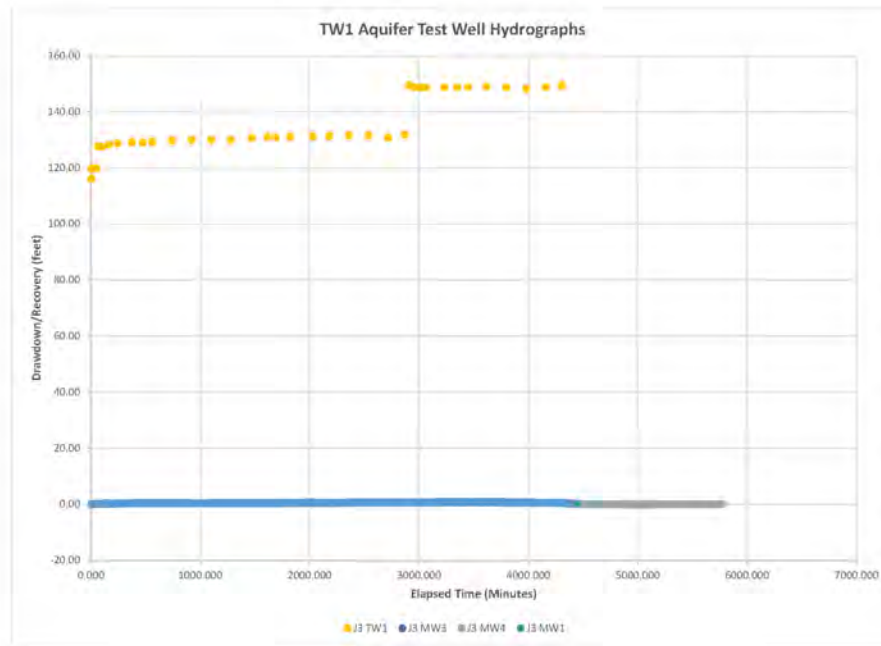


Figure 26: TW-1 aquifer test well hydrographs: (*top*) with TW-1, and (*bottom*) without TW-1.

TW 2 Aquifer Test, Well Hydrographs

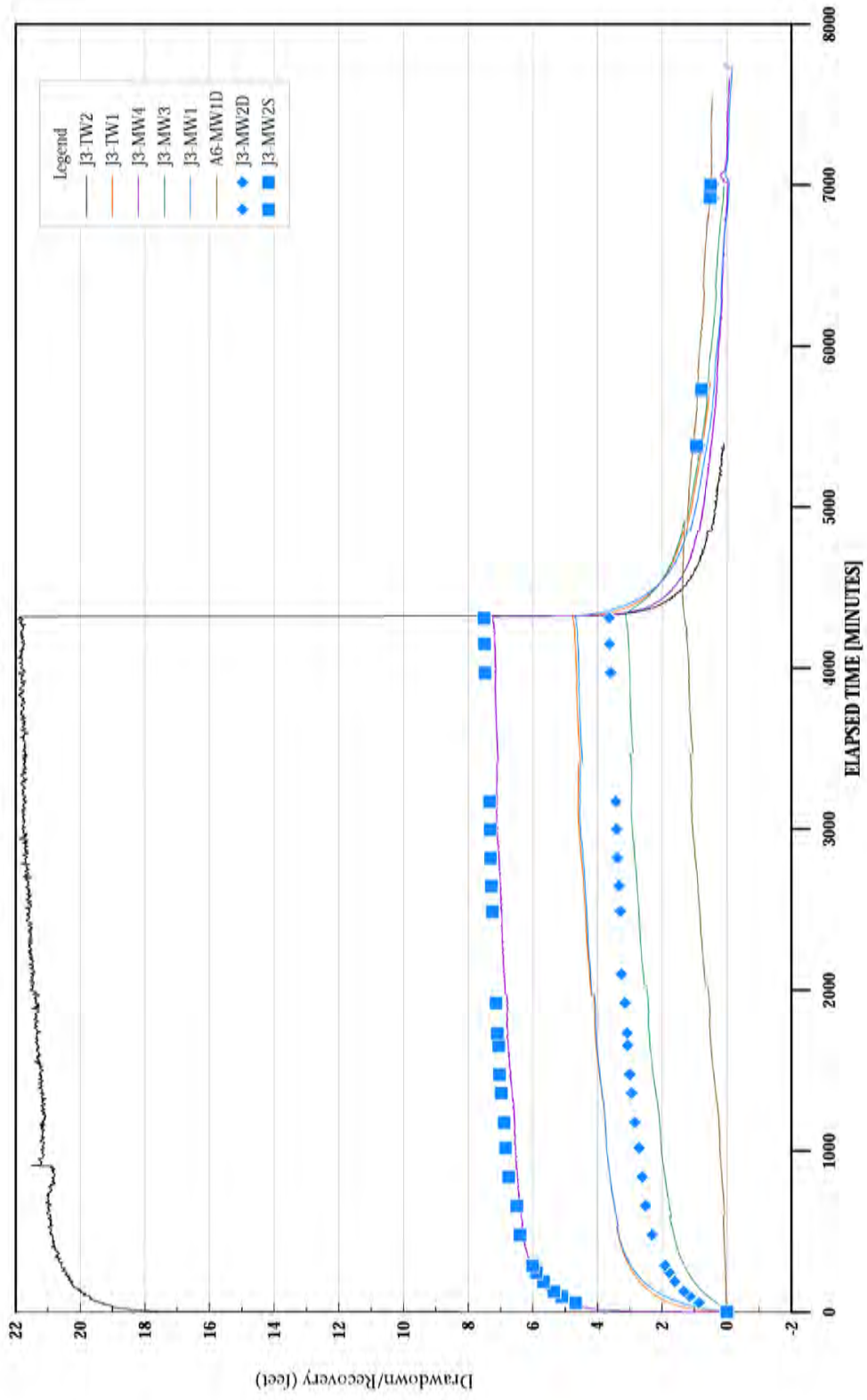


Figure 27: TW-2 aquifer test well hydrographs.

aquifer in the vicinity of Site J3. Those values are presented in red text in Table 3.

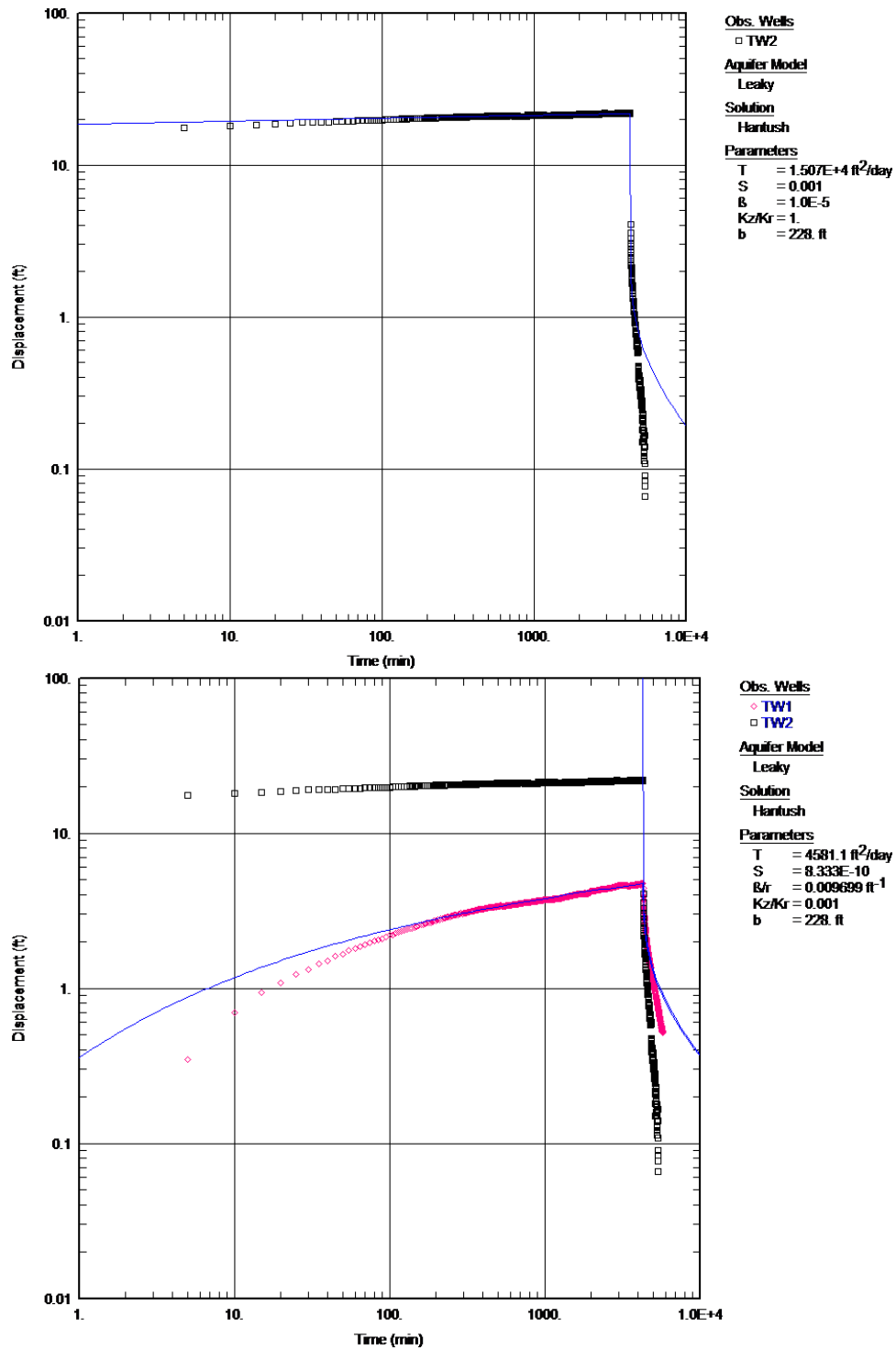


Figure 28: AQTESOLV results for TW-2 alone (*top*), and TW-1 (*bottom*).

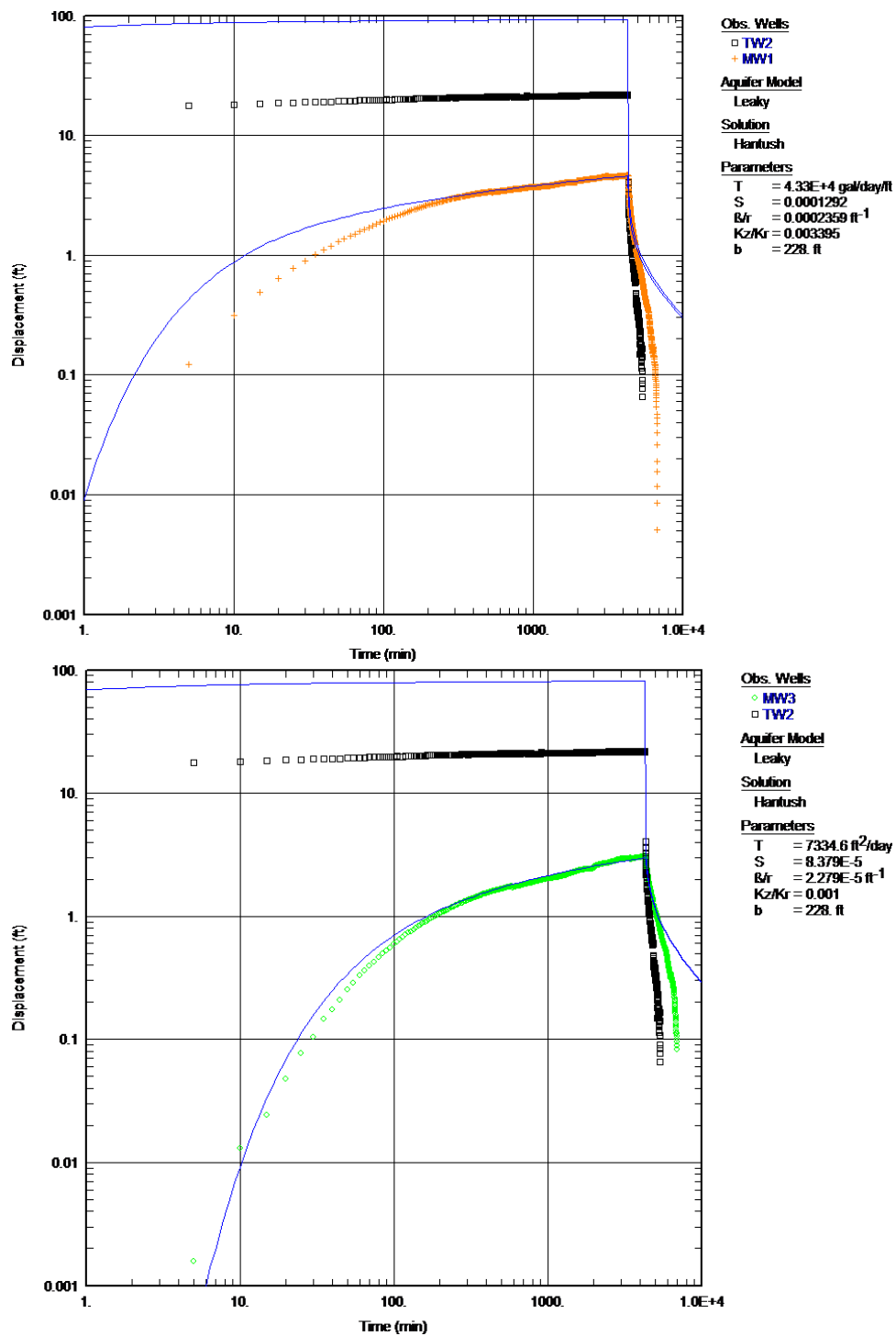


Figure 29: AQTESOLV results for MW-1 (*top*), and MW-3 (*bottom*).

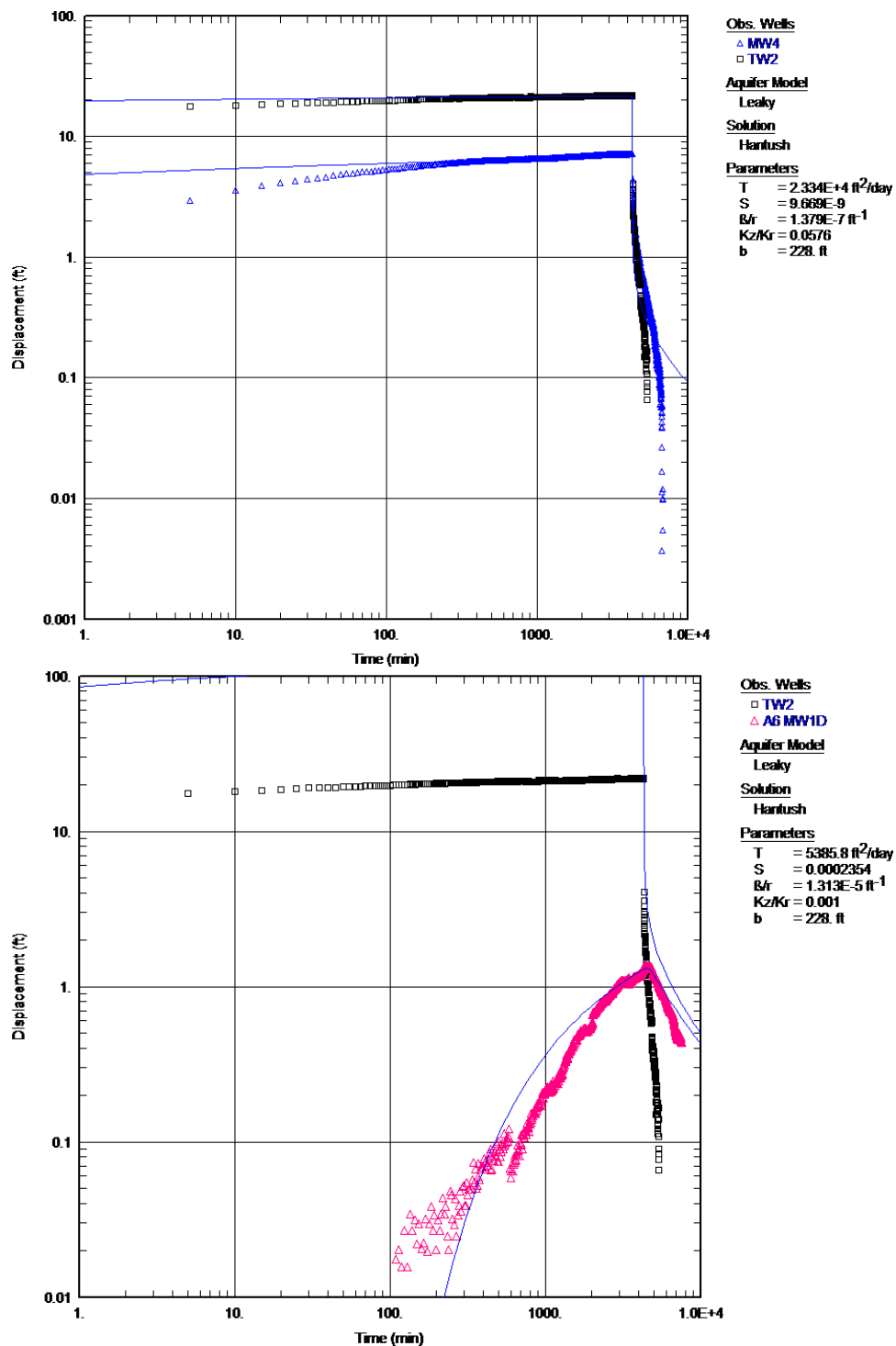


Figure 30: AQTESOLV results for MW-4 (top), and A6-MW-1D (bottom).

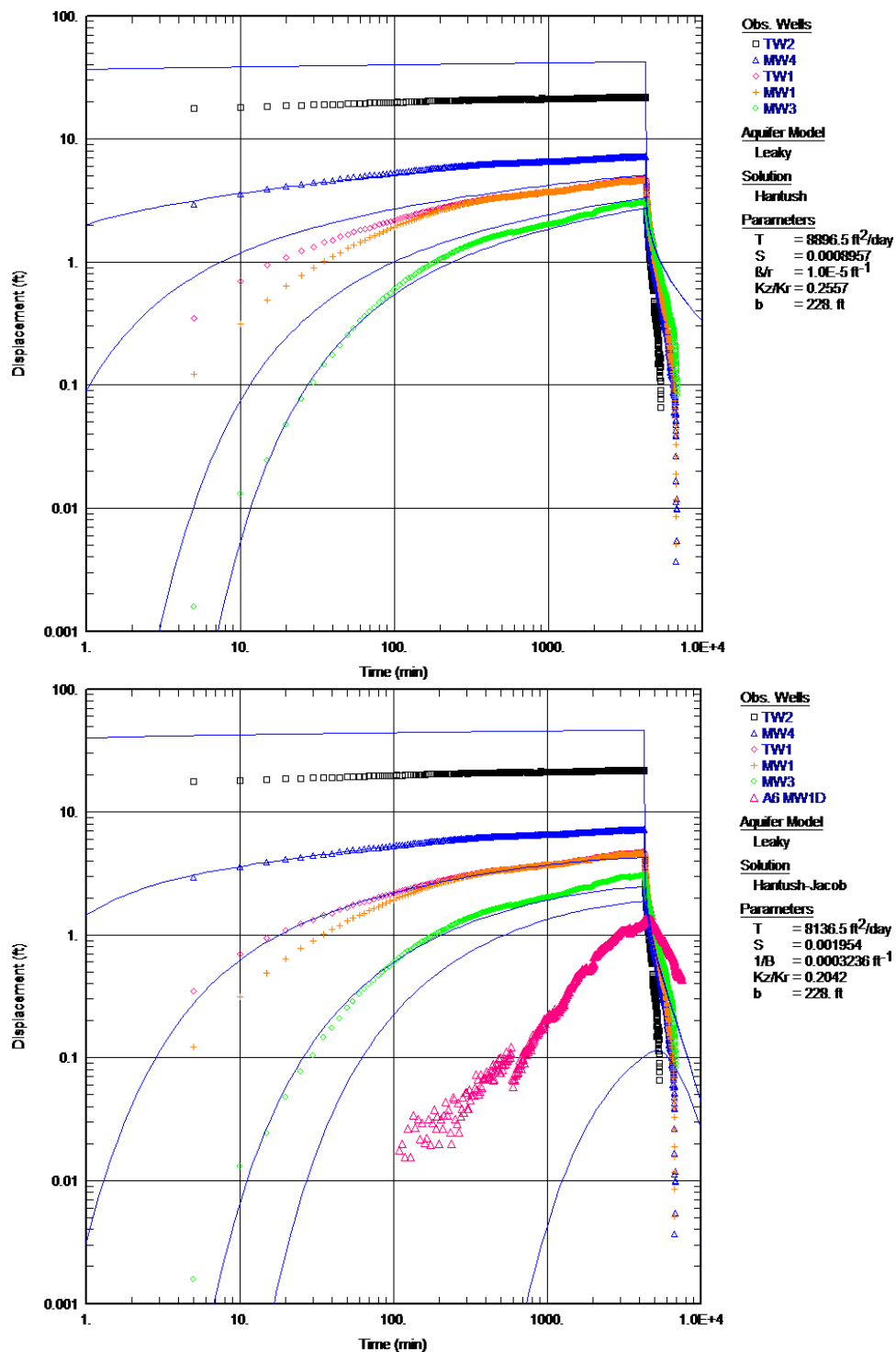


Figure 31: AQTESOLV results for TW-1, MW-1, MW-3, and MW-4 (*top*), and TW-1, MW-1, MW-3, MW-4, and A6 MW-1D (*bottom*).

Table 3: Summary of hydraulic parameters derived from aquifer testing of TW-2.

Well ID	Distance from TW2 (ft)	Transmissivity, T (ft ² /day)	Storativity, S (-)	Specific Storage, S_s (1/ft)	Anisotropy ratio, k_z/k_r (-)	Leakance, L (1/ft)	Resistance, c (days)
TW-2	0.5	15,070	-	-	1.0	1×10^{-5}	6.6×10^5
TW-1	104.3	4,582	8.3×10^{-10}	3.6×10^{-12}	0.001	9.7×10^{-3}	83.
MW-1	626	5,790	1.3×10^{-4}	1.0×10^{-6}	0.003	2.4×10^{-4}	2.3×10^3
MW-3	964	7,335	8.4×10^{-5}	3.7×10^{-7}	0.001	2.3×10^{-5}	2.6×10^5
MW-4	73	23,340	9.7×10^{-9}	4.2×10^{-11}	0.06	1.4×10^{-7}	2.2×10^6
A6-MW-1D	6,314	5,386	2.4×10^{-4}	1.0×10^{-6}	0.001	1.3×10^{-5}	1.1×10^6
TW-1,MW-1,and MW-3,MW-4	-	8,594	9.0×10^{-4}	4.0×10^{-6}	0.246	1.0×10^{-5}	1.2×10^6
TW-1,MW-1,MW-3, and MW-4, A6-MW-1D	-	8,136	2.0×10^{-3}	1.0×10^{-5}	0.20	3.2×10^{-4}	1.2×10^3

Notes: ft = feet. ft/day = feet per day.

6 Water Quality

INTERA collected raw-water samples from select monitoring wells and the two test wells to characterize the water-quality characteristics of the aquifer system. The monitoring well samples were collected over the course of four days between 8/1/22 and 8/4/22 and the test well samples were collected during the respective aquifer tests (Section 5). The samples were analyzed for inorganic and metal constituents by Eurofins Laboratory, Inc.

The analytical lab results are summarized in three tables: Table 4 presents field parameters and the results for general chemistry from the monitoring wells, Table 5 shows the results for 29 metal constituents for the monitoring wells, and Table 6 presents the results from the test wells. Full lab reports are included as Appendix C.

Figure 32 shows a piper plot with results from the monitoring wells. A piper plot is a tri-linear diagram which summarizes and illustrates the major inorganic species in the sample. A piper diagram can be used to compare different water samples and determine water type. The clustering of data points on the plot indicates that the sources are similar in type. All of the water sampled can be classified as calcium-bicarbonate water, which is typical for Indiana.

All of the samples exhibit elevated iron and manganese concentrations, with iron ranging from 0.62 to 3.1 mg/L and manganese ranging from 0.07 to 1.3 mg/L (Tables 5 and 6). All of the samples exceeded the USEPA secondary maximum contaminant level (SMCL) of 0.3 mg/L for iron and 0.05 mg/L for manganese. For both iron and manganese, the SMCL is set to minimize corrosion, staining, and undesirable taste and odor effects. Given the observed concentrations, treatment would be required for both iron and manganese. Most iron and manganese removal treatment processes incorporate oxidation to convert dissolved forms of the metals to a solid, followed by a filtration process.

Results from Site J3 suggest that arsenic levels are elevated at some locations in the aquifer system above the drinking-water standard. Elevated arsenic concentrations in groundwater sources are a national and regional concern (Warner et al., 2003). One of the monitoring wells, J3-MW-2D, and both test wells exhibited arsenic concentrations well above the USEPA maximum contaminant level (MCL) of 0.010 mg/L (Tables 5 and 6). The arsenic MCL is in place to minimize potential health effects from long-term exposure, including skin damage, problems with circulatory systems, and increased cancer risk. Arsenic is naturally occurring in groundwater, entering water sources through erosion of natural deposits in rocks. The mobilization of arsenic in groundwater can occur if there is a source of arsenic in the geologic materials and if the geochemical conditions are conducive to transport. Arsenic concentrations higher than the MCL would require treatment. Given the specific observed concentrations higher than the MCL and the general range of observed iron concentrations, there is the potential to promote the removal of arsenic with iron removal processes for drinking water via adsorption and co-precipitation.

Table 4: General chemistry results from the monitoring wells.

Parameter	Units	RL	MDL	C1-MW-1	C2-MW-1S	C2-MW-1D	J3-MW-2S	J3-MW-2D	D3-MW-1	A6-MW-1S	A6-MW-1D
Sample Date				08/01/22	08/04/22	08/04/22	08/03/22	08/03/22	08/01/22	08/03/22	08/02/22
Field pH	-	-	-	7.16	7.1	7.26	7.38	7.41	7.03	7.12	7.41
Specific Conductance	uS/cm	-	-	629	678	555	661	608	691	693	574
Bromide	mg/l	0.25	0.050	<0.25	<0.25	0.07	<0.25	<0.25	<0.25	<0.25	<0.25
Calcium	mg/l	0.20	0.044	93	100	62	76	73	110	96	60
Chloride	mg/l	0.20	0.170	20	16	3.7	17	6.9	23	20	6.4
Fluoride	mg/l	0.20	0.067	0.40	0.35	0.65	0.61	0.67	0.26	0.39	0.64
Magnesium	mg/l	0.20	0.049	31	33	25	30	32	37	32	27
Nitrate as N	mg/l	0.20	0.068	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Nitrite as N	mg/l	0.20	0.050	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Orthophosphate as P	mg/l	0.20	0.065	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Sulfate	mg/l	0.20	0.095	70	80	2	71	40	88	84	3.4
Alkalinity	mg/l	5.0	3.7	270	280	310	280	290	310	280	310
Ammonia	mg/l	0.40	0.20	<0.20	<0.20	0.4	0.48	0.55	<0.20	0.2	1.1

Notes: mg/l = milligrams per liter; RL = Reporting Limit; MDL = Method Detection Limit; NA = Not Available

Values below the Reporting Limit are approximate .

Table 5: Metals results from the monitoring wells.

Parameter	Units	RL	MDL	C1-MW-1	C2-MW-1S	C2-MW-1D	J3-MW-2S	J3-MW-2D	D3-MW-1	A6-MW-1S	A6-MW-1D
Sample Date	-	-	-	08/01/22	08/04/22	08/04/22	08/03/22	08/03/22	08/01/22	08/03/22	08/02/22
Aluminum	mg/L	0.10	0.025	0.049	<0.10	0.058	0.026	<0.10	0.031	<0.10	0.026
Antimony	mg/L	0.0030	0.0013	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Arsenic	mg/L	0.0010	0.00023	0.0026	0.005	0.00032	0.0016	0.016	0.0012	0.00097	0.0004
Barium	mg/L	0.0025	0.0007	0.19	0.21	0.22	0.076	0.14	0.11	0.16	0.2
Beryllium	mg/L	0.0010	0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	0.050	0.013	0.029	0.022	0.09	0.049	0.072	0.016	0.019	0.095
Cadmium	mg/L	0.00050	0.00017	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chromium	mg/L	0.0050	0.0011	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt	mg/L	0.0010	0.00040	<0.0010	<0.0010	<0.0010	0.00046	<0.0010	<0.0010	<0.0010	<0.0010
Copper	mg/L	0.0020	0.0005	<0.0020	<0.0020	<0.0020	0.00051	<0.0020	<0.0020	<0.0020	<0.0020
Iron	mg/L	0.10	0.047	2	3.1	1.3	2.3	0.81	3.3	2.7	2.2
Lead	mg/L	0.00050	0.00019	<0.00050	<0.00050	<0.00050	0.00073	<0.00050	<0.00050	<0.00050	<0.00050
Lithium	mg/L	0.010	0.0025	0.0049	0.004	0.0075	0.015	0.0089	0.005	0.0052	0.014
Manganese	mg/L	0.0025	0.00079	0.11	0.075	0.18	0.51	0.07	0.098	0.091	0.052
Mercury	mg/L	0.00020	0.000098	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	ug/L	0.00500	0.0025	0.11	0.065	0.0085	0.02	0.012	0.0054	0.0069	0.0081
Molybdenum	mg/L	0.0050	0.0025	0.01	0.0065	0.0085	0.02	0.012	0.0054	0.0069	0.0081
Nickel	mg/L	0.0020	0.00063	0.0007	<0.0020	<0.0020	0.0015	<0.0020	<0.0020	<0.0020	<0.0020
Potassium	mg/L	0.50	0.110	1.20	1	1.4	2.5	1.5	1.1	1.1	2
Selenium	mg/L	0.0025	0.0010	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
Silver	mg/L	0.00050	0.00012	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Sodium	mg/L	0.20	0.077	11	5.4	30	34	20	6.1	15	36
Strontium	mg/L	0.0040	0.0006	0.27	0.17	0.47	0.61	0.81	0.19	0.24	0.69
Thallium	mg/L	0.0020	0.0006	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Tin	mg/L	0.0050	0.0013	0.00	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Titanium	mg/L	0.0050	0.0018	0.00	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Vanadium	mg/L	0.0050	0.0022	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zinc	mg/L	0.020	0.0069	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020

Notes: mg/L = milligrams per liter; RL = Reporting Limit; MDL = Method Detection Limit

Values below the Reporting Limit are approximate.

Table 6: Water-quality results from the test wells at Site J3.

Parameter	Units	RL	MDL	TW-1	TW-2
Sample Date	-	-	-	09/15/22	09/12/22
General Chemistry					
Bromide	mg/l	0.25	0.050	<0.25	<0.25
Chloride	mg/l	0.20	0.170	3.7	15
Fluoride	mg/l	0.20	0.067	0.62	0.31
Nitrate as N	mg/l	0.20	0.068	<0.20	<0.20
Nitrite as N	mg/l	0.20	0.050	0.051	<0.20
Orthophosphate as P	mg/l	0.20	0.065	<0.20	<0.20
Sulfate	mg/l	0.20	0.095	86	65
Alkalinity	mg/l	5.0	3.7	250	270
Ammonia	mg/l	0.40	0.20	0.89	0.67
Metals					
Antimony	mg/l	0.0030	0.0013	0.0020	<0.0030
Arsenic	mg/l	0.0010	0.00015	0.022	0.018
Barium	mg/l	0.0025	0.00037	0.200	0.11
Beryllium	mg/l	0.0010	0.00043	<0.0010	<0.0010
Cadmium	mg/l	0.00050	0.00015	<0.00050	<0.00050
Chromium	mg/l	0.0050	0.0023	<0.0050	<0.0050
Copper	mg/l	0.0020	0.00063	<0.0020	0.0023
Iron	mg/l	0.20	0.12	0.62	2.2
Lead	mg/l	0.00050	0.00016	<0.00050	<0.00050
Manganese	mg/l	0.0025	0.0011	0.066	1.3
Mercury	mg/l	0.0020	0.00020	<0.0020	<0.0020
Nickel	mg/l	0.0020	0.00092	0.00097	0.00013
Selenium	mg/l	0.0025	0.0011	<0.0025	<0.0025
Silver	mg/l	0.00050	0.00050	<0.0050	<0.00050
Thallium	mg/l	0.0020	0.0020	<0.0020	<0.0020

Notes: mg/l = milligrams per liter; RL = Reporting Limit;

MDL = Method Detection Limit; NA = Not Available

Values below the Reporting Limit are approximate .

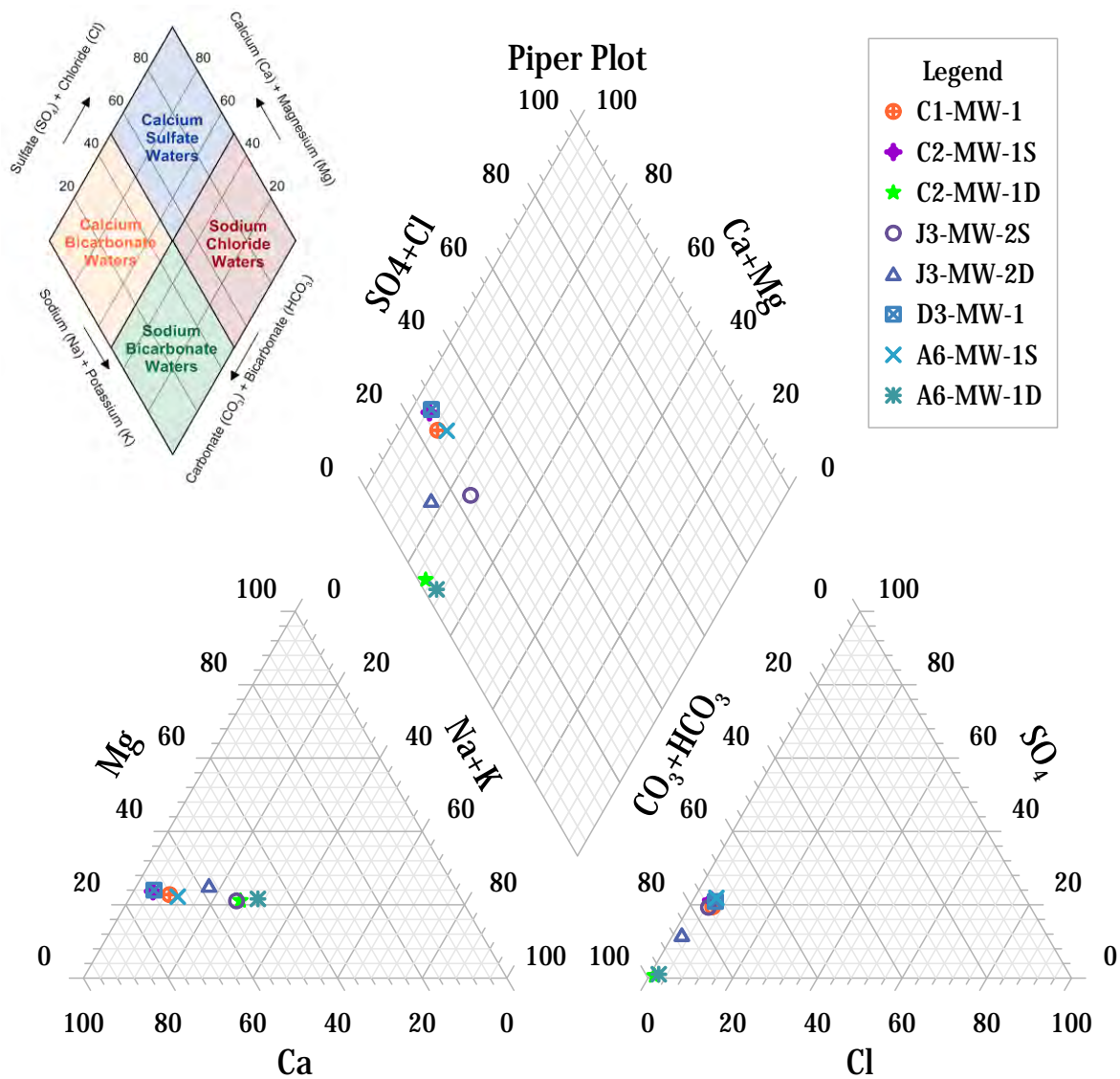


Figure 32: Piper plot of water-quality parameters.

7 Groundwater Accessibility Model

Exploratory borings and soil descriptions at individual testing sites indicate that there is significant spatial variability in thicknesses, depths, and material descriptions of permeable layers throughout the study area. Further, hydraulic testing of Site J3 indicates that aquifer hydraulic properties vary spatially across the site. Site J3 is different than the Frankfort Municipal Well Field as the Shallow and Deep aquifers are less hydraulically separated and the soil material varies from silt through medium sand, rather than the coarser materials encountered at the Frankfort Well Field. Results from the aquifer testing and data analysis at J3 provide no definitive conceptual model of recharge to the aquifers that supports a conclusive estimate of sustainable yield. However, we use conservative assumptions and engineering experience analyzing well fields in similar settings to estimate the sustainable yield of the J3 Site.

7.1 Hydrogeologic Conceptual Model and Parameterization

A hydrogeologic conceptual model was developed from boring logs at sites J3 and A6, the 3D geologic model, and the results of hydraulic testing of J3-TW-2. The conceptual model was implemented in the transient groundwater flow modeling code TTim to evaluate the potential yield of the site (Bakker, 2013b,a). The conceptual model is illustrated in Figure 33. The model consists of a fixed water level overlying the site; the regional water table is controlled by the many drain tiles and surface drainages that have been constructed in the farm fields to control groundwater flooding of crops. The source of water supplying the sustainable yield at the site is assumed to be vertical leakage from the the water table which is replenished by recharge from precipitation and infiltration at the land surface, as illustrated in Figure 33.

The hydraulic properties associated with the layering illustrated in Figure 33 are summarized in Table 7. The uppermost model layer represents a till layer and is simulated as a leaky layer (Leaky Layer 0). A fixed water table overlies the layer.

Aquifer Layer 1 represents another thick layer of clay encountered in site borings, but is represented as an aquifer layer rather than a leaky layer. Leaky Layer 1 and Leaky Layer 2 sandwich Aquifer Layer 1 from the top and bottom, and approximate the vertical resistance to flow of Aquifer Layer 1 in the numerical model. The combined resistances of Leaky Layers 1, 2, and 3 are based on the leakance evaluated from the pumping test analysis of 1,200 days (Table 3). A calibrated value of 3,200 days was estimated by simulation of the aquifer test, as described below in Section 7.2.

$$c_1 + c_2 + c_3 = 3,200 \text{ days}$$

The individual resistances were initially specified according to the relative thickness of Leaky Layer 0 (30 feet) and Aquifer Layer 0 (40 feet)

$$c_1 = \frac{30}{70} \times 3,200 = 1,400 \text{ days}$$

Table 7: Properties of the aquifer layers (*top*) and the leaky layers (*bottom*) specified in the groundwater yield model.

Aquifer Layer	Thickness, H (ft)	Hydraulic Conductivity, k (ft/day)	Specific Storage, S_s (1/ft)
0	20	55	1.5×10^{-5}
1	39	.01	0
2	34	55	1.5×10^{-5}
3	34	55	1.5×10^{-5}
4	34	55	1.5×10^{-5}
5	34	55	1.5×10^{-5}

Notes: ft = feet. ft/day = feet per day.

Leaky Layer	Thickness, H^* (ft)	Resistance, c (day)	Specific Storage, S_s (1/ft)
0	30	1200	0
1	1	1000	0
2	1	1000	0
3	1	3	0
4	1	3	0
5	1	3	0

Notes: ft = feet.

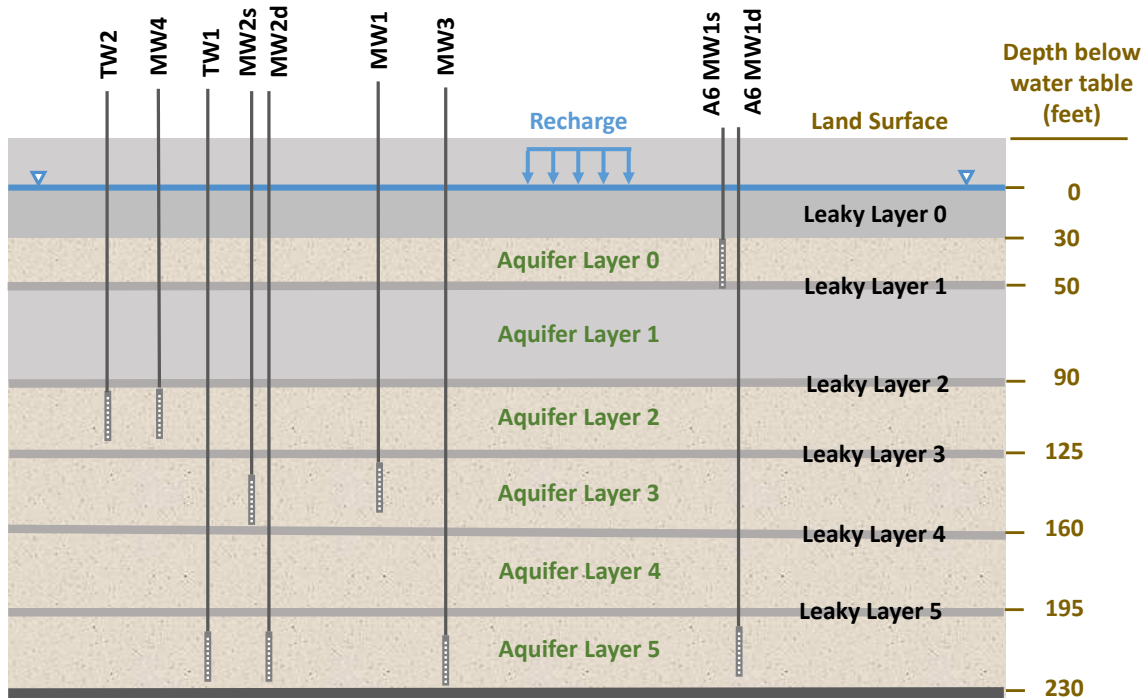


Figure 33: Implementation of the hydrogeologic conceptual model.

$$c_2 + c_3 = \frac{40}{70} \times 3,200 = 1,800 \text{ days}$$

Final values of 1,200 days for Leaky Layer 0 and 2,000 days for Leaky Layer 1 and 2 combined (Table 7) were adjusted from the initial values based on the aquifer test simulation described below.

The transmissivity of the combined permeable aquifer layers (Aquifer Layers 0, 2, 3, 4, and 5) is based on results of the pumping test analysis (Table 3), and adjusted during the aquifer test simulation:

$$T = (4 \text{ layers} \times 34 \text{ feet/layer} + 20 \text{ feet}) \times 55 \text{ feet/day} = 8,600 \text{ ft}^2/\text{day}$$

The Specific Storage of Aquifer Layers 0, 2, 3, 4, and 5, are based on the pumping test analysis. The specific storage of Aquifer Layer 1 is specified as zero, while the remaining Leaky Layers have values of $1.5 \times 10^{-5} \text{ days}^{-1}$. Leaky Layers 3, 4, and 5 are used to simulate vertical anisotropy ratio of 0.2 in Aquifer Layers 2 through 5; the resistance of each leaky layer is based on the vertical hydraulic conductivity of half the overlying and underlying aquifer layer,

$$c_i = \frac{0.5H_{i-1}}{0.2k_{i-1}} + \frac{0.5H_i}{0.2k_i} = \frac{34 \text{ ft}}{0.2 \times 55 \text{ ft/day}} = 3 \text{ days}$$

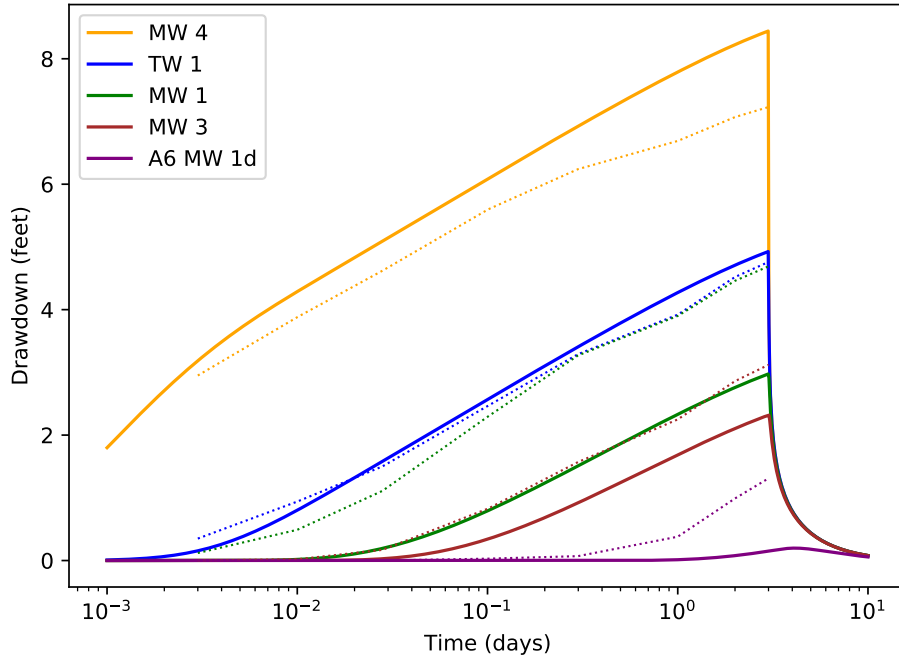


Figure 34: A comparison of simulated and observed drawdown in the monitoring well network at Site J3. Simulated results are solid lines, while observations are dotted lines.

This anisotropy ratio was evaluated from the pumping test analysis (Table 7).

7.2 Aquifer Test Simulation

The numerical model described above allows for a more general description of the aquifer than allowed for in the AQTESOLV software used to estimate aquifer parameters. While the parameters specified in the numerical model are based on the AQTESOLV results, the more general parameterization of the numerical model was assessed by simulating the aquifer test conducted at J3 by pumping TW-2 for 72 hours. Figure 34 presents a comparison of simulated drawdown and observed drawdown in the network of monitoring wells. The results are comparable to the AQTESOLV results, with an improved response at MW-3.

7.3 Evaluation of Potential Yield

The model was used to estimate the potential sustainable yield of the a hypothetical well field constructed at the J3 Site. The physical properties of the simulated production wells were assumed to be similar to test well J3-TW-2 (see Table 8). The potential yield of the site was simulated by specifying an instantaneous drop in water level at the well to 90 feet below the water table. As illustrated in Figure 33, this drops the water level in Aquifer Layer 2 to the

Table 8: Assumed production well properties.

Property	Symbol	Units	Value
Effective radius	r_w	ft	0.5
Screen length	L	ft	34
Efficiency	ϵ	%	60
Max drawdown	D	ft	90

Note: ft = feet.

Table 9: Potential yield of a well field near Site J3.

Number of wells	Well Spacing (ft)	Total Yield 100% Efficiency		Total Yield 60% Efficiency	
		(gpm)	(MGD)	(gpm)	(MGD)
1	–	890	1.3	540	0.8
3	100	1980	2.8	1190	1.7
3	500	2280	3.3	1370	2.0
3	1000	2390	3.4	1430	2.1
3	5000	2620	3.8	1570	2.3

Notes: ft = feet. gpm = gallons per minute. MGD = million gallons per day.

top of the layer. The simulated wells are screened over the full depth of Aquifer Layer 2. The discharge of the well is then simulated through time. Results are illustrated in Figure 35, for a single well, three wells with a spacing of 100 feet, and 3 wells with a spacing of 1,000 feet. In all cases, a steady-state discharge is obtained after about 12 days of pumping. For a single well, the steady, or sustainable yield, is 894 gpm when operating at 100% efficiency.

Figure 36 illustrates a section through the well fields with resulting water levels in each aquifer layer for each of the three scenarios, after a steady-state condition has been reached.

The potential sustainable yields at Site J3, for a single well and several 3-well configurations with differing spacing are presented in Table 9. Wells constructed with 100% efficiency at this site would be unlikely due to the variation in the physical description of aquifer material noted on the boring and well construction logs. A practical well efficiency of 60% is assumed for each of the simulated wells, based on engineering experience. The predicted well field yields are presented in the final two columns of Table 9, with values in bold lettering.

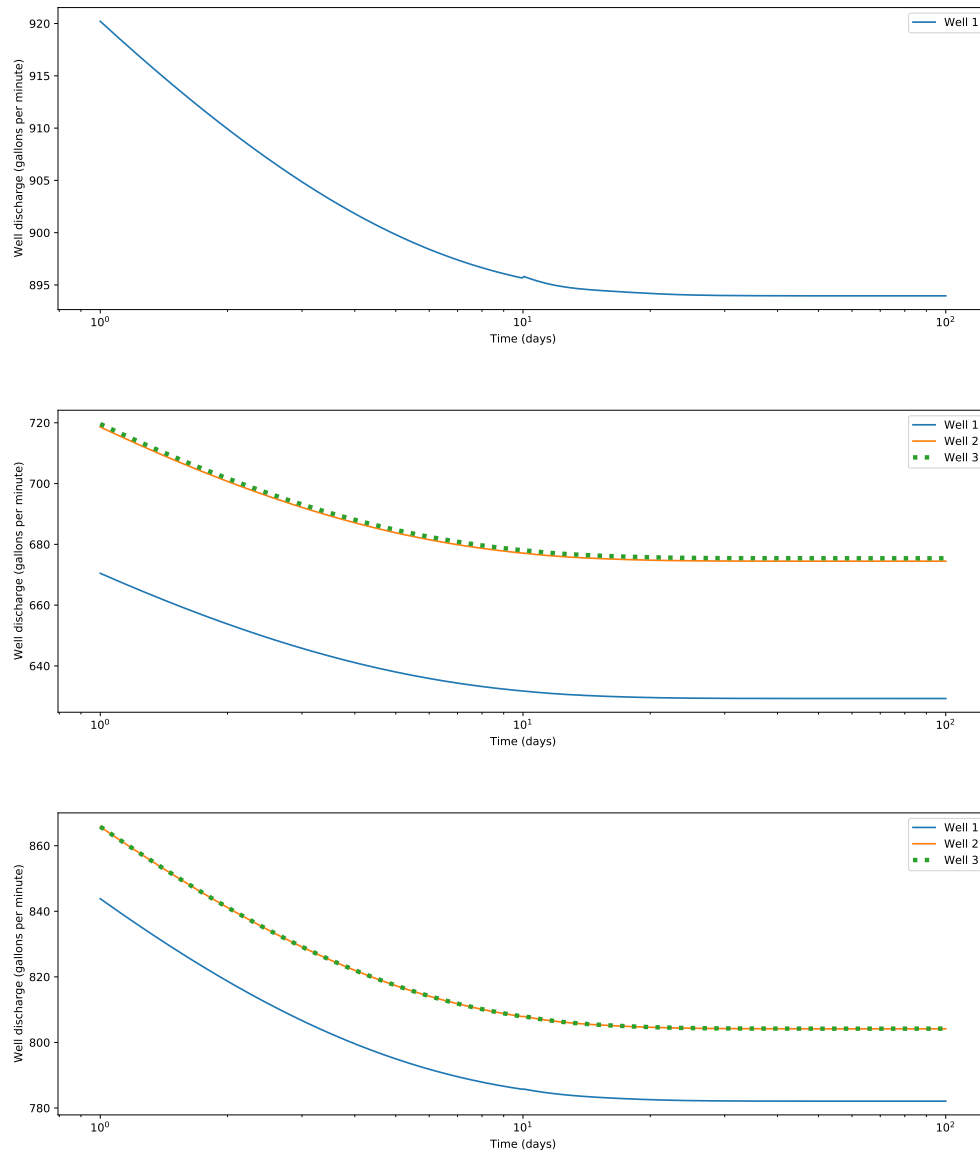


Figure 35: Potential yield for well field with a maximum drawdown of 90 feet and 100% efficiency; (*top*) single well, (*middle*) three wells at 100 foot spacing, and (*bottom*) 1000 foot spacing. All wells operating at 100 % efficiency.

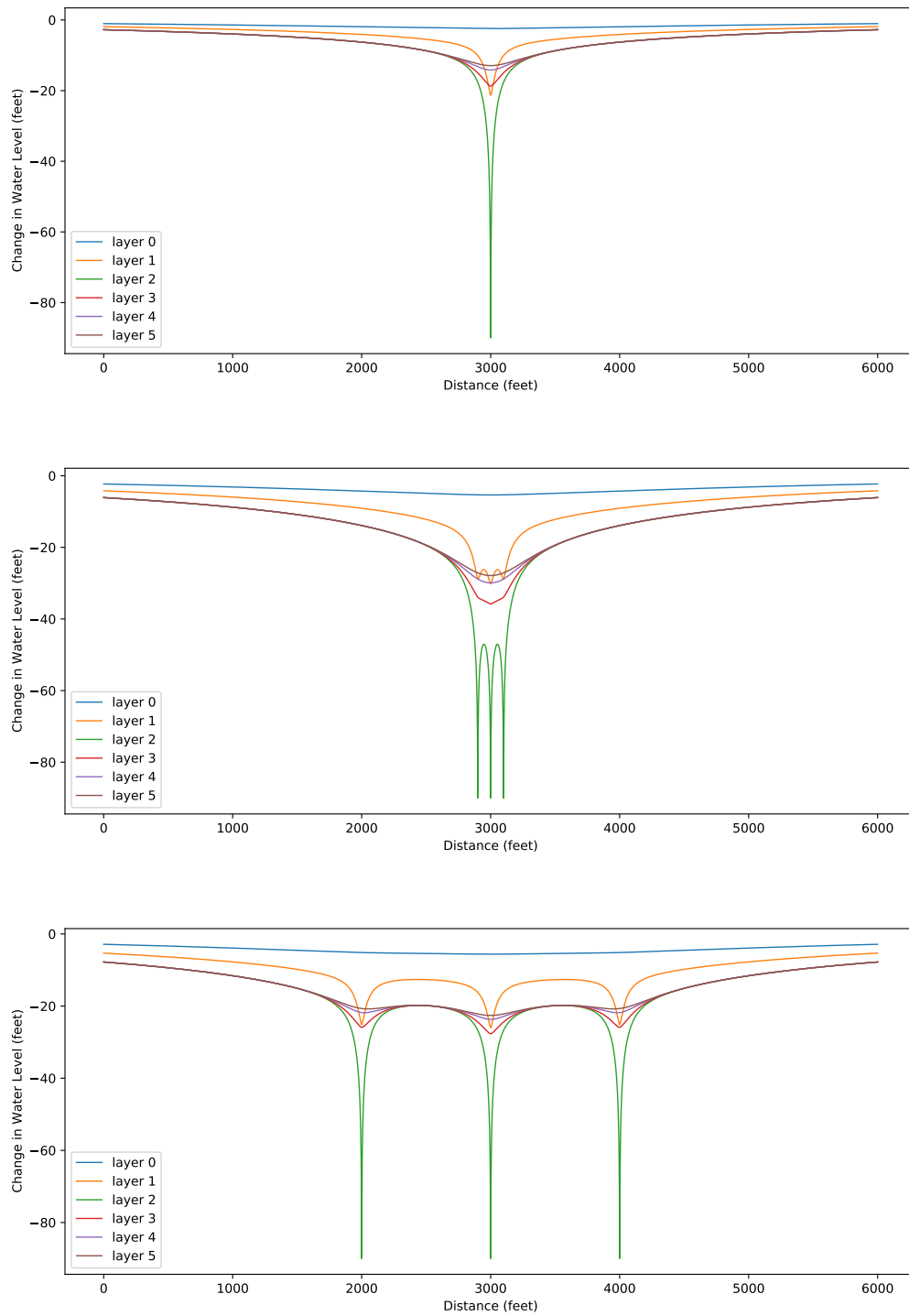


Figure 36: Water levels at steady state for (*top*) a single well, (*middle*) three wells with 100 foot spacing, and (*bottom*) 1,000 foot spacing. The wells are screened in Aquifer Layer 2.

7.4 Conclusions

The source of long-term, sustainable yield to a well field located at site J3 is assumed to be from leakage from the shallow clay and sand aquifer, and is therefore highly dependent on the characteristics of the clay layers, specifically the resistance to vertical flow. During the three day pumping test, a semiconfined response was observed in the nearest monitoring well, J3-MW-4, but it was less evident in the remaining monitoring wells. It is likely that other factors, typical of this glacial till environment, affect recharge to the deep aquifer layers. These features may include high-permeability channels, spatially variable hydraulic properties, and discontinuous clay lenses, which cannot be directly assessed by a pumping test. Here we use the results of the aquifer test analysis along with engineering judgment based on experience designing well fields in similar settings to estimate the sustainable yield of a well field constructed at Site J3.

