

RE: 4/16/2024 Town of Peshtigo Board Meeting

Sellwood, Alyssa A - DNR <alyssa.sellwood@wisconsin.gov>

Fri 4/12/2024 12:47 PM

To: Town of Peshtigo Chair <topchair@townofpeshtigo.org>

Hi Jennifer

No public meetings are currently scheduled. If people have questions or concerns, the DNR is always available and happy to talk with individuals. We can be reached via email at DNRJCI PFAS@wisconsin.gov or at 1-888-626-3244. People are also welcome to contact me directly at 608-622-8606.

We will also continue to share updates at your request for board meetings and to provide quarterly updates on the "Activities, Actions and Updates" tab on [DNR's Webpage](#) and through the email listserv people can opt into.

Since the town's last board meeting, there have been a few updates to share:

- The DNR responded to the [Site Investigation Update for the Stanton Street Facility](#). The DNR recommended more actions to define the extent of PFAS contamination coming from the Stanton Street Site.
- JCI/Tyco submitted a [Monitoring Plan for Groundwater and Surface Water](#) around the FTC. The DNR is reviewing and will respond to this plan.
- JCI/Tyco submitted a revision to the [Alternative Water Management Plan for the Potable Well Sampling Area \(PWSA\)](#), which was originally submitted in 2020. The revision incorporates the option for new deep wells and discusses that the connection of properties in the PWSA to the city of Marinette public water supply did not receive the support and approvals needed to proceed as an option at this time. The DNR is reviewing and will respond with items needing clarification in the revised plan.
- JCI/Tyco provided [documentation of deep monitoring wells](#). These are the wells that will be used to evaluate the groundwater conditions in the deep aquifer around the PWSA.

Alyssa Sellwood

Phone: 608-622-8606

Alyssa.Sellwood@wisconsin.gov

From: Town of Peshtigo Chair <topchair@townofpeshtigo.org>

Sent: Tuesday, April 9, 2024 5:05 PM

To: Sellwood, Alyssa A - DNR <alyssa.sellwood@wisconsin.gov>

Subject: 4/16/2024 Town of Peshtigo Board Meeting

CAUTION: This email originated from outside the organization.

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Hi Alyssa,

We will be having our Town of Peshtigo Board Meeting a week from today, Tuesday April 16th, in the event you have any updates to share. I'm certain one of the pressing questions will be when the next DNR listening session will be for our area since last month you stated it's currently on hold.

Thank you!

Jennifer Friday



March 21, 2024

MS. DENICE NELSON
JOHNSON CONTROLS, INC
5757 N. GREEN BAY AVENUE
MILWAUKEE, WI 53209

Via Email Only to denice.karen.nelson@jci.com

SUBJECT: Response to *Site Investigation Status Report*
JCI/Tyco Stanton (PFAS), 1 Stanton Street, Marinette, WI
ChemDesign (PFAS), 2 Stanton Street, Marinette, WI
BRRTS #02-38-581955 and #02-38-583852

Dear Ms. Nelson:

On Feb. 16, 2024, the Wisconsin Department of Natural Resources (DNR) received the *Site Investigation Status Report* (the "SI Status Report") submitted by Arcadis U.S., Inc. (Arcadis), on behalf of Johnson Controls, Inc., and Tyco Fire Products LP (JCI/Tyco). The report was accompanied by the fee required under Wisconsin Administrative Code (Wis. Admin. Code) § NR 749.04(1) for DNR review and response. The SI Status Report summarized results for the on-going investigations of discharges of per and polyfluoroalkyl substances (PFAS) for both BRRTS 02-38-581955 and 02-38-583852¹ (collectively referred to herein as the "Stanton Site").

The DNR reviewed the SI Status Report and provides recommendations herein for next steps in the site investigation for the Stanton Site. JCI/Tyco should provide a site investigation workplan within 60 days of receipt of this letter with its proposed next steps in the site investigation (Wis. Admin. Code § NR 716.09(1)).

Background

The Stanton Site includes multiple parcels, of which, JCI/Tyco currently owns approximately 51-acres along the Menominee River. An adjacent 15-acre parcel, previously owned by JCI/Tyco, is now owned by KKIL Stanton LLC (KKIL) and contains an office building and a parking lot. JCI/Tyco retains responsibility for the PFAS contamination on this parcel caused by JCI/Tyco's historical discharges of PFAS.

The PFAS contamination at the Stanton Site is associated with discharges from JCI/Tyco's and ChemDesign's operations. Since around 1964, JCI/Tyco has blended and packaged PFAS-containing aqueous film forming foams (AFFF), and currently they also manufacture fire extinguishers and other fire suppression system hardware at the Site. JCI/Tyco also conducted fire training on the parcel currently owned the KKIL in the 1950s through early 1960s. ChemDesign is a synthetic organic chemistry toll service provider and since 1983 it has leased approximately 7.4-acres of the property from JCI/Tyco. Starting in 2005, ChemDesign has provided reactor space to process a series of different perfluorinated compound intermediates from raw materials for JCI/Tyco. While the specific discharge mechanisms for PFAS at the Stanton Site are not defined, JCI/Tyco and ChemDesign have

¹ ChemDesign Product Inc. (ChemDesign) leases 12 buildings and two tank farms on approximately 7.4 acres of the Stanton Street property from JCI/Tyco. ChemDesign is the responsible party for PFAS discharges from their operations under BRRTS 02-38-583852. However, because ChemDesign's operations are co-located with JCI/Tyco's on the property, JCI/Tyco has included potential releases and evaluation of PFAS for BRRTS 02-38-583852 in this SI Status Report.

indicated that the PFAS contamination is likely from incidental discharges of AFFF and PFAS-containing materials throughout their history of use on the property.

Summary of Prior Submittals

Historically, much of the property was investigated and underwent Resource Conservation and Recovery Act (RCRA) corrective action measures for arsenic contamination, which is tracked under BRRTS case #02-38-000011. The corrective actions include a hydraulic barrier wall that encompasses a large portion of the 51-acre property.

JCI/Tyco has suggested that the RCRA corrective action measures for arsenic will also control contaminant migration and address risk associated with PFAS. However, because the discharge sources and transport pathways for the PFAS contamination at the Site differ from the arsenic, a site investigation for PFAS completed in accordance with Wis. Admin. Code ch. NR 716 is required. The nature, degree and extent of the PFAS contamination must be defined (Wis. Admin. Code § NR 716.11(3)(a)) to evaluate effectiveness of the current corrective action measures and evaluate remedial actions to address PFAS contamination (Wis. Admin. Code § NR 716.11(3)(b)).

The DNR has received the following submittals documenting site investigation activities for PFAS at the Site.

Submittal	DNR Response	Comments/Notes
July 6, 2020, <i>Interim Site Investigation Report</i> . BRRTS #02-38-581955	Aug. 31, 2021	<ul style="list-style-type: none"> - Six groundwater and eight soil samples (inside) and 12 groundwater (outside), including three bedrock wells. - Samples analyzed for 14 PFAS compounds. Concentrations of PFOA up to 9,100 ppt (inside) and over 1,000 ppt in bedrock. - Additional investigation needed to address data gaps on affected media, degree and extent of impacts, migration pathways and to expand testing to include 36 PFAS.
Aug. 11, 2020, <i>Conceptual Site Model</i> . BRRTS #02-38-581955		
Aug. 11, 2020, <i>Aerial Deposition Evaluation Report</i> . BRRTS #02-38-581955		
Mar. 22, 2021, <i>Site Investigation Workplan</i> . BRRTS #02-38-581955		
Jan. 12, 2022, <i>Limited Site Investigation Report</i> . BRRTS# 02-38-583852	Mar. 4, 2022	<ul style="list-style-type: none"> - Eleven soil and groundwater samples for 36 PFAS from temporary direct push borings (inside). - Highest concentrations were 6:2 fluorotelomer sulfonate² (FTS); greater than 100,000 ppt in soil and groundwater. - Future work to be combined with BRRTS 02-38-581955.
Feb. 7, 2022, <i>Response to DNR’s Aug. 31, 2021 Comments</i> . #02-38-581955	n/a	<ul style="list-style-type: none"> - Summary of RCRA remediation measures and controls. - Summary of historical and current activities related to PFAS. - Review of changes in shoreline and land development. - Overview of planned upgrade to stormwater management.

² 6:2 FTS was not included in the analyte list of 14 PFAS previously tested on the Stanton Site.

Submittal	DNR Response	Comments/Notes
Mar. 22, 2022, <i>Site Investigation Status Report</i> . BRRTS #02-38-581955 and #02-38-583852	May 19, 2022	<ul style="list-style-type: none"> - Sampled 45 groundwater monitoring wells for 36 PFAS; including 13 (inside), 20 (outside) and 12 bedrock wells. - 6:2 FTS makes up highest proportion of PFAS (inside). 6:2 FTS also detected outside but decrease with distance from the barrier wall. - PFAS in bedrock likely migrated from Fire Technology Center (FTC). Further testing needed to evaluate if PFAS from Site is also contributing to PFAS in the bedrock. - Stormwater discharging to Menominee River has PFOA over 200 ppt and PFOS over 40 ppt. - Additional investigation recommended to define extent of contamination in groundwater outside the wall, evaluate if the KKIL property contains PFAS source areas related to historical AFFF use and evaluate PFAS discharge to the Menominee River.

NOTE:

inside or (outside) = samples collected from locations inside (or outside) the hydraulic barrier wall that was installed in 2010 for the RCRA site.

Summary of SI Status Report

On Mar. 22, 2022, JCI/Tyco submitted a *Site Investigation Work Plan* with its plans for next steps in the investigation. The DNR provided review comments and recommendations in a letter dated May 19, 2022. The site investigation activities and evaluations presented in the most recent SI Status Report were completed based on that 2022 *Site Investigation Work Plan* and the DNR’s response.

Between July 2022 and Oct. 2023, JCI/Tyco performed additional work in the site investigation that included the following:

- Collected soil and groundwater samples from six temporary vertical aquifer profile (VAP) points; five around the former fire training area now part of the KKIL parcel and one in the right-of-way on 8th Street.
- Collected one round of groundwater samples from 25 NR 141 monitoring wells outside the barrier wall (including four new wells).
- Collected groundwater samples from 11 bedrock wells, both inside and outside the barrier wall.
- Measured groundwater levels in coordination with others to improve interpretation of localized groundwater flow patterns around the hydraulic barrier wall.
- Collected two rounds of surface water samples from eight locations in the Menominee River.

JCI/Tyco presented its findings and conclusions in the SI Status Report, which included the following:

- The KKIL property contains PFAS contamination, but the concentrations were not indicative of historical AFFF use or training on this parcel. The PFAS contamination was attribute, in part, to fill materials.
- Groundwater with 6:2 FTS, perfluorooctanoic acid (PFOA), four other perfluorocarboxylic acids and perfluorooctane sulfonate (PFOS) is indicative of PFAS discharges from the Stanton Site. The 6:2 FTS is a useful marker to distinguish PFAS coming from the Stanton Site as compared to other upgradient sources.
- PFAS detected in the shallow bedrock is predominantly associated with migration of PFAS from the FTC and is interpreted to discharge to the Menominee River.

- Groundwater in the overburden outside the barrier wall, flows around the wall and discharges into the Menominee River, east of the facility. However, to the north of the Stanton Site, a localized preferential flow pathway (a former log run) influences the groundwater flow direction and causes groundwater to flow toward the northwest before discharging to the river.
- The flux of PFAS into the Menominee River is not causing the surface water concentrations of the river to exceed Wisconsin's current surface water criteria of 95 ppt for PFOA and 8 ppt for PFOS.

DNR Review and Recommendations

JCI/Tyco did not include recommendations or propose next steps in this SI Status Report. However, it is the DNR's understanding that JCI/Tyco is interested in establishing concurrence with the DNR on the nature, degree and extent of PFAS contamination from the Stanton Site. The DNR reviewed the SI Status Report and recommends additional sampling and evaluation to define the nature, degree and extent of PFAS contamination. The DNR's recommendations are summarized below.

Unconsolidated Aquifer – Outside Containment Wall:

In the SI Status Report, JCI/Tyco concluded that historical AFFF use or testing did not contribute to the PFAS contamination detected on the parcel currently owned by KKIL and that the PFAS contamination from the Stanton Site that is in the groundwater outside the barrier wall is limited to the unconsolidated aquifer in a narrow zone that flows around the barrier wall and discharges to the Menominee River.

The DNR agrees that the conceptual site model (CSM) and data collected to date supports these general conclusions; however, some refinements and further evaluation are recommended to move toward concurrence with the DNR on the interpretation of the specific extent of PFAS contamination from the Stanton Site.

- **Recommendation #1:** Present isoconcentration contours for 6:2 FTS (down to concentration of 10 ppt or similar) to help illustrate how the extent of PFAS contamination from the Stanton Site was delineated or differentiated from upgradient sources.

The presence of 6:2 FTS can help to determine the extent of PFAS contamination attributable to the Stanton Site; 6:2 FTS is the PFAS with the highest concentration in shallow groundwater inside the barrier wall on the property, it is typically associated with AFFF and not with other PFAS sources and it is known to degrade to short-chained perfluorocarboxylic acids in aerobic environment. Thus, detections of 6:2 FTS in the unconsolidated aquifer around the barrier wall are most likely attributable to discharges from the Stanton Site and not to migration of PFAS from other upgradient sources.

- **Recommendation #2a:** Continue to include KKIL parcel in the CSM and include the boundary of this parcel on maps and figures for the Stanton Site. The KKIL parcel was previously part of JCI/Tyco's Stanton facility and is considered part of the Stanton Site. (A figure from JCI/Tyco's 2020 *Site Investigation Work Plan* that shows the former approximate property boundary is attached.)

The property immediately west of the Stanton Site is also a BRRTS site (BRRTS 02-38-587281 or "Marinette Marine"). In Section 4.5 of the SI Status Report, JCI/Tyco indicates that Marinette Marine is upgradient and side-gradient of the Stanton Site. *The DNR disagrees with this conclusion.* When the KKIL parcel is included in the CSM, Marinette Marine is downgradient and side-gradient from the Stanton Site. The groundwater flow paths presented in the SI Status Report show that groundwater moves from the Stanton Site onto the Marinette Marine property, and not vice versa.

- **Recommendation #2b:** Include PFAS detected on the KKIL property in the isoconcentration contours depicting the extent of contamination for the Stanton Site. PFAS was detected in the VAP samples

JCI/Tyco collected on the KKIL parcel, and JCI/Tyco has attributed these, in part, to “fill.” The PFAS detected in four of the five VAP groundwater samples include 6:2 FTS at concentrations greater than 100 ppt, indicating that the source of the PFAS is the Stanton Site. Even if the PFAS are attributable to “fill,” it is most likely that this fill originated from and/or was impacted by discharges at the Stanton Site. As such, the isoconcentration contours used to define the extent of contamination should include the area characterized by vertical aquifer profiles VAP-66 to VAP-69. A permanent NR 141 monitoring well is recommended to better define the extent of contamination in this area.

- **Recommendation #2c:** Use groundwater flow paths and relative PFAS concentrations to refine interpretation of where PFAS from Stanton Site has migrated onto the Marinette Marine property. PFAS were detected in soil and groundwater on the Marinette Marine property. While these PFAS may be attributed in part to discharges that occurred on the Marinette Marine property, the relative concentrations of PFAS detected on Marinette Marine are similar to those detected in samples JCI/Tyco collected on the KKIL parcel. The flow paths for groundwater originating on the Stanton Site (including the KKIL parcel) extend onto the Marinette Marine property and indicate that the Stanton Site can contribute to the PFAS detected in the groundwater on this adjacent parcel.
- **Recommendation #3:** Sample groundwater east of the 6th Street Slip to define the extent of PFAS contamination to the southeast along the Menominee River. At monitoring well MW022M, 6:2 FTS was detected at 190 ppt, which suggests that the PFAS is from the Stanton Site and is not from migration of an upgradient source. The concentration of PFOA was also higher in monitoring well MW022M (71 ppt) as compared to the next upgradient monitoring well MW129M-45 (41 ppt), further supporting that PFAS from Stanton Site is contributing to the PFAS contamination detected at this location. Additional testing east of monitoring well MW022M may help to confirm if the 6th Street Slip represents the boundary of PFAS from the Stanton Site or if the PFAS contamination extends farther to the southeast.

Shallow Weathered Bedrock:

In the SI Status Report, JCI/Tyco concludes that the PFAS detected in the shallow bedrock below the Stanton Site are from migration of PFAS from the FTC and this PFAS-contaminated groundwater discharges to the Menominee River. Assuming that data from the site investigation continues to indicate the FTC is the source of PFAS contamination to the shallow bedrock, then reporting on the monitoring of the shallow bedrock can be done under the site investigation for the FTC and does not need to be duplicated for the Stanton Site.³

The DNR agrees that the FTC appears to be the primary contributor to the PFAS detected in the shallow bedrock but recommends that JCI/Tyco provide additional data to bolster this conclusion. The basis for this recommendation is described below.

Previously, in the Mar. 2022, SI Status Report, two bedrock monitoring wells (MW040D and MW108D) on the Stanton Site were found to have high concentrations of 6:2 FTS (e.g., greater than 1,000 ppt), which were an order of magnitude greater than what was detected in upgradient bedrock monitoring wells. The DNR questioned whether this was evidence of migration of PFAS-impacted groundwater from the overlying unconsolidated aquifer at the Stanton Site. JCI/Tyco said it was not migration from the Stanton Site and it attributed these high concentrations to faulty well construction. To test this conclusion, JCI/Tyco selected other bedrock monitoring wells within the barrier wall on the Stanton Site to sample during the most recent, Nov. 2022, monitoring event.

³ In that investigation, additional work is recommended to bolster and confirm the CSM presented by JCI/Tyco, that PFAS in the shallow bedrock discharges to the surface water at the Menominee River.

In the samples collected in Nov. 2022, the concentration of 6:2 FTS in the shallow bedrock below the Stanton Site were on the order of 100 ppt, which is in line with concentrations detected in upgradient bedrock monitoring wells. Based on this, the DNR agrees that the CSM and body of data collected to date supports that migration of PFAS from the FTC is likely the primary contributor to PFAS detected in the shallow bedrock below the Stanton Site. (Degradation of 6:2 FTS is slow to occur in anerobic environments, so its persistence and migration in the more confined bedrock layer from the FTC is feasible as compared to the unconsolidated aquifer.)

However, the recent groundwater samples collected from the shallow bedrock still showed an increase (albeit less pronounced) in the concentration of 6:2 FTS in monitoring wells sampled on the Stanton Site (e.g., MW042D) as compared to upgradient wells (e.g., MW125D-60 and PW-28-75). This pattern could be an artifact of sampling a heterogenous and anisotropic media like the weathered bedrock, but it also could be evidence that the Stanton Site contributes to some of the PFAS detected in the bedrock below the Stanton Site. Further evaluation is recommended to determine whether this is a contribution of significance.

- **Recommendation #4:** Provide a response as to whether the faulty well construction could be contributing to migration of PFAS into the shallow bedrock below the Site? If poor well construction is not a potential pathway for contaminant migration, please describe how and why.
- **Recommendation #5:** Install another bedrock monitoring well along Carney Boulevard in the area between monitoring well MW125D-60 and Shore Drive. JCI/Tyco's conclusion that the Stanton Site does not have an appreciable contribution to the PFAS in the shallow bedrock, would be bolstered if a bedrock well upgradient of the Stanton Site in this area had concentrations of 6:2 FTS (and PFOA) that were similar to, or greater than, those detected in the shallow bedrock at the Stanton Site.

Menominee River:

The PFAS-impacted groundwater in the unconsolidated aquifer that is not contained by the barrier wall, discharges to the Menominee River. The concentrations of PFAS measured in the surface water in the Menominee River have been below Wisconsin's current surface water standards for PFOA and PFOS. Sediment along the bed of the river has not been tested to evaluate if PFAS is present in this media.

While the resulting concentrations of PFAS in the surface water of the river remain low, this outcome is primarily because of the dilution that occurs when the groundwater enters this large body of fast-moving surface water. JCI/Tyco should collect sufficient data in its investigation to evaluate the flux of PFAS to the Menominee River and select interim or remedial actions that may be needed to limit the discharge of PFAS from groundwater into the river.

Soil and Unconsolidated Aquifer Inside Barrier Wall:

Sampling results for PFAS in the soil and unconsolidated aquifer inside the barrier wall were presented in JCI/Tyco's and ChemDesign's prior submittals, but further evaluation was not included in this SI Status Report. A complete site investigation will require having sufficient information to estimate the mass of contamination in the source area (Wis. Admin. Code § NR 716.11(3)(d)) and evaluate potential pathways for migration, including drainage improvements (Wis. Admin. Code § NR 716.11(5)(a)).

Maps and cross-sections with isoconcentrations to depict the degree of PFAS contamination in the soil and unconsolidated groundwater within the barrier wall are required (Wis. Admin. Code § NR 716.15(4)). These visual aids are needed to ensure that environmental media within the barrier wall is properly managed so as to prevent migration of PFAS to the environment outside of the barrier wall. This includes, but is not limited to, PFAS migration that can occur from excavation and movement of soil, from water discharged from dewatering and other groundwater management activities and from stormwater runoff.

In the case of stormwater, PFAS has been detected in the stormwater that discharges from the Stanton Site to the Menominee River at concentrations that exceed Wisconsin's current surface water standards. The DNR understands that JCI/Tyco recently completed upgrades to its stormwater management, with the goal of limiting contaminant migration in stormwater moving off the Stanton Site. Monitoring of the stormwater for PFAS is required as part of this site investigation, especially given that stormwater has been documented to be a contaminant migration pathway for PFAS at the Stanton Site (Wis. Admin. § NR 716.11(5)(a)). If PFAS concentrations in the stormwater remain over surface water standards, then additional characterization to evaluate the source of the PFAS in stormwater and to select interim or remedial actions will be required (Wis. Admin. Code § NR 716.17(3)).

Next Steps

Additional work is required for JCI/Tyco to meet the objectives of a complete site investigation for PFAS at the Stanton Site (Wis. Admin. Code § NR 716.01). Within 60 days of receipt of this letter JCI/Tyco should submit a Site Investigation Work Plan describing its next steps for the site investigation (Wis. Admin. Code § NR 716.09(1)).

In that Site Investigation Work Plan, the DNR recommends that JCI/Tyco include the additional evaluations and field investigations summarized in this letter. This includes the specific recommendations to help define the nature, degree, and extent of contamination outside the barrier wall, the general recommendations to collect additional data as needed to estimate the mass and map the degree of contamination within the barrier wall and to evaluate and select remedial actions, as needed, to address the PFAS contamination at the Stanton Site.

If you have any questions, please contact me at Alyssa.Sellwood@wisconsin.gov or (608) 622-8606.

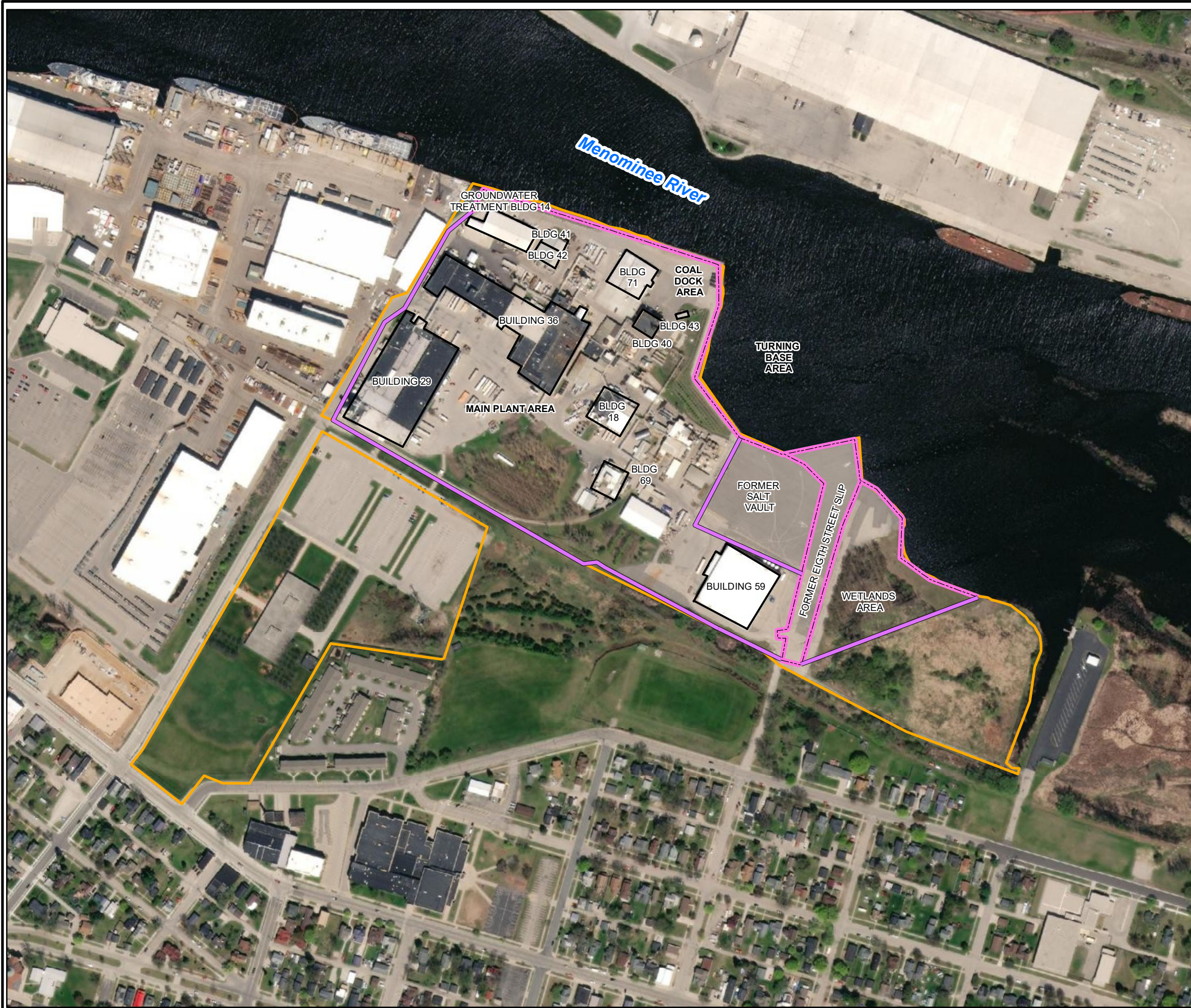
Sincerely,



Alyssa Sellwood, PE
Water Resources Engineer
Remediation & Redevelopment Program

Attachments: Figure 2 Site Layout (from JCI/Tyco's 2020 Site Investigation Work Plan)

cc: Jodie Thistle, DNR (via email: Jodie.Thistle@wisconsin.gov)
Sarah Krueger, DNR (via email: Sarah.Krueger@wisconsin.gov)
Sarah Anderson, DNR (via email: Sarah.Anderson@wisconsin.gov)
Dave Mielke, ChemDesign (via email: dmielke@chemdesign.com)

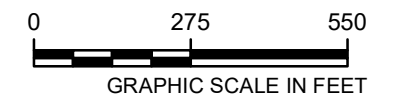


LEGEND:

- APPROXIMATE SITE PROPERTY BOUNDARY
- SHEET PILE WALL
- SLURRY WALL

NOTES:

- ROAD DATA SOURCE: OPEN STREET MAP, ACCESSED FALL 2017.
- SERVICE LAYER CREDITS: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRIID, IGN, AND THE GIS USER COMMUNITY



TYCO STANTON STREET FACILITY
MARINETTE, WISCONSIN
SITE INVESTIGATION WORK PLAN

SITE LAYOUT



Notice: Use this form to request a **written response (on agency letterhead)** from the Department of Natural Resources (DNR) regarding technical assistance, a post-closure change to a site, a specialized agreement or liability clarification for Property with known or suspected environmental contamination. A fee will be required as is authorized by s. 292.55, Wis. Stats., and NR 749, Wis. Adm. Code., unless noted in the instructions below. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records law [ss. 19.31 - 19.39, Wis. Stats.].

Definitions

"Property" refers to the subject Property that is perceived to have been or has been impacted by the discharge of hazardous substances.

"Liability Clarification" refers to a written determination by the Department provided in response to a request made on this form. The response clarifies whether a person is or may become liable for the environmental contamination of a Property, as provided in s. 292.55, Wis. Stats.

"Technical Assistance" refers to the Department's assistance or comments on the planning and implementation of an environmental investigation or environmental cleanup on a Property in response to a request made on this form as provided in s. 292.55, Wis. Stats.

"Post-closure modification" refers to changes to Property boundaries and/or continuing obligations for Properties or sites that received closure letters for which continuing obligations have been applied or where contamination remains. Many, but not all, of these sites are included on the GIS Registry layer of RR Sites Map to provide public notice of residual contamination and continuing obligations.

Select the Correct Form

This form should be used to request the following from the DNR:

- Technical Assistance
- Liability Clarification
- Post-Closure Modifications
- Specialized Agreements (tax cancellation, negotiated agreements, etc.)

Do **not** use this form if one of the following applies:

- Request for an **off-site liability exemption or clarification** for Property that has been or is perceived to be contaminated by one or more hazardous substances that originated on another Property containing the source of the contamination. Use DNR's Off-Site Liability Exemption and Liability Clarification Application Form 4400-201.
- Submittal of an Environmental Assessment for the **Lender Liability Exemption**, s 292.21, Wis. Stats., **if no response or review by DNR is requested**. Use the Lender Liability Exemption Environmental Assessment Tracking Form 4400-196.
- Request for an **exemption to develop on a historic fill site** or licensed landfill. Use DNR's Form 4400-226 or 4400-226A.
- **Request for closure** for Property where the investigation and cleanup actions are completed. Use DNR's Case Closure - GIS Registry Form 4400-202.

All forms, publications and additional information are available on the internet at: dnr.wi.gov/topic/Brownfields/Pubs.html.

Instructions

1. Complete sections 1, 2, 6 and 7 for all requests. Be sure to provide adequate and complete information.
2. Select the type of assistance requested: Section 3 for technical assistance or post-closure modifications, Section 4 for a written determination or clarification of environmental liabilities; or Section 5 for a specialized agreement.
3. Include the fee payment that is listed in Section 3, 4, or 5, unless you are a "Voluntary Party" enrolled in the Voluntary Party Liability Exemption Program **and** the questions in Section 2 direct otherwise. Information on to whom and where to send the fee is found in Section 8 of this form.
4. Send the completed request, supporting materials and the fee to the appropriate DNR regional office where the Property is located. See the map on the last page of this form. A paper copy of the signed form and all reports and supporting materials shall be sent with an electronic copy of the form and supporting materials on a compact disk. For electronic document submittal requirements see: <http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf>

The time required for DNR's determination varies depending on the complexity of the site, and the clarity and completeness of the request and supporting documentation.

Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

Form 4400-237 (R 12/18)

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Section 1. Contact and Recipient Information

Requester Information

This is the person requesting technical assistance or a post-closure modification review, that his or her liability be clarified or a specialized agreement and is identified as the requester in Section 7. DNR will address its response letter to this person.

Last Name Nelson	First Denice	MI	Organization/ Business Name Tyco Fire Products LP
Mailing Address 2700 Industrial Parkway South			City Marinette
			State WI
			ZIP Code 54143
Phone # (include area code)	Fax # (include area code)	Email	

The requester listed above: (select all that apply)

- Is currently the owner
 Is considering selling the Property
 Is renting or leasing the Property
 Is considering acquiring the Property
 Is a lender with a mortgagee interest in the Property
 Other. Explain the status of the Property with respect to the applicant:

Contact Information (to be contacted with questions about this request)

Select if same as requester

Contact Last Name Milionis	First Peter	MI	Organization/ Business Name Arcadis
Mailing Address 126 N Jefferson Street, Suite 400			City Milwaukee
			State WI
			ZIP Code 53202
Phone # (include area code) (267) 685-1815	Fax # (include area code)	Email peter.milionis@arcadis.com	

Environmental Consultant (if applicable)

Contact Last Name Milionis	First Peter	MI	Organization/ Business Name Arcadis
Mailing Address 126 N Jefferson Street, Suite 400			City Milwaukee
			State WI
			ZIP Code 53202
Phone # (include area code)	Fax # (include area code)	Email	

Section 2. Property Information

Property Name Tyco Fire Technology Center - PFCs			FID No. (if known) 438005590
BRRTS No. (if known) 0238580694		Parcel Identification Number	
Street Address 2700 Industrial Parkway South			City Marinette
			State WI
			ZIP Code 54143
County Marinette	Municipality where the Property is located <input checked="" type="radio"/> City <input type="radio"/> Town <input type="radio"/> Village of Marinette	Property is composed of: <input type="radio"/> Single tax parcel <input checked="" type="radio"/> Multiple tax parcels	Property Size Acres 380

Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

Form 4400-237 (R 12/18)

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1. Is a response needed by a specific date? (e.g., Property closing date) Note: Most requests are completed within 60 days. Please plan accordingly.

No Yes

Date requested by: _____

Reason: _____

2. Is the "Requester" enrolled as a Voluntary Party in the Voluntary Party Liability Exemption (VPLE) program?

No. **Include the fee that is required for your request in Section 3, 4 or 5.**

Yes. **Do not include a separate fee.** This request will be billed separately through the VPLE Program.

Fill out the information in Section 3, 4 or 5 which corresponds with the type of request:

Section 3. Technical Assistance or Post-Closure Modifications;

Section 4. Liability Clarification; or Section 5. Specialized Agreement.

Section 3. Request for Technical Assistance or Post-Closure Modification

Select the type of technical assistance requested: [Numbers in brackets are for WI DNR Use]

- No Further Action Letter (NFA) (Immediate Actions) - NR 708.09, [183] - **Include a fee of \$350.** Use for a written response to an immediate action after a discharge of a hazardous substance occurs. Generally, these are for a one-time spill event.
- Review of Site Investigation Work Plan - NR 716.09, [135] - **Include a fee of \$700.**
- Review of Site Investigation Report - NR 716.15, [137] - **Include a fee of \$1050.**
- Approval of a Site-Specific Soil Cleanup Standard - NR 720.10 or 12, [67] - **Include a fee of \$1050.**
- Review of a Remedial Action Options Report - NR 722.13, [143] - **Include a fee of \$1050.**
- Review of a Remedial Action Design Report - NR 724.09, [148] - **Include a fee of \$1050.**
- Review of a Remedial Action Documentation Report - NR 724.15, [152] - **Include a fee of \$350**
- Review of a Long-term Monitoring Plan - NR 724.17, [25] - **Include a fee of \$425.**
- Review of an Operation and Maintenance Plan - NR 724.13, [192] - **Include a fee of \$425.**

Other Technical Assistance - s. 292.55, Wis. Stats. [97] (For request to build on an abandoned landfill use Form 4400-226)

- Schedule a Technical Assistance Meeting - **Include a fee of \$700.**
- Hazardous Waste Determination - **Include a fee of \$700.**
- Other Technical Assistance - **Include a fee of \$700.** Explain your request in an attachment.

Post-Closure Modifications - NR 727, [181]

- Post-Closure Modifications: Modification to Property boundaries and/or continuing obligations of a closed site or Property; sites may be on the GIS Registry. This also includes removal of a site or Property from the GIS Registry. **Include a fee of \$1050, and:**
 - Include a fee of \$300 for sites with residual soil contamination; and
 - Include a fee of \$350 for sites with residual groundwater contamination, monitoring wells or for vapor intrusion continuing obligations.

Attach a description of the changes you are proposing, and documentation as to why the changes are needed (if the change to a Property, site or continuing obligation will result in revised maps, maintenance plans or photographs, those documents may be submitted later in the approval process, on a case-by-case basis).

Skip Sections 4 and 5 if the technical assistance you are requesting is listed above and complete Sections 6 and 7 of this fo

Section 6. Other Information Submitted

Identify all materials that are included with this request.

Send both a paper copy of the signed form and all reports and supporting materials, and an electronic copy of the form and all reports, including Environmental Site Assessment Reports, and supporting materials on a compact disk.

Include one copy of any document from any state agency files that you want the Department to review as part of this request. The person submitting this request is responsible for contacting other state agencies to obtain appropriate reports or information.

Phase I Environmental Site Assessment Report - Date: _____

Phase II Environmental Site Assessment Report - Date: _____

Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

Form 4400-237 (R 12/18)

Page 4 of 5

Legal Description of Property (required for all liability requests and specialized agreements)

Map of the Property (required for all liability requests and specialized agreements)

Analytical results of the following sampled media: Select all that apply and include date of collection.

Groundwater Soil Sediment Other medium - Describe: _____

Date of Collection: _____

A copy of the closure letter and submittal materials

Draft tax cancellation agreement

Draft agreement for assignment of tax foreclosure judgment

Other report(s) or information - Describe: Interim Long Term Monitoring Plan for Groundwater and Surface Water

For Property with newly identified discharges of hazardous substances only: Has a notification of a discharge of a hazardous substance been sent to the DNR as required by s. NR 706.05(1)(b), Wis. Adm. Code?

Yes - Date (if known): _____

No

Note: The Notification for Hazardous Substance Discharge (non-emergency) form is available at:

dnr.wi.gov/files/PDF/forms/4400/4400-225.pdf.

Section 7. Certification by the Person who completed this form

I am the person submitting this request (requester)

I prepared this request for: Denice Nelson

Requester Name

I certify that I am familiar with the information submitted on this request, and that the information on and included with this request is true, accurate and complete to the best of my knowledge. I also certify I have the legal authority and the applicant's permission to make this request.

Signature



Date Signed

3/15/2024

Senior Environmental Specialist

Title

(414) 277-6233

Telephone Number (include area code)

Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

Form 4400-237 (R 12/18)

Page 5 of 5

Section 8. DNR Contacts and Addresses for Request Submittals

Send or deliver one paper copy and one electronic copy on a compact disk of the completed request, supporting materials, and fee to the region where the property is located to the address below. Contact a [DNR regional brownfields specialist](#) with any questions about this form or a specific situation involving a contaminated property. For electronic document submittal requirements see: <http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf>.

DNR NORTHERN REGION

Attn: RR Program Assistant
Department of Natural Resources
223 E Steinfest Rd Antigo, WI 54409

DNR NORTHEAST REGION

Attn: RR Program Assistant
Department of Natural Resources
2984 Shawano Avenue
Green Bay WI 54313

DNR SOUTH CENTRAL REGION

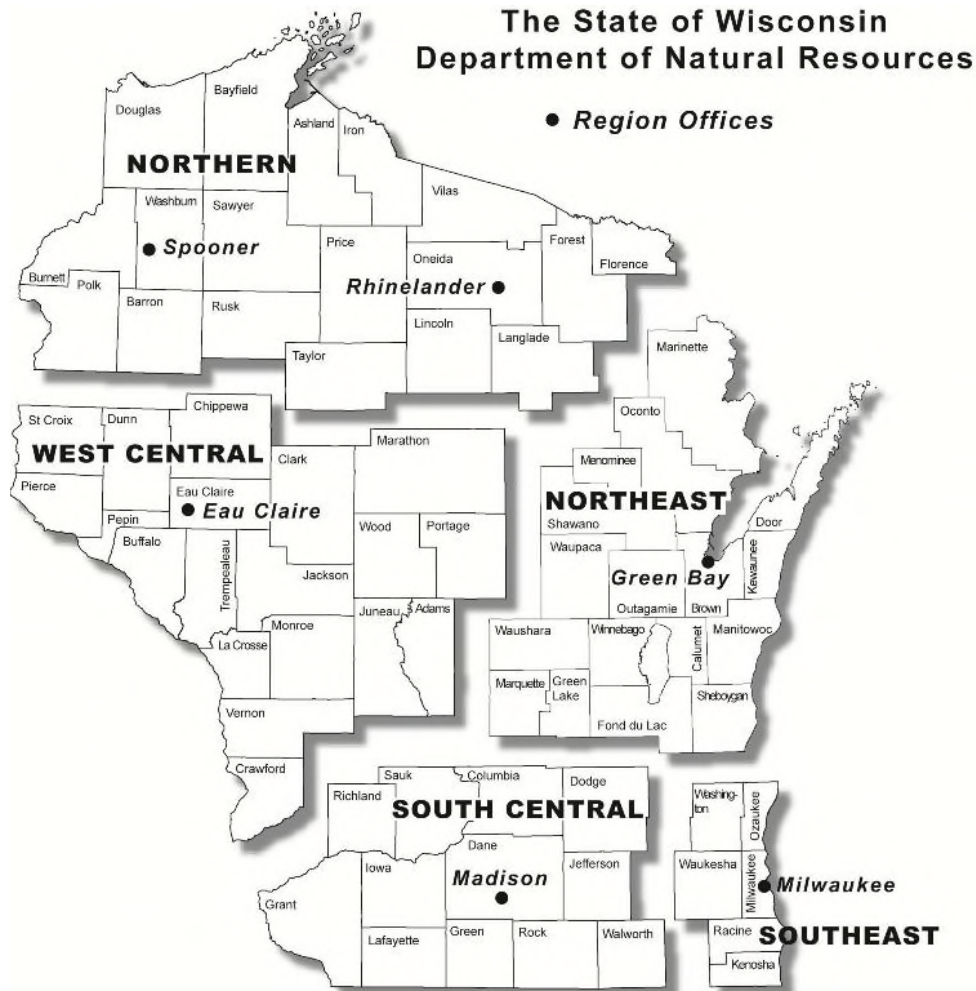
Attn: RR Program Assistant
Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg WI 53711

DNR SOUTHEAST REGION

Attn: RR Program Assistant
Department of Natural Resources
2300 North Martin Luther King Drive
Milwaukee WI 53212

DNR WEST CENTRAL REGION

Attn: RR Program Assistant
Department of Natural Resources
1300 Clairemont Ave.
Eau Claire WI 54702



Note: These are the Remediation and Redevelopment Program's designated regions. Other DNR program regional boundaries may be different.

DNR Use Only			
Date Received	Date Assigned	BRRTS Activity Code	BRRTS No. (if used)
DNR Reviewer		Comments	
Fee Enclosed? <input type="radio"/> Yes <input type="radio"/> No	Fee Amount \$	Date Additional Information Requested	Date Requested for DNR Response Letter
Date Approved	Final Determination		



Tyco Fire Products LP

Interim Long Term Monitoring Plan for Groundwater and Surface Water

Tyco Fire Technology Center
Marinette, Wisconsin

BRRTS No. 02-38-580694

March 2024

This document is intended only for the use of the individual or entity for which it was prepared and may contain information that is privileged, confidential and exempt from disclosure under applicable law. Any dissemination, distribution or copying of this document is strictly prohibited.

Interim Long Term Monitoring Plan for Groundwater and Surface Water

Tyco Fire Technology Center
Marinette, Wisconsin
BRRTS No. 02-38-580694

March 2024

Prepared By:

Arcadis U.S., Inc.
126 North Jefferson Street, Suite 400
Milwaukee
Wisconsin 53202
Phone: 414 276 7742
Fax: 414 276 7603

Prepared For:

Tyco Fire Products LP
2700 Industrial Parkway South
Marinette
Wisconsin 54143

Our Ref:

30168592



Scott Potter
Project Lead/Technical Expert



Tim Molitor, PG
Project Geologist



Matthew Coleman
Project Scientist

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Acronyms and Abbreviations

Arcadis	Arcadis U.S., Inc.
BRRTS	Bureau for Remediation and Redevelopment Tracking System
ES	Enforcement Standard
FTC	Fire Technology Center
GETS	groundwater extraction and treatment system
LTM	long term monitoring
MW	monitoring well
ng/L	nanograms per liter
NR	Natural Resources
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
QAPP	Quality Assurance Project Plan
Site	Fire Technology Center located at 2700 Industrial Parkway South, Marinette, Wisconsin
TSS	Total Suspended Solids
Tyco	Tyco Fire Products LP
WDNR	Wisconsin Department of Natural Resources
Wis. Adm. Code	Wisconsin Administrative Code (Wis. Adm. Code).

1 Introduction

This document describes the Interim Long Term Monitoring (LTM) Plan for groundwater and surface water associated with the Tyco Fire Products LP (Tyco) Fire Technology Center (FTC) located at 2700 Industrial Parkway South in Marinette, Wisconsin (the Site; **Figure 1**). This Interim LTM Plan is associated with ongoing investigations of per- and polyfluoroalkyl substances (PFAS) being completed by Tyco within the Wisconsin Department of Natural Resources (WDNR) Environmental Repair Program, pursuant to the requirements of Natural Resources (NR) Chapter 716 of the Wisconsin Administrative Code (Wis. Adm. Code). The objectives of this Interim LTM Plan are to:

- Document the stability and attenuation of the site-related PFAS in groundwater.
- Verify that concentrations of site-related PFAS in surface water in Ditches A, C, and D are decreasing over time.

The sampling and analysis described in this Interim LTM Plan will be conducted in accordance with NR 724.17 and specifically the environmental standards established in Wisconsin and regulated by WDNR. The laboratory analytical methods, method detection limits, and reporting limits are outlined in the QAPP (Arcadis 2023a), and the method detection limits and reporting limits will be lower than the applicable standards.

This Interim LTM Plan spans the first five years of the Site's LTM program from 2024 to 2029. Through this interim period, monitoring will be implemented concurrently with the existing LTM Plan for the groundwater extraction and treatment system (GETS) (Arcadis 2021) and the existing LTM Plan associated with the deep bedrock aquifer wells (Arcadis 2022). At the end of the five-year period, a final LTM Plan, incorporating all monitoring programs associated with the Site, will be prepared for submittal to the WDNR. During implementation of the Interim LTM Plan, monitoring events will be completed concurrently with the other monitoring programs when possible (e.g., completing Interim LTM and GETS LTM during the same field mobilization).

In its first year, the Interim LTM Plan includes 84 existing monitoring wells, up to 14 new monitoring wells planned for construction in 2024 (up to 98 wells in total), and 6 surface water locations. The plan is dynamic, including changes in sampling frequency based on the program year and observed results. The conditional elements of the groundwater monitoring plan, designed to account for seasonality and reducing sampling redundancies, are described in **Section 3.2**.

To organize the sampling program, monitoring wells have been divided into four zones, as shown on **Figure 2**. The proposed monitoring zones and general sampling frequencies associated with this Interim LTM Plan are defined as follows:

- **FTC (Non-GETS):** This zone encompasses the Site and includes 24 existing monitoring wells. Monitoring wells that are already included in the GETS LTM Plan are not included in this area and will continue to be sampled as part of the GETS LTM at this time. Monitoring wells in this zone are expected to be sampled semi-annually for two years and then annually thereafter.
- **Northern Plume:** This zone of the plume is northeast of the Site and GETS monitoring network. This zone includes 18 existing monitoring wells. Monitoring wells in this zone are expected to be sampled semi-annually for one year and then annually thereafter.
- **Southern Plume:** This zone of the plume is southeast of the Site and includes 21 existing monitoring wells. Monitoring wells in this zone are expected to be sampled semi-annually for one year and then annually thereafter.

INTERIM LONG TERM MONITORING PLAN FOR GROUNDWATER AND SURFACE WATER

- **Boundary Zone:** This zone includes 21 existing monitoring wells that will be used to monitor the perimeter of the Northern and Southern Plumes to confirm that the plume is not expanding. Monitoring wells in this zone are expected to be sampled semi-annually for one year, then annually for two years; sampling will be biennial thereafter. Additionally, a subset of the monitoring wells will be sampled at a higher frequency (i.e., quarterly) during the first two years of LTM implementation.

In accordance with the August 2023 Additional Site Investigation Work Plan (Arcadis 2023b), up to eleven overburden monitoring wells and three shallow bedrock monitoring wells will be installed in Spring/Summer 2024 (**Figure 2**). These newly installed monitoring wells will be incorporated into the zones associated with this Interim LTM Plan as applicable. Specifically, wells are expected to be incorporated as follows:

- Up to three overburden monitoring wells to be added to the Northern Plume Zone
- Three overburden monitoring wells to be added to the Southern Plume Zone
- Up to five overburden and three bedrock monitoring wells to be added to the Boundary Zone

In addition to groundwater monitoring, surface water samples will be collected from six locations (two in the North Branch of Ditch A; two in Ditch C; two in Ditch D) on a semi-annual basis during the period of the Interim LTM Plan. Surface water elevations will also be measured at eight locations (three along the West Branch of Ditch A; three along the North Branch of Ditch A; one along Ditch D; one on the connecting ditch between Ditches A and D) on a semi-annual basis in the first year of the Interim LTM and annually thereafter.

The remainder of this Interim LTM Plan describes the proposed monitoring tasks, schedule, and methods to be employed. Sampling protocols, analytical methods, and quality assurance/quality control measures applicable to this plan are documented in the Final Quality Assurance Project Plan (QAPP; Arcadis 2023a).

2 Interim Long Term Monitoring Plan Components

The Interim LTM Plan includes three major components: groundwater sampling, surface water sampling, and water level measurements. This section describes each data type, the purpose of collecting the data, and data collection locations. The sampling schedule for each data type is described in **Section 3**. Sampling methods are described in **Section 4**.

2.1 Groundwater Sampling

The existing monitoring well network associated with the Site is divided into the following monitoring programs and zones (**Table 1; Figure 2**): FTC (Non-GETS); GETS Network; Northern Plume; Southern Plume; Boundary Zone; and Deep Well Network. As described in **Section 1**, monitoring related to the GETS and deep aquifer well program is not included in this Interim LTM Plan as they are currently covered under other approved programs. The zone-specific groundwater sampling programs associated with this Interim LTM Plan are described below in **Sections 2.1.1 through 2.1.4**.

2.1.1 FTC (Non-GETS) Well Network

The FTC (Non-GETS) Zone encompasses monitoring wells on the Outdoor Testing and Training Area (OTA) and surrounding areas on or proximal to the Site that are not already included/sampled as part of the GETS program.

Purpose	Monitor trends within the OTA and surroundings
Monitoring Locations	24 existing monitoring wells (23 overburden; 1 bedrock) as shown on Figures 2 and 3 and listed in Table 2

2.1.2 Northern Plume Well Network

The Northern Plume Sampling Zone is northeast of the Site and GETS Network.

Purpose	Track plume stability and attenuation north of the Site
Monitoring Locations	<ul style="list-style-type: none"> • 18 existing monitoring wells (10 overburden; 8 bedrock) as shown on Figures 2 and 4 and listed in Table 2 • Up to three new overburden monitoring wells as shown on Figure 2

2.1.3 Southern Plume Well Network

The Southern Plume Sampling Zone is southeast of the FTC (Non-GETS) Zone and GETS Network.

Purpose	Track plume stability and attenuation south of the Site
Monitoring Locations	<ul style="list-style-type: none"> • 21 existing monitoring wells (18 overburden; 3 bedrock) as shown on Figures 2 and 5 and listed in Table 2 • Up to three new overburden monitoring wells as shown on Figure 2

2.1.4 Boundary Zone Well Network

The Boundary Zone forms a perimeter around the other zones and extends as far south as Rader Road.

Purpose	Confirm that the plume is stable and not expanding
Monitoring Locations	<ul style="list-style-type: none"> • 21 existing monitoring wells (18 overburden; 3 bedrock) as shown on Figures 2 through 5 and listed in Table 2 • Up to five new overburden and three new bedrock monitoring wells as shown on Figure 2

Existing monitoring wells located south of Rader Road are outside of the plume and boundary zone, and therefore, are not included in the Boundary Zone. These monitoring wells (**Table 1**) are proposed to be abandoned in accordance with NR 141 Wis. Admin. Code.

2.2 Ditch Surface Water Sampling

Surface water samples will be collected from Ditches A, C, and D, at previously-sampled locations. Surface water monitoring in Ditch B is associated with the GETS LTM and is not included in this Interim LTM Plan.

Purpose	<ul style="list-style-type: none"> • Confirm that the groundwater plume is not expanding • Confirm that surface water concentrations are decreasing
Monitoring Locations	<p>As shown on Figure 6 and listed in Table 4:</p> <ul style="list-style-type: none"> • Two previously sampled locations in the North Branch of Ditch A • Two previously sampled locations in Ditch C • Two previously sampled locations in Ditch D

2.3 Groundwater and Surface Water Gauging

Groundwater and surface water elevations will be measured, as applicable, during groundwater and surface water sampling events. Gauging associated with this Interim LTM Plan is anticipated to be completed concurrently with gauging associated with the GETS program, minimally on an annual basis, to obtain a comprehensive “snap-shot” of water levels.

Purpose	Document groundwater flow patterns and assess long-term water-level trends.
Monitoring Locations	<p>Groundwater gauging locations, as shown on Figures 2 through 5 and listed in Table 2:</p> <ul style="list-style-type: none"> • 84 existing monitoring wells within the FTC (Non-GETS), Northern Plume, Southern Plume, and Boundary Zone • Up to 14 new monitoring wells with the Northern Plume, Southern Plume, and Boundary Zone <p>Surface water gauging locations, as shown on Figure 6 and listed in Table 3:</p> <ul style="list-style-type: none"> • Three existing surveyed benchmarks along the West Branch of Ditch A • Three existing surveyed benchmarks along the North Branch of Ditch A • One existing surveyed benchmark along Ditch D • One existing surveyed benchmark along the connecting section of Ditches A and D

3 Monitoring Schedule

This section describes the anticipated schedule for data collection in each year of the Interim LTM Plan. The schedule is subject to change and details regarding changes described in **Section 3.2**.

3.1 Five-Year Monitoring Schedule

The Interim LTM Plan will be implemented over a five-year period. At the end of the five-year period, a final LTM Plan, incorporating all the monitoring programs associated with the Site, will be prepared for submittal to the WDNR. Sampling frequencies of monitoring wells may be adjusted as described in the plan modifications, which are listed below and discussed in detail in **Section 3.2**.

Groundwater Monitoring Schedule

Year	Zone	Monitoring Frequency	Plan Modifications
1	FTC (Non-GETS)	Semi-Annual (2 Events)	None
	Northern and Southern Plumes		
	Boundary Zone	Semi-Annual (2 Events); Subset of 10 MWs to be sampled quarterly (2 Additional Events)	
2	FTC (Non-GETS)	Semi-Annual (2 Events)	No sampling at a MW if sampling reduced to biennial (every two years): <ul style="list-style-type: none"> • If PFAS concentrations < criteria in both sampling events in Year 1 • If MWs are redundant within a cluster based on Year 1 PFAS results
	Northern and Southern Plumes	Annual (1 Event)	
	Boundary Zone	Annual (1 Event); Subset of 10 MWs to be sampled quarterly (3 Additional Events)	
3	FTC (Non-GETS)	Annual + Biennial (1 Event) (i.e., All FTC Zone MWs sampled)	None
	Northern and Southern Plumes	Annual + Biennial (1 Event) (i.e., All Northern and Southern Plume Zone MWs sampled)	
	Boundary Zone	Annual (1 Event)	
4	FTC (Non-GETS)	Annual (1 Event)	No sampling at a MW if sampling reduced to biennial: <ul style="list-style-type: none"> • If PFAS concentrations < criteria for 2 or more consecutive events (Years 1- 3) • If MWs are redundant within a cluster based on Years 1-3 PFAS results
	Northern and Southern Plumes	Annual (1 Event)	
	Boundary Zone	No Sampling	
5	FTC (Non-GETS)	Annual + Biennial (1 Event) (i.e., All FTC Zone MWs sampled)	None
	Northern and Southern Plumes	Annual + Biennial (1 Event) (i.e., All Northern and Southern Plume Zone MWs sampled)	
	Boundary Zones	Biennial (1 Event)	

Surface Water Monitoring Schedule

Year	Ditch	Monitoring Frequency	Plan Modifications
1 - 5	A, C, D	Semi-Annual (2 Events)	None

3.2 Monitoring Schedule Modifications

This Interim LTM Plan contains conditional elements of the groundwater monitoring plan, designed to account for seasonality and provide flexibility for reducing sampling redundancies. The conditional elements of the plan are as follows:

- At a minimum, all monitoring wells included in this plan will be sampled semi-annually (i.e., wet season and dry season) for the first year to account for seasonality. The results of the semi-annual sampling events will be reflected in the timing of the subsequent annual sampling events (i.e., annual sampling will be completed during the time of year that exhibited overall higher PFAS concentrations across all monitoring zones).
- The sampling frequency for a monitoring well inside the plume may be reduced to biennial if PFAS concentrations are less than criteria¹ for two consecutive events. Reductions in sampling frequency at monitoring wells within the FTC (Non-GETS) Zone and the Northern and Southern Plume Zones will be evaluated after Year 1 (before Year 2 monitoring) and after Year 3 (before Year 4 monitoring).
- The sampling frequency for a monitoring well may be reduced to biennial if the well is determined to be redundant within the well cluster (i.e., the monitoring well is screened within the same hydrostratigraphic unit and has similar PFAS concentrations) after two consecutive events. Reductions in sampling frequency at monitoring wells within the FTC (Non-GETS) Zone and the Northern and Southern Plume Zones will be evaluated after Year 1 (before Year 2 monitoring) and after Year 3 (before Year 4 monitoring).
- After five years of monitoring, the monitoring well network and sampling frequencies will be reviewed and refined prior to implementing the final LTM Plan.

All modifications to the sampling frequencies will be provided to WDNR in routine reporting described in **Section 6**.

¹ At this time, there are no established enforcement standards for PFAS in groundwater. PFAS concentrations will be compared to the Recommended Enforcement Standards provided in **Table 5** to evaluate reductions in monitoring well sampling frequencies. If Enforcement Standards are promulgated during the implementation of the Interim LTM Plan, the criteria for reducing sampling frequency will be re-evaluated.

4 Field Methods

The field methodologies for groundwater and surface water monitoring are described in this section.

4.1 Groundwater Monitoring

4.1.1 Manual Water-Level Measurements

Water elevations will be manually measured using a water-level meter at existing and proposed monitoring wells (**Table 2**). When gauging and sampling events occur concurrently, water elevations will be measured prior to sample collection. Monitoring wells will be gauged for depth to water and depth to the bottom of the well at all locations identified in **Table 2** at least annually².

4.1.2 Groundwater Sample Collection

Low-flow sampling procedures will be implemented for groundwater sampling, using a peristaltic pump and dedicated down-well disposable tubing, at existing and proposed monitoring wells (**Table 2**). Analytical samples will be collected after groundwater parameters measured with a field probe, including dissolved oxygen, pH, specific conductivity, and oxidation-reduction potential, are shown to have stabilized at each well in accordance with the QAPP (Arcadis 2023a) procedures. At any location where drawdown does not stabilize during the low-flow sampling attempt, low-flow sampling will be discontinued and, minimally, one well volume will be purged using a PFAS-free submersible pump in accordance with the QAPP; a sample will be collected after the water level in the monitoring well has recovered at least five feet.

Samples will be collected for PFAS analysis following the procedures described in **Section 5**.

4.2 Surface Water Monitoring

4.2.1 Surface Water Elevation Measurements

Water surface elevation measurements of Ditches A and D will be collected at eight existing surveyed benchmark locations where the ditch is crossed by roads (**Table 3**). Water levels will be measured using a tape or rod extending directly down to the water surface from marked surveyed measuring points.

4.2.2 Ditch Surface Water Sample Collection

Surface water sample collections will take place in Ditches A, C and D at six previously sampled locations (**Table 4**). Surface water samples will be collected by dipping a sample bottle below the surface of the water. Samples will be analyzed for PFAS following the procedures described in **Section 5**.

² A comprehensive round of water level measurements will be collected twice in Year 1 during the quarterly sampling events. In Years 2 through 5, a comprehensive round of water level measurements will be collected annually. Monitoring wells that are sampled biennially will be included in all comprehensive rounds of water level measurements.

5 Quality Assurance and Quality Control

5.1 Special Considerations for PFAS Sampling

The detection of PFAS compounds at very low concentrations can be influenced by common PFAS-containing materials that may be present at the sampling site. Therefore, to minimize the potential for cross-contamination, special attention will be given to sampling materials (e.g., tubing), decontamination procedures, and clothing and personal care products used by sampling personnel. Detailed standard operating procedures that will be followed during investigation activities are provided in the QAPP (Arcadis 2023a).

Quality assurance samples are specified in the QAPP for each type of media to be sampled. Sampling for PFAS compounds will include the submission of one laboratory-supplied field reagent blank per day to detect the presence of ambient PFAS in the sampling area that may influence samples during collection. PFAS-free water used for the field reagent blank sample will be brought to the Site in a laboratory-supplied bottle. Field staff will transfer the laboratory-supplied PFAS-free water into an empty sample bottle. This field reagent blank will be placed in the same cooler as other samples intended for PFAS analyses.

Equipment will be decontaminated with PFAS-free water between use at each sampling location. Only Alconox, Liquinox, or methanol will be used as decontamination materials. To assess the adequacy of the decontamination process, an equipment rinsate blank will be collected every 20 samples or per day, whichever is more frequent. To prepare a rinsate blank, a sample of PFAS-free water will be poured over or through decontaminated field equipment before collection of environmental samples.

5.2 Laboratory Methods and Analysis

Details regarding the analytical methods to be used for each media are provided in the QAPP (Arcadis 2023a). The laboratory methods to be used for the proposed analytical parameters, along with the recommended frequency for collection of matrix spike/matrix spike duplicate and duplicate samples, are summarized below. Media analyzed for PFAS will be analyzed for the 36 PFAS analytes required by WDNR (WDNR 2020) and listed in the QAPP.

Laboratory Methods and QA/QC Frequency

Matrix	Parameter	Laboratory Method	Matrix Spike/ Matrix Spike Duplicate Frequency	Field Duplicate Frequency	Field Reagent Blank Frequency	Equipment Rinsate Blank Frequency
Water	PFAS	Modified USEPA 537 (36 compounds)	1/20	1/10	1/day	1/20
Water	TSS	USEPA 160.2	None	1/10	None	None

6 Reporting

Routine reports summarizing the results of the Interim LTM will be prepared and submitted to WDNR. Reports of monitoring results are to be submitted after each sampling event (NR 724.17(3m)) in accordance with the notification requirements outlined in NR 716.14. However, because the monitoring activities will be completed routinely for many years, an alternate notification schedule is proposed.

Reports are proposed to be submitted to WDNR semi-annually in Years 1 and 2 and annually in Years 3, 4, and 5; therefore, a total of seven reports are proposed to be submitted. Reports are proposed to be submitted within 30 days of receipt of all laboratory analytical data collected during the reporting period.

At a minimum, reports will include:

- a brief summary of the activities completed during the reporting period;
- applicable data tables and figures summarizing monitoring results (i.e., analytical data and water elevations);
- laboratory reports, data validation reports, and field sampling logs; and,
- an updated groundwater sampling plan table to capture planned reductions in sampling frequencies, if any, for the next reporting period and justifications for the reductions.

At least annually, data trend plots for perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) will be included in reporting for wells in the Boundary Zone that are proposed to be sampled quarterly in Years 1 and 2.

Surface water analytical results will be compared to 95 nanograms per liter (ng/L) for PFOA and 8 ng/L for PFOS (**Table 5**). The groundwater analytical results will be compared to the Wisconsin Department of Health Services recommended groundwater quality enforcement standards (ES) for PFAS compounds (**Table 5**). If ES are promulgated for groundwater during the implementation of the Interim LTM Plan, the criteria for reducing sampling frequency will be re-evaluated.

At the conclusion of the 5-year Interim LTM period, a final LTM Plan will be prepared for submittal to WDNR incorporating all the monitoring programs associated with the Site. The final LTM Plan will be a comprehensive plan and will incorporate the GETS LTM and deep aquifer well LTM. This final plan will be submitted to WDNR within 60 days of submission of the seventh (final) routine report associated with the Interim LTM Plan.

7 References

Arcadis. 2021. Long-Term Monitoring Plan for the Groundwater Extraction and Treatment System, Tyco Fire Technology Center, Marinette, Wisconsin 54143, BRRTS No. 02-38-580694. July 16.

Arcadis. 2023a. Final Quality Assurance Project Plan Addendum, Tyco Per- and Polyfluoroalkyl Substances (PFAS) Site Investigation and Private Well Sampling Activities, Marinette, Wisconsin. May 1.

Arcadis. 2023b. 2023 Additional Site Investigation Work Plan, Tyco FTC PFAS, 2700 Industrial Parkway South, Marinette, Wisconsin. August 24.

Arcadis. 2022. Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan. September 27.

WDNR. 2020. Letter from David Neste. May 27.

Tables

Table 1
Monitoring Well Construction
Interim LTM Plan
Tyco Fire Technology Center
Marinette, Wisconsin

Well ID	Area	Year Installed	Zone	Northing	Easting	Ground Elevation (ft NAVD88)	Top of Casing Elevation (ft NAVD88)	Survey Date	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Surface Finish
FTC (non-GETS) Plume Well Group											
HMW-2-3S ¹	FTC	-	S	461171.6	2576750.1	611.3	613.19	12/06/22	6	16	SU
HMW-2-3D ¹	FTC	-	D	461173.3	2576753.0	611.4	614.37	12/06/22	32	42	SU
FTC-2S	FTC	1993	S	462333.2	2577206.6	611.3	611.08	05/10/21	5	15	FM
FTC-2D	FTC	1993	D	462335.3	2577215.4	611.5	611.15	05/10/21	27	32	FM
FTC-31	FTC	1995	S	462049.3	2577284.7	NA	610.28	08/16/16	3	13	FM
FTC-34S	FTC	1996	S	462115.2	2577669.0	NA	608.50	08/16/16	3	13	FM
FTC-34D	FTC	1996	D	462117.0	2577666.1	NA	608.72	08/16/16	28	33	FM
FTC-44	FTC	2003	S	461808.4	2577590.8	NA	611.30	08/16/16	5	15	SU
PZ-4S ²	FTC	2010	D	NA	NA	NA	607.89	NA	36	41	SU
PZ-11	FTC	NA	D	461872.6	2578131.0	NA	611.41	04/29/16	41	46	SU
PZ-14S	FTC	NA	S	462736.7	2577956.9	NA	610.77	08/16/16	4	19	SU
PZ-14D	FTC	NA	D	462739.6	2577964.8	NA	611.15	08/16/16	25	35	SU
PZ-67-16	FTC	2022	S	462134.2	2576628.1	611.8	611.43	08/31/22	6	16	FM
PZ-9	FTC	NA	D	463351.7	2578076.4	NA	611.16	08/16/16	38	43	SU
PZ-19	FTC	NA	D	463133.7	2580048.4	NA	608.70	04/29/16	27	37	SU
PZ-59-21	Offsite	2022	S	463843.5	2575547.5	613.6	613.12	08/31/22	11	21	FM
PZ-65-16	FTC	2022	S	463214.8	2577133.1	610.1	609.72	08/31/22	6	16	SU
PZ-65-33	FTC	2022	D	463220.8	2577133.1	609.9	610.09	08/31/22	28	33	SU
PZ-67-40	FTC	2022	D	462145.5	2576625.0	611.7	611.35	08/31/22	35	40	FM
PZ-68-16	FTC	2022	S	462087.9	2575878.5	610.9	613.51	08/31/22	6	16	SU
PZ-68-26	FTC	2022	D	462079.6	2575878.1	611.0	613.92	08/31/22	21	26	SU
PZ-68-66	FTC	2022	BR	462099.6	2575885.2	610.9	613.55	12/06/22	61	66	SU
PZ-69-24	FTC	2022	S	462530.0	2579219.3	612.3	614.75	12/06/22	14	24	SU
PZ-69-43	FTC	2022	D	462533.4	2579214.7	614.5	612.23	12/06/22	38	43	SU
Northern Plume Well Group											
PZ-28-14	Offsite	2019	S	467125.0	2583162.7	594.7	594.41	09/09/21	9	14	FM
PZ-28-54	Offsite	2019	D	467123.2	2583168.6	594.8	594.47	09/09/21	49	54	FM
PZ-28-75	Offsite	2020	BR	467127.7	2583152.3	594.6	594.29	01/07/21	65	75	FM
PZ-63-60	Offsite	2022	BR	466843.7	2582055.9	594.7	594.15	12/06/22	55	60	FM
MW013S-R	Offsite	2022	S	469102.59	2583254.96	589.94	589.35	12/06/22	9	19	FM
MW013M-R	Offsite	2022	D	469092.91	2583271.22	589.86	589.26	12/06/22	30	35	FM
MW013D-R	Offsite	2022	BR	469097.89	2583262.63	589.91	589.60	12/06/22	41	46	FM
MW125S-20	Offsite	2020	S	468124.9	2582658.0	596.5	596.16	01/07/21	10	20	FM
MW125M-35	Offsite	2020	D	468123.8	2582646.8	596.6	596.26	01/07/21	30	35	FM
MW125D-60	Offsite	2020	BR	468123.1	2582652.0	596.4	596.03	01/07/21	50	60	FM
MW128S-17	Offsite	2022	S	468745.6	2584546.1	595.6	595.14	12/06/22	7	17	FM
MW128M-30	Offsite	2022	D	468739.6	2584544.3	595.7	595.16	12/06/22	25	30	FM
MW129S-21	Offsite	2022	S	468500.1	2585920.6	586.1	585.33	12/06/22	11	21	FM
MW129M-45	Offsite	2022	D	468494.0	2585918.9	586.0	585.57	12/06/22	40	45	FM
MW042D	Stanton	-	BR	469846.6	2584162.1	NA	587.2	NA	50	55	SU
MW046D	Stanton	-	BR	469473.3	2585481.9	NA	585.0	NA	53.5	58.51	SU
MW064D	Stanton	-	BR	469426.3	2584598.4	NA	588.8	NA	51.7	56.69	SU
MW118D-R	Stanton	-	BR	470462.1	2584807.0	NA	585.6	NA	47	52	FM

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Southern Plume Well Group											
TW-03	Offsite	2018	S	458244.3	2580830.6	598.3	598.07	11/06/18	10	20	FM
MW-101-16	Offsite	2018	S	459912.1	2580497.8	603.4	603.18	09/06/18	6	16	FM
MW-101-72	Offsite	2018	D	459907.9	2580496.3	603.5	603.20	09/06/18	62	72	FM
PZ-33-12	Offsite	2019	S	460123.9	2582902.9	594.7	594.33	09/09/21	7	12	FM
PZ-33-33	Offsite	2019	D	460123.7	2582897.4	594.6	594.33	09/09/21	28	33	FM
PZ-33-67	Offsite	2019	D	460123.1	2582892.7	594.6	594.42	09/09/21	57	67	FM
PZ-33-105	Offsite	2022	BR	459912.9	2582765.6	594.4	594.19	12/06/22	100	105	FM
PZ-34-17	Offsite	2019	S	457159.4	2583554.2	591.1	590.78	09/09/21	7	17	FM
PZ-34-84	Offsite	2019	D	457164.3	2583555.2	591.3	590.87	09/09/21	74	84	FM
PZ-35-17	Offsite	2019	S	459506.0	2577175.7	608.7	608.18	09/09/21	7	17	FM
PZ-35-37	Offsite	2019	D	459501.9	2577178.8	608.7	608.20	09/09/21	32	37	FM
PZ-35-48	Offsite	2019	D	459497.4	2577182.1	608.5	608.16	09/09/21	43	48	FM
PZ-46-19	Offsite	2020	S	459758.8	2578839.8	604.3	603.91	01/07/21	9	19	FM
PZ-46-40	Offsite	2020	D	459758.1	2578828.6	604.4	603.99	01/07/21	30	40	FM
PZ-46-65	Offsite	2020	D	459757.7	2578819.8	604.2	603.82	01/07/21	60	65	FM
PZ-70-17	FTC	2022	S	460233.9	2577370.9	608.7	611.46	12/06/22	7	17	SU
PZ-70-33	FTC	2022	D	460231.0	2577365.8	608.6	611.11	12/06/22	28	33	SU
PZ-70-55	FTC	2022	D	460222.5	2577349.2	609.2	611.95	12/06/22	50	55	SU
PZ-70-83	FTC	2022	BR	460225.2	2577361.7	608.6	611.57	12/06/22	73	83	SU
PZ-71-111	Offsite	2022	BR	461300.0	2580741.4	605.8	605.23	12/06/22	101	111	FM
PZ-76-34	Offsite	2022	D	459789.7	2584628.1	592.8	592.29	12/06/22	29	34	FM
Boundary Zone Well Group											
MW-100-32	Offsite	2018	D	457304.1	2578843.5	602.1	601.45	09/06/18	22	32	FM
MW-100-68	Offsite	2018	D	457304.3	2578849.0	602.1	601.83	09/06/18	58	68	FM
MW126S-20	Offsite	2020	S	469387.1	2581781.3	598.4	598.06	01/07/21	10	20	FM
MW126D-40	Offsite	2020	BR	469386.5	2581775.5	598.4	597.79	01/07/21	30	40	FM
TW-01	Offsite	2018	S	454749.4	2580449.1	594.7	594.47	11/06/18	9.5	19.5	FM
TW-02	Offsite	2018	S	456286.9	2580955.6	594.1	593.85	11/06/18	10	20	FM
TW-04	Offsite	2018	S	455223.9	2583148.3	593.9	593.60	11/06/18	10	20	FM
TW-05	Offsite	2018	S	454646.6	2578511.1	597.8	597.52	11/06/18	10	20	FM
PZ-26-11	Offsite	2019	S	466609.4	2579203.4	597.9	597.77	09/09/21	6	11	FM
PZ-26-36	Offsite	2022	BR	466619.3	2579206.6	597.0	596.14	12/06/22	31	36	FM
PZ-44-73	Offsite	2019	D	454734.7	2580183.8	595.2	594.63	09/09/21	63	73	FM
PZ-60-20	Offsite	2022	S	461877.2	2574148.8	612.9	612.50	08/31/22	10	20	FM
PZ-61-11	Offsite	2022	S	463970.7	2587161.1	585.4	584.99	08/31/22	6	11	FM
PZ-62-62	Offsite	2022	D	466239.8	2586295.7	585.0	584.59	12/06/22	57	62	FM
PZ-66-20	FTC	2022	S	460222.5	2575675.8	613.9	616.07	12/06/22	10	20	SU
PZ-66-57	FTC	2022	D	460538.8	2575677.4	614.6	617.26	12/06/22	52	57	SU
PZ-73-16	Offsite	2022	S	455740.3	2578713.6	601.7	601.23	12/06/22	6	16	FM
PZ-73-75	Offsite	2022	D	455736.0	2578704.5	601.9	601.37	12/06/22	70	75	FM
PZ-75-18	Offsite	2022	S	457336.4	2577001.7	605.5	605.13	12/06/22	8	18	FM
PZ-77-16	Offsite	2022	S	458682.5	2575530.9	606.9	609.79	12/06/22	5.7	15.7	SU
PZ-78-74	Offsite	2022	BR	467282.2	2586583.8	586.1	585.66	12/06/22	71.5	73.5	FM

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GETS Well Group³											
PZ-1D	FTC	2010	BR	463765.5	2579848.6	NA	606.2	08/16/16	63.5	68.5	SU
PZ-3	FTC	2010	D	462780.0	2579903.6	NA	609.2	08/16/16	38.0	43	SU
PZ-4D	FTC	2010	BR	462514.6	2578515.2	605.8	607.9	01/07/21	68.5	73.5	SU
PZ-15S	FTC	NA	S	463911.0	2579668.7	605.2	608.2	05/10/21	4.0	19	SU
PZ-15D	FTC	NA	D	463914.2	2579671.3	605.0	608.2	05/10/21	22.0	32	SU
PZ-16S	FTC	NA	S	463910.1	2579069.6	NA	609.3	04/29/16	4.0	19	SU
PZ-16D	FTC	NA	D	463913.8	2579072.1	NA	609.0	04/29/16	28.0	38	SU
PZ-18D	FTC	NA	D	462752.5	2579763.4	NA	609.6	08/16/16	37.0	47	SU
PZ-22S	FTC	NA	S	462770.3	2579826.4	NA	609.7	04/29/16	10.0	20	SU
PZ-22D	FTC	NA	D	462767.2	2579825.1	NA	609.6	04/29/16	31.0	41	SU
PZ-23	Offsite	2017	D	464564.7	2580218.1	597.9	597.6	05/24/22	35.0	40	FM
PZ-24-17	Offsite	2019	S	461565.5	2580738.8	605.2	604.8	09/09/21	7.0	17	FM
PZ-24-47	Offsite	2019	D	461570.2	2580738.9	605.6	604.7	09/09/21	37.0	47	FM
PZ-25-17	Offsite	2019	S	465263.6	2579969.3	598.6	598.3	09/09/21	7.0	17	FM
PZ-29-17	Offsite	2019	S	465386.4	2581734.1	593.9	593.6	09/09/21	7.0	17	FM
PZ-29-43	Offsite	2019	D	465386.3	2581729.5	593.8	593.5	09/09/21	38.0	43	FM
PZ-29-68	Offsite	2020	BR	465386.4	2581721.4	593.7	593.5	01/07/21	58.0	68	FM
PZ-30-12	Offsite	2019	S	464126.0	2582520.2	594.6	594.3	09/09/21	7.0	12	FM
PZ-30-45	Offsite	2019	D	464123.4	2582525.0	594.5	594.2	09/09/21	35.0	45	FM
PZ-30-59	Offsite	2019	D	464121.2	2582529.1	594.4	594.2	09/09/21	54.0	59	FM
PZ-31-17	Offsite	2019	S	462494.2	2582369.0	595.8	595.5	09/09/21	7.0	17	FM
PZ-31-40	Offsite	2019	D	462490.8	2582364.0	595.7	595.4	09/09/21	35.0	40	FM
PZ-31-53	Offsite	2019	D	462491.4	2582374.6	595.8	595.2	09/09/21	48.0	53	FM
PZ-32-18	Offsite	2019	S	461901.1	2583990.8	591.6	591.2	09/09/21	8.0	18	FM
PZ-32-72	Offsite	2019	D	461908.3	2583990.8	591.7	591.2	09/09/21	67.0	72	FM
PZ-45-31	Offsite	2020	D	463858.4	2579412.7	605.7	607.9	01/07/21	21.0	31	SU
PZ-47-40	FTC	2021	D	463488.1	2578741.0	608.2	611.0	09/09/21	35	40	SU
PZ-51-38	Offsite	2021	D	463344.4	2582027.2	594.9	594.4	09/09/21	33.0	38	FM
PZ-53-40	Offsite	2021	D	461921.2	2582490.5	596.0	595.7	09/09/21	35	40	FM
PZ-55-64	Offsite	2021	D	462662.5	2580658.8	616.5	616.3	09/09/21	59	64	FM
PZ-56-42	Offsite	2021	D	463289.6	2580664.2	605.9	605.4	09/09/21	37.2	42.2	FM
PZ-57-38	Offsite	2021	D	462908.7	2583829.9	594.3	594.0	09/09/21	33.0	38	FM
PZ-58-40	Offsite	2022	D	462256.6	2582444.3	596.6	596.4	08/31/22	35.0	40	FM
PZ-58-50	Offsite	2022	D	462249.5	2582444.4	596.8	596.4	12/06/22	45.0	50	FM
MW-EX-2	FTC	2021	D	463835.9	2579741.4	604.4	606.8	12/06/22	19.5	29.5	SU
MW-EX-3	Offsite	2021	D	464476.0	2580784.0	592.5	594.9	12/06/22	22.0	27	SU
MW-EX-4	Offsite	2021	D	464231.5	2581108.9	592.9	595.5	12/06/22	22.0	27	SU
MW-EX-5	Offsite	2021	D	463913.1	2581502.3	592.3	594.5	12/06/22	45.0	50	SU
Deep Monitoring Well Network⁴											
DMW-01	Offsite	2023	BR	459755.8	2578796.8	604.4	605.8	05/19/23	153.0	460	SU
DMW-02	Offsite	2023	BR	459892.0	2582759.9	594.2	595.8	05/19/23	168.0	500	SU
DMW-03	Offsite	2023	BR	455458.8	2581137.1	593.8	595.6	12/06/23	153.0	510	SU
DMW-04	Offsite	2023	BR	457140.0	2583550.1	591.1	590.8	12/06/23	168.0	500	SU

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Monitoring Wells Proposed to be Abandoned (South of Rader Road)											
PZ-36-19	Offsite	2019	S	453114.4	2582364.3	590.4	589.9	09/09/21	9.0	19	FM
PZ-36-38	Offsite	2019	D	453114.1	2582371.0	590.4	589.9	09/09/21	33.0	38	FM
PZ-36-85	Offsite	2019	D	453113.9	2582376.2	590.5	590.0	09/09/21	80.0	85	FM
PZ-37-12	Offsite	2019	S	451323.3	2581905.2	589.3	588.9	09/09/21	7.0	12	FM
PZ-37-29	Offsite	2019	D	451323.0	2581900.0	589.4	589.0	09/09/21	19.0	29	FM
PZ-37-75	Offsite	2019	D	451322.7	2581895.2	589.4	589.0	09/09/21	65.0	75	FM
PZ-38-17	Offsite	2019	S	450592.2	2580685.1	592.2	591.8	09/09/21	7.0	17	FM
PZ-38-75	Offsite	2019	D	450587.8	2580683.8	592.3	591.9	09/09/21	65.0	75	FM
PZ-41-17	Offsite	2019	S	452089.3	2578723.3	595.3	594.9	09/09/21	7.0	17	FM
PZ-41-84	Offsite	2019	D	452089.0	2578718.6	595.2	594.8	09/09/21	74.0	84	FM
PZ-42-17	Offsite	2019	S	451824.9	2580449.4	592.5	592.1	09/09/21	7.0	17	FM
PZ-42-76	Offsite	2019	D	451824.9	2580454.0	592.5	592.2	09/09/21	66.0	76	FM
PZ-43-19	Offsite	2019	S	452660.3	2580933.3	592.9	592.4	09/09/21	9.0	19	FM
PZ-43-80	Offsite	2019	D	452647.9	2580928.5	592.5	592.0	09/09/21	75.0	80	FM

Notes:

- (1) Bottom of screen is measured total depth, but all were soft bottoms. HMW-2-3 series wells have slotted screens with threaded joints.
- (2) The top of casing elevation for PZ-4S is not available. The groundwater elevation shown has been estimated by calculating the approximate top of casing elevation by measuring the length of the stickup above ground surface and adding the length to the surveyed ground surface elevation at nearby PZ-4D.
- (3) The GETS well network is inclusive of all monitoring wells that are sampled and/or gauged in accordance with the GETS LTM Plan (Arcadis 2021); however select wells identified in other LTM well network groups (e.g. PZ-68-16 in the FTC Well Network) are gauged as part of the GETS LTM.
- (4) The deep monitoring well network is inclusive of monitoring wells that are sampled and/or gauged in accordance with the Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan (Arcadis 2022). These monitoring wells are not screened and are open borehole at the depths indicated in the table.

Vertical Datum: North American Vertical Datum (NAVD) 1988

Acronyms/Abbreviations:

bgs = below ground surface

ft = feet

FTC = Fire Technology Center

LTM = long term monitoring

GETS = groundwater extraction and treatment system

NA = not available

Zone screened abbreviations: S = shallow overburden < 25 feet deep; D = deep overburden > 25 feet deep; BR = bedrock

Surface finish abbreviations: FM = flush mount; SU = stick up

Table 2
Groundwater Monitoring Plan
Interim LTM Plan
Tyco Fire Technology Center
Marinette, Wisconsin

Well ID	Area	Zone	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Year 1: Semi-Annual Sampling - All Wells in All Groups; Quarterly Sampling - Select Boundary Zone Wells				Year 2 ¹ : Annual Sampling - Boundary Zone, Northern and Southern Plume Groups; Semi-Annual Sampling - FTC; Quarterly Sampling - Select Boundary Zone Wells				Year 3: Annual/Biennial Sampling - All MWs in All Groups	Year 4 ² : Annual Sampling - FTC, Northern and Southern Plume Groups	Year 5: Annual/Biennial Sampling - All MWs in All Groups
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q2/Q4 ³	Q2/Q4 ³	Q2/Q4 ³
FTC (non-GETS) Well Group															
HMW-2-3S	FTC	S	6	16		X		X		X		X	X	X	X
HMW-2-3D	FTC	D	32	42		X		X		X		X	X	X	X
FTC-2S	FTC	S	5	15		X		X		X		X	X	X	X
FTC-2D	FTC	D	27	32		X		X		X		X	X	X	X
FTC-31	FTC	S	3	13		X		X		X		X	X	X	X
FTC-34S	FTC	S	3	13		X		X		X		X	X	X	X
FTC-34D	FTC	D	28	33		X		X		X		X	X	X	X
FTC-44	FTC	S	5	15		X		X		X		X	X	X	X
PZ-4S	FTC	D	36	41		X		X		X		X	X	X	X
PZ-11	FTC	D	41	46		X		X		X		X	X	X	X
PZ-14S	FTC	S	4	19		X		X		X		X	X	X	X
PZ-14D	FTC	D	25	35		X		X		X		X	X	X	X
PZ-67-16	FTC	S	6	16		X		X		X		X	X	X	X
PZ-9	FTC	D	38	43		X		X		X		X	X	X	X
PZ-19	FTC	D	27	37		X		X		X		X	X	X	X
PZ-59-21	Offsite	S	11	21		X		X		X		X	X	X	X
PZ-65-16	FTC	S	6	16		X		X		X		X	X	X	X
PZ-65-33	FTC	D	28	33		X		X		X		X	X	X	X
PZ-67-40	FTC	D	35	40		X		X		X		X	X	X	X
PZ-68-16	FTC	S	6	16		X		X		X		X	X	X	X
PZ-68-26	FTC	D	21	26		X		X		X		X	X	X	X
PZ-68-66	FTC	BR	61	66		X		X		X		X	X	X	X
PZ-69-24	FTC	S	14	24		X		X		X		X	X	X	X
PZ-69-43	FTC	D	38	43		X		X		X		X	X	X	X

Table 2
Groundwater Monitoring Plan
Interim LTM Plan
Tyco Fire Technology Center
Marinette, Wisconsin

Well ID	Area	Zone	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Year 1:		Year 2 ¹ :			Year 3:	Year 4 ² :	Year 5:
					Semi-Annual Sampling - All Wells in All Groups; Quarterly Sampling - Select Boundary Zone Wells		Annual Sampling - Boundary Zone, Northern and Southern Plume Groups; Semi-Annual Sampling - FTC; Quarterly Sampling - Select Boundary Zone Wells			Annual/Biennial Sampling - All MWs in All Groups	Annual Sampling - FTC, Northern and Southern Plume Groups	Annual/Biennial Sampling - All MWs in All Groups
Northern Plume Well Group												
PZ-28-14	Offsite	S	9	14	X	X			X ⁴	X	X	X
PZ-28-54	Offsite	D	49	54	X	X			X ⁴	X	X	X
PZ-28-75	Offsite	BR	65	75	X	X			X ⁴	X	X	X
PZ-63-60	Offsite	BR	55	60	X	X			X ⁴	X	X	X
MW013S-R	Offsite	S	9	19	X	X			X ⁴	X	X	X
MW013M-R	Offsite	D	30	35	X	X			X ⁴	X	X	X
MW013D-R	Offsite	BR	41	46	X	X			X ⁴	X	X	X
MW125S-20	Offsite	S	10	20	X	X			X ⁴	X	X	X
MW125M-35	Offsite	D	30	35	X	X			X ⁴	X	X	X
MW125D-60	Offsite	BR	50	60	X	X			X ⁴	X	X	X
MW128S-17	Offsite	S	7	17	X	X			X ⁴	X	X	X
MW128M-30	Offsite	D	25	30	X	X			X ⁴	X	X	X
MW129S-21	Offsite	S	11	21	X	X			X ⁴	X	X	X
MW129M-45	Offsite	D	40	45	X	X			X ⁴	X	X	X
MW042D	Stanton	BR	50	55	X	X			X ⁴	X	X	X
MW046D	Stanton	BR	53.5	58.51	X	X			X ⁴	X	X	X
MW064D	Stanton	BR	51.7	56.69	X	X			X ⁴	X	X	X
MW118D-R	Stanton	BR	47	52	X	X			X ⁴	X	X	X
<i>Church St MW (PZ-63)</i>	<i>Offsite</i>	<i>S</i>	<i>TBD</i>	<i>TBD</i>	<i>X</i>	<i>X</i>			<i>X⁴</i>	<i>X</i>	<i>X</i>	<i>X</i>
<i>10th St MW(s)</i>	<i>Offsite</i>	<i>S/D</i>	<i>TBD</i>	<i>TBD</i>	<i>X</i>	<i>X</i>			<i>X⁴</i>	<i>X</i>	<i>X</i>	<i>X</i>

Table 2
Groundwater Monitoring Plan
Interim LTM Plan
Tyco Fire Technology Center
Marinette, Wisconsin

Well ID	Area	Zone	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Year 1: Semi-Annual Sampling - All Wells in All Groups; Quarterly Sampling - Select Boundary Zone Wells			Year 2 ¹ : Annual Sampling - Boundary Zone, Northern and Southern Plume Groups; Semi-Annual Sampling - FTC; Quarterly Sampling - Select Boundary Zone Wells			Year 3: Annual/Biennial Sampling - All MWs in All Groups	Year 4 ² : Annual Sampling - FTC, Northern and Southern Plume Groups	Year 5: Annual/Biennial Sampling - All MWs in All Groups	
Southern Plume Well Group														
TW-03	Offsite	S	10	20		X	X			X ⁴	X	X	X	
MW-101-16	Offsite	S	6	16		X	X			X ⁴	X	X	X	
MW-101-72	Offsite	D	62	72		X	X			X ⁴	X	X	X	
PZ-33-12	Offsite	S	7	12		X	X			X ⁴	X	X	X	
PZ-33-33	Offsite	D	28	33		X	X			X ⁴	X	X	X	
PZ-33-67	Offsite	D	57	67		X	X			X ⁴	X	X	X	
PZ-33-105	Offsite	BR	100	105		X	X			X ⁴	X	X	X	
PZ-34-17	Offsite	S	7	17		X	X			X ⁴	X	X	X	
PZ-34-84	Offsite	D	74	84		X	X			X ⁴	X	X	X	
PZ-35-17	Offsite	S	7	17		X	X			X ⁴	X	X	X	
PZ-35-37	Offsite	D	32	37		X	X			X ⁴	X	X	X	
PZ-35-48	Offsite	D	43	48		X	X			X ⁴	X	X	X	
PZ-46-19	Offsite	S	9	19		X	X			X ⁴	X	X	X	
PZ-46-40	Offsite	D	30	40		X	X			X ⁴	X	X	X	
PZ-46-65	Offsite	D	60	65		X	X			X ⁴	X	X	X	
PZ-70-17	FTC	S	7	17		X	X			X ⁴	X	X	X	
PZ-70-33	FTC	D	28	33		X	X			X ⁴	X	X	X	
PZ-70-55	FTC	D	50	55		X	X			X ⁴	X	X	X	
PZ-70-83	FTC	BR	73	83		X	X			X ⁴	X	X	X	
PZ-71-111	Offsite	BR	101	111		X	X			X ⁴	X	X	X	
PZ-76-34	Offsite	D	29	34		X	X			X ⁴	X	X	X	
<i>Green Gable Rd MW (PZ-72)</i>	<i>Offsite</i>	<i>D</i>	<i>TBD</i>	<i>TBD</i>		<i>X</i>	<i>X</i>			<i>X⁴</i>	<i>X</i>	<i>X</i>	<i>X</i>	
<i>1 - Shore Dr MW (PZ-74)</i>	<i>Offsite</i>	<i>S</i>	<i>TBD</i>	<i>TBD</i>		<i>X</i>	<i>X</i>			<i>X⁴</i>	<i>X</i>	<i>X</i>	<i>X</i>	
<i>2 - Shore Dr MW (PZ-74)</i>	<i>Offsite</i>	<i>D</i>	<i>TBD</i>	<i>TBD</i>		<i>X</i>	<i>X</i>			<i>X⁴</i>	<i>X</i>	<i>X</i>	<i>X</i>	

Table 2
Groundwater Monitoring Plan
Interim LTM Plan
Tyco Fire Technology Center
Marinette, Wisconsin

Well ID	Area	Zone	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Year 1: Semi-Annual Sampling - All Wells in All Groups; Quarterly Sampling - Select Boundary Zone Wells				Year 2 ¹ : Annual Sampling - Boundary Zone, Northern and Southern Plume Groups; Semi-Annual Sampling - FTC; Quarterly Sampling - Select Boundary Zone Wells				Year 3: Annual/Biennial Sampling - All MWs in All Groups	Year 4 ² : Annual Sampling - FTC, Northern and Southern Plume Groups	Year 5: Annual/Biennial Sampling - All MWs in All Groups	
Boundary Zone Well Group																
MW-100-32	Offsite	D	22	32	X	X	X	X	X	X	X	X ⁴	X			X
MW-100-68	Offsite	D	58	68	X	X	X	X	X	X	X	X ⁴	X			X
MW126S-20	Offsite	S	10	20				X				X ⁴	X			X
MW126D-40	Offsite	BR	30	40				X				X ⁴	X			X
TW-01	Offsite	S	9.5	19.5				X				X ⁴	X			X
TW-02	Offsite	S	10	20				X				X ⁴	X			X
TW-04	Offsite	S	10	20	X	X	X	X	X	X	X	X ⁴	X			X
TW-05	Offsite	S	10	20				X				X ⁴	X			X
PZ-26-11	Offsite	S	6	11	X	X	X	X	X	X	X	X ⁴	X			X
PZ-26-36	Offsite	BR	31	36	X	X	X	X	X	X	X	X ⁴	X			X
PZ-44-73	Offsite	D	63	73				X				X ⁴	X			X
PZ-60-20	Offsite	S	10	20	X	X	X	X	X	X	X	X ⁴	X			X
PZ-61-11	Offsite	S	6	11				X				X ⁴	X			X
PZ-62-62	Offsite	D	57	62				X				X ⁴	X			X
PZ-66-20	FTC	S	10	20				X				X ⁴	X			X
PZ-66-57	FTC	D	52	57				X				X ⁴	X			X
PZ-73-16	Offsite	S	6	16				X				X ⁴	X			X
PZ-73-75	Offsite	D	70	75				X				X ⁴	X			X
PZ-75-18	Offsite	S	8	18				X				X ⁴	X			X
PZ-77-16	Offsite	S	5.7	15.7				X				X ⁴	X			X
PZ-78-74	Offsite	BR	71.5	73.5	X	X	X	X	X	X	X	X ⁴	X			X
<i>Shore Dr MW (TW-04)</i>	<i>Offsite</i>	<i>D</i>	<i>TBD</i>	<i>TBD</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X⁴</i>	<i>X</i>			<i>X</i>
<i>Stanley Ln MW (PZ-73)</i>	<i>Offsite</i>	<i>D</i>	<i>TBD</i>	<i>TBD</i>				<i>X</i>				<i>X⁴</i>	<i>X</i>			<i>X</i>
<i>Madsen Rd MW (MW-100)</i>	<i>Offsite</i>	<i>BR</i>	<i>TBD</i>	<i>TBD</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X⁴</i>	<i>X</i>			<i>X</i>
<i>Madsen Rd MW</i>	<i>Offsite</i>	<i>BR</i>	<i>TBD</i>	<i>TBD</i>				<i>X</i>				<i>X⁴</i>	<i>X</i>			<i>X</i>
<i>Rader Rd MW(s)</i>	<i>S/D</i>	<i>TBD</i>	<i>TBD</i>	<i>TBD</i>				<i>X</i>				<i>X⁴</i>	<i>X</i>			<i>X</i>
<i>4th St MW (PZ-78)</i>	<i>Offsite</i>	<i>S</i>	<i>TBD</i>	<i>TBD</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X⁴</i>	<i>X</i>			<i>X</i>
<i>Lincoln St MW</i>	<i>Offsite</i>	<i>BR</i>	<i>TBD</i>	<i>TBD</i>				<i>X</i>				<i>X⁴</i>	<i>X</i>			<i>X</i>

Table 2
Groundwater Monitoring Plan
Interim LTM Plan
Tyco Fire Technology Center
Marinette, Wisconsin

Well ID	Area	Zone	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Year 1: Semi-Annual Sampling - All Wells in All Groups; Quarterly Sampling - Select Boundary Zone Wells	Year 2 ¹ : Annual Sampling - Boundary Zone, Northern and Southern Plume Groups; Semi-Annual Sampling - FTC; Quarterly Sampling - Select Boundary Zone Wells	Year 3: Annual/Biennial Sampling - All MWs in All Groups	Year 4 ² : Annual Sampling - FTC, Northern and Southern Plume Groups	Year 5: Annual/Biennial Sampling - All MWs in All Groups
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Notes:
All wells will be sampled for PFAS via Modified 537 method.
All wells will be gauged during sampling; at minimum, comprehensive rounds of gauging across all well groups will be completed semi-annually in years 1 and 2; in years 3 to 5, comprehensive gauging will be completed annually during the Q4 sampling event.
This monitoring plan shows the most conservative sampling approach in years 2 and 4; some wells may be removed or the sampling frequency may be reduced pending results from years 1 and 2.
(1) FTC - sampling at redundant wells will be reduced from semi-annual to annual; N. Plume and S. Plume - annual sampling will be reduced to biennial sampling at wells with 2 rounds of "clean" or identified as redundant; Boundary Zone - A subset of wells may be sampled quarterly, all other wells will be sampled annually or reduced to biennially if identified as redundant.
(2) FTC - all wells sampled annually; N. Plume and S. Plume - No sampling at any wells previously reduced to biennial sampling; Boundary Zone - No sampling, all wells reduced to biennial.
(3) The results of previous semi-annual sampling events will determine the timing of subsequent annual sampling events (i.e., annual sampling in Yr 4 and Yr 5 will be completed during the time of year that previously exhibited overall higher PFAS concentrations across all monitoring zones).
(4) N. Plume, S. Plume and Boundary Zone - The results of previous semi-annual sampling events will determine the timing of the Yr 3 annual sampling event (i.e., Yr 3 annual sampling will be completed during the time of year that previously exhibited overall higher PFAS concentrations across all monitoring zones).
Vertical Datum: North American Vertical Datum (NAVD) 1988
Acronyms/Abbreviations:
bgs = below ground surface
ft = feet
FTC = Fire Technology Center
GETS = groundwater extraction and treatment system
NA = not available
Zone screened abbreviations: S = shallow overburden < 25 feet deep; D = deep overburden > 25 feet deep; BR = bedrock
Surface finish abbreviations: FM = flush mount; SU = stick up

Table 3
Surface Water Monitoring Locations
Interim LTM Plan
Tyco Fire Technology Center
Marinette, Wisconsin

Location ID	Approximate Northing	Approximate Easting	Ditch	Monitoring Task
Interim LTM Surface Water Monitoring Locations				
SW-10	454622.33	2577900.45	A	Sampling
SW-12	457345.63	2578759.81	A	Sampling
SW-30	464592.04	2587793.91	C	Sampling
SW-31	463510.03	2586758.72	C	Sampling
SW-33	456798.96	2583460.17	D	Sampling
SW-36	460092.70	2582005.37	AD	Sampling
SG-10	454651.16	2577823.71	A	Gauging
SG-12	457336.70	2578735.48	A	Gauging
SG-13	457326.57	2577401.97	A	Gauging
SG-26	459954.13	2579450.05	A	Gauging
SG-36	460101.02	2582119.10	D	Gauging
SG-45	460015.76	2580829.09	AD	Gauging
SG-47	457379.72	2575405.66	A	Gauging
SG-48	456484.65	2578250.39	A	Gauging
GETS LTM Surface Water Monitoring Locations¹				
SW-U10	464304.96	2577216.74	B	Sampling
SW-U03	464584.05	2579775.41	B	Sampling
SW-M09	464609.37	2580872.38	B	Sampling
SW-M07	464231.65	2581309.05	B	Sampling
SW-M04	463543.51	2582099.25	B	Sampling
SW-M01	462918.11	2582479.07	B	Sampling
SW-L09	461725.52	2583542.17	B	Sampling
SG-A1	462175.88	2576923.70	A	Gauging
SG-23	463399.53	2576808.46	A	Gauging
SG-50	463376.34	2576546.61	A	Gauging
SG-53	463645.42	2575386.62	B	Gauging
SG-U10	464305.27	2577082.23	B	Gauging
SG-U03	464616.87	2580026.83	B	Gauging
SG-M09	464728.45	2580715.44	B	Gauging
SG-M01	462816.30	2582507.70	B	Gauging
SG-L09	461731.81	2583377.89	B	Gauging

Notes:

(1) GETS LTM Surface Water Monitoring Locations are listed for reference purposes only and are monitored in accordance with the GETS LTM plan (Arcadis 2021).

Acronyms/Abbreviations:

LTM = Long Term Monitoring

SW = Surface Water

SG = Staff Gauge

Table 4
Surface Water Sampling Plan
Interim LTM Plan
Tyco Fire Technology Center
Marinette, Wisconsin

Location ID	Approximate Northing	Approximate Easting	Ditch	Year 1-5: Semi-Annual Sampling			
				Q1	Q2	Q3	Q4
SW-10	454622.33	2577900.45	A		X		X
SW-12	457345.63	2578759.81	A		X		X
SW-30	464592.04	2587793.91	C		X		X
SW-31	463510.03	2586758.72	C		X		X
SW-33	456798.96	2583460.17	D		X		X
SW-36	460092.70	2582005.37	AD		X		X

Table 5
Groundwater Recommended Enforcement Standards and Surface Water Standards
Interim LTM Plan
Tyco Fire Technology Center
Marinette, Wisconsin

Analyte	CAS	June 2019 DHS Recommended ES (Not Adopted by DNR Board) ¹	November 2020 DHS Recommended ES (Not Yet Proposed for Rulemaking by DNR) ²	WDNR Surface Water Standards (Non-Drinking Water Source) ^(3,4)
PFBA	375-22-4	--	10,000	--
PFPeA	2706-90-3	--	--	--
PFHxA	307-24-4	--	150,000	--
PFHpA	375-85-9	--	--	--
PFOA	335-67-1	20	--	95
PFNA	375-95-1	--	30	--
PFDA	335-76-2	--	300	--
PFUnA	2058-94-8	--	3,000	--
PFDoA	307-55-1	--	500	--
PFTriA	72629-94-8	--	--	--
PFTeA	376-06-7	--	10,000	--
PFHxDA	67905-19-5	--	--	--
PFODA	16517-11-6	--	400,000	--
PFBS	375-73-5	--	450,000	--
PFPeS	2706-91-4	--	--	--
PFHxS	355-46-4	--	40	--
PFHpS	375-92-8	--	--	--
PFOS	1763-23-1	20	--	8
PFNS	68259-12-1	--	--	--
PFDS	335-77-3	--	--	--
PFDoS	79780-39-5	--	--	--
4:2 FTS	757124-72-4	--	--	--
6:2 FTS	27619-97-2	--	--	--
8:2 FTS	39108-34-4	--	--	--
10:2 FTS	120226-60-0	--	--	--
FOSA	754-91-6	--	20 (2)	--
NMeFOSA	31506-32-8	--	--	--
NEtFOSA	4151-50-2	--	20 (2)	--
NMeFOSAA	2355-31-9	--	--	--
NEtFOSAA	2991-50-6	--	20 (2)	--
NMeFOSE	24448-09-7	--	--	--
NEtFOSE	1691-99-2	--	20 (2)	--
HFPO-DA (GenX)	13252-13-6	--	300	--
ADONA	919005-14-4	--	3,000	--
F-53B Major	756426-58-1	--	--	--
F-53B Minor	763051-92-9	--	--	--

Notes on Page 2.

Table 5
Groundwater Recommended Enforcement Standards and Surface Water Standards
Interim LTM Plan
Tyco Fire Technology Center
Marinette, Wisconsin

Notes:

(1) = In June 2019, WDHS recommended individual groundwater standards of 20 ng/L for PFOA and PFOS. The WDNR proposed those standards through the state rulemaking process. In February 2022, the Wisconsin Natural Resource Board did not approve the proposed rulemaking for groundwater. In August 2022, WDNR promulgated a drinking water standard of 70 ng/L for PFOA and PFOS, individually and combined, for public water systems. This standard does not apply to private drinking water wells.

(2) = In November 2020 the Wisconsin DHS recommended a combined groundwater standard of 20 ng/L for: FOSA, NEtFOSE, NEtFOSA, NEtFOSAA, PFOS and PFOA. DHS also recommended individual standards for FOSA, NEtFOSE, NEtFOSA, NEtFOSAA, PFBS, PFHxS, PFNA, PFDA, PFDoA, PFHxA, PFTeA, PFUnA, PFBA, PFODA, DONA, and GenX. The agency's authority under the scope statement expired in September 2023. In September 2022, the Governor approved a Statement of Scope to establish groundwater standards for PFOA, PFOS, PFBS and GenX (referred to as the "Four PFAS"). The Statement of Scope was approved by the Natural Resources Board in December 2022. Pursuant to state law, the WDNR has stopped work on the proposed rule and notified the state legislature that, following economic analysis, the proposed costs would exceed statutory thresholds. As a result, the WDNR cannot continue the rulemaking without authorization from the state legislature.

(3) = The surface water quality standard for PFOA is 20 ng/L for waters classified as public water supplies and 95 ng/L for all other surface waters (WDNR NR 102.4). Ditches A, C, and D are not used for public drinking water supplies; therefore, the applicable standard for PFOA is 95 ng/L.

(4) = The surface water quality standard for PFOS is 8 ng/L for all waters except those that cannot naturally support fish and do not have downstream waters that support fish (WDNR NR 102.4).

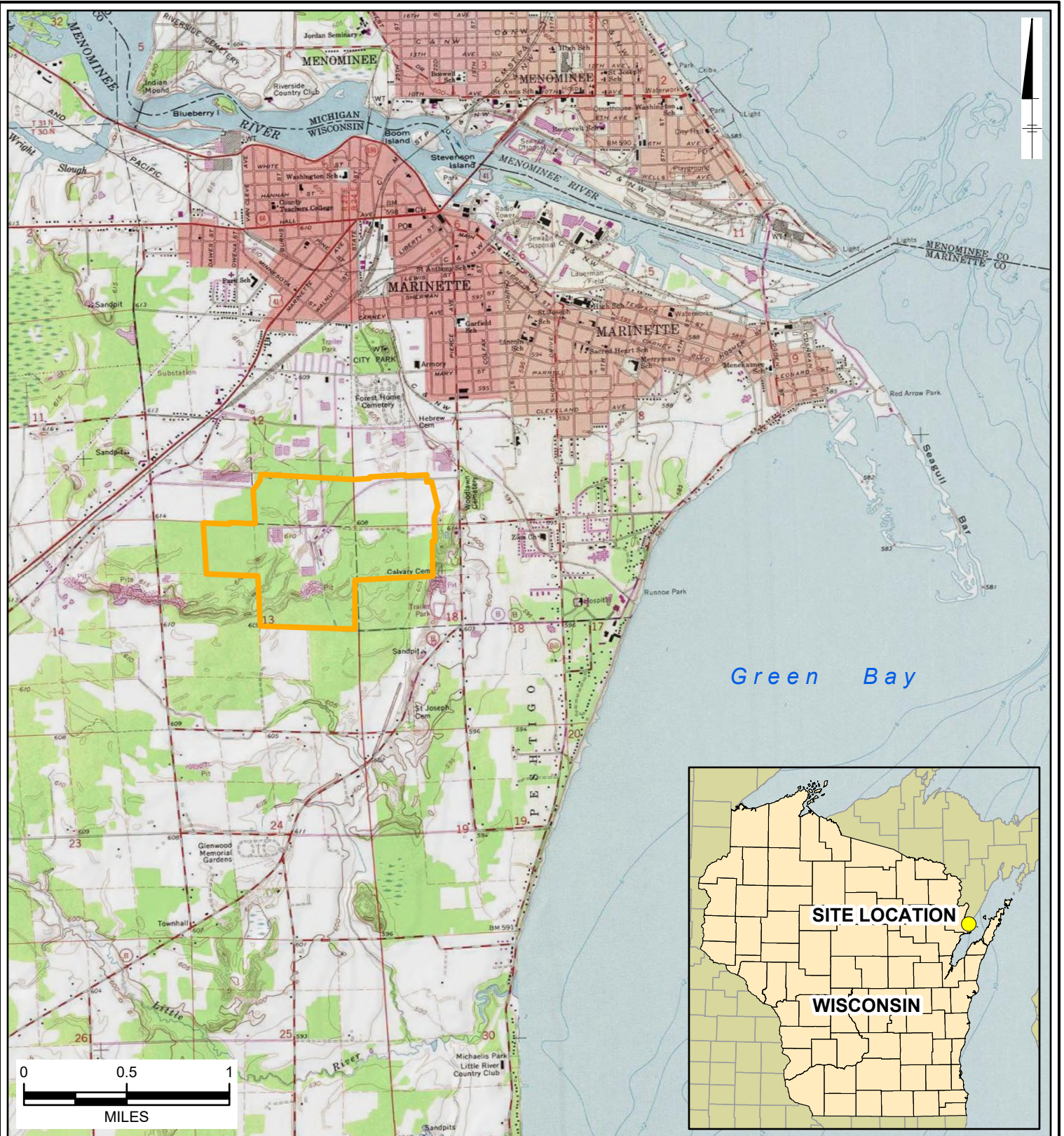
Acronyms and Abbreviations:

-- = No standard
 < = Compound not detected at reporting detection limit.
 DHS = Department of Health Services
 ES = Enforcement Standard
 ng/L = nanograms per liter
 WDNR = Wisconsin Department of Natural Resources

Chemical Abbreviation:

PFOA = Perfluorooctanoic acid (C8)	PFPeS = Perfluoropentanesulfonic acid (C5)
PFOS = Perfluorooctanesulfonic acid (C8)	PFHpS = Perfluoroheptanesulfonic acid (C7)
PFBS = Perfluorobutanesulfonic acid (C4)	PFNS = Perfluorononanesulfonic acid (C9)
PFHpA = Perfluoroheptanoic acid (C7)	PFDS = Perfluorodecanesulfonic acid (C10)
PFHxS = Perfluorohexanesulfonic acid (C6)	PFDoS = Perfluorododecanesulfonic acid (C12)
PFNA = Perfluorononanoic acid (C9)	FOSA = Perfluorooctanesulfonamide (C8)
PFDA = Perfluorodecanoic acid (C10)	NEtFOSA = N-ethylperfluorooctanesulfonamide (C10)
PFDoA = Perfluorododecanoic acid (C12)	NMeFOSA = N-methylperfluorooctanesulfonamide (C9)
PFHxA = Perfluorohexanoic acid (C6)	NMeFOSE = N-methylperfluorooctanesulfonamidoethanol (C11)
PFTeA = Perfluorotetradecanoic acid (C14)	NEtFOSE = N-ethylperfluorooctanesulfonamidoethanol (C12)
PFTriA = Perfluorotridecanoic acid (C13)	4:2 FTS = 4:2 fluorotelomer sulfonate (C6)
PFUnA = Perfluoroundecanoic acid (C11)	6:2 FTS = 6:2 fluorotelomer sulfonate (C8)
NEtFOSAA = N-ethylperfluorooctanesulfonamidoacetic acid (C12)	8:2 FTS = 8:2 fluorotelomer sulfonate (C10)
NMeFOSAA = N-methylperfluorooctanesulfonamidoacetic acid (C11)	10:2 FTS = 10:2 fluorotelomer sulfonate (C12)
PFBA = Perfluorobutanoic acid (C4)	ADONA = 4,8-Dioxa-3H-perfluorononanoic acid (C7)
PFPeA = Perfluoropentanoic acid (C5)	HFPO-DA (GenX) = Hexafluoropropylene oxide dimer acid (C6)
PFHxDA = Perfluoro-n-hexadecanoic acid (C16)	F-53B Major = 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (C8)
PFODA = Perfluoro-n-octadecanoic acid (C18)	F-53B Minor = 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (C10)

Figures



LEGEND

 APPROXIMATE FTC SITE PROPERTY BOUNDARY

NOTES:

1. TOPOGRAPHIC MAP SOURCE: USA TOPO MAPS: COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED, ACCESSED FEBRUARY 2024.
2. ACRONYMS:
FTC - FIRE TECHNOLOGY CENTER

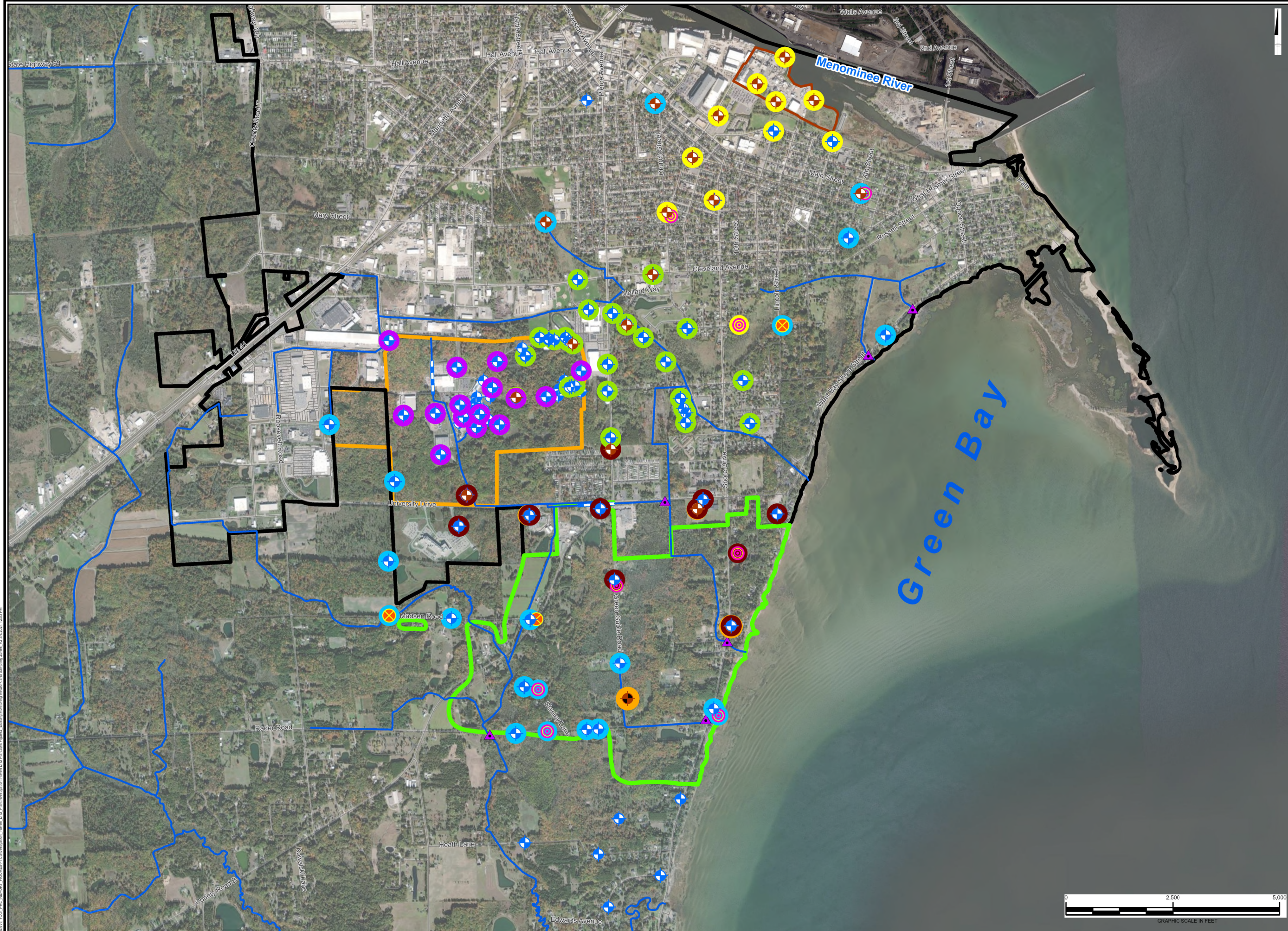
**TYCO FIRE TECHNOLOGY CENTER
MARINETTE, WISCONSIN
INTERIM LONG TERM MONITORING PLAN FOR
GROUNDWATER AND SURFACE ATER**

SITE LOCATION



FIGURE 1

City of Minneapolis/Citrix Div/Group: IMDVC Created By: Last Saved By: yadavs0264
TYCO/Marinette, WI
Arcadis-us.com/app/GIS/Processing/ENVTYCO_PRO_REPORT_FIGURES/FTCInvestigation_Interim_LTM_Plan/appx_2/27/2024_5:28 PM



LEGEND

- APPROXIMATE MARINETTE CITY BOUNDARY
- APPROXIMATE FTC SITE PROPERTY BOUNDARY
- APPROXIMATE STANTON STREET FACILITY PROPERTY BOUNDARY
- PRIVATE WELL SAMPLING AREA
- ROAD
- CULVERT
- DITCH OR STREAM
- BEDROCK MONITORING WELL OR PIEZOMETER
- OVERBURDEN MONITORING WELL OR PIEZOMETER
- DEEP BEDROCK MONITORING WELL

MONITORING ZONES:

- NORTHERN PLUME
- FTC (NON-GETS)
- SOUTHERN PLUME
- BOUNDARY ZONE
- GETS NETWORK
- DEEP MONITORING WELL NETWORK

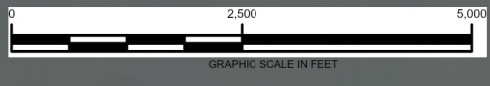
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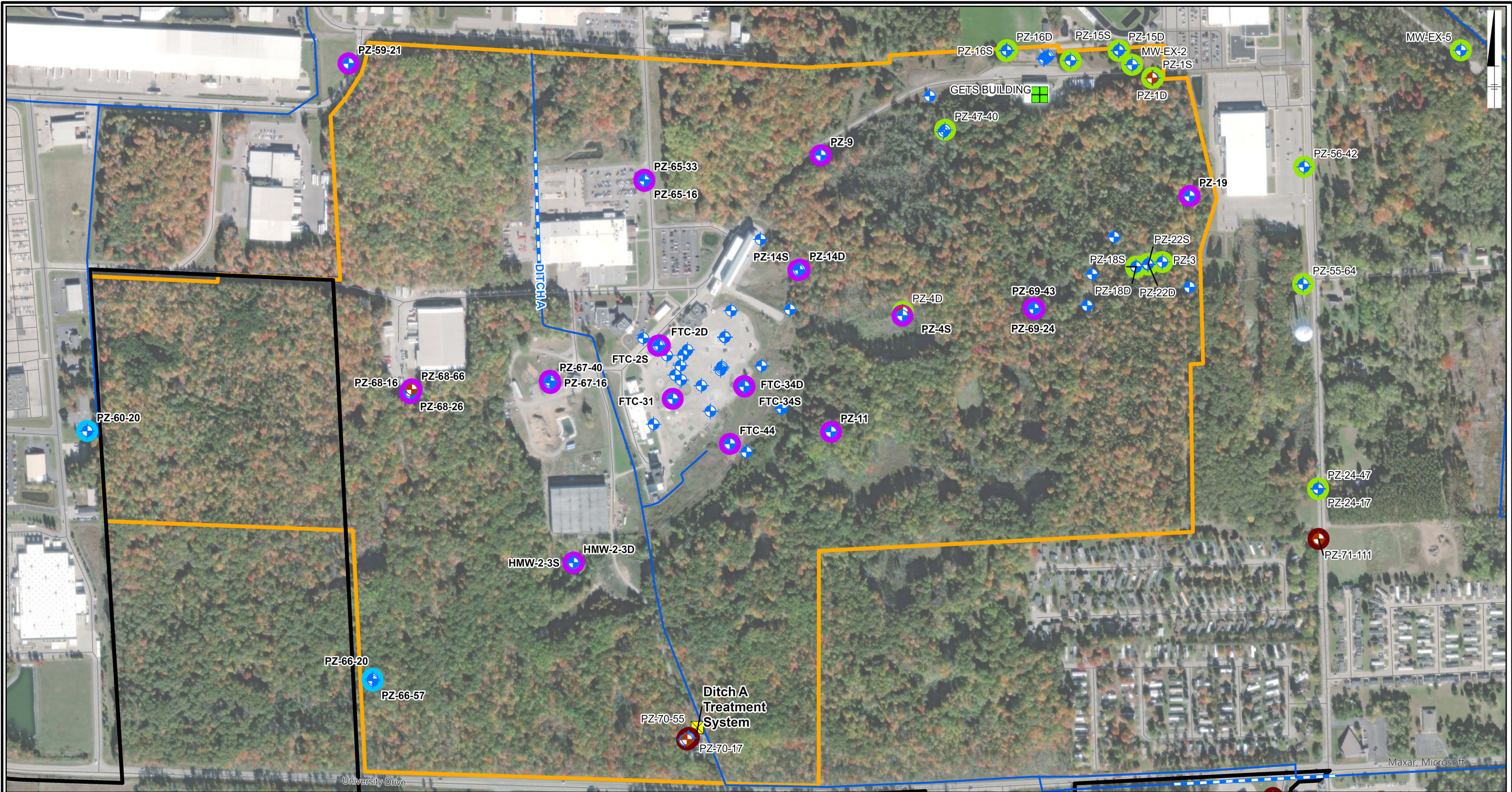
- OVERBURDEN MONITORING WELL
- SHALLOW BEDROCK MONITORING WELL

NOTES:

- GETS MONITORING WELLS AND DEEP BEDROCK MONITORING WELLS ARE IDENTIFIED FOR REFERENCE PURPOSES ONLY. MONITORING OF GETS NETWORK WELLS IS COMPLETED IN ACCORDANCE WITH THE GETS LTM PLAN (ARCADIS, 2021). MONITORING OF THE DEEP MONITORING WELL NETWORK IS COMPLETED IN ACCORDANCE WITH THE DEEP AQUIFER BEDROCK WELL DESIGN AND LONG-TERM MONITORING WORK PLAN (ARCADIS 2022).
- ACRONYMS:
GETS - GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
FTC - FIRE TECHNOLOGY CENTER
- AERIAL IMAGERY SOURCE: ESRI MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY.

