APPENDICES

Appendix A – Task 3 Technical Memorandum

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Technical Memorandum

Date:	May 1, 2026
To:	Christina Buck, PhD, Assistant Director Butte County Department of Water and Resource Conservation
From:	Michael van den Enden, PG (9286), Principal Geologist
Subject:	Groundwater Recharge Project Identification Geosyntec Project Number: 26006451.001

INTRODUCTION

This technical memorandum (TM) presents the results of the groundwater recharge identification task for the Vina Groundwater Subbasin (Figure 1). This work is being conducted in accordance with the Contract Number X25488 (Contract) between Butte County (the County) and Geosyntec Consultants, Inc., (Geosyntec) dated April 4, 2024, as amended on July 29, 2025. This TM represents completion of Task 3 of the contract.

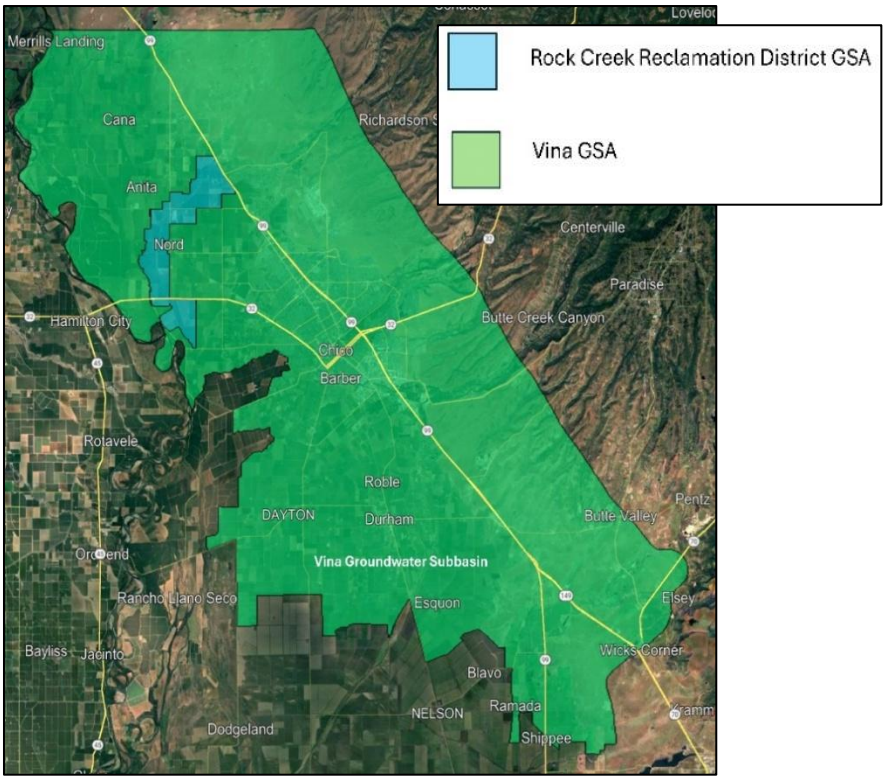

Figure 1. Outline of the Vina Groundwater Subbasin Showing GSA Boundaries

Overview and Purpose

The groundwater recharge identification task is part of Component 5, Task 2 of the Vina Groundwater Sustainability Agency (GSA) Sustainable Groundwater Management Act (SGMA) Implementation Grant, Agreement Number 4600014696, funded through the California Department of Water Resources (DWR). As outlined in the Contract amended on July 29, 2025, this task consists of the following activities:

- Obtaining information from stakeholders regarding potential recharge projects that could be completed within the short term.
- After review of information, conduct site visits and outreach with project proponents, landowners, and relevant water purveyors to gather additional details and discuss feasibility for conducting recharge.

The purpose of this TM is to document the sites assessed and selected for field investigations and pilot testing of groundwater recharge methods. Detailed analyses of the field investigations and pilot testing will be presented in the *Groundwater Recharge Investigation and Preliminary Design Report* and *Pilot Project Implementation Report* that will be combined into a single deliverable.