Well field scenarios with three wells were tested, based on the size of the parcel. We expect a maximum yield of 2.1 MGD at the J3 Site with a well spacing of 1,000 feet. The A6 Site lies approximately a mile away from Site J3. Exploratory borings suggest that Site A6 may be more productive than the J3 Site, although it was not tested in this study. Geologic and hydrologic conditions in the region are highly spatially variable and further aquifer testing would be required to estimate yields for other sites. An additional well field constructed at the A6 Site would not be expected to significantly affect the yield of the J3 Site due to the separation distance. A conservative estimate of the total yield of two well fields, each consisting of three wells, constructed at Site J3 and Site A6 is 4 MGD.

References

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Appendix

A Test Boring and Well Construction Logs



Hole ID: A6-MW-1

Location: Clinton Co., IN
Site: A6

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

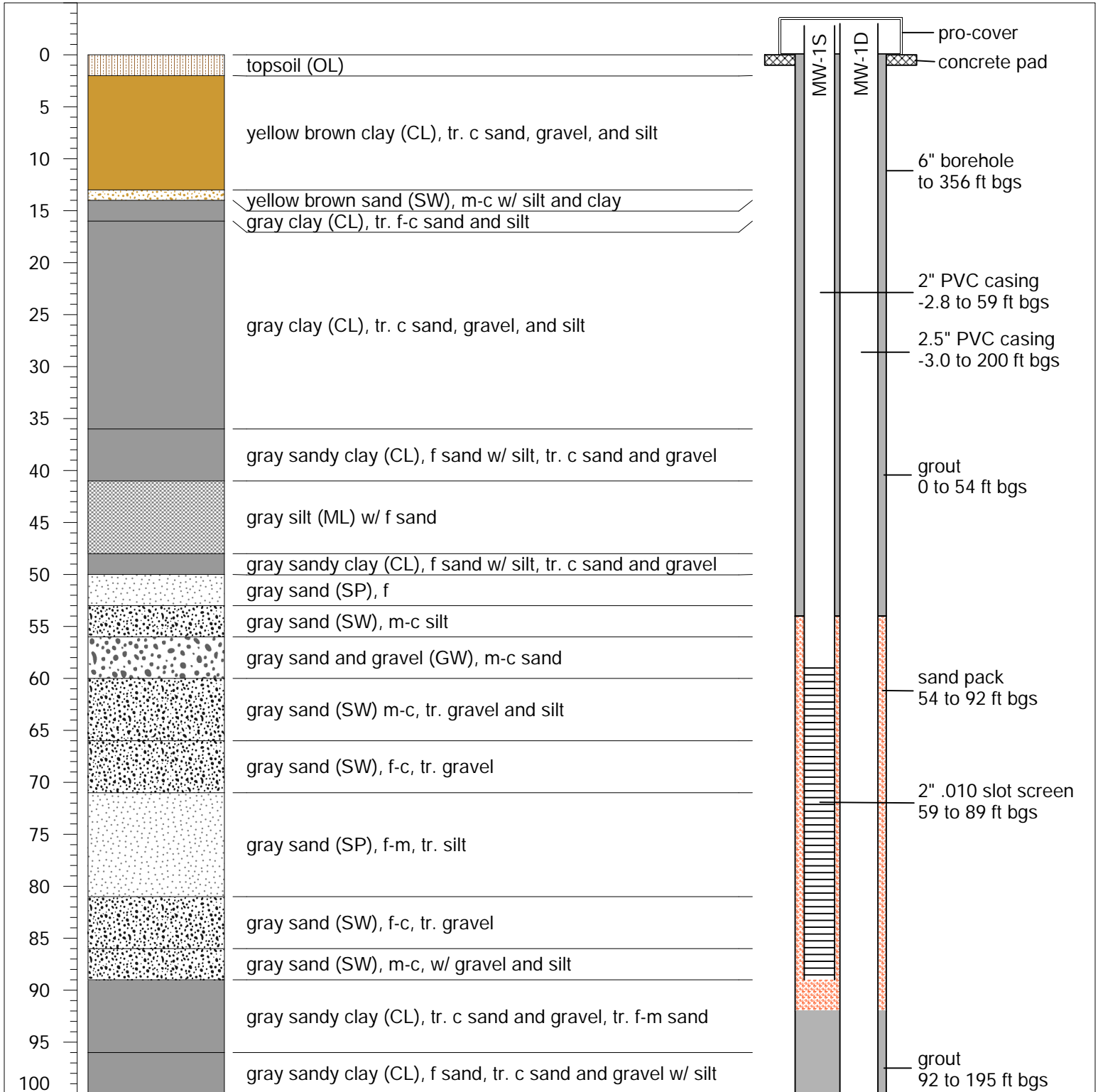
Elevation: 861 ft amsl Lat: 40.242829°
Total Depth: 356 ft Long: -86.600752°

Date start: 4/21/2022

Date finish: 4/26/2022

Date abandoned: 9/21/2022

Depth (ft bgs)	Lithology	Lithologic Description	Well Construction
----------------	-----------	------------------------	-------------------



Total Depth = 356 ft bgs
bgs = below ground surface

A6-MW-1

Page: 1 of 4



Hole ID: A6-MW-1

Location: Clinton Co., IN
Site: A6

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

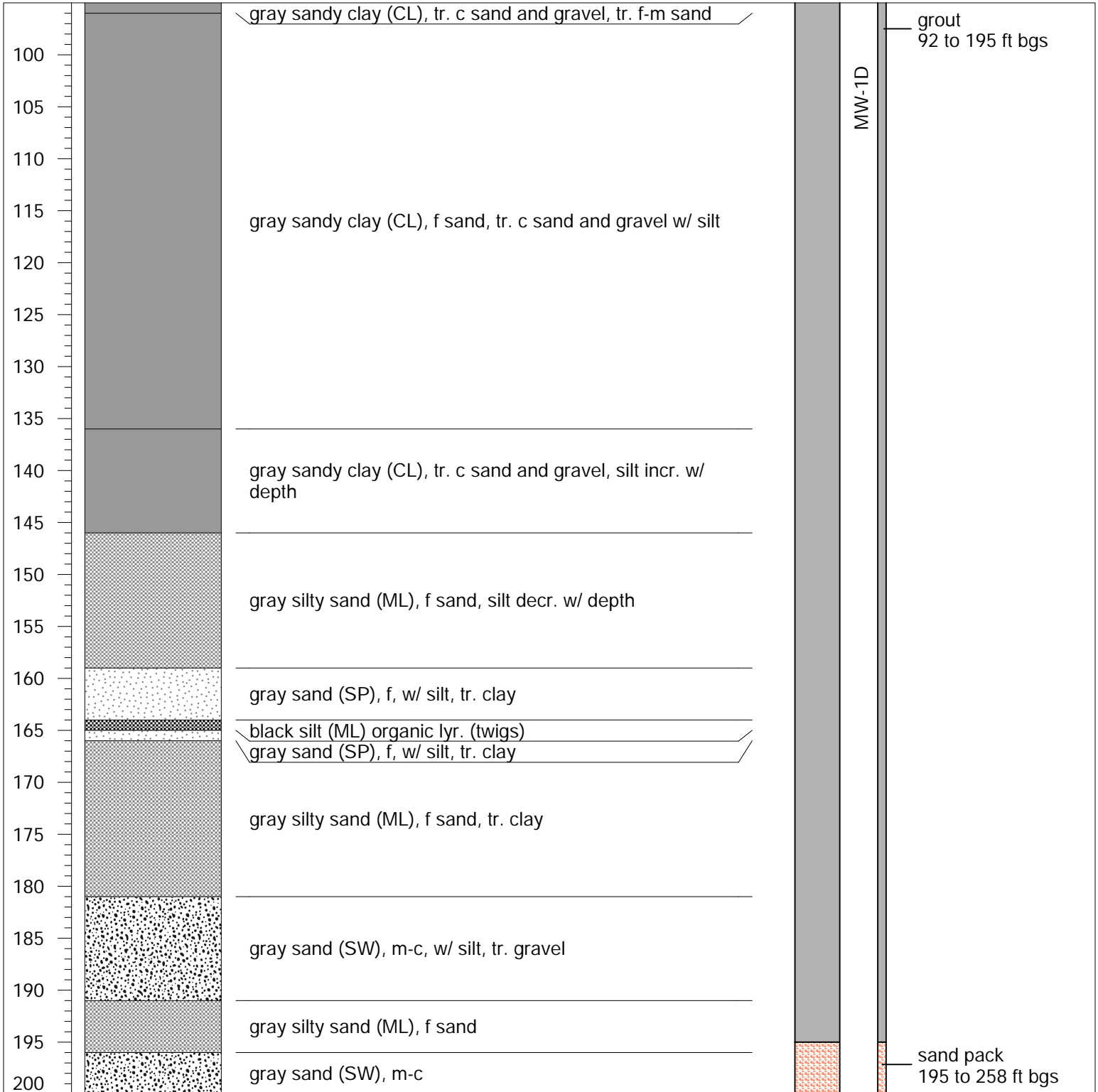
Elevation: 861 ft amsl Lat: 40.242829°
Total Depth: 356 ft Long: -86.600752°

Date start: 4/21/2022

Date finish: 4/26/2022

Date abandoned: 9/21/2022

Depth (ft bgs)	Lithology	Lithologic Description	Well Construction
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Total Depth = 356 ft bgs
bgs = below ground surface

A6-MW-1



Hole ID: A6-MW-1

Location: Clinton Co., IN
Site: A6

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

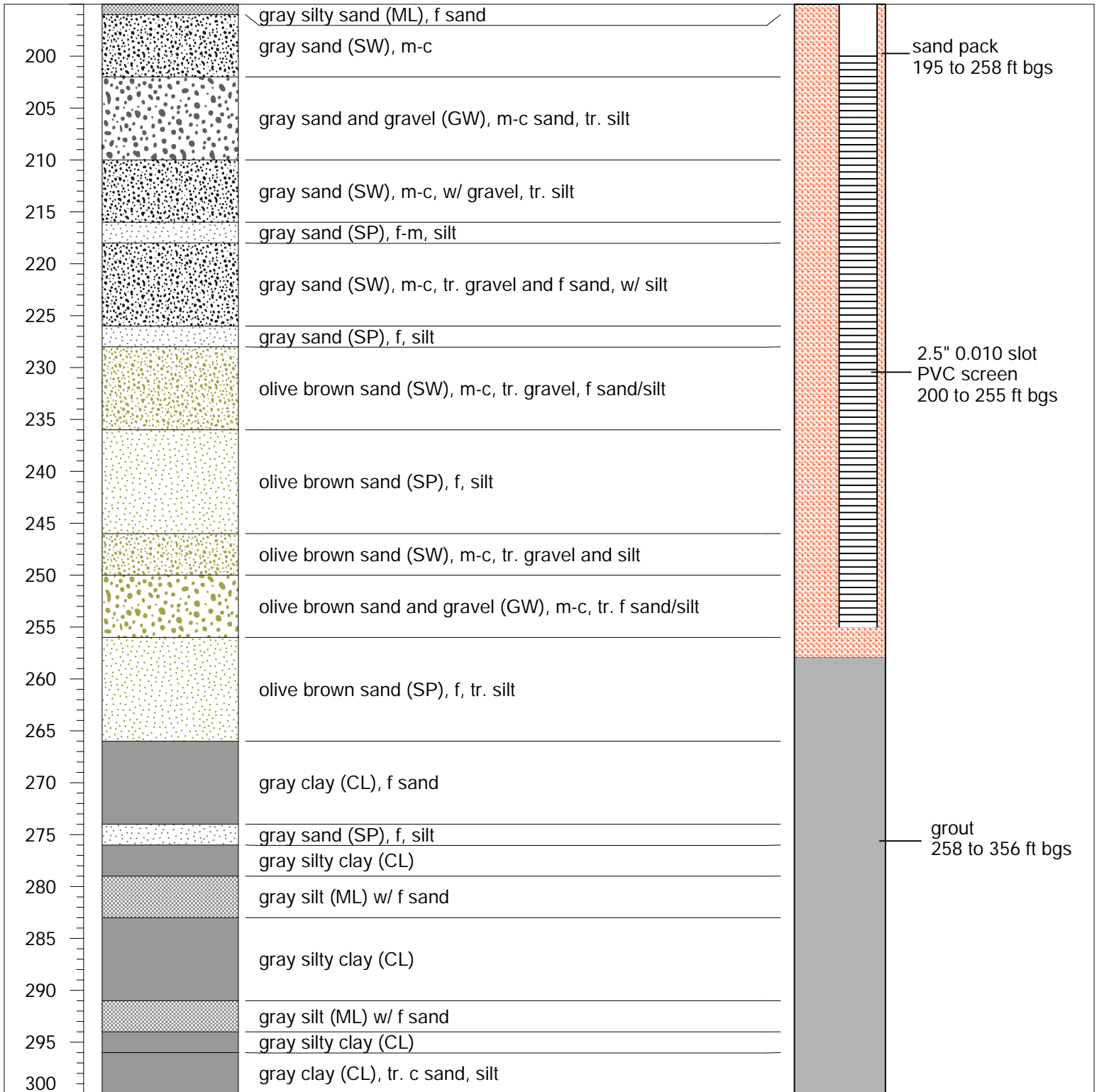
Elevation: 861 ft amsl Lat: 40.242829°
Total Depth: 356 ft Long: -86.600752°

Date start: 4/21/2022

Date finish: 4/26/2022

Date abandoned: 9/21/2022

Depth (ft bgs)	Lithology	Lithologic Description	Well Construction
----------------	-----------	------------------------	-------------------



Total Depth = 356 ft bgs
bgs = below ground surface



Hole ID: A6-MW-1

Location: Clinton Co., IN
Site: A6

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

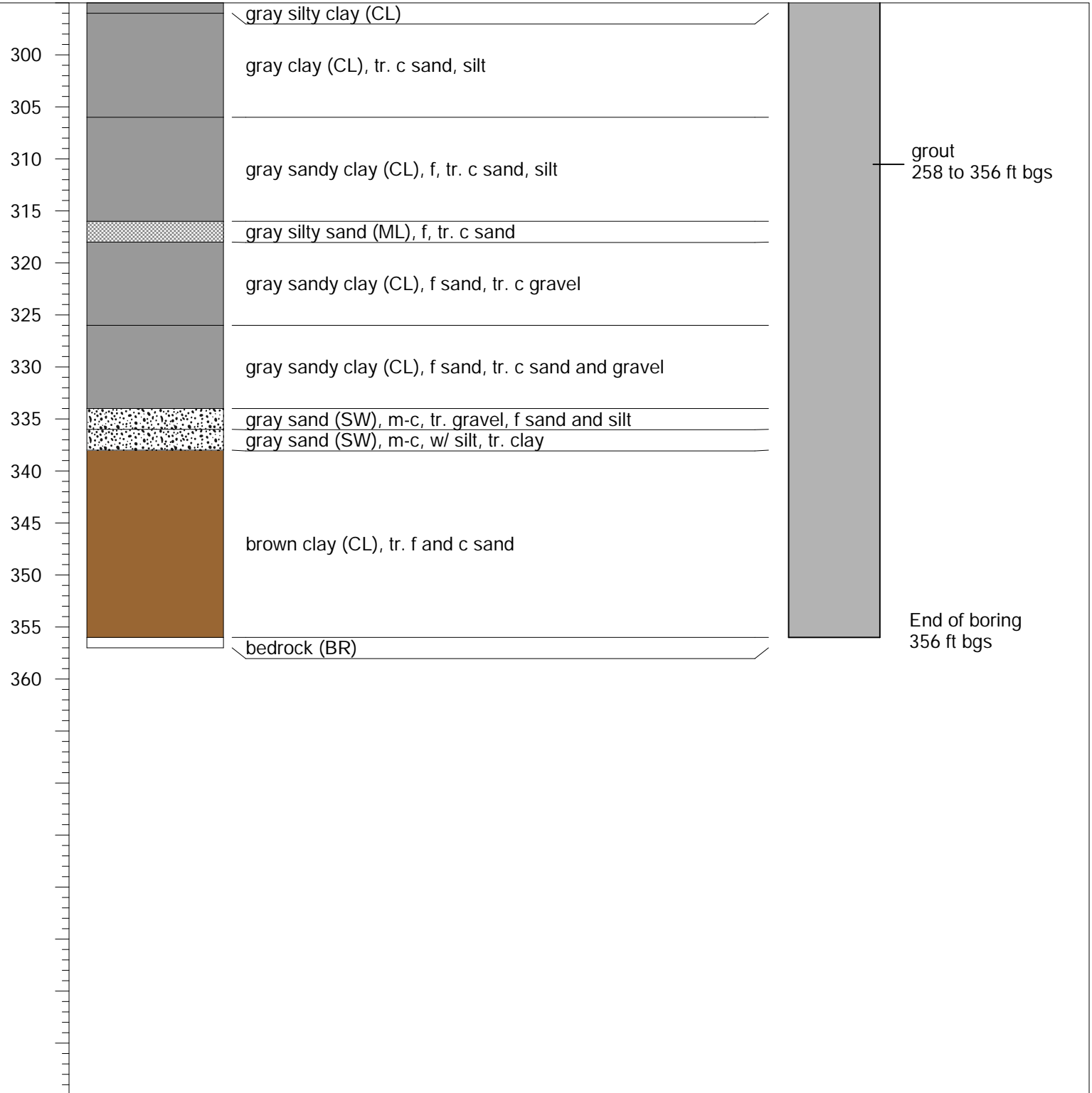
Elevation: 861 ft amsl Lat: 40.242829°
Total Depth: 356 ft Long: -86.600752°

Date start: 4/21/2022

Date finish: 4/26/2022

Date abandoned: 9/21/2022

Depth (ft bgs)	Lithology	Lithologic Description	Well Construction
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Hole ID: A6-TB-1

Location: Clinton Co., IN
Site: A6

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

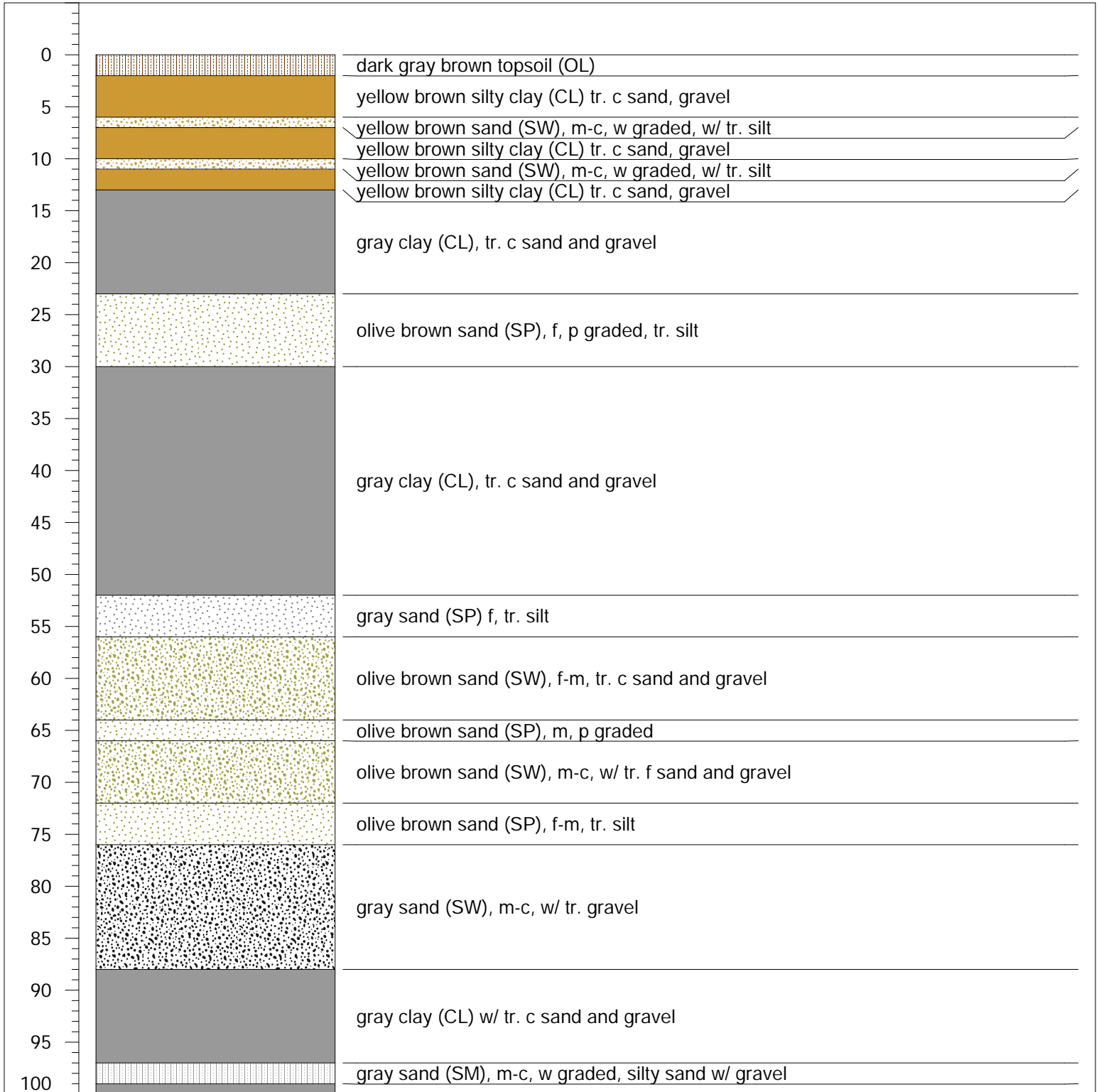
Elevation: 869 ft amsl Lat: 40.242275°
Total Depth: 106 ft Long: -86.601493°

Date start: 4/11/2022

Date finish: 4/12/2022

Date abandoned: 4/12/2022

Depth (ft bgs)	Lithology	Lithologic Description
----------------	-----------	------------------------



Total Depth = 106 ft bgs
bgs = below ground surface

A6-TB-1

Page: 1 of 2



Hole ID: A6-TB-1

Location: Clinton Co., IN
Site: A6

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

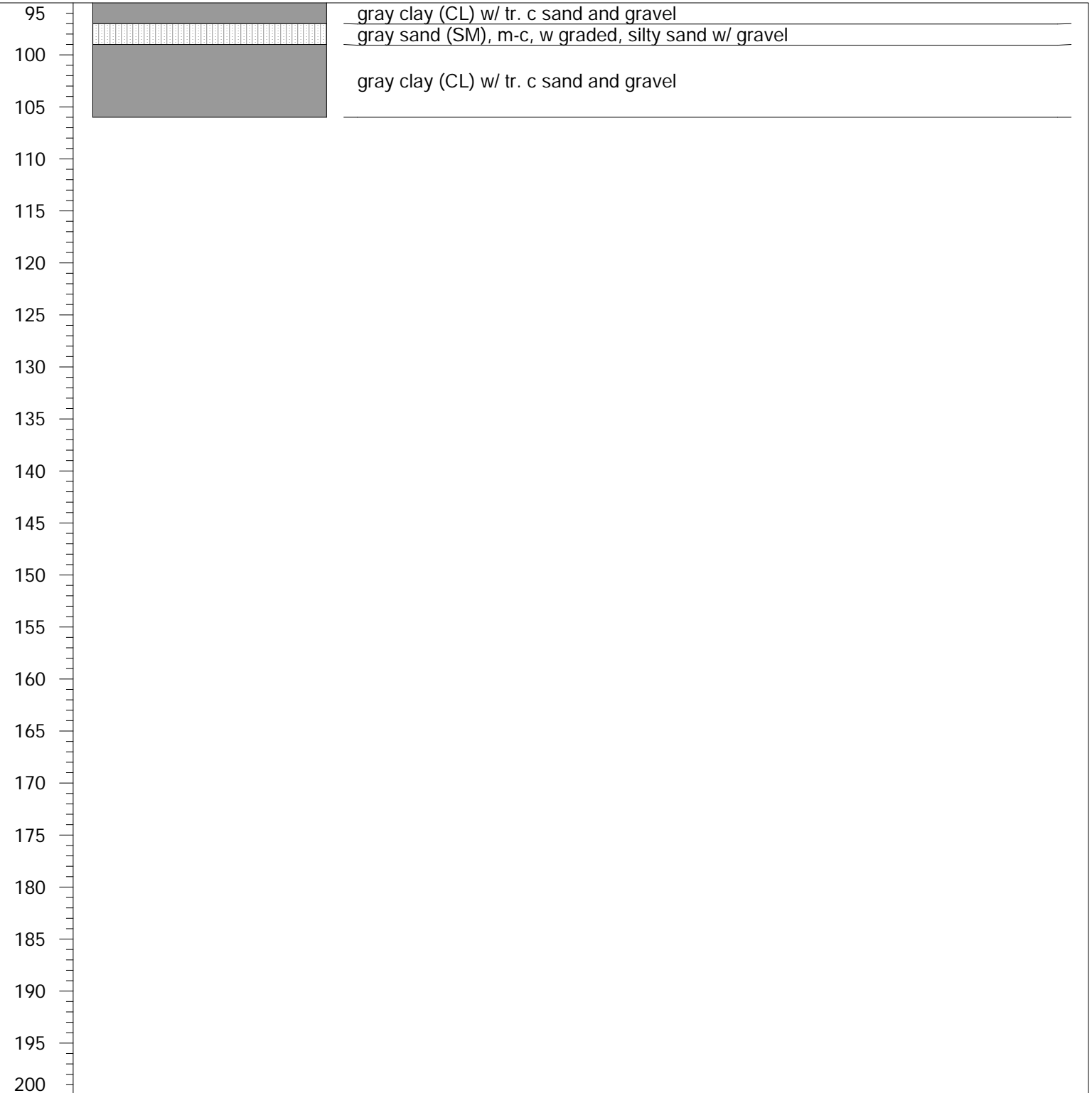
Elevation: 869 ft amsl Lat: 40.242275°
Total Depth: 106 ft Long: -86.601493°

Date start: 4/11/2022

Date finish: 4/12/2022

Date abandoned: 4/12/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Hole ID: A6-TB-2

Location: Clinton Co., IN
Site: A6

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

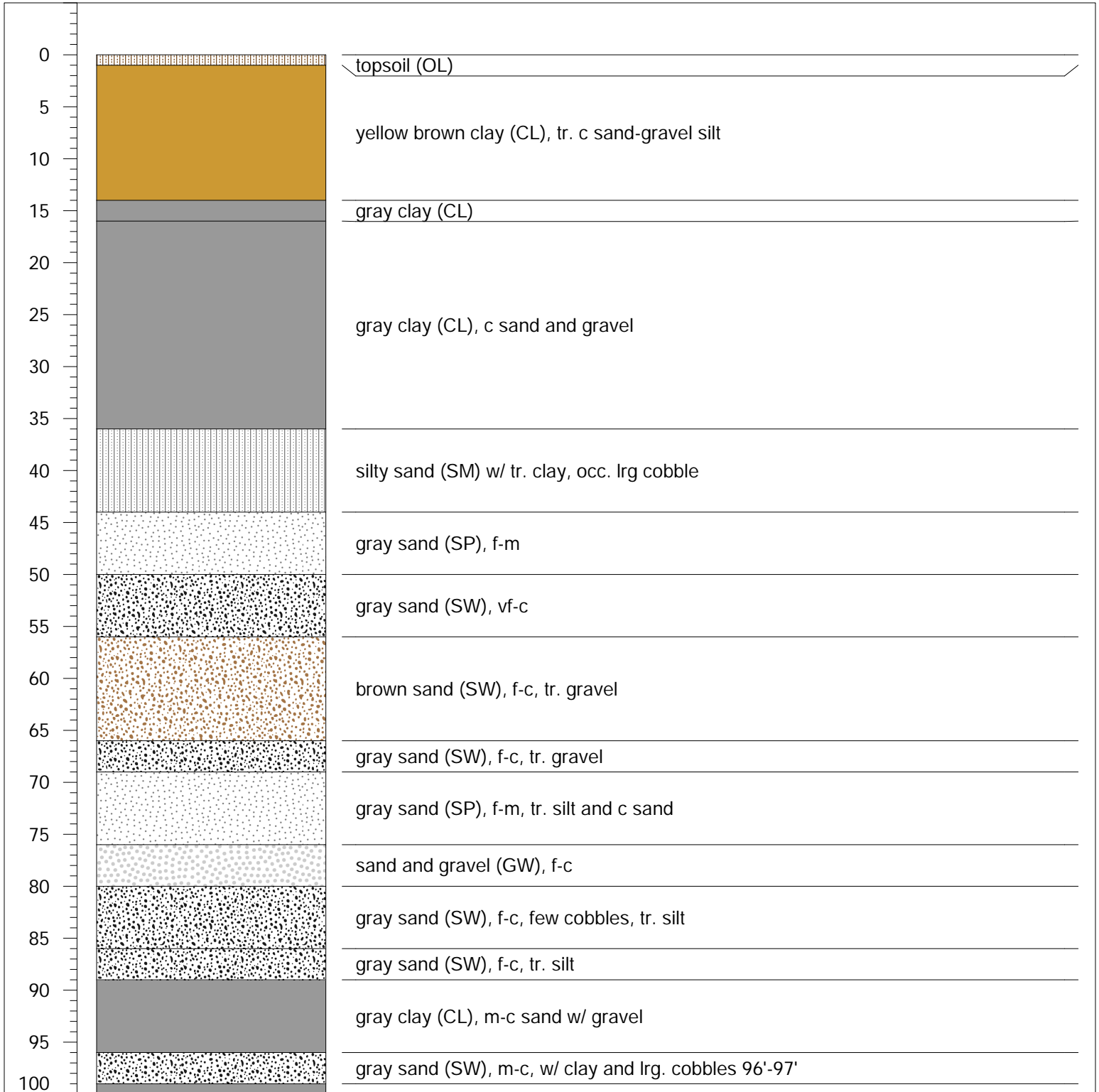
Elevation: 861 ft amsl Lat: 40.242443°
Total Depth: 396 ft Long: -86.601218°

Date start: 4/07/2022

Date finish: 4/11/2022

Date abandoned: 4/11/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Total Depth = 396 ft bgs
bgs = below ground surface



Hole ID: A6-TB-2

Location: Clinton Co., IN
Site: A6

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 861 ft amsl **Lat:** 40.242443°
Total Depth: 396 ft **Long:** -86.601218°

Date start: 4/07/2022

Date finish: 4/11/2022

Date abandoned: 4/11/2022

Depth (ft bgs)	Lithology	Lithologic Description
95		gray clay (CL), m-c sand w/ gravel
100		gray sand (SW), m-c, w/ clay and lrg. cobbles 96'-97'
105		gray clay (CL), c sand-gravel
115		gray clay (CL) w/ tr. c sand and gravel, silt decr. w/ depth
130		gray clay (CL), tr. c sand, gravel, silt
140		gray silt (ML), clay
150		gray silt (ML), tr. f sand
155		gray sand (SP), f-m, tr. clay, tr. c sand and silt
160		gray silt (ML), tr. clay and gravel
170		gray silt (ML) w/ clay
175		olive brown clayey sand (SC), f-c, tr. gravel
180		silt (ML) w/ clay, tr. c sand and gravel
185		gray silty sand (SM) w/ clay
190		gray clayey sand (SC), f-c, tr. gravel
195		gray sand (SW), m-c, w/ f sand and clay, tr. gravel, silt
200		

Total Depth = 396 ft bgs
bgs = below ground surface

A6-TB-2

Page: 2 of 3



Hole ID: A6-TB-2

Location: Clinton Co., IN
Site: A6

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 861 ft amsl Lat: 40.242443°
Total Depth: 396 ft Long: -86.601218°

Date start: 4/07/2022

Date finish: 4/11/2022

Date abandoned: 4/11/2022

Depth (ft bgs)	Lithology	Lithologic Description
195		gray clayey sand (SC), f-c, tr. gravel
200		gray sand (SW), m-c, w/ f sand and clay, tr. gravel, silt
205		gray silty sand (SM), vf-c, f incr. at bottom
210		gray silty sand (SM), vf-c, w/ clay
215		gray sand (SW), m-c, tr. c gravel, cobbles
220		gray sand (SW), m-c, tr. gravel
225		gray sand (SP), f-m
230		gray silty sand (SM), vf-c
235		gray sand (SP), f-m, w/ c sand and gravel, tr. silt, coarsing w/ depth
240		gray sand (SW), m-c, tr. gravel, silt
245		gray sand (SP), f-m, silt, tr. clay
250		gray sand (SW), m-c, tr. gravel, silt
255		gray sand (SP), f-m, tr. silt
260		gray sand (SW), m-c, tr. silt
265		gray sand (SP), f, silt
270		gray clay (CL), f-m sand, tr. c sand-gravel, sand decr. w/depth, silt
275		
280		sandy clay (SC), f-m, tr. c sand
285		silty gravel (GM), m-c sand, w/ silt, tr. clay
290		
295		gray sand (SW), m-c, tr. gravel and silt
300		

Total Depth = 396 ft bgs
bgs = below ground surface

A6-TB-2

Page: 3 of 4



Hole ID: A6-TB-2

Location: Clinton Co., IN
Site: A6

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 861 ft amsl Lat: 40.242443°
Total Depth: 396 ft Long: -86.601218°

Date start: 4/07/2022

Date finish: 4/11/2022

Date abandoned: 4/11/2022

Depth (ft bgs)	Lithology	Lithologic Description
295		gray sand (SW), m-c, tr. gravel and silt
300		brown gray sand (SP), f-m, tr. silt
305		dark gray brown sand (SP), f, tr. silt
310		dark gray brown sand (SP), f-m, tr. silt
315		dark gray brown sand (SP), f, tr. silt
320		dark gray brown sand (SP), f-m, tr. silt
325		gray clay (CL), tr. gravel
330		gray clayey sand (SC), f, tr. c sand and gravel
335		yellow brown - gray clay (CL), tr. c sand and gravel
340		yellow brown clayey sand (SC), f
345		yellow brown clay (CL), tr. c sand
350		yellow brown sandy clay (CL), f sand
355		yellow brown sand (SP), f, w/ silt, tr. clay
360		gray silty sand (SM), f-m w/ c at bottom, tr. gravel
365		gray sand (SP), f, coarsing to m-c w/ depth, silt
370		gray sand (SW), f-c
375		brown-gray silty clay (CL)
380		brown-gray silty sand (SM), f
385		gray silty sand (SM), vf-c
390		gray silty sand and gravel (GM), m-c
395		gray clay (CL), tr. c sand and gravel
400		gray silty sand and gravel (GM), m-c
		white limestone bedrock

Total Depth = 396 ft bgs
bgs = below ground surface

A6-TB-2

Page: 4 of 4



Hole ID: C1-MW-1

Location: Clinton Co., IN
Site: C1

Logged by: R. Corrigan, INTERA

Drilling Method: Sonic

Elevation: 860 ft amsl

Lat: 40.257251°

Drilled by: A. Little, Cascade

Borehole diameter: 6"

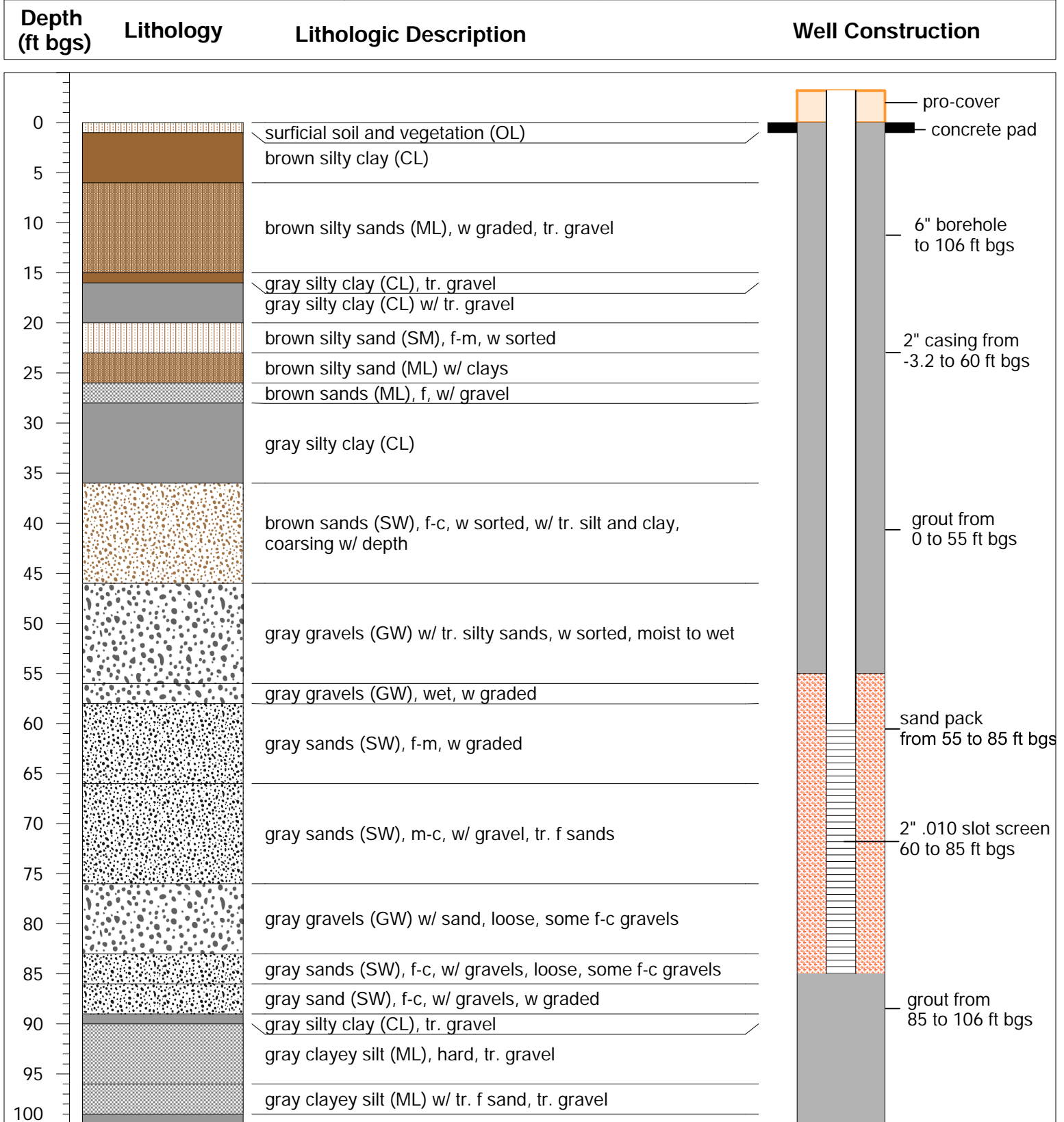
Total Depth: 106 ft

Long: -86.591300°

Date start: 5/10/2022

Date finish: 5/10/2022

Date abandoned: 9/22/2022



Total Depth = 106 ft bgs
bgs = below ground surface

C1-MW-1

Page: 1 of 2



Hole ID: C1-MW-1

Location: Clinton Co., IN
Site: C1

Logged by: R. Corrigan, INTERA
Drilled by: A. Little, Cascade

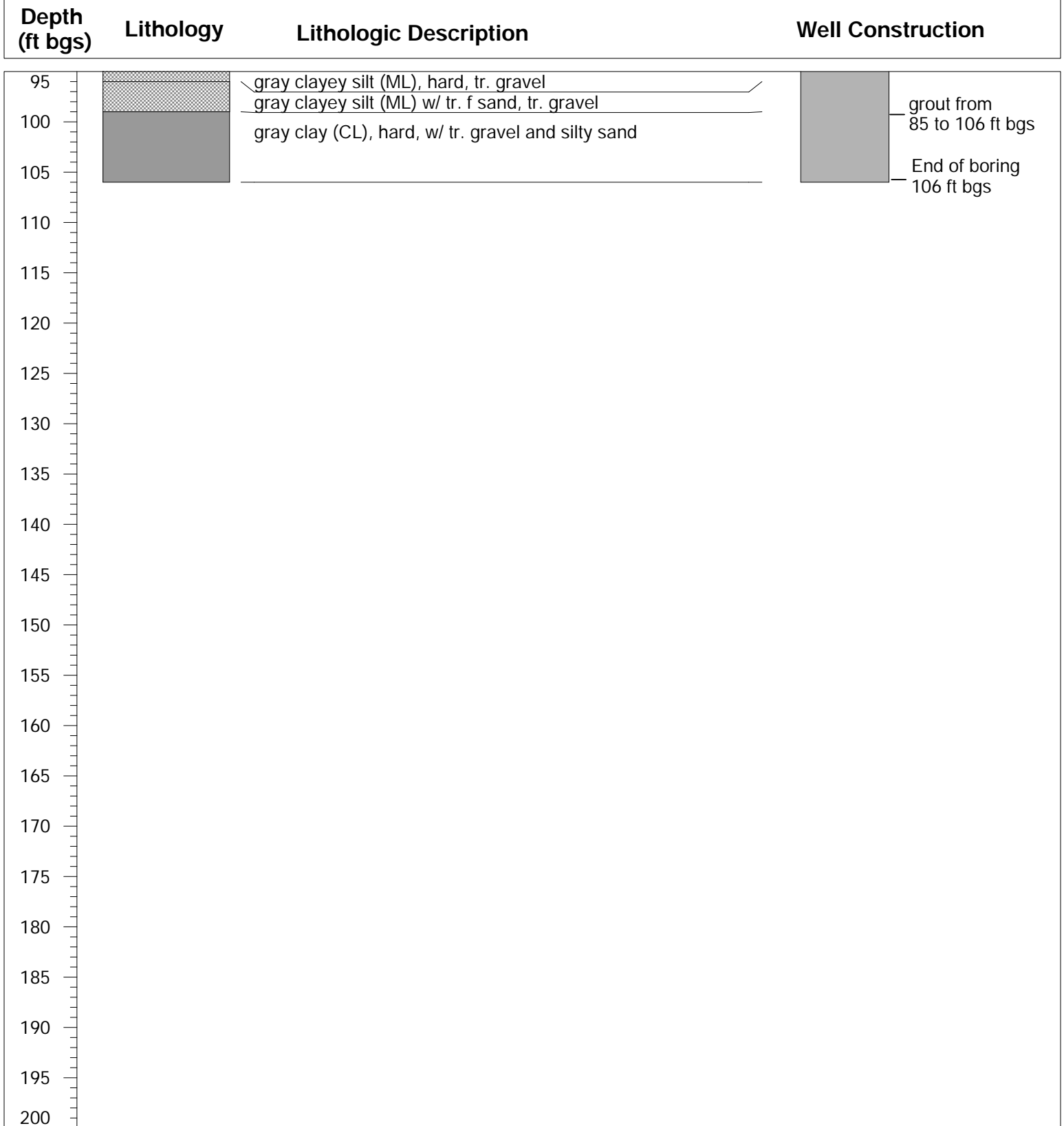
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 860 ft amsl Lat: 40.257251°
Total Depth: 106 ft Long: -86.591300°

Date start: 5/10/2022

Date finish: 5/10/2022

Date abandoned: 9/22/2022



Total Depth = 106 ft bgs
bgs = below ground surface

C1-MW-1



Hole ID: C1-TB-1

Location: Clinton Co., IN
Site: C1

Logged by: P. Jurcek, INTERERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

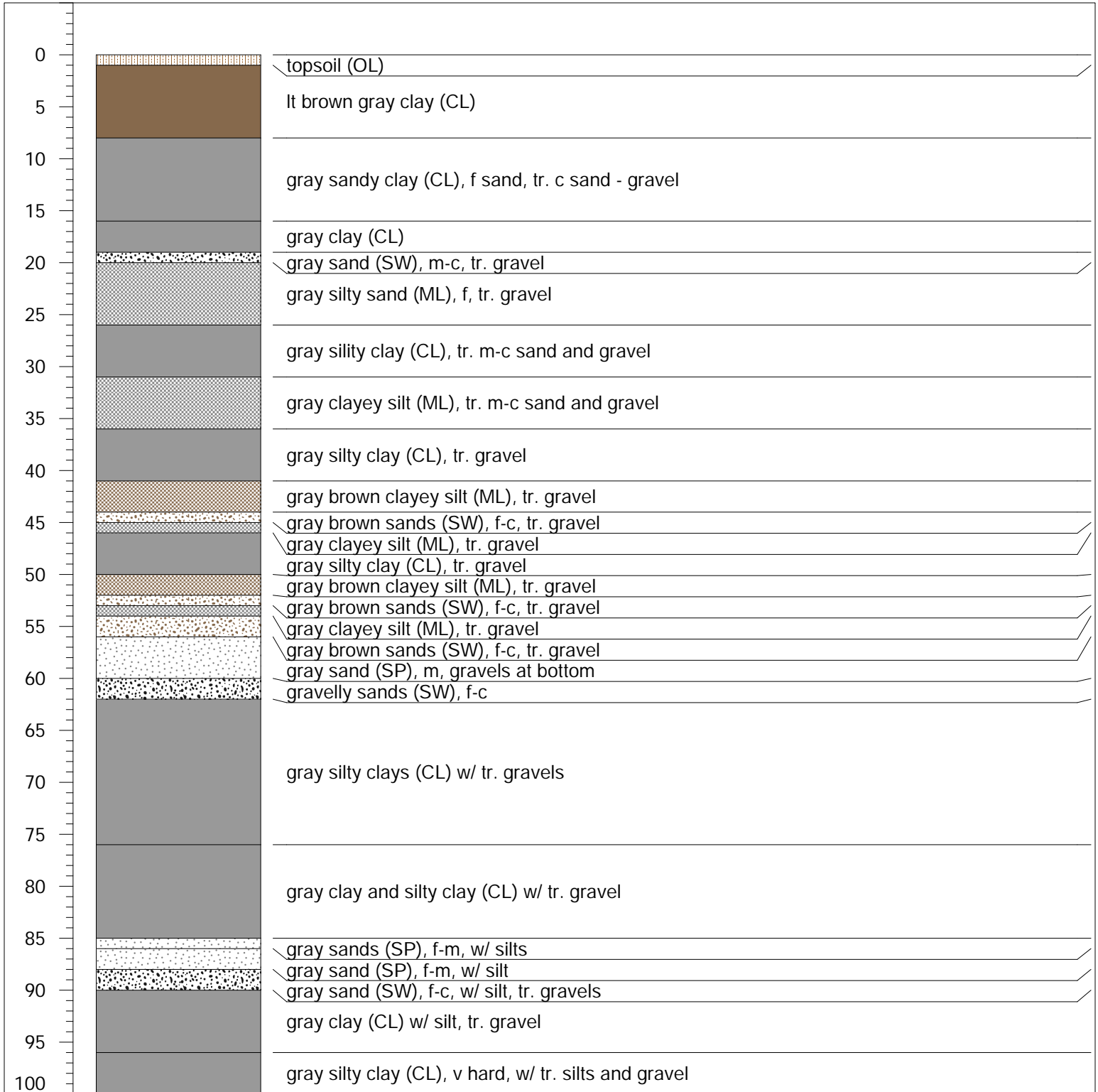
Elevation: 861 ft amsl Lat: 40.256720°
Total Depth: 366 ft Long: -86.591150°

Date start: 4/27/2022

Date finish: 4/30/2022

Date abandoned: 4/30/2022

Depth (ft bgs)	Lithology	Lithologic Description
----------------	-----------	------------------------



Total Depth = 366 ft bgs
bgs = below ground surface

C1-TB-1

Page: 1 of 4



Hole ID: C1-TB-1

Location: Clinton Co., IN
Site: C1

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 861 ft amsl Lat: 40.256720°
Total Depth: 366 ft Long: -86.591150°

Date start: 4/27/2022

Date finish: 4/30/2022

Date abandoned: 4/30/2022

Depth (ft bgs)	Lithology	Lithologic Description
95		gray clay (CL) w/ silt, tr. gravel
100		gray silty clay (CL), v hard, w/ tr. silts and gravel
105		gray silty clay (CL)
110		gray silty sand (SM), f
115		gray sand (SP), f-m, tr. gravels
115		black gray silty clay (CL)
120		gray clay (CL) w/o gravels
120		gray silty sand (SM), f, tr. gravel
120		gray gravelly clay (GC)
125		gray clay (CL) w/ silt
130		gray silty clay (CL) w/ tr. gravel, dry, flakes into 4" chunks, tr. f-m sands
135		dark gray clay (CL), dense, w/ tr. f sands at bottom
140		dark gray brown silty clay (ML), w/ tr. m sand - f gravel
145		dark gray brown silty clay (CL), dense, tr. f-m sand
150		dark gray brown clayey silt (ML), dense, tr. m sand, purple stain at bottom 1' pot. chem weathering
155		gray silty clay (CL), plastic, moist, tr. f-m sand
160		gray clayey silt (ML)
165		dark gray silty clay (CL)
170		gray clayey silt (ML), f-m sand
175		dark gray brown silty clay (CL), w/ tr. gravels, loose, dry
180		dark gray silty clay (CL), f-m, tr. gravel, dry, sl. plastic
185		dark gray silty clay (CL), f-m, tr. gravel, dry, sl. plastic
190		dark gray silty clay (CL), f-m, tr. gravel and f sand
195		dark gray silty clay (CL), f-m, tr. gravel and f sand
200		dark gray silty clay (CL), f-m, tr. gravel and f sand



Hole ID: C1-TB-1

Location: Clinton Co., IN
Site: C1

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 861 ft amsl **Lat:** 40.256720°
Total Depth: 366 ft **Long:** -86.591150°

Date start: 4/27/2022

Date finish: 4/30/2022

Date abandoned: 4/30/2022

Depth (ft bgs)	Lithology	Lithologic Description
195		dark gray silty clay (CL), f-m, tr. gravel, dry, sl. plastic
200		
205		dark gray silty clay (CL), f-m, tr. gravel and f sand
210		
215		dark gray clayey silt (ML) w/ tr. gravel and f sands, soft bottom 1' w/ sand
220		
225		gray silty clay (CL) and clayey silt (ML) interchange t/o, tr. f-m gravels, cobble, and tr. sand
230		
235		
240		gray silty clay (CL) and clayey silt (ML) interchange t/o, tr. m sand and f gravel, dry/hard
245		
250		gray silty clay (CL) w/ tr. sand and f gravel
255		gray silty sand (SM), f-m, w/ tr. c sand, p graded, tr. clay gray clay (CL)
260		
265		dark gray silty clay (CL) w/ tr. gravel and sand
270		dark gray clayey sand (SC), vf
271		dark gray clayey sandy gravel (GC), vf-c
272		dark gray silty, clay sand (SC), vf
273		dark gray silty clay (CL)
275		
280		
285		dark gray silty clay (CL) and clayey silt (ML), dense, dry, tr. f sand and gravel
290		
295		
300		gray silty sand (ML), f, w/ clay, tr. c sand and gravel

Total Depth = 366 ft bgs
bgs = below ground surface



Hole ID: C1-TB-1

Location: Clinton Co., IN
Site: C1

Logged by: P. Jurcek, INTERERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 861 ft amsl Lat: 40.256720°
Total Depth: 366 ft Long: -86.591150°

Date start: 4/27/2022

Date finish: 4/30/2022

Date abandoned: 4/30/2022

Depth (ft bgs)	Lithology	Lithologic Description
295		dark gray silty clay (CL) and clayey silt (ML), dense, dry, tr. f sand and gravel
300		
305		gray silty sand (ML), f, w/ clay, tr. c sand and gravel
310		
315		gray silt (ML) w/ clay, tr. c sand and gravel
315		gray sand (SP), f, w/ silt and clay
315		gray silt (ML) w/ clay, tr. c sand and gravel
320		gray sandy clay (CL), f, tr. c sand
320		gray olive brown silty sand (ML), f, tr. c sand and gravel
325		brown sand (SP), f-m
325		brown sand (SC), m-c, tr. silt and gravel
330		brown silty clay (CL)
335		brown silt (ML), f sand
340		brown silty clay (CL)
345		brown silt (ML) w/ f sand, tr. c sand
350		gray clayey sand and gravel (GC), f-c
355		gray silty sand and gravel (GM), f-c, tr. c gravel and cobbles, clay
360		gray sandy clay (CL) w/ silt, tr. c sand and gravel
365		gray LS bedrock
370		
375		
380		
385		
390		
395		
400		



Hole ID: C1-TB-2

Location: Clinton Co., IN
Site: C1

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

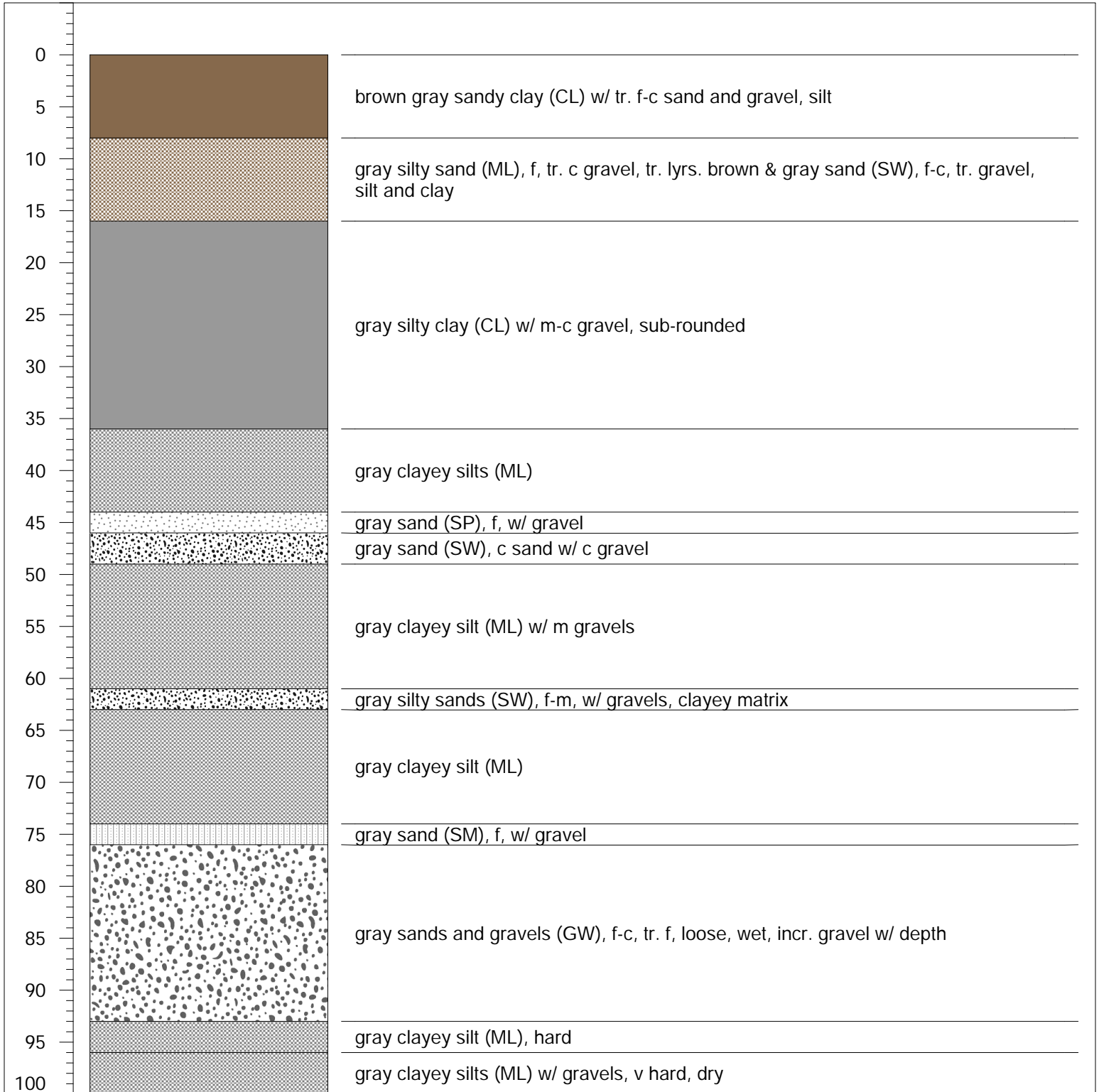
Elevation: 862 ft amsl Lat: 40.256890°
Total Depth: 106 ft Long: -86.591412°

Date start: 4/30/2022

Date finish: 5/10/2022

Date abandoned: 5/10/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Total Depth = 106 ft bgs
bgs = below ground surface