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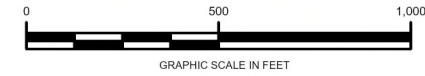
- APPROXIMATE MARINETTE CITY BOUNDARY
- APPROXIMATE FTC SITE PROPERTY BOUNDARY
- ROAD
- DITCH OR STREAM
- CULVERT

- OVERBURDEN MONITORING WELL OR PIEZOMETER
- BEDROCK MONITORING WELL OR PIEZOMETER
- GETS BUILDING
- SURFACE WATER TREATMENT SYSTEM

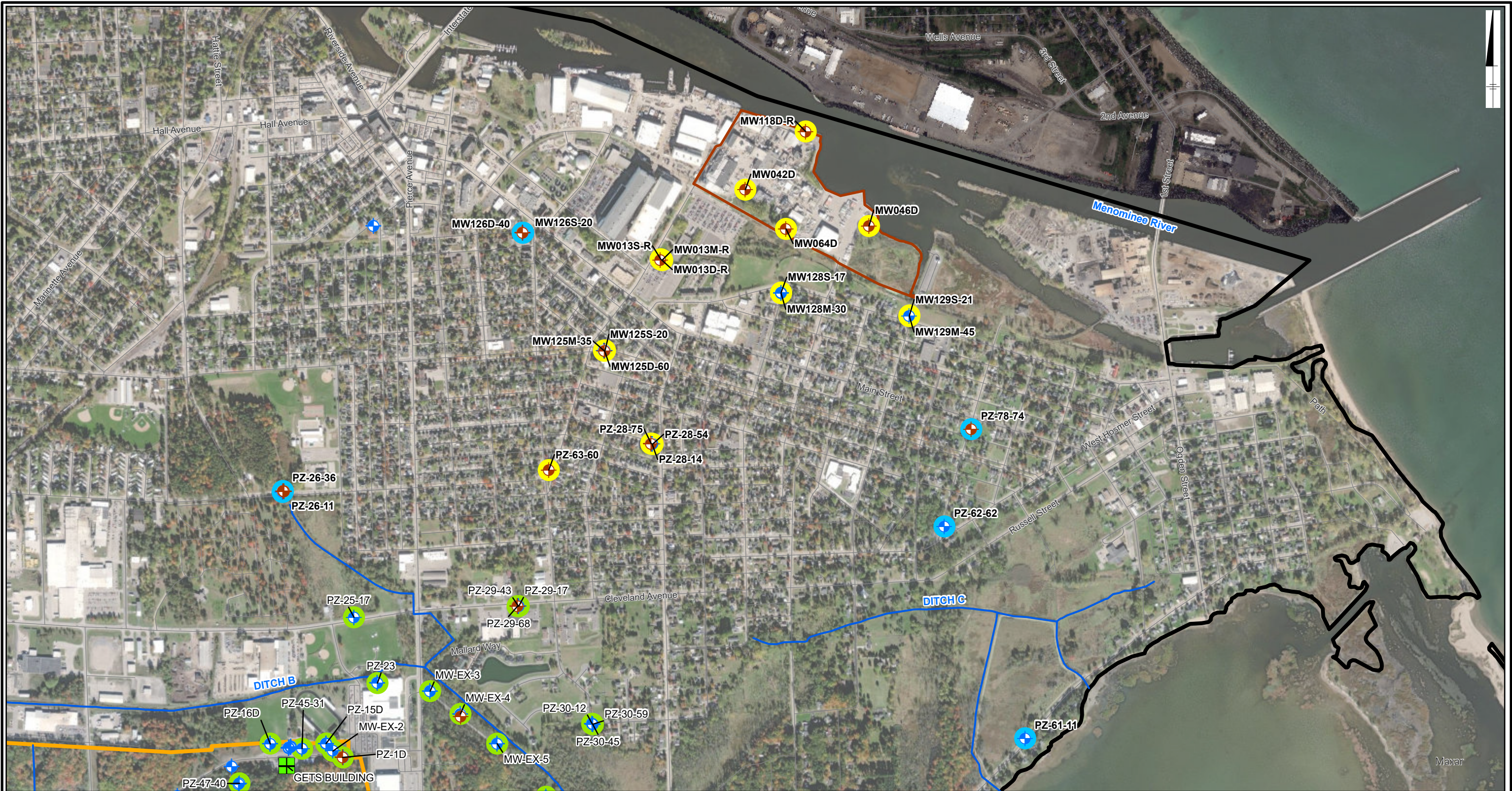
MONITORING ZONES:

- FTC (NON-GETS)
- SOUTHERN PLUME
- BOUNDARY ZONE
- GETS NETWORK

NOTES:
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 2. ACRONYMS:
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 FTC - FIRE TECHNOLOGY CENTER
 3. AERIAL IMAGERY SOURCE: ESRI MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY



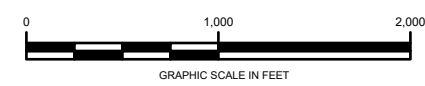
TYCO FIRE TECHNOLOGY CENTER
 MARINETTE, WISCONSIN
**INTERIM LONG TERM MONITORING PLAN FOR
 GROUNDWATER AND SURFACE WATER**
**FTC (NON-GETS) PLUME AND BOUNDARY
 ZONE WELL NETWORK**



LEGEND

- APPROXIMATE MARINETTE CITY BOUNDARY
- APPROXIMATE STANTON STREET FACILITY PROPERTY BOUNDARY
- APPROXIMATE FTC SITE PROPERTY BOUNDARY
- ROAD
- DITCH OR STREAM
- CULVERT
- BEDROCK MONITORING WELL OR PIEZOMETER
- OVERBURDEN MONITORING WELL OR PIEZOMETER
- GETS BUILDING
- MONITORING ZONES:**
- NORTHERN PLUME
- BOUNDARY ZONE
- GETS NETWORK

NOTES:
 1. GETS MONITORING WELLS ARE IDENTIFIED FOR REFERENCE PURPOSES ONLY. MONITORING OF GETS NETWORK MONITORING WELLS IS COMPLETED IN ACCORDANCE WITH THE GETS LTM PLAN (ARCADIS, 2021).
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 FTC - FIRE TECHNOLOGY CENTER
 3. AERIAL IMAGERY SOURCE: ESRI MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY



TYCO FIRE TECHNOLOGY CENTER
 MARINETTE, WISCONSIN
**INTERIM LONG TERM MONITORING PLAN FOR
 GROUNDWATER AND SURFACE WATER**

**NORTHERN PLUME AND BOUNDARY ZONE
 WELL NETWORK**

ARCADIS | **FIGURE 4**

T:\ENV\TYCOI_PRO_REPORT_FIGURES\FTCInvestigation_Interim_LTM_Plan\Investigation_Interim_LTM_Plan.aprx Figure5_SOUTHERN PLUME SAMPLING ZONE37/2024 6:21 PM Last Saved By: av00976



LEGEND

	PRIVATE WELL SAMPLING AREA		OVERBURDEN MONITORING WELL OR PIEZOMETER		FTC (NON-GETS)
	APPROXIMATE MARINETTE CITY BOUNDARY		BEDROCK MONITORING WELL OR PIEZOMETER		SOUTHERN PLUME
	APPROXIMATE FTC SITE PROPERTY BOUNDARY		DEEP BEDROCK MONITORING WELL		BOUNDARY ZONE
	ROAD		SURFACE WATER TREATMENT SYSTEM		GETS NETWORK
	DITCH OR STREAM				DEEP MONITORING WELL NETWORK
	CULVERT				

MONITORING ZONES:


	FTC (NON-GETS)
	SOUTHERN PLUME
	BOUNDARY ZONE
	GETS NETWORK
	DEEP MONITORING WELL NETWORK

NOTES:

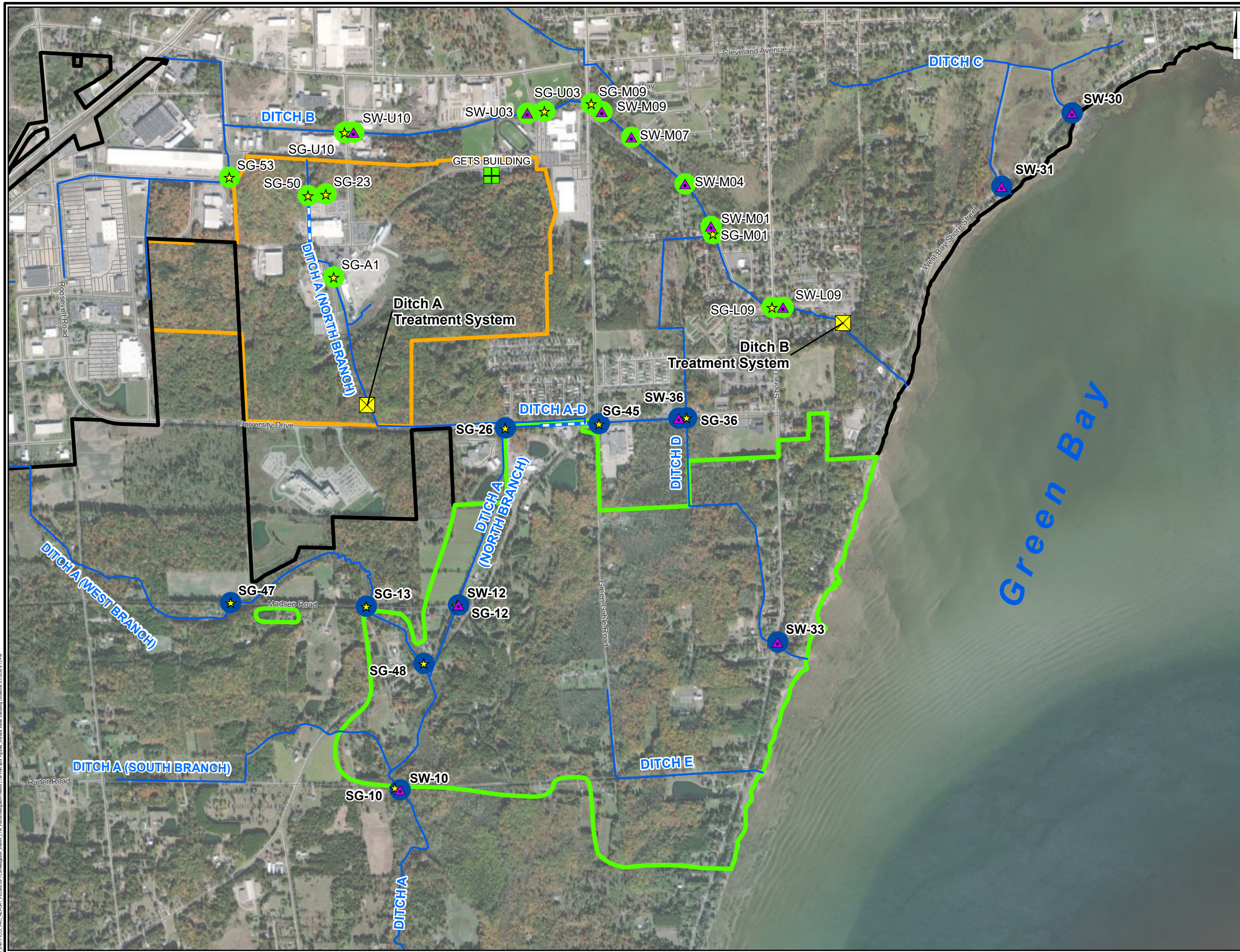
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- ACRONYMS:
GETS - GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
FTC - FIRE TECHNOLOGY CENTER
- AERIAL IMAGERY SOURCE: ESRI MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY

TYCO FIRE TECHNOLOGY CENTER
MARINETTE, WISCONSIN
**INTERIM LONG TERM MONITORING PLAN FOR
GROUNDWATER AND SURFACE WATER**

**SOUTHERN PLUME AND BOUNDARY ZONE
WELL NETWORK**



**FIGURE
5**



LEGEND

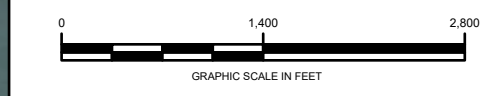
- APPROXIMATE FTC SITE PROPERTY BOUNDARY
- PRIVATE WELL SAMPLING AREA
- APPROXIMATE MARINETTE CITY BOUNDARY
- ROAD
- CULVERT
- DITCH OR STREAM
- ▲ SURFACE WATER SAMPLING
- ★ STAFF GAUGE
- GETS BUILDING
- SURFACE WATER TREATMENT SYSTEM

MONITORING ZONES:

- GETS LTM SURFACE WATER MONITORING LOCATION
- INTERIM LTM SURFACE WATER MONITORING LOCATION

NOTES:

1. MONITORING OF DITCH B IS COMPLETED IN ACCORDANCE WITH THE GETS LTM PLAN (ARCADIS, 2021).
2. ACRONYMS:
 FTC - FIRE TECHNOLOGY CENTER
 GETS - GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
 LTM - LONG TERM MONITORING
3. AERIAL IMAGERY SOURCE: ESRI MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY



TYCO FIRE TECHNOLOGY CENTER
 MARINETTE, WISCONSIN
 INTERIM LONG TERM MONITORING PLAN FOR
 GROUNDWATER AND SURFACE WATER

SURFACE WATER MONITORING LOCATIONS

T:\ENVI\TYCO_FTC\REPORT_FIGURE6\Figure6.mxd, LTM Plan Investigation Interim LTM Plan, ArcGIS Figure, Surface Water Sampling Locations 3/7/2024 4:12 PM

Arcadis U.S., Inc.

126 North Jefferson Street, Suite 400

Milwaukee, Wisconsin 53202

Tel 414 276 7742

Fax 414 276 7603

www.arcadis.com

Notice: Use this form to request a **written response (on agency letterhead)** from the Department of Natural Resources (DNR) regarding technical assistance, a post-closure change to a site, a specialized agreement or liability clarification for Property with known or suspected environmental contamination. A fee will be required as is authorized by s. 292.55, Wis. Stats., and NR 749, Wis. Adm. Code., unless noted in the instructions below. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records law [ss. 19.31 - 19.39, Wis. Stats.].

Definitions

"Property" refers to the subject Property that is perceived to have been or has been impacted by the discharge of hazardous substances.

"Liability Clarification" refers to a written determination by the Department provided in response to a request made on this form. The response clarifies whether a person is or may become liable for the environmental contamination of a Property, as provided in s. 292.55, Wis. Stats.

"Technical Assistance" refers to the Department's assistance or comments on the planning and implementation of an environmental investigation or environmental cleanup on a Property in response to a request made on this form as provided in s. 292.55, Wis. Stats.

"Post-closure modification" refers to changes to Property boundaries and/or continuing obligations for Properties or sites that received closure letters for which continuing obligations have been applied or where contamination remains. Many, but not all, of these sites are included on the GIS Registry layer of RR Sites Map to provide public notice of residual contamination and continuing obligations.

Select the Correct Form

This form should be used to request the following from the DNR:

- Technical Assistance
- Liability Clarification
- Post-Closure Modifications
- Specialized Agreements (tax cancellation, negotiated agreements, etc.)

Do **not** use this form if one of the following applies:

- Request for an **off-site liability exemption or clarification** for Property that has been or is perceived to be contaminated by one or more hazardous substances that originated on another Property containing the source of the contamination. Use DNR's Off-Site Liability Exemption and Liability Clarification Application Form 4400-201.
- Submittal of an Environmental Assessment for the **Lender Liability Exemption**, s 292.21, Wis. Stats., **if no response or review by DNR is requested**. Use the Lender Liability Exemption Environmental Assessment Tracking Form 4400-196.
- Request for an **exemption to develop on a historic fill site** or licensed landfill. Use DNR's Form 4400-226 or 4400-226A.
- **Request for closure** for Property where the investigation and cleanup actions are completed. Use DNR's Case Closure - GIS Registry Form 4400-202.

All forms, publications and additional information are available on the internet at: dnr.wi.gov/topic/Brownfields/Pubs.html.

Instructions

1. Complete sections 1, 2, 6 and 7 for all requests. Be sure to provide adequate and complete information.
2. Select the type of assistance requested: Section 3 for technical assistance or post-closure modifications, Section 4 for a written determination or clarification of environmental liabilities; or Section 5 for a specialized agreement.
3. Include the fee payment that is listed in Section 3, 4, or 5, unless you are a "Voluntary Party" enrolled in the Voluntary Party Liability Exemption Program **and** the questions in Section 2 direct otherwise. Information on to whom and where to send the fee is found in Section 8 of this form.
4. Send the completed request, supporting materials and the fee to the appropriate DNR regional office where the Property is located. See the map on the last page of this form. A paper copy of the signed form and all reports and supporting materials shall be sent with an electronic copy of the form and supporting materials on a compact disk. For electronic document submittal requirements see: <http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf>

The time required for DNR's determination varies depending on the complexity of the site, and the clarity and completeness of the request and supporting documentation.

Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

Form 4400-237 (R 12/18)

Page 2 of 5

Section 1. Contact and Recipient Information

Requester Information

This is the person requesting technical assistance or a post-closure modification review, that his or her liability be clarified or a specialized agreement and is identified as the requester in Section 7. DNR will address its response letter to this person.

Last Name Nelson	First Denice	MI	Organization/ Business Name Tyco Fire Products LP
Mailing Address 2700 Industrial Parkway South		City Marinette	State WI
		ZIP Code 54143	
Phone # (include area code)	Fax # (include area code)	Email	

The requester listed above: (select all that apply)

- Is currently the owner
 Is considering selling the Property
 Is renting or leasing the Property
 Is considering acquiring the Property
 Is a lender with a mortgagee interest in the Property
 Other. Explain the status of the Property with respect to the applicant:

Contact Information (to be contacted with questions about this request)

Select if same as requester

Contact Last Name Johnson	First Shauna	MI	Organization/ Business Name Arcadis
Mailing Address 225 West Wacker Drive, Suite 2015		City Chicago	State IL
		ZIP Code 60606	
Phone # (include area code) (312) 575-3732	Fax # (include area code)	Email shauna.johnson@arcadis.com	

Environmental Consultant (if applicable)

Contact Last Name Johnson	First Shauna	MI	Organization/ Business Name
Mailing Address 225 West Wacker Drive, Suite 2015		City Chicago	State IL
		ZIP Code 60606	
Phone # (include area code) (312) 575-3732	Fax # (include area code)	Email shauna.johnson@arcadis.com	

Section 2. Property Information

Property Name Tyco Fire Technology Center - PFCs	FID No. (if known) 438005590
BRRTS No. (if known) 0238580694	Parcel Identification Number
Street Address 2700 Industrial Parkway South	City Marinette
	State WI
	ZIP Code 54143
County Marinette	Municipality where the Property is located <input checked="" type="radio"/> City <input type="radio"/> Town <input type="radio"/> Village of Marinette
Property is composed of: <input type="radio"/> Single tax parcel	<input checked="" type="radio"/> Multiple tax parcels
Property Size Acres 380	

Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

Form 4400-237 (R 12/18)

Page 3 of 5

1. Is a response needed by a specific date? (e.g., Property closing date) Note: Most requests are completed within 60 days. Please plan accordingly.

No Yes

Date requested by: _____

Reason: _____

2. Is the "Requester" enrolled as a Voluntary Party in the Voluntary Party Liability Exemption (VPLE) program?

No. **Include the fee that is required for your request in Section 3, 4 or 5.**

Yes. **Do not include a separate fee.** This request will be billed separately through the VPLE Program.

Fill out the information in Section 3, 4 or 5 which corresponds with the type of request:

Section 3. Technical Assistance or Post-Closure Modifications;

Section 4. Liability Clarification; or Section 5. Specialized Agreement.

Section 3. Request for Technical Assistance or Post-Closure Modification

Select the type of technical assistance requested: [Numbers in brackets are for WI DNR Use]

- No Further Action Letter (NFA) (Immediate Actions) - NR 708.09, [183] - **Include a fee of \$350.** Use for a written response to an immediate action after a discharge of a hazardous substance occurs. Generally, these are for a one-time spill event.
- Review of Site Investigation Work Plan - NR 716.09, [135] - **Include a fee of \$700.**
- Review of Site Investigation Report - NR 716.15, [137] - **Include a fee of \$1050.**
- Approval of a Site-Specific Soil Cleanup Standard - NR 720.10 or 12, [67] - **Include a fee of \$1050.**
- Review of a Remedial Action Options Report - NR 722.13, [143] - **Include a fee of \$1050.**
- Review of a Remedial Action Design Report - NR 724.09, [148] - **Include a fee of \$1050.**
- Review of a Remedial Action Documentation Report - NR 724.15, [152] - **Include a fee of \$350**
- Review of a Long-term Monitoring Plan - NR 724.17, [25] - **Include a fee of \$425.**
- Review of an Operation and Maintenance Plan - NR 724.13, [192] - **Include a fee of \$425.**

Other Technical Assistance - s. 292.55, Wis. Stats. [97] (For request to build on an abandoned landfill use Form 4400-226)

- Schedule a Technical Assistance Meeting - **Include a fee of \$700.**
- Hazardous Waste Determination - **Include a fee of \$700.**
- Other Technical Assistance - **Include a fee of \$700.** Explain your request in an attachment.

Post-Closure Modifications - NR 727, [181]

- Post-Closure Modifications: Modification to Property boundaries and/or continuing obligations of a closed site or Property; sites may be on the GIS Registry. This also includes removal of a site or Property from the GIS Registry. **Include a fee of \$1050, and:**
 - Include a fee of \$300 for sites with residual soil contamination; and
 - Include a fee of \$350 for sites with residual groundwater contamination, monitoring wells or for vapor intrusion continuing obligations.

Attach a description of the changes you are proposing, and documentation as to why the changes are needed (if the change to a Property, site or continuing obligation will result in revised maps, maintenance plans or photographs, those documents may be submitted later in the approval process, on a case-by-case basis).

Skip Sections 4 and 5 if the technical assistance you are requesting is listed above and complete Sections 6 and 7 of this fo

Section 6. Other Information Submitted

Identify all materials that are included with this request.

Send both a paper copy of the signed form and all reports and supporting materials, and an electronic copy of the form and all reports, including Environmental Site Assessment Reports, and supporting materials on a compact disk.

Include one copy of any document from any state agency files that you want the Department to review as part of this request. The person submitting this request is responsible for contacting other state agencies to obtain appropriate reports or information.

Phase I Environmental Site Assessment Report - Date: _____

Phase II Environmental Site Assessment Report - Date: _____

**Technical Assistance, Environmental Liability
Clarification or Post-Closure Modification Request**

Form 4400-237 (R 12/18)

Page 4 of 5

- Legal Description of Property (required for all liability requests and specialized agreements)
- Map of the Property (required for all liability requests and specialized agreements)

Analytical results of the following sampled media: Select all that apply and include date of collection.

Groundwater Soil Sediment Other medium - Describe: _____

Date of Collection: _____

- A copy of the closure letter and submittal materials
- Draft tax cancellation agreement
- Draft agreement for assignment of tax foreclosure judgment
- Other report(s) or information - Describe: Revised Comprehensive Alternative Water Management Plan

For Property with newly identified discharges of hazardous substances only: Has a notification of a discharge of a hazardous substance been sent to the DNR as required by s. NR 706.05(1)(b), Wis. Adm. Code?

- Yes - Date (if known): _____
- No

Note: The Notification for Hazardous Substance Discharge (non-emergency) form is available at:
dnr.wi.gov/files/PDF/forms/4400/4400-225.pdf.

Section 7. Certification by the Person who completed this form

- I am the person submitting this request (requester)
- I prepared this request for: Denice Nelson
Requester Name

I certify that I am familiar with the information submitted on this request, and that the information on and included with this request is true, accurate and complete to the best of my knowledge. I also certify I have the legal authority and the applicant's permission to make this request.

Jean Rutkowski
Signature

4/1/2024
Date Signed

Senior Environmental Specialist
Title

(414) 276-7742
Telephone Number (include area code)

Technical Assistance, Environmental Liability Clarification or Post-Closure Modification Request

Form 4400-237 (R 12/18)

Page 5 of 5

Section 8. DNR Contacts and Addresses for Request Submittals

Send or deliver one paper copy and one electronic copy on a compact disk of the completed request, supporting materials, and fee to the region where the property is located to the address below. Contact a [DNR regional brownfields specialist](#) with any questions about this form or a specific situation involving a contaminated property. For electronic document submittal requirements see: <http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf>.

DNR NORTHERN REGION

Attn: RR Program Assistant
Department of Natural Resources
223 E Steinfest Rd Antigo, WI 54409

DNR NORTHEAST REGION

Attn: RR Program Assistant
Department of Natural Resources
2984 Shawano Avenue
Green Bay WI 54313

DNR SOUTH CENTRAL REGION

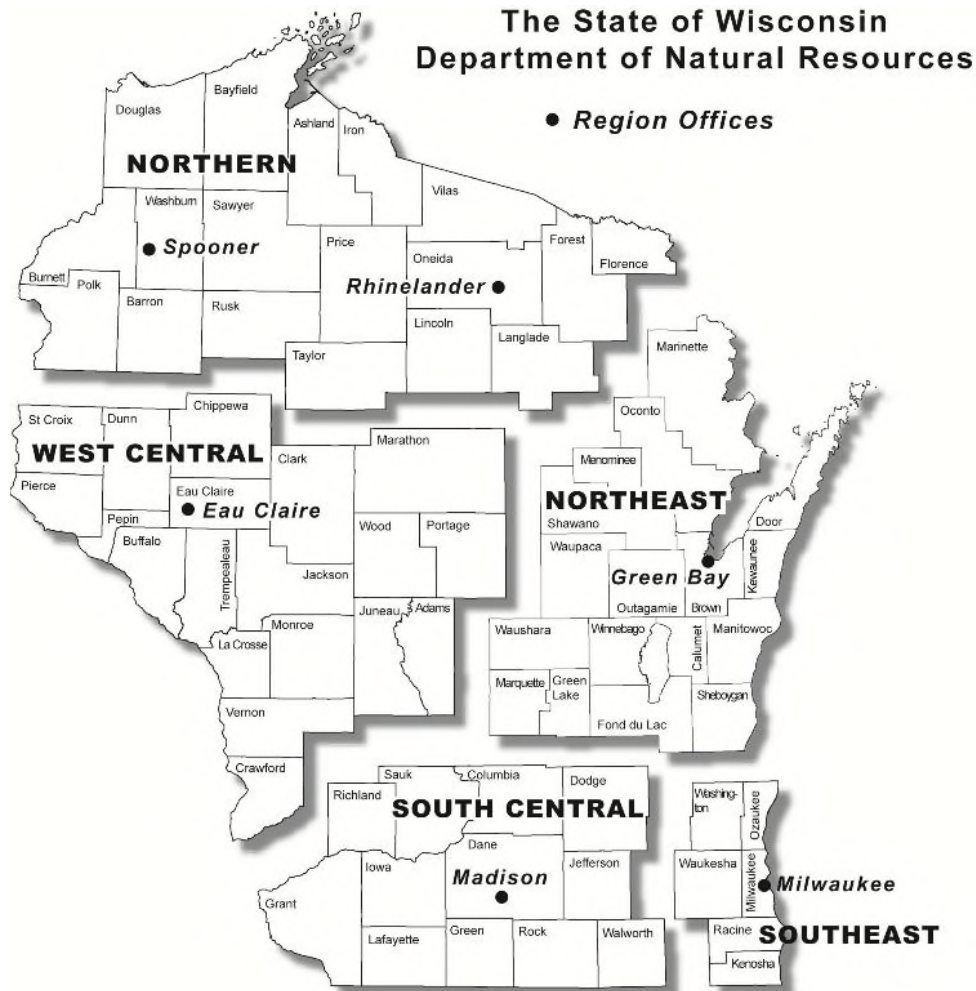
Attn: RR Program Assistant
Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg WI 53711

DNR SOUTHEAST REGION

Attn: RR Program Assistant
Department of Natural Resources
2300 North Martin Luther King Drive
Milwaukee WI 53212

DNR WEST CENTRAL REGION

Attn: RR Program Assistant
Department of Natural Resources
1300 Clairemont Ave.
Eau Claire WI 54702



Note: These are the Remediation and Redevelopment Program's designated regions. Other DNR program regional boundaries may be different.

DNR Use Only			
Date Received	Date Assigned	BRRTS Activity Code	BRRTS No. (if used)
DNR Reviewer		Comments	
Fee Enclosed? <input type="radio"/> Yes <input type="radio"/> No	Fee Amount \$	Date Additional Information Requested	Date Requested for DNR Response Letter
Date Approved	Final Determination		

Tyco Fire Products LP

Revised Comprehensive Alternative Water Management Plan

**Tyco Fire Technology Center, 2700 Industrial Parkway,
Marinette, Wisconsin 54143 BRRTS# 02-38-580694, 02-38-
581955**

April 2024

Comprehensive Alternative Water Management Plan

Tyco Fire Technology Center, 2700 Industrial Parkway South, Marinette, Wisconsin 54143; BRRTS# 02-38-580694, 02-38-581955

April 1, 2024

Prepared By:

Arcadis U.S., Inc.
126 N. Jefferson Street
Suite 400
Milwaukee
Wisconsin 53202
Tel 414 276 7742
Fax 414 276 7603

Prepared For:

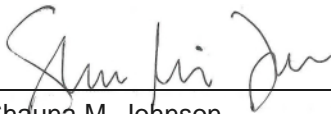
Tyco Fire Products LP
2700 Industrial Parkway South
Marinette, Wisconsin 54143

Our Ref:

30203152



Lisa M. Rutkowski
Senior Environmental Specialist



Shauna M. Johnson
Certified Project Manager



Scott T. Potter, PhD
Chief Hydrogeologist

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2 Background..... 1

 2.1 Site Description and History 1

 2.2 Recent Alternative Water Management Processes 2

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3 Interim Comprehensive Alternative Management Solution 2

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 3.2 Point of Entry Treatment Systems 3

 3.3 Connect to Existing Infrastructure 3

4 Proposed Final Alternative Water Management Solution 3

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Figures

Figure 1. Fire Technology Center Location

Figure 2. Stanton Street Location

Figure 3. Outdoor Testing/Training Area

Figure 4. Potable Well Sampling Area

Acronyms and Abbreviations

AFFF	aqueous film-forming foam
Arcadis	Arcadis U.S., Inc.
FTC	Fire Technology Center
HAL	Health Advisory Level
OTA	Outdoor Testing/Training Area
PWSA	potable well sampling area
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
POET	point of entry treatment
Tyco	Tyco Fire Products LP
USEPA	United States Environmental Protection Agency
WDNR	Wisconsin Department of Natural Resources

1 Introduction

On behalf of Tyco Fire Products LP (Tyco), Arcadis U.S., Inc. (Arcadis) prepared this Revised Comprehensive Alternative Water Management Plan to address the interim drinking water needs of residents and businesses in the potable well sampling area (PWSA) related to the per- and poly-fluoroalkyl substances (PFAS) investigation activities near the Tyco Fire Technology Center (FTC) located at 2700 Industrial Parkway South in Marinette, Wisconsin (**Figure 1**). This plan no longer addresses drinking water alternatives for Tyco's Stanton Street facility at 1 Stanton Street (**Figure 2**) because PFAS impacts from those operations are predominantly contained onsite or do not extend to any areas using private drinking water wells (Arcadis 2024A). A long-term solution for private replacement deep drinking water wells (Replacement Wells) is described in the PWSA Drinking Water Update (Arcadis 2022). Tyco is currently installing Replacement Wells and updating Wisconsin's Department of Natural Resources (WDNR) on progress (Arcadis 2024B).

2 Background

2.1 Site Description and History

The FTC is a fire suppressant training, testing, and research and development (R&D) facility, occupying approximately 380 acres in southern Marinette, Wisconsin. The Site lies approximately 1 mile west of the Green Bay shoreline and 1.6 miles south of the Menominee River, which is the border with Michigan. The developed area of the Site is contained within an approximately 60-acre central campus comprising 13 buildings and a 9-acre plot referred to as the Outdoor Testing/Training Area (OTA). **Figure 3** shows the site layout. The OTA includes the Firefighting School area (where firefighting scenarios are simulated) and the R&D area (where product testing occurs). The training area is an open gravel lot containing concrete and clay pads and steel pans, some with props where a contained fire is started and extinguished to test the performance of the fire suppression products. Two fire test houses are located on the southern edge of the OTA. Other site buildings support training, R&D, quality testing activities, warehousing, and manufacturing. The area of the Site outside the central campus comprises more than 300 acres of undeveloped forest and wetlands.

Aqueous film-forming foam (AFFF) was historically used as part of outdoor R&D, quality testing, and firefighting training activities at the OTA, until outdoor AFFF use was discontinued in 2017. Current outdoor R&D, quality testing, and firefighting training activities use dry chemical fire suppressants that do not contain PFAS. In 2020, Tyco constructed the Advanced Research and Testing Facility north of the OTA to provide an indoor area for the testing of firefighting foam products. Wastewater (typically 97 percent water and 3 percent foam) is contained and conveyed to a wastewater treatment facility located within the building, where it is treated and disposed of in accordance with an industrial pretreatment discharge permit issued by the City of Marinette, and/or shipped to a licensed waste disposal site.

In addition to the FTC, Tyco operates a manufacturing facility in Marinette approximately 1.5 miles to the northeast of the Site on Stanton Street, adjacent to the Menominee River (Stanton Street Site; **Figure 2**). Investigations relating to PFAS at the Stanton Street Site are conducted as part of a separate program under BRRTS No. 02-38-581955.

2.2 Recent Alternative Water Management Processes

As a result of detecting PFAS in off-site groundwater, a potable supply well sampling program of approximately 140 private wells was initiated in December 2017. Tyco immediately offered cases of bottled water and bottled water services to all community members within the private drinking water well sampling area at no cost to the residents.

As sample analyses were completed, Tyco offered point of entry treatment (POET) systems to those locations where PFAS was detected and confirmed in potable well samples at concentrations above the United States Environmental Protection Agency (USEPA) Lifetime Health Advisory Level (HAL). Working in conjunction with the Wisconsin Department of Natural Resources (WDNR), Tyco assessed available data and took action by expanding the PWSA in January 2018 and immediately offering bottled water service and private well testing to all added parcels. Tyco then expanded the POET system offer to include any private drinking water well with a confirmed detection of PFAS above the laboratory reporting limits for compounds within Wisconsin Department of Health Services (WDHS) Cycle 10 and 11 recommendations. Current criteria for offering a POET system as well as POET system operation, maintenance, and reporting are described in the 9th Revised Long Term Potable Well Sampling Plan (Arcadis 2024C). To date, POET systems have been installed in 47 locations and Tyco has tested 173 private drinking water wells. The POET systems and potable wells within the defined PWSA will continue to be sampled as outlined in the Revised Long-Term Potable Well Sampling Plan (Arcadis 2024C) that was submitted to WDNR. An updated version of that sampling plan will be provided to WDNR in October 2024. Residents within the defined PWSA will continue to receive bottled water service, sampling, and POET system maintenance as appropriate while Tyco works to install Replacement Wells.

2.3 Sampling Area

Tyco's PWSA is roughly contained to the north by University Drive, to the west by County Road B, to the south by Rader Road and to the east by the Bay of Green Bay. **Figure 4** outlines the PWSA.

The PWSA is defined using data collected from desktop studies of local geology and analytical data from field investigations. It is demonstrative of the total area of potential effect for Tyco operations in the area as demonstrated in the 2023 Site Investigation Status Report (Arcadis) and currently extends well beyond the limit of PFAS contamination. The PWSA may adjust as additional data supports.

3 Interim Comprehensive Alternative Water Management Solution

3.1 Bottled Water

Bottled water is offered to all homeowners and well users within the defined PWSA with a letter sent via overnight courier that alerts the property owner/user of the ongoing investigation activities as well as the availability of sampling and bottled water service at no cost to them. Homeowners are asked to call a toll-free number to set up sampling and bottled water service.

3.2 Point of Entry Treatment Systems

The interim POET system solution is offered to properties within the PWSA with confirmed PFAS detections above Wisconsin Department of Health Services (WDHS) current recommended groundwater standards where a Replacement Well is not feasible. Properties with private drinking water wells within the City of Marinette are not eligible for POETs as they are required by municipal code to connect to municipal water.

3.3 Connect to Existing Infrastructure

Tyco is evaluating how to proceed with connections to a permanent community water supply system for certain properties with private drinking water wells within the City of Marinette that do not currently have a water main directly adjacent to the structure.

4 Proposed Final Alternative Water Management Solution

4.1 Remedial Actions

The *Remedial Action Options Report for Long-Term Drinking Water Supply, Town of Peshtigo, Wisconsin* (RAOR) dated September 2019 includes an interim evaluation of remedial actions to provide long-term drinking water supply alternatives associated with response actions on the east side of the Town of Peshtigo along the southern border of the City of Marinette, Wisconsin, in accordance with Wisconsin Administrative Code (WAC), Chapter NR 700, where applicable. This evaluation of long-term drinking water supply alternatives was conducted to identify potentially feasible options for the residences with affected private water supply wells within the Town of Peshtigo. The evaluation identified eight drinking water supply alternatives and provided conceptual-level information for comparison of the alternatives.

Based on the evaluation of the initial eight alternatives and stakeholder feedback, five alternatives were selected for more detailed assessments. After further evaluation, the recommended long-term drinking water supply for the PWSA in the Town of Peshtigo was Alternative 1, City of Marinette Public Water System Expansion. This alternative would have required a change in the City Charter or annexation of the PWSA into the City of Marinette. Neither option was approved by residents of the PWSA, so Tyco offered Replacement Wells to all properties within the PWSA.

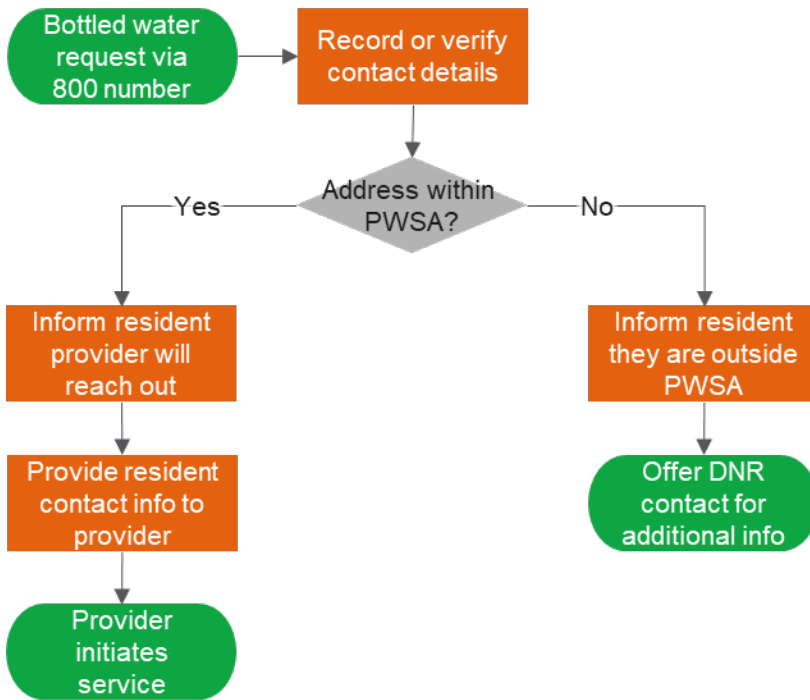
Private well owners within the PWSA can respond to Tyco's offer of a free Replacement Well by submitting a notarized agreement that was provided with the Replacement Well offer. Replacement Wells are being installed in accordance with the well design provided in the September 2022 PWSA Drinking Water Update (Arcadis 2022), which meets or exceeds the specifications of Wis. Adm. Code 812. Each property receiving a new well is being supplied with a high-efficiency water softener, a sediment filter, and a reverse osmosis treatment system. Each well will be tested for PFAS and secondary water quality parameters prior to and after connection to the residence. Tyco agreed to maintain each new well for a 20-year period following installation.

5 Managing Interim Solution Requests

5.1 Bottled Water Requests

Bottled water requests will continue to be managed through the toll-free number set up for this project. Anyone requesting bottled water will provide the address specific to their request which will be compared to the PWSA. If the property is found to be within the PWSA, a bottled water service provider will be informed by Arcadis that they are approved to start service for a new property. The bottled water service provider will contact that resident directly to set up and initiate service. Tyco will fund bottled water service. Properties outside the PWSA will be informed that they are not currently part of the investigation area and not eligible for free bottled water and they will be offered contact information for WDNR to answer any additional questions. A flow chart depicting this process is provided below.

Flow Chart 1. Bottled Water Request Management



5.2 POET Requests

Properties within the PWSA eligible for a POET system based on sampling results are notified via phone call and sampling results letter. They will first be reminded of the availability of a Replacement Well. If that option is not feasible, an interim POET system will be installed after an inspection of the property to determine the appropriate location for the system and confirmation that system components are available for the POET vendor to install. After installation, the POET will be maintained as described in the Revised Long-Term Potable Well Sampling Plan (Arcadis 2024C).

6 Ceasing Interim Alternative Water Management Solutions

Bottled water service and POET maintenance will cease in any of the following scenarios:

- Homeowner request
- Replacement Well installation with confirmation of drinking water quality
- Vacant or unoccupied properties.

Other criteria may be developed as additional data is obtained and as other conditions warrant.

7 References

Arcadis 2018. Revised Long-Term Potable Well Sampling Plan. Tyco Fire Products LP. April.

Arcadis 2019. Remedial Action Options Report for Long-Term Drinking Water Supply, Town of Peshtigo, Wisconsin. Tyco Fire Products LP. September.

Arcadis 2022. PWSA Drinking Water Update. Tyco Fire Technology Center, 2700 Industrial Parkway South, Marinette, WI 54143. BRRTS #02-38-580694. September.

Arcadis 2023. Site Investigation Status Report. Tyco Fire Technology Center, Marinette, Wisconsin. BRRTS #02-38-580694. April.

Arcadis 2024A. Site Investigation Status Report. Tyco Stanton Street Facility. Marinette, Wisconsin. BRRTS #02-38-581955. February.

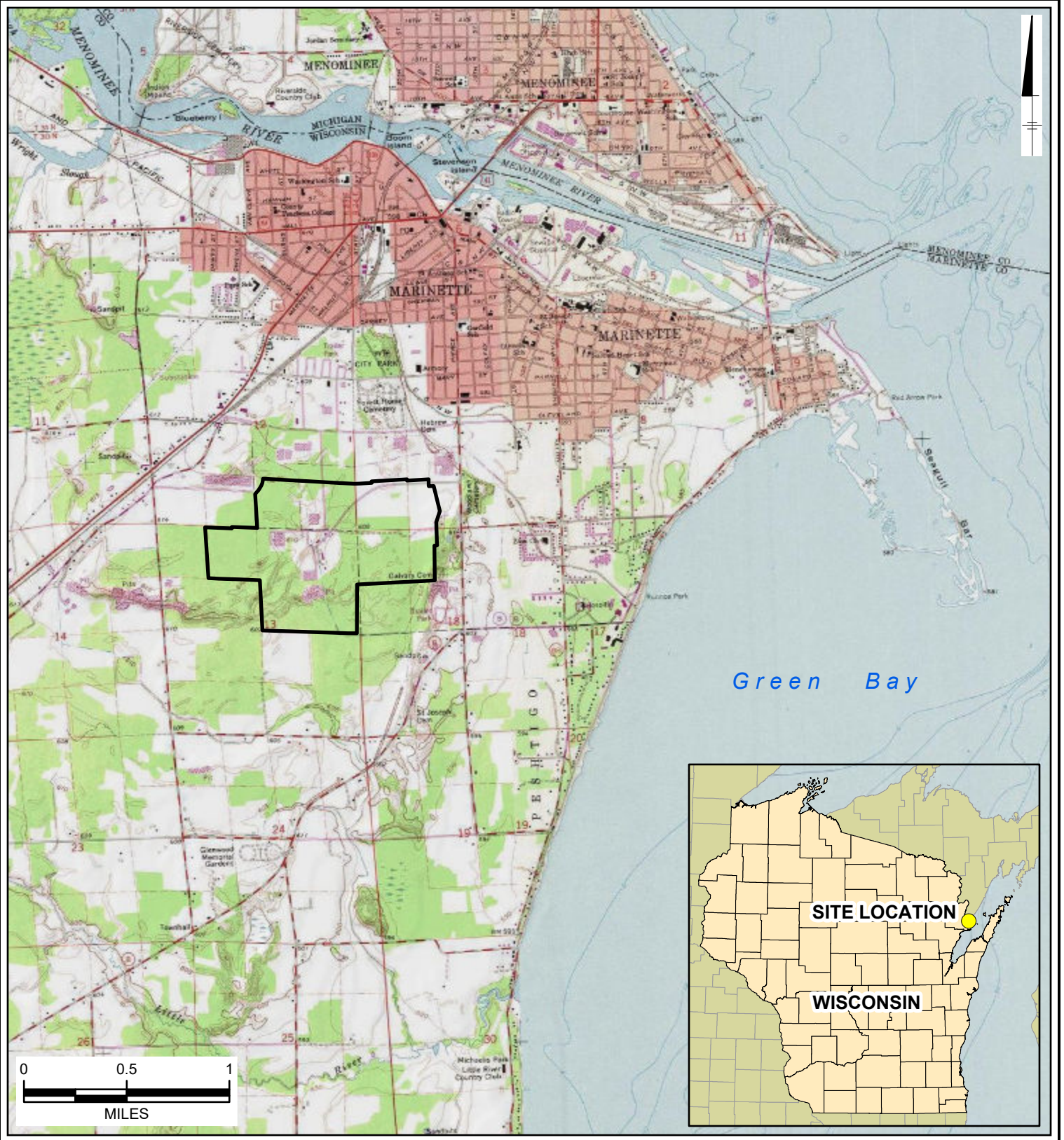
Arcadis 2024B. Deep Aquifer Bedrock Well Design – Quarterly Deep Private Well Update. Tyco Fire Technology Center, Marinette, WI. BRRTS #02-38-580694. March.

Arcadis 2024C. 9th Revised Long Term Potable Well Sampling Plan. Tyco Fire Technology Center, 2700 Industrial Parkway South. Marinette, Wisconsin. BRRTS# 02-38-580694. April.

CH2M Hill 2015. Revised Barrier Wall Groundwater Monitoring Plan Update. Tyco Fire Products LP. September.
Tyco letter to WDNR. Re: Additional Information Request. Submitted March 12, 2018.

Figures

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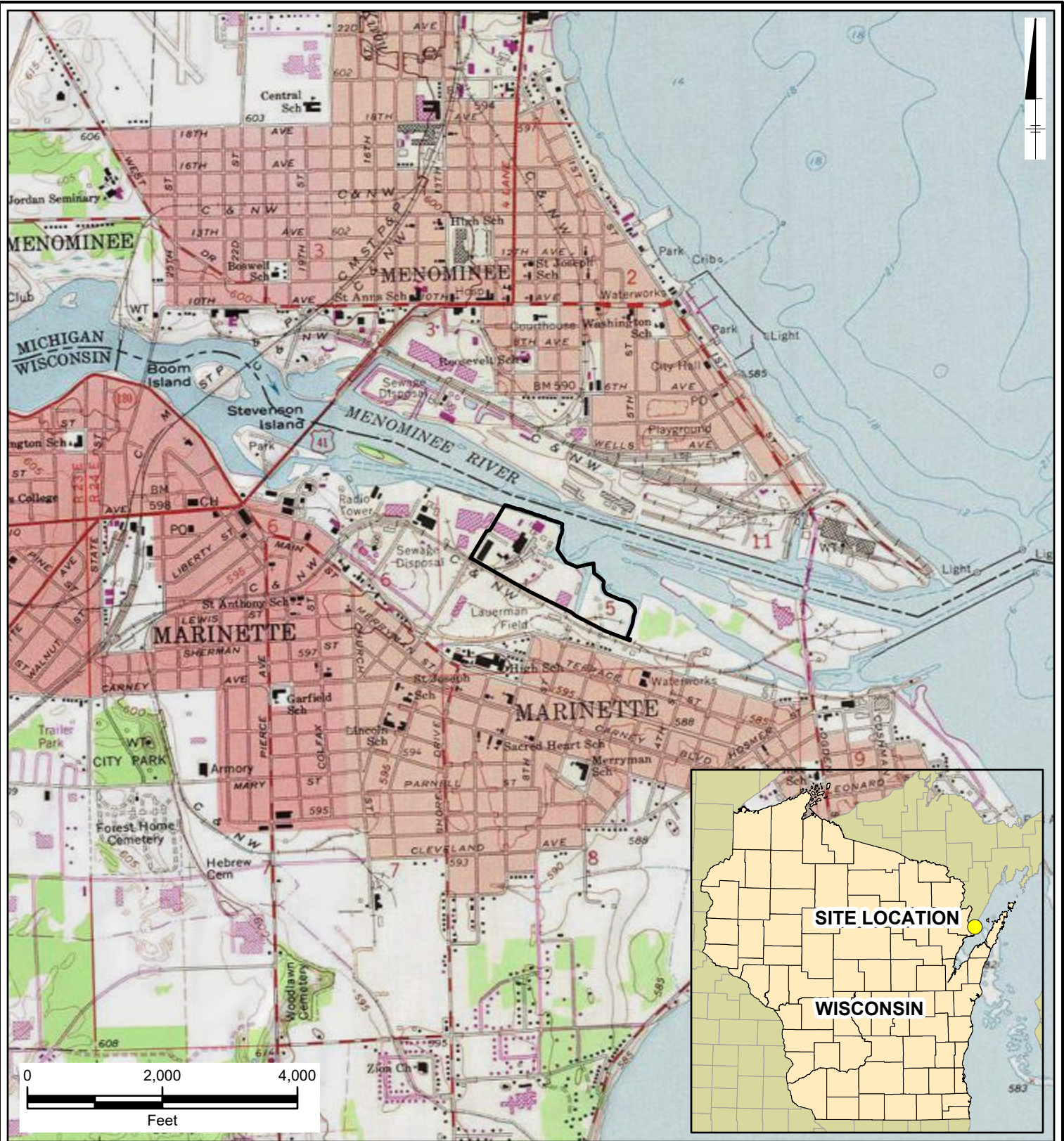
LEGEND:

 APPROXIMATE SITE PROPERTY BOUNDARY

NOTES:

1. TOPOGRAPHIC MAP SOURCE: USA TOPO MAPS; COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED, ACCESSED MARCH 2024.

TYCO FIRE PRODUCTS LP MARINETTE, WISCONSIN	
FIRE TECHNOLOGY CENTER LOCATION	
	FIGURE 1



LEGEND:

 APPROXIMATE SITE PROPERTY BOUNDARY

NOTES:

1. TOPOGRAPHIC MAP SOURCE: USA TOPO MAPS; COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED, ACCESSED MARCH 2024.

TYCO FIRE PRODUCTS LP
MARINETTE, WISCONSIN

STANTON STREET LOCATION



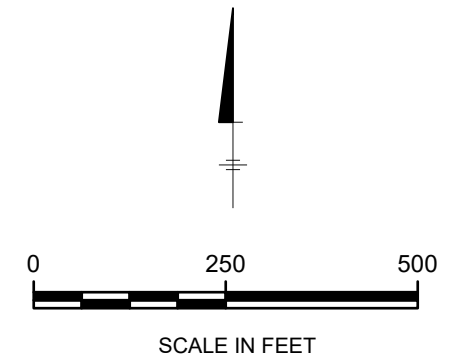
**FIGURE
2**

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LEGEND:

 OUTDOOR TESTING/TRAINING AREA

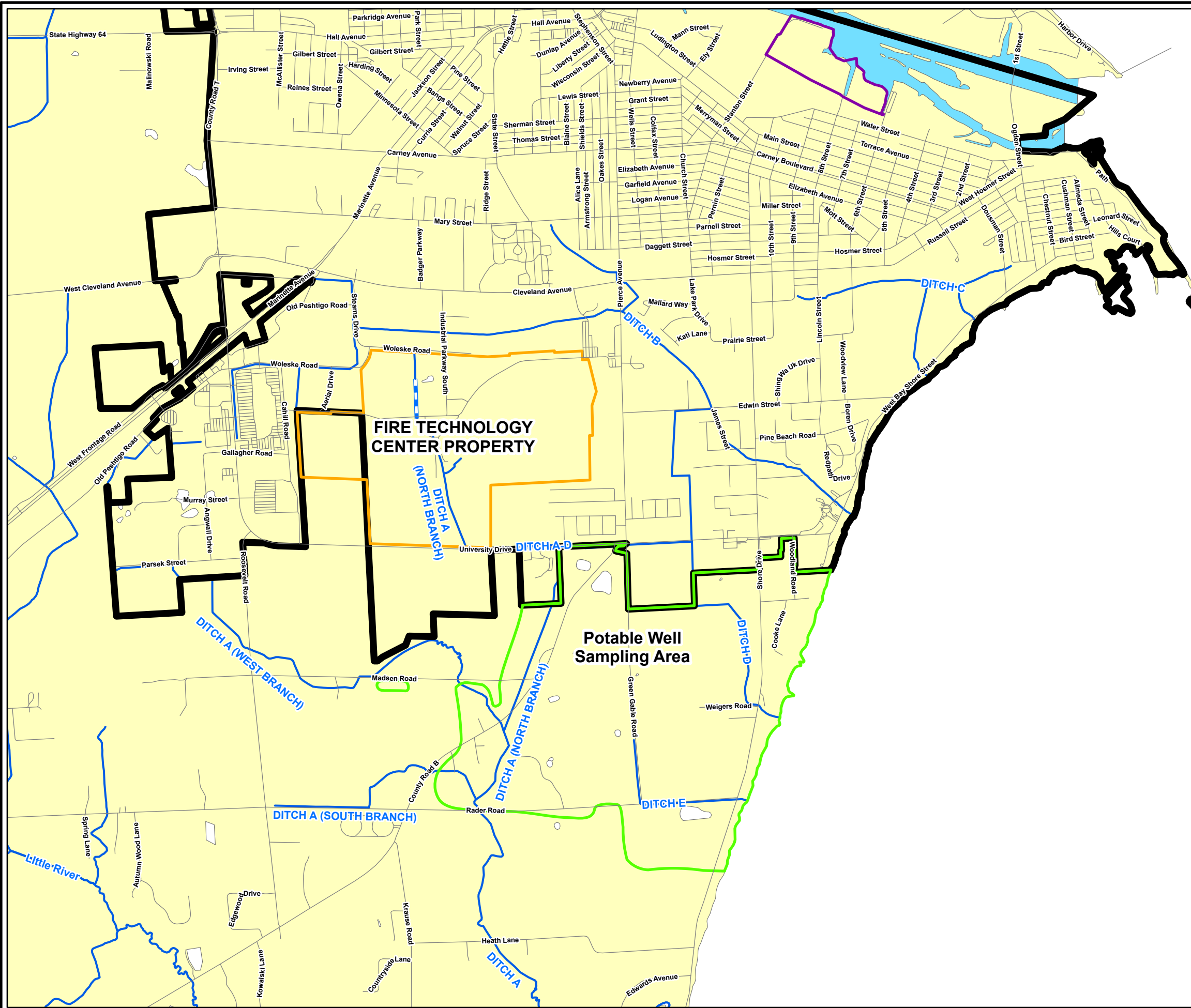


TYCO FIRE PRODUCTS LP
MARINETTE, WISCONSIN

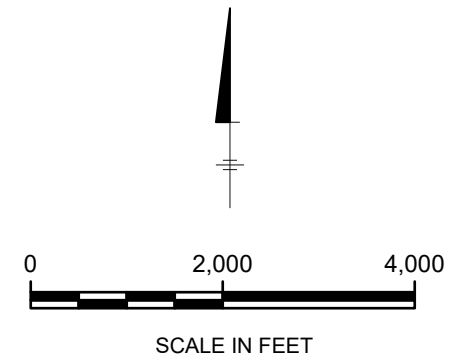
OUTDOOR TESTING/TRAINING AREA

 **ARCADIS**

FIGURE
3




- LEGEND:**
- POTABLE WELL SAMPLING AREA
 - APPROXIMATE STANTON STREET FACILITY PROPERTY BOUNDARY
 - APPROXIMATE SITE PROPERTY BOUNDARY
 - APPROXIMATE MARINETTE CITY BOUNDARY
 - WATERBODY
 - DITCH OR STREAM
 - ROAD



TYCO FIRE PRODUCTS LP
MARINETTE, WISCONSIN

POTABLE WELL SAMPLING AREA


FIGURE
4

Arcadis U.S., Inc.

126 North Jefferson Street, Suite 400

Milwaukee, Wisconsin 53202

Tel 414 276 7742

Fax 414 276 7603

www.arcadis.com

Alyssa Sellwood
Complex Sites Project Manager, Remediation and Redevelopment Program
State of Wisconsin Department of Natural Resources
101 South Webster Street
Box 7921
Madison, WI 53707-7921

Arcadis U.S., Inc.
126 North Jefferson Street
Suite 400
Milwaukee
Wisconsin 53202
Phone: 414 276 7742
Fax: 414 276 7603
www.arcadis.com

Date: April 1, 2024

Our Ref: 30219428

Subject: Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work
Plan – Interim Action Status Update
Tyco Fire Technology Center, Marinette, WI
BRRTS# 02-38-580694

Dear Ms. Sellwood,

On behalf of Tyco Fire Products LP (Tyco), Arcadis U.S., Inc. (Arcadis) prepared this Deep Aquifer Bedrock Well Design and Long-Term Monitoring Interim Action Status Update (Memo) in response to the Wisconsin Department of Natural Resources (WDNR) letter dated November 18, 2023. This November 2023 WDNR letter commented on the submittal of the Deep Aquifer Bedrock Well Design and Long-Term Monitoring – Interim Response Status Update (Interim Memo I), dated August 23, 2023. The next steps outlined within the November 2023 WDNR letter included the submittal of an interim action report within 6 months after the data from deep monitoring wells DMW-03 and DMW-04 was received.

In fulfillment of the most recent WDNR request, Arcadis is providing a status update as an interim measure following the installation of the remainder of the complete deep monitoring well network in the Potable Well Sampling Area (PWSA). This Memo includes the information requested within the November 2023 WDNR letter.

Tyco continues to investigate per- and poly-fluoroalkyl substances (PFAS) potentially related to the Tyco Fire Technology Center located at 2700 Industrial Parkway South in Marinette, Wisconsin (the Site; **Figure 1**).

Objectives

The intention of the installation of these deep monitoring wells is to be part of the long-term groundwater monitoring network. Additionally, investigation activities proposed the use of geophysical logging to verify the geology and conceptual site model (CSM) and to collect groundwater samples to define chemistry of the deep groundwater aquifer.

Well Design and Construction

As outlined in the Work Plan (Arcadis 2022), the deep monitoring wells were designed with an upper borehole 6-inch steel casing from the surface to approximately 75 feet below first encountered bedrock, a surface casing 10-inch diameter steel protective casing installed and grouted to surface, and protective casing finished above or at

grade. The casing depth of 75 feet below the bedrock surface was selected to extend a conservative distance into the bedrock to prevent cross-contamination between aquifers. Deep monitoring wells were then extended with an open borehole from the bottom of the upper casing to an approximate depth of 500 feet below ground surface (bgs). This depth permits the well to collect water from the lower Ordovician and Cambrian bedrock aquifers. Well construction reports are included in **Attachment 1**.

	DMW-01	DMW-02	DMW-03	DMW-04
Wisconsin Unique Well ID	AAT581	AAT582	AAZ792	AAZ793
Year Installed	2023	2023	2023	2023
Depth to top of bedrock	73 feet bgs	92 feet bgs	100 feet bgs	108 feet bgs
Depth of surface casing (6" steel)	153 feet bgs	168 feet bgs	153 feet bgs	168 feet bgs
Total depth	460 feet bgs	500 feet bgs	510 feet bgs	543 feet bgs
Liner depth	307 feet bgs	--	--	--

After installation activities were completed at each deep monitoring well, development activities occurred until the purge water was practicably clear and free of sediment. All investigation derived waste was containerized and transported to the project site for treatment and/or disposal.

Well Geophysics

In January 2024, Tyco completed geophysical logging and groundwater sampling at two monitoring wells located in the PWSA to assess the geology CSM in the area (DMW-03 and DMW-04). Locations of the monitoring wells can be found on **Figure 1**, geophysical logs can be found in **Attachment 2**. The logging suite included tools to assess both the geology and hydraulic characteristics of the borehole.

Well Profiling Results

The lithology in both boreholes matched previous work completed to understand the regional geology. The geophysical logs, with supplemental information from the driller’s logs, show stratigraphy consistent with the CSM that was developed for the Site; the surficial glacial overburden was underlain by the Sinnippe Group aquitard which overlies the lower Ordovician and Cambrian age bedrock units comprising the deep aquifer. These lower aquifer bedrock units were logged with pitted and vuggy dolomite throughout the formations.

The hydrostratigraphy in both boreholes is consistent with past logging events as well. Location DMW-03 intersected a highly transmissive zone of pitted and vuggy dolomite, near the base of the Prairie du Chien or within the Trempealeau Group, around 490 feet bgs through the terminal depth of the boring. Location DMW-04 has a narrower transmissive zone of pitted and vuggy dolomite around 513 feet bgs, and smaller transmissive zones throughout in comparison to the other monitoring wells. Because of the nature of the transmissive zone in

Memo

Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan– Status Update

April 1, 2024

DMW-04, the well is only able to be purged at a rate of about 1.5 gallons per minute (gpm). While the transmissivity of DMW-04 is not identical to that of the other three monitoring wells, a geochemical assessment of the analytical data aligns with parameters seen in DMW-01 through DMW-03.

Well Profiling Variations Update

As noted in the Interim Memo I (Arcadis 2023), the geophysical logging at monitoring well DMW-01 encountered an unforeseen lithological and hydrological condition. Based on the logging event and subsequent analytical sampling, a shale seam with connate water was identified containing groundwater with elevated concentrations of naturally occurring minerals. A permanent liner was installed from the top of the existing well casing to 307 feet bgs to prevent sulfur rich water identified from migrating downward in the well and to enable future groundwater samples to represent the deep aquifer being monitored (**Figure 2a**). The well was redeveloped and pump tested to ensure the liner installation was successful.

This approach to install a permanent liner will be the common aesthetic correction if connate waters are encountered in the aquitard at other locations within the PWSA.

Monitoring Well Sampling Results

In December 2023, Arcadis on behalf of Tyco collected groundwater samples from four deep monitoring wells (DMW-01 and DMW-02; third quarter samples), (DMW-03 and DMW-04; first quarter samples) completed in the deep bedrock aquifer for analyses. Samples were taken from each well following purging approximately five well volumes (DMW-01 through DMW-03), and three well volumes (DMW-04). Sampling included the following analysis:

- PFAS (USEPA Method 537 Modified)
- Metals (USEPA Methods 6020 & 7470)
- Major Ions (USEPA Method 9056)
- Alkalinity (USEPA Method 2320)
- Hardness (USEPA Method SM2340)
- Sulfur & Sulfides (USEPA Method 6010 & SM4500)
- Radium 226 + 228 (USEPA Method 903.0 & 904.0)
- Uranium (USEPA Method 6020)

Sample results are summarized on **Table 1**. Concentrations for the analytical suite were consistent with other analytical results across the aquifer regionally and with PFAS largely non-detect and below applicable screening levels at all locations. These results are similar to all private deep well analytical results collected to date and demonstrate the deep monitoring wells are representative of deep groundwater conditions. Previous data collected at deep monitoring wells (DMW-01 and DMW-02) was reported with the Interim Memo I (Arcadis 2023).

Appropriate QA/QC samples were collected in accordance with the project QAPP. Electronic copies of chain of custody forms and laboratory analytical reports generated as part of this sampling event are provided in **Attachment 3**.

Continued Efforts

The results in this Memo support deep wells as a permanent drinking water solution in the PWSA. The monitoring well sampling results continue to support the verification process that PFAS associated with the Site is not present in deep groundwater. Tyco continues to install private deep bedrock wells as a drinking water solution for neighbors that request to participate in the program.

While the Work Plan (Arcadis 2022) proposed a 5x volumetric purge, site sampling data indicates a reduced purge volume would be equally representative. To support reducing the volumetric purge, the first quarter 2024 sampling event consisted of analyzing water collected at approximately 33%, 67%, and 100% volumes for statistical comparison. Following receipt of this laboratory data, a geochemical statistical comparison from this sampling event will be utilized to adjust sampling procedures at each well during future events.

Conclusion and Next Steps

The installation and initial monitoring of DMW-03 and DMW-04, and the continued monitoring at DMW-01 and DMW-02 reported in this Memo show that the deep bedrock aquifer is a viable drinking water source. The first significant water producing zone in the deep aquifer is 40 to 50-foot-thick zone of pitted and vuggy dolomite, starting at an approximate depth of 400 to 500 feet bgs. This transmissive zone is protected from the shallow aquifer system by an aquitard present in the Sinnipee Group, the shallowest bedrock unit present. The installation of all four monitoring wells, DMW-01 through DMW-04, support the understanding of the thickness of the shallow bedrock aquitard and the depth of the transmissive zone.

As noted in this Memo, a permanent liner was successfully installed in DMW-01 to prevent sulfur rich water from migrating downward in the well and to enable future groundwater samples to represent the deep aquifer being monitored. This approach to install a permanent liner will be the approach to isolate connate waters and improve the aesthetics of the water if they are encountered in the aquitard at other locations within the PWSA (**Figure 2b**).

A final report detailing the complete monitoring well network will be submitted in the first quarter of 2025 following a collection of a minimum of four rounds of data from all deep monitoring wells. Per WDNR request, the initial review of data indicates the water quality in residential wells is similar to the water quality in the deep monitoring wells. However, statistical comparison of the data to confirm this initial interpretation will be performed when multiple data sets are available. The assessment will include a geochemical analysis of the data within and between each well and will be included in the final report.

Sincerely,
Arcadis U.S., Inc.



Scott T. Potter, PhD
Chief Hydrogeologist

Email: Scott.Potter@arcadis.com
Direct Line: (267) 685-1800

Memo

Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan– Status Update

April 1, 2024

CC. Denice Nelson, JCI
Scott Wahl, JCI

Enclosures:

Tables

Figures

Attachment 1 – Well Construction Reports

Attachment 2 – Geophysical Logs

Attachment 3 – Laboratory Reports

Memo

Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan– Status Update

April 1, 2024

Table

Table 1
Groundwater Sampling Results
Tyco Fire Technology Center



Analyte	June 2019 DHS (Not Adopted by DNR Board) ¹	November 2020 DHS (Not Yet Proposed for Rulemaking by DNR) ²	Applicable Standards ³	Location	DMW-01	DMW-02	DMW-03	DMW-03	DMW-04
				Sample ID	DMW-01 (121223)	DMW-02 (120723)	DMW-03 (120423)	DUP-004 (120423)	DMW-04 (120723)
				Parent Sample ID				DMW-03 (120423)	
				Sample Date	12/12/2023	12/07/2023	12/04/2023	12/04/2023	12/07/2023
				Sample Event	Q3	Q3	Q1	Q1	Q1
Units									
Radium-226	--	--	--	pCi/L	NS	NS	44.8	41.7	5.46
Radium-228	--	--	--	pCi/L	NS	NS	1.29	1.17	2.01
Radium-226,228 combined	--	--	5	pCi/L	NS	NS	46.1	42.9	7.47
Alkalinity	--	--	--	mg/L	NS	NS	92	92	120
Alkalinity, Carbonate	--	--	--	mg/L	NS	NS	<5.0 U	<5.0 U	<5.0 U
Alkalinity, Bicarbonate	--	--	--	mg/L	NS	NS	92	92	120
Hardness (as CaCO3)	--	--	180	mg/L	380	1500	520	540	380
Sulfide	--	--	--	mg/L	NS	NS	<1.0 U	<1.0 U	<1.0 U
Sulfur	--	--	--	mg/L	NS	NS	290	290	110
Aluminum	--	--	--	µg/L	<100 U	<100 U	<100 U	<100 U	<100 U
Iron	--	--	300	µg/L	<350 UB	920	200	190	8900
Lead	--	--	--	µg/L	<0.50 U	<0.50 U	<0.50 U	<0.50 U	<0.50 U
Magnesium	--	--	--	µg/L	36,000	110,000	52,000	51,000	36,000
Manganese	--	--	--	µg/L	16	44	6.5	6.3	100
Nickel	--	--	--	µg/L	<2.0 U	<2.0 U	<2.0 U	<2.0 U	3.3
Potassium	--	--	--	µg/L	5,500	5,800	5,900	5,900	6,500
Silver	--	--	--	µg/L	<0.50 U	<0.50 U	<0.50 U	<0.50 U	<0.50 U
Sodium	--	--	--	µg/L	42,000	56,000	45,000	44,000	46,000
Thallium	--	--	--	µg/L	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U
Antimony	--	--	--	µg/L	<3.0 U	<3.0 U	<3.0 U	<3.0 U	<3.0 U
Barium	--	--	--	µg/L	9.8	4.6	16	16	15
Beryllium	--	--	--	µg/L	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
Cadmium	--	--	--	µg/L	<0.50 U	<0.50 U	<0.50 U	<0.50 U	<0.50 U
Chromium	--	--	--	µg/L	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U
Cobalt	--	--	--	µg/L	<1.0 U	0.61 J	<1.0 U	0.40 J	0.69 J
Copper	--	--	--	µg/L	<2.0 UB	1.1 J	<2.0 U	<2.0 U	1.6 J
Zinc	--	--	--	µg/L	15 J	16 J	<20 U	<20 U	26
Calcium	--	--	--	µg/L	93,000	370,000	99,000	97,000	71,000
Selenium	--	--	--	µg/L	<2.5 U	<2.5 U	<2.5 U	<2.5 U	<2.5 U
Arsenic	--	--	--	µg/L	<1.0 U	1.5	0.24 J	<1.0 U	0.48 J
Vanadium	--	--	--	µg/L	<5.0 U	<5.0 U	<5.0 U	<5.0 U	<5.0 U
Uranium	--	--	--	µg/L	NS	NS	0.25 J	0.45 J	0.45 J
Boron	--	--	--	µg/L	280	220	240	250	220
Strontium	1,500	--	--	µg/L	4,000	9,400	12,000	12,000	9,300
Mercury	--	--	--	µg/L	<0.20 U	<0.20 U	<0.20 U	<0.20 U	<0.20 U
Nitrate-N	--	--	--	mg/L	<1.0 U	<1.0 UJ-	<1.0 U	<1.0 U	<1.0 UJ-
Bromide	--	--	--	mg/L	0.32 J	0.40 J	0.50 J	0.49 J	0.26 J
ortho-Phosphate (As P)	--	--	--	mg/L	<1.0 U	<1.0 UJ-	<1.0 U	<1.0 U	<1.0 UJ-
Nitrite	--	--	--	mg/L	<1.0 U	<1.0 UJ-	<1.0 U	<1.0 U	<1.0 UJ-
Chloride	--	--	--	mg/L	57	62	68	69	45
Fluoride (F-, Anion)	--	--	--	mg/L	2.3	1.6	1.2	1.1	1.2
Sulfate	--	--	250	mg/L	370	1,300	440	440	310

Notes on Page 3.

Table 1
Groundwater Sampling Results
Tyco Fire Technology Center



Analyte	June 2019 DHS (Not Adopted by DNR Board) ¹	November 2020 DHS (Not Yet Proposed for Rulemaking by DNR) ²	Applicable Standards ³	Location	DMW-01	DMW-02	DMW-03	DMW-03	DMW-04
				Sample ID	DMW-01 (121223)	DMW-02 (120723)	DMW-03 (120423)	DUP-004 (120423)	DMW-04 (120723)
				Parent Sample ID				DMW-03 (120423)	
				Sample Date	12/12/2023	12/07/2023	12/04/2023	12/04/2023	12/07/2023
				Sample Event	Q3	Q3	Q1	Q1	Q1
				Units					
PFOA	20	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFOS	20	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFBS	--	450,000	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFHpA	--	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFHxS	--	40	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFNA	--	30	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFDA	--	300	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFDaA	--	500	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFHxA	--	150,000	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFTeA	--	10,000	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFTriA	--	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFUnA	--	3,000	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
NEtFOSAA	--	20 (2)	--	ng/L	<4.3 U	<4.1 U	<4.9 U	<4.7 U	<4.8 U
NMeFOSAA	--	--	--	ng/L	<4.3 U	<4.1 U	<4.9 U	<4.7 U	<4.8 U
PFBA	--	10,000	--	ng/L	<4.3 U	<4.1 U	<4.9 U	<4.7 U	<4.9 U
PFPeA	--	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFHxDA	--	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFODA	--	400,000	--	ng/L	<1.7 UJ	<1.6 UJ	<2.0 UJ	<1.9 UJ	<1.9 UJ
PFPeS	--	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFHpS	--	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFNS	--	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFDS	--	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
PFDoS	--	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
FOSA	--	20 (2)	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
NEtFOSA	--	20 (2)	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
NMeFOSA	--	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
NMeFOSE	--	--	--	ng/L	<3.5 U	<3.3 U	<3.9 U	<3.8 U	<3.8 U
NEtFOSE	--	20 (2)	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
4:2 FTS	--	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
6:2 FTS	--	--	--	ng/L	<4.3 U	<4.1 U	<4.9 U	<4.7 U	<4.8 U
8:2 FTS	--	--	--	ng/L	<1.7 U	<1.6 U	0.55 J	<1.9 U	<1.9 U
10:2 FTS	--	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
ADONA	--	3,000	--	ng/L	<1.7 U	<1.6 U	<2.0 U	0.50 J	<1.9 U
HFPO-DA (GenX)	--	300	--	ng/L	<3.5 U	<3.3 U	<3.9 U	<3.8 U	<3.8 U
F-53B Major	--	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U
F-53B Minor	--	--	--	ng/L	<1.7 U	<1.6 U	<2.0 U	<1.9 U	<1.9 U

Notes on Page 3.

Table 1
Groundwater Sampling Results
Tyco Fire Technology Center



Notes:

< = Compound not detected at reporting detection limit.
 (1) = In June 2019, WDHS recommended individual groundwater standards of 20 ng/L for PFOA and PFOS. The WDNR proposed those standards through the state rulemaking process. In February 2022, the Wisconsin Natural Resource Board did not approve the proposed rulemaking for groundwater. In August 2022, WDNR promulgated a drinking water standard of 70 ng/L for PFOA and PFOS, individually and combined, for public water systems. This standard does not apply to private drinking water wells.
 (2) = In November 2020 the Wisconsin DHS recommended a combined groundwater standard of 20 ng/L for: FOSA, NEtFOSE, NEtFOSA, NEtFOSAA, PFOS and PFOA. DHS also recommended individual standards for FOSA, NEtFOSE, NEtFOSA, NEtFOSAA, PFBS, PFHxS, PFNA, PFDA, PFDoA, PFHxA, PFTeA, PFUnA, PFBA, PFODA, DONA, and GenX. The agency's authority under the scope statement expired in September 2023. In September 2022, the Governor approved a Statement of Scope to establish groundwater standards for PFOA, PFOS, PFBS and GenX (referred to as the "Four PFAS"). The Statement of Scope was approved by the Natural Resources Board in December 2022. Pursuant to state law, the WDNR has stopped work on the proposed rule and notified the state legislature that, following economic analysis, the proposed costs would exceed statutory thresholds. As a result, the WDNR cannot continue the rulemaking without authorization from the state legislature.
 (3) = Wis. Admin. Code ch. NR 809 Maximum Contaminant Level in drinking water for Radium-226,228 combined; Hardness as calcium carbonate - very hard defined as > 180 ppm; Iron under Wis. Admin Code ch. NR 140 Enforcement Standard.
 -- = No standard
 N = Normal sample
 ng/L = nanograms per liter
 mg/L = milligrams per liter
 ug/L = micrograms per liter
 pCi/L = picocuries per liter
 NS = Not sampled

J = The analyte was positively identified; however the associated numerical value is an estimated concentration only
 U = The analyte was analyzed for but the result was not detected above the method detection limit.
 UB = The analyte is considered nondetect at the listed value due to associated blank contamination.
 UJ = The analyte was analyzed for but was not detected. The reported reporting limit (RL) is approximate and may be inaccurate or imprecise.

Chemical Abbreviation:

PFOA = Perfluorooctanoic acid	PFPeS = Perfluoropentanesulfonic acid
PFOS = Perfluorooctanesulfonic acid	PFHpS = Perfluoroheptanesulfonic acid
PFBS = Perfluorobutanesulfonic acid	PFNS = Perfluorononanesulfonic acid
PFHpA = Perfluoroheptanoic acid	PFDS = Perfluorodecanesulfonic acid
PFHxS = Perfluorohexanesulfonic acid	PFDoS = Perfluorododecanesulfonic acid
PFNA = Perfluorononanoic acid	FOSA = Perfluorooctane sulfonamide
PFDA = Perfluorodecanoic acid	NEtFOSA = N-Ethyl perfluorooctane sulfonamide
PFDoA = Perfluorododecanoic acid	NMeFOSA = N-Methyl perfluorooctane sulfonamide
PFHxA = Perfluorohexanoic acid	NMeFOSE = N-Methyl perfluorooctane sulfonamidoethanol
PFTeA = Perfluorotetradecanoic acid	NEtFOSE = N-Ethyl perfluorooctane sulfonamidoethanol
PFTriA = Perfluorotridecanoic acid	4:2 FTS = 4:2 Fluorotelomer sulfonic acid
PFUnA = Perfluoroundecanoic acid	6:2 FTS = 6:2 Fluorotelomer sulfonic acid
NEtFOSAA = N-Ethyl perfluorooctane sulfonamidoacetic acid	8:2 FTS = 8:2 Fluorotelomer sulfonic acid
NMeFOSAA = N-Methyl perfluorooctane sulfonamidoacetic acid	10:2 FTS = 10:2 Fluorotelomer sulfonic acid
PFBA = Perfluorobutanoic acid	ADONA = 4,8-Dioxa-3H-perfluorononanoic acid
PFPeA = Perfluoropentanoic acid	HFPO-DA (GenX) = Hexafluoropropylene oxide dimer acid
PFHxDA = Perfluorohexadecanoic acid	F-53B Major = 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid
PFODA = Perfluorooctadecanoic acid	F-53B Minor = 11-chloroicosadecafluoro-3-oxaundecane-1-sulfonic acid

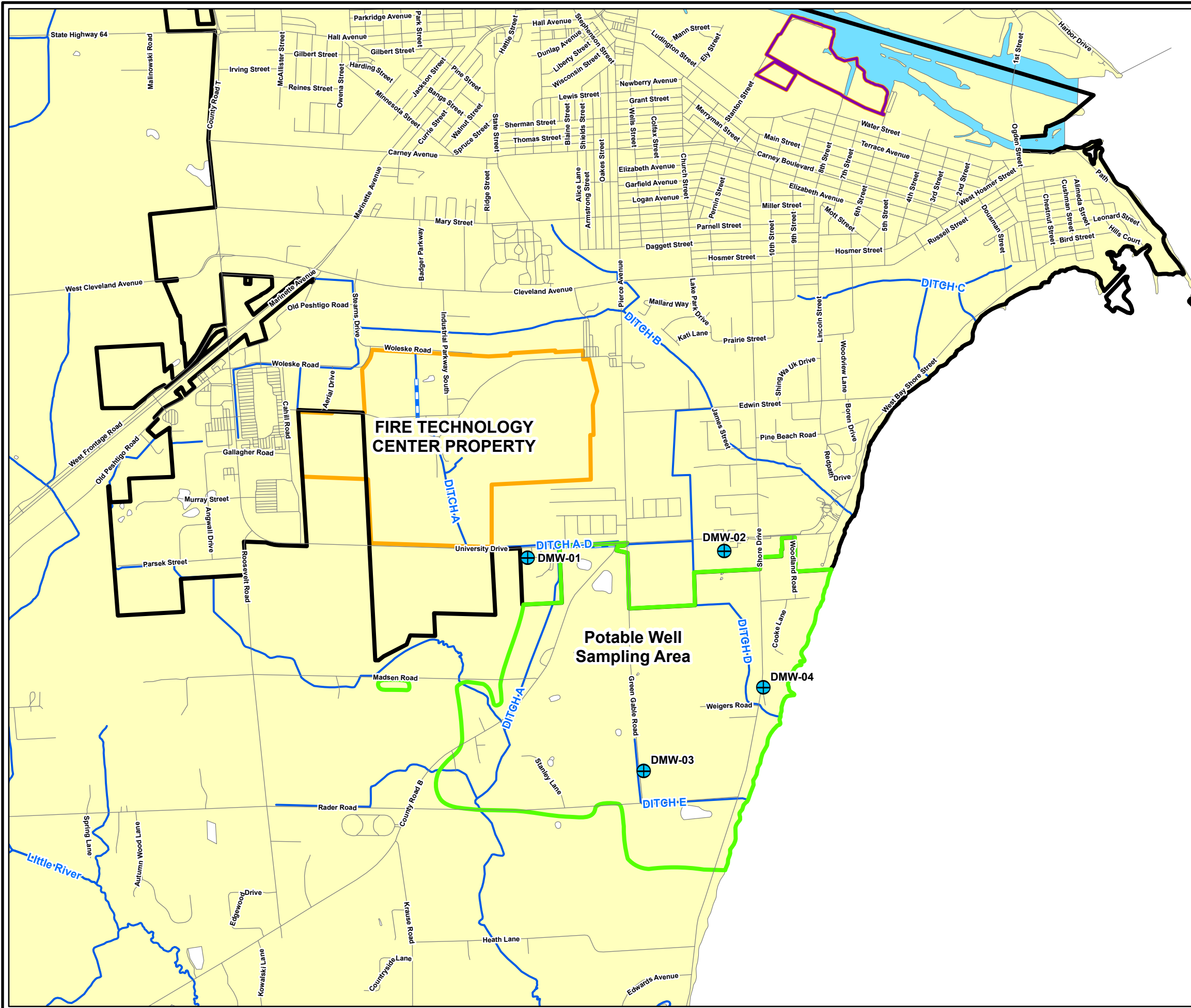
Memo

Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan– Status Update

April 1, 2024

Figures

TY_ENVTYCO_PRO_REPORT_FIGURES/FTCD/Deep_Monitoring_Well.aprx 12/21/2023 5:51 PM



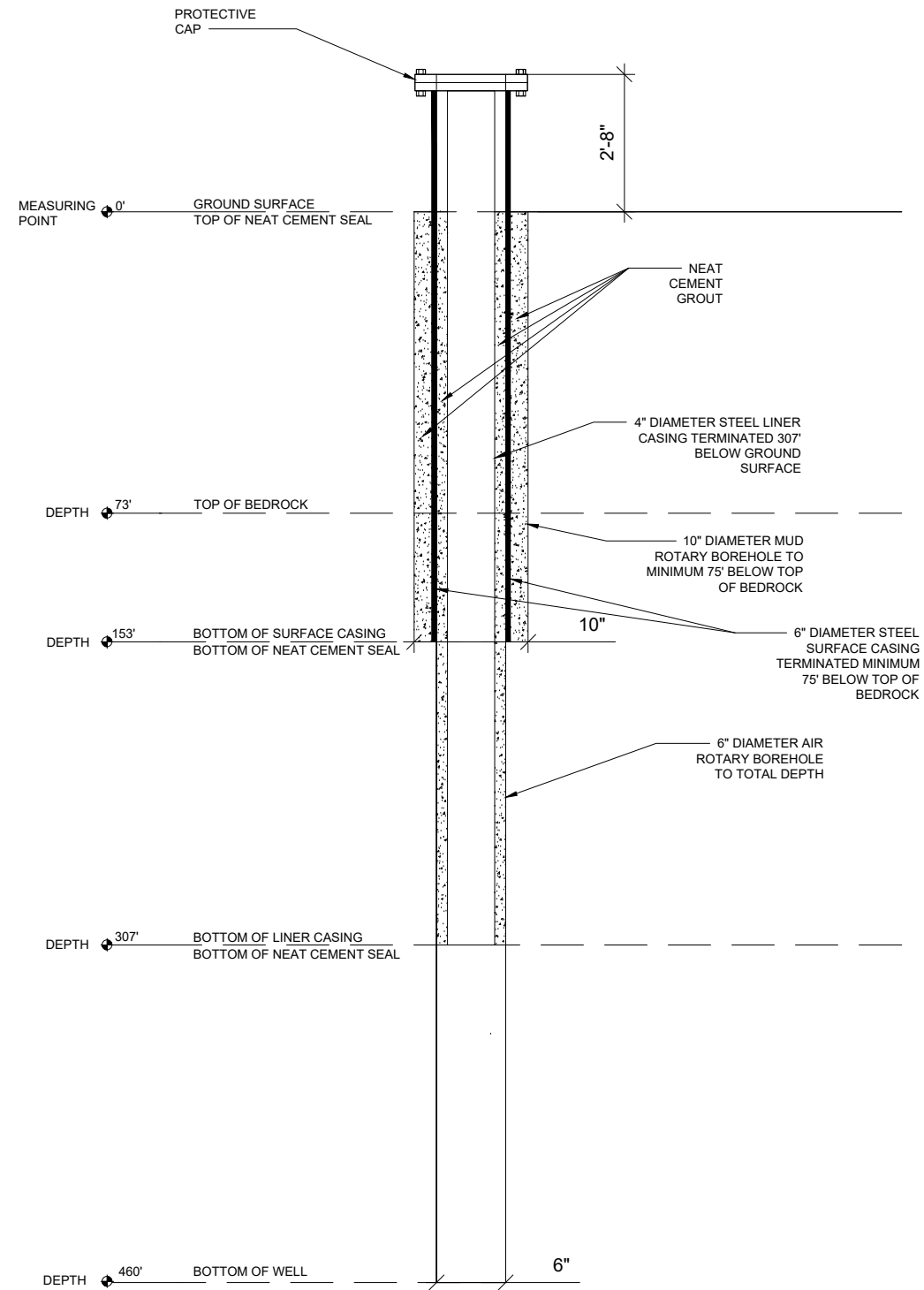
LEGEND:

- DEEP MONITORING WELL LOCATION
- POTABLE WELL SAMPLING AREA
- STANTON STREET FACILITY BOUNDARY
- APPROXIMATE SITE PROPERTY BOUNDARY
- APPROXIMATE MARINETTE CITY BOUNDARY
- WATERBODY
- DITCH OR STREAM
- ROAD

TYCO FIRE PRODUCTS LP
MARINETTE, WISCONSIN

DEEP MONITORING WELL LOCATIONS

ARCADIS | **FIGURE 1**



A BEDROCK WELL LINER DETAILS
NTS

		Professional Engineer's Name	
		Professional Engineer's No.	
		State	Date Signed
		Project Mgr.	
No.	Date	Revisions	By Ckd
<small>THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.</small>			
		Designed by	Drawn by
		Checked by	



TYCO FIRE PRODUCTS LP - MARINETTE, WI 54143-2542

**2a- BEDROCK MONITORING
WELL DMW-01 LINER DETAILS**

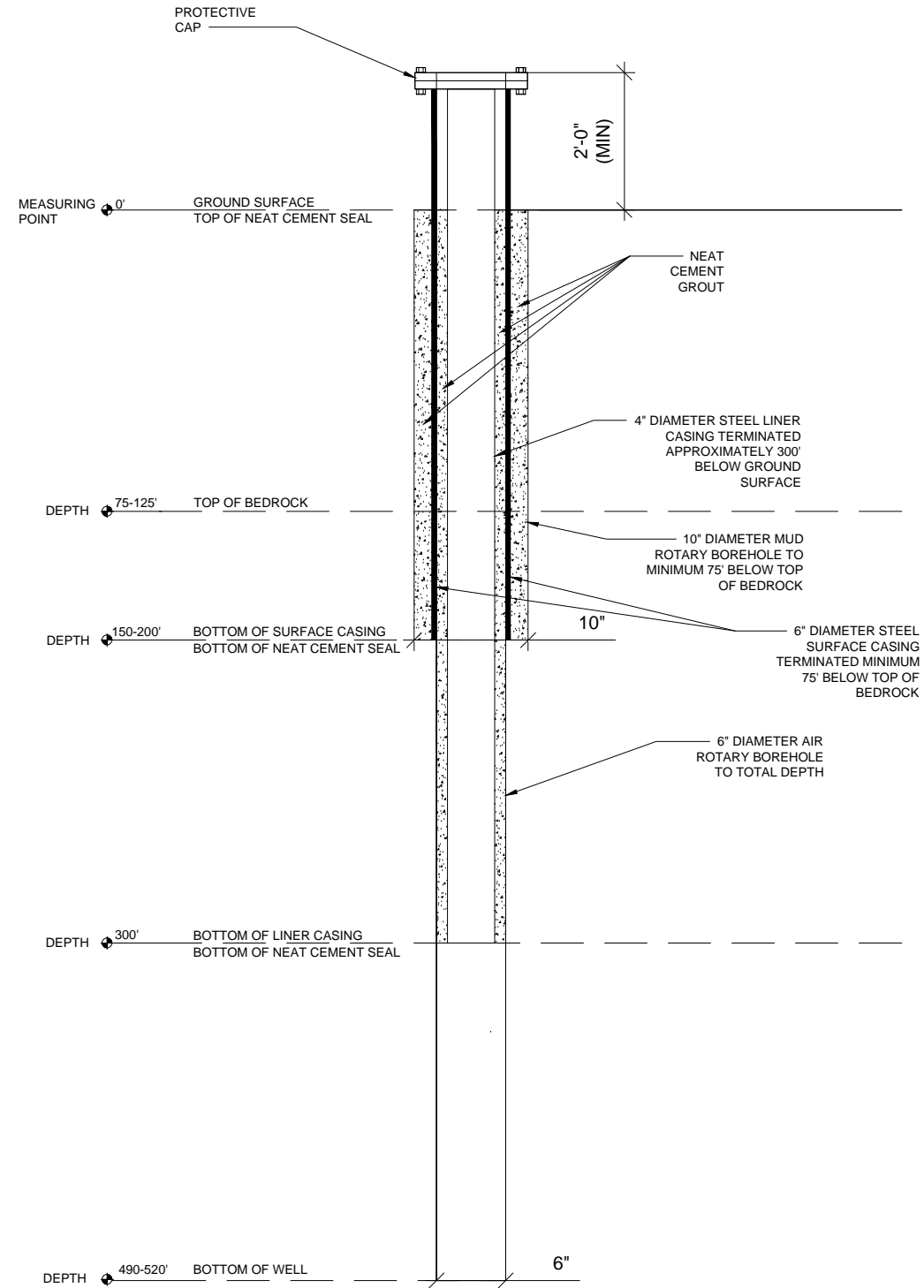
ARCADIS Project No.
30168809.1.4.1

Date
MARCH, 2024

ARCADIS
126 N. JEFFERSON ST.
SUITE 400
MILWAUKEE, WI 53202
TEL. 414.276.7742

**FIGURE
2a**

C:\Users\BDoyle\OneDrive - ARCADIS\Desktop\Marinette Private Well - Copy.dwg LAYOUT: M-16-01 - Saved: 8/22/2023 3:35 PM - ACADVER: 23.05 (LMS TECH) - PAGES: 23 - PLOTSTYLETABLE: - - - PLOTTED: 8/23/2023 8:45 AM BY: DOYLE, BRIGID



A BEDROCK WELL LINER DETAILS
NTS

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
Professional Engineer's No.		
State	Date Signed	Project Mgr.
Designed by	Drawn by	Checked by


 ARCADIS U.S., INC.

TYCO FIRE PRODUCTS LP - MARINETTE, WI 54143-2542
**2b - BEDROCK WELL LINER
DETAILS**

ARCADIS Project No. 30168807.1.4.1
Date AUGUST, 2023
ARCADIS 126 N. JEFFERSON ST. SUITE 400 MILWAUKEE, WI 53202 TEL: 414.276.7742

**FIGURE
2b**

Memo

Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan– Status Update

April 1, 2024

Attachments

Memo

Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan– Status Update

April 1, 2024

Attachment 1

Well Construction Logs

Jail

Route to: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name: DMW-01 Tyco Fire Products
 Local Grid Location of Well: 45.07009 ft. N. S. 87.63752 ft. E. W.
 Well Name: DMW-01
 Facility License, Permit or Monitoring No.: AA7581
 Local Grid Origin (estimated:) or Well Location
 Lat. _____ " Long. _____
 Facility ID: _____
 St. Plane _____ ft. N. _____ ft. E. S/C/N
 Section Location of Waste/Source: NW 1/4 of SW 1/4 of Sec. 18, T. 30 N. R. 24 E. W.
 Date Well Installed: 02/05/2023
 Well Installed By: Name (first, last) and Firm: Perry Storkamp
Traut Companies

A. Protective pipe, top elevation 22" AGS ft. MSL
 B. Well casing, top elevation 18" AGS ft. MSL
 C. Land surface elevation NA ft. MSL
 D. Surface seal, bottom _____ ft. MSL or 153 ft.

12. USCS classification of soil near screen:
 GP GM GC GW SW SP
 SM SC ML MH CL CH
 Bedrock
 13. Sieve analysis performed? Yes No
 14. Drilling method used: Rotary 50
 Hollow Stem Auger 41
 Other
 15. Drilling fluid used: Water 02 Air 01
 Drilling Mud 03 None 99
 16. Drilling additives used? Yes No
 Describe: _____
 17. Source of water (attach analysis, if required):
City Water

1. Cap and lock? Yes No
 2. Protective cover pipe:
 a. Inside diameter: 12 in.
 b. Length: 8 ft.
 c. Material: Steel 04
 Other
 d. Additional protection? Yes No
 If yes, describe: _____
 3. Surface seal: Bentonite 30
 Concrete 01
 Other
 4. Material between well casing and protective pipe:
 Bentonite 30
 Other
Cement
 5. Annular space seal: a. Granular/Chipped Bentonite 33
 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry 35
 c. _____ Lbs/gal mud weight Bentonite slurry 31
 d. 0 % Bentonite Bentonite-cement grout 50
 e. 51 Ft³ volume added for any of the above
 f. How installed: 24 cuft of cement for 6"x4" Tremie Tremie pumped 02
 Gravity 08
 6. Bentonite seal: a. Bentonite granules 33
 b. 1/4 in. 3/8 in. 1/2 in. Bentonite chips 32
 c. NA Other
 7. Fine sand material: Manufacturer, product name & mesh size
 a. NA
 b. Volume added NA ft³
 8. Filter pack material: Manufacturer, product name & mesh size
 a. NA
 b. Volume added NA ft³
 9. Well casing: Flush threaded PVC schedule 40 23
 Flush threaded PVC schedule 80 24
6" Steel to 153' / 4" steel Other
 10. Screen material: NA / 0-207
 a. Screen type: Factory cut 11
 Continuous slot 01
 Other
 b. Manufacturer NA
 c. Slot size: _____ in.
 d. Slotted length: _____ ft.
 11. Backfill material (below filter pack): None 14
 Other

E. Bentonite seal, top NA ft. MSL or _____ ft.
 F. Fine sand, top NA ft. MSL or _____ ft.
 G. Filter pack, top NA ft. MSL or _____ ft.
 H. Screen joint, top NA ft. MSL or _____ ft.
 I. Well bottom _____ ft. MSL or 460 ft.
 J. Filter pack, bottom NA ft. MSL or _____ ft.
 K. Borehole, bottom _____ ft. MSL or 460 ft.
 L. Borehole, diameter 16" x 6" in.
 M. O.D. well casing 6.625 in. / 4.5"
 N. I.D. well casing 6.025 in. / 4.026"

I hereby certify that the information on this form is true and correct to the best of my knowledge.
 Signature: [Signature] Firm: Traut Companies

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

Route to: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name <u>TYCO Fire Products</u>	County Name <u>Marquette</u>	Well Name <u>DMW-01</u>
Facility License, Permit or Monitoring Number	County Code <u>38</u>	Wis. Unique Well Number <u>AAT581</u>
		DNR Well ID Number _____

1. Can this well be purged dry? Yes No

2. Well development method
- surged with bailer and bailed 41
 - surged with bailer and pumped 61
 - surged with block and bailed 42
 - surged with block and pumped 62
 - surged with block, bailed and pumped 70
 - compressed air 20
 - bailed only 10
 - pumped only 51
 - pumped slowly 50
 - Other _____

3. Time spent developing well 60 min.

4. Depth of well (from top of well casing) 461 ft.

5. Inside diameter of well 6 in.

6. Volume of water in filter pack and well casing NA gal.

7. Volume of water removed from well 450.0 gal.

8. Volume of water added (if any) 0 gal.

9. Source of water added NA

10. Analysis performed on water added? Yes No
(If yes, attach results)

17. Additional comments on development:

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>12.00</u> ft.	<u>12.00</u> ft.
Date	b. <u>02/02/2023</u>	<u>02/05/2023</u>
Time	c. _____ <input type="checkbox"/> a.m. _____ <input type="checkbox"/> p.m.	_____ <input type="checkbox"/> a.m. _____ <input type="checkbox"/> p.m.
12. Sediment in well bottom	<u>0</u> inches	<u>0.0</u> inches
13. Water clarity	Clear <input checked="" type="checkbox"/> 10 Turbid <input type="checkbox"/> 15 (Describe)	Clear <input type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe)

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids NA mg/l _____ mg/l

15. COD NA mg/l _____ mg/l

16. Well developed by: Name (first, last) and Firm

First Name: PEVY Last Name: STOKAMP

Firm: TRACUT COMPANIES

Name and Address of Facility Contact/Owner/Responsible Party

First Name: _____ Last Name: _____
Name: _____

Facility/Firm: _____

Street: _____

City/State/Zip: _____

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: [Signature]

Print Name: Jake Tommsdick

Firm: Tracut Companies

Jail

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater Waste Management
Remediation/Revelpment Other

Page 1 of 1

Facility/Project Name Tyo Fire Products			License/Permit/Monitoring Number		Boring Number	
Boring Drilled By: Name of crew chief (first, last) and Firm First Name: Ferry Last Name: Starkamp			Date Drilling Started 02/02/2023 <small>m m d d y y y y</small>		Date Drilling Completed 02/05/2023 <small>m m d d y y y y</small>	
Firm: Traut Companies			Final Static Water Level 12 Feet MSL		Surface Elevation NA Feet MSL	
WI Unique Well No. AAT581		DNR Well ID No.		Well Name DMW-01		Borehole Diameter 10'-6" inches
Local Grid Origin <input type="checkbox"/> (estimated) or Boring Location <input type="checkbox"/>			Lat 0 ' "		Local Grid Location 45.07009 <input checked="" type="checkbox"/> N 87.63752 <input type="checkbox"/> E	
State Plane N , E			Long 0 ' "		Feet <input type="checkbox"/> S 0 Feet <input checked="" type="checkbox"/> W	
NW 1/4 of SW 1/4 of Section 18 , T 30 N, R 24 E			County Marquette		County Code 38	
Facility ID			Civil Town/City/ or Village Marquette			

Sample Number and Type	Length At. & Recovered (in)	Blow Counts	Depth in Feet (Below ground surface)	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			2	BLACK SOIL											
			15	FINE BROWN SAND											
			25	BROWN CLAY											
			60	BROWN CLAY SAND SEAMS											
			73	BROKEN LIME STONE TAN											
			121	HARD TAN LIMESTONE											
			140	160 HARD GRAY LIMESTONE											
			215	HARD GRAY + TAN LIMESTONE											
			215	TAN + BROWN LIMESTONE											
			460												

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature *JM Duke* Firm Traut Companies

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

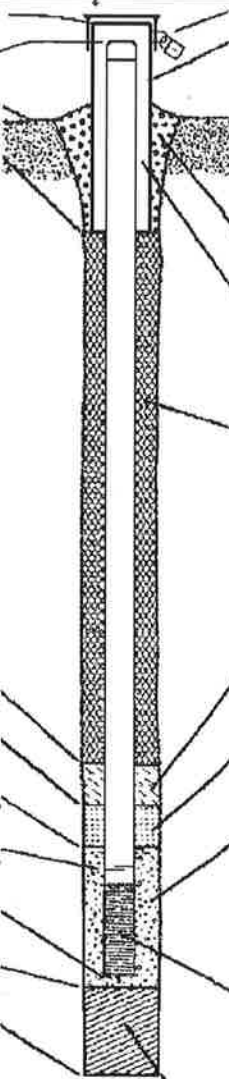
Field House

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater Waste Management
 Remediation/Redevelopment Other

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name Tyco Fire Products		Local Grid Location of Well 45.07019 ft. N. 87.62207 ft. E.		Well Name DMW-02	
Facility License, Permit or Monitoring No.		Local Grid Origin (estimated:) or Well Location Lat. " Long. " or		Wis. Unique Well No. AAT582 DNR Well ID No.	
Facility ID		St. Plane ft. N. ft. E. S/C/N		Date Well Installed 8/23/2023 m m d d y y y y	
Type of Well Well Code 11 / MW		Section Location of Waste/Source NE 1/4 of SE 1/4 of Sec. 18, T. 30 N. R. 24		Well Installed By: Name (first, last) and Firm Perry Storkamp Trout Companies	
Distance from Waste/Source NA ft.		Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input checked="" type="checkbox"/> Not Known		Gov. Lot Number NA	

<p>A. Protective pipe, top elevation 22' ft. MSL</p> <p>B. Well casing, top elevation 18' ft. MSL</p> <p>C. Land surface elevation NA ft. MSL</p> <p>D. Surface seal, bottom 168' ft. MSL or</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock <input checked="" type="checkbox"/></p> <p>13. Sieve analysis performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>14. Drilling method used: Rotary <input checked="" type="checkbox"/> 50 Hollow Stem Auger <input type="checkbox"/> 41 Other <input type="checkbox"/></p> <p>15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input checked="" type="checkbox"/> 01 Drilling Mud <input checked="" type="checkbox"/> 03 None <input type="checkbox"/> 99</p> <p>16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Describe _____</p> <p>17. Source of water (attach analysis, if required): <u>City water</u></p> </div> <p>E. Bentonite seal, top NA ft. MSL or _____ ft.</p> <p>F. Fine sand, top NA ft. MSL or _____ ft.</p> <p>G. Filter pack, top NA ft. MSL or _____ ft.</p> <p>H. Screen joint, top NA ft. MSL or _____ ft.</p> <p>I. Well bottom _____ ft. MSL or 500 ft.</p> <p>J. Filter pack, bottom NA ft. MSL or _____ ft.</p> <p>K. Borehole, bottom _____ ft. MSL or 500 ft.</p> <p>L. Borehole, diameter 10" x 6" in.</p> <p>M. O.D. well casing 6.025 in.</p> <p>N. I.D. well casing 6.025 in.</p>	 <p>1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>2. Protective cover pipe: a. Inside diameter: 12" in. b. Length: 8 ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/></p> <p>d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____</p> <p>3. Surface seal: Bentonite <input type="checkbox"/> 30 Concrete <input checked="" type="checkbox"/> 01 Other <input type="checkbox"/></p> <p>4. Material between well casing and protective pipe: <u>Cement</u> Bentonite <input type="checkbox"/> 30 Other <input checked="" type="checkbox"/></p> <p>5. Annular space seal: a. Granular/Chipped Bentonite <input type="checkbox"/> 33 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight Bentonite slurry <input type="checkbox"/> 31 d. 0 % Bentonite Bentonite-cement grout <input checked="" type="checkbox"/> 50 e. 59 Ft³ volume added for any of the above f. How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input checked="" type="checkbox"/> 02 Gravity <input type="checkbox"/> 08</p> <p>6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite chips <input type="checkbox"/> 32 c. NA Other <input type="checkbox"/></p> <p>7. Fine sand material: Manufacturer, product name & mesh size a. NA b. Volume added NA ft³</p> <p>8. Filter pack material: Manufacturer, product name & mesh size a. NA b. Volume added NA ft³</p> <p>9. Well casing: Flush threaded PVC schedule 40 <input type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 <u>6" steel to 168'</u> Other <input checked="" type="checkbox"/></p> <p>10. Screen material: NA a. Screen type: Factory cut <input type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/> b. Manufacturer NA c. Slot size: _____ 0. _____ in. d. Slotted length: _____ ft.</p> <p>11. Backfill material (below filter pack): <u>NA</u> None <input type="checkbox"/> 14 Other <input type="checkbox"/></p>
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I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature [Signature] Firm **Trout Companies**

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

Route to: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name <u>TYCO Fire Products</u>	County Name <u>Marquette</u>	Well Name <u>DMW-02</u>
Facility License, Permit or Monitoring Number	County Code <u>38</u>	Wis. Unique Well Number <u>AAT582</u>
		DNR Well ID Number _____

1. Can this well be purged dry? Yes No

2. Well development method
- surged with bailer and bailed 41
 - surged with bailer and pumped 61
 - surged with block and bailed 42
 - surged with block and pumped 62
 - surged with block, bailed and pumped 70
 - compressed air 20
 - bailed only 10
 - pumped only 51
 - pumped slowly 50
 - Other _____

3. Time spent developing well 60 min.

4. Depth of well (from top of well casing) 501' ft.

5. Inside diameter of well 6.025 in.

6. Volume of water in filter pack and well casing NA gal.

7. Volume of water removed from well 9000 gal.

8. Volume of water added (if any) NA gal.

9. Source of water added NA

10. Analysis performed on water added? Yes No
(If yes, attach results)

17. Additional comments on development:

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>8.0</u> ft.	<u>8.00</u> ft.
Date	b. <u>02/23/2023</u> m m d d y y y y	<u>02/23/2023</u> m m d d y y y y
Time	c. _____ : _____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	_____ : _____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
12. Sediment in well bottom	<u>0.0</u> inches	<u>0.0</u> inches
13. Water clarity	Clear <input checked="" type="checkbox"/> 10 Turbid <input type="checkbox"/> 15 (Describe)	Clear <input type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe)

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids _____ mg/l _____ mg/l

15. COD _____ mg/l _____ mg/l

16. Well developed by: Name (first, last) and Firm

First Name: PERRY Last Name: STORKAMP

Firm: TRAUT COMPANIES

Name and Address of Facility Contact /Owner/Responsible Party

First Name: _____ Last Name: _____
Name: _____ Name: _____

Facility/Firm: _____

Street: _____

City/State/Zip: _____

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: [Signature]

Print Name: Jake Tomische

Firm: Traut Companies

Field House

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater Waste Management
 Remediation/Revelopment Other

Page 1 of 1

Facility/Project Name <u>Tro Fire Products</u>		License/Permit/Monitoring Number <u>AAT582</u>	Boring Number
Boring Drilled By: Name of crew chief (first, last) and Firm First Name: <u>Rory</u> Last Name: <u>Storkamp</u> Firm: <u>Traut Companies</u>		Date Drilling Started <u>02/19/2023</u> <small>m m d d y y y y</small>	Date Drilling Completed <u>02/23/2023</u> <small>m m d d y y y y</small>
Drilling Method <u>Rotary - mud/Air</u>		Final Static Water Level Feet MSL	Surface Elevation Feet MSL
WI Unique Well No. <u>AAT582</u>	DNR Well ID No. _____	Well Name <u>DMW-02</u>	Borehole Diameter <u>10" x 6"</u> inches
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/> State Plane _____ N, _____ E		Lat _____ " _____ "	Local Grid Location <u>45.07019</u> <input checked="" type="checkbox"/> N <u>87.62267</u> <input type="checkbox"/> E _____ Feet <input type="checkbox"/> S _____ Feet <input checked="" type="checkbox"/> W
Facility ID <u>NE 1/4 of SE 1/4 of Section 18, T 30 N, R 24E</u>		County Code <u>38</u>	Civil Town/City/ or Village <u>City of Marinette</u>
County <u>Marinette</u>			

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet (Below ground surface)	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			<u>2</u>	<u>Black Soil</u>											
			<u>12</u>	<u>FINE BROWN SAND</u>											
			<u>92</u>	<u>BROKEN LIMESTONE TAN</u>											
			<u>95</u>	<u>HARD LIMESTONE TAN</u>											
			<u>435</u>	<u>TAN TO BROWN LIMESTONE</u>											
			<u>500</u>	<u>BROWN TAN LIMESTONE</u>											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm _____

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

DMW-03 "woods"

Route to: Watershed/Wastewater Waste Management
 Remediation/Redevelopment Other

Facility/Project Name: Tyco Fire Products Local Grid Location of Well: _____ ft. N. _____ ft. E. _____ ft. S. _____ ft. W.

Facility License, Permit or Monitoring No.: _____ Local Grid Origin (estimated:) or Well Location Lat. _____ " Long. _____ " or _____

Facility ID: _____ St. Plane 45.058087 ft. N, -87.628856 ft. E. S/C/N

Type of Well: _____ Well Code 11 MW Section Location of Waste/Source: SW 1/4 of NE 1/4 of Sec. 19, T. 30 N, R. 24 E W

Distance from Waste/Source _____ ft. Inf. Stds. Apply Location of Well Relative to Waste/Source: u Upgradient s Sidegradient d Downgradient n Not Known Gov. Lot Number _____

Well Name: DMW-03 Wis. Unique Well No. AA2792 DNR Well ID No. _____
 Date Well Installed: 11/21/2023
 Well Installed By: Name (first, last) and Firm: Perry Starkamp
Trant Companies

A. Protective pipe, top elevation 2.77 AGS 1.8 AGS ft. MSL Yes No

B. Well casing, top elevation _____ ft. MSL

C. Land surface elevation _____ ft. MSL

D. Surface seal, bottom _____ ft. MSL or 5 ft.

12. USCS classification of soil near screen:
 GP GM GC GW SW SP
 SM SC ML MH CL CH
 Bedrock

13. Sieve analysis performed? Yes No

14. Drilling method used: Rotary 50
 Hollow Stem Auger 41
 Other

15. Drilling fluid used: Water 02 Air 01
 Drilling Mud 03 None 99

16. Drilling additives used? Yes No
 Describe _____

17. Source of water (attach analysis, if required):
City Water

E. Bentonite seal, top _____ ft. MSL or NA ft.

F. Fine sand, top _____ ft. MSL or NA ft.

G. Filter pack, top _____ ft. MSL or NA ft.

H. Screen joint, top _____ ft. MSL or NA ft.

I. Well bottom _____ ft. MSL or 510 ft.

J. Filter pack, bottom _____ ft. MSL or NA ft.

K. Borehole, bottom _____ ft. MSL or 510 ft.

L. Borehole, diameter 10" in. to 178'
6" in. to 510'

M. O.D. well casing 6.625 in. to 178'

N. I.D. well casing 6.065 in. to 178'

1. Cap and lock? Yes No

2. Protective cover pipe:
 a. Inside diameter: _____ in.
 b. Length: _____ ft.
 c. Material: Steel 04
 Other
 d. Additional protection? Yes No
 If yes, describe: _____

3. Surface seal: Bentonite 30
 Concrete 01
 Other

4. Material between well casing and protective pipe: Sand
 Bentonite 30
 Other

5. Annular space seal:
 a. Granular/Chipped Bentonite 33
 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry 35
 c. _____ Lbs/gal mud weight Bentonite slurry 31
 d. 0 % Bentonite Bentonite-cement grout 50
 e. 62 Ft³ volume added for any of the above
 f. How installed: Tremie 01
 Tremie pumped 02
 Gravity 08

6. Bentonite seal:
 a. Bentonite granules 33
 b. 1/4 in. 3/8 in. 1/2 in. Bentonite chips 32
 c. NA Other

7. Fine sand material: Manufacturer, product name & mesh size
 a. NA
 b. Volume added _____ ft³

8. Filter pack material: Manufacturer, product name & mesh size
 a. NA
 b. Volume added _____ ft³

9. Well casing: Flush threaded PVC schedule 40 23
 Flush threaded PVC schedule 80 24
6" steel Other

10. Screen material: NA
 a. Screen type: Factory cut 11
 Continuous slot 01
 Other
 b. Manufacturer _____
 c. Slot size: _____ in.
 d. Slotted length: _____ ft.

11. Backfill material (below filter pack): NA
 None 14
 Other

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: [Signature] Firm: Trant Companies

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

Route to: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name <u>Tyco Fire Products</u>	County Name <u>Marquette</u>	Well Name <u>DMW-03</u>
Facility License, Permit or Monitoring Number	County Code <u>38</u>	Wis. Unique Well Number <u>AA2792</u>
		DNR Well ID Number _____

1. Can this well be purged dry? Yes No
2. Well development method
- surged with bailer and bailed 41
 - surged with bailer and pumped 61
 - surged with block and bailed 42
 - surged with block and pumped 62
 - surged with block, bailed and pumped 70
 - compressed air 20
 - bailed only 10
 - pumped only 51
 - pumped slowly 50
 - Other _____
3. Time spent developing well 120 min.
4. Depth of well (from top of well casing) 512.0 ft.
5. Inside diameter of well 6.06 in.
6. Volume of water in filter pack and well casing 7400 gal.
7. Volume of water removed from well 36000 gal.
8. Volume of water added (if any) NA gal.
9. Source of water added NA
10. Analysis performed on water added? Yes No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>6.00</u> ft.	<u>6.00</u> ft.
Date	b. <u>11/26/2023</u> m m d d y y y y	<u>11/21/2023</u> m m d d y y y y
Time	c. <u>4:00</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	<u>6:00</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.
12. Sediment in well bottom	<u>0</u> inches	<u>0</u> inches
13. Water clarity	Clear <input checked="" type="checkbox"/> 10 Turbid <input type="checkbox"/> 15 (Describe) _____	Clear <input checked="" type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe) _____

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids NA mg/l _____ mg/l

15. COD NA mg/l _____ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Perry Last Name: Storkamp
Firm: Traut Companies

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party

First Name: _____ Last Name: _____
Name: _____

Facility/Firm: TYCO FTC

Street: 2700 Industrial Parkway S

City/State/Zip: Marquette, WI 54413

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: [Signature]

Print Name: Dale Tomsche

Firm: Traut Companies


NOTE: See instructions for more information including a list of county codes and well type codes.

Route To: Watershed/Wastewater Waste Management
Remediation/Revelpoment Other

Facility/Project Name Tyco Fire Products			License/Permit/Monitoring Number		Boring Number		
Boring Drilled By: Name of crew chief (first, last) and Firm First Name: Perry Last Name: Star Kemp Firm: Trant Companies			Date Drilling Started 11/18/2023 m m d d y y y y		Date Drilling Completed 11/21/2023 m m d d y y y y		
WI Unique Well No. A A 2793		DNR Well ID No.		Well Name DMW-03		Final Static Water Level 6 Feet MSL	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/> State Plane 45-058087 N, -87-628856 E		Lat 0 ' "		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W		Surface Elevation Feet MSL	
SW 1/4 of NE 1/4 of Section 19 , T 30 N, R 24		Long 0 ' "		Borehole Diameter 6 inches		Drilling Method Mud/Air Rotary	
Facility ID		County Marquette		County Code 38		Civil Town/City/ or Village Town of Peshtigo	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet (Below ground surface)	Soil/Rock Description And Geologic Origin For Each Major Unit			USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
				Depth	material	Color					Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
				0-2	Top Soil	Black										
				2-45	Fine Sand	Brown										
				45-55	Sandy clay	Brown										
				55-85	Fine Sand	Brown										
				85-100	Clay	Brown										
				100-510	lime Stone	tan										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature 	Firm Trant Companies
--	--------------------------------

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DMW-04 "Ditch"

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name Tyco Fire Products	Local Grid Location of Well ft. <input type="checkbox"/> N. <input type="checkbox"/> S. <input type="checkbox"/> E. <input type="checkbox"/> W.	Well Name DMZ-04
Facility License, Permit or Monitoring No.	Local Grid Origin (estimated) or Well Location Lat. _____ Long. _____	Wis. Unique Well No. AAZ79S DNR Well ID No. _____
Facility ID	St. Plane 45.062576 ft. N. -87.619348 ft. E. SIC/N	Date Well Installed 11/17/2023 m m d d y y y y
Type of Well Well Code 17, MW	Section Location of Waste/Source NW 1/4 of NW 1/4 of Sec. 20, T. 30, N. R. 24 <input checked="" type="checkbox"/> E <input type="checkbox"/> W	Well Installed By: Name (first, last) and Firm Perry, Storkamp Trant companies
Distance from Waste/Source _____ ft.	Location of Gradient Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input checked="" type="checkbox"/> Not Known	Gov. Lot Number _____

- A. Protective pipe, top elevation _____ ft. MSL
- B. Well casing, top elevation _____ ft. MSL
- C. Land surface elevation _____ ft. MSL
- D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS classification of soil near screen:
 GP GM GC GW SW SP
 SM SC ML MH CL CH
 Bedrock

13. Sieve analysis performed? Yes No

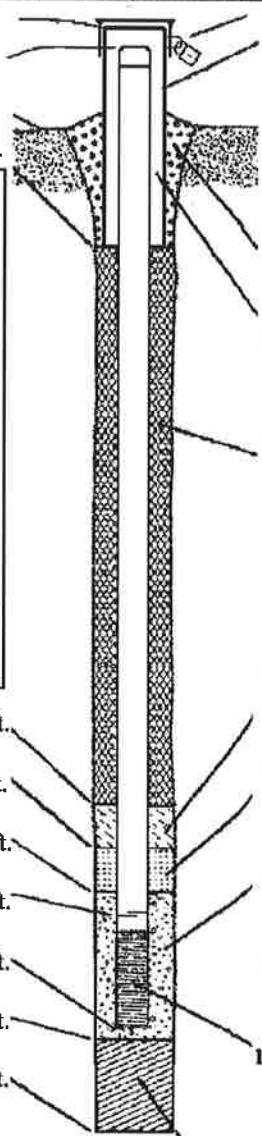
14. Drilling method used: Rotary 50
 Hollow Stem Auger 41
 Other

15. Drilling fluid used: Water 02 Air 01
 Drilling Mud 03 None 99

16. Drilling additives used? Yes No

Describe _____

17. Source of water (attach analysis, if required):
City water



- 1. Cap and lock? Yes No
- 2. Protective cover pipe:
 - a. Inside diameter: _____ in.
 - b. Length: _____ ft.
 - c. Material: **NA** Steel 04
Other
 - d. Additional protection? Yes No
If yes, describe: **Flush mount / plug with concrete pad**
- 3. Surface seal: Bentonite 30
Concrete 01
Other
- 4. Material between well casing and protective pipe: Bentonite 30
Other **neat cement**
- 5. Annular space seal:
 - a. Granular/Chipped Bentonite 33
 - b. _____ Lbs/gal mud weight ... Bentonite-sand slurry 35
 - c. _____ Lbs/gal mud weight ... Bentonite slurry 31
 - d. **0** % Bentonite ... Bentonite-cement grout 50
 - e. **65** Ft³ volume added for any of the above
 - f. How installed: Tremie 01
Tremie pumped 02
Gravity 08
- 6. Bentonite seal:
 - a. Bentonite granules 33
 - b. 1/4 in. 3/8 in. 1/2 in. Bentonite chips 32
 - c. **NA** Other
- 7. Fine sand material: Manufacturer, product name & mesh size
 - a. **NA**
 - b. Volume added _____ ft³
- 8. Filter pack material: Manufacturer, product name & mesh size
 - a. **NA**
 - b. Volume added _____ ft³
- 9. Well casing: Flush threaded PVC schedule 40 23
 Flush threaded PVC schedule 80 24
 Other **6" steel**
- 10. Screen material:
 - a. Screen type: Factory cut 11
Continuous slot 01
Other
 - b. Manufacturer _____
 - c. Slot size: _____ in.
 - d. Slotted length: _____ ft.
- 11. Backfill material (below filter pack): None 14
Other

- E. Bentonite seal, top _____ ft. MSL or **NA** ft.
- F. Fine sand, top _____ ft. MSL or **NA** ft.
- G. Filter pack, top _____ ft. MSL or **NA** ft.
- H. Screen joint, top _____ ft. MSL or **NA** ft.
- I. Well bottom _____ ft. MSL or **543** ft.
- J. Filter pack, bottom _____ ft. MSL or **NA** ft.
- K. Borehole, bottom _____ ft. MSL or **543** ft.
- L. Borehole, diameter **10" to 185'**
6 7/8" to 543'
- M. O.D. well casing **6.625 in. to 185'**
- N. I.D. well casing **6.065 in. to 185'**

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: *[Signature]* Firm: **Trant companies**

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

Route to: Watershed/Wastewater Waste Management
Remediation/Redevelopment Other

Facility/Project Name <u>Tyco Fire Products</u>	County Name <u>Marquette</u>	Well Name <u>DMW-04</u>
Facility License, Permit or Monitoring Number	County Code <u>38</u>	Wis. Unique Well Number <u>AA2793</u>
		DNR Well ID Number _____

1. Can this well be purged dry? Yes No

2. Well development method

- surged with bailer and bailed 41
- surged with bailer and pumped 61
- surged with block and bailed 42
- surged with block and pumped 62
- surged with block, bailed and pumped 70
- compressed air 20
- bailed only 10
- pumped only 51
- pumped slowly 50
- Other _____ _____

3. Time spent developing well 120 min.

4. Depth of well (from top of well casing) 545 ft.

5. Inside diameter of well 6.06 in.

6. Volume of water in filter pack and well casing 7960 gal.

7. Volume of water removed from well 36000 gal.

8. Volume of water added (if any) NA gal.

9. Source of water added NA

10. Analysis performed on water added? Yes No
(If yes, attach results)

Before Development After Development

11. Depth to Water (from top of well casing) a. 1 ft. 1 ft.

Date b. 11/17/2023 11/17/2023
m m d d y y y y m m d d y y y y

Time c. 3:00 a.m. 5:00 p.m.