Initial Selection of Sites

The County, in coordination with the Agricultural Groundwater Users of Butte County (AGUBC), led the public process to obtain information from stakeholders regarding potential recharge projects that could be implemented within the short term. This included public meetings to the Butte County Water Commission (June 4, 2025 and December 3, 2025), Butte County Technical Advisory Committee (March 13, 2025), Vina Groundwater Sustainability Agency Stakeholder Advisory Committee (April 23, 2025), other workshops and presentations (July 29, 2024, March 25, 2025, May 21, 2025, December 3, 2025), and targeted landowner outreach. Based on this information, several sites were identified (listed in Table 1 and shown on Figures 2 [North Area] and 3 [South Area]). Several other sites were also considered but were not added to the list due to various issues such as access and land use restrictions.

After site visits and discussions with landowners, seven sites, highlighted in Table 1, were selected for field investigations. Investigations included towed transient electromagnetic surveys (tTEM), cone penetrometer testing (CPT), soil borings and permeability testing, installation of groundwater monitoring wells, installation of stilling wells within streams and surface impoundments, water quality testing, and condition assessments as summarized in Table 2. Details of these methods and results will be presented in the combined *Groundwater Recharge and Pilot Test Report*.

Table 1. Potential Groundwater Recharge Sites

Site	Size (Acres)	Rationale for no Further Action
North Area		
N1	1,900	Poor Recharge Potential
N2	50	Site Access
N3*	700	NA
N4*	342	NA
N5*	242	NA
N6*	92	NA
N7	5	Small Site
N8*	103	NA
South Area		
S1*	88	NA
S2	93	Site Access
S3	7 miles[1]	Site Access
S4	29	Site Access
S5	297	Site Access
S6*	133	NA
S7[2]*	3.2 miles	NA

Notes:
[1] The site is along a linear pathway on easements next to canals/drainage ways.
[2] Measurement is for Linear Pipeline
* Site selected for field investigation
The highlighted cells are the sites selected for field investigations.