C1-TB-2



Hole ID: C1-TB-2

Location: Clinton Co., IN
Site: C1

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

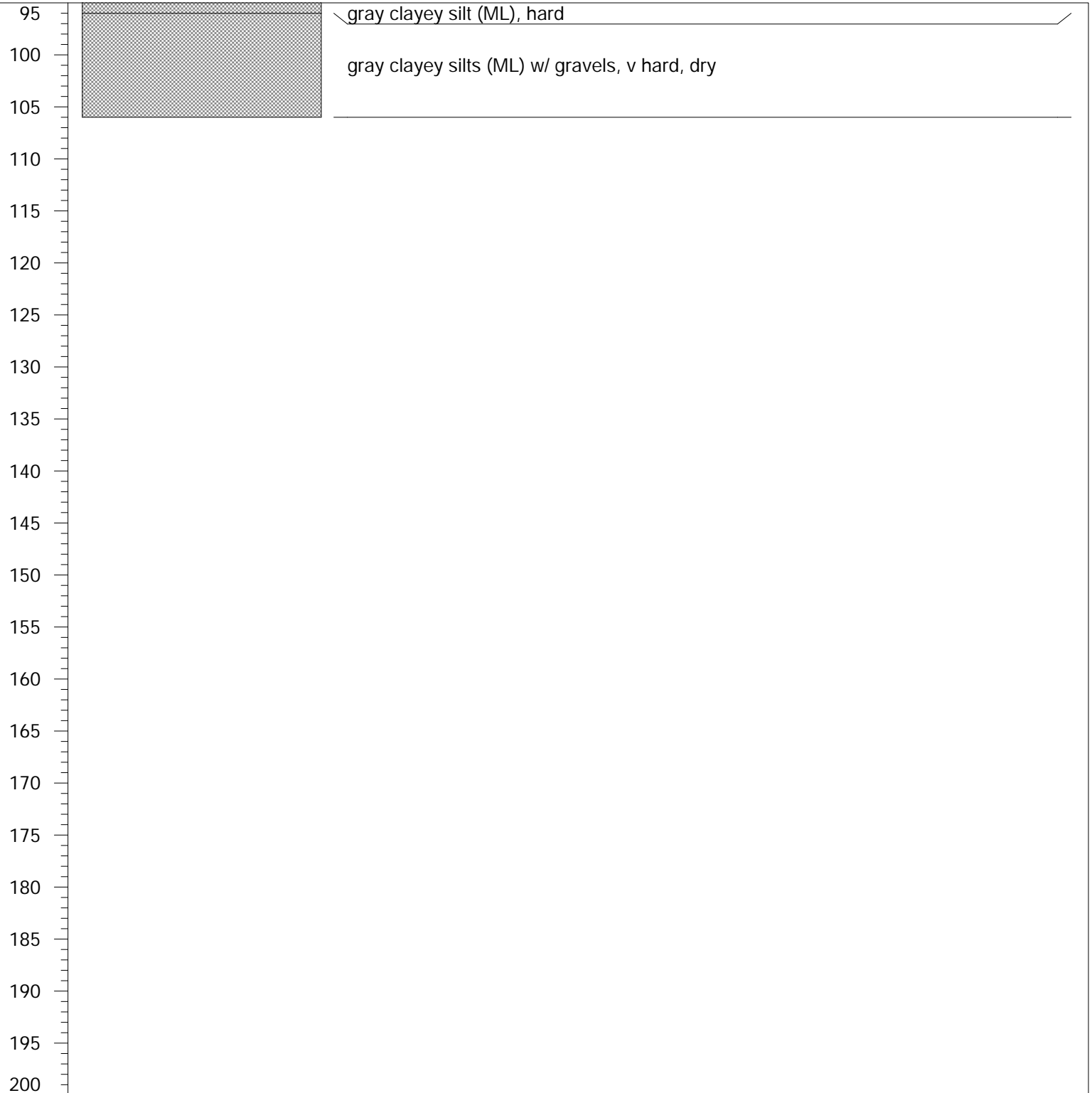
Elevation: 862 ft amsl Lat: 40.256890°
Total Depth: 106 ft Long: -86.591412°

Date start: 4/30/2022

Date finish: 5/10/2022

Date abandoned: 5/10/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Hole ID: C2-MW-1

Location: Clinton Co., IN
Site: C2

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

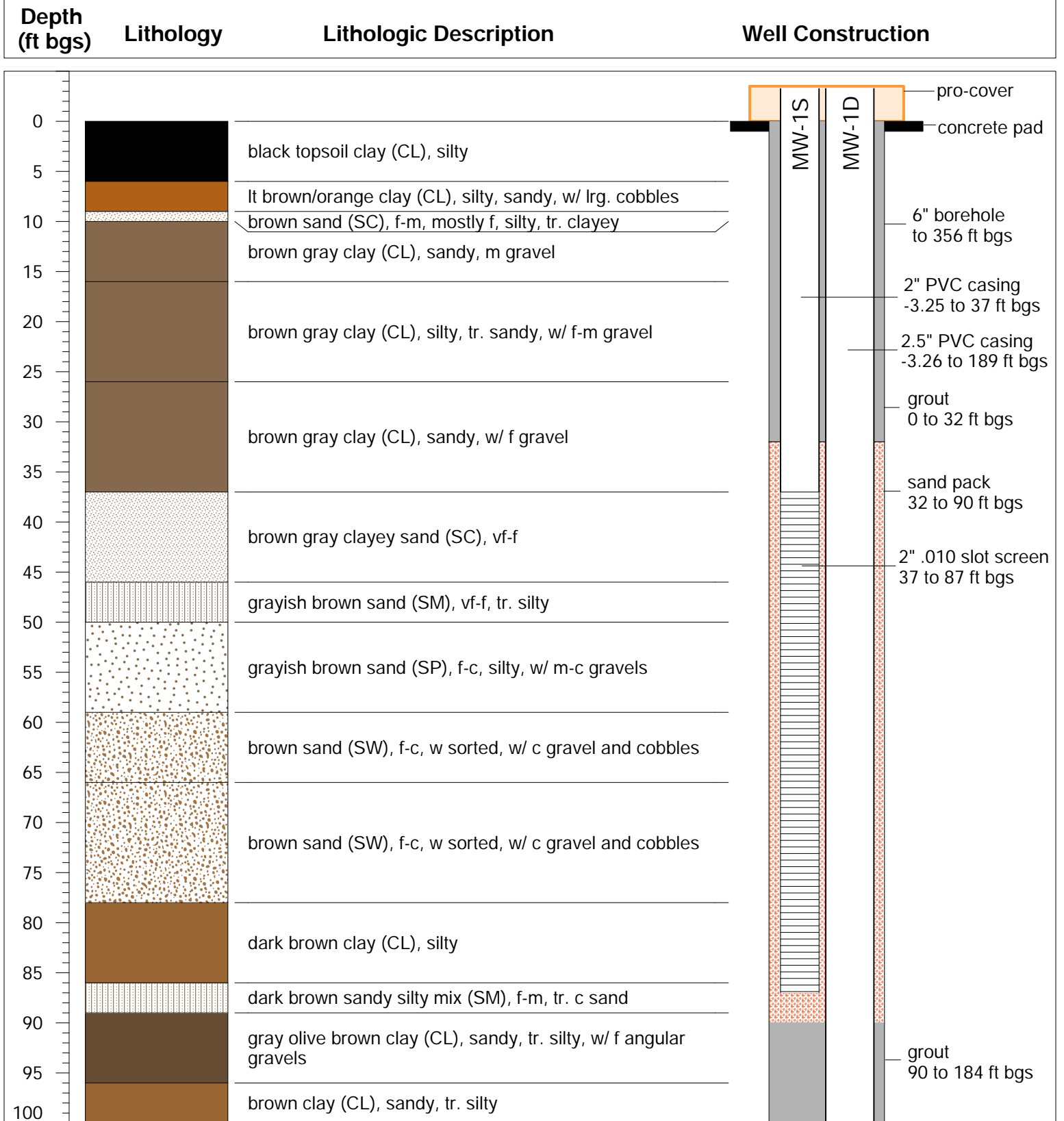
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 862 ft amsl Lat: 40.257102°
Total Depth: 356 ft Long: -86.581662°

Date start: 6/07/2022

Date finish: 6/18/2022

Date abandoned: 9/22/2022



Total Depth = 356 ft bgs
bgs = below ground surface



Hole ID: C2-MW-1

Location: Clinton Co., IN
Site: C2

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

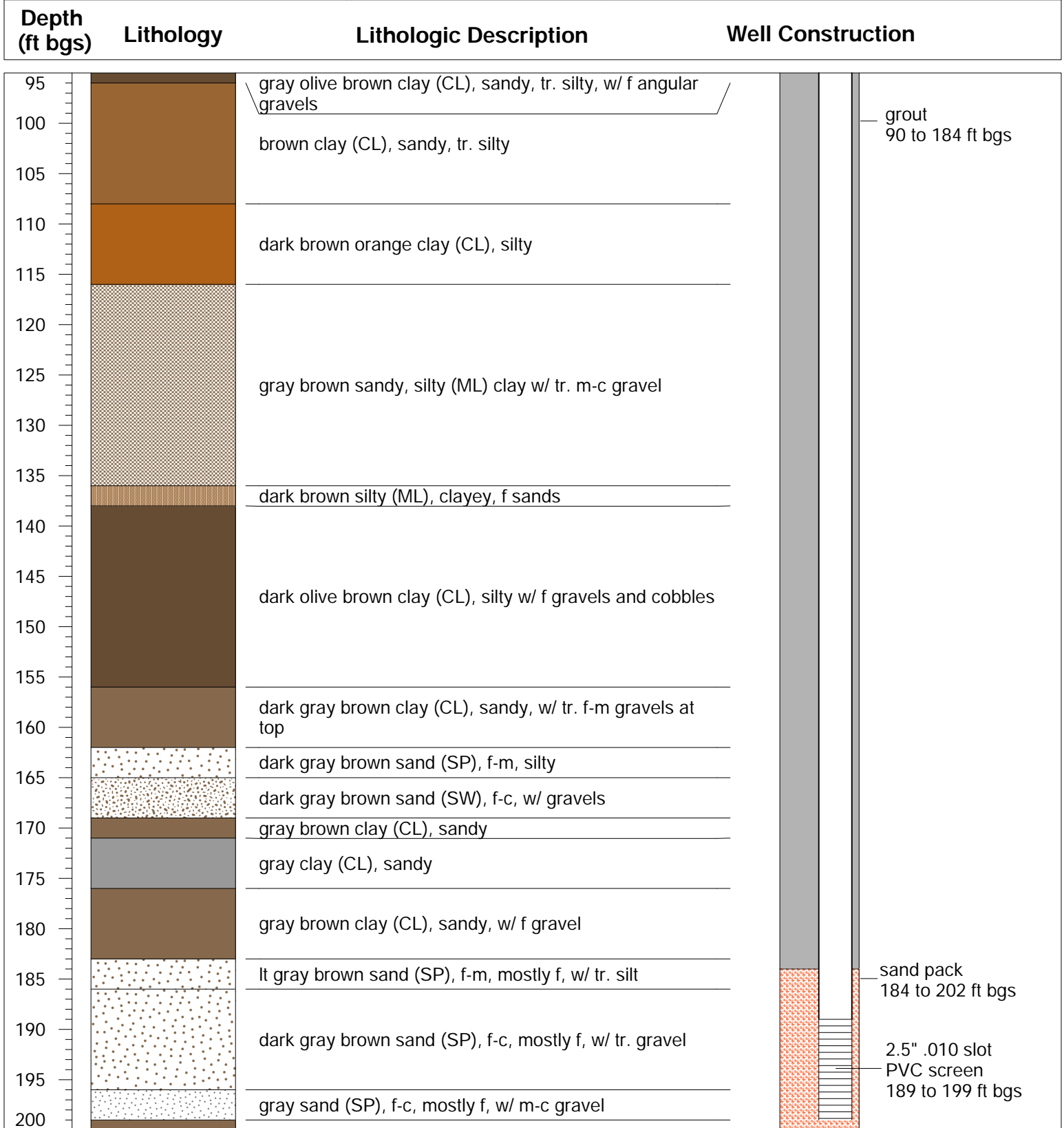
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 862 ft amsl Lat: 40.257102°
Total Depth: 356 ft Long: -86.581662°

Date start: 6/07/2022

Date finish: 6/18/2022

Date abandoned: 9/22/2022



Total Depth = 356 ft bgs
bgs = below ground surface

C2-MW-1

Page: 2 of 4



Hole ID: C2-MW-1

Location: Clinton Co., IN
Site: C2

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

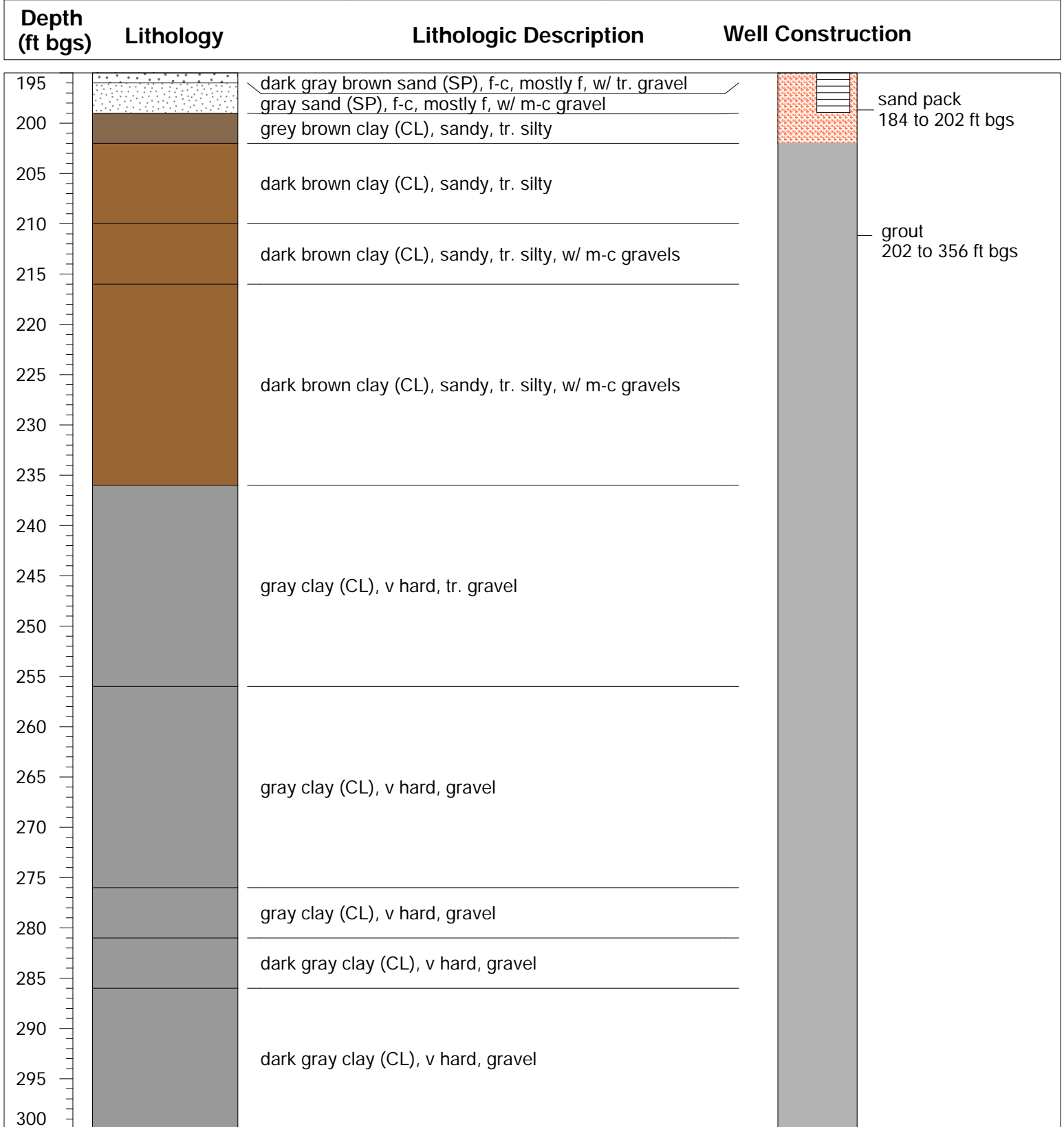
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 862 ft amsl Lat: 40.257102°
Total Depth: 356 ft Long: -86.581662°

Date start: 6/07/2022

Date finish: 6/18/2022

Date abandoned: 9/22/2022



Total Depth = 356 ft bgs
bgs = below ground surface

C2-MW-1



Hole ID: C2-MW-1

Location: Clinton Co., IN
Site: C2

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

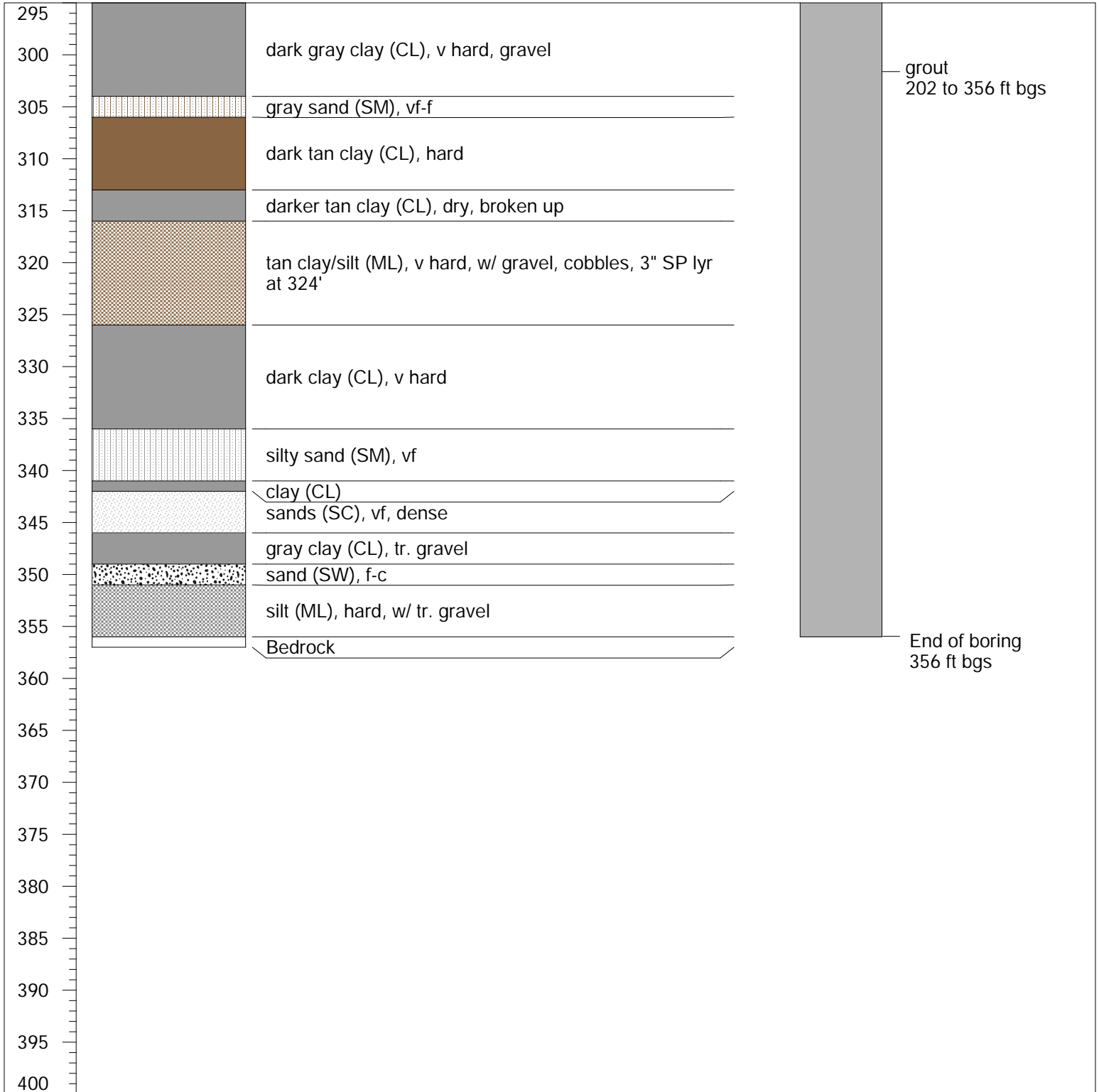
Elevation: 862 ft amsl Lat: 40.257102°
Total Depth: 356 ft Long: -86.581662°

Date start: 6/07/2022

Date finish: 6/18/2022

Date abandoned: 9/22/2022

Depth (ft bgs)	Lithology	Lithologic Description	Well Construction
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Total Depth = 356 ft bgs
bgs = below ground surface

C2-MW-1

Page: 4 of 4



Hole ID: C2-TB-1

Location: Clinton Co., IN
Site: C2

Logged by: B. Boggs, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

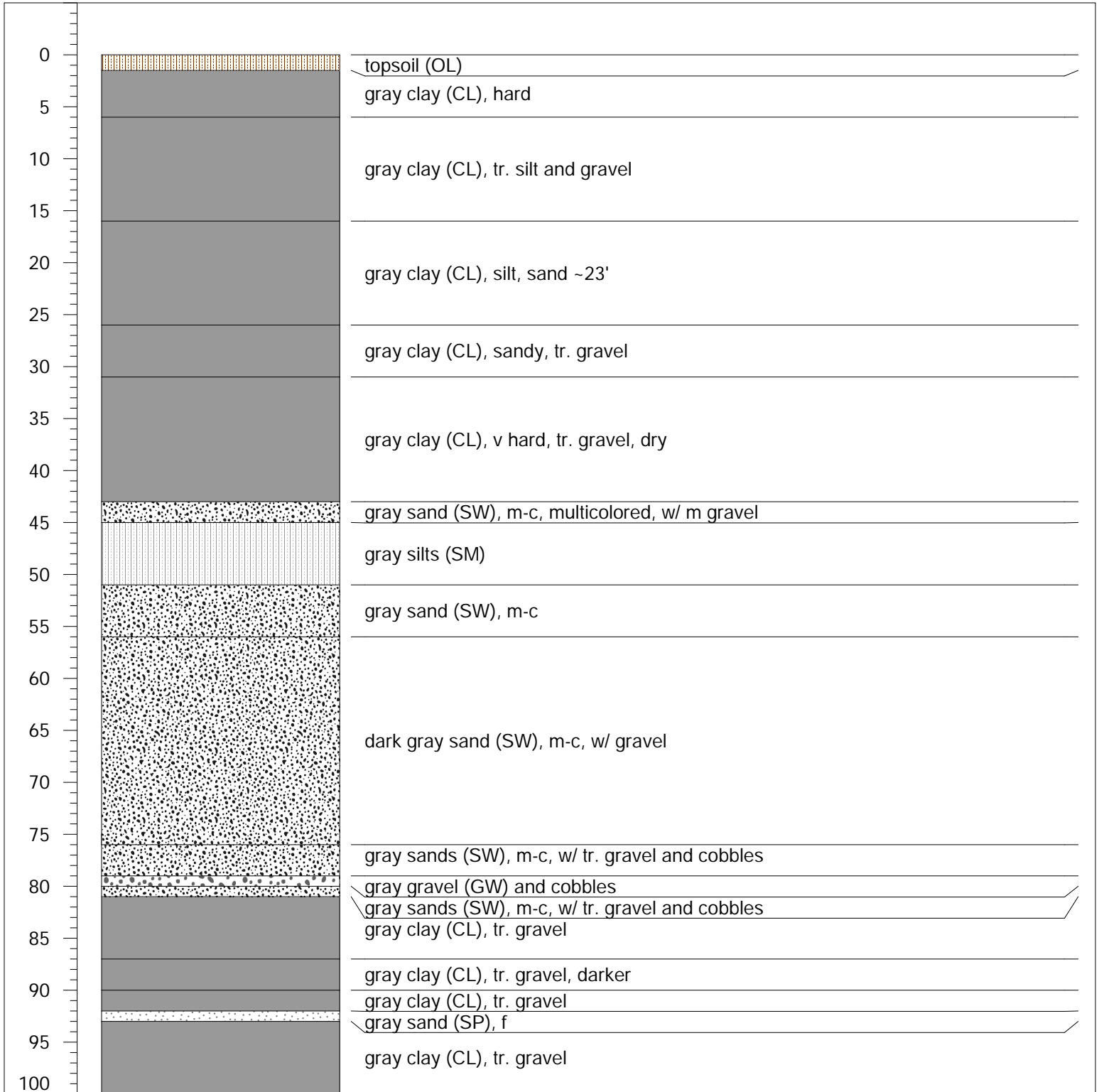
Elevation: 862 ft amsl **Lat:** 40.256721°
Total Depth: 364 ft **Long:** -86.581554°

Date start: 5/25/2022

Date finish: 6/02/2022

Date abandoned: 6/03/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Total Depth = 364 ft bgs
bgs = below ground surface

C2-TB-1

Page: 1 of 4



Hole ID: C2-TB-1

Location: Clinton Co., IN
Site: C2

Logged by: B. Boggs, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 862 ft amsl **Lat:** 40.256721°
Total Depth: 364 ft **Long:** -86.581554°

Date start: 5/25/2022

Date finish: 6/02/2022

Date abandoned: 6/03/2022

Depth (ft bgs)	Lithology	Lithologic Description
95		gray clay (CL), tr. gravel
105		
110		tan clay (CL), tr. gravel
115		
120		gray clay (CL), v hard, w/ tr. silts
125		
130		
132		gray sand (SW), f-c
133		gray clay (CL), v hard, w/ tr. silts
135		
140		lt. gray clay (CL), v hard, tr. gravel
145		
150		dark gray clay (CL), v hard
155		
160		dark gray clay (CL), v hard, gravel
165		gray sand (SW), m-c, gravel, dark band ~165'
170		
172		gray gravel (GW), coarse
173		dark gray clay (CL), v hard, gravel
175		
180		sand (SW), m-c, gravel
182		clay (CL), v hard
183		gray sand (SP), m-c, gravel
184		gray sand (SW), m-c, gravel
185		gray sand (SP), m-c, gravel
186		gray sand (SW), m-c, gravel
187		gray sand (SP), m-c, 1' band c gravel at 190'
188		gray gravel (GW)
189		gray sand (SP), m-c, gravel
190		gray sand (SW), m-c, gravel
191		
192		
193		
194		
195		
196		
197		
198		
199		
200		

Total Depth = 364 ft bgs
bgs = below ground surface

C2-TB-1



Hole ID: C2-TB-1

Location: Clinton Co., IN
Site: C2

Logged by: B. Boggs, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 862 ft amsl Lat: 40.256721°
Total Depth: 364 ft Long: -86.581554°

Date start: 5/25/2022

Date finish: 6/02/2022

Date abandoned: 6/03/2022

Depth (ft bgs)	Lithology	Lithologic Description
195		gray sand (SP), m-c, gravel
200		
205		gray clay (CL), v hard, silt
210		
215		
220		gray clay (CL), v hard
225		
230		gray silt (ML), gravel, tr. clay
235		gray clay (CL), v hard
240		
245		dark gray clay (CL), v hard
250		
255		
260		
265		dark gray clay (CL), v hard, tr. gravel, silt, organics ~266'
270		
275		
280		dark clay (CL), v hard, tr. gravel
285		dark gray clay (CL), v hard, tr. gravel, silt
290		gray clay (CL), v hard, gravel
295		gray sand (SM), vf-f, loose, tr. gravel, poor water prod.
300		gray sand (SM), f-c, w/ gravel and silt

Total Depth = 364 ft bgs
bgs = below ground surface

C2-TB-1

Page: 3 of 4



Hole ID: C2-TB-1

Location: Clinton Co., IN
Site: C2

Logged by: B. Boggs, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 862 ft amsl Lat: 40.256721°
Total Depth: 364 ft Long: -86.581554°

Date start: 5/25/2022

Date finish: 6/02/2022

Date abandoned: 6/03/2022

Depth (ft bgs)	Lithology	Lithologic Description
295		gray sand (SM), vf-f, loose, tr. gravel, poor water prod.
300		gray sand (SM), f-c, w/ gravel and silt dark gray clay (CL), v hard
305		gray rock (GM)
310		dark brown clay (CL), v hard, tr. gravel
315		dark gray clay (CL), v hard, brown and white lines
320		gray clay (CL), w/ sand band ~309'
325		tan clay (CL), w/ organic streaks
330		tan-gray sand (SP), f
335		tan sand (SP), vf-f, tr. organic streaks
340		gray clay (CL)
345		dark gray sand (SP), vf-f
350		gray sand (SP), vf-f
355		gray gravel (GM), w/ silt, cobbles
360		Bedrock

Total Depth = 364 ft bgs
bgs = below ground surface

C2-TB-1

Page: 4 of 4



Hole ID: C2-TB-2

Location: Clinton Co., IN
Site: C2

Logged by: H. Manlove, INTERERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

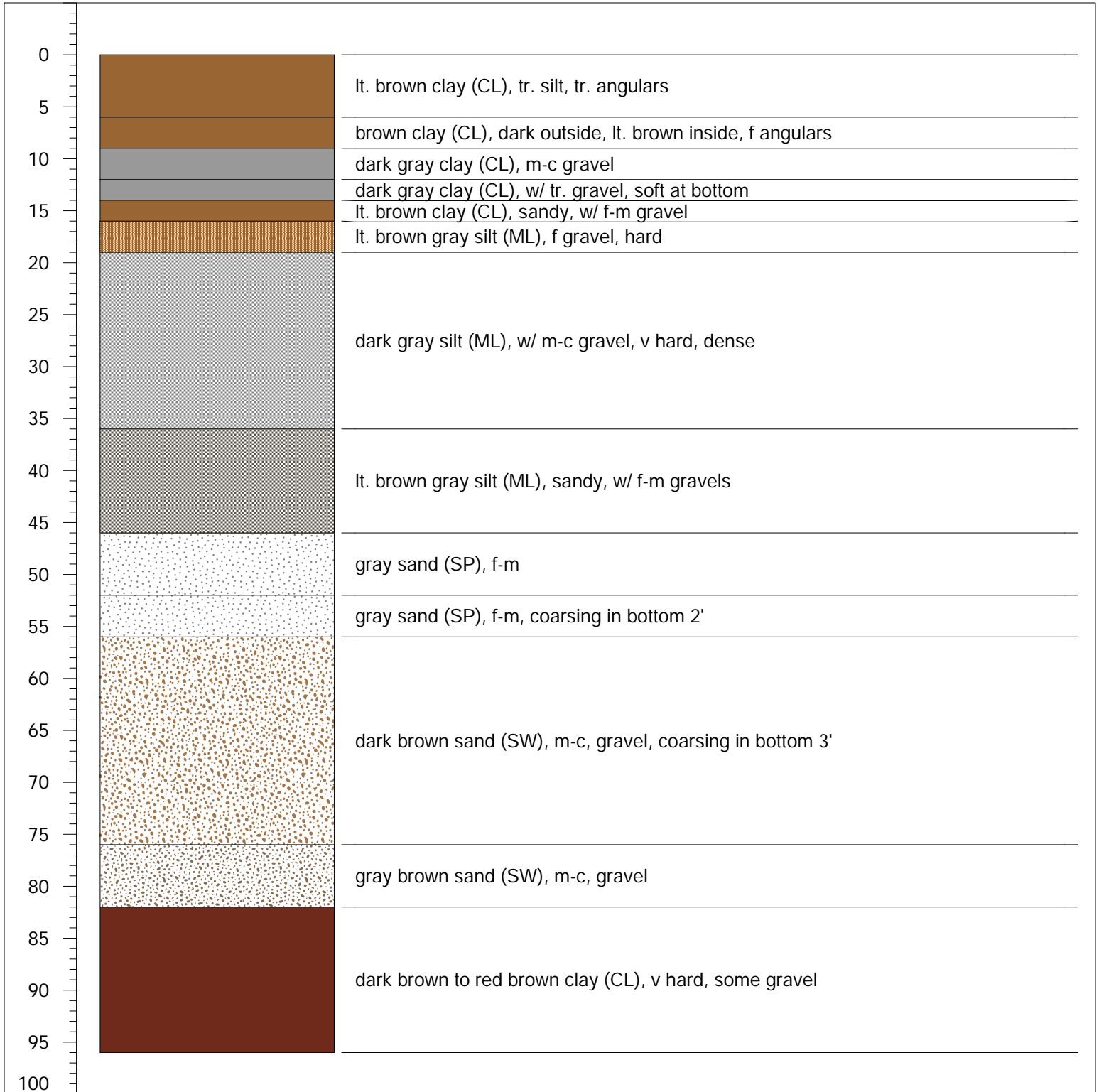
Elevation: 862 ft amsl **Lat:** 40.256508°
Total Depth: 96 ft **Long:** -86.581804°

Date start: 6/03/2022

Date finish: 6/03/2022

Date abandoned: 6/04/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Total Depth = 96 ft bgs
bgs = below ground surface

C2-TB-2

Page: 1 of 1



Hole ID: C2-TB-2

Location: Clinton Co., IN
Site: C2

Logged by: H. Manlove, INTERA

Drilling Method: Sonic

Elevation: 862 ft amsl

Lat: 40.256508°

Drilled by: A. Little, Cascade

Borehole diameter: 6"

Total Depth: 96 ft

Long: -86.581804°

Date start: 6/03/2022

Date finish: 6/03/2022

Date abandoned: 6/04/2022

Depth
(ft bgs)

Lithology

Lithologic Description

100



Hole ID: C2-TB-2

Location: Clinton Co., IN
Site: C2

Logged by: H. Manlove, INTERA

Drilling Method: Sonic

Elevation: 862 ft amsl

Lat: 40.256508°

Drilled by: A. Little, Cascade

Borehole diameter: 6"

Total Depth: 96 ft

Long: -86.581804°

Date start: 6/03/2022

Date finish: 6/03/2022

Date abandoned: 6/04/2022

Depth
(ft bgs)

Lithology

Lithologic Description

Depth (ft bgs)	Lithology	Lithologic Description
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Hole ID: C2-TB-2

Location: Clinton Co., IN
Site: C2

Logged by: H. Manlove, INTERA

Drilling Method: Sonic

Elevation: 862 ft amsl

Lat: 40.256508°

Drilled by: A. Little, Cascade

Borehole diameter: 6"

Total Depth: 96 ft

Long: -86.581804°

Date start: 6/03/2022

Date finish: 6/03/2022

Date abandoned: 6/04/2022

Depth
(ft bgs)

Lithology

Lithologic Description

Depth (ft bgs)	Lithology	Lithologic Description
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Hole ID: C2-TB-3

Location: Clinton Co., IN
Site: C2

Logged by: H. Manlove, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

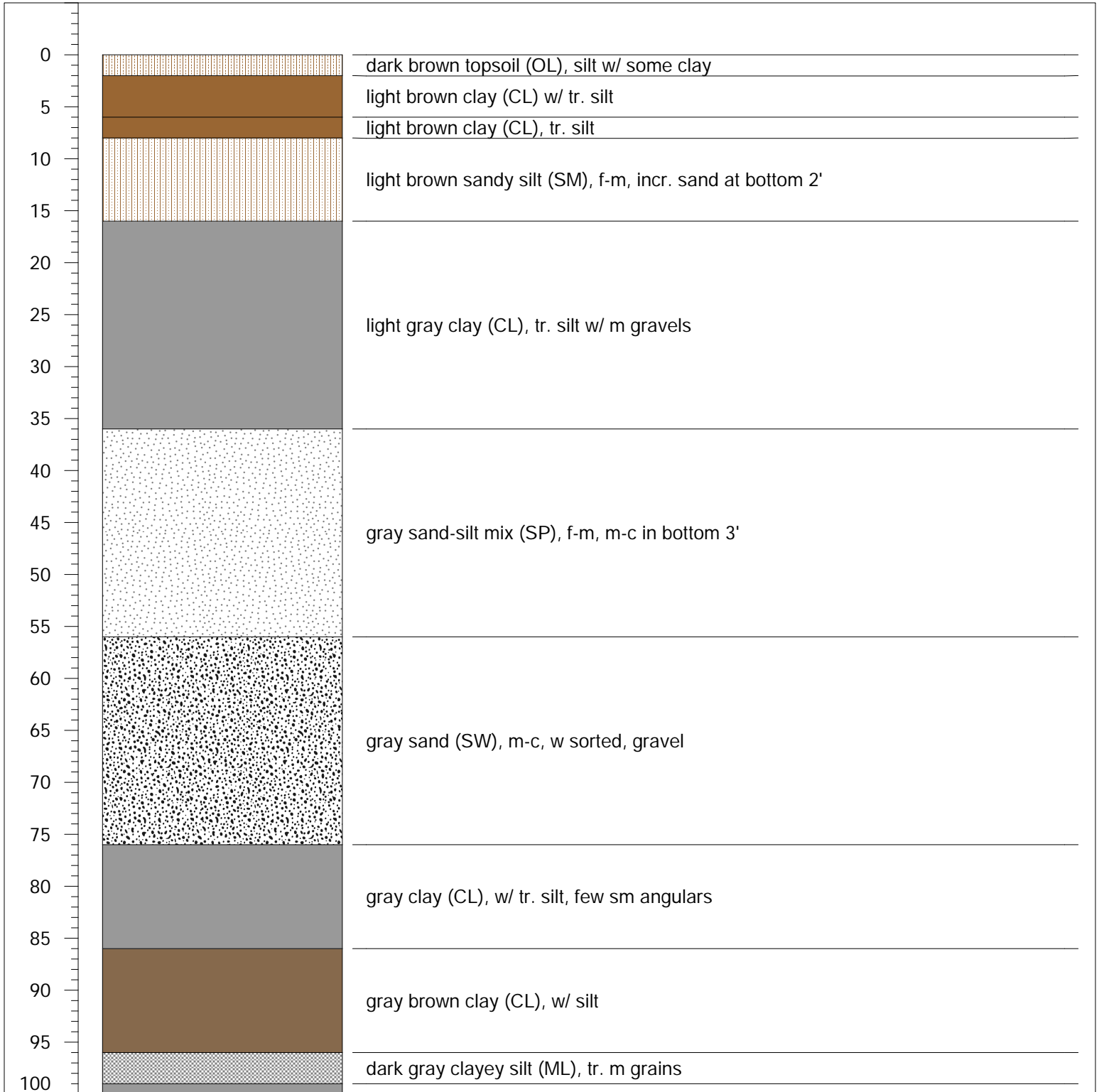
Elevation: 862 ft amsl Lat: 40.257094°
Total Depth: 216 ft Long: -86.581672°

Date start: 6/04/2022

Date finish: 6/05/2022

Date abandoned: 6/07/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Total Depth = 216 ft bgs
bgs = below ground surface

C2-TB-3

Page: 1 of 3



Hole ID: C2-TB-3

Location: Clinton Co., IN
Site: C2

Logged by: H. Manlove, INTERA

Drilling Method: Sonic

Elevation: 862 ft amsl

Lat: 40.257094°

Drilled by: A. Little, Cascade

Borehole diameter: 6"

Total Depth: 216 ft

Long: -86.581672°

Date start: 6/04/2022

Date finish: 6/05/2022

Date abandoned: 6/07/2022

Depth (ft bgs)	Lithology	Lithologic Description
95		gray brown clay (CL), w/ silt
100		dark gray clayey silt (ML), tr. m grains
105		gray clay (CL), tr. f angulars
110		light brown silty clay (CL), w/ tr. red and yellow, chunky, v hard
115		light brown clay (CL), silty
120		dark gray clay (CL), tr. silty, yellow-orange inner core
125		gray sand-silt mix (SM), f-c
130		gray sandy clay (SC), f sands
135		gray sandy clay (SC), f-c, w/ tr. m-c grains
140		gray clay (CL), w/ tr. silt
145		olive gray clay (CL), sandy, tr. silt
150		dark gray brown clay (CL), sandy, tr. silt, black spots t/o
155		light gray sandy clay mix (SC), vf-f
160		dark gray silty sand (SM), f-m, tr. m-c gravels
165		light gray clay (CL), sandy
170		light gray silty sand (SM), f-c
175		light gray clay (CL), sandy
180		light gray clayey sand (SC), vf-f
185		light gray silty sand (SM), f, w/ tr. m-c
190		light gray clay (CL), w/ sand, tr. c gravel and cobbles
195		
200		

Total Depth = 216 ft bgs
bgs = below ground surface

C2-TB-3

Page: 2 of 3



Hole ID: C2-TB-3

Location: Clinton Co., IN
Site: C2

Logged by: H. Manlove, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

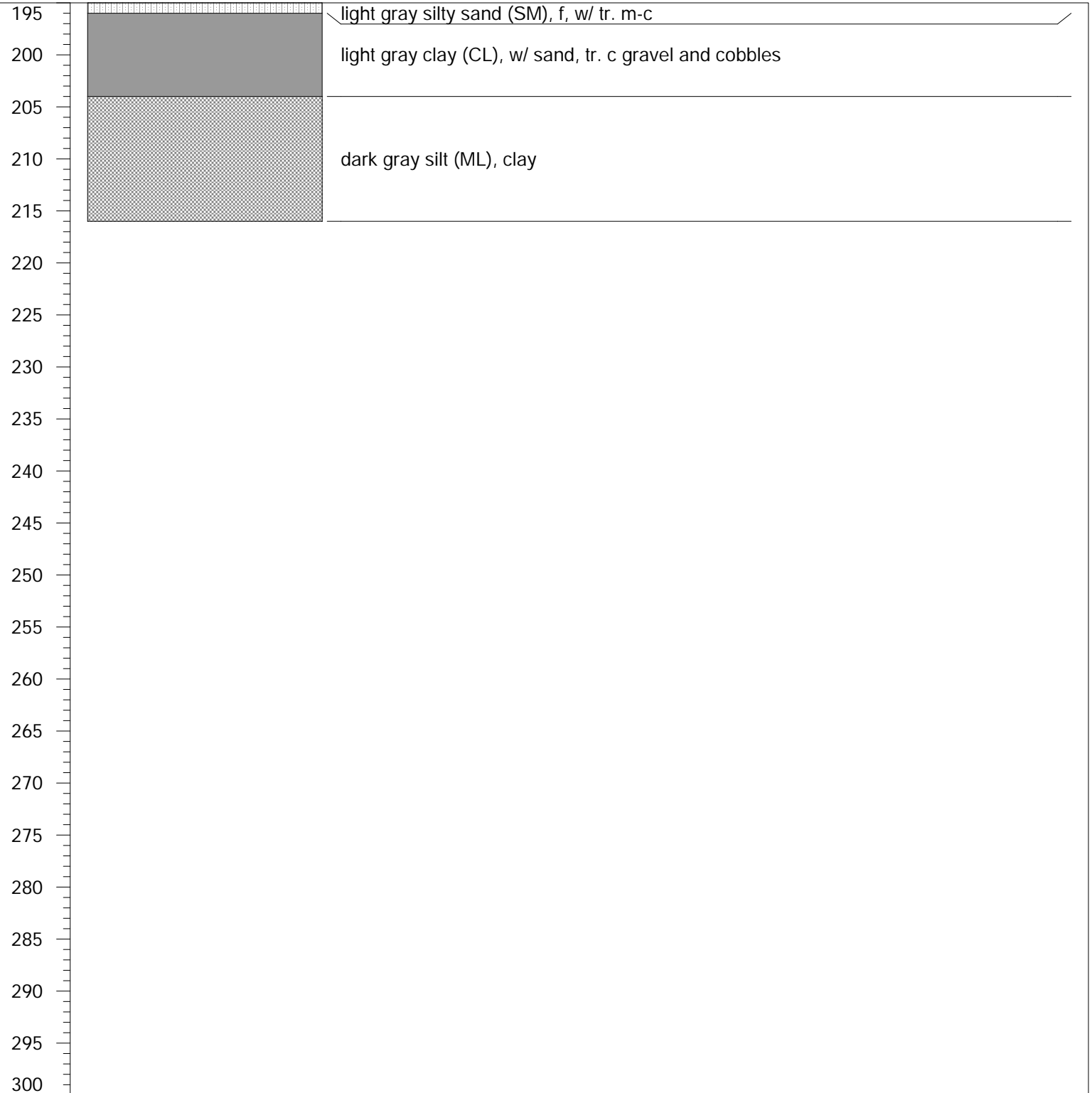
Elevation: 862 ft amsl Lat: 40.257094°
Total Depth: 216 ft Long: -86.581672°

Date start: 6/04/2022

Date finish: 6/05/2022

Date abandoned: 6/07/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Hole ID: D3-MW-1

Location: Clinton Co., IN
Site: D3

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

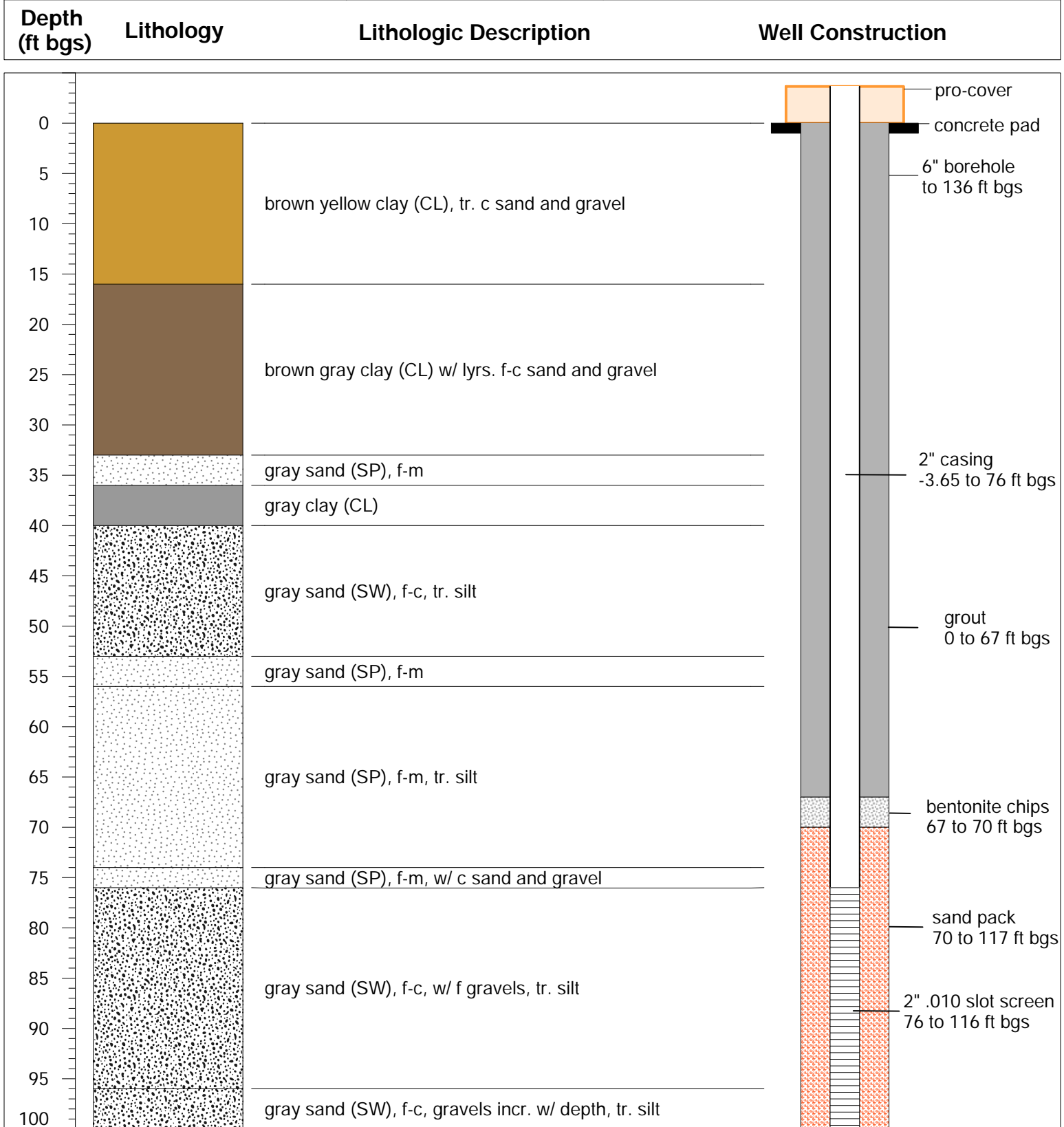
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 869 ft amsl Lat: 40.228460°
Total Depth: 136 ft Long: -86.588920°

Date start: 4/06/2022

Date finish: 4/07/2022

Date abandoned: 9/22/2022



Total Depth = 136 ft bgs
bgs = below ground surface

D3-MW-1

Page: 1 of 2



Hole ID: D3-MW-1

Location: Clinton Co., IN
Site: D3

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

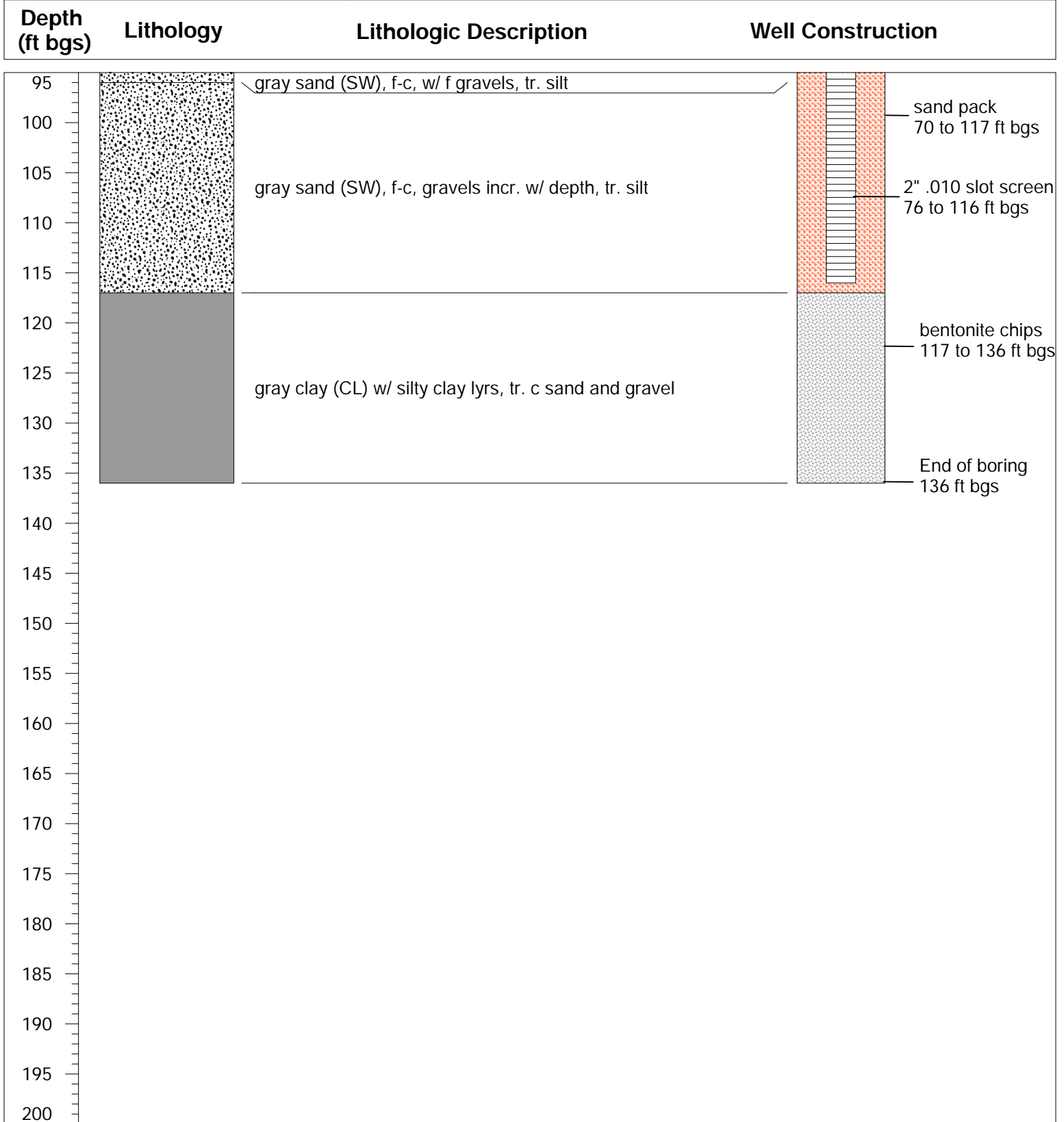
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 869 ft amsl Lat: 40.228460°
Total Depth: 136 ft Long: -86.588920°

Date start: 4/06/2022

Date finish: 4/07/2022

Date abandoned: 9/22/2022



Total Depth = 136 ft bgs
bgs = below ground surface



Hole ID: D3-TB-1

Location: Clinton Co., IN
Site: D3

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

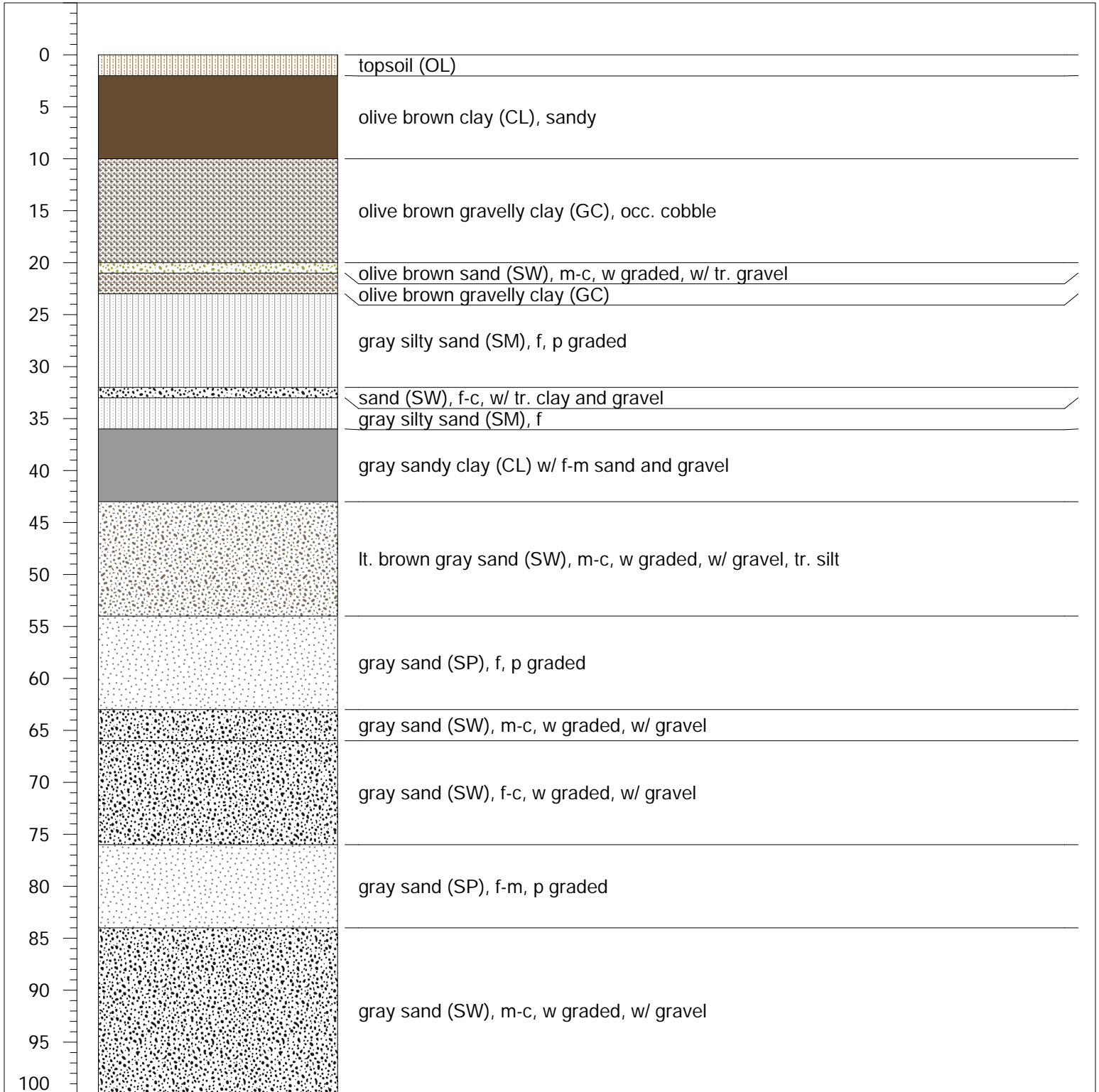
Elevation: 868 ft amsl Lat: 40.228871°
Total Depth: 336 ft Long: -86.589539°