12. Sediment in well bottom 0 inches 0 inches

13. Water clarity Clear 10 Clear 20
Turbid 15 Turbid 25
(Describe) (Describe)

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids _____ mg/l _____ mg/l

15. COD _____ mg/l _____ mg/l

16. Well developed by: Name (first, last) and Firm

First Name: Perry Last Name: Storkamp

Firm: Trant companies

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party

First Name: _____ Last Name: _____

Facility/Firm: Tyco FTC

Street: 2700 Industrial Parkway South

City/State/Zip: Marquette, WI 54143

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: [Signature]

Print Name: Jake Tamsche

Firm: Trant companies


Route To: Watershed/Wastewater Waste Management
Remediation/Revelopment Other

Page 1 of 1

Facility/Project Name TYCO Fire Products		License/Permit/Monitoring Number	Boring Number 1
Boring Drilled By: Name of crew chief (first, last) and Firm First Name: Jerry Last Name: Storkamp Firm: Traut Companies		Date Drilling Started 11/14/2023 m m d d y y y y	Date Drilling Completed 11/17/2023 m m d d y y y y
WI Unique Well No. AA2793	DNR Well ID No.	Well Name DMW-34	Borehole Diameter 10 1/2 inches
Local Grid Origin <input type="checkbox"/> (estimated) or Boring Location State Plane N		Final Static Water Level 1 Feet MSL	Surface Elevation Feet MSL
Local Grid Location NW 1/4 of NW 1/4 of Section 20 , T 30 N, R 24 E		Lat 0 ' "	Local Grid Location 45.062576 N -82.619318 W
Facility ID		County Marinette	Civil Town/City/ or Village Town of Peshtigo

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet (Below ground surface)	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments				
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200					
			0-2	Top Soil														
			2-40	Fine Sand														
			40-75	Sandy clay														
			75-95	Sand/gavel														
			95-108	clay														
			108-543	lime stone														

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature 	Firm Traut Companies
--	--------------------------------

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Memo

Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan– Status Update

April 1, 2024

Attachment 2

Geophysical Logs



borehole geophysics / hydrophysics

Electric Log

COMPANY: Arcadis

PROJECT: Deep Well Program

DATE LOGGED: 17 January 2024

WELL: DMW-3

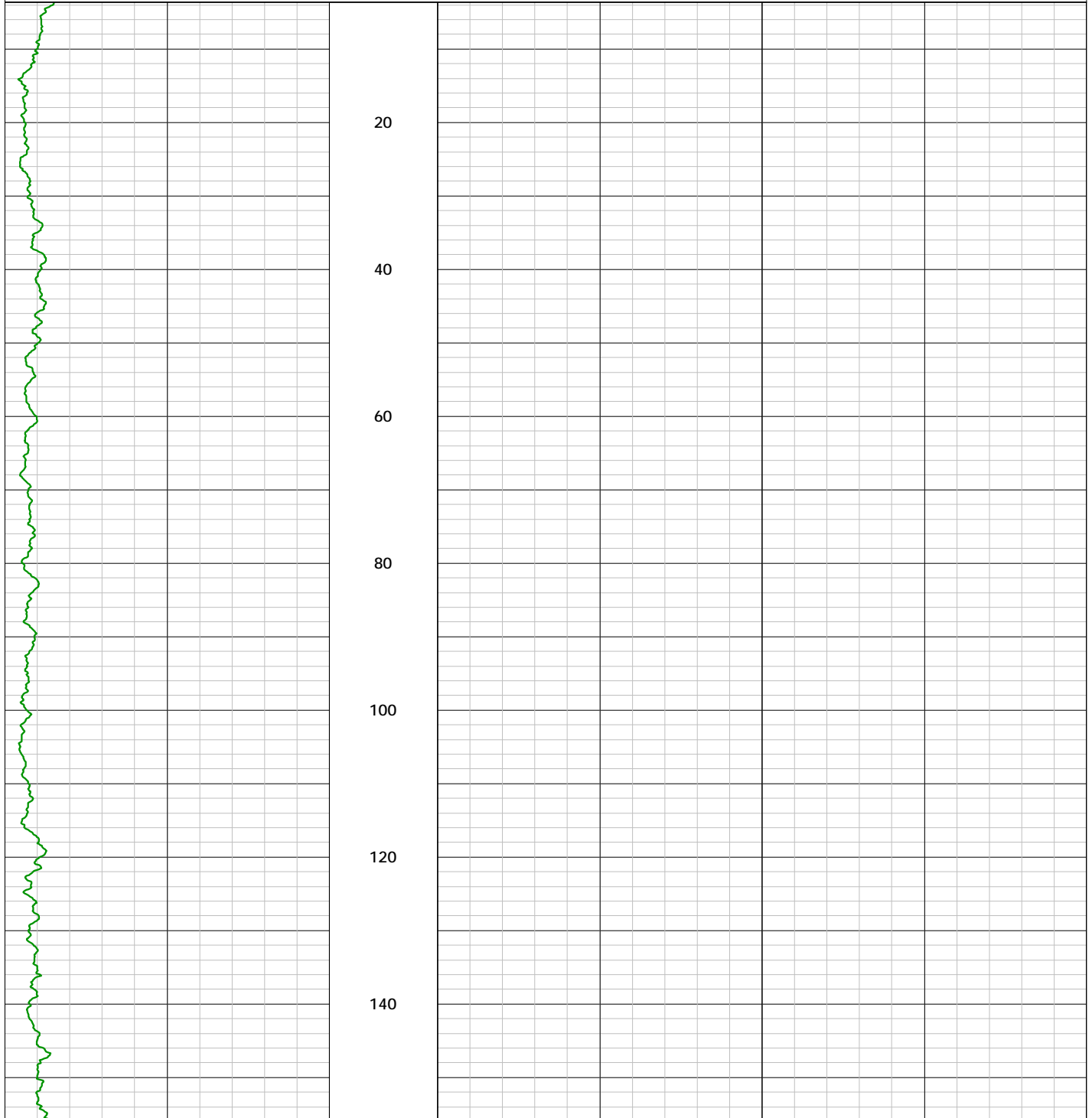
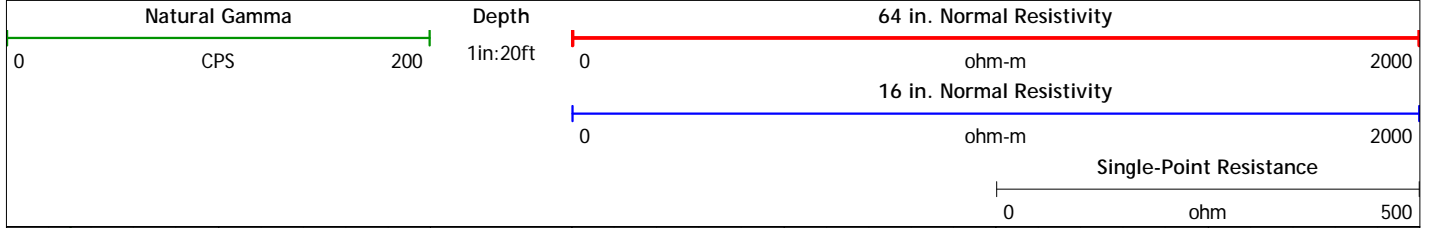
833 Hogback Drive

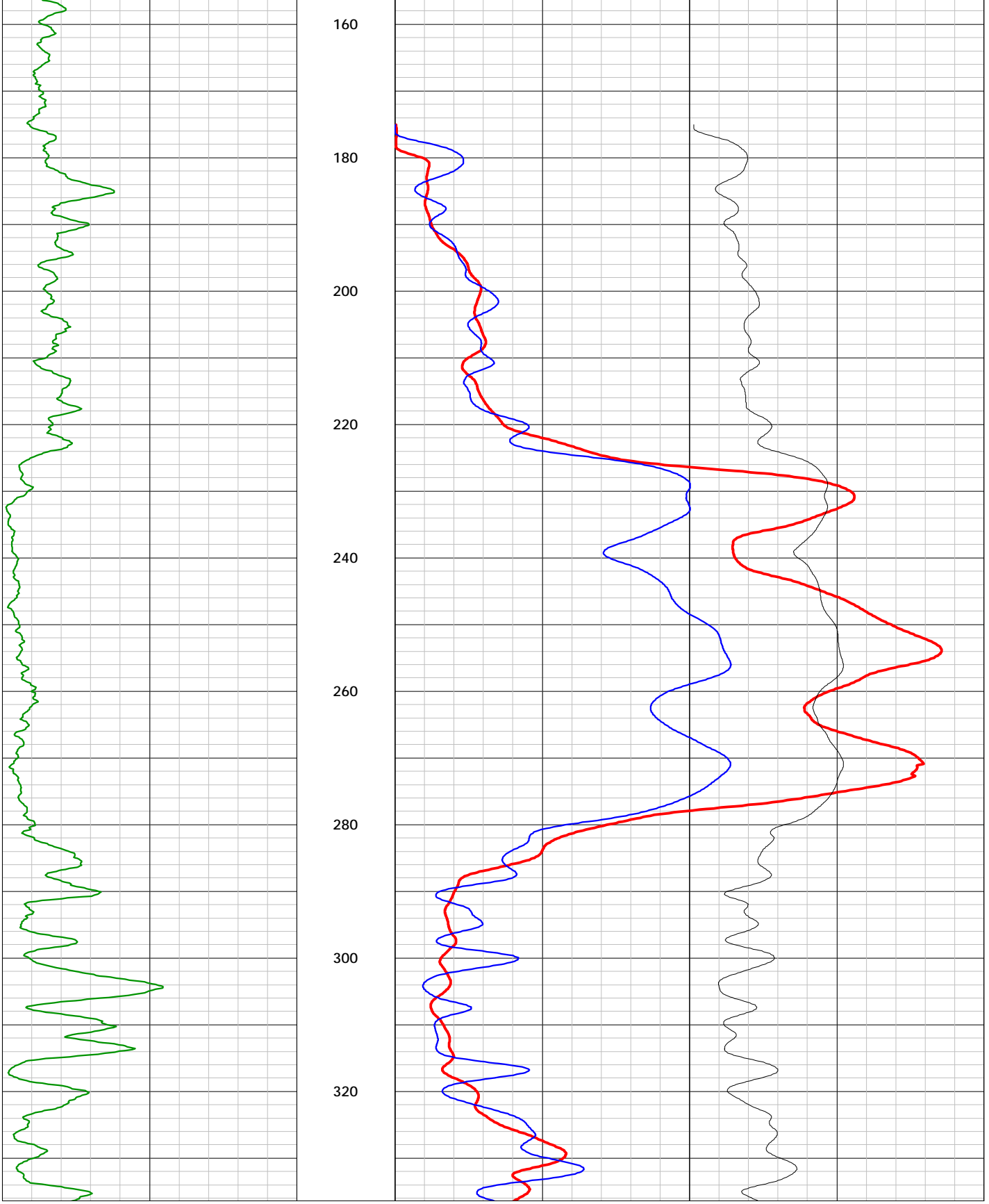
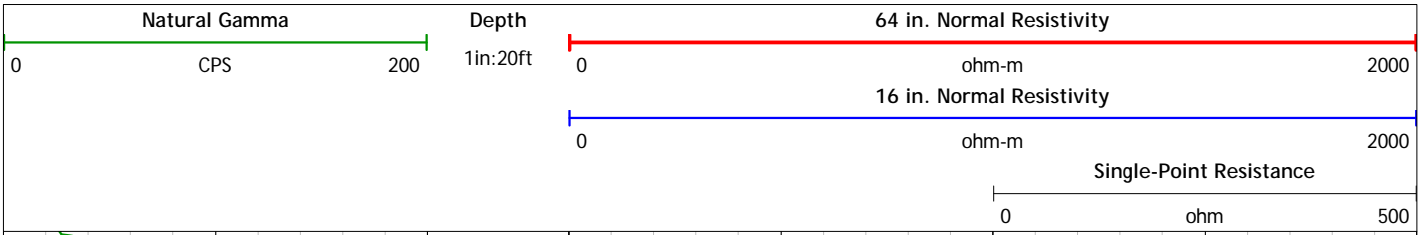
Golden, CO 80403

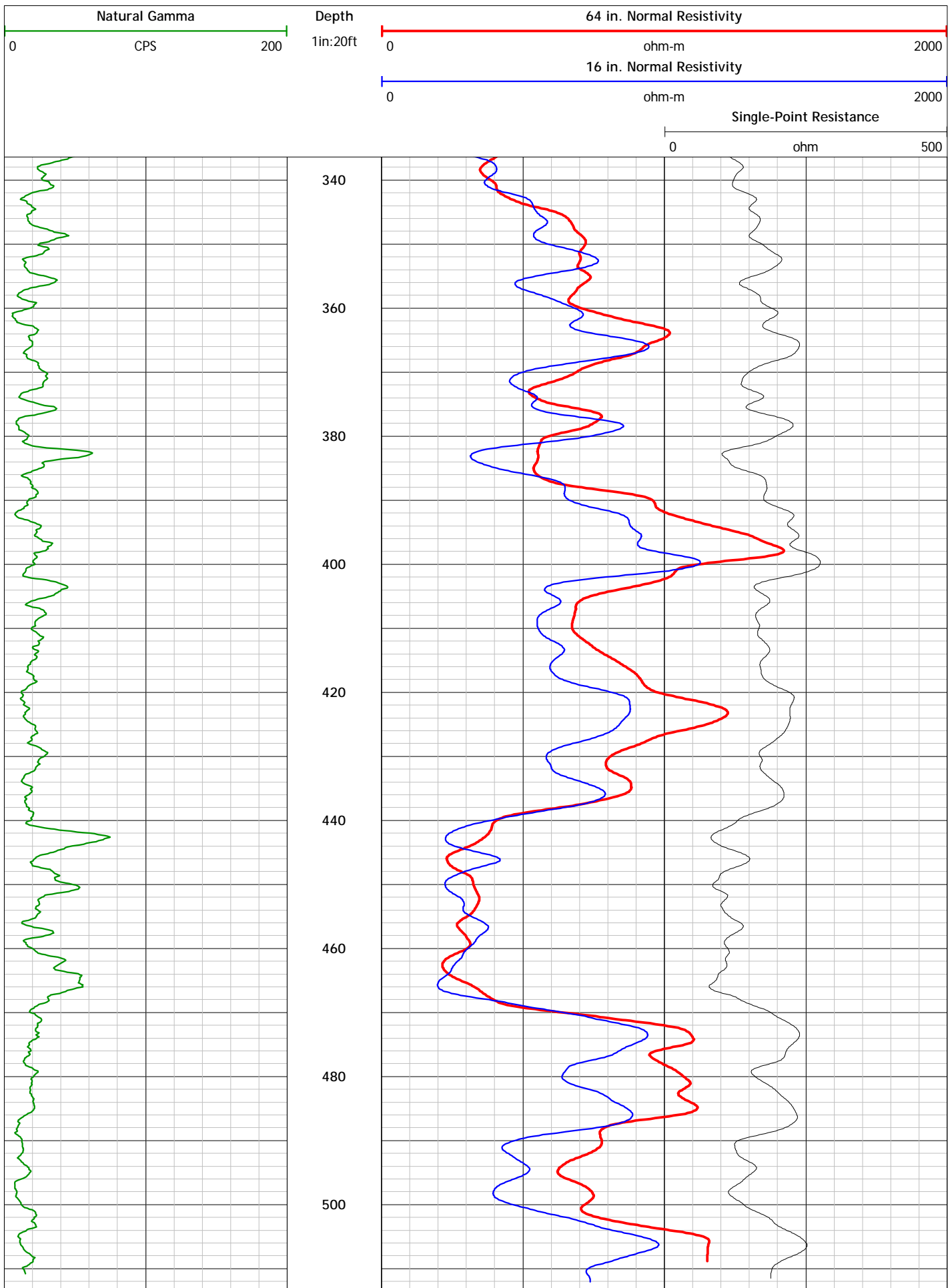
(303) 279-0171

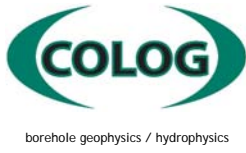
www.colog.com

COMMENTS:









Temperature & Fluid Conductivity

833 Hogback Drive
Golden, CO 80403
(303) 279-0171
www.colog.com

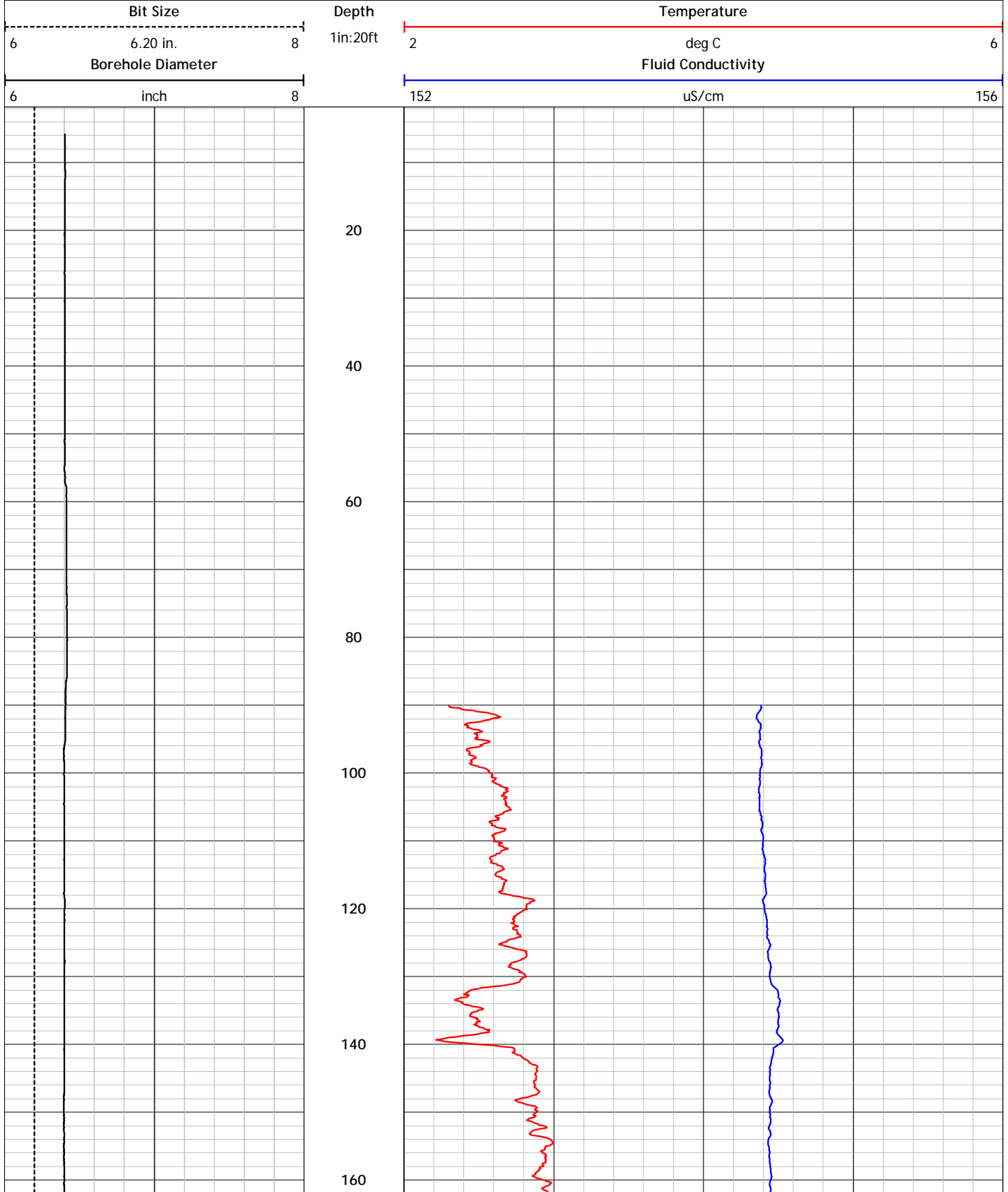
COMPANY: Arcadis

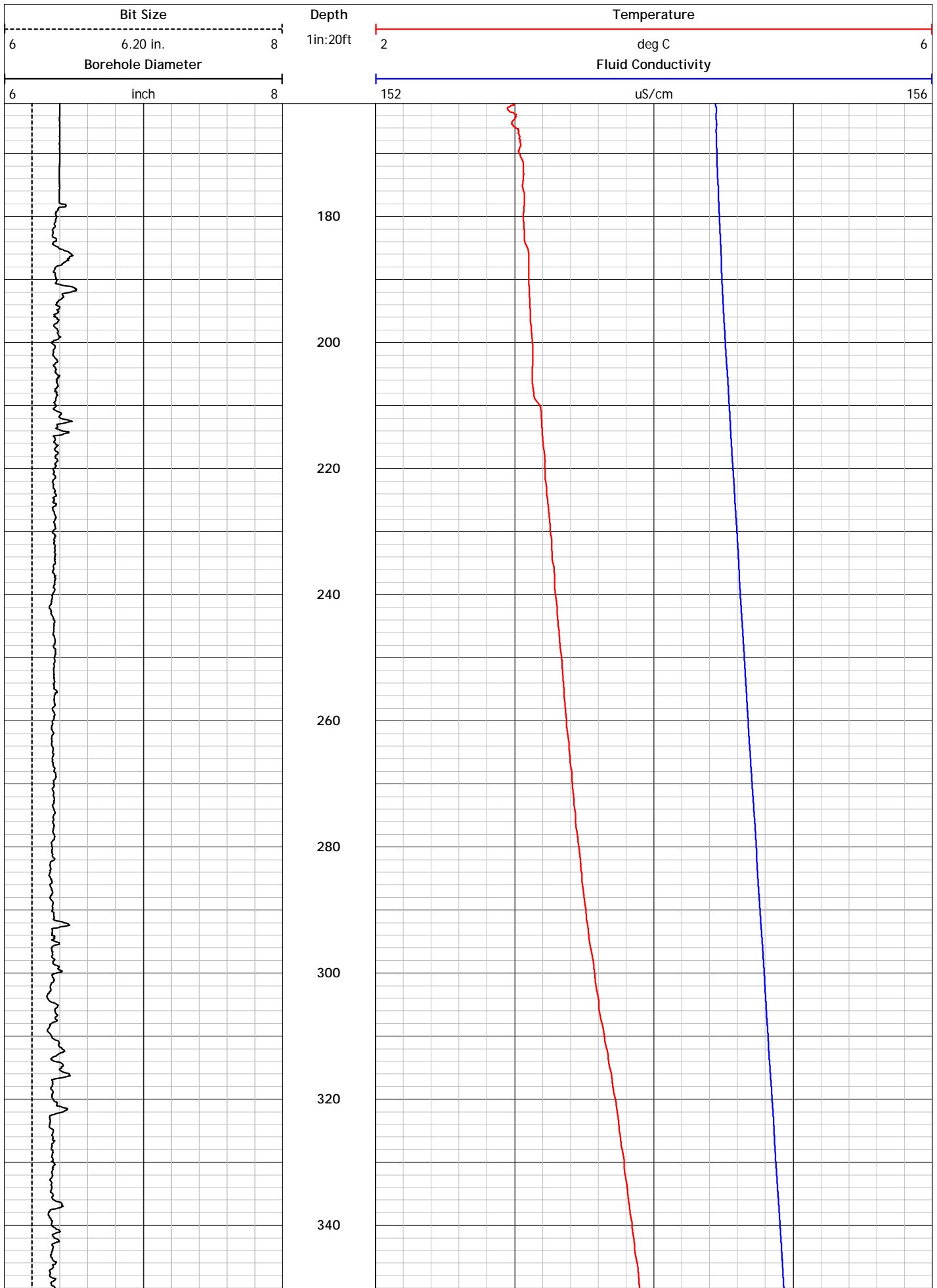
PROJECT: Deep Well Program

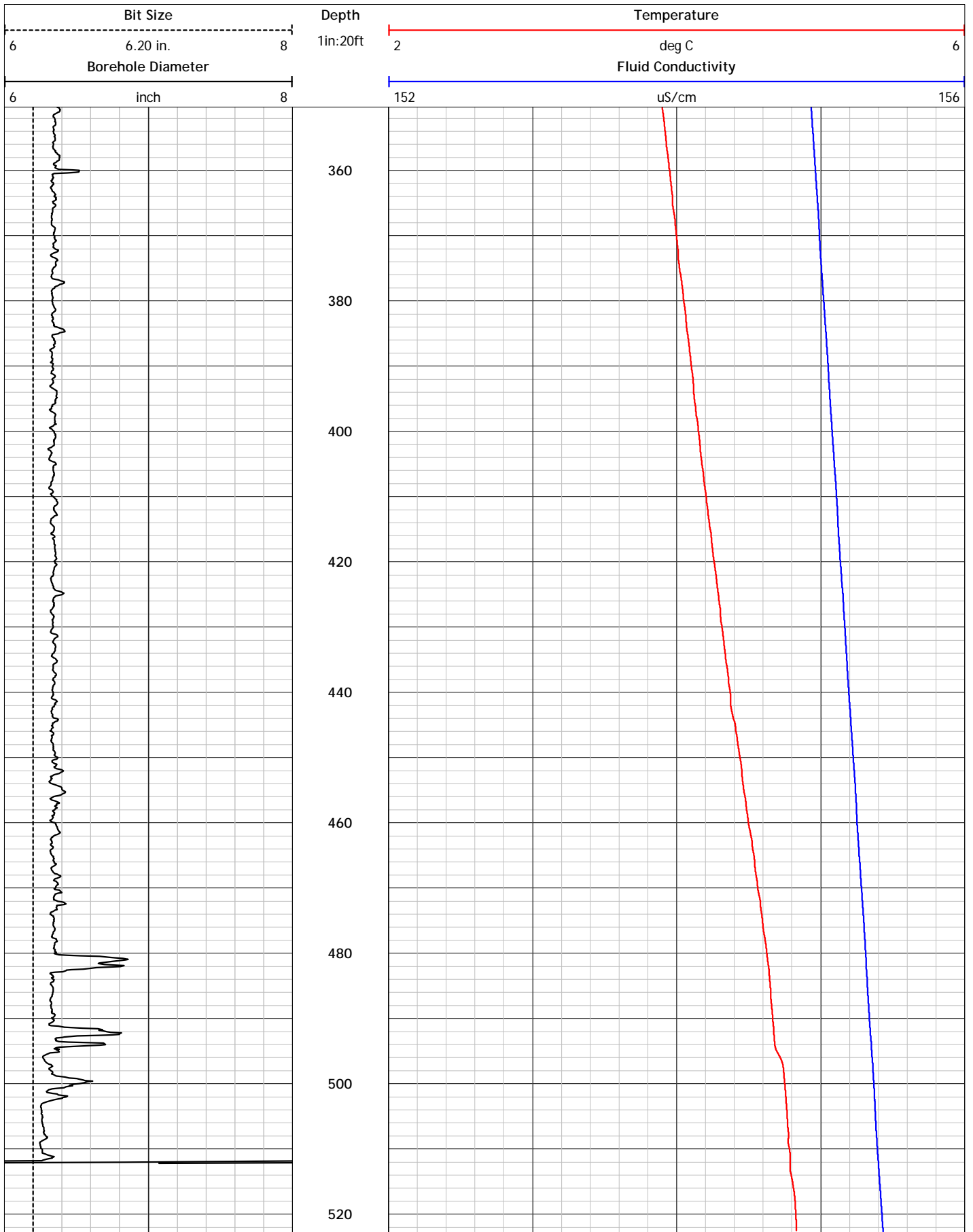
DATE LOGGED: 17 January 2024

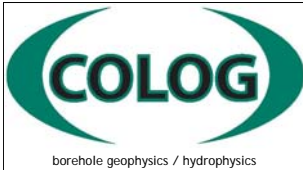
WELL: DMW-3

COMMENTS:









Optical & Acoustic Televiewer

833 Hogback Drive
 Golden, CO 80403
 (303) 279-0171
 www.colog.com

COMPANY: Arcadis

PROJECT: Deep Well Program

DATE LOGGED: 17 January 2024

WELL: DMW-3

LOCATION: Marinette, WI

LOG MEASURED FROM: Ground Surface

FIELD ENGINEER(S): G. Kennedy

TOP & BOTTOM OF CASING: 0.0 ft - 177.3 ft

WITNESSED BY: NA

BOREHOLE DIAMETER: 6.2 in.

DEPTH DRILLER: 510.0 ft

FLUID LEVEL DEPTH: NA

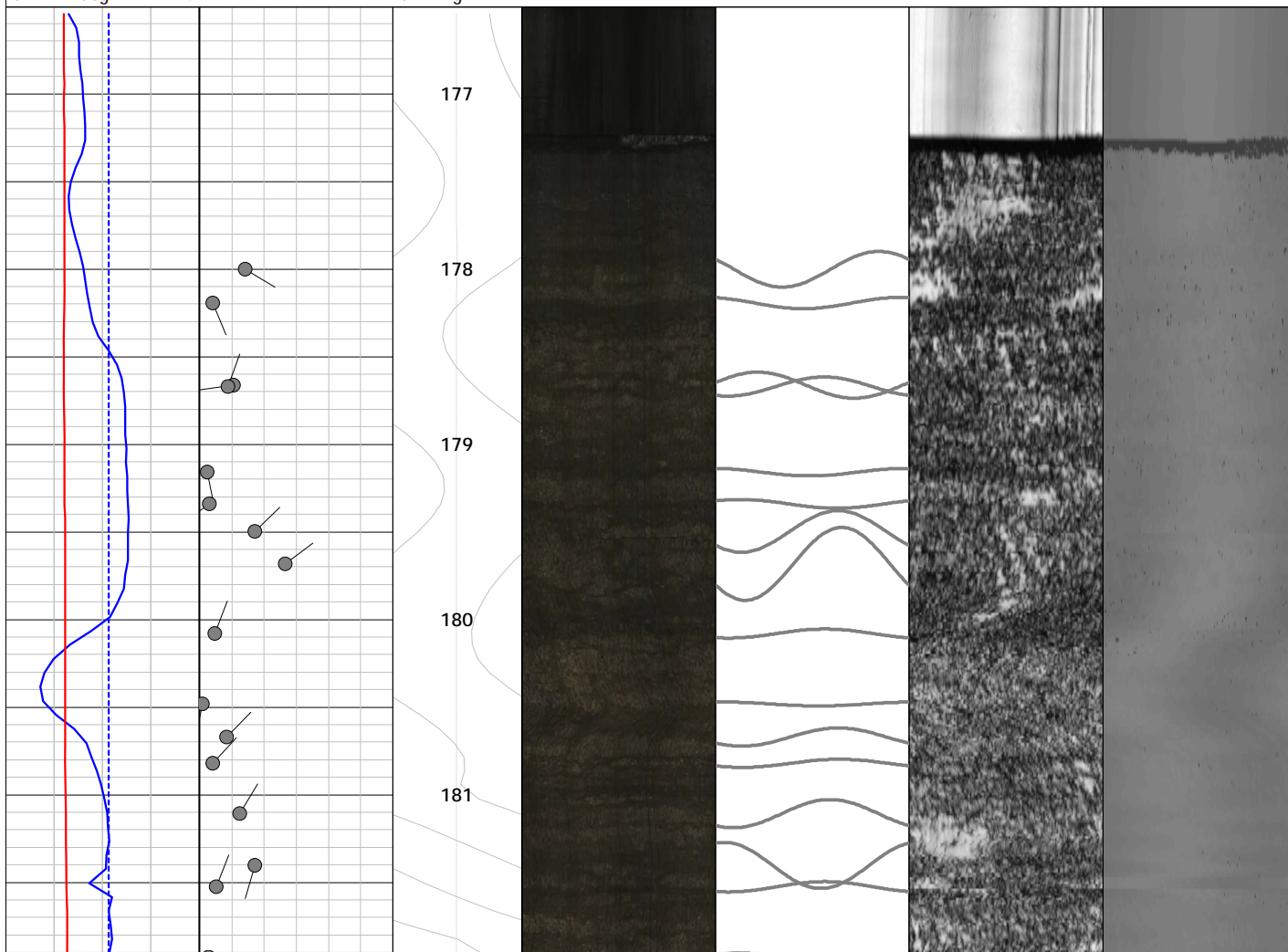
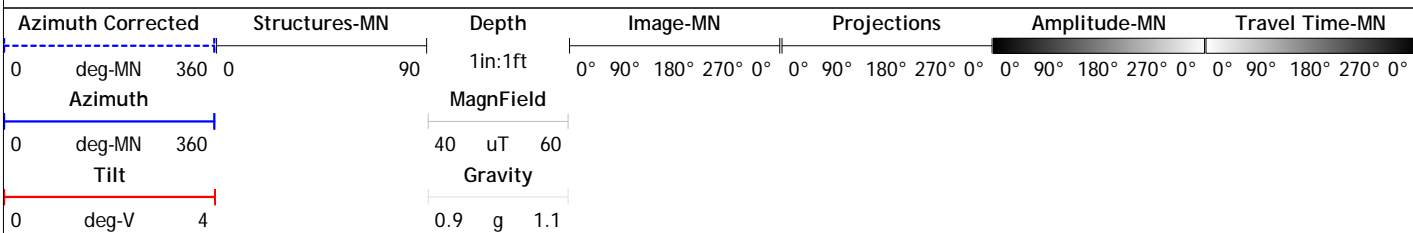
DEPTH LOGGER: 514.0 ft

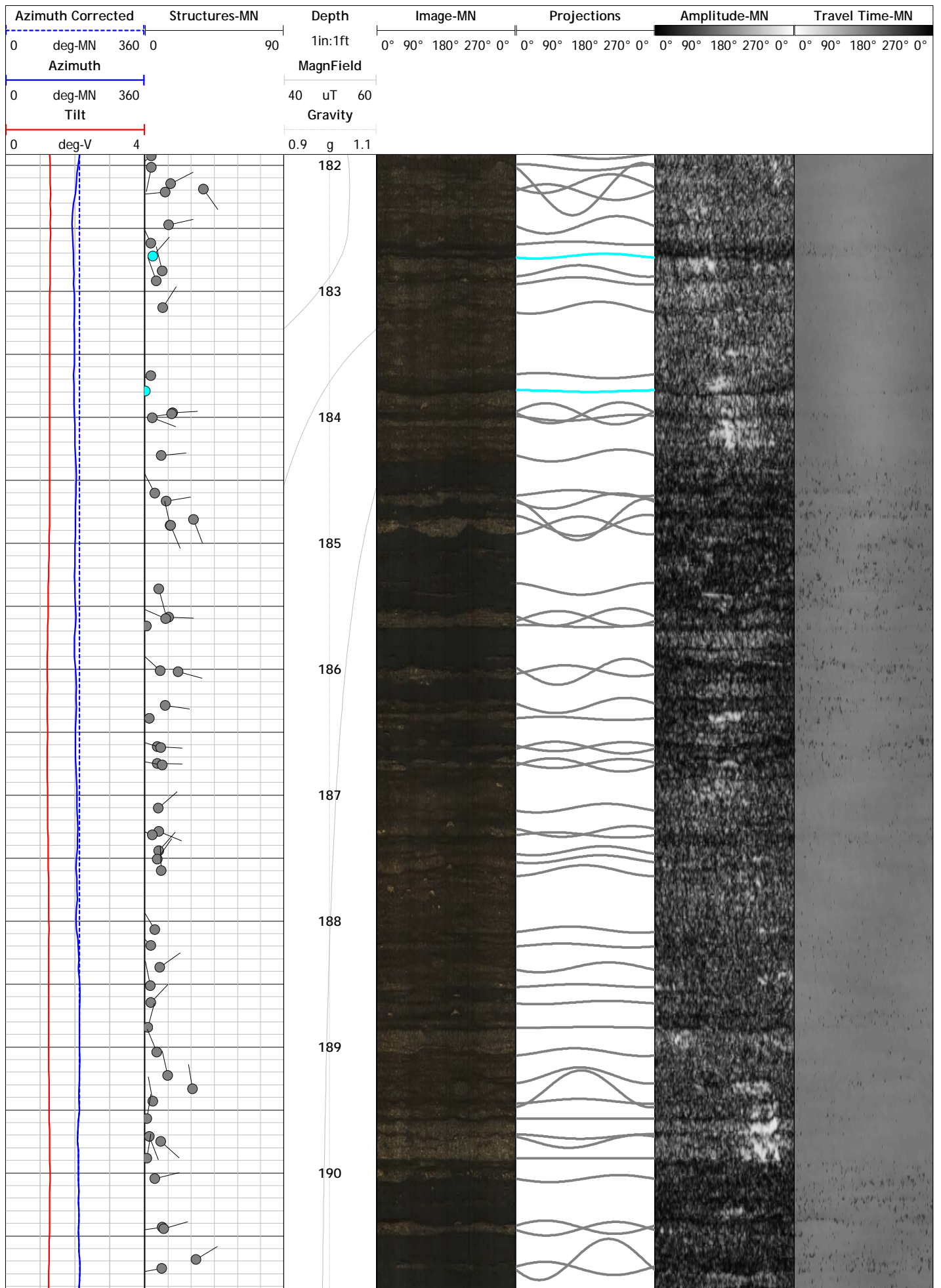
ORIENTATION REFERENCE: Magnetic North

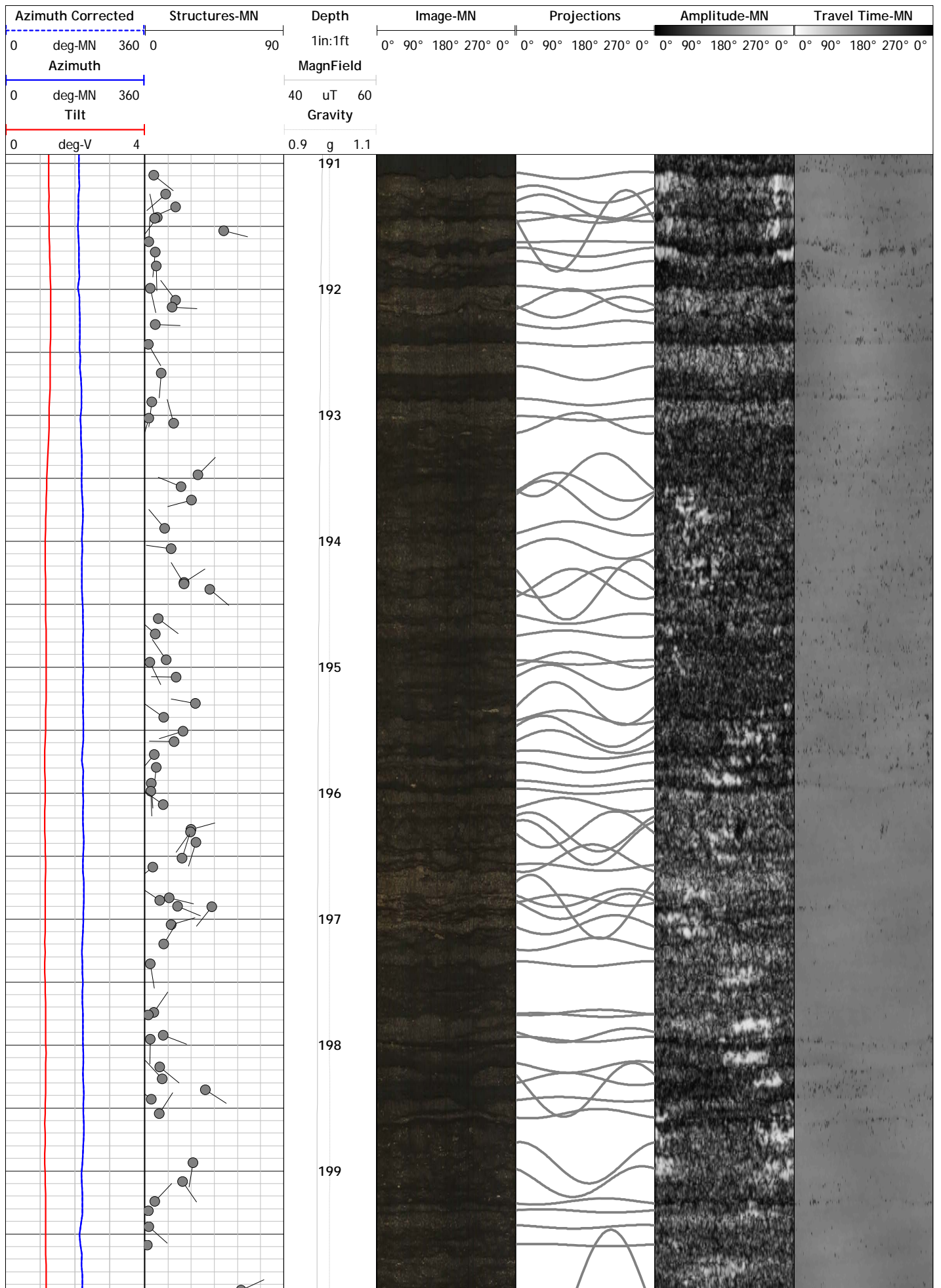
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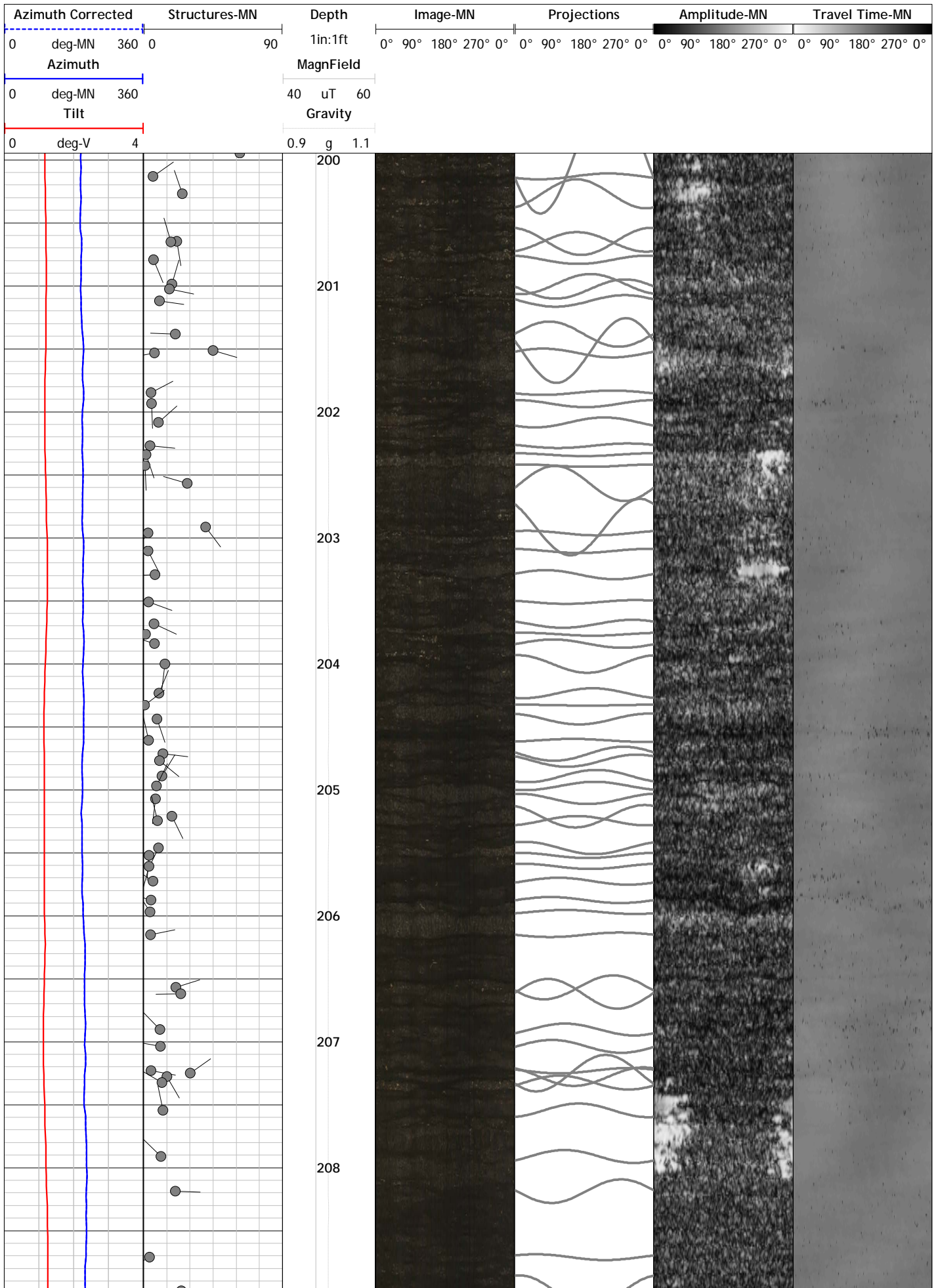
STRUCTURE LEGEND:

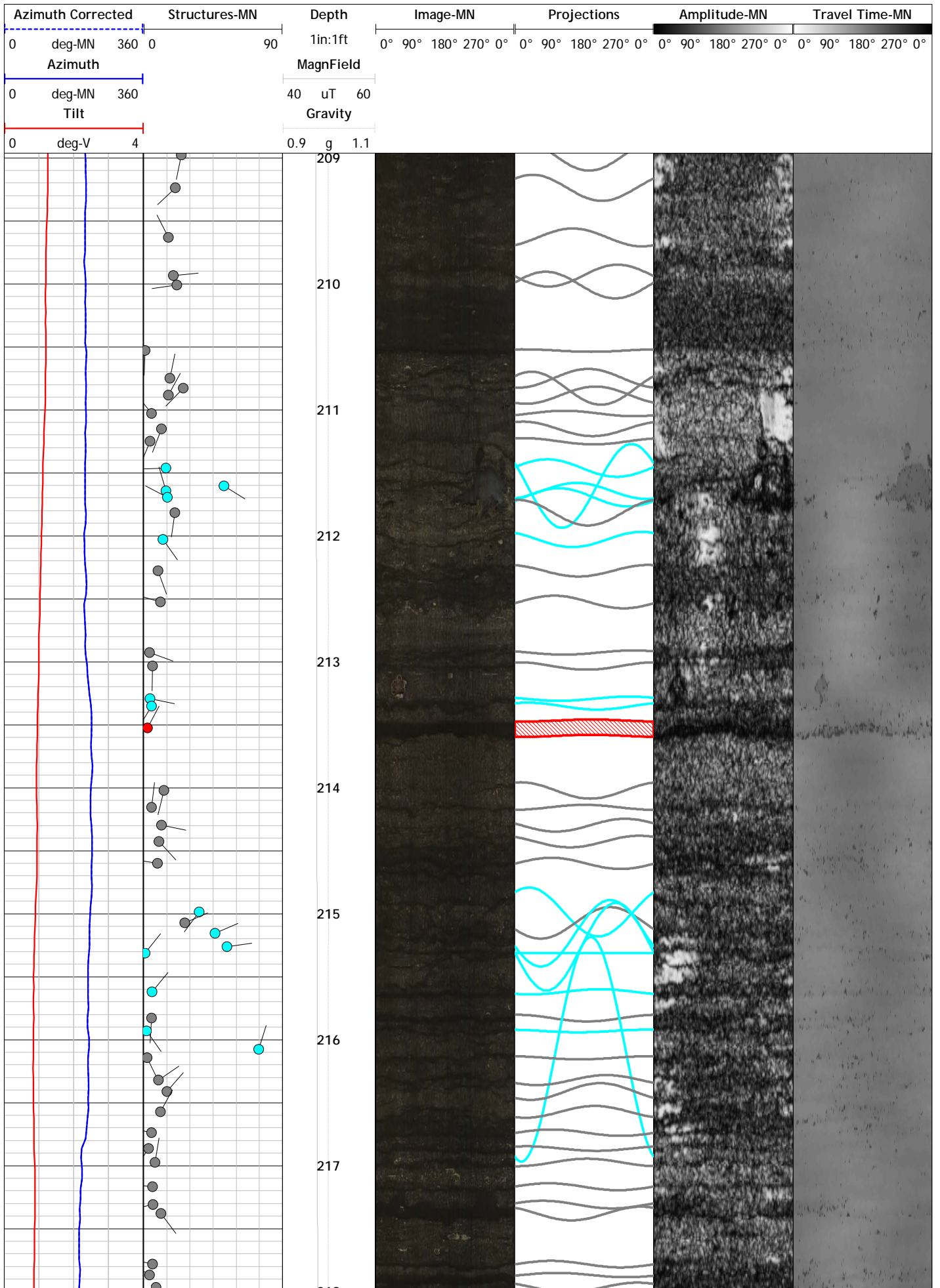
- 0 - Healed Fracture/Bedding Plane
- 1 - Partial Fracture
- 2 - Complete Fracture
- 3 - Open Fracture
- 4 - Wide Fracture/Multiple Fractures

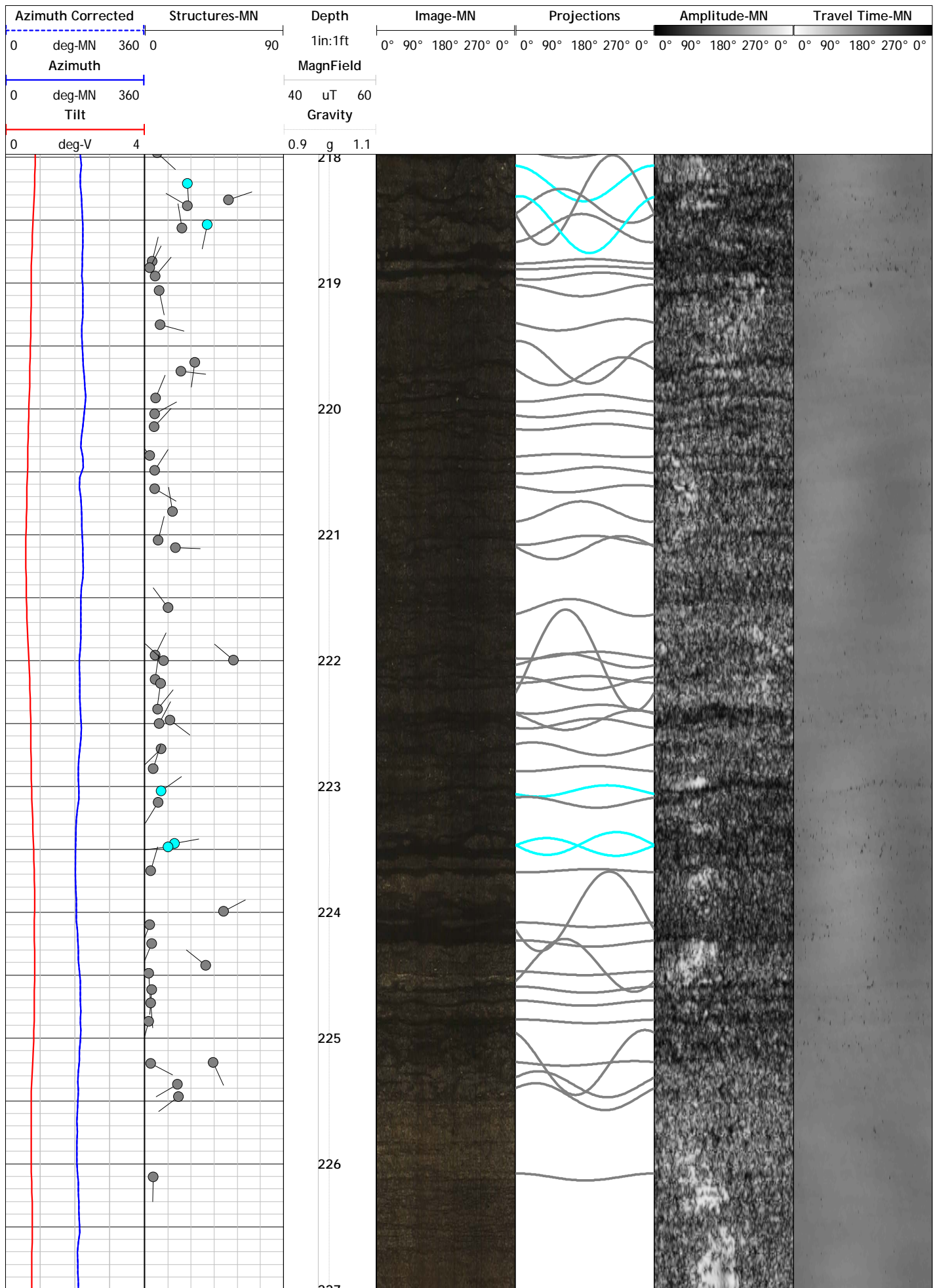


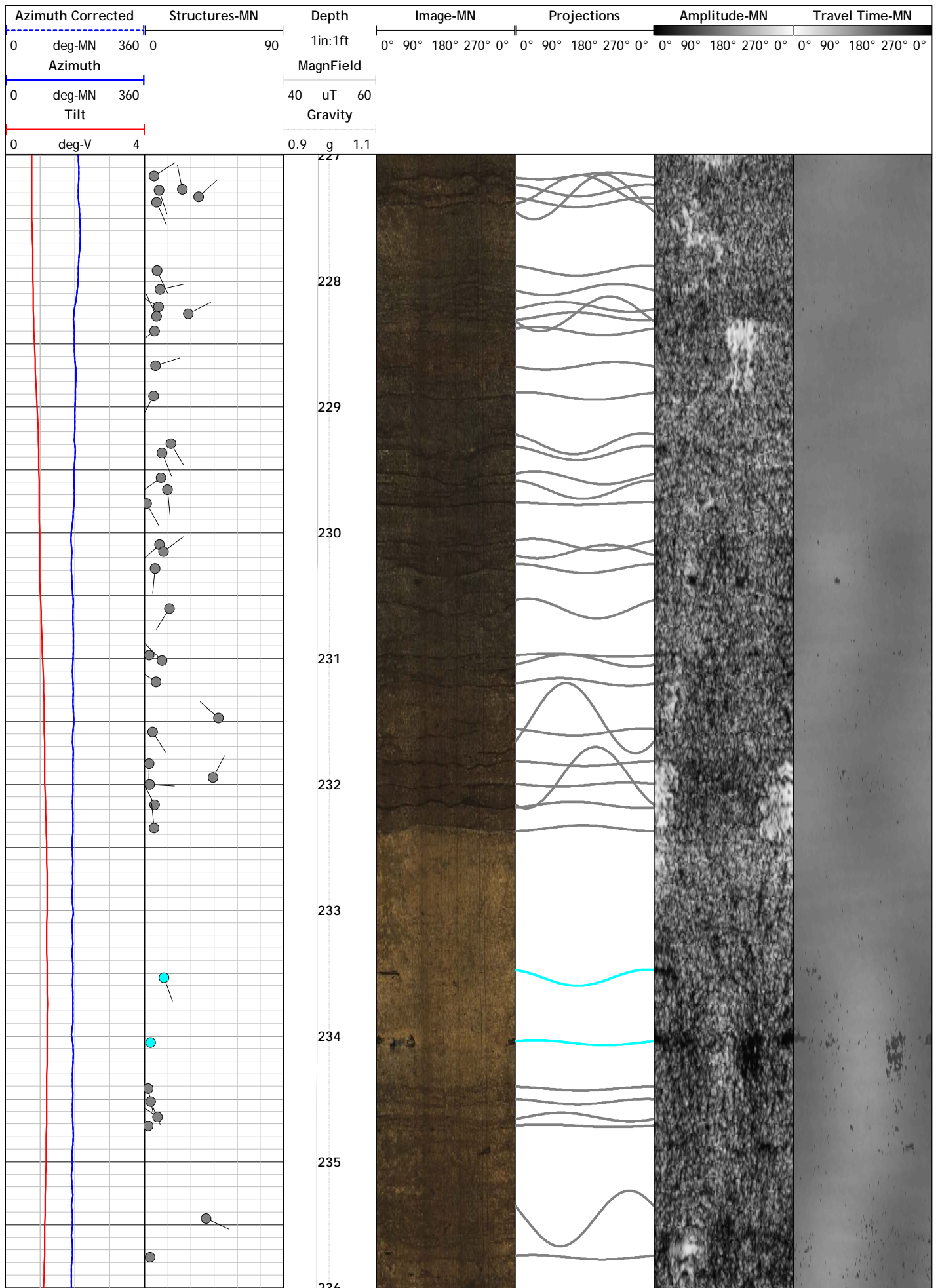


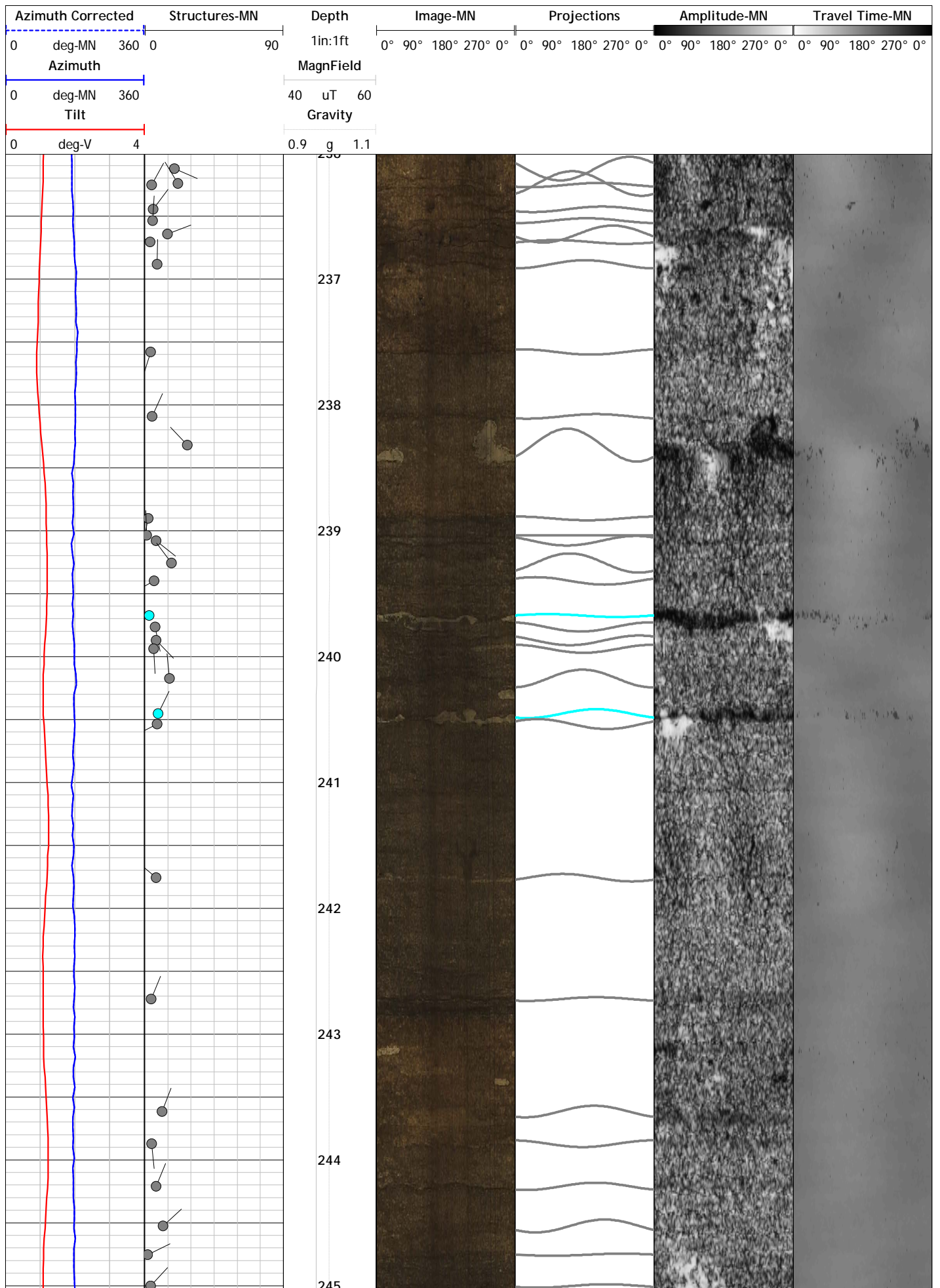


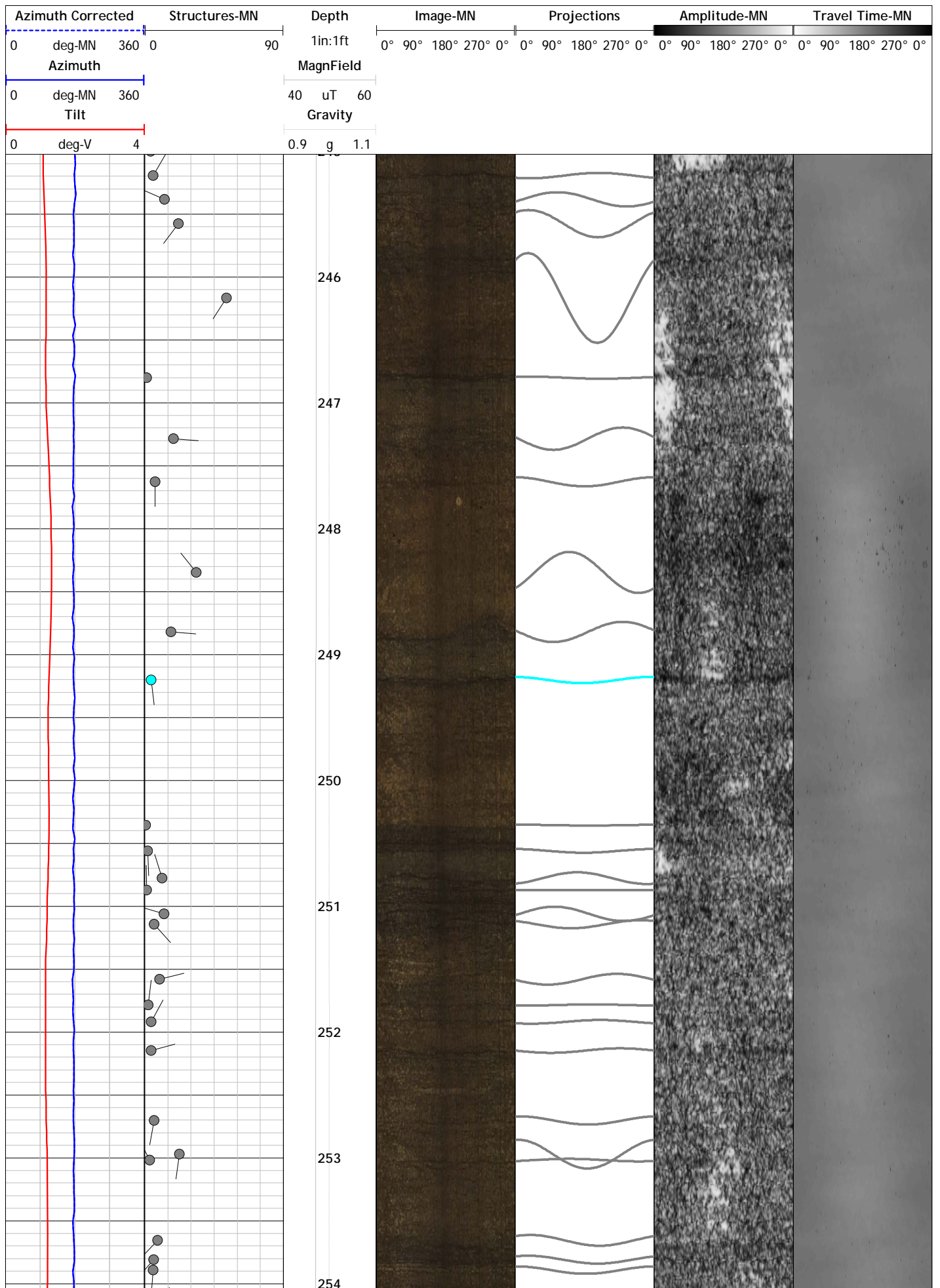


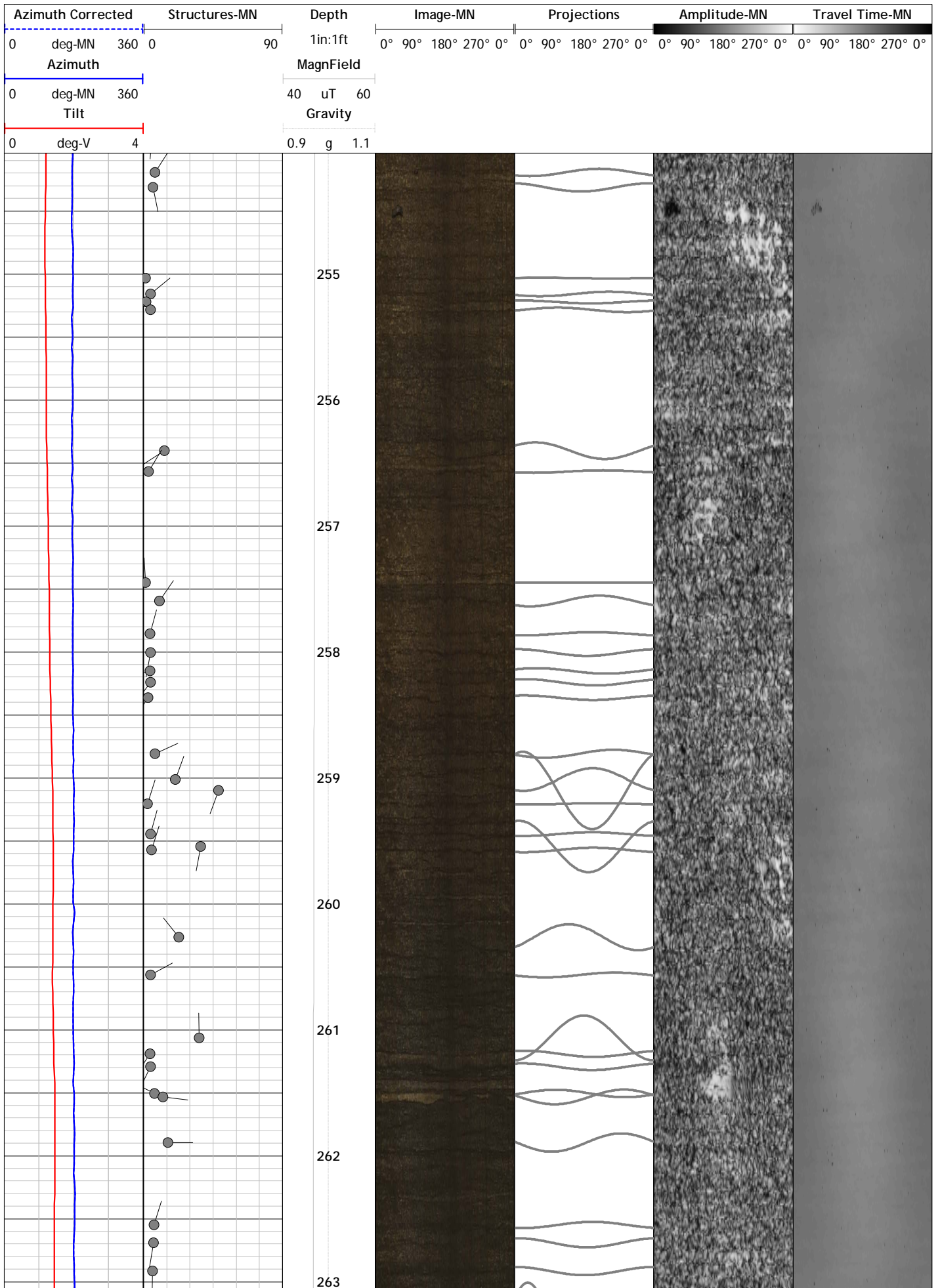


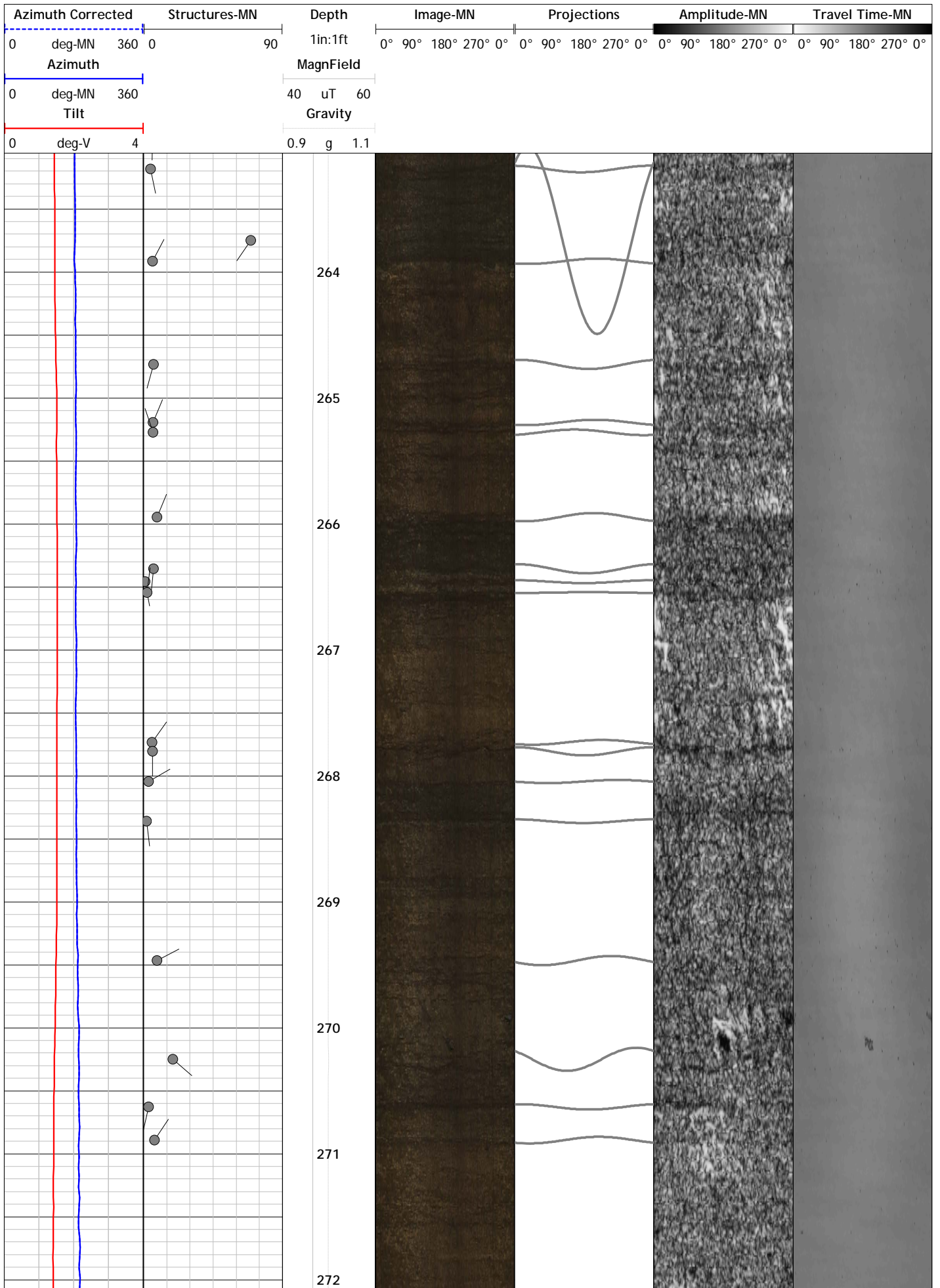


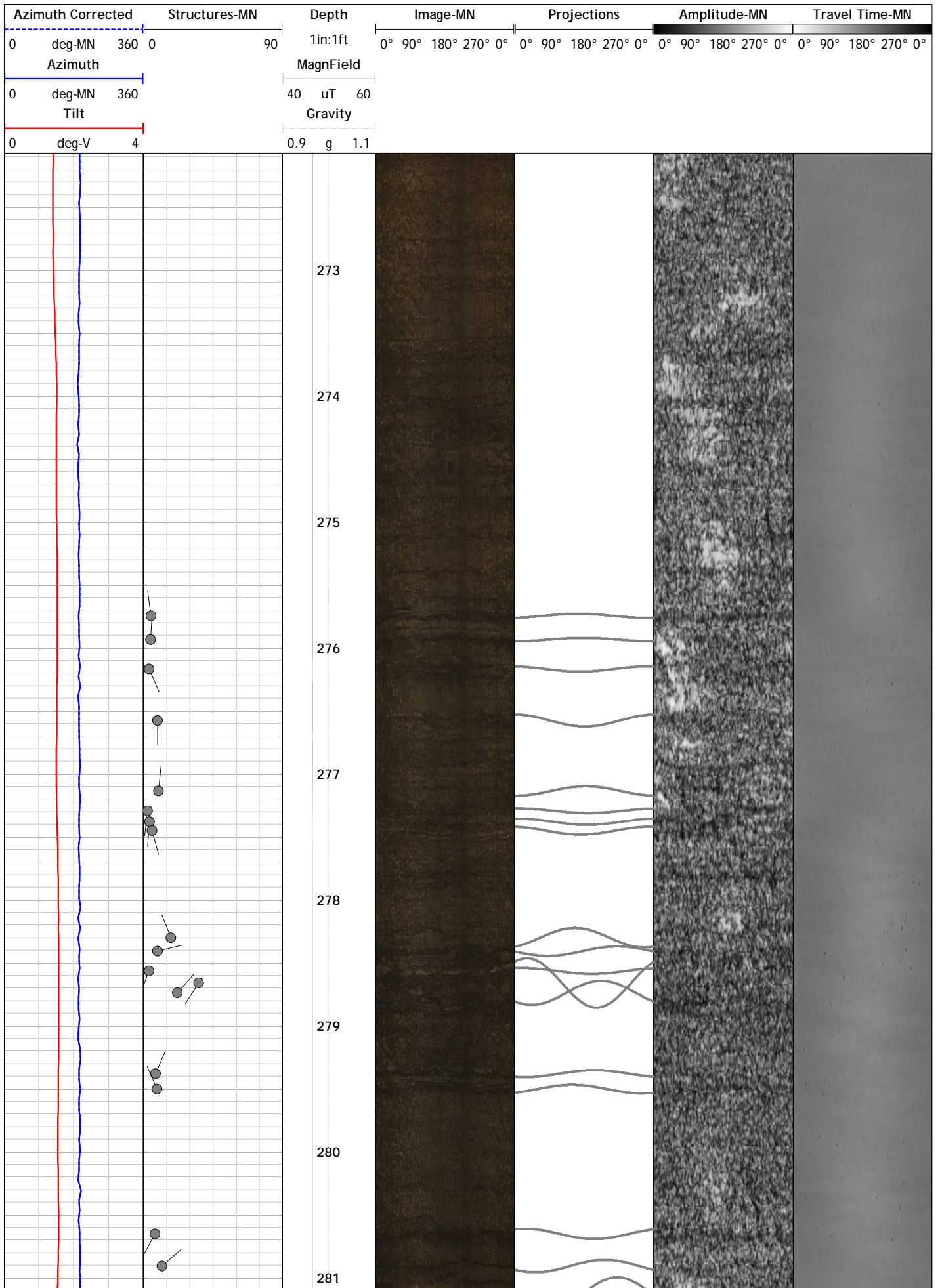


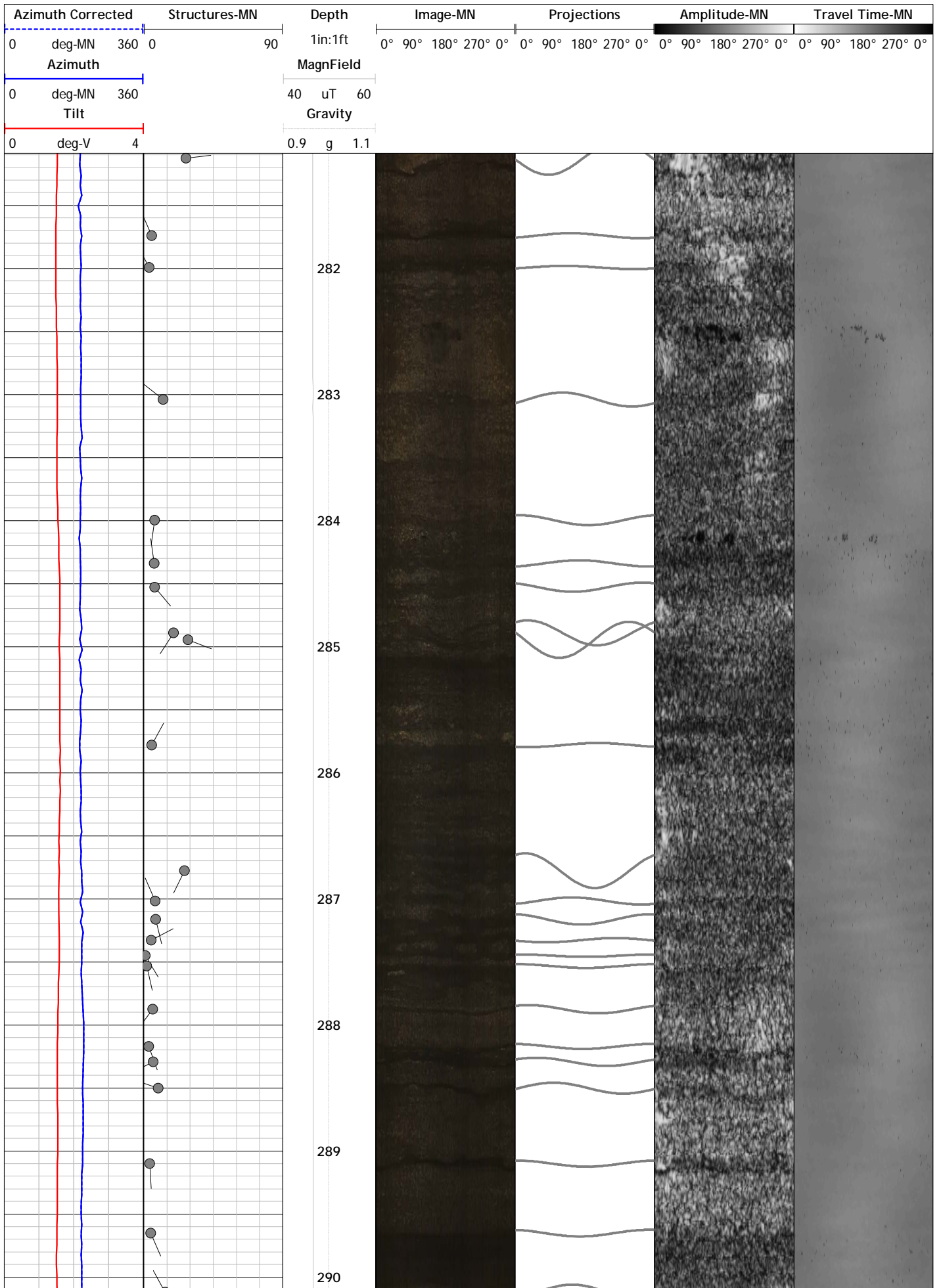


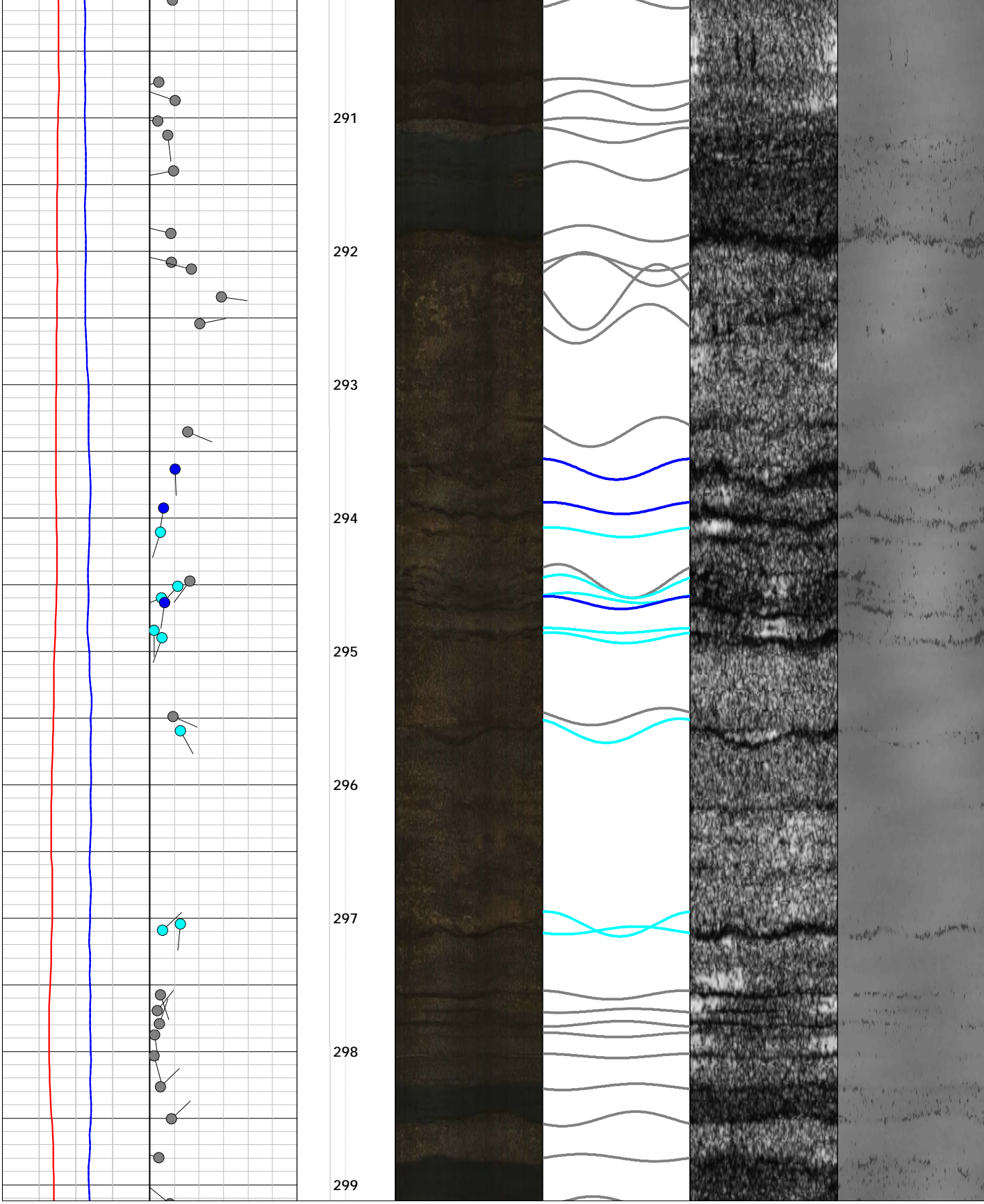
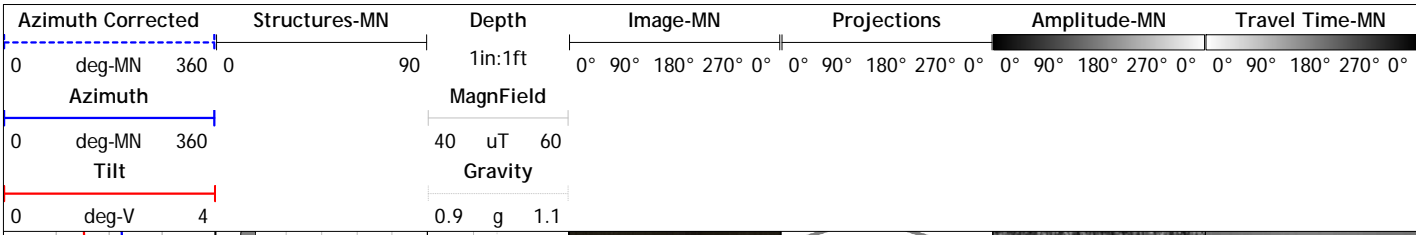