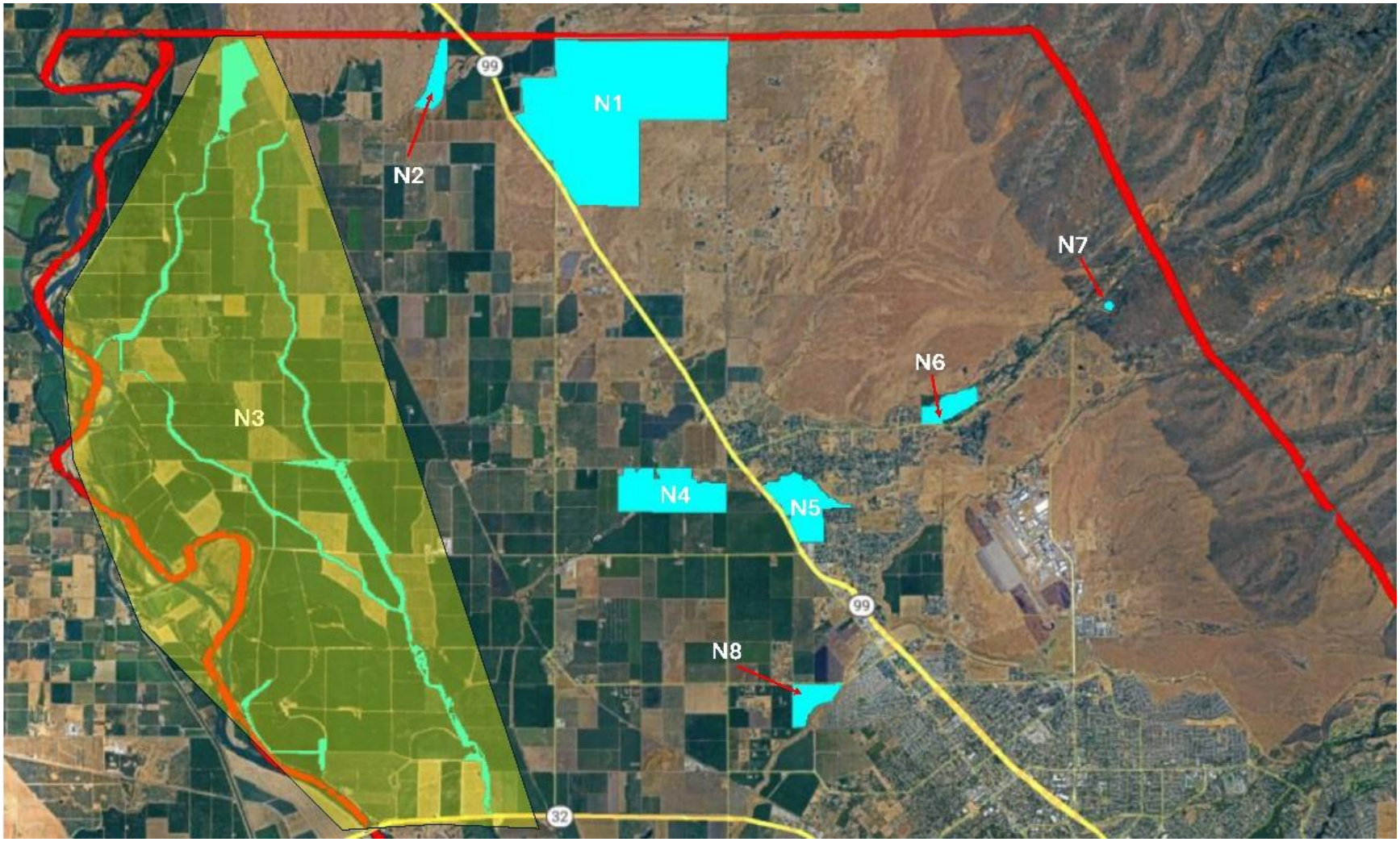

Figure 2. North Area Sites

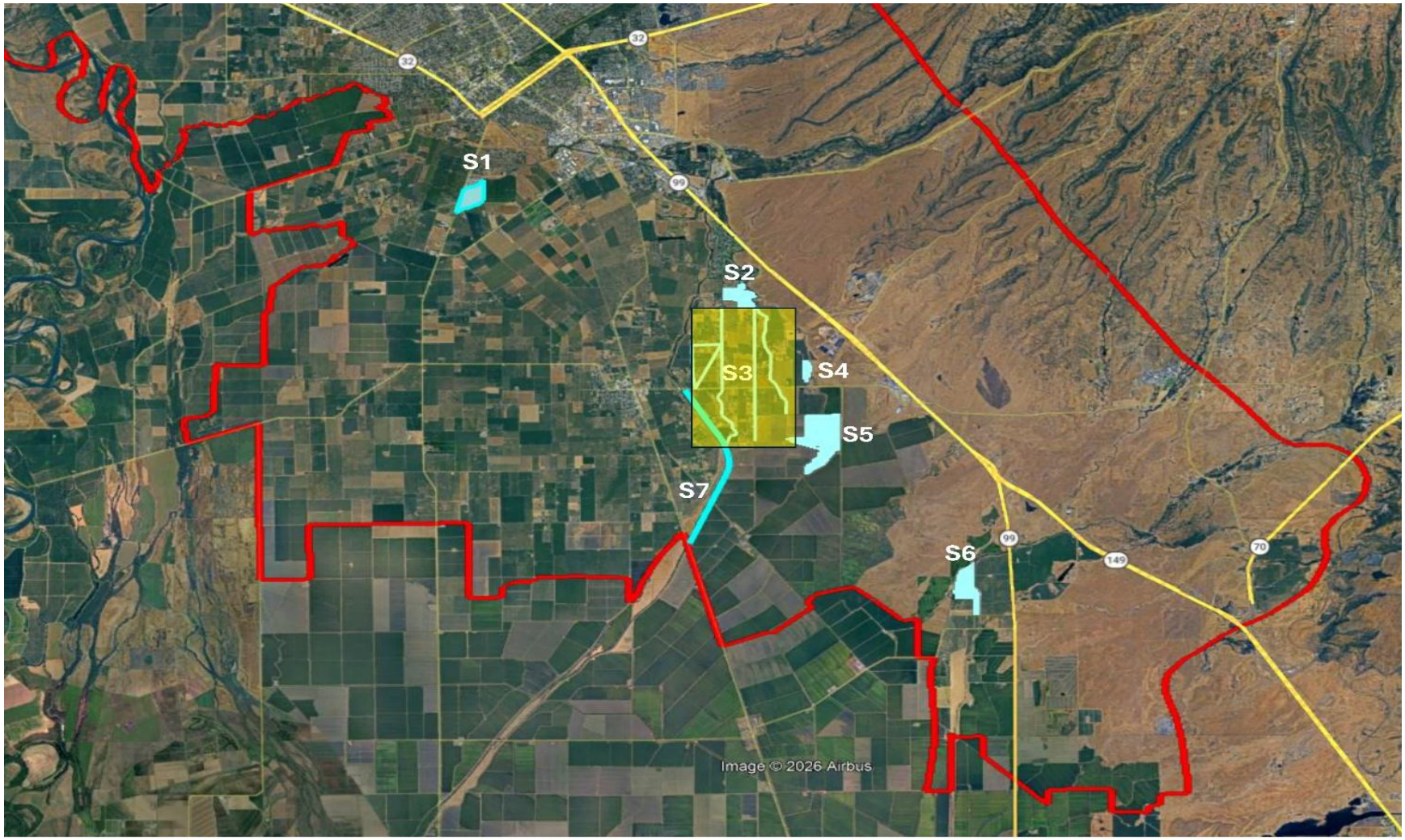

Figure 3. South Area Sites

Table 2. Investigative Activities Conducted at Selected Sites

Activity	N3	N4	N5	N6	N8	S1	S6	S7
tTEM		o	o	o	o	o	o	
CPT			o			o		
Soil Boring/Perm Testing	o	o	o	o		o	o	
Monitoring Well		o	o				o	
Stream Stilling Well		o	o	o				
Water Quality Testing		o	o				o	
Condition Assessment								o

Based on these investigations, discussions, and approval from property owners, pilot tests were conducted at four sites: N3, N4, N5, and S1 (Figures 2 and 3). While the contact originally assumed three pilot sites, and additional site was included to further evaluate recharge feasibility across varying site conditions. Pilot tests included infiltration basins, reverse tile drains, and FloodMAR under California Water Code 1242.1 as summarized in Table 3. Details of these methods and the results obtained will be presented in the combined *Groundwater Recharge Investigation and Pilot Test Report*.

Table 3. Summary of Pilot Testing

Activity	N3	N4	N5	S1
Infiltration Basin	o	o	o	o
Reverse Tile Drain				o
FloodMAR (WC 1242.1)				o

Appendix B – DMWC Pipeline Assessment Report

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Technical Memorandum

Date:	June 8, 2026
To:	Christina Buck, Ph.D., Assistant Director Butte County Department of Water and Resource Conservation
Copies to:	Joe Turner, Mike van den Eden
From:	Mike Rudd, P.E. C51806
Subject:	**Durham Mutual Water Company Mainline Assessment and ROM Cost Estimate**

I. INTRODUCTION