Date start: 3/29/2022

Date finish: 4/05/2022

Date abandoned: 4/05/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Total Depth = 336 ft bgs
bgs = below ground surface

D3-TB-1

Page: 1 of 4



Hole ID: D3-TB-1

Location: Clinton Co., IN
Site: D3

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 868 ft amsl Lat: 40.228871°
Total Depth: 336 ft Long: -86.589539°

Date start: 3/29/2022

Date finish: 4/05/2022

Date abandoned: 4/05/2022

Depth (ft bgs)	Lithology	Lithologic Description
95		
100		gray sand (SW), m-c, w graded, w/ gravel
105		
110		gray sand (SW), m-c, w/ tr. f sand, gravel incr. w/ depth
115		clayey sand (SC), f, w/ gravel
120		dark gray clay (CL) w/ m-c sand and gravel
125		
130		gray silt (ML) w/ f sand and gravel
135		
140		gray clay (CL), f-c, gravel, and tr. silt
145		
150		
155		gray clayey silt (ML), w/ clay, f sand, and tr. gravel
160		
165		gray sand (SW), f-c, w graded gray clayey silt (ML), w/ clay, f sand, and tr. gravel
170		gray clay (CL) w/ silt, f sand, and tr. gravel
175		
180		
185		gray silt (ML), w/ f sand, tr. clay, and tr. gravel
190		
195		
200		gray to gray-brown clay (CL), w/ silt, f sand, and tr. gravel

Total Depth = 336 ft bgs
bgs = below ground surface

D3-TB-1



Hole ID: D3-TB-1	Location: Clinton Co., IN Site: D3
Logged by: P. Jurcek, INTERA Drilled by: A. Little, Cascade	Drilling Method: Sonic Borehole diameter: 6"
Date start: 3/29/2022	Date finish: 4/05/2022
Elevation: 868 ft amsl	Lat: 40.228871°
Total Depth: 336 ft	Long: -86.589539°
Date abandoned: 4/05/2022	

Depth (ft bgs)	Lithology	Lithologic Description
195		gray silt (ML), w/ f sand, tr. clay, and tr. gravel
200		gray to gray-brown clay (CL), w/ silt, f sand, and tr. gravel
205		
210		
215		gray sand (SW), f-c, w graded, w/ tr. gravel and silt
220		gray clay (CL) w/ silt, and tr. gravel
225		
230		gray sand (SW), f-c, w graded, w/ gravel, silt, and tr. clay
235		
240		
245		gray clay (CL) w/ tr. c sand and gravel
250		gray sand (SW), f-c, w graded, w/ gravel, silt, and tr. clay
255		gray clay (CL) w/ tr. c sand and gravel
260		gray sand (SW), f-c, w graded, w/ gravel, silt, and tr. clay
265		gray clay (CL) w/ tr. c sand and gravel
270		gray sand (SW), f-c, w graded, w/ gravel, silt, and tr. clay
275		gray sand (SP), m, p graded, w/ c. sand and tr. silt
280		gray sand (SW), f-c, w graded, w/ tr. gravel, tr. silt, and tr. clay
285		gray clay (CL) w/ tr. c sand and gravel
290		
295		gray clayey sand (SC) f-m sand, w/ tr. gravel
300		gray clay (CL) w/ tr. c sand and gravel
		dark gray clay (CL) w/ silt, and tr. c sand

Total Depth = 336 ft bgs
bgs = below ground surface



Hole ID: D3-TB-1

Location: Clinton Co., IN
Site: D3

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

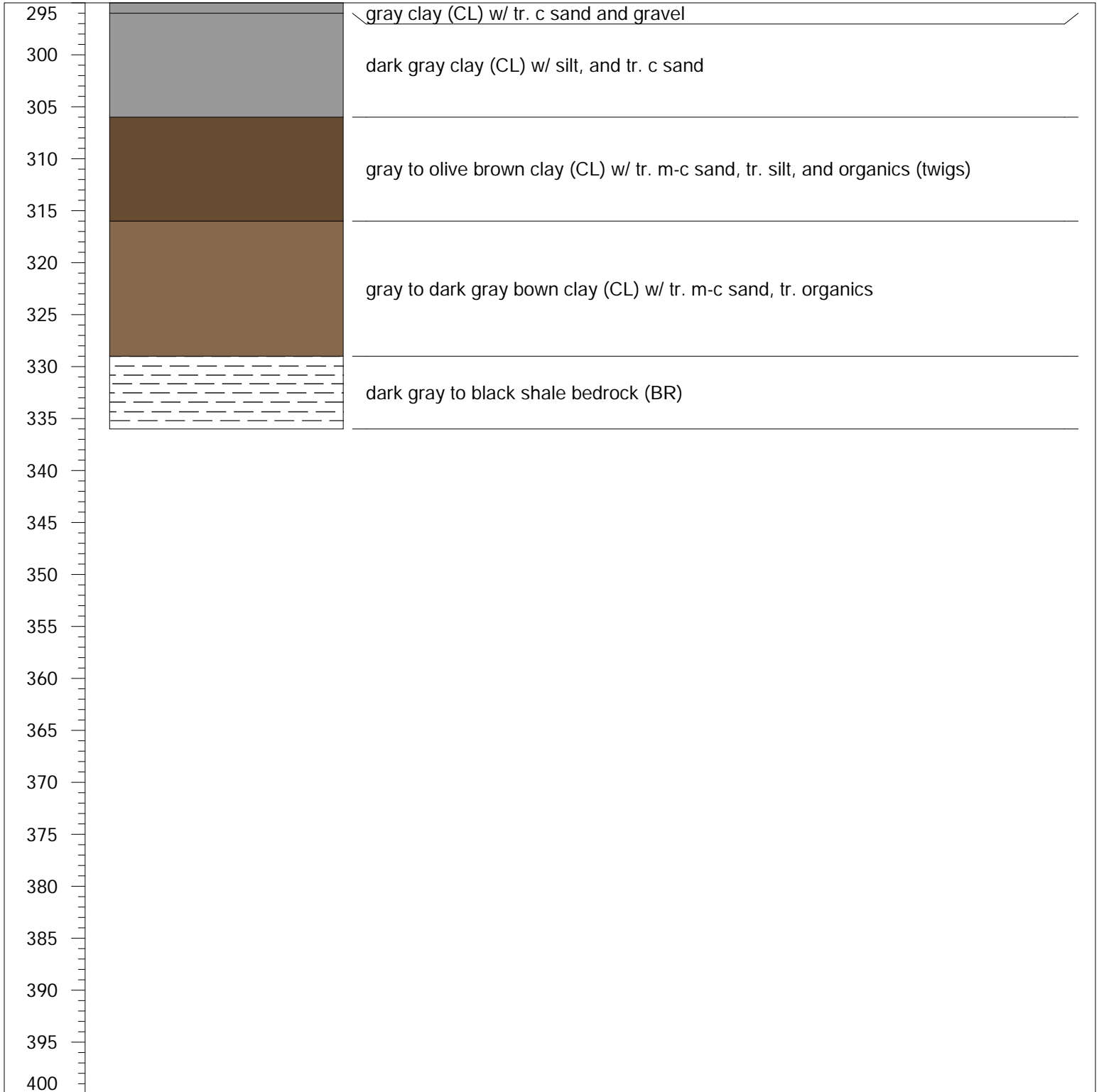
Elevation: 868 ft amsl Lat: 40.228871°
Total Depth: 336 ft Long: -86.589539°

Date start: 3/29/2022

Date finish: 4/05/2022

Date abandoned: 4/05/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Hole ID: J3-MW-1

Location: Clinton Co., IN
Site: J3

Logged by: R. Corrigan, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

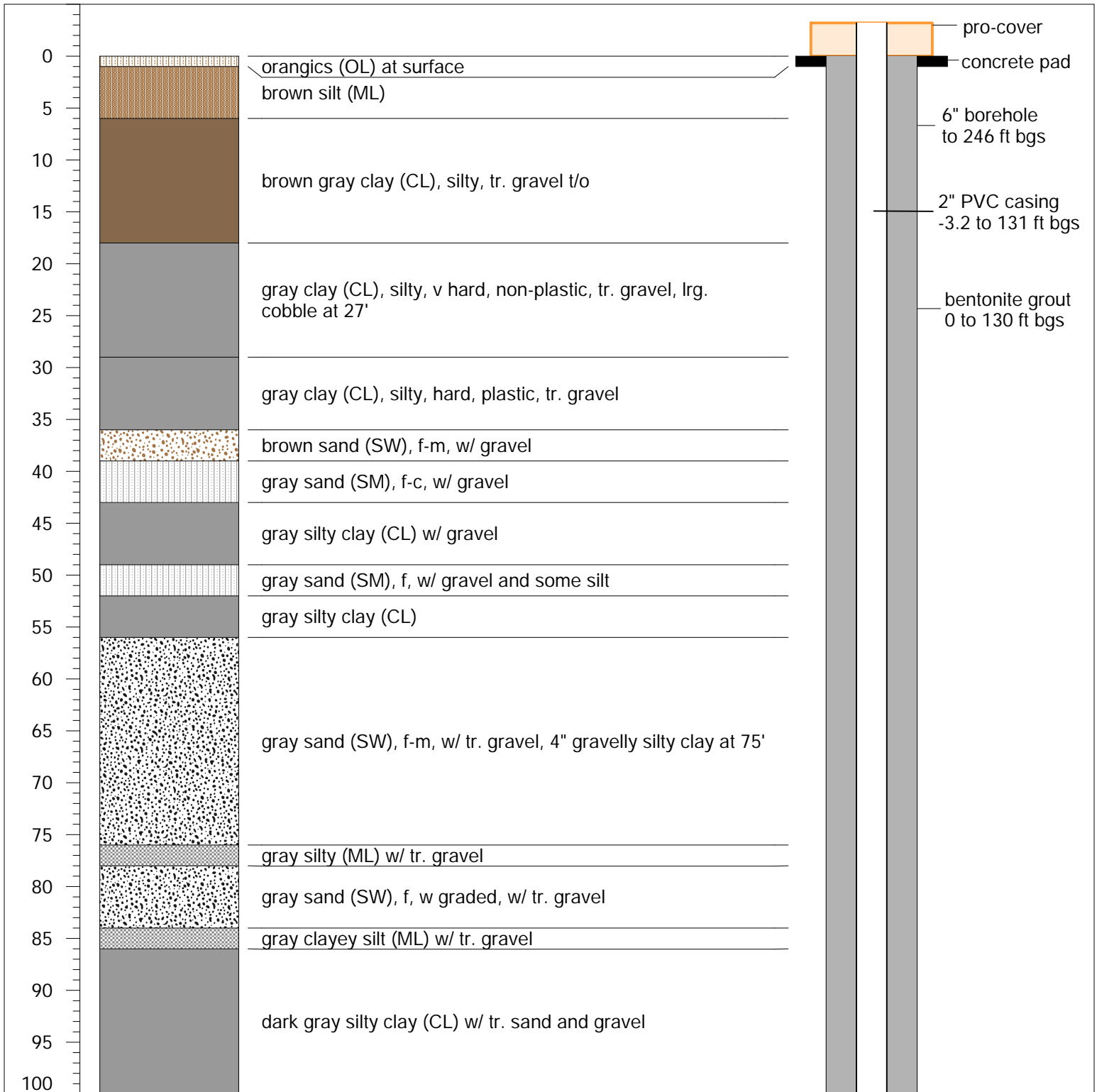
Elevation: 856 ft amsl Lat: 40.242913°
Total Depth: 246 ft Long: -86.625094°

Date start: 5/17/2022

Date finish: 5/24/2022

Date abandoned: 9/22/2022

Depth (ft bgs)	Lithology	Lithologic Description	Well Construction
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Total Depth = 246 ft bgs
bgs = below ground surface

J3-MW-1

Page: 1 of 3



Hole ID: J3-MW-1

Location: Clinton Co., IN
Site: J3

Logged by: R. Corrigan, INTERA

Drilling Method: Sonic

Elevation: 856 ft amsl Lat: 40.242913°

Drilled by: A. Little, Cascade

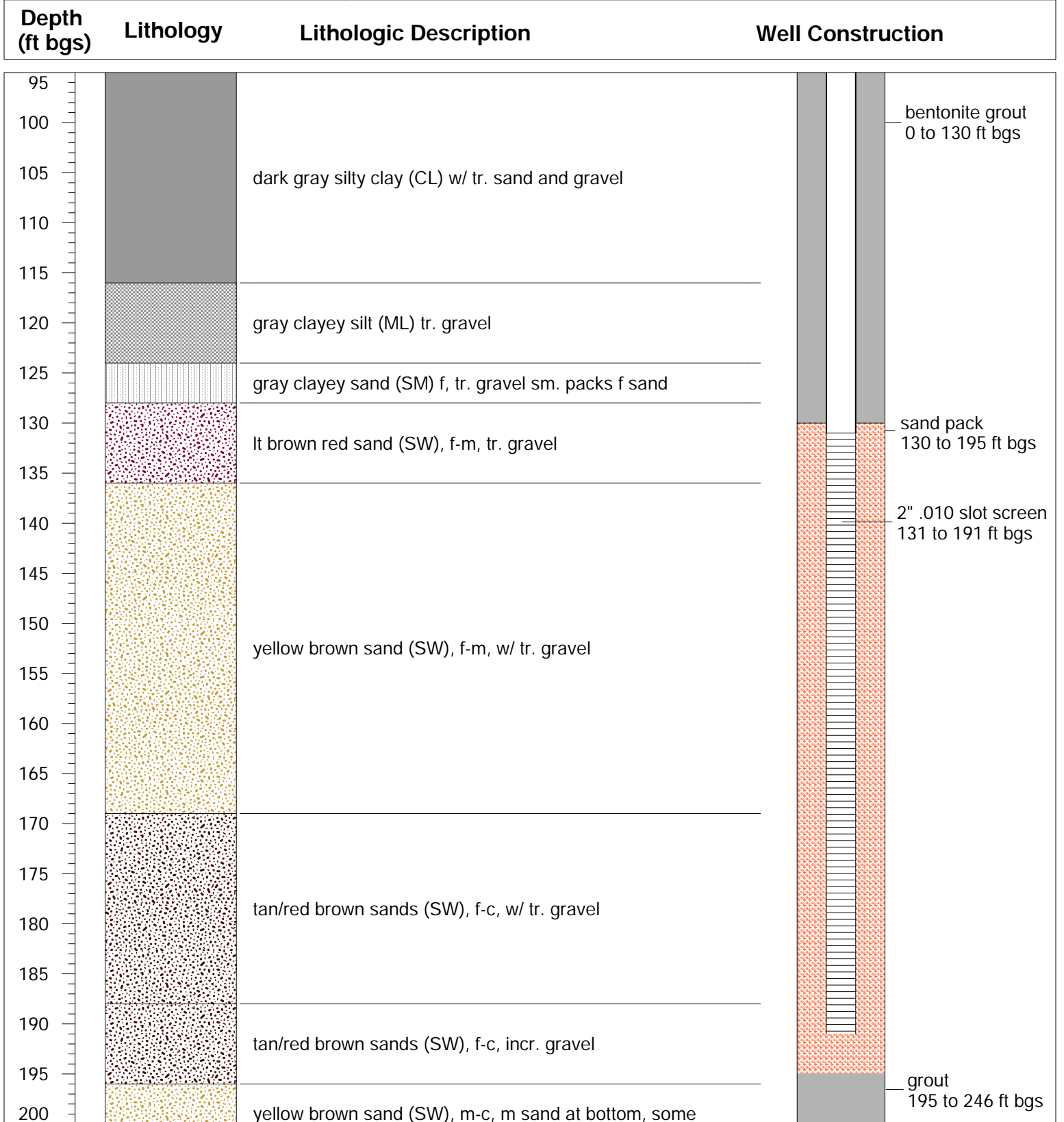
Borehole diameter: 6"

Total Depth: 246 ft Long: -86.625094°

Date start: 5/17/2022

Date finish: 5/24/2022

Date abandoned: 9/22/2022



Total Depth = 246 ft bgs
bgs = below ground surface

J3-MW-1

Page: 2 of 3



Hole ID: J3-MW-1

Location: Clinton Co., IN
Site: J3

Logged by: R. Corrigan, INTERA

Drilling Method: Sonic

Elevation: 856 ft amsl

Lat: 40.242913°

Drilled by: A. Little, Cascade

Borehole diameter: 6"

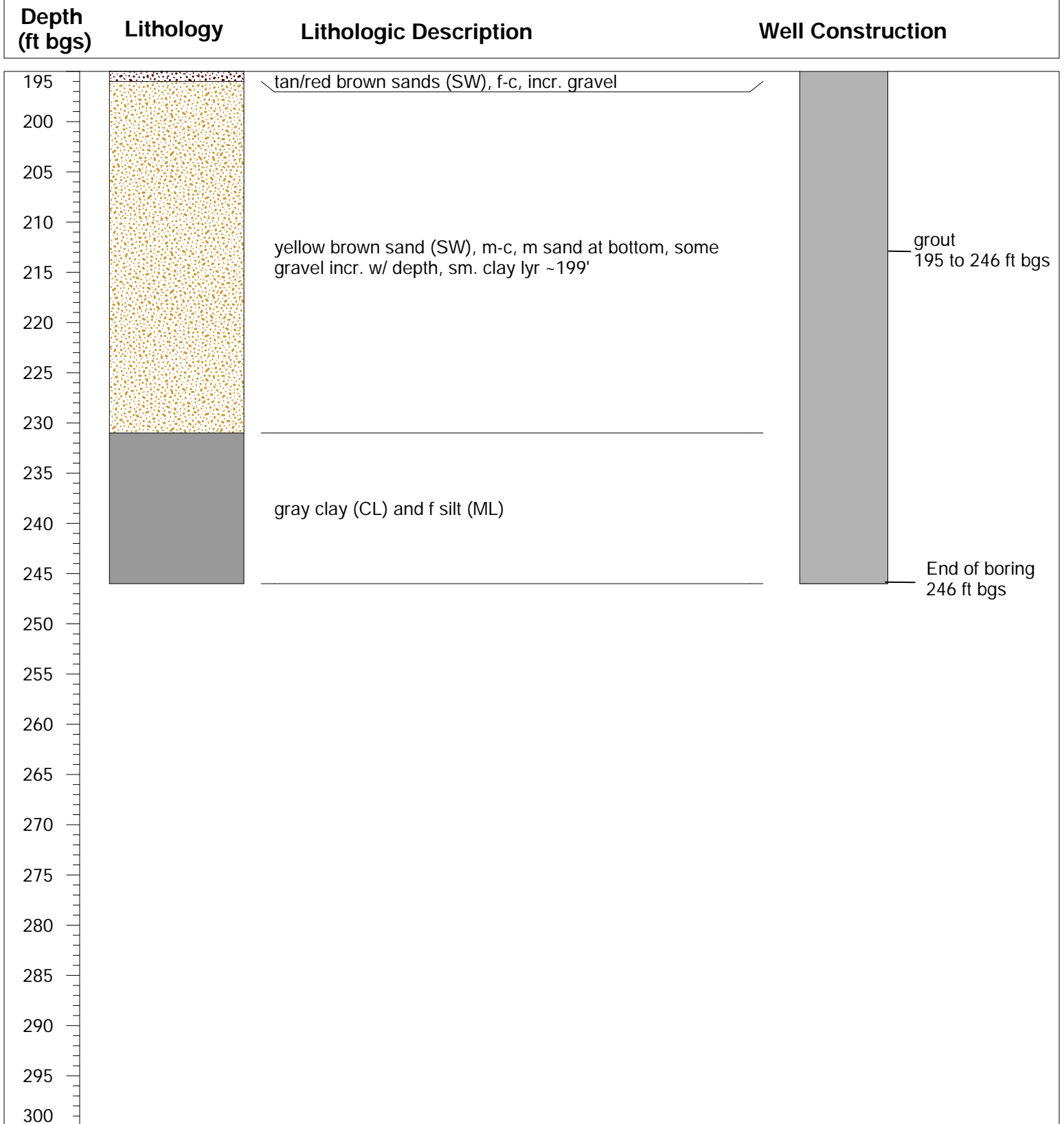
Total Depth: 246 ft

Long: -86.625094°

Date start: 5/17/2022

Date finish: 5/24/2022

Date abandoned: 9/22/2022



Total Depth = 246 ft bgs
bgs = below ground surface



Hole ID: J3-MW-2

Location: Clinton Co., IN
Site: J3

Logged by: B. Boggs, INTERA
Drilled by: A. Little, Cascade

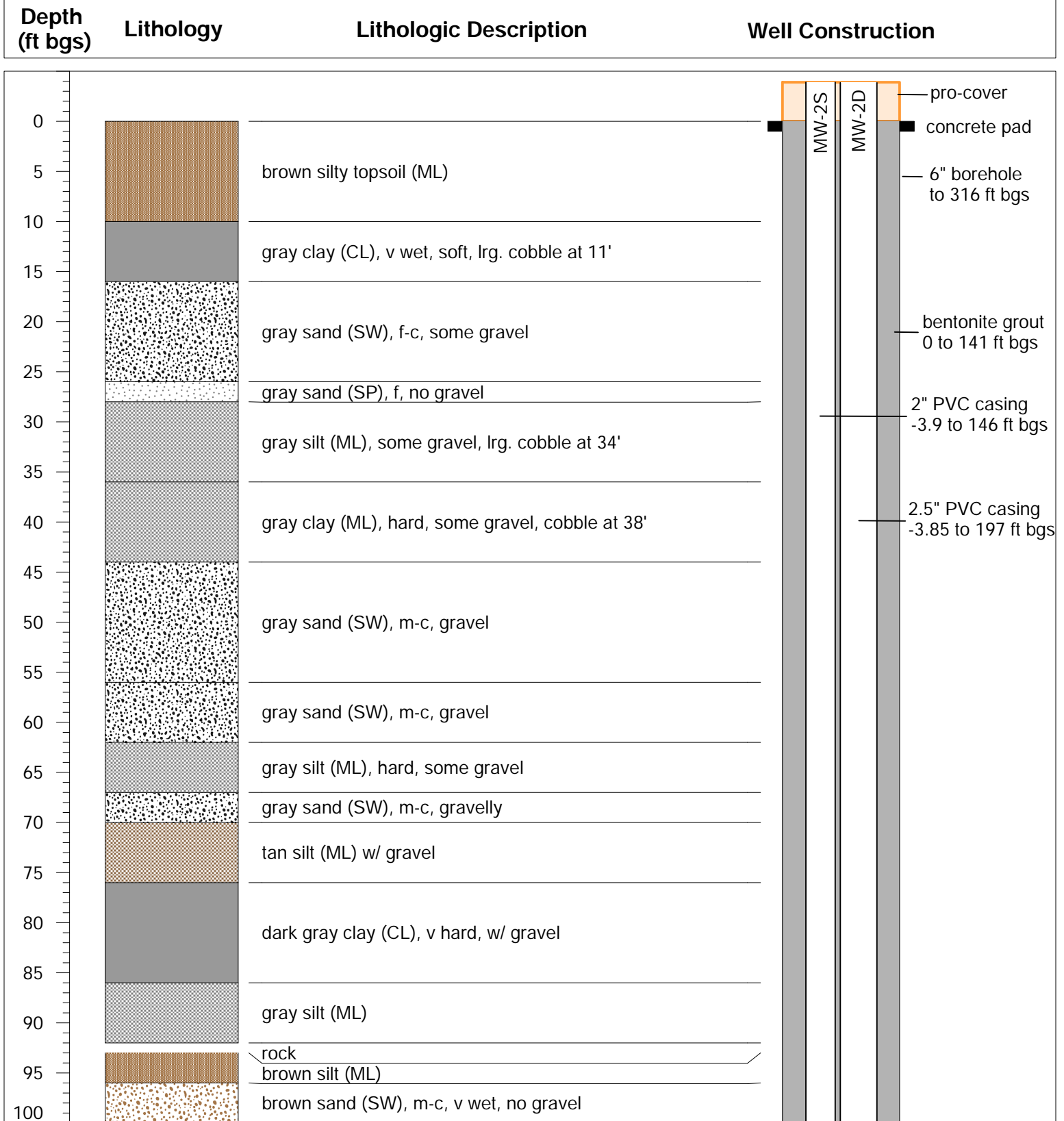
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 845 ft amsl Lat: 40.241696°
Total Depth: 316 ft Long: -86.623598°

Date start: 7/20/2022

Date finish: 7/22/2022

Date abandoned: 9/23/2022



Total Depth = 316 ft bgs
bgs = below ground surface

J3-MW-2

Page: 1 of 4



Hole ID: J3-MW-2

Location: Clinton Co., IN
Site: J3

Logged by: B. Boggs, INTERA
Drilled by: A. Little, Cascade

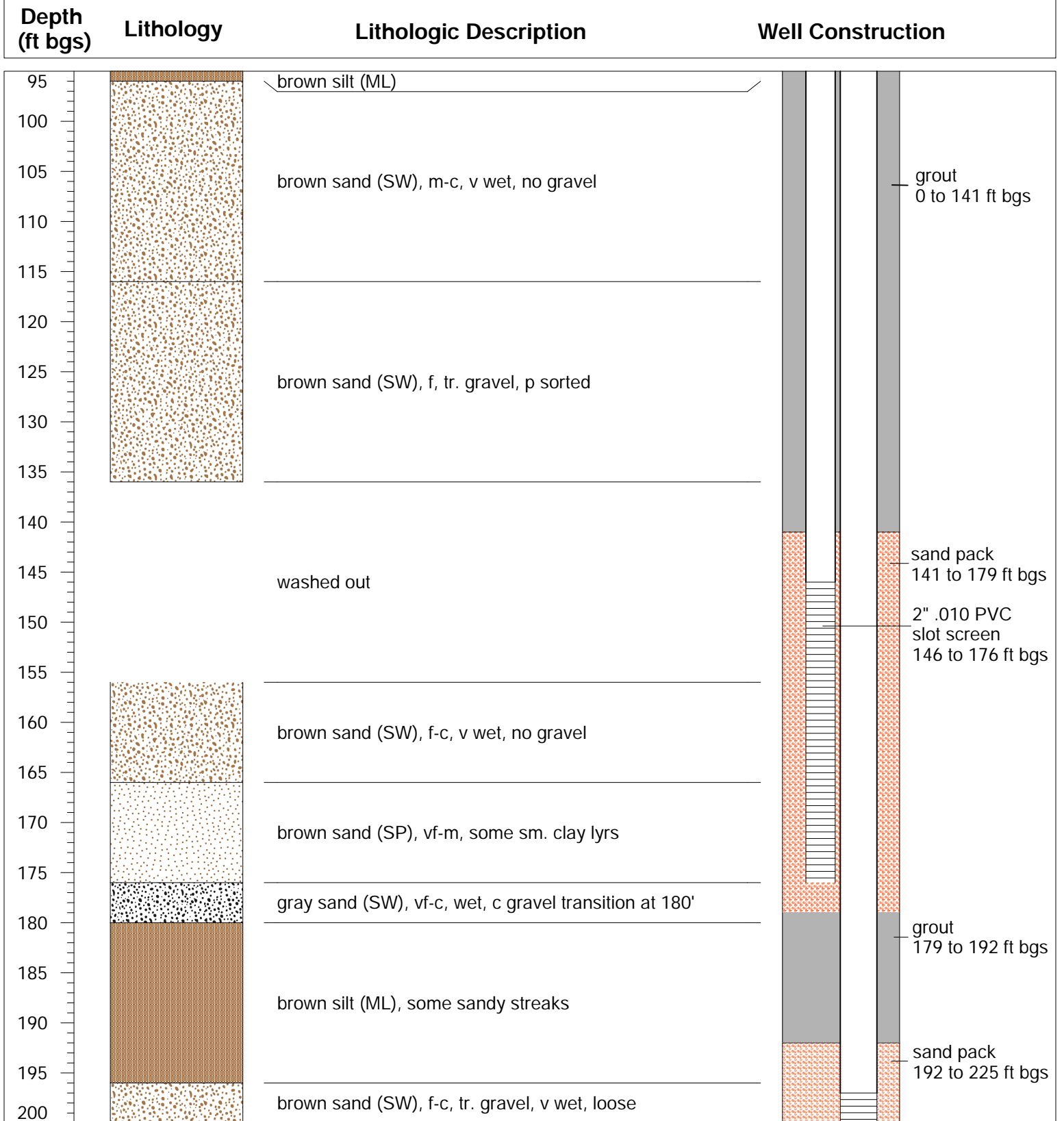
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 845 ft amsl Lat: 40.241696°
Total Depth: 316 ft Long: -86.623598°

Date start: 7/20/2022

Date finish: 7/22/2022

Date abandoned: 9/23/2022



Total Depth = 316 ft bgs
bgs = below ground surface

J3-MW-2

Page: 2 of 4



Hole ID: J3-MW-2

Location: Clinton Co., IN
Site: J3

Logged by: B. Boggs, INTERA
Drilled by: A. Little, Cascade

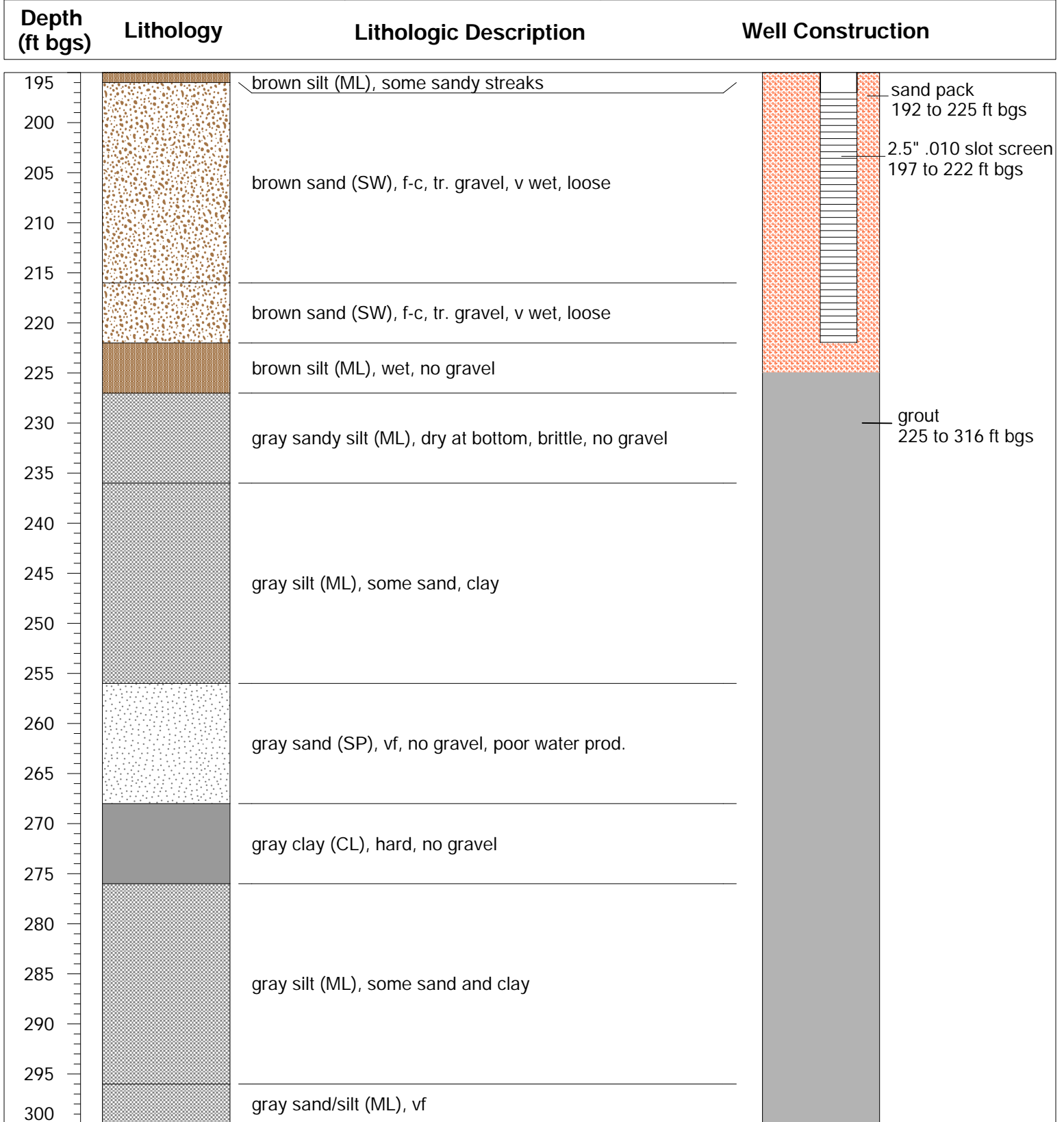
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 845 ft amsl Lat: 40.241696°
Total Depth: 316 ft Long: -86.623598°

Date start: 7/20/2022

Date finish: 7/22/2022

Date abandoned: 9/23/2022



Total Depth = 316 ft bgs
bgs = below ground surface

J3-MW-2

Page: 3 of 4



Hole ID: J3-TB-3

Location: Clinton Co., IN
Site: J3

Logged by: B. Boggs, INTERA
Drilled by: A. Little, Cascade

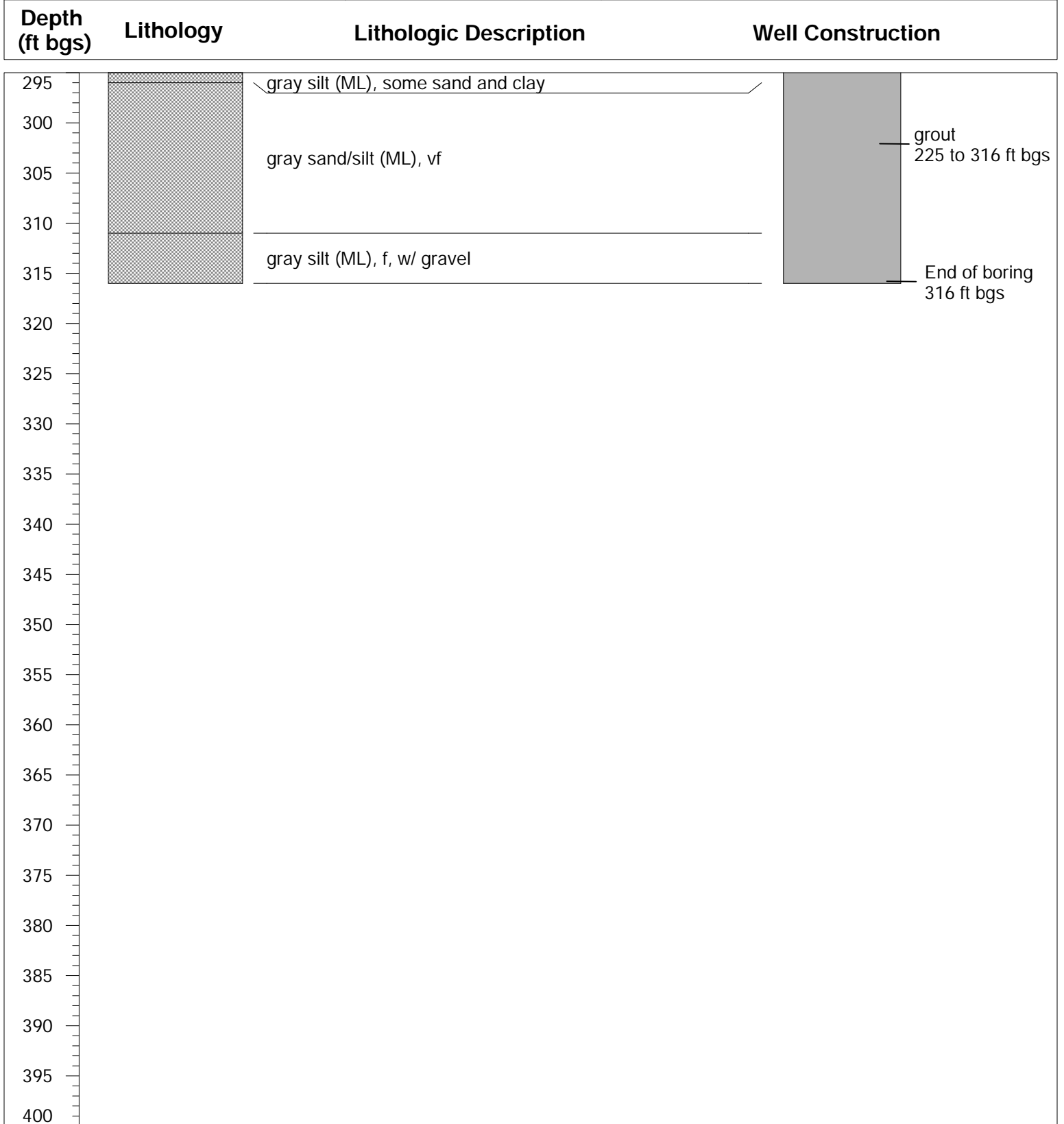
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 845 ft amsl Lat: 40.241696°
Total Depth: 316 ft Long: -86.623598°

Date start: 7/20/2022

Date finish: 7/22/2022

Date abandoned: 9/23/2022



Total Depth = 316 ft bgs
bgs = below ground surface

J3-TB-3

Page: 4 of 4



Hole ID: J3-MW-3

Location: Clinton Co., IN
Site: J3

Logged by: H. Manlove, INTERERA

Drilling Method: Sonic

Elevation: 846 ft amsl **Lat:** 40.241628°

Drilled by: A. Little, Cascade

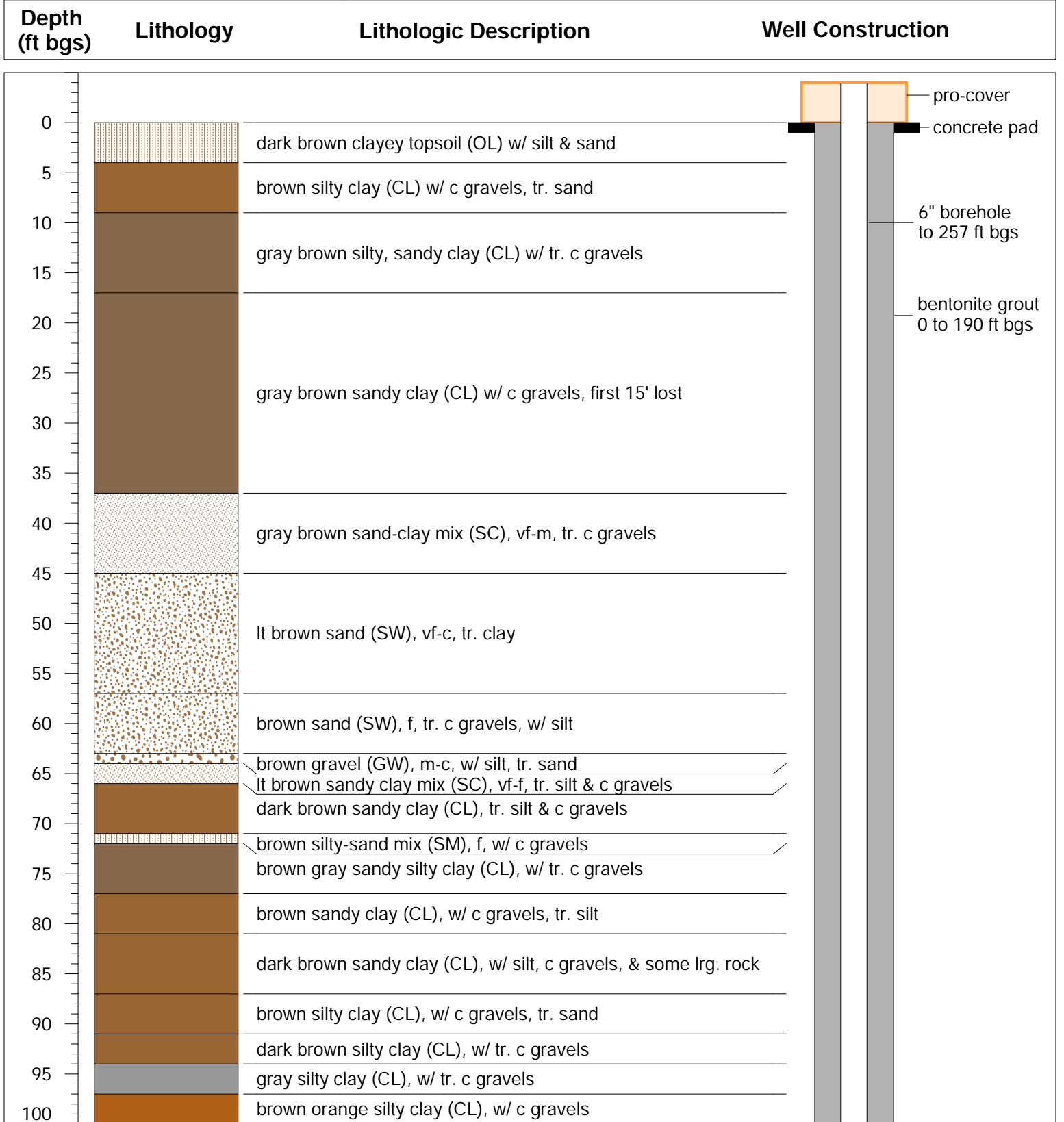
Borehole diameter: 6"

Total Depth: 257 ft **Long:** -86.623832°

Date start: 8/08/2022

Date finish: 8/09/2022

Date abandoned: 8/09/2022



Total Depth = 257 ft bgs
bgs = below ground surface

J3-MW-3

Page: 1 of 3



Hole ID: J3-MW-3

Location: Clinton Co., IN
Site: J3

Logged by: H. Manlove, INTERA
Drilled by: A. Little, Cascade

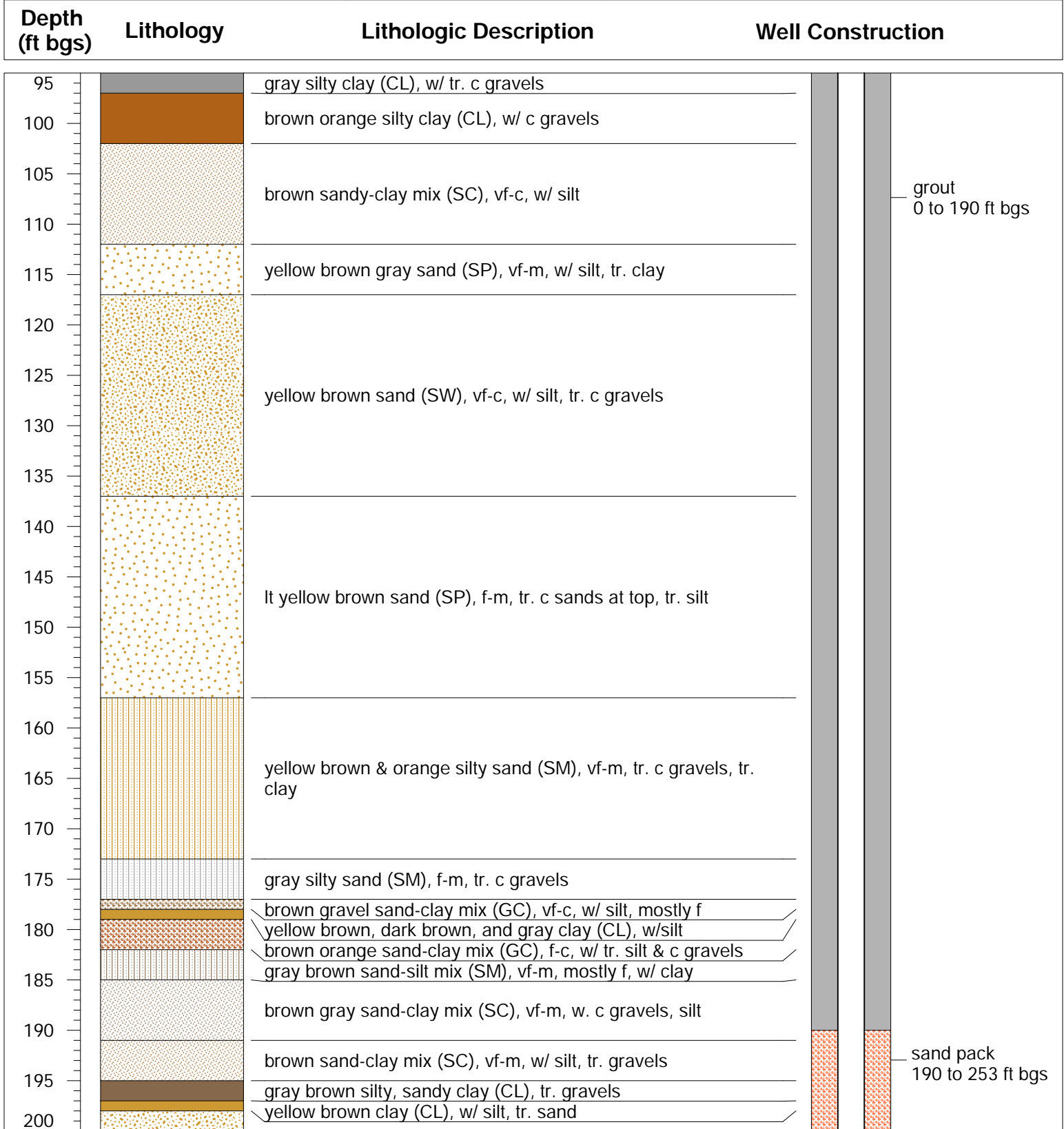
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 846 ft amsl Lat: 40.241628°
Total Depth: 257 ft Long: -86.623832°

Date start: 8/08/2022

Date finish: 8/09/2022

Date abandoned: 8/09/2022



Total Depth = 257 ft bgs
bgs = below ground surface

J3-MW-3

Page: 2 of 3



Hole ID: J3-MW-3

Location: Clinton Co., IN
Site: J3

Logged by: H. Manlove, INTERA
Drilled by: A. Little, Cascade

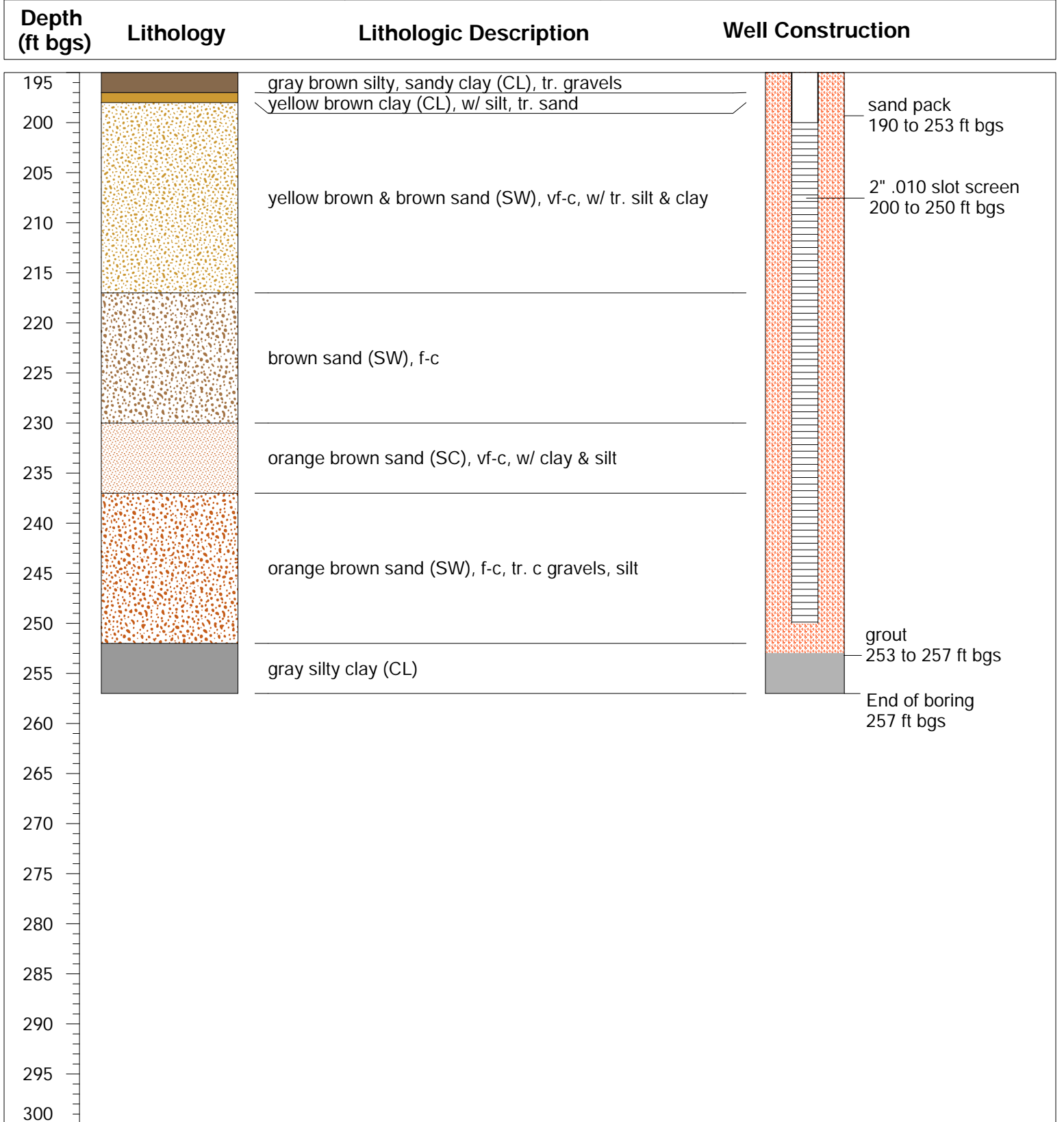
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 846 ft amsl Lat: 40.241628°
Total Depth: 257 ft Long: -86.623832°

Date start: 8/08/2022

Date finish: 8/09/2022

Date abandoned: 8/09/2022



Total Depth = 257 ft bgs
bgs = below ground surface

J3-MW-3

Page: 3 of 3



Hole ID: J3-MW-4

Location: Clinton Co., IN
Site: J3

Logged by: H. Manlove, INTERA

Drilling Method: Sonic

Elevation: 841 ft amsl

Lat: 40.241887°

Drilled by: A. Little, Cascade

Borehole diameter: 6"

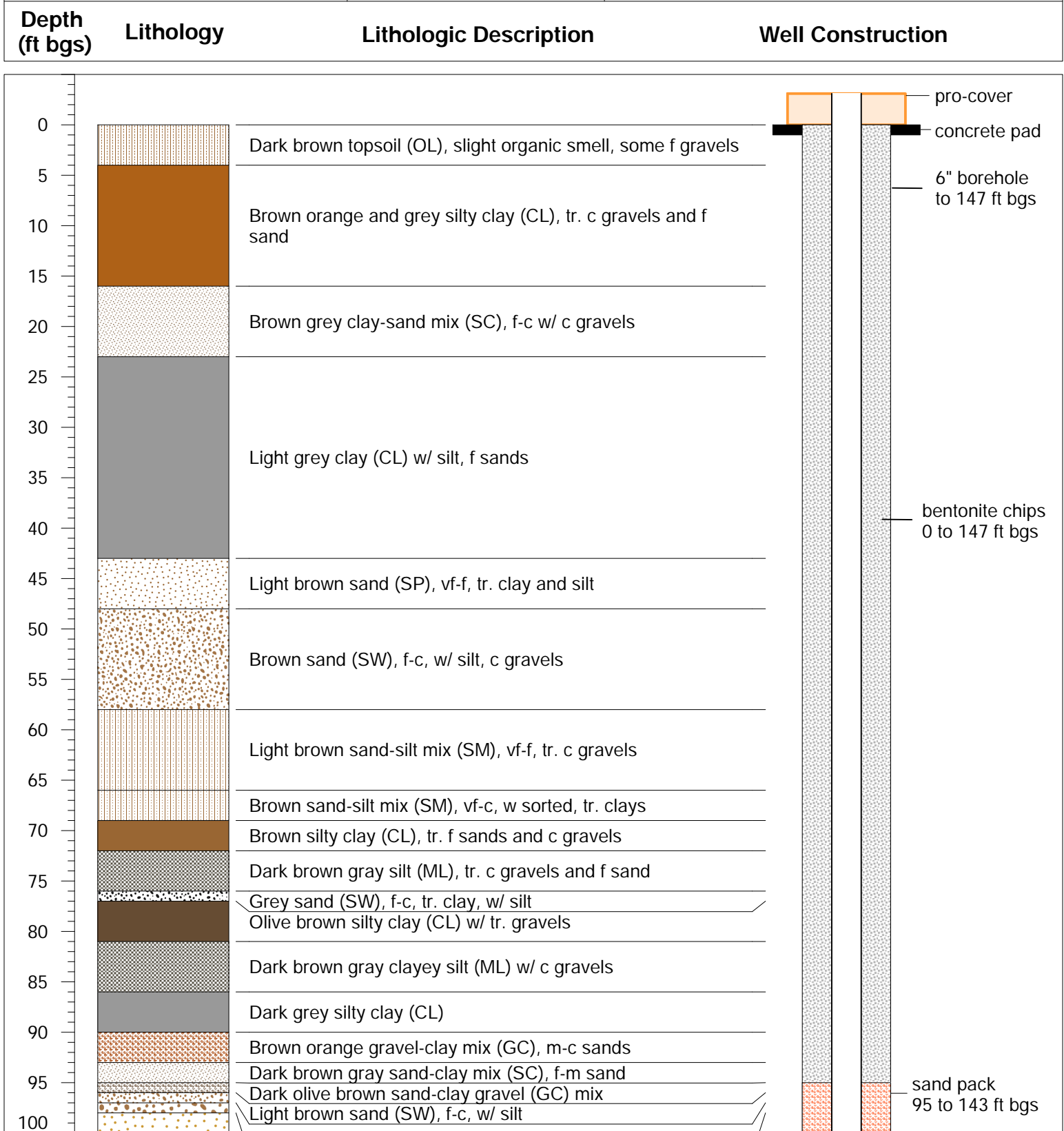
Total Depth: 147 ft

Long: -86.623037°

Date start: 8/31/2022

Date finish: 8/31/2022

Date abandoned: 9/23/2022



Total Depth = 147 ft bgs
bgs = below ground surface

J3-MW-4

Page: 1 of 2



Hole ID: J3-MW-4

Location: Clinton Co., IN
Site: J3

Logged by: H. Manlove, INTERA
Drilled by: A. Little, Cascade

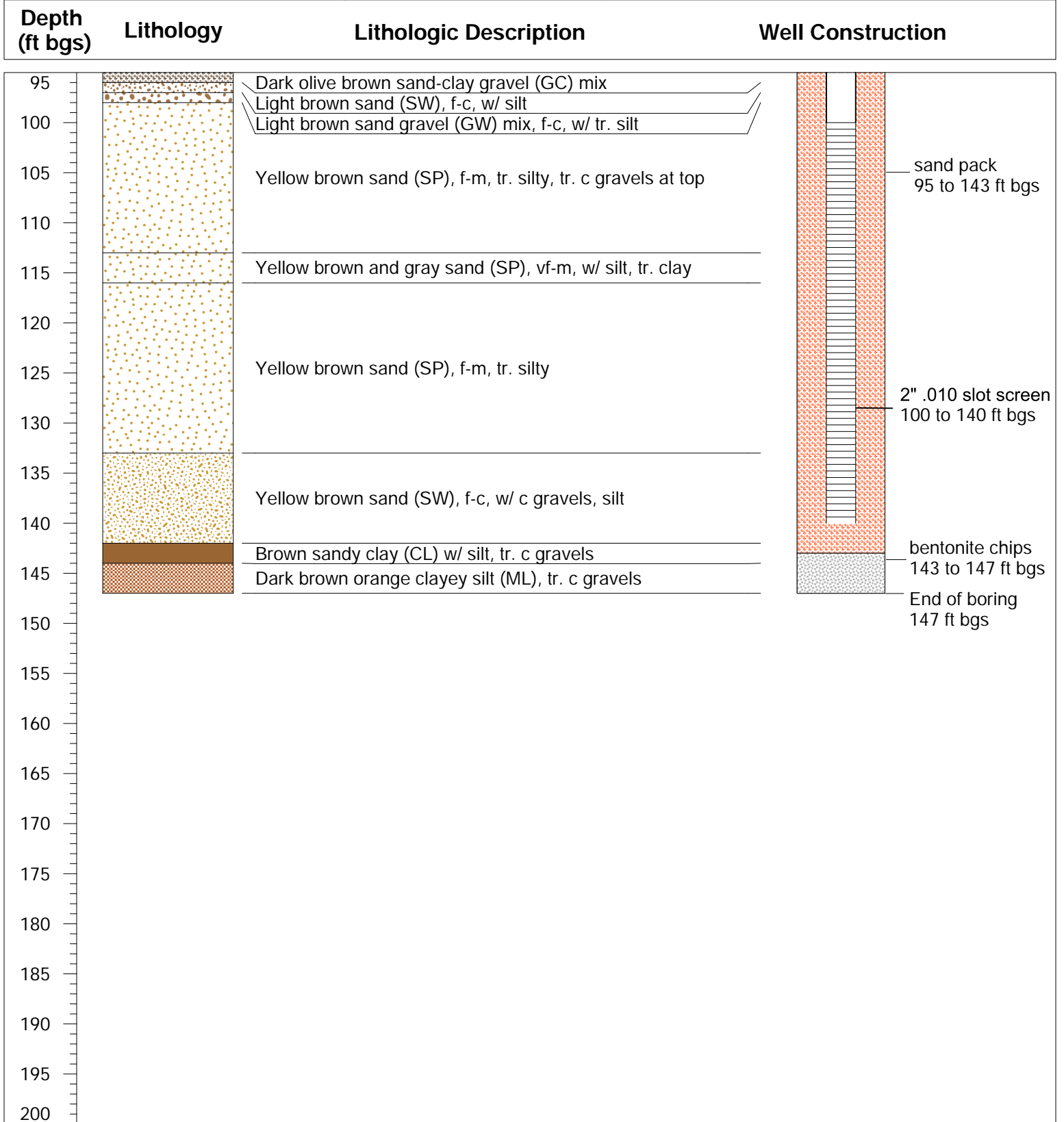
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 841 ft amsl Lat: 40.241887°
Total Depth: 147 ft Long: -86.623037°