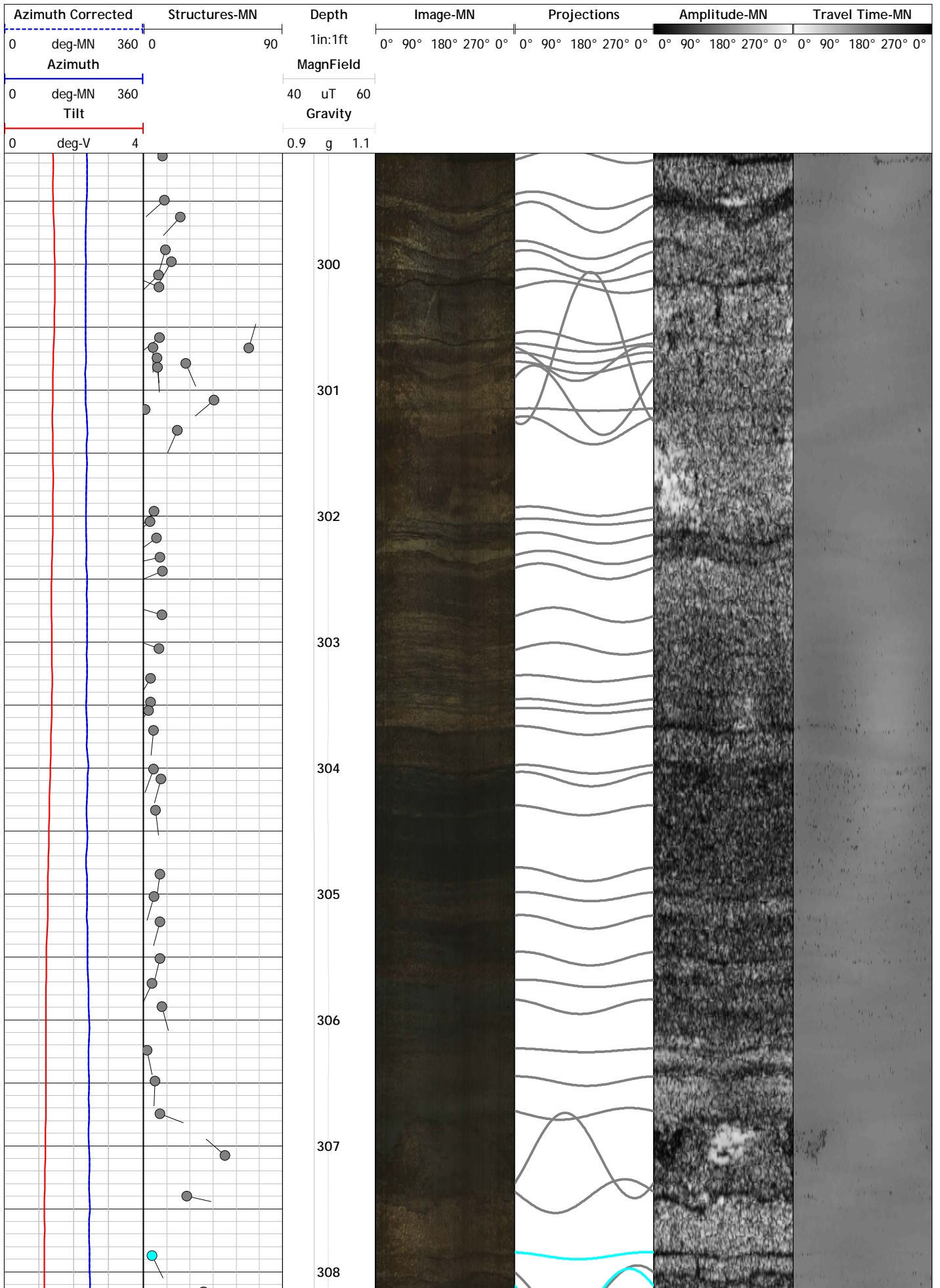


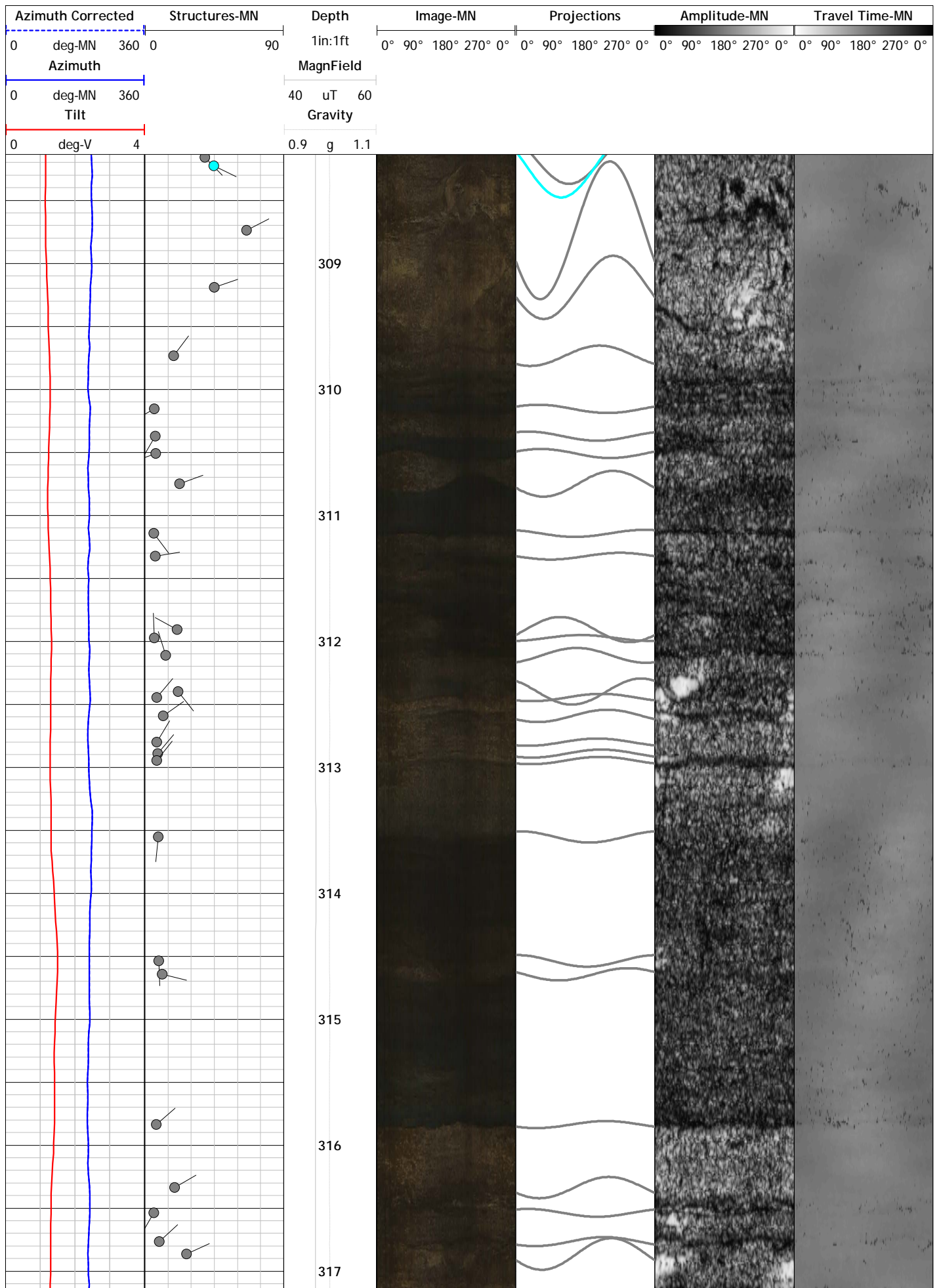


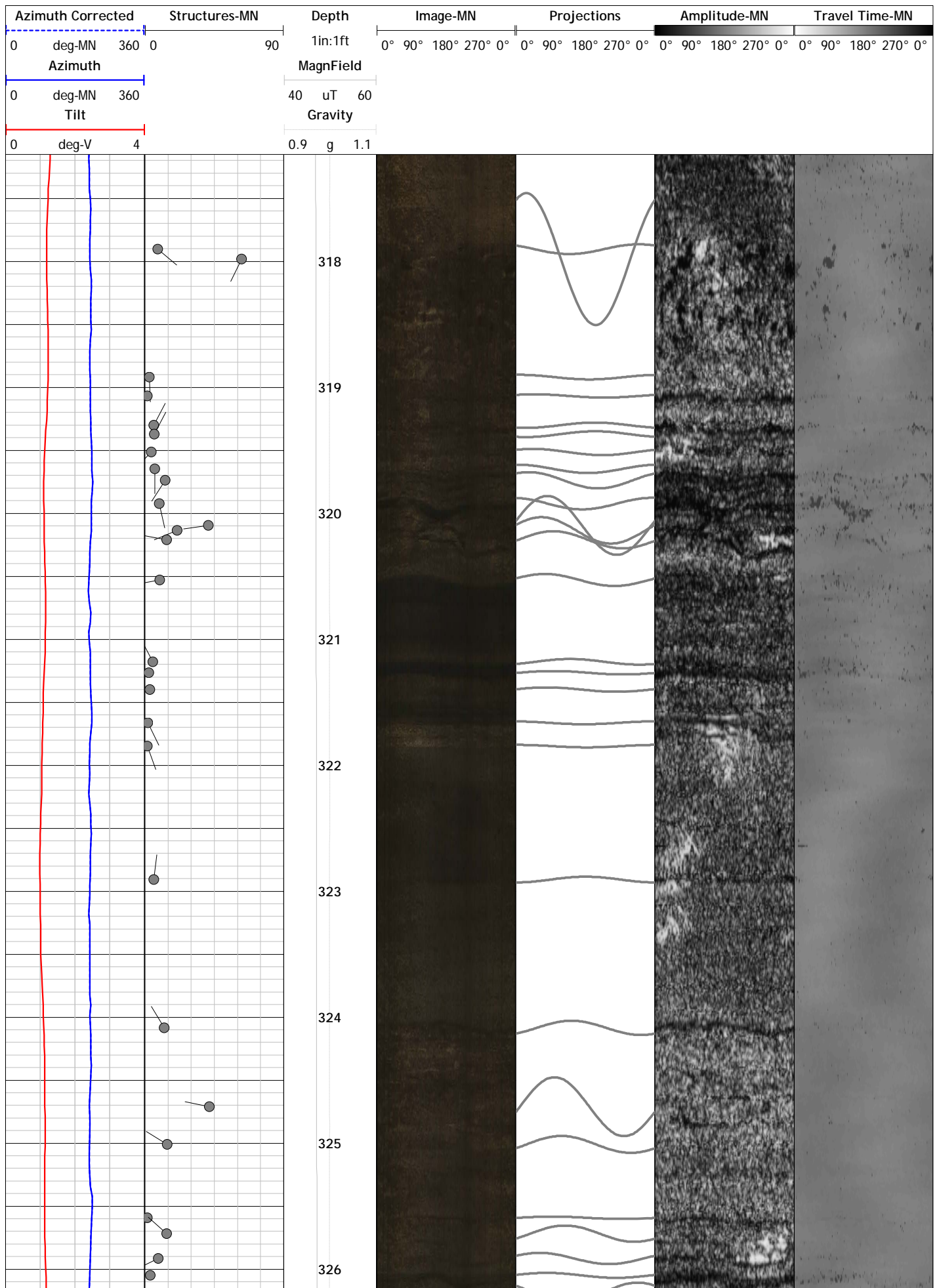


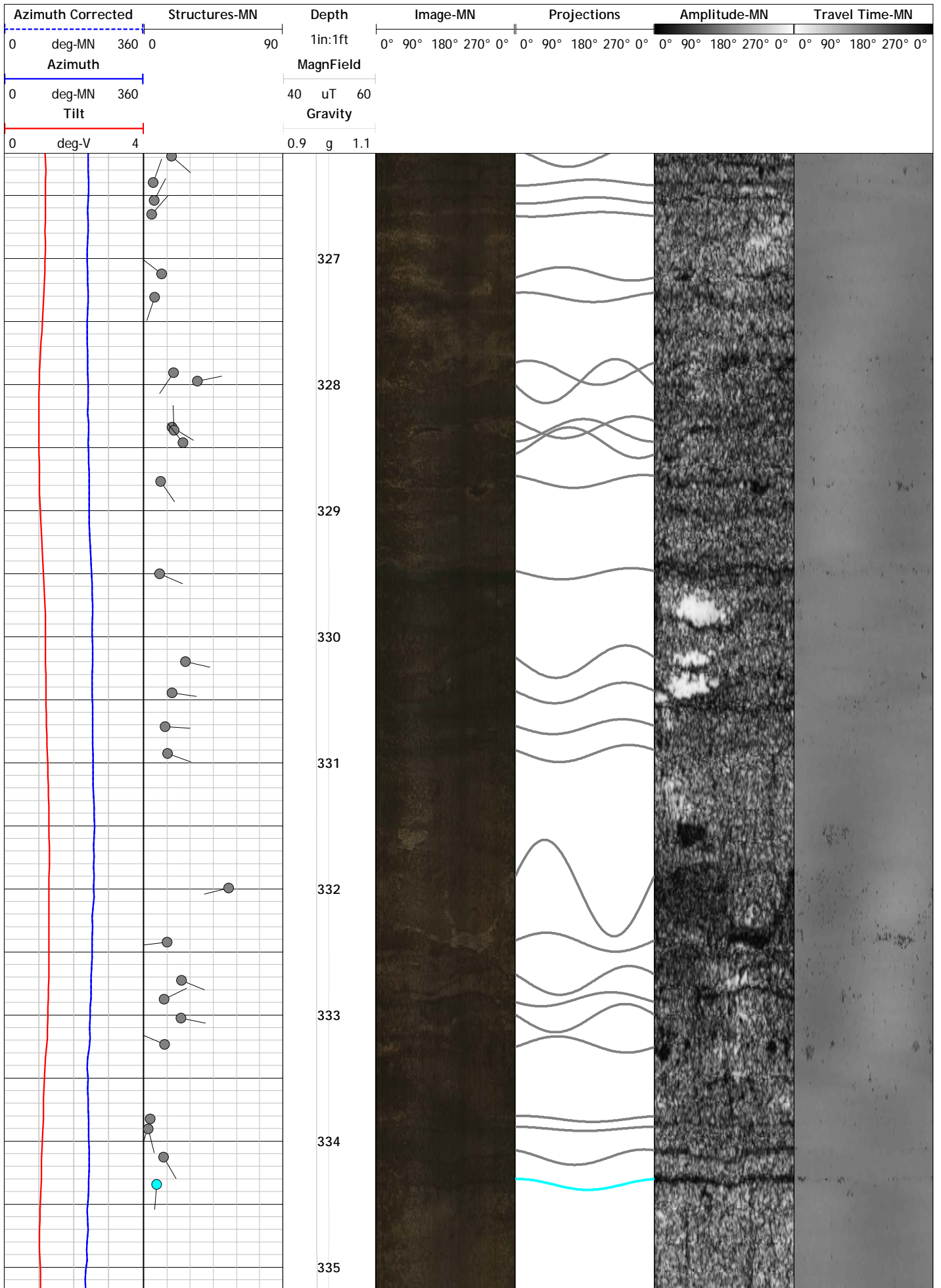


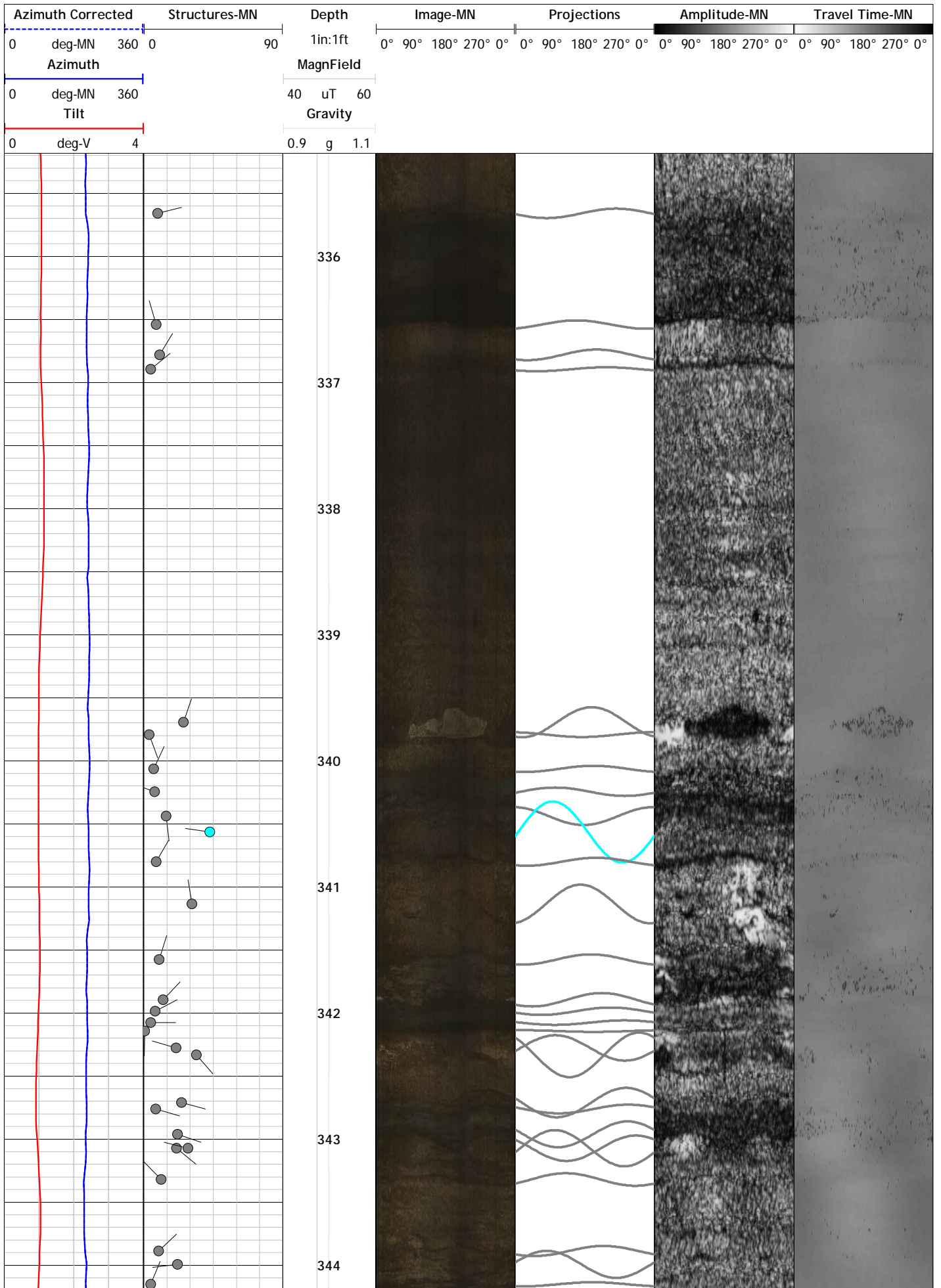


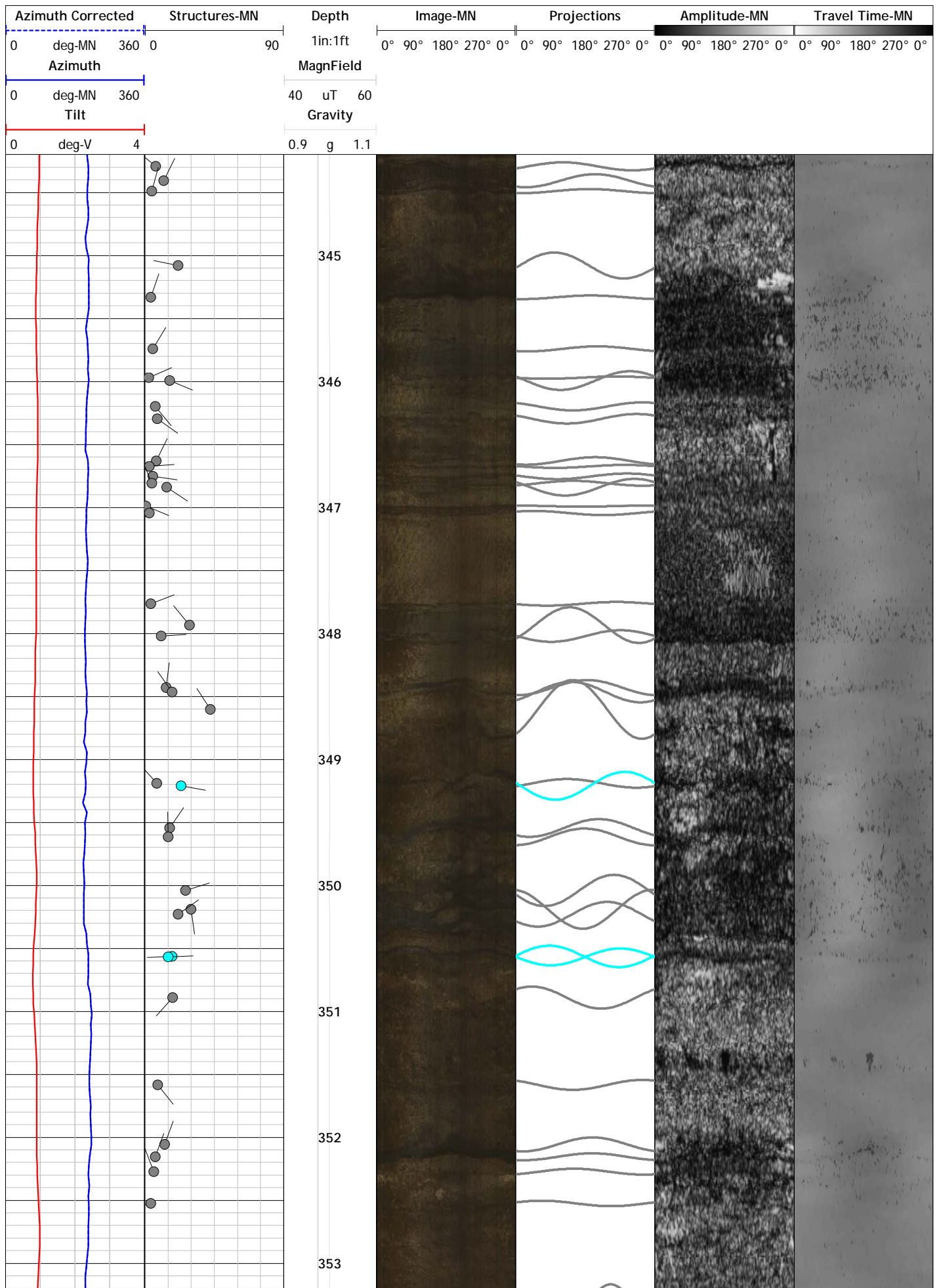


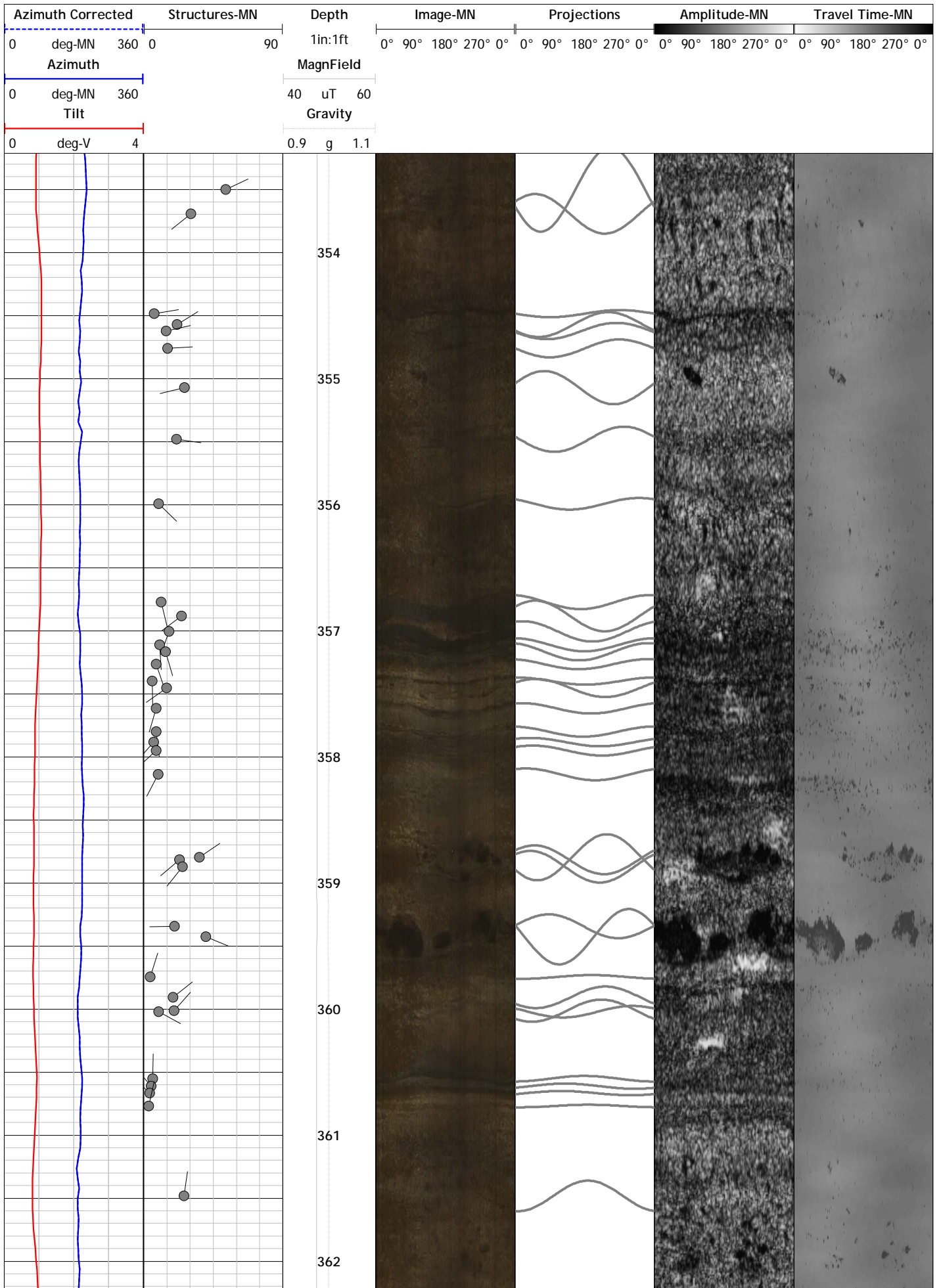


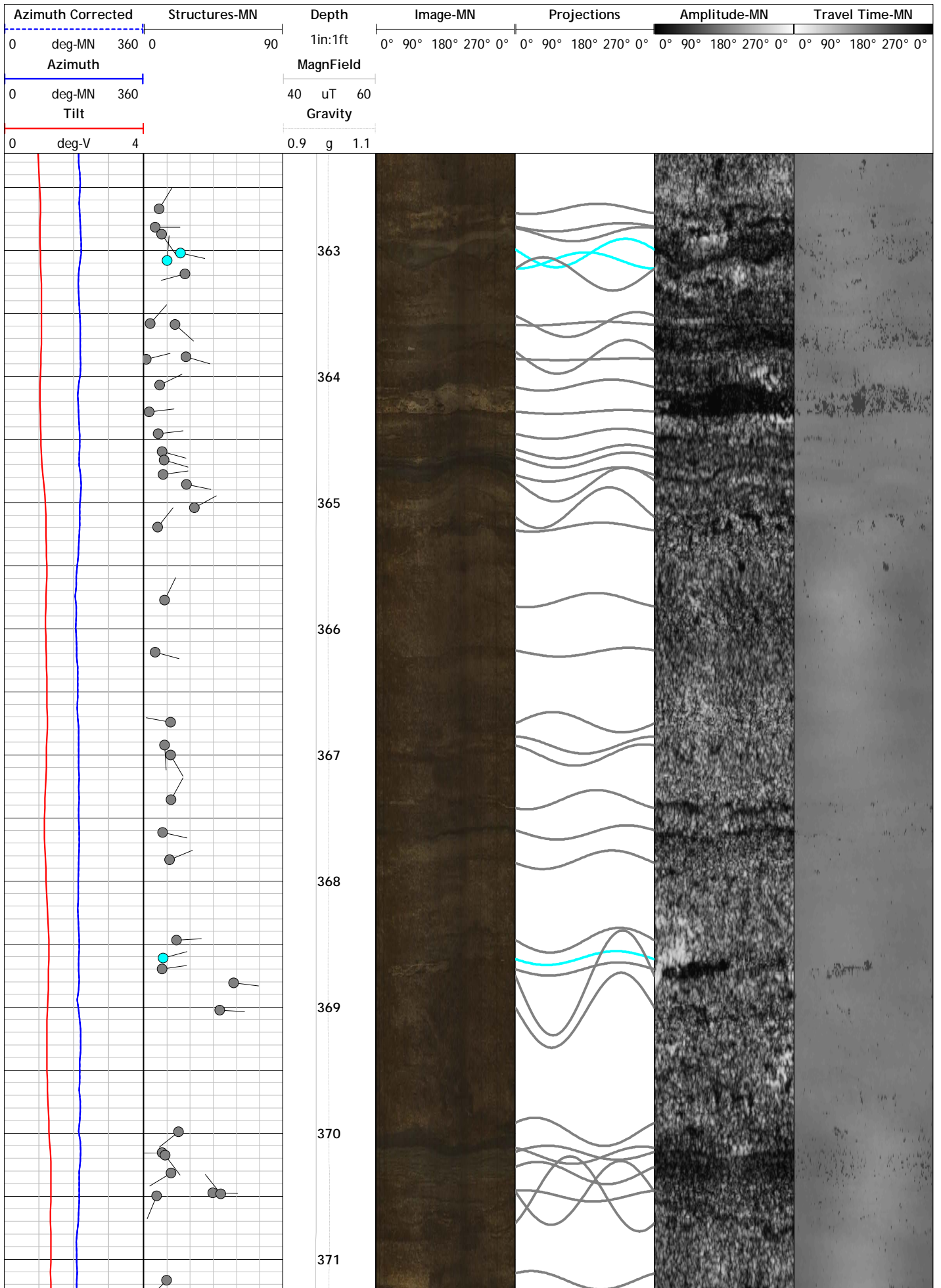


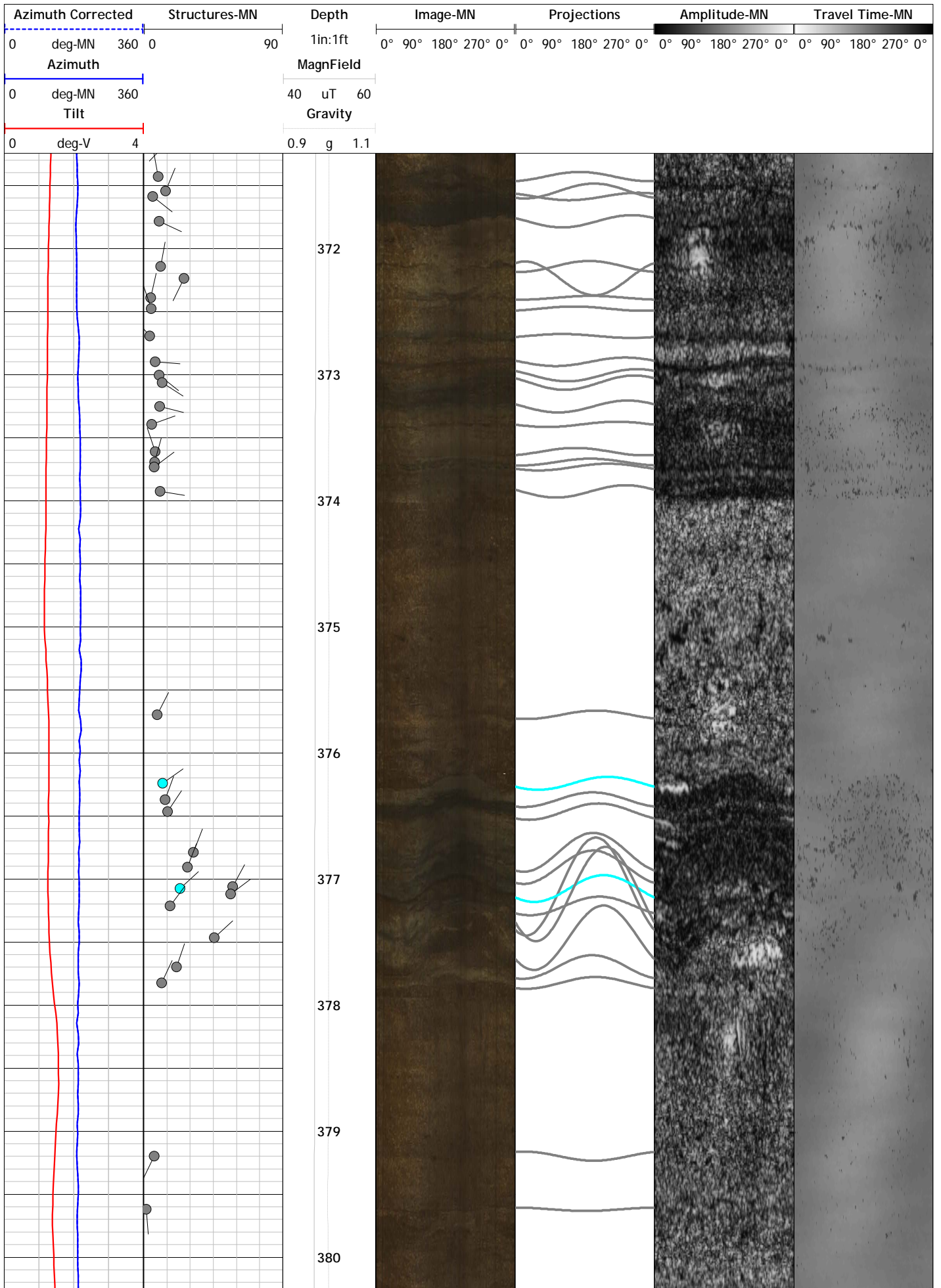


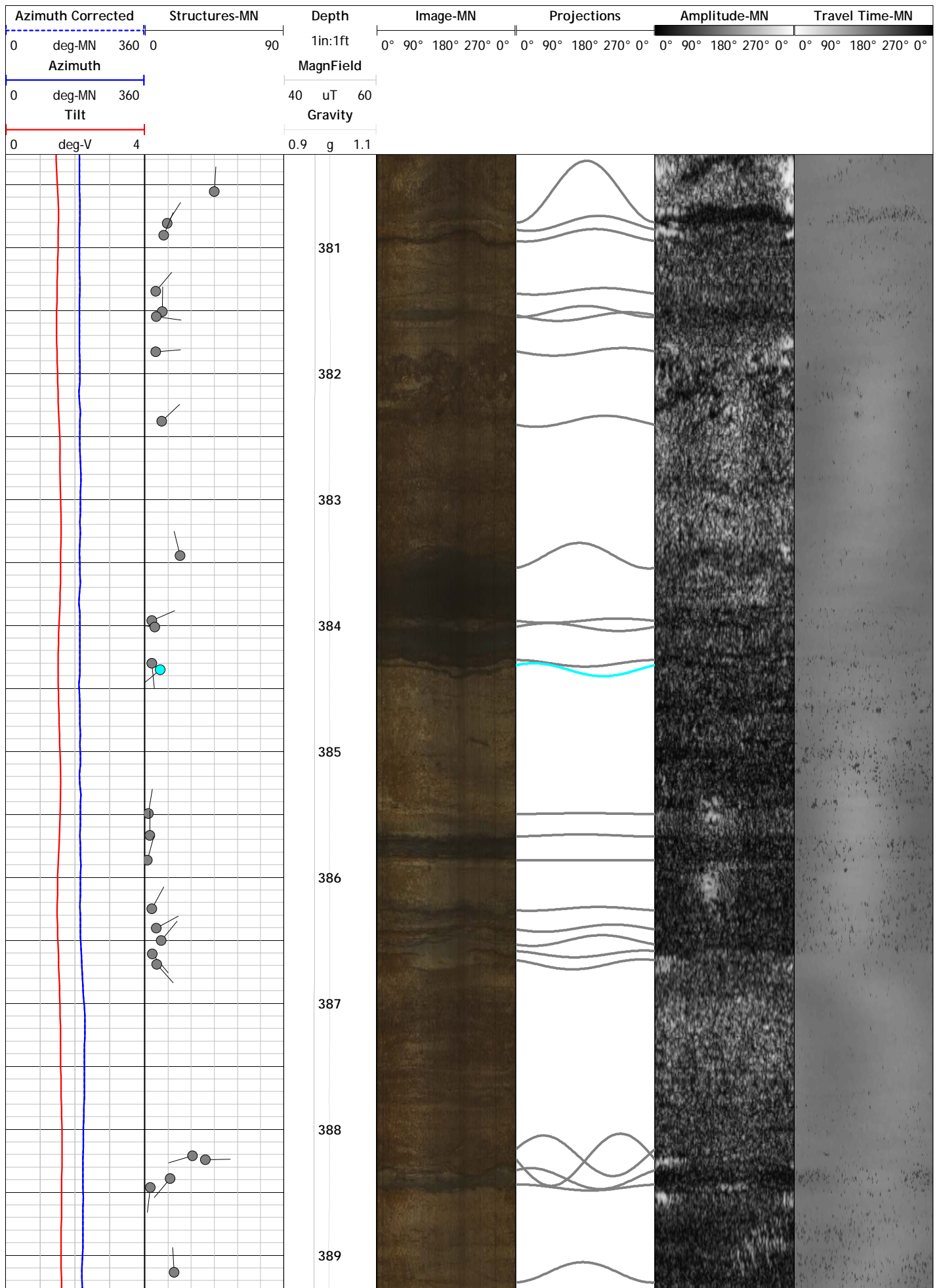


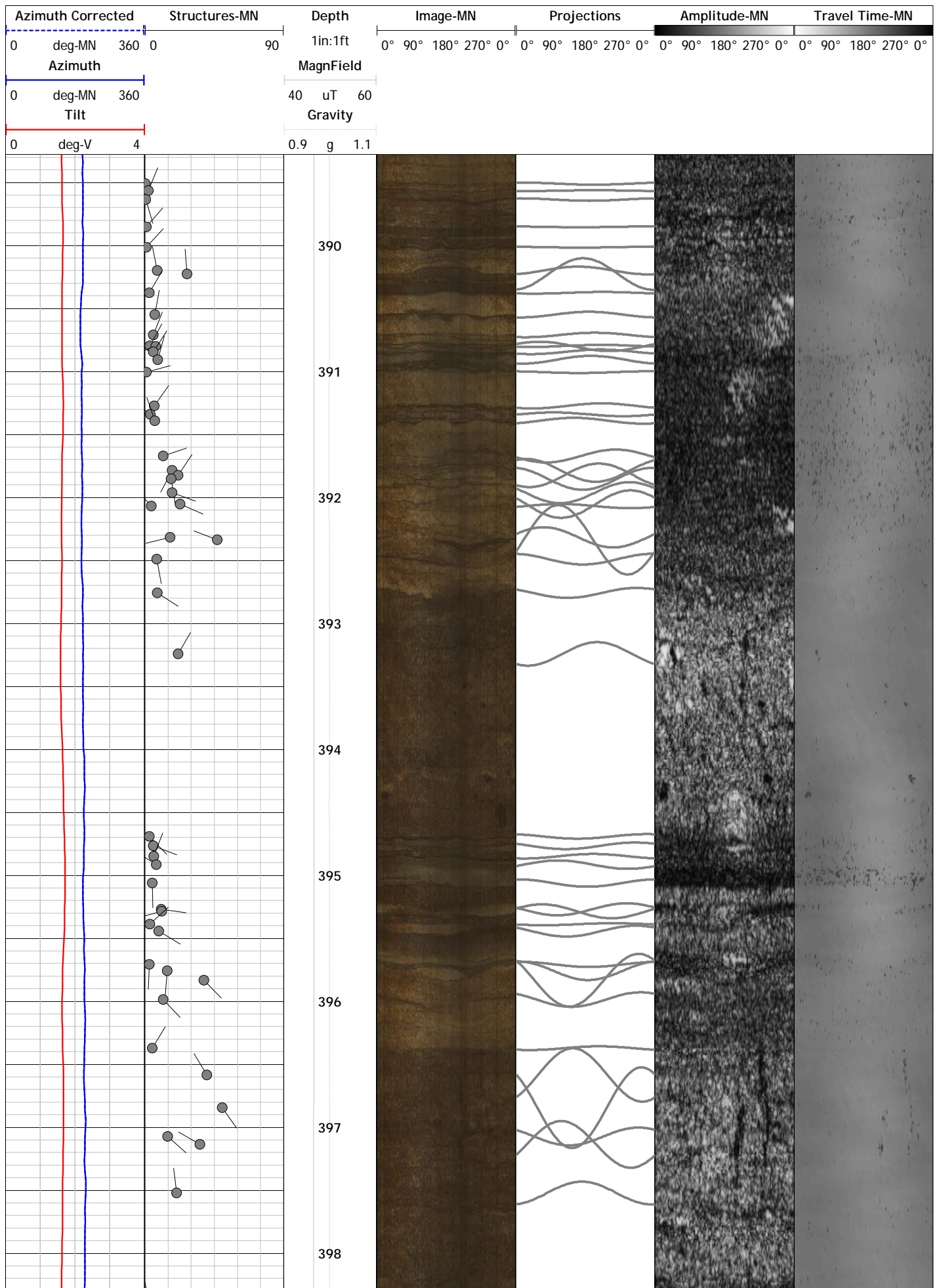


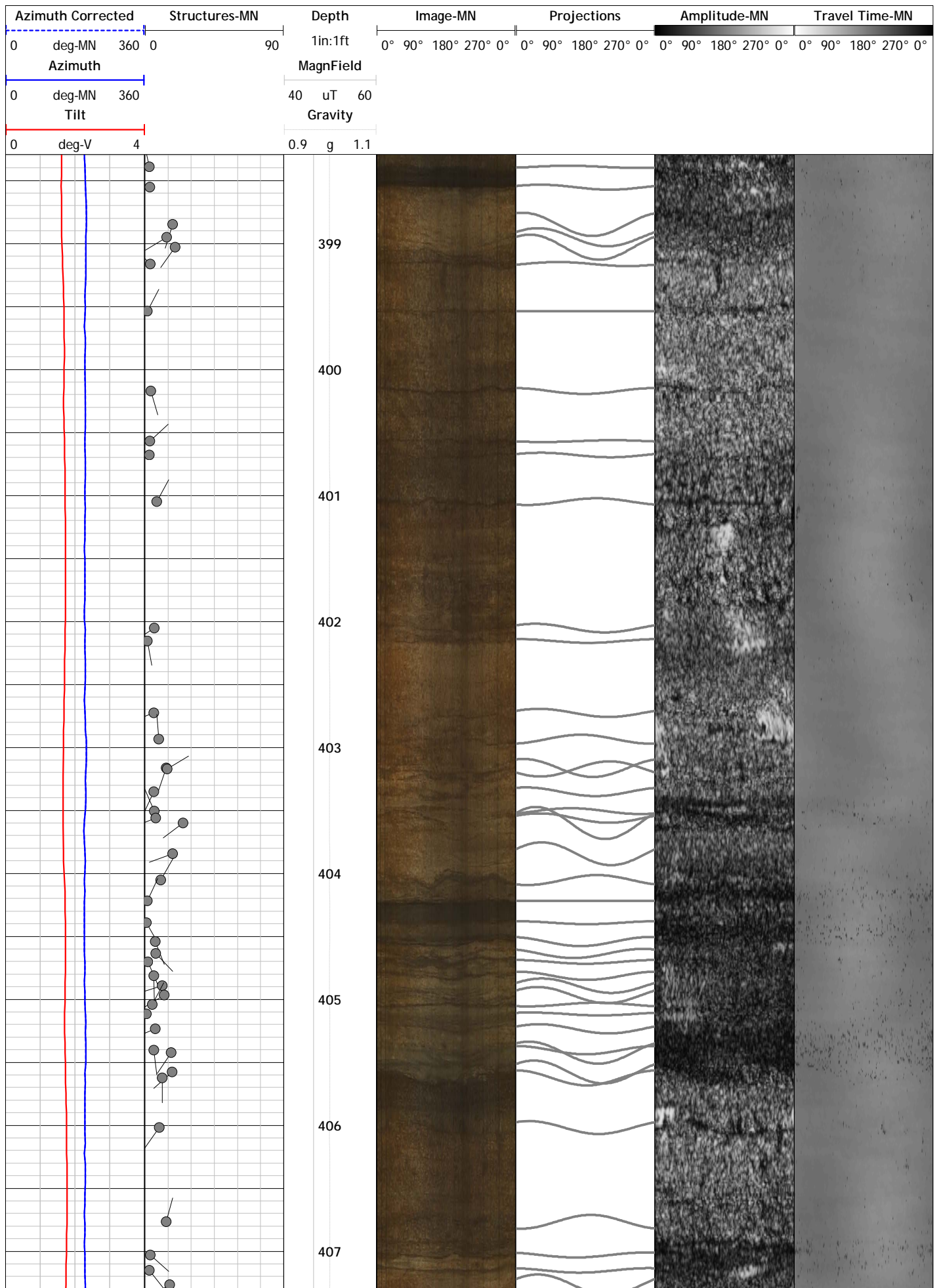


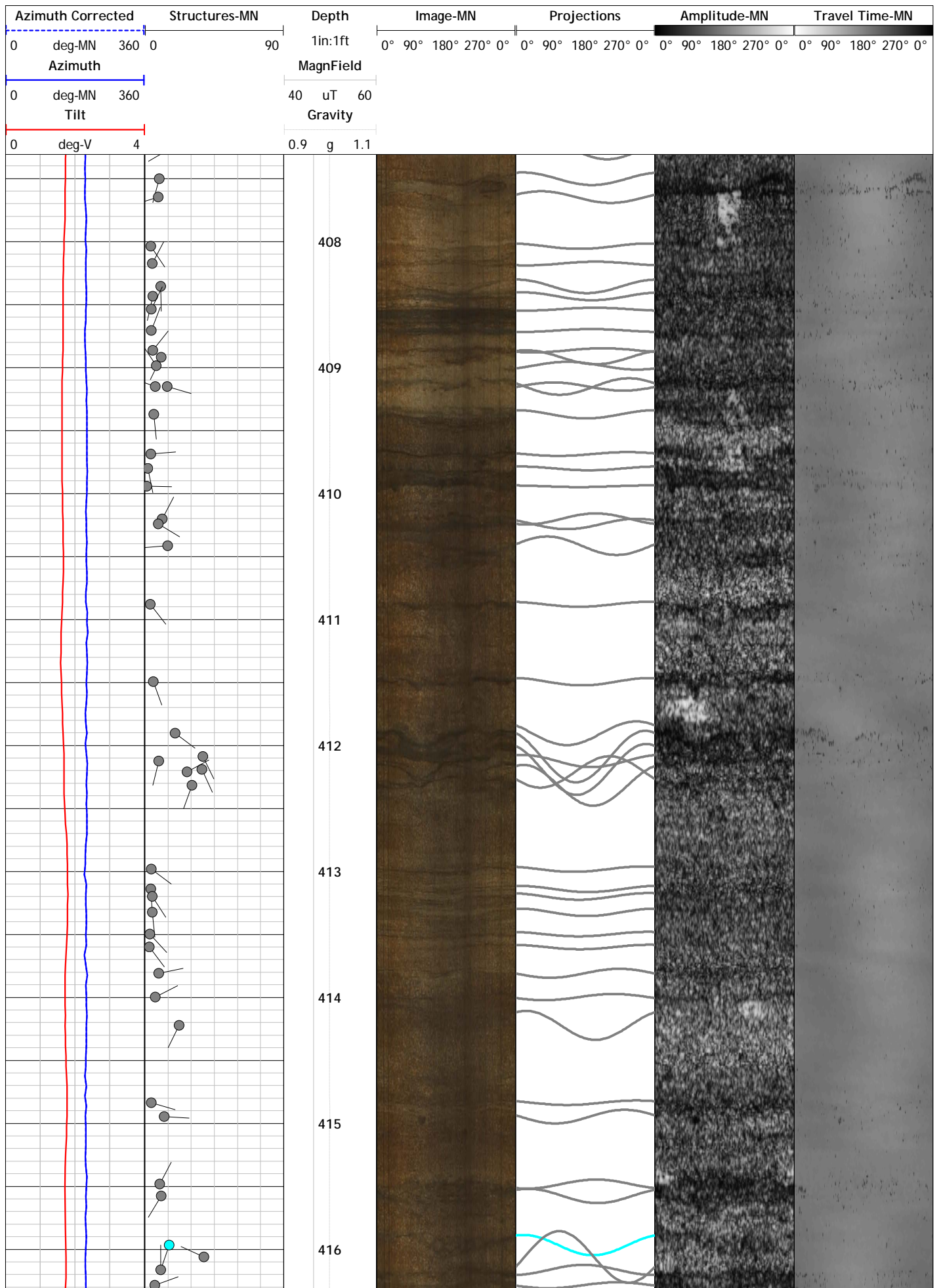


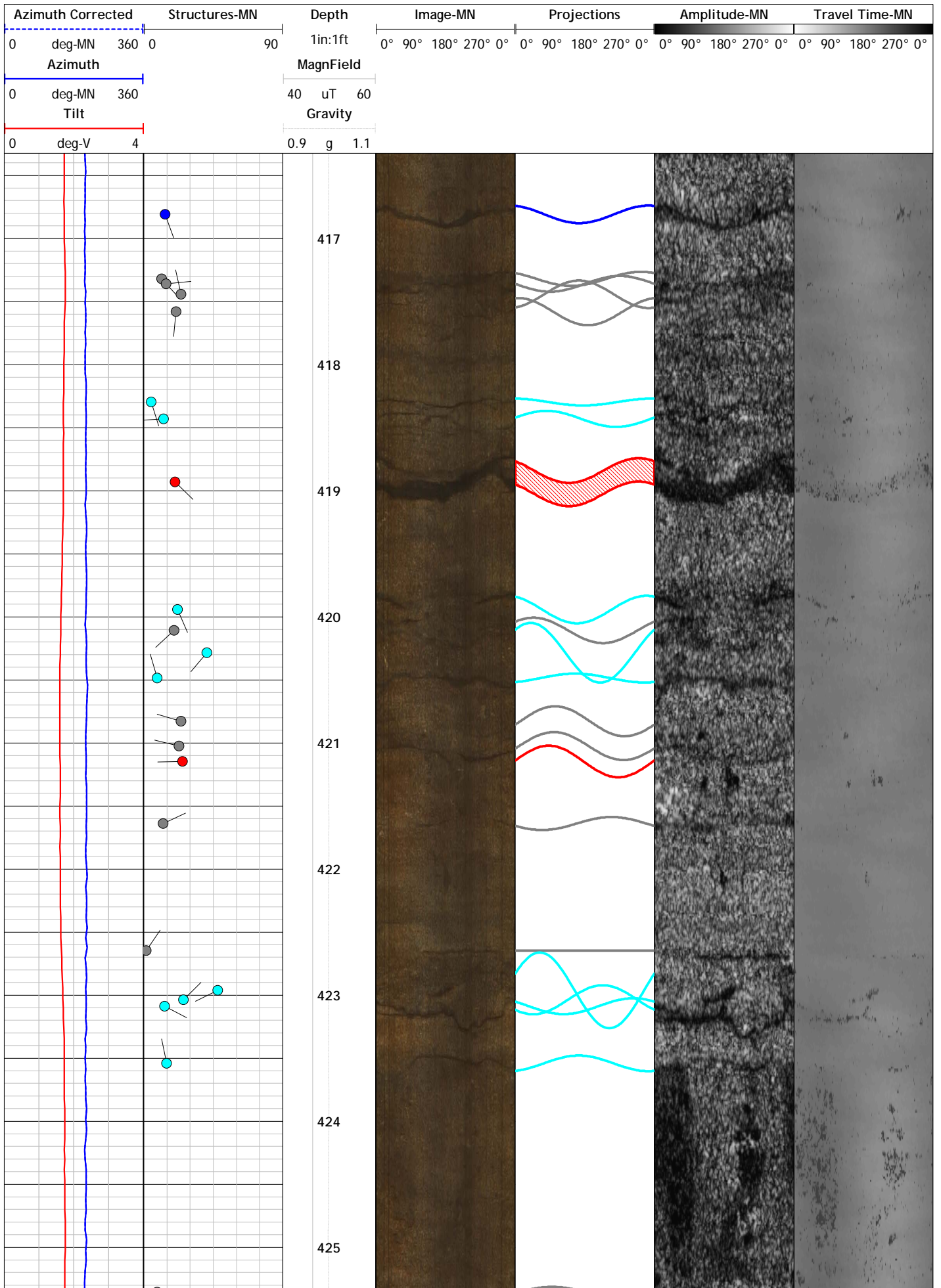


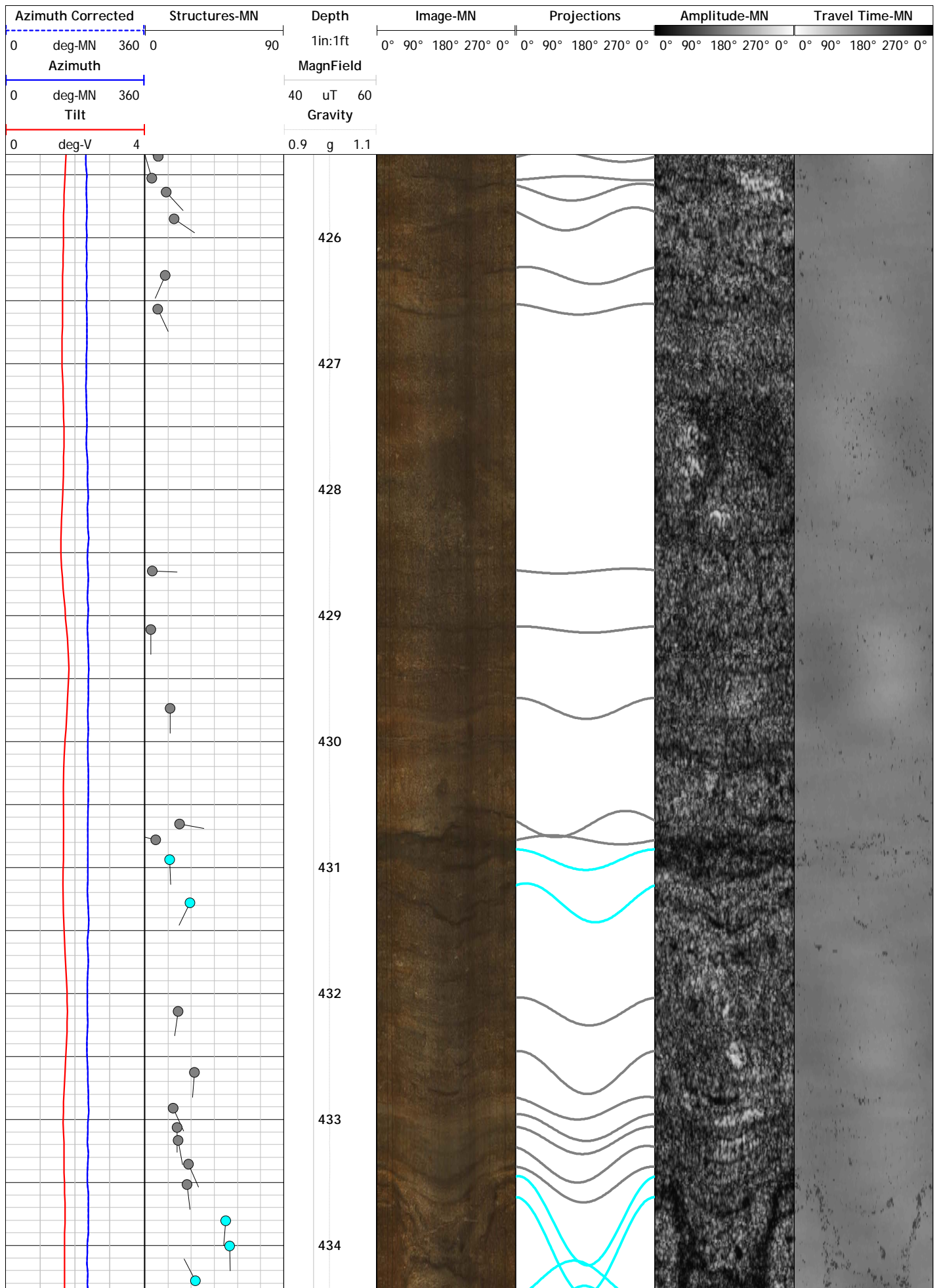


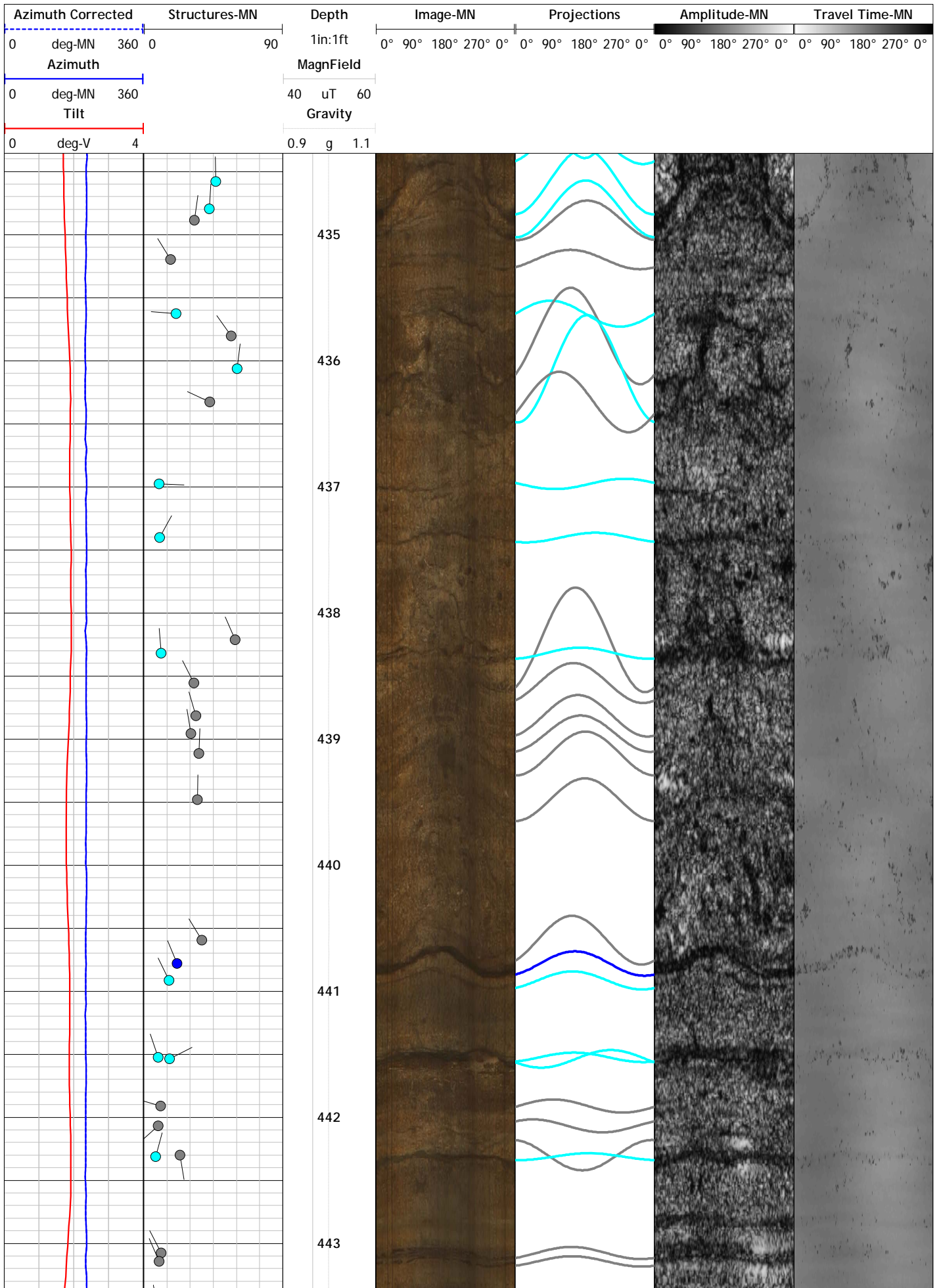


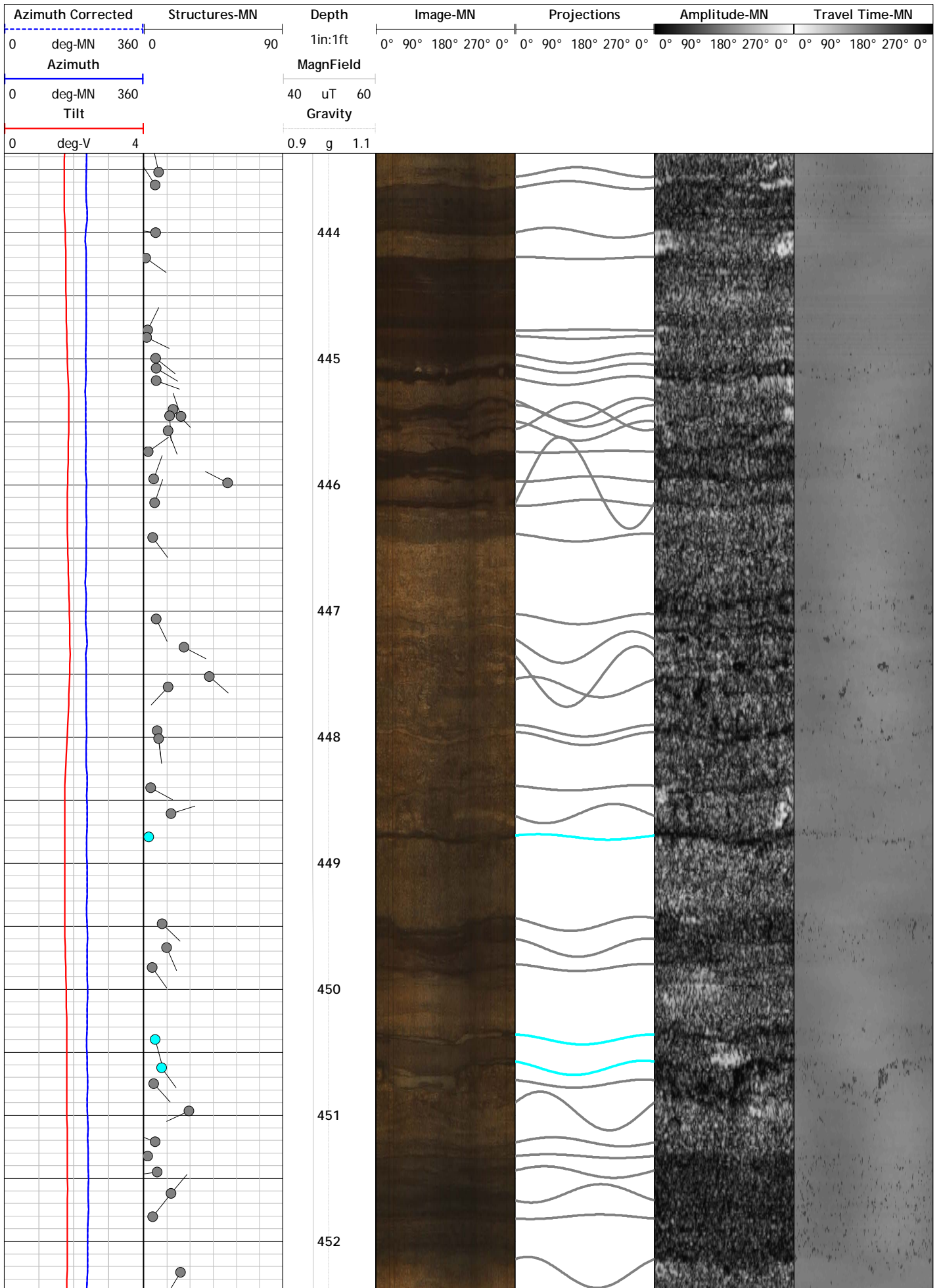


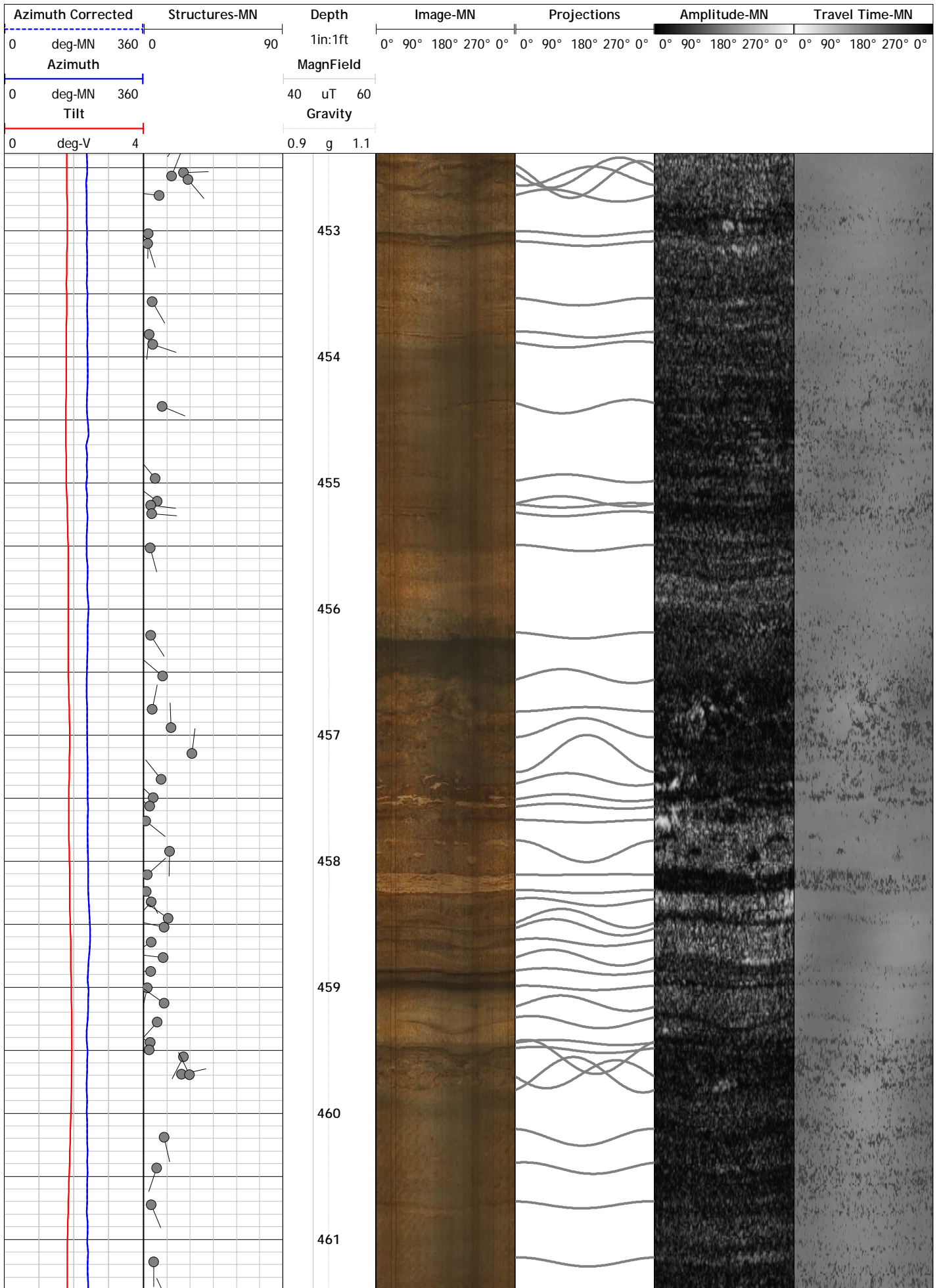


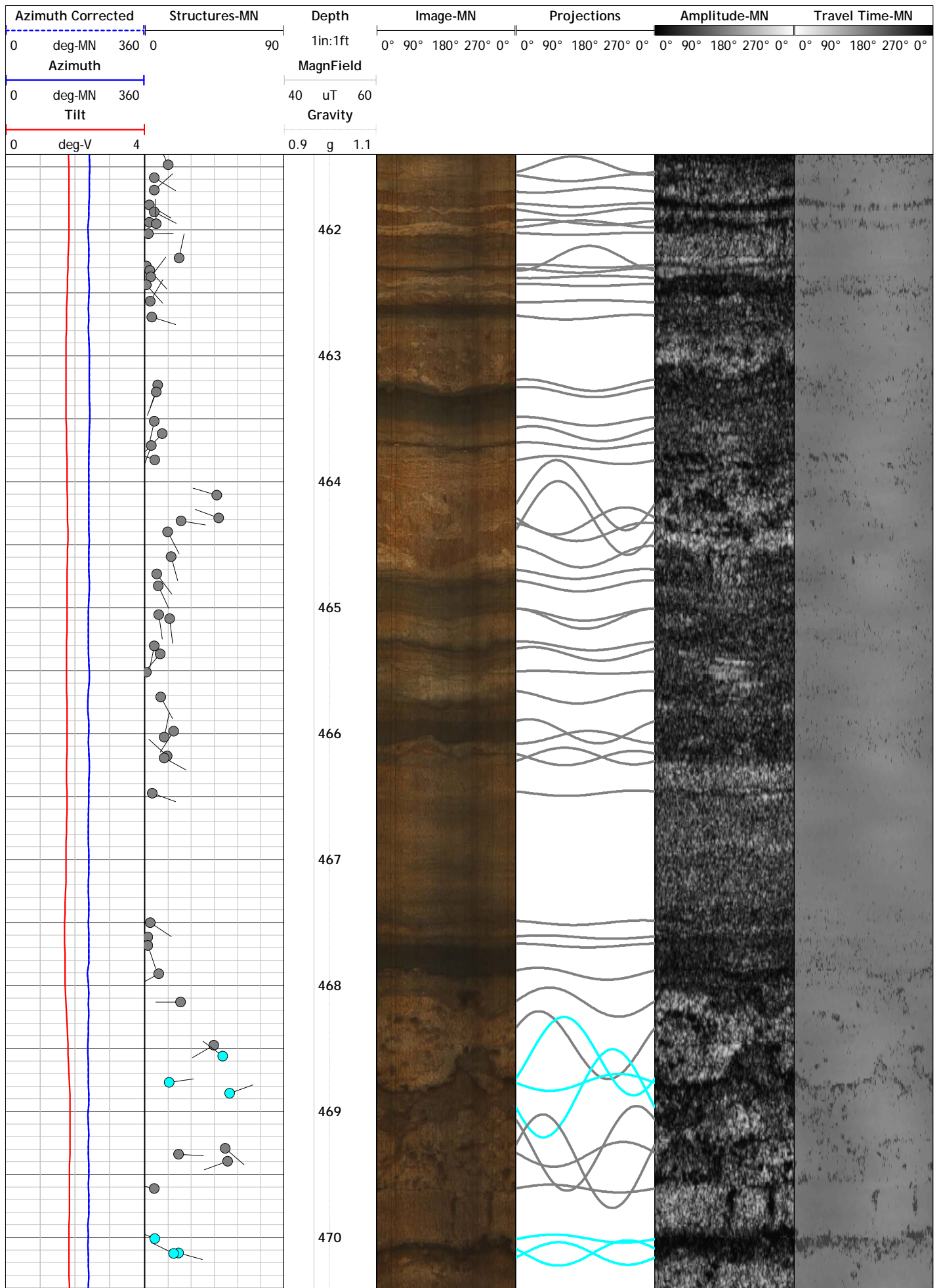


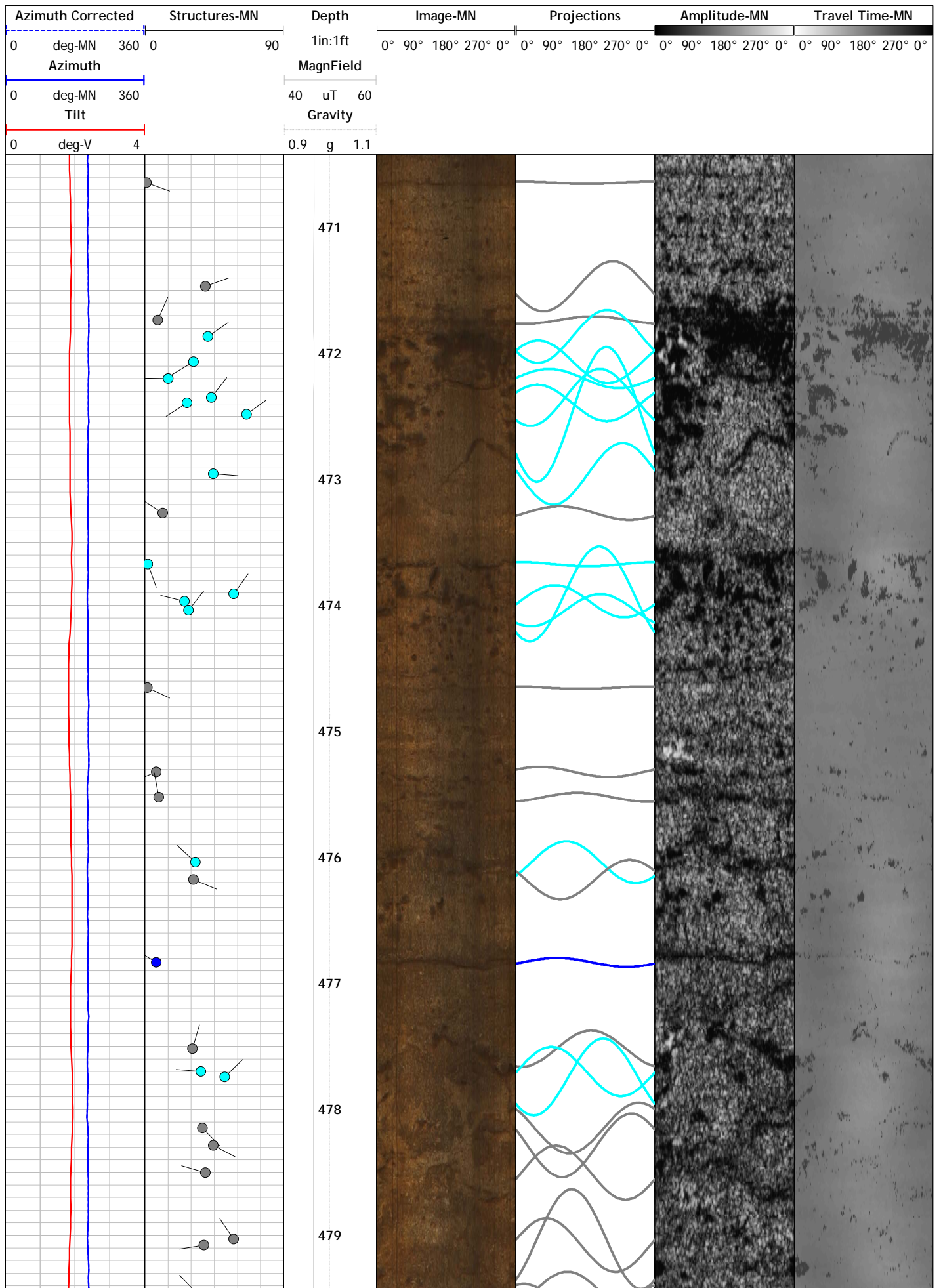


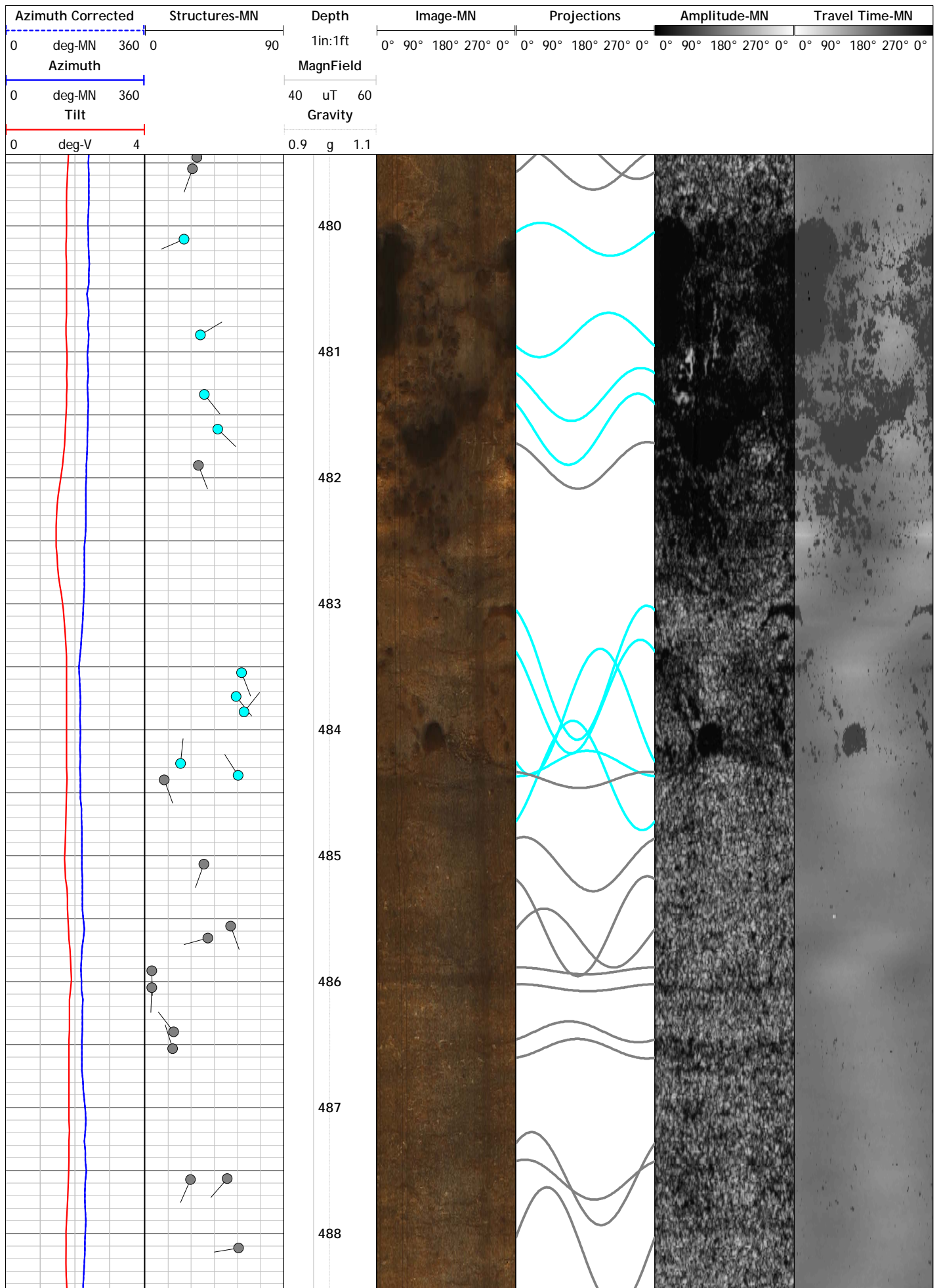


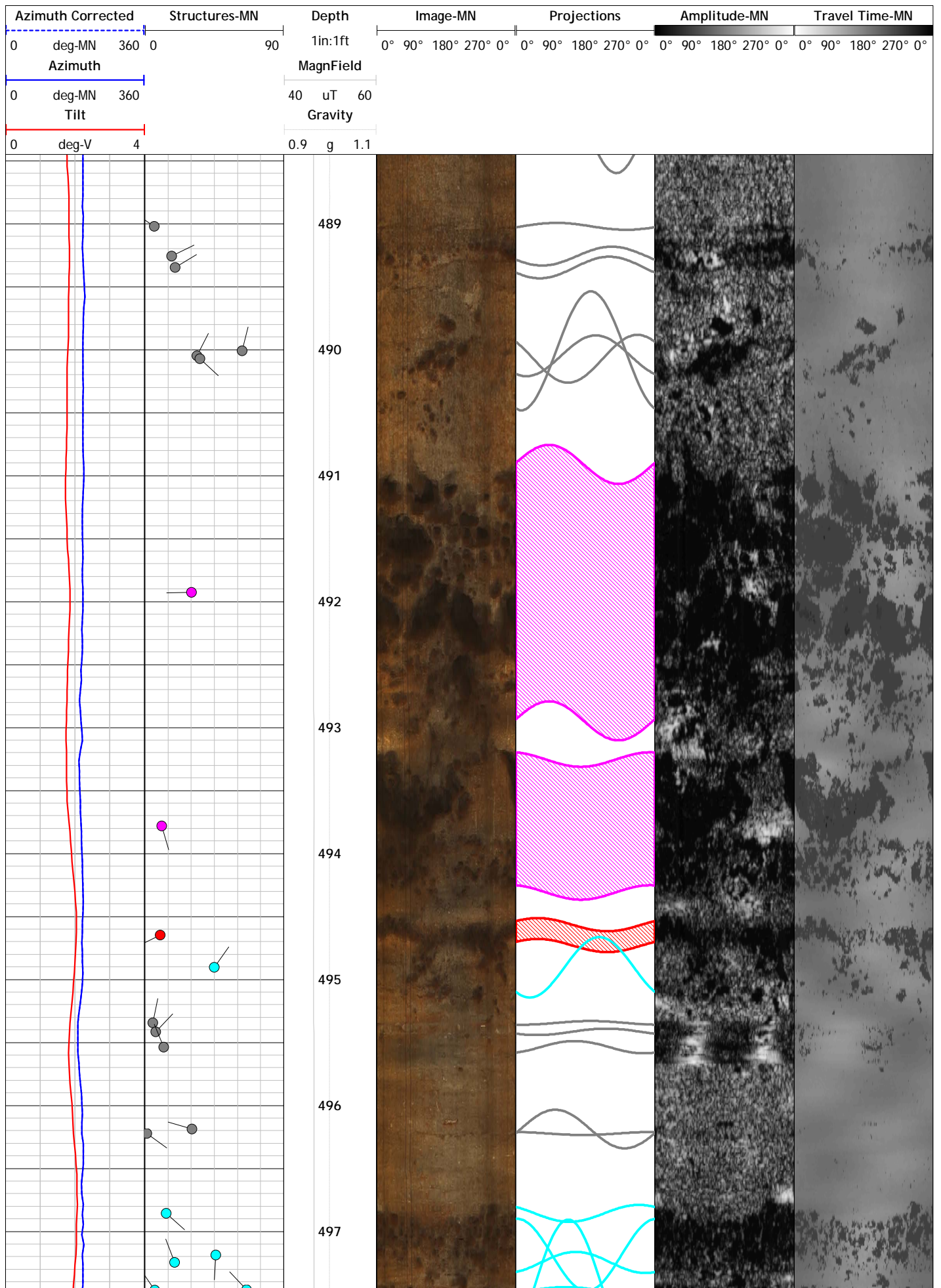


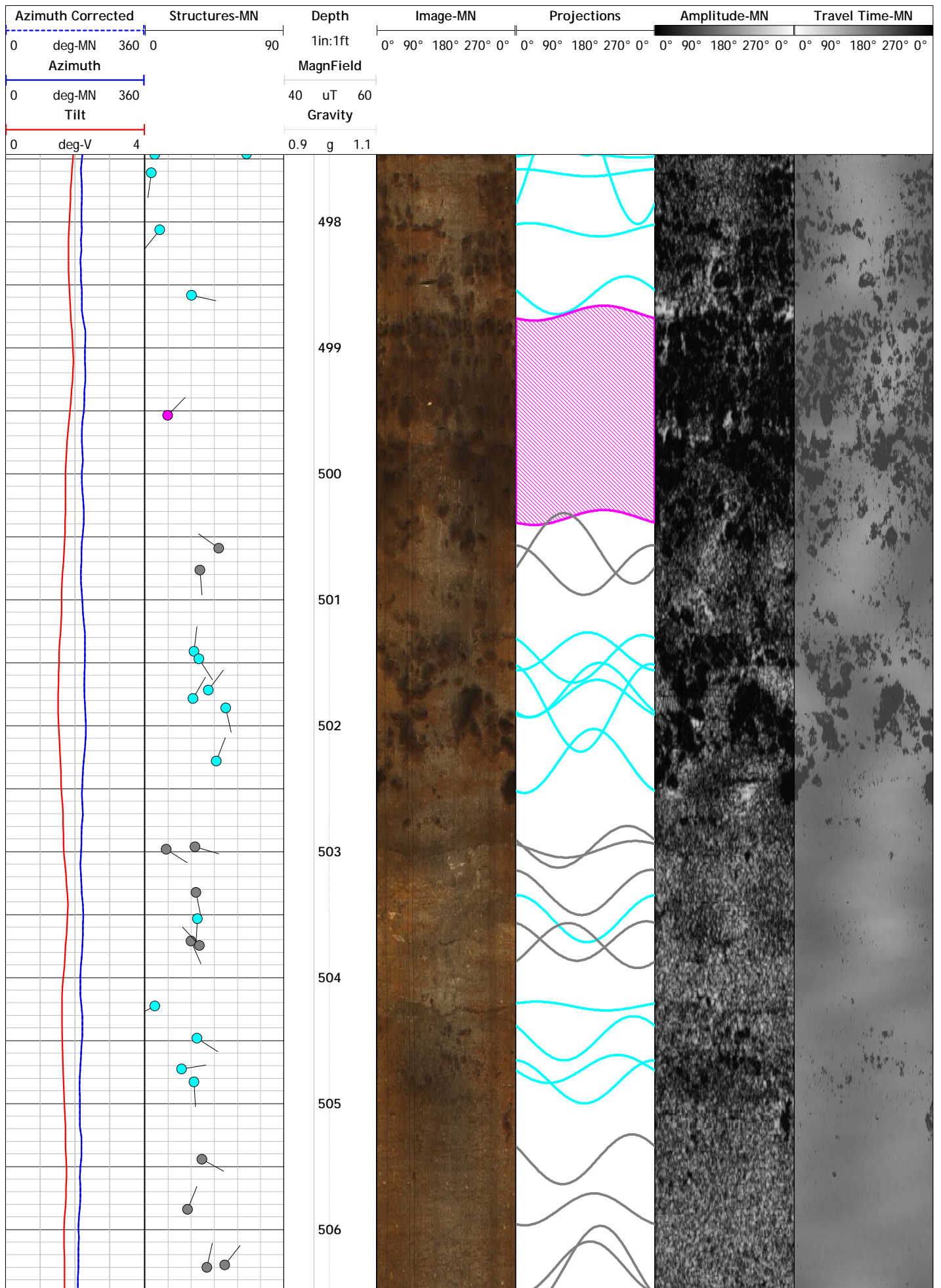


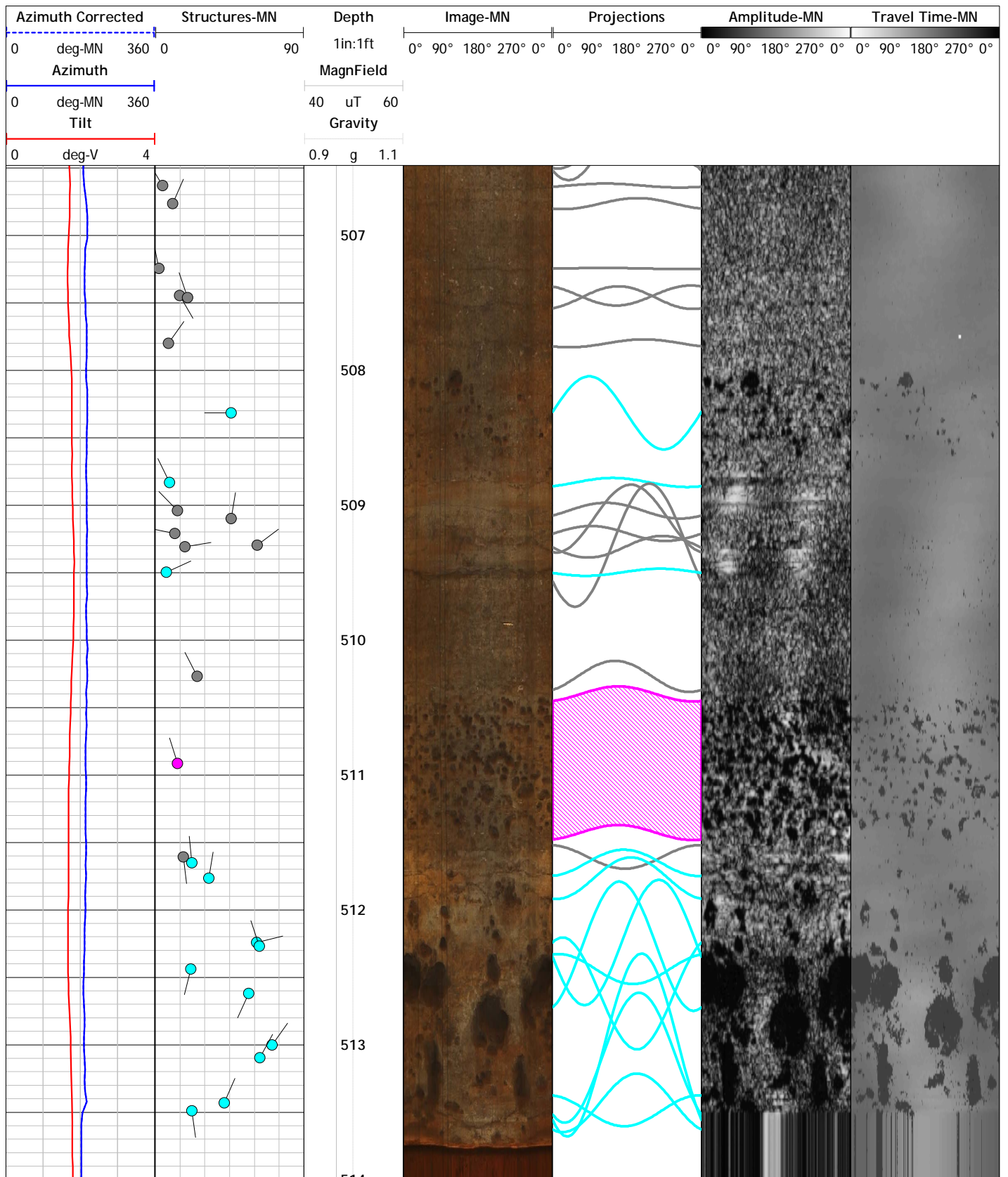




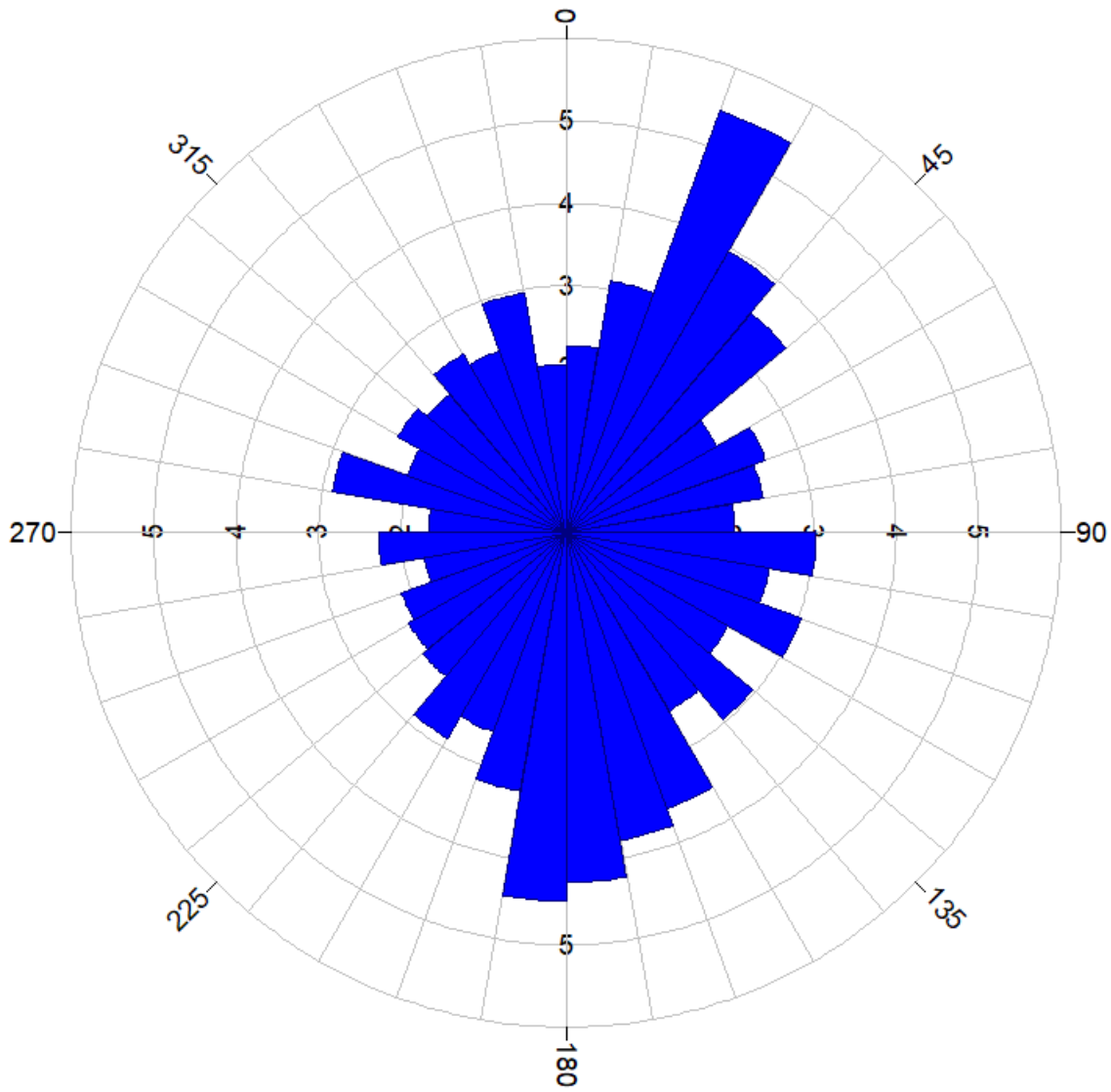






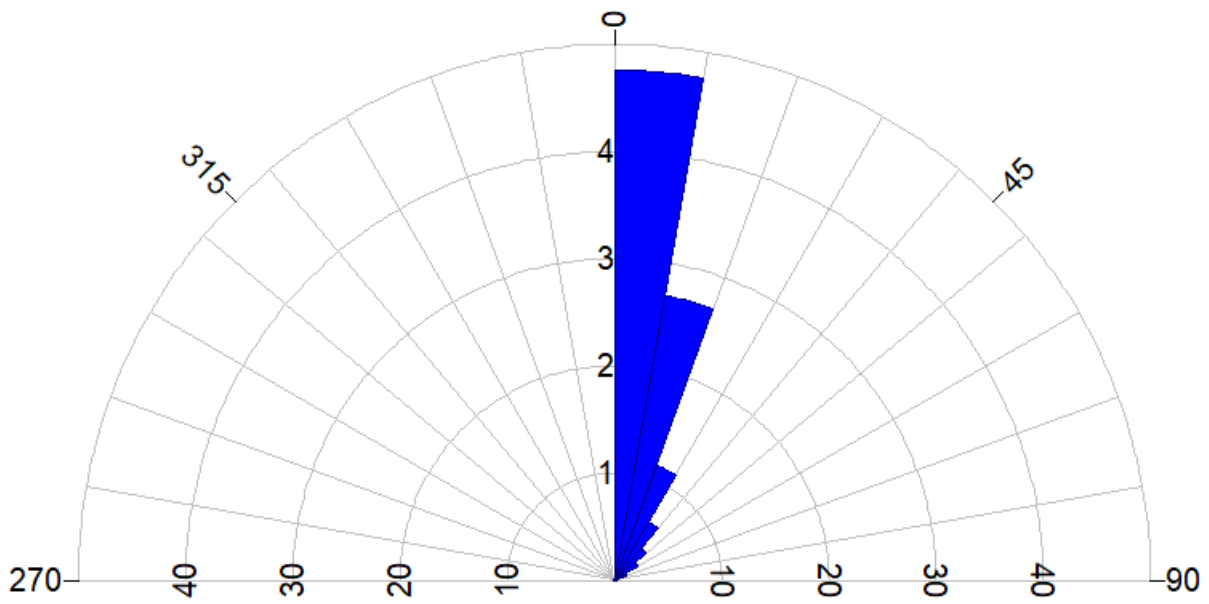


Rose Diagram - Dip Directions
Televiewer Image Features
Arcadis
Deep Well Program
DMW-3
17 January 2024



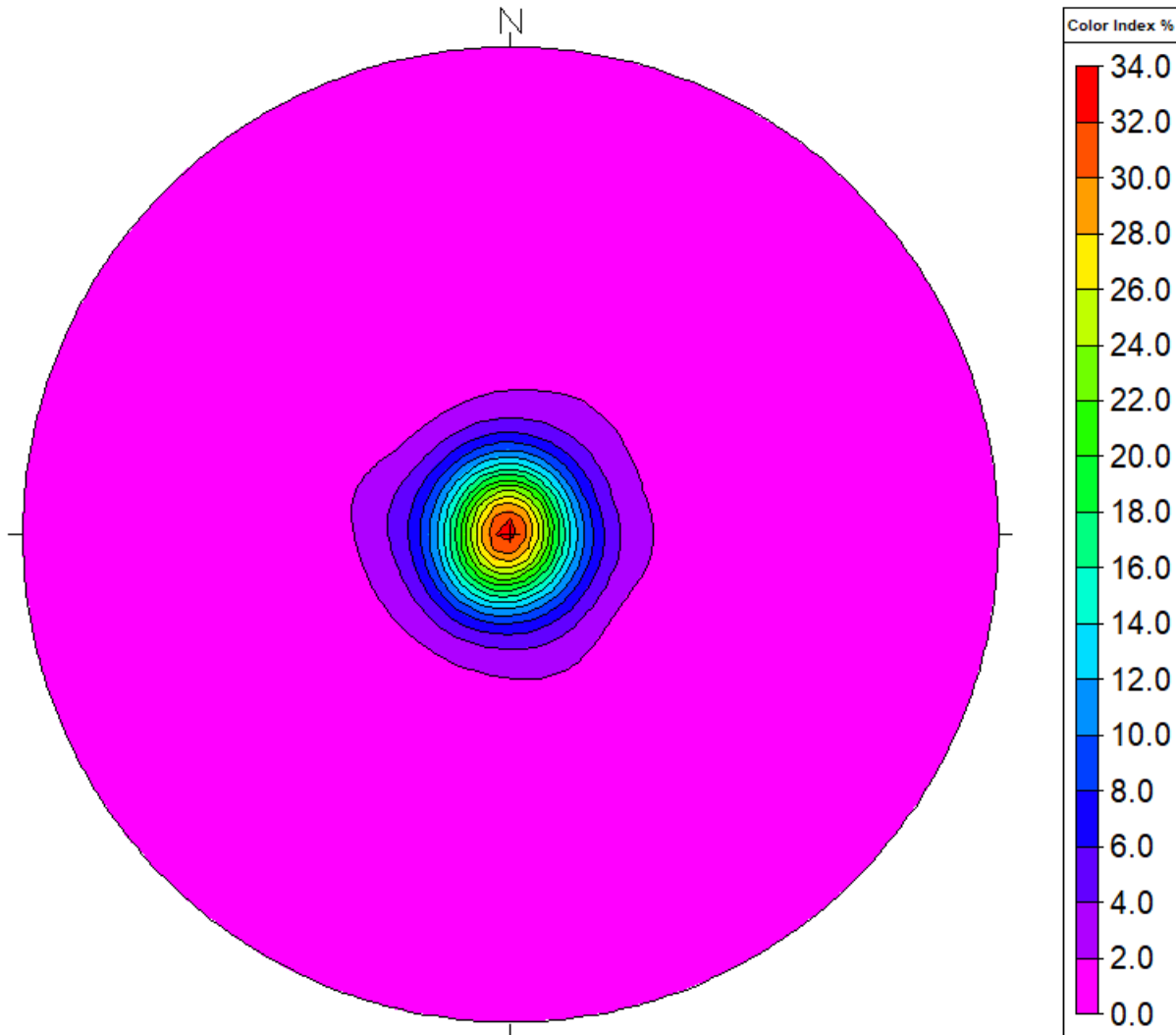
All directions are with respect to magnetic north.

Rose Diagram - Dip Angles
Televiewer Image Features
Arcadis
Deep Well Program
DMW-3
17 January 2024



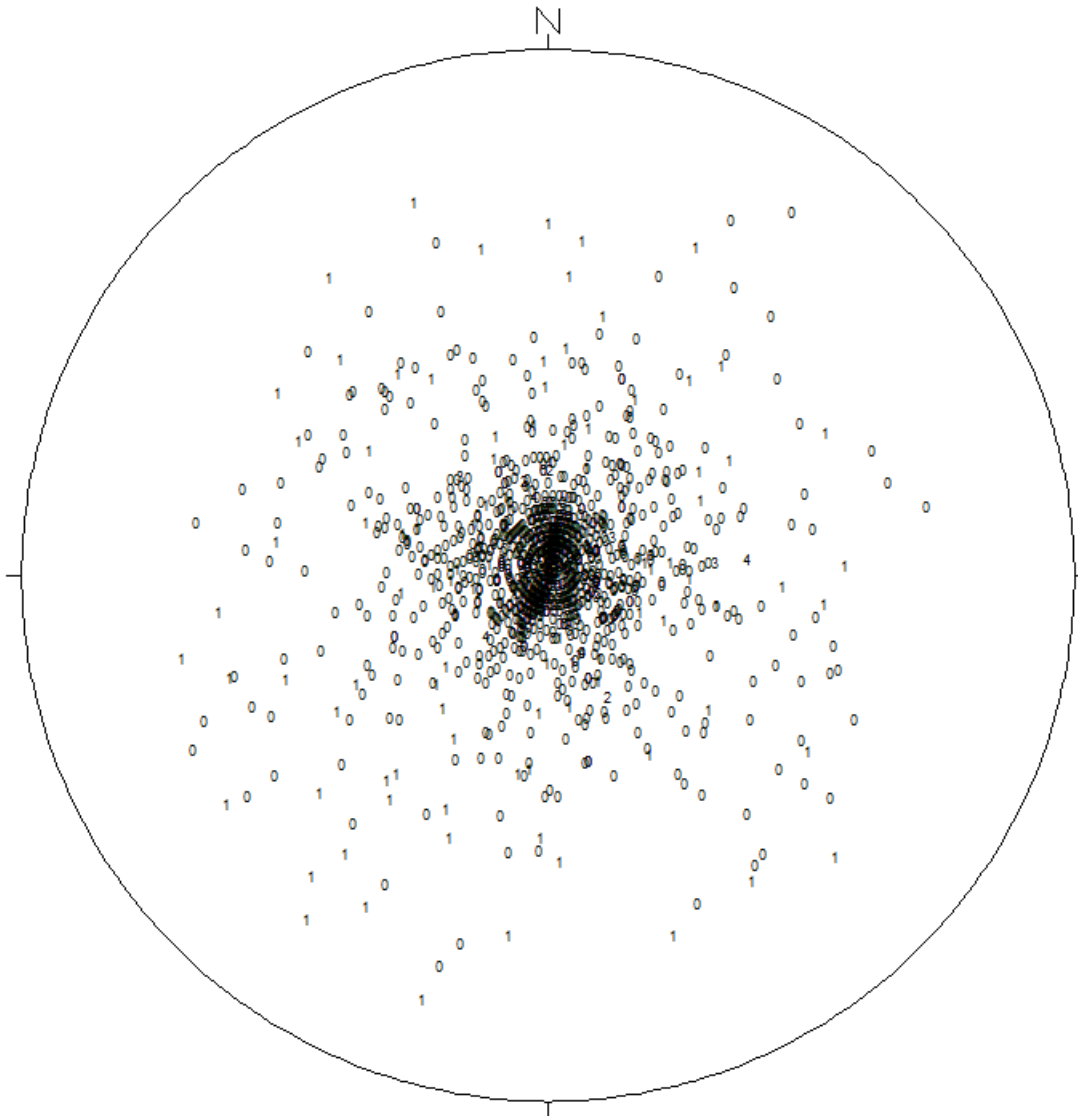
All directions are with respect to magnetic north.

Stereonet Diagram - Schmidt Projection
Televiwer Image Features
Arcadis
Deep Well Program
DMW-3
17 January 2024



All directions are with respect to magnetic north.

Stereonet Diagram - Schmidt Projection
Televiewer Image Features
Arcadis
Deep Well Program
DMW-3
17 January 2024



All directions are with respect to magnetic north.



Orientation Summary Table
TelevIEWER Image Features
Arcadis
Deep Well Program
DMW-3
17 January 2024

Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1	54.25	178.0	121	21	0	0
2	54.31	178.2	158	6	0	0
3	54.46	178.7	262	16	0	0
4	54.46	178.7	20	13	0	0
5	54.61	179.2	169	4	0	0
6	54.66	179.3	234	4	0	0
7	54.71	179.5	46	26	0	0
8	54.77	179.7	53	40	0	0
9	54.89	180.1	21	7	0	0
10	55.01	180.5	191	1	0	0
11	55.07	180.7	45	12	0	0
12	55.11	180.8	43	6	0	0
13	55.20	181.1	31	19	0	0
14	55.29	181.4	196	26	0	0
15	55.33	181.5	22	8	0	0
16	55.45	181.9	232	4	0	0
17	55.48	182.0	191	4	0	0
18	55.52	182.2	63	17	0	0
19	55.53	182.2	145	38	0	0
20	55.54	182.2	264	13	0	0
21	55.62	182.5	77	15	0	0
22	55.66	182.6	335	4	0	0
23	55.69	182.7	41	5	0	1
24	55.73	182.8	346	11	0	0
25	55.75	182.9	341	8	0	0
26	55.82	183.1	33	12	0	0
27	55.98	183.7	253	4	0	0
28	56.02	183.8	193	0	0	1
29	56.07	184.0	86	18	0	0
30	56.07	184.0	262	17	0	0
31	56.08	184.0	112	5	0	0
32	56.18	184.3	85	11	0	0
33	56.27	184.6	332	6	0	0
34	56.29	184.7	80	14	0	0
35	56.33	184.8	159	31	0	0
36	56.35	184.9	348	16	0	0
37	56.35	184.9	157	17	0	0
38	56.50	185.4	165	9	0	0
39	56.57	185.6	92	15	0	0
40	56.57	185.6	294	13	0	0
41	56.59	185.7	211	1	0	0

All directions are with respect to magnetic north.



Orientation Summary Table
TelevIEWER Image Features
Arcadis
Deep Well Program
DMW-3
17 January 2024

Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
42	56.70	186.0	313	10	0	0
43	56.70	186.0	105	22	0	0
44	56.78	186.3	98	13	0	0
45	56.81	186.4	292	3	0	0
46	56.88	186.6	94	8	0	0
47	56.88	186.6	288	10	0	0
48	56.92	186.8	91	8	0	0
49	56.92	186.8	280	11	0	0
50	57.03	187.1	49	9	0	0
51	57.09	187.3	112	9	0	0
52	57.10	187.3	292	5	0	0
53	57.13	187.4	42	9	0	0
54	57.15	187.5	35	8	0	0
55	57.18	187.6	358	11	0	0
56	57.32	188.1	329	6	0	0
57	57.36	188.2	316	4	0	0
58	57.42	188.4	55	10	0	0
59	57.46	188.5	349	4	0	0
60	57.50	188.7	43	4	0	0
61	57.56	188.9	15	2	0	0
62	57.62	189.0	338	8	0	0
63	57.68	189.2	347	15	0	0
64	57.71	189.3	350	31	0	0
65	57.74	189.4	349	5	0	0
66	57.78	189.6	9	1	0	0
67	57.82	189.7	159	3	0	0
68	57.84	189.8	131	10	0	0
69	57.88	189.9	9	1	0	0
70	57.92	190.0	76	7	0	0
71	58.04	190.4	262	11	0	0
72	58.05	190.4	74	12	0	0
73	58.12	190.7	59	33	0	0
74	58.14	190.8	259	11	0	0
75	58.25	191.1	128	6	0	0
76	58.29	191.3	229	14	0	0
77	58.32	191.4	247	20	0	0
78	58.35	191.4	217	8	0	0
79	58.35	191.4	349	6	0	0
80	58.38	191.5	104	51	0	0
81	58.41	191.6	2	2	0	0
82	58.43	191.7	186	7	0	0

All directions are with respect to magnetic north.



Orientation Summary Table
TelevIEWER Image Features
Arcadis
Deep Well Program
DMW-3
17 January 2024

Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
83	58.47	191.8	179	7	0	0
84	58.52	192.0	167	4	0	0
85	58.55	192.1	323	20	0	0
86	58.56	192.1	94	18	0	0
87	58.61	192.3	93	7	0	0
88	58.66	192.4	150	2	0	0
89	58.73	192.7	185	11	0	0
90	58.80	192.9	187	5	0	0
91	58.84	193.0	197	3	0	0
92	58.85	193.1	345	19	0	0
93	58.97	193.5	45	34	0	0
94	59.00	193.6	293	23	0	0
95	59.03	193.7	255	30	0	0
96	59.10	193.9	320	13	0	0
97	59.15	194.1	278	17	0	0
98	59.23	194.3	57	25	0	0
99	59.23	194.3	329	25	0	0
100	59.25	194.4	130	42	0	0
101	59.32	194.6	126	9	0	0
102	59.36	194.7	311	7	0	0
103	59.42	194.9	326	14	0	0
104	59.42	195.0	154	3	0	0
105	59.46	195.1	271	20	0	0
106	59.52	195.3	281	33	0	0
107	59.56	195.4	305	12	0	0
108	59.59	195.5	253	25	0	0
109	59.62	195.6	272	19	0	0
110	59.65	195.7	220	6	0	0
111	59.68	195.8	187	8	0	0
112	59.72	195.9	177	4	0	0
113	59.74	196.0	178	4	0	0
114	59.77	196.1	305	12	0	0
115	59.83	196.3	75	30	0	0
116	59.84	196.3	215	30	0	0
117	59.86	196.4	198	33	0	0
118	59.90	196.5	18	24	0	0
119	59.92	196.6	231	5	0	0
120	59.99	196.8	104	16	0	0
121	60.00	196.9	304	10	0	0
122	60.02	196.9	112	21	0	0
123	60.02	196.9	219	43	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
124	60.06	197.1	73	17	0	0
125	60.11	197.2	31	12	0	0
126	60.16	197.4	171	4	0	0
127	60.27	197.7	34	6	0	0
128	60.28	197.8	247	2	0	0
129	60.33	197.9	111	12	0	0
130	60.34	198.0	181	4	0	0
131	60.40	198.2	130	10	0	0
132	60.43	198.3	317	11	0	0
133	60.46	198.4	122	39	0	0
134	60.48	198.4	308	4	0	0
135	60.51	198.5	32	9	0	0
136	60.64	198.9	189	31	0	0
137	60.68	199.1	145	24	0	0
138	60.73	199.2	43	6	0	0
139	60.75	199.3	269	2	0	0
140	60.79	199.4	132	3	0	0
141	60.84	199.6	266	2	0	0
142	60.94	200.0	66	62	0	0
143	61.00	200.1	54	6	0	0
144	61.04	200.3	341	25	0	0
145	61.16	200.7	171	21	0	0
146	61.16	200.7	343	18	0	0
147	61.20	200.8	158	6	0	0
148	61.26	201.0	17	18	0	0
149	61.27	201.0	101	17	0	0
150	61.30	201.1	98	10	0	0
151	61.38	201.4	272	21	0	0
152	61.42	201.5	107	45	0	0
153	61.43	201.5	260	7	0	0
154	61.52	201.9	62	5	0	0
155	61.55	201.9	178	5	0	0
156	61.59	202.1	48	10	0	0
157	61.65	202.3	96	4	0	0
158	61.67	202.3	162	2	0	0
159	61.70	202.4	178	1	0	0
160	61.74	202.6	286	28	0	0
161	61.85	202.9	143	40	0	0
162	61.86	203.0	216	3	0	0
163	61.90	203.1	153	3	0	0
164	61.96	203.3	267	7	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
165	62.03	203.5	110	3	0	0
166	62.08	203.7	115	7	0	0
167	62.11	203.8	197	1	0	0
168	62.13	203.8	288	7	0	0
169	62.18	204.0	187	14	0	0
170	62.25	204.2	22	10	0	0
171	62.28	204.3	53	1	0	0
172	62.31	204.4	162	9	0	0
173	62.37	204.6	347	3	0	0
174	62.40	204.7	97	12	0	0
175	62.41	204.8	130	10	0	0
176	62.45	204.9	31	12	0	0
177	62.47	205.0	26	8	0	0
178	62.51	205.1	187	8	0	0
179	62.55	205.2	154	18	0	0
180	62.56	205.3	346	9	0	0
181	62.62	205.5	206	10	0	0
182	62.64	205.5	185	4	0	0
183	62.67	205.6	195	4	0	0
184	62.71	205.7	304	6	0	0
185	62.75	205.9	286	5	0	0
186	62.78	206.0	328	4	0	0
187	62.83	206.2	78	5	0	0
188	62.96	206.6	73	21	0	0
189	62.98	206.6	269	24	0	0
190	63.06	206.9	316	11	0	0
191	63.11	207.0	281	11	0	0
192	63.16	207.2	100	5	0	0
193	63.17	207.3	54	30	0	0
194	63.18	207.3	150	15	0	0
195	63.19	207.3	300	12	0	0
196	63.26	207.6	349	13	0	0
197	63.37	207.9	315	11	0	0
198	63.46	208.2	92	20	0	0
199	63.61	208.7	242	4	0	0
200	63.70	209.0	192	24	0	0
201	63.78	209.2	227	21	0	0
202	63.90	209.6	333	16	0	0
203	63.99	209.9	84	19	0	0
204	64.01	210.0	262	21	0	0
205	64.17	210.5	182	1	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
206	64.24	210.8	12	17	0	0
207	64.26	210.8	224	26	0	0
208	64.28	210.9	29	16	0	0
209	64.32	211.0	322	5	0	0
210	64.36	211.2	201	11	0	0
211	64.39	211.3	202	4	0	0
212	64.45	211.5	268	14	0	1
213	64.50	211.6	122	52	0	1
214	64.51	211.6	344	14	0	1
215	64.52	211.7	298	15	0	1
216	64.56	211.8	188	20	0	0
217	64.63	212.0	145	13	0	1
218	64.70	212.3	160	9	0	0
219	64.78	212.5	287	11	0	0
220	64.90	212.9	110	4	0	0
221	64.93	213.0	181	6	0	0
222	65.01	213.3	102	4	0	1
223	65.03	213.4	211	5	0	1
224	65.08	213.5	28	3	37	3
225	65.23	214.0	194	13	0	0
226	65.28	214.2	7	5	0	0
227	65.32	214.3	102	12	0	0
228	65.36	214.4	137	10	0	0
229	65.41	214.6	279	9	0	0
230	65.53	215.0	216	36	0	1
231	65.55	215.1	66	27	0	0
232	65.58	215.2	67	46	0	1
233	65.61	215.3	82	54	0	1
234	65.63	215.3	39	1	0	1
235	65.72	215.6	40	5	0	1
236	65.78	215.8	183	5	0	0
237	65.82	215.9	145	2	0	1
238	65.86	216.1	17	75	0	1
239	65.88	216.2	153	2	0	0
240	65.93	216.3	56	10	0	0
241	65.96	216.4	41	15	0	0
242	66.01	216.6	28	11	0	0
243	66.06	216.7	283	5	0	0
244	66.10	216.9	214	3	0	0
245	66.13	217.0	9	7	0	0
246	66.19	217.2	276	6	0	0

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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
247	66.24	217.3	259	6	0	0
248	66.26	217.4	143	11	0	0
249	66.38	217.8	282	6	0	0
250	66.41	217.9	302	4	0	0
251	66.44	218.0	133	8	0	0
252	66.51	218.2	177	28	0	1
253	66.55	218.3	71	54	0	0
254	66.57	218.4	300	28	0	0
255	66.61	218.5	191	40	0	1
256	66.62	218.6	351	24	0	0
257	66.70	218.8	13	5	0	0
258	66.71	218.9	27	3	0	0
259	66.74	219.0	40	7	0	0
260	66.77	219.1	169	9	0	0
261	66.85	219.3	105	10	0	0
262	66.94	219.6	188	32	0	0
263	66.96	219.7	96	24	0	0
264	67.03	219.9	23	7	0	0
265	67.07	220.0	61	6	0	0
266	67.10	220.1	42	6	0	0
267	67.17	220.4	322	3	0	0
268	67.21	220.5	32	6	0	0
269	67.25	220.6	120	6	0	0
270	67.31	220.8	351	18	0	0
271	67.37	221.0	14	9	0	0
272	67.39	221.1	93	20	0	0
273	67.54	221.6	323	15	0	0
274	67.65	222.0	27	7	0	0
275	67.67	222.0	310	58	0	0
276	67.67	222.0	313	12	0	0
277	67.71	222.2	8	7	0	0
278	67.72	222.2	188	10	0	0
279	67.78	222.4	39	9	0	0
280	67.81	222.5	127	17	0	0
281	67.82	222.5	27	9	0	0
282	67.88	222.7	226	11	0	0
283	67.93	222.9	18	5	0	0
284	67.98	223.0	55	10	0	1
285	68.01	223.1	212	9	0	0
286	68.11	223.5	80	19	0	1
287	68.12	223.5	263	15	0	1

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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
288	68.17	223.7	17	4	0	0
289	68.27	224.0	62	51	0	0
290	68.31	224.1	201	3	0	0
291	68.35	224.3	202	5	0	0
292	68.40	224.4	308	39	0	0
293	68.42	224.5	177	2	0	0
294	68.46	224.6	185	5	0	0
295	68.49	224.7	176	4	0	0
296	68.54	224.9	195	2	0	0
297	68.64	225.2	156	44	0	0
298	68.64	225.2	117	4	0	0
299	68.69	225.4	240	21	0	0
300	68.72	225.5	233	22	0	0
301	68.92	226.1	181	5	0	0
302	69.24	227.2	57	6	0	0
303	69.27	227.3	349	25	0	0
304	69.27	227.3	162	9	0	0
305	69.29	227.3	47	35	0	0
306	69.30	227.4	156	8	0	0
307	69.47	227.9	155	8	0	0
308	69.52	228.1	77	10	0	0
309	69.56	228.2	301	9	0	0
310	69.57	228.3	63	28	0	0
311	69.58	228.3	335	8	0	0
312	69.62	228.4	234	7	0	0
313	69.70	228.7	72	7	0	0
314	69.77	228.9	209	6	0	0
315	69.89	229.3	150	17	0	0
316	69.91	229.4	158	11	0	0
317	69.97	229.6	234	11	0	0
318	70.00	229.7	174	15	0	0
319	70.03	229.8	151	1	0	0
320	70.13	230.1	228	10	0	0
321	70.15	230.2	53	12	0	0
322	70.19	230.3	185	7	0	0
323	70.29	230.6	213	16	0	0
324	70.40	231.0	292	3	0	0
325	70.41	231.0	315	11	0	0
326	70.47	231.2	303	7	0	0
327	70.56	231.5	312	48	0	0
328	70.59	231.6	147	5	0	0

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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
329	70.66	231.8	181	3	0	0
330	70.70	232.0	27	44	0	0
331	70.71	232.0	93	3	0	0
332	70.76	232.2	332	7	0	0
333	70.82	232.4	355	6	0	0
334	71.18	233.5	161	13	0	1
335	71.34	234.1	246	4	0	1
336	71.45	234.4	168	2	0	0
337	71.48	234.5	157	4	0	0
338	71.52	234.7	305	8	0	0
339	71.54	234.7	285	2	0	0
340	71.77	235.5	115	40	0	0
341	71.86	235.8	240	3	0	0
342	71.97	236.1	114	19	0	0
343	72.01	236.2	328	22	0	0
344	72.01	236.3	29	5	0	0
345	72.07	236.5	37	6	0	0
346	72.10	236.5	4	5	0	0
347	72.13	236.6	69	15	0	0
348	72.15	236.7	299	4	0	0
349	72.20	236.9	1	8	0	0
350	72.41	237.6	198	4	0	0
351	72.57	238.1	24	5	0	0
352	72.64	238.3	316	28	0	0
353	72.82	238.9	192	2	0	0
354	72.86	239.0	358	1	0	0
355	72.87	239.1	128	7	0	0
356	72.93	239.3	323	18	0	0
357	72.97	239.4	242	6	0	0
358	73.05	239.7	290	3	0	1
359	73.08	239.8	168	7	0	0
360	73.11	239.9	135	8	0	0
361	73.13	239.9	176	6	0	0
362	73.21	240.2	355	16	0	0
363	73.29	240.5	26	9	0	1
364	73.32	240.5	243	8	0	0
365	73.69	241.8	310	7	0	0
366	73.98	242.7	22	4	0	0
367	74.26	243.6	21	11	0	0
368	74.33	243.9	175	5	0	0
369	74.44	244.2	23	8	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
370	74.53	244.5	47	12	0	0
371	74.60	244.8	64	2	0	0
372	74.68	245.0	43	4	0	0
373	74.74	245.2	30	6	0	0
374	74.79	245.4	294	13	0	0
375	74.85	245.6	216	22	0	0
376	75.03	246.2	213	53	0	0
377	75.22	246.8	265	1	0	0
378	75.37	247.3	95	19	0	0
379	75.48	247.6	180	7	0	0
380	75.70	248.4	321	33	0	0
381	75.84	248.8	94	17	0	0
382	75.96	249.2	173	4	0	1
383	76.31	250.4	334	1	0	0
384	76.37	250.6	178	2	0	0
385	76.44	250.8	342	11	0	0
386	76.47	250.9	359	1	0	0
387	76.52	251.1	286	13	0	0
388	76.55	251.1	138	6	0	0
389	76.68	251.6	76	9	0	0
390	76.75	251.8	7	2	0	0
391	76.79	251.9	29	4	0	0
392	76.86	252.2	75	4	0	0
393	77.02	252.7	191	6	0	0
394	77.11	253.0	187	23	0	0
395	77.12	253.0	333	3	0	0
396	77.31	253.7	223	9	0	0
397	77.36	253.8	221	6	0	0
398	77.39	253.9	185	5	0	0
399	77.48	254.2	33	7	0	0
400	77.51	254.3	169	6	0	0
401	77.73	255.0	324	1	0	0
402	77.77	255.2	51	5	0	0
403	77.79	255.2	212	2	0	0
404	77.81	255.3	305	5	0	0
405	78.15	256.4	238	14	0	0
406	78.20	256.6	31	3	0	0
407	78.47	257.5	357	1	0	0
408	78.52	257.6	35	10	0	0
409	78.60	257.9	15	4	0	0
410	78.64	258.0	190	5	0	0

All directions are with respect to magnetic north.



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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
411	78.68	258.2	252	4	0	0
412	78.71	258.2	217	4	0	0
413	78.75	258.4	214	3	0	0
414	78.89	258.8	66	7	0	0
415	78.95	259.0	20	21	0	0
416	78.97	259.1	200	49	0	0
417	79.00	259.2	18	3	0	0
418	79.08	259.5	15	5	0	0
419	79.11	259.6	191	37	0	0
420	79.12	259.6	18	5	0	0
421	79.33	260.3	322	23	0	0
422	79.42	260.6	61	5	0	0
423	79.57	261.1	359	36	0	0
424	79.61	261.2	214	4	0	0
425	79.64	261.3	206	4	0	0
426	79.71	261.5	297	7	0	0
427	79.71	261.5	96	13	0	0
428	79.83	261.9	90	16	0	0
429	80.03	262.6	17	7	0	0
430	80.07	262.7	189	7	0	0
431	80.14	262.9	182	6	0	0
432	80.22	263.2	169	4	0	0
433	80.39	263.8	214	70	0	0
434	80.44	263.9	27	6	0	0
435	80.69	264.7	195	6	0	0
436	80.83	265.2	23	6	0	0
437	80.86	265.3	342	6	0	0
438	81.06	266.0	22	9	0	0
439	81.18	266.4	186	6	0	0
440	81.22	266.5	169	1	0	0
441	81.24	266.6	6	2	0	0
442	81.60	267.7	35	5	0	0
443	81.63	267.8	180	6	0	0
444	81.70	268.1	60	3	0	0
445	81.80	268.4	173	2	0	0
446	82.13	269.5	62	9	0	0
447	82.37	270.3	131	19	0	0
448	82.49	270.6	192	3	0	0
449	82.57	270.9	34	7	0	0
450	84.05	275.8	353	5	0	0
451	84.10	275.9	3	4	0	0

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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
452	84.18	276.2	157	3	0	0
453	84.30	276.6	179	9	0	0
454	84.47	277.1	6	10	0	0
455	84.52	277.3	187	3	0	0
456	84.55	277.4	185	4	0	0
457	84.57	277.5	165	6	0	0
458	84.83	278.3	338	18	0	0
459	84.86	278.4	76	9	0	0
460	84.91	278.6	201	4	0	0
461	84.94	278.7	213	36	0	0
462	84.96	278.7	42	22	0	0
463	85.16	279.4	24	8	0	0
464	85.19	279.5	336	9	0	0
465	85.54	280.7	208	7	0	0
466	85.62	280.9	49	12	0	0
467	85.69	281.1	83	27	0	0
468	85.87	281.7	336	5	0	0
469	85.95	282.0	331	3	0	0
470	86.27	283.0	308	12	0	0
471	86.56	284.0	189	7	0	0
472	86.67	284.3	352	7	0	0
473	86.72	284.5	140	7	0	0
474	86.83	284.9	213	19	0	0
475	86.85	285.0	111	29	0	0
476	87.11	285.8	28	5	0	0
477	87.41	286.8	206	27	0	0
478	87.48	287.0	336	7	0	0
479	87.53	287.2	166	8	0	0
480	87.58	287.3	63	5	0	0
481	87.61	287.5	149	1	0	0
482	87.64	287.5	167	2	0	0
483	87.75	287.9	217	6	0	0
484	87.83	288.2	160	3	0	0
485	87.87	288.3	243	6	0	0
486	87.93	288.5	288	9	0	0
487	88.12	289.1	177	4	0	0
488	88.29	289.7	156	5	0	0
489	88.43	290.1	332	14	0	0
490	88.61	290.7	256	6	0	0
491	88.66	290.9	289	16	0	0
492	88.71	291.0	273	5	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
493	88.74	291.1	173	11	0	0
494	88.82	291.4	260	14	0	0
495	88.96	291.9	284	13	0	0
496	89.03	292.1	283	13	0	0
497	89.04	292.1	284	26	0	0
498	89.11	292.4	99	44	0	0
499	89.17	292.6	79	31	0	0
500	89.42	293.4	113	23	0	0
501	89.50	293.6	178	15	0	2
502	89.59	293.9	190	8	0	2
503	89.64	294.1	197	7	0	1
504	89.75	294.5	217	25	0	0
505	89.77	294.5	223	17	0	1
506	89.79	294.6	247	7	0	1
507	89.80	294.6	188	9	0	2
508	89.87	294.8	180	3	0	1
509	89.89	294.9	200	7	0	1
510	90.07	295.5	114	14	0	0
511	90.10	295.6	151	19	0	1
512	90.54	297.1	185	19	0	1
513	90.55	297.1	47	8	0	1
514	90.70	297.6	161	7	0	0
515	90.74	297.7	39	5	0	0
516	90.77	297.8	18	6	0	0
517	90.79	297.9	172	3	0	0
518	90.84	298.0	165	3	0	0
519	90.91	298.3	45	6	0	0
520	90.99	298.5	47	13	0	0
521	91.07	298.8	287	5	0	0
522	91.18	299.1	309	12	0	0
523	91.28	299.5	229	14	0	0
524	91.33	299.6	223	24	0	0
525	91.41	299.9	196	14	0	0
526	91.43	300.0	210	18	0	0
527	91.47	300.1	226	10	0	0
528	91.49	300.2	292	10	0	0
529	91.62	300.6	232	10	0	0
530	91.64	300.7	180	6	0	0
531	91.64	300.7	16	68	0	0
532	91.67	300.8	175	9	0	0
533	91.68	300.8	157	27	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
534	91.69	300.8	176	9	0	0
535	91.77	301.1	230	46	0	0
536	91.79	301.2	223	1	0	0
537	91.84	301.3	203	22	0	0
538	92.04	302.0	219	7	0	0
539	92.06	302.1	231	4	0	0
540	92.10	302.2	234	8	0	0
541	92.15	302.3	257	11	0	0
542	92.18	302.4	247	12	0	0
543	92.29	302.8	286	12	0	0
544	92.37	303.1	290	10	0	0
545	92.44	303.3	211	4	0	0
546	92.50	303.5	211	4	0	0
547	92.52	303.5	217	3	0	0
548	92.57	303.7	186	6	0	0
549	92.66	304.0	200	6	0	0
550	92.69	304.1	196	11	0	0
551	92.76	304.3	173	8	0	0
552	92.92	304.8	188	11	0	0
553	92.97	305.0	196	7	0	0
554	93.03	305.2	195	11	0	0
555	93.12	305.5	193	11	0	0
556	93.18	305.7	205	5	0	0
557	93.24	305.9	164	12	0	0
558	93.34	306.2	169	2	0	0
559	93.42	306.5	182	7	0	0
560	93.50	306.8	111	10	0	0
561	93.60	307.1	311	53	0	0
562	93.70	307.4	103	28	0	0
563	93.84	307.9	154	6	0	1
564	93.93	308.2	136	39	0	0
565	93.95	308.2	116	45	0	1
566	94.10	308.7	63	66	0	0
567	94.24	309.2	71	45	0	0
568	94.41	309.7	37	19	0	0
569	94.53	310.2	240	6	0	0
570	94.60	310.4	210	7	0	0
571	94.64	310.5	250	7	0	0
572	94.72	310.8	70	23	0	0
573	94.84	311.1	143	6	0	0
574	94.89	311.3	81	7	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
575	95.07	311.9	298	21	0	0
576	95.09	312.0	358	6	0	0
577	95.13	312.1	342	14	0	0
578	95.22	312.4	141	22	0	0
579	95.23	312.5	40	8	0	0
580	95.28	312.6	54	12	0	0
581	95.34	312.8	31	8	0	0
582	95.37	312.9	40	8	0	0
583	95.39	313.0	38	8	0	0
584	95.57	313.6	186	9	0	0
585	95.87	314.5	178	9	0	0
586	95.90	314.6	104	11	0	0
587	96.27	315.8	49	8	0	0
588	96.42	316.3	60	19	0	0
589	96.48	316.5	210	6	0	0
590	96.55	316.8	48	9	0	0
591	96.58	316.9	66	27	0	0
592	96.90	317.9	130	8	0	0
593	96.92	318.0	207	63	0	0
594	97.21	318.9	178	3	0	0
595	97.25	319.1	236	2	0	0
596	97.32	319.3	28	6	0	0
597	97.34	319.4	28	6	0	0
598	97.39	319.5	224	4	0	0
599	97.43	319.7	180	6	0	0
600	97.46	319.7	212	13	0	0
601	97.51	319.9	167	9	0	0
602	97.57	320.1	262	41	0	0
603	97.58	320.1	247	21	0	0
604	97.60	320.2	280	14	0	0
605	97.70	320.5	260	10	0	0
606	97.90	321.2	332	5	0	0
607	97.92	321.3	299	3	0	0
608	97.96	321.4	274	3	0	0
609	98.04	321.7	153	2	0	0
610	98.10	321.9	161	2	0	0
611	98.42	322.9	6	6	0	0
612	98.78	324.1	329	13	0	0
613	98.97	324.7	281	42	0	0
614	99.06	325.0	302	14	0	0
615	99.24	325.6	307	2	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
616	99.28	325.7	311	14	0	0
617	99.34	325.9	244	9	0	0
618	99.38	326.1	272	4	0	0
619	99.42	326.2	131	18	0	0
620	99.49	326.4	20	6	0	0
621	99.53	326.5	28	7	0	0
622	99.56	326.7	41	5	0	0
623	99.71	327.1	308	12	0	0
624	99.76	327.3	199	7	0	0
625	99.95	327.9	214	19	0	0
626	99.97	328.0	78	35	0	0
627	100.08	328.3	121	18	0	0
628	100.08	328.4	358	20	0	0
629	100.11	328.5	321	25	0	0
630	100.21	328.8	146	11	0	0
631	100.43	329.5	113	10	0	0
632	100.64	330.2	103	27	0	0
633	100.72	330.5	98	18	0	0
634	100.80	330.7	93	14	0	0
635	100.87	330.9	110	15	0	0
636	101.19	332.0	256	55	0	0
637	101.32	332.4	263	15	0	0
638	101.42	332.7	112	24	0	0
639	101.46	332.9	64	13	0	0
640	101.51	333.0	101	24	0	0
641	101.57	333.2	293	14	0	0
642	101.75	333.8	196	4	0	0
643	101.77	333.9	166	3	0	0
644	101.84	334.1	149	13	0	0
645	101.91	334.3	184	8	0	1
646	102.31	335.7	76	9	0	0
647	102.58	336.5	344	8	0	0
648	102.65	336.8	31	10	0	0
649	102.69	336.9	51	4	0	0
650	103.54	339.7	18	26	0	0
651	103.57	339.8	160	3	0	0
652	103.65	340.1	25	6	0	0
653	103.71	340.2	290	7	0	0
654	103.77	340.4	174	15	0	0
655	103.80	340.6	278	43	0	1
656	103.88	340.8	30	8	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
657	103.98	341.1	350	31	0	0
658	104.11	341.6	18	10	0	0
659	104.21	341.9	43	13	0	0
660	104.24	342.0	62	7	0	0
661	104.27	342.1	90	4	0	0
662	104.28	342.1	181	1	0	0
663	104.33	342.3	286	21	0	0
664	104.34	342.3	139	34	0	0
665	104.46	342.7	105	25	0	0
666	104.47	342.8	106	8	0	0
667	104.53	343.0	109	22	0	0
668	104.57	343.1	130	21	0	0
669	104.57	343.1	284	29	0	0
670	104.64	343.3	316	11	0	0
671	104.82	343.9	47	10	0	0
672	104.85	344.0	263	22	0	0
673	104.90	344.2	23	5	0	0
674	104.94	344.3	309	7	0	0
675	104.98	344.4	26	12	0	0
676	105.00	344.5	15	4	0	0
677	105.18	345.1	281	21	0	0
678	105.26	345.3	19	4	0	0
679	105.38	345.7	31	5	0	0
680	105.45	346.0	66	3	0	0
681	105.46	346.0	113	16	0	0
682	105.52	346.2	141	7	0	0
683	105.55	346.3	126	8	0	0
684	105.65	346.6	27	7	0	0
685	105.67	346.7	86	3	0	0
686	105.69	346.8	98	5	0	0
687	105.71	346.8	338	5	0	0
688	105.72	346.8	124	14	0	0
689	105.76	347.0	113	1	0	0
690	105.78	347.0	231	3	0	0
691	106.00	347.8	69	4	0	0
692	106.05	347.9	321	29	0	0
693	106.08	348.0	87	11	0	0
694	106.20	348.4	7	14	0	0
695	106.21	348.5	325	18	0	0
696	106.25	348.6	327	43	0	0
697	106.43	349.2	318	8	0	0

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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
698	106.44	349.2	100	23	0	1
699	106.54	349.5	35	16	0	0
700	106.56	349.6	359	15	0	0
701	106.69	350.0	73	26	0	0
702	106.74	350.2	172	30	0	0
703	106.75	350.2	55	22	0	0
704	106.85	350.6	268	18	0	1
705	106.85	350.6	88	15	0	1
706	106.95	350.9	221	18	0	0
707	107.16	351.6	141	8	0	0
708	107.31	352.1	20	13	0	0
709	107.34	352.2	20	7	0	0
710	107.37	352.3	339	6	0	0
711	107.45	352.5	254	4	0	0
712	107.75	353.5	65	53	0	0
713	107.80	353.7	232	30	0	0
714	108.05	354.5	80	7	0	0
715	108.07	354.6	58	22	0	0
716	108.09	354.6	78	15	0	0
717	108.13	354.8	86	16	0	0
718	108.23	355.1	257	26	0	0
719	108.35	355.5	98	21	0	0
720	108.51	356.0	134	10	0	0
721	108.74	356.8	166	11	0	0
722	108.78	356.9	233	24	0	0
723	108.82	357.0	199	16	0	0
724	108.85	357.1	177	10	0	0
725	108.87	357.2	163	14	0	0
726	108.89	357.3	161	8	0	0
727	108.94	357.4	178	5	0	0
728	108.95	357.5	234	15	0	0
729	109.00	357.6	196	8	0	0
730	109.06	357.8	173	8	0	0
731	109.08	357.9	222	7	0	0
732	109.10	358.0	227	8	0	0
733	109.16	358.1	207	9	0	0
734	109.36	358.8	56	36	0	0
735	109.37	358.8	230	23	0	0
736	109.38	358.9	219	25	0	0
737	109.53	359.4	269	20	0	0
738	109.55	359.4	113	40	0	0

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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
739	109.65	359.8	18	4	0	0
740	109.70	359.9	51	19	0	0
741	109.73	360.0	42	20	0	0
742	109.73	360.0	119	10	0	0
743	109.90	360.6	2	6	0	0
744	109.91	360.6	319	5	0	0
745	109.93	360.7	313	4	0	0
746	109.96	360.8	12	3	0	0
747	110.18	361.5	8	26	0	0
748	110.54	362.7	32	10	0	0
749	110.59	362.8	90	8	0	0
750	110.60	362.9	145	12	0	0
751	110.65	363.0	102	24	0	1
752	110.67	363.1	4	15	0	1
753	110.70	363.2	254	27	0	0
754	110.82	363.6	41	4	0	0
755	110.82	363.6	132	20	0	0
756	110.90	363.8	106	27	0	0
757	110.90	363.9	76	2	0	0
758	110.97	364.1	64	10	0	0
759	111.03	364.3	84	4	0	0
760	111.08	364.5	84	9	0	0
761	111.13	364.6	105	12	0	0
762	111.15	364.7	106	13	0	0
763	111.18	364.8	82	13	0	0
764	111.21	364.9	101	28	0	0
765	111.26	365.0	62	33	0	0
766	111.31	365.2	39	9	0	0
767	111.49	365.8	26	14	0	0
768	111.61	366.2	105	7	0	0
769	111.78	366.7	280	17	0	0
770	111.84	366.9	176	13	0	0
771	111.86	367.0	150	17	0	0
772	111.97	367.4	29	18	0	0
773	112.05	367.6	103	12	0	0
774	112.11	367.8	67	17	0	0
775	112.31	368.5	87	21	0	0
776	112.35	368.6	75	13	0	1
777	112.38	368.7	81	12	0	0
778	112.41	368.8	97	58	0	0
779	112.48	369.0	93	49	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
780	112.77	370.0	232	22	0	0
781	112.82	370.2	269	12	0	0
782	112.83	370.2	144	14	0	0
783	112.87	370.3	239	18	0	0
784	112.92	370.5	91	45	0	0
785	112.92	370.5	322	50	0	0
786	112.93	370.5	203	8	0	0
787	113.13	371.2	224	15	0	0
788	113.21	371.4	350	9	0	0
789	113.25	371.5	22	14	0	0
790	113.26	371.6	129	6	0	0
791	113.32	371.8	115	10	0	0
792	113.43	372.2	11	11	0	0
793	113.46	372.2	206	26	0	0
794	113.50	372.4	13	5	0	0
795	113.53	372.5	341	5	0	0
796	113.60	372.7	319	4	0	0
797	113.66	372.9	94	8	0	0
798	113.69	373.0	129	10	0	0
799	113.71	373.1	123	12	0	0
800	113.77	373.3	104	10	0	0
801	113.81	373.4	70	5	0	0
802	113.88	373.6	342	7	0	0
803	113.90	373.7	15	7	0	0
804	113.92	373.7	53	7	0	0
805	113.97	373.9	99	11	0	0
806	114.51	375.7	27	9	0	0
807	114.68	376.2	55	12	0	1
808	114.72	376.4	20	14	0	0
809	114.75	376.5	33	15	0	0
810	114.85	376.8	21	32	0	0
811	114.88	376.9	21	28	0	0
812	114.93	377.1	28	58	0	0
813	114.93	377.1	47	23	0	1
814	114.95	377.1	53	56	0	0
815	114.97	377.2	36	17	0	0
816	115.05	377.5	47	46	0	0
817	115.12	377.7	18	21	0	0
818	115.16	377.8	25	12	0	0
819	115.58	379.2	206	7	0	0
820	115.71	379.6	176	2	0	0

All directions are with respect to magnetic north.



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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
821	115.99	380.6	3	45	0	0
822	116.07	380.8	32	14	0	0
823	116.10	380.9	23	12	0	0
824	116.24	381.4	40	7	0	0
825	116.28	381.5	1	11	0	0
826	116.30	381.6	98	8	0	0
827	116.38	381.8	86	7	0	0
828	116.55	382.4	47	11	0	0
829	116.88	383.5	346	23	0	0
830	117.03	384.0	66	5	0	0
831	117.05	384.0	279	7	0	0
832	117.13	384.3	174	4	0	0
833	117.15	384.4	231	10	0	1
834	117.50	385.5	10	2	0	0
835	117.55	385.7	0	3	0	0
836	117.61	385.9	15	2	0	0
837	117.73	386.3	28	5	0	0
838	117.78	386.4	61	7	0	0
839	117.81	386.5	39	11	0	0
840	117.84	386.6	140	5	0	0
841	117.86	386.7	138	8	0	0
842	118.33	388.2	253	31	0	0
843	118.34	388.2	89	39	0	0
844	118.38	388.4	220	16	0	0
845	118.40	388.5	187	4	0	0
846	118.61	389.1	356	19	0	0
847	118.72	389.5	224	0	0	0
848	118.74	389.6	22	2	0	0
849	118.76	389.6	163	1	0	0
850	118.83	389.9	41	1	0	0
851	118.88	390.0	43	1	0	0
852	118.93	390.2	349	8	0	0
853	118.94	390.2	356	27	0	0
854	118.99	390.4	31	3	0	0
855	119.04	390.6	10	7	0	0
856	119.09	390.7	22	6	0	0
857	119.12	390.8	29	3	0	0
858	119.12	390.8	251	7	0	0
859	119.13	390.8	33	6	0	0
860	119.15	390.9	15	8	0	0
861	119.18	391.0	75	1	0	0

All directions are with respect to magnetic north.



Orientation Summary Table
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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
862	119.26	391.3	36	6	0	0
863	119.28	391.3	306	3	0	0
864	119.30	391.4	341	6	0	0
865	119.38	391.7	72	12	0	0
866	119.42	391.8	207	18	0	0
867	119.43	391.8	34	21	0	0
868	119.44	391.9	170	17	0	0
869	119.47	392.0	110	18	0	0
870	119.50	392.1	113	23	0	0
871	119.50	392.1	317	4	0	0
872	119.58	392.3	256	16	0	0
873	119.59	392.3	291	47	0	0
874	119.63	392.5	169	8	0	0
875	119.71	392.8	123	8	0	0
876	119.86	393.2	30	21	0	0
877	120.30	394.7	136	3	0	0
878	120.32	394.8	111	6	0	0
879	120.35	394.9	21	6	0	0
880	120.37	394.9	303	7	0	0
881	120.41	395.1	179	5	0	0
882	120.48	395.3	98	11	0	0
883	120.48	395.3	254	11	0	0
884	120.51	395.4	48	3	0	0
885	120.53	395.4	121	9	0	0
886	120.61	395.7	182	3	0	0
887	120.63	395.8	185	14	0	0
888	120.65	395.8	136	38	0	0
889	120.70	396.0	137	12	0	0
890	120.81	396.4	31	5	0	0
891	120.88	396.6	329	40	0	0
892	120.96	396.8	144	50	0	0
893	121.03	397.1	131	15	0	0
894	121.05	397.1	300	36	0	0
895	121.16	397.5	354	21	0	0
896	121.43	398.4	347	3	0	0
897	121.48	398.6	260	3	0	0
898	121.57	398.9	197	18	0	0
899	121.60	399.0	239	14	0	0
900	121.62	399.0	216	19	0	0
901	121.66	399.2	315	4	0	0
902	121.78	399.5	27	2	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
903	121.97	400.2	164	4	0	0
904	122.09	400.6	48	3	0	0
905	122.13	400.7	267	3	0	0
906	122.24	401.1	28	8	0	0
907	122.54	402.1	237	6	0	0
908	122.58	402.2	169	2	0	0
909	122.75	402.7	249	6	0	0
910	122.82	402.9	355	9	0	0
911	122.89	403.2	199	14	0	0
912	122.89	403.2	59	14	0	0
913	122.94	403.4	205	6	0	0
914	122.99	403.5	336	6	0	0
915	123.01	403.6	248	7	0	0
916	123.02	403.6	233	25	0	0
917	123.09	403.9	250	18	0	0
918	123.15	404.1	29	10	0	0
919	123.21	404.2	25	2	0	0
920	123.26	404.4	151	1	0	0
921	123.30	404.5	158	7	0	0
922	123.33	404.6	137	7	0	0
923	123.35	404.7	156	2	0	0
924	123.39	404.8	179	6	0	0
925	123.41	404.9	253	11	0	0
926	123.43	405.0	239	13	0	0
927	123.46	405.0	28	5	0	0
928	123.48	405.1	238	1	0	0
929	123.51	405.2	248	7	0	0
930	123.57	405.4	173	6	0	0
931	123.57	405.4	214	17	0	0
932	123.62	405.6	228	18	0	0
933	123.63	405.6	180	11	0	0
934	123.75	406.0	216	9	0	0
935	123.98	406.8	15	14	0	0
936	124.06	407.0	132	4	0	0
937	124.10	407.2	141	3	0	0
938	124.14	407.3	240	16	0	0
939	124.21	407.5	195	9	0	0
940	124.25	407.7	252	9	0	0
941	124.37	408.0	146	4	0	0
942	124.41	408.2	27	5	0	0
943	124.47	408.4	179	10	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
944	124.49	408.4	193	5	0	0
945	124.52	408.5	26	4	0	0
946	124.57	408.7	21	4	0	0
947	124.62	408.9	39	5	0	0
948	124.64	408.9	206	10	0	0
949	124.66	409.0	326	7	0	0
950	124.71	409.2	290	7	0	0
951	124.71	409.2	107	15	0	0
952	124.78	409.4	174	6	0	0
953	124.87	409.7	86	4	0	0
954	124.91	409.8	168	2	0	0
955	124.95	409.9	91	1	0	0
956	125.03	410.2	27	11	0	0
957	125.04	410.2	122	9	0	0
958	125.10	410.4	266	15	0	0
959	125.24	410.9	142	3	0	0
960	125.42	411.5	160	5	0	0
961	125.55	411.9	127	20	0	0
962	125.61	412.1	154	37	0	0
963	125.61	412.1	193	9	0	0
964	125.64	412.2	156	37	0	0
965	125.64	412.2	61	27	0	0
966	125.68	412.3	200	31	0	0
967	125.88	413.0	127	4	0	0
968	125.93	413.1	176	4	0	0
969	125.94	413.2	147	5	0	0
970	125.98	413.3	174	5	0	0
971	126.03	413.5	138	3	0	0
972	126.07	413.6	142	3	0	0
973	126.13	413.8	78	9	0	0
974	126.19	414.0	63	7	0	0
975	126.25	414.2	206	22	0	0
976	126.44	414.8	106	4	0	0
977	126.48	415.0	94	12	0	0
978	126.64	415.5	28	10	0	0
979	126.67	415.6	212	11	0	0
980	126.79	416.0	199	16	0	1
981	126.82	416.1	294	38	0	0
982	126.85	416.2	0	10	0	0
983	126.89	416.3	70	6	0	0
984	127.04	416.8	161	14	0	2

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
985	127.20	417.3	138	12	0	0
986	127.21	417.4	84	14	0	0
987	127.24	417.4	348	24	0	0
988	127.28	417.6	186	21	0	0
989	127.50	418.3	162	5	0	1
990	127.54	418.4	266	13	0	1
991	127.69	418.9	134	20	53	3
992	128.00	419.9	156	22	0	1
993	128.05	420.1	228	20	0	0
994	128.10	420.3	220	41	0	1
995	128.17	420.5	344	9	0	1
996	128.27	420.8	286	24	0	0
997	128.33	421.0	283	23	0	0
998	128.37	421.2	269	25	0	3
999	128.52	421.6	65	13	0	0
1000	128.82	422.7	34	2	0	0
1001	128.92	423.0	244	48	0	1
1002	128.94	423.0	45	26	0	1
1003	128.96	423.1	118	14	0	1
1004	129.09	423.5	349	15	0	1
1005	129.65	425.4	286	9	0	0
1006	129.70	425.5	344	5	0	0
1007	129.74	425.6	137	14	0	0
1008	129.80	425.9	124	19	0	0
1009	129.94	426.3	203	13	0	0
1010	130.02	426.6	155	8	0	0
1011	130.65	428.7	93	5	0	0
1012	130.79	429.1	180	4	0	0
1013	130.98	429.7	180	16	0	0
1014	131.26	430.7	100	23	0	0
1015	131.30	430.8	284	7	0	0
1016	131.35	430.9	178	16	0	1
1017	131.45	431.3	206	29	0	1
1018	131.72	432.1	188	22	0	0
1019	131.87	432.6	185	32	0	0
1020	131.95	432.9	156	18	0	0
1021	132.00	433.1	180	21	0	0
1022	132.03	433.2	169	22	0	0
1023	132.09	433.4	157	28	0	0
1024	132.14	433.5	173	27	0	0
1025	132.23	433.8	185	52	0	1

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1026	132.29	434.0	179	55	0	1
1027	132.37	434.3	333	33	0	1
1028	132.46	434.6	359	47	0	1
1029	132.53	434.8	3	43	0	1
1030	132.55	434.9	8	33	0	0
1031	132.65	435.2	328	17	0	0
1032	132.78	435.6	275	21	0	1
1033	132.83	435.8	324	57	0	0
1034	132.91	436.1	7	60	0	1
1035	132.99	436.3	295	43	0	0
1036	133.19	437.0	92	10	0	1
1037	133.32	437.4	29	10	0	1
1038	133.57	438.2	337	59	0	0
1039	133.60	438.3	355	11	0	1
1040	133.67	438.6	333	32	0	0
1041	133.75	438.8	344	34	0	0
1042	133.80	439.0	351	31	0	0
1043	133.84	439.1	2	36	0	0
1044	133.95	439.5	1	35	0	0
1045	134.29	440.6	329	38	0	0
1046	134.35	440.8	338	22	0	2
1047	134.39	440.9	334	16	0	1
1048	134.58	441.5	341	9	0	1
1049	134.58	441.5	63	17	0	1
1050	134.69	441.9	286	11	0	0
1051	134.74	442.1	228	9	0	0
1052	134.81	442.3	171	23	0	0
1053	134.82	442.3	15	8	0	1
1054	135.05	443.1	333	11	0	0
1055	135.07	443.1	336	10	0	0
1056	135.18	443.5	347	10	0	0
1057	135.22	443.6	327	7	0	0
1058	135.33	444.0	279	8	0	0
1059	135.39	444.2	126	1	0	0
1060	135.57	444.8	27	2	0	0
1061	135.58	444.8	117	2	0	0
1062	135.64	445.0	129	8	0	0
1063	135.66	445.1	121	8	0	0
1064	135.69	445.2	110	8	0	0
1065	135.76	445.4	136	19	0	0
1066	135.78	445.5	176	17	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1067	135.78	445.5	341	24	0	0
1068	135.81	445.6	159	16	0	0
1069	135.86	445.7	55	3	0	0
1070	135.93	446.0	20	6	0	0
1071	135.94	446.0	297	54	0	0
1072	135.98	446.1	19	7	0	0
1073	136.07	446.4	144	6	0	0
1074	136.27	447.1	154	8	0	0
1075	136.33	447.3	118	26	0	0
1076	136.40	447.5	131	42	0	0
1077	136.43	447.6	223	16	0	0
1078	136.54	448.0	172	9	0	0
1079	136.55	448.0	173	10	0	0
1080	136.67	448.4	119	4	0	0
1081	136.74	448.6	72	18	0	0
1082	136.79	448.8	252	3	0	1
1083	137.00	449.5	134	12	0	0
1084	137.06	449.7	156	15	0	0
1085	137.11	449.8	145	5	0	0
1086	137.28	450.4	164	7	0	1
1087	137.35	450.6	144	12	0	1
1088	137.39	450.8	138	6	0	0
1089	137.46	451.0	245	29	0	0
1090	137.53	451.2	290	7	0	0
1091	137.56	451.3	297	2	0	0
1092	137.60	451.5	262	9	0	0
1093	137.65	451.6	40	18	0	0
1094	137.71	451.8	38	6	0	0
1095	137.85	452.3	211	24	0	0
1096	137.93	452.5	88	26	0	0
1097	137.94	452.6	22	18	0	0
1098	137.95	452.6	140	29	0	0
1099	137.99	452.7	276	10	0	0
1100	138.08	453.0	181	3	0	0
1101	138.11	453.1	163	3	0	0
1102	138.25	453.6	150	6	0	0
1103	138.33	453.8	186	3	0	0
1104	138.35	453.9	109	6	0	0
1105	138.50	454.4	112	12	0	0
1106	138.67	455.0	321	7	0	0
1107	138.73	455.2	307	9	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1108	138.74	455.2	97	4	0	0
1109	138.76	455.2	94	5	0	0
1110	138.84	455.5	165	4	0	0
1111	139.05	456.2	147	5	0	0
1112	139.15	456.5	310	12	0	0
1113	139.23	456.8	12	6	0	0
1114	139.28	456.9	358	18	0	0
1115	139.34	457.2	7	31	0	0
1116	139.40	457.4	321	11	0	0
1117	139.45	457.5	315	6	0	0
1118	139.46	457.6	307	4	0	0
1119	139.50	457.7	128	1	0	0
1120	139.57	457.9	181	17	0	0
1121	139.63	458.1	48	2	0	0
1122	139.67	458.2	153	2	0	0
1123	139.70	458.3	222	5	0	0
1124	139.74	458.5	305	16	0	0
1125	139.76	458.5	283	13	0	0
1126	139.80	458.7	239	5	0	0
1127	139.83	458.8	277	13	0	0
1128	139.87	458.9	273	4	0	0
1129	139.90	459.0	193	2	0	0
1130	139.94	459.1	305	13	0	0
1131	139.99	459.3	222	9	0	0
1132	140.04	459.4	297	4	0	0
1133	140.06	459.5	244	4	0	0
1134	140.07	459.6	207	26	0	0
1135	140.11	459.7	78	25	0	0
1136	140.11	459.7	333	29	0	0
1137	140.27	460.2	167	13	0	0
1138	140.34	460.4	198	8	0	0
1139	140.43	460.7	157	5	0	0
1140	140.57	461.2	181	6	0	0
1141	140.66	461.5	335	15	0	0
1142	140.69	461.6	121	6	0	0
1143	140.72	461.7	48	6	0	0
1144	140.76	461.8	121	3	0	0
1145	140.77	461.9	118	6	0	0
1146	140.80	461.9	243	3	0	0
1147	140.80	462.0	358	7	0	0
1148	140.83	462.0	89	2	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1149	140.89	462.2	11	22	0	0
1150	140.91	462.3	234	1	0	0
1151	140.92	462.3	137	3	0	0
1152	140.93	462.4	36	4	0	0
1153	140.95	462.4	138	1	0	0
1154	140.99	462.6	30	4	0	0
1155	141.03	462.7	107	4	0	0
1156	141.19	463.2	198	8	0	0
1157	141.21	463.3	201	7	0	0
1158	141.28	463.5	193	6	0	0
1159	141.31	463.6	223	11	0	0
1160	141.34	463.7	200	4	0	0
1161	141.38	463.8	289	7	0	0
1162	141.46	464.1	286	46	0	0
1163	141.52	464.3	290	48	0	0
1164	141.52	464.3	99	23	0	0
1165	141.55	464.4	152	15	0	0
1166	141.61	464.6	165	17	0	0
1167	141.65	464.7	143	8	0	0
1168	141.68	464.8	155	9	0	0
1169	141.75	465.1	172	9	0	0
1170	141.76	465.1	174	16	0	0
1171	141.83	465.3	192	6	0	0
1172	141.84	465.4	221	10	0	0
1173	141.89	465.5	273	1	0	0
1174	141.95	465.7	152	10	0	0
1175	142.03	466.0	213	19	0	0
1176	142.05	466.0	11	13	0	0
1177	142.09	466.2	313	15	0	0
1178	142.09	466.2	118	13	0	0
1179	142.18	466.5	110	5	0	0
1180	142.49	467.5	123	4	0	0
1181	142.53	467.6	279	2	0	0
1182	142.55	467.7	161	2	0	0
1183	142.62	467.9	241	9	0	0
1184	142.69	468.1	270	23	0	0
1185	142.79	468.5	240	45	0	0
1186	142.82	468.6	306	50	0	1
1187	142.88	468.8	82	16	0	1
1188	142.91	468.9	71	55	0	1
1189	143.04	469.3	131	52	0	0

All directions are with respect to magnetic north.



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Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1190	143.05	469.3	94	22	0	0
1191	143.07	469.4	250	54	0	0
1192	143.14	469.6	283	6	0	0
1193	143.26	470.0	292	6	0	1
1194	143.29	470.1	105	22	0	1
1195	143.30	470.1	296	19	0	1
1196	143.45	470.6	110	1	0	0
1197	143.70	471.5	70	39	0	0
1198	143.79	471.7	24	8	0	0
1199	143.83	471.9	56	41	0	1
1200	143.88	472.1	239	32	0	1
1201	143.93	472.2	272	15	0	1
1202	143.97	472.4	38	43	0	1
1203	143.98	472.4	237	27	0	1
1204	144.01	472.5	54	66	0	1
1205	144.16	473.0	95	44	0	1
1206	144.25	473.3	303	12	0	0
1207	144.37	473.7	161	2	0	1
1208	144.45	473.9	36	57	0	1
1209	144.47	474.0	284	26	0	1
1210	144.49	474.0	38	28	0	1
1211	144.67	474.7	115	2	0	0
1212	144.88	475.3	248	7	0	0
1213	144.94	475.5	349	9	0	0
1214	145.10	476.0	313	33	0	1
1215	145.14	476.2	112	31	0	0
1216	145.34	476.8	301	8	0	2
1217	145.55	477.5	16	31	0	0
1218	145.60	477.7	275	36	0	1
1219	145.62	477.7	46	52	0	1
1220	145.74	478.2	136	37	0	0
1221	145.78	478.3	118	44	0	0
1222	145.85	478.5	286	39	0	0
1223	146.01	479.0	326	58	0	0
1224	146.02	479.1	260	38	0	0
1225	146.14	479.5	316	34	0	0
1226	146.17	479.6	200	31	0	0
1227	146.34	480.1	246	25	0	1
1228	146.57	480.9	59	36	0	1
1229	146.71	481.3	141	39	0	1
1230	146.80	481.6	134	47	0	1

All directions are with respect to magnetic north.



Orientation Summary Table
TelevIEWER Image Features
Arcadis
Deep Well Program
DMW-3
17 January 2024

Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1231	146.88	481.9	159	35	0	0
1232	147.39	483.6	159	63	0	1
1233	147.44	483.7	142	59	0	1
1234	147.48	483.9	38	64	0	1
1235	147.61	484.3	6	23	0	1
1236	147.63	484.4	328	60	0	1
1237	147.65	484.4	161	13	0	0
1238	147.85	485.1	200	38	0	0
1239	148.00	485.6	160	55	0	0
1240	148.03	485.7	254	41	0	0
1241	148.11	485.9	179	4	0	0
1242	148.15	486.1	182	4	0	0
1243	148.25	486.4	322	19	0	0
1244	148.29	486.5	343	18	0	0
1245	148.61	487.6	221	53	0	0
1246	148.61	487.6	204	30	0	0
1247	148.78	488.1	261	61	0	0
1248	149.05	489.0	304	6	0	0
1249	149.13	489.3	64	17	0	0
1250	149.15	489.4	59	20	0	0
1251	149.36	490.0	14	63	0	0
1252	149.37	490.1	27	34	0	0
1253	149.37	490.1	133	36	0	0
1254	149.94	491.9	268	30	532	4
1255	150.50	493.8	164	11	314	4
1256	150.77	494.7	243	10	50	3
1257	150.85	494.9	35	45	0	1
1258	150.98	495.4	12	5	0	0
1259	151.00	495.4	44	7	0	0
1260	151.04	495.5	338	12	0	0
1261	151.24	496.2	286	30	0	0
1262	151.25	496.2	126	1	0	0
1263	151.44	496.9	132	14	0	1
1264	151.54	497.2	183	46	0	1
1265	151.56	497.2	339	19	0	1
1266	151.63	497.5	316	66	0	1
1267	151.63	497.5	325	6	0	1
1268	151.67	497.6	188	4	0	1
1269	151.81	498.1	219	10	0	1
1270	151.97	498.6	103	30	0	1
1271	152.26	499.5	44	15	482	4

All directions are with respect to magnetic north.



Orientation Summary Table
 Televiewer Image Features
 Arcadis
 Deep Well Program
 DMW-3
 17 January 2024

Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1272	152.58	500.6	305	48	0	0
1273	152.63	500.8	175	36	0	0
1274	152.83	501.4	7	32	0	1
1275	152.85	501.5	147	35	0	1
1276	152.92	501.7	37	41	0	1
1277	152.95	501.8	30	31	0	1
1278	152.97	501.9	167	52	0	1
1279	153.09	502.3	21	46	0	1
1280	153.30	503.0	107	33	0	0
1281	153.31	503.0	123	14	0	0
1282	153.41	503.3	169	33	0	0
1283	153.48	503.5	183	34	0	1
1284	153.53	503.7	156	30	0	0
1285	153.54	503.8	318	35	0	0
1286	153.69	504.2	242	6	0	1
1287	153.77	504.5	122	34	0	1
1288	153.84	504.7	80	24	0	1
1289	153.87	504.8	177	32	0	1
1290	154.06	505.4	119	37	0	0
1291	154.18	505.8	22	28	0	0
1292	154.31	506.3	38	52	0	0
1293	154.32	506.3	12	40	0	0
1294	154.42	506.6	329	4	0	0
1295	154.46	506.8	24	11	0	0
1296	154.61	507.2	348	2	0	0
1297	154.67	507.5	150	15	0	0
1298	154.67	507.5	341	19	0	0
1299	154.78	507.8	35	8	0	0
1300	154.94	508.3	270	46	0	1
1301	155.09	508.8	334	9	0	1
1302	155.16	509.0	316	13	0	0
1303	155.17	509.1	9	46	0	0
1304	155.21	509.2	281	12	0	0
1305	155.23	509.3	53	62	0	0
1306	155.24	509.3	81	18	0	0
1307	155.30	509.5	66	7	0	1
1308	155.53	510.3	333	25	0	0
1309	155.73	510.9	342	14	306	4
1310	155.94	511.6	173	17	0	0
1311	155.95	511.7	354	22	0	1
1312	155.98	511.8	10	33	0	1

All directions are with respect to magnetic north.



Orientation Summary Table
Televiewer Image Features
Arcadis
Deep Well Program
DMW-3
17 January 2024

Table DMW-3:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1313	156.13	512.2	76	62	0	1
1314	156.14	512.3	342	63	0	1
1315	156.19	512.4	194	22	0	1
1316	156.25	512.6	204	56	0	1
1317	156.36	513.0	35	71	0	1
1318	156.39	513.1	29	63	0	1
1319	156.49	513.4	24	42	0	1
1320	156.51	513.5	172	22	0	1

All directions are with respect to magnetic north.

Table DMW-03:2. Summary of Corehole Dynamic Flowmeter Test-Station Results Under Ambient Conditions; Arcadis; Deep Well Program; Marinette, WI; Wellbore: DMW-03

DMW-03					
Depth (feet)	Flow in Borehole During Ambient Testing (GPM)	Ambient Flow Direction in Borehole	Flow in Borehole During Pumping (GPM)	% of Total Extraction Flow	Comments
150.0	0.00		NA	NA	Test conducted inside casing. No flow identified, as expected.
182.0	0.00		NA	NA	No flow observed under ambient conditions.
207.0	0.00		NA	NA	No flow observed under ambient conditions.
243.0	0.00		NA	NA	No flow observed under ambient conditions.
262.0	0.00		NA	NA	No flow observed under ambient conditions at 262.0 feet, indicating 0.01 gpm of ambient upflow from below this test depth exits the borehole under ambient conditions between 262.0 - 285.0 feet.
285.0	0.01	↑	NA	NA	No change in flow is observed under ambient conditions between 304.5 - 374.0 feet.
313.0	0.01	↑	NA	NA	No change in flow is observed under ambient conditions between 313.0 - 336.0 feet.
336.0	0.01	↑	NA	NA	No change in flow is observed under ambient conditions between 336.0 - 364.0 feet.
364.0	0.01	↑	NA	NA	No change in flow is observed under ambient conditions between 364.0 - 381.0 feet.
381.0	0.01	↑	NA	NA	0.03 gpm exits the borehole between 381.0 - 424.0 feet.

Table DMW-03:2. Summary of Corehole Dynamic Flowmeter Test-Station Results Under Ambient Conditions; Arcadis; Deep Well Program; Marinette, WI; Wellbore: DMW-03

424.0	0.04	↑	NA	NA	No change in flow observed under ambient conditions between 424.0 - 436.5 feet.
436.5	0.04	↑	NA	NA	0.03 gpm enters the borehole under ambient conditions between 436.5 - 444.5 feet and migrates up the borehole.
444.5	0.01	↑	NA	NA	No change in flow observed under ambient conditions between 444.5 - 452.0 feet.
452.0	0.01	↑	NA	NA	No change in flow observed under ambient conditions.
472.5	0.01	↑	NA	NA	No change in flow observed under ambient conditions.
484.0	0.01	↑	NA	NA	0.01 gpm enters the borehole under ambient conditions between 484.0 - 494.0 feet and migrates up the borehole.
494.0	0.00		NA	NA	No flow observed under ambient conditions.
507.0	0.00		NA	NA	No flow observed under ambient conditions.

Ambient WL (ftbgs) 2.00
 Bottom of casing (ftbgs) 177.3
 Total Depth (TD) (ftbgs) 514
 Avg. Extraction Rate (gpm) NA
 Observed Drawdown (ft) NA
 Specific Capacity (gpm/ft-dd) NA

Note: Negative flow is downflow in the borehole. Positive flow is upflow in the borehole.
 Additional note: Testing conducted under ambient conditions only.

Table DMW-03:3. Summary Of Corehole Dynamic Flowmeter Results With Hydraulic Conductivity And Transmissivity Estimations; Arcadis; Deep Well Program; Marinette, WI; Wellbore: DMW-03

Well Name	DMW-03
Ambient Depth to Water (ftbtoc)	NA
Ambient Depth to Water (ftbgs)	2.00
Open Borehole Interval (ftbgs)	177.3 - 514.0

Diameter of Wellbore (ft)	0.50
Drawdown (ft)	NA
Effective Radius (ft)	NA

Corehole Dynamic Flowmeter Results: DMW-03									
Interval No.	Top of Interval (ft)	Bottom of Interval (ft)	Length of Interval (ft)	Ambient Flow (gpm)	Darcy Velocity in Aquifer (ft/day)	Interval-Specific Flow Rate During Pumping (gpm)	Interval-Specific Hydraulic Conductivity ¹ (ft/day)	Transmissivity (ft ² /day)	Comments
1	262.0	285.0	23.0	-0.01	NA	NA	NA	NA	
2	381.0	424.0	43.0	-0.03	NA	NA	NA	NA	
3	436.5	444.5	8.0	0.03	NA	NA	NA	NA	
4	484.0	494.0	10.0	0.01	NA	NA	NA	NA	
Borehole Transmissivity Using Thiem Equation								NA	
Borehole Hydraulic Conductivity (K=T/b; b=length of borehole) Using Thiem Equation							NA		

Note: Negative flow, if any, is outflow from the borehole to the aquifer, positive flow is inflow to the borehole.

¹ No hydraulic conductivity and transmissivity estimates are made due to testing under only one pressure conditions (ambient).

² Darcy Velocity, or Specific Discharge in aquifer, is calculated using the observed volumetric flow rate, the cross-sectional area of the flow interval in the wellbore and a wellbore convergence factor of 2.5 (Drost, 1968). The Darcy Velocity is only applicable to ambient horizontal flow.

All depths reported herein are referenced to ground surface.