This Technical Memorandum presents the results of the Durham Mutual Water Company (DMWC) mainline assessment task for the Vina Groundwater Subbasin (Figure 1). This work is being conducted in accordance with the Contract Number X25488 (Contract) between Butte County (County) and Geosyntec Consultants, Inc. (Geosyntec) dated April 4, 2024, as amended on July 29, 2025. This TM documents a portion of the work completed under Task 5 of the contract.

Figure 1. Overview Map of the Vina Groundwater Subbasin showing GSA boundaries and the DMWC Mainline.

II. OVERVIEW AND PURPOSE

The DMWC mainline (Figure 2) is the backbone of its irrigation delivery system, and the purpose of this assessment is to determine its current condition, assess the need for upgrades, and provide a rough-order-of-magnitude (ROM) cost estimate for those upgrades. This assessment task is funded through Component 5, of the Vina Groundwater Sustainability Agency (GSA) Sustainable Groundwater Management Act (SGMA) Implementation Grant, Agreement Number 4600014696, administered by the California Department of Water Resources (DWR), and is being completed under Task 5 of the amended County-Geosyntec contract. This effort consists of the following activities:

- GPS survey of each Junction Box, Air Relief Valve, and Siphon Valve, with velocity measurements, and observations (i.e., leaks, access issues, etc.);
- Closed-circuit television (CCTV) survey of the mainline;
- CCTV survey of the north and south siphons of the mainline;
- Data summary tables showing CCTV survey details and percent coverage, and results including specific points of concern, and recommendations for cleaning, repair, or replacement.
- Using the GPS survey, CCTV inspection, and available cost information, provide a ROM cost estimate for rehabilitation.

Figure 2. DMWC Mainline System Map.