Date start: 8/31/2022

Date finish: 8/31/2022

Date abandoned: 9/23/2022



Total Depth = 147 ft bgs
bgs = below ground surface



Hole ID: J3-TB-1

Location: Clinton Co., IN
Site: J3

Logged by: R. Corrigan, INTERERA
Drilled by: A. Little, Cascade

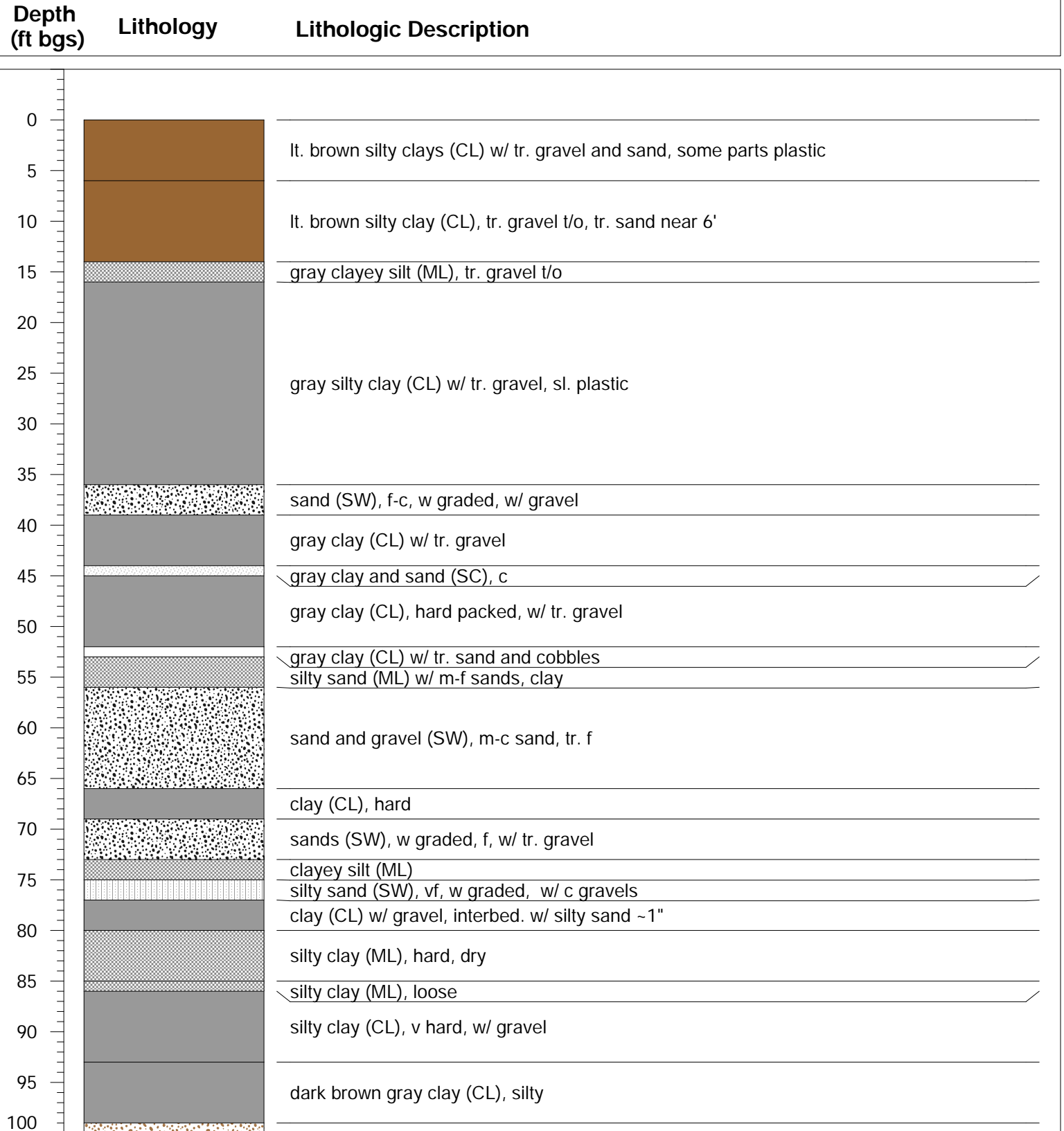
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 853 ft amsl Lat: 40.242537°
Total Depth: 366 ft Long: -86.625939°

Date start: 5/11/2022

Date finish: 5/16/2022

Date abandoned: 5/16/2022



Total Depth = 366 ft bgs
bgs = below ground surface

J3-TB-1

Page: 1 of 4



Hole ID: J3-TB-1

Location: Clinton Co., IN
Site: J3

Logged by: R. Corrigan, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 853 ft amsl Lat: 40.242537°
Total Depth: 366 ft Long: -86.625939°

Date start: 5/11/2022

Date finish: 5/16/2022

Date abandoned: 5/16/2022

Depth (ft bgs)	Lithology	Lithologic Description
95		dark brown gray clay (CL), silty
100		sand (SW), f-c, w sorted, w/ clay, silt
105		dark brown gray clay (CL), silty
110		dark brown silt (ML), clayey, tr. sand and gravel
115		dark brown sand (SW), m, w sorted, tr. gravel, clay
120		
125		brown sand (SW), w graded, f, tr. silt
130		
135		lt. brown sand (SW), m-c to m-f, lots of gravel
140		
145		lt. brown sand (SW), f-m, few fines, no gravel
150		
155		
160		brown sand (SW), f-m, tr. gravel
165		
170		sand (SW), c, tr. gravel
175		lt. brown sand (SW), f-m, w graded, no gravel
180		silty sand (SM), vf, compact, no gravel
185		silty sands (SW), vf, v wet
190		washed out
195		sands (SW), f to m-f
200		brown sands (SW), m to m-f, tr. gravel in bottom 1'

Total Depth = 366 ft bgs
bgs = below ground surface

J3-TB-1

Page: 2 of 4



Hole ID: J3-TB-1

Location: Clinton Co., IN
Site: J3

Logged by: R. Corrigan, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 853 ft amsl Lat: 40.242537°
Total Depth: 366 ft Long: -86.625939°

Date start: 5/11/2022

Date finish: 5/16/2022

Date abandoned: 5/16/2022

Depth (ft bgs)	Lithology	Lithologic Description
195		brown sands (SW), m to m-f, tr. gravel in bottom 1'
200		
205		
210		sand (SW), m-c, w/ tr. gravel, no fines
215		
220		silt (ML), w graded
225		
230		sand (SW), f, w graded
235		brown silty sand (SM), vf-f, tr. gravel, v loose and wet
240		brown sandy silt (SM), f, no gravel
245		gray silt (ML), tr. gravel, f sand, and clay
250		
255		gray silt (ML) w/ tr. sand and gravel
260		
265		gray clayey (CL) silt gray clayey silt (ML) w/ tr. gravel
270		brown gray silty clay (CL), hard, dry, tr. gravel
275		
280		gray clayey silt (ML) w/ tr. gravel and sand
285		gray silty clay (CL), v hard gray silty sand (SM), f
290		gray sandy silt (SM), f
295		gray silty clay (CL), v hard, tr. gravel
300		gray silty clay (CL) w/ tr. gravel t/o, v dense and hard, sl. plastic

Total Depth = 366 ft bgs
bgs = below ground surface



Hole ID: J3-TB-1

Location: Clinton Co., IN
Site: J3

Logged by: R. Corrigan, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

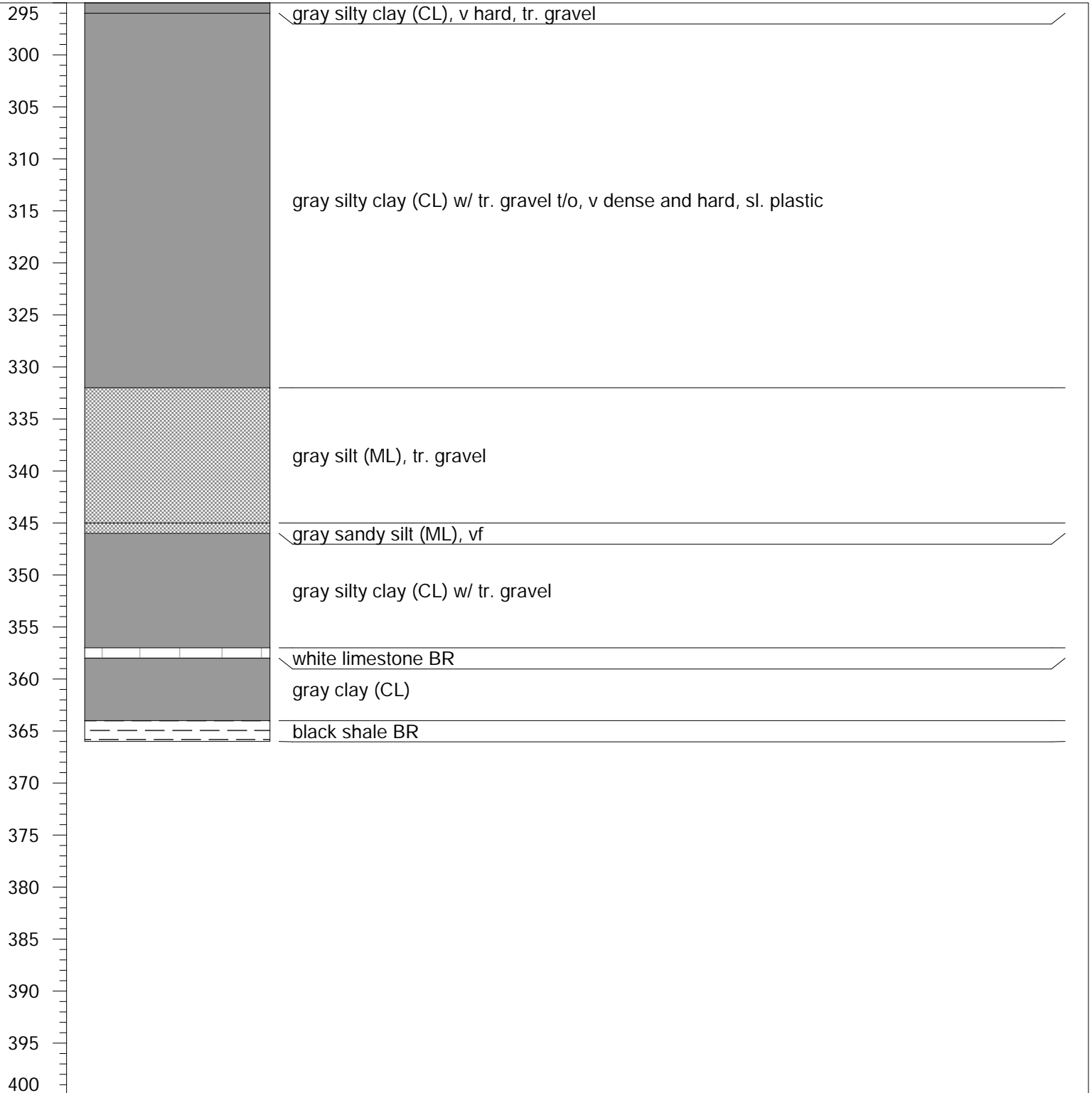
Elevation: 853 ft amsl Lat: 40.242537°
Total Depth: 366 ft Long: -86.625939°

Date start: 5/11/2022

Date finish: 5/16/2022

Date abandoned: 5/16/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Total Depth = 366 ft bgs
bgs = below ground surface



Hole ID: J3-TB-2

Location: Clinton Co., IN
Site: J3

Logged by: R. Corrigan, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

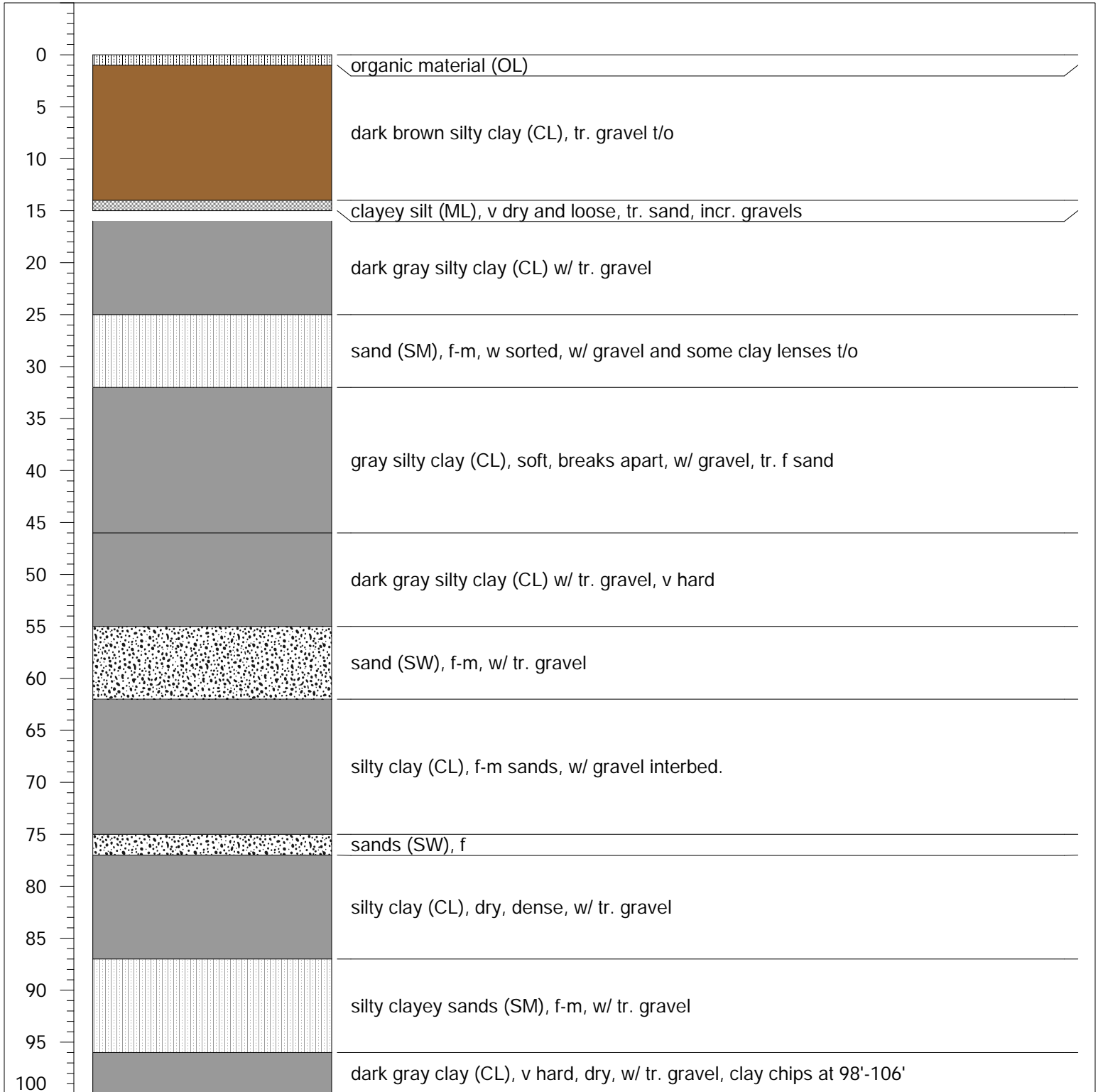
Elevation: 850 ft amsl Lat: 40.242376°
Total Depth: 116 ft Long: -86.625688°

Date start: 5/17/2022

Date finish: 5/17/2022

Date abandoned: 5/17/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Total Depth = 116 ft bgs
bgs = below ground surface

J3-TB-2

Page: 1 of 2



Hole ID: J3-TB-2

Location: Clinton Co., IN
Site: J3

Logged by: R. Corrigan, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

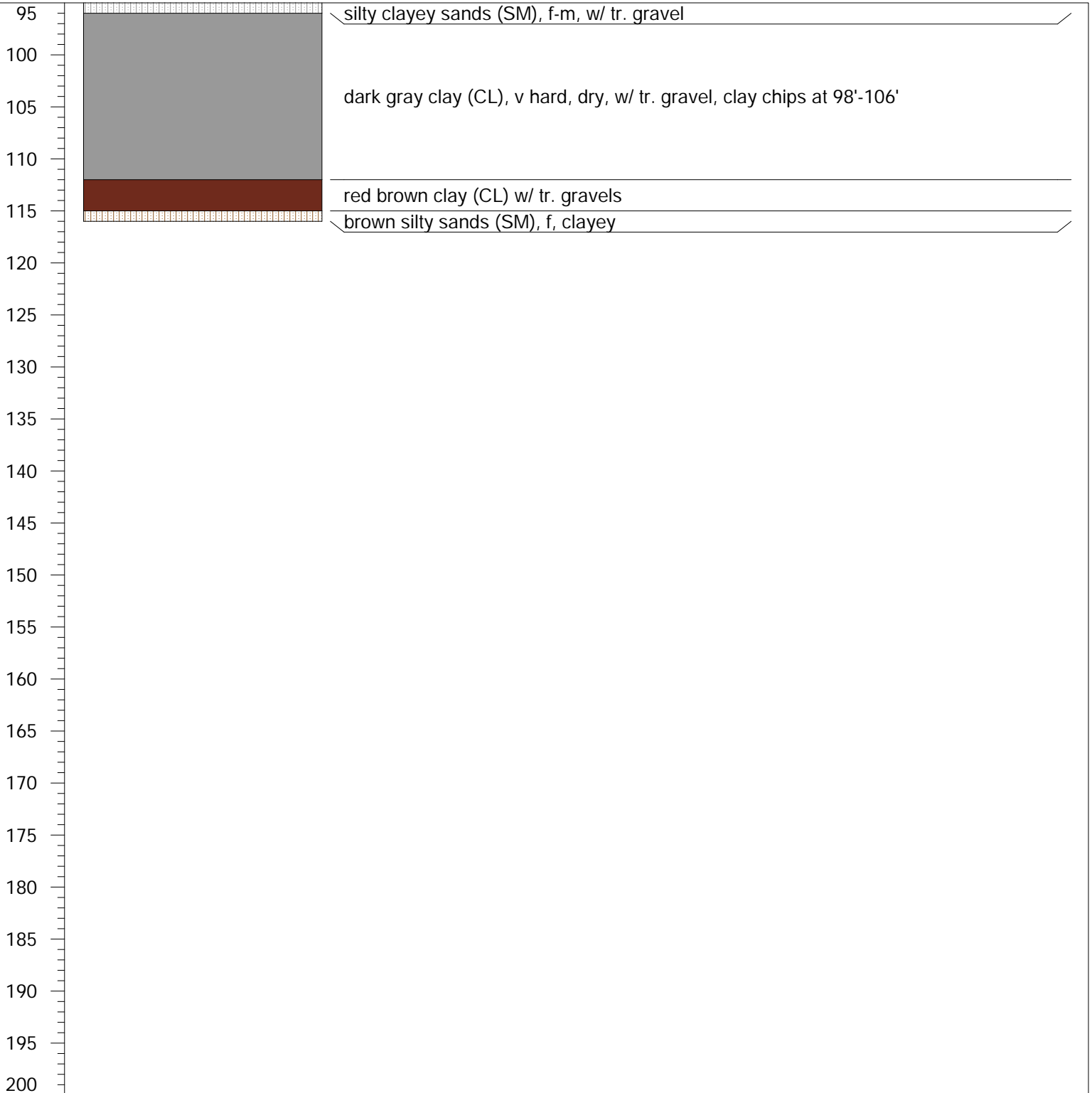
Elevation: 850 ft amsl Lat: 40.242376°
Total Depth: 116 ft Long: -86.625688°

Date start: 5/17/2022

Date finish: 5/17/2022

Date abandoned: 5/17/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Hole ID: J3-TB-5

Location: Clinton Co., IN
Site: J3

Logged by: H. Manlove, INTERA

Drilling Method: Sonic

Elevation: 838 ft amsl

Lat: 40.240534°

Drilled by: A. Little, Cascade

Borehole diameter: 6"

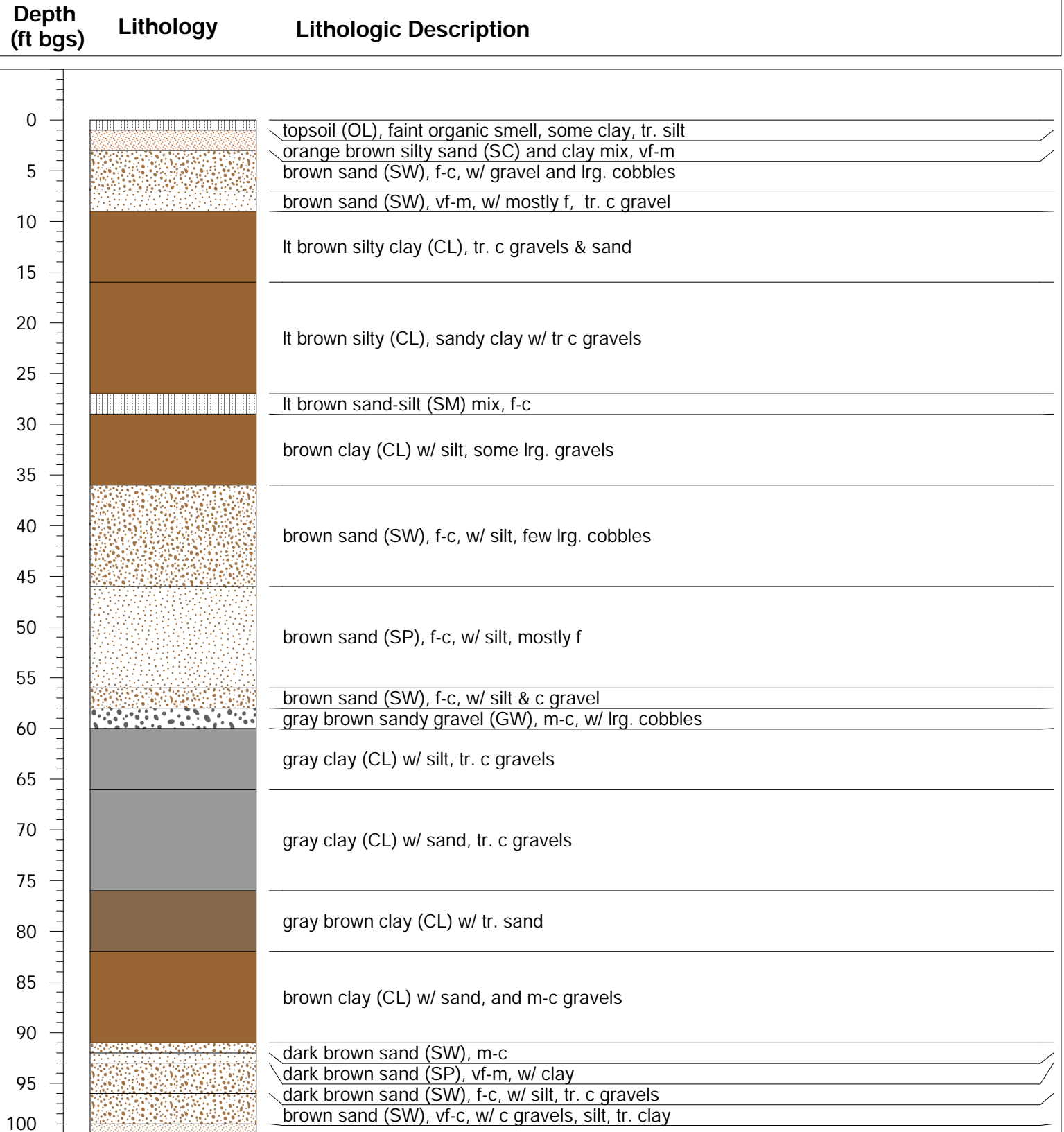
Total Depth: 216 ft

Long: -86.625826°

Date start: 8/04/2022

Date finish: 8/05/2022

Date abandoned: 8/05/2022



Total Depth = 216 ft bgs
bgs = below ground surface

J3-TB-5



Hole ID: J3-TB-5

Location: Clinton Co., IN
Site: J3

Logged by: H. Manlove, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 838 ft amsl Lat: 40.240534°
Total Depth: 216 ft Long: -86.625826°

Date start: 8/04/2022

Date finish: 8/05/2022

Date abandoned: 8/05/2022

Depth (ft bgs)	Lithology	Lithologic Description
95		dark brown sand (SW), f-c, w/ silt, tr. c gravels
100		brown sand (SW), vf-c, w/ c gravels, silt, tr. clay
		brown sandy clay (SC), vf-m, tr. c gravels
		brown clayey gravel (GC), sand-clay mix, vf-c
105		
110		lt orange brown sand (SP), f-m
115		
120		
125		brown orange sand (SP), f-m, tr. gray silt at bottom
130		
135		
140		
145		brown orange sand (SP), f-m
150		
155		brown orange sand-clay (SC) mix, f-m
		brown orange sand-clay (SC) mix, incr. clay, vf-f
160		
		brown sand (SW), f-c, w/ c gravels, silt
165		
170		brown sand (SP), f-c, w/ silt, tr. c gravels
175		
180		
		brown sand (SW), vf-f, w/ m gravels, tr. silt
185		
190		
		tan brown sandy clay (CL)
195		
		yellow brown sandy clay (CL)
200		

Total Depth = 216 ft bgs
bgs = below ground surface

J3-TB-5



Hole ID: J3-TB-5

Location: Clinton Co., IN
Site: J3

Logged by: H. Manlove, INTERA

Drilling Method: Sonic

Elevation: 838 ft amsl

Lat: 40.240534°

Drilled by: A. Little, Cascade

Borehole diameter: 6"

Total Depth: 216 ft

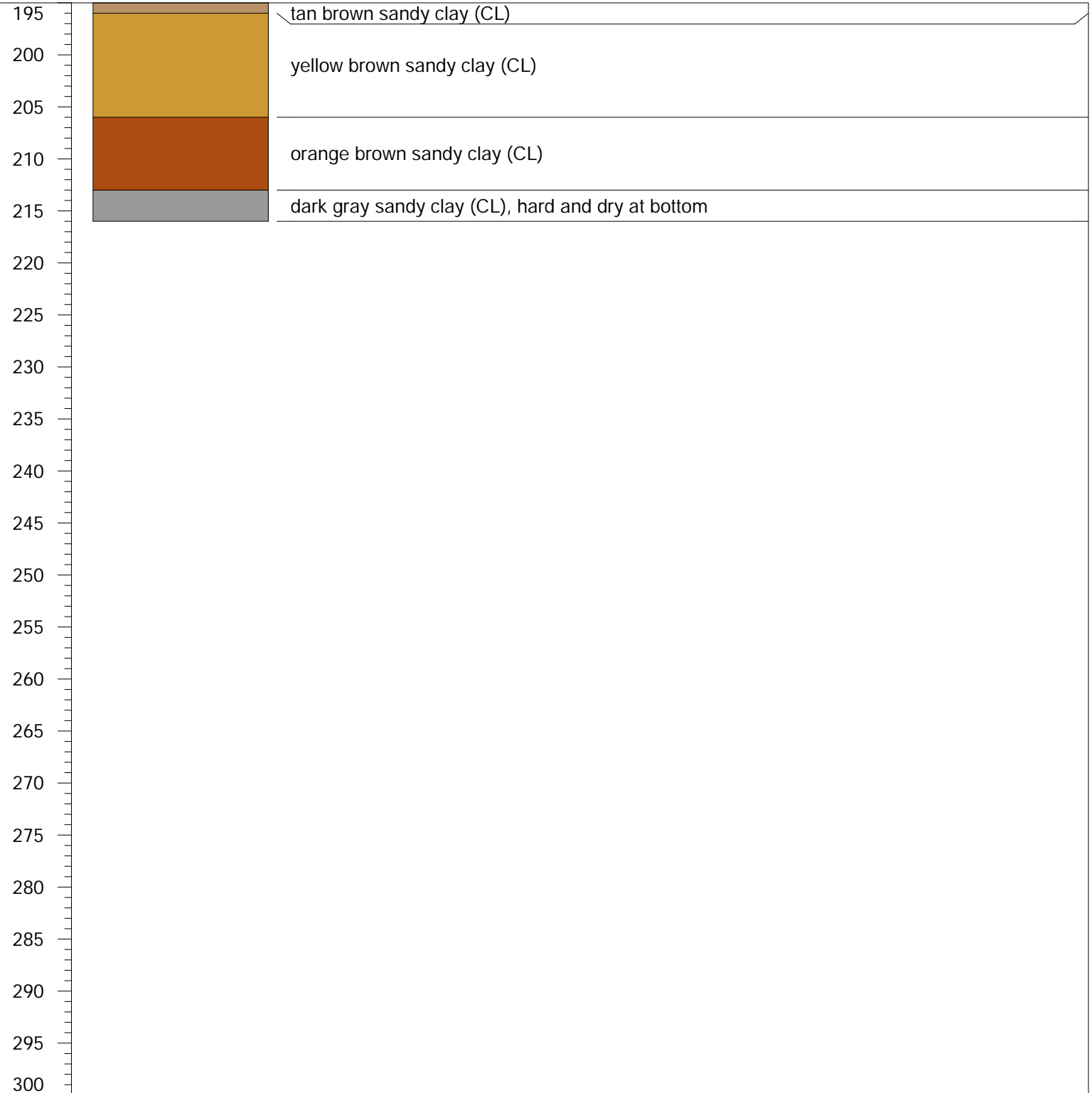
Long: -86.625826°

Date start: 8/04/2022

Date finish: 8/05/2022

Date abandoned: 8/05/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Hole ID: J3-TB-7

Location: Clinton Co., IN
Site: J3

Logged by: H. Manlove, INTERERA

Drilling Method: Sonic

Elevation: 850 ft amsl

Lat: 40.242547°

Drilled by: A. Little, Cascade

Borehole diameter: 6"

Total Depth: 226 ft

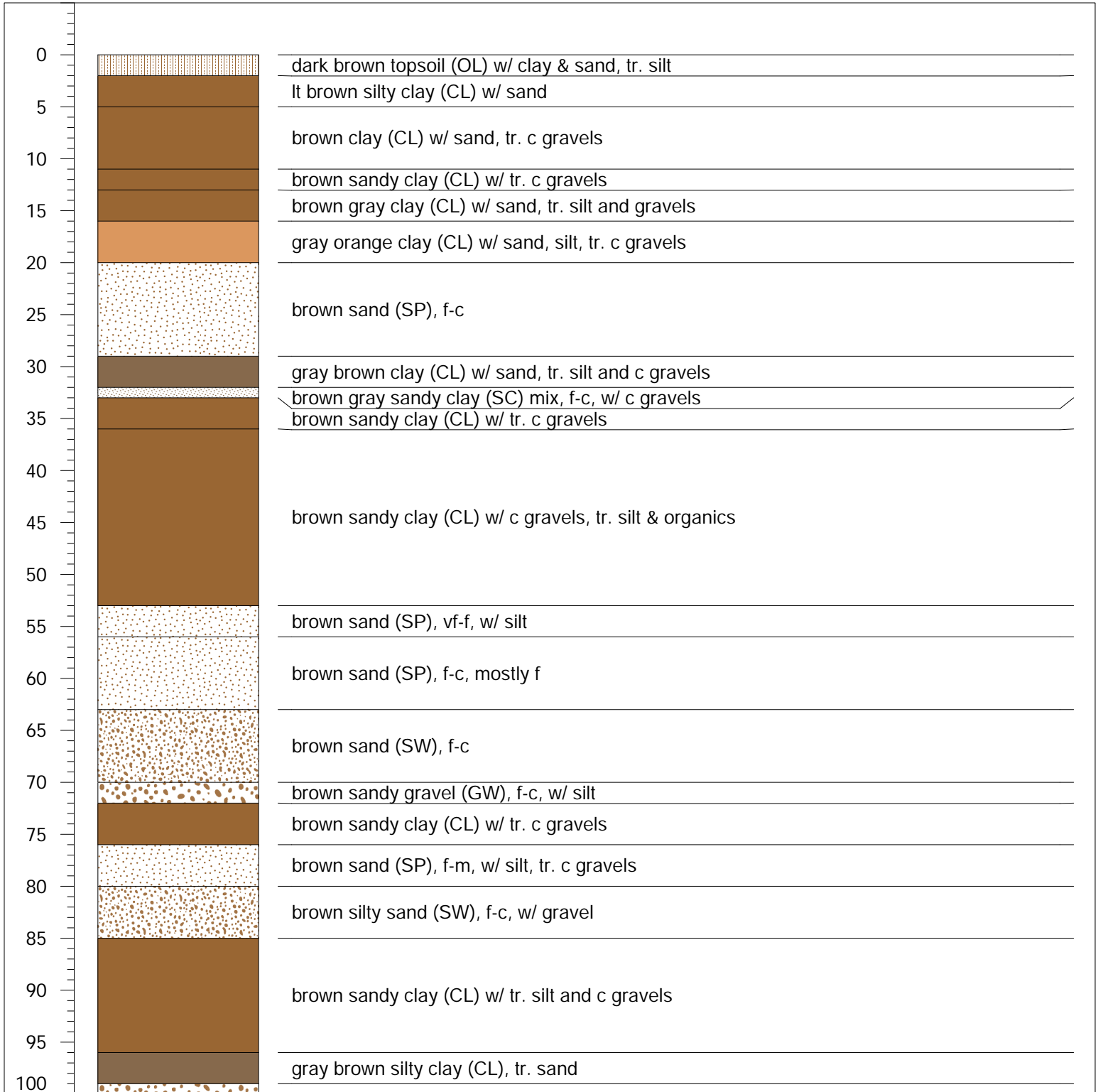
Long: -86.622975°

Date start: 8/06/2022

Date finish: 8/07/2022

Date abandoned: 8/08/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Total Depth = 226 ft bgs
bgs = below ground surface

J3-TB-7

Page: 1 of 3



Hole ID: J3-TB-7

Location: Clinton Co., IN
Site: J3

Logged by: H. Manlove, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 850 ft amsl Lat: 40.242547°
Total Depth: 226 ft Long: -86.622975°

Date start: 8/06/2022

Date finish: 8/07/2022

Date abandoned: 8/08/2022

Depth (ft bgs)	Lithology	Lithologic Description
95		brown sandy clay (CL) w/ tr. silt and c gravels
100		gray brown silty clay (CL), tr. sand
105		brown silty gravel (GW), f-c, w/ sand
110		brown sand (SW), f-c, w/ silt
115		red brown sand (SP), f-m, w/ tr. silt and c gravels
120		yellow brown sand (SP), f-m
125		
130		
135		brown sand (SP), vf-m, w/ tr. gray clay
140		
145		brown tan sand (SP), f-c, mostly f, tr. c gravels, w/ silt
150		
155		dark gray orange sandy clay (CL), tr. silt and gravels
160		
165		brown orange sand (SP), f-c, w/ silt
170		
175		brown orange sand (SW), vf-c, w/ c gravels, silt, tr. gray clay
180		
185		brown sand (SW), vf-c, w/ silt, c gravels, and tr. clay incr. at bottom
190		
195		
200		brown gray sand (SP), f-m, w/ silt, tr. c gravel at top, tr. clay at bottom

Total Depth = 226 ft bgs
bgs = below ground surface

J3-TB-7

Page: 2 of 3



Hole ID: J3-TB-7

Location: Clinton Co., IN
Site: J3

Logged by: H. Manlove, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

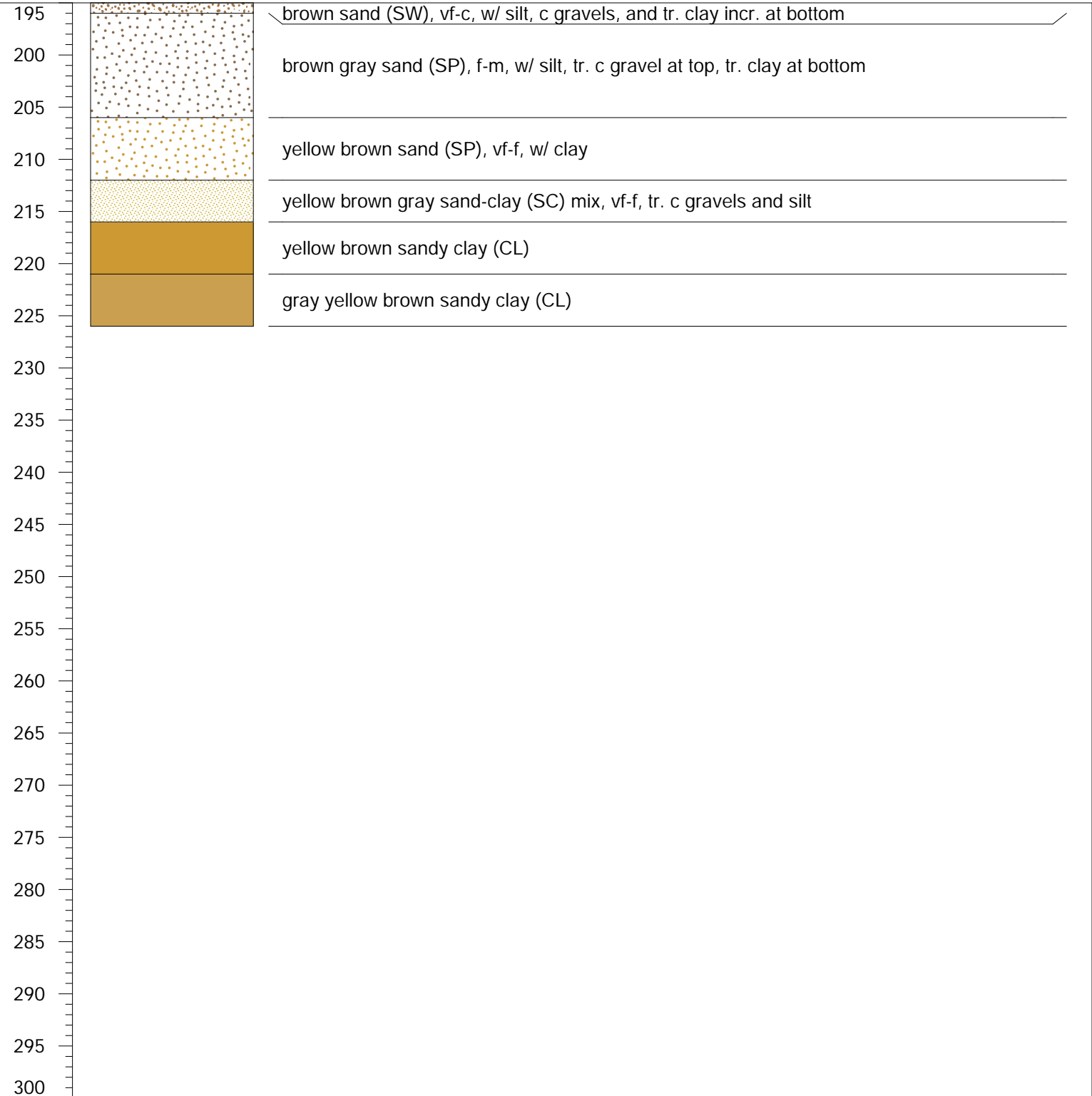
Elevation: 850 ft amsl Lat: 40.242547°
Total Depth: 226 ft Long: -86.622975°

Date start: 8/06/2022

Date finish: 8/07/2022

Date abandoned: 8/08/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Hole ID: J3-TW-1

Location: Clinton Co., IN
Site: J3

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

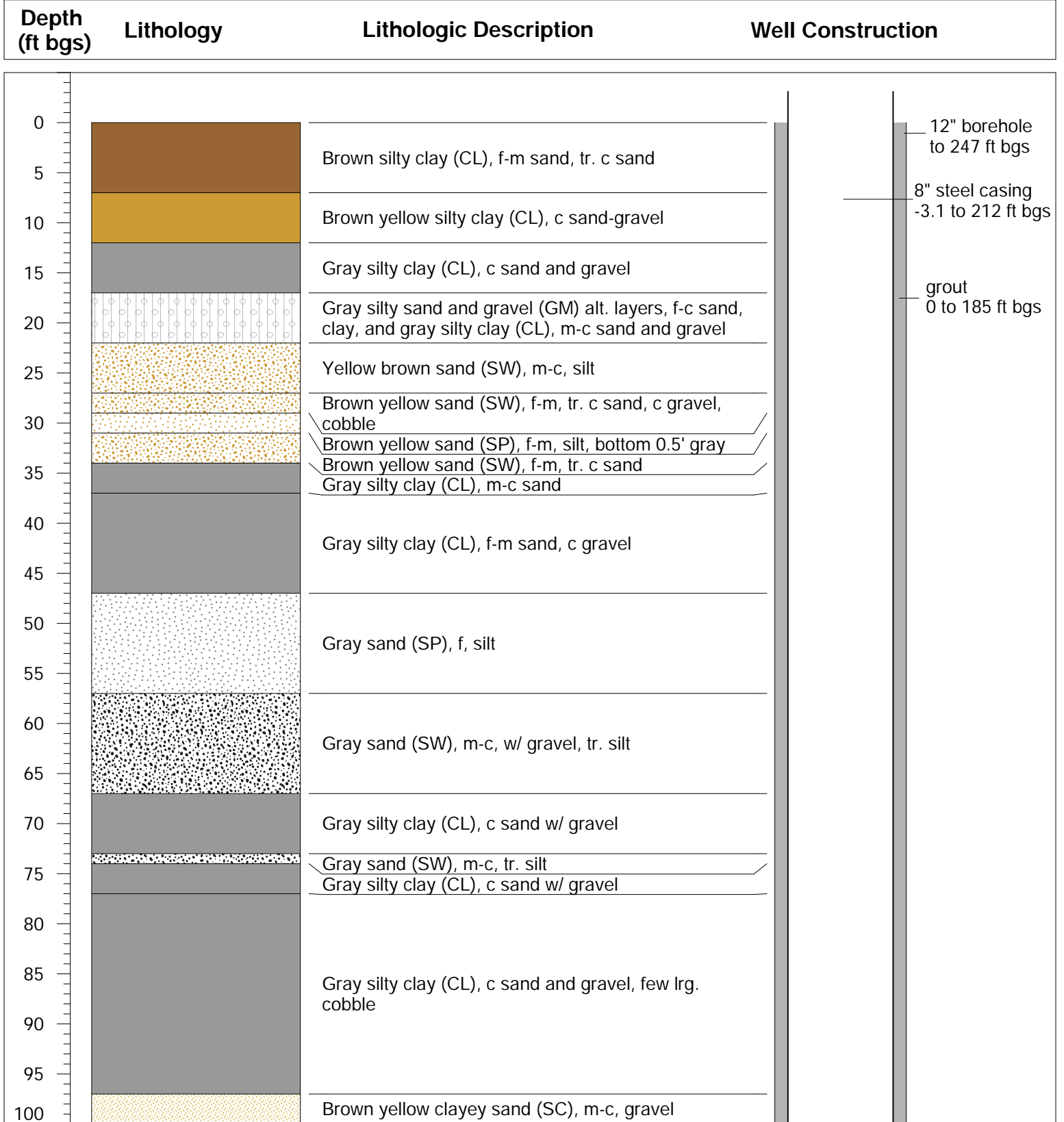
Drilling Method: Sonic
Borehole diameter: 12"

Elevation: 847 ft amsl Lat: 40.24217°
Total Depth: 247 ft Long: -86.62320°

Date start: 8/16/2022

Date finish: 8/16/2022

Date abandoned: 9/23/2022



Total Depth = 247 ft bgs
bgs = below ground surface

J3-TW-1

Page: 1 of 3



Hole ID: J3-TW-1

Location: Clinton Co., IN
Site: J3

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

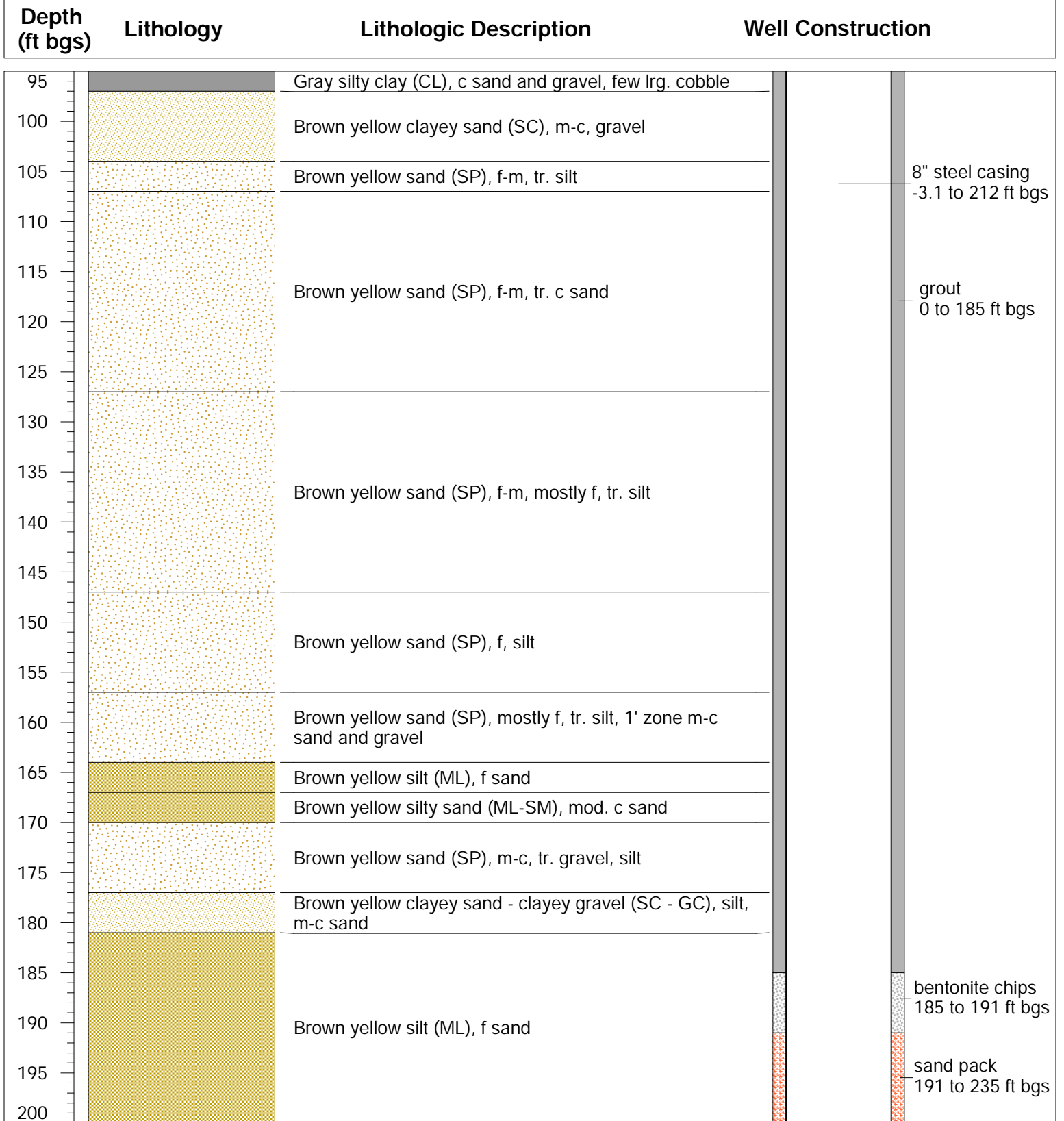
Drilling Method: Sonic
Borehole diameter: 12"

Elevation: 847 ft amsl Lat: 40.24217°
Total Depth: 247 ft Long: -86.62320°

Date start: 8/16/2022

Date finish: 8/16/2022

Date abandoned: 9/23/2022



Total Depth = 247 ft bgs
bgs = below ground surface

J3-TW-1

Page: 2 of 3



Hole ID: J3-TW-1

Location: Clinton Co., IN
Site: J3

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

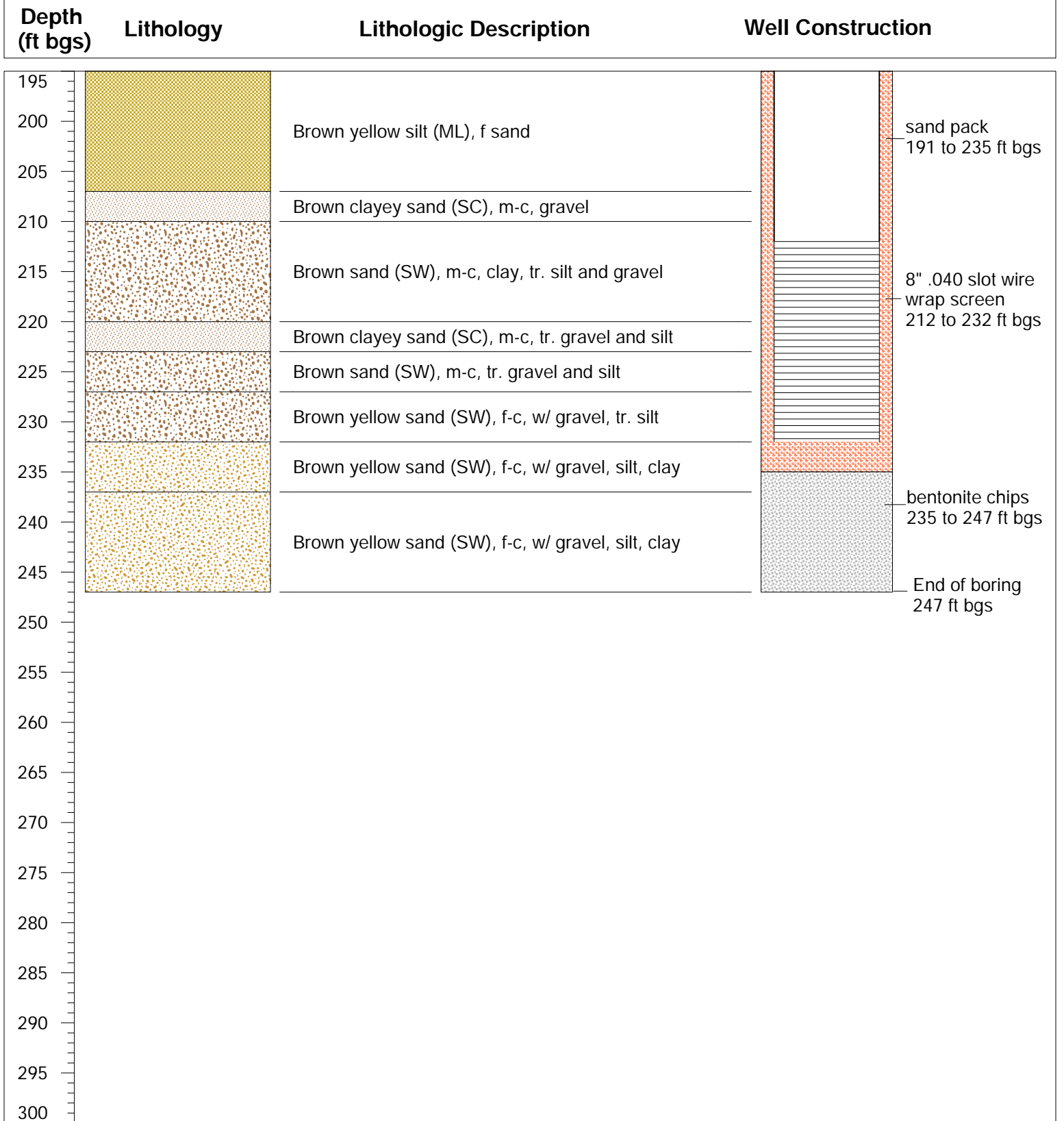
Drilling Method: Sonic
Borehole diameter: 12"

Elevation: 847 ft amsl Lat: 40.24217°
Total Depth: 247 ft Long: -86.62320°

Date start: 8/16/2022

Date finish: 8/16/2022

Date abandoned: 9/23/2022



Total Depth = 247 ft bgs
bgs = below ground surface

J3-TW-1

Page: 3 of 3



Hole ID: J3-TW-2

Location: Clinton Co., IN
Site: J3

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

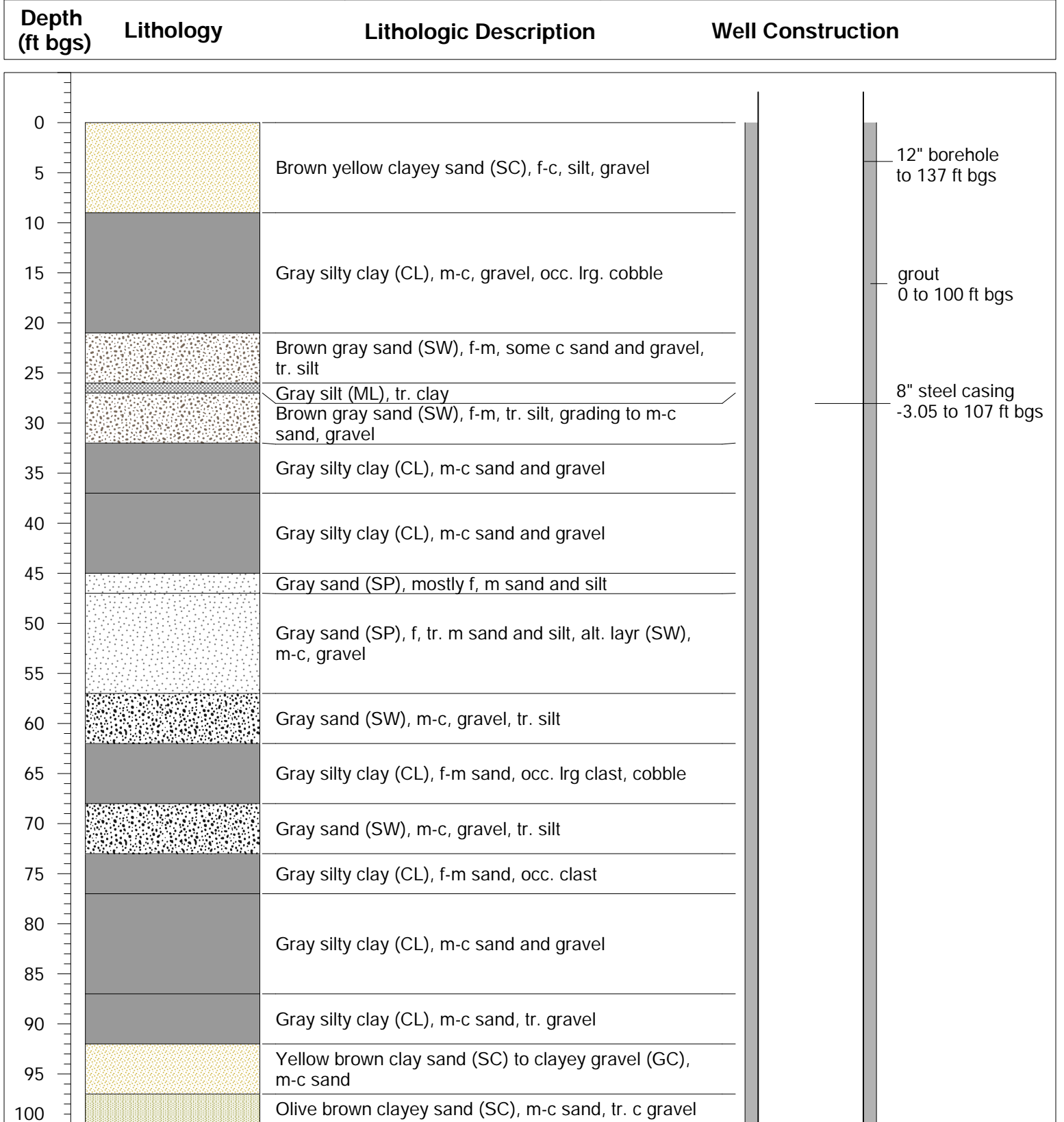
Drilling Method: Sonic
Borehole diameter: 12"