NA = Not Applicable



borehole geophysics / hydrophysics

Electric Log

COMPANY: Arcadis

PROJECT: Deep Well Program

DATE LOGGED: 18 January 2024

WELL: DMW-4

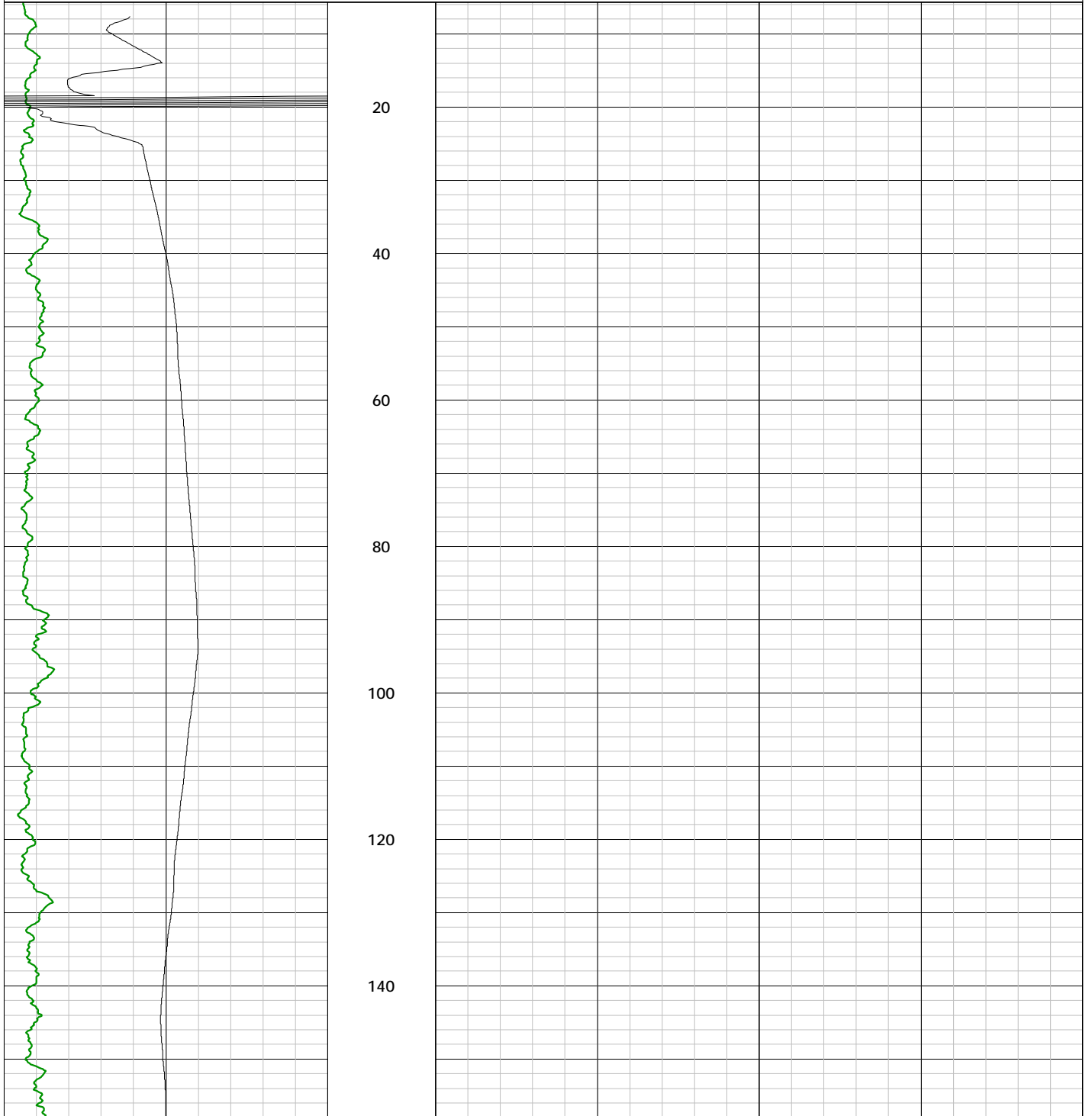
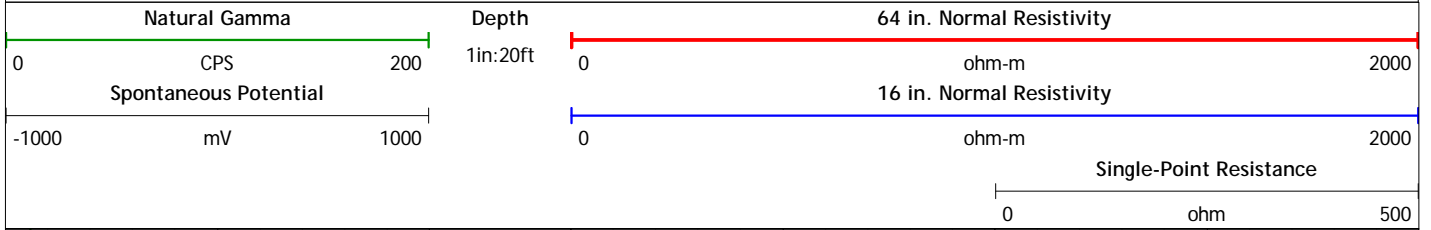
833 Hogback Drive

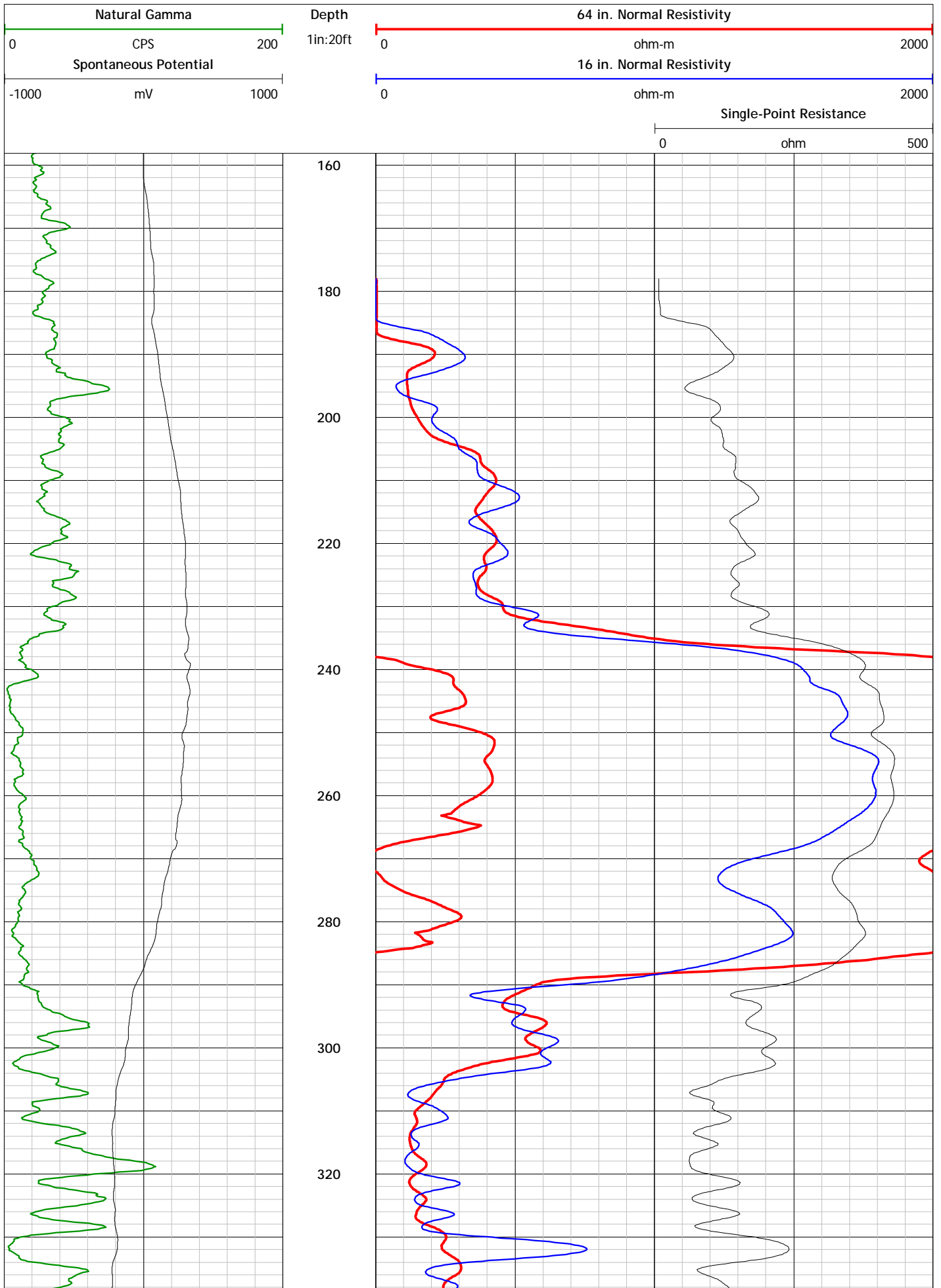
Golden, CO 80403

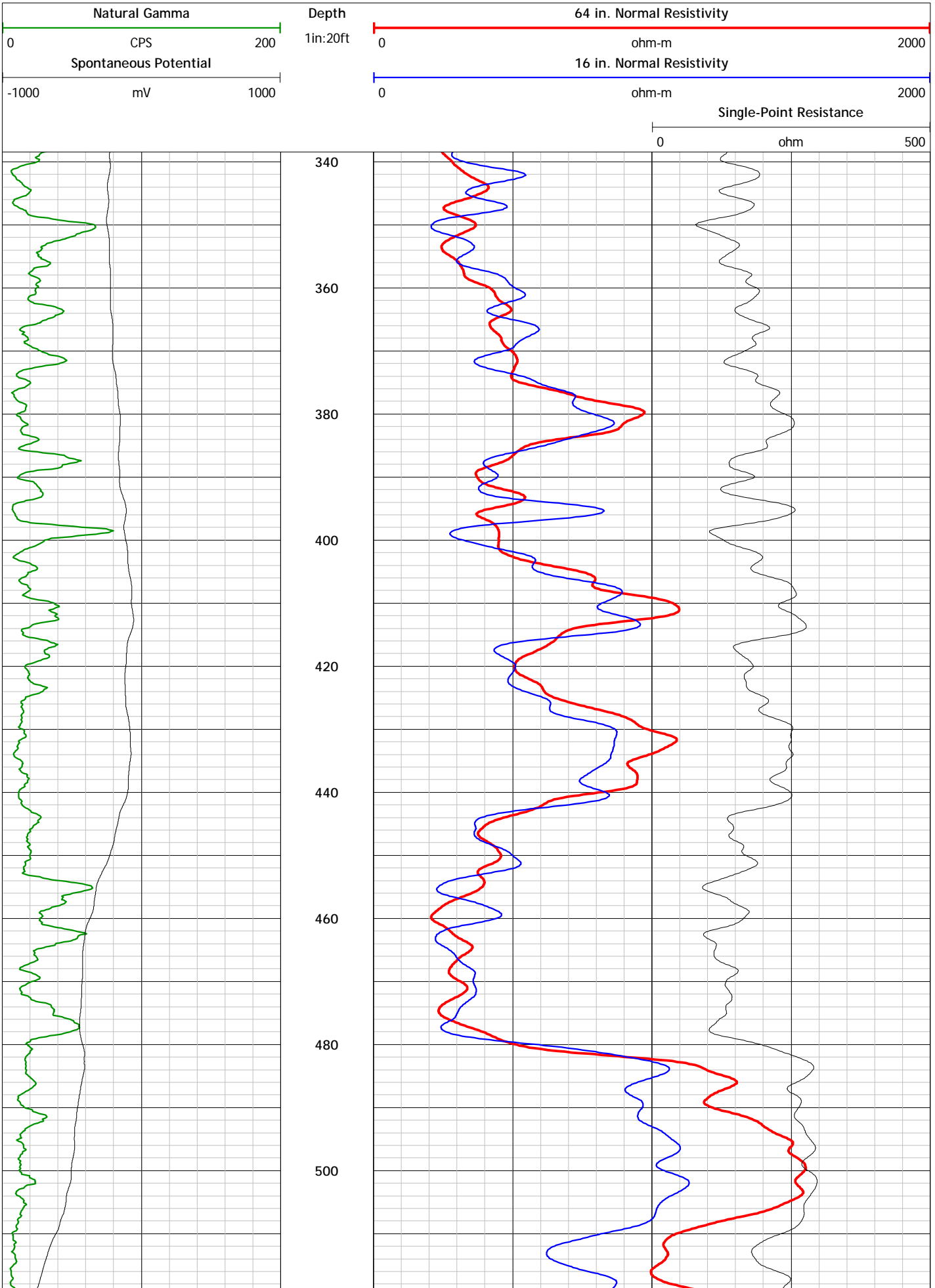
(303) 279-0171

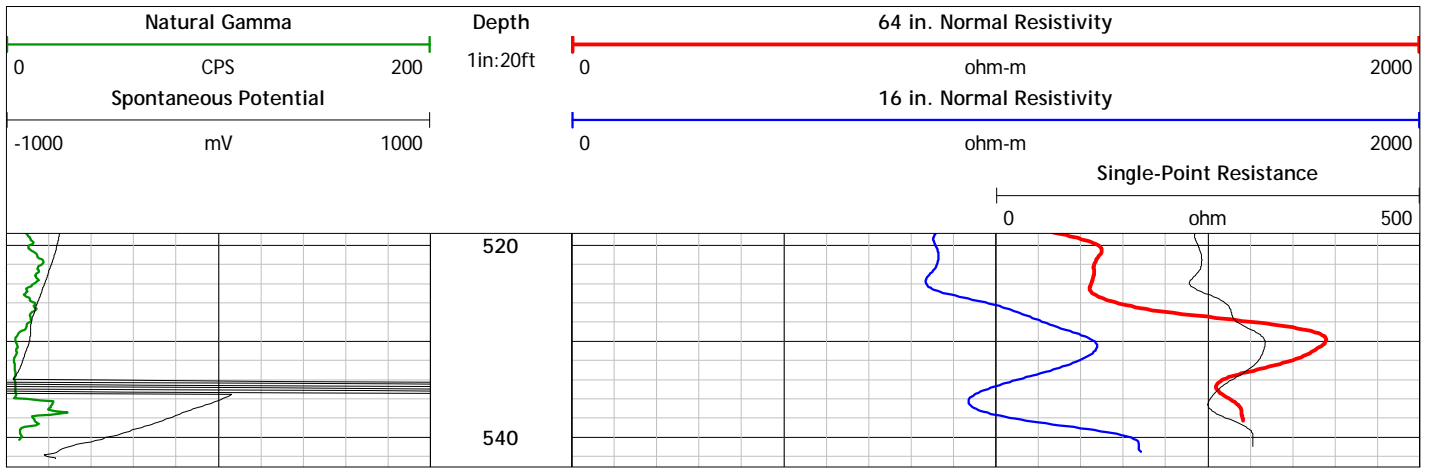
www.colog.com

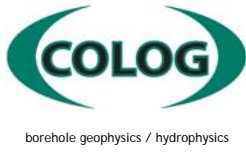
COMMENTS:











Temperature & Fluid Conductivity

833 Hogback Drive
 Golden, CO 80403
 (303) 279-0171
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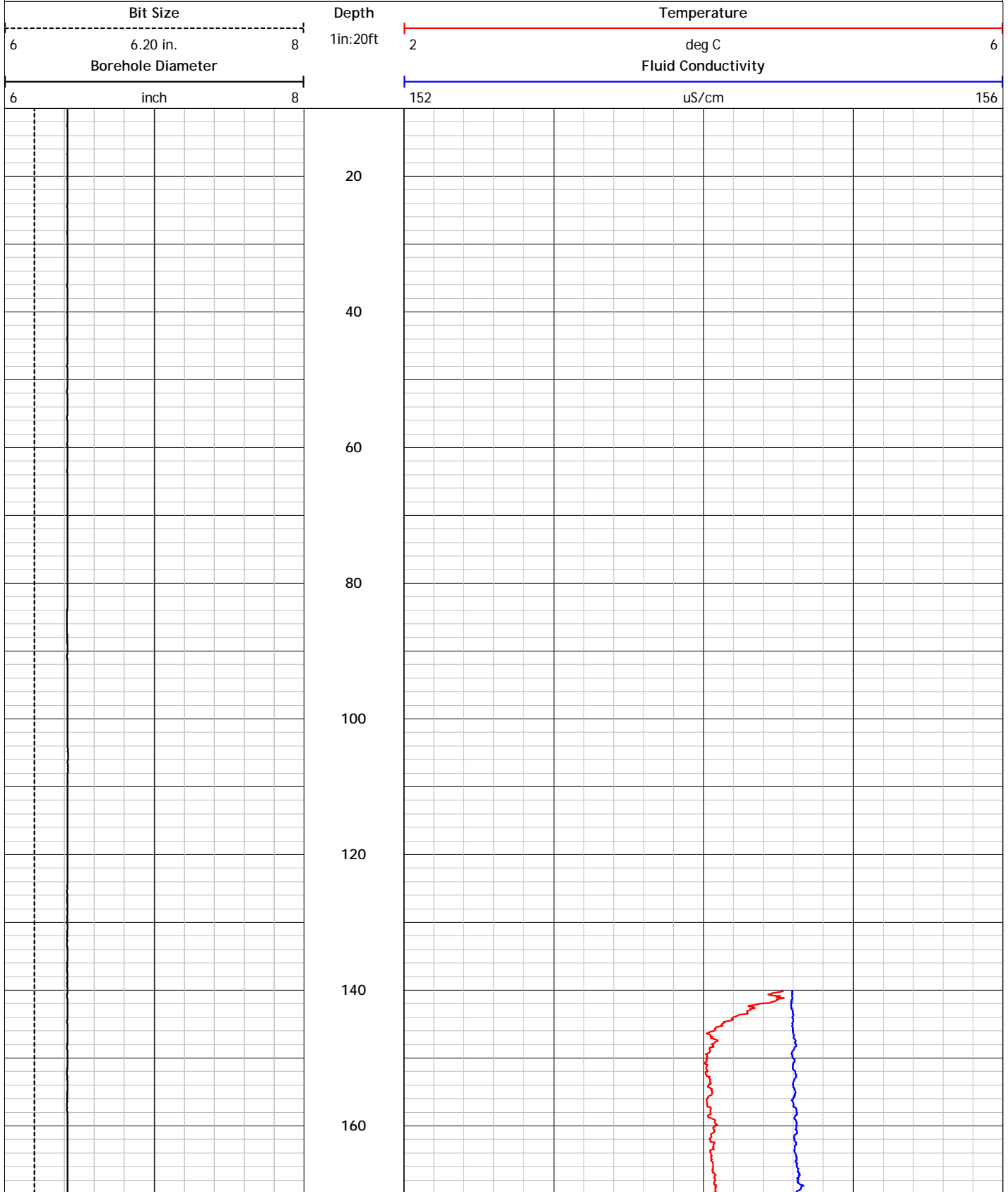
COMPANY: Arcadis

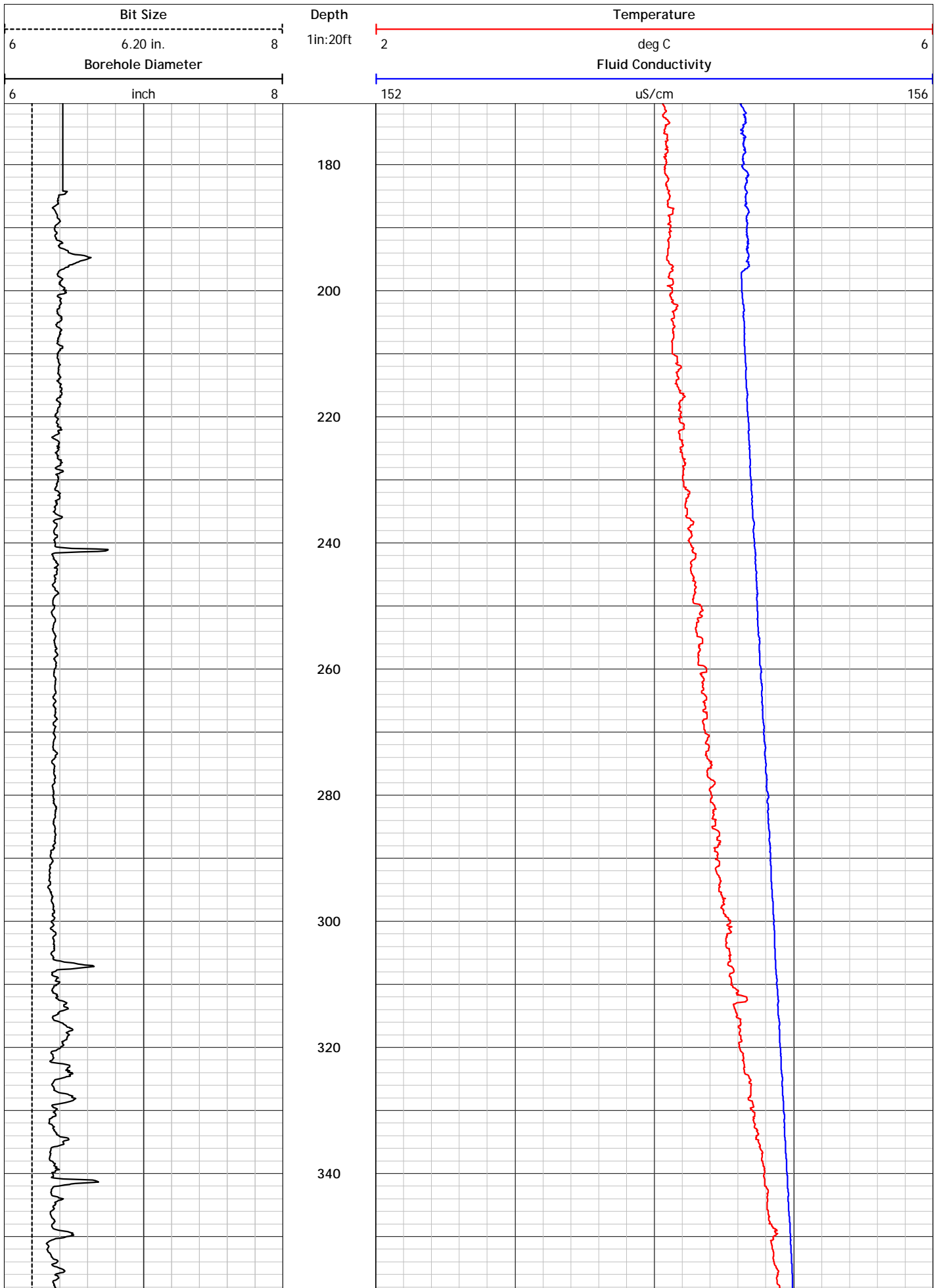
PROJECT: Deep Well Program

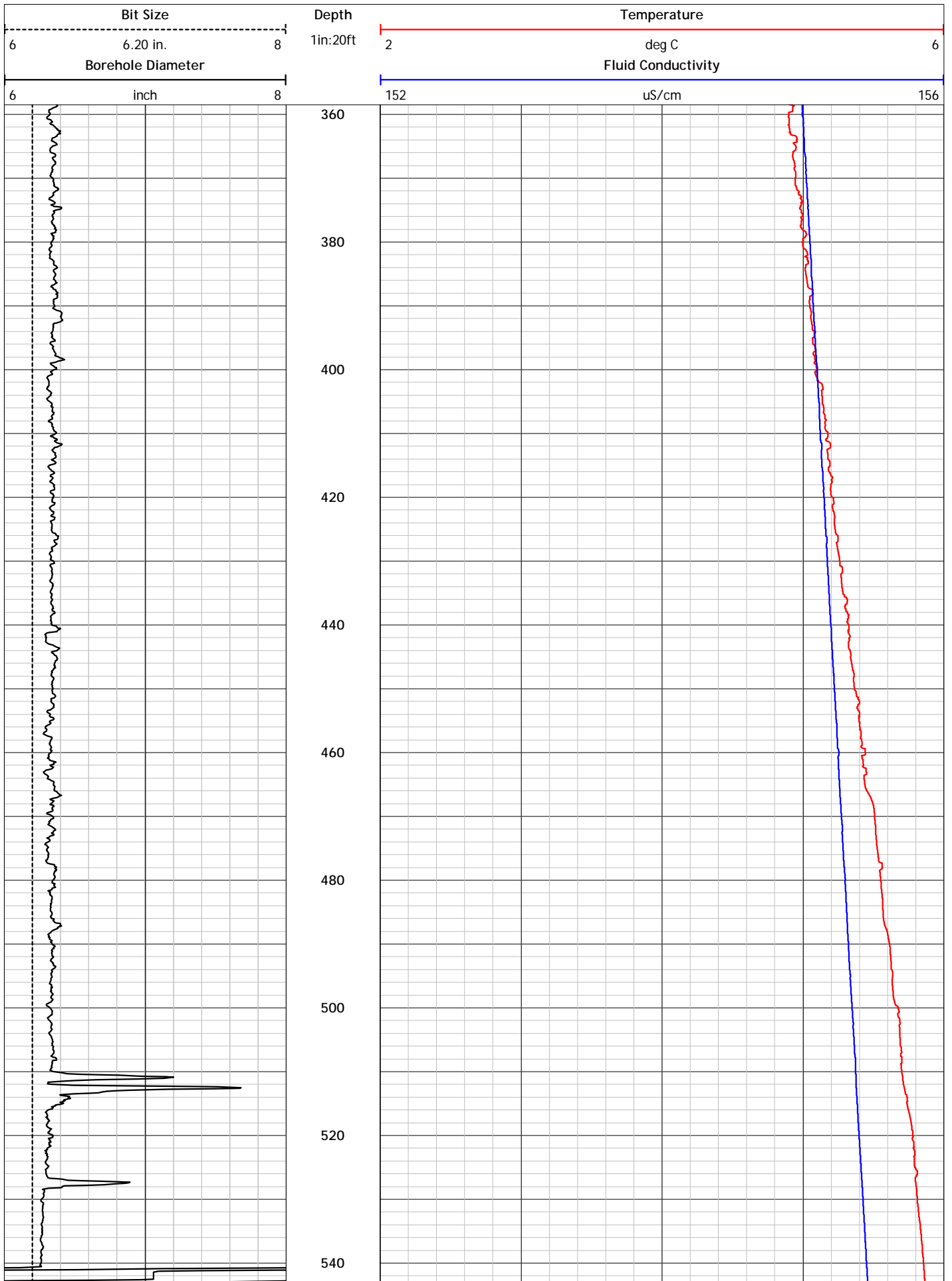
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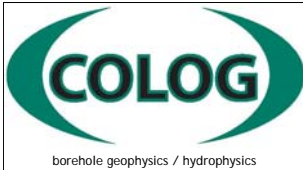
WELL: DMW-4

COMMENTS:









Optical & Acoustic Televiewer

833 Hogback Drive
 Golden, CO 80403
 (303) 279-0171
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COMPANY: Arcadis

PROJECT: Deep Well Program

DATE LOGGED: 18 January 2024

WELL: DMW-4

LOCATION: Marinette, WI

LOG MEASURED FROM: Ground Surface

FIELD ENGINEER(S): G. Kennedy

TOP & BOTTOM OF CASING: 0.0 ft - 185.7 ft

WITNESSED BY: NA

BOREHOLE DIAMETER: 6.2 in.

DEPTH DRILLER: 543.0 ft

FLUID LEVEL DEPTH: NA

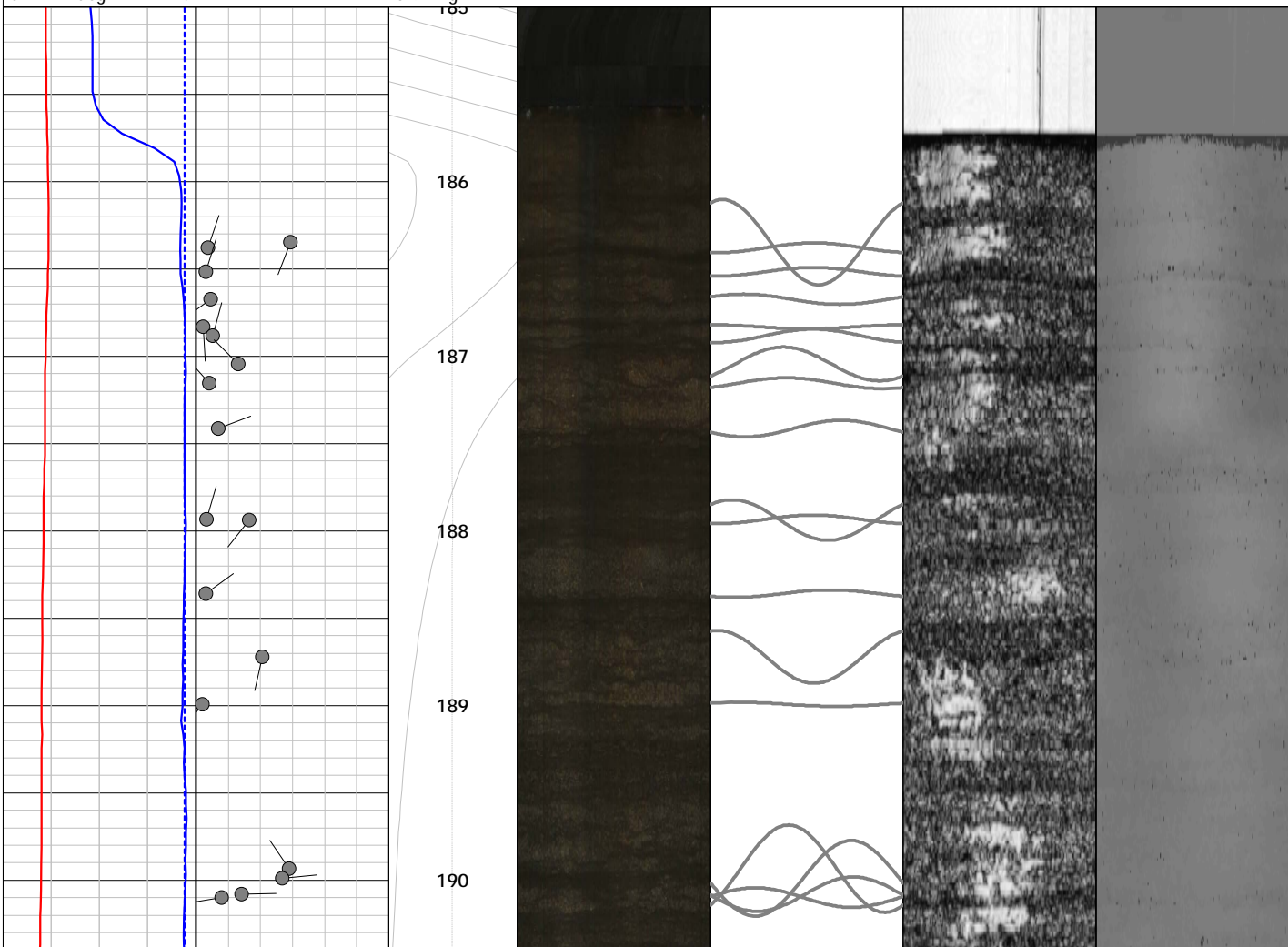
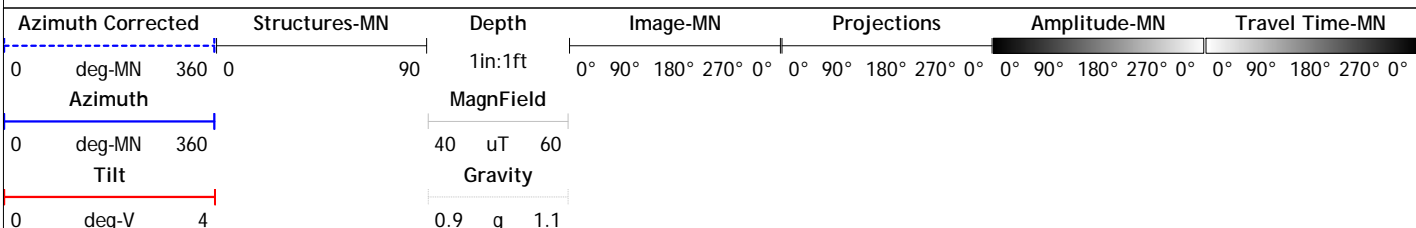
DEPTH LOGGER: 542.1 ft

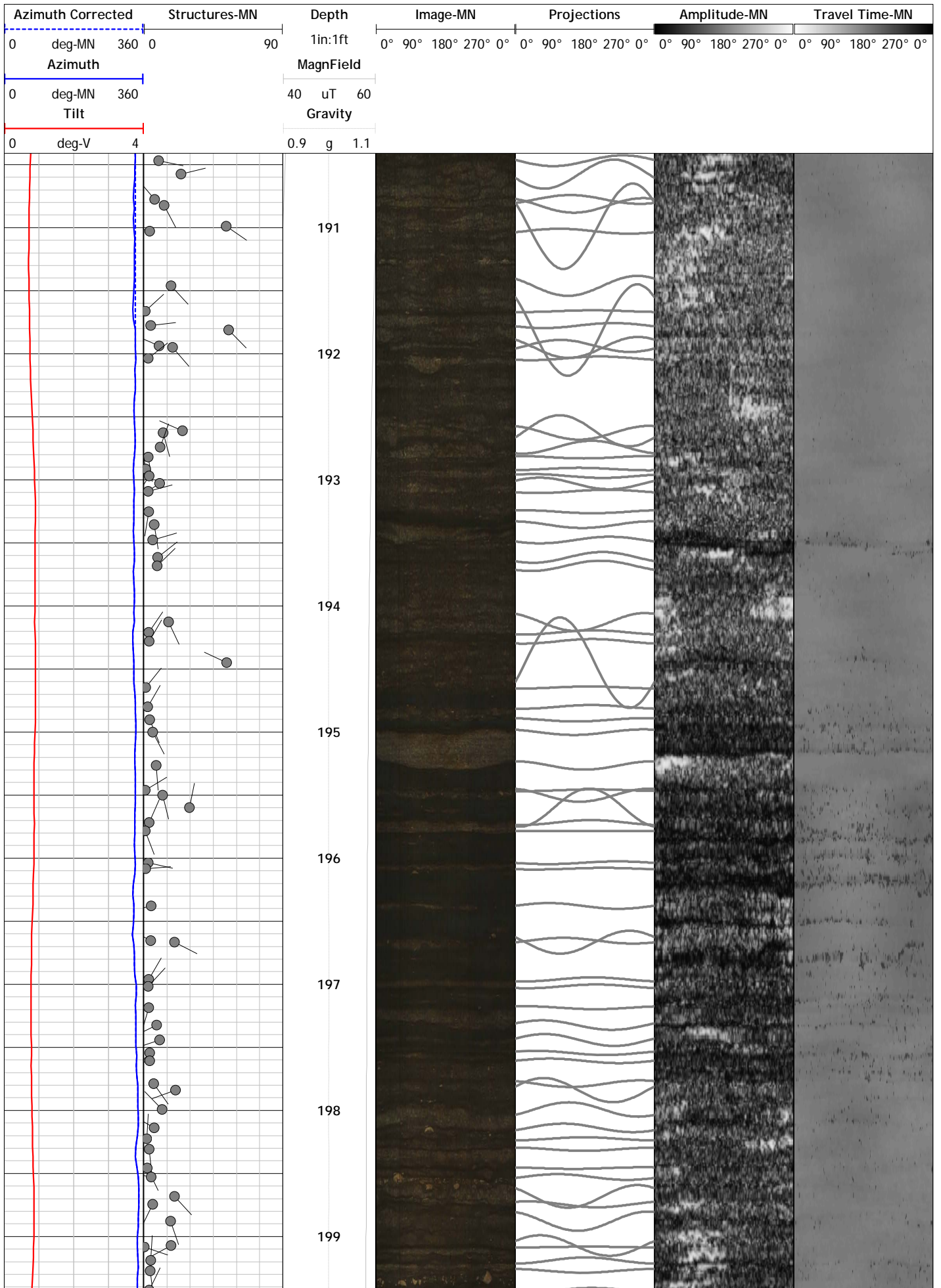
ORIENTATION REFERENCE: Magnetic North

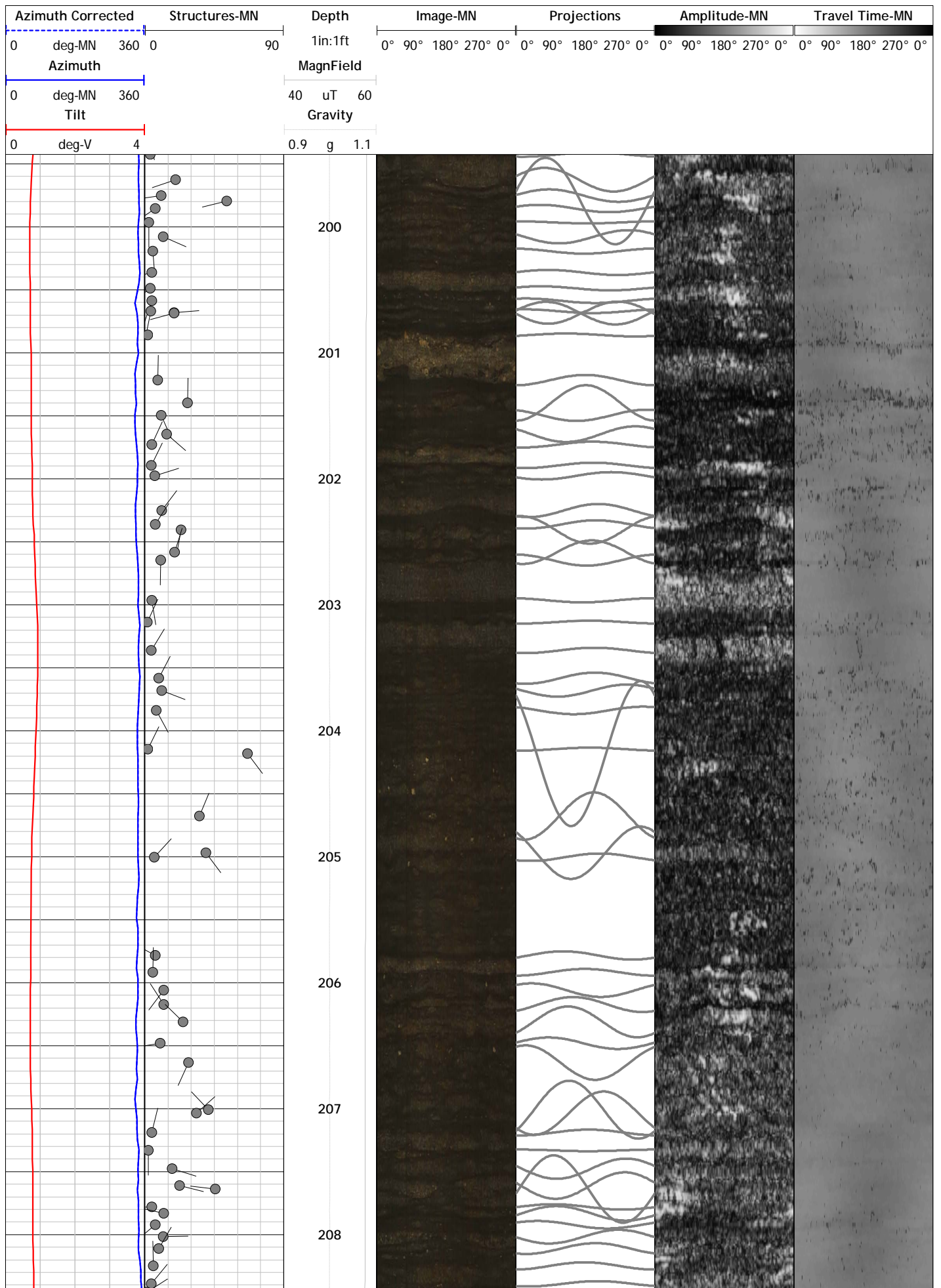
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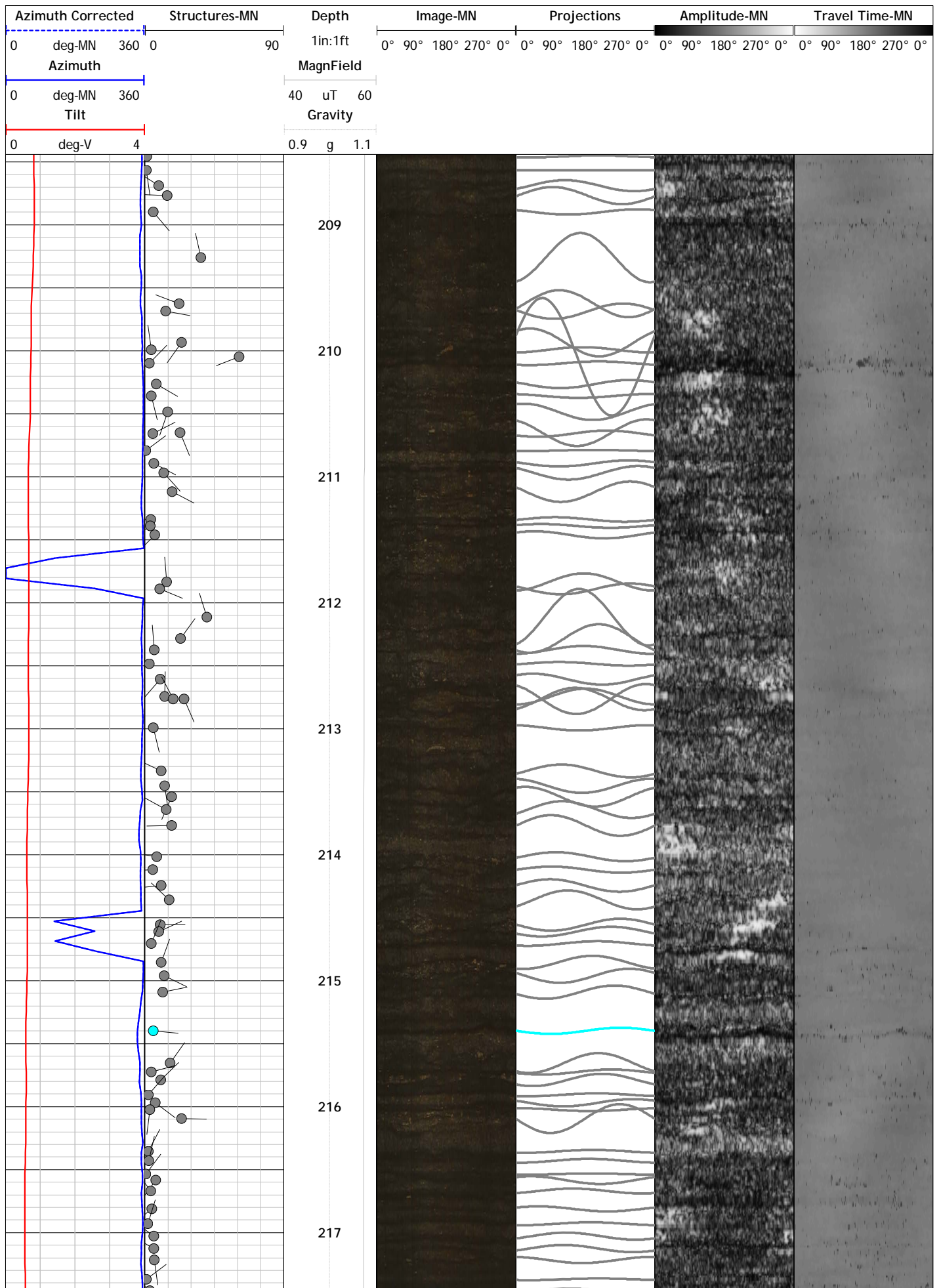
STRUCTURE LEGEND:

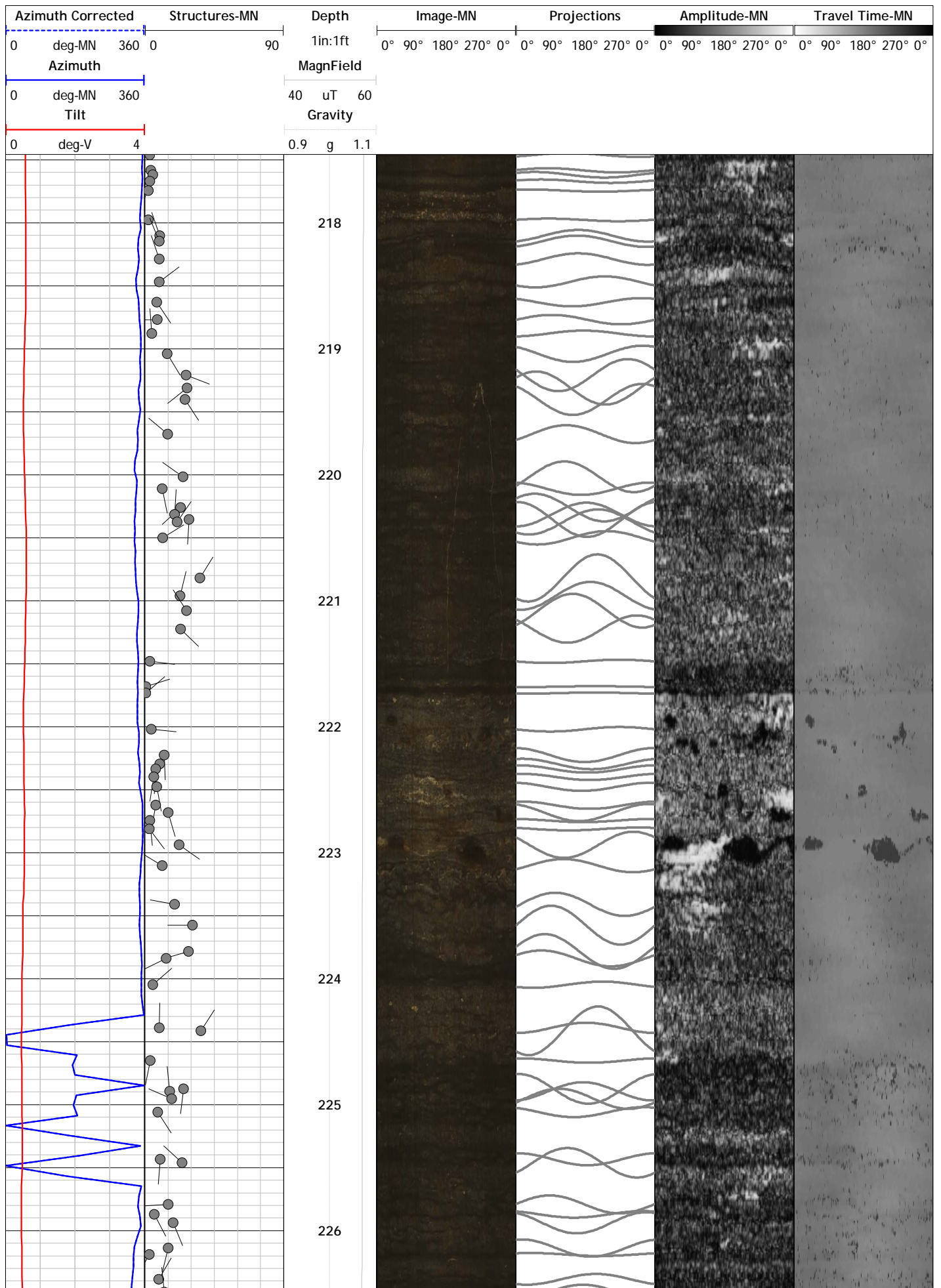
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- 1 - Partial Fracture
- 2 - Complete Fracture
- 3 - Open Fracture
- 4 - Wide Fracture/Multiple Fractures

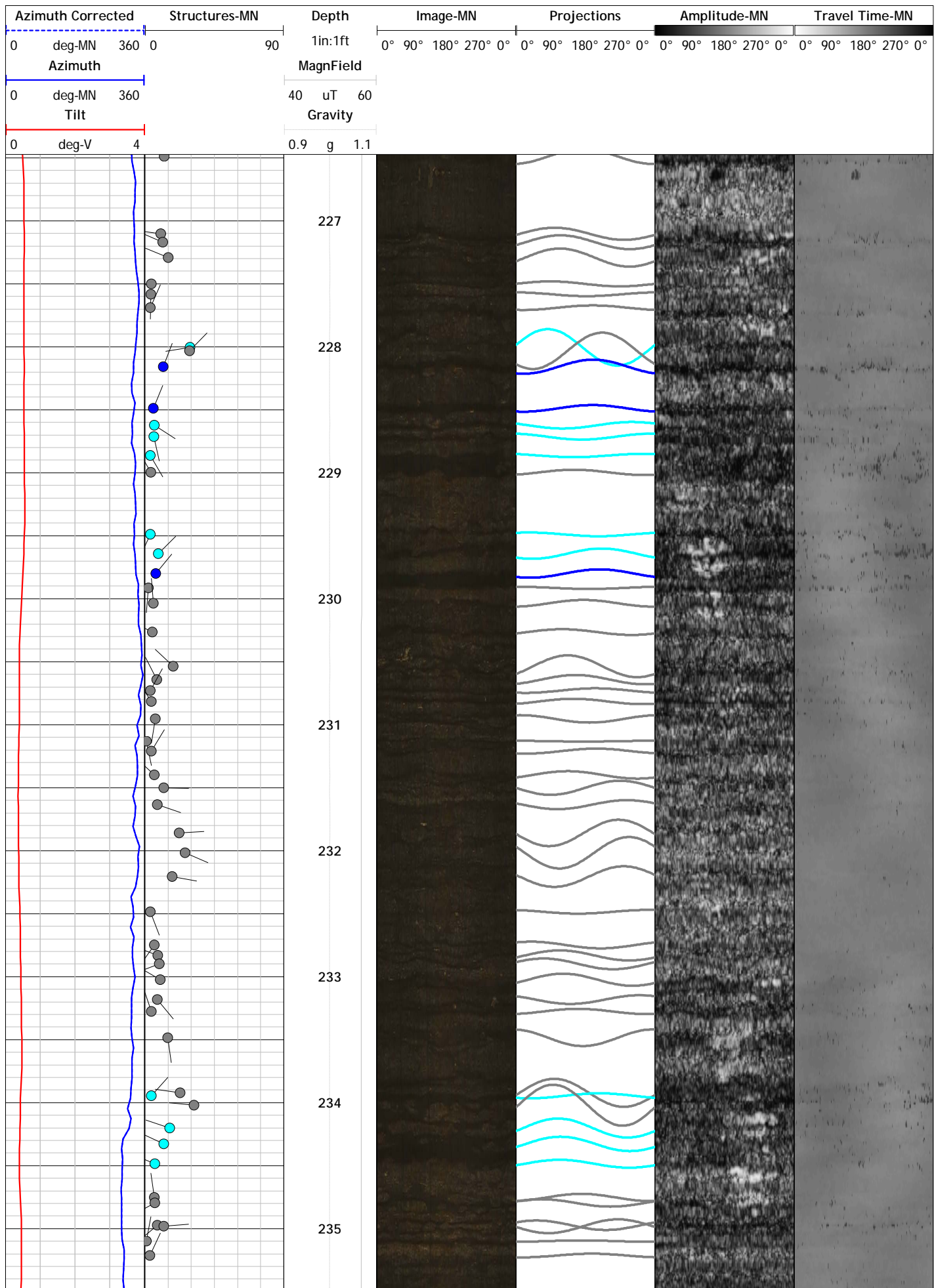


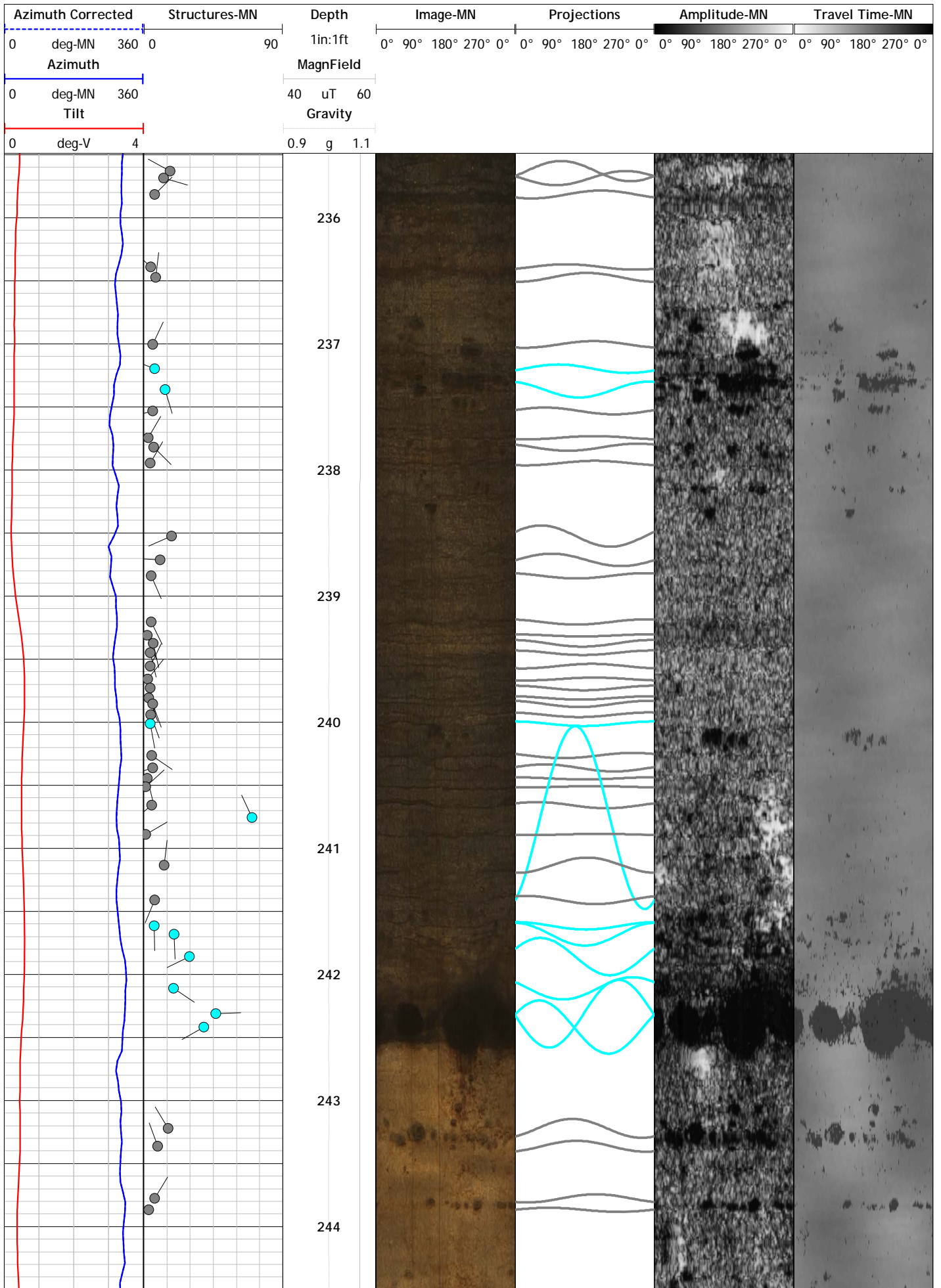


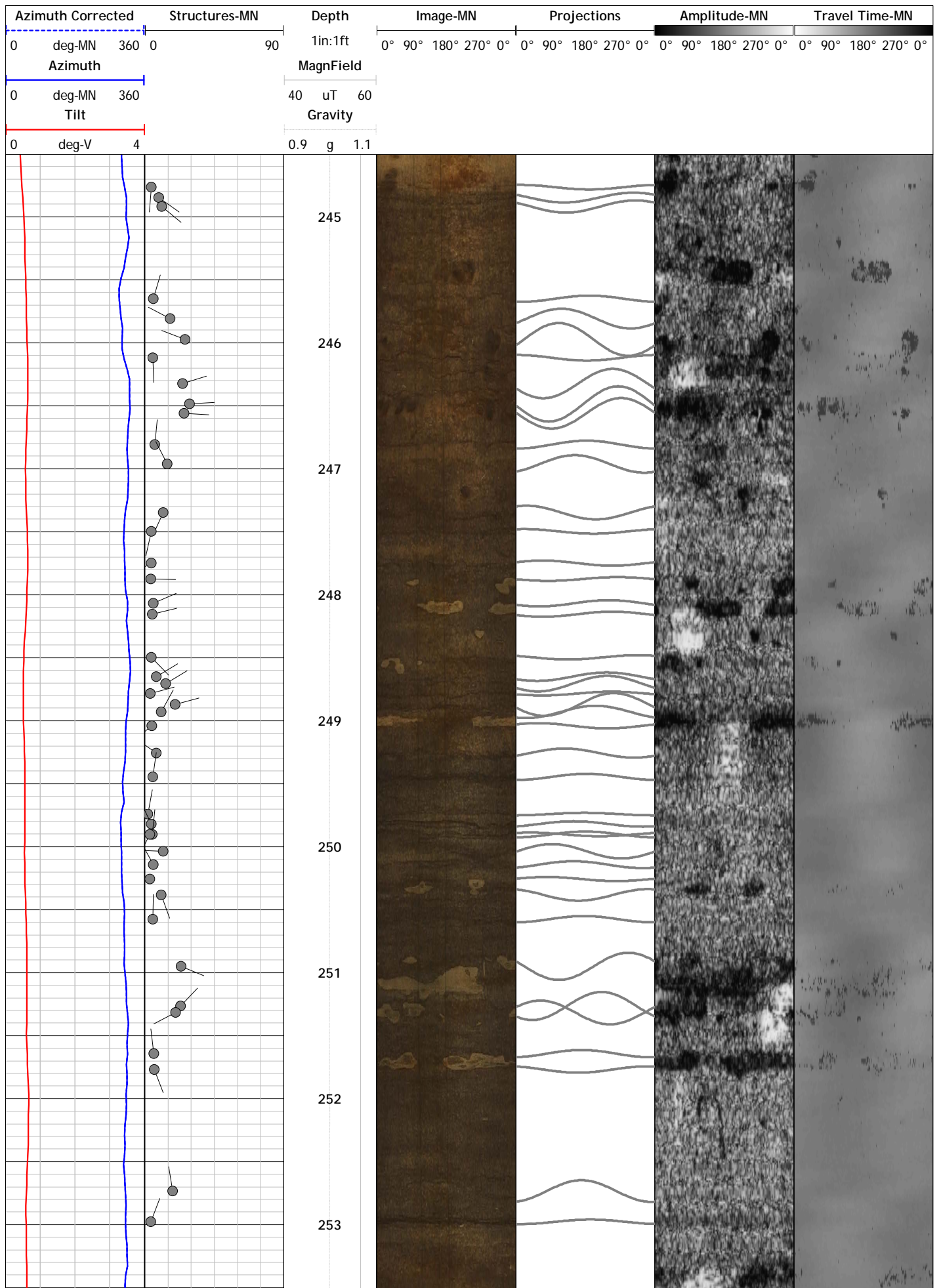


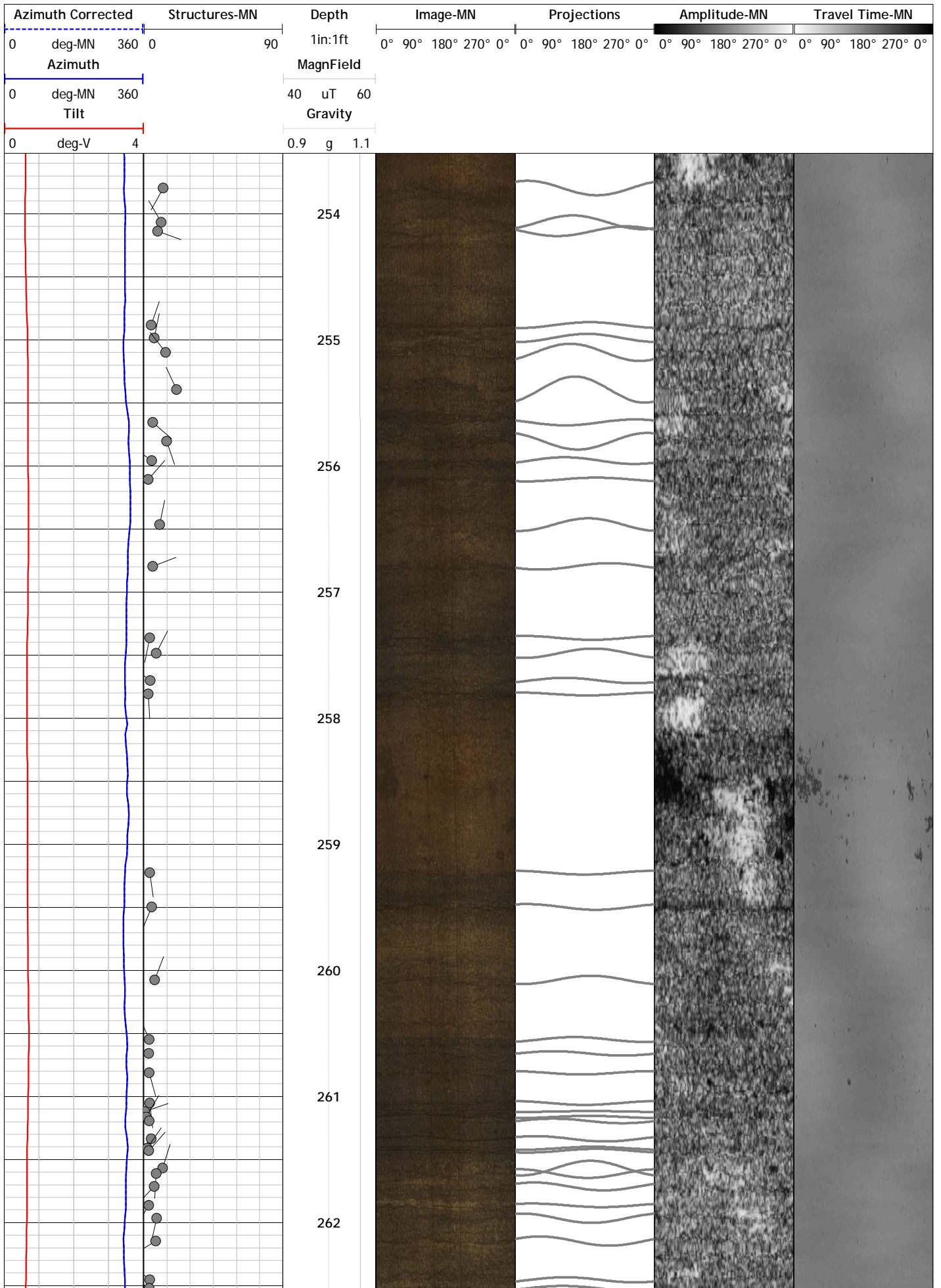


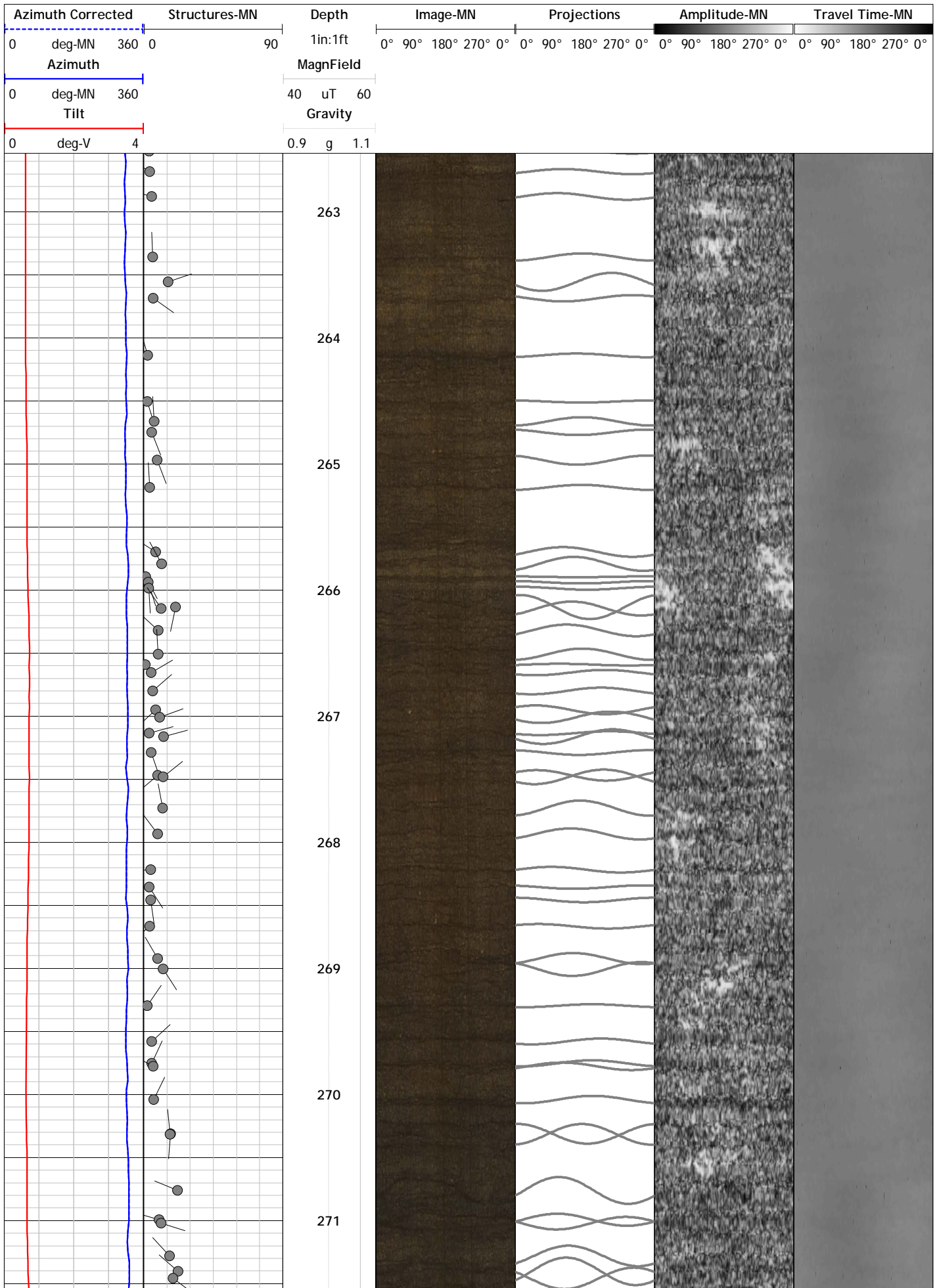


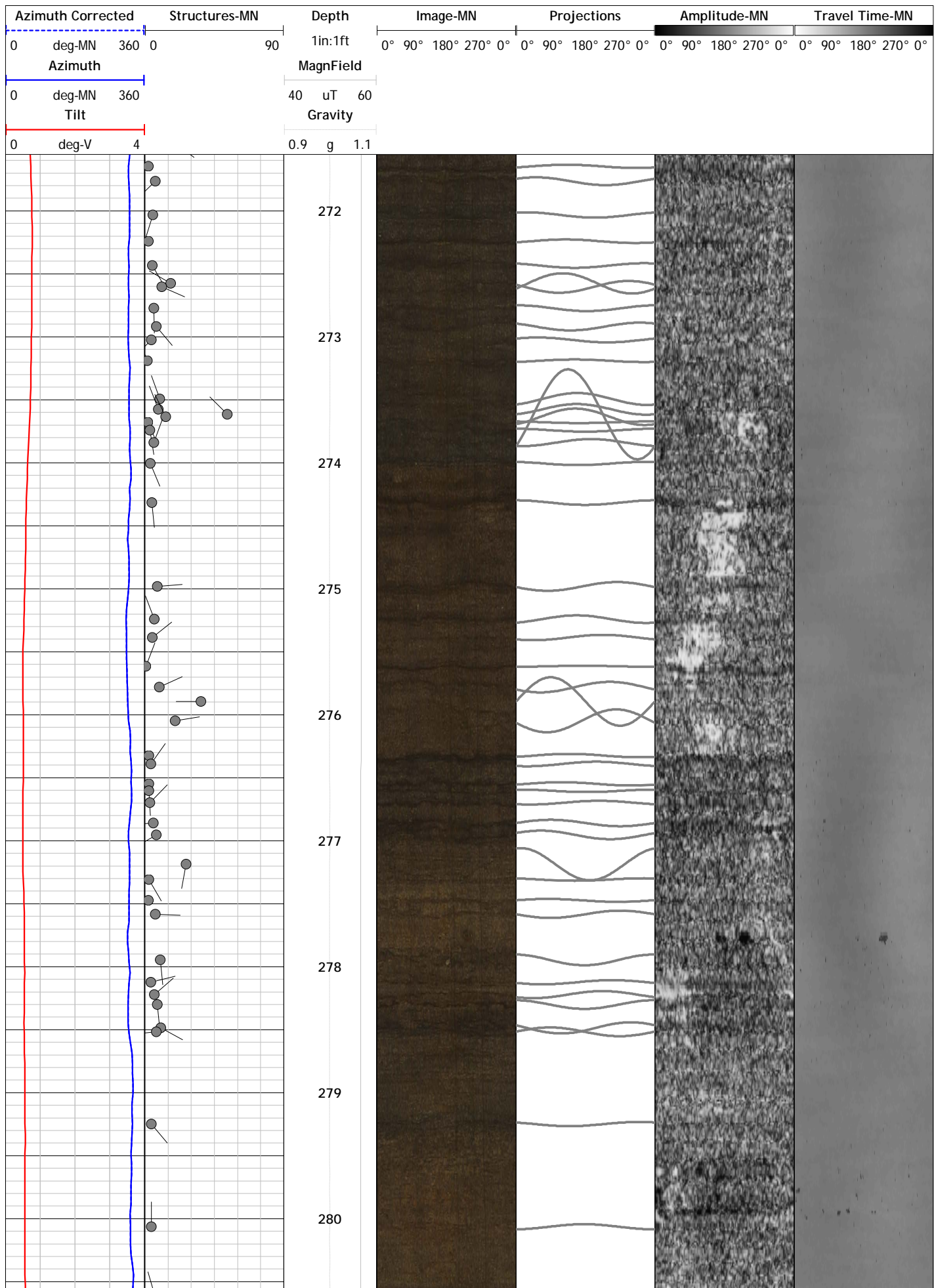


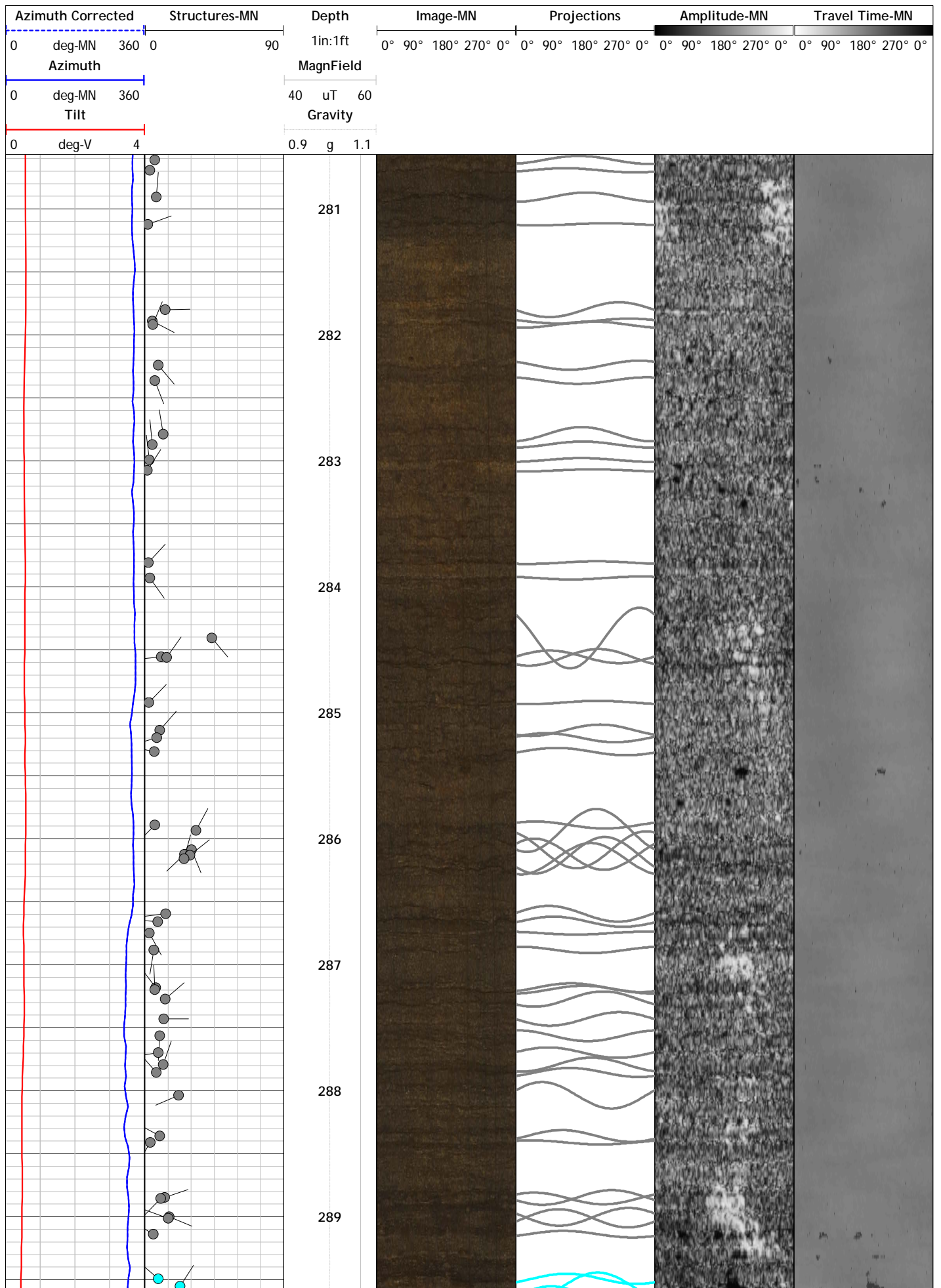


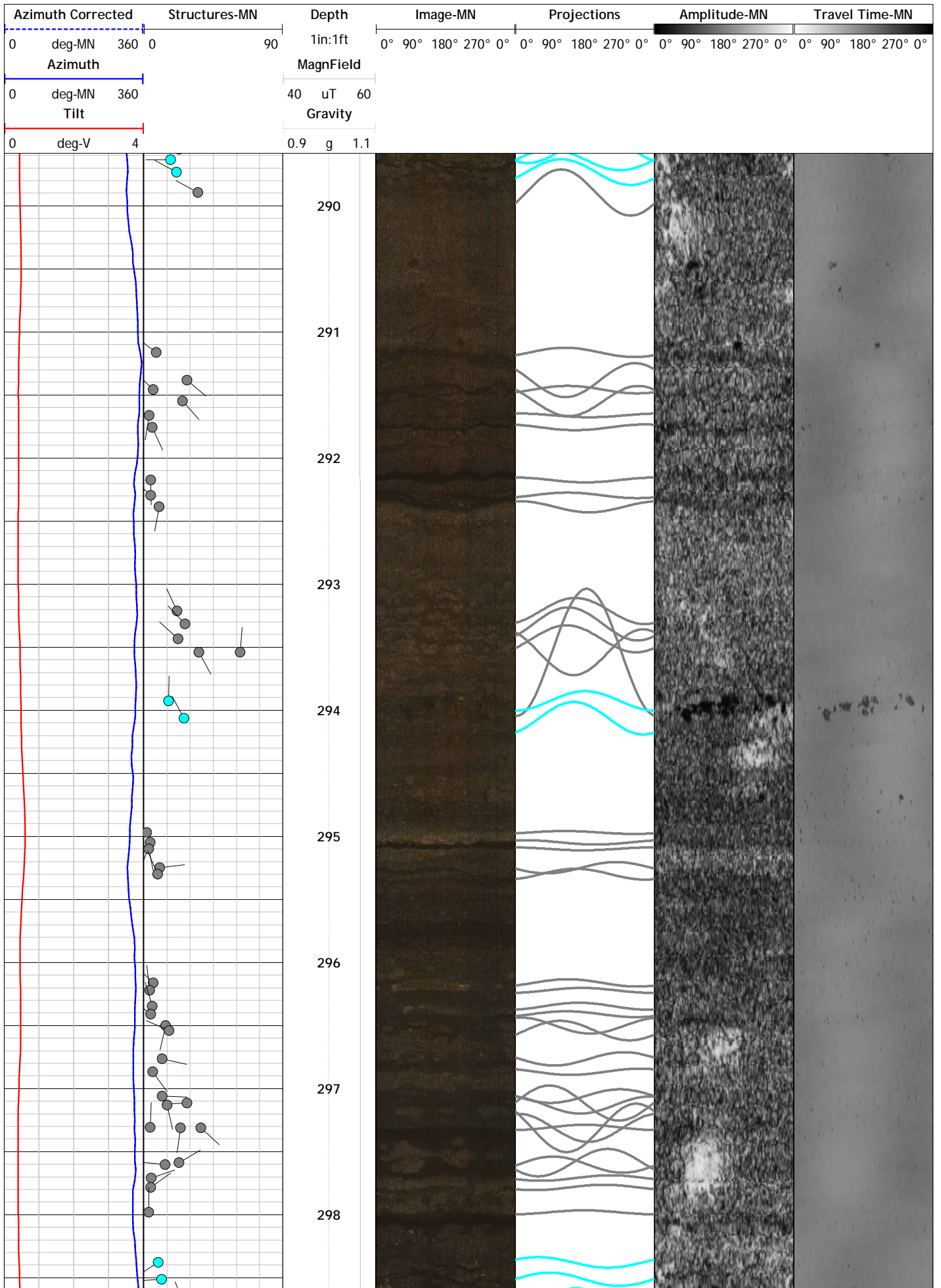


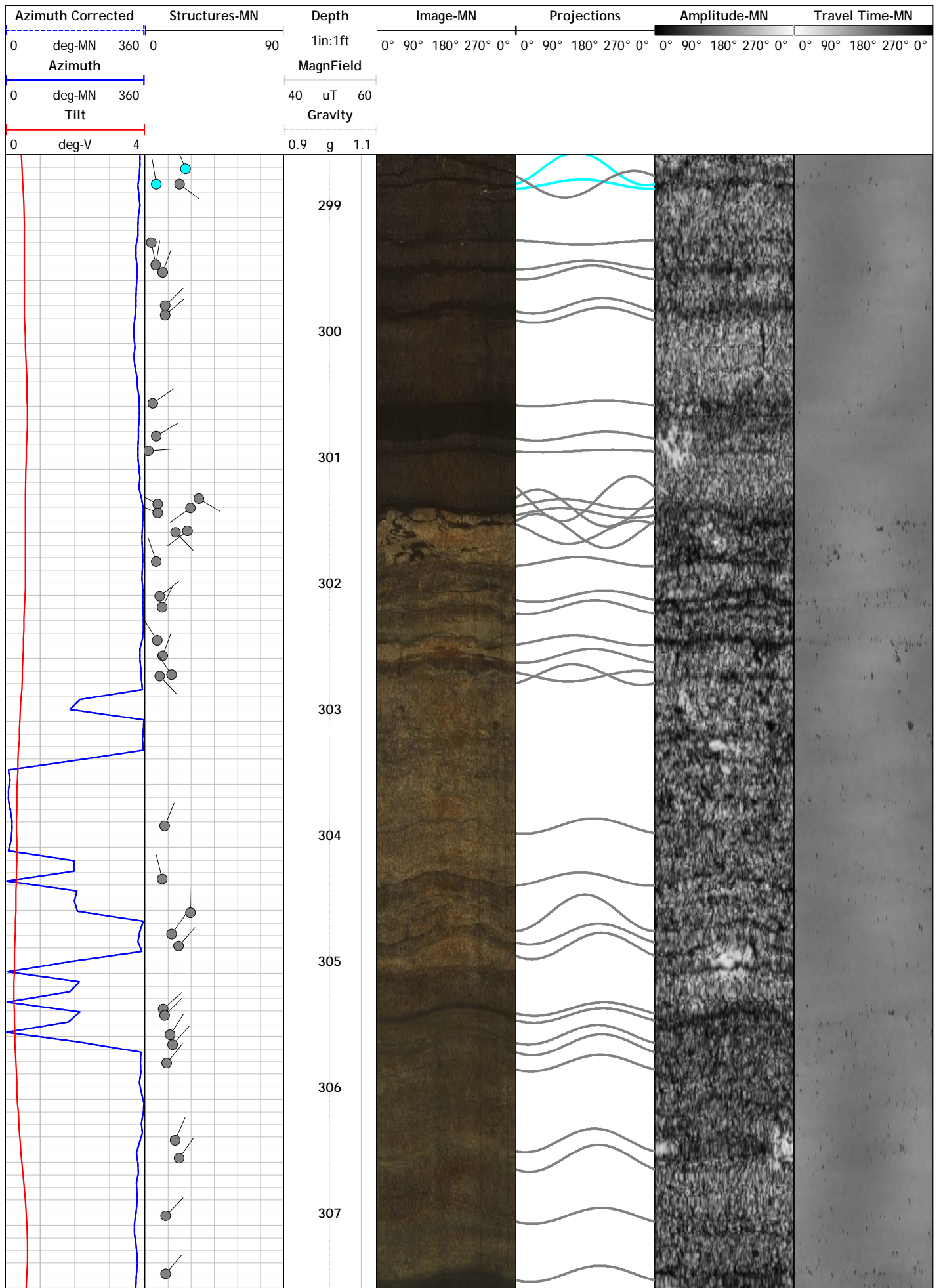


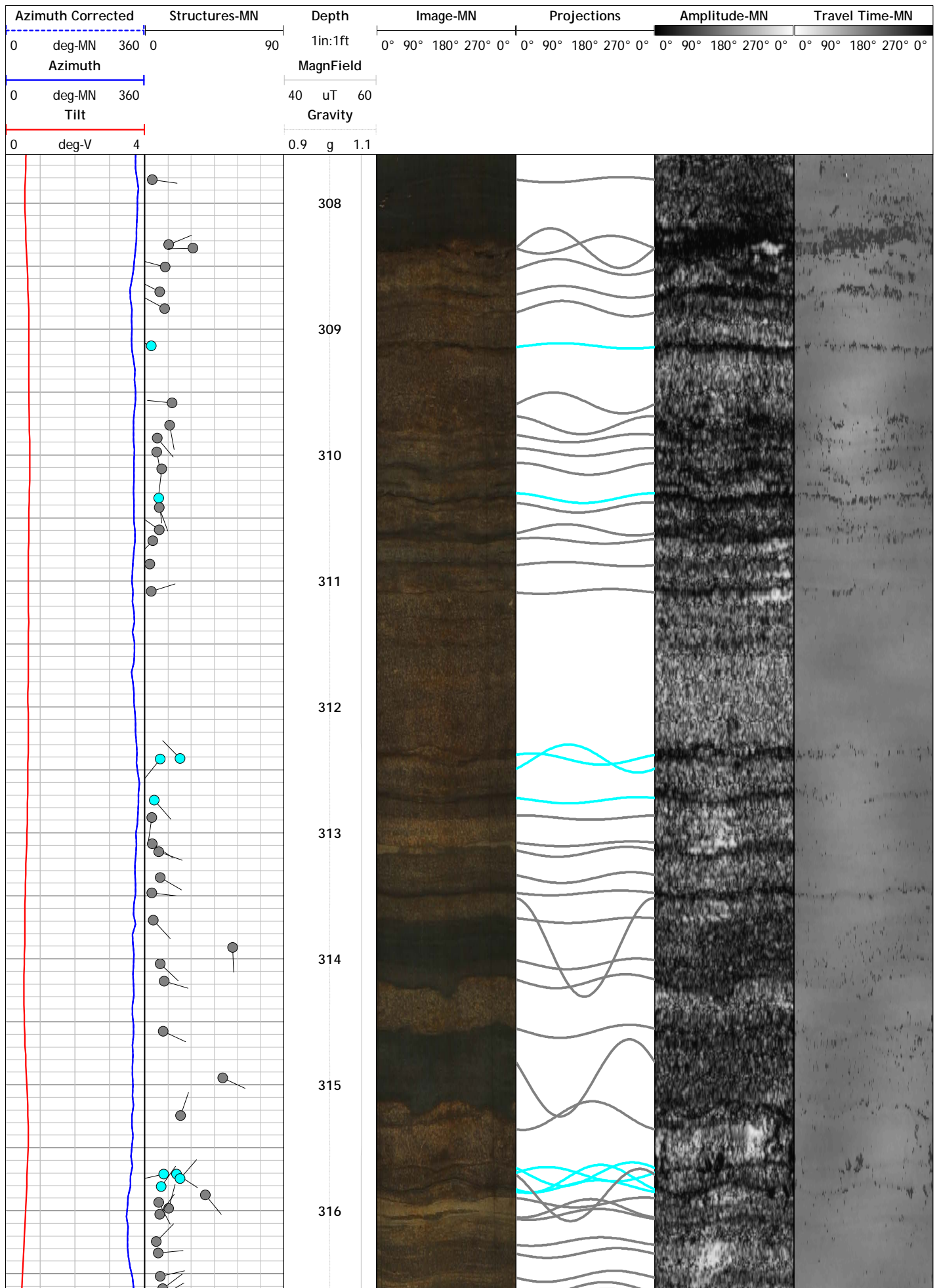


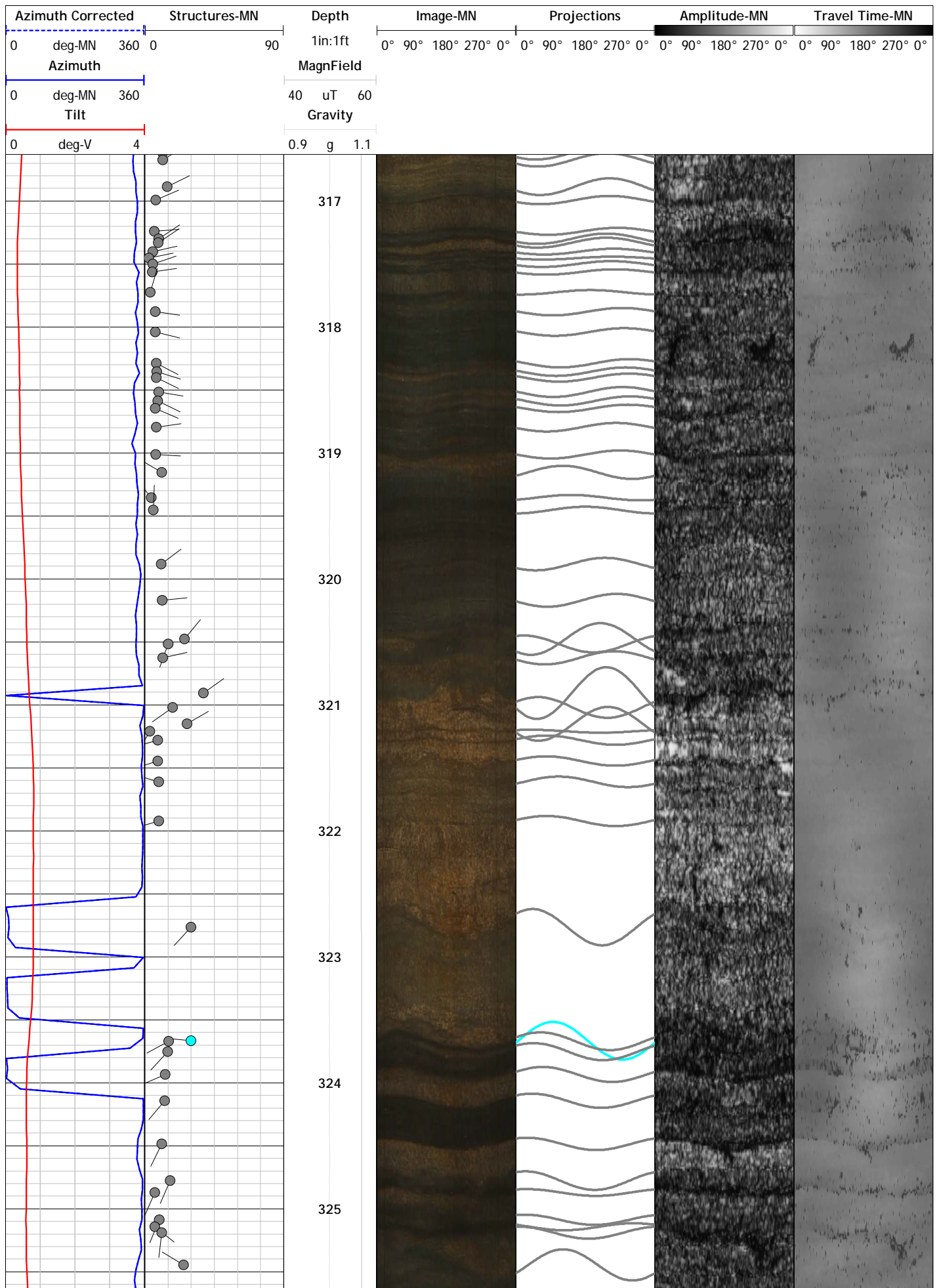


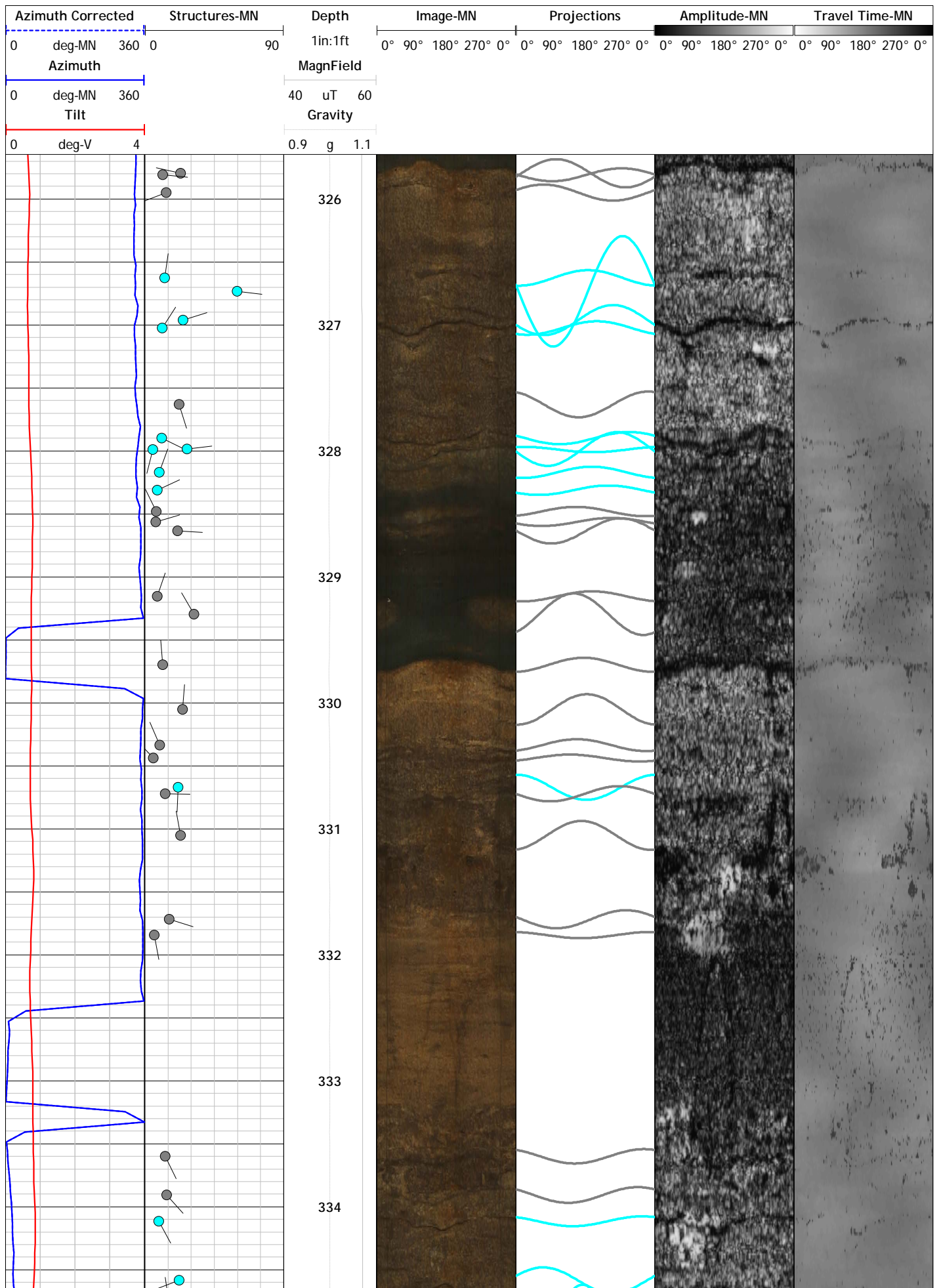


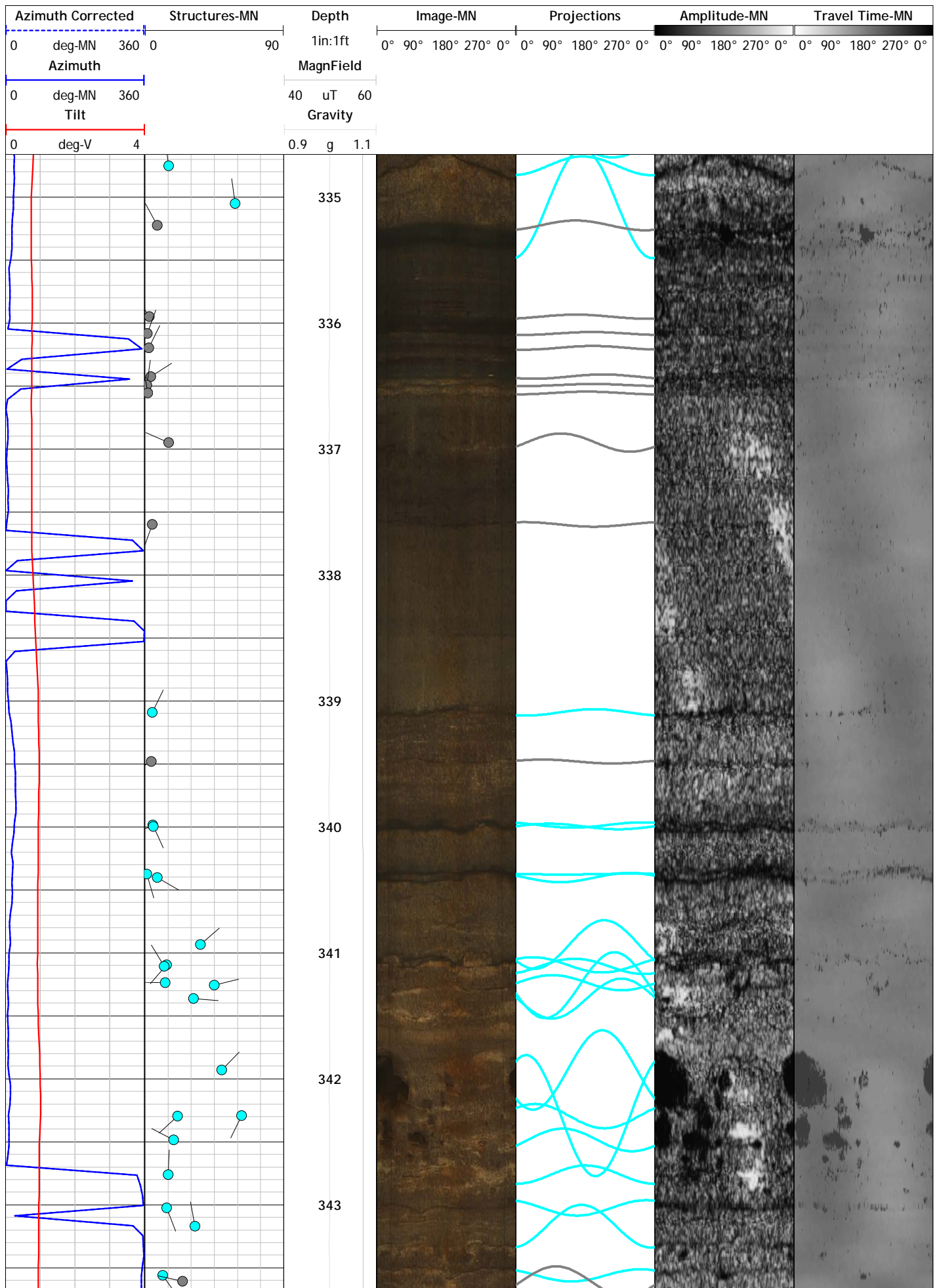


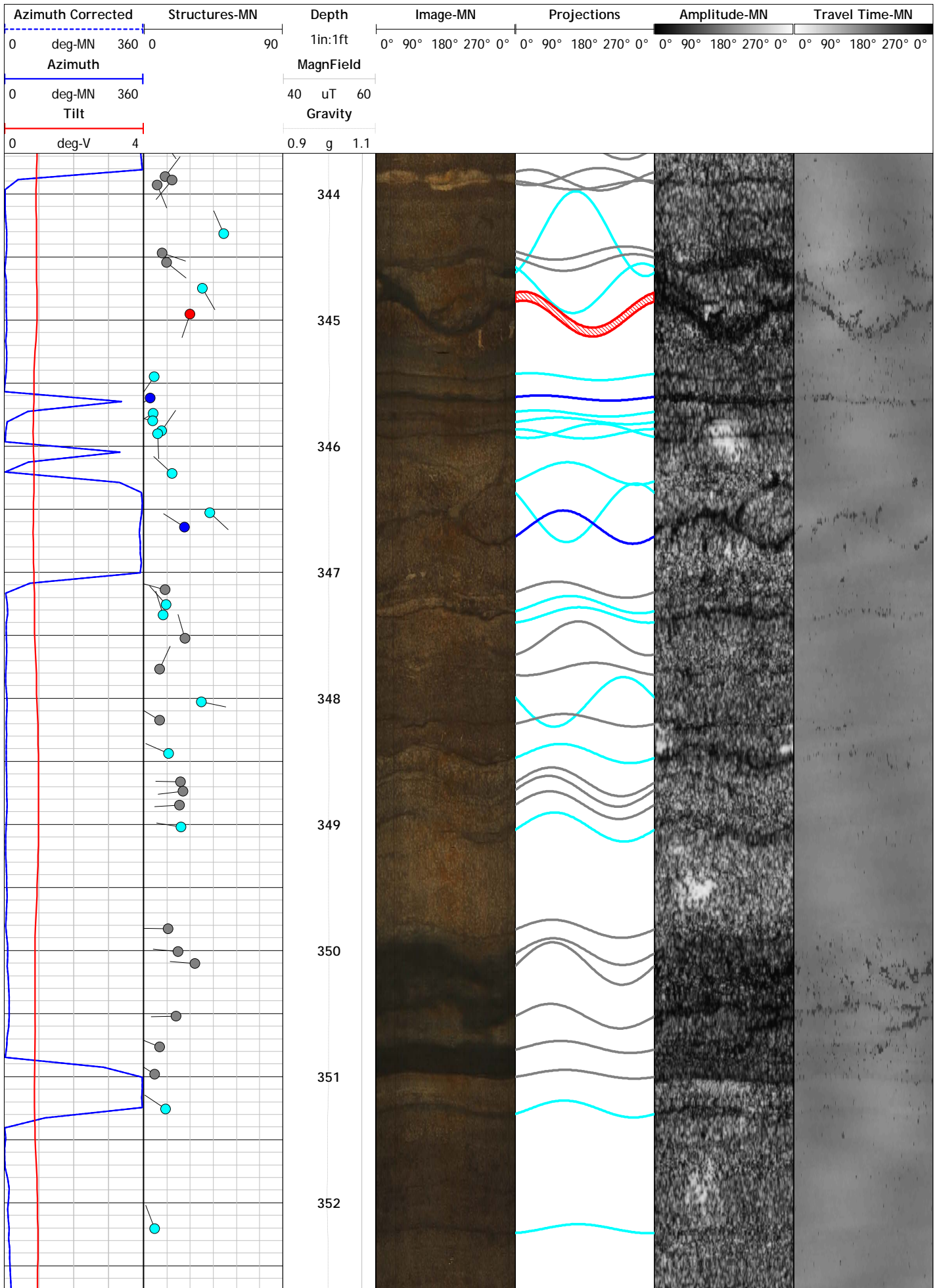


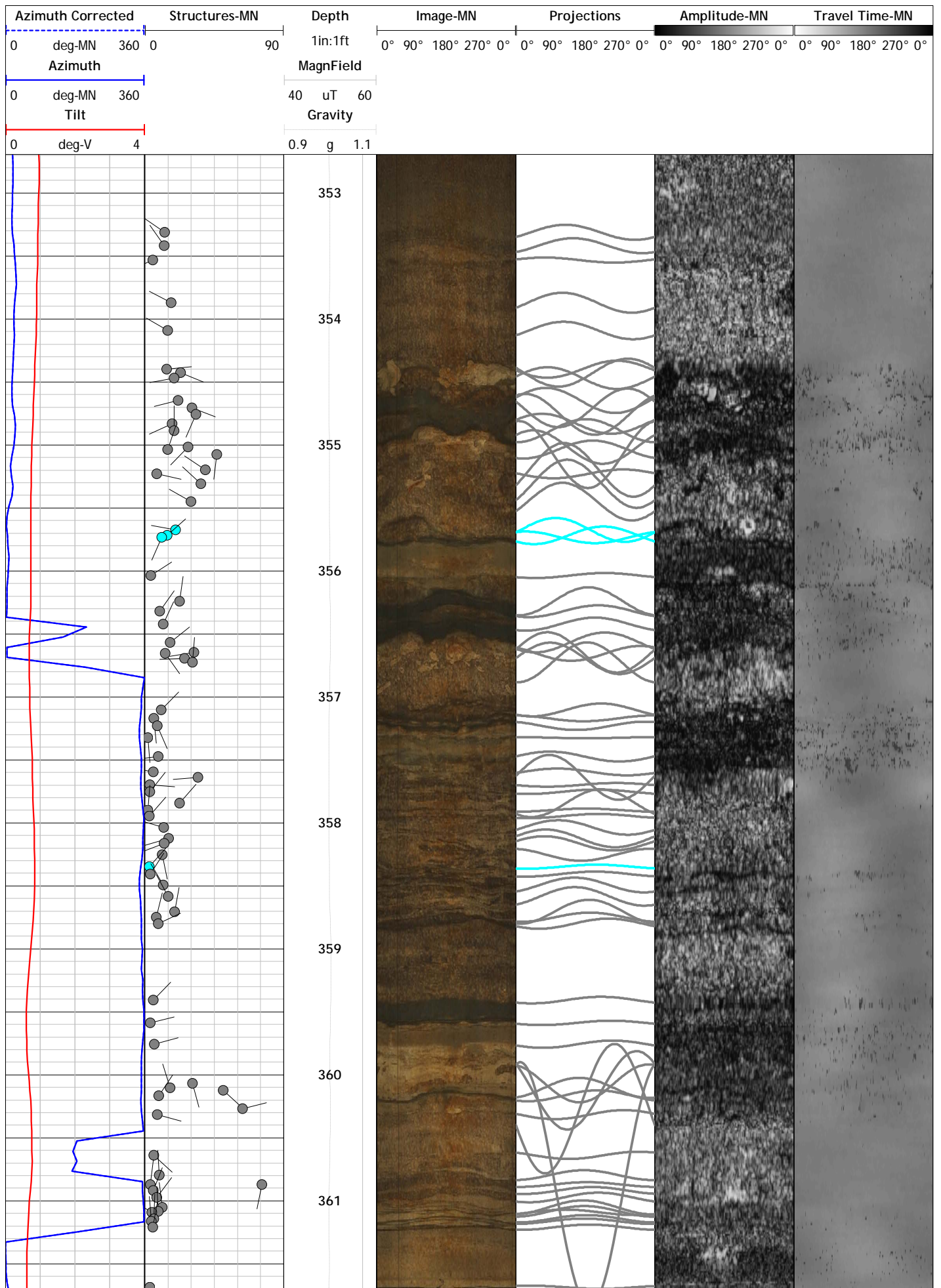


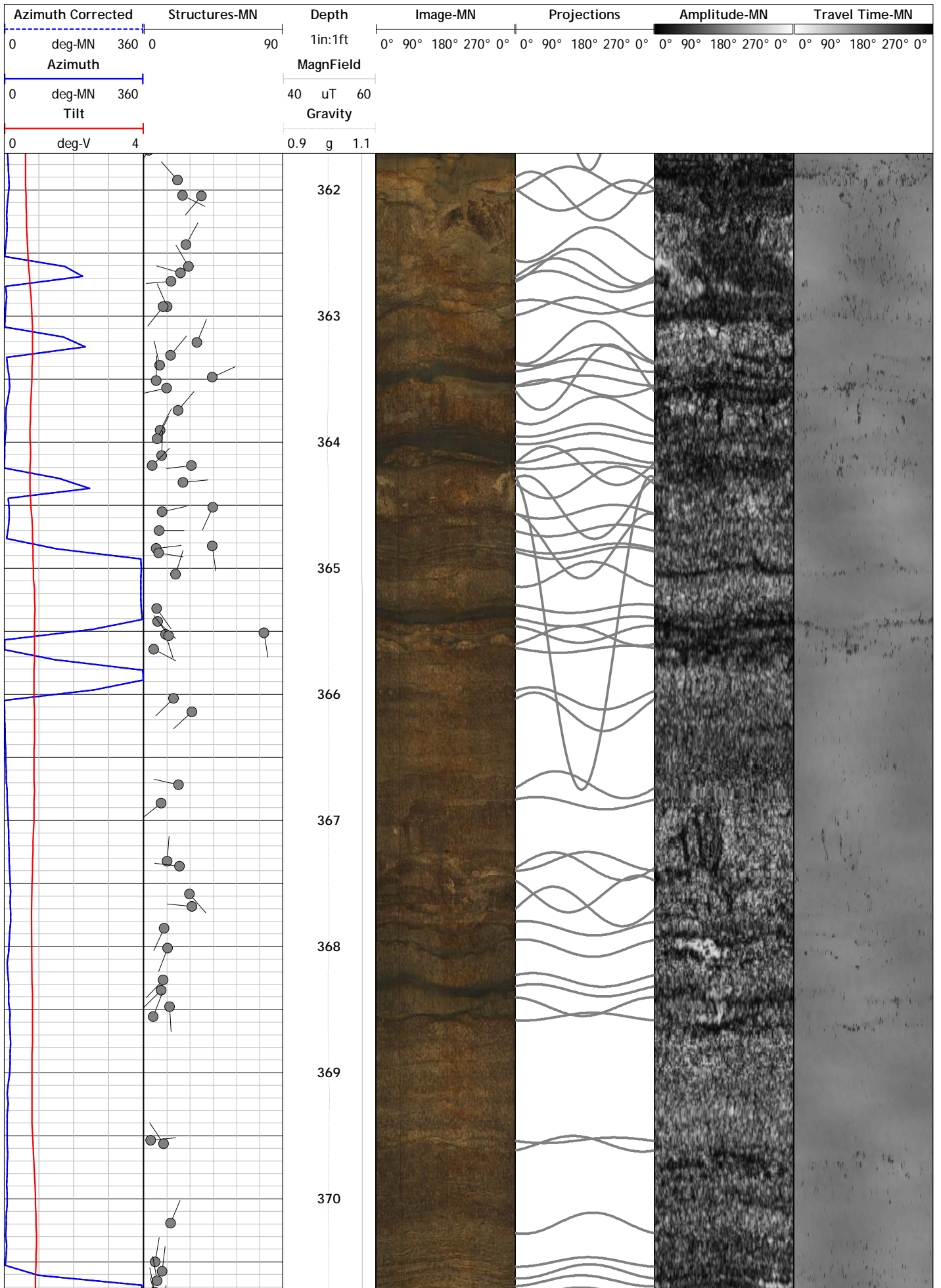


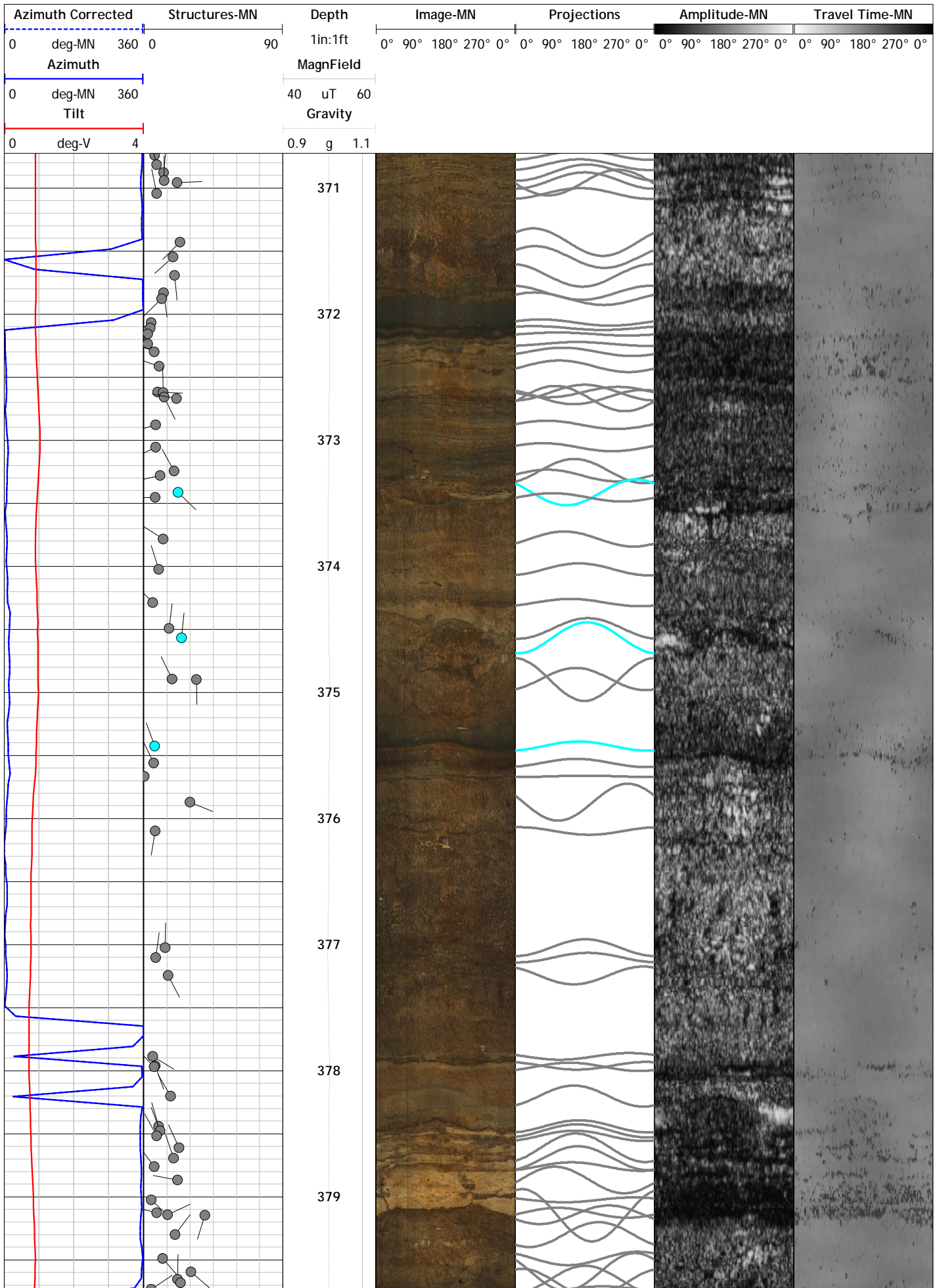


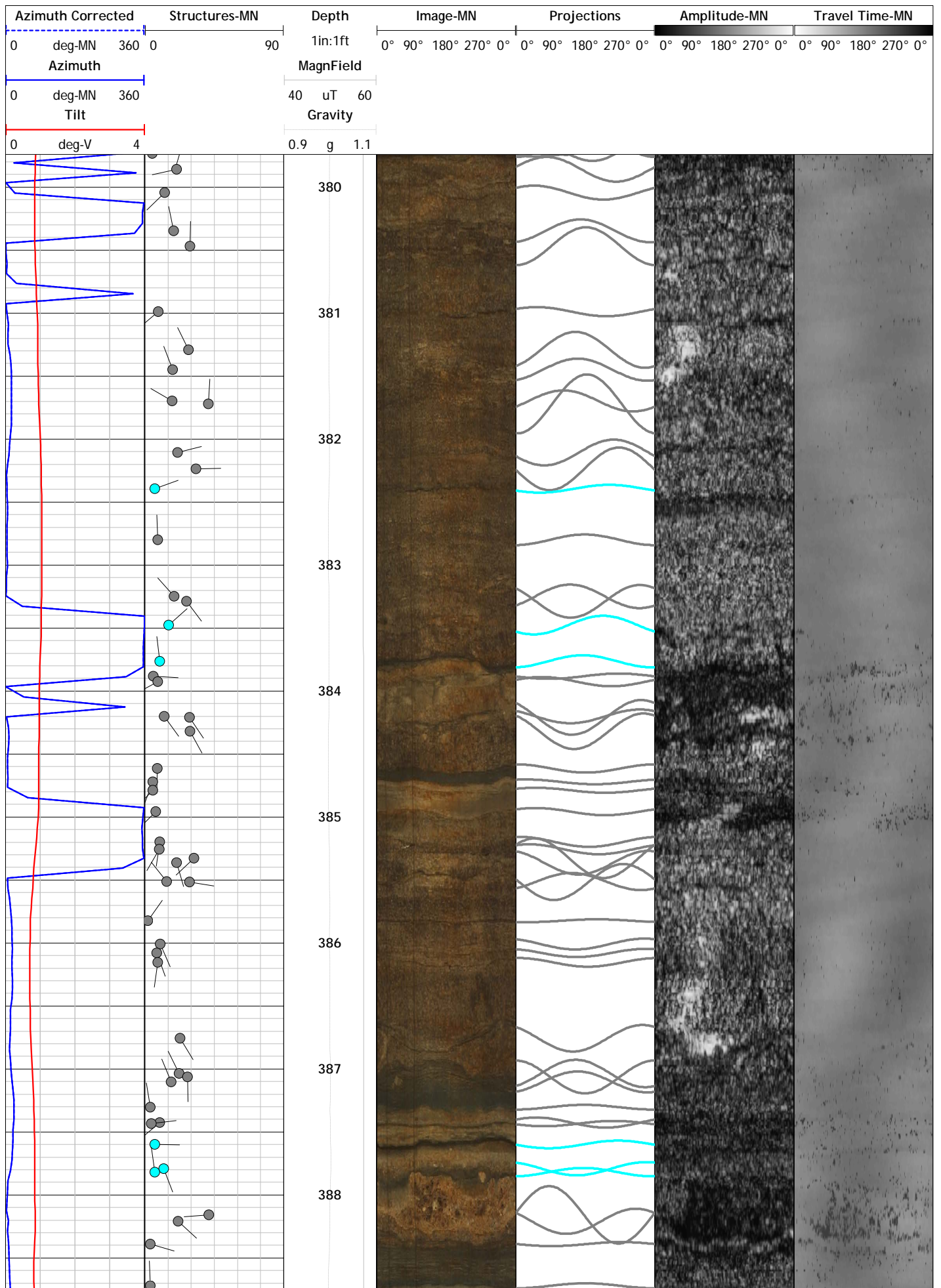


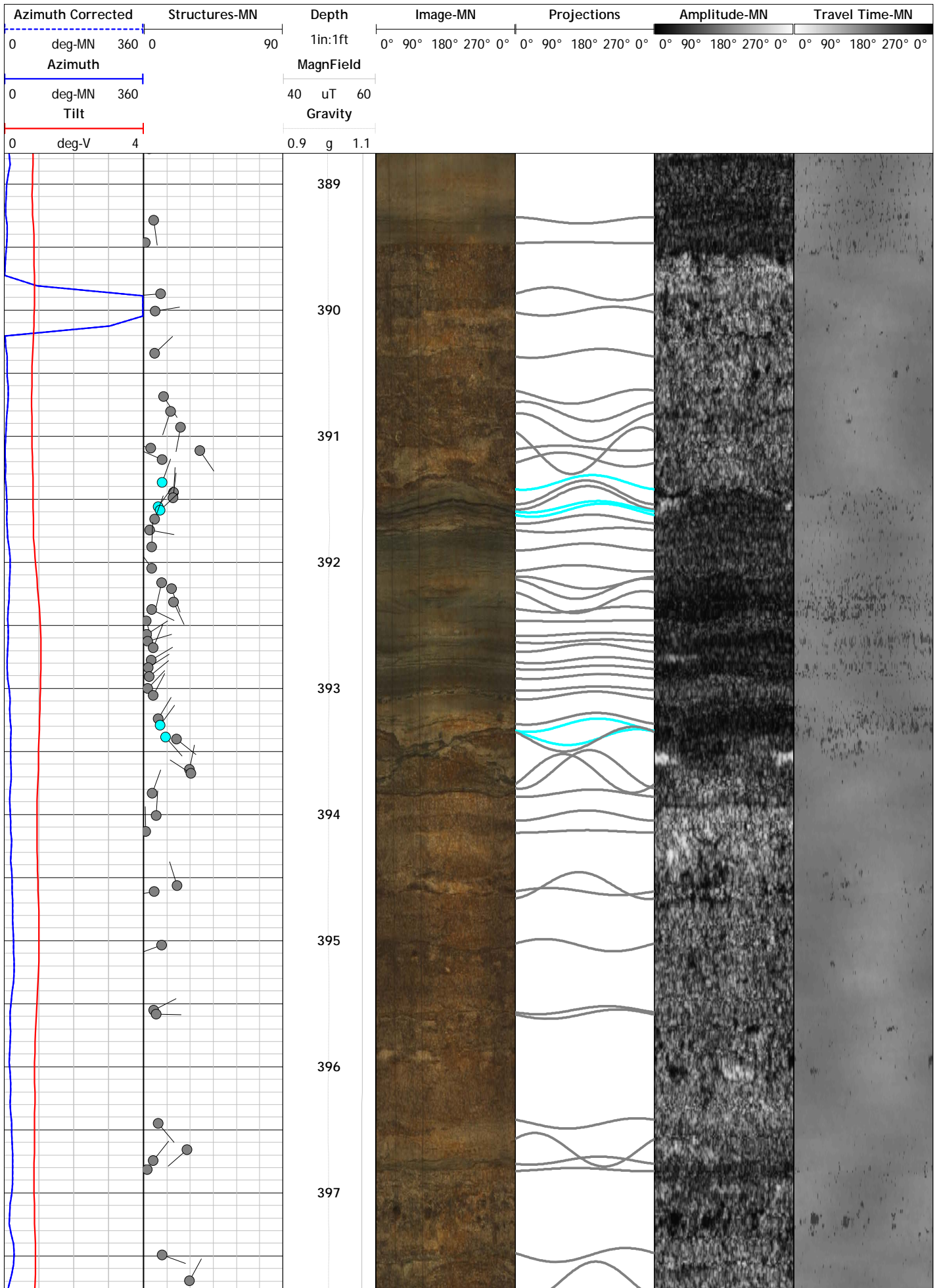


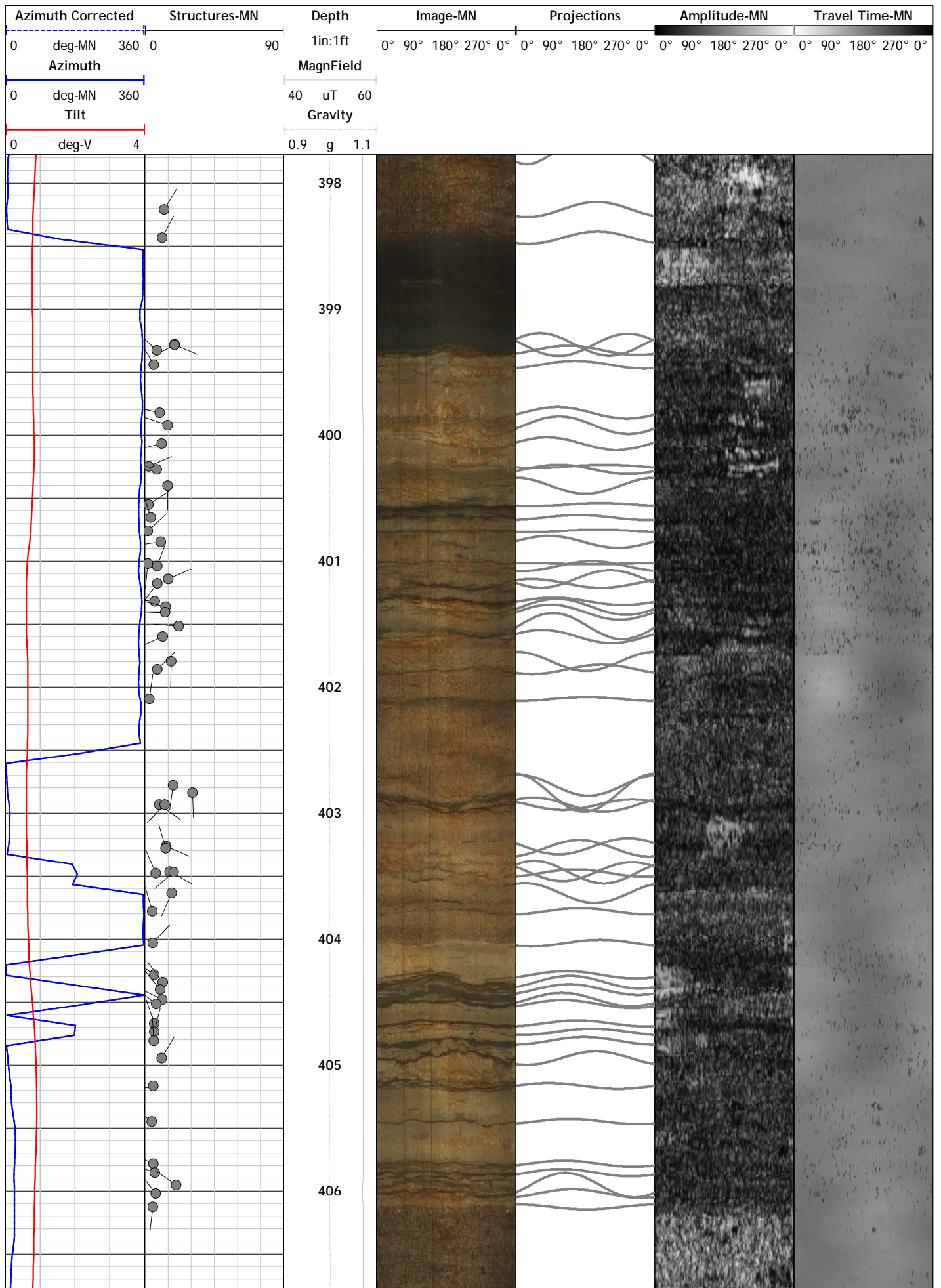


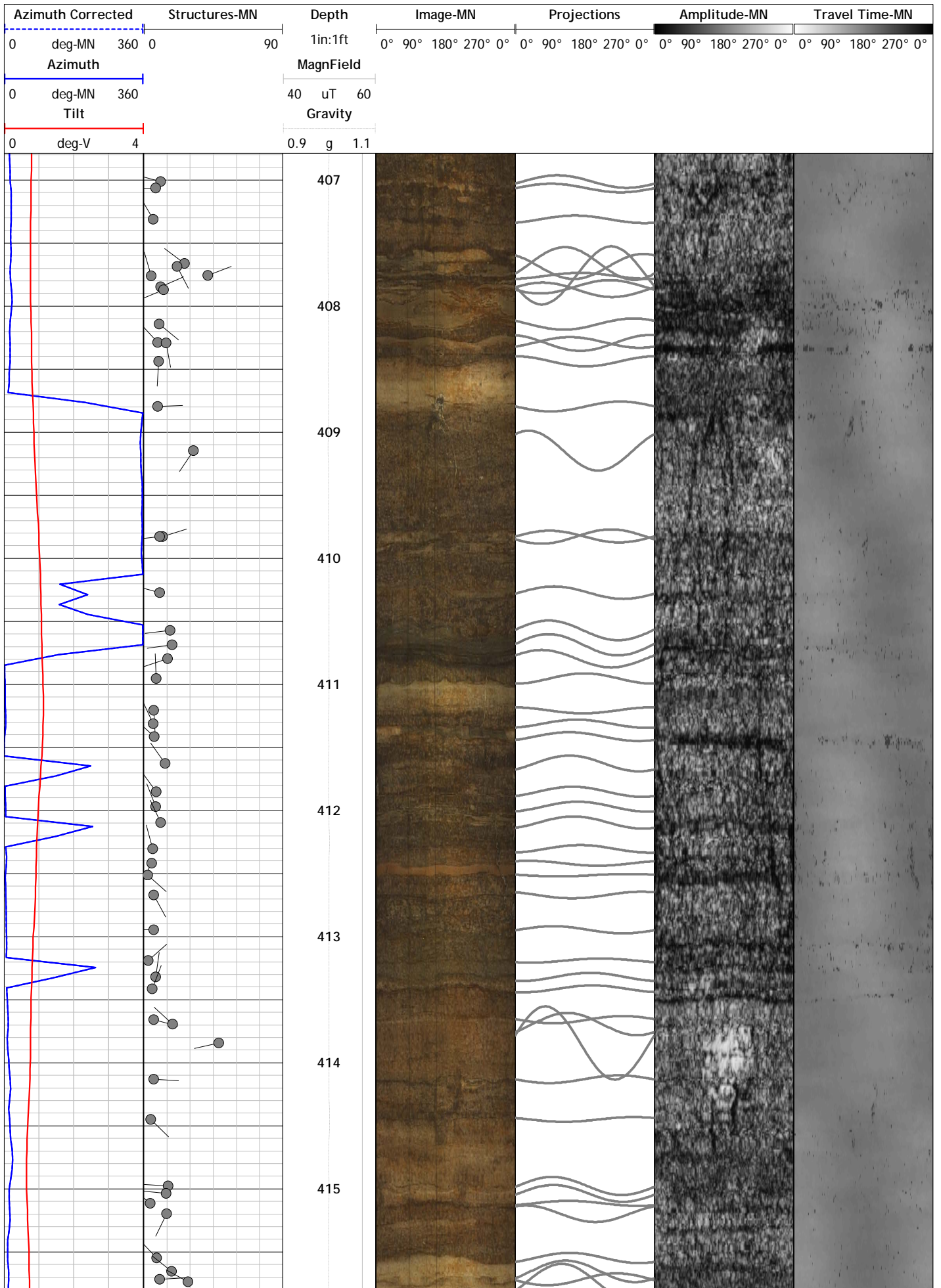


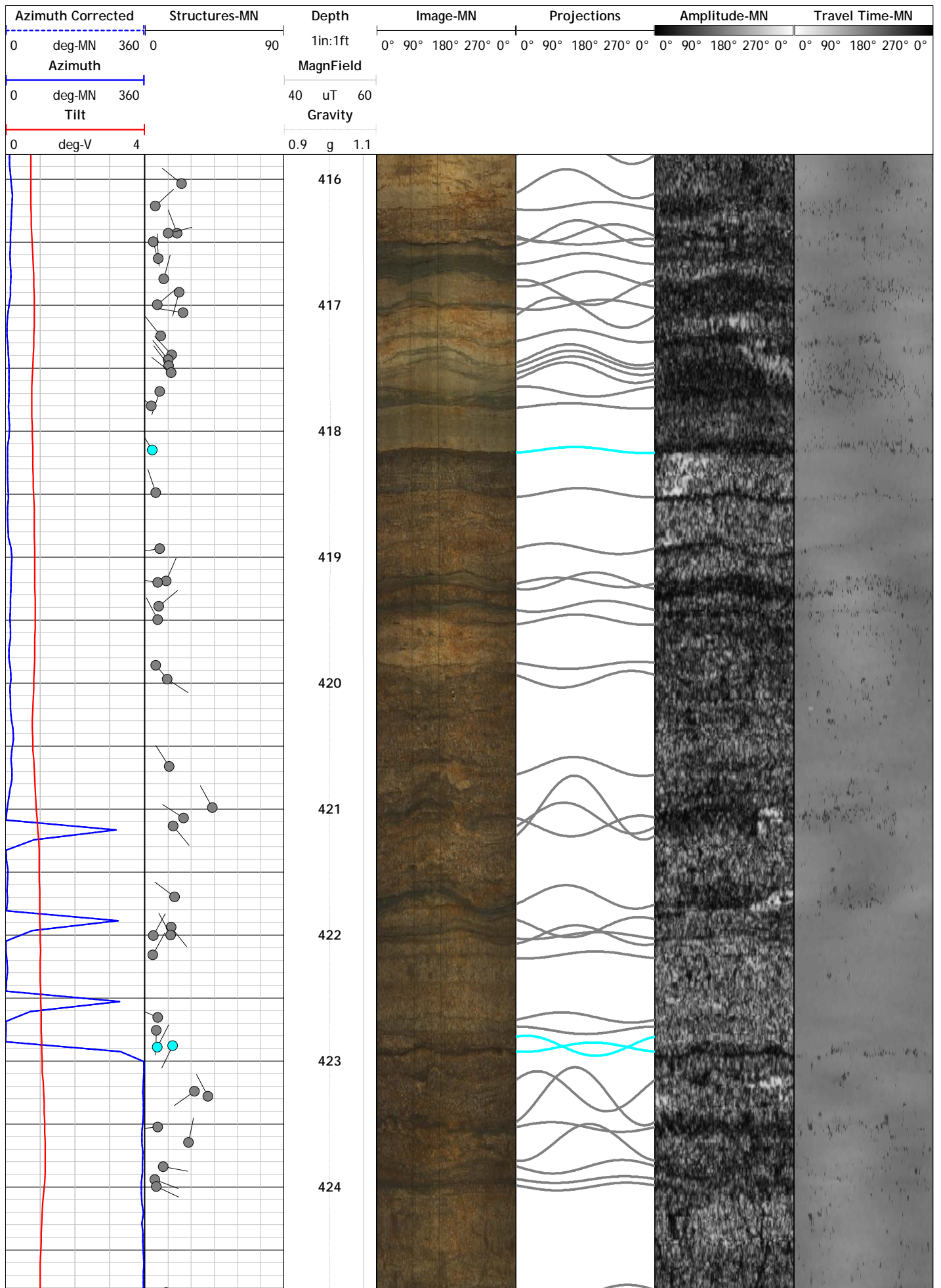


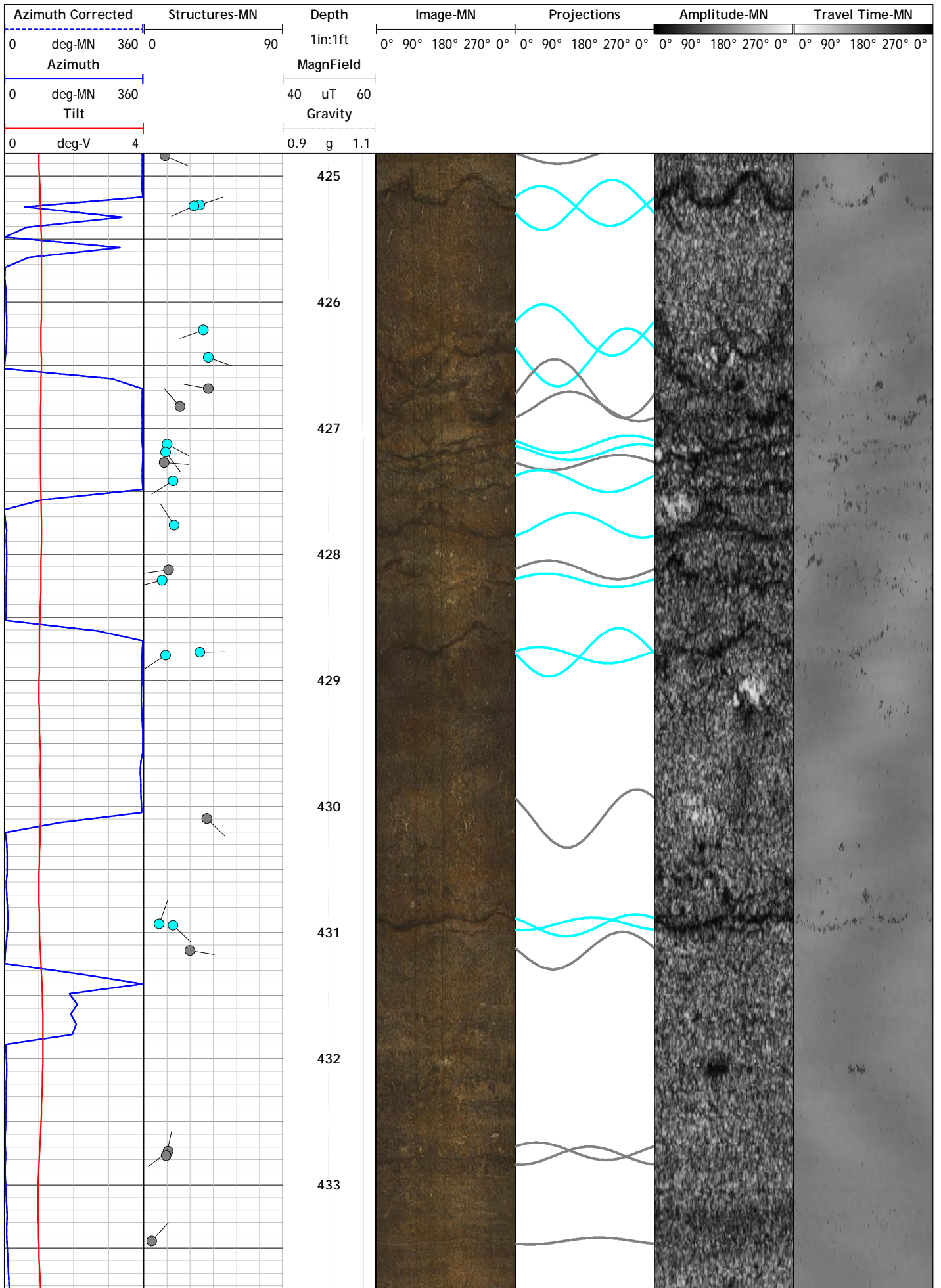


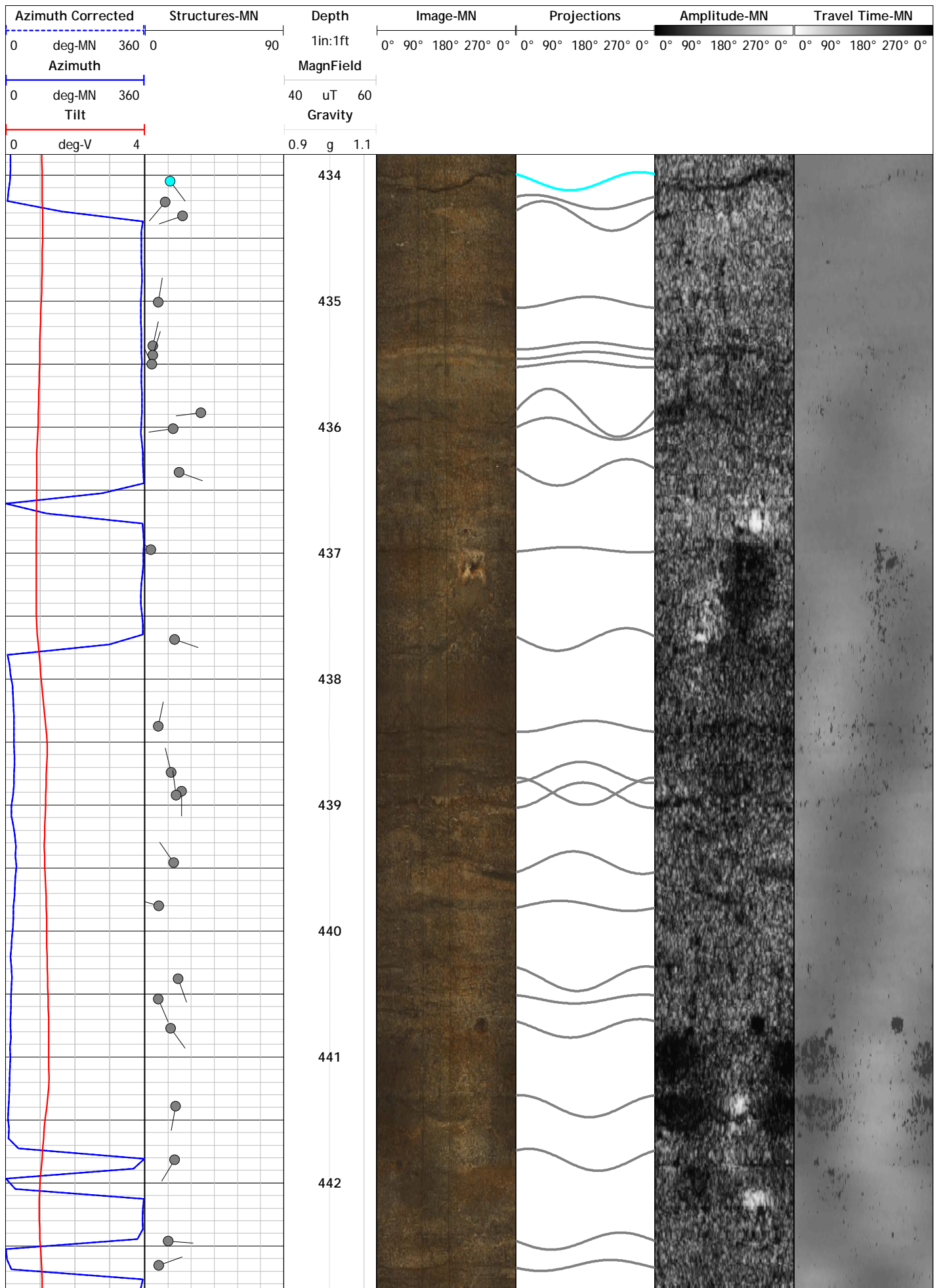


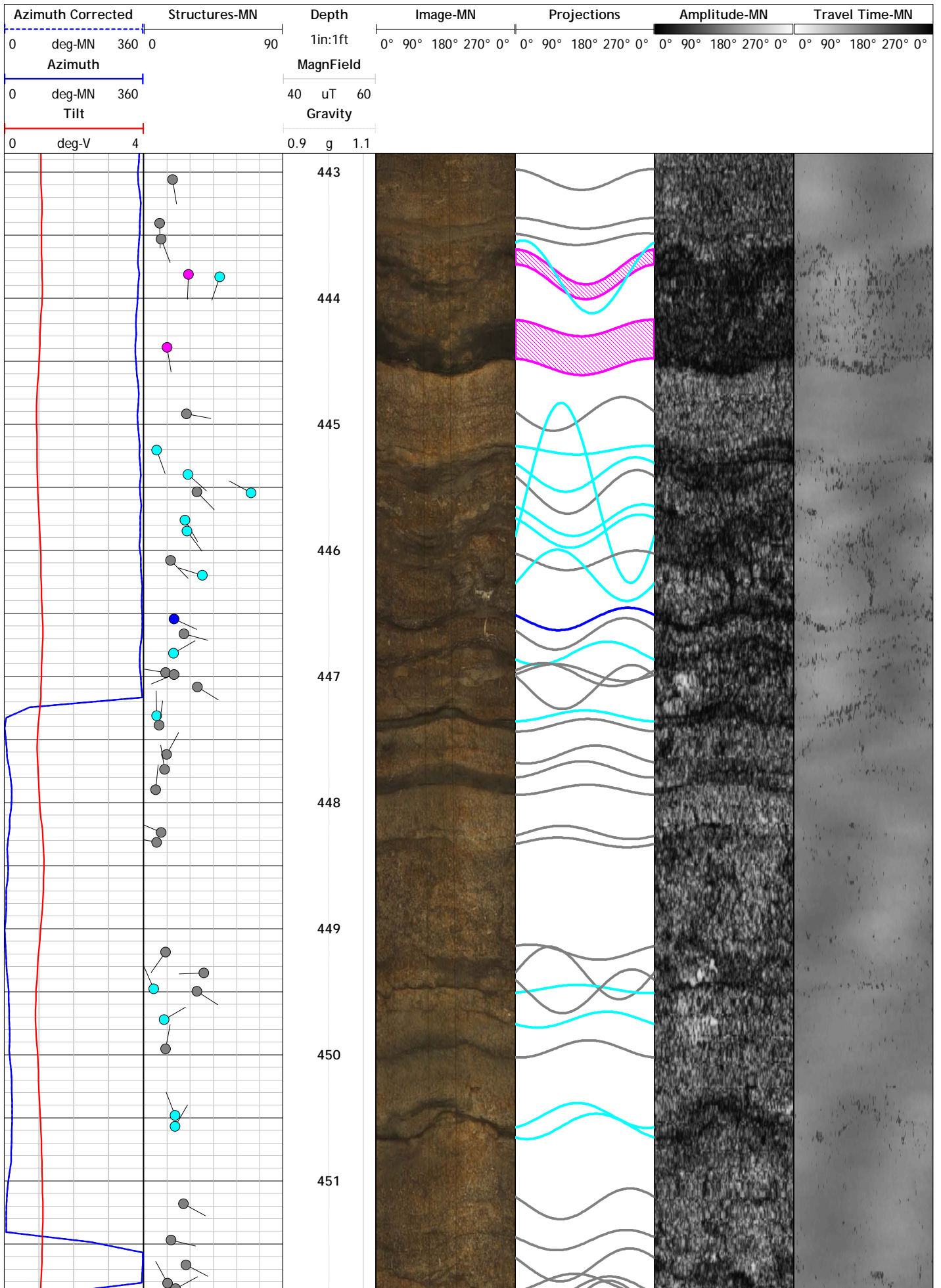


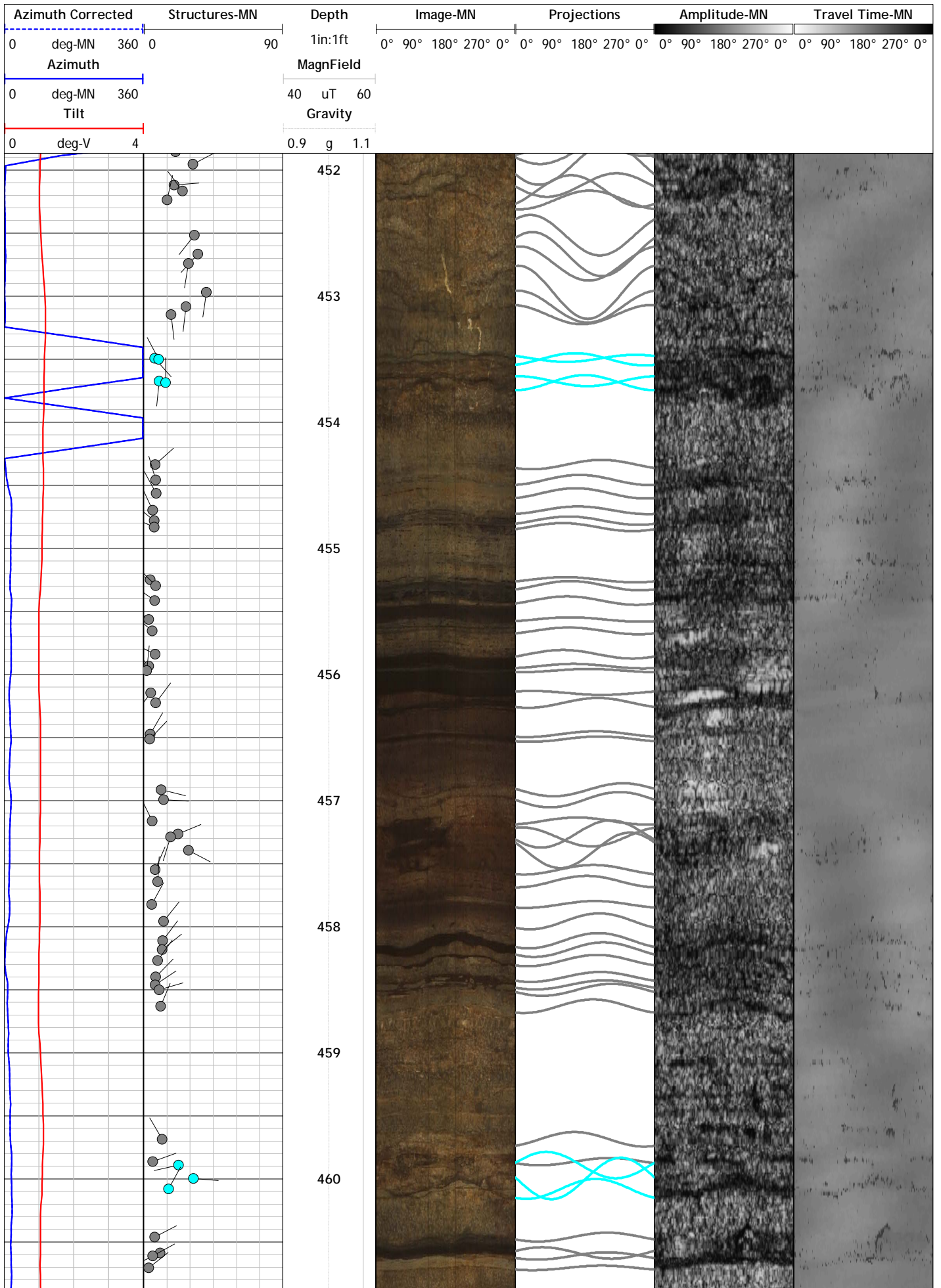


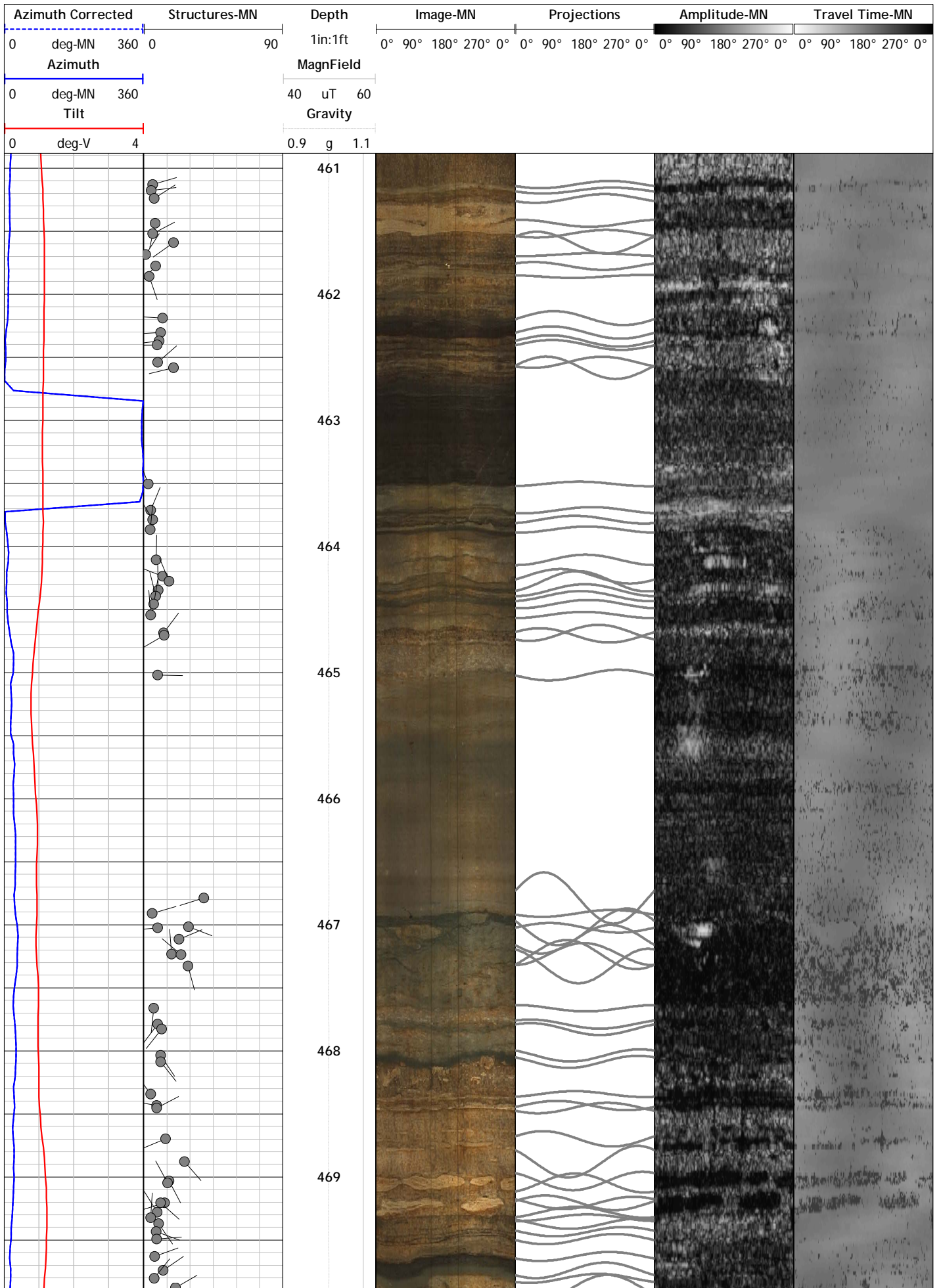


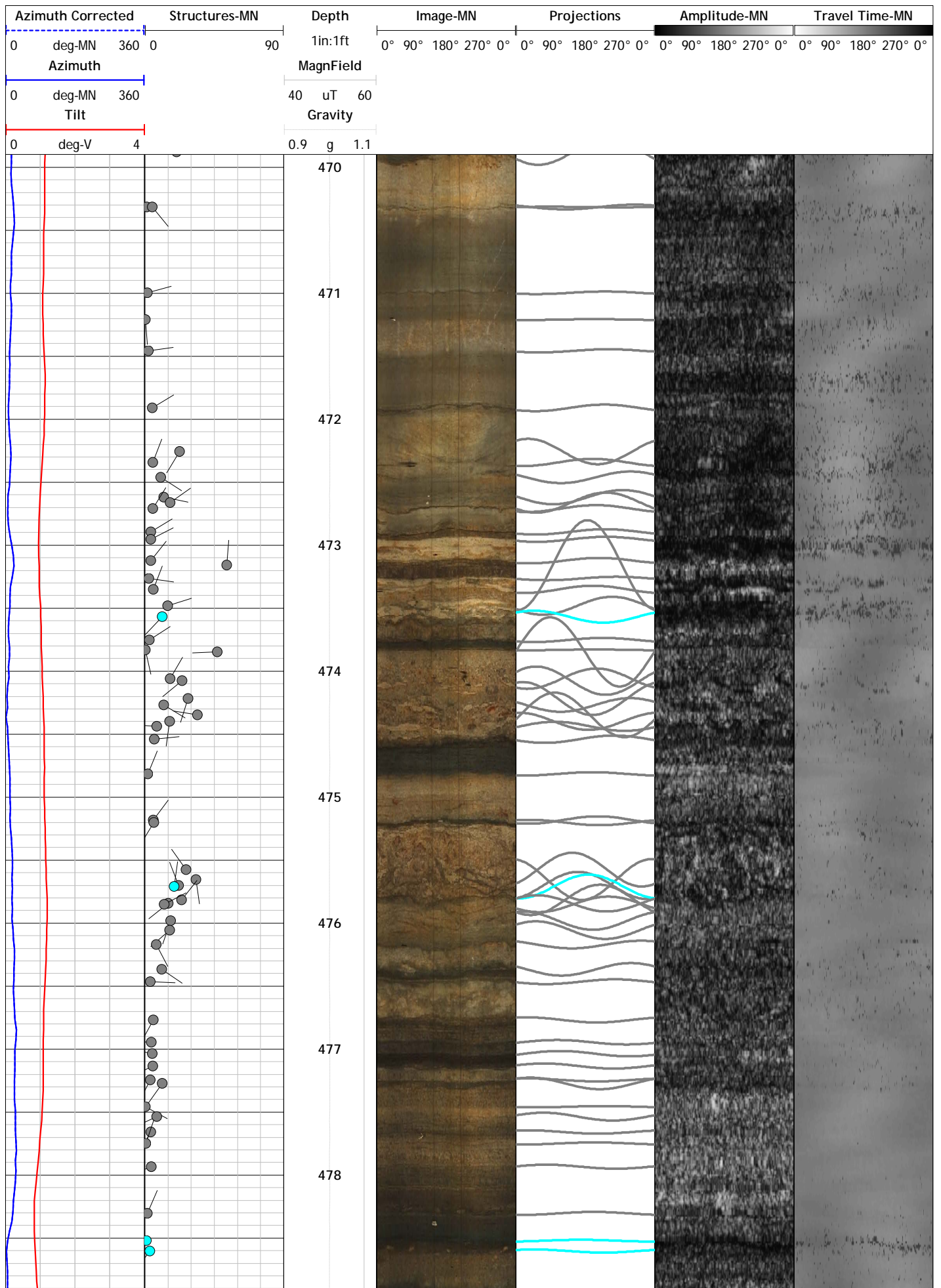


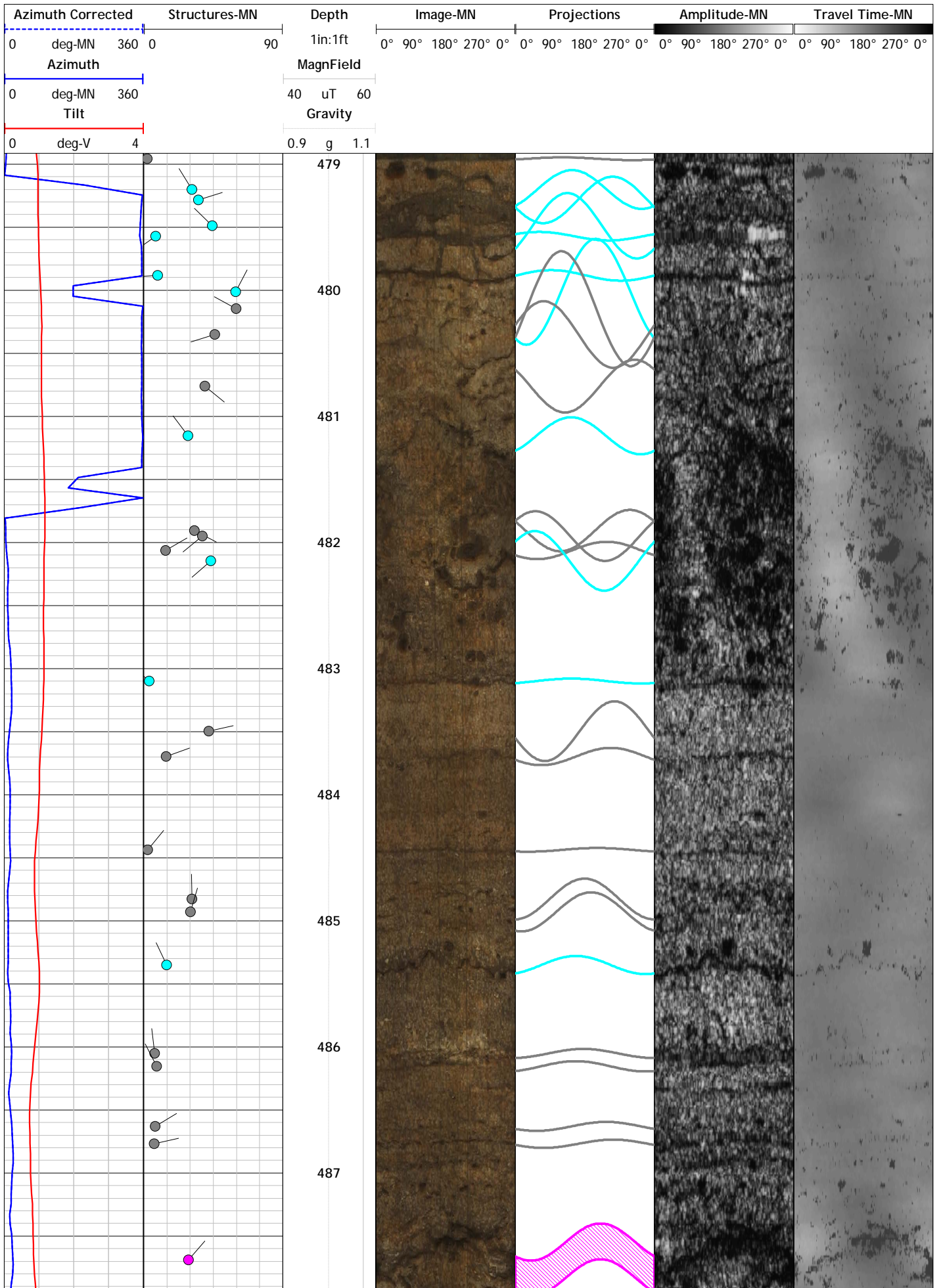


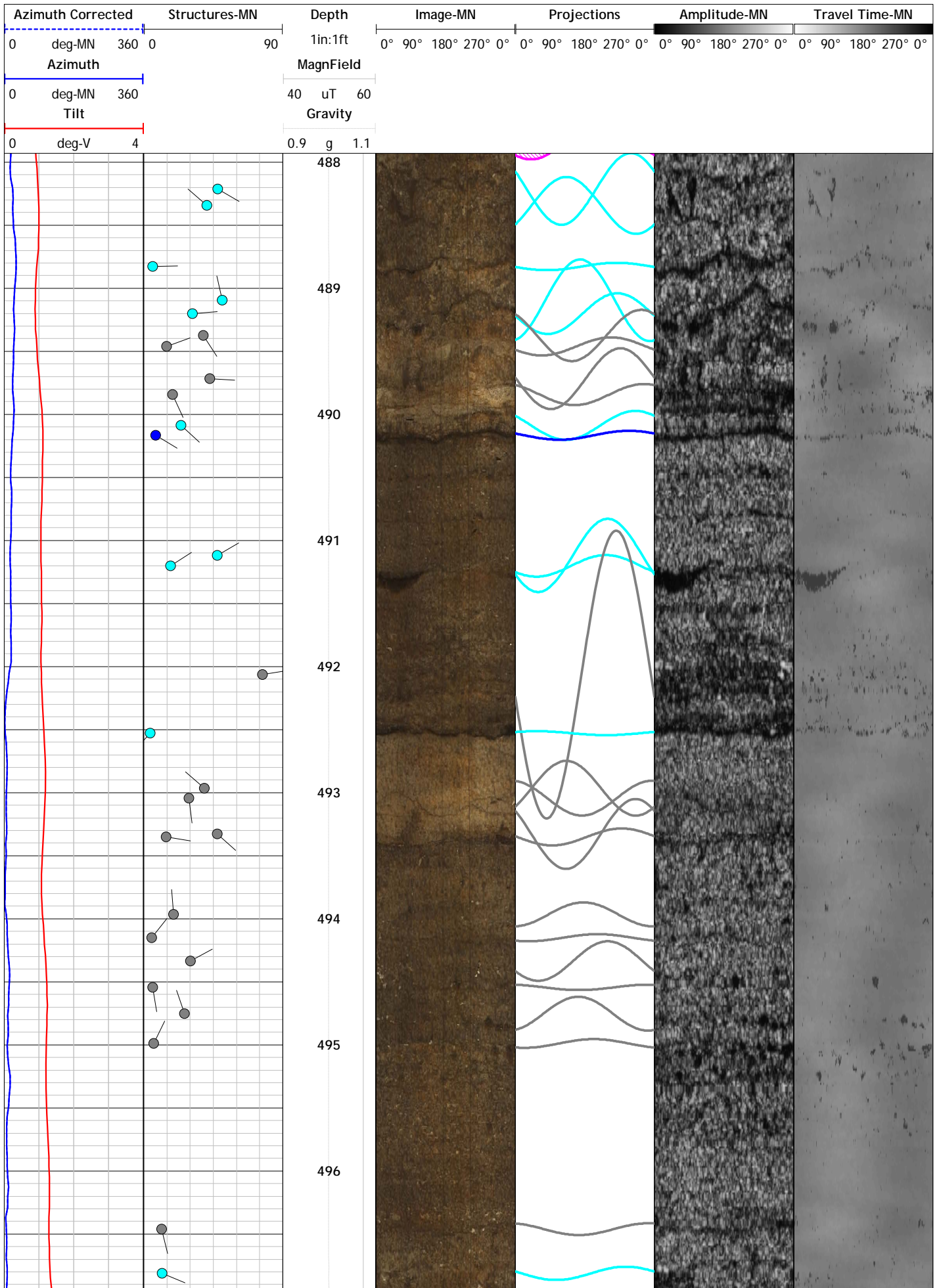


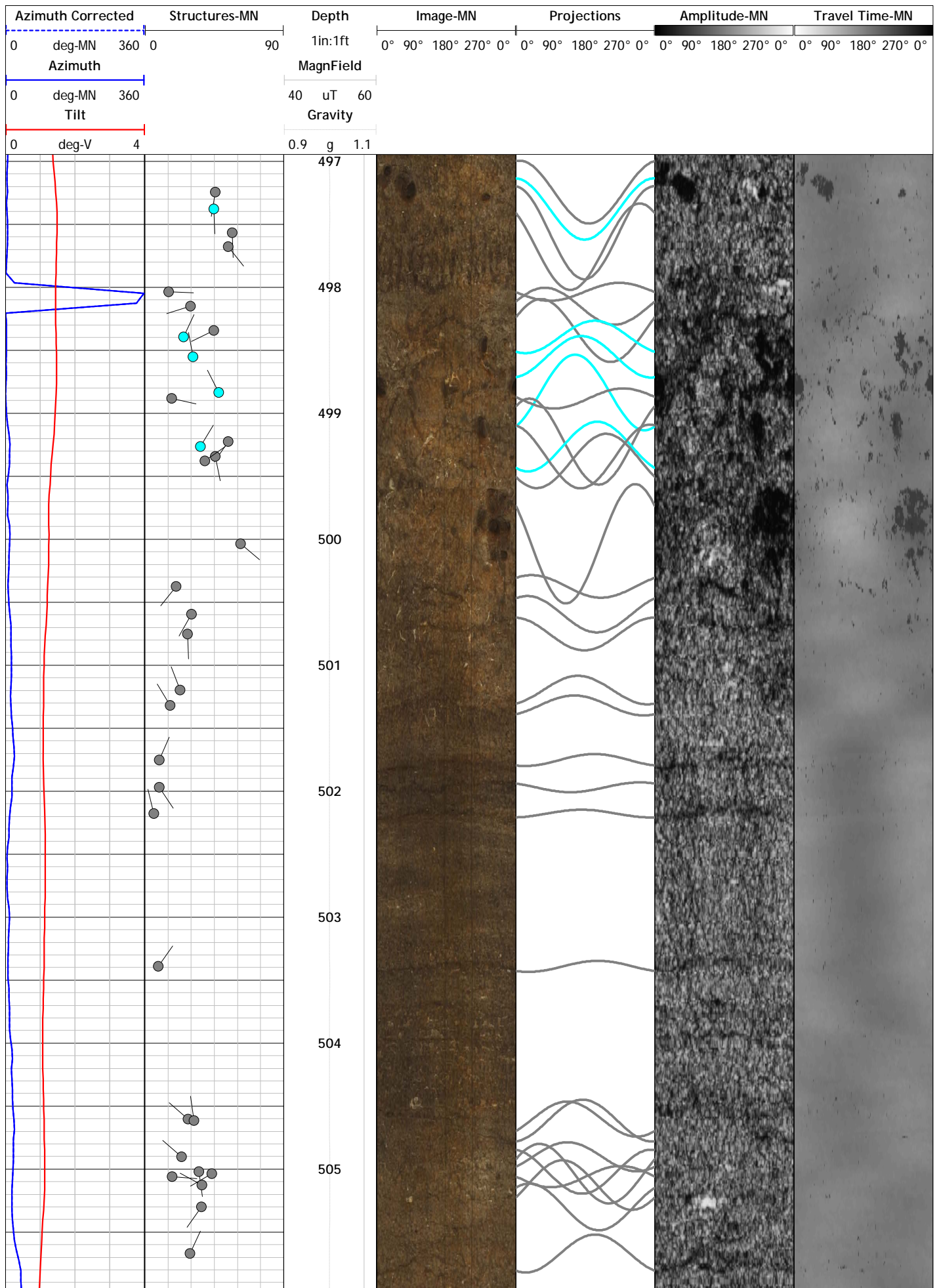


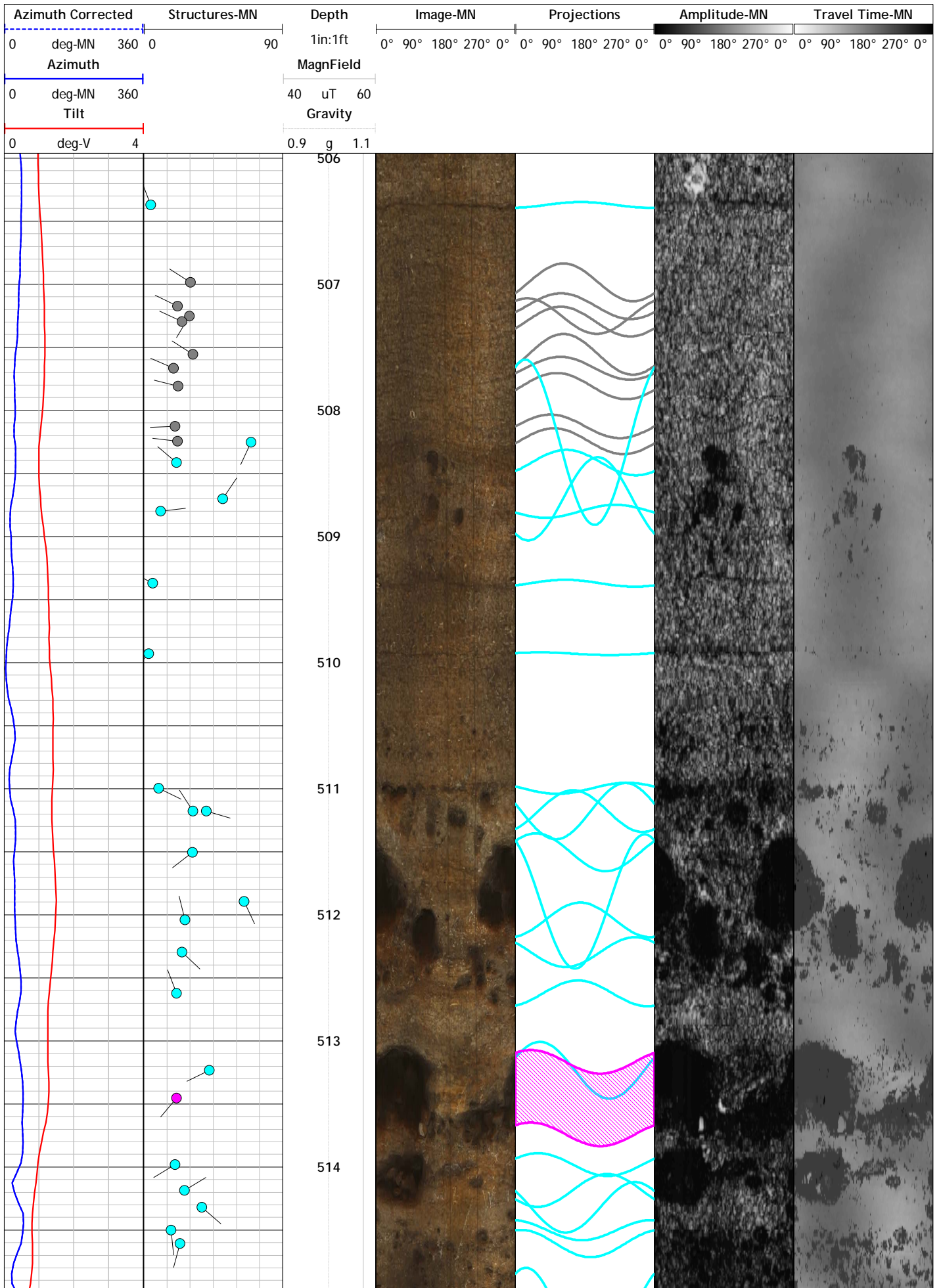


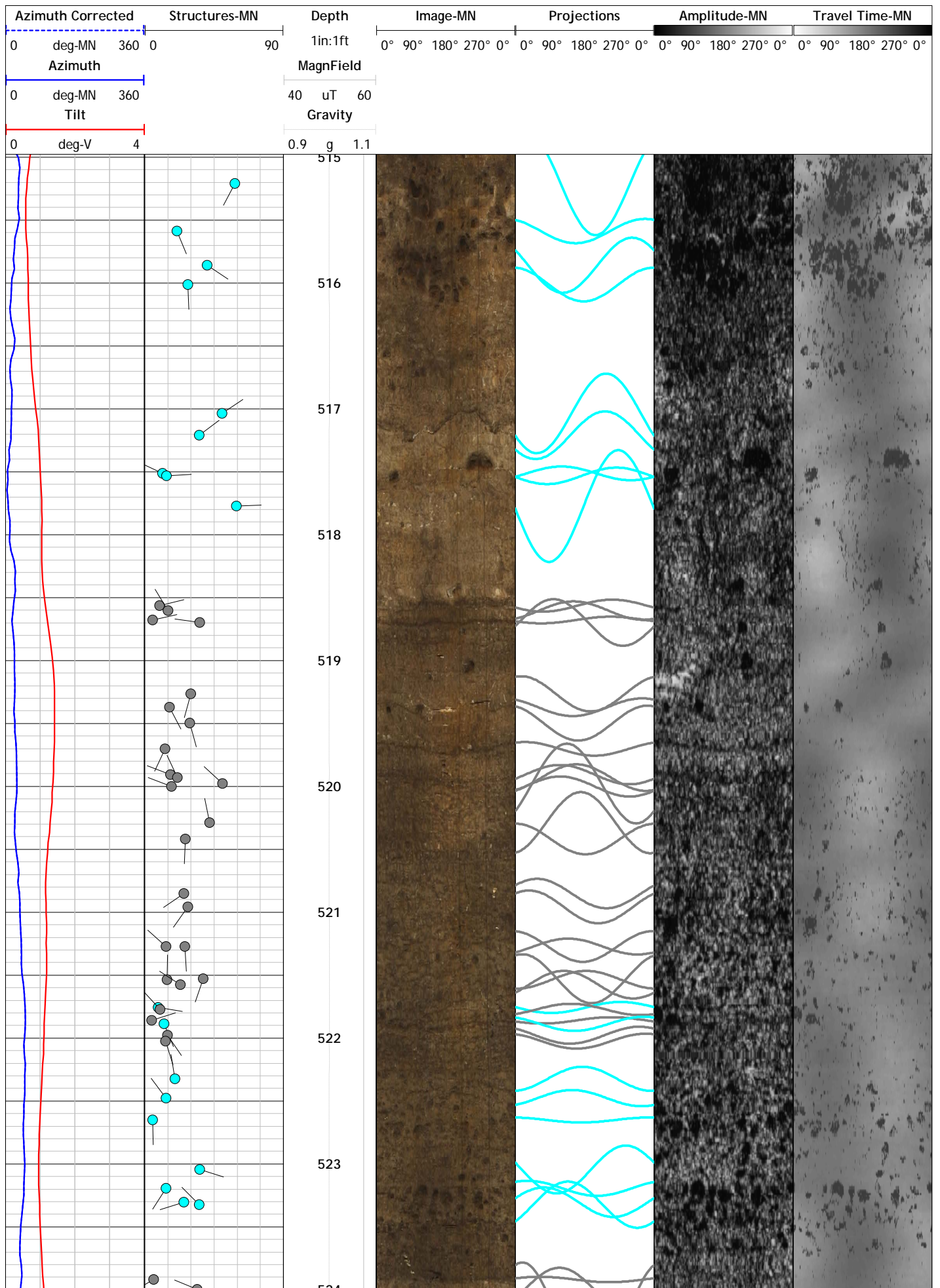


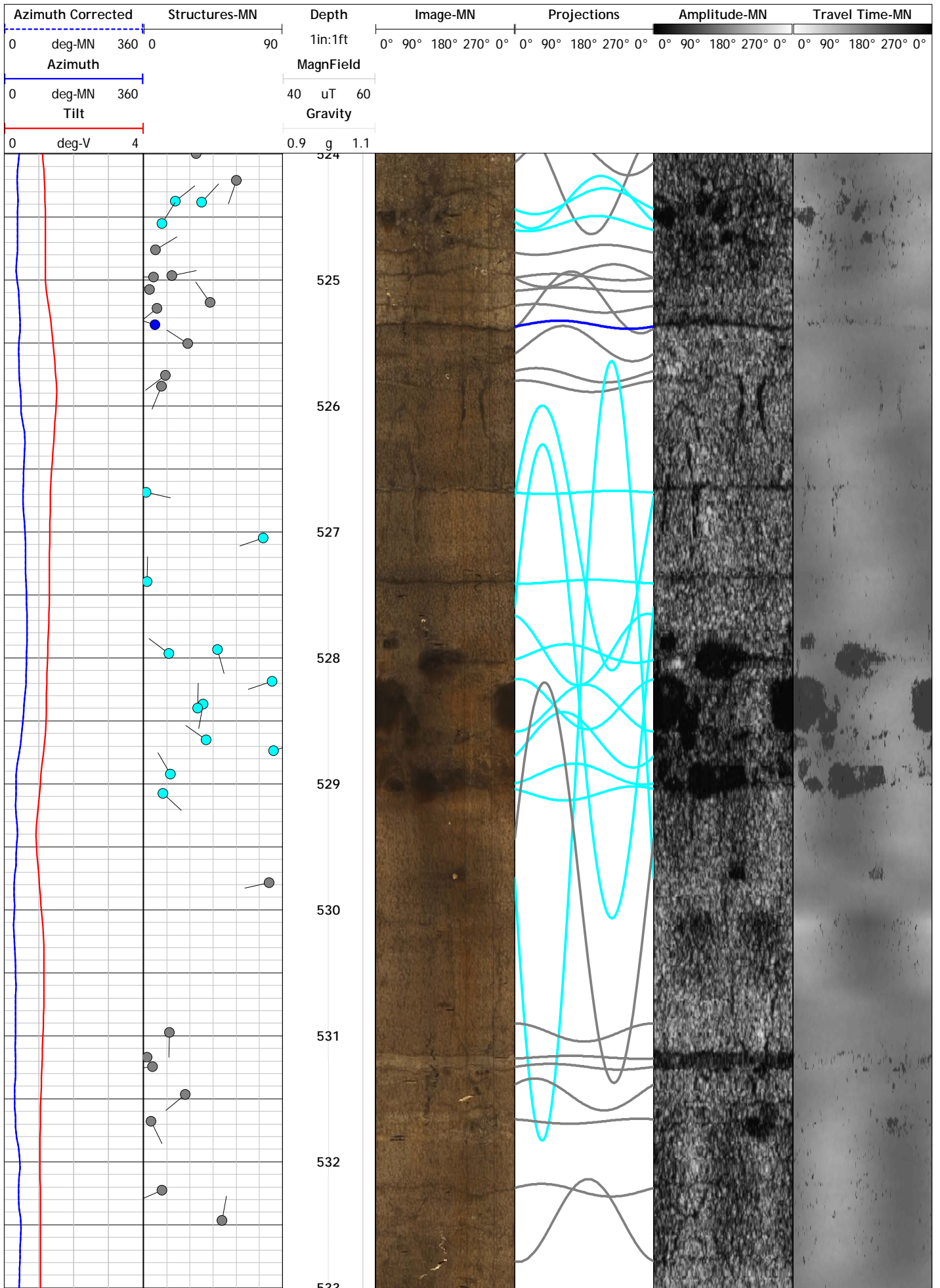


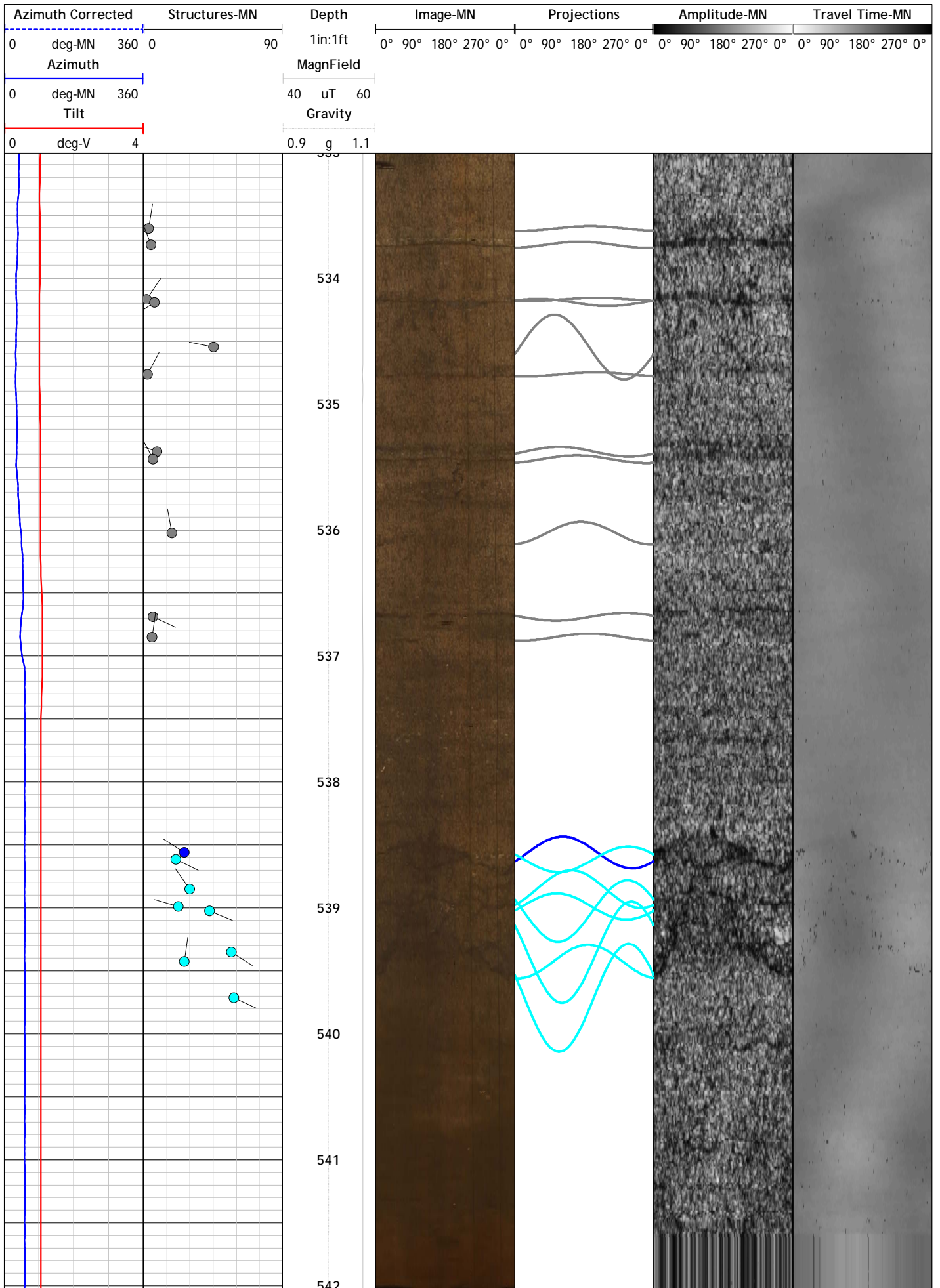




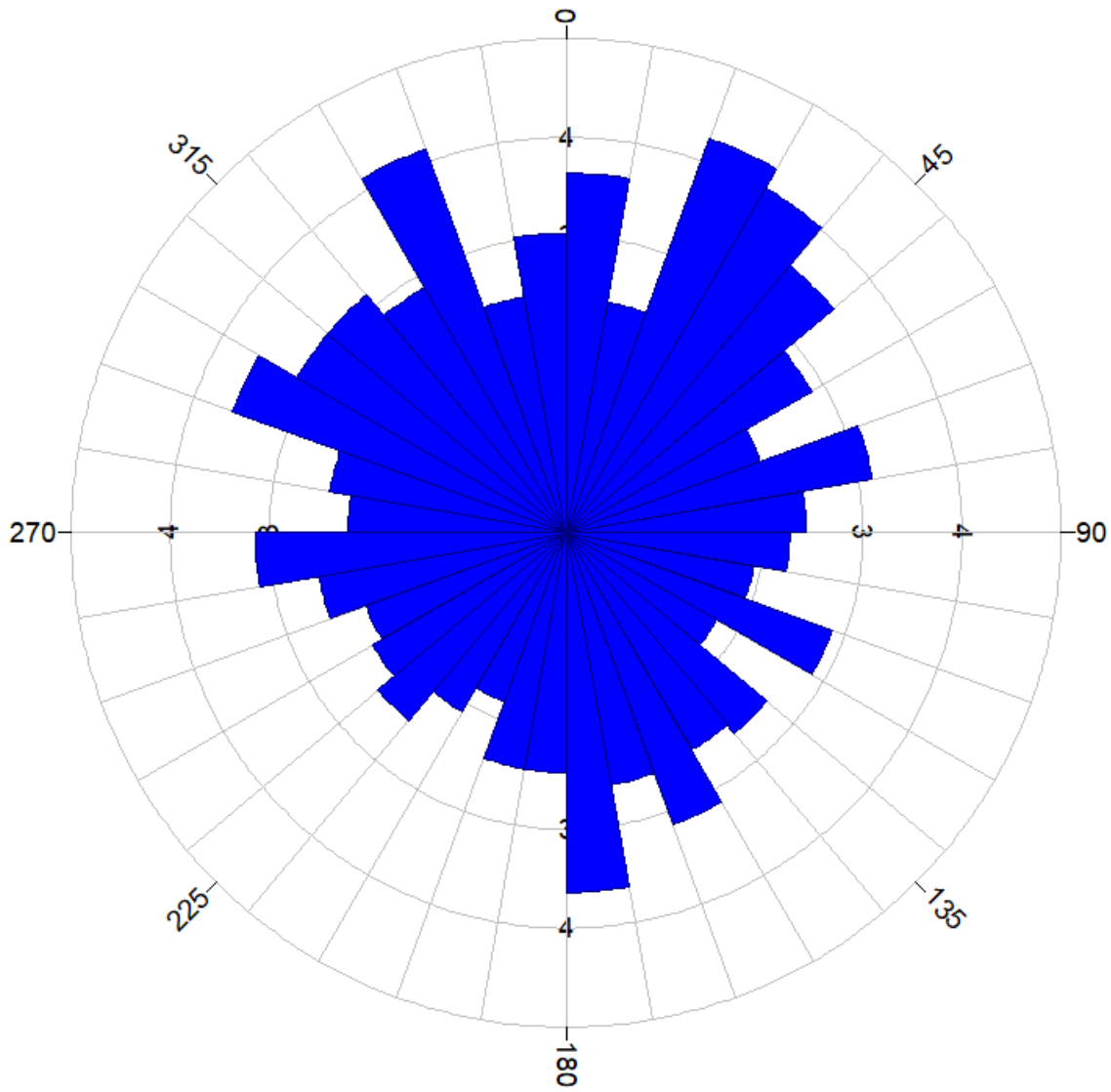






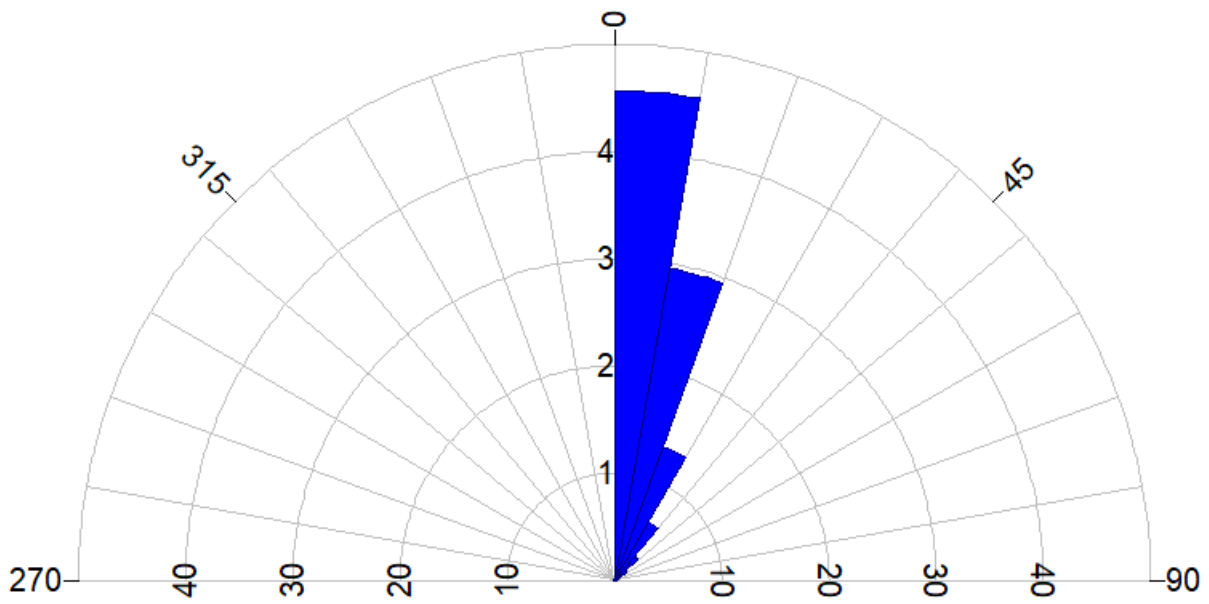


Rose Diagram - Dip Directions
Televiewer Image Features
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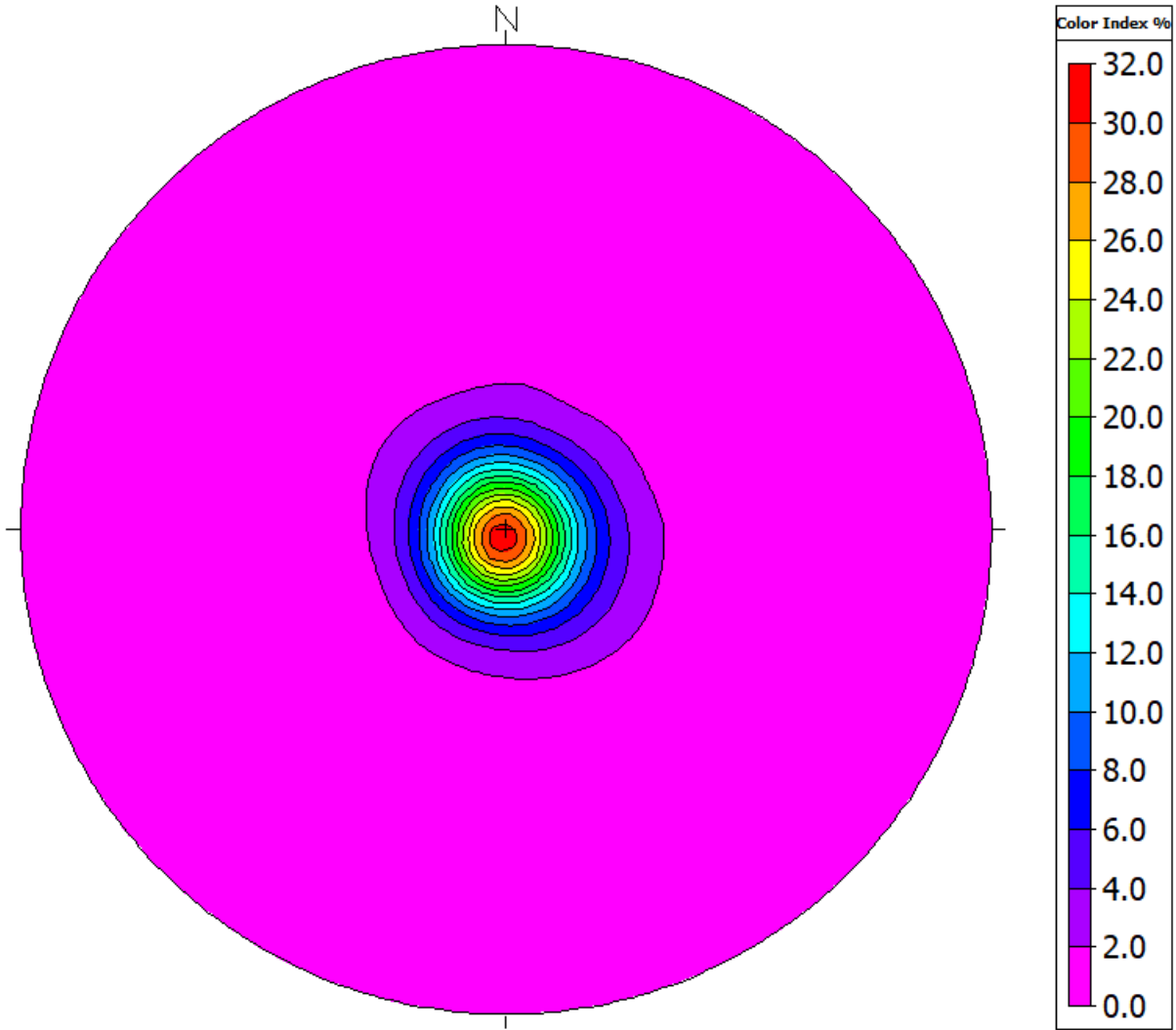
All directions are with respect to magnetic north.

Rose Diagram - Dip Angles
Televiewer Image Features
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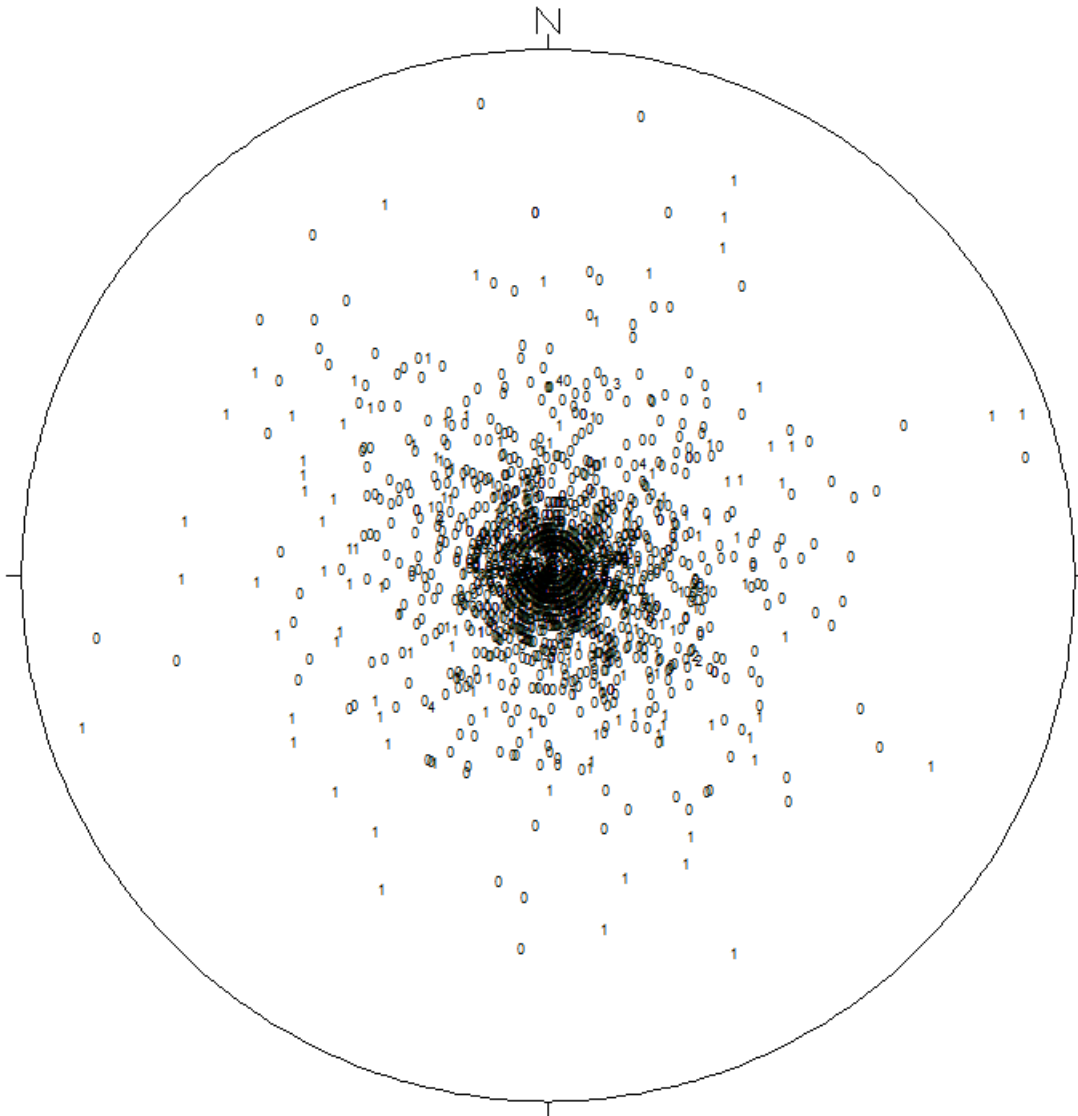
All directions are with respect to magnetic north.

Stereonet Diagram - Schmidt Projection
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All directions are with respect to magnetic north.

Stereonet Diagram - Schmidt Projection
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All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1	56.80	186.4	201	44	0	0
2	56.81	186.4	19	5	0	0
3	56.85	186.5	18	5	0	0
4	56.90	186.7	234	7	0	0
5	56.95	186.8	176	3	0	0
6	56.96	186.9	15	8	0	0
7	57.01	187.0	315	20	0	0
8	57.05	187.2	318	6	0	0
9	57.12	187.4	69	10	0	0
10	57.28	187.9	17	5	0	0
11	57.28	187.9	218	25	0	0
12	57.41	188.4	54	4	0	0
13	57.52	188.7	193	31	0	0
14	57.60	189.0	218	3	0	0
15	57.89	189.9	326	43	0	0
16	57.91	190.0	84	40	0	0
17	57.94	190.1	89	21	0	0
18	57.94	190.1	260	12	0	0
19	58.06	190.5	102	10	0	0
20	58.09	190.6	76	24	0	0
21	58.15	190.8	320	7	0	0
22	58.16	190.8	152	13	0	0
23	58.21	191.0	124	53	0	0
24	58.23	191.0	286	4	0	0
25	58.36	191.5	137	18	0	0
26	58.42	191.7	48	1	0	0
27	58.45	191.8	83	4	0	0
28	58.46	191.8	136	55	0	0
29	58.50	191.9	294	10	0	0
30	58.51	192.0	139	19	0	0
31	58.53	192.0	52	3	0	0
32	58.71	192.6	294	25	0	0
33	58.71	192.6	165	13	0	0
34	58.75	192.7	20	10	0	0
35	58.77	192.8	171	3	0	0
36	58.80	192.9	351	1	0	0
37	58.82	193.0	213	4	0	0
38	58.84	193.0	238	10	0	0
39	58.85	193.1	74	3	0	0
40	58.90	193.3	189	3	0	0
41	58.93	193.4	171	7	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
42	58.97	193.5	73	6	0	0
43	59.01	193.6	51	9	0	0
44	59.03	193.7	46	9	0	0
45	59.17	194.1	156	16	0	0
46	59.20	194.2	35	3	0	0
47	59.22	194.3	30	3	0	0
48	59.27	194.5	295	54	0	0
49	59.33	194.7	38	1	0	0
50	59.38	194.8	30	3	0	0
51	59.41	194.9	158	4	0	0
52	59.44	195.0	153	6	0	0
53	59.52	195.3	176	8	0	0
54	59.58	195.5	58	1	0	0
55	59.59	195.5	166	12	0	0
56	59.62	195.6	11	30	0	0
57	59.66	195.7	24	4	0	0
58	59.67	195.8	159	1	0	0
59	59.75	196.0	102	3	0	0
60	59.77	196.1	86	1	0	0
61	59.86	196.4	257	5	0	0
62	59.94	196.7	298	4	0	0
63	59.95	196.7	117	20	0	0
64	60.03	197.0	30	3	0	0
65	60.05	197.0	42	3	0	0
66	60.10	197.2	197	3	0	0
67	60.14	197.3	244	8	0	0
68	60.18	197.4	252	10	0	0
69	60.21	197.5	222	4	0	0
70	60.23	197.6	257	4	0	0
71	60.29	197.8	145	7	0	0
72	60.30	197.8	250	20	0	0
73	60.35	198.0	316	12	0	0
74	60.39	198.1	300	7	0	0
75	60.42	198.2	3	2	0	0
76	60.44	198.3	174	4	0	0
77	60.49	198.5	154	2	0	0
78	60.51	198.5	281	5	0	0
79	60.56	198.7	138	20	0	0
80	60.58	198.7	206	6	0	0
81	60.62	198.9	162	17	0	0
82	60.68	199.1	242	18	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
83	60.68	199.1	109	0	0	0
84	60.71	199.2	4	5	0	0
85	60.74	199.3	173	4	0	0
86	60.79	199.4	26	3	0	0
87	60.85	199.6	251	20	0	0
88	60.88	199.8	262	11	0	0
89	60.90	199.8	257	53	0	0
90	60.92	199.9	236	7	0	0
91	60.95	200.0	180	2	0	0
92	60.98	200.1	114	12	0	0
93	61.02	200.2	175	5	0	0
94	61.07	200.4	255	4	0	0
95	61.11	200.5	234	4	0	0
96	61.14	200.6	199	5	0	0
97	61.16	200.7	192	4	0	0
98	61.17	200.7	86	19	0	0
99	61.17	200.7	255	19	0	0
100	61.22	200.9	298	2	0	0
101	61.33	201.2	1	8	0	0
102	61.39	201.4	2	28	0	0
103	61.42	201.5	157	11	0	0
104	61.46	201.6	131	14	0	0
105	61.49	201.7	24	5	0	0
106	61.54	201.9	26	4	0	0
107	61.56	202.0	73	7	0	0
108	61.65	202.3	37	11	0	0
109	61.68	202.4	33	7	0	0
110	61.69	202.4	191	24	0	0
111	61.75	202.6	18	19	0	0
112	61.77	202.7	181	10	0	0
113	61.87	203.0	170	5	0	0
114	61.92	203.1	24	2	0	0
115	61.98	203.4	32	4	0	0
116	62.05	203.6	28	9	0	0
117	62.08	203.7	111	11	0	0
118	62.13	203.8	152	7	0	0
119	62.22	204.2	26	2	0	0
120	62.23	204.2	144	67	0	0
121	62.39	204.7	23	35	0	0
122	62.47	205.0	143	39	0	0
123	62.48	205.0	43	6	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
124	62.72	205.8	299	7	0	0
125	62.76	205.9	1	5	0	0
126	62.81	206.1	218	12	0	0
127	62.84	206.2	327	12	0	0
128	62.88	206.3	315	25	0	0
129	62.94	206.5	261	10	0	0
130	62.98	206.6	204	28	0	0
131	63.10	207.0	317	41	0	0
132	63.11	207.0	48	33	0	0
133	63.15	207.2	14	4	0	0
134	63.19	207.3	180	2	0	0
135	63.24	207.5	108	18	0	0
136	63.28	207.6	104	22	0	0
137	63.29	207.6	277	46	0	0
138	63.33	207.8	268	5	0	0
139	63.35	207.8	282	12	0	0
140	63.37	207.9	230	7	0	0
141	63.40	208.0	89	12	0	0
142	63.43	208.1	30	9	0	0
143	63.47	208.3	359	6	0	0
144	63.52	208.4	39	4	0	0
145	63.54	208.5	57	1	0	0
146	63.57	208.6	172	1	0	0
147	63.61	208.7	303	9	0	0
148	63.63	208.8	272	15	0	0
149	63.67	208.9	140	5	0	0
150	63.78	209.3	347	36	0	0
151	63.90	209.6	291	22	0	0
152	63.91	209.7	101	13	0	0
153	63.99	209.9	215	24	0	0
154	64.00	210.0	352	4	0	0
155	64.02	210.1	248	61	0	0
156	64.04	210.1	45	3	0	0
157	64.09	210.3	120	7	0	0
158	64.12	210.4	166	4	0	0
159	64.16	210.5	198	15	0	0
160	64.21	210.7	158	23	0	0
161	64.21	210.7	63	5	0	0
162	64.25	210.8	53	1	0	0
163	64.28	210.9	118	6	0	0
164	64.30	211.0	138	12	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
165	64.35	211.1	118	18	0	0
166	64.42	211.3	273	4	0	0
167	64.43	211.4	235	4	0	0
168	64.45	211.5	224	7	0	0
169	64.57	211.8	355	14	0	0
170	64.58	211.9	113	10	0	0
171	64.65	212.1	343	40	0	0
172	64.71	212.3	36	23	0	0
173	64.73	212.4	355	6	0	0
174	64.77	212.5	281	3	0	0
175	64.80	212.6	221	10	0	0
176	64.84	212.7	1	13	0	0
177	64.85	212.8	157	25	0	0
178	64.85	212.8	333	18	0	0
179	64.92	213.0	166	5	0	0
180	65.03	213.3	295	11	0	0
181	65.06	213.5	172	13	0	0
182	65.09	213.5	204	17	0	0
183	65.12	213.6	298	14	0	0
184	65.16	213.8	269	17	0	0
185	65.23	214.0	280	8	0	0
186	65.26	214.1	266	5	0	0
187	65.30	214.3	265	11	0	0
188	65.34	214.4	313	16	0	0
189	65.40	214.6	89	10	0	0
190	65.41	214.6	66	9	0	0
191	65.44	214.7	23	4	0	0
192	65.49	214.9	20	11	0	0
193	65.52	215.0	116	12	0	0
194	65.56	215.1	78	11	0	0
195	65.65	215.4	96	6	0	1
196	65.73	215.7	35	17	0	0
197	65.75	215.7	75	4	0	0
198	65.77	215.8	46	10	0	0
199	65.81	215.9	41	2	0	0
200	65.83	216.0	127	7	0	0
201	65.85	216.0	187	3	0	0
202	65.86	216.1	91	24	0	0
203	65.94	216.4	27	2	0	0
204	65.97	216.4	12	3	0	0
205	66.00	216.5	37	1	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
206	66.01	216.6	216	7	0	0
207	66.04	216.7	323	4	0	0
208	66.08	216.8	232	5	0	0
209	66.12	216.9	18	2	0	0
210	66.15	217.0	306	6	0	0
211	66.18	217.1	300	6	0	0
212	66.21	217.2	172	6	0	0
213	66.25	217.4	54	1	0	0
214	66.28	217.5	311	3	0	0
215	66.32	217.6	254	4	0	0
216	66.33	217.6	223	5	0	0
217	66.35	217.7	236	3	0	0
218	66.37	217.8	207	2	0	0
219	66.44	218.0	251	2	0	0
220	66.48	218.1	341	10	0	0
221	66.49	218.2	338	9	0	0
222	66.53	218.3	341	9	0	0
223	66.59	218.5	53	9	0	0
224	66.64	218.6	146	8	0	0
225	66.68	218.8	269	8	0	0
226	66.71	218.9	355	4	0	0
227	66.76	219.0	149	14	0	0
228	66.82	219.2	111	27	0	0
229	66.85	219.3	231	27	0	0
230	66.87	219.4	148	26	0	0
231	66.96	219.7	310	15	0	0
232	67.06	220.0	305	25	0	0
233	67.09	220.1	169	11	0	0
234	67.14	220.3	227	23	0	0
235	67.15	220.3	3	19	0	0
236	67.17	220.4	184	29	0	0
237	67.17	220.4	34	21	0	0
238	67.21	220.5	58	12	0	0
239	67.31	220.8	32	36	0	0
240	67.35	221.0	14	23	0	0
241	67.39	221.1	327	27	0	0
242	67.43	221.2	134	23	0	0
243	67.51	221.5	97	3	0	0
244	67.57	221.7	73	0	0	0
245	67.58	221.7	49	1	0	0
246	67.67	222.0	96	4	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
247	67.74	222.2	178	13	0	0
248	67.76	222.3	195	10	0	0
249	67.77	222.3	184	7	0	0
250	67.79	222.4	190	6	0	0
251	67.81	222.5	170	8	0	0
252	67.85	222.6	190	7	0	0
253	67.87	222.7	164	15	0	0
254	67.89	222.8	174	3	0	0
255	67.91	222.8	143	3	0	0
256	67.95	222.9	125	22	0	0
257	68.00	223.1	302	11	0	0
258	68.10	223.4	280	19	0	0
259	68.15	223.6	270	31	0	0
260	68.21	223.8	254	28	0	0
261	68.23	223.8	244	14	0	0
262	68.29	224.1	49	5	0	0
263	68.39	224.4	1	9	0	0
264	68.40	224.4	33	36	0	0
265	68.47	224.7	191	4	0	0
266	68.54	224.9	187	25	0	0
267	68.55	224.9	354	16	0	0
268	68.56	225.0	293	17	0	0
269	68.60	225.1	147	8	0	0
270	68.71	225.4	185	10	0	0
271	68.72	225.5	312	24	0	0
272	68.82	225.8	266	15	0	0
273	68.85	225.9	152	6	0	0
274	68.87	225.9	158	18	0	0
275	68.93	226.1	194	15	0	0
276	68.94	226.2	210	3	0	0
277	69.00	226.4	30	9	0	0
278	69.03	226.5	355	12	0	0
279	69.22	227.1	278	10	0	0
280	69.24	227.2	293	12	0	0
281	69.28	227.3	292	15	0	0
282	69.34	227.5	262	4	0	0
283	69.37	227.6	181	4	0	0
284	69.40	227.7	23	4	0	0
285	69.49	228.0	261	29	0	1
286	69.50	228.0	44	29	0	0
287	69.54	228.2	22	12	0	2

All directions are with respect to magnetic north.



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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
288	69.64	228.5	23	5	0	2
289	69.68	228.6	123	6	0	1
290	69.71	228.7	168	6	0	1
291	69.76	228.9	150	3	0	1
292	69.80	229.0	330	4	0	0
293	69.95	229.5	205	4	0	1
294	69.99	229.6	45	9	0	1
295	70.04	229.8	40	7	0	2
296	70.08	229.9	185	2	0	0
297	70.12	230.0	355	5	0	0
298	70.18	230.3	296	5	0	0
299	70.27	230.5	313	18	0	0
300	70.30	230.6	333	8	0	0
301	70.33	230.7	29	4	0	0
302	70.35	230.8	326	4	0	0
303	70.40	231.0	189	7	0	0
304	70.45	231.1	168	1	0	0
305	70.47	231.2	32	4	0	0
306	70.53	231.4	312	6	0	0
307	70.56	231.5	91	12	0	0
308	70.60	231.6	109	8	0	0
309	70.67	231.9	86	22	0	0
310	70.72	232.0	113	26	0	0
311	70.78	232.2	100	18	0	0
312	70.86	232.5	159	4	0	0
313	70.94	232.8	215	6	0	0
314	70.97	232.8	291	8	0	0
315	70.99	232.9	249	9	0	0
316	71.02	233.0	300	10	0	0
317	71.07	233.2	141	8	0	0
318	71.10	233.3	341	4	0	0
319	71.17	233.5	173	15	0	0
320	71.30	233.9	278	23	0	0
321	71.30	233.9	42	4	0	1
322	71.33	234.0	275	32	0	0
323	71.38	234.2	288	16	0	1
324	71.42	234.3	295	12	0	1
325	71.47	234.5	292	7	0	1
326	71.55	234.8	352	6	0	0
327	71.57	234.8	242	6	0	0
328	71.62	235.0	230	8	0	0

All directions are with respect to magnetic north.



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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
329	71.62	235.0	85	12	0	0
330	71.66	235.1	11	1	0	0
331	71.69	235.2	25	3	0	0
332	71.82	235.6	298	17	0	0
333	71.84	235.7	106	13	0	0
334	71.88	235.8	45	7	0	0
335	72.05	236.4	313	4	0	0
336	72.08	236.5	7	8	0	0
337	72.24	237.0	25	6	0	0
338	72.30	237.2	291	7	0	1
339	72.35	237.4	163	14	0	1
340	72.40	237.5	255	6	0	0
341	72.47	237.8	30	3	0	0
342	72.49	237.8	135	6	0	0
343	72.53	238.0	30	4	0	0
344	72.70	238.5	246	18	0	0
345	72.76	238.7	273	11	0	0
346	72.80	238.8	156	5	0	0
347	72.91	239.2	154	5	0	0
348	72.94	239.3	158	2	0	0
349	72.96	239.4	168	6	0	0
350	72.98	239.5	166	4	0	0
351	73.02	239.6	27	4	0	0
352	73.05	239.7	38	3	0	0
353	73.07	239.7	170	4	0	0
354	73.09	239.8	159	3	0	0
355	73.11	239.9	161	6	0	0
356	73.13	239.9	160	4	0	0
357	73.16	240.0	170	4	0	1
358	73.23	240.3	124	5	0	0
359	73.26	240.4	252	6	0	0
360	73.29	240.5	166	2	0	0
361	73.31	240.5	48	1	0	0
362	73.35	240.7	231	5	0	0
363	73.38	240.8	335	70	0	1
364	73.42	240.9	60	1	0	0
365	73.50	241.1	7	13	0	0
366	73.58	241.4	203	7	0	0
367	73.65	241.6	178	7	0	1
368	73.66	241.7	178	19	0	1
369	73.72	241.9	244	30	0	1

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
370	73.80	242.1	123	19	0	1
371	73.86	242.3	87	47	0	1
372	73.89	242.4	241	39	0	1
373	74.13	243.2	328	16	0	0
374	74.18	243.4	340	9	0	0
375	74.30	243.8	32	7	0	0
376	74.33	243.9	262	3	0	0
377	74.60	244.8	184	4	0	0
378	74.63	244.9	126	9	0	0
379	74.65	244.9	129	11	0	0
380	74.87	245.7	16	5	0	0
381	74.92	245.8	298	16	0	0
382	74.97	246.0	291	26	0	0
383	75.02	246.1	178	5	0	0
384	75.08	246.3	73	25	0	0
385	75.13	246.5	86	29	0	0
386	75.15	246.6	94	26	0	0
387	75.23	246.8	6	7	0	0
388	75.27	247.0	333	15	0	0
389	75.39	247.4	204	12	0	0
390	75.44	247.5	193	4	0	0
391	75.51	247.8	242	4	0	0
392	75.55	247.9	92	4	0	0
393	75.61	248.1	67	6	0	0
394	75.64	248.2	77	5	0	0
395	75.74	248.5	136	4	0	0
396	75.79	248.7	59	7	0	0
397	75.80	248.7	59	14	0	0
398	75.83	248.8	75	4	0	0
399	75.86	248.9	75	19	0	0
400	75.87	248.9	29	11	0	0
401	75.91	249.0	231	5	0	0
402	75.97	249.3	306	7	0	0
403	76.03	249.5	8	5	0	0
404	76.12	249.7	11	2	0	0
405	76.15	249.8	334	4	0	0
406	76.17	249.9	6	5	0	0
407	76.17	249.9	208	3	0	0
408	76.21	250.0	272	12	0	0
409	76.24	250.1	332	6	0	0
410	76.28	250.3	254	3	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
411	76.32	250.4	160	11	0	0
412	76.38	250.6	2	5	0	0
413	76.49	251.0	112	23	0	0
414	76.59	251.3	44	23	0	0
415	76.60	251.3	242	20	0	0
416	76.70	251.6	353	6	0	0
417	76.74	251.8	159	6	0	0
418	77.03	252.7	351	18	0	0
419	77.11	253.0	22	4	0	0
420	77.36	253.8	208	13	0	0
421	77.44	254.1	329	11	0	0
422	77.46	254.1	110	9	0	0
423	77.69	254.9	19	5	0	0
424	77.72	255.0	11	7	0	0
425	77.75	255.1	322	14	0	0
426	77.84	255.4	335	21	0	0
427	77.92	255.7	131	6	0	0
428	77.97	255.8	161	15	0	0
429	78.02	256.0	305	5	0	0
430	78.06	256.1	41	3	0	0
431	78.17	256.5	12	10	0	0
432	78.27	256.8	69	6	0	0
433	78.44	257.4	191	4	0	0
434	78.48	257.5	27	8	0	0
435	78.55	257.7	307	4	0	0
436	78.58	257.8	176	3	0	0
437	79.01	259.2	171	4	0	0
438	79.10	259.5	202	5	0	0
439	79.27	260.1	21	7	0	0
440	79.42	260.6	337	4	0	0
441	79.45	260.7	270	3	0	0
442	79.49	260.8	164	4	0	0
443	79.57	261.1	173	4	0	0
444	79.59	261.1	71	1	0	0
445	79.60	261.2	30	2	0	0
446	79.61	261.2	272	4	0	0
447	79.65	261.3	224	5	0	0
448	79.68	261.4	35	2	0	0
449	79.68	261.4	41	3	0	0
450	79.73	261.6	17	12	0	0
451	79.74	261.6	184	8	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
452	79.77	261.7	223	7	0	0
453	79.81	261.9	211	3	0	0
454	79.85	262.0	193	9	0	0
455	79.90	262.1	239	8	0	0
456	79.99	262.5	309	4	0	0
457	80.02	262.5	301	3	0	0
458	80.06	262.7	303	4	0	0
459	80.13	262.9	285	5	0	0
460	80.27	263.4	358	6	0	0
461	80.33	263.6	71	16	0	0
462	80.37	263.7	125	6	0	0
463	80.51	264.1	344	3	0	0
464	80.62	264.5	162	2	0	0
465	80.67	264.7	356	7	0	0
466	80.70	264.8	158	5	0	0
467	80.76	265.0	159	9	0	0
468	80.83	265.2	356	4	0	0
469	80.99	265.7	302	8	0	0
470	81.01	265.8	332	11	0	0
471	81.04	265.9	152	1	0	0
472	81.06	265.9	163	3	0	0
473	81.07	266.0	177	3	0	0
474	81.12	266.1	192	21	0	0
475	81.12	266.2	326	11	0	0
476	81.17	266.3	312	9	0	0
477	81.23	266.5	356	9	0	0
478	81.26	266.6	274	1	0	0
479	81.28	266.7	60	5	0	0
480	81.32	266.8	49	6	0	0
481	81.37	267.0	228	8	0	0
482	81.38	267.0	71	10	0	0
483	81.42	267.1	75	4	0	0
484	81.43	267.2	75	13	0	0
485	81.47	267.3	161	5	0	0
486	81.52	267.5	230	9	0	0
487	81.53	267.5	52	13	0	0
488	81.60	267.7	349	12	0	0
489	81.67	267.9	323	9	0	0
490	81.75	268.2	267	4	0	0
491	81.80	268.4	147	4	0	0
492	81.83	268.5	172	5	0	0

All directions are with respect to magnetic north.



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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
493	81.89	268.7	231	4	0	0
494	81.97	268.9	330	9	0	0
495	81.99	269.0	147	13	0	0
496	82.08	269.3	34	2	0	0
497	82.17	269.6	48	5	0	0
498	82.22	269.8	25	5	0	0
499	82.23	269.8	299	6	0	0
500	82.31	270.0	26	6	0	0
501	82.39	270.3	185	17	0	0
502	82.39	270.3	354	17	0	0
503	82.53	270.8	292	22	0	0
504	82.60	271.0	286	10	0	0
505	82.61	271.0	108	11	0	0
506	82.69	271.3	317	17	0	0
507	82.72	271.4	311	22	0	0
508	82.74	271.5	127	19	0	0
509	82.80	271.7	309	2	0	0
510	82.84	271.8	226	7	0	0
511	82.91	272.0	197	5	0	0
512	82.98	272.2	305	2	0	0
513	83.04	272.4	150	5	0	0
514	83.08	272.6	300	17	0	0
515	83.09	272.6	113	11	0	0
516	83.14	272.8	178	6	0	0
517	83.19	272.9	140	8	0	0
518	83.22	273.0	226	4	0	0
519	83.27	273.2	337	2	0	0
520	83.36	273.5	340	10	0	0
521	83.39	273.6	339	9	0	0
522	83.40	273.6	315	53	0	0
523	83.40	273.6	334	14	0	0
524	83.42	273.7	156	2	0	0
525	83.44	273.7	170	3	0	0
526	83.47	273.8	20	6	0	0
527	83.52	274.0	158	4	0	0
528	83.61	274.3	175	4	0	0
529	83.81	275.0	85	8	0	0
530	83.89	275.2	339	6	0	0
531	83.94	275.4	51	5	0	0
532	84.01	275.6	21	1	0	0
533	84.06	275.8	66	9	0	0

All directions are with respect to magnetic north.



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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
534	84.09	275.9	269	36	0	0
535	84.14	276.1	81	20	0	0
536	84.22	276.3	316	3	0	0
537	84.24	276.4	35	4	0	0
538	84.29	276.6	292	2	0	0
539	84.31	276.6	177	3	0	0
540	84.34	276.7	44	3	0	0
541	84.39	276.9	266	5	0	0
542	84.42	277.0	240	7	0	0
543	84.49	277.2	191	27	0	0
544	84.52	277.3	150	3	0	0
545	84.57	277.5	253	2	0	0
546	84.61	277.6	93	7	0	0
547	84.72	277.9	175	10	0	0
548	84.77	278.1	76	4	0	0
549	84.80	278.2	49	6	0	0
550	84.83	278.3	175	8	0	0
551	84.88	278.5	118	10	0	0
552	84.89	278.5	264	7	0	0
553	85.12	279.3	140	4	0	0
554	85.36	280.1	0	4	0	0
555	85.53	280.6	344	6	0	0
556	85.55	280.7	304	3	0	0
557	85.62	280.9	5	8	0	0
558	85.69	281.1	70	2	0	0
559	85.89	281.8	89	13	0	0
560	85.92	281.9	118	5	0	0
561	85.93	281.9	23	5	0	0
562	86.03	282.2	140	9	0	0
563	86.06	282.4	159	6	0	0
564	86.19	282.8	351	12	0	0
565	86.22	282.9	355	5	0	0
566	86.26	283.0	353	3	0	0
567	86.28	283.1	33	2	0	0
568	86.51	283.8	42	2	0	0
569	86.54	283.9	144	3	0	0
570	86.69	284.4	140	44	0	0
571	86.73	284.6	264	11	0	0
572	86.73	284.6	36	14	0	0
573	86.84	284.9	44	3	0	0
574	86.91	285.1	41	10	0	0

All directions are with respect to magnetic north.



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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
575	86.93	285.2	254	8	0	0
576	86.96	285.3	281	6	0	0
577	87.14	285.9	224	6	0	0
578	87.15	285.9	29	33	0	0
579	87.20	286.1	157	30	0	0
580	87.21	286.1	227	26	0	0
581	87.21	286.1	51	29	0	0
582	87.22	286.2	15	25	0	0
583	87.36	286.6	263	13	0	0
584	87.37	286.7	275	8	0	0
585	87.40	286.8	152	3	0	0
586	87.44	286.9	189	6	0	0
587	87.53	287.2	324	7	0	0
588	87.54	287.2	358	6	0	0
589	87.56	287.3	49	13	0	0
590	87.61	287.4	90	12	0	0
591	87.65	287.6	183	10	0	0
592	87.69	287.7	261	9	0	0
593	87.72	287.8	19	12	0	0
594	87.74	287.9	319	7	0	0
595	87.79	288.0	247	22	0	0
596	87.89	288.4	298	10	0	0
597	87.91	288.4	211	4	0	0
598	88.04	288.9	71	13	0	0
599	88.04	288.9	224	10	0	0
600	88.09	289.0	113	16	0	0
601	88.09	289.0	290	15	0	0
602	88.13	289.1	301	5	0	0
603	88.24	289.5	311	9	0	1
604	88.25	289.6	33	23	0	1
605	88.28	289.6	270	17	0	1
606	88.31	289.7	298	21	0	1
607	88.36	289.9	298	35	0	0
608	88.75	291.2	306	8	0	0
609	88.81	291.4	130	28	0	0
610	88.84	291.5	314	6	0	0
611	88.86	291.6	139	25	0	0
612	88.90	291.7	189	4	0	0
613	88.93	291.8	156	5	0	0
614	89.06	292.2	179	5	0	0
615	89.09	292.3	312	4	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
616	89.12	292.4	190	10	0	0
617	89.37	293.2	335	21	0	0
618	89.40	293.3	317	27	0	0
619	89.44	293.4	312	22	0	0
620	89.47	293.5	151	36	0	0
621	89.47	293.5	5	62	0	0
622	89.59	293.9	1	16	0	1
623	89.63	294.1	331	26	0	1
624	89.91	295.0	301	2	0	0
625	89.93	295.1	200	4	0	0
626	89.95	295.1	169	3	0	0
627	89.99	295.3	83	10	0	0
628	90.01	295.3	337	9	0	0
629	90.27	296.2	314	6	0	0
630	90.29	296.2	353	4	0	0
631	90.33	296.4	344	6	0	0
632	90.35	296.4	309	5	0	0
633	90.37	296.5	192	14	0	0
634	90.39	296.5	294	16	0	0
635	90.45	296.8	103	12	0	0
636	90.49	296.9	144	6	0	0
637	90.54	297.1	92	12	0	0
638	90.56	297.1	267	28	0	0
639	90.57	297.1	168	15	0	0
640	90.62	297.3	2	4	0	0
641	90.62	297.3	133	37	0	0
642	90.62	297.3	188	24	0	0
643	90.71	297.6	60	23	0	0
644	90.71	297.6	276	14	0	0
645	90.74	297.7	72	5	0	0
646	90.76	297.8	54	5	0	0
647	90.82	298.0	1	3	0	0
648	90.95	298.4	237	9	0	1
649	90.99	298.5	266	11	0	1
650	91.05	298.7	337	26	0	1
651	91.09	298.8	351	7	0	1
652	91.09	298.8	127	23	0	0
653	91.23	299.3	168	4	0	0
654	91.28	299.5	10	7	0	0
655	91.30	299.5	20	12	0	0
656	91.38	299.8	46	13	0	0

All directions are with respect to magnetic north.



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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
657	91.40	299.9	49	13	0	0
658	91.62	300.6	55	5	0	0
659	91.70	300.8	59	8	0	0
660	91.73	301.0	85	2	0	0
661	91.85	301.3	121	35	0	0
662	91.86	301.4	298	8	0	0
663	91.87	301.4	235	30	0	0
664	91.88	301.5	294	8	0	0
665	91.92	301.6	233	28	0	0
666	91.93	301.6	136	20	0	0
667	92.00	301.8	341	7	0	0
668	92.08	302.1	51	10	0	0
669	92.11	302.2	26	11	0	0
670	92.19	302.5	328	8	0	0
671	92.23	302.6	20	12	0	0
672	92.27	302.7	325	17	0	0
673	92.28	302.7	137	10	0	0
674	92.64	303.9	22	13	0	0
675	92.77	304.4	346	11	0	0
676	92.85	304.6	359	30	0	0
677	92.90	304.8	36	17	0	0
678	92.93	304.9	42	22	0	0
679	93.08	305.4	48	12	0	0
680	93.10	305.4	45	13	0	0
681	93.14	305.6	33	16	0	0
682	93.17	305.7	42	18	0	0
683	93.21	305.8	39	14	0	0
684	93.40	306.4	24	20	0	0
685	93.44	306.6	36	22	0	0
686	93.58	307.0	45	14	0	0
687	93.72	307.5	40	14	0	0
688	93.82	307.8	98	5	0	0
689	93.98	308.3	68	15	0	0
690	93.99	308.4	269	31	0	0
691	94.03	308.5	286	13	0	0
692	94.09	308.7	297	10	0	0
693	94.13	308.8	299	13	0	0
694	94.23	309.1	291	4	0	1
695	94.36	309.6	275	18	0	0
696	94.41	309.8	170	16	0	0
697	94.45	309.9	140	8	0	0

All directions are with respect to magnetic north.



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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
698	94.48	310.0	170	8	0	0
699	94.52	310.1	187	11	0	0
700	94.59	310.3	173	9	0	1
701	94.62	310.4	161	9	0	0
702	94.67	310.6	305	9	0	0
703	94.70	310.7	224	5	0	0
704	94.75	310.9	292	3	0	0
705	94.82	311.1	72	4	0	0
706	95.22	312.4	316	23	0	1
707	95.23	312.4	219	10	0	1
708	95.32	312.7	139	6	0	1
709	95.37	312.9	189	4	0	0
710	95.43	313.1	124	5	0	0
711	95.45	313.2	110	9	0	0
712	95.51	313.4	120	10	0	0
713	95.55	313.5	97	4	0	0
714	95.61	313.7	137	5	0	0
715	95.68	313.9	177	57	0	0
716	95.72	314.0	133	10	0	0
717	95.76	314.2	106	12	0	0
718	95.88	314.6	115	12	0	0
719	96.00	315.0	115	50	0	0
720	96.09	315.2	19	23	0	0
721	96.23	315.7	257	12	0	1
722	96.23	315.7	122	20	0	1
723	96.24	315.7	41	23	0	1
724	96.26	315.8	36	11	0	1
725	96.28	315.9	141	39	0	0
726	96.30	315.9	152	9	0	0
727	96.31	316.0	16	15	0	0
728	96.33	316.0	36	10	0	0
729	96.39	316.3	44	7	0	0
730	96.42	316.3	84	9	0	0
731	96.48	316.5	77	10	0	0
732	96.51	316.6	54	11	0	0
733	96.52	316.7	59	12	0	0
734	96.59	316.9	64	14	0	0
735	96.62	317.0	67	7	0	0
736	96.69	317.2	86	6	0	0
737	96.71	317.3	57	9	0	0
738	96.72	317.3	57	9	0	0

All directions are with respect to magnetic north.



Orientation Summary Table
TelevIEWER Image Features
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DMW-4
18 January 2024

Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
739	96.74	317.4	77	5	0	0
740	96.76	317.5	78	3	0	0
741	96.77	317.5	71	5	0	0
742	96.79	317.6	82	5	0	0
743	96.84	317.7	16	4	0	0
744	96.89	317.9	98	7	0	0
745	96.94	318.0	104	7	0	0
746	97.01	318.3	118	8	0	0
747	97.03	318.4	107	8	0	0
748	97.05	318.4	116	7	0	0
749	97.08	318.5	99	9	0	0
750	97.11	318.6	117	8	0	0
751	97.12	318.7	113	7	0	0
752	97.17	318.8	82	8	0	0
753	97.23	319.0	93	7	0	0
754	97.28	319.2	300	11	0	0
755	97.34	319.4	320	4	0	0
756	97.37	319.5	2	5	0	0
757	97.50	319.9	54	11	0	0
758	97.59	320.2	84	11	0	0
759	97.68	320.5	40	26	0	0
760	97.69	320.5	199	15	0	0
761	97.73	320.6	77	12	0	0
762	97.81	320.9	55	38	0	0
763	97.85	321.0	235	18	0	0
764	97.89	321.2	60	27	0	0
765	97.90	321.2	210	3	0	0
766	97.93	321.3	253	8	0	0
767	97.97	321.4	252	8	0	0
768	98.03	321.6	286	9	0	0
769	98.12	321.9	254	9	0	0
770	98.38	322.8	222	30	0	0
771	98.65	323.7	275	30	0	1
772	98.65	323.7	242	15	0	0
773	98.68	323.8	223	15	0	0
774	98.73	323.9	247	13	0	0
775	98.80	324.1	220	13	0	0
776	98.90	324.5	207	11	0	0
777	98.99	324.8	203	17	0	0
778	99.02	324.9	204	7	0	0
779	99.09	325.1	202	9	0	0

All directions are with respect to magnetic north.



Orientation Summary Table
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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
780	99.10	325.1	128	7	0	0
781	99.12	325.2	187	11	0	0
782	99.19	325.4	301	25	0	0
783	99.30	325.8	283	23	0	0
784	99.31	325.8	96	12	0	0
785	99.35	326.0	249	14	0	0
786	99.56	326.6	8	13	0	1
787	99.59	326.7	97	60	0	1
788	99.66	327.0	73	25	0	1
789	99.68	327.0	32	11	0	1
790	99.86	327.6	162	22	0	0
791	99.94	327.9	116	11	0	1
792	99.97	328.0	83	27	0	1
793	99.97	328.0	194	5	0	1
794	100.03	328.2	20	9	0	1
795	100.07	328.3	65	8	0	1
796	100.12	328.5	334	7	0	0
797	100.15	328.6	74	7	0	0
798	100.17	328.6	94	21	0	0
799	100.33	329.2	19	8	0	0
800	100.37	329.3	329	32	0	0
801	100.49	329.7	355	11	0	0
802	100.60	330.1	4	24	0	0
803	100.69	330.3	337	10	0	0
804	100.72	330.4	316	5	0	0
805	100.79	330.7	182	22	0	1
806	100.80	330.7	92	13	0	0
807	100.90	331.1	350	23	0	0
808	101.11	331.7	108	16	0	0
809	101.14	331.8	170	6	0	0
810	101.68	333.6	154	13	0	0
811	101.78	333.9	139	14	0	0
812	101.84	334.1	151	9	0	1
813	101.98	334.6	249	22	0	1
814	102.03	334.8	351	15	0	1
815	102.12	335.1	352	59	0	1
816	102.18	335.2	331	8	0	0
817	102.40	336.0	326	3	0	0
818	102.44	336.1	20	2	0	0
819	102.47	336.2	26	3	0	0
820	102.54	336.4	57	4	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
821	102.56	336.5	8	1	0	0
822	102.58	336.6	350	2	0	0
823	102.70	337.0	294	15	0	0
824	102.90	337.6	199	5	0	0
825	103.35	339.1	26	5	0	1
826	103.47	339.5	239	4	0	0
827	103.63	340.0	156	5	0	1
828	103.63	340.0	256	5	0	1
829	103.74	340.4	164	1	0	1
830	103.75	340.4	120	8	0	1
831	103.92	340.9	49	36	0	1
832	103.96	341.1	221	14	0	1
833	103.97	341.1	329	13	0	1
834	104.01	341.2	271	13	0	1
835	104.02	341.3	76	45	0	1
836	104.05	341.4	95	31	0	1
837	104.22	341.9	44	50	0	1
838	104.33	342.3	206	63	0	1
839	104.33	342.3	227	21	0	1
840	104.39	342.5	298	19	0	1
841	104.47	342.8	2	15	0	1
842	104.55	343.0	159	14	0	1
843	104.60	343.2	350	32	0	1
844	104.72	343.6	145	11	0	1
845	104.73	343.6	282	24	0	0
846	104.81	343.9	37	14	0	0
847	104.82	343.9	219	18	0	0
848	104.83	343.9	157	9	0	0
849	104.95	344.3	336	52	0	1
850	104.99	344.5	109	12	0	0
851	105.02	344.5	128	15	0	0
852	105.08	344.8	149	38	0	1
853	105.14	345.0	199	30	19	3
854	105.29	345.5	214	7	0	1
855	105.34	345.6	236	4	0	2
856	105.38	345.7	240	6	0	1
857	105.40	345.8	284	6	0	1
858	105.42	345.9	34	12	0	1
859	105.43	345.9	178	9	0	1
860	105.53	346.2	313	18	0	1
861	105.62	346.5	133	43	0	1

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
862	105.66	346.6	303	27	0	2
863	105.81	347.1	285	14	0	0
864	105.84	347.3	318	14	0	1
865	105.87	347.3	343	13	0	1
866	105.93	347.5	343	27	0	0
867	106.00	347.8	24	10	0	0
868	106.08	348.0	101	37	0	1
869	106.13	348.2	301	10	0	0
870	106.20	348.4	294	16	0	1
871	106.27	348.7	271	24	0	0
872	106.30	348.7	263	26	0	0
873	106.33	348.9	266	23	0	0
874	106.38	349.0	279	24	0	1
875	106.63	349.8	272	16	0	0
876	106.68	350.0	276	22	0	0
877	106.71	350.1	275	33	0	0
878	106.84	350.5	269	21	0	0
879	106.91	350.8	292	10	0	0
880	106.98	351.0	303	7	0	0
881	107.06	351.3	304	14	0	1
882	107.35	352.2	339	7	0	1
883	107.69	353.3	305	13	0	0
884	107.72	353.4	325	12	0	0
885	107.76	353.5	247	5	0	0
886	107.86	353.9	298	17	0	0
887	107.93	354.1	300	15	0	0
888	108.02	354.4	85	14	0	0
889	108.03	354.4	112	23	0	0
890	108.04	354.5	260	19	0	0
891	108.09	354.6	256	22	0	0
892	108.12	354.7	111	31	0	0
893	108.13	354.8	204	33	0	0
894	108.15	354.8	246	18	0	0
895	108.17	354.9	0	19	0	0
896	108.21	355.0	224	28	0	0
897	108.22	355.0	19	15	0	0
898	108.23	355.1	187	47	0	0
899	108.26	355.2	304	39	0	0
900	108.27	355.2	103	8	0	0
901	108.30	355.3	312	36	0	0
902	108.34	355.5	299	30	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
903	108.41	355.7	281	20	0	1
904	108.42	355.7	48	15	0	1
905	108.43	355.7	204	11	0	1
906	108.52	356.0	57	4	0	0
907	108.58	356.2	8	23	0	0
908	108.61	356.3	35	10	0	0
909	108.64	356.4	25	12	0	0
910	108.68	356.6	52	16	0	0
911	108.71	356.7	261	32	0	0
912	108.71	356.7	145	13	0	0
913	108.72	356.7	267	26	0	0
914	108.73	356.7	4	31	0	0
915	108.84	357.1	44	11	0	0
916	108.87	357.2	174	6	0	0
917	108.88	357.2	157	8	0	0
918	108.91	357.3	176	2	0	0
919	108.96	357.5	263	9	0	0
920	109.00	357.6	280	6	0	0
921	109.01	357.6	265	35	0	0
922	109.03	357.7	95	3	0	0
923	109.04	357.8	39	3	0	0
924	109.07	357.8	41	23	0	0
925	109.09	357.9	5	2	0	0
926	109.10	358.0	41	3	0	0
927	109.13	358.0	286	12	0	0
928	109.15	358.1	254	15	0	0
929	109.17	358.2	249	13	0	0
930	109.19	358.3	169	11	0	0
931	109.23	358.4	42	3	0	1
932	109.24	358.4	33	4	0	0
933	109.27	358.5	330	12	0	0
934	109.30	358.6	332	15	0	0
935	109.33	358.7	10	19	0	0
936	109.35	358.8	13	7	0	0
937	109.36	358.8	65	9	0	0
938	109.55	359.4	45	5	0	0
939	109.60	359.6	76	4	0	0
940	109.65	359.8	75	6	0	0
941	109.75	360.1	165	31	0	0
942	109.76	360.1	343	17	0	0
943	109.76	360.1	133	51	0	0

All directions are with respect to magnetic north.



Orientation Summary Table
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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
944	109.78	360.2	34	9	0	0
945	109.81	360.3	76	63	0	0
946	109.83	360.3	105	8	0	0
947	109.92	360.6	132	6	0	0
948	109.97	360.8	356	9	0	0
949	109.99	360.9	7	3	0	0
950	109.99	360.9	191	76	0	0
951	110.01	360.9	22	5	0	0
952	110.02	361.0	37	8	0	0
953	110.05	361.1	353	11	0	0
954	110.06	361.1	357	9	0	0
955	110.06	361.1	301	4	0	0
956	110.08	361.1	2	6	0	0
957	110.08	361.2	356	4	0	0
958	110.10	361.2	10	5	0	0
959	110.24	361.7	213	3	0	0
960	110.31	361.9	318	22	0	0
961	110.35	362.0	117	25	0	0
962	110.35	362.1	220	37	0	0
963	110.47	362.4	28	27	0	0
964	110.52	362.6	330	29	0	0
965	110.54	362.7	286	24	0	0
966	110.56	362.7	265	18	0	0
967	110.62	362.9	337	15	0	0
968	110.62	362.9	219	12	0	0
969	110.71	363.2	23	34	0	0
970	110.74	363.3	39	17	0	0
971	110.76	363.4	347	10	0	0
972	110.79	363.5	66	44	0	0
973	110.80	363.5	1	8	0	0
974	110.82	363.6	258	15	0	0
975	110.87	363.8	40	22	0	0
976	110.92	363.9	27	11	0	0
977	110.94	364.0	27	9	0	0
978	110.98	364.1	3	12	0	0
979	111.00	364.2	263	31	0	0
980	111.01	364.2	45	5	0	0
981	111.04	364.3	84	26	0	0
982	111.11	364.5	204	45	0	0
983	111.11	364.6	77	12	0	0
984	111.16	364.7	90	10	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
985	111.20	364.8	172	44	0	0
986	111.20	364.8	83	8	0	0
987	111.22	364.9	99	10	0	0
988	111.27	365.1	18	20	0	0
989	111.35	365.3	145	8	0	0
990	111.38	365.4	134	9	0	0
991	111.41	365.5	171	78	0	0
992	111.41	365.5	163	14	0	0
993	111.41	365.5	325	16	0	0
994	111.45	365.6	118	7	0	0
995	111.57	366.0	226	19	0	0
996	111.60	366.1	228	31	0	0
997	111.78	366.7	282	22	0	0
998	111.82	366.9	231	11	0	0
999	111.96	367.3	5	15	0	0
1000	111.97	367.4	277	23	0	0
1001	112.04	367.6	139	30	0	0
1002	112.07	367.7	276	31	0	0
1003	112.12	367.9	205	13	0	0
1004	112.17	368.0	201	16	0	0
1005	112.25	368.3	223	12	0	0
1006	112.27	368.4	226	11	0	0
1007	112.31	368.5	176	17	0	0
1008	112.34	368.6	22	6	0	0
1009	112.64	369.5	85	5	0	0
1010	112.64	369.6	326	13	0	0
1011	112.83	370.2	22	17	0	0
1012	112.93	370.5	9	7	0	0
1013	112.95	370.6	7	12	0	0
1014	112.97	370.7	349	9	0	0
1015	113.00	370.7	349	7	0	0
1016	113.03	370.8	345	8	0	0
1017	113.04	370.9	5	13	0	0
1018	113.06	370.9	360	13	0	0
1019	113.07	371.0	88	22	0	0
1020	113.09	371.0	348	9	0	0
1021	113.21	371.4	225	23	0	0
1022	113.25	371.6	228	19	0	0
1023	113.29	371.7	174	20	0	0
1024	113.33	371.8	172	13	0	0
1025	113.35	371.9	225	11	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1026	113.41	372.1	239	5	0	0
1027	113.42	372.1	217	4	0	0
1028	113.43	372.2	268	3	0	0
1029	113.46	372.2	334	3	0	0
1030	113.48	372.3	296	7	0	0
1031	113.51	372.4	289	10	0	0
1032	113.57	372.6	92	9	0	0
1033	113.57	372.6	359	12	0	0
1034	113.59	372.7	153	13	0	0
1035	113.59	372.7	281	21	0	0
1036	113.65	372.9	254	8	0	0
1037	113.71	373.1	244	8	0	0
1038	113.76	373.2	331	20	0	0
1039	113.78	373.3	257	11	0	0
1040	113.82	373.4	134	22	0	1
1041	113.83	373.5	269	7	0	0
1042	113.93	373.8	303	13	0	0
1043	114.00	374.0	342	9	0	0
1044	114.08	374.3	316	6	0	0
1045	114.14	374.5	7	17	0	0
1046	114.17	374.6	5	24	0	1
1047	114.27	374.9	334	18	0	0
1048	114.27	374.9	179	34	0	0
1049	114.43	375.4	340	7	0	1
1050	114.47	375.6	333	7	0	0
1051	114.50	375.7	337	0	0	0
1052	114.57	375.9	112	30	0	0
1053	114.64	376.1	190	7	0	0
1054	114.92	377.0	1	14	0	0
1055	114.94	377.1	8	8	0	0
1056	114.98	377.2	152	16	0	0
1057	115.18	377.9	122	6	0	0
1058	115.20	378.0	160	7	0	0
1059	115.21	378.0	316	7	0	0
1060	115.28	378.2	329	17	0	0
1061	115.35	378.4	344	10	0	0
1062	115.36	378.5	339	10	0	0
1063	115.37	378.5	331	8	0	0
1064	115.40	378.6	336	23	0	0
1065	115.42	378.7	341	19	0	0
1066	115.45	378.8	323	7	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1067	115.48	378.9	280	22	0	0
1068	115.53	379.0	134	5	0	0
1069	115.56	379.1	284	8	0	0
1070	115.56	379.1	65	16	0	0
1071	115.56	379.1	198	40	0	0
1072	115.61	379.3	37	20	0	0
1073	115.67	379.5	139	12	0	0
1074	115.70	379.6	131	30	0	0
1075	115.72	379.7	1	22	0	0
1076	115.73	379.7	197	24	0	0
1077	115.74	379.7	57	5	0	0
1078	115.78	379.9	257	21	0	0
1079	115.84	380.0	226	13	0	0
1080	115.93	380.4	348	19	0	0
1081	115.97	380.5	1	29	0	0
1082	116.13	381.0	230	9	0	0
1083	116.22	381.3	333	28	0	0
1084	116.27	381.5	339	18	0	0
1085	116.34	381.7	300	18	0	0
1086	116.35	381.7	4	41	0	0
1087	116.47	382.1	76	21	0	0
1088	116.51	382.2	89	33	0	0
1089	116.56	382.4	70	6	0	1
1090	116.68	382.8	358	8	0	0
1091	116.81	383.3	318	19	0	0
1092	116.83	383.3	144	27	0	0
1093	116.88	383.5	48	15	0	1
1094	116.97	383.8	353	10	0	1
1095	117.01	383.9	94	5	0	0
1096	117.02	383.9	241	9	0	0
1097	117.10	384.2	144	13	0	0
1098	117.11	384.2	146	29	0	0
1099	117.14	384.3	152	29	0	0
1100	117.23	384.6	182	8	0	0
1101	117.26	384.7	201	5	0	0
1102	117.28	384.8	224	5	0	0
1103	117.34	385.0	225	7	0	0
1104	117.41	385.2	188	10	0	0
1105	117.43	385.3	211	9	0	0
1106	117.45	385.3	227	32	0	0
1107	117.46	385.4	163	21	0	0

All directions are with respect to magnetic north.