Elevation: 844 ft amsl **Lat:** 40.24190°
Total Depth: 137 ft **Long:** -86.62330°

Date start: 8/22/2022

Date finish: 8/22/2022

Date abandoned: 9/23/2022



Total Depth = 137 ft bgs
bgs = below ground surface

J3-TW-2



Hole ID: J3-TW-2

Location: Clinton Co., IN
Site: J3

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

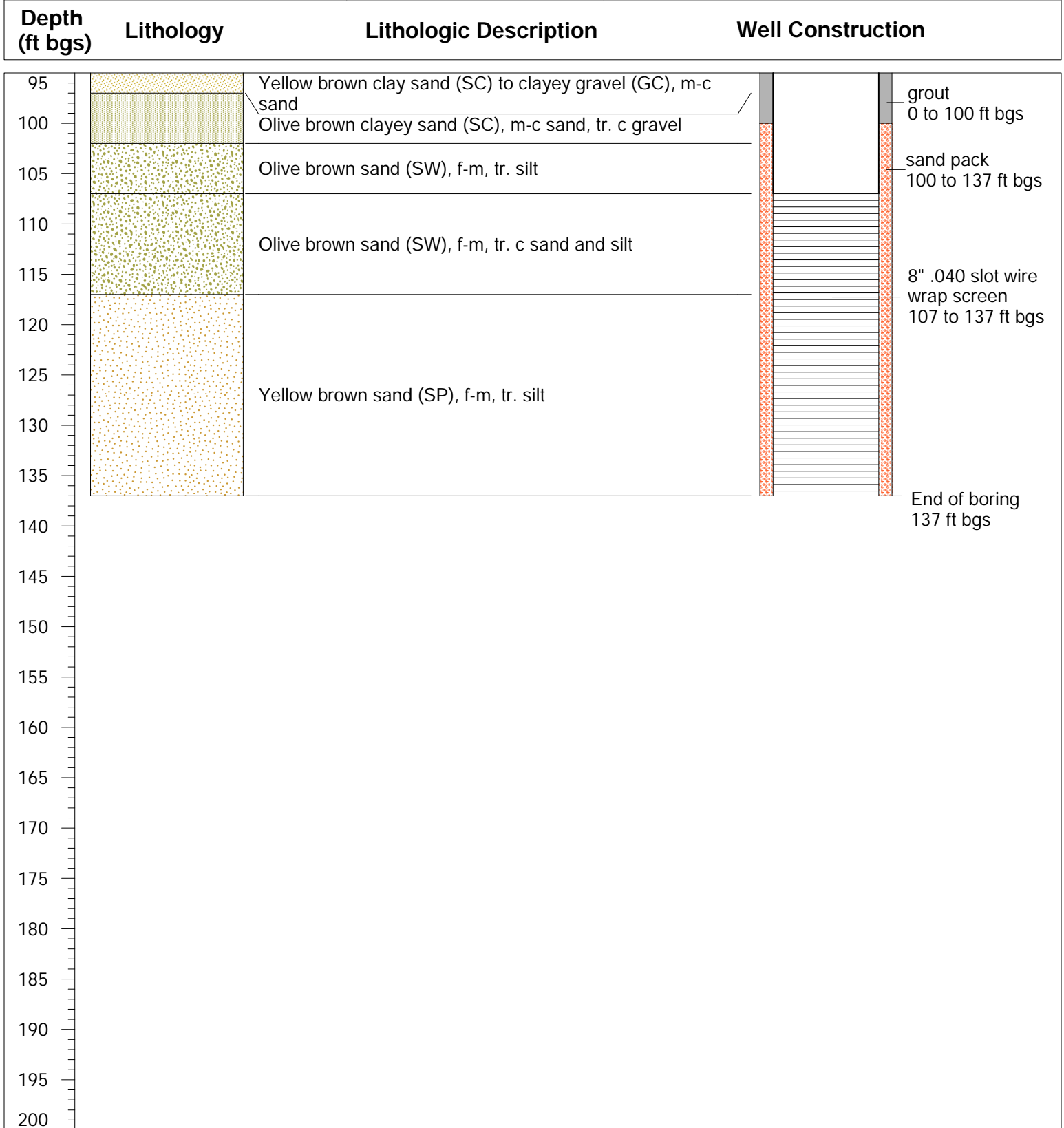
Drilling Method: Sonic
Borehole diameter: 12"

Elevation: 844 ft amsl Lat: 40.24190°
Total Depth: 137 ft Long: -86.62330°

Date start: 8/22/2022

Date finish: 8/22/2022

Date abandoned: 9/23/2022



Total Depth = 137 ft bgs
bgs = below ground surface



Hole ID: M1-TB-1

Location: Clinton Co., IN
Site: M1

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

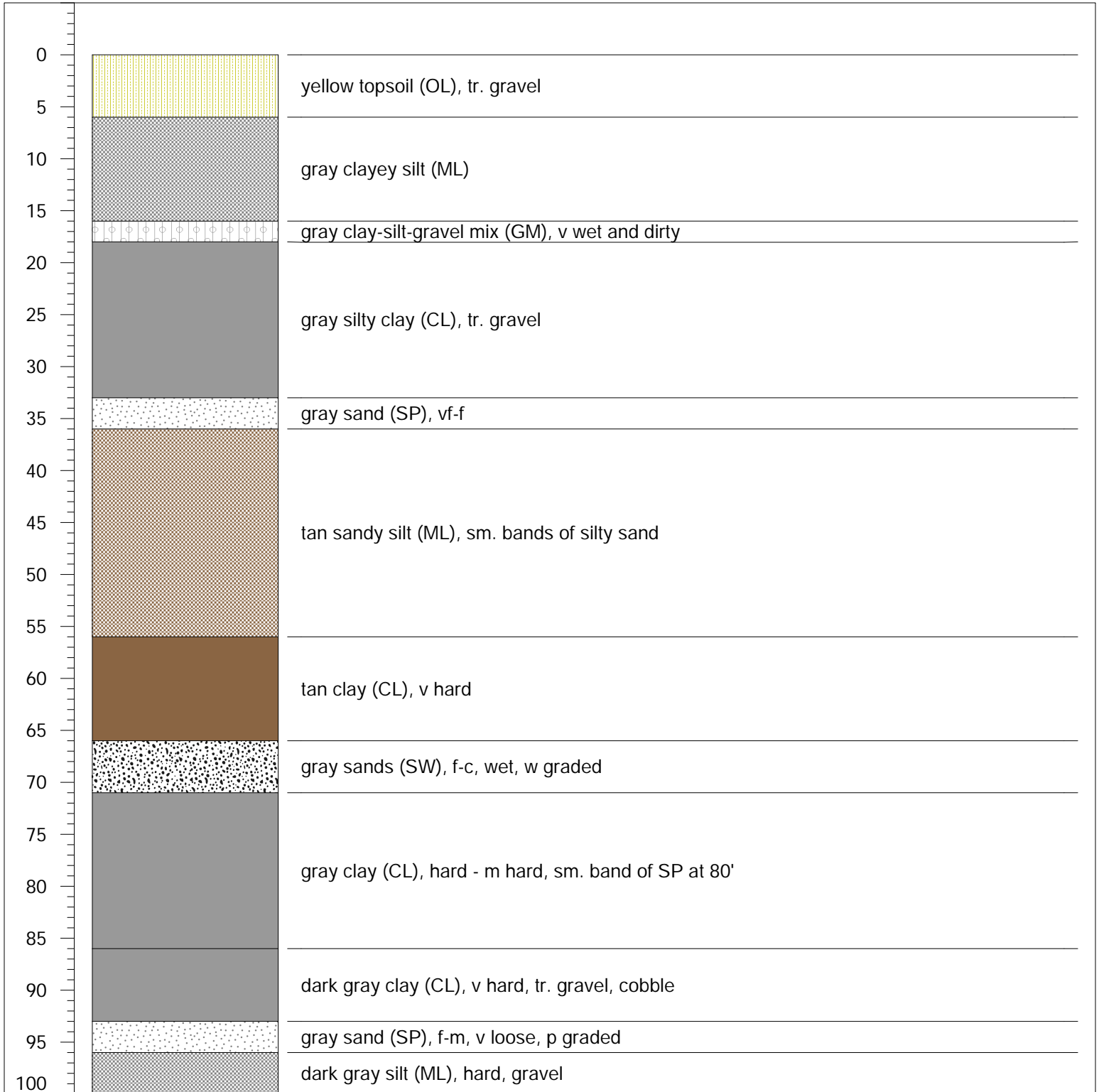
Elevation: 861 ft amsl Lat: 40.242482°
Total Depth: 340 ft Long: -86.600934°

Date start: 7/06/2022

Date finish: 7/08/2022

Date abandoned: 7/08/2022

Depth (ft bgs)	Lithology	Lithologic Description
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Total Depth = 340 ft bgs
bgs = below ground surface

M1-TB-1

Page: 1 of 4



Hole ID: M1-TB-1

Location: Clinton Co., IN
Site: M1

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

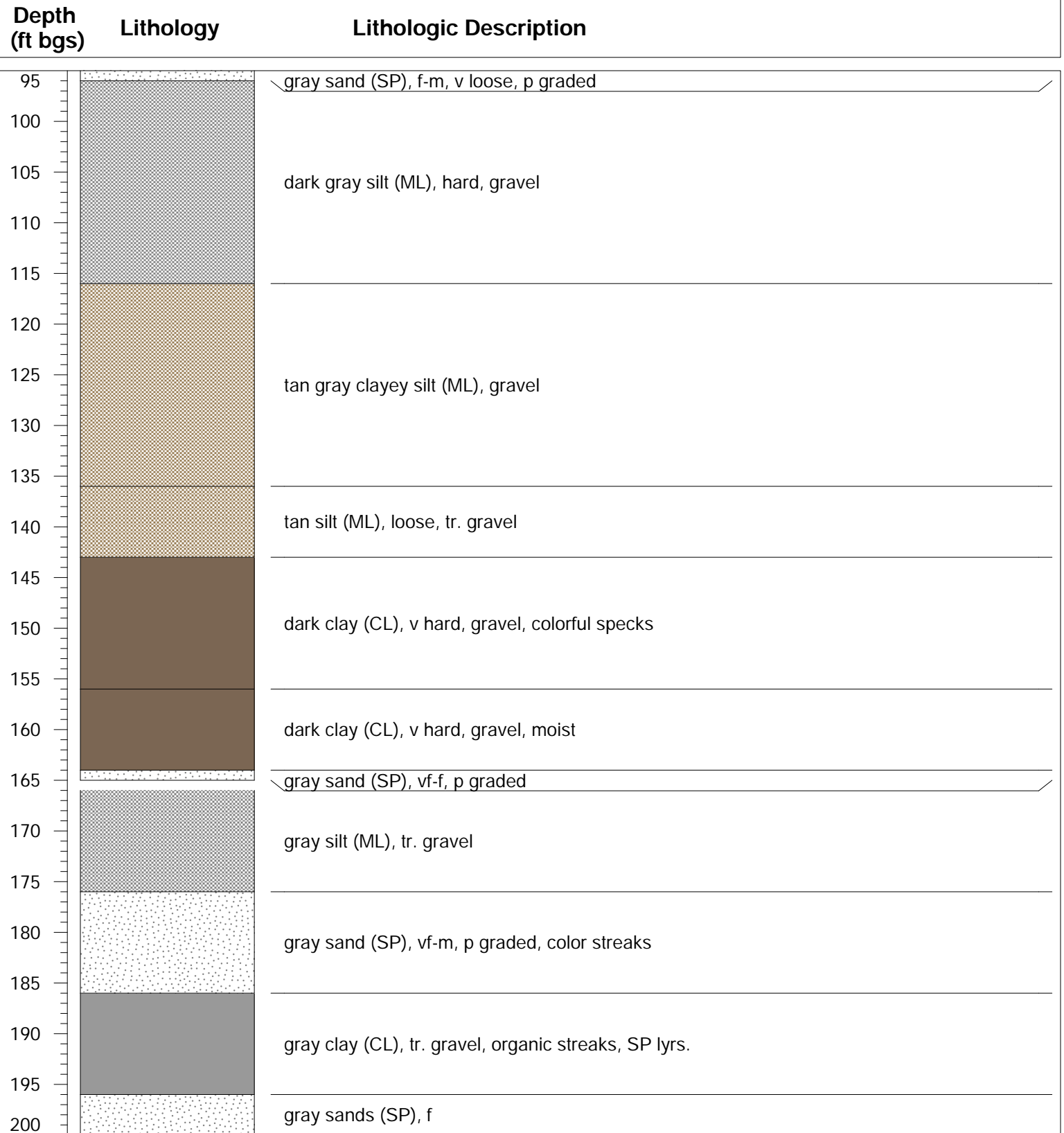
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 861 ft amsl Lat: 40.242482°
Total Depth: 340 ft Long: -86.600934°

Date start: 7/06/2022

Date finish: 7/08/2022

Date abandoned: 7/08/2022



Total Depth = 340 ft bgs
bgs = below ground surface

M1-TB-1



Hole ID: M1-TB-1

Location: Clinton Co., IN
Site: M1

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 861 ft amsl Lat: 40.242482°
Total Depth: 340 ft Long: -86.600934°

Date start: 7/06/2022

Date finish: 7/08/2022

Date abandoned: 7/08/2022

Depth (ft bgs)	Lithology	Lithologic Description
195		gray clay (CL), tr. gravel, organic streaks, SP lysr.
200		gray sands (SP), f
205		gray clay (CL), v hard, gravel
210		gray sand (SP), f-m, wet, p graded
215		
220		lt gray sand (SP), f, moist, loose
225		lt gray sand (SP), f, moist, loose, w/ tr. gravel, subrounded
230		gray clay (CL), silty, hard/soft, moist gray silty sand (SM), f, w/ gravel, cobbles at bottom gray clay (CL) w/ cobbles and gravel, hard/soft gray silty sand (SM), f-m, w/ tr. gravel
235		gray clay (CL), soft, moist dark gray clay (CL), hard dry, w/ gravel
240		lt gray clay (CL), hard dry, w/ gravel
245		
250		lt gray clayey sand (SC), f-c lt gray clay (CL), hard dry, w/ gravel gray silt (ML), f
255		
260		
265		gray clayey silt (ML), f, hard, moist
270		
275		
280		
285		gray clayey silt (ML), f, soft, wet, loose
290		
295		
300		

Total Depth = 340 ft bgs
bgs = below ground surface

M1-TB-1



Hole ID: M1-TB-1

Location: Clinton Co., IN
Site: M1

Logged by: P. Jurcek, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

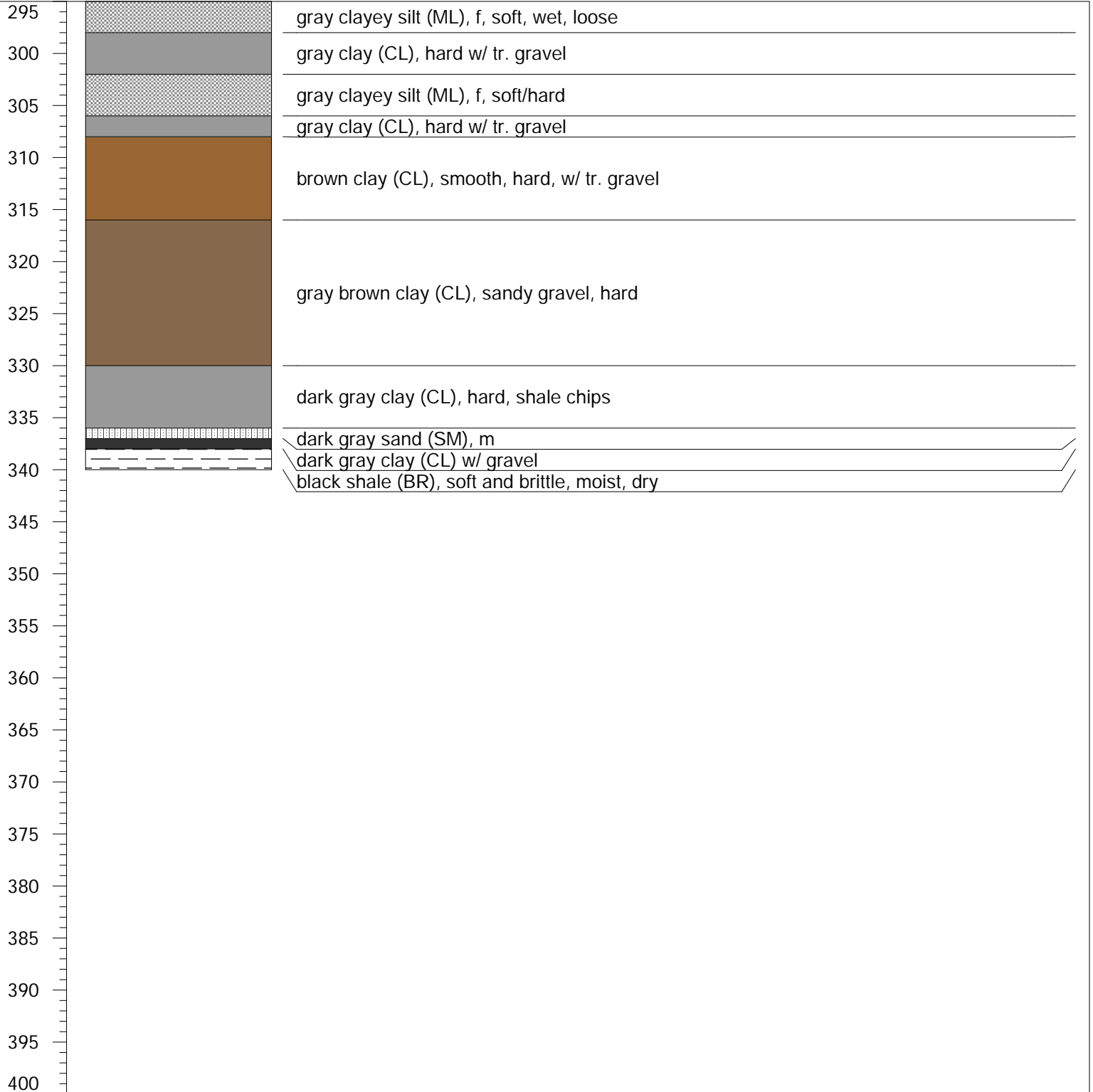
Elevation: 861 ft amsl Lat: 40.242482°
Total Depth: 340 ft Long: -86.600934°

Date start: 7/06/2022

Date finish: 7/08/2022

Date abandoned: 7/08/2022

Depth (ft bgs)	Lithology	Lithologic Description
----------------	-----------	------------------------



Total Depth = 340 ft bgs
bgs = below ground surface

M1-TB-1

Page: 4 of 4



Hole ID: N1-TB-1

Location: Clinton Co., IN
Site: N1

Logged by: B. Boggs, INTERA
Drilled by: A. Little, Cascade

Drilling Method: Sonic
Borehole diameter: 6"

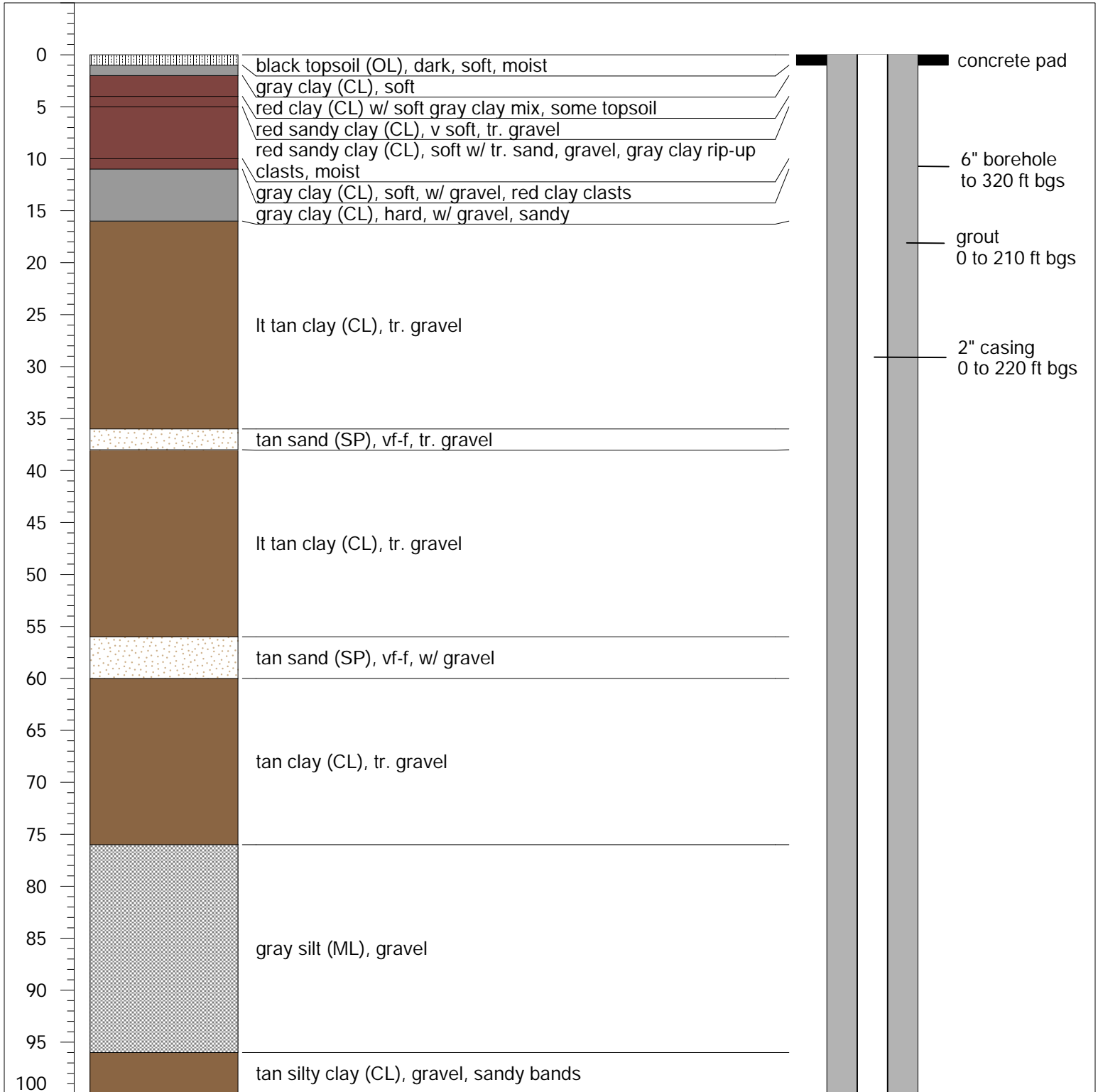
Elevation: 843 ft amsl Lat: 40.23584°
Total Depth: 320 ft Long: -86.66979°

Date start: 7/10/2022

Date finish: 7/12/2022

Date abandoned: xxxxx

Depth (ft bgs)	Lithology	Lithologic Description	Well Construction
----------------	-----------	------------------------	-------------------



Total Depth = 320 ft bgs
bgs = below ground surface

N1-TB-1



Hole ID: N1-TB-1

Location: Clinton Co., IN
Site: N1

Logged by: B. Boggs, INTERA
Drilled by: A. Little, Cascade

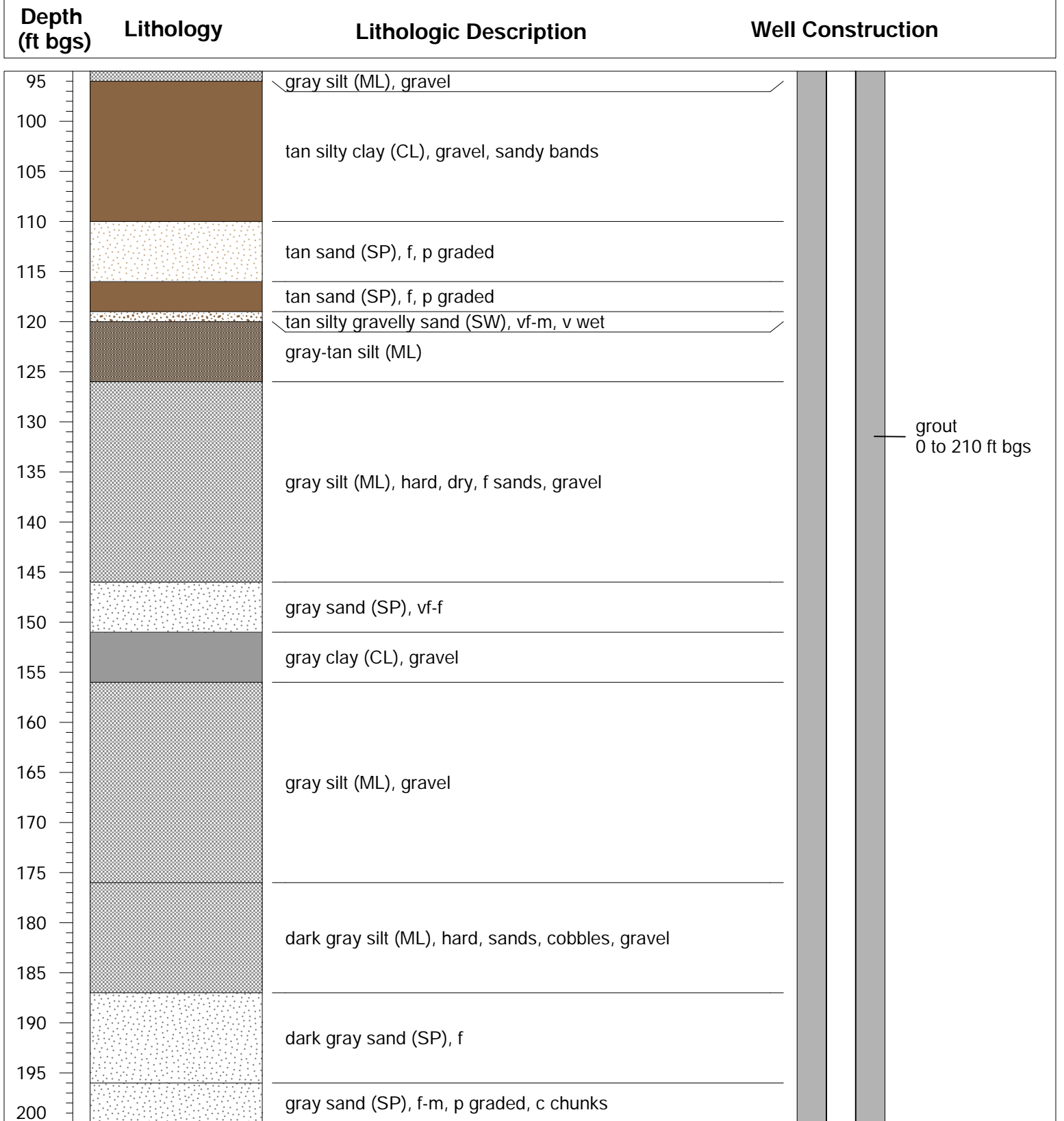
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 843 ft amsl Lat: 40.23584°
Total Depth: 320 ft Long: -86.66979°

Date start: 7/10/2022

Date finish: 7/12/2022

Date abandoned: xxxxxx



Total Depth = 320 ft bgs
bgs = below ground surface

N1-TB-1



Hole ID: N1-TB-1

Location: Clinton Co., IN
Site: N1

Logged by: B. Boggs, INTERA
Drilled by: A. Little, Cascade

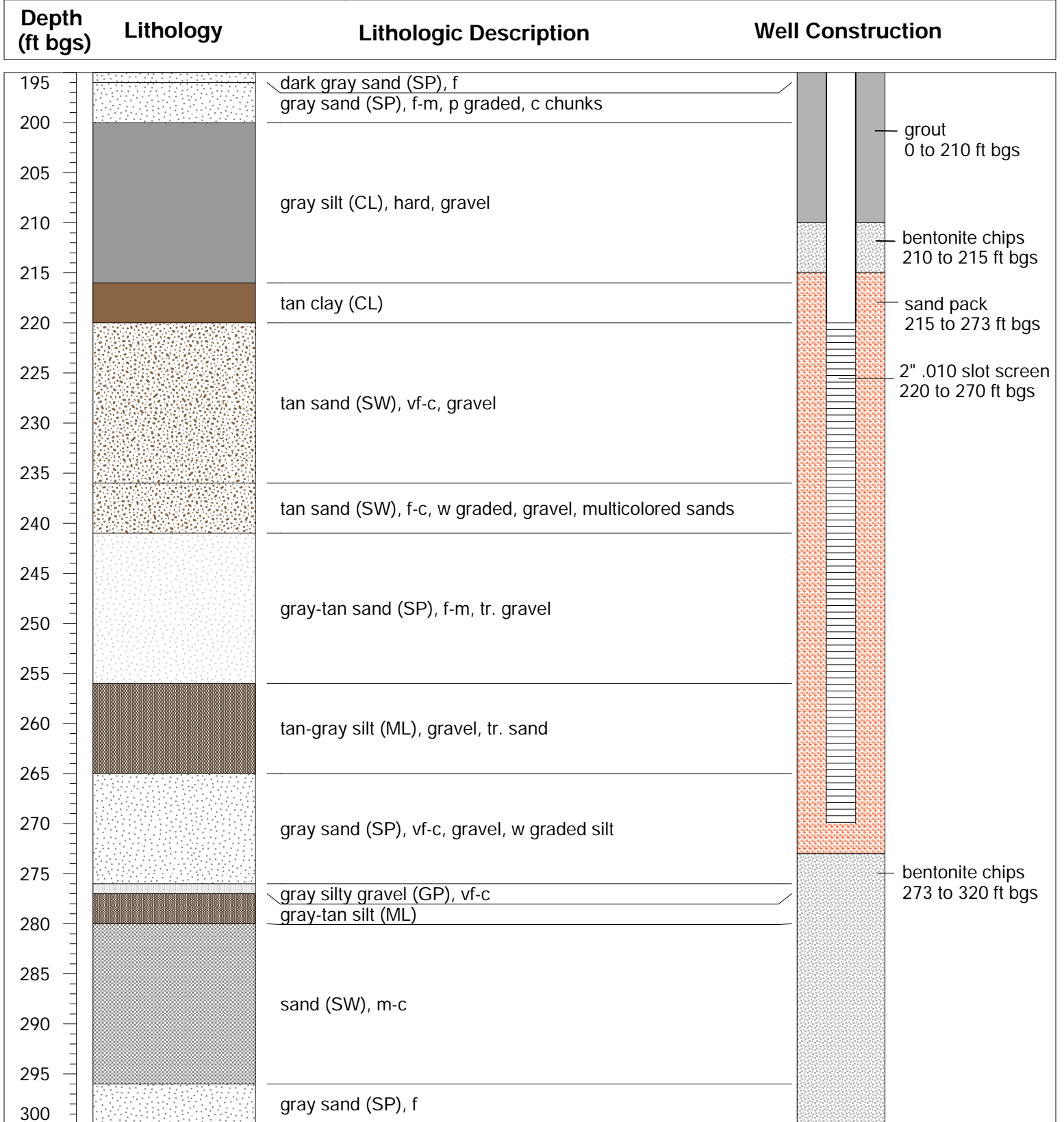
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 843 ft amsl
Total Depth: 320 ft
Lat: 40.23584°
Long: -86.66979°

Date start: 7/10/2022

Date finish: 7/12/2022

Date abandoned: xxxxx



Total Depth = 320 ft bgs
bgs = below ground surface

N1-TB-1

Page: 3 of 4



Hole ID: N1-TB-1

Location: Clinton Co., IN
Site: N1

Logged by: B. Boggs, INTERA
Drilled by: A. Little, Cascade

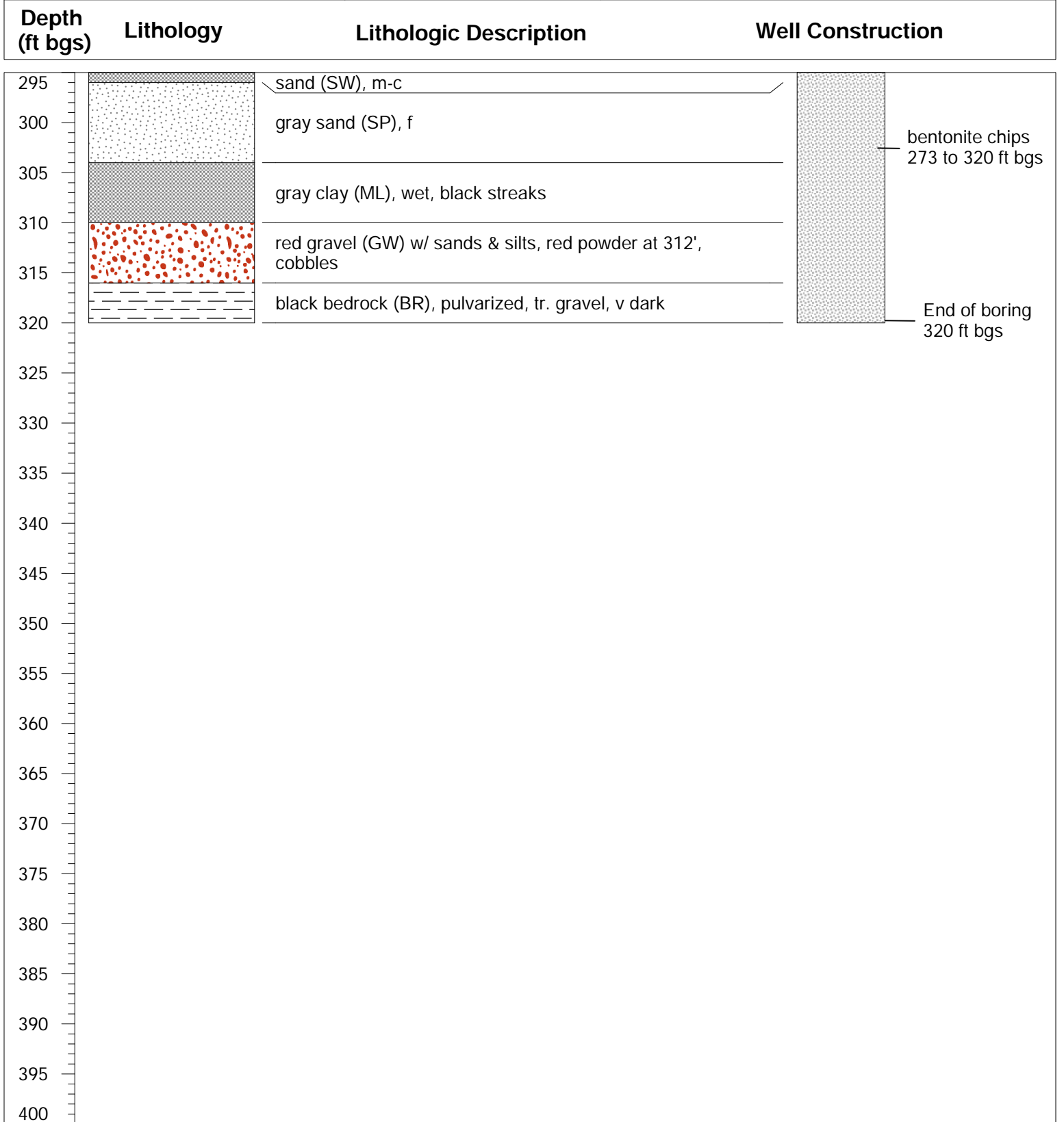
Drilling Method: Sonic
Borehole diameter: 6"

Elevation: 843 ft amsl Lat: 40.23584°
Total Depth: 320 ft Long: -86.66979°

Date start: 7/10/2022

Date finish: 7/12/2022

Date abandoned: xxxxx



Total Depth = 320 ft bgs
bgs = below ground surface

N1-TB-1

Page: 4 of 4

B 3D Geologic Model Well Logs

IDNR Well Logs

Well Log ID#	X	Y
131329	70260.7	1819760.7
132689	76092.1	1833189.7
133483	70111.1	1822403.7
133498	70357.8	1816647.6
133522	44861.0	1821615.5
133533	62072.6	1814499.3
133538	67744.2	1817801.2
133547	51582.5	1821084.4
133557	65011.6	1822500.8
133568	57172.3	1820647.2
133572	70185.4	1824941.1
133573	47652.0	1815553.1
133576	53475.5	1827562.1
133577	67874.1	1825655.4
133598	67290.3	1812457.9
133622	62468.8	1826052.0
136265	88451.9	1817630.6
136345	75355.4	1820589.3
136355	74747.8	1829644.2
136360	74474.3	1825805.2
136490	78269.2	1809880.1
136495	75454.3	1814130.7
136505	83089.2	1813553.0
136575	93682.6	1814709.2
136595	85775.1	1811199.0
137797	88419.3	1809690.0
18107	70288.2	1819411.4
19036	83335.7	1828616.6
232151	52657.2	1820950.0
243651	85124.0	1828487.8
243676	83709.8	1828939.2
243686	85113.9	1830236.3
243751	84642.9	1829200.5
261295	67476.8	1810153.9
261304	75185.2	1816537.6
261334	78874.3	1820244.1
261339	76914.0	1815194.1
261359	68146.7	1804924.5
269098	83250.4	1822386.3
269636	78114.7	1829735.5
269687	83282.2	1827358.0
275957	84588.7	1829208.5
278987	72494.6	1820299.4
279047	51279.0	1824479.9
279070	93682.5	1814987.3

IDNR Well Logs (Cont.)

Well Log ID#	X	Y
304076	98064.9	1814369.2
306136	87000.0	1831870.1
306143	87325.3	1832111.4
306144	85937.7	1831081.9
306169	85897.9	1831056.2
307073	43205.2	1821092.2
31493	87638.5	1831115.4
31498	87571.2	1831654.7
31518	87548.4	1831011.7
31528	86997.0	1831893.1
31543	87023.1	1831882.9
31553	85878.6	1831082.8
31646	93249.2	1828353.1
31661	92679.1	1826440.6
31681	78486.3	1825705.7
31714	92871.6	1822764.1
31734	91946.8	1825458.0
319918	88085.4	1825446.4
319922	61507.6	1818183.7
331787	67238.5	1819721.3
331788	58057.1	1820792.8
339544	87179.6	1820171.6
345325	57263.5	1828935.3
351835	69147.3	1823810.9
355950	69320.3	1833592.7
361482	68676.3	1832633.5
367375	70177.2	1821945.7
367402	46061.4	1827750.2
38154	80850.7	1820166.5
38227	59941.9	1830412.8
38236	65221.8	1815254.7
38241	70359.1	1819573.6
392034	73583.9	1820181.4
392038	62144.1	1817062.1
394477	54485.0	1816763.4
394478	71070.4	1833356.5
400347	85466.1	1831157.9
404178	59648.8	1824641.5
404259	66024.9	1833757.9
404325	70117.4	1821005.7
411202	77835.1	1812010.5
411548	72451.5	1807633.6
415048	90024.8	1812499.7
415083	76704.0	1809916.8
415091	84915.7	1815067.7

IDNR Well Logs (Cont.)

Well Log ID#	X	Y
416957	55390.5	1813670.7
417042	93991.2	1818758.6
418031	70360.5	1821439.9
418662	73932.5	1820494.6
420644	84467.1	1828024.9
422871	81585.6	1820103.4
423252	75581.2	1826153.8
428355	92181.9	1824996.9
431918	92074.2	1825432.5
433457	60176.7	1825125.3
433464	87244.4	1826952.4
435323	81652.9	1820443.1
372581	86311.3	1833282.5

New Borings Drilled for this Project

Boring ID	X	Y
A6-MW-1	67323.3	1820530.0
A6-TB-1	67114.3	1820330.0
AB-TB-2	67191.7	1820390.0
C1-MW-1	70016.2	1825740.0
C1-TB-1	70056.6	1825560.0
C1-TB-2	69984.1	1825620.0
C2-MW-1	72706.2	1825670.0
C2-TB-1	72735.0	1825530.0
C2-TB-2	72664.3	1825460.0
C2-TB-3_MW	72760.0	1825680.0
D3-MW-1	70353.8	1815260.0
D3-TB-1	70336.0	1815390.0
D3-TB-2	70385.6	1815420.0
J3-MW-1	60519.9	1820640.0
J3-TB-1	60290.8	1820500.0
J3-TB-2	60360.2	1820440.0
J3-TB-3	60931.0	1820182.0
J3-TB-4	60865.0	1820160.0
J3-TB-5	60310.9	1819760.0
J3-TB-7	61129.1	1820480.0
M1-TB-1	51611.9	1826310.0
N1-TB-1	47916.0	1818260.0
J3-TW-1	61055.0	1820381.0
J3-TW-2	61052.0	1820294.0
J3-MW-4	61121.0	1820249.0

Coordinate System - NAD 1983 2011 StatePlane Indiana East FIPS 1301 Ft US

C Water-Quality Lab Reports

ANALYTICAL REPORT

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-220535-1
Client Project/Site: Clinton County Water Study

For:
INTERA Inc
101 West Kirkwood Avenue
Suite 247
Bloomington, Indiana 47404

Attn: Rhett Moore



Authorized for release by:
8/25/2022 8:23:13 AM

Diana Mockler, Project Manager I
(219)252-7570

Diana.Mockler@et.eurofinsus.com

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results through



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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Job ID: 500-220535-1

Laboratory: Eurofins Chicago

Narrative

Job Narrative 500-220535-1

Comments

No additional comments.

Receipt

The samples were received on 8/8/2022 1:50 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.2° C.

Receipt Exceptions

The following sample(s) was received with less than 2 days remaining on the holding time or less than one shift (8 hours) remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: C1-MW-1 (500-220535-1), C2-MW-1S (500-220535-2), C2-MW-1D (500-220535-3), J3-MW-2S (500-220535-4), J3-MW-2D (500-220535-5), D3-MW-1 (500-220535-6), A6-MW-1S (500-220535-7) and A6-MW-1D (500-220535-8).

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

Method 9056A: The following samples was received outside of holding time for analytes Nitrate as N, Nitrite as N and Orthophosphate as P: C1-MW-1 (500-220535-1), C2-MW-1S (500-220535-2), C2-MW-1D (500-220535-3), J3-MW-2S (500-220535-4), J3-MW-2D (500-220535-5), D3-MW-1 (500-220535-6), A6-MW-1S (500-220535-7) and A6-MW-1D (500-220535-8).

Method 9056A: The closing continuing calibration verification (CCV) associated with batch 500-669146 recovered 2% below the lower control limit for Orthophosphate as P. Only the batch QC samples (500-220535-A-3 MS) and (500-220535-A-3 MSD) were associated with this CCV ; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: C1-MW-1

Lab Sample ID: 500-220535-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	0.049	J	0.10	0.025	mg/L	1		6020A	Total Recoverable
Arsenic	0.0026		0.0010	0.00023	mg/L	1		6020A	Total Recoverable
Barium	0.19		0.0025	0.00073	mg/L	1		6020A	Total Recoverable
Boron	0.029	J	0.050	0.013	mg/L	1		6020A	Total Recoverable
Calcium	93		0.20	0.044	mg/L	1		6020A	Total Recoverable
Iron	2.0		0.10	0.047	mg/L	1		6020A	Total Recoverable
Lithium	0.0049	J	0.010	0.0025	mg/L	1		6020A	Total Recoverable
Magnesium	31		0.20	0.049	mg/L	1		6020A	Total Recoverable
Manganese	0.11		0.0025	0.00079	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0069		0.0050	0.0025	mg/L	1		6020A	Total Recoverable
Nickel	0.00070	J	0.0020	0.00063	mg/L	1		6020A	Total Recoverable
Potassium	1.2		0.50	0.11	mg/L	1		6020A	Total Recoverable
Sodium	11		0.20	0.077	mg/L	1		6020A	Total Recoverable
Strontium	0.27		0.0040	0.00064	mg/L	1		6020A	Total Recoverable
Tin	0.0018	J	0.0050	0.0013	mg/L	1		6020A	Total Recoverable
Titanium	0.0024	J	0.0050	0.0018	mg/L	1		6020A	Total Recoverable
Chloride	20		2.0	1.7	mg/L	10		9056A	Total/NA
Fluoride	0.40		0.20	0.067	mg/L	1		9056A	Total/NA
Sulfate	70		2.0	0.95	mg/L	10		9056A	Total/NA
Alkalinity	270		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: C2-MW-1S

Lab Sample ID: 500-220535-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.0050		0.0010	0.00023	mg/L	1		6020A	Total Recoverable
Barium	0.21		0.0025	0.00073	mg/L	1		6020A	Total Recoverable
Boron	0.022	J	0.050	0.013	mg/L	1		6020A	Total Recoverable
Calcium	100		0.20	0.044	mg/L	1		6020A	Total Recoverable
Iron	3.1		0.10	0.047	mg/L	1		6020A	Total Recoverable
Lithium	0.0040	J	0.010	0.0025	mg/L	1		6020A	Total Recoverable
Magnesium	33		0.20	0.049	mg/L	1		6020A	Total Recoverable
Manganese	0.075		0.0025	0.00079	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0065		0.0050	0.0025	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Eurofins Chicago

Detection Summary

Client: INTERA Inc
 Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: C2-MW-1S (Continued)

Lab Sample ID: 500-220535-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Potassium	1.0		0.50	0.11	mg/L	1		6020A	Total Recoverable
Sodium	5.4		0.20	0.077	mg/L	1		6020A	Total Recoverable
Strontium	0.17		0.0040	0.00064	mg/L	1		6020A	Total Recoverable
Chloride	16		2.0	1.7	mg/L	10		9056A	Total/NA
Fluoride	0.35		0.20	0.067	mg/L	1		9056A	Total/NA
Sulfate	80		2.0	0.95	mg/L	10		9056A	Total/NA
Alkalinity	280		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: C2-MW-1D

Lab Sample ID: 500-220535-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	0.058	J	0.10	0.025	mg/L	1		6020A	Total Recoverable
Arsenic	0.00032	J	0.0010	0.00023	mg/L	1		6020A	Total Recoverable
Barium	0.22		0.0025	0.00073	mg/L	1		6020A	Total Recoverable
Boron	0.090		0.050	0.013	mg/L	1		6020A	Total Recoverable
Calcium	62		0.20	0.044	mg/L	1		6020A	Total Recoverable
Iron	1.3		0.10	0.047	mg/L	1		6020A	Total Recoverable
Lithium	0.0075	J	0.010	0.0025	mg/L	1		6020A	Total Recoverable
Magnesium	25		0.20	0.049	mg/L	1		6020A	Total Recoverable
Manganese	0.18		0.0025	0.00079	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0085		0.0050	0.0025	mg/L	1		6020A	Total Recoverable
Potassium	1.4		0.50	0.11	mg/L	1		6020A	Total Recoverable
Sodium	30		0.20	0.077	mg/L	1		6020A	Total Recoverable
Strontium	0.47		0.0040	0.00064	mg/L	1		6020A	Total Recoverable
Bromide	0.070	J	0.25	0.050	mg/L	1		9056A	Total/NA
Chloride	3.7		0.20	0.17	mg/L	1		9056A	Total/NA
Fluoride	0.65		0.20	0.067	mg/L	1		9056A	Total/NA
Sulfate	2.0		0.20	0.095	mg/L	1		9056A	Total/NA
Alkalinity	310		5.0	3.7	mg/L	1		SM 2320B	Total/NA
Ammonia	0.40		0.20	0.10	mg/L	1		SM 4500 NH3 G	Total/NA

Client Sample ID: J3-MW-2S

Lab Sample ID: 500-220535-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	0.026	J	0.10	0.025	mg/L	1		6020A	Total Recoverable
Arsenic	0.0016		0.0010	0.00023	mg/L	1		6020A	Total Recoverable
Barium	0.076		0.0025	0.00073	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Euofins Chicago

Detection Summary

Client: INTERA Inc
 Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: J3-MW-2S (Continued)

Lab Sample ID: 500-220535-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.049	J	0.050	0.013	mg/L	1		6020A	Total Recoverable
Calcium	76		0.20	0.044	mg/L	1		6020A	Total Recoverable
Cobalt	0.00046	J	0.0010	0.00040	mg/L	1		6020A	Total Recoverable
Copper	0.00051	J	0.0020	0.00050	mg/L	1		6020A	Total Recoverable
Iron	2.3		0.10	0.047	mg/L	1		6020A	Total Recoverable
Lead	0.00073		0.00050	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.015		0.010	0.0025	mg/L	1		6020A	Total Recoverable
Magnesium	30		0.20	0.049	mg/L	1		6020A	Total Recoverable
Manganese	0.51		0.0025	0.00079	mg/L	1		6020A	Total Recoverable
Molybdenum	0.020		0.0050	0.0025	mg/L	1		6020A	Total Recoverable
Nickel	0.0015	J	0.0020	0.00063	mg/L	1		6020A	Total Recoverable
Potassium	2.5		0.50	0.11	mg/L	1		6020A	Total Recoverable
Sodium	34		0.20	0.077	mg/L	1		6020A	Total Recoverable
Strontium	0.61		0.0040	0.00064	mg/L	1		6020A	Total Recoverable
Chloride	17		2.0	1.7	mg/L	10		9056A	Total/NA
Fluoride	0.61		0.20	0.067	mg/L	1		9056A	Total/NA
Sulfate	71		2.0	0.95	mg/L	10		9056A	Total/NA
Alkalinity	280		5.0	3.7	mg/L	1		SM 2320B	Total/NA
Ammonia	0.48		0.40	0.20	mg/L	2		SM 4500 NH3 G	Total/NA

Client Sample ID: J3-MW-2D

Lab Sample ID: 500-220535-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.016		0.0010	0.00023	mg/L	1		6020A	Total Recoverable
Barium	0.14		0.0025	0.00073	mg/L	1		6020A	Total Recoverable
Boron	0.072		0.050	0.013	mg/L	1		6020A	Total Recoverable
Calcium	73		0.20	0.044	mg/L	1		6020A	Total Recoverable
Iron	0.81		0.10	0.047	mg/L	1		6020A	Total Recoverable
Lithium	0.0089	J	0.010	0.0025	mg/L	1		6020A	Total Recoverable
Magnesium	32		0.20	0.049	mg/L	1		6020A	Total Recoverable
Manganese	0.070		0.0025	0.00079	mg/L	1		6020A	Total Recoverable
Molybdenum	0.012		0.0050	0.0025	mg/L	1		6020A	Total Recoverable
Potassium	1.5		0.50	0.11	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Eurofins Chicago

Detection Summary

Client: INTERA Inc
 Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: J3-MW-2D (Continued)

Lab Sample ID: 500-220535-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sodium	20		0.20	0.077	mg/L	1		6020A	Total Recoverable
Strontium	0.81		0.0040	0.00064	mg/L	1		6020A	Total Recoverable
Chloride	6.9		0.20	0.17	mg/L	1		9056A	Total/NA
Fluoride	0.67		0.20	0.067	mg/L	1		9056A	Total/NA
Sulfate	40		2.0	0.95	mg/L	10		9056A	Total/NA
Alkalinity	290		5.0	3.7	mg/L	1		SM 2320B	Total/NA
Ammonia	0.55		0.40	0.20	mg/L	2		SM 4500 NH3 G	Total/NA

Client Sample ID: D3-MW-1

Lab Sample ID: 500-220535-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	0.031	J	0.10	0.025	mg/L	1		6020A	Total Recoverable
Arsenic	0.0012		0.0010	0.00023	mg/L	1		6020A	Total Recoverable
Barium	0.11		0.0025	0.00073	mg/L	1		6020A	Total Recoverable
Boron	0.016	J	0.050	0.013	mg/L	1		6020A	Total Recoverable
Calcium	110		0.20	0.044	mg/L	1		6020A	Total Recoverable
Iron	3.3		0.10	0.047	mg/L	1		6020A	Total Recoverable
Lithium	0.0050	J	0.010	0.0025	mg/L	1		6020A	Total Recoverable
Magnesium	37		0.20	0.049	mg/L	1		6020A	Total Recoverable
Manganese	0.098		0.0025	0.00079	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0054		0.0050	0.0025	mg/L	1		6020A	Total Recoverable
Potassium	1.1		0.50	0.11	mg/L	1		6020A	Total Recoverable
Sodium	6.1		0.20	0.077	mg/L	1		6020A	Total Recoverable
Strontium	0.19		0.0040	0.00064	mg/L	1		6020A	Total Recoverable
Chloride	23		4.0	3.4	mg/L	20		9056A	Total/NA
Fluoride	0.26		0.20	0.067	mg/L	1		9056A	Total/NA
Sulfate	88		4.0	1.9	mg/L	20		9056A	Total/NA
Alkalinity	310		5.0	3.7	mg/L	1		SM 2320B	Total/NA

Client Sample ID: A6-MW-1S

Lab Sample ID: 500-220535-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.00097	J	0.0010	0.00023	mg/L	1		6020A	Total Recoverable
Barium	0.16		0.0025	0.00073	mg/L	1		6020A	Total Recoverable
Boron	0.019	J	0.050	0.013	mg/L	1		6020A	Total Recoverable
Calcium	96		0.20	0.044	mg/L	1		6020A	Total Recoverable
Iron	2.7		0.10	0.047	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Eurofins Chicago

Detection Summary

Client: INTERA Inc
 Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: A6-MW-1S (Continued)

Lab Sample ID: 500-220535-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0052	J	0.010	0.0025	mg/L	1		6020A	Total Recoverable
Magnesium	32		0.20	0.049	mg/L	1		6020A	Total Recoverable
Manganese	0.091		0.0025	0.00079	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0069		0.0050	0.0025	mg/L	1		6020A	Total Recoverable
Potassium	1.1		0.50	0.11	mg/L	1		6020A	Total Recoverable
Sodium	15		0.20	0.077	mg/L	1		6020A	Total Recoverable
Strontium	0.24		0.0040	0.00064	mg/L	1		6020A	Total Recoverable
Chloride	20		2.0	1.7	mg/L	10		9056A	Total/NA
Fluoride	0.39		0.20	0.067	mg/L	1		9056A	Total/NA
Sulfate	84		2.0	0.95	mg/L	10		9056A	Total/NA
Alkalinity	280		5.0	3.7	mg/L	1		SM 2320B	Total/NA
Ammonia	0.20		0.20	0.10	mg/L	1		SM 4500 NH3 G	Total/NA

Client Sample ID: A6-MW-1D

Lab Sample ID: 500-220535-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	0.026	J	0.10	0.025	mg/L	1		6020A	Total Recoverable
Arsenic	0.00040	J	0.0010	0.00023	mg/L	1		6020A	Total Recoverable
Barium	0.20		0.0025	0.00073	mg/L	1		6020A	Total Recoverable
Boron	0.095		0.050	0.013	mg/L	1		6020A	Total Recoverable
Calcium	60		0.20	0.044	mg/L	1		6020A	Total Recoverable
Iron	2.2		0.10	0.047	mg/L	1		6020A	Total Recoverable
Lithium	0.014		0.010	0.0025	mg/L	1		6020A	Total Recoverable
Magnesium	27		0.20	0.049	mg/L	1		6020A	Total Recoverable
Manganese	0.052		0.0025	0.00079	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0081		0.0050	0.0025	mg/L	1		6020A	Total Recoverable
Potassium	2.0		0.50	0.11	mg/L	1		6020A	Total Recoverable
Sodium	36		0.20	0.077	mg/L	1		6020A	Total Recoverable
Strontium	0.69		0.0040	0.00064	mg/L	1		6020A	Total Recoverable
Chloride	6.4		0.20	0.17	mg/L	1		9056A	Total/NA
Fluoride	0.64		0.20	0.067	mg/L	1		9056A	Total/NA
Sulfate	3.4		0.20	0.095	mg/L	1		9056A	Total/NA
Alkalinity	310		5.0	3.7	mg/L	1		SM 2320B	Total/NA
Ammonia	1.1		0.40	0.20	mg/L	2		SM 4500 NH3 G	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Chicago