Orientation Summary Table
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DMW-4
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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1108	117.50	385.5	322	14	0	0
1109	117.51	385.5	100	29	0	0
1110	117.60	385.8	35	2	0	0
1111	117.66	386.0	157	10	0	0
1112	117.68	386.1	160	8	0	0
1113	117.70	386.2	188	8	0	0
1114	117.88	386.8	149	23	0	0
1115	117.97	387.0	334	22	0	0
1116	117.98	387.1	179	28	0	0
1117	117.99	387.1	338	17	0	0
1118	118.05	387.3	351	3	0	0
1119	118.09	387.4	230	9	0	0
1120	118.09	387.4	83	4	0	0
1121	118.14	387.6	91	6	0	1
1122	118.20	387.8	159	12	0	1
1123	118.21	387.8	352	7	0	1
1124	118.31	388.2	265	41	0	0
1125	118.33	388.2	132	22	0	0
1126	118.38	388.4	106	4	0	0
1127	118.48	388.7	357	4	0	0
1128	118.66	389.3	172	6	0	0
1129	118.71	389.5	269	1	0	0
1130	118.83	389.9	265	11	0	0
1131	118.88	390.0	81	7	0	0
1132	118.98	390.3	46	7	0	0
1133	119.08	390.7	147	13	0	0
1134	119.12	390.8	199	17	0	0
1135	119.16	390.9	191	24	0	0
1136	119.21	391.1	285	4	0	0
1137	119.21	391.1	145	36	0	0
1138	119.23	391.2	294	12	0	0
1139	119.29	391.4	20	12	0	1
1140	119.31	391.5	3	19	0	0
1141	119.33	391.5	7	19	0	0
1142	119.35	391.6	36	9	0	1
1143	119.36	391.6	46	11	0	1
1144	119.38	391.7	20	7	0	0
1145	119.40	391.7	100	4	0	0
1146	119.45	391.9	2	5	0	0
1147	119.50	392.1	325	5	0	0
1148	119.53	392.2	192	12	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1149	119.55	392.2	160	18	0	0
1150	119.58	392.3	155	19	0	0
1151	119.60	392.4	116	5	0	0
1152	119.62	392.5	164	2	0	0
1153	119.66	392.6	57	2	0	0
1154	119.67	392.6	74	3	0	0
1155	119.69	392.7	22	6	0	0
1156	119.72	392.8	59	5	0	0
1157	119.73	392.8	58	3	0	0
1158	119.76	392.9	51	4	0	0
1159	119.79	393.0	43	3	0	0
1160	119.80	393.1	28	6	0	0
1161	119.86	393.2	32	9	0	0
1162	119.87	393.3	36	11	0	1
1163	119.91	393.4	139	14	0	1
1164	119.91	393.4	128	21	0	0
1165	119.98	393.6	12	30	0	0
1166	119.99	393.7	303	30	0	0
1167	120.04	393.8	20	5	0	0
1168	120.09	394.0	4	8	0	0
1169	120.13	394.1	358	1	0	0
1170	120.26	394.6	343	22	0	0
1171	120.28	394.6	259	7	0	0
1172	120.41	395.0	250	11	0	0
1173	120.56	395.6	63	6	0	0
1174	120.57	395.6	91	8	0	0
1175	120.84	396.5	140	9	0	0
1176	120.90	396.7	229	28	0	0
1177	120.93	396.7	39	6	0	0
1178	120.95	396.8	321	2	0	0
1179	121.15	397.5	109	12	0	0
1180	121.22	397.7	29	30	0	0
1181	121.37	398.2	31	13	0	0
1182	121.44	398.4	28	11	0	0
1183	121.70	399.3	240	19	0	0
1184	121.70	399.3	112	19	0	0
1185	121.72	399.3	312	8	0	0
1186	121.75	399.4	330	6	0	0
1187	121.87	399.8	283	10	0	0
1188	121.90	399.9	289	15	0	0
1189	121.94	400.1	256	11	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1190	122.00	400.3	66	3	0	0
1191	122.00	400.3	286	8	0	0
1192	122.04	400.4	180	15	0	0
1193	122.09	400.6	57	2	0	0
1194	122.12	400.7	342	4	0	0
1195	122.15	400.8	48	2	0	0
1196	122.18	400.9	262	10	0	0
1197	122.23	401.0	186	2	0	0
1198	122.24	401.0	20	8	0	0
1199	122.27	401.1	67	15	0	0
1200	122.28	401.2	217	8	0	0
1201	122.32	401.3	273	6	0	0
1202	122.33	401.4	284	14	0	0
1203	122.35	401.4	267	13	0	0
1204	122.38	401.5	275	22	0	0
1205	122.41	401.6	246	12	0	0
1206	122.47	401.8	181	17	0	0
1207	122.49	401.9	46	8	0	0
1208	122.56	402.1	8	3	0	0
1209	122.77	402.8	188	18	0	0
1210	122.79	402.8	177	31	0	0
1211	122.81	402.9	125	9	0	0
1212	122.82	402.9	224	13	0	0
1213	122.91	403.3	113	14	0	0
1214	122.92	403.3	344	14	0	0
1215	122.98	403.5	118	16	0	0
1216	122.98	403.5	229	19	0	0
1217	122.98	403.5	336	7	0	0
1218	123.03	403.6	203	17	0	0
1219	123.07	403.8	344	5	0	0
1220	123.15	404.0	43	5	0	0
1221	123.22	404.3	306	6	0	0
1222	123.24	404.3	323	12	0	0
1223	123.26	404.4	321	10	0	0
1224	123.29	404.5	296	11	0	0
1225	123.30	404.5	307	7	0	0
1226	123.34	404.7	342	6	0	0
1227	123.36	404.7	14	6	0	0
1228	123.39	404.8	356	6	0	0
1229	123.43	404.9	30	11	0	0
1230	123.50	405.2	257	5	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1231	123.58	405.5	308	4	0	0
1232	123.68	405.8	295	5	0	0
1233	123.71	405.9	290	6	0	0
1234	123.73	406.0	306	20	0	0
1235	123.75	406.0	321	7	0	0
1236	123.79	406.1	187	5	0	0
1237	124.06	407.0	285	11	0	0
1238	124.07	407.1	267	8	0	0
1239	124.15	407.3	330	6	0	0
1240	124.25	407.7	307	26	0	0
1241	124.26	407.7	153	22	0	0
1242	124.29	407.8	69	41	0	0
1243	124.29	407.8	344	5	0	0
1244	124.31	407.9	67	11	0	0
1245	124.32	407.9	248	13	0	0
1246	124.40	408.1	130	10	0	0
1247	124.45	408.3	318	9	0	0
1248	124.45	408.3	169	14	0	0
1249	124.49	408.4	183	10	0	0
1250	124.60	408.8	87	9	0	0
1251	124.71	409.2	213	32	0	0
1252	124.92	409.8	72	12	0	0
1253	124.92	409.8	263	10	0	0
1254	125.05	410.3	285	10	0	0
1255	125.14	410.6	263	17	0	0
1256	125.18	410.7	262	18	0	0
1257	125.21	410.8	252	15	0	0
1258	125.26	411.0	358	8	0	0
1259	125.34	411.2	177	6	0	0
1260	125.37	411.3	335	6	0	0
1261	125.40	411.4	313	7	0	0
1262	125.46	411.6	324	14	0	0
1263	125.53	411.9	324	8	0	0
1264	125.57	412.0	338	8	0	0
1265	125.61	412.1	335	11	0	0
1266	125.67	412.3	345	6	0	0
1267	125.71	412.4	209	5	0	0
1268	125.73	412.5	132	3	0	0
1269	125.78	412.7	151	6	0	0
1270	125.87	413.0	270	6	0	0
1271	125.94	413.2	48	3	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1272	125.98	413.3	8	8	0	0
1273	126.01	413.4	21	5	0	0
1274	126.08	413.7	105	6	0	0
1275	126.09	413.7	313	19	0	0
1276	126.14	413.8	257	49	0	0
1277	126.23	414.1	94	7	0	0
1278	126.32	414.5	134	5	0	0
1279	126.49	415.0	273	16	0	0
1280	126.50	415.0	276	15	0	0
1281	126.53	415.1	310	4	0	0
1282	126.55	415.2	206	15	0	0
1283	126.66	415.6	317	8	0	0
1284	126.69	415.7	308	18	0	0
1285	126.71	415.7	86	10	0	0
1286	126.72	415.7	299	29	0	0
1287	126.81	416.0	309	24	0	0
1288	126.86	416.2	47	7	0	0
1289	126.93	416.4	339	21	0	0
1290	126.93	416.4	76	15	0	0
1291	126.95	416.5	166	6	0	0
1292	126.99	416.6	358	9	0	0
1293	127.04	416.8	15	12	0	0
1294	127.07	416.9	195	22	0	0
1295	127.10	417.0	50	8	0	0
1296	127.12	417.1	279	25	0	0
1297	127.17	417.2	322	10	0	0
1298	127.22	417.4	318	17	0	0
1299	127.23	417.4	321	15	0	0
1300	127.25	417.5	323	15	0	0
1301	127.27	417.5	308	17	0	0
1302	127.31	417.7	199	10	0	0
1303	127.35	417.8	310	4	0	0
1304	127.45	418.2	328	5	0	1
1305	127.56	418.5	341	7	0	0
1306	127.69	418.9	262	10	0	0
1307	127.77	419.2	24	14	0	0
1308	127.77	419.2	279	8	0	0
1309	127.83	419.4	50	9	0	0
1310	127.86	419.5	333	8	0	0
1311	127.97	419.9	140	7	0	0
1312	128.01	420.0	123	15	0	0

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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1313	128.22	420.7	327	16	0	0
1314	128.32	421.0	331	44	0	0
1315	128.34	421.1	302	25	0	0
1316	128.36	421.1	141	18	0	0
1317	128.53	421.7	307	19	0	0
1318	128.61	421.9	142	17	0	0
1319	128.63	422.0	331	17	0	0
1320	128.63	422.0	29	6	0	0
1321	128.67	422.2	29	5	0	0
1322	128.82	422.7	293	8	0	0
1323	128.86	422.8	182	8	0	0
1324	128.89	422.9	206	18	0	1
1325	128.90	422.9	27	8	0	1
1326	129.00	423.2	234	32	0	0
1327	129.02	423.3	332	41	0	0
1328	129.09	423.5	264	8	0	0
1329	129.13	423.7	11	28	0	0
1330	129.19	423.8	100	12	0	0
1331	129.22	423.9	111	6	0	0
1332	129.24	424.0	115	7	0	0
1333	129.49	424.8	113	14	0	0
1334	129.61	425.2	71	36	0	1
1335	129.61	425.2	245	32	0	1
1336	129.91	426.2	250	38	0	1
1337	129.98	426.4	110	42	0	1
1338	130.06	426.7	280	42	0	0
1339	130.10	426.8	319	23	0	0
1340	130.19	427.1	117	15	0	1
1341	130.21	427.2	143	14	0	1
1342	130.23	427.3	95	13	0	0
1343	130.28	427.4	239	19	0	1
1344	130.38	427.8	327	20	0	1
1345	130.49	428.1	262	16	0	0
1346	130.52	428.2	256	12	0	1
1347	130.69	428.8	89	36	0	1
1348	130.70	428.8	237	14	0	1
1349	131.09	430.1	134	41	0	0
1350	131.35	430.9	20	10	0	1
1351	131.35	430.9	133	19	0	1
1352	131.41	431.1	99	30	0	0
1353	131.90	432.7	232	16	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1354	131.91	432.8	12	14	0	0
1355	132.12	433.5	42	5	0	0
1356	132.30	434.1	143	16	0	1
1357	132.35	434.2	220	13	0	0
1358	132.38	434.3	251	25	0	0
1359	132.59	435.0	9	9	0	0
1360	132.70	435.4	12	5	0	0
1361	132.72	435.4	18	5	0	0
1362	132.74	435.5	335	4	0	0
1363	132.86	435.9	263	36	0	0
1364	132.90	436.0	262	18	0	0
1365	133.00	436.4	110	22	0	0
1366	133.19	437.0	309	4	0	0
1367	133.41	437.7	109	19	0	0
1368	133.62	438.4	12	9	0	0
1369	133.73	438.7	346	17	0	0
1370	133.77	438.9	180	24	0	0
1371	133.78	438.9	352	20	0	0
1372	133.95	439.5	326	18	0	0
1373	134.05	439.8	286	9	0	0
1374	134.23	440.4	160	22	0	0
1375	134.28	440.5	157	9	0	0
1376	134.35	440.8	144	17	0	0
1377	134.54	441.4	190	20	0	0
1378	134.67	441.8	212	19	0	0
1379	134.86	442.5	95	15	0	0
1380	134.92	442.7	70	9	0	0
1381	135.04	443.1	171	19	0	0
1382	135.15	443.4	179	10	0	0
1383	135.19	443.5	159	11	0	0
1384	135.27	443.8	182	29	32	4
1385	135.28	443.8	198	49	0	1
1386	135.45	444.4	171	15	91	4
1387	135.61	444.9	100	28	0	0
1388	135.70	445.2	160	8	0	1
1389	135.76	445.4	131	29	0	1
1390	135.80	445.5	136	35	0	0
1391	135.80	445.5	298	70	0	1
1392	135.87	445.8	150	27	0	1
1393	135.90	445.9	143	28	0	1
1394	135.97	446.1	136	17	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1395	136.00	446.2	287	38	0	1
1396	136.11	446.5	114	19	0	2
1397	136.14	446.7	105	26	0	0
1398	136.19	446.8	60	19	0	1
1399	136.24	447.0	279	14	0	0
1400	136.24	447.0	247	20	0	0
1401	136.27	447.1	122	35	0	0
1402	136.34	447.3	359	8	0	1
1403	136.36	447.4	9	10	0	0
1404	136.43	447.6	28	15	0	0
1405	136.47	447.7	351	13	0	0
1406	136.52	447.9	5	8	0	0
1407	136.62	448.2	294	11	0	0
1408	136.65	448.3	282	8	0	0
1409	136.91	449.2	215	14	0	0
1410	136.96	449.4	268	39	0	0
1411	137.00	449.5	336	6	0	1
1412	137.01	449.5	123	34	0	0
1413	137.07	449.7	60	13	0	1
1414	137.14	450.0	10	14	0	0
1415	137.31	450.5	339	20	0	1
1416	137.33	450.6	30	20	0	1
1417	137.52	451.2	119	26	0	0
1418	137.61	451.5	103	18	0	0
1419	137.67	451.7	117	27	0	0
1420	137.71	451.8	332	15	0	0
1421	137.73	451.9	61	20	0	0
1422	137.76	452.0	62	32	0	0
1423	137.81	452.1	85	20	0	0
1424	137.82	452.2	323	25	0	0
1425	137.84	452.2	13	15	0	0
1426	137.93	452.5	218	33	0	0
1427	137.97	452.7	223	35	0	0
1428	138.00	452.7	190	29	0	0
1429	138.07	453.0	188	40	0	0
1430	138.10	453.1	187	27	0	0
1431	138.12	453.2	173	18	0	0
1432	138.22	453.5	138	7	0	1
1433	138.23	453.5	332	10	0	1
1434	138.28	453.7	185	10	0	1
1435	138.28	453.7	360	14	0	1

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1436	138.48	454.3	49	7	0	0
1437	138.52	454.5	344	8	0	0
1438	138.55	454.6	332	8	0	0
1439	138.59	454.7	335	6	0	0
1440	138.62	454.8	309	7	0	0
1441	138.63	454.8	293	7	0	0
1442	138.76	455.3	296	4	0	0
1443	138.78	455.3	316	8	0	0
1444	138.81	455.4	306	7	0	0
1445	138.85	455.6	307	3	0	0
1446	138.89	455.7	310	5	0	0
1447	138.94	455.8	295	7	0	0
1448	138.97	455.9	318	3	0	0
1449	138.98	456.0	6	2	0	0
1450	139.03	456.2	217	4	0	0
1451	139.06	456.2	36	8	0	0
1452	139.13	456.5	30	4	0	0
1453	139.14	456.5	43	4	0	0
1454	139.27	456.9	104	11	0	0
1455	139.29	457.0	94	13	0	0
1456	139.34	457.2	334	5	0	0
1457	139.37	457.3	68	22	0	0
1458	139.38	457.3	197	17	0	0
1459	139.41	457.4	118	29	0	0
1460	139.46	457.6	24	7	0	0
1461	139.49	457.6	4	9	0	0
1462	139.54	457.8	29	5	0	0
1463	139.59	458.0	39	13	0	0
1464	139.63	458.1	37	12	0	0
1465	139.65	458.2	52	12	0	0
1466	139.68	458.3	36	9	0	0
1467	139.72	458.4	44	8	0	0
1468	139.74	458.5	56	7	0	0
1469	139.75	458.5	74	10	0	0
1470	139.79	458.6	23	11	0	0
1471	140.11	459.7	329	12	0	0
1472	140.17	459.9	71	6	0	0
1473	140.17	459.9	258	23	0	1
1474	140.21	460.0	95	32	0	1
1475	140.23	460.1	28	16	0	1
1476	140.35	460.5	63	7	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1477	140.39	460.6	246	11	0	0
1478	140.39	460.6	62	6	0	0
1479	140.42	460.7	51	3	0	0
1480	140.55	461.1	74	6	0	0
1481	140.57	461.2	83	5	0	0
1482	140.59	461.2	57	7	0	0
1483	140.65	461.4	192	7	0	0
1484	140.67	461.5	62	6	0	0
1485	140.69	461.6	234	19	0	0
1486	140.72	461.7	33	1	0	0
1487	140.75	461.8	223	8	0	0
1488	140.77	461.9	162	4	0	0
1489	140.88	462.2	274	12	0	0
1490	140.91	462.3	267	11	0	0
1491	140.93	462.4	264	10	0	0
1492	140.94	462.4	267	9	0	0
1493	140.98	462.5	49	9	0	0
1494	140.99	462.6	256	19	0	0
1495	141.27	463.5	339	3	0	0
1496	141.34	463.7	22	4	0	0
1497	141.36	463.8	328	6	0	0
1498	141.39	463.9	6	4	0	0
1499	141.46	464.1	1	8	0	0
1500	141.50	464.2	292	12	0	0
1501	141.51	464.3	338	16	0	0
1502	141.53	464.4	359	9	0	0
1503	141.55	464.4	346	8	0	0
1504	141.57	464.5	10	6	0	0
1505	141.59	464.5	355	5	0	0
1506	141.64	464.7	36	13	0	0
1507	141.64	464.7	240	13	0	0
1508	141.74	465.0	91	9	0	0
1509	142.28	466.8	253	39	0	0
1510	142.31	466.9	74	5	0	0
1511	142.35	467.0	111	29	0	0
1512	142.35	467.0	264	9	0	0
1513	142.38	467.1	67	23	0	0
1514	142.41	467.2	355	18	0	0
1515	142.41	467.2	310	24	0	0
1516	142.44	467.3	164	28	0	0
1517	142.54	467.7	185	7	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1518	142.58	467.8	217	9	0	0
1519	142.59	467.8	218	11	0	0
1520	142.66	468.0	147	11	0	0
1521	142.67	468.1	142	11	0	0
1522	142.75	468.3	324	5	0	0
1523	142.78	468.4	280	8	0	0
1524	142.79	468.5	62	8	0	0
1525	142.86	468.7	248	14	0	0
1526	142.91	468.9	139	26	0	0
1527	142.96	469.0	152	16	0	0
1528	142.97	469.1	331	16	0	0
1529	143.02	469.2	252	13	0	0
1530	143.02	469.2	132	11	0	0
1531	143.04	469.3	328	9	0	0
1532	143.05	469.3	3	5	0	0
1533	143.06	469.4	146	10	0	0
1534	143.08	469.4	110	8	0	0
1535	143.10	469.5	85	8	0	0
1536	143.14	469.6	71	7	0	0
1537	143.18	469.7	55	13	0	0
1538	143.20	469.8	39	7	0	0
1539	143.22	469.9	60	21	0	0
1540	143.35	470.3	223	1	0	0
1541	143.35	470.3	141	5	0	0
1542	143.56	471.0	75	2	0	0
1543	143.62	471.2	175	0	0	0
1544	143.70	471.5	82	2	0	0
1545	143.84	471.9	59	5	0	0
1546	143.94	472.3	211	22	0	0
1547	143.97	472.3	21	5	0	0
1548	144.01	472.5	122	10	0	0
1549	144.05	472.6	101	12	0	0
1550	144.07	472.7	55	16	0	0
1551	144.08	472.7	32	5	0	0
1552	144.14	472.9	59	4	0	0
1553	144.16	473.0	63	4	0	0
1554	144.21	473.1	39	4	0	0
1555	144.22	473.2	5	53	0	0
1556	144.25	473.3	98	3	0	0
1557	144.28	473.4	21	5	0	0
1558	144.32	473.5	72	15	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1559	144.34	473.6	223	11	0	1
1560	144.40	473.8	57	3	0	0
1561	144.42	473.8	167	0	0	0
1562	144.43	473.9	268	47	0	0
1563	144.49	474.1	30	16	0	0
1564	144.50	474.1	231	24	0	0
1565	144.54	474.2	198	28	0	0
1566	144.56	474.3	121	12	0	0
1567	144.58	474.4	280	34	0	0
1568	144.60	474.4	188	16	0	0
1569	144.61	474.4	273	8	0	0
1570	144.64	474.5	84	6	0	0
1571	144.73	474.8	22	2	0	0
1572	144.83	475.2	36	5	0	0
1573	144.84	475.2	212	6	0	0
1574	144.96	475.6	324	27	0	0
1575	144.98	475.7	171	33	0	0
1576	144.99	475.7	339	22	0	0
1577	145.00	475.7	8	19	0	1
1578	145.03	475.8	38	24	0	0
1579	145.04	475.8	232	15	0	0
1580	145.04	475.9	62	13	0	0
1581	145.08	476.0	199	17	0	0
1582	145.10	476.1	229	16	0	0
1583	145.14	476.2	153	7	0	0
1584	145.20	476.4	124	11	0	0
1585	145.23	476.5	93	4	0	0
1586	145.32	476.8	209	6	0	0
1587	145.37	477.0	272	4	0	0
1588	145.40	477.0	281	5	0	0
1589	145.43	477.1	244	5	0	0
1590	145.47	477.3	207	4	0	0
1591	145.47	477.3	216	11	0	0
1592	145.53	477.5	118	0	0	0
1593	145.55	477.5	245	8	0	0
1594	145.59	477.7	210	4	0	0
1595	145.62	477.8	19	1	0	0
1596	145.67	477.9	249	4	0	0
1597	145.79	478.3	24	2	0	0
1598	145.85	478.5	333	1	0	1
1599	145.88	478.6	217	3	0	1

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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1600	145.99	479.0	279	2	0	0
1601	146.06	479.2	328	31	0	1
1602	146.08	479.3	73	35	0	1
1603	146.15	479.5	314	44	0	1
1604	146.17	479.6	235	8	0	1
1605	146.27	479.9	266	9	0	1
1606	146.31	480.0	28	59	0	1
1607	146.35	480.2	299	60	0	0
1608	146.41	480.4	253	46	0	0
1609	146.54	480.8	130	40	0	0
1610	146.66	481.2	323	29	0	1
1611	146.89	481.9	118	33	0	0
1612	146.90	482.0	231	38	0	0
1613	146.93	482.1	60	14	0	0
1614	146.96	482.2	229	43	0	1
1615	147.25	483.1	311	4	0	1
1616	147.37	483.5	78	42	0	0
1617	147.43	483.7	71	14	0	0
1618	147.66	484.4	39	2	0	0
1619	147.78	484.8	359	31	0	0
1620	147.81	484.9	16	30	0	0
1621	147.93	485.4	335	15	0	1
1622	148.15	486.1	353	7	0	0
1623	148.18	486.2	333	8	0	0
1624	148.32	486.6	59	7	0	0
1625	148.37	486.8	78	7	0	0
1626	148.65	487.7	41	29	74	4
1627	148.81	488.2	120	48	0	1
1628	148.85	488.4	311	41	0	1
1629	149.00	488.8	89	6	0	1
1630	149.07	489.1	347	51	0	1
1631	149.11	489.2	85	32	0	1
1632	149.16	489.4	147	39	0	0
1633	149.19	489.5	70	15	0	0
1634	149.27	489.7	93	43	0	0
1635	149.30	489.8	156	19	0	0
1636	149.38	490.1	133	24	0	1
1637	149.40	490.2	122	8	0	2
1638	149.69	491.1	60	48	0	1
1639	149.72	491.2	57	18	0	1
1640	149.98	492.1	81	77	0	0

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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1641	150.12	492.5	222	4	0	1
1642	150.26	493.0	311	39	0	0
1643	150.28	493.0	173	29	0	0
1644	150.37	493.3	132	48	0	0
1645	150.37	493.4	99	15	0	0
1646	150.56	494.0	356	19	0	0
1647	150.62	494.2	39	5	0	0
1648	150.67	494.3	61	30	0	0
1649	150.74	494.6	171	6	0	0
1650	150.80	494.8	342	26	0	0
1651	150.87	495.0	26	6	0	0
1652	151.32	496.5	166	11	0	0
1653	151.43	496.8	112	12	0	1
1654	151.56	497.3	189	46	0	0
1655	151.60	497.4	178	45	0	1
1656	151.66	497.6	177	57	0	0
1657	151.69	497.7	142	54	0	0
1658	151.80	498.0	93	15	0	0
1659	151.84	498.2	253	29	0	0
1660	151.89	498.3	244	45	0	0
1661	151.91	498.4	25	25	0	1
1662	151.96	498.6	349	31	0	1
1663	152.05	498.8	333	48	0	1
1664	152.06	498.9	103	17	0	0
1665	152.17	499.2	214	54	0	0
1666	152.17	499.3	31	36	0	1
1667	152.20	499.3	168	46	0	0
1668	152.21	499.4	55	39	0	0
1669	152.41	500.0	130	62	0	0
1670	152.52	500.4	219	20	0	0
1671	152.58	500.6	210	30	0	0
1672	152.63	500.8	178	28	0	0
1673	152.77	501.2	339	23	0	0
1674	152.80	501.3	329	16	0	0
1675	152.93	501.8	24	9	0	0
1676	153.00	502.0	147	9	0	0
1677	153.06	502.2	346	6	0	0
1678	153.43	503.4	35	9	0	0
1679	153.80	504.6	311	28	0	0
1680	153.81	504.6	352	32	0	0
1681	153.89	504.9	311	24	0	0

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1682	153.93	505.0	172	35	0	0
1683	153.93	505.0	240	43	0	0
1684	153.94	505.1	94	18	0	0
1685	153.96	505.1	299	37	0	0
1686	154.02	505.3	215	37	0	0
1687	154.13	505.7	25	29	0	0
1688	154.34	506.4	339	5	0	1
1689	154.53	507.0	303	30	0	0
1690	154.59	507.2	296	22	0	0
1691	154.61	507.3	211	30	0	0
1692	154.63	507.3	295	25	0	0
1693	154.70	507.6	303	32	0	0
1694	154.74	507.7	293	19	0	0
1695	154.78	507.8	284	22	0	0
1696	154.88	508.1	268	20	0	0
1697	154.91	508.3	277	22	0	0
1698	154.91	508.3	205	70	0	1
1699	154.96	508.4	310	21	0	1
1700	155.05	508.7	34	51	0	1
1701	155.08	508.8	83	11	0	1
1702	155.26	509.4	297	6	0	1
1703	155.43	509.9	223	3	0	1
1704	155.75	511.0	116	10	0	1
1705	155.81	511.2	328	32	0	1
1706	155.81	511.2	107	41	0	1
1707	155.91	511.5	232	31	0	1
1708	156.03	511.9	155	65	0	1
1709	156.07	512.0	346	27	0	1
1710	156.15	512.3	133	25	0	1
1711	156.25	512.6	339	21	0	1
1712	156.43	513.2	243	42	0	1
1713	156.50	513.5	221	21	165	4
1714	156.66	514.0	238	20	0	1
1715	156.73	514.2	59	26	0	1
1716	156.76	514.3	131	38	0	1
1717	156.82	514.5	175	18	0	1
1718	156.85	514.6	195	24	0	1
1719	157.04	515.2	208	58	0	1
1720	157.15	515.6	157	21	0	1
1721	157.23	515.9	124	40	0	1
1722	157.28	516.0	178	28	0	1

All directions are with respect to magnetic north.



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Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1723	157.59	517.0	56	50	0	1
1724	157.65	517.2	53	35	0	1
1725	157.74	517.5	295	12	0	1
1726	157.74	517.5	86	14	0	1
1727	157.82	517.8	88	60	0	1
1728	158.06	518.6	76	10	0	0
1729	158.07	518.6	328	15	0	0
1730	158.09	518.7	77	5	0	0
1731	158.10	518.7	278	36	0	0
1732	158.27	519.3	195	30	0	0
1733	158.30	519.4	153	16	0	0
1734	158.34	519.5	165	29	0	0
1735	158.40	519.7	205	13	0	0
1736	158.47	519.9	291	17	0	0
1737	158.47	519.9	335	21	0	0
1738	158.49	520.0	312	50	0	0
1739	158.50	520.0	291	17	0	0
1740	158.58	520.3	349	42	0	0
1741	158.62	520.4	183	26	0	0
1742	158.76	520.9	235	25	0	0
1743	158.79	521.0	216	28	0	0
1744	158.88	521.3	312	14	0	0
1745	158.88	521.3	176	26	0	0
1746	158.96	521.5	199	38	0	0
1747	158.97	521.5	1	14	0	0
1748	158.98	521.6	303	23	0	0
1749	159.03	521.8	99	9	0	1
1750	159.04	521.8	317	10	0	0
1751	159.06	521.9	73	5	0	0
1752	159.07	521.9	158	12	0	1
1753	159.10	522.0	145	15	0	0
1754	159.11	522.0	163	13	0	0
1755	159.20	522.3	351	20	0	1
1756	159.25	522.5	323	14	0	1
1757	159.30	522.7	179	5	0	1
1758	159.42	523.0	107	36	0	1
1759	159.47	523.2	213	14	0	1
1760	159.50	523.3	253	25	0	1
1761	159.51	523.3	315	35	0	1
1762	159.69	523.9	240	6	0	0
1763	159.72	524.0	293	34	0	0

All directions are with respect to magnetic north.



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Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1764	159.78	524.2	198	60	0	0
1765	159.83	524.4	52	20	0	1
1766	159.83	524.4	43	38	0	1
1767	159.88	524.6	32	12	0	1
1768	159.95	524.8	58	8	0	0
1769	160.01	525.0	79	18	0	0
1770	160.01	525.0	271	6	0	0
1771	160.04	525.1	292	4	0	0
1772	160.07	525.2	325	43	0	0
1773	160.09	525.2	232	9	0	0
1774	160.13	525.4	287	7	0	2
1775	160.17	525.5	303	29	0	0
1776	160.25	525.8	234	14	0	0
1777	160.28	525.8	202	11	0	0
1778	160.53	526.7	103	2	0	1
1779	160.64	527.1	251	77	0	1
1780	160.75	527.4	1	2	0	1
1781	160.91	527.9	165	48	0	1
1782	160.93	528.0	307	16	0	1
1783	160.99	528.2	252	83	0	1
1784	161.05	528.4	190	39	0	1
1785	161.06	528.4	1	35	0	1
1786	161.13	528.7	306	40	0	1
1787	161.16	528.7	71	84	0	1
1788	161.21	528.9	330	17	0	1
1789	161.26	529.1	133	12	0	1
1790	161.48	529.8	257	81	0	0
1791	161.84	531.0	182	17	0	0
1792	161.90	531.2	299	2	0	0
1793	161.92	531.2	263	6	0	0
1794	161.99	531.5	231	27	0	0
1795	162.06	531.7	153	5	0	0
1796	162.22	532.2	247	12	0	0
1797	162.30	532.5	10	51	0	0
1798	162.64	533.6	9	3	0	0
1799	162.68	533.7	339	5	0	0
1800	162.82	534.2	34	2	0	0
1801	162.82	534.2	237	7	0	0
1802	162.93	534.6	282	45	0	0
1803	162.99	534.8	28	3	0	0
1804	163.18	535.4	289	9	0	0

All directions are with respect to magnetic north.



Orientation Summary Table
Televiewer Image Features
Arcadis
Deep Well Program
DMW-4
18 January 2024

Table DMW-4:1

Feature No.	Depth (meters)	Depth (feet)	Dip Direction (degrees)	Dip Angle (degrees)	Feature Aperture (mm)	Feature Rank (0 to 5)
1805	163.20	535.4	333	6	0	0
1806	163.38	536.0	349	18	0	0
1807	163.58	536.7	115	6	0	0
1808	163.63	536.9	8	5	0	0
1809	164.15	538.6	302	26	0	2
1810	164.17	538.6	116	21	0	1
1811	164.24	538.9	325	30	0	1
1812	164.28	539.0	286	23	0	1
1813	164.29	539.0	113	43	0	1
1814	164.39	539.4	123	57	0	1
1815	164.42	539.4	8	26	0	1
1816	164.50	539.7	115	58	0	1

All directions are with respect to magnetic north.

Table DMW-04:2. Summary of Corehole Dynamic Flowmeter Test-Station Results Under Ambient Conditions; Arcadis; Deep Well Program; Marinette, WI; Wellbore: DMW-04

DMW-04					
Depth (feet)	Flow in Borehole During Ambient Testing (GPM)	Ambient Flow Direction in Borehole	Flow in Borehole During Pumping (GPM)	% of Total Extraction Flow	Comments
160.0	0.00		NA	NA	Test conducted inside casing. No flow identified, as expected.
220.0	0.00		NA	NA	No flow observed under ambient conditions.
270.0	0.00		NA	NA	No flow observed under ambient conditions.
300.0	0.00		NA	NA	No flow observed under ambient conditions.
326.0	0.00		NA	NA	No flow observed under ambient conditions.
360.0	0.00		NA	NA	No flow observed under ambient conditions.
420.0	0.00		NA	NA	No flow observed under ambient conditions.
442.0	0.00		NA	NA	No flow observed under ambient conditions.
451.5	-0.01	↓	NA	NA	0.01 gpm enters the borehole under ambient conditions between 442.0 - 451.5 feet and migrates down the borehole.
471.0	-0.01	↓	NA	NA	No change in flow observed under ambient conditions between 451.5 - 471.0 feet.
505.0	-0.01	↓	NA	NA	No change in flow observed under ambient conditions between 471.0 - 505.0 feet.

Table DMW-04:2. Summary of Corehole Dynamic Flowmeter Test-Station Results Under Ambient Conditions; Arcadis; Deep Well Program; Marinette, WI; Wellbore: DMW-04

521.5	-0.01	↓	NA	NA	No change in flow observed under ambient conditions between 505.0 - 521.5 feet.
533.0	-0.02	↓	NA	NA	0.01 gpm enters the borehole under ambient conditions between 521.5 - 533.0 feet and migrates down the borehole.
539.8	-0.02	↓	NA	NA	0.02 gpm exits the borehole below 539.8 feet under ambient conditions, between 539.8 - 542.1 feet (TD).

Ambient WL (ftbgs) 0.00
 Bottom of casing (ftbgs) 185.7
 Total Depth (TD) (ftbgs) 542.1
 Avg. Extraction Rate (gpm) NA
 Observed Drawdown (ft) NA
 Specific Capacity (gpm/ft-dd) NA

Note: Negative flow is downflow in the borehole. Positive flow is upflow in the borehole.
 Additional note: Testing conducted under ambient conditions only.

Table DMW-04:3. Summary Of Corehole Dynamic Flowmeter Results With Hydraulic Conductivity And Transmissivity Estimations; Arcadis; Deep Well Program; Marinette, WI; Wellbore: DMW-04

Well Name	DMW-04
Ambient Depth to Water (ftbtoc)	NA
Ambient Depth to Water (ftbgs)	0.00
Open Borehole Interval (ftbgs)	185.7 - 542.1

Diameter of Wellbore (ft)	0.50
Drawdown (ft)	NA
Effective Radius (ft)	NA

Corehole Dynamic Flowmeter Results: DMW-04									
Interval No.	Top of Interval (ft)	Bottom of Interval (ft)	Length of Interval (ft)	Ambient Flow (gpm)	Darcy Velocity in Aquifer (ft/day)	Interval-Specific Flow Rate During Pumping (gpm)	Interval-Specific Hydraulic Conductivity ¹ (ft/day)	Transmissivity (ft ² /day)	Comments
1	442.0	451.5	9.5	0.01	NA	NA	NA	NA	
2	521.5	533.0	11.5	0.01	NA	NA	NA	NA	
3*	539.8	542.1	2.3	-0.02	NA	NA	NA	NA	
Borehole Transmissivity Using Thiem Equation								NA	
Borehole Hydraulic Conductivity (K=T/b; b=length of borehole) Using Thiem Equation							NA		

Note: Negative flow, if any, is outflow from the borehole to the aquifer, positive flow is inflow to the borehole.

¹ No hydraulic conductivity and transmissivity estimates are made due to testing under only one pressure conditions (ambient).

² Darcy Velocity, or Specific Discharge in aquifer, is calculated using the observed volumetric flow rate, the cross-sectional area of the flow interval in the wellbore and a wellbore convergence factor of 2.5 (Drost, 1968). The Darcy Velocity is only applicable to ambient horizontal flow.

* The bottom of this interval is assumed to be total depth (542.1 feet).

All depths reported herein are referenced to ground surface.

NA = Not Applicable

Memo

Deep Aquifer Bedrock Well Design and Long-Term Monitoring Work Plan– Status Update

April 1, 2024

Attachment 3

Lab Reports

ANALYTICAL REPORT

PREPARED FOR

Attn: Lisa Rutkowski
ARCADIS US Inc
126 North Jefferson Street
Suite 400
Milwaukee, Wisconsin 53202
Generated 2/2/2024 4:55:46 PM Revision 1

JOB DESCRIPTION

Marinette, WI Deep Well 30168809.1.4.1

JOB NUMBER

500-243658-1

Eurofins Chicago

Job Notes

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of Eurofins Environment Testing North Central, LLC and its client. All questions regarding this report should be directed to the Eurofins Environment Testing North Central, LLC Project Manager who has signed this report.

Results relate only to the items tested and the sample(s) as received by the laboratory. The results, detection limits (LOD) and Quantitation Limits (LOQ) have been adjusted for sample dilutions and/or solids content.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Chicago Project Manager.

Compliance Statement

The LOD and LOQ reported are adjusted by the dilution factor when a dilution factor greater than 1 is needed. Additionally, where results are indicated as being reported on a dry weight basis, the LOD and LOQ are adjusted for moisture content as well.

Definitions of Limits

- LOD = Limit of Detection = MDL as defined by 40 CFR part 136 Appendix B
- LOQ = Limit of Quantitation = 3.33 x LOD as defined by Wisconsin
- RL = Report Limit = a concentration supported by a standard in the calibration curves

Authorization



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Revision 1

Authorized for release by
Jodie Bracken, Project Manager I
Jodie.Bracken@ET.EurofinsUS.com
Designee for
Sandie Fredrick, Senior Project Manager
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660



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Case Narrative

Client: ARCADIS US Inc
Project: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Job ID: 500-243658-1

Eurofins Chicago

Job Narrative 500-243658-1

Revision

The report being provided is a revision of the original report sent on 1/17/2024. The revision has been added to correct the narrative and forms regarding the ICV for Be. Upon further review, based on the analytical method, the data was not applicable.

Receipt

The samples were received on 12/9/2023 10:25 AM. 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 0.0° 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: Sample #2 sampled 12/7 1055, received 12/9 1025 for IC.

RAD

Method 904.0: Radium batch 640728

The detection goal was not met for the following sample(s). Sample was prepped at a reduced volume due to the presence of matrix interferences: 500-243658-2. Analytical results are reported with the detection limit achieved.

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

Metals

Method 6010D: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 280-637471 and analytical batch 280-638024 were outside control limits for one or more analytes. See QC Sample Results for detail. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery is within acceptance limits.

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

LCMS

Method 537 (modified): The laboratory control sample and laboratory control sample duplicate (LCS/LCSD) for preparation batch 320-727292 and analytical batch 320-727499 recovered below the control limit for the following analyte: Perfluoro-n-octadecanoic acid (PFODA). This is a legacy analyte for the method and the state of Wisconsin is no longer concerned with its recovery; therefore, the data have been reported.

Method 537 (modified): The method blank for preparation batch 320-727292 contained Perfluorobutanoic acid (PFBA) above half the reporting limit (1/2RL). Some of the samples associated with this method blank did not contain the target compound; therefore, re-extraction and/or re-analysis of samples were not performed: 500-243658-3 and MB 320-727292/1-A.

Method 537 (modified): The low level continuing calibration verification (CCVL) associated with batch 320-727474 recovered outside control limit for Perfluoro-n-octadecanoic acid (PFODA). This analyte is not a state regulated analyte; therefore, the data have been reported.

Method 537 (modified): The low level continuing calibration verification (CCVL) associated with batch 320-728068 recovered above the upper control limit for NtFOSA. The method blank (MB) associated with this CCV was non-detect for the affected analyte; therefore, the data have been reported. The associated MB is affected: CCVL 320-728068/4 and MB 320-727292/1-A.

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

General Chemistry

Method 9056A: The following samples were received with 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: 500-243658-2 and 500-243658-3.

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

Organic Prep

Method 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-727292.

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Case Narrative

Client: ARCADIS US Inc
Project: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Job ID: 500-243658-1 (Continued)

Eurofins Chicago

preparation batch 320-727292
Method: 3535 PFC-W
Matrix: Aqueous

Method 3535: The following samples in preparation batch 320-727292 were yellow in color prior to extraction. 500-243658-2

preparation batch 320-727292
Method: 3535 PFC-W
Matrix: Aqueous

Method 3535: The following samples in preparation batch 320-727292 were observed to have floating particulates present in the sample bottle. 500-243658-2 and 500-243658-3

preparation batch 320-727292
Method: 3535 PFC-W
Matrix: Aqueous

Method 3535: During the solid phase extraction process, the following samples contain non-settable particulates which clogged the solid phase extraction column: 500-243658-2.

preparation batch 320-727292
Method: 3535 PFC-W
Matrix: Aqueous

Method 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-730932.

Method: 3535_PFC_28D
Matrix: Water

Method 3535: The following sample in preparation batch 320-730932 was observed to have a thin layer of sediment present in the bottom of the bottle prior to extraction. 500-243658-2

Method: 3535_PFC_28D
Matrix: Water

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

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Method Summary

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	EET SAC
6010D	Metals (ICP)	SW846	EET DEN
6020B	Metals (ICP/MS)	SW846	EET CHI
6020B	Metals (ICP/MS)	SW846	EET SL
7470A	Mercury (CVAA)	SW846	EET CHI
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	EET CHI
9056A	Anions, Ion Chromatography	SW846	EET CHI
SM 2320B	Alkalinity	SM	EET CHI
SM 4500 S2 F	Sulfide, Total	SM	EET CHI
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
Pos			
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET DEN
3010A	Preparation, Total Metals	SW846	EET SL
3535	Solid-Phase Extraction (SPE)	SW846	EET SAC
7470A	Preparation, Mercury	SW846	EET CHI
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

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.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

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

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: ARCADIS US Inc
Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-243658-1	Field Blank-12-07-2023-DMW	Water	12/07/23 11:00	12/09/23 10:25
500-243658-2	DMW-04	Water	12/07/23 10:55	12/09/23 10:25
500-243658-3	DMW-02	Water	12/07/23 20:15	12/09/23 10:25

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Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Client Sample ID: Field Blank-12-07-2023-DMW

Lab Sample ID: 500-243658-1

Date Collected: 12/07/23 11:00

Matrix: Water

Date Received: 12/09/23 10:25

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoropentanoic acid (PFPeA)	<1.8		1.8	0.43	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluorohexanoic acid (PFHxA)	<1.8		1.8	0.51	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluoroheptanoic acid (PFHpA)	<1.8		1.8	0.22	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluorooctanoic acid (PFOA)	<1.8		1.8	0.75	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluorononanoic acid (PFNA)	<1.8		1.8	0.24	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluorodecanoic acid (PFDA)	<1.8		1.8	0.27	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluoroundecanoic acid (PFUnA)	<1.8		1.8	0.97	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluorododecanoic acid (PFDoA)	<1.8		1.8	0.48	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluorotridecanoic acid (PFTrDA)	<1.8		1.8	1.1	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluorotetradecanoic acid (PFTeA)	<1.8		1.8	0.64	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<1.8		1.8	0.78	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluoro-n-octadecanoic acid (PFODA)	<1.8	*	1.8	0.83	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluorobutanesulfonic acid (PFBS)	<1.8		1.8	0.18	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluoropentanesulfonic acid (PFPeS)	<1.8		1.8	0.26	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluorohexanesulfonic acid (PFHxS)	<1.8		1.8	0.50	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluoroheptanesulfonic acid (PFHpS)	<1.8		1.8	0.17	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluorooctanesulfonic acid (PFOS)	<1.8		1.8	0.48	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluorononanesulfonic acid (PFNS)	<1.8		1.8	0.33	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluorodecanesulfonic acid (PFDS)	<1.8		1.8	0.28	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluorododecanesulfonic acid (PFDoS)	<1.8		1.8	0.85	ng/L		12/12/23 20:09	12/14/23 18:47	1
Perfluorooctanesulfonamide (FOSA)	<1.8		1.8	0.86	ng/L		12/12/23 20:09	12/14/23 18:47	1
NEtFOSA	<1.8		1.8	0.77	ng/L		12/12/23 20:09	12/14/23 18:47	1
NMeFOSA	<1.8		1.8	0.38	ng/L		12/12/23 20:09	12/14/23 18:47	1
NMeFOSAA	<4.4		4.4	1.1	ng/L		12/12/23 20:09	12/14/23 18:47	1
NEtFOSAA	<4.4		4.4	1.1	ng/L		12/12/23 20:09	12/14/23 18:47	1
NMeFOSE	<3.5		3.5	1.2	ng/L		12/12/23 20:09	12/14/23 18:47	1
NEtFOSE	<1.8		1.8	0.75	ng/L		12/12/23 20:09	12/14/23 18:47	1
4:2 FTS	<1.8		1.8	0.21	ng/L		12/12/23 20:09	12/14/23 18:47	1
6:2 FTS	<4.4		4.4	2.2	ng/L		12/12/23 20:09	12/14/23 18:47	1
8:2 FTS	<1.8		1.8	0.40	ng/L		12/12/23 20:09	12/14/23 18:47	1
10:2 FTS	<1.8		1.8	0.59	ng/L		12/12/23 20:09	12/14/23 18:47	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<1.8		1.8	0.35	ng/L		12/12/23 20:09	12/14/23 18:47	1
HFPO-DA (GenX)	<3.5		3.5	1.3	ng/L		12/12/23 20:09	12/14/23 18:47	1
9Cl-PF3ONS	<1.8		1.8	0.21	ng/L		12/12/23 20:09	12/14/23 18:47	1
11Cl-PF3OUdS	<1.8		1.8	0.28	ng/L		12/12/23 20:09	12/14/23 18:47	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	105		25 - 150				12/12/23 20:09	12/14/23 18:47	1
13C5 PFPeA	102		25 - 150				12/12/23 20:09	12/14/23 18:47	1
13C2 PFHxA	102		25 - 150				12/12/23 20:09	12/14/23 18:47	1
13C4 PFHpA	99		25 - 150				12/12/23 20:09	12/14/23 18:47	1
13C4 PFOA	114		25 - 150				12/12/23 20:09	12/14/23 18:47	1
13C5 PFNA	101		25 - 150				12/12/23 20:09	12/14/23 18:47	1
13C2 PFDA	104		25 - 150				12/12/23 20:09	12/14/23 18:47	1
13C2 PFUnA	97		25 - 150				12/12/23 20:09	12/14/23 18:47	1
13C2 PFDoA	104		25 - 150				12/12/23 20:09	12/14/23 18:47	1

Eurofins Chicago

Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Client Sample ID: Field Blank-12-07-2023-DMW

Lab Sample ID: 500-243658-1

Date Collected: 12/07/23 11:00

Matrix: Water

Date Received: 12/09/23 10:25

Method: EPA 537 (modified) - Fluorinated Alkyl Substances (Continued)

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C2 PFTeDA	102		25 - 150	12/12/23 20:09	12/14/23 18:47	1
13C2 PFHxDA	102		25 - 150	12/12/23 20:09	12/14/23 18:47	1
13C3 PFBS	92		25 - 150	12/12/23 20:09	12/14/23 18:47	1
18O2 PFHxS	100		25 - 150	12/12/23 20:09	12/14/23 18:47	1
13C4 PFOS	108		25 - 150	12/12/23 20:09	12/14/23 18:47	1
13C8 FOSA	86		10 - 150	12/12/23 20:09	12/14/23 18:47	1
d3-NMeFOSAA	124		25 - 150	12/12/23 20:09	12/14/23 18:47	1
d5-NEtFOSAA	120		25 - 150	12/12/23 20:09	12/14/23 18:47	1
d-N-MeFOSA-M	80		10 - 150	12/12/23 20:09	12/14/23 18:47	1
d-N-EtFOSA-M	84		10 - 150	12/12/23 20:09	12/14/23 18:47	1
d7-N-MeFOSE-M	101		10 - 150	12/12/23 20:09	12/14/23 18:47	1
d9-N-EtFOSE-M	108		10 - 150	12/12/23 20:09	12/14/23 18:47	1
M2-4:2 FTS	115		25 - 150	12/12/23 20:09	12/14/23 18:47	1
M2-6:2 FTS	113		25 - 150	12/12/23 20:09	12/14/23 18:47	1
M2-8:2 FTS	106		25 - 150	12/12/23 20:09	12/14/23 18:47	1
13C3 HFPO-DA	99		25 - 150	12/12/23 20:09	12/14/23 18:47	1
13C2 10:2 FTS	88		25 - 150	12/12/23 20:09	12/14/23 18:47	1

Method: EPA 537 (modified) - Fluorinated Alkyl Substances - RE

<i>Analyte</i>	<i>Result</i>	<i>Qualifier</i>	<i>RL</i>	<i>MDL</i>	<i>Unit</i>	<i>D</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Perfluorobutanoic acid (PFBA)	<5.0		5.0	2.4	ng/L		01/02/24 12:30	01/03/24 15:03	1

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C4 PFBA	101		25 - 150	01/02/24 12:30	01/03/24 15:03	1

Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Client Sample ID: DMW-04

Lab Sample ID: 500-243658-2

Date Collected: 12/07/23 10:55

Matrix: Water

Date Received: 12/09/23 10:25

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoropentanoic acid (PFPeA)	<1.9		1.9	0.47	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluorohexanoic acid (PFHxA)	<1.9		1.9	0.55	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluoroheptanoic acid (PFHpA)	<1.9		1.9	0.24	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluorooctanoic acid (PFOA)	<1.9		1.9	0.81	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluorononanoic acid (PFNA)	<1.9		1.9	0.26	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluorodecanoic acid (PFDA)	<1.9		1.9	0.30	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluoroundecanoic acid (PFUnA)	<1.9		1.9	1.0	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluorododecanoic acid (PFDoA)	<1.9		1.9	0.52	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluorotridecanoic acid (PFTrDA)	<1.9		1.9	1.2	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluorotetradecanoic acid (PFTeA)	<1.9		1.9	0.70	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<1.9		1.9	0.85	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluoro-n-octadecanoic acid (PFODA)	<1.9	*	1.9	0.90	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluorobutanesulfonic acid (PFBS)	<1.9		1.9	0.19	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluoropentanesulfonic acid (PFPeS)	<1.9		1.9	0.29	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluorohexanesulfonic acid (PFHxS)	<1.9		1.9	0.54	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluoroheptanesulfonic acid (PFHpS)	<1.9		1.9	0.18	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluorooctanesulfonic acid (PFOS)	<1.9		1.9	0.52	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluorononanesulfonic acid (PFNS)	<1.9		1.9	0.35	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluorodecanesulfonic acid (PFDS)	<1.9		1.9	0.31	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluorododecanesulfonic acid (PFDoS)	<1.9		1.9	0.93	ng/L		12/12/23 20:09	12/14/23 18:57	1
Perfluorooctanesulfonamide (FOSA)	<1.9		1.9	0.94	ng/L		12/12/23 20:09	12/14/23 18:57	1
NEtFOSA	<1.9		1.9	0.83	ng/L		12/12/23 20:09	12/14/23 18:57	1
NMeFOSA	<1.9		1.9	0.41	ng/L		12/12/23 20:09	12/14/23 18:57	1
NMeFOSAA	<4.8		4.8	1.1	ng/L		12/12/23 20:09	12/14/23 18:57	1
NEtFOSAA	<4.8		4.8	1.2	ng/L		12/12/23 20:09	12/14/23 18:57	1
NMeFOSE	<3.8		3.8	1.3	ng/L		12/12/23 20:09	12/14/23 18:57	1
NEtFOSE	<1.9		1.9	0.81	ng/L		12/12/23 20:09	12/14/23 18:57	1
4:2 FTS	<1.9		1.9	0.23	ng/L		12/12/23 20:09	12/14/23 18:57	1
6:2 FTS	<4.8		4.8	2.4	ng/L		12/12/23 20:09	12/14/23 18:57	1
8:2 FTS	<1.9		1.9	0.44	ng/L		12/12/23 20:09	12/14/23 18:57	1
10:2 FTS	<1.9		1.9	0.64	ng/L		12/12/23 20:09	12/14/23 18:57	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<1.9		1.9	0.38	ng/L		12/12/23 20:09	12/14/23 18:57	1
HFPO-DA (GenX)	<3.8		3.8	1.4	ng/L		12/12/23 20:09	12/14/23 18:57	1
9Cl-PF3ONS	<1.9		1.9	0.23	ng/L		12/12/23 20:09	12/14/23 18:57	1
11Cl-PF3OUdS	<1.9		1.9	0.31	ng/L		12/12/23 20:09	12/14/23 18:57	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	71		25 - 150				12/12/23 20:09	12/14/23 18:57	1
13C5 PFPeA	63		25 - 150				12/12/23 20:09	12/14/23 18:57	1
13C2 PFHxA	66		25 - 150				12/12/23 20:09	12/14/23 18:57	1
13C4 PFHpA	74		25 - 150				12/12/23 20:09	12/14/23 18:57	1
13C4 PFOA	68		25 - 150				12/12/23 20:09	12/14/23 18:57	1
13C5 PFNA	65		25 - 150				12/12/23 20:09	12/14/23 18:57	1
13C2 PFDA	63		25 - 150				12/12/23 20:09	12/14/23 18:57	1
13C2 PFUnA	51		25 - 150				12/12/23 20:09	12/14/23 18:57	1
13C2 PFDoA	49		25 - 150				12/12/23 20:09	12/14/23 18:57	1

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Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Client Sample ID: DMW-04

Lab Sample ID: 500-243658-2

Date Collected: 12/07/23 10:55

Matrix: Water

Date Received: 12/09/23 10:25

Method: EPA 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFTeDA	49		25 - 150	12/12/23 20:09	12/14/23 18:57	1
13C2 PFHxDA	58		25 - 150	12/12/23 20:09	12/14/23 18:57	1
13C3 PFBS	62		25 - 150	12/12/23 20:09	12/14/23 18:57	1
18O2 PFHxS	69		25 - 150	12/12/23 20:09	12/14/23 18:57	1
13C4 PFOS	65		25 - 150	12/12/23 20:09	12/14/23 18:57	1
13C8 FOSA	58		10 - 150	12/12/23 20:09	12/14/23 18:57	1
d3-NMeFOSAA	73		25 - 150	12/12/23 20:09	12/14/23 18:57	1
d5-NEtFOSAA	63		25 - 150	12/12/23 20:09	12/14/23 18:57	1
d-N-MeFOSA-M	46		10 - 150	12/12/23 20:09	12/14/23 18:57	1
d-N-EtFOSA-M	44		10 - 150	12/12/23 20:09	12/14/23 18:57	1
d7-N-MeFOSE-M	43		10 - 150	12/12/23 20:09	12/14/23 18:57	1
d9-N-EtFOSE-M	44		10 - 150	12/12/23 20:09	12/14/23 18:57	1
M2-4:2 FTS	82		25 - 150	12/12/23 20:09	12/14/23 18:57	1
M2-6:2 FTS	60		25 - 150	12/12/23 20:09	12/14/23 18:57	1
M2-8:2 FTS	59		25 - 150	12/12/23 20:09	12/14/23 18:57	1
13C3 HFPO-DA	64		25 - 150	12/12/23 20:09	12/14/23 18:57	1
13C2 10:2 FTS	39		25 - 150	12/12/23 20:09	12/14/23 18:57	1

Method: EPA 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<4.9		4.9	2.4	ng/L		01/02/24 12:30	01/03/24 15:15	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	92		25 - 150	01/02/24 12:30	01/03/24 15:15	1

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	110		2.0	0.56	mg/L		12/15/23 14:32	12/20/23 08:45	20

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Uranium	0.45	J	1.0	0.15	ug/L		12/15/23 13:55	12/19/23 18:16	2

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<100		100	25	ug/L		12/14/23 09:07	12/21/23 20:29	1
Antimony	<3.0		3.0	1.3	ug/L		12/14/23 09:07	12/21/23 20:29	1
Arsenic	0.48	J	1.0	0.23	ug/L		12/14/23 09:07	12/21/23 20:29	1
Barium	15		2.5	0.73	ug/L		12/14/23 09:07	12/21/23 20:29	1
Beryllium	<1.0		1.0	0.53	ug/L		12/14/23 09:07	01/02/24 14:53	1
Boron	220	B	50	13	ug/L		12/14/23 09:07	12/21/23 20:29	1
Cadmium	<0.50		0.50	0.17	ug/L		12/14/23 09:07	12/21/23 20:29	1
Calcium	71000	B	200	44	ug/L		12/14/23 09:07	12/21/23 20:29	1
Chromium	<5.0		5.0	1.1	ug/L		12/14/23 09:07	12/21/23 20:29	1
Cobalt	0.69	J	1.0	0.40	ug/L		12/14/23 09:07	12/21/23 20:29	1
Copper	1.6	J	2.0	0.50	ug/L		12/14/23 09:07	12/21/23 20:29	1
Iron	8900		100	47	ug/L		12/14/23 09:07	12/21/23 20:29	1
Lead	<0.50		0.50	0.19	ug/L		12/14/23 09:07	12/21/23 20:29	1
Magnesium	36000		200	49	ug/L		12/14/23 09:07	12/21/23 20:29	1
Manganese	100		2.5	0.79	ug/L		12/14/23 09:07	12/21/23 20:29	1
Nickel	3.3		2.0	0.63	ug/L		12/14/23 09:07	12/21/23 20:29	1

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Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Client Sample ID: DMW-04

Lab Sample ID: 500-243658-2

Date Collected: 12/07/23 10:55

Matrix: Water

Date Received: 12/09/23 10:25

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	6500		500	110	ug/L		12/14/23 09:07	12/21/23 20:29	1
Selenium	<2.5		2.5	0.98	ug/L		12/14/23 09:07	12/21/23 20:29	1
Silver	<0.50		0.50	0.12	ug/L		12/14/23 09:07	12/21/23 20:29	1
Sodium	46000		200	77	ug/L		12/14/23 09:07	12/21/23 20:29	1
Strontium	9300	B	4.0	0.64	ug/L		12/14/23 09:07	12/21/23 20:29	1
Thallium	<2.0		2.0	0.57	ug/L		12/14/23 09:07	12/21/23 20:29	1
Vanadium	<5.0		5.0	2.2	ug/L		12/14/23 09:07	12/21/23 20:29	1
Zinc	26		20	6.9	ug/L		12/14/23 09:07	12/21/23 20:29	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	0.079	ug/L		12/20/23 12:00	12/21/23 07:46	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	380		0.91	0.46	mg/L		12/14/23 09:07	12/18/23 10:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide (SW846 9056A)	0.26	J	1.0	0.18	mg/L			12/11/23 10:26	1
Nitrate as N (SW846 9056A)	<1.0	H	1.0	0.043	mg/L			12/11/23 10:26	1
Chloride (SW846 9056A)	45		10	1.2	mg/L			12/11/23 17:16	10
Nitrite as N (SW846 9056A)	<1.0	H	1.0	0.070	mg/L			12/11/23 10:26	1
Fluoride (SW846 9056A)	1.2		1.0	0.19	mg/L			12/11/23 10:26	1
Orthophosphate as P (SW846 9056A)	<1.0	H	1.0	0.13	mg/L			12/11/23 10:26	1
Sulfate (SW846 9056A)	310		10	2.1	mg/L			12/11/23 17:16	10
Alkalinity, Total (SM 2320B)	120	B	5.0	3.7	mg/L			12/20/23 13:36	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	120	B	5.0	3.7	mg/L			12/20/23 13:36	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<5.0		5.0	3.7	mg/L			12/20/23 13:36	1
Sulfide (SM 4500 S2 F)	<1.0		1.0	0.23	mg/L			12/11/23 23:30	1

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	5.46		0.832	0.966	1.00	0.511	pCi/L	12/14/23 10:28	01/15/24 20:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.3		30 - 110					12/14/23 10:28	01/15/24 20:06	1

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	2.01	G	0.782	0.803	1.00	1.03	pCi/L	12/14/23 10:31	01/15/24 12:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.3		30 - 110					12/14/23 10:31	01/15/24 12:28	1
Y Carrier	69.5		30 - 110					12/14/23 10:31	01/15/24 12:28	1

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Client Sample Results

Client: ARCADIS US Inc
Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Client Sample ID: DMW-04

Lab Sample ID: 500-243658-2

Date Collected: 12/07/23 10:55

Matrix: Water

Date Received: 12/09/23 10:25

Method: TAL-STL Ra226_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	7.47		1.14	1.26	5.00	1.03	pCi/L		01/17/24 13:31	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Client Sample ID: DMW-02

Lab Sample ID: 500-243658-3

Date Collected: 12/07/23 20:15

Matrix: Water

Date Received: 12/09/23 10:25

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<4.1		4.1	2.0	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluoropentanoic acid (PFPeA)	<1.6		1.6	0.40	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluorohexanoic acid (PFHxA)	<1.6		1.6	0.47	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluoroheptanoic acid (PFHpA)	<1.6		1.6	0.20	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluorooctanoic acid (PFOA)	<1.6		1.6	0.69	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluorononanoic acid (PFNA)	<1.6		1.6	0.22	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluorodecanoic acid (PFDA)	<1.6		1.6	0.25	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluoroundecanoic acid (PFUnA)	<1.6		1.6	0.90	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluorododecanoic acid (PFDoA)	<1.6		1.6	0.45	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluorotridecanoic acid (PFTrDA)	<1.6		1.6	1.1	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluorotetradecanoic acid (PFTeA)	<1.6		1.6	0.59	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<1.6		1.6	0.73	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluoro-n-octadecanoic acid (PFODA)	<1.6	*	1.6	0.77	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluorobutanesulfonic acid (PFBS)	<1.6		1.6	0.16	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluoropentanesulfonic acid (PFPeS)	<1.6		1.6	0.24	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluorohexanesulfonic acid (PFHxS)	<1.6		1.6	0.46	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluoroheptanesulfonic acid (PFHpS)	<1.6		1.6	0.15	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluorooctanesulfonic acid (PFOS)	<1.6		1.6	0.44	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluorononanesulfonic acid (PFNS)	<1.6		1.6	0.30	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluorodecanesulfonic acid (PFDS)	<1.6		1.6	0.26	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluorododecanesulfonic acid (PFDoS)	<1.6		1.6	0.79	ng/L		12/12/23 20:09	12/14/23 19:07	1
Perfluorooctanesulfonamide (FOSA)	<1.6		1.6	0.80	ng/L		12/12/23 20:09	12/14/23 19:07	1
NEtFOSA	<1.6		1.6	0.71	ng/L		12/12/23 20:09	12/14/23 19:07	1
NMeFOSA	<1.6		1.6	0.35	ng/L		12/12/23 20:09	12/14/23 19:07	1
NMeFOSAA	<4.1		4.1	0.98	ng/L		12/12/23 20:09	12/14/23 19:07	1
NEtFOSAA	<4.1		4.1	1.1	ng/L		12/12/23 20:09	12/14/23 19:07	1
NMeFOSE	<3.3		3.3	1.1	ng/L		12/12/23 20:09	12/14/23 19:07	1
NEtFOSE	<1.6		1.6	0.69	ng/L		12/12/23 20:09	12/14/23 19:07	1
4:2 FTS	<1.6		1.6	0.20	ng/L		12/12/23 20:09	12/14/23 19:07	1
6:2 FTS	<4.1		4.1	2.0	ng/L		12/12/23 20:09	12/14/23 19:07	1
8:2 FTS	<1.6		1.6	0.37	ng/L		12/12/23 20:09	12/14/23 19:07	1
10:2 FTS	<1.6		1.6	0.55	ng/L		12/12/23 20:09	12/14/23 19:07	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<1.6		1.6	0.33	ng/L		12/12/23 20:09	12/14/23 19:07	1
HFPO-DA (GenX)	<3.3		3.3	1.2	ng/L		12/12/23 20:09	12/14/23 19:07	1
9Cl-PF3ONS	<1.6		1.6	0.20	ng/L		12/12/23 20:09	12/14/23 19:07	1
11Cl-PF3OUdS	<1.6		1.6	0.26	ng/L		12/12/23 20:09	12/14/23 19:07	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	103		25 - 150				12/12/23 20:09	12/14/23 19:07	1
13C5 PFPeA	98		25 - 150				12/12/23 20:09	12/14/23 19:07	1
13C2 PFHxA	98		25 - 150				12/12/23 20:09	12/14/23 19:07	1
13C4 PFHpA	109		25 - 150				12/12/23 20:09	12/14/23 19:07	1
13C4 PFOA	106		25 - 150				12/12/23 20:09	12/14/23 19:07	1
13C5 PFNA	105		25 - 150				12/12/23 20:09	12/14/23 19:07	1
13C2 PFDA	101		25 - 150				12/12/23 20:09	12/14/23 19:07	1
13C2 PFUnA	103		25 - 150				12/12/23 20:09	12/14/23 19:07	1

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Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Client Sample ID: DMW-02

Lab Sample ID: 500-243658-3

Date Collected: 12/07/23 20:15

Matrix: Water

Date Received: 12/09/23 10:25

Method: EPA 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	104		25 - 150	12/12/23 20:09	12/14/23 19:07	1
13C2 PFTeDA	103		25 - 150	12/12/23 20:09	12/14/23 19:07	1
13C2 PFHxDA	104		25 - 150	12/12/23 20:09	12/14/23 19:07	1
13C3 PFBS	100		25 - 150	12/12/23 20:09	12/14/23 19:07	1
18O2 PFHxS	109		25 - 150	12/12/23 20:09	12/14/23 19:07	1
13C4 PFOS	107		25 - 150	12/12/23 20:09	12/14/23 19:07	1
13C8 FOSA	94		10 - 150	12/12/23 20:09	12/14/23 19:07	1
d3-NMeFOSAA	136		25 - 150	12/12/23 20:09	12/14/23 19:07	1
d5-NEtFOSAA	130		25 - 150	12/12/23 20:09	12/14/23 19:07	1
d-N-MeFOSA-M	83		10 - 150	12/12/23 20:09	12/14/23 19:07	1
d-N-EtFOSA-M	88		10 - 150	12/12/23 20:09	12/14/23 19:07	1
d7-N-MeFOSE-M	86		10 - 150	12/12/23 20:09	12/14/23 19:07	1
d9-N-EtFOSE-M	94		10 - 150	12/12/23 20:09	12/14/23 19:07	1
M2-4:2 FTS	109		25 - 150	12/12/23 20:09	12/14/23 19:07	1
M2-6:2 FTS	105		25 - 150	12/12/23 20:09	12/14/23 19:07	1
M2-8:2 FTS	109		25 - 150	12/12/23 20:09	12/14/23 19:07	1
13C3 HFPO-DA	101		25 - 150	12/12/23 20:09	12/14/23 19:07	1
13C2 10:2 FTS	84		25 - 150	12/12/23 20:09	12/14/23 19:07	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<100		100	25	ug/L		12/14/23 09:07	12/21/23 20:33	1
Antimony	<3.0		3.0	1.3	ug/L		12/14/23 09:07	12/21/23 20:33	1
Arsenic	1.5		1.0	0.23	ug/L		12/14/23 09:07	12/21/23 20:33	1
Barium	4.6		2.5	0.73	ug/L		12/14/23 09:07	12/21/23 20:33	1
Beryllium	<1.0		1.0	0.53	ug/L		12/14/23 09:07	01/02/24 14:57	1
Boron	220	B	50	13	ug/L		12/14/23 09:07	12/21/23 20:33	1
Cadmium	<0.50		0.50	0.17	ug/L		12/14/23 09:07	12/21/23 20:33	1
Calcium	370000	B	200	44	ug/L		12/14/23 09:07	12/21/23 20:33	1
Chromium	<5.0		5.0	1.1	ug/L		12/14/23 09:07	12/21/23 20:33	1
Cobalt	0.61	J	1.0	0.40	ug/L		12/14/23 09:07	12/21/23 20:33	1
Copper	1.1	J	2.0	0.50	ug/L		12/14/23 09:07	12/21/23 20:33	1
Iron	920		100	47	ug/L		12/14/23 09:07	12/21/23 20:33	1
Lead	<0.50		0.50	0.19	ug/L		12/14/23 09:07	12/21/23 20:33	1
Magnesium	110000		200	49	ug/L		12/14/23 09:07	12/21/23 20:33	1
Manganese	44		2.5	0.79	ug/L		12/14/23 09:07	12/21/23 20:33	1
Nickel	<2.0		2.0	0.63	ug/L		12/14/23 09:07	12/21/23 20:33	1
Potassium	5800		500	110	ug/L		12/14/23 09:07	12/21/23 20:33	1
Selenium	<2.5		2.5	0.98	ug/L		12/14/23 09:07	12/21/23 20:33	1
Silver	<0.50		0.50	0.12	ug/L		12/14/23 09:07	12/21/23 20:33	1
Sodium	56000		200	77	ug/L		12/14/23 09:07	12/21/23 20:33	1
Strontium	9400	B	4.0	0.64	ug/L		12/14/23 09:07	12/21/23 20:33	1
Thallium	<2.0		2.0	0.57	ug/L		12/14/23 09:07	12/21/23 20:33	1
Vanadium	<5.0		5.0	2.2	ug/L		12/14/23 09:07	12/21/23 20:33	1
Zinc	16	J	20	6.9	ug/L		12/14/23 09:07	12/21/23 20:33	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	0.079	ug/L		12/20/23 12:00	12/21/23 07:48	1

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Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Client Sample ID: DMW-02

Lab Sample ID: 500-243658-3

Date Collected: 12/07/23 20:15

Matrix: Water

Date Received: 12/09/23 10:25

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	1500		0.91	0.46	mg/L		12/14/23 09:07	12/18/23 10:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide (SW846 9056A)	0.40	J	1.0	0.18	mg/L			12/11/23 10:41	1
Nitrate as N (SW846 9056A)	<1.0	H	1.0	0.043	mg/L			12/11/23 10:41	1
Chloride (SW846 9056A)	62		5.0	0.58	mg/L			12/11/23 17:31	5
Nitrite as N (SW846 9056A)	<1.0	H	1.0	0.070	mg/L			12/11/23 10:41	1
Fluoride (SW846 9056A)	1.6		1.0	0.19	mg/L			12/11/23 10:41	1
Orthophosphate as P (SW846 9056A)	<1.0	H	1.0	0.13	mg/L			12/11/23 10:41	1
Sulfate (SW846 9056A)	1300		100	21	mg/L			12/11/23 17:46	100

Definitions/Glossary

Client: ARCADIS US Inc
Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*-	LCS and/or LCSD is outside acceptance limits, low biased.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
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
B	Compound was found in the blank and sample.
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
U	Result is less than the sample detection limit.

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

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-727292/1-A
Matrix: Water
Analysis Batch: 728104

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 727292

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorobutanoic acid (PFBA)	2.76	J	5.0	2.4	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluoropentanoic acid (PFPeA)	<2.0		2.0	0.49	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	0.58	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	0.25	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	0.85	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	0.27	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	0.31	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	1.1	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	0.55	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluorotridecanoic acid (PFTrDA)	<2.0		2.0	1.3	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluorotetradecanoic acid (PFTeA)	<2.0		2.0	0.73	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<2.0		2.0	0.89	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluoro-n-octadecanoic acid (PFODA)	<2.0		2.0	0.94	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	0.20	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluoropentanesulfonic acid (PFPeS)	<2.0		2.0	0.30	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0	0.57	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		2.0	0.19	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	0.54	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluorononanesulfonic acid (PFNS)	<2.0		2.0	0.37	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluorodecanesulfonic acid (PFDS)	<2.0		2.0	0.32	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluorododecanesulfonic acid (PFDoS)	<2.0		2.0	0.97	ng/L		12/12/23 20:09	12/16/23 19:08	1
Perfluorooctanesulfonamide (FOSA)	<2.0		2.0	0.98	ng/L		12/12/23 20:09	12/16/23 19:08	1
NEtFOSA	<2.0		2.0	0.87	ng/L		12/12/23 20:09	12/16/23 19:08	1
NMeFOSA	<2.0		2.0	0.43	ng/L		12/12/23 20:09	12/16/23 19:08	1
NMeFOSAA	<5.0		5.0	1.2	ng/L		12/12/23 20:09	12/16/23 19:08	1
NEtFOSAA	<5.0		5.0	1.3	ng/L		12/12/23 20:09	12/16/23 19:08	1
NMeFOSE	<4.0		4.0	1.4	ng/L		12/12/23 20:09	12/16/23 19:08	1
NEtFOSE	<2.0		2.0	0.85	ng/L		12/12/23 20:09	12/16/23 19:08	1
4:2 FTS	<2.0		2.0	0.24	ng/L		12/12/23 20:09	12/16/23 19:08	1
6:2 FTS	<5.0		5.0	2.5	ng/L		12/12/23 20:09	12/16/23 19:08	1
8:2 FTS	<2.0		2.0	0.46	ng/L		12/12/23 20:09	12/16/23 19:08	1
10:2 FTS	<2.0		2.0	0.67	ng/L		12/12/23 20:09	12/16/23 19:08	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	0.40	ng/L		12/12/23 20:09	12/16/23 19:08	1
HFPO-DA (GenX)	<4.0		4.0	1.5	ng/L		12/12/23 20:09	12/16/23 19:08	1
9Cl-PF3ONS	<2.0		2.0	0.24	ng/L		12/12/23 20:09	12/16/23 19:08	1
11Cl-PF3OUdS	<2.0		2.0	0.32	ng/L		12/12/23 20:09	12/16/23 19:08	1
Isotope Dilution	MB	MB	Limits	Prepared	Analyzed	Dil Fac			
	%Recovery	Qualifier							
13C4 PFBA	107		25 - 150	12/12/23 20:09	12/16/23 19:08	1			
13C5 PFPeA	122		25 - 150	12/12/23 20:09	12/16/23 19:08	1			
13C2 PFHxA	109		25 - 150	12/12/23 20:09	12/16/23 19:08	1			
13C4 PFHpA	127		25 - 150	12/12/23 20:09	12/16/23 19:08	1			
13C4 PFOA	103		25 - 150	12/12/23 20:09	12/16/23 19:08	1			
13C5 PFNA	99		25 - 150	12/12/23 20:09	12/16/23 19:08	1			

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-727292/1-A
Matrix: Water
Analysis Batch: 728104

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 727292

Isotope Dilution	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFDA	92		25 - 150	12/12/23 20:09	12/16/23 19:08	1
13C2 PFUnA	95		25 - 150	12/12/23 20:09	12/16/23 19:08	1
13C2 PFDoA	98		25 - 150	12/12/23 20:09	12/16/23 19:08	1
13C2 PFTeDA	97		25 - 150	12/12/23 20:09	12/16/23 19:08	1
13C2 PFHxDA	85		25 - 150	12/12/23 20:09	12/16/23 19:08	1
13C3 PFBS	109		25 - 150	12/12/23 20:09	12/16/23 19:08	1
18O2 PFHxS	110		25 - 150	12/12/23 20:09	12/16/23 19:08	1
13C4 PFOS	98		25 - 150	12/12/23 20:09	12/16/23 19:08	1
13C8 FOSA	102		10 - 150	12/12/23 20:09	12/16/23 19:08	1
d3-NMeFOSAA	76		25 - 150	12/12/23 20:09	12/16/23 19:08	1
d5-NEtFOSAA	85		25 - 150	12/12/23 20:09	12/16/23 19:08	1
d-N-MeFOSA-M	75		10 - 150	12/12/23 20:09	12/16/23 19:08	1
d-N-EtFOSA-M	73		10 - 150	12/12/23 20:09	12/16/23 19:08	1
d7-N-MeFOSE-M	127		10 - 150	12/12/23 20:09	12/16/23 19:08	1
d9-N-EtFOSE-M	130		10 - 150	12/12/23 20:09	12/16/23 19:08	1
M2-4:2 FTS	102		25 - 150	12/12/23 20:09	12/16/23 19:08	1
M2-6:2 FTS	120		25 - 150	12/12/23 20:09	12/16/23 19:08	1
M2-8:2 FTS	99		25 - 150	12/12/23 20:09	12/16/23 19:08	1
13C3 HFPO-DA	92		25 - 150	12/12/23 20:09	12/16/23 19:08	1
13C2 10:2 FTS	86		25 - 150	12/12/23 20:09	12/16/23 19:08	1

Lab Sample ID: LCS 320-727292/2-A
Matrix: Water
Analysis Batch: 727499

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 727292

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec	Limits
Perfluoropentanoic acid (PFPeA)	160	141		ng/L		88	60 - 135	
Perfluorohexanoic acid (PFHxA)	160	138		ng/L		86	60 - 135	
Perfluoroheptanoic acid (PFHpA)	160	134		ng/L		84	60 - 135	
Perfluorooctanoic acid (PFOA)	160	130		ng/L		81	60 - 135	
Perfluorononanoic acid (PFNA)	160	142		ng/L		89	60 - 135	
Perfluorodecanoic acid (PFDA)	160	137		ng/L		86	60 - 135	
Perfluoroundecanoic acid (PFUnA)	160	129		ng/L		81	60 - 135	
Perfluorododecanoic acid (PFDoA)	160	137		ng/L		86	60 - 135	
Perfluorotridecanoic acid (PFTTrDA)	160	139		ng/L		87	60 - 135	
Perfluorotetradecanoic acid (PFTeA)	160	146		ng/L		91	60 - 135	
Perfluoro-n-hexadecanoic acid (PFHxDA)	160	148		ng/L		93	60 - 135	
Perfluoro-n-octadecanoic acid (PFODA)	160	88.3	*-	ng/L		55	60 - 135	
Perfluorobutanesulfonic acid (PFBS)	142	145		ng/L		102	60 - 135	
Perfluoropentanesulfonic acid (PFPeS)	150	172		ng/L		115	60 - 135	
Perfluorohexanesulfonic acid (PFHxS)	146	142		ng/L		97	60 - 135	

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-727292/2-A
Matrix: Water
Analysis Batch: 727499

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 727292

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoroheptanesulfonic acid (PFHpS)	153	153		ng/L		100	60 - 135
Perfluorooctanesulfonic acid (PFOS)	149	141		ng/L		95	60 - 135
Perfluorononanesulfonic acid (PFNS)	154	139		ng/L		90	60 - 135
Perfluorodecanesulfonic acid (PFDS)	154	139		ng/L		90	60 - 135
Perfluorododecanesulfonic acid (PFDoS)	155	135		ng/L		87	60 - 135
Perfluorooctanesulfonamide (FOSA)	160	154		ng/L		96	60 - 135
NEtFOSA	160	161		ng/L		101	60 - 135
NMeFOSA	160	154		ng/L		96	60 - 135
NMeFOSAA	160	158		ng/L		99	60 - 135
NEtFOSAA	160	147		ng/L		92	60 - 135
NMeFOSE	160	147		ng/L		92	60 - 135
NEtFOSE	160	127		ng/L		79	60 - 135
4:2 FTS	150	139		ng/L		93	60 - 135
6:2 FTS	152	123		ng/L		81	60 - 135
8:2 FTS	154	162		ng/L		105	60 - 135
10:2 FTS	155	149		ng/L		96	60 - 135
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	151	120		ng/L		79	60 - 135
HFPO-DA (GenX)	160	154		ng/L		96	60 - 135
9Cl-PF3ONS	149	137		ng/L		91	60 - 135
11Cl-PF3OUdS	151	131		ng/L		87	60 - 135

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFBA	95		25 - 150
13C5 PFPeA	96		25 - 150
13C2 PFHxA	94		25 - 150
13C4 PFHpA	102		25 - 150
13C4 PFOA	109		25 - 150
13C5 PFNA	95		25 - 150
13C2 PFDA	101		25 - 150
13C2 PFUnA	103		25 - 150
13C2 PFDoA	98		25 - 150
13C2 PFTeDA	91		25 - 150
13C2 PFHxDA	101		25 - 150
13C3 PFBS	90		25 - 150
18O2 PFHxS	99		25 - 150
13C4 PFOS	99		25 - 150
13C8 FOSA	84		10 - 150
d3-NMeFOSAA	123		25 - 150
d5-NEtFOSAA	113		25 - 150
d-N-MeFOSA-M	86		10 - 150
d-N-EtFOSA-M	85		10 - 150
d7-N-MeFOSE-M	91		10 - 150
d9-N-EtFOSE-M	101		10 - 150

QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-727292/2-A
Matrix: Water
Analysis Batch: 727499

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 727292

Isotope Dilution	LCS LCS		Limits
	%Recovery	Qualifier	
M2-4:2 FTS	114		25 - 150
M2-6:2 FTS	109		25 - 150
M2-8:2 FTS	92		25 - 150
13C3 HFPO-DA	102		25 - 150
13C2 10:2 FTS	80		25 - 150

Lab Sample ID: LCSD 320-727292/3-A
Matrix: Water
Analysis Batch: 727499

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 727292

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec		RPD	Limit
							Limits	RPD		
Perfluorobutanoic acid (PFBA)	160	144		ng/L		90	60 - 135	0	30	
Perfluoropentanoic acid (PFPeA)	160	154		ng/L		96	60 - 135	9	30	
Perfluorohexanoic acid (PFHxA)	160	153		ng/L		96	60 - 135	10	30	
Perfluoroheptanoic acid (PFHpA)	160	144		ng/L		90	60 - 135	7	30	
Perfluorooctanoic acid (PFOA)	160	145		ng/L		90	60 - 135	11	30	
Perfluorononanoic acid (PFNA)	160	149		ng/L		93	60 - 135	5	30	
Perfluorodecanoic acid (PFDA)	160	145		ng/L		90	60 - 135	5	30	
Perfluoroundecanoic acid (PFUnA)	160	136		ng/L		85	60 - 135	6	30	
Perfluorododecanoic acid (PFDoA)	160	141		ng/L		88	60 - 135	3	30	
Perfluorotridecanoic acid (PFTrDA)	160	138		ng/L		86	60 - 135	1	30	
Perfluorotetradecanoic acid (PFTeA)	160	148		ng/L		92	60 - 135	1	30	
Perfluoro-n-hexadecanoic acid (PFHxDA)	160	170		ng/L		106	60 - 135	14	30	
Perfluoro-n-octadecanoic acid (PFODA)	160	94.6	*-	ng/L		59	60 - 135	7	30	
Perfluorobutanesulfonic acid (PFBS)	142	145		ng/L		102	60 - 135	0	30	
Perfluoropentanesulfonic acid (PFPeS)	150	167		ng/L		111	60 - 135	3	30	
Perfluorohexanesulfonic acid (PFHxS)	146	136		ng/L		93	60 - 135	4	30	
Perfluoroheptanesulfonic acid (PFHpS)	153	149		ng/L		98	60 - 135	3	30	
Perfluorooctanesulfonic acid (PFOS)	149	149		ng/L		100	60 - 135	6	30	
Perfluorononanesulfonic acid (PFNS)	154	152		ng/L		99	60 - 135	9	30	
Perfluorodecanesulfonic acid (PFDS)	154	152		ng/L		99	60 - 135	9	30	
Perfluorododecanesulfonic acid (PFDoS)	155	141		ng/L		91	60 - 135	5	30	
Perfluorooctanesulfonamide (FOSA)	160	174		ng/L		109	60 - 135	12	30	
NEtFOSA	160	169		ng/L		106	60 - 135	5	30	
NMeFOSA	160	164		ng/L		102	60 - 135	6	30	
NMeFOSAA	160	162		ng/L		101	60 - 135	2	30	
NEtFOSAA	160	163		ng/L		102	60 - 135	10	30	
NMeFOSE	160	158		ng/L		99	60 - 135	7	30	

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-727292/3-A
Matrix: Water
Analysis Batch: 727499

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 727292

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
NEtFOSE	160	157		ng/L		98	60 - 135	21	30
4:2 FTS	150	147		ng/L		98	60 - 135	5	30
6:2 FTS	152	135		ng/L		89	60 - 135	9	30
8:2 FTS	154	150		ng/L		98	60 - 135	8	30
10:2 FTS	155	155		ng/L		101	60 - 135	4	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	151	131		ng/L		87	60 - 135	9	30
HFPO-DA (GenX)	160	154		ng/L		96	60 - 135	0	30
9CI-PF3ONS	149	147		ng/L		98	60 - 135	7	30
11CI-PF3OUdS	151	135		ng/L		89	60 - 135	3	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	LCSD Limits
13C4 PFBA	106		25 - 150
13C5 PFPeA	102		25 - 150
13C2 PFHxA	106		25 - 150
13C4 PFHpA	120		25 - 150
13C4 PFOA	113		25 - 150
13C5 PFNA	106		25 - 150
13C2 PFDA	107		25 - 150
13C2 PFUnA	110		25 - 150
13C2 PFDoA	108		25 - 150
13C2 PFTeDA	106		25 - 150
13C2 PFHxDA	107		25 - 150
13C3 PFBS	100		25 - 150
18O2 PFHxS	114		25 - 150
13C4 PFOS	106		25 - 150
13C8 FOSA	85		10 - 150
d3-NMeFOSAA	135		25 - 150
d5-NEtFOSAA	117		25 - 150
d-N-MeFOSA-M	86		10 - 150
d-N-EtFOSA-M	87		10 - 150
d7-N-MeFOSE-M	86		10 - 150
d9-N-EtFOSE-M	88		10 - 150
M2-4:2 FTS	131		25 - 150
M2-6:2 FTS	108		25 - 150
M2-8:2 FTS	114		25 - 150
13C3 HFPO-DA	109		25 - 150
13C2 10:2 FTS	83		25 - 150

Lab Sample ID: MB 320-730932/1-A
Matrix: Water
Analysis Batch: 731253

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 730932

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<5.0		5.0	2.4	ng/L		01/02/24 12:30	01/03/24 14:30	1

Isotope Dilution	MB %Recovery	MB Qualifier	MB Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	99		25 - 150	01/02/24 12:30	01/03/24 14:30	1

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LLCS 320-730932/2-A
Matrix: Water
Analysis Batch: 731253

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 730932

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorobutanoic acid (PFBA)	8.00	8.67		ng/L		108	50 - 150
		LLCS	LLCS				
Isotope Dilution	%Recovery	Qualifier	Limits				
<i>13C4 PFBA</i>	105		25 - 150				

Lab Sample ID: LLCSD 320-730932/3-A
Matrix: Water
Analysis Batch: 731253

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 730932

Analyte	Spike Added	LLCSD Result	LLCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	8.00	9.03		ng/L		113	50 - 150	4	30
		LLCSD	LLCSD						
Isotope Dilution	%Recovery	Qualifier	Limits						
<i>13C4 PFBA</i>	106		25 - 150						

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 280-637471/1-A
Matrix: Water
Analysis Batch: 637766

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 637471

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	<0.10		0.10	0.028	mg/L		12/15/23 14:32	12/18/23 14:58	1

Lab Sample ID: LCS 280-637471/2-A
Matrix: Water
Analysis Batch: 637766

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 637471

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfur	20.0	20.5		mg/L		102	80 - 120

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 160-640887/1-A
Matrix: Water
Analysis Batch: 641477

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 640887

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Uranium	<1.0		1.0	0.15	ug/L		12/15/23 13:55	12/19/23 17:52	2

Lab Sample ID: LCS 160-640887/2-A
Matrix: Water
Analysis Batch: 641477

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 640887

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Uranium	1000	1060		ug/L		106	80 - 120

QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

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

Lab Sample ID: MB 500-746694/1-A
Matrix: Water
Analysis Batch: 747971

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 746694

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Aluminum	<100		100	25	ug/L		12/14/23 09:07	12/21/23 20:18	1
Antimony	<3.0		3.0	1.3	ug/L		12/14/23 09:07	12/21/23 20:18	1
Arsenic	<1.0		1.0	0.23	ug/L		12/14/23 09:07	12/21/23 20:18	1
Barium	<2.5		2.5	0.73	ug/L		12/14/23 09:07	12/21/23 20:18	1
Boron	17.5	J	50	13	ug/L		12/14/23 09:07	12/21/23 20:18	1
Cadmium	<0.50		0.50	0.17	ug/L		12/14/23 09:07	12/21/23 20:18	1
Calcium	49.5	J	200	44	ug/L		12/14/23 09:07	12/21/23 20:18	1
Chromium	<5.0		5.0	1.1	ug/L		12/14/23 09:07	12/21/23 20:18	1
Cobalt	<1.0		1.0	0.40	ug/L		12/14/23 09:07	12/21/23 20:18	1
Copper	<2.0		2.0	0.50	ug/L		12/14/23 09:07	12/21/23 20:18	1
Iron	<100		100	47	ug/L		12/14/23 09:07	12/21/23 20:18	1
Lead	<0.50		0.50	0.19	ug/L		12/14/23 09:07	12/21/23 20:18	1
Magnesium	<200		200	49	ug/L		12/14/23 09:07	12/21/23 20:18	1
Manganese	<2.5		2.5	0.79	ug/L		12/14/23 09:07	12/21/23 20:18	1
Nickel	<2.0		2.0	0.63	ug/L		12/14/23 09:07	12/21/23 20:18	1
Potassium	<500		500	110	ug/L		12/14/23 09:07	12/21/23 20:18	1
Selenium	<2.5		2.5	0.98	ug/L		12/14/23 09:07	12/21/23 20:18	1
Silver	<0.50		0.50	0.12	ug/L		12/14/23 09:07	12/21/23 20:18	1
Sodium	<200		200	77	ug/L		12/14/23 09:07	12/21/23 20:18	1
Strontium	2.85	J	4.0	0.64	ug/L		12/14/23 09:07	12/21/23 20:18	1
Thallium	<2.0		2.0	0.57	ug/L		12/14/23 09:07	12/21/23 20:18	1
Vanadium	<5.0		5.0	2.2	ug/L		12/14/23 09:07	12/21/23 20:18	1
Zinc	<20		20	6.9	ug/L		12/14/23 09:07	12/21/23 20:18	1

Lab Sample ID: MB 500-746694/1-A
Matrix: Water
Analysis Batch: 748781

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 746694

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Beryllium	<1.0		1.0	0.53	ug/L		12/14/23 09:07	01/02/24 14:28	1

Lab Sample ID: LCS 500-746694/2-A
Matrix: Water
Analysis Batch: 747971

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 746694

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec	
							Limits	
Aluminum	2000	1920		ug/L		96	80 - 120	
Antimony	500	485		ug/L		97	80 - 120	
Arsenic	100	98.1		ug/L		98	80 - 120	
Barium	500	493		ug/L		99	80 - 120	
Boron	1000	1000		ug/L		100	80 - 120	
Cadmium	50.0	47.7		ug/L		95	80 - 120	
Calcium	10000	8410		ug/L		84	80 - 120	
Chromium	200	201		ug/L		100	80 - 120	
Cobalt	500	502		ug/L		100	80 - 120	
Copper	250	242		ug/L		97	80 - 120	
Iron	1000	1020		ug/L		102	80 - 120	
Lead	100	103		ug/L		103	80 - 120	
Magnesium	10000	9560		ug/L		96	80 - 120	

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

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

Lab Sample ID: LCS 500-746694/2-A
 Matrix: Water
 Analysis Batch: 747971

Client Sample ID: Lab Control Sample
 Prep Type: Total Recoverable
 Prep Batch: 746694

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	500	498		ug/L		100	80 - 120
Nickel	500	518		ug/L		104	80 - 120
Potassium	10000	9780		ug/L		98	80 - 120
Selenium	100	98.9		ug/L		99	80 - 120
Silver	50.0	47.6		ug/L		95	80 - 120
Sodium	10000	9390		ug/L		94	80 - 120
Strontium	1000	967		ug/L		97	80 - 120
Thallium	100	103		ug/L		103	80 - 120
Vanadium	500	489		ug/L		98	80 - 120
Zinc	500	520		ug/L		104	80 - 120

Lab Sample ID: LCS 500-746694/2-A
 Matrix: Water
 Analysis Batch: 748781

Client Sample ID: Lab Control Sample
 Prep Type: Total Recoverable
 Prep Batch: 746694

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Beryllium	50.0	47.5		ug/L		95	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-747575/12-A
 Matrix: Water
 Analysis Batch: 747796

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 747575

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	0.079	ug/L		12/20/23 12:00	12/21/23 07:39	1

Lab Sample ID: LCS 500-747575/13-A
 Matrix: Water
 Analysis Batch: 747796

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 747575

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.01	1.98		ug/L		99	80 - 120

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 500-746059/3
 Matrix: Water
 Analysis Batch: 746059

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	<1.0		1.0	0.043	mg/L			12/11/23 09:26	1
Nitrite as N	<1.0		1.0	0.070	mg/L			12/11/23 09:26	1
Orthophosphate as P	<1.0		1.0	0.13	mg/L			12/11/23 09:26	1

QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

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

Lab Sample ID: LCS 500-746059/4
Matrix: Water
Analysis Batch: 746059

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	20.0	19.6		mg/L		98	80 - 120
Nitrite as N	20.0	20.0		mg/L		100	80 - 120
Orthophosphate as P	20.0	18.0		mg/L		90	80 - 120

Lab Sample ID: MB 500-746060/3
Matrix: Water
Analysis Batch: 746060

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<1.0		1.0	0.18	mg/L			12/11/23 09:26	1
Chloride	<1.0		1.0	0.12	mg/L			12/11/23 09:26	1
Fluoride	<1.0		1.0	0.19	mg/L			12/11/23 09:26	1
Sulfate	<1.0		1.0	0.21	mg/L			12/11/23 09:26	1

Lab Sample ID: LCS 500-746060/4
Matrix: Water
Analysis Batch: 746060

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	20.0	18.2		mg/L		91	80 - 120
Chloride	20.0	20.1		mg/L		101	80 - 120
Fluoride	20.0	19.4		mg/L		97	80 - 120
Sulfate	20.0	20.0		mg/L		100	80 - 120

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-747719/29
Matrix: Water
Analysis Batch: 747719

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity, Total	4.24	J	5.0	3.7	mg/L			12/20/23 15:54	1
Bicarbonate Alkalinity as CaCO3	4.24	J	5.0	3.7	mg/L			12/20/23 15:54	1
Carbonate Alkalinity as CaCO3	<5.0		5.0	3.7	mg/L			12/20/23 15:54	1

Lab Sample ID: LCS 500-747719/4
Matrix: Water
Analysis Batch: 747719

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity, Total	100	102		mg/L		102	90 - 110

Method: SM 4500 S2 F - Sulfide, Total

Lab Sample ID: MB 500-746173/1
Matrix: Water
Analysis Batch: 746173

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	<1.0		1.0	0.23	mg/L			12/11/23 22:02	1

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Method: SM 4500 S2 F - Sulfide, Total (Continued)

Lab Sample ID: LCS 500-746173/2
 Matrix: Water
 Analysis Batch: 746173

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfide	3.72	3.51		mg/L		94	85 - 115

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-640727/1-A
 Matrix: Water
 Analysis Batch: 644396

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 640727

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.292	U	0.172	0.173	1.00	0.292	pCi/L	12/14/23 10:28	01/15/24 20:11	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.8		30 - 110					12/14/23 10:28	01/15/24 20:11	1

Lab Sample ID: LCS 160-640727/2-A
 Matrix: Water
 Analysis Batch: 644396

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 640727

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-226	11.3	10.37		1.35	1.00	0.365	pCi/L	92	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	95.3		30 - 110						

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-640728/1-A
 Matrix: Water
 Analysis Batch: 644329

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 640728

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.653	U	0.435	0.439	1.00	0.653	pCi/L	12/14/23 10:31	01/15/24 12:28	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.8		30 - 110					12/14/23 10:31	01/15/24 12:28	1
Y Carrier	73.6		30 - 110					12/14/23 10:31	01/15/24 12:28	1

Lab Sample ID: LCS 160-640728/2-A
 Matrix: Water
 Analysis Batch: 644329

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 640728

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-228	9.30	10.38		1.41	1.00	0.521	pCi/L	112	75 - 125

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QC Sample Results

Client: ARCADIS US Inc
Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-640728/2-A
Matrix: Water
Analysis Batch: 644329

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 640728

Carrier	LCS		Limits
	%Yield	Qualifier	
Ba Carrier	95.3		30 - 110
Y Carrier	76.3		30 - 110

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Lab Chronicle

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Client Sample ID: Field Blank-12-07-2023-DMW

Lab Sample ID: 500-243658-1

Date Collected: 12/07/23 11:00

Matrix: Water

Date Received: 12/09/23 10:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3535	RE		730932	C1A	EET SAC	01/02/24 12:30
Total/NA	Analysis	537 (modified)	RE	1	731253	K1S	EET SAC	01/03/24 15:03
Total/NA	Prep	3535			727292	ERR	EET SAC	12/12/23 20:09
Total/NA	Analysis	537 (modified)		1	727499	AP1	EET SAC	12/14/23 18:47

Client Sample ID: DMW-04

Lab Sample ID: 500-243658-2

Date Collected: 12/07/23 10:55

Matrix: Water

Date Received: 12/09/23 10:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3535	RE		730932	C1A	EET SAC	01/02/24 12:30
Total/NA	Analysis	537 (modified)	RE	1	731253	K1S	EET SAC	01/03/24 15:15
Total/NA	Prep	3535			727292	ERR	EET SAC	12/12/23 20:09
Total/NA	Analysis	537 (modified)		1	727499	AP1	EET SAC	12/14/23 18:57
Total Recoverable	Prep	3005A			637471	MSM	EET DEN	12/15/23 14:32
Total Recoverable	Analysis	6010D		20	638024	ADL	EET DEN	12/20/23 08:45
Total Recoverable	Prep	3005A			746694	BDE	EET CHI	12/14/23 09:07 - 12/14/23 09:37 ¹
Total Recoverable	Analysis	6020B		1	747971	SJ	EET CHI	12/21/23 20:29
Total Recoverable	Prep	3005A			746694	BDE	EET CHI	12/14/23 09:07 - 12/14/23 09:37 ¹
Total Recoverable	Analysis	6020B		1	748781	RN	EET CHI	01/02/24 14:53
Total/NA	Prep	3010A			640887	LKP	EET SL	12/15/23 13:55
Total/NA	Analysis	6020B		2	641477	CGB	EET SL	12/19/23 18:16
Total/NA	Prep	7470A			747575	MJG	EET CHI	12/20/23 12:00 - 12/20/23 14:00 ¹
Total/NA	Analysis	7470A		1	747796	MJG	EET CHI	12/21/23 07:46
Total Recoverable	Prep	3005A			746694	BDE	EET CHI	12/14/23 09:07 - 12/14/23 09:37 ¹
Total Recoverable	Analysis	SM 2340B		1	747137	DAJ	EET CHI	12/18/23 10:51
Total/NA	Analysis	9056A		1	746059	W1T	EET CHI	12/11/23 10:26
Total/NA	Analysis	9056A		1	746060	W1T	EET CHI	12/11/23 10:26
Total/NA	Analysis	9056A		10	746060	W1T	EET CHI	12/11/23 17:16
Total/NA	Analysis	SM 2320B		1	747719	SO	EET CHI	12/20/23 13:36
Total/NA	Analysis	SM 4500 S2 F		1	746173	CLB	EET CHI	12/11/23 23:30 - 12/11/23 23:35 ¹
Total/NA	Prep	PrecSep-21			640727	KAC	EET SL	12/14/23 10:28
Total/NA	Analysis	903.0		1	644400	FLC	EET SL	01/15/24 20:06
Total/NA	Prep	PrecSep_0			640728	KAC	EET SL	12/14/23 10:31
Total/NA	Analysis	904.0		1	644329	FLC	EET SL	01/15/24 12:28
Total/NA	Analysis	Ra226_Ra228 Pos		1	644683	EMH	EET SL	01/17/24 13:31

Client Sample ID: DMW-02

Lab Sample ID: 500-243658-3

Date Collected: 12/07/23 20:15

Matrix: Water

Date Received: 12/09/23 10:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3535			727292	ERR	EET SAC	12/12/23 20:09
Total/NA	Analysis	537 (modified)		1	727499	AP1	EET SAC	12/14/23 19:07

Lab Chronicle

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Client Sample ID: DMW-02

Lab Sample ID: 500-243658-3

Date Collected: 12/07/23 20:15

Matrix: Water

Date Received: 12/09/23 10:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			746694	BDE	EET CHI	12/14/23 09:07 - 12/14/23 09:37 ¹
Total Recoverable	Analysis	6020B		1	747971	SJ	EET CHI	12/21/23 20:33
Total Recoverable	Prep	3005A			746694	BDE	EET CHI	12/14/23 09:07 - 12/14/23 09:37 ¹
Total Recoverable	Analysis	6020B		1	748781	RN	EET CHI	01/02/24 14:57
Total/NA	Prep	7470A			747575	MJG	EET CHI	12/20/23 12:00 - 12/20/23 14:00 ¹
Total/NA	Analysis	7470A		1	747796	MJG	EET CHI	12/21/23 07:48
Total Recoverable	Prep	3005A			746694	BDE	EET CHI	12/14/23 09:07 - 12/14/23 09:37 ¹
Total Recoverable	Analysis	SM 2340B		1	747137	DAJ	EET CHI	12/18/23 10:51
Total/NA	Analysis	9056A		1	746059	W1T	EET CHI	12/11/23 10:41
Total/NA	Analysis	9056A		1	746060	W1T	EET CHI	12/11/23 10:41
Total/NA	Analysis	9056A		5	746060	W1T	EET CHI	12/11/23 17:31
Total/NA	Analysis	9056A		100	746060	W1T	EET CHI	12/11/23 17:46

¹ This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

- EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200
- EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
- EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600
- EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Laboratory: Eurofins Chicago

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

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	999580010	08-31-24

Laboratory: Eurofins Denver

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

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	999615430	08-31-24

Laboratory: Eurofins Sacramento

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

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	998204680	08-31-24

Laboratory: Eurofins St. Louis

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-24
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	06-30-24
Connecticut	State	PH-0241	03-31-25
Florida	NELAP	E87689	06-30-24
HI - RadChem Recognition	State	n/a	06-30-24
Illinois	NELAP	200023	11-30-24
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-24
Kentucky (DW)	State	KY90125	12-31-24
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-24
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-24
Louisiana (DW)	State	LA011	12-31-24
Maryland	State	310	09-30-24
Massachusetts	State	M-MO054	06-30-24
MI - RadChem Recognition	State	9005	06-30-24
Missouri	State	780	06-30-25
Nevada	State	MO00054	07-31-24
New Jersey	NELAP	MO002	06-30-24
New Mexico	State	MO00054	06-30-24
New York	NELAP	11616	03-31-24
North Carolina (DW)	State	29700	07-31-24
North Dakota	State	R-207	06-30-24
Oklahoma	NELAP	9997	08-31-24
Oregon	NELAP	4157	09-01-24
Pennsylvania	NELAP	68-00540	02-28-24
South Carolina	State	85002001	06-30-24

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

Accreditation/Certification Summary

Client: ARCADIS US Inc
Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Laboratory: Eurofins St. Louis (Continued)

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

Authority	Program	Identification Number	Expiration Date
Texas	NELAP	T104704193	07-31-24
US Fish & Wildlife	US Federal Programs	058448	07-31-24
USDA	US Federal Programs	P330-17-00028	05-18-26
Utah	NELAP	MO00054	07-31-24
Virginia	NELAP	10310	06-15-25
Washington	State	C592	08-30-24
West Virginia DEP	State	381	01-31-24

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University Park, IL 60484-3101
phone 708 534 5200 fax 708 534 5211

Regulatory Program: DW NPDES RCRA Other

500-243658 COC

Client Contact		Project Manager: Lisa Rutkowski		Site Contact:		Date:		COC No											
Arcadis U S , Inc		Email: N/A		Lab Contact: Sandie Fredrick		Carrier: FedEx		1 of 1 COCs											
126 North Jefferson Street, Suite 400		Analysis Turnaround Time						Sampler											
Milwaukee, WI 53202		<input type="checkbox"/> CALENDAR DAYS <input checked="" type="checkbox"/> WORKING DAYS						For Lab Use Only:											
Phone		TAT if different from Below <u>STANDARD</u>						Walk-in Client.											
FAX		<input checked="" type="checkbox"/> 2 weeks						Lab Sampling											
Project Name Marinette, WI		<input type="checkbox"/> 1 week						Lab Project Number											
Site Marinette, WI		<input type="checkbox"/> 2 days						50020191 - 50021668											
P O # 30468907-1-2-3 30168809		<input type="checkbox"/> 1 day						500-243658											
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	EPA 537 Modified (36 Compounds)	Rad 226 903	Rad 228 904	TAL Metals 6020A / 7470A	Hardness SM234B	Sulfur 6010D	Total Sulfide SM4500	Anions 9056A	Uranium 6020B	Alkalinity 2320B	Sample Specific Notes
WS-R				G	W		N												
WS-R POST				G	W		N												
DUP				G	W		N												
1	Field Blank-12-07-2023 - DMW	12/7/23	1100	G	W	2	N	M	X										Field Blank
2	DMW - 04	12/7/23	1055	G	W	9	N	N	X	X	X	X	X	X	X	X	X	X	
3	DMW - 02	12/7/23	1055 2015	G	W	4	N	N	X			X	X		X				
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other - Zn Acetate/NaOH; 7=None								7	4	4	4	4	4	6	7	4	7		
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample								Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)											
<input checked="" 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"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months											
Special Instructions/QC Requirements & Comments: Level 4, Questions call L. Rutkowski TAT: Standard																			
Custody Seals intact <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Custody Seal No 0900		Cooler Temp (°C) Obs'd 0.1+0.0				Corr'd				Therm ID No							
Relinquished by [Signature]		Company Arcadis		Date/Time 12/8/23		Received by				Company		Date/Time							
Relinquished by		Company		Date/Time		Received by				Company		Date/Time							
Relinquished by		Company		Date/Time		Received in Laboratory by [Signature]				Company EEIA		Date/Time 12/19/23 1025							



ARCADIS (DEEP WELL)
JCI/ARCADIS
2700 INDUSTRIAL PARKWAY
BUILDING 112-RECEIVING STATION 5
MARINETTE, WI 54143
UNITED STATES US

ACTWGT: 25.00 LB MAN
CAD: 0780307/CAFE3755



500-243658 Waybi

TO **SAMPLE RECEIPT**
EUROFINS CHICAGO
2417 BOND ST.

54565/FORP/AFD7

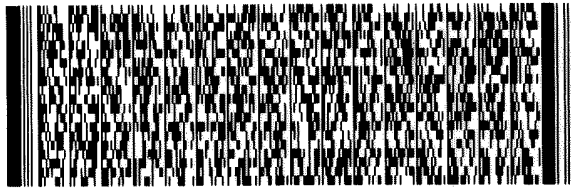
UNIVERSITY PARK IL 60484

(708) 534-5200
THU:
PO:

REF:

DEPT:

RMA: III III III III



FedEx
Express



J233823051201 WY

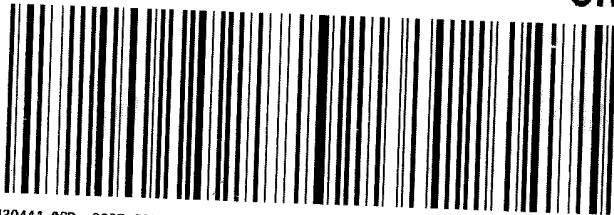
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0221 7163 1500 6442

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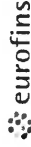
RETURNS MON-SAT
SATURDAY 1:30P 4T
PRIORITY OVERNIGHT 14

60484
IL-US
ORD



5439444 08Dec2023 GRBA 581G2/7C14/C088

Chain of Custody Record



Client Information (Sub Contract Lab)		Lab PM Fredrick, Sandie	Carrier Tracking No(s)	COC No: 500-182642.1
Shipping/Receiving		E-Mail: Sandra.Fredrick@et.eurofins.com	State of Origin: Wisconsin	Page: Page 1 of 1
Company TestAmerica Laboratories, Inc.		Accreditations Required (See note) State - Wisconsin, State Program - Wisconsin		Job #: 500-243658-2
Address: 13715 Rider Trail North, City: Earth City State, Zip MO, 63045 Phone 314-298-8566(Tel) 314-298-8757(Fax) Email		Analysis Requested		Preservation Codes: M - Hexane N - None O - AsNaO2 P - NaZO4S Q - NaZSO3 R - NaZSO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Y - Trizma L - EDA Z - other (specify)
Due Date Requested: 12/27/2023 TAT Requested (days):		Perform MS/MSD (Yes or No) 6020B/3010A .2% Uranium		Total Number of Containers
PO #: WO #: Project #: 50021668 SSOW#:		Field Filtered Sample (Yes or No)		
Project Name: Marnette, WI Deep Well 30168809.1.4.1 Site		Sample Date	Sample Time	Sample Type (C=comp, G=grab)
Matrix (W=water, S=solid, O=water/soil, BT=TISSUE, A=Air)		Preservation Code:	12/7/23	10:55 Central
Sample Identification - Client ID (Lab ID)		DMW-04 (500-243658-2)	X	Water
<p>Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Chicago.</p>				
<p>Possible Hazard Identification <input type="checkbox"/> Unconfirmed <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months</p>				
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2				
Empty Kit Relinquished by: _____ Date: _____ Method of Shipment: _____				
Relinquished by: <i>[Signature]</i>		Received by: <i>[Signature]</i>		
Relinquished by: _____ Date/Time: 12/11/23 1300		Date/Time: DEC 13 2023 0915		
Relinquished by: _____ Date/Time: _____		Date/Time: _____		
Custody Seals Intact: Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks:		



Chain of Custody Record



Environment Testing



Client Information (Sub Contract Lab)		Sampler:	Lab PM	Carrier Tracking No(s)	COC No:							
Client Contact		Phone	Frederick, Sandie		500-182642.1							
Shipping/Receiving		E-Mail:	Sandra.Frederick@et.eurofins.com	State of Origin:	Page 1 of 1							
Company		Accreditations Required (See note):			Job #							
TesAmerica Laboratories, Inc.		State - Wisconsin; State Program - Wisconsin			500-243658-1							
Address		Due Date Requested:	Preservation Codes:									
13715 Rider Trail North,		1/17/2024	A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:									
City		TAT Requested (days):	M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Y - Trizma Z - other (specify)									
State, Zip		PO #										
MO, 63045		WO #										
Phone		Project #										
314-298-8566(Tel) 314-298-8757(Fax)		500Z1668										
Email		SSOW#										
Project Name												
Marinette, WI Deep Well 30168809.1.4.1												
Site												
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=water/oil, BT=Tissue, A=All)	Preservation Code	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PreSep_21 Radium-226 (GFP)	904.0/PreSep_0 Standard Target List	R226_228GFP_C_P	Total Number of Containers	Special Instructions/Note:
DMW-04 (500-243658-2)	12/7/23	10:55 Central		Water		X	X	X	X		3	
<p>Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Chicago.</p>												
Possible Hazard Identification												
Unconfirmed												
Deliverable Requested: I, II, III, IV, Other (specify)												
Primary Deliverable Rank: 2												
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												
Special Instructions/QC Requirements:												
Time:												
Received by:												
Date/Time:												
Company:												
Received by:												
Date/Time:												
Company:												
Received by:												
Date/Time:												
Company:												
Cooler Temperature(s) °C and Other Remarks:												



Login Sample Receipt Checklist

Client: ARCADIS US Inc

Job Number: 500-243658-1

Login Number: 243658

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	
Cooler Temperature is recorded.	True	0.0
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)	False	
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	

Login Sample Receipt Checklist

Client: ARCADIS US Inc

Job Number: 500-243658-1

Login Number: 243658

List Number: 3

Creator: Little, Matthew L

List Source: Eurofins Denver

List Creation: 12/12/23 02:04 PM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
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	
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?	N/A	
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.	N/A	
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	

Login Sample Receipt Checklist

Client: ARCADIS US Inc

Job Number: 500-243658-1

Login Number: 243658

List Number: 2

Creator: Morazzini, Dominic S

List Source: Eurofins Sacramento

List Creation: 12/12/23 10:38 AM

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	2462883
Sample custody seals, if present, are intact.	N/A	
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	0.9
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?	N/A	Received project as a subcontract.
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.	N/A	
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: ARCADIS US Inc

Job Number: 500-243658-1

Login Number: 243658

List Number: 4

Creator: Pinette, Meadow L

List Source: Eurofins St. Louis

List Creation: 12/13/23 11:36 AM

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.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Tracer/Carrier Summary

Client: ARCADIS US Inc
Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (30-110)							
500-243658-2	DMW-04	90.3							
LCS 160-640727/2-A	Lab Control Sample	95.3							
MB 160-640727/1-A	Method Blank	86.8							

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)						
500-243658-2	DMW-04	90.3	69.5						
LCS 160-640728/2-A	Lab Control Sample	95.3	76.3						
MB 160-640728/1-A	Method Blank	86.8	73.6						

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier



Environment Testing

Sacramento Sample Receiving Notes (SSRN)



Tracking # 7051 7618 3534

Job 500-243658 Field Sheet

SO (PO) / FO / SAT / 2-Day / Ground / UPS / CDO / Courier
GSL / OnTrac / Goldstreak / USPS / Other

Use this form to record Sample Custody Seal Cooler Custody Seal, Temperature & corrected Temperature & other observations. File in the job folder with the COC

Therm ID <u>L06</u> Corr Factor: (+/-) <u>NA</u> °C	Notes _____ _____ _____ _____ _____ _____ _____ _____ _____ _____																																																															
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Cooler Custody Seal <u>2462883</u>																																																																
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*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

Isotope Dilution Summary

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFBA (25-150)	PFPeA (25-150)	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
500-243658-1	Field Blank-12-07-2023-DMW	105	102	102	99	114	101	104	97
500-243658-1 - RE	Field Blank-12-07-2023-DMW	101							
500-243658-2	DMW-04	71	63	66	74	68	65	63	51
500-243658-2 - RE	DMW-04	92							
500-243658-3	DMW-02	103	98	98	109	106	105	101	103
LCS 320-727292/2-A	Lab Control Sample	95	96	94	102	109	95	101	103
LCSD 320-727292/3-A	Lab Control Sample Dup	106	102	106	120	113	106	107	110
LLCS 320-730932/2-A	Lab Control Sample	105							
LLCSD 320-730932/3-A	Lab Control Sample Dup	106							
MB 320-727292/1-A	Method Blank	107	122	109	127	103	99	92	95
MB 320-730932/1-A	Method Blank	99							

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFDoA (25-150)	PFTDA (25-150)	PFHxDA (25-150)	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (10-150)	d3NMFOS (25-150)
500-243658-1	Field Blank-12-07-2023-DMW	104	102	102	92	100	108	86	124
500-243658-1 - RE	Field Blank-12-07-2023-DMW								
500-243658-2	DMW-04	49	49	58	62	69	65	58	73
500-243658-2 - RE	DMW-04								
500-243658-3	DMW-02	104	103	104	100	109	107	94	136
LCS 320-727292/2-A	Lab Control Sample	98	91	101	90	99	99	84	123
LCSD 320-727292/3-A	Lab Control Sample Dup	108	106	107	100	114	106	85	135
LLCS 320-730932/2-A	Lab Control Sample								
LLCSD 320-730932/3-A	Lab Control Sample Dup								
MB 320-727292/1-A	Method Blank	98	97	85	109	110	98	102	76
MB 320-730932/1-A	Method Blank								

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	d5NEFOS (25-150)	dMeFOSA (10-150)	dEtFOSA (10-150)	NMFm (10-150)	NEFM (10-150)	M242FTS (25-150)	M262FTS (25-150)	M282FTS (25-150)
500-243658-1	Field Blank-12-07-2023-DMW	120	80	84	101	108	115	113	106
500-243658-1 - RE	Field Blank-12-07-2023-DMW								
500-243658-2	DMW-04	63	46	44	43	44	82	60	59
500-243658-2 - RE	DMW-04								
500-243658-3	DMW-02	130	83	88	86	94	109	105	109
LCS 320-727292/2-A	Lab Control Sample	113	86	85	91	101	114	109	92
LCSD 320-727292/3-A	Lab Control Sample Dup	117	86	87	86	88	131	108	114
LLCS 320-730932/2-A	Lab Control Sample								
LLCSD 320-730932/3-A	Lab Control Sample Dup								
MB 320-727292/1-A	Method Blank	85	75	73	127	130	102	120	99
MB 320-730932/1-A	Method Blank								

		Percent Isotope Dilution Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	HFPODA (25-150)	M102FTS (25-150)
500-243658-1	Field Blank-12-07-2023-DMW	99	88
500-243658-1 - RE	Field Blank-12-07-2023-DMW		
500-243658-2	DMW-04	64	39
500-243658-2 - RE	DMW-04		
500-243658-3	DMW-02	101	84
LCS 320-727292/2-A	Lab Control Sample	102	80
LCSD 320-727292/3-A	Lab Control Sample Dup	109	83

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Isotope Dilution Summary

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243658-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)	
		HFPODA (25-150)	M102FTS (25-150)
LLCS 320-730932/2-A	Lab Control Sample		
LLCSD 320-730932/3-A	Lab Control Sample Dup		
MB 320-727292/1-A	Method Blank	92	86
MB 320-730932/1-A	Method Blank		

Surrogate Legend

- PFBA = 13C4 PFBA
- PFPeA = 13C5 PFPeA
- PFHxA = 13C2 PFHxA
- C4PFHA = 13C4 PFHpA
- PFOA = 13C4 PFOA
- PFNA = 13C5 PFNA
- PFDA = 13C2 PFDA
- PFUnA = 13C2 PFUnA
- PFDaA = 13C2 PFDaA
- PFTDA = 13C2 PFTeDA
- PFHxDA = 13C2 PFHxDA
- C3PFBS = 13C3 PFBS
- PFHxS = 18O2 PFHxS
- PFOS = 13C4 PFOS
- PFOSA = 13C8 FOSA
- d3NMFOS = d3-NMeFOSAA
- d5NEFOS = d5-NEtFOSAA
- dMeFOSA = d-N-MeFOSA-M
- dEtFOSA = d-N-EtFOSA-M
- NMFM = d7-N-MeFOSE-M
- NEFM = d9-N-EtFOSE-M
- M242FTS = M2-4:2 FTS
- M262FTS = M2-6:2 FTS
- M282FTS = M2-8:2 FTS
- HFPODA = 13C3 HFPO-DA
- M102FTS = 13C2 10:2 FTS





ANALYTICAL REPORT

PREPARED FOR

Attn: Lisa Rutkowski
ARCADIS US Inc
126 North Jefferson Street
Suite 400
Milwaukee, Wisconsin 53202

Generated 1/2/2024 6:06:09 PM

JOB DESCRIPTION

Marinette, WI Deep Well 30168809.1.4.1

JOB NUMBER

500-243882-1

Eurofins Chicago

Job Notes

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of Eurofins Environment Testing North Central, LLC and its client. All questions regarding this report should be directed to the Eurofins Environment Testing North Central, LLC Project Manager who has signed this report.

Results relate only to the items tested and the sample(s) as received by the laboratory. The results, detection limits (LOD) and Quantitation Limits (LOQ) have been adjusted for sample dilutions and/or solids content.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Chicago Project Manager.

Compliance Statement

The LOD and LOQ reported are adjusted by the dilution factor when a dilution factor greater than 1 is needed. Additionally, where results are indicated as being reported on a dry weight basis, the LOD and LOQ are adjusted for moisture content as well.

Definitions of Limits

- LOD = Limit of Detection = MDL as defined by 40 CFR part 136 Appendix B
- LOQ = Limit of Quantitation = 3.33 x LOD as defined by Wisconsin
- RL = Report Limit = a concentration supported by a standard in the calibration curves

Authorization



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Authorized for release by
Sandie Fredrick, Senior Project Manager
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660



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Case Narrative

Client: ARCADIS US Inc
Project: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Job ID: 500-243882-1

Eurofins Chicago

Job Narrative 500-243882-1

Receipt

The samples were received on 12/14/2023 10:12 AM. 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 3.4° C.

Metals

Method 6020B: The initial low level calibration verification (ICVL) result for batch 748781 was above the upper control limit for Be. Sample results were non-detects, and have been reported as qualified data.

Method 6020B: The method blank for prep batch 746885 contained Ca above the reporting limit (RL). Associated sample(s) were not re-extracted and/or re-analyzed because results were greater than 10X the value found in the method blank.

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

LCMS

Method 537 (modified): The low laboratory control sample (LLCS) for preparation batch 320-728748 and analytical batch 320-729663 recovered below the control limit for the following analyte: Perfluoro-n-octadecanoic acid (PFODA). This is a legacy analyte for the method and the state of Wisconsin is no longer concerned with its recovery; therefore, the data have been reported. LLCS 320-728748/2-A

Method 537 (modified): The RPD of the low laboratory control sample (LLCS) and low laboratory control sample duplicate (LLCSD) for preparation batch 320-728748 and analytical batch 320-729663 recovered outside control limits for the following analyte: Perfluoro-n-octadecanoic acid (PFODA). This is a legacy analyte for the method and the state of Wisconsin is no longer concerned with its recovery; 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.

General Chemistry

Methods 300.0, 9056A: The method blank for analytical batch 500-746729 contained Nitrite as N above the method detection limit. This target analyte concentration was less than the reporting limit (RL) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed.

Methods 300.0, 9056A: The method blank for analytical batch 500-746730 contained Chloride above the method detection limit. This target analyte concentration was less than the reporting limit (RL) in the method blank; therefore, re-extraction and/or re-analysis of samples was not performed.

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

Organic Prep

Method 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-728748.
preparation batch 320-728748
Method: 3535 PFC_28D-W
Matrix: Aqueous

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

Eurofins Chicago

Method Summary

Client: ARCADIS US Inc
Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	EET SAC
6020B	Metals (ICP/MS)	SW846	EET CHI
7470A	Mercury (CVAA)	SW846	EET CHI
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	EET CHI
9056A	Anions, Ion Chromatography	SW846	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
3535	Solid-Phase Extraction (SPE)	SW846	EET SAC
7470A	Preparation, Mercury	SW846	EET CHI

Protocol References:

EPA = US Environmental Protection Agency

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

EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: ARCADIS US Inc
Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-243882-1	Field Blank-12-12-2023-DMW	Water	12/12/23 14:40	12/14/23 10:12
500-243882-2	DMW-01	Water	12/12/23 14:35	12/14/23 10:12

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Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Client Sample ID: Field Blank-12-12-2023-DMW

Lab Sample ID: 500-243882-1

Date Collected: 12/12/23 14:40

Matrix: Water

Date Received: 12/14/23 10:12

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<4.4		4.4	2.1	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluoropentanoic acid (PFPeA)	<1.8		1.8	0.43	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluorohexanoic acid (PFHxA)	<1.8		1.8	0.51	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluoroheptanoic acid (PFHpA)	<1.8		1.8	0.22	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluorooctanoic acid (PFOA)	<1.8		1.8	0.75	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluorononanoic acid (PFNA)	<1.8		1.8	0.24	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluorodecanoic acid (PFDA)	<1.8		1.8	0.27	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluoroundecanoic acid (PFUnA)	<1.8		1.8	0.97	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluorododecanoic acid (PFDoA)	<1.8		1.8	0.49	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluorotridecanoic acid (PFTrDA)	<1.8		1.8	1.1	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluorotetradecanoic acid (PFTeA)	<1.8		1.8	0.65	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<1.8		1.8	0.79	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluoro-n-octadecanoic acid (PFODA)	<1.8	*1 *-	1.8	0.83	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluorobutanesulfonic acid (PFBS)	<1.8		1.8	0.18	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluoropentanesulfonic acid (PFPeS)	<1.8		1.8	0.27	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluorohexanesulfonic acid (PFHxS)	<1.8		1.8	0.50	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluoroheptanesulfonic acid (PFHpS)	<1.8		1.8	0.17	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluorooctanesulfonic acid (PFOS)	<1.8		1.8	0.48	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluorononanesulfonic acid (PFNS)	<1.8		1.8	0.33	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluorodecanesulfonic acid (PFDS)	<1.8		1.8	0.28	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluorododecanesulfonic acid (PFDoS)	<1.8		1.8	0.86	ng/L		12/19/23 05:34	12/22/23 23:38	1
Perfluorooctanesulfonamide (FOSA)	<1.8		1.8	0.87	ng/L		12/19/23 05:34	12/22/23 23:38	1
NEtFOSA	<1.8		1.8	0.77	ng/L		12/19/23 05:34	12/22/23 23:38	1
NMeFOSA	<1.8		1.8	0.38	ng/L		12/19/23 05:34	12/22/23 23:38	1
NMeFOSAA	<4.4		4.4	1.1	ng/L		12/19/23 05:34	12/22/23 23:38	1
NEtFOSAA	<4.4		4.4	1.1	ng/L		12/19/23 05:34	12/22/23 23:38	1
NMeFOSE	<3.5		3.5	1.2	ng/L		12/19/23 05:34	12/22/23 23:38	1
NEtFOSE	<1.8		1.8	0.75	ng/L		12/19/23 05:34	12/22/23 23:38	1
4:2 FTS	<1.8		1.8	0.21	ng/L		12/19/23 05:34	12/22/23 23:38	1
6:2 FTS	<4.4		4.4	2.2	ng/L		12/19/23 05:34	12/22/23 23:38	1
8:2 FTS	<1.8		1.8	0.41	ng/L		12/19/23 05:34	12/22/23 23:38	1
10:2 FTS	<1.8		1.8	0.59	ng/L		12/19/23 05:34	12/22/23 23:38	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<1.8		1.8	0.35	ng/L		12/19/23 05:34	12/22/23 23:38	1
HFPO-DA (GenX)	<3.5		3.5	1.3	ng/L		12/19/23 05:34	12/22/23 23:38	1
9Cl-PF3ONS	<1.8		1.8	0.21	ng/L		12/19/23 05:34	12/22/23 23:38	1
11Cl-PF3OUdS	<1.8		1.8	0.28	ng/L		12/19/23 05:34	12/22/23 23:38	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	80		25 - 150				12/19/23 05:34	12/22/23 23:38	1
13C5 PFPeA	86		25 - 150				12/19/23 05:34	12/22/23 23:38	1
13C2 PFHxA	91		25 - 150				12/19/23 05:34	12/22/23 23:38	1
13C4 PFHpA	88		25 - 150				12/19/23 05:34	12/22/23 23:38	1
13C4 PFOA	98		25 - 150				12/19/23 05:34	12/22/23 23:38	1
13C5 PFNA	98		25 - 150				12/19/23 05:34	12/22/23 23:38	1
13C2 PFDA	100		25 - 150				12/19/23 05:34	12/22/23 23:38	1
13C2 PFUnA	95		25 - 150				12/19/23 05:34	12/22/23 23:38	1

Eurofins Chicago

Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Client Sample ID: Field Blank-12-12-2023-DMW

Lab Sample ID: 500-243882-1

Date Collected: 12/12/23 14:40

Matrix: Water

Date Received: 12/14/23 10:12

Method: EPA 537 (modified) - Fluorinated Alkyl Substances (Continued)

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C2 PFDoA	97		25 - 150	12/19/23 05:34	12/22/23 23:38	1
13C2 PFTeDA	93		25 - 150	12/19/23 05:34	12/22/23 23:38	1
13C2 PFHxDA	75		25 - 150	12/19/23 05:34	12/22/23 23:38	1
13C3 PFBS	77		25 - 150	12/19/23 05:34	12/22/23 23:38	1
18O2 PFHxS	87		25 - 150	12/19/23 05:34	12/22/23 23:38	1
13C4 PFOS	105		25 - 150	12/19/23 05:34	12/22/23 23:38	1
13C8 FOSA	95		10 - 150	12/19/23 05:34	12/22/23 23:38	1
d3-NMeFOSAA	97		25 - 150	12/19/23 05:34	12/22/23 23:38	1
d5-NEtFOSAA	93		25 - 150	12/19/23 05:34	12/22/23 23:38	1
d-N-MeFOSA-M	70		10 - 150	12/19/23 05:34	12/22/23 23:38	1
d-N-EtFOSA-M	71		10 - 150	12/19/23 05:34	12/22/23 23:38	1
d7-N-MeFOSE-M	80		10 - 150	12/19/23 05:34	12/22/23 23:38	1
d9-N-EtFOSE-M	87		10 - 150	12/19/23 05:34	12/22/23 23:38	1
M2-4:2 FTS	107		25 - 150	12/19/23 05:34	12/22/23 23:38	1
M2-6:2 FTS	113		25 - 150	12/19/23 05:34	12/22/23 23:38	1
M2-8:2 FTS	118		25 - 150	12/19/23 05:34	12/22/23 23:38	1
13C3 HFPO-DA	90		25 - 150	12/19/23 05:34	12/22/23 23:38	1
13C2 10:2 FTS	108		25 - 150	12/19/23 05:34	12/22/23 23:38	1

Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Client Sample ID: DMW-01

Lab Sample ID: 500-243882-2

Date Collected: 12/12/23 14:35

Matrix: Water

Date Received: 12/14/23 10:12

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<4.3		4.3	2.1	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluoropentanoic acid (PFPeA)	<1.7		1.7	0.42	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluorohexanoic acid (PFHxA)	<1.7		1.7	0.50	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluoroheptanoic acid (PFHpA)	<1.7		1.7	0.22	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluorooctanoic acid (PFOA)	<1.7		1.7	0.74	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluorononanoic acid (PFNA)	<1.7		1.7	0.23	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluorodecanoic acid (PFDA)	<1.7		1.7	0.27	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluoroundecanoic acid (PFUnA)	<1.7		1.7	0.95	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluorododecanoic acid (PFDoA)	<1.7		1.7	0.48	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluorotridecanoic acid (PFTrDA)	<1.7		1.7	1.1	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluorotetradecanoic acid (PFTeA)	<1.7		1.7	0.63	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<1.7		1.7	0.77	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluoro-n-octadecanoic acid (PFODA)	<1.7	*1 *-	1.7	0.81	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluorobutanesulfonic acid (PFBS)	<1.7		1.7	0.17	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluoropentanesulfonic acid (PFPeS)	<1.7		1.7	0.26	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluorohexanesulfonic acid (PFHxS)	<1.7		1.7	0.49	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluoroheptanesulfonic acid (PFHpS)	<1.7		1.7	0.16	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluorooctanesulfonic acid (PFOS)	<1.7		1.7	0.47	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluorononanesulfonic acid (PFNS)	<1.7		1.7	0.32	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluorodecanesulfonic acid (PFDS)	<1.7		1.7	0.28	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluorododecanesulfonic acid (PFDoS)	<1.7		1.7	0.84	ng/L		12/19/23 05:34	12/22/23 23:49	1
Perfluorooctanesulfonamide (FOSA)	<1.7		1.7	0.85	ng/L		12/19/23 05:34	12/22/23 23:49	1
NEtFOSA	<1.7		1.7	0.75	ng/L		12/19/23 05:34	12/22/23 23:49	1
NMeFOSA	<1.7		1.7	0.37	ng/L		12/19/23 05:34	12/22/23 23:49	1
NMeFOSAA	<4.3		4.3	1.0	ng/L		12/19/23 05:34	12/22/23 23:49	1
NEtFOSAA	<4.3		4.3	1.1	ng/L		12/19/23 05:34	12/22/23 23:49	1
NMeFOSE	<3.5		3.5	1.2	ng/L		12/19/23 05:34	12/22/23 23:49	1
NEtFOSE	<1.7		1.7	0.74	ng/L		12/19/23 05:34	12/22/23 23:49	1
4:2 FTS	<1.7		1.7	0.21	ng/L		12/19/23 05:34	12/22/23 23:49	1
6:2 FTS	<4.3		4.3	2.2	ng/L		12/19/23 05:34	12/22/23 23:49	1
8:2 FTS	<1.7		1.7	0.40	ng/L		12/19/23 05:34	12/22/23 23:49	1
10:2 FTS	<1.7		1.7	0.58	ng/L		12/19/23 05:34	12/22/23 23:49	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<1.7		1.7	0.35	ng/L		12/19/23 05:34	12/22/23 23:49	1
HFPO-DA (GenX)	<3.5		3.5	1.3	ng/L		12/19/23 05:34	12/22/23 23:49	1
9Cl-PF3ONS	<1.7		1.7	0.21	ng/L		12/19/23 05:34	12/22/23 23:49	1
11Cl-PF3OUdS	<1.7		1.7	0.28	ng/L		12/19/23 05:34	12/22/23 23:49	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	71		25 - 150				12/19/23 05:34	12/22/23 23:49	1
13C5 PFPeA	76		25 - 150				12/19/23 05:34	12/22/23 23:49	1
13C2 PFHxA	84		25 - 150				12/19/23 05:34	12/22/23 23:49	1
13C4 PFHpA	86		25 - 150				12/19/23 05:34	12/22/23 23:49	1
13C4 PFOA	88		25 - 150				12/19/23 05:34	12/22/23 23:49	1
13C5 PFNA	91		25 - 150				12/19/23 05:34	12/22/23 23:49	1
13C2 PFDA	98		25 - 150				12/19/23 05:34	12/22/23 23:49	1
13C2 PFUnA	93		25 - 150				12/19/23 05:34	12/22/23 23:49	1

Eurofins Chicago

Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Client Sample ID: DMW-01

Lab Sample ID: 500-243882-2

Date Collected: 12/12/23 14:35

Matrix: Water

Date Received: 12/14/23 10:12

Method: EPA 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	94		25 - 150	12/19/23 05:34	12/22/23 23:49	1
13C2 PFTeDA	95		25 - 150	12/19/23 05:34	12/22/23 23:49	1
13C2 PFHxDA	74		25 - 150	12/19/23 05:34	12/22/23 23:49	1
13C3 PFBS	73		25 - 150	12/19/23 05:34	12/22/23 23:49	1
18O2 PFHxS	86		25 - 150	12/19/23 05:34	12/22/23 23:49	1
13C4 PFOS	98		25 - 150	12/19/23 05:34	12/22/23 23:49	1
13C8 FOSA	99		10 - 150	12/19/23 05:34	12/22/23 23:49	1
d3-NMeFOSAA	93		25 - 150	12/19/23 05:34	12/22/23 23:49	1
d5-NEtFOSAA	94		25 - 150	12/19/23 05:34	12/22/23 23:49	1
d-N-MeFOSA-M	80		10 - 150	12/19/23 05:34	12/22/23 23:49	1
d-N-EtFOSA-M	76		10 - 150	12/19/23 05:34	12/22/23 23:49	1
d7-N-MeFOSE-M	82		10 - 150	12/19/23 05:34	12/22/23 23:49	1
d9-N-EtFOSE-M	91		10 - 150	12/19/23 05:34	12/22/23 23:49	1
M2-4:2 FTS	89		25 - 150	12/19/23 05:34	12/22/23 23:49	1
M2-6:2 FTS	104		25 - 150	12/19/23 05:34	12/22/23 23:49	1
M2-8:2 FTS	101		25 - 150	12/19/23 05:34	12/22/23 23:49	1
13C3 HFPO-DA	84		25 - 150	12/19/23 05:34	12/22/23 23:49	1
13C2 10:2 FTS	106		25 - 150	12/19/23 05:34	12/22/23 23:49	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<100		100	25	ug/L		12/15/23 08:47	12/21/23 21:34	1
Antimony	<3.0		3.0	1.3	ug/L		12/15/23 08:47	12/21/23 21:34	1
Arsenic	<1.0		1.0	0.23	ug/L		12/15/23 08:47	12/21/23 21:34	1
Barium	9.8		2.5	0.73	ug/L		12/15/23 08:47	12/21/23 21:34	1
Beryllium	<1.0	^1+	1.0	0.53	ug/L		12/15/23 08:47	01/02/24 13:41	1
Boron	280	B	50	13	ug/L		12/15/23 08:47	01/02/24 13:41	1
Cadmium	<0.50		0.50	0.17	ug/L		12/15/23 08:47	12/21/23 21:34	1
Calcium	93000	B	200	44	ug/L		12/15/23 08:47	12/21/23 21:34	1
Chromium	<5.0		5.0	1.1	ug/L		12/15/23 08:47	12/21/23 21:34	1
Cobalt	<1.0		1.0	0.40	ug/L		12/15/23 08:47	12/21/23 21:34	1
Copper	1.8	J B	2.0	0.50	ug/L		12/15/23 08:47	12/21/23 21:34	1
Iron	350	B	100	47	ug/L		12/15/23 08:47	12/21/23 21:34	1
Lead	<0.50		0.50	0.19	ug/L		12/15/23 08:47	12/21/23 21:34	1
Magnesium	36000	B	200	49	ug/L		12/15/23 08:47	12/21/23 21:34	1
Manganese	16	B	2.5	0.79	ug/L		12/15/23 08:47	12/21/23 21:34	1
Nickel	<2.0		2.0	0.63	ug/L		12/15/23 08:47	12/21/23 21:34	1
Potassium	5500		500	110	ug/L		12/15/23 08:47	12/21/23 21:34	1
Selenium	<2.5		2.5	0.98	ug/L		12/15/23 08:47	12/21/23 21:34	1
Silver	<0.50		0.50	0.12	ug/L		12/15/23 08:47	12/21/23 21:34	1
Sodium	42000	B	200	77	ug/L		12/15/23 08:47	12/21/23 21:34	1
Strontium	4000		4.0	0.64	ug/L		12/15/23 08:47	12/21/23 21:34	1
Thallium	<2.0		2.0	0.57	ug/L		12/15/23 08:47	12/21/23 21:34	1
Vanadium	<5.0		5.0	2.2	ug/L		12/15/23 08:47	12/21/23 21:34	1
Zinc	15	J	20	6.9	ug/L		12/15/23 08:47	12/21/23 21:34	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	0.079	ug/L		12/28/23 14:20	12/29/23 09:34	1

Eurofins Chicago

Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Client Sample ID: DMW-01

Lab Sample ID: 500-243882-2

Date Collected: 12/12/23 14:35

Matrix: Water

Date Received: 12/14/23 10:12

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	380		0.91	0.46	mg/L		12/15/23 08:47	12/22/23 13:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide (SW846 9056A)	0.32	J	1.0	0.18	mg/L			12/14/23 12:02	1
Nitrate as N (SW846 9056A)	<1.0		1.0	0.043	mg/L			12/14/23 12:02	1
Chloride (SW846 9056A)	57	B	10	1.2	mg/L			12/14/23 15:34	10
Nitrite as N (SW846 9056A)	<1.0		1.0	0.070	mg/L			12/14/23 12:02	1
Fluoride (SW846 9056A)	2.3		1.0	0.19	mg/L			12/14/23 12:02	1
Orthophosphate as P (SW846 9056A)	<1.0		1.0	0.13	mg/L			12/14/23 12:02	1
Sulfate (SW846 9056A)	370		10	2.1	mg/L			12/14/23 15:34	10



Definitions/Glossary

Client: ARCADIS US Inc
Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*-	LCS and/or LCSD is outside acceptance limits, low biased.
*1	LCS/LCSD RPD exceeds control limits.

Metals

Qualifier	Qualifier Description
^1+	Initial Calibration Verification (ICV) is outside acceptance limits, high biased.
B	Compound was found in the blank and sample.
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
B	Compound was found in the blank and sample.
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: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-728748/1-A
Matrix: Water
Analysis Batch: 729663

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 728748

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorobutanoic acid (PFBA)	<5.0		5.0	2.4	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluoropentanoic acid (PFPeA)	<2.0		2.0	0.49	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	0.58	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	0.25	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	0.85	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	0.27	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	0.31	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	1.1	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	0.55	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluorotridecanoic acid (PFTrDA)	<2.0		2.0	1.3	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluorotetradecanoic acid (PFTeA)	<2.0		2.0	0.73	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<2.0		2.0	0.89	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluoro-n-octadecanoic acid (PFODA)	<2.0		2.0	0.94	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	0.20	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluoropentanesulfonic acid (PFPeS)	<2.0		2.0	0.30	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0	0.57	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		2.0	0.19	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	0.54	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluorononanesulfonic acid (PFNS)	<2.0		2.0	0.37	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluorodecanesulfonic acid (PFDS)	<2.0		2.0	0.32	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluorododecanesulfonic acid (PFDoS)	<2.0		2.0	0.97	ng/L		12/19/23 05:26	12/22/23 22:07	1
Perfluorooctanesulfonamide (FOSA)	<2.0		2.0	0.98	ng/L		12/19/23 05:26	12/22/23 22:07	1
NEtFOSA	<2.0		2.0	0.87	ng/L		12/19/23 05:26	12/22/23 22:07	1
NMeFOSA	<2.0		2.0	0.43	ng/L		12/19/23 05:26	12/22/23 22:07	1
NMeFOSAA	<5.0		5.0	1.2	ng/L		12/19/23 05:26	12/22/23 22:07	1
NEtFOSAA	<5.0		5.0	1.3	ng/L		12/19/23 05:26	12/22/23 22:07	1
NMeFOSE	<4.0		4.0	1.4	ng/L		12/19/23 05:26	12/22/23 22:07	1
NEtFOSE	<2.0		2.0	0.85	ng/L		12/19/23 05:26	12/22/23 22:07	1
4:2 FTS	<2.0		2.0	0.24	ng/L		12/19/23 05:26	12/22/23 22:07	1
6:2 FTS	<5.0		5.0	2.5	ng/L		12/19/23 05:26	12/22/23 22:07	1
8:2 FTS	<2.0		2.0	0.46	ng/L		12/19/23 05:26	12/22/23 22:07	1
10:2 FTS	<2.0		2.0	0.67	ng/L		12/19/23 05:26	12/22/23 22:07	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	0.40	ng/L		12/19/23 05:26	12/22/23 22:07	1
HFPO-DA (GenX)	<4.0		4.0	1.5	ng/L		12/19/23 05:26	12/22/23 22:07	1
9Cl-PF3ONS	<2.0		2.0	0.24	ng/L		12/19/23 05:26	12/22/23 22:07	1
11Cl-PF3OUdS	<2.0		2.0	0.32	ng/L		12/19/23 05:26	12/22/23 22:07	1
	MB	MB							
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	78		25 - 150				12/19/23 05:26	12/22/23 22:07	1
13C5 PFPeA	86		25 - 150				12/19/23 05:26	12/22/23 22:07	1
13C2 PFHxA	92		25 - 150				12/19/23 05:26	12/22/23 22:07	1
13C4 PFHpA	98		25 - 150				12/19/23 05:26	12/22/23 22:07	1
13C4 PFOA	89		25 - 150				12/19/23 05:26	12/22/23 22:07	1
13C5 PFNA	108		25 - 150				12/19/23 05:26	12/22/23 22:07	1

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-728748/1-A
Matrix: Water
Analysis Batch: 729663

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 728748

Isotope Dilution	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFDA	100		25 - 150	12/19/23 05:26	12/22/23 22:07	1
13C2 PFUnA	97		25 - 150	12/19/23 05:26	12/22/23 22:07	1
13C2 PFDoA	92		25 - 150	12/19/23 05:26	12/22/23 22:07	1
13C2 PFTeDA	87		25 - 150	12/19/23 05:26	12/22/23 22:07	1
13C2 PFHxDA	70		25 - 150	12/19/23 05:26	12/22/23 22:07	1
13C3 PFBS	76		25 - 150	12/19/23 05:26	12/22/23 22:07	1
18O2 PFHxS	86		25 - 150	12/19/23 05:26	12/22/23 22:07	1
13C4 PFOS	101		25 - 150	12/19/23 05:26	12/22/23 22:07	1
13C8 FOSA	92		10 - 150	12/19/23 05:26	12/22/23 22:07	1
d3-NMeFOSAA	104		25 - 150	12/19/23 05:26	12/22/23 22:07	1
d5-NEtFOSAA	89		25 - 150	12/19/23 05:26	12/22/23 22:07	1
d-N-MeFOSA-M	80		10 - 150	12/19/23 05:26	12/22/23 22:07	1
d-N-EtFOSA-M	81		10 - 150	12/19/23 05:26	12/22/23 22:07	1
d7-N-MeFOSE-M	88		10 - 150	12/19/23 05:26	12/22/23 22:07	1
d9-N-EtFOSE-M	92		10 - 150	12/19/23 05:26	12/22/23 22:07	1
M2-4:2 FTS	101		25 - 150	12/19/23 05:26	12/22/23 22:07	1
M2-6:2 FTS	100		25 - 150	12/19/23 05:26	12/22/23 22:07	1
M2-8:2 FTS	113		25 - 150	12/19/23 05:26	12/22/23 22:07	1
13C3 HFPO-DA	92		25 - 150	12/19/23 05:26	12/22/23 22:07	1
13C2 10:2 FTS	115		25 - 150	12/19/23 05:26	12/22/23 22:07	1

Lab Sample ID: LLCS 320-728748/2-A
Matrix: Water
Analysis Batch: 729663

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 728748

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorobutanoic acid (PFBA)	8.00	8.62		ng/L		108	50 - 150
Perfluoropentanoic acid (PFPeA)	8.00	9.39		ng/L		117	50 - 150
Perfluorohexanoic acid (PFHxA)	8.00	8.86		ng/L		111	50 - 150
Perfluoroheptanoic acid (PFHpA)	8.00	9.09		ng/L		114	50 - 150
Perfluorooctanoic acid (PFOA)	8.00	9.70		ng/L		121	50 - 150
Perfluorononanoic acid (PFNA)	8.00	9.63		ng/L		120	50 - 150
Perfluorodecanoic acid (PFDA)	8.00	9.17		ng/L		115	50 - 150
Perfluoroundecanoic acid (PFUnA)	8.00	9.06		ng/L		113	50 - 150
Perfluorododecanoic acid (PFDoA)	8.00	10.0		ng/L		125	50 - 150
Perfluorotridecanoic acid (PFTTrDA)	8.00	9.60		ng/L		120	50 - 150
Perfluorotetradecanoic acid (PFTeA)	8.00	8.74		ng/L		109	50 - 150
Perfluoro-n-hexadecanoic acid (PFHxDA)	8.00	8.54		ng/L		107	50 - 150
Perfluoro-n-octadecanoic acid (PFODA)	8.00	2.73	*-	ng/L		34	50 - 150
Perfluorobutanesulfonic acid (PFBS)	7.10	8.02		ng/L		113	50 - 150
Perfluoropentanesulfonic acid (PFPeS)	7.52	9.95		ng/L		132	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	7.30	8.33		ng/L		114	50 - 150

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LLCS 320-728748/2-A
Matrix: Water
Analysis Batch: 729663

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 728748

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoroheptanesulfonic acid (PFHpS)	7.63	7.37		ng/L		97	50 - 150
Perfluorooctanesulfonic acid (PFOS)	7.44	8.54		ng/L		115	50 - 150
Perfluorononanesulfonic acid (PFNS)	7.70	8.40		ng/L		109	50 - 150
Perfluorodecanesulfonic acid (PFDS)	7.71	8.53		ng/L		111	50 - 150
Perfluorododecanesulfonic acid (PFDoS)	7.76	8.29		ng/L		107	50 - 150
Perfluorooctanesulfonamide (FOSA)	8.00	9.19		ng/L		115	50 - 150
NEtFOSA	8.00	8.83		ng/L		110	50 - 150
NMeFOSA	8.00	10.2		ng/L		127	50 - 150
NMeFOSAA	8.00	7.70		ng/L		96	50 - 150
NEtFOSAA	8.00	9.00		ng/L		112	50 - 150
NMeFOSE	8.00	9.35		ng/L		117	50 - 150
NEtFOSE	8.00	8.88		ng/L		111	50 - 150
4:2 FTS	7.50	7.96		ng/L		106	50 - 150
6:2 FTS	7.62	9.10		ng/L		120	50 - 150
8:2 FTS	7.68	8.90		ng/L		116	50 - 150
10:2 FTS	7.73	7.01		ng/L		91	50 - 150
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.57	8.12		ng/L		107	50 - 150
HFPO-DA (GenX)	8.00	8.58		ng/L		107	50 - 150
9Cl-PF3ONS	7.47	8.65		ng/L		116	50 - 150
11Cl-PF3OUdS	7.55	8.39		ng/L		111	50 - 150

Isotope Dilution	LLCS		Limits
	%Recovery	Qualifier	
13C4 PFBA	75		25 - 150
13C5 PFPeA	81		25 - 150
13C2 PFHxA	93		25 - 150
13C4 PFHpA	96		25 - 150
13C4 PFOA	98		25 - 150
13C5 PFNA	103		25 - 150
13C2 PFDA	100		25 - 150
13C2 PFUnA	93		25 - 150
13C2 PFDoA	95		25 - 150
13C2 PFTeDA	99		25 - 150
13C2 PFHxDA	80		25 - 150
13C3 PFBS	76		25 - 150
18O2 PFHxS	91		25 - 150
13C4 PFOS	99		25 - 150
13C8 FOSA	100		10 - 150
d3-NMeFOSAA	91		25 - 150
d5-NEtFOSAA	94		25 - 150
d-N-MeFOSA-M	79		10 - 150
d-N-EtFOSA-M	78		10 - 150
d7-N-MeFOSE-M	92		10 - 150
d9-N-EtFOSE-M	96		10 - 150

QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LLCS 320-728748/2-A
Matrix: Water
Analysis Batch: 729663

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 728748

Isotope Dilution	LLCS		Limits
	%Recovery	Qualifier	
M2-4:2 FTS	95		25 - 150
M2-6:2 FTS	91		25 - 150
M2-8:2 FTS	101		25 - 150
13C3 HFPO-DA	93		25 - 150
13C2 10:2 FTS	108		25 - 150

Lab Sample ID: LLCSD 320-728748/3-A
Matrix: Water
Analysis Batch: 729663

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 728748

Analyte	Spike Added	LLCSD Result	LLCSD Qualifier	Unit	D	%Rec	%Rec		RPD	Limit
							Limits	RPD		
Perfluorobutanoic acid (PFBA)	8.00	7.90		ng/L		99	50 - 150	9	30	
Perfluoropentanoic acid (PFPeA)	8.00	8.40		ng/L		105	50 - 150	11	30	
Perfluorohexanoic acid (PFHxA)	8.00	8.37		ng/L		105	50 - 150	6	30	
Perfluoroheptanoic acid (PFHpA)	8.00	8.28		ng/L		103	50 - 150	9	30	
Perfluorooctanoic acid (PFOA)	8.00	9.60		ng/L		120	50 - 150	1	30	
Perfluorononanoic acid (PFNA)	8.00	9.37		ng/L		117	50 - 150	3	30	
Perfluorodecanoic acid (PFDA)	8.00	8.70		ng/L		109	50 - 150	5	30	
Perfluoroundecanoic acid (PFUnA)	8.00	8.78		ng/L		110	50 - 150	3	30	
Perfluorododecanoic acid (PFDoA)	8.00	9.28		ng/L		116	50 - 150	7	30	
Perfluorotridecanoic acid (PFTrDA)	8.00	8.87		ng/L		111	50 - 150	8	30	
Perfluorotetradecanoic acid (PFTeA)	8.00	8.86		ng/L		111	50 - 150	1	30	
Perfluoro-n-hexadecanoic acid (PFHxDA)	8.00	8.29		ng/L		104	50 - 150	3	30	
Perfluoro-n-octadecanoic acid (PFODA)	8.00	4.45	*1	ng/L		56	50 - 150	48	30	
Perfluorobutanesulfonic acid (PFBS)	7.10	8.20		ng/L		115	50 - 150	2	30	
Perfluoropentanesulfonic acid (PFPeS)	7.52	9.76		ng/L		130	50 - 150	2	30	
Perfluorohexanesulfonic acid (PFHxS)	7.30	7.96		ng/L		109	50 - 150	4	30	
Perfluoroheptanesulfonic acid (PFHpS)	7.63	8.51		ng/L		111	50 - 150	14	30	
Perfluorooctanesulfonic acid (PFOS)	7.44	8.52		ng/L		115	50 - 150	0.2	30	
Perfluorononanesulfonic acid (PFNS)	7.70	8.93		ng/L		116	50 - 150	6	30	
Perfluorodecanesulfonic acid (PFDS)	7.71	8.96		ng/L		116	50 - 150	5	30	
Perfluorododecanesulfonic acid (PFDoS)	7.76	8.94		ng/L		115	50 - 150	8	30	
Perfluorooctanesulfonamide (FOSA)	8.00	8.63		ng/L		108	50 - 150	6	30	
NEtFOSA	8.00	9.43		ng/L		118	50 - 150	7	30	
NMeFOSA	8.00	8.92		ng/L		112	50 - 150	13	30	
NMeFOSAA	8.00	8.87		ng/L		111	50 - 150	14	30	
NEtFOSAA	8.00	8.22		ng/L		103	50 - 150	9	30	
NMeFOSE	8.00	8.64		ng/L		108	50 - 150	8	30	

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LLCSD 320-728748/3-A
 Matrix: Water
 Analysis Batch: 729663

Client Sample ID: Lab Control Sample Dup
 Prep Type: Total/NA
 Prep Batch: 728748

Analyte	Spike Added	LLCSD Result	LLCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
NETFOSE	8.00	7.81		ng/L		98	50 - 150	13	30
4:2 FTS	7.50	7.62		ng/L		102	50 - 150	4	30
6:2 FTS	7.62	7.88		ng/L		103	50 - 150	14	30
8:2 FTS	7.68	7.40		ng/L		96	50 - 150	18	30
10:2 FTS	7.73	8.63		ng/L		112	50 - 150	21	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.57	7.77		ng/L		103	50 - 150	4	30
HFPO-DA (GenX)	8.00	8.13		ng/L		102	50 - 150	5	30
9CI-PF3ONS	7.47	8.15		ng/L		109	50 - 150	6	30
11CI-PF3OUdS	7.55	9.26		ng/L		123	50 - 150	10	30

Isotope Dilution	LLCSD %Recovery	LLCSD Qualifier	LLCSD Limits
13C4 PFBA	81		25 - 150
13C5 PFPeA	86		25 - 150
13C2 PFHxA	92		25 - 150
13C4 PFHpA	99		25 - 150
13C4 PFOA	95		25 - 150
13C5 PFNA	96		25 - 150
13C2 PFDA	107		25 - 150
13C2 PFUnA	101		25 - 150
13C2 PFDoA	108		25 - 150
13C2 PFTeDA	104		25 - 150
13C2 PFHxDA	98		25 - 150
13C3 PFBS	80		25 - 150
18O2 PFHxS	90		25 - 150
13C4 PFOS	101		25 - 150
13C8 FOSA	99		10 - 150
d3-NMeFOSAA	97		25 - 150
d5-NEtFOSAA	101		25 - 150
d-N-MeFOSA-M	80		10 - 150
d-N-EtFOSA-M	76		10 - 150
d7-N-MeFOSE-M	89		10 - 150
d9-N-EtFOSE-M	97		10 - 150
M2-4:2 FTS	91		25 - 150
M2-6:2 FTS	104		25 - 150
M2-8:2 FTS	117		25 - 150
13C3 HFPO-DA	93		25 - 150
13C2 10:2 FTS	109		25 - 150

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 500-746885/1-A
 Matrix: Water
 Analysis Batch: 747971

Client Sample ID: Method Blank
 Prep Type: Total Recoverable
 Prep Batch: 746885

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	34.6	J	100	25	ug/L		12/15/23 08:47	12/21/23 20:52	1
Antimony	<3.0		3.0	1.3	ug/L		12/15/23 08:47	12/21/23 20:52	1
Arsenic	<1.0		1.0	0.23	ug/L		12/15/23 08:47	12/21/23 20:52	1

Euofins Chicago

QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

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

Lab Sample ID: MB 500-746885/1-A
Matrix: Water
Analysis Batch: 747971

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 746885

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Barium	<2.5		2.5	0.73	ug/L		12/15/23 08:47	12/21/23 20:52	1
Cadmium	<0.50		0.50	0.17	ug/L		12/15/23 08:47	12/21/23 20:52	1
Calcium	347		200	44	ug/L		12/15/23 08:47	12/21/23 20:52	1
Chromium	<5.0		5.0	1.1	ug/L		12/15/23 08:47	12/21/23 20:52	1
Cobalt	<1.0		1.0	0.40	ug/L		12/15/23 08:47	12/21/23 20:52	1
Copper	0.809	J	2.0	0.50	ug/L		12/15/23 08:47	12/21/23 20:52	1
Iron	91.8	J	100	47	ug/L		12/15/23 08:47	12/21/23 20:52	1
Lead	0.206	J	0.50	0.19	ug/L		12/15/23 08:47	12/21/23 20:52	1
Magnesium	156	J	200	49	ug/L		12/15/23 08:47	12/21/23 20:52	1
Manganese	1.87	J	2.5	0.79	ug/L		12/15/23 08:47	12/21/23 20:52	1
Nickel	<2.0		2.0	0.63	ug/L		12/15/23 08:47	12/21/23 20:52	1
Potassium	<500		500	110	ug/L		12/15/23 08:47	12/21/23 20:52	1
Selenium	<2.5		2.5	0.98	ug/L		12/15/23 08:47	12/21/23 20:52	1
Silver	<0.50		0.50	0.12	ug/L		12/15/23 08:47	12/21/23 20:52	1
Sodium	146	J	200	77	ug/L		12/15/23 08:47	12/21/23 20:52	1
Strontium	<4.0		4.0	0.64	ug/L		12/15/23 08:47	12/21/23 20:52	1
Thallium	<2.0		2.0	0.57	ug/L		12/15/23 08:47	12/21/23 20:52	1
Vanadium	<5.0		5.0	2.2	ug/L		12/15/23 08:47	12/21/23 20:52	1
Zinc	<20		20	6.9	ug/L		12/15/23 08:47	12/21/23 20:52	1

Lab Sample ID: MB 500-746885/1-A
Matrix: Water
Analysis Batch: 748781

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 746885

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Beryllium	<1.0	^1+	1.0	0.53	ug/L		12/15/23 08:47	01/02/24 13:03	1
Boron	14.2	J	50	13	ug/L		12/15/23 08:47	01/02/24 13:03	1

Lab Sample ID: LCS 500-746885/2-A
Matrix: Water
Analysis Batch: 747971

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 746885

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	500	479		ug/L		96	80 - 120
Arsenic	100	98.4		ug/L		98	80 - 120
Barium	500	517		ug/L		103	80 - 120
Cadmium	50.0	47.6		ug/L		95	80 - 120
Calcium	10000	8520		ug/L		85	80 - 120
Chromium	200	200		ug/L		100	80 - 120
Cobalt	500	506		ug/L		101	80 - 120
Copper	250	246		ug/L		98	80 - 120
Iron	1000	1030		ug/L		103	80 - 120
Lead	100	101		ug/L		101	80 - 120
Magnesium	10000	9550		ug/L		96	80 - 120
Manganese	500	499		ug/L		100	80 - 120
Nickel	500	523		ug/L		105	80 - 120
Potassium	10000	10000		ug/L		100	80 - 120
Selenium	100	98.6		ug/L		99	80 - 120

Eurofins Chicago

QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

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

Lab Sample ID: LCS 500-746885/2-A
Matrix: Water
Analysis Batch: 747971

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 746885

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Silver	50.0	47.6		ug/L		95	80 - 120
Sodium	10000	9600		ug/L		96	80 - 120
Strontium	1000	969		ug/L		97	80 - 120
Thallium	100	103		ug/L		103	80 - 120
Vanadium	500	489		ug/L		98	80 - 120
Zinc	500	519		ug/L		104	80 - 120

Lab Sample ID: LCS 500-746885/2-A
Matrix: Water
Analysis Batch: 748781

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 746885

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Beryllium	50.0	50.1	^1+	ug/L		100	80 - 120
Boron	1000	1060		ug/L		106	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-748424/12-A
Matrix: Water
Analysis Batch: 748531

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 748424

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	0.079	ug/L		12/28/23 14:20	12/29/23 09:08	1

Lab Sample ID: LCS 500-748424/13-A
Matrix: Water
Analysis Batch: 748531

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 748424

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.01	2.04		ug/L		102	80 - 120

Lab Sample ID: 500-243882-2 MS
Matrix: Water
Analysis Batch: 748531

Client Sample ID: DMW-01
Prep Type: Total/NA
Prep Batch: 748424

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	<0.20		1.00	1.04		ug/L		104	75 - 125

Lab Sample ID: 500-243882-2 MSD
Matrix: Water
Analysis Batch: 748531

Client Sample ID: DMW-01
Prep Type: Total/NA
Prep Batch: 748424

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Mercury	<0.20		1.00	1.02		ug/L		102	75 - 125	2	20

QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: 500-243882-2 DU
 Matrix: Water
 Analysis Batch: 748531

Client Sample ID: DMW-01
 Prep Type: Total/NA
 Prep Batch: 748424

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Mercury	<0.20		<0.20		ug/L		NC	20

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 500-746729/3
 Matrix: Water
 Analysis Batch: 746729

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	<1.0		1.0	0.043	mg/L			12/14/23 11:32	1
Nitrite as N	0.180	J	1.0	0.070	mg/L			12/14/23 11:32	1
Orthophosphate as P	<1.0		1.0	0.13	mg/L			12/14/23 11:32	1

Lab Sample ID: LCS 500-746729/4
 Matrix: Water
 Analysis Batch: 746729

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	20.0	20.0		mg/L		100	80 - 120
Nitrite as N	20.0	20.1		mg/L		101	80 - 120
Orthophosphate as P	20.0	19.2		mg/L		96	80 - 120

Lab Sample ID: MB 500-746730/3
 Matrix: Water
 Analysis Batch: 746730

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<1.0		1.0	0.18	mg/L			12/14/23 11:32	1
Chloride	0.252	J	1.0	0.12	mg/L			12/14/23 11:32	1
Fluoride	<1.0		1.0	0.19	mg/L			12/14/23 11:32	1
Sulfate	<1.0		1.0	0.21	mg/L			12/14/23 11:32	1

Lab Sample ID: MB 500-746749/1-A
 Matrix: Water
 Analysis Batch: 746730

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<1.0		1.0	0.18	mg/L			12/14/23 15:04	1
Chloride	0.246	J	1.0	0.12	mg/L			12/14/23 15:04	1
Fluoride	<1.0		1.0	0.19	mg/L			12/14/23 15:04	1
Sulfate	<1.0		1.0	0.21	mg/L			12/14/23 15:04	1

Lab Sample ID: LCS 500-746730/4
 Matrix: Water
 Analysis Batch: 746730

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	20.0	19.4		mg/L		97	80 - 120
Chloride	20.0	20.6		mg/L		103	80 - 120
Fluoride	20.0	20.4		mg/L		102	80 - 120

Eurofins Chicago

QC Sample Results

Client: ARCADIS US Inc
Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

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

Lab Sample ID: LCS 500-746730/4
Matrix: Water
Analysis Batch: 746730

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	20.0	20.5		mg/L		103	80 - 120

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Lab Chronicle

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Client Sample ID: Field Blank-12-12-2023-DMW

Lab Sample ID: 500-243882-1

Date Collected: 12/12/23 14:40

Matrix: Water

Date Received: 12/14/23 10:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3535			728748	GAT	EET SAC	12/19/23 05:34
Total/NA	Analysis	537 (modified)		1	729663	D1R	EET SAC	12/22/23 23:38

Client Sample ID: DMW-01

Lab Sample ID: 500-243882-2

Date Collected: 12/12/23 14:35

Matrix: Water

Date Received: 12/14/23 10:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3535			728748	GAT	EET SAC	12/19/23 05:34
Total/NA	Analysis	537 (modified)		1	729663	D1R	EET SAC	12/22/23 23:49
Total Recoverable	Prep	3005A			746885	BDE	EET CHI	12/15/23 08:47 - 12/15/23 09:17 ¹
Total Recoverable	Analysis	6020B		1	747971	SJ	EET CHI	12/21/23 21:34
Total Recoverable	Prep	3005A			746885	BDE	EET CHI	12/15/23 08:47 - 12/15/23 09:17 ¹
Total Recoverable	Analysis	6020B		1	748781	RN	EET CHI	01/02/24 13:41
Total/NA	Prep	7470A			748424	MJG	EET CHI	12/28/23 14:20 - 12/28/23 16:20 ¹
Total/NA	Analysis	7470A		1	748531	MJG	EET CHI	12/29/23 09:34
Total Recoverable	Prep	3005A			746885	BDE	EET CHI	12/15/23 08:47 - 12/15/23 09:17 ¹
Total Recoverable	Analysis	SM 2340B		1	748036	DAJ	EET CHI	12/22/23 13:38
Total/NA	Analysis	9056A		1	746729	W1T	EET CHI	12/14/23 12:02
Total/NA	Analysis	9056A		1	746730	W1T	EET CHI	12/14/23 12:02
Total/NA	Analysis	9056A		10	746730	W1T	EET CHI	12/14/23 15:34

¹ This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200
 EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: ARCADIS US Inc
Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Laboratory: Eurofins Chicago

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

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	999580010	08-31-24

Laboratory: Eurofins Sacramento

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

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	998204680	08-31-24

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Chain of Custody Record



Regulatory Program: DW NPDES RCRA Other

500-243882 COC

Client Contact		Email: N/A		Site Contact:		Date:		COC No	
Arcadis U S , Inc		Tel/Fax: N/A		Lab Contact: Sandie Fredrick		Carrier: FedEx		1 of 1 COCs	
126 North Jefferson Street, Suite 400		Analysis Turnaround Time						Sampler	
Milwaukee, WI 53202		<input type="checkbox"/> CALENDAR DAYS <input checked="" type="checkbox"/> WORKING DAYS TAT if different from Below STANDARD <input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day						For Lab Use Only: Walk-in Client Lab Sampling	
Project Name Marinette, WI		Phone						Lab Project Number 50020494 50021668	
Site Marinette, WI		FAX						Sample Specific Notes 500-243882	
P O # 30168807-1-2 30168809									

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	EPA 537 Modified (36 Compounds)	Rad 226 903	Rad 228 904	TAL Metals 6020A / 7470A	Hardness SM234B	Sulfur 6010D	Total Sulfide SM4500	Antions 9056A	Uranium 6020B	Alkalinity 2320B	Sample Specific Notes	
																		7	4
WS-R			G	W		N													
WS-R POST			G	W		N													
DUP-			G	W		N													
1 Field Blank-12-12-2023 -DMW	12-12-23	1440	G	W	2	N	M	X											Field Blank
2 DMW-01	↓	1435	G	W	4	N	M	X		X	X			X					

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other - Zn Acetate/NaOH; 7=None 7 4 4 4 4 4 6 7 4 7

Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample

Non-Hazard Flammable Skin Irritant Poison B Unknown

Return to Client Disposal by Lab Archive for _____ Months

Special Instructions/QC Requirements & Comments:
Level 4, Questions call L. Rutkowski
TAT: Standard

Custody Seals Intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No <u>1500</u>	Cooler Temp (°C) Obs'd <u>3.6</u> Corr'd <u>3.4</u>	Therm ID No _____
Relinquished by <u>[Signature]</u>	Company Arcadis	Date/Time <u>12-13-2023</u>	Received by _____
Relinquished by _____	Company _____	Date/Time _____	Received by _____
Relinquished by _____	Company _____	Date/Time _____	Received in Laboratory by: <u>[Signature]</u>
			Company <u>EETA</u> Date/Time <u>12/14/23 0945</u>

MILWAUKEE DEEP WELL
JCI/ARCADIS
2700 INDUSTRIAL PARKWAY
BUILDING 112-RECEIVING STATION 5
MARINETTE, WI 54143
UNITED STATES US

ACTUAL WT: 25.00 LB MAN
CAD: 0780307/CAFE3755



500-243882 Waybi

TO **SAMPLE RECEIPT**
EUROFINS CHICAGO
2417 BOND ST.

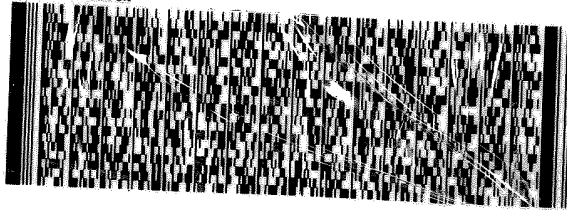
UNIVERSITY PARK IL 60484

(708) 534-5200
INU:
PO:

REF:

DEPT:

RMA:



FedEx
Express



AN 18215023051281100

RETURNS MON-SAT

THU - 14 DEC 12:00P
PRIORITY OVERNIGHT

FedEx
TRK#
0221 **7163 1500 6431**

XN JOTA

60484
IL-US **ORD**

EXP 10/24



#5006678-12

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Login Sample Receipt Checklist

Client: ARCADIS US Inc

Job Number: 500-243882-1

Login Number: 243882

List Source: Eurofins Chicago

List Number: 1

Creator: Hernandez, Stephanie

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	3.4
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 <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: ARCADIS US Inc

Job Number: 500-243882-1

Login Number: 243882

List Number: 2

Creator: Simmons, Jason C

List Source: Eurofins Sacramento

List Creation: 12/15/23 02:50 PM

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.	N/A	
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	1.4 c
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?	N/A	Received project as a subcontract.
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.	N/A	
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Isotope Dilution Summary

Client: ARCADIS US Inc
 Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFBA (25-150)	PFPeA (25-150)	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
500-243882-1	Field Blank-12-12-2023-DMW	80	86	91	88	98	98	100	95
500-243882-2	DMW-01	71	76	84	86	88	91	98	93
LLCS 320-728748/2-A	Lab Control Sample	75	81	93	96	98	103	100	93
LLCSD 320-728748/3-A	Lab Control Sample Dup	81	86	92	99	95	96	107	101
MB 320-728748/1-A	Method Blank	78	86	92	98	89	108	100	97

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFDaA (25-150)	PFTDA (25-150)	PFHxDA (25-150)	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (10-150)	d3NMFOS (25-150)
500-243882-1	Field Blank-12-12-2023-DMW	97	93	75	77	87	105	95	97
500-243882-2	DMW-01	94	95	74	73	86	98	99	93
LLCS 320-728748/2-A	Lab Control Sample	95	99	80	76	91	99	100	91
LLCSD 320-728748/3-A	Lab Control Sample Dup	108	104	98	80	90	101	99	97
MB 320-728748/1-A	Method Blank	92	87	70	76	86	101	92	104

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	d5NEFOS (25-150)	dMeFOSA (10-150)	dEtFOSA (10-150)	NMFM (10-150)	NEFM (10-150)	M242FTS (25-150)	M262FTS (25-150)	M282FTS (25-150)
500-243882-1	Field Blank-12-12-2023-DMW	93	70	71	80	87	107	113	118
500-243882-2	DMW-01	94	80	76	82	91	89	104	101
LLCS 320-728748/2-A	Lab Control Sample	94	79	78	92	96	95	91	101
LLCSD 320-728748/3-A	Lab Control Sample Dup	101	80	76	89	97	91	104	117
MB 320-728748/1-A	Method Blank	89	80	81	88	92	101	100	113

		Percent Isotope Dilution Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	HFPODA (25-150)	M102FTS (25-150)
500-243882-1	Field Blank-12-12-2023-DMW	90	108
500-243882-2	DMW-01	84	106
LLCS 320-728748/2-A	Lab Control Sample	93	108
LLCSD 320-728748/3-A	Lab Control Sample Dup	93	109
MB 320-728748/1-A	Method Blank	92	115

Surrogate Legend

- PFBA = 13C4 PFBA
- PFPeA = 13C5 PFPeA
- PFHxA = 13C2 PFHxA
- C4PFHA = 13C4 PFHpA
- PFOA = 13C4 PFOA
- PFNA = 13C5 PFNA
- PFDA = 13C2 PFDA
- PFUnA = 13C2 PFUnA
- PFDaA = 13C2 PFDaA
- PFTDA = 13C2 PFTeDA
- PFHxDA = 13C2 PFHxDA
- C3PFBS = 13C3 PFBS
- PFHxS = 18O2 PFHxS
- PFOS = 13C4 PFOS
- PFOSA = 13C8 FOSA
- d3NMFOS = d3-NMeFOSAA
- d5NEFOS = d5-NEtFOSAA
- dMeFOSA = d-N-MeFOSA-M

Isotope Dilution Summary

Client: ARCADIS US Inc

Project/Site: Marinette, WI Deep Well 30168809.1.4.1

Job ID: 500-243882-1

dEtFOSA = d-N-EtFOSA-M

NMFM = d7-N-MeFOSE-M

NEFM = d9-N-EtFOSE-M

M242FTS = M2-4:2 FTS

M262FTS = M2-6:2 FTS

M282FTS = M2-8:2 FTS

HFPODA = 13C3 HFPO-DA

M102FTS = 13C2 10:2 FTS

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ANALYTICAL REPORT

PREPARED FOR

Attn: Lisa Rutkowski
ARCADIS US Inc
126 North Jefferson Street
Suite 400
Milwaukee, Wisconsin 53202

Generated 1/4/2024 3:39:56 PM

JOB DESCRIPTION

Marinette Dp Private Well 30168807.1.2.3

JOB NUMBER

500-243417-1

Eurofins Chicago

Job Notes

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of Eurofins Environment Testing North Central, LLC and its client. All questions regarding this report should be directed to the Eurofins Environment Testing North Central, LLC Project Manager who has signed this report.

Results relate only to the items tested and the sample(s) as received by the laboratory. The results, detection limits (LOD) and Quantitation Limits (LOQ) have been adjusted for sample dilutions and/or solids content.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Chicago Project Manager.

Compliance Statement

The LOD and LOQ reported are adjusted by the dilution factor when a dilution factor greater than 1 is needed. Additionally, where results are indicated as being reported on a dry weight basis, the LOD and LOQ are adjusted for moisture content as well.

Definitions of Limits

- LOD = Limit of Detection = MDL as defined by 40 CFR part 136 Appendix B
- LOQ = Limit of Quantitation = 3.33 x LOD as defined by Wisconsin
- RL = Report Limit = a concentration supported by a standard in the calibration curves

Authorization



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Authorized for release by
Sandie Fredrick, Senior Project Manager
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660



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Case Narrative

Client: ARCADIS US Inc
Project: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Job ID: 500-243417-1

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Job Narrative 500-243417-1

Receipt

The samples were received on 12/6/2023 10:10 AM. 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 1.0° C.

RAD

Methods 904.0, 9320: Radium-228 prep batch 160-640055: The sample duplicate precision for the following sample associated with preparation batch 160-640055 and analytical batch 160-641897 was outside control limits: 400-246824-K-9-F MSD. Non-homogeneity of the sample matrix was observed during prep.

Methods 904.0, 9320: Radium-228 prep batch 160-640055: The following sample(s) did not meet the requested limit (RL) due to the reduced sample volume attributed to the presence of matrix interference. During preparation the analyst visually noted matrix effects. The data have been reported with this narrative. 400-246824-K-9-F MSD

Methods 903.0, 9315: Radium-226 batch 640054 The matrix spike / matrix spike duplicate (400-246824-K-9-C MSD) precision was outside control limits. Sample matrix interference is suspected, as the laboratory control sample (LCS) recovery was within limits and the MS/MSD recoveries were also well within acceptable QC limits demonstrating method accuracy.

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

Metals

Method 6020B: The initial low level calibration verification (ICVL) result for batch 748781 was above the upper control limit for Be. Sample results were non-detects, and have been reported as qualified data.

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

LCMS

Method 537 (modified): The low level laboratory control sample (LLCS) for preparation batch 320-726710 and analytical batch 320-727171 recovered below the control limit for the following analyte: Perfluoro-n-octadecanoic acid (PFODA). This is a legacy analyte for the method and the state of Wisconsin is no longer concerned with its recovery; therefore, the data have been reported: LLCS 320-726710/2-A.

Method 537 (modified): The following field blank (FB) sample has a detection above half the reporting limit (RL) for Perfluorooctanoic acid (PFOA): 500-243417-2. The sample was re-analyzed with concurring results; 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.

General Chemistry

Method 9056A: The following sample was received outside of holding time: 500-243417-1.

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

Organic Prep

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

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Method Summary

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	EET SAC
6010D	Metals (ICP)	SW846	EET DEN
6020B	Metals (ICP/MS)	SW846	EET CHI
6020B	Metals (ICP/MS)	SW846	EET SL
7470A	Mercury (CVAA)	SW846	EET CHI
SM 2340B	Total Hardness (as CaCO3) by calculation	SM	EET CHI
9056A	Anions, Ion Chromatography	SW846	EET CHI
SM 2320B	Alkalinity	SM	EET CHI
SM 4500 S2 F	Sulfide, Total	SM	EET CHI
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
Pos			
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CHI
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET DEN
3010A	Preparation, Total Metals	SW846	EET SL
3535	Solid-Phase Extraction (SPE)	SW846	EET SAC
7470A	Preparation, Mercury	SW846	EET CHI
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

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.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

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

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: ARCADIS US Inc
Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
500-243417-1	DUP-004	Water	12/04/23 00:00	12/06/23 10:10
500-243417-2	Field Blank-12-04-2023-DW	Water	12/04/23 14:15	12/06/23 10:10
500-243417-3	DMW-03	Water	12/04/23 14:10	12/06/23 10:10
500-243417-4	EB-004	Water	12/04/23 14:20	12/06/23 10:10

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Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Client Sample ID: DUP-004

Lab Sample ID: 500-243417-1

Date Collected: 12/04/23 00:00

Matrix: Water

Date Received: 12/06/23 10:10

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<4.7		4.7	2.3	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluoropentanoic acid (PFPeA)	<1.9		1.9	0.46	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluorohexanoic acid (PFHxA)	<1.9		1.9	0.54	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluoroheptanoic acid (PFHpA)	<1.9		1.9	0.23	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluorooctanoic acid (PFOA)	<1.9		1.9	0.80	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluorononanoic acid (PFNA)	<1.9		1.9	0.25	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluorodecanoic acid (PFDA)	<1.9		1.9	0.29	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluoroundecanoic acid (PFUnA)	<1.9		1.9	1.0	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluorododecanoic acid (PFDoA)	<1.9		1.9	0.52	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluorotridecanoic acid (PFTrDA)	<1.9		1.9	1.2	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluorotetradecanoic acid (PFTeA)	<1.9		1.9	0.69	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<1.9		1.9	0.84	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluoro-n-octadecanoic acid (PFODA)	<1.9	*	1.9	0.88	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluorobutanesulfonic acid (PFBS)	<1.9		1.9	0.19	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluoropentanesulfonic acid (PFPeS)	<1.9		1.9	0.28	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluorohexanesulfonic acid (PFHxS)	<1.9		1.9	0.54	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluoroheptanesulfonic acid (PFHpS)	<1.9		1.9	0.18	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluorooctanesulfonic acid (PFOS)	<1.9		1.9	0.51	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluorononanesulfonic acid (PFNS)	<1.9		1.9	0.35	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluorodecanesulfonic acid (PFDS)	<1.9		1.9	0.30	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluorododecanesulfonic acid (PFDoS)	<1.9		1.9	0.91	ng/L		12/11/23 11:43	12/12/23 22:30	1
Perfluorooctanesulfonamide (FOSA)	<1.9		1.9	0.92	ng/L		12/11/23 11:43	12/12/23 22:30	1
NEtFOSA	<1.9		1.9	0.82	ng/L		12/11/23 11:43	12/12/23 22:30	1
NMeFOSA	<1.9		1.9	0.40	ng/L		12/11/23 11:43	12/12/23 22:30	1
NMeFOSAA	<4.7		4.7	1.1	ng/L		12/11/23 11:43	12/12/23 22:30	1
NEtFOSAA	<4.7		4.7	1.2	ng/L		12/11/23 11:43	12/12/23 22:30	1
NMeFOSE	<3.8		3.8	1.3	ng/L		12/11/23 11:43	12/12/23 22:30	1
NEtFOSE	<1.9		1.9	0.80	ng/L		12/11/23 11:43	12/12/23 22:30	1
4:2 FTS	<1.9		1.9	0.23	ng/L		12/11/23 11:43	12/12/23 22:30	1
6:2 FTS	<4.7		4.7	2.3	ng/L		12/11/23 11:43	12/12/23 22:30	1
8:2 FTS	<1.9		1.9	0.43	ng/L		12/11/23 11:43	12/12/23 22:30	1
10:2 FTS	<1.9		1.9	0.63	ng/L		12/11/23 11:43	12/12/23 22:30	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	0.50	J	1.9	0.38	ng/L		12/11/23 11:43	12/12/23 22:30	1
HFPO-DA (GenX)	<3.8		3.8	1.4	ng/L		12/11/23 11:43	12/12/23 22:30	1
9Cl-PF3ONS	<1.9		1.9	0.23	ng/L		12/11/23 11:43	12/12/23 22:30	1
11Cl-PF3OUdS	<1.9		1.9	0.30	ng/L		12/11/23 11:43	12/12/23 22:30	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	100		25 - 150				12/11/23 11:43	12/12/23 22:30	1
13C5 PFPeA	90		25 - 150				12/11/23 11:43	12/12/23 22:30	1
13C2 PFHxA	98		25 - 150				12/11/23 11:43	12/12/23 22:30	1
13C4 PFHpA	94		25 - 150				12/11/23 11:43	12/12/23 22:30	1
13C4 PFOA	99		25 - 150				12/11/23 11:43	12/12/23 22:30	1
13C5 PFNA	96		25 - 150				12/11/23 11:43	12/12/23 22:30	1
13C2 PFDA	97		25 - 150				12/11/23 11:43	12/12/23 22:30	1
13C2 PFUnA	84		25 - 150				12/11/23 11:43	12/12/23 22:30	1

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Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Client Sample ID: DUP-004

Lab Sample ID: 500-243417-1

Date Collected: 12/04/23 00:00

Matrix: Water

Date Received: 12/06/23 10:10

Method: EPA 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	85		25 - 150	12/11/23 11:43	12/12/23 22:30	1
13C2 PFTeDA	84		25 - 150	12/11/23 11:43	12/12/23 22:30	1
13C2 PFHxDA	105		25 - 150	12/11/23 11:43	12/12/23 22:30	1
13C3 PFBS	81		25 - 150	12/11/23 11:43	12/12/23 22:30	1
18O2 PFHxS	102		25 - 150	12/11/23 11:43	12/12/23 22:30	1
13C4 PFOS	96		25 - 150	12/11/23 11:43	12/12/23 22:30	1
13C8 FOSA	83		10 - 150	12/11/23 11:43	12/12/23 22:30	1
d3-NMeFOSAA	109		25 - 150	12/11/23 11:43	12/12/23 22:30	1
d5-NEtFOSAA	112		25 - 150	12/11/23 11:43	12/12/23 22:30	1
d-N-MeFOSA-M	68		10 - 150	12/11/23 11:43	12/12/23 22:30	1
d-N-EtFOSA-M	72		10 - 150	12/11/23 11:43	12/12/23 22:30	1
d7-N-MeFOSE-M	72		10 - 150	12/11/23 11:43	12/12/23 22:30	1
d9-N-EtFOSE-M	81		10 - 150	12/11/23 11:43	12/12/23 22:30	1
M2-4:2 FTS	122		25 - 150	12/11/23 11:43	12/12/23 22:30	1
M2-6:2 FTS	100		25 - 150	12/11/23 11:43	12/12/23 22:30	1
M2-8:2 FTS	95		25 - 150	12/11/23 11:43	12/12/23 22:30	1
13C3 HFPO-DA	101		25 - 150	12/11/23 11:43	12/12/23 22:30	1
13C2 10:2 FTS	71		25 - 150	12/11/23 11:43	12/12/23 22:30	1

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	290		2.0	0.56	mg/L		12/12/23 15:20	12/15/23 01:29	20

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Uranium	0.45	J	1.0	0.15	ug/L		12/13/23 13:40	12/15/23 15:20	2

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<100		100	25	ug/L		12/13/23 09:21	12/21/23 20:10	1
Antimony	<3.0		3.0	1.3	ug/L		12/13/23 09:21	12/21/23 20:10	1
Arsenic	<1.0		1.0	0.23	ug/L		12/13/23 09:21	12/21/23 20:10	1
Barium	16		2.5	0.73	ug/L		12/13/23 09:21	12/21/23 20:10	1
Beryllium	<1.0	^1+	1.0	0.53	ug/L		12/13/23 09:21	01/02/24 14:16	1
Boron	250		50	13	ug/L		12/13/23 09:21	12/21/23 20:10	1
Cadmium	<0.50		0.50	0.17	ug/L		12/13/23 09:21	12/21/23 20:10	1
Calcium	97000		200	44	ug/L		12/13/23 09:21	12/21/23 20:10	1
Chromium	<5.0		5.0	1.1	ug/L		12/13/23 09:21	12/21/23 20:10	1
Cobalt	0.40	J	1.0	0.40	ug/L		12/13/23 09:21	12/21/23 20:10	1
Copper	<2.0		2.0	0.50	ug/L		12/13/23 09:21	12/21/23 20:10	1
Iron	190		100	47	ug/L		12/13/23 09:21	12/21/23 20:10	1
Lead	<0.50		0.50	0.19	ug/L		12/13/23 09:21	12/21/23 20:10	1
Magnesium	51000		200	49	ug/L		12/13/23 09:21	12/21/23 20:10	1
Manganese	6.3		2.5	0.79	ug/L		12/13/23 09:21	12/21/23 20:10	1
Nickel	<2.0		2.0	0.63	ug/L		12/13/23 09:21	12/21/23 20:10	1
Potassium	5900		500	110	ug/L		12/13/23 09:21	12/21/23 20:10	1
Selenium	<2.5		2.5	0.98	ug/L		12/13/23 09:21	12/21/23 20:10	1
Silver	<0.50		0.50	0.12	ug/L		12/13/23 09:21	12/21/23 20:10	1
Sodium	44000		200	77	ug/L		12/13/23 09:21	12/21/23 20:10	1
Strontium	12000		4.0	0.64	ug/L		12/13/23 09:21	12/21/23 20:10	1

Eurofins Chicago

Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Client Sample ID: DUP-004

Lab Sample ID: 500-243417-1

Date Collected: 12/04/23 00:00

Matrix: Water

Date Received: 12/06/23 10:10

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	<2.0		2.0	0.57	ug/L		12/13/23 09:21	12/21/23 20:10	1
Vanadium	<5.0		5.0	2.2	ug/L		12/13/23 09:21	12/21/23 20:10	1
Zinc	<20		20	6.9	ug/L		12/13/23 09:21	12/21/23 20:10	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	0.079	ug/L		12/13/23 10:25	12/14/23 09:07	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	540		0.91	0.46	mg/L		12/13/23 09:21	12/14/23 14:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide (SW846 9056A)	0.49	J	1.0	0.18	mg/L			12/06/23 16:17	1
Nitrate as N (SW846 9056A)	<1.0	H3	1.0	0.043	mg/L			12/06/23 11:48	1
Chloride (SW846 9056A)	69		20	2.3	mg/L			12/06/23 14:50	20
Nitrite as N (SW846 9056A)	<1.0	H3	1.0	0.070	mg/L			12/06/23 11:48	1
Fluoride (SW846 9056A)	1.1		1.0	0.19	mg/L			12/06/23 11:48	1
Orthophosphate as P (SW846 9056A)	<1.0	H3	1.0	0.13	mg/L			12/06/23 11:48	1
Sulfate (SW846 9056A)	440		20	4.1	mg/L			12/07/23 09:20	20
Alkalinity, Total (SM 2320B)	92		5.0	3.7	mg/L			12/12/23 15:58	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	92		5.0	3.7	mg/L			12/12/23 15:58	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<5.0		5.0	3.7	mg/L			12/12/23 15:58	1
Sulfide (SM 4500 S2 F)	<1.0		1.0	0.23	mg/L			12/07/23 23:24	1

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	41.7	F	1.08	3.91	1.00	0.113	pCi/L	12/08/23 10:30	01/02/24 14:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	107		30 - 110					12/08/23 10:30	01/02/24 14:21	1

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.17	F	0.385	0.400	1.00	0.462	pCi/L	12/08/23 10:33	12/22/23 11:26	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	107		30 - 110					12/08/23 10:33	12/22/23 11:26	1
Y Carrier	88.6		30 - 110					12/08/23 10:33	12/22/23 11:26	1

Method: TAL-STL Ra226_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	42.9		1.15	3.93	5.00	0.462	pCi/L		01/04/24 10:48	1

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Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Client Sample ID: Field Blank-12-04-2023-DW

Lab Sample ID: 500-243417-2

Date Collected: 12/04/23 14:15

Matrix: Water

Date Received: 12/06/23 10:10

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<4.8		4.8	2.3	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluoropentanoic acid (PFPeA)	<1.9		1.9	0.47	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluorohexanoic acid (PFHxA)	<1.9		1.9	0.55	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluoroheptanoic acid (PFHpA)	<1.9		1.9	0.24	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluorooctanoic acid (PFOA)	1.3	J	1.9	0.81	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluorononanoic acid (PFNA)	<1.9		1.9	0.26	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluorodecanoic acid (PFDA)	<1.9		1.9	0.30	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluoroundecanoic acid (PFUnA)	<1.9		1.9	1.1	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluorododecanoic acid (PFDoA)	<1.9		1.9	0.53	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluorotridecanoic acid (PFTrDA)	<1.9		1.9	1.2	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluorotetradecanoic acid (PFTeA)	<1.9		1.9	0.70	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<1.9		1.9	0.85	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluoro-n-octadecanoic acid (PFODA)	<1.9	*	1.9	0.90	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluorobutanesulfonic acid (PFBS)	<1.9		1.9	0.19	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluoropentanesulfonic acid (PFPeS)	<1.9		1.9	0.29	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluorohexanesulfonic acid (PFHxS)	<1.9		1.9	0.54	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluoroheptanesulfonic acid (PFHpS)	<1.9		1.9	0.18	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluorooctanesulfonic acid (PFOS)	<1.9		1.9	0.52	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluorononanesulfonic acid (PFNS)	<1.9		1.9	0.35	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluorodecanesulfonic acid (PFDS)	<1.9		1.9	0.31	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluorododecanesulfonic acid (PFDoS)	<1.9		1.9	0.93	ng/L		12/11/23 11:43	12/12/23 22:40	1
Perfluorooctanesulfonamide (FOSA)	<1.9		1.9	0.94	ng/L		12/11/23 11:43	12/12/23 22:40	1
NEtFOSA	<1.9		1.9	0.83	ng/L		12/11/23 11:43	12/12/23 22:40	1
NMeFOSA	<1.9		1.9	0.41	ng/L		12/11/23 11:43	12/12/23 22:40	1
NMeFOSAA	<4.8		4.8	1.1	ng/L		12/11/23 11:43	12/12/23 22:40	1
NEtFOSAA	<4.8		4.8	1.2	ng/L		12/11/23 11:43	12/12/23 22:40	1
NMeFOSE	<3.8		3.8	1.3	ng/L		12/11/23 11:43	12/12/23 22:40	1
NEtFOSE	<1.9		1.9	0.81	ng/L		12/11/23 11:43	12/12/23 22:40	1
4:2 FTS	<1.9		1.9	0.23	ng/L		12/11/23 11:43	12/12/23 22:40	1
6:2 FTS	<4.8		4.8	2.4	ng/L		12/11/23 11:43	12/12/23 22:40	1
8:2 FTS	<1.9		1.9	0.44	ng/L		12/11/23 11:43	12/12/23 22:40	1
10:2 FTS	<1.9		1.9	0.64	ng/L		12/11/23 11:43	12/12/23 22:40	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<1.9		1.9	0.38	ng/L		12/11/23 11:43	12/12/23 22:40	1
HFPO-DA (GenX)	<3.8		3.8	1.4	ng/L		12/11/23 11:43	12/12/23 22:40	1
9Cl-PF3ONS	<1.9		1.9	0.23	ng/L		12/11/23 11:43	12/12/23 22:40	1
11Cl-PF3OUdS	<1.9		1.9	0.31	ng/L		12/11/23 11:43	12/12/23 22:40	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	106		25 - 150				12/11/23 11:43	12/12/23 22:40	1
13C5 PFPeA	106		25 - 150				12/11/23 11:43	12/12/23 22:40	1
13C2 PFHxA	93		25 - 150				12/11/23 11:43	12/12/23 22:40	1
13C4 PFHpA	103		25 - 150				12/11/23 11:43	12/12/23 22:40	1
13C4 PFOA	99		25 - 150				12/11/23 11:43	12/12/23 22:40	1
13C5 PFNA	100		25 - 150				12/11/23 11:43	12/12/23 22:40	1
13C2 PFDA	98		25 - 150				12/11/23 11:43	12/12/23 22:40	1
13C2 PFUnA	89		25 - 150				12/11/23 11:43	12/12/23 22:40	1

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Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Client Sample ID: Field Blank-12-04-2023-DW

Lab Sample ID: 500-243417-2

Date Collected: 12/04/23 14:15

Matrix: Water

Date Received: 12/06/23 10:10

Method: EPA 537 (modified) - Fluorinated Alkyl Substances (Continued)

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C2 PFDoA	92		25 - 150	12/11/23 11:43	12/12/23 22:40	1
13C2 PFTeDA	90		25 - 150	12/11/23 11:43	12/12/23 22:40	1
13C2 PFHxDA	102		25 - 150	12/11/23 11:43	12/12/23 22:40	1
13C3 PFBS	95		25 - 150	12/11/23 11:43	12/12/23 22:40	1
18O2 PFHxS	105		25 - 150	12/11/23 11:43	12/12/23 22:40	1
13C4 PFOS	99		25 - 150	12/11/23 11:43	12/12/23 22:40	1
13C8 FOSA	79		10 - 150	12/11/23 11:43	12/12/23 22:40	1
d3-NMeFOSAA	123		25 - 150	12/11/23 11:43	12/12/23 22:40	1
d5-NEtFOSAA	119		25 - 150	12/11/23 11:43	12/12/23 22:40	1
d-N-MeFOSA-M	60		10 - 150	12/11/23 11:43	12/12/23 22:40	1
d-N-EtFOSA-M	61		10 - 150	12/11/23 11:43	12/12/23 22:40	1
d7-N-MeFOSE-M	75		10 - 150	12/11/23 11:43	12/12/23 22:40	1
d9-N-EtFOSE-M	77		10 - 150	12/11/23 11:43	12/12/23 22:40	1
M2-4:2 FTS	121		25 - 150	12/11/23 11:43	12/12/23 22:40	1
M2-6:2 FTS	108		25 - 150	12/11/23 11:43	12/12/23 22:40	1
M2-8:2 FTS	101		25 - 150	12/11/23 11:43	12/12/23 22:40	1
13C3 HFPO-DA	104		25 - 150	12/11/23 11:43	12/12/23 22:40	1
13C2 10:2 FTS	83		25 - 150	12/11/23 11:43	12/12/23 22:40	1

Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Client Sample ID: DMW-03

Lab Sample ID: 500-243417-3

Date Collected: 12/04/23 14:10

Matrix: Water

Date Received: 12/06/23 10:10

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<4.9		4.9	2.4	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluoropentanoic acid (PFPeA)	<2.0		2.0	0.48	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	0.57	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	0.25	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	0.84	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	0.27	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	0.31	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	1.1	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	0.54	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluorotridecanoic acid (PFTrDA)	<2.0		2.0	1.3	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluorotetradecanoic acid (PFTeA)	<2.0		2.0	0.72	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<2.0		2.0	0.88	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluoro-n-octadecanoic acid (PFODA)	<2.0	*	2.0	0.93	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	0.20	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluoropentanesulfonic acid (PFPeS)	<2.0		2.0	0.30	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0	0.56	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		2.0	0.19	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	0.53	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluorononanesulfonic acid (PFNS)	<2.0		2.0	0.36	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluorodecanesulfonic acid (PFDS)	<2.0		2.0	0.32	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluorododecanesulfonic acid (PFDoS)	<2.0		2.0	0.96	ng/L		12/11/23 11:43	12/12/23 22:51	1
Perfluorooctanesulfonamide (FOSA)	<2.0		2.0	0.97	ng/L		12/11/23 11:43	12/12/23 22:51	1
NEtFOSA	<2.0		2.0	0.86	ng/L		12/11/23 11:43	12/12/23 22:51	1
NMeFOSA	<2.0		2.0	0.42	ng/L		12/11/23 11:43	12/12/23 22:51	1
NMeFOSAA	<4.9		4.9	1.2	ng/L		12/11/23 11:43	12/12/23 22:51	1
NEtFOSAA	<4.9		4.9	1.3	ng/L		12/11/23 11:43	12/12/23 22:51	1
NMeFOSE	<3.9		3.9	1.4	ng/L		12/11/23 11:43	12/12/23 22:51	1
NEtFOSE	<2.0		2.0	0.84	ng/L		12/11/23 11:43	12/12/23 22:51	1
4:2 FTS	<2.0		2.0	0.24	ng/L		12/11/23 11:43	12/12/23 22:51	1
6:2 FTS	<4.9		4.9	2.5	ng/L		12/11/23 11:43	12/12/23 22:51	1
8:2 FTS	0.55	J	2.0	0.45	ng/L		12/11/23 11:43	12/12/23 22:51	1
10:2 FTS	<2.0		2.0	0.66	ng/L		12/11/23 11:43	12/12/23 22:51	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	0.39	ng/L		12/11/23 11:43	12/12/23 22:51	1
HFPO-DA (GenX)	<3.9		3.9	1.5	ng/L		12/11/23 11:43	12/12/23 22:51	1
9Cl-PF3ONS	<2.0		2.0	0.24	ng/L		12/11/23 11:43	12/12/23 22:51	1
11Cl-PF3OUdS	<2.0		2.0	0.32	ng/L		12/11/23 11:43	12/12/23 22:51	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	105		25 - 150				12/11/23 11:43	12/12/23 22:51	1
13C5 PFPeA	88		25 - 150				12/11/23 11:43	12/12/23 22:51	1
13C2 PFHxA	98		25 - 150				12/11/23 11:43	12/12/23 22:51	1
13C4 PFHpA	106		25 - 150				12/11/23 11:43	12/12/23 22:51	1
13C4 PFOA	99		25 - 150				12/11/23 11:43	12/12/23 22:51	1
13C5 PFNA	97		25 - 150				12/11/23 11:43	12/12/23 22:51	1
13C2 PFDA	94		25 - 150				12/11/23 11:43	12/12/23 22:51	1
13C2 PFUnA	95		25 - 150				12/11/23 11:43	12/12/23 22:51	1

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Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Client Sample ID: DMW-03

Lab Sample ID: 500-243417-3

Date Collected: 12/04/23 14:10

Matrix: Water

Date Received: 12/06/23 10:10

Method: EPA 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	92		25 - 150	12/11/23 11:43	12/12/23 22:51	1
13C2 PFTeDA	95		25 - 150	12/11/23 11:43	12/12/23 22:51	1
13C2 PFHxDA	108		25 - 150	12/11/23 11:43	12/12/23 22:51	1
13C3 PFBS	87		25 - 150	12/11/23 11:43	12/12/23 22:51	1
18O2 PFHxS	97		25 - 150	12/11/23 11:43	12/12/23 22:51	1
13C4 PFOS	99		25 - 150	12/11/23 11:43	12/12/23 22:51	1
13C8 FOSA	88		10 - 150	12/11/23 11:43	12/12/23 22:51	1
d3-NMeFOSAA	127		25 - 150	12/11/23 11:43	12/12/23 22:51	1
d5-NEtFOSAA	116		25 - 150	12/11/23 11:43	12/12/23 22:51	1
d-N-MeFOSA-M	71		10 - 150	12/11/23 11:43	12/12/23 22:51	1
d-N-EtFOSA-M	73		10 - 150	12/11/23 11:43	12/12/23 22:51	1
d7-N-MeFOSE-M	82		10 - 150	12/11/23 11:43	12/12/23 22:51	1
d9-N-EtFOSE-M	88		10 - 150	12/11/23 11:43	12/12/23 22:51	1
M2-4:2 FTS	113		25 - 150	12/11/23 11:43	12/12/23 22:51	1
M2-6:2 FTS	102		25 - 150	12/11/23 11:43	12/12/23 22:51	1
M2-8:2 FTS	99		25 - 150	12/11/23 11:43	12/12/23 22:51	1
13C3 HFPO-DA	101		25 - 150	12/11/23 11:43	12/12/23 22:51	1
13C2 10:2 FTS	89		25 - 150	12/11/23 11:43	12/12/23 22:51	1

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfur	290		2.0	0.56	mg/L		12/12/23 15:20	12/15/23 01:33	20

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Uranium	0.25	J	1.0	0.15	ug/L		12/13/23 13:40	12/15/23 15:24	2

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<100		100	25	ug/L		12/13/23 09:21	12/21/23 20:14	1
Antimony	<3.0		3.0	1.3	ug/L		12/13/23 09:21	12/21/23 20:14	1
Arsenic	0.24	J	1.0	0.23	ug/L		12/13/23 09:21	12/21/23 20:14	1
Barium	16		2.5	0.73	ug/L		12/13/23 09:21	12/21/23 20:14	1
Beryllium	<1.0	^1+	1.0	0.53	ug/L		12/13/23 09:21	01/02/24 14:20	1
Boron	240		50	13	ug/L		12/13/23 09:21	12/21/23 20:14	1
Cadmium	<0.50		0.50	0.17	ug/L		12/13/23 09:21	12/21/23 20:14	1
Calcium	99000		200	44	ug/L		12/13/23 09:21	12/21/23 20:14	1
Chromium	<5.0		5.0	1.1	ug/L		12/13/23 09:21	12/21/23 20:14	1
Cobalt	<1.0		1.0	0.40	ug/L		12/13/23 09:21	12/21/23 20:14	1
Copper	<2.0		2.0	0.50	ug/L		12/13/23 09:21	12/21/23 20:14	1
Iron	200		100	47	ug/L		12/13/23 09:21	12/21/23 20:14	1
Lead	<0.50		0.50	0.19	ug/L		12/13/23 09:21	12/21/23 20:14	1
Magnesium	52000		200	49	ug/L		12/13/23 09:21	12/21/23 20:14	1
Manganese	6.5		2.5	0.79	ug/L		12/13/23 09:21	12/21/23 20:14	1
Nickel	<2.0		2.0	0.63	ug/L		12/13/23 09:21	12/21/23 20:14	1
Potassium	5900		500	110	ug/L		12/13/23 09:21	12/21/23 20:14	1
Selenium	<2.5		2.5	0.98	ug/L		12/13/23 09:21	12/21/23 20:14	1
Silver	<0.50		0.50	0.12	ug/L		12/13/23 09:21	12/21/23 20:14	1
Sodium	45000		200	77	ug/L		12/13/23 09:21	12/21/23 20:14	1
Strontium	12000		4.0	0.64	ug/L		12/13/23 09:21	12/21/23 20:14	1

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Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Client Sample ID: DMW-03

Lab Sample ID: 500-243417-3

Date Collected: 12/04/23 14:10

Matrix: Water

Date Received: 12/06/23 10:10

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	<2.0		2.0	0.57	ug/L		12/13/23 09:21	12/21/23 20:14	1
Vanadium	<5.0		5.0	2.2	ug/L		12/13/23 09:21	12/21/23 20:14	1
Zinc	<20		20	6.9	ug/L		12/13/23 09:21	12/21/23 20:14	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	0.079	ug/L		12/13/23 10:25	12/14/23 09:14	1

Method: SM 2340B - Total Hardness (as CaCO3) by calculation - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	520		0.91	0.46	mg/L		12/13/23 09:21	12/14/23 14:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide (SW846 9056A)	0.50	J	1.0	0.18	mg/L			12/06/23 16:32	1
Nitrate as N (SW846 9056A)	<1.0		1.0	0.043	mg/L			12/06/23 12:03	1
Chloride (SW846 9056A)	68		20	2.3	mg/L			12/06/23 15:28	20
Nitrite as N (SW846 9056A)	<1.0		1.0	0.070	mg/L			12/06/23 12:03	1
Fluoride (SW846 9056A)	1.2		1.0	0.19	mg/L			12/06/23 12:03	1
Orthophosphate as P (SW846 9056A)	<1.0		1.0	0.13	mg/L			12/06/23 12:03	1
Sulfate (SW846 9056A)	440		20	4.1	mg/L			12/07/23 09:35	20
Alkalinity, Total (SM 2320B)	92		5.0	3.7	mg/L			12/12/23 16:06	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	92		5.0	3.7	mg/L			12/12/23 16:06	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<5.0		5.0	3.7	mg/L			12/12/23 16:06	1
Sulfide (SM 4500 S2 F)	<1.0		1.0	0.23	mg/L			12/07/23 23:32	1

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	44.8	F	1.10	4.18	1.00	0.0955	pCi/L	12/08/23 10:30	01/02/24 14:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.0		30 - 110					12/08/23 10:30	01/02/24 14:21	1

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.29	F	0.440	0.455	1.00	0.532	pCi/L	12/08/23 10:33	12/22/23 11:26	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.0		30 - 110					12/08/23 10:33	12/22/23 11:26	1
Y Carrier	81.5		30 - 110					12/08/23 10:33	12/22/23 11:26	1

Method: TAL-STL Ra226_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	46.1		1.18	4.20	5.00	0.532	pCi/L		01/04/24 10:48	1

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Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Client Sample ID: EB-004

Lab Sample ID: 500-243417-4

Date Collected: 12/04/23 14:20

Matrix: Water

Date Received: 12/06/23 10:10

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	<4.9		4.9	2.4	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluoropentanoic acid (PFPeA)	<2.0		2.0	0.48	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	0.57	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	0.25	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	0.84	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	0.27	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	0.31	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	1.1	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	0.54	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluorotridecanoic acid (PFTrDA)	<2.0		2.0	1.3	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluorotetradecanoic acid (PFTeA)	<2.0		2.0	0.72	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<2.0		2.0	0.88	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluoro-n-octadecanoic acid (PFODA)	<2.0	*	2.0	0.93	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	0.20	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluoropentanesulfonic acid (PFPeS)	<2.0		2.0	0.30	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0	0.56	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		2.0	0.19	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	0.53	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluorononanesulfonic acid (PFNS)	<2.0		2.0	0.36	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluorodecanesulfonic acid (PFDS)	<2.0		2.0	0.32	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluorododecanesulfonic acid (PFDoS)	<2.0		2.0	0.96	ng/L		12/11/23 11:43	12/12/23 23:22	1
Perfluorooctanesulfonamide (FOSA)	<2.0		2.0	0.97	ng/L		12/11/23 11:43	12/12/23 23:22	1
NEtFOSA	<2.0		2.0	0.86	ng/L		12/11/23 11:43	12/12/23 23:22	1
NMeFOSA	<2.0		2.0	0.42	ng/L		12/11/23 11:43	12/12/23 23:22	1
NMeFOSAA	<4.9		4.9	1.2	ng/L		12/11/23 11:43	12/12/23 23:22	1
NEtFOSAA	<4.9		4.9	1.3	ng/L		12/11/23 11:43	12/12/23 23:22	1
NMeFOSE	<3.9		3.9	1.4	ng/L		12/11/23 11:43	12/12/23 23:22	1
NEtFOSE	<2.0		2.0	0.84	ng/L		12/11/23 11:43	12/12/23 23:22	1
4:2 FTS	<2.0		2.0	0.24	ng/L		12/11/23 11:43	12/12/23 23:22	1
6:2 FTS	<4.9		4.9	2.5	ng/L		12/11/23 11:43	12/12/23 23:22	1
8:2 FTS	<2.0		2.0	0.45	ng/L		12/11/23 11:43	12/12/23 23:22	1
10:2 FTS	<2.0		2.0	0.66	ng/L		12/11/23 11:43	12/12/23 23:22	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	0.39	ng/L		12/11/23 11:43	12/12/23 23:22	1
HFPO-DA (GenX)	<3.9		3.9	1.5	ng/L		12/11/23 11:43	12/12/23 23:22	1
9Cl-PF3ONS	<2.0		2.0	0.24	ng/L		12/11/23 11:43	12/12/23 23:22	1
11Cl-PF3OUdS	<2.0		2.0	0.32	ng/L		12/11/23 11:43	12/12/23 23:22	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	101		25 - 150				12/11/23 11:43	12/12/23 23:22	1
13C5 PFPeA	93		25 - 150				12/11/23 11:43	12/12/23 23:22	1
13C2 PFHxA	95		25 - 150				12/11/23 11:43	12/12/23 23:22	1
13C4 PFHpA	101		25 - 150				12/11/23 11:43	12/12/23 23:22	1
13C4 PFOA	102		25 - 150				12/11/23 11:43	12/12/23 23:22	1
13C5 PFNA	96		25 - 150				12/11/23 11:43	12/12/23 23:22	1
13C2 PFDA	96		25 - 150				12/11/23 11:43	12/12/23 23:22	1
13C2 PFUnA	89		25 - 150				12/11/23 11:43	12/12/23 23:22	1

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Client Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Client Sample ID: EB-004

Lab Sample ID: 500-243417-4

Date Collected: 12/04/23 14:20

Matrix: Water

Date Received: 12/06/23 10:10

Method: EPA 537 (modified) - Fluorinated Alkyl Substances (Continued)

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C2 PFDoA	94		25 - 150	12/11/23 11:43	12/12/23 23:22	1
13C2 PFTeDA	92		25 - 150	12/11/23 11:43	12/12/23 23:22	1
13C2 PFHxDA	95		25 - 150	12/11/23 11:43	12/12/23 23:22	1
13C3 PFBS	89		25 - 150	12/11/23 11:43	12/12/23 23:22	1
18O2 PFHxS	97		25 - 150	12/11/23 11:43	12/12/23 23:22	1
13C4 PFOS	95		25 - 150	12/11/23 11:43	12/12/23 23:22	1
13C8 FOSA	72		10 - 150	12/11/23 11:43	12/12/23 23:22	1
d3-NMeFOSAA	116		25 - 150	12/11/23 11:43	12/12/23 23:22	1
d5-NEtFOSAA	119		25 - 150	12/11/23 11:43	12/12/23 23:22	1
d-N-MeFOSA-M	66		10 - 150	12/11/23 11:43	12/12/23 23:22	1
d-N-EtFOSA-M	72		10 - 150	12/11/23 11:43	12/12/23 23:22	1
d7-N-MeFOSE-M	76		10 - 150	12/11/23 11:43	12/12/23 23:22	1
d9-N-EtFOSE-M	80		10 - 150	12/11/23 11:43	12/12/23 23:22	1
M2-4:2 FTS	118		25 - 150	12/11/23 11:43	12/12/23 23:22	1
M2-6:2 FTS	99		25 - 150	12/11/23 11:43	12/12/23 23:22	1
M2-8:2 FTS	90		25 - 150	12/11/23 11:43	12/12/23 23:22	1
13C3 HFPO-DA	99		25 - 150	12/11/23 11:43	12/12/23 23:22	1
13C2 10:2 FTS	79		25 - 150	12/11/23 11:43	12/12/23 23:22	1

Definitions/Glossary

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*-	LCS and/or LCSD is outside acceptance limits, low biased.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
^1+	Initial Calibration Verification (ICV) 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.

General Chemistry

Qualifier	Qualifier Description
H3	Sample was received and analyzed past holding time. This does not meet regulatory requirements.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Rad

Qualifier	Qualifier Description
F	MS/MSD Recovery and/or RPD exceeds the control limits
U	Result is less than the sample detection limit.

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: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-726710/1-A
Matrix: Water
Analysis Batch: 727171

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 726710

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorobutanoic acid (PFBA)	<5.0		5.0	2.4	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluoropentanoic acid (PFPeA)	<2.0		2.0	0.49	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0	0.58	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0	0.25	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0	0.85	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluorononanoic acid (PFNA)	<2.0		2.0	0.27	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0	0.31	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0	1.1	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0	0.55	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluorotridecanoic acid (PFTrDA)	<2.0		2.0	1.3	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluorotetradecanoic acid (PFTeA)	<2.0		2.0	0.73	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<2.0		2.0	0.89	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluoro-n-octadecanoic acid (PFODA)	<2.0		2.0	0.94	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0	0.20	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluoropentanesulfonic acid (PFPeS)	<2.0		2.0	0.30	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0	0.57	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		2.0	0.19	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0	0.54	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluorononanesulfonic acid (PFNS)	<2.0		2.0	0.37	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluorodecanesulfonic acid (PFDS)	<2.0		2.0	0.32	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluorododecanesulfonic acid (PFDoS)	<2.0		2.0	0.97	ng/L		12/11/23 11:43	12/12/23 19:15	1
Perfluorooctanesulfonamide (FOSA)	<2.0		2.0	0.98	ng/L		12/11/23 11:43	12/12/23 19:15	1
NEtFOSA	<2.0		2.0	0.87	ng/L		12/11/23 11:43	12/12/23 19:15	1
NMeFOSA	<2.0		2.0	0.43	ng/L		12/11/23 11:43	12/12/23 19:15	1
NMeFOSAA	<5.0		5.0	1.2	ng/L		12/11/23 11:43	12/12/23 19:15	1
NEtFOSAA	<5.0		5.0	1.3	ng/L		12/11/23 11:43	12/12/23 19:15	1
NMeFOSE	<4.0		4.0	1.4	ng/L		12/11/23 11:43	12/12/23 19:15	1
NEtFOSE	<2.0		2.0	0.85	ng/L		12/11/23 11:43	12/12/23 19:15	1
4:2 FTS	<2.0		2.0	0.24	ng/L		12/11/23 11:43	12/12/23 19:15	1
6:2 FTS	<5.0		5.0	2.5	ng/L		12/11/23 11:43	12/12/23 19:15	1
8:2 FTS	<2.0		2.0	0.46	ng/L		12/11/23 11:43	12/12/23 19:15	1
10:2 FTS	<2.0		2.0	0.67	ng/L		12/11/23 11:43	12/12/23 19:15	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0	0.40	ng/L		12/11/23 11:43	12/12/23 19:15	1
HFPO-DA (GenX)	<4.0		4.0	1.5	ng/L		12/11/23 11:43	12/12/23 19:15	1
9Cl-PF3ONS	<2.0		2.0	0.24	ng/L		12/11/23 11:43	12/12/23 19:15	1
11Cl-PF3OUdS	<2.0		2.0	0.32	ng/L		12/11/23 11:43	12/12/23 19:15	1
		MB MB							
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	97		25 - 150				12/11/23 11:43	12/12/23 19:15	1
13C5 PFPeA	99		25 - 150				12/11/23 11:43	12/12/23 19:15	1
13C2 PFHxA	94		25 - 150				12/11/23 11:43	12/12/23 19:15	1
13C4 PFHpA	100		25 - 150				12/11/23 11:43	12/12/23 19:15	1
13C4 PFOA	101		25 - 150				12/11/23 11:43	12/12/23 19:15	1
13C5 PFNA	98		25 - 150				12/11/23 11:43	12/12/23 19:15	1

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-726710/1-A
Matrix: Water
Analysis Batch: 727171

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 726710

Isotope Dilution	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFDA	97		25 - 150	12/11/23 11:43	12/12/23 19:15	1
13C2 PFUnA	92		25 - 150	12/11/23 11:43	12/12/23 19:15	1
13C2 PFDoA	95		25 - 150	12/11/23 11:43	12/12/23 19:15	1
13C2 PFTeDA	90		25 - 150	12/11/23 11:43	12/12/23 19:15	1
13C2 PFHxDA	95		25 - 150	12/11/23 11:43	12/12/23 19:15	1
13C3 PFBS	91		25 - 150	12/11/23 11:43	12/12/23 19:15	1
18O2 PFHxS	103		25 - 150	12/11/23 11:43	12/12/23 19:15	1
13C4 PFOS	90		25 - 150	12/11/23 11:43	12/12/23 19:15	1
13C8 FOSA	80		10 - 150	12/11/23 11:43	12/12/23 19:15	1
d3-NMeFOSAA	117		25 - 150	12/11/23 11:43	12/12/23 19:15	1
d5-NEtFOSAA	104		25 - 150	12/11/23 11:43	12/12/23 19:15	1
d-N-MeFOSA-M	63		10 - 150	12/11/23 11:43	12/12/23 19:15	1
d-N-EtFOSA-M	68		10 - 150	12/11/23 11:43	12/12/23 19:15	1
d7-N-MeFOSE-M	85		10 - 150	12/11/23 11:43	12/12/23 19:15	1
d9-N-EtFOSE-M	87		10 - 150	12/11/23 11:43	12/12/23 19:15	1
M2-4:2 FTS	120		25 - 150	12/11/23 11:43	12/12/23 19:15	1
M2-6:2 FTS	107		25 - 150	12/11/23 11:43	12/12/23 19:15	1
M2-8:2 FTS	97		25 - 150	12/11/23 11:43	12/12/23 19:15	1
13C3 HFPO-DA	97		25 - 150	12/11/23 11:43	12/12/23 19:15	1
13C2 10:2 FTS	90		25 - 150	12/11/23 11:43	12/12/23 19:15	1

Lab Sample ID: LLCS 320-726710/2-A
Matrix: Water
Analysis Batch: 727171

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 726710

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec	Limits
Perfluoropentanoic acid (PFPeA)	8.00	7.69		ng/L		96	50 - 150	
Perfluorohexanoic acid (PFHxA)	8.00	7.17		ng/L		90	50 - 150	
Perfluoroheptanoic acid (PFHpA)	8.00	7.39		ng/L		92	50 - 150	
Perfluorooctanoic acid (PFOA)	8.00	6.85		ng/L		86	50 - 150	
Perfluorononanoic acid (PFNA)	8.00	7.24		ng/L		90	50 - 150	
Perfluorodecanoic acid (PFDA)	8.00	7.24		ng/L		90	50 - 150	
Perfluoroundecanoic acid (PFUnA)	8.00	7.16		ng/L		90	50 - 150	
Perfluorododecanoic acid (PFDoA)	8.00	7.93		ng/L		99	50 - 150	
Perfluorotridecanoic acid (PFTTrDA)	8.00	6.97		ng/L		87	50 - 150	
Perfluorotetradecanoic acid (PFTeA)	8.00	6.54		ng/L		82	50 - 150	
Perfluoro-n-hexadecanoic acid (PFHxDA)	8.00	6.97		ng/L		87	50 - 150	
Perfluoro-n-octadecanoic acid (PFODA)	8.00	3.85	*-	ng/L		48	50 - 150	
Perfluorobutanesulfonic acid (PFBS)	7.10	6.89		ng/L		97	50 - 150	
Perfluoropentanesulfonic acid (PFPeS)	7.52	7.30		ng/L		97	50 - 150	
Perfluorohexanesulfonic acid (PFHxS)	7.30	6.60		ng/L		90	50 - 150	

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LLCS 320-726710/2-A
Matrix: Water
Analysis Batch: 727171

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 726710

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoroheptanesulfonic acid (PFHpS)	7.63	6.72		ng/L		88	50 - 150
Perfluorooctanesulfonic acid (PFOS)	7.44	6.67		ng/L		90	50 - 150
Perfluorononanesulfonic acid (PFNS)	7.70	6.58		ng/L		86	50 - 150
Perfluorodecanesulfonic acid (PFDS)	7.71	6.52		ng/L		85	50 - 150
Perfluorododecanesulfonic acid (PFDoS)	7.76	5.95		ng/L		77	50 - 150
Perfluorooctanesulfonamide (FOSA)	8.00	7.57		ng/L		95	50 - 150
NEtFOSA	8.00	6.21		ng/L		78	50 - 150
NMeFOSA	8.00	6.88		ng/L		86	50 - 150
NMeFOSAA	8.00	6.88		ng/L		86	50 - 150
NEtFOSAA	8.00	6.93		ng/L		87	50 - 150
NMeFOSE	8.00	7.09		ng/L		89	50 - 150
NEtFOSE	8.00	6.35		ng/L		79	50 - 150
4:2 FTS	7.50	7.91		ng/L		105	50 - 150
6:2 FTS	7.62	7.98		ng/L		105	50 - 150
8:2 FTS	7.68	6.53		ng/L		85	50 - 150
10:2 FTS	7.73	6.18		ng/L		80	50 - 150
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.57	7.83		ng/L		103	50 - 150
HFPO-DA (GenX)	8.00	7.08		ng/L		88	50 - 150
9Cl-PF3ONS	7.47	6.69		ng/L		90	50 - 150
11Cl-PF3OUdS	7.55	6.19		ng/L		82	50 - 150

Isotope Dilution	LLCS		Limits
	%Recovery	Qualifier	
13C4 PFBA	101		25 - 150
13C5 PFPeA	92		25 - 150
13C2 PFHxA	94		25 - 150
13C4 PFHpA	100		25 - 150
13C4 PFOA	100		25 - 150
13C5 PFNA	102		25 - 150
13C2 PFDA	98		25 - 150
13C2 PFUnA	95		25 - 150
13C2 PFDoA	96		25 - 150
13C2 PFTeDA	91		25 - 150
13C2 PFHxDA	100		25 - 150
13C3 PFBS	90		25 - 150
18O2 PFHxS	101		25 - 150
13C4 PFOS	96		25 - 150
13C8 FOSA	82		10 - 150
d3-NMeFOSAA	125		25 - 150
d5-NEtFOSAA	125		25 - 150
d-N-MeFOSA-M	73		10 - 150
d-N-EtFOSA-M	78		10 - 150
d7-N-MeFOSE-M	83		10 - 150
d9-N-EtFOSE-M	92		10 - 150

QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LLCS 320-726710/2-A
 Matrix: Water
 Analysis Batch: 727171

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 726710

Isotope Dilution	LLCS LLCS		Limits
	%Recovery	Qualifier	
M2-4:2 FTS	100		25 - 150
M2-6:2 FTS	91		25 - 150
M2-8:2 FTS	104		25 - 150
13C3 HFPO-DA	98		25 - 150
13C2 10:2 FTS	90		25 - 150

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 280-636964/1-A
 Matrix: Water
 Analysis Batch: 637287

Client Sample ID: Method Blank
 Prep Type: Total Recoverable
 Prep Batch: 636964

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Sulfur	<0.10		0.10	0.028	mg/L		12/12/23 15:20	12/13/23 15:57	1

Lab Sample ID: LCS 280-636964/2-A
 Matrix: Water
 Analysis Batch: 637287

Client Sample ID: Lab Control Sample
 Prep Type: Total Recoverable
 Prep Batch: 636964

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Sulfur	20.0	19.6		mg/L		98	80 - 120

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 160-640635/1-A
 Matrix: Water
 Analysis Batch: 640993

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 640635

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Uranium	<1.0		1.0	0.15	ug/L		12/13/23 13:40	12/15/23 14:29	2

Lab Sample ID: LCS 160-640635/2-A
 Matrix: Water
 Analysis Batch: 640993

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 640635

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Uranium	1000	1060		ug/L		106	80 - 120

Lab Sample ID: MB 500-746486/1-A
 Matrix: Water
 Analysis Batch: 747971

Client Sample ID: Method Blank
 Prep Type: Total Recoverable
 Prep Batch: 746486

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Aluminum	<100		100	25	ug/L		12/13/23 09:21	12/21/23 20:03	1
Antimony	<3.0		3.0	1.3	ug/L		12/13/23 09:21	12/21/23 20:03	1
Arsenic	<1.0		1.0	0.23	ug/L		12/13/23 09:21	12/21/23 20:03	1
Barium	<2.5		2.5	0.73	ug/L		12/13/23 09:21	12/21/23 20:03	1
Boron	<50		50	13	ug/L		12/13/23 09:21	12/21/23 20:03	1
Cadmium	<0.50		0.50	0.17	ug/L		12/13/23 09:21	12/21/23 20:03	1
Calcium	<200		200	44	ug/L		12/13/23 09:21	12/21/23 20:03	1

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

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

Lab Sample ID: MB 500-746486/1-A
Matrix: Water
Analysis Batch: 747971

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 746486

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	<5.0		5.0	1.1	ug/L		12/13/23 09:21	12/21/23 20:03	1
Cobalt	<1.0		1.0	0.40	ug/L		12/13/23 09:21	12/21/23 20:03	1
Copper	<2.0		2.0	0.50	ug/L		12/13/23 09:21	12/21/23 20:03	1
Iron	<100		100	47	ug/L		12/13/23 09:21	12/21/23 20:03	1
Lead	<0.50		0.50	0.19	ug/L		12/13/23 09:21	12/21/23 20:03	1
Magnesium	<200		200	49	ug/L		12/13/23 09:21	12/21/23 20:03	1
Manganese	<2.5		2.5	0.79	ug/L		12/13/23 09:21	12/21/23 20:03	1
Nickel	<2.0		2.0	0.63	ug/L		12/13/23 09:21	12/21/23 20:03	1
Potassium	<500		500	110	ug/L		12/13/23 09:21	12/21/23 20:03	1
Selenium	<2.5		2.5	0.98	ug/L		12/13/23 09:21	12/21/23 20:03	1
Silver	<0.50		0.50	0.12	ug/L		12/13/23 09:21	12/21/23 20:03	1
Sodium	<200		200	77	ug/L		12/13/23 09:21	12/21/23 20:03	1
Strontium	<4.0		4.0	0.64	ug/L		12/13/23 09:21	12/21/23 20:03	1
Thallium	<2.0		2.0	0.57	ug/L		12/13/23 09:21	12/21/23 20:03	1
Vanadium	<5.0		5.0	2.2	ug/L		12/13/23 09:21	12/21/23 20:03	1
Zinc	<20		20	6.9	ug/L		12/13/23 09:21	12/21/23 20:03	1

Lab Sample ID: MB 500-746486/1-A
Matrix: Water
Analysis Batch: 748781

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 746486

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	<1.0	^1+	1.0	0.53	ug/L		12/13/23 09:21	01/02/24 14:09	1

Lab Sample ID: LCS 500-746486/2-A
Matrix: Water
Analysis Batch: 747971

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 746486

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aluminum	2000	1990		ug/L		100	80 - 120
Antimony	500	492		ug/L		98	80 - 120
Arsenic	100	99.9		ug/L		100	80 - 120
Barium	500	510		ug/L		102	80 - 120
Boron	1000	997		ug/L		100	80 - 120
Cadmium	50.0	48.3		ug/L		97	80 - 120
Calcium	10000	8550		ug/L		86	80 - 120
Chromium	200	205		ug/L		102	80 - 120
Cobalt	500	513		ug/L		103	80 - 120
Copper	250	246		ug/L		99	80 - 120
Iron	1000	1060		ug/L		106	80 - 120
Lead	100	101		ug/L		101	80 - 120
Magnesium	10000	9770		ug/L		98	80 - 120
Manganese	500	506		ug/L		101	80 - 120
Nickel	500	533		ug/L		107	80 - 120
Potassium	10000	9970		ug/L		100	80 - 120
Selenium	100	100		ug/L		100	80 - 120
Silver	50.0	48.1		ug/L		96	80 - 120
Sodium	10000	9610		ug/L		96	80 - 120
Strontium	1000	981		ug/L		98	80 - 120

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

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

Lab Sample ID: LCS 500-746486/2-A
 Matrix: Water
 Analysis Batch: 747971

Client Sample ID: Lab Control Sample
 Prep Type: Total Recoverable
 Prep Batch: 746486

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Thallium	100	103		ug/L		103	80 - 120
Vanadium	500	498		ug/L		100	80 - 120
Zinc	500	542		ug/L		108	80 - 120

Lab Sample ID: LCS 500-746486/2-A
 Matrix: Water
 Analysis Batch: 748781

Client Sample ID: Lab Control Sample
 Prep Type: Total Recoverable
 Prep Batch: 746486

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Beryllium	50.0	48.1	^1+	ug/L		96	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 500-746502/12-A
 Matrix: Water
 Analysis Batch: 746723

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 746502

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.20		0.20	0.079	ug/L		12/13/23 10:25	12/14/23 08:25	1

Lab Sample ID: LCS 500-746502/13-A
 Matrix: Water
 Analysis Batch: 746723

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 746502

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.01	2.10		ug/L		105	80 - 120

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 500-745332/9
 Matrix: Water
 Analysis Batch: 745332

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromide	<1.0		1.0	0.18	mg/L			12/06/23 10:05	1

Lab Sample ID: LCS 500-745332/10
 Matrix: Water
 Analysis Batch: 745332

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromide	20.0	20.9		mg/L		105	80 - 120

Lab Sample ID: MB 500-745394/3
 Matrix: Water
 Analysis Batch: 745394

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.0		1.0	0.12	mg/L			12/06/23 10:54	1
Fluoride	<1.0		1.0	0.19	mg/L			12/06/23 10:54	1
Sulfate	<1.0		1.0	0.21	mg/L			12/06/23 10:54	1

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QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: LCS 500-745394/4
Matrix: Water
Analysis Batch: 745394

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	20.0	19.8		mg/L		99	80 - 120
Fluoride	20.0	21.5		mg/L		108	80 - 120
Sulfate	20.0	20.5		mg/L		103	80 - 120

Lab Sample ID: MB 500-745395/3
Matrix: Water
Analysis Batch: 745395

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	<1.0		1.0	0.043	mg/L			12/06/23 10:54	1
Nitrite as N	<1.0		1.0	0.070	mg/L			12/06/23 10:54	1
Orthophosphate as P	<1.0		1.0	0.13	mg/L			12/06/23 10:54	1

Lab Sample ID: LCS 500-745395/4
Matrix: Water
Analysis Batch: 745395

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	20.0	20.6		mg/L		103	80 - 120
Nitrite as N	20.0	19.6		mg/L		98	80 - 120
Orthophosphate as P	20.0	20.0		mg/L		100	80 - 120

Lab Sample ID: MB 500-745547/3
Matrix: Water
Analysis Batch: 745547

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<1.0		1.0	0.21	mg/L			12/07/23 08:33	1

Lab Sample ID: LCS 500-745547/4
Matrix: Water
Analysis Batch: 745547

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	20.0	20.9		mg/L		105	80 - 120

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 500-746449/28
Matrix: Water
Analysis Batch: 746449

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity, Total	<5.0		5.0	3.7	mg/L			12/12/23 14:47	1
Bicarbonate Alkalinity as CaCO3	<5.0		5.0	3.7	mg/L			12/12/23 14:47	1
Carbonate Alkalinity as CaCO3	<5.0		5.0	3.7	mg/L			12/12/23 14:47	1

QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: LCS 500-746449/29
 Matrix: Water
 Analysis Batch: 746449

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Alkalinity, Total	100	104		mg/L		104	90 - 110

Method: SM 4500 S2 F - Sulfide, Total

Lab Sample ID: MB 500-745739/1
 Matrix: Water
 Analysis Batch: 745739

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	<1.0		1.0	0.23	mg/L			12/07/23 22:07	1

Lab Sample ID: LCS 500-745739/2
 Matrix: Water
 Analysis Batch: 745739

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfide	3.72	3.60		mg/L		97	85 - 115

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-640054/1-A
 Matrix: Water
 Analysis Batch: 642720

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 640054

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.138	U	0.0651	0.0651	1.00	0.138	pCi/L	12/08/23 10:30	01/02/24 12:27	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.8		30 - 110					12/08/23 10:30	01/02/24 12:27	1

Lab Sample ID: LCS 160-640054/2-A
 Matrix: Water
 Analysis Batch: 642721

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 640054

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-226	11.3	11.27		1.16	1.00	0.129	pCi/L	99	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	88.1		30 - 110						

QC Sample Results

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-640055/1-A
Matrix: Water
Analysis Batch: 641897

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 640055

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	<0.582	U	0.283	0.284	1.00	0.582	pCi/L	12/08/23 10:33	12/22/23 11:18	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	93.8		30 - 110		12/08/23 10:33	12/22/23 11:18	1			
Y Carrier	81.1		30 - 110		12/08/23 10:33	12/22/23 11:18	1			

Lab Sample ID: LCS 160-640055/2-A
Matrix: Water
Analysis Batch: 641897

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 640055

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec Limits
				Uncert. (2σ+/-)					
Radium-228	9.38	10.39		1.41	1.00	0.571	pCi/L	111	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	88.1		30 - 110						
Y Carrier	81.5		30 - 110						

Lab Chronicle

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Client Sample ID: DUP-004

Lab Sample ID: 500-243417-1

Date Collected: 12/04/23 00:00

Matrix: Water

Date Received: 12/06/23 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3535			726710	FXY	EET SAC	12/11/23 11:43
Total/NA	Analysis	537 (modified)		1	727171	RS1	EET SAC	12/12/23 22:30
Total Recoverable	Prep	3005A			636964	MSM	EET DEN	12/12/23 15:20
Total Recoverable	Analysis	6010D		20	637447	BN	EET DEN	12/15/23 01:29
Total Recoverable	Prep	3005A			746486	BDE	EET CHI	12/13/23 09:21 - 12/13/23 09:51 ¹
Total Recoverable	Analysis	6020B		1	747971	SJ	EET CHI	12/21/23 20:10
Total Recoverable	Prep	3005A			746486	BDE	EET CHI	12/13/23 09:21 - 12/13/23 09:51 ¹
Total Recoverable	Analysis	6020B		1	748781	RN	EET CHI	01/02/24 14:16
Total/NA	Prep	3010A			640635	LKP	EET SL	12/13/23 13:40
Total/NA	Analysis	6020B		2	640993	CGB	EET SL	12/15/23 15:20
Total/NA	Prep	7470A			746502	MJG	EET CHI	12/13/23 10:25 - 12/13/23 12:25 ¹
Total/NA	Analysis	7470A		1	746723	MJG	EET CHI	12/14/23 09:07
Total Recoverable	Prep	3005A			746486	BDE	EET CHI	12/13/23 09:21 - 12/13/23 09:51 ¹
Total Recoverable	Analysis	SM 2340B		1	746752	DAJ	EET CHI	12/14/23 14:22
Total/NA	Analysis	9056A		1	745394	NMB	EET CHI	12/06/23 11:48
Total/NA	Analysis	9056A		1	745395	NMB	EET CHI	12/06/23 11:48
Total/NA	Analysis	9056A		20	745394	NMB	EET CHI	12/06/23 14:50
Total/NA	Analysis	9056A		1	745332	NMB	EET CHI	12/06/23 16:17
Total/NA	Analysis	9056A		20	745547	NMB	EET CHI	12/07/23 09:20
Total/NA	Analysis	SM 2320B		1	746449	SO	EET CHI	12/12/23 15:58
Total/NA	Analysis	SM 4500 S2 F		1	745739	CLB	EET CHI	12/07/23 23:24 - 12/07/23 23:32 ¹
Total/NA	Prep	PrecSep-21			640054	KAC	EET SL	12/08/23 10:30
Total/NA	Analysis	903.0		1	642720	FLC	EET SL	01/02/24 14:21
Total/NA	Prep	PrecSep_0			640055	KAC	EET SL	12/08/23 10:33
Total/NA	Analysis	904.0		1	641881	SCB	EET SL	12/22/23 11:26
Total/NA	Analysis	Ra226_Ra228 Pos		1	642919	EMH	EET SL	01/04/24 10:48

Client Sample ID: Field Blank-12-04-2023-DW

Lab Sample ID: 500-243417-2

Date Collected: 12/04/23 14:15

Matrix: Water

Date Received: 12/06/23 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3535			726710	FXY	EET SAC	12/11/23 11:43
Total/NA	Analysis	537 (modified)		1	727171	RS1	EET SAC	12/12/23 22:40

Client Sample ID: DMW-03

Lab Sample ID: 500-243417-3

Date Collected: 12/04/23 14:10

Matrix: Water

Date Received: 12/06/23 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3535			726710	FXY	EET SAC	12/11/23 11:43
Total/NA	Analysis	537 (modified)		1	727171	RS1	EET SAC	12/12/23 22:51
Total Recoverable	Prep	3005A			636964	MSM	EET DEN	12/12/23 15:20
Total Recoverable	Analysis	6010D		20	637447	BN	EET DEN	12/15/23 01:33

Eurofins Chicago

Lab Chronicle

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Client Sample ID: DMW-03

Lab Sample ID: 500-243417-3

Date Collected: 12/04/23 14:10

Matrix: Water

Date Received: 12/06/23 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			746486	BDE	EET CHI	12/13/23 09:21 - 12/13/23 09:51 ¹
Total Recoverable	Analysis	6020B		1	747971	SJ	EET CHI	12/21/23 20:14
Total Recoverable	Prep	3005A			746486	BDE	EET CHI	12/13/23 09:21 - 12/13/23 09:51 ¹
Total Recoverable	Analysis	6020B		1	748781	RN	EET CHI	01/02/24 14:20
Total/NA	Prep	3010A			640635	LKP	EET SL	12/13/23 13:40
Total/NA	Analysis	6020B		2	640993	CGB	EET SL	12/15/23 15:24
Total/NA	Prep	7470A			746502	MJG	EET CHI	12/13/23 10:25 - 12/13/23 12:25 ¹
Total/NA	Analysis	7470A		1	746723	MJG	EET CHI	12/14/23 09:14
Total Recoverable	Prep	3005A			746486	BDE	EET CHI	12/13/23 09:21 - 12/13/23 09:51 ¹
Total Recoverable	Analysis	SM 2340B		1	746752	DAJ	EET CHI	12/14/23 14:22
Total/NA	Analysis	9056A		1	745394	NMB	EET CHI	12/06/23 12:03
Total/NA	Analysis	9056A		1	745395	NMB	EET CHI	12/06/23 12:03
Total/NA	Analysis	9056A		20	745394	NMB	EET CHI	12/06/23 15:28
Total/NA	Analysis	9056A		1	745332	NMB	EET CHI	12/06/23 16:32
Total/NA	Analysis	9056A		20	745547	NMB	EET CHI	12/07/23 09:35
Total/NA	Analysis	SM 2320B		1	746449	SO	EET CHI	12/12/23 16:06
Total/NA	Analysis	SM 4500 S2 F		1	745739	CLB	EET CHI	12/07/23 23:32 - 12/07/23 23:40 ¹
Total/NA	Prep	PrecSep-21			640054	KAC	EET SL	12/08/23 10:30
Total/NA	Analysis	903.0		1	642720	FLC	EET SL	01/02/24 14:21
Total/NA	Prep	PrecSep_0			640055	KAC	EET SL	12/08/23 10:33
Total/NA	Analysis	904.0		1	641881	SCB	EET SL	12/22/23 11:26
Total/NA	Analysis	Ra226_Ra228 Pos		1	642919	EMH	EET SL	01/04/24 10:48

Client Sample ID: EB-004

Lab Sample ID: 500-243417-4

Date Collected: 12/04/23 14:20

Matrix: Water

Date Received: 12/06/23 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3535			726710	FXY	EET SAC	12/11/23 11:43
Total/NA	Analysis	537 (modified)		1	727171	RS1	EET SAC	12/12/23 23:22

¹ This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

- EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200
- EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
- EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600
- EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Laboratory: Eurofins Chicago

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

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	999580010	08-31-24

Laboratory: Eurofins Denver

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

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	999615430	08-31-24

Laboratory: Eurofins Sacramento

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

Authority	Program	Identification Number	Expiration Date
Wisconsin	State	998204680	08-31-24

Laboratory: Eurofins St. Louis

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-24
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	06-30-24
Connecticut	State	PH-0241	03-31-25
Florida	NELAP	E87689	06-30-24
HI - RadChem Recognition	State	n/a	06-30-24
Illinois	NELAP	200023	11-30-24
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-24
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-24
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-24
Louisiana (DW)	State	LA011	12-31-24
Maryland	State	310	09-30-24
Massachusetts	State	M-MO054	06-30-24
MI - RadChem Recognition	State	9005	06-30-24
Missouri	State	780	06-30-25
Nevada	State	MO000542020-1	07-31-24
New Jersey	NELAP	MO002	06-30-24
New Mexico	State	MO00054	06-30-24
New York	NELAP	11616	03-31-24
North Carolina (DW)	State	29700	07-31-24
North Dakota	State	R-207	06-30-24
Oklahoma	NELAP	9997	08-31-24
Oregon	NELAP	4157	09-01-24
Pennsylvania	NELAP	68-00540	02-28-24
South Carolina	State	85002001	06-30-24
Texas	NELAP	T104704193	07-31-24

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

Accreditation/Certification Summary

Client: ARCADIS US Inc
Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Laboratory: Eurofins St. Louis (Continued)

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

Authority	Program	Identification Number	Expiration Date
US Fish & Wildlife	US Federal Programs	058448	07-31-24
USDA	US Federal Programs	P330-17-00028	05-18-26
Utah	NELAP	MO000542021-14	07-31-24
Virginia	NELAP	10310	06-15-25
Washington	State	C592	08-30-24
West Virginia DEP	State	381	01-31-24

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Chain of Custody Record



Regulatory Program: DW NPDES RCRA Other

Project Manager: Lisa Rutkowski 500-243417 COC

Client Contact		Email: N/A		Site Contact:		Date:		COC No:																									
Arcadis U S , Inc		Tel/Fax: N/A		Lab Contact: Sandie Fredrick		Carrier: FedEx		1 of 1 COCs																									
126 North Jefferson Street, Suite 400		Analysis Turnaround Time																															
Milwaukee, WI 53202		<input type="checkbox"/> CALENDAR DAYS <input checked="" type="checkbox"/> WORKING DAYS TAT if different from Below STANDARD <input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day																															
Phone		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Filtered Sample (Y/N)</td> <td>Perform MS / MSD (Y/N)</td> <td>EPA 537 Modified (36 Compounds)</td> <td>Rad 226 903</td> <td>Rad 228 904</td> <td>TAL Metals 6020A / 7470A</td> <td>Hardness SM234B</td> <td>Sulfur 6010D</td> <td>Total Sulfide SM4500</td> <td>Anions 9056A</td> <td>Uranium 6020B</td> <td>Alkalinity 2320B</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>								Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	EPA 537 Modified (36 Compounds)	Rad 226 903	Rad 228 904	TAL Metals 6020A / 7470A	Hardness SM234B	Sulfur 6010D	Total Sulfide SM4500	Anions 9056A	Uranium 6020B	Alkalinity 2320B												
Filtered Sample (Y/N)	Perform MS / MSD (Y/N)									EPA 537 Modified (36 Compounds)	Rad 226 903	Rad 228 904	TAL Metals 6020A / 7470A	Hardness SM234B	Sulfur 6010D	Total Sulfide SM4500	Anions 9056A	Uranium 6020B	Alkalinity 2320B														
FAX																																	
Project Name Marinette, WI																																	
Site Marinette, WI		Sampler:		For Lab Use Only:		Lab Project Number																											
P O # 30168807 1 2 3		Walk-in Client		Lab Sampling		50020191		500-243417																									
								Sample Specific Notes																									
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.																											
WS-R				G	W																												
WS-R-POST				G	W																												
1	DUP-004	12/4/23		G	W	9	N	X	X	X	X	X	X	X	X	X	X	X	X	Duplicate													
2	Field Blank-12-04-2023 -DW		1415	G	W	2	N	X												Field Blank													
3	DMW-03		1410			9	N	X	X	X	X	X	X	X	X	X	X	X	X														
4	EB-004		1420			2	N	X												Equipment Blank													
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other - Zn Acetate/NaOH; 7=None							7	4	4	4	4	4	6	7	4	7																	
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample							Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)																										
<input checked="" 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"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months																										
Special Instructions/QC Requirements & Comments: Level 4, Questions call L. Rutkowski TAT: Standard																																	
Custody Seals Intact <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Custody Seal No			Cooler Temp (°C) Obs'd 1-1		Corr'd 1-0		Therm ID No																								
Relinquished by <i>[Signature]</i>		Company Arcadis		Date/Time 12/5/2023 1400		Received by		Company		Date/Time																							
Relinquished by		Company		Date/Time		Received by		Company		Date/Time																							
Relinquished by		Company		Date/Time		Received in Laboratory by <i>Stephanie Hemondale</i>		Company EETA		Date/Time 12/11/23 1010																							

MARINETTE 'DEEP' WELL /
JCI/ARCADIS
2700 INDUSTRIAL PARKWAY
BUILDING 112-RECEIVING STATION 5
MARINETTE, WI 54143
UNITED STATES US

ACTIVITY: 65.00 LB FMN
CAD: 0780307/CAFE3755



500-243417 Waybi

TO **SAMPLE RECEIPT**
EUROFINS CHICAGO
2417 BOND ST.

58565/FBMP/4617

UNIVERSITY PARK IL 60484

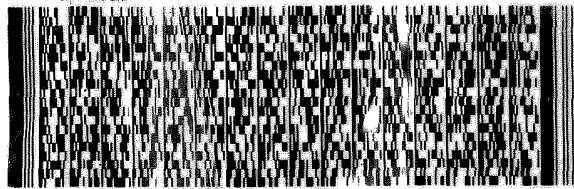
(708) 634-6200

REF:

INU:
PO:

DEPT:

RMA: ||| ||| |||



FedEx
Express



J2330230612014V

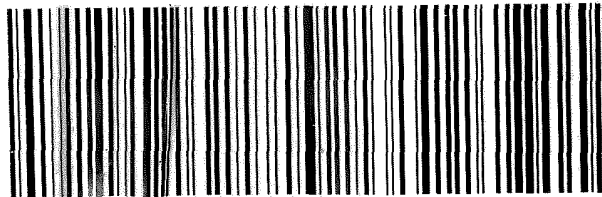
FedEx

TRK# 7163 1500 6453
0221

WED - 06 DEC AA
PRIORITY OVERNIGHT

XN JOTA

60484
IL-US
ORD



3604346 05Dec2023 GRBA 581G2/7C14/C088

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Chain of Custody Record



Client Information (Sub Contract Lab)		Lab PM Fredrick, Sandie	Carrier Tracking No(s): 500-182444.1
Client Contact: Shipping/Receiving		State of Origin: Wisconsin	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		E-Mail: Sandra.Fredrick@et.eurofins.com	Job #: 500-243417-1
Address: 13715 Rider Trail North, City: Earth City State, Zip: MO, 63045 Phone: 314-298-8566(Tel) 314-298-8757(Fax) Email:		Accreditations Required (See note): State - Wisconsin; State Program - Wisconsin	Preservation Codes: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Y - Trizma Z - other (specify) Other:
Due Date Requested: 1/15/2024 TAT Requested (days):		Analysis Requested	
PO #: WO #: Project #: 50020191 SSOW#:			
Project Name: Marinette Dp Private Well 30168807.1.2.3 Site:		Total Number of Containers	
Sample Date			
Sample Time		Special Instructions/Note:	
Sample Type (C=Comp, G=grab)			
Matrix (W=water, S=solid, O=oil, BT=Tissue, AA=Air)		Field Filtered Sample (Yes or No)	
Preservation Code:			
DUP-004 (500-243417-1)		Form MS/MSD (Yes or No)	
DMW-03 (500-243417-3)			
12/4/23		903.0/PreSep_21 Radium-226 (GFPc)	
14:10			
Central		904.0/PreSep_0 Standard Target List	
12/4/23			
Water		R226_228GFPc_P	
Water			
602B/3010A_2% Uranium		602B/3010A_2% Uranium	

Note: Since laboratory accreditations are subject to change, Eurofins Chicago places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the Eurofins Chicago laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Chicago attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Chicago.

Possible Hazard Identification
Unconfirmed
Deliverable Requested: I, II, III, IV, Other (specify) _____ Primary Deliverable Rank: 2

Empty Kit Relinquished by: _____ Date: _____
Relinquished by: *Alme* Date: 12/16/23 1500
Relinquished by: *Alme* Date: _____
Relinquished by: _____ Date/Time: _____

Received by: *M. Pinette* Date/Time: DEC 7 2023 09:30
Received by: _____ Date/Time: _____

Cooler Temperature(s) °C and Other Remarks: _____

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

Special Instructions/QC Requirements: _____

Method of Shipment: _____



Login Sample Receipt Checklist

Client: ARCADIS US Inc

Job Number: 500-243417-1

Login Number: 243417

List Number: 1

Creator: Hernandez, Stephanie

List Source: Eurofins Chicago

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	1.0
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 <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: ARCADIS US Inc

Job Number: 500-243417-1

Login Number: 243417

List Number: 4

Creator: Held, Wesley

List Source: Eurofins Denver

List Creation: 12/07/23 05:37 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
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	
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?	N/A	
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.	N/A	
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	



Login Sample Receipt Checklist

Client: ARCADIS US Inc

Job Number: 500-243417-1

Login Number: 243417

List Number: 3

Creator: Simmons, Jason C

List Source: Eurofins Sacramento

List Creation: 12/07/23 01:42 PM

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	2462772
Sample custody seals, if present, are intact.	N/A	
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	2.5c
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?	N/A	Received project as a subcontract.
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.	N/A	
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: ARCADIS US Inc

Job Number: 500-243417-1

Login Number: 243417

List Number: 2

Creator: Pinette, Meadow L

List Source: Eurofins St. Louis

List Creation: 12/07/23 01:09 PM

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.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Tracer/Carrier Summary

Client: ARCADIS US Inc
Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (30-110)							
500-243417-1	DUP-004	107							
500-243417-3	DMW-03	97.0							
LCS 160-640054/2-A	Lab Control Sample	88.1							
MB 160-640054/1-A	Method Blank	93.8							

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)						
500-243417-1	DUP-004	107	88.6						
500-243417-3	DMW-03	97.0	81.5						
LCS 160-640055/2-A	Lab Control Sample	88.1	81.5						
MB 160-640055/1-A	Method Blank	93.8	81.1						

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier



Environment Testing

Sacramento Sample Receiving Notes (SSRN)



Job: _____

500-243417 Field Sheet

Tracking #: 705176182600

SO / PO / FO / SAT / 2-Day / Ground / UPS / CDO / Courier
GSL / OnTrac / Goldstreak / USPS / Other _____

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations. File in the job folder with the COC.

Therm. ID: LE11 Corr. Factor: (+/-) - °C
Ice 1 Wet 1 Gel _____ Other _____
Cooler Custody Seal: 2462772
Cooler ID: _____
Temp Observed: 25 °C Corrected: 2.5 °C
From: Temp Blank Sample

Opening/Processing The Shipment Yes No NA
Cooler compromised/tampered with?
Cooler Temperature is acceptable?
Frozen samples show signs of thaw?
Initials: [Signature] Date: 12/7/23

Unpacking/Labeling The Samples Yes No NA
Containers are not broken or leaking?
Samples compromised/tampered with?
COC is complete w/o discrepancies
Sample custody seal?
Sample containers have legible labels?
Sample date/times are provided?
Appropriate containers are used?
Sample bottles are completely filled?
Sample preservatives verified?
Is the Field Sampler's name on COC?
Samples w/o discrepancies?
Zero headspace?
Alkalinity has no headspace?
Perchlorate has headspace?
(Methods 314, 331, 6850)
Multiphasic samples are not present?

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")
Initials: [Signature] Date: 12/7/23

Notes: _____

Trizma Lot #(s): _____

Ammonium
Acetate Lot #(s): _____

Login Completion Yes No NA
Receipt Temperature on COC?
NCM Filed?
Samples received within hold time?
Log Release checked in TALS?

Initials: [Signature] Date: 12/7/23

Isotope Dilution Summary

Client: ARCADIS US Inc
 Project/Site: Marinette Dp Private Well 30168807.1.2.3

Job ID: 500-243417-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFBA (25-150)	PFPeA (25-150)	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
500-243417-1	DUP-004	100	90	98	94	99	96	97	84
500-243417-2	Field Blank-12-04-2023-DW	106	106	93	103	99	100	98	89
500-243417-3	DMW-03	105	88	98	106	99	97	94	95
500-243417-4	EB-004	101	93	95	101	102	96	96	89
LLCS 320-726710/2-A	Lab Control Sample	101	92	94	100	100	102	98	95
MB 320-726710/1-A	Method Blank	97	99	94	100	101	98	97	92

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFDaA (25-150)	PFTDA (25-150)	PFHxDA (25-150)	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (10-150)	d3NMFOS (25-150)
500-243417-1	DUP-004	85	84	105	81	102	96	83	109
500-243417-2	Field Blank-12-04-2023-DW	92	90	102	95	105	99	79	123
500-243417-3	DMW-03	92	95	108	87	97	99	88	127
500-243417-4	EB-004	94	92	95	89	97	95	72	116
LLCS 320-726710/2-A	Lab Control Sample	96	91	100	90	101	96	82	125
MB 320-726710/1-A	Method Blank	95	90	95	91	103	90	80	117

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	d5NEFOS (25-150)	dMeFOSA (10-150)	dEtFOSA (10-150)	NMFM (10-150)	NEFM (10-150)	M242FTS (25-150)	M262FTS (25-150)	M282FTS (25-150)
500-243417-1	DUP-004	112	68	72	72	81	122	100	95
500-243417-2	Field Blank-12-04-2023-DW	119	60	61	75	77	121	108	101
500-243417-3	DMW-03	116	71	73	82	88	113	102	99
500-243417-4	EB-004	119	66	72	76	80	118	99	90
LLCS 320-726710/2-A	Lab Control Sample	125	73	78	83	92	100	91	104
MB 320-726710/1-A	Method Blank	104	63	68	85	87	120	107	97

		Percent Isotope Dilution Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	HFPODA (25-150)	M102FTS (25-150)
500-243417-1	DUP-004	101	71
500-243417-2	Field Blank-12-04-2023-DW	104	83
500-243417-3	DMW-03	101	89
500-243417-4	EB-004	99	79
LLCS 320-726710/2-A	Lab Control Sample	98	90
MB 320-726710/1-A	Method Blank	97	90

Surrogate Legend

- PFBA = 13C4 PFBA
- PFPeA = 13C5 PFPeA
- PFHxA = 13C2 PFHxA
- C4PFHA = 13C4 PFHpA
- PFOA = 13C4 PFOA
- PFNA = 13C5 PFNA
- PFDA = 13C2 PFDA
- PFUnA = 13C2 PFUnA
- PFDaA = 13C2 PFDaA
- PFTDA = 13C2 PFTeDA
- PFHxDA = 13C2 PFHxDA
- C3PFBS = 13C3 PFBS
- PFHxS = 18O2 PFHxS
- PFOS = 13C4 PFOS

Isotope Dilution Summary

Client: ARCADIS US Inc

Job ID: 500-243417-1

Project/Site: Marinette Dp Private Well 30168807.1.2.3

PFOSA = 13C8 FOSA
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
dMeFOSA = d-N-MeFOSA-M
dEtFOSA = d-N-EtFOSA-M
NMFm = d7-N-MeFOSE-M
NEFM = d9-N-EtFOSE-M
M242FTS = M2-4:2 FTS
M262FTS = M2-6:2 FTS
M282FTS = M2-8:2 FTS
HFPODA = 13C3 HFPO-DA
M102FTS = 13C2 10:2 FTS

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