Method Summary

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	EET CHI
7470A	Mercury (CVAA)	SW846	EET CHI
9056A	Anions, Ion Chromatography	SW846	EET CHI
SM 2320B	Alkalinity	SM	EET CHI
SM 4500 NH3 G	Ammonia	SM	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
7470A	Preparation, Mercury	SW846	EET CHI
SM 4500 NH3 B	Distillation, Ammonia	SM	EET CHI

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-220535-1	C1-MW-1	Water	08/01/22 15:00	08/08/22 13:50
500-220535-2	C2-MW-1S	Water	08/04/22 14:30	08/08/22 13:50
500-220535-3	C2-MW-1D	Water	08/04/22 14:00	08/08/22 13:50
500-220535-4	J3-MW-2S	Water	08/03/22 17:00	08/08/22 13:50
500-220535-5	J3-MW-2D	Water	08/03/22 16:30	08/08/22 13:50
500-220535-6	D3-MW-1	Water	08/01/22 13:40	08/08/22 13:50
500-220535-7	A6-MW-1S	Water	08/03/22 14:30	08/08/22 13:50
500-220535-8	A6-MW-1D	Water	08/02/22 14:00	08/08/22 13:50

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Client Sample Results

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: C1-MW-1

Lab Sample ID: 500-220535-1

Date Collected: 08/01/22 15:00

Matrix: Water

Date Received: 08/08/22 13:50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	0.049	J	0.10	0.025	mg/L		08/12/22 07:56	08/13/22 05:34	1
Antimony	<0.0030		0.0030	0.0013	mg/L		08/12/22 07:56	08/13/22 05:34	1
Arsenic	0.0026		0.0010	0.00023	mg/L		08/12/22 07:56	08/13/22 05:34	1
Barium	0.19		0.0025	0.00073	mg/L		08/12/22 07:56	08/13/22 05:34	1
Beryllium	<0.0010		0.0010	0.00053	mg/L		08/12/22 07:56	08/13/22 05:34	1
Boron	0.029	J	0.050	0.013	mg/L		08/12/22 07:56	08/13/22 05:34	1
Cadmium	<0.00050		0.00050	0.00017	mg/L		08/12/22 07:56	08/13/22 05:34	1
Calcium	93		0.20	0.044	mg/L		08/12/22 07:56	08/13/22 05:34	1
Chromium	<0.0050		0.0050	0.0011	mg/L		08/12/22 07:56	08/13/22 05:34	1
Cobalt	<0.0010		0.0010	0.00040	mg/L		08/12/22 07:56	08/13/22 05:34	1
Copper	<0.0020		0.0020	0.00050	mg/L		08/12/22 07:56	08/13/22 05:34	1
Iron	2.0		0.10	0.047	mg/L		08/12/22 07:56	08/13/22 05:34	1
Lead	<0.00050		0.00050	0.00019	mg/L		08/12/22 07:56	08/13/22 05:34	1
Lithium	0.0049	J	0.010	0.0025	mg/L		08/12/22 07:56	08/15/22 13:52	1
Magnesium	31		0.20	0.049	mg/L		08/12/22 07:56	08/13/22 05:34	1
Manganese	0.11		0.0025	0.00079	mg/L		08/12/22 07:56	08/13/22 05:34	1
Molybdenum	0.0069		0.0050	0.0025	mg/L		08/12/22 07:56	08/13/22 05:34	1
Nickel	0.00070	J	0.0020	0.00063	mg/L		08/12/22 07:56	08/13/22 05:34	1
Potassium	1.2		0.50	0.11	mg/L		08/12/22 07:56	08/13/22 05:34	1
Selenium	<0.0025		0.0025	0.00098	mg/L		08/12/22 07:56	08/13/22 05:34	1
Silver	<0.00050		0.00050	0.00012	mg/L		08/12/22 07:56	08/13/22 05:34	1
Sodium	11		0.20	0.077	mg/L		08/12/22 07:56	08/15/22 13:52	1
Strontium	0.27		0.0040	0.00064	mg/L		08/12/22 07:56	08/13/22 05:34	1
Thallium	<0.0020		0.0020	0.00057	mg/L		08/12/22 07:56	08/13/22 05:34	1
Tin	0.0018	J	0.0050	0.0013	mg/L		08/12/22 07:56	08/13/22 05:34	1
Titanium	0.0024	J	0.0050	0.0018	mg/L		08/12/22 07:56	08/13/22 05:34	1
Vanadium	<0.0050		0.0050	0.0022	mg/L		08/12/22 07:56	08/13/22 05:34	1
Zinc	<0.020		0.020	0.0069	mg/L		08/12/22 07:56	08/13/22 05:34	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000098	mg/L		08/17/22 10:25	08/18/22 09:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<0.25		0.25	0.050	mg/L			08/09/22 13:56	1
Chloride	20		2.0	1.7	mg/L			08/09/22 16:12	10
Fluoride	0.40		0.20	0.067	mg/L			08/22/22 16:16	1
Nitrate as N	<0.20	H3	0.20	0.068	mg/L			08/09/22 13:56	1
Nitrite as N	<0.20	H3	0.20	0.050	mg/L			08/09/22 13:56	1
Orthophosphate as P	<0.20	H3	0.20	0.065	mg/L			08/09/22 13:56	1
Sulfate	70		2.0	0.95	mg/L			08/09/22 16:12	10
Alkalinity	270		5.0	3.7	mg/L			08/10/22 11:35	1
Ammonia	<0.20		0.20	0.10	mg/L		08/09/22 10:20	08/09/22 13:47	1

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Client Sample Results

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: C2-MW-1S

Lab Sample ID: 500-220535-2

Date Collected: 08/04/22 14:30

Matrix: Water

Date Received: 08/08/22 13:50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.10		0.10	0.025	mg/L		08/12/22 07:56	08/13/22 05:58	1
Antimony	<0.0030		0.0030	0.0013	mg/L		08/12/22 07:56	08/13/22 05:58	1
Arsenic	0.0050		0.0010	0.00023	mg/L		08/12/22 07:56	08/13/22 05:58	1
Barium	0.21		0.0025	0.00073	mg/L		08/12/22 07:56	08/13/22 05:58	1
Beryllium	<0.0010		0.0010	0.00053	mg/L		08/12/22 07:56	08/13/22 05:58	1
Boron	0.022	J	0.050	0.013	mg/L		08/12/22 07:56	08/13/22 05:58	1
Cadmium	<0.00050		0.00050	0.00017	mg/L		08/12/22 07:56	08/13/22 05:58	1
Calcium	100		0.20	0.044	mg/L		08/12/22 07:56	08/13/22 05:58	1
Chromium	<0.0050		0.0050	0.0011	mg/L		08/12/22 07:56	08/13/22 05:58	1
Cobalt	<0.0010		0.0010	0.00040	mg/L		08/12/22 07:56	08/13/22 05:58	1
Copper	<0.0020		0.0020	0.00050	mg/L		08/12/22 07:56	08/13/22 05:58	1
Iron	3.1		0.10	0.047	mg/L		08/12/22 07:56	08/13/22 05:58	1
Lead	<0.00050		0.00050	0.00019	mg/L		08/12/22 07:56	08/13/22 05:58	1
Lithium	0.0040	J	0.010	0.0025	mg/L		08/12/22 07:56	08/15/22 14:16	1
Magnesium	33		0.20	0.049	mg/L		08/12/22 07:56	08/13/22 05:58	1
Manganese	0.075		0.0025	0.00079	mg/L		08/12/22 07:56	08/13/22 05:58	1
Molybdenum	0.0065		0.0050	0.0025	mg/L		08/12/22 07:56	08/13/22 05:58	1
Nickel	<0.0020		0.0020	0.00063	mg/L		08/12/22 07:56	08/13/22 05:58	1
Potassium	1.0		0.50	0.11	mg/L		08/12/22 07:56	08/13/22 05:58	1
Selenium	<0.0025		0.0025	0.00098	mg/L		08/12/22 07:56	08/13/22 05:58	1
Silver	<0.00050		0.00050	0.00012	mg/L		08/12/22 07:56	08/13/22 05:58	1
Sodium	5.4		0.20	0.077	mg/L		08/12/22 07:56	08/15/22 14:16	1
Strontium	0.17		0.0040	0.00064	mg/L		08/12/22 07:56	08/13/22 05:58	1
Thallium	<0.0020		0.0020	0.00057	mg/L		08/12/22 07:56	08/13/22 05:58	1
Tin	<0.0050		0.0050	0.0013	mg/L		08/12/22 07:56	08/13/22 05:58	1
Titanium	<0.0050		0.0050	0.0018	mg/L		08/12/22 07:56	08/13/22 05:58	1
Vanadium	<0.0050		0.0050	0.0022	mg/L		08/12/22 07:56	08/13/22 05:58	1
Zinc	<0.020		0.020	0.0069	mg/L		08/12/22 07:56	08/13/22 05:58	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000098	mg/L		08/17/22 10:25	08/18/22 09:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<0.25		0.25	0.050	mg/L			08/09/22 14:09	1
Chloride	16		2.0	1.7	mg/L			08/09/22 16:25	10
Fluoride	0.35		0.20	0.067	mg/L			08/22/22 16:57	1
Nitrate as N	<0.20	H3	0.20	0.068	mg/L			08/09/22 14:09	1
Nitrite as N	<0.20	H3	0.20	0.050	mg/L			08/09/22 14:09	1
Orthophosphate as P	<0.20	H3	0.20	0.065	mg/L			08/09/22 14:09	1
Sulfate	80		2.0	0.95	mg/L			08/09/22 16:25	10
Alkalinity	280		5.0	3.7	mg/L			08/10/22 11:43	1
Ammonia	<0.20		0.20	0.10	mg/L		08/09/22 10:20	08/09/22 13:50	1

Client Sample Results

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: C2-MW-1D

Lab Sample ID: 500-220535-3

Date Collected: 08/04/22 14:00

Matrix: Water

Date Received: 08/08/22 13:50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	0.058	J	0.10	0.025	mg/L		08/12/22 07:56	08/13/22 06:02	1
Antimony	<0.0030		0.0030	0.0013	mg/L		08/12/22 07:56	08/13/22 06:02	1
Arsenic	0.00032	J	0.0010	0.00023	mg/L		08/12/22 07:56	08/13/22 06:02	1
Barium	0.22		0.0025	0.00073	mg/L		08/12/22 07:56	08/13/22 06:02	1
Beryllium	<0.0010		0.0010	0.00053	mg/L		08/12/22 07:56	08/13/22 06:02	1
Boron	0.090		0.050	0.013	mg/L		08/12/22 07:56	08/13/22 06:02	1
Cadmium	<0.00050		0.00050	0.00017	mg/L		08/12/22 07:56	08/13/22 06:02	1
Calcium	62		0.20	0.044	mg/L		08/12/22 07:56	08/13/22 06:02	1
Chromium	<0.0050		0.0050	0.0011	mg/L		08/12/22 07:56	08/13/22 06:02	1
Cobalt	<0.0010		0.0010	0.00040	mg/L		08/12/22 07:56	08/13/22 06:02	1
Copper	<0.0020		0.0020	0.00050	mg/L		08/12/22 07:56	08/13/22 06:02	1
Iron	1.3		0.10	0.047	mg/L		08/12/22 07:56	08/13/22 06:02	1
Lead	<0.00050		0.00050	0.00019	mg/L		08/12/22 07:56	08/13/22 06:02	1
Lithium	0.0075	J	0.010	0.0025	mg/L		08/12/22 07:56	08/15/22 14:19	1
Magnesium	25		0.20	0.049	mg/L		08/12/22 07:56	08/13/22 06:02	1
Manganese	0.18		0.0025	0.00079	mg/L		08/12/22 07:56	08/13/22 06:02	1
Molybdenum	0.0085		0.0050	0.0025	mg/L		08/12/22 07:56	08/13/22 06:02	1
Nickel	<0.0020		0.0020	0.00063	mg/L		08/12/22 07:56	08/13/22 06:02	1
Potassium	1.4		0.50	0.11	mg/L		08/12/22 07:56	08/13/22 06:02	1
Selenium	<0.0025		0.0025	0.00098	mg/L		08/12/22 07:56	08/13/22 06:02	1
Silver	<0.00050		0.00050	0.00012	mg/L		08/12/22 07:56	08/13/22 06:02	1
Sodium	30		0.20	0.077	mg/L		08/12/22 07:56	08/15/22 14:19	1
Strontium	0.47		0.0040	0.00064	mg/L		08/12/22 07:56	08/13/22 06:02	1
Thallium	<0.0020		0.0020	0.00057	mg/L		08/12/22 07:56	08/13/22 06:02	1
Tin	<0.0050		0.0050	0.0013	mg/L		08/12/22 07:56	08/13/22 06:02	1
Titanium	<0.0050		0.0050	0.0018	mg/L		08/12/22 07:56	08/13/22 06:02	1
Vanadium	<0.0050		0.0050	0.0022	mg/L		08/12/22 07:56	08/13/22 06:02	1
Zinc	<0.020		0.020	0.0069	mg/L		08/12/22 07:56	08/13/22 06:02	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000098	mg/L		08/17/22 10:25	08/18/22 09:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	0.070	J	0.25	0.050	mg/L			08/09/22 14:23	1
Chloride	3.7		0.20	0.17	mg/L			08/09/22 14:23	1
Fluoride	0.65		0.20	0.067	mg/L			08/22/22 17:10	1
Nitrate as N	<0.20	H3	0.20	0.068	mg/L			08/09/22 14:23	1
Nitrite as N	<0.20	H3	0.20	0.050	mg/L			08/09/22 14:23	1
Orthophosphate as P	<0.20	F1 H3	0.20	0.065	mg/L			08/09/22 14:23	1
Sulfate	2.0		0.20	0.095	mg/L			08/09/22 14:23	1
Alkalinity	310		5.0	3.7	mg/L			08/10/22 11:51	1
Ammonia	0.40		0.20	0.10	mg/L		08/17/22 09:35	08/17/22 12:13	1

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Client Sample Results

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: J3-MW-2S

Lab Sample ID: 500-220535-4

Date Collected: 08/03/22 17:00

Matrix: Water

Date Received: 08/08/22 13:50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	0.026	J	0.10	0.025	mg/L		08/12/22 07:56	08/13/22 06:05	1
Antimony	<0.0030		0.0030	0.0013	mg/L		08/12/22 07:56	08/13/22 06:05	1
Arsenic	0.0016		0.0010	0.00023	mg/L		08/12/22 07:56	08/13/22 06:05	1
Barium	0.076		0.0025	0.00073	mg/L		08/12/22 07:56	08/13/22 06:05	1
Beryllium	<0.0010		0.0010	0.00053	mg/L		08/12/22 07:56	08/13/22 06:05	1
Boron	0.049	J	0.050	0.013	mg/L		08/12/22 07:56	08/13/22 06:05	1
Cadmium	<0.00050		0.00050	0.00017	mg/L		08/12/22 07:56	08/13/22 06:05	1
Calcium	76		0.20	0.044	mg/L		08/12/22 07:56	08/13/22 06:05	1
Chromium	<0.0050		0.0050	0.0011	mg/L		08/12/22 07:56	08/13/22 06:05	1
Cobalt	0.00046	J	0.0010	0.00040	mg/L		08/12/22 07:56	08/13/22 06:05	1
Copper	0.00051	J	0.0020	0.00050	mg/L		08/12/22 07:56	08/13/22 06:05	1
Iron	2.3		0.10	0.047	mg/L		08/12/22 07:56	08/13/22 06:05	1
Lead	0.00073		0.00050	0.00019	mg/L		08/12/22 07:56	08/13/22 06:05	1
Lithium	0.015		0.010	0.0025	mg/L		08/12/22 07:56	08/15/22 14:23	1
Magnesium	30		0.20	0.049	mg/L		08/12/22 07:56	08/13/22 06:05	1
Manganese	0.51		0.0025	0.00079	mg/L		08/12/22 07:56	08/13/22 06:05	1
Molybdenum	0.020		0.0050	0.0025	mg/L		08/12/22 07:56	08/13/22 06:05	1
Nickel	0.0015	J	0.0020	0.00063	mg/L		08/12/22 07:56	08/13/22 06:05	1
Potassium	2.5		0.50	0.11	mg/L		08/12/22 07:56	08/13/22 06:05	1
Selenium	<0.0025		0.0025	0.00098	mg/L		08/12/22 07:56	08/13/22 06:05	1
Silver	<0.00050		0.00050	0.00012	mg/L		08/12/22 07:56	08/13/22 06:05	1
Sodium	34		0.20	0.077	mg/L		08/12/22 07:56	08/15/22 14:23	1
Strontium	0.61		0.0040	0.00064	mg/L		08/12/22 07:56	08/13/22 06:05	1
Thallium	<0.0020		0.0020	0.00057	mg/L		08/12/22 07:56	08/13/22 06:05	1
Tin	<0.0050		0.0050	0.0013	mg/L		08/12/22 07:56	08/13/22 06:05	1
Titanium	<0.0050		0.0050	0.0018	mg/L		08/12/22 07:56	08/13/22 06:05	1
Vanadium	<0.0050		0.0050	0.0022	mg/L		08/12/22 07:56	08/13/22 06:05	1
Zinc	<0.020		0.020	0.0069	mg/L		08/12/22 07:56	08/13/22 06:05	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000098	mg/L		08/17/22 10:25	08/18/22 09:49	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<0.25		0.25	0.050	mg/L			08/09/22 14:36	1
Chloride	17		2.0	1.7	mg/L			08/09/22 17:06	10
Fluoride	0.61		0.20	0.067	mg/L			08/22/22 17:24	1
Nitrate as N	<0.20	H3	0.20	0.068	mg/L			08/09/22 14:36	1
Nitrite as N	<0.20	H3	0.20	0.050	mg/L			08/09/22 14:36	1
Orthophosphate as P	<0.20	H3	0.20	0.065	mg/L			08/09/22 14:36	1
Sulfate	71		2.0	0.95	mg/L			08/09/22 17:06	10
Alkalinity	280		5.0	3.7	mg/L			08/10/22 11:27	1
Ammonia	0.48		0.40	0.20	mg/L		08/09/22 10:20	08/09/22 14:10	2

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Client Sample Results

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: J3-MW-2D

Lab Sample ID: 500-220535-5

Date Collected: 08/03/22 16:30

Matrix: Water

Date Received: 08/08/22 13:50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.10		0.10	0.025	mg/L		08/12/22 07:56	08/13/22 06:09	1
Antimony	<0.0030		0.0030	0.0013	mg/L		08/12/22 07:56	08/13/22 06:09	1
Arsenic	0.016		0.0010	0.00023	mg/L		08/12/22 07:56	08/13/22 06:09	1
Barium	0.14		0.0025	0.00073	mg/L		08/12/22 07:56	08/13/22 06:09	1
Beryllium	<0.0010		0.0010	0.00053	mg/L		08/12/22 07:56	08/13/22 06:09	1
Boron	0.072		0.050	0.013	mg/L		08/12/22 07:56	08/13/22 06:09	1
Cadmium	<0.00050		0.00050	0.00017	mg/L		08/12/22 07:56	08/13/22 06:09	1
Calcium	73		0.20	0.044	mg/L		08/12/22 07:56	08/13/22 06:09	1
Chromium	<0.0050		0.0050	0.0011	mg/L		08/12/22 07:56	08/13/22 06:09	1
Cobalt	<0.0010		0.0010	0.00040	mg/L		08/12/22 07:56	08/13/22 06:09	1
Copper	<0.0020		0.0020	0.00050	mg/L		08/12/22 07:56	08/13/22 06:09	1
Iron	0.81		0.10	0.047	mg/L		08/12/22 07:56	08/13/22 06:09	1
Lead	<0.00050		0.00050	0.00019	mg/L		08/12/22 07:56	08/13/22 06:09	1
Lithium	0.0089	J	0.010	0.0025	mg/L		08/12/22 07:56	08/15/22 14:26	1
Magnesium	32		0.20	0.049	mg/L		08/12/22 07:56	08/13/22 06:09	1
Manganese	0.070		0.0025	0.00079	mg/L		08/12/22 07:56	08/13/22 06:09	1
Molybdenum	0.012		0.0050	0.0025	mg/L		08/12/22 07:56	08/13/22 06:09	1
Nickel	<0.0020		0.0020	0.00063	mg/L		08/12/22 07:56	08/13/22 06:09	1
Potassium	1.5		0.50	0.11	mg/L		08/12/22 07:56	08/13/22 06:09	1
Selenium	<0.0025		0.0025	0.00098	mg/L		08/12/22 07:56	08/13/22 06:09	1
Silver	<0.00050		0.00050	0.00012	mg/L		08/12/22 07:56	08/13/22 06:09	1
Sodium	20		0.20	0.077	mg/L		08/12/22 07:56	08/15/22 14:26	1
Strontium	0.81		0.0040	0.00064	mg/L		08/12/22 07:56	08/13/22 06:09	1
Thallium	<0.0020		0.0020	0.00057	mg/L		08/12/22 07:56	08/13/22 06:09	1
Tin	<0.0050		0.0050	0.0013	mg/L		08/12/22 07:56	08/13/22 06:09	1
Titanium	<0.0050		0.0050	0.0018	mg/L		08/12/22 07:56	08/13/22 06:09	1
Vanadium	<0.0050		0.0050	0.0022	mg/L		08/12/22 07:56	08/13/22 06:09	1
Zinc	<0.020		0.020	0.0069	mg/L		08/12/22 07:56	08/13/22 06:09	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000098	mg/L		08/17/22 10:25	08/18/22 09:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<0.25		0.25	0.050	mg/L			08/09/22 14:50	1
Chloride	6.9		0.20	0.17	mg/L			08/09/22 14:50	1
Fluoride	0.67		0.20	0.067	mg/L			08/22/22 18:05	1
Nitrate as N	<0.20	H3	0.20	0.068	mg/L			08/09/22 14:50	1
Nitrite as N	<0.20	H3	0.20	0.050	mg/L			08/09/22 14:50	1
Orthophosphate as P	<0.20	H3	0.20	0.065	mg/L			08/09/22 14:50	1
Sulfate	40		2.0	0.95	mg/L			08/09/22 17:20	10
Alkalinity	290		5.0	3.7	mg/L			08/10/22 11:59	1
Ammonia	0.55		0.40	0.20	mg/L		08/09/22 10:20	08/09/22 14:19	2

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Client Sample Results

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: D3-MW-1

Lab Sample ID: 500-220535-6

Date Collected: 08/01/22 13:40

Matrix: Water

Date Received: 08/08/22 13:50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	0.031	J	0.10	0.025	mg/L		08/12/22 07:56	08/13/22 06:12	1
Antimony	<0.0030		0.0030	0.0013	mg/L		08/12/22 07:56	08/13/22 06:12	1
Arsenic	0.0012		0.0010	0.00023	mg/L		08/12/22 07:56	08/13/22 06:12	1
Barium	0.11		0.0025	0.00073	mg/L		08/12/22 07:56	08/13/22 06:12	1
Beryllium	<0.0010		0.0010	0.00053	mg/L		08/12/22 07:56	08/13/22 06:12	1
Boron	0.016	J	0.050	0.013	mg/L		08/12/22 07:56	08/13/22 06:12	1
Cadmium	<0.00050		0.00050	0.00017	mg/L		08/12/22 07:56	08/13/22 06:12	1
Calcium	110		0.20	0.044	mg/L		08/12/22 07:56	08/13/22 06:12	1
Chromium	<0.0050		0.0050	0.0011	mg/L		08/12/22 07:56	08/13/22 06:12	1
Cobalt	<0.0010		0.0010	0.00040	mg/L		08/12/22 07:56	08/13/22 06:12	1
Copper	<0.0020		0.0020	0.00050	mg/L		08/12/22 07:56	08/13/22 06:12	1
Iron	3.3		0.10	0.047	mg/L		08/12/22 07:56	08/13/22 06:12	1
Lead	<0.00050		0.00050	0.00019	mg/L		08/12/22 07:56	08/13/22 06:12	1
Lithium	0.0050	J	0.010	0.0025	mg/L		08/12/22 07:56	08/15/22 14:30	1
Magnesium	37		0.20	0.049	mg/L		08/12/22 07:56	08/13/22 06:12	1
Manganese	0.098		0.0025	0.00079	mg/L		08/12/22 07:56	08/13/22 06:12	1
Molybdenum	0.0054		0.0050	0.0025	mg/L		08/12/22 07:56	08/13/22 06:12	1
Nickel	<0.0020		0.0020	0.00063	mg/L		08/12/22 07:56	08/13/22 06:12	1
Potassium	1.1		0.50	0.11	mg/L		08/12/22 07:56	08/13/22 06:12	1
Selenium	<0.0025		0.0025	0.00098	mg/L		08/12/22 07:56	08/13/22 06:12	1
Silver	<0.00050		0.00050	0.00012	mg/L		08/12/22 07:56	08/13/22 06:12	1
Sodium	6.1		0.20	0.077	mg/L		08/12/22 07:56	08/15/22 14:30	1
Strontium	0.19		0.0040	0.00064	mg/L		08/12/22 07:56	08/13/22 06:12	1
Thallium	<0.0020		0.0020	0.00057	mg/L		08/12/22 07:56	08/13/22 06:12	1
Tin	<0.0050		0.0050	0.0013	mg/L		08/12/22 07:56	08/13/22 06:12	1
Titanium	<0.0050		0.0050	0.0018	mg/L		08/12/22 07:56	08/13/22 06:12	1
Vanadium	<0.0050		0.0050	0.0022	mg/L		08/12/22 07:56	08/13/22 06:12	1
Zinc	<0.020		0.020	0.0069	mg/L		08/12/22 07:56	08/13/22 06:12	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000098	mg/L		08/17/22 10:25	08/18/22 10:00	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<0.25		0.25	0.050	mg/L			08/09/22 15:04	1
Chloride	23		4.0	3.4	mg/L			08/09/22 17:34	20
Fluoride	0.26		0.20	0.067	mg/L			08/22/22 18:19	1
Nitrate as N	<0.20	H3	0.20	0.068	mg/L			08/09/22 15:04	1
Nitrite as N	<0.20	H3	0.20	0.050	mg/L			08/09/22 15:04	1
Orthophosphate as P	<0.20	H3	0.20	0.065	mg/L			08/09/22 15:04	1
Sulfate	88		4.0	1.9	mg/L			08/09/22 17:34	20
Alkalinity	310		5.0	3.7	mg/L			08/10/22 12:07	1
Ammonia	<0.20		0.20	0.10	mg/L		08/09/22 10:20	08/09/22 14:22	1

Client Sample Results

Client: INTERA Inc
 Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: A6-MW-1S

Lab Sample ID: 500-220535-7

Date Collected: 08/03/22 14:30

Matrix: Water

Date Received: 08/08/22 13:50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<0.10		0.10	0.025	mg/L		08/12/22 07:56	08/13/22 06:16	1
Antimony	<0.0030		0.0030	0.0013	mg/L		08/12/22 07:56	08/13/22 06:16	1
Arsenic	0.00097	J	0.0010	0.00023	mg/L		08/12/22 07:56	08/13/22 06:16	1
Barium	0.16		0.0025	0.00073	mg/L		08/12/22 07:56	08/13/22 06:16	1
Beryllium	<0.0010		0.0010	0.00053	mg/L		08/12/22 07:56	08/13/22 06:16	1
Boron	0.019	J	0.050	0.013	mg/L		08/12/22 07:56	08/13/22 06:16	1
Cadmium	<0.00050		0.00050	0.00017	mg/L		08/12/22 07:56	08/13/22 06:16	1
Calcium	96		0.20	0.044	mg/L		08/12/22 07:56	08/13/22 06:16	1
Chromium	<0.0050		0.0050	0.0011	mg/L		08/12/22 07:56	08/13/22 06:16	1
Cobalt	<0.0010		0.0010	0.00040	mg/L		08/12/22 07:56	08/13/22 06:16	1
Copper	<0.0020		0.0020	0.00050	mg/L		08/12/22 07:56	08/13/22 06:16	1
Iron	2.7		0.10	0.047	mg/L		08/12/22 07:56	08/13/22 06:16	1
Lead	<0.00050		0.00050	0.00019	mg/L		08/12/22 07:56	08/13/22 06:16	1
Lithium	0.0052	J	0.010	0.0025	mg/L		08/12/22 07:56	08/15/22 14:33	1
Magnesium	32		0.20	0.049	mg/L		08/12/22 07:56	08/13/22 06:16	1
Manganese	0.091		0.0025	0.00079	mg/L		08/12/22 07:56	08/13/22 06:16	1
Molybdenum	0.0069		0.0050	0.0025	mg/L		08/12/22 07:56	08/13/22 06:16	1
Nickel	<0.0020		0.0020	0.00063	mg/L		08/12/22 07:56	08/13/22 06:16	1
Potassium	1.1		0.50	0.11	mg/L		08/12/22 07:56	08/13/22 06:16	1
Selenium	<0.0025		0.0025	0.00098	mg/L		08/12/22 07:56	08/13/22 06:16	1
Silver	<0.00050		0.00050	0.00012	mg/L		08/12/22 07:56	08/13/22 06:16	1
Sodium	15		0.20	0.077	mg/L		08/12/22 07:56	08/15/22 14:33	1
Strontium	0.24		0.0040	0.00064	mg/L		08/12/22 07:56	08/13/22 06:16	1
Thallium	<0.0020		0.0020	0.00057	mg/L		08/12/22 07:56	08/13/22 06:16	1
Tin	<0.0050		0.0050	0.0013	mg/L		08/12/22 07:56	08/13/22 06:16	1
Titanium	<0.0050		0.0050	0.0018	mg/L		08/12/22 07:56	08/13/22 06:16	1
Vanadium	<0.0050		0.0050	0.0022	mg/L		08/12/22 07:56	08/13/22 06:16	1
Zinc	<0.020		0.020	0.0069	mg/L		08/12/22 07:56	08/13/22 06:16	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000098	mg/L		08/17/22 10:25	08/18/22 10:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<0.25		0.25	0.050	mg/L			08/09/22 15:17	1
Chloride	20		2.0	1.7	mg/L			08/09/22 17:47	10
Fluoride	0.39		0.20	0.067	mg/L			08/22/22 18:33	1
Nitrate as N	<0.20	H3	0.20	0.068	mg/L			08/09/22 15:17	1
Nitrite as N	<0.20	H3	0.20	0.050	mg/L			08/09/22 15:17	1
Orthophosphate as P	<0.20	H3	0.20	0.065	mg/L			08/09/22 15:17	1
Sulfate	84		2.0	0.95	mg/L			08/09/22 17:47	10
Alkalinity	280		5.0	3.7	mg/L			08/10/22 12:16	1
Ammonia	0.20		0.20	0.10	mg/L		08/09/22 10:20	08/09/22 14:25	1

Client Sample Results

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: A6-MW-1D

Lab Sample ID: 500-220535-8

Date Collected: 08/02/22 14:00

Matrix: Water

Date Received: 08/08/22 13:50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	0.026	J	0.10	0.025	mg/L		08/12/22 07:56	08/13/22 06:26	1
Antimony	<0.0030		0.0030	0.0013	mg/L		08/12/22 07:56	08/13/22 06:26	1
Arsenic	0.00040	J	0.0010	0.00023	mg/L		08/12/22 07:56	08/13/22 06:26	1
Barium	0.20		0.0025	0.00073	mg/L		08/12/22 07:56	08/13/22 06:26	1
Beryllium	<0.0010		0.0010	0.00053	mg/L		08/12/22 07:56	08/13/22 06:26	1
Boron	0.095		0.050	0.013	mg/L		08/12/22 07:56	08/16/22 19:32	1
Cadmium	<0.00050		0.00050	0.00017	mg/L		08/12/22 07:56	08/13/22 06:26	1
Calcium	60		0.20	0.044	mg/L		08/12/22 07:56	08/13/22 06:26	1
Chromium	<0.0050		0.0050	0.0011	mg/L		08/12/22 07:56	08/13/22 06:26	1
Cobalt	<0.0010		0.0010	0.00040	mg/L		08/12/22 07:56	08/13/22 06:26	1
Copper	<0.0020		0.0020	0.00050	mg/L		08/12/22 07:56	08/13/22 06:26	1
Iron	2.2		0.10	0.047	mg/L		08/12/22 07:56	08/13/22 06:26	1
Lead	<0.00050		0.00050	0.00019	mg/L		08/12/22 07:56	08/13/22 06:26	1
Lithium	0.014		0.010	0.0025	mg/L		08/12/22 07:56	08/15/22 14:37	1
Magnesium	27		0.20	0.049	mg/L		08/12/22 07:56	08/13/22 06:26	1
Manganese	0.052		0.0025	0.00079	mg/L		08/12/22 07:56	08/13/22 06:26	1
Molybdenum	0.0081		0.0050	0.0025	mg/L		08/12/22 07:56	08/13/22 06:26	1
Nickel	<0.0020		0.0020	0.00063	mg/L		08/12/22 07:56	08/13/22 06:26	1
Potassium	2.0		0.50	0.11	mg/L		08/12/22 07:56	08/13/22 06:26	1
Selenium	<0.0025		0.0025	0.00098	mg/L		08/12/22 07:56	08/13/22 06:26	1
Silver	<0.00050		0.00050	0.00012	mg/L		08/12/22 07:56	08/13/22 06:26	1
Sodium	36		0.20	0.077	mg/L		08/12/22 07:56	08/15/22 14:37	1
Strontium	0.69		0.0040	0.00064	mg/L		08/12/22 07:56	08/13/22 06:26	1
Thallium	<0.0020		0.0020	0.00057	mg/L		08/12/22 07:56	08/13/22 06:26	1
Tin	<0.0050		0.0050	0.0013	mg/L		08/12/22 07:56	08/13/22 06:26	1
Titanium	<0.0050		0.0050	0.0018	mg/L		08/12/22 07:56	08/13/22 06:26	1
Vanadium	<0.0050		0.0050	0.0022	mg/L		08/12/22 07:56	08/13/22 06:26	1
Zinc	<0.020		0.020	0.0069	mg/L		08/12/22 07:56	08/13/22 06:26	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000098	mg/L		08/17/22 10:25	08/18/22 10:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<0.25		0.25	0.050	mg/L			08/09/22 15:31	1
Chloride	6.4		0.20	0.17	mg/L			08/09/22 15:31	1
Fluoride	0.64		0.20	0.067	mg/L			08/22/22 18:46	1
Nitrate as N	<0.20	H3	0.20	0.068	mg/L			08/09/22 15:31	1
Nitrite as N	<0.20	H3	0.20	0.050	mg/L			08/09/22 15:31	1
Orthophosphate as P	<0.20	H3	0.20	0.065	mg/L			08/09/22 15:31	1
Sulfate	3.4		0.20	0.095	mg/L			08/09/22 15:31	1
Alkalinity	310		5.0	3.7	mg/L			08/10/22 12:27	1
Ammonia	1.1		0.40	0.20	mg/L		08/09/22 10:20	08/09/22 14:29	2

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Definitions/Glossary

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Qualifiers

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL, and the absolute difference between results is < the upper reporting limits for both.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
^	Continuing Calibration Verification (CCV) is outside acceptance limits, low biased.
F1	MS and/or MSD recovery exceeds control limits.
H3	Sample was received and analyzed past holding time.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Metals

Prep Batch: 669710

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-220535-1	C1-MW-1	Total Recoverable	Water	3005A	
500-220535-2	C2-MW-1S	Total Recoverable	Water	3005A	
500-220535-3	C2-MW-1D	Total Recoverable	Water	3005A	
500-220535-4	J3-MW-2S	Total Recoverable	Water	3005A	
500-220535-5	J3-MW-2D	Total Recoverable	Water	3005A	
500-220535-6	D3-MW-1	Total Recoverable	Water	3005A	
500-220535-7	A6-MW-1S	Total Recoverable	Water	3005A	
500-220535-8	A6-MW-1D	Total Recoverable	Water	3005A	
MB 500-669710/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 500-669710/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
500-220535-1 MS	C1-MW-1	Total Recoverable	Water	3005A	
500-220535-1 MSD	C1-MW-1	Total Recoverable	Water	3005A	
500-220535-1 DU	C1-MW-1	Total Recoverable	Water	3005A	

Analysis Batch: 670046

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-220535-1	C1-MW-1	Total Recoverable	Water	6020A	669710
500-220535-2	C2-MW-1S	Total Recoverable	Water	6020A	669710
500-220535-3	C2-MW-1D	Total Recoverable	Water	6020A	669710
500-220535-4	J3-MW-2S	Total Recoverable	Water	6020A	669710
500-220535-5	J3-MW-2D	Total Recoverable	Water	6020A	669710
500-220535-6	D3-MW-1	Total Recoverable	Water	6020A	669710
500-220535-7	A6-MW-1S	Total Recoverable	Water	6020A	669710
500-220535-8	A6-MW-1D	Total Recoverable	Water	6020A	669710
MB 500-669710/1-A	Method Blank	Total Recoverable	Water	6020A	669710
LCS 500-669710/2-A	Lab Control Sample	Total Recoverable	Water	6020A	669710
500-220535-1 MS	C1-MW-1	Total Recoverable	Water	6020A	669710
500-220535-1 MSD	C1-MW-1	Total Recoverable	Water	6020A	669710
500-220535-1 DU	C1-MW-1	Total Recoverable	Water	6020A	669710

Analysis Batch: 670254

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-220535-1	C1-MW-1	Total Recoverable	Water	6020A	669710
500-220535-2	C2-MW-1S	Total Recoverable	Water	6020A	669710
500-220535-3	C2-MW-1D	Total Recoverable	Water	6020A	669710
500-220535-4	J3-MW-2S	Total Recoverable	Water	6020A	669710
500-220535-5	J3-MW-2D	Total Recoverable	Water	6020A	669710
500-220535-6	D3-MW-1	Total Recoverable	Water	6020A	669710
500-220535-7	A6-MW-1S	Total Recoverable	Water	6020A	669710
500-220535-8	A6-MW-1D	Total Recoverable	Water	6020A	669710
MB 500-669710/1-A	Method Blank	Total Recoverable	Water	6020A	669710
LCS 500-669710/2-A	Lab Control Sample	Total Recoverable	Water	6020A	669710
500-220535-1 MS	C1-MW-1	Total Recoverable	Water	6020A	669710
500-220535-1 MSD	C1-MW-1	Total Recoverable	Water	6020A	669710
500-220535-1 DU	C1-MW-1	Total Recoverable	Water	6020A	669710

Analysis Batch: 670461

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-220535-8	A6-MW-1D	Total Recoverable	Water	6020A	669710

QC Association Summary

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Metals

Prep Batch: 670467

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-220535-1	C1-MW-1	Total/NA	Water	7470A	
500-220535-2	C2-MW-1S	Total/NA	Water	7470A	
500-220535-3	C2-MW-1D	Total/NA	Water	7470A	
500-220535-4	J3-MW-2S	Total/NA	Water	7470A	
500-220535-5	J3-MW-2D	Total/NA	Water	7470A	
500-220535-6	D3-MW-1	Total/NA	Water	7470A	
500-220535-7	A6-MW-1S	Total/NA	Water	7470A	
500-220535-8	A6-MW-1D	Total/NA	Water	7470A	
MB 500-670467/12-A	Method Blank	Total/NA	Water	7470A	
LCS 500-670467/13-A	Lab Control Sample	Total/NA	Water	7470A	
500-220535-5 MS	J3-MW-2D	Total/NA	Water	7470A	
500-220535-5 MSD	J3-MW-2D	Total/NA	Water	7470A	
500-220535-5 DU	J3-MW-2D	Total/NA	Water	7470A	

Analysis Batch: 670699

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-220535-1	C1-MW-1	Total/NA	Water	7470A	670467
500-220535-2	C2-MW-1S	Total/NA	Water	7470A	670467
500-220535-3	C2-MW-1D	Total/NA	Water	7470A	670467
500-220535-4	J3-MW-2S	Total/NA	Water	7470A	670467
500-220535-5	J3-MW-2D	Total/NA	Water	7470A	670467
500-220535-6	D3-MW-1	Total/NA	Water	7470A	670467
500-220535-7	A6-MW-1S	Total/NA	Water	7470A	670467
500-220535-8	A6-MW-1D	Total/NA	Water	7470A	670467
MB 500-670467/12-A	Method Blank	Total/NA	Water	7470A	670467
LCS 500-670467/13-A	Lab Control Sample	Total/NA	Water	7470A	670467
500-220535-5 MS	J3-MW-2D	Total/NA	Water	7470A	670467
500-220535-5 MSD	J3-MW-2D	Total/NA	Water	7470A	670467
500-220535-5 DU	J3-MW-2D	Total/NA	Water	7470A	670467

General Chemistry

Prep Batch: 669028

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-220535-1	C1-MW-1	Total/NA	Water	SM 4500 NH3 B	
500-220535-2	C2-MW-1S	Total/NA	Water	SM 4500 NH3 B	
500-220535-4	J3-MW-2S	Total/NA	Water	SM 4500 NH3 B	
500-220535-5	J3-MW-2D	Total/NA	Water	SM 4500 NH3 B	
500-220535-6	D3-MW-1	Total/NA	Water	SM 4500 NH3 B	
500-220535-7	A6-MW-1S	Total/NA	Water	SM 4500 NH3 B	
500-220535-8	A6-MW-1D	Total/NA	Water	SM 4500 NH3 B	
MB 500-669028/1-A	Method Blank	Total/NA	Water	SM 4500 NH3 B	
LCS 500-669028/2-A	Lab Control Sample	Total/NA	Water	SM 4500 NH3 B	

Analysis Batch: 669146

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-220535-1	C1-MW-1	Total/NA	Water	9056A	
500-220535-1	C1-MW-1	Total/NA	Water	9056A	
500-220535-2	C2-MW-1S	Total/NA	Water	9056A	
500-220535-2	C2-MW-1S	Total/NA	Water	9056A	
500-220535-3	C2-MW-1D	Total/NA	Water	9056A	

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QC Association Summary

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

General Chemistry (Continued)

Analysis Batch: 669146 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-220535-4	J3-MW-2S	Total/NA	Water	9056A	
500-220535-4	J3-MW-2S	Total/NA	Water	9056A	
500-220535-5	J3-MW-2D	Total/NA	Water	9056A	
500-220535-5	J3-MW-2D	Total/NA	Water	9056A	
500-220535-6	D3-MW-1	Total/NA	Water	9056A	
500-220535-6	D3-MW-1	Total/NA	Water	9056A	
500-220535-7	A6-MW-1S	Total/NA	Water	9056A	
500-220535-7	A6-MW-1S	Total/NA	Water	9056A	
500-220535-8	A6-MW-1D	Total/NA	Water	9056A	
MB 500-669146/3	Method Blank	Total/NA	Water	9056A	
LCS 500-669146/4	Lab Control Sample	Total/NA	Water	9056A	
500-220535-3 MS	C2-MW-1D	Total/NA	Water	9056A	
500-220535-3 MSD	C2-MW-1D	Total/NA	Water	9056A	

Analysis Batch: 669187

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-220535-1	C1-MW-1	Total/NA	Water	SM 4500 NH3 G	669028
500-220535-2	C2-MW-1S	Total/NA	Water	SM 4500 NH3 G	669028
500-220535-4	J3-MW-2S	Total/NA	Water	SM 4500 NH3 G	669028
500-220535-5	J3-MW-2D	Total/NA	Water	SM 4500 NH3 G	669028
500-220535-6	D3-MW-1	Total/NA	Water	SM 4500 NH3 G	669028
500-220535-7	A6-MW-1S	Total/NA	Water	SM 4500 NH3 G	669028
500-220535-8	A6-MW-1D	Total/NA	Water	SM 4500 NH3 G	669028
MB 500-669028/1-A	Method Blank	Total/NA	Water	SM 4500 NH3 G	669028
LCS 500-669028/2-A	Lab Control Sample	Total/NA	Water	SM 4500 NH3 G	669028

Analysis Batch: 669378

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-220535-1	C1-MW-1	Total/NA	Water	SM 2320B	
500-220535-2	C2-MW-1S	Total/NA	Water	SM 2320B	
500-220535-3	C2-MW-1D	Total/NA	Water	SM 2320B	
500-220535-4	J3-MW-2S	Total/NA	Water	SM 2320B	
500-220535-5	J3-MW-2D	Total/NA	Water	SM 2320B	
500-220535-6	D3-MW-1	Total/NA	Water	SM 2320B	
500-220535-7	A6-MW-1S	Total/NA	Water	SM 2320B	
500-220535-8	A6-MW-1D	Total/NA	Water	SM 2320B	
MB 500-669378/3	Method Blank	Total/NA	Water	SM 2320B	
LCS 500-669378/4	Lab Control Sample	Total/NA	Water	SM 2320B	

Prep Batch: 670436

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-220535-3	C2-MW-1D	Total/NA	Water	SM 4500 NH3 B	
MB 500-670436/1-A	Method Blank	Total/NA	Water	SM 4500 NH3 B	
LCS 500-670436/2-A	Lab Control Sample	Total/NA	Water	SM 4500 NH3 B	
500-220535-3 MS	C2-MW-1D	Total/NA	Water	SM 4500 NH3 B	
500-220535-3 MSD	C2-MW-1D	Total/NA	Water	SM 4500 NH3 B	

Analysis Batch: 670522

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-220535-3	C2-MW-1D	Total/NA	Water	SM 4500 NH3 G	670436
MB 500-670436/1-A	Method Blank	Total/NA	Water	SM 4500 NH3 G	670436

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QC Association Summary

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

General Chemistry (Continued)

Analysis Batch: 670522 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 500-670436/2-A	Lab Control Sample	Total/NA	Water	SM 4500 NH3 G	670436
500-220535-3 MS	C2-MW-1D	Total/NA	Water	SM 4500 NH3 G	670436
500-220535-3 MSD	C2-MW-1D	Total/NA	Water	SM 4500 NH3 G	670436

Analysis Batch: 671150

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-220535-1	C1-MW-1	Total/NA	Water	9056A	
500-220535-2	C2-MW-1S	Total/NA	Water	9056A	
500-220535-3	C2-MW-1D	Total/NA	Water	9056A	
500-220535-4	J3-MW-2S	Total/NA	Water	9056A	
500-220535-5	J3-MW-2D	Total/NA	Water	9056A	
500-220535-6	D3-MW-1	Total/NA	Water	9056A	
500-220535-7	A6-MW-1S	Total/NA	Water	9056A	
500-220535-8	A6-MW-1D	Total/NA	Water	9056A	
MB 500-671150/9	Method Blank	Total/NA	Water	9056A	
LCS 500-671150/10	Lab Control Sample	Total/NA	Water	9056A	
500-220535-1 MS	C1-MW-1	Total/NA	Water	9056A	
500-220535-1 MSD	C1-MW-1	Total/NA	Water	9056A	

QC Sample Results

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 500-669710/1-A
Matrix: Water
Analysis Batch: 670046

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 669710

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Aluminum	<0.10		0.10	0.025	mg/L		08/12/22 07:56	08/13/22 05:27	1
Antimony	<0.0030		0.0030	0.0013	mg/L		08/12/22 07:56	08/13/22 05:27	1
Arsenic	<0.0010		0.0010	0.00023	mg/L		08/12/22 07:56	08/13/22 05:27	1
Barium	<0.0025		0.0025	0.00073	mg/L		08/12/22 07:56	08/13/22 05:27	1
Beryllium	<0.0010		0.0010	0.00053	mg/L		08/12/22 07:56	08/13/22 05:27	1
Boron	<0.050		0.050	0.013	mg/L		08/12/22 07:56	08/13/22 05:27	1
Cadmium	<0.00050		0.00050	0.00017	mg/L		08/12/22 07:56	08/13/22 05:27	1
Calcium	<0.20		0.20	0.044	mg/L		08/12/22 07:56	08/13/22 05:27	1
Chromium	<0.0050		0.0050	0.0011	mg/L		08/12/22 07:56	08/13/22 05:27	1
Cobalt	<0.0010		0.0010	0.00040	mg/L		08/12/22 07:56	08/13/22 05:27	1
Copper	<0.0020		0.0020	0.00050	mg/L		08/12/22 07:56	08/13/22 05:27	1
Iron	<0.10		0.10	0.047	mg/L		08/12/22 07:56	08/13/22 05:27	1
Lead	<0.00050		0.00050	0.00019	mg/L		08/12/22 07:56	08/13/22 05:27	1
Magnesium	<0.20		0.20	0.049	mg/L		08/12/22 07:56	08/13/22 05:27	1
Manganese	<0.0025		0.0025	0.00079	mg/L		08/12/22 07:56	08/13/22 05:27	1
Molybdenum	<0.0050		0.0050	0.0025	mg/L		08/12/22 07:56	08/13/22 05:27	1
Nickel	<0.0020		0.0020	0.00063	mg/L		08/12/22 07:56	08/13/22 05:27	1
Potassium	<0.50		0.50	0.11	mg/L		08/12/22 07:56	08/13/22 05:27	1
Selenium	<0.0025		0.0025	0.00098	mg/L		08/12/22 07:56	08/13/22 05:27	1
Silver	<0.00050		0.00050	0.00012	mg/L		08/12/22 07:56	08/13/22 05:27	1
Strontium	<0.0040		0.0040	0.00064	mg/L		08/12/22 07:56	08/13/22 05:27	1
Thallium	<0.0020		0.0020	0.00057	mg/L		08/12/22 07:56	08/13/22 05:27	1
Tin	<0.0050		0.0050	0.0013	mg/L		08/12/22 07:56	08/13/22 05:27	1
Titanium	<0.0050		0.0050	0.0018	mg/L		08/12/22 07:56	08/13/22 05:27	1
Vanadium	<0.0050		0.0050	0.0022	mg/L		08/12/22 07:56	08/13/22 05:27	1
Zinc	<0.020		0.020	0.0069	mg/L		08/12/22 07:56	08/13/22 05:27	1

Lab Sample ID: MB 500-669710/1-A
Matrix: Water
Analysis Batch: 670254

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 669710

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Lithium	<0.010		0.010	0.0025	mg/L		08/12/22 07:56	08/15/22 13:21	1
Sodium	<0.20		0.20	0.077	mg/L		08/12/22 07:56	08/15/22 13:21	1

Lab Sample ID: LCS 500-669710/2-A
Matrix: Water
Analysis Batch: 670046

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 669710

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Aluminum	2.00	2.12		mg/L		106	80 - 120
Antimony	0.500	0.514		mg/L		103	80 - 120
Arsenic	0.100	0.100		mg/L		100	80 - 120
Barium	0.500	0.529		mg/L		106	80 - 120
Beryllium	0.0500	0.0550		mg/L		110	80 - 120
Boron	1.00	1.11		mg/L		111	80 - 120
Cadmium	0.0500	0.0503		mg/L		101	80 - 120
Calcium	10.0	10.5		mg/L		105	80 - 120
Chromium	0.200	0.207		mg/L		103	80 - 120

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QC Sample Results

Client: INTERA Inc
 Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 500-669710/2-A
Matrix: Water
Analysis Batch: 670046

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 669710

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cobalt	0.500	0.510		mg/L		102	80 - 120
Copper	0.250	0.263		mg/L		105	80 - 120
Iron	1.00	1.05		mg/L		105	80 - 120
Lead	0.100	0.107		mg/L		107	80 - 120
Magnesium	10.0	10.7		mg/L		107	80 - 120
Manganese	0.500	0.514		mg/L		103	80 - 120
Molybdenum	1.00	0.948		mg/L		95	80 - 120
Nickel	0.500	0.519		mg/L		104	80 - 120
Potassium	10.0	10.4		mg/L		104	80 - 120
Selenium	0.100	0.103		mg/L		103	80 - 120
Silver	0.0500	0.0497		mg/L		99	80 - 120
Strontium	1.00	1.00		mg/L		100	80 - 120
Thallium	0.100	0.107		mg/L		107	80 - 120
Tin	1.00	1.01		mg/L		101	80 - 120
Titanium	1.00	0.981		mg/L		98	80 - 120
Vanadium	0.500	0.511		mg/L		102	80 - 120
Zinc	0.500	0.522		mg/L		104	80 - 120

Lab Sample ID: LCS 500-669710/2-A
Matrix: Water
Analysis Batch: 670254

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 669710

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Lithium	0.100	0.102		mg/L		102	80 - 120
Sodium	10.0	10.1		mg/L		101	80 - 120

Lab Sample ID: 500-220535-1 MS
Matrix: Water
Analysis Batch: 670046

Client Sample ID: C1-MW-1
Prep Type: Total Recoverable
Prep Batch: 669710

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	0.049	J	2.00	2.16		mg/L		106	75 - 125
Antimony	<0.0030		0.500	0.528		mg/L		106	75 - 125
Arsenic	0.0026		0.100	0.106		mg/L		103	75 - 125
Barium	0.19		0.500	0.723		mg/L		106	75 - 125
Beryllium	<0.0010		0.0500	0.0541		mg/L		108	75 - 125
Boron	0.029	J	1.00	1.10		mg/L		107	75 - 125
Cadmium	<0.00050		0.0500	0.0506		mg/L		101	75 - 125
Calcium	93		10.0	105	4	mg/L		117	75 - 125
Chromium	<0.0050		0.200	0.205		mg/L		103	75 - 125
Cobalt	<0.0010		0.500	0.494		mg/L		99	75 - 125
Copper	<0.0020		0.250	0.260		mg/L		104	75 - 125
Iron	2.0		1.00	3.05		mg/L		104	75 - 125
Lead	<0.00050		0.100	0.106		mg/L		106	75 - 125
Magnesium	31		10.0	41.9		mg/L		107	75 - 125
Manganese	0.11		0.500	0.611		mg/L		101	75 - 125
Molybdenum	0.0069		1.00	0.981		mg/L		97	75 - 125
Nickel	0.00070	J	0.500	0.504		mg/L		101	75 - 125
Potassium	1.2		10.0	11.7		mg/L		105	75 - 125

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QC Sample Results

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 500-220535-1 MS
Matrix: Water
Analysis Batch: 670046

Client Sample ID: C1-MW-1
Prep Type: Total Recoverable
Prep Batch: 669710

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec	
	Result	Qualifier	Added	Result	Qualifier				Limits	RPD
Selenium	<0.0025		0.100	0.105		mg/L		105	75 - 125	
Silver	<0.00050		0.0500	0.0499		mg/L		100	75 - 125	
Strontium	0.27		1.00	1.29		mg/L		102	75 - 125	
Thallium	<0.0020		0.100	0.107		mg/L		107	75 - 125	
Tin	0.0018	J	1.00	1.04		mg/L		104	75 - 125	
Titanium	0.0024	J	1.00	0.982		mg/L		98	75 - 125	
Vanadium	<0.0050		0.500	0.510		mg/L		102	75 - 125	
Zinc	<0.020		0.500	0.518		mg/L		104	75 - 125	

Lab Sample ID: 500-220535-1 MS
Matrix: Water
Analysis Batch: 670254

Client Sample ID: C1-MW-1
Prep Type: Total Recoverable
Prep Batch: 669710

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec	
	Result	Qualifier	Added	Result	Qualifier				Limits	RPD
Lithium	0.0049	J	0.100	0.108		mg/L		103	75 - 125	
Sodium	11		10.0	20.7		mg/L		99	75 - 125	

Lab Sample ID: 500-220535-1 MSD
Matrix: Water
Analysis Batch: 670046

Client Sample ID: C1-MW-1
Prep Type: Total Recoverable
Prep Batch: 669710

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec		RPD	
	Result	Qualifier	Added	Result	Qualifier				Limits	RPD	Limit	
Aluminum	0.049	J	2.00	2.16		mg/L		105	75 - 125	0	20	
Antimony	<0.0030		0.500	0.536		mg/L		107	75 - 125	1	20	
Arsenic	0.0026		0.100	0.107		mg/L		105	75 - 125	1	20	
Barium	0.19		0.500	0.723		mg/L		106	75 - 125	0	20	
Beryllium	<0.0010		0.0500	0.0547		mg/L		109	75 - 125	1	20	
Boron	0.029	J	1.00	1.13		mg/L		110	75 - 125	3	20	
Cadmium	<0.00050		0.0500	0.0519		mg/L		104	75 - 125	3	20	
Calcium	93		10.0	106	4	mg/L		126	75 - 125	1	20	
Chromium	<0.0050		0.200	0.208		mg/L		104	75 - 125	1	20	
Cobalt	<0.0010		0.500	0.509		mg/L		102	75 - 125	3	20	
Copper	<0.0020		0.250	0.266		mg/L		106	75 - 125	2	20	
Iron	2.0		1.00	3.10		mg/L		109	75 - 125	2	20	
Lead	<0.00050		0.100	0.107		mg/L		107	75 - 125	1	20	
Magnesium	31		10.0	42.5		mg/L		112	75 - 125	1	20	
Manganese	0.11		0.500	0.621		mg/L		103	75 - 125	2	20	
Molybdenum	0.0069		1.00	1.02		mg/L		101	75 - 125	4	20	
Nickel	0.00070	J	0.500	0.510		mg/L		102	75 - 125	1	20	
Potassium	1.2		10.0	11.6		mg/L		104	75 - 125	1	20	
Selenium	<0.0025		0.100	0.106		mg/L		106	75 - 125	1	20	
Silver	<0.00050		0.0500	0.0509		mg/L		102	75 - 125	2	20	
Strontium	0.27		1.00	1.32		mg/L		105	75 - 125	2	20	
Thallium	<0.0020		0.100	0.108		mg/L		108	75 - 125	1	20	
Tin	0.0018	J	1.00	1.06		mg/L		105	75 - 125	2	20	
Titanium	0.0024	J	1.00	0.994		mg/L		99	75 - 125	1	20	
Vanadium	<0.0050		0.500	0.517		mg/L		103	75 - 125	1	20	
Zinc	<0.020		0.500	0.534		mg/L		107	75 - 125	3	20	

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QC Sample Results

Client: INTERA Inc
 Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 500-220535-1 MSD
Matrix: Water
Analysis Batch: 670254

Client Sample ID: C1-MW-1
Prep Type: Total Recoverable
Prep Batch: 669710

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits		Limit
Lithium	0.0049	J	0.100	0.110		mg/L		105	75 - 125	2	20
Sodium	11		10.0	21.0		mg/L		103	75 - 125	1	20

Lab Sample ID: 500-220535-1 DU
Matrix: Water
Analysis Batch: 670046

Client Sample ID: C1-MW-1
Prep Type: Total Recoverable
Prep Batch: 669710

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	RPD
	Result	Qualifier	Result	Qualifier				Limit
Aluminum	0.049	J	0.0539	J	mg/L		9	20
Antimony	<0.0030		<0.0030		mg/L		NC	20
Arsenic	0.0026		0.00254		mg/L		0.6	20
Barium	0.19		0.196		mg/L		3	20
Beryllium	<0.0010		<0.0010		mg/L		NC	20
Boron	0.029	J	0.0207	J F5	mg/L		33	20
Cadmium	<0.00050		<0.00050		mg/L		NC	20
Calcium	93		95.7		mg/L		2	20
Chromium	<0.0050		<0.0050		mg/L		NC	20
Cobalt	<0.0010		<0.0010		mg/L		NC	20
Copper	<0.0020		<0.0020		mg/L		NC	20
Iron	2.0		2.05		mg/L		2	20
Lead	<0.00050		<0.00050		mg/L		NC	20
Magnesium	31		31.8		mg/L		2	20
Manganese	0.11		0.107		mg/L		2	20
Molybdenum	0.0069		0.00614		mg/L		12	20
Nickel	0.00070	J	<0.0020		mg/L		NC	20
Potassium	1.2		1.24		mg/L		0.7	20
Selenium	<0.0025		<0.0025		mg/L		NC	20
Silver	<0.00050		<0.00050		mg/L		NC	20
Strontium	0.27		0.271		mg/L		0.4	20
Thallium	<0.0020		<0.0020		mg/L		NC	20
Tin	0.0018	J	<0.0050		mg/L		NC	20
Titanium	0.0024	J	0.00188	J F5	mg/L		24	20
Vanadium	<0.0050		<0.0050		mg/L		NC	20
Zinc	<0.020		<0.020		mg/L		NC	20

Lab Sample ID: 500-220535-1 DU
Matrix: Water
Analysis Batch: 670254

Client Sample ID: C1-MW-1
Prep Type: Total Recoverable
Prep Batch: 669710

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	RPD
	Result	Qualifier	Result	Qualifier				Limit
Lithium	0.0049	J	0.00455	J	mg/L		8	20
Sodium	11		10.8		mg/L		0.5	20

QC Sample Results

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-670467/12-A
Matrix: Water
Analysis Batch: 670699

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 670467

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000098	mg/L		08/17/22 10:25	08/18/22 08:34	1

Lab Sample ID: LCS 500-670467/13-A
Matrix: Water
Analysis Batch: 670699

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 670467

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00200	0.00190		mg/L		95	80 - 120

Lab Sample ID: 500-220535-5 MS
Matrix: Water
Analysis Batch: 670699

Client Sample ID: J3-MW-2D
Prep Type: Total/NA
Prep Batch: 670467

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	<0.00020		0.00100	0.000972		mg/L		97	75 - 125

Lab Sample ID: 500-220535-5 MSD
Matrix: Water
Analysis Batch: 670699

Client Sample ID: J3-MW-2D
Prep Type: Total/NA
Prep Batch: 670467

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	<0.00020		0.00100	0.00101		mg/L		101	75 - 125	4	20

Lab Sample ID: 500-220535-5 DU
Matrix: Water
Analysis Batch: 670699

Client Sample ID: J3-MW-2D
Prep Type: Total/NA
Prep Batch: 670467

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	<0.00020		<0.00020		mg/L		NC	20

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 500-669146/3
Matrix: Water
Analysis Batch: 669146

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<0.25		0.25	0.050	mg/L			08/09/22 13:24	1
Chloride	<0.20		0.20	0.17	mg/L			08/09/22 13:24	1
Nitrate as N	<0.20		0.20	0.068	mg/L			08/09/22 13:24	1
Nitrite as N	<0.20		0.20	0.050	mg/L			08/09/22 13:24	1
Orthophosphate as P	<0.20		0.20	0.065	mg/L			08/09/22 13:24	1
Sulfate	<0.20		0.20	0.095	mg/L			08/09/22 13:24	1

Lab Sample ID: LCS 500-669146/4
Matrix: Water
Analysis Batch: 669146

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	2.00	2.03		mg/L		101	80 - 120

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QC Sample Results

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 500-669146/4
Matrix: Water
Analysis Batch: 669146

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	3.00	2.70		mg/L		90	80 - 120
Nitrate as N	2.00	1.94		mg/L		97	80 - 120
Nitrite as N	2.00	2.01		mg/L		101	80 - 120
Orthophosphate as P	2.00	2.05		mg/L		103	80 - 120
Sulfate	5.00	5.27		mg/L		105	80 - 120

Lab Sample ID: 500-220535-3 MS
Matrix: Water
Analysis Batch: 669146

Client Sample ID: C2-MW-1D
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	0.070	J	1.00	0.871		mg/L		80	80 - 120
Chloride	3.7		1.00	4.85		mg/L		118	80 - 120
Nitrate as N	<0.20	H3	1.00	0.911		mg/L		91	80 - 120
Nitrite as N	<0.20	H3	1.00	1.11		mg/L		111	80 - 120
Orthophosphate as P	<0.20	F1 H3	1.00	0.763	F1 ^-	mg/L		76	80 - 120
Sulfate	2.0		2.50	4.44		mg/L		99	80 - 120

Lab Sample ID: 500-220535-3 MSD
Matrix: Water
Analysis Batch: 669146

Client Sample ID: C2-MW-1D
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Bromide	0.070	J	1.00	0.903		mg/L		83	80 - 120	4	15
Chloride	3.7		1.00	4.87		mg/L		120	80 - 120	0	15
Nitrate as N	<0.20	H3	1.00	0.929		mg/L		93	80 - 120	2	15
Nitrite as N	<0.20	H3	1.00	1.13		mg/L		113	80 - 120	1	15
Orthophosphate as P	<0.20	F1 H3	1.00	0.751	^- F1	mg/L		75	80 - 120	2	15
Sulfate	2.0		2.50	4.44		mg/L		99	80 - 120	0	15

Lab Sample ID: MB 500-671150/9
Matrix: Water
Analysis Batch: 671150

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.20		0.20	0.067	mg/L			08/22/22 11:24	1

Lab Sample ID: LCS 500-671150/10
Matrix: Water
Analysis Batch: 671150

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	1.00	0.988		mg/L		99	80 - 120

Lab Sample ID: 500-220535-1 MS
Matrix: Water
Analysis Batch: 671150

Client Sample ID: C1-MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	0.40		0.600	0.944		mg/L		90	80 - 120

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QC Sample Results

Client: INTERA Inc
 Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: 500-220535-1 MSD
 Matrix: Water
 Analysis Batch: 671150

Client Sample ID: C1-MW-1
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Fluoride	0.40		0.600	0.930		mg/L		88	80 - 120	1	15

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-669378/3
 Matrix: Water
 Analysis Batch: 669378

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<5.0		5.0	3.7	mg/L			08/10/22 11:02	1

Lab Sample ID: LCS 500-669378/4
 Matrix: Water
 Analysis Batch: 669378

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	100	103		mg/L		103	90 - 110

Method: SM 4500 NH3 G - Ammonia

Lab Sample ID: MB 500-669028/1-A
 Matrix: Water
 Analysis Batch: 669187

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 669028

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	<0.20		0.20	0.10	mg/L		08/09/22 10:20	08/09/22 13:42	1

Lab Sample ID: LCS 500-669028/2-A
 Matrix: Water
 Analysis Batch: 669187

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 669028

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia	2.00	1.77		mg/L		89	86 - 113

Lab Sample ID: MB 500-670436/1-A
 Matrix: Water
 Analysis Batch: 670522

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 670436

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	<0.20		0.20	0.10	mg/L		08/17/22 09:35	08/17/22 11:57	1

Lab Sample ID: LCS 500-670436/2-A
 Matrix: Water
 Analysis Batch: 670522

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 670436

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia	2.00	1.91		mg/L		95	86 - 113

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QC Sample Results

Client: INTERA Inc
 Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Method: SM 4500 NH3 G - Ammonia (Continued)

Lab Sample ID: 500-220535-3 MS
Matrix: Water
Analysis Batch: 670522

Client Sample ID: C2-MW-1D
Prep Type: Total/NA
Prep Batch: 670436

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Ammonia	0.40		2.00	2.38		mg/L		99	75 - 125

Lab Sample ID: 500-220535-3 MSD
Matrix: Water
Analysis Batch: 670522

Client Sample ID: C2-MW-1D
Prep Type: Total/NA
Prep Batch: 670436

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Ammonia	0.40		2.00	2.25		mg/L		92	75 - 125	6	20

- 1
- 2
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- 13
- 14

Lab Chronicle

Client: INTERA Inc
 Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: C1-MW-1
Date Collected: 08/01/22 15:00
Date Received: 08/08/22 13:50

Lab Sample ID: 500-220535-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670046	FXG	EET CHI	08/13/22 05:34
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670254	FXG	EET CHI	08/15/22 13:52
Total/NA	Prep	7470A			670467	MJG	EET CHI	08/17/22 10:25 - 08/17/22 12:25 ¹
Total/NA	Analysis	7470A		1	670699	MJG	EET CHI	08/18/22 09:43
Total/NA	Analysis	9056A		1	671150	EAT	EET CHI	08/22/22 16:16
Total/NA	Analysis	9056A		1	669146	EAT	EET CHI	08/09/22 13:56
Total/NA	Analysis	9056A		10	669146	EAT	EET CHI	08/09/22 16:12
Total/NA	Analysis	SM 2320B		1	669378	SMO	EET CHI	08/10/22 11:35
Total/NA	Prep	SM 4500 NH3 B			669028	KF	EET CHI	08/09/22 10:20 - 08/09/22 11:20 ¹
Total/NA	Analysis	SM 4500 NH3 G		1	669187	KF	EET CHI	08/09/22 13:47

Client Sample ID: C2-MW-1S
Date Collected: 08/04/22 14:30
Date Received: 08/08/22 13:50

Lab Sample ID: 500-220535-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670046	FXG	EET CHI	08/13/22 05:58
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670254	FXG	EET CHI	08/15/22 14:16
Total/NA	Prep	7470A			670467	MJG	EET CHI	08/17/22 10:25 - 08/17/22 12:25 ¹
Total/NA	Analysis	7470A		1	670699	MJG	EET CHI	08/18/22 09:45
Total/NA	Analysis	9056A		1	671150	EAT	EET CHI	08/22/22 16:57
Total/NA	Analysis	9056A		1	669146	EAT	EET CHI	08/09/22 14:09
Total/NA	Analysis	9056A		10	669146	EAT	EET CHI	08/09/22 16:25
Total/NA	Analysis	SM 2320B		1	669378	SMO	EET CHI	08/10/22 11:43
Total/NA	Prep	SM 4500 NH3 B			669028	KF	EET CHI	08/09/22 10:20 - 08/09/22 11:20 ¹
Total/NA	Analysis	SM 4500 NH3 G		1	669187	KF	EET CHI	08/09/22 13:50

Client Sample ID: C2-MW-1D
Date Collected: 08/04/22 14:00
Date Received: 08/08/22 13:50

Lab Sample ID: 500-220535-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670046	FXG	EET CHI	08/13/22 06:02
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670254	FXG	EET CHI	08/15/22 14:19
Total/NA	Prep	7470A			670467	MJG	EET CHI	08/17/22 10:25 - 08/17/22 12:25 ¹
Total/NA	Analysis	7470A		1	670699	MJG	EET CHI	08/18/22 09:47
Total/NA	Analysis	9056A		1	671150	EAT	EET CHI	08/22/22 17:10
Total/NA	Analysis	9056A		1	669146	EAT	EET CHI	08/09/22 14:23

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Lab Chronicle

Client: INTERA Inc
 Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: C2-MW-1D

Date Collected: 08/04/22 14:00

Date Received: 08/08/22 13:50

Lab Sample ID: 500-220535-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	SM 2320B		1	669378	SMO	EET CHI	08/10/22 11:51
Total/NA	Prep	SM 4500 NH3 B			670436	KF	EET CHI	08/17/22 09:35 - 08/17/22 10:35 ¹
Total/NA	Analysis	SM 4500 NH3 G		1	670522	KF	EET CHI	08/17/22 12:13

Client Sample ID: J3-MW-2S

Date Collected: 08/03/22 17:00

Date Received: 08/08/22 13:50

Lab Sample ID: 500-220535-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670046	FXG	EET CHI	08/13/22 06:05
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670254	FXG	EET CHI	08/15/22 14:23
Total/NA	Prep	7470A			670467	MJG	EET CHI	08/17/22 10:25 - 08/17/22 12:25 ¹
Total/NA	Analysis	7470A		1	670699	MJG	EET CHI	08/18/22 09:49
Total/NA	Analysis	9056A		1	671150	EAT	EET CHI	08/22/22 17:24
Total/NA	Analysis	9056A		1	669146	EAT	EET CHI	08/09/22 14:36
Total/NA	Analysis	9056A		10	669146	EAT	EET CHI	08/09/22 17:06
Total/NA	Analysis	SM 2320B		1	669378	SMO	EET CHI	08/10/22 11:27
Total/NA	Prep	SM 4500 NH3 B			669028	KF	EET CHI	08/09/22 10:20 - 08/09/22 11:20 ¹
Total/NA	Analysis	SM 4500 NH3 G		2	669187	KF	EET CHI	08/09/22 14:10

Client Sample ID: J3-MW-2D

Date Collected: 08/03/22 16:30

Date Received: 08/08/22 13:50

Lab Sample ID: 500-220535-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670046	FXG	EET CHI	08/13/22 06:09
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670254	FXG	EET CHI	08/15/22 14:26
Total/NA	Prep	7470A			670467	MJG	EET CHI	08/17/22 10:25 - 08/17/22 12:25 ¹
Total/NA	Analysis	7470A		1	670699	MJG	EET CHI	08/18/22 09:51
Total/NA	Analysis	9056A		1	671150	EAT	EET CHI	08/22/22 18:05
Total/NA	Analysis	9056A		1	669146	EAT	EET CHI	08/09/22 14:50
Total/NA	Analysis	9056A		10	669146	EAT	EET CHI	08/09/22 17:20
Total/NA	Analysis	SM 2320B		1	669378	SMO	EET CHI	08/10/22 11:59
Total/NA	Prep	SM 4500 NH3 B			669028	KF	EET CHI	08/09/22 10:20 - 08/09/22 11:20 ¹
Total/NA	Analysis	SM 4500 NH3 G		2	669187	KF	EET CHI	08/09/22 14:19

Lab Chronicle

Client: INTERA Inc
 Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: D3-MW-1
Date Collected: 08/01/22 13:40
Date Received: 08/08/22 13:50

Lab Sample ID: 500-220535-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670046	FXG	EET CHI	08/13/22 06:12
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670254	FXG	EET CHI	08/15/22 14:30
Total/NA	Prep	7470A			670467	MJG	EET CHI	08/17/22 10:25 - 08/17/22 12:25 ¹
Total/NA	Analysis	7470A		1	670699	MJG	EET CHI	08/18/22 10:00
Total/NA	Analysis	9056A		1	671150	EAT	EET CHI	08/22/22 18:19
Total/NA	Analysis	9056A		1	669146	EAT	EET CHI	08/09/22 15:04
Total/NA	Analysis	9056A		20	669146	EAT	EET CHI	08/09/22 17:34
Total/NA	Analysis	SM 2320B		1	669378	SMO	EET CHI	08/10/22 12:07
Total/NA	Prep	SM 4500 NH3 B			669028	KF	EET CHI	08/09/22 10:20 - 08/09/22 11:20 ¹
Total/NA	Analysis	SM 4500 NH3 G		1	669187	KF	EET CHI	08/09/22 14:22

Client Sample ID: A6-MW-1S
Date Collected: 08/03/22 14:30
Date Received: 08/08/22 13:50

Lab Sample ID: 500-220535-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670046	FXG	EET CHI	08/13/22 06:16
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670254	FXG	EET CHI	08/15/22 14:33
Total/NA	Prep	7470A			670467	MJG	EET CHI	08/17/22 10:25 - 08/17/22 12:25 ¹
Total/NA	Analysis	7470A		1	670699	MJG	EET CHI	08/18/22 10:02
Total/NA	Analysis	9056A		1	671150	EAT	EET CHI	08/22/22 18:33
Total/NA	Analysis	9056A		1	669146	EAT	EET CHI	08/09/22 15:17
Total/NA	Analysis	9056A		10	669146	EAT	EET CHI	08/09/22 17:47
Total/NA	Analysis	SM 2320B		1	669378	SMO	EET CHI	08/10/22 12:16
Total/NA	Prep	SM 4500 NH3 B			669028	KF	EET CHI	08/09/22 10:20 - 08/09/22 11:20 ¹
Total/NA	Analysis	SM 4500 NH3 G		1	669187	KF	EET CHI	08/09/22 14:25

Client Sample ID: A6-MW-1D
Date Collected: 08/02/22 14:00
Date Received: 08/08/22 13:50

Lab Sample ID: 500-220535-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670046	FXG	EET CHI	08/13/22 06:26
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670254	FXG	EET CHI	08/15/22 14:37
Total Recoverable	Prep	3005A			669710	BDE	EET CHI	08/12/22 07:56 - 08/12/22 08:26 ¹
Total Recoverable	Analysis	6020A		1	670461	FXG	EET CHI	08/16/22 19:32
Total/NA	Prep	7470A			670467	MJG	EET CHI	08/17/22 10:25 - 08/17/22 12:25 ¹
Total/NA	Analysis	7470A		1	670699	MJG	EET CHI	08/18/22 10:08

Eurofins Chicago

Lab Chronicle

Client: INTERA Inc
Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Client Sample ID: A6-MW-1D

Lab Sample ID: 500-220535-8

Date Collected: 08/02/22 14:00

Matrix: Water

Date Received: 08/08/22 13:50

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Analyst</u>	<u>Lab</u>	<u>Prepared or Analyzed</u>
Total/NA	Analysis	9056A		1	671150	EAT	EET CHI	08/22/22 18:46
Total/NA	Analysis	9056A		1	669146	EAT	EET CHI	08/09/22 15:31
Total/NA	Analysis	SM 2320B		1	669378	SMO	EET CHI	08/10/22 12:27
Total/NA	Prep	SM 4500 NH3 B			669028	KF	EET CHI	08/09/22 10:20 - 08/09/22 11:20 ¹
Total/NA	Analysis	SM 4500 NH3 G		2	669187	KF	EET CHI	08/09/22 14:29

¹ Completion dates and times are reported or not reported per method requirements or individual lab discretion.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: INTERA Inc
 Project/Site: Clinton County Water Study

Job ID: 500-220535-1

Laboratory: Eurofins Chicago

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2903	04-29-22 *
Georgia	State	N/A	04-29-22 *
Georgia (DW)	State	939	04-30-23
Hawaii	State	NA	04-29-23
Illinois	NELAP	IL00035	04-30-23
Indiana	State	C-IL-02	04-29-23
Iowa	State	082	05-01-22 *
Kansas	NELAP	E-10161	10-31-22
Kentucky (UST)	State	AI # 108083	04-29-22 *
Kentucky (WW)	State	KY90023	12-31-22
Louisiana	NELAP	02046	06-30-23
Mississippi	State	NA	04-30-22 *
North Carolina (WW/SW)	State	291	12-31-22
North Dakota	State	R-194	04-30-23
Oklahoma	State	8908	08-31-22
South Carolina	State	77001003	04-29-22 *
USDA	US Federal Programs	P330-18-00018	02-11-24
Wisconsin	State	999580010	08-31-22
Wyoming	State	8TMS-Q	04-30-22 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.



Eurofins Chicago

2417 Bond Street
 University Park IL 60484
 Phone 708-534-5200 Fax 708-534-5211

Chain of Custody Record



Environment Testing
 America

Client Information		Sampler: Oliver Wittman		Lab PM: Mockler Diana J		Carrier Tracking No(s)		COC No: 500-104073-44577 1													
Client Contact: Rhett Moore		Phone: 812-219-6552		E-Mail: Diana Mockler@et.eurofinsus.com		State of Origin: Indiana		Page: Page 1 of 1													
Company: INTERA Inc		PWSID		Analysis Requested				Job #: INDFA-CLINTONCO													
Address: 101 West Kirkwood Avenue Suite 247		Due Date Requested		<table border="1"> <tr> <td>Field Filtered Sample (Yes or No)</td> <td>Perform MS/MSD (Yes or No)</td> <td>9056A - Anions (7)</td> <td>6020A, 7470A</td> <td>SM4500NH3_G - Ammonia</td> <td>2320B - Alkalinity</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>				Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9056A - Anions (7)	6020A, 7470A	SM4500NH3_G - Ammonia	2320B - Alkalinity							Preservation Codes	
Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9056A - Anions (7)	6020A, 7470A					SM4500NH3_G - Ammonia	2320B - Alkalinity												
City: Bloomington		TAT Requested (days):						A HCL		M Hexane											
State, Zip: IN 47404		Compliance Project. <input type="checkbox"/> Yes <input type="checkbox"/> No						B NaOH		N None											
Phone: 812-676-9984(Tel)		PO #:		C Zn Acetate		O AsNaO2															
Email: RMoore@intera.com		Purchase Order Requested		D Nitric Acid		P Na2O4S															
Project Name: Clinton County Water Study		WO #:		E NaHSO4		Q Na2SO3															
Site:		Project #: 50020424		F MeOH		R Na2S2O3															
		SSOW#:		G Amchlor		S H2SO4															
				H Ascorbic Acid		T TSP Dodecahydrate															
				I Ice		U Acetone															
				J DI Water		V MCAA															
				K EDTA		W pH 4-5															
				L EDA		Y Trizma															
						Z other (specify)															
						Other:															
						ICE MELTED															
						Special Instructions/Note															

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9056A - Anions (7)	6020A, 7470A	SM4500NH3_G - Ammonia	2320B - Alkalinity	Total Number of containers	Special Instructions/Note
1 C1-MW-1	8/1/22	1500	G	Water			✓	✓	✓	✓		
2 C2-MW-1S	8/4/22	1430	G	Water			✓	✓	✓	✓		
3 C2-MW-1D	8/4/22	1400	G	Water			✓	✓	✓	✓		
4 J3-MW-2S	8/3/22	1700	G	Water			✓	✓	✓	✓		
5 J3-MW-2D	8/3/22	1630	G	Water			✓	✓	✓	✓		Northwest 11
6 D3-MW-1	8/1/22	1340	G	Water			✓	✓	✓	✓		510
7 A6-MW-1S	8/3/22	1430	G	Water			✓	✓	✓	✓		
8 A6-MW-1D	8/2/22	1400	G	Water			✓	✓	✓	✓		

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Empty Kit Relinquished by _____ Date _____ Time _____ Method of Shipment: **VIA FedEx**

Relinquished by: Diana Mockler	Date/Time: 8/8/22 10:46	Company: ETNC	Received by: Diana Mockler	Date/Time: 8/8/22 10:45	Company: ETNC
Relinquished by: [Signature]	Date/Time: 8/8/22 13:00	Company: BETA	Received by: [Signature]	Date/Time: 8/8/22 12:11	Company: BETA
Relinquished by: [Signature]	Date/Time: 8/8/22 13:00	Company: BETA	Received by: [Signature]	Date/Time: 8/8/22 13:00	Company: BETA

Custody Seals Intact. Yes No

Cooler Temperature(s) °C and Other Remarks: **1.2 → 1.2**



Login Sample Receipt Checklist

Client: INTERA Inc

Job Number: 500-220535-1

Login Number: 220535

List Source: Eurofins Chicago

List Number: 1

Creator: Buckley, Paula M

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.2
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



ANALYTICAL REPORT

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-222084-1

Client Project/Site: Clinton County Test Production Wells

For:

INTERA Inc
101 West Kirkwood Avenue
Suite 247
Bloomington, Indiana 47404

Attn: Rhett Moore



Authorized for release by:

9/29/2022 9:02:36 AM

Diana Mockler, Project Manager I
(219)252-7570

Diana.Mockler@et.eurofinsus.com

LINKS

Review your project
results through



Have a Question?



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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

Client: INTERA Inc
Project/Site: Clinton County Test Production Wells

Job ID: 500-222084-1

Job ID: 500-222084-1

Laboratory: Eurofins Chicago

Narrative

**Job Narrative
500-222084-1**

Comments

No additional comments.

Receipt

The sample was received on 9/12/2022 3:40 PM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.0° C.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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Method Summary

Client: INTERA Inc
Project/Site: Clinton County Test Production Wells

Job ID: 500-222084-1

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	EET CHI
200.8	Metals (ICP/MS)	EPA	EET CHI
245.1	Mercury (CVAA)	EPA	EET CHI
300.0	Anions, Ion Chromatography	MCAWW	EET CHI
SM 2320B	Alkalinity	SM	EET CHI
SM 4500 NH3 G	Ammonia	SM	EET CHI
245.1	Preparation, Mercury	EPA	EET CHI
SM 4500 NH3 B	Distillation, Ammonia	SM	EET CHI
Soluble Metals	Preparation, Soluble	None	EET CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: INTERA Inc
Project/Site: Clinton County Test Production Wells

Job ID: 500-222084-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-222084-1	J3-TW2	Water	09/12/22 13:30	09/12/22 15:40

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Client Sample Results

Client: INTERA Inc
 Project/Site: Clinton County Test Production Wells

Job ID: 500-222084-1

Client Sample ID: J3-TW2

Lab Sample ID: 500-222084-1

Date Collected: 09/12/22 13:30

Matrix: Water

Date Received: 09/12/22 15:40

Method: 200.7 Rev 4.4 - Metals (ICP) - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	2.2		0.20	0.12	mg/L		09/15/22 09:36	09/15/22 12:38	1

Method: 200.8 - Metals (ICP/MS) - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030	0.0013	mg/L		09/14/22 15:20	09/15/22 00:02	1
Lead	<0.00050		0.00050	0.00016	mg/L		09/14/22 15:20	09/15/22 00:02	1
Arsenic	0.018		0.0010	0.00015	mg/L		09/14/22 15:20	09/15/22 00:02	1
Barium	0.11		0.0025	0.00037	mg/L		09/14/22 15:20	09/15/22 00:02	1
Beryllium	<0.0010		0.0010	0.00043	mg/L		09/22/22 13:50	09/22/22 15:08	1
Cadmium	<0.00050		0.00050	0.00015	mg/L		09/14/22 15:20	09/15/22 00:02	1
Chromium	<0.0050		0.0050	0.0023	mg/L		09/14/22 15:20	09/15/22 00:02	1
Copper	0.0023		0.0020	0.00063	mg/L		09/14/22 15:20	09/15/22 00:02	1
Manganese	1.3		0.0025	0.0011	mg/L		09/14/22 15:20	09/15/22 00:02	1
Nickel	0.0013	J	0.0020	0.00092	mg/L		09/14/22 15:20	09/15/22 00:02	1
Selenium	<0.0025		0.0025	0.0011	mg/L		09/22/22 13:50	09/22/22 15:08	1
Silver	<0.00050		0.00050	0.000078	mg/L		09/22/22 13:50	09/22/22 15:08	1
Thallium	<0.0020		0.0020	0.00065	mg/L		09/14/22 15:20	09/15/22 00:02	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000091	mg/L		09/14/22 12:35	09/15/22 09:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<0.25		0.25	0.050	mg/L			09/13/22 11:28	1
Chloride	15		2.0	1.7	mg/L			09/13/22 12:36	10
Fluoride	0.31		0.20	0.067	mg/L			09/13/22 11:28	1
Nitrate as N	<0.20		0.20	0.068	mg/L			09/13/22 11:28	1
Nitrite as N	<0.20		0.20	0.050	mg/L			09/13/22 11:28	1
Orthophosphate as P	<0.20		0.20	0.065	mg/L			09/13/22 11:28	1
Sulfate	65		2.0	0.95	mg/L			09/13/22 12:36	10
Alkalinity	270		5.0	3.7	mg/L			09/20/22 20:10	1
Ammonia	0.67		0.20	0.10	mg/L		09/13/22 09:15	09/13/22 13:21	1

Definitions/Glossary

Client: INTERA Inc
Project/Site: Clinton County Test Production Wells

Job ID: 500-222084-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Sample Results

Client: INTERA Inc
 Project/Site: Clinton County Test Production Wells

Job ID: 500-222084-1

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 500-674750/1-A
Matrix: Water
Analysis Batch: 674835

Client Sample ID: Method Blank
Prep Type: Soluble
Prep Batch: 674750

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<0.20		0.20	0.12	mg/L		09/15/22 09:36	09/15/22 12:08	1

Lab Sample ID: LCS 500-674750/2-A
Matrix: Water
Analysis Batch: 674835

Client Sample ID: Lab Control Sample
Prep Type: Soluble
Prep Batch: 674750

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	1.00	1.07		mg/L		107	85 - 115

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 500-674625/1-A
Matrix: Water
Analysis Batch: 674775

Client Sample ID: Method Blank
Prep Type: Soluble
Prep Batch: 674625

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030	0.0013	mg/L		09/14/22 15:20	09/14/22 23:19	1
Lead	<0.00050		0.00050	0.00016	mg/L		09/14/22 15:20	09/14/22 23:19	1
Arsenic	<0.0010		0.0010	0.00015	mg/L		09/14/22 15:20	09/14/22 23:19	1
Barium	<0.0025		0.0025	0.00037	mg/L		09/14/22 15:20	09/14/22 23:19	1
Cadmium	<0.00050		0.00050	0.00015	mg/L		09/14/22 15:20	09/14/22 23:19	1
Chromium	<0.0050		0.0050	0.0023	mg/L		09/14/22 15:20	09/14/22 23:19	1
Copper	<0.0020		0.0020	0.00063	mg/L		09/14/22 15:20	09/14/22 23:19	1
Manganese	<0.0025		0.0025	0.0011	mg/L		09/14/22 15:20	09/14/22 23:19	1
Nickel	<0.0020		0.0020	0.00092	mg/L		09/14/22 15:20	09/14/22 23:19	1
Thallium	<0.0020		0.0020	0.00065	mg/L		09/14/22 15:20	09/14/22 23:19	1

Lab Sample ID: LCS 500-674625/2-A
Matrix: Water
Analysis Batch: 674775

Client Sample ID: Lab Control Sample
Prep Type: Soluble
Prep Batch: 674625

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.500	0.434		mg/L		87	85 - 115
Lead	0.100	0.106		mg/L		106	85 - 115
Arsenic	0.100	0.0991		mg/L		99	85 - 115
Barium	0.500	0.510		mg/L		102	85 - 115
Cadmium	0.0500	0.0486		mg/L		97	85 - 115
Chromium	0.200	0.207		mg/L		104	85 - 115
Copper	0.250	0.241		mg/L		96	85 - 115
Manganese	0.500	0.528		mg/L		106	85 - 115
Nickel	0.500	0.522		mg/L		104	85 - 115
Thallium	0.100	0.109		mg/L		109	85 - 115

Lab Sample ID: 500-222084-1 MS
Matrix: Water
Analysis Batch: 674775

Client Sample ID: J3-TW2
Prep Type: Soluble
Prep Batch: 674625

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	<0.0030		0.500	0.407		mg/L		81	70 - 130
Lead	<0.00050		0.100	0.114		mg/L		114	70 - 130

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QC Sample Results

Client: INTERA Inc
 Project/Site: Clinton County Test Production Wells

Job ID: 500-222084-1

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: 500-222084-1 MS
Matrix: Water
Analysis Batch: 674775

Client Sample ID: J3-TW2
Prep Type: Soluble
Prep Batch: 674625

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.018		0.100	0.130		mg/L		112	70 - 130
Barium	0.11		0.500	0.675		mg/L		112	70 - 130
Cadmium	<0.00050		0.0500	0.0527		mg/L		105	70 - 130
Chromium	<0.0050		0.200	0.226		mg/L		113	70 - 130
Copper	0.0023		0.250	0.245		mg/L		97	70 - 130
Manganese	1.3		0.500	1.82		mg/L		108	70 - 130
Nickel	0.0013	J	0.500	0.555		mg/L		111	70 - 130
Thallium	<0.0020		0.100	0.118		mg/L		118	70 - 130

Lab Sample ID: 500-222084-1 DU
Matrix: Water
Analysis Batch: 674775

Client Sample ID: J3-TW2
Prep Type: Soluble
Prep Batch: 674625

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Antimony	<0.0030		<0.0030		mg/L		NC	20
Lead	<0.00050		<0.00050		mg/L		NC	20
Arsenic	0.018		0.0185		mg/L		0.8	20
Barium	0.11		0.114		mg/L		0.5	20
Cadmium	<0.00050		<0.00050		mg/L		NC	20
Chromium	<0.0050		<0.0050		mg/L		NC	20
Copper	0.0023		<0.0020		mg/L		NC	20
Manganese	1.3		1.30		mg/L		1	20
Nickel	0.0013	J	0.00139	J	mg/L		9	20
Thallium	<0.0020		<0.0020		mg/L		NC	20

Lab Sample ID: MB 500-675936/1-A
Matrix: Water
Analysis Batch: 676126

Client Sample ID: Method Blank
Prep Type: Soluble
Prep Batch: 675936

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	<0.0010		0.0010	0.00043	mg/L		09/22/22 13:50	09/22/22 14:58	1
Selenium	<0.0025		0.0025	0.0011	mg/L		09/22/22 13:50	09/22/22 14:58	1
Silver	<0.00050		0.00050	0.000078	mg/L		09/22/22 13:50	09/22/22 14:58	1

Lab Sample ID: LCS 500-675936/2-A
Matrix: Water
Analysis Batch: 676126

Client Sample ID: Lab Control Sample
Prep Type: Soluble
Prep Batch: 675936

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Beryllium	0.0500	0.0484		mg/L		97	85 - 115
Selenium	0.100	0.0960		mg/L		96	85 - 115
Silver	0.0500	0.0497		mg/L		99	85 - 115

Lab Sample ID: 500-222084-1 MS
Matrix: Water
Analysis Batch: 676126

Client Sample ID: J3-TW2
Prep Type: Soluble
Prep Batch: 675936

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Beryllium	<0.0010		0.0500	0.0473		mg/L		95	70 - 130
Selenium	<0.0025		0.100	0.105		mg/L		105	70 - 130

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QC Sample Results

Client: INTERA Inc
 Project/Site: Clinton County Test Production Wells

Job ID: 500-222084-1

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: 500-222084-1 MS
 Matrix: Water
 Analysis Batch: 676126

Client Sample ID: J3-TW2
 Prep Type: Soluble
 Prep Batch: 675936

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Silver	<0.00050		0.0500	0.0472		mg/L		94	70 - 130

Lab Sample ID: 500-222084-1 DU
 Matrix: Water
 Analysis Batch: 676126

Client Sample ID: J3-TW2
 Prep Type: Soluble
 Prep Batch: 675936

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Beryllium	<0.0010		<0.0010		mg/L		NC	20
Selenium	<0.0025		<0.0025		mg/L		NC	20
Silver	<0.00050		<0.00050		mg/L		NC	20

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 500-674577/12-A
 Matrix: Water
 Analysis Batch: 674804

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 674577

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000091	mg/L		09/14/22 12:35	09/15/22 08:58	1

Lab Sample ID: LCS 500-674577/13-A
 Matrix: Water
 Analysis Batch: 674804

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 674577

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00200	0.00207		mg/L		104	85 - 115

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-674380/3
 Matrix: Water
 Analysis Batch: 674380

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<0.25		0.25	0.050	mg/L			09/13/22 11:01	1
Chloride	<0.20		0.20	0.17	mg/L			09/13/22 11:01	1
Fluoride	<0.20		0.20	0.067	mg/L			09/13/22 11:01	1
Nitrate as N	<0.20		0.20	0.068	mg/L			09/13/22 11:01	1
Nitrite as N	<0.20		0.20	0.050	mg/L			09/13/22 11:01	1
Orthophosphate as P	<0.20		0.20	0.065	mg/L			09/13/22 11:01	1
Sulfate	<0.20		0.20	0.095	mg/L			09/13/22 11:01	1

Lab Sample ID: LCS 500-674380/4
 Matrix: Water
 Analysis Batch: 674380

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	2.00	1.90		mg/L		95	90 - 110
Chloride	3.00	2.77		mg/L		92	90 - 110
Fluoride	1.00	0.912		mg/L		91	90 - 110

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QC Sample Results

Client: INTERA Inc
 Project/Site: Clinton County Test Production Wells

Job ID: 500-222084-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 500-674380/4
 Matrix: Water
 Analysis Batch: 674380

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate as N	2.00	1.89		mg/L		94	90 - 110
Nitrite as N	2.00	2.15		mg/L		108	90 - 110
Orthophosphate as P	2.00	2.20		mg/L		110	90 - 110
Sulfate	5.00	4.97		mg/L		99	90 - 110

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-675600/27
 Matrix: Water
 Analysis Batch: 675600

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<5.0		5.0	3.7	mg/L			09/20/22 17:35	1

Lab Sample ID: LCS 500-675600/28
 Matrix: Water
 Analysis Batch: 675600

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	100	105		mg/L		105	90 - 110

Method: SM 4500 NH3 G - Ammonia

Lab Sample ID: MB 500-674305/1-A
 Matrix: Water
 Analysis Batch: 674393

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 674305

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	<0.20		0.20	0.10	mg/L		09/13/22 09:15	09/13/22 12:18	1

Lab Sample ID: LCS 500-674305/2-A
 Matrix: Water
 Analysis Batch: 674393

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 674305

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia	2.00	1.98		mg/L		99	86 - 113

Lab Chronicle

Client: INTERA Inc
 Project/Site: Clinton County Test Production Wells

Job ID: 500-222084-1

Client Sample ID: J3-TW2

Lab Sample ID: 500-222084-1

Date Collected: 09/12/22 13:30

Matrix: Water

Date Received: 09/12/22 15:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Soluble	Prep	Soluble Metals			674750	JJB	EET CHI	09/15/22 09:36
Soluble	Analysis	200.7 Rev 4.4		1	674835	JJB	EET CHI	09/15/22 12:38
Soluble	Prep	Soluble Metals			674625	FXG	EET CHI	09/14/22 15:20
Soluble	Analysis	200.8		1	674775	FXG	EET CHI	09/15/22 00:02
Soluble	Prep	Soluble Metals			675936	FXG	EET CHI	09/22/22 13:50
Soluble	Analysis	200.8		1	676126	FXG	EET CHI	09/22/22 15:08
Total/NA	Prep	245.1			674577	MJG	EET CHI	09/14/22 12:35 - 09/14/22 14:35 ¹
Total/NA	Analysis	245.1		1	674804	MJG	EET CHI	09/15/22 09:12
Total/NA	Analysis	300.0		1	674380	EAT	EET CHI	09/13/22 11:28
Total/NA	Analysis	300.0		10	674380	EAT	EET CHI	09/13/22 12:36
Total/NA	Analysis	SM 2320B		1	675600	SMO	EET CHI	09/20/22 20:10
Total/NA	Prep	SM 4500 NH3 B			674305	KF	EET CHI	09/13/22 09:15 - 09/13/22 10:15 ¹
Total/NA	Analysis	SM 4500 NH3 G		1	674393	KF	EET CHI	09/13/22 13:21

¹ Completion dates and times are reported or not reported per method requirements or individual lab discretion.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: INTERA Inc
Project/Site: Clinton County Test Production Wells

Job ID: 500-222084-1

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

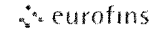
Authority	Program	Identification Number	Expiration Date
Indiana	State	C-IL-02	04-29-23

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Eurofins Chicago

2417 Bond Street
 University Park IL 60484
 Phone 708-534-5200 Fax 708-534 5211

Chain of Custody Record



Client Information		Sampler: <u>J. Pinkard</u>		Lab PM: Mockler Diana J		Carrier Tracking No(s)		COC No: 500-104996-44841 1					
Client Contact: Rhett Moore		Phone		E-Mail: Diana Mockler@et eurofinsus.com		State of Origin		Page: Page 1 of 1					
Company: INTERA Inc		PWSID		Analysis Requested						Job #: <u>500-222084</u>			
Address: 101 West Kirkwood Avenue Suite 247 City: Bloomington State Zip: IN 47404 Phone: 812-676-9984(Tel) 500-222084 COC Email: RMoore@intera.com		Due Date Requested		TAT Requested (days)		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No		PO #		Purchase Order Requested		W/O # <u>INDFA-1008 Clinton Co. Test</u>	
Project Name: Clinton County Test Production Wells		Project #: 50020569		SSOW#		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		2320B - Alkalinity		3M4500NH3_G - Ammonia	
Site		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=waste/soil, BT=Tissue, A=Air)		200.7 245.1		300 - Anions 7	
Sample Identification		Preservation Code		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		2320B - Alkalinity		3M4500NH3_G - Ammonia		200.7 245.1	
13-TV2		9/12/22 1330		G		Water		X		X		X	
						Water							
Possible Hazard Identification		<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months		Deliverable Requested I II III IV Other (specify)		Special Instructions/QC Requirements		Total Number of containers	
Empty Kit Relinquished by		Date		Time		Method of Shipment		Relinquished by		Date/Time		Company	
J. Pinkard		9-12-22		1540		1540		J. Pinkard		9-12-22 1540		Company	
Relinquished by		Date/Time		Company		Received by		Date/Time		Company		Other:	
												A HCL M Hexane B NaOH N None C Zn Acetate O AsNaO2 D Nitric Acid P Na2O4S E NaHSO4 Q Na2SO3 F MeOH R Na2S2O3 G Amchlor S H2SO4 H Ascorbic Acid T TSP Dodecahydrate I Ice U Acetone J DI Water V MCAA K EDTA W pH 4-5 L EDA Y Trizma Z other (specify)	

Custody Seals Intact | Custody Seal No

4.3 → 3.0



Login Sample Receipt Checklist

Client: INTERA Inc

Job Number: 500-222084-1

Login Number: 222084

List Number: 1

Creator: Scott, Sherri L

List Source: Eurofins Chicago

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



ANALYTICAL REPORT

Eurofins Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-222317-1

Client Project/Site: Clinton County Test Production Wells

For:

INTERA Inc
101 West Kirkwood Avenue
Suite 247
Bloomington, Indiana 47404

Attn: Rhett Moore



Authorized for release by:

9/29/2022 11:57:43 AM

Diana Mockler, Project Manager I
(219)252-7570

Diana.Mockler@et.eurofinsus.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

Client: INTERA Inc
Project/Site: Clinton County Test Production Wells

Job ID: 500-222317-1

Job ID: 500-222317-1

Laboratory: Eurofins Chicago

Narrative

**Job Narrative
500-222317-1**

Comments

No additional comments.

Receipt

The sample was received on 9/15/2022 2:57 PM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 10.1° C.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

Method 300.0: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 500-674869 recovered outside control limits for the following analytes: Nitrite as N and Orthophosphate as P. These analytes were biased high in the LCS and were not detected and short hold in nature in the associated samples; therefore, the data have been reported.

Method 300.0: The continuing calibration verification (CCV) associated with batch 500-674869 recovered above the upper control limit for Orthophosphate as P. The samples associated with this CCV were QC for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCV 500-674869/13).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



Method Summary

Client: INTERA Inc
Project/Site: Clinton County Test Production Wells

Job ID: 500-222317-1

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	EET CHI
200.8	Metals (ICP/MS)	EPA	EET CHI
245.1	Mercury (CVAA)	EPA	EET CHI
300.0	Anions, Ion Chromatography	MCAWW	EET CHI
SM 2320B	Alkalinity	SM	EET CHI
SM 4500 NH3 G	Ammonia	SM	EET CHI
245.1	Preparation, Mercury	EPA	EET CHI
SM 4500 NH3 B	Distillation, Ammonia	SM	EET CHI
Soluble Metals	Preparation, Soluble	None	EET CHI

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Sample Summary

Client: INTERA Inc
Project/Site: Clinton County Test Production Wells

Job ID: 500-222317-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-222317-1	J3-TW1	Water	09/15/22 13:00	09/15/22 14:57

1

2

3

4

5

6

7

8

9

10

11

12

Client Sample Results

Client: INTERA Inc
 Project/Site: Clinton County Test Production Wells

Job ID: 500-222317-1

Client Sample ID: J3-TW1

Lab Sample ID: 500-222317-1

Date Collected: 09/15/22 13:00

Matrix: Water

Date Received: 09/15/22 14:57

Method: 200.7 Rev 4.4 - Metals (ICP) - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.62		0.20	0.12	mg/L		09/22/22 11:28	09/22/22 14:42	1

Method: 200.8 - Metals (ICP/MS) - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0020	J	0.0030	0.0013	mg/L		09/28/22 10:52	09/28/22 11:47	1
Arsenic	0.022		0.0010	0.00015	mg/L		09/28/22 10:52	09/28/22 11:47	1
Barium	0.20		0.0025	0.00037	mg/L		09/28/22 10:52	09/28/22 11:47	1
Beryllium	<0.0010		0.0010	0.00043	mg/L		09/28/22 10:52	09/28/22 11:47	1
Cadmium	<0.00050		0.00050	0.00015	mg/L		09/28/22 10:52	09/28/22 11:47	1
Chromium	<0.0050		0.0050	0.0023	mg/L		09/28/22 10:52	09/28/22 11:47	1
Copper	<0.0020		0.0020	0.00063	mg/L		09/28/22 10:52	09/28/22 11:47	1
Lead	<0.00050		0.00050	0.00016	mg/L		09/28/22 10:52	09/28/22 11:47	1
Manganese	0.066		0.0025	0.0011	mg/L		09/28/22 10:52	09/28/22 11:47	1
Nickel	0.00097	J	0.0020	0.00092	mg/L		09/28/22 10:52	09/28/22 11:47	1
Selenium	<0.0025		0.0025	0.0011	mg/L		09/28/22 10:52	09/28/22 11:47	1
Silver	<0.00050		0.00050	0.000078	mg/L		09/28/22 10:52	09/28/22 11:47	1
Thallium	<0.0020		0.0020	0.00065	mg/L		09/28/22 10:52	09/28/22 11:47	1

Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000091	mg/L		09/20/22 15:15	09/21/22 08:03	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<0.25		0.25	0.050	mg/L			09/16/22 00:33	1
Chloride	3.7		0.20	0.17	mg/L			09/16/22 00:33	1
Fluoride	0.62		0.20	0.067	mg/L			09/16/22 00:33	1
Nitrate as N	<0.20		0.20	0.068	mg/L			09/16/22 00:33	1
Nitrite as N	0.051	J **	0.20	0.050	mg/L			09/16/22 00:33	1
Orthophosphate as P	<0.20		0.20	0.065	mg/L			09/16/22 00:33	1
Sulfate	86		2.0	0.95	mg/L			09/16/22 00:46	10
Alkalinity	250		5.0	3.7	mg/L			09/28/22 15:12	1
Ammonia	0.89		0.20	0.10	mg/L		09/16/22 10:40	09/16/22 16:51	1

Definitions/Glossary

Client: INTERA Inc
Project/Site: Clinton County Test Production Wells

Job ID: 500-222317-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Sample Results

Client: INTERA Inc
 Project/Site: Clinton County Test Production Wells

Job ID: 500-222317-1

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 500-675902/1-A
Matrix: Water
Analysis Batch: 676034

Client Sample ID: Method Blank
Prep Type: Soluble
Prep Batch: 675902

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<0.20		0.20	0.12	mg/L		09/22/22 11:28	09/22/22 13:59	1

Lab Sample ID: LCS 500-675902/2-A
Matrix: Water
Analysis Batch: 676034

Client Sample ID: Lab Control Sample
Prep Type: Soluble
Prep Batch: 675902

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	1.00	1.05		mg/L		105	85 - 115

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 500-676822/1-A
Matrix: Water
Analysis Batch: 676878

Client Sample ID: Method Blank
Prep Type: Soluble
Prep Batch: 676822

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.0030		0.0030	0.0013	mg/L		09/28/22 10:52	09/28/22 11:40	1
Arsenic	<0.0010		0.0010	0.00015	mg/L		09/28/22 10:52	09/28/22 11:40	1
Barium	<0.0025		0.0025	0.00037	mg/L		09/28/22 10:52	09/28/22 11:40	1
Beryllium	<0.0010		0.0010	0.00043	mg/L		09/28/22 10:52	09/28/22 11:40	1
Cadmium	<0.00050		0.00050	0.00015	mg/L		09/28/22 10:52	09/28/22 11:40	1
Chromium	<0.0050		0.0050	0.0023	mg/L		09/28/22 10:52	09/28/22 11:40	1
Copper	<0.0020		0.0020	0.00063	mg/L		09/28/22 10:52	09/28/22 11:40	1
Lead	<0.00050		0.00050	0.00016	mg/L		09/28/22 10:52	09/28/22 11:40	1
Manganese	<0.0025		0.0025	0.0011	mg/L		09/28/22 10:52	09/28/22 11:40	1
Nickel	<0.0020		0.0020	0.00092	mg/L		09/28/22 10:52	09/28/22 11:40	1
Selenium	<0.0025		0.0025	0.0011	mg/L		09/28/22 10:52	09/28/22 11:40	1
Silver	<0.00050		0.00050	0.000078	mg/L		09/28/22 10:52	09/28/22 11:40	1
Thallium	<0.0020		0.0020	0.00065	mg/L		09/28/22 10:52	09/28/22 11:40	1

Lab Sample ID: LCS 500-676822/2-A
Matrix: Water
Analysis Batch: 676878

Client Sample ID: Lab Control Sample
Prep Type: Soluble
Prep Batch: 676822

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.500	0.490		mg/L		98	85 - 115
Arsenic	0.100	0.0951		mg/L		95	85 - 115
Barium	0.500	0.493		mg/L		99	85 - 115
Beryllium	0.0500	0.0454		mg/L		91	85 - 115
Cadmium	0.0500	0.0474		mg/L		95	85 - 115
Chromium	0.200	0.196		mg/L		98	85 - 115
Copper	0.250	0.244		mg/L		98	85 - 115
Lead	0.100	0.105		mg/L		105	85 - 115
Manganese	0.500	0.489		mg/L		98	85 - 115
Nickel	0.500	0.485		mg/L		97	85 - 115
Selenium	0.100	0.0937		mg/L		94	85 - 115
Silver	0.0500	0.0499		mg/L		100	85 - 115
Thallium	0.100	0.105		mg/L		105	85 - 115

QC Sample Results

Client: INTERA Inc
 Project/Site: Clinton County Test Production Wells

Job ID: 500-222317-1

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 500-675526/12-A
 Matrix: Water
 Analysis Batch: 675699

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 675526

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000091	mg/L		09/20/22 15:15	09/21/22 07:29	1

Lab Sample ID: LCS 500-675526/13-A
 Matrix: Water
 Analysis Batch: 675699

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 675526

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00200	0.00198		mg/L		99	85 - 115

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 500-674869/3
 Matrix: Water
 Analysis Batch: 674869

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<0.25		0.25	0.050	mg/L			09/15/22 15:56	1
Chloride	<0.20		0.20	0.17	mg/L			09/15/22 15:56	1
Fluoride	<0.20		0.20	0.067	mg/L			09/15/22 15:56	1
Nitrate as N	<0.20		0.20	0.068	mg/L			09/15/22 15:56	1
Nitrite as N	<0.20		0.20	0.050	mg/L			09/15/22 15:56	1
Orthophosphate as P	<0.20	^+	0.20	0.065	mg/L			09/15/22 15:56	1
Sulfate	<0.20		0.20	0.095	mg/L			09/15/22 15:56	1

Lab Sample ID: LCS 500-674869/4
 Matrix: Water
 Analysis Batch: 674869

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	2.00	2.02		mg/L		101	90 - 110
Chloride	3.00	2.90		mg/L		97	90 - 110
Fluoride	1.00	1.00		mg/L		100	90 - 110
Nitrate as N	2.00	1.96		mg/L		98	90 - 110
Nitrite as N	2.00	2.47	*+	mg/L		124	90 - 110
Orthophosphate as P	2.00	2.18	^+	mg/L		109	90 - 110
Sulfate	5.00	5.07		mg/L		101	90 - 110

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-677007/28
 Matrix: Water
 Analysis Batch: 677007

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<5.0		5.0	3.7	mg/L			09/28/22 13:55	1

QC Sample Results

Client: INTERA Inc
 Project/Site: Clinton County Test Production Wells

Job ID: 500-222317-1

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: LCS 500-677007/29
 Matrix: Water
 Analysis Batch: 677007

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity	100	106		mg/L		106	90 - 110

Method: SM 4500 NH3 G - Ammonia

Lab Sample ID: MB 500-674953/1-A
 Matrix: Water
 Analysis Batch: 675246

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 674953

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	<0.20		0.20	0.10	mg/L		09/16/22 10:40	09/16/22 16:46	1

Lab Sample ID: LCS 500-674953/2-A
 Matrix: Water
 Analysis Batch: 675246

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 674953

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia	2.00	2.01		mg/L		100	86 - 113

Lab Chronicle

Client: INTERA Inc
 Project/Site: Clinton County Test Production Wells

Job ID: 500-222317-1

Client Sample ID: J3-TW1

Lab Sample ID: 500-222317-1

Date Collected: 09/15/22 13:00

Matrix: Water

Date Received: 09/15/22 14:57

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Soluble	Prep	Soluble Metals			675902	JJB	EET CHI	09/22/22 11:28
Soluble	Analysis	200.7 Rev 4.4		1	676034	JJB	EET CHI	09/22/22 14:42
Soluble	Prep	Soluble Metals			676822	FXG	EET CHI	09/28/22 10:52
Soluble	Analysis	200.8		1	676878	FXG	EET CHI	09/28/22 11:47
Total/NA	Prep	245.1			675526	MJG	EET CHI	09/20/22 15:15 - 09/20/22 17:15 ¹
Total/NA	Analysis	245.1		1	675699	MJG	EET CHI	09/21/22 08:03
Total/NA	Analysis	300.0		1	674869	EAT	EET CHI	09/16/22 00:33
Total/NA	Analysis	300.0		10	674869	EAT	EET CHI	09/16/22 00:46
Total/NA	Analysis	SM 2320B		1	677007	SMO	EET CHI	09/28/22 15:12
Total/NA	Prep	SM 4500 NH3 B			674953	KF	EET CHI	09/16/22 10:40 - 09/16/22 11:40 ¹
Total/NA	Analysis	SM 4500 NH3 G		1	675246	KF	EET CHI	09/16/22 16:51

¹ Completion dates and times are reported or not reported per method requirements or individual lab discretion.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200



Accreditation/Certification Summary

Client: INTERA Inc
Project/Site: Clinton County Test Production Wells

Job ID: 500-222317-1

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Indiana	State	C-IL-02	04-29-23

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12

Login Sample Receipt Checklist

Client: INTERA Inc

Job Number: 500-222317-1

Login Number: 222317

List Source: Eurofins Chicago

List Number: 1

Creator: Hernandez, Stephanie

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	Received same day of collection; chilling process has begun.
Cooler Temperature is recorded.	True	10.1
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