III. GPS SURVEY OF MAINLINE

The GPS survey of the DMWC mainline was conducted by Geosyntec staff on March 18, 2026, as part of the overall mainline conditions assessment. The field effort focused on documenting the locations and characteristics of mainline junction boxes and other accessible system features, and on collecting field observations to support the evaluation of potential leakage along the system. Based on the project work plan and field setup, the survey was intended to provide survey-grade location data, elevations, and related field observations for each accessible structure, enabling the existing system to be more accurately mapped and evaluated.

Following the field procedures developed for this task, survey data were collected using survey-grade GPS equipment and a mobile field data collection platform, with points recorded at junction boxes and at locations corresponding to upstream and downstream pipe positions. A velocity measurement device was also brought to the field to support flow observations; however, it failed approximately halfway through the survey. Field conditions indicated that the velocity component of the survey would not have provided a reliable basis for determining flow or identifying potential leakage at each location because variables such as overflow weirs, junction box cover configurations, and deep standing water affected the representativeness of point velocity measurements. Accordingly, the survey results, together with photographs and field notes, were used primarily to support system mapping and to identify visible conditions that could help prioritize subsequent CCTV inspection of pipeline segments where leakage had been reported or observed during the field assessment.

Velocity measurements were attempted during the March 18, 2026, GPS survey; however, the velocity meter failed before measurements could be completed at all planned junction boxes. The limited measurements collected prior to equipment failure are included in Attachment A only as field observations, where available, and were not used as a quantitative basis for estimating conveyance losses because the dataset is incomplete and because localized field conditions, including standing water, junction box geometry, overflow/weir conditions, and access constraints, limited the representativeness of point velocity readings. Accordingly, the GPS survey and visual/access documentation components of this scope item are considered complete for mapping and condition-screening purposes, while the velocity-measurement component is not considered complete for quantitative leakage assessment. All accessible air relief valves and siphon valves encountered during the GPS survey were located and documented. Maps depicting the results of the GPS survey, along with a summary table of the collected data, are provided in Attachment A.

IV. CCTV SURVEY OF MAINLINE

A. Survey Methodology

The CCTV survey was conducted by Ground Penetrating Radar Systems, LLC (GPRS) using a tethered rover equipped with a 360-degree rotating camera, under the supervision of Geosyntec personnel. The camera and rover were capable of operating in water; however, water reduced visibility and limited the ability to inspect the pipe effectively. The rover's maximum operational distance was 900 feet, constrained by cable length. It was able to traverse small rocks and debris,

but larger obstructions prevented further movement.

The rover was lowered into each junction box along the pipeline and navigated from one junction box to the next, capturing video footage of each segment. If the rover was unable to traverse the entire segment to the next junction box, the distance traveled and the encountered obstacle were documented. An attempt was then made to approach the segment from the opposite side. During the survey, pipe diameter, material, and condition were recorded along with the corresponding distance from the junction box.

The CCTV survey was initially scoped using an estimated mainline length of approximately 11,983 feet, based on information available prior to completion of the GPS survey. During the assessment, the GPS survey refined the mapped mainline length to approximately 12,142 feet. The updated GPS-based length is used in this memo as the controlling basis for calculating inspection coverage and developing planning-level rehabilitation quantities. Because it was uncertain whether the full mainline could be surveyed within the scheduled timeframe, the inspection was prioritized to focus first on sections suspected of leaking. Because it was uncertain whether the full mainline could be surveyed within the scheduled timeframe, the inspection was prioritized to focus first on sections suspected of leaking. The table below correlates the prioritized CCTV survey segments, listed in the order they were completed, with the DMWC pipe segments from the upstream junction box (JB) 1 to the downstream JB 16. Table 1 also lists the corresponding pages in the CCTV report for each DMWC pipe segment. The full GPRS CCTV report is provided as Attachment B and can be accessed using the following link: https://web.wincan.com/#/app/guest-project/b205aee9-90c6-4304-91a5-812ac43ddeaa12781f05-e6fc-4877-b2ef-86de19fd5615

Table 1. Correlation of DMWC Pipe Segments and CCTV-Inspected Sections.

DMWC Pipe Segment	CCTV Start-Stop	Pipe Section (CCTV report)	CCTV Point A	CCTV Point B	Segment Length GIS (ft)	Segment Length CCTV (ft)	% of Pipe Inspected[3]	CCTV report page(s)
1	JB 2 - JB 1	12	JB2	JB1	668	650	97	41
2	JB 2 - JB 3	11	JB2	JB3	1,077	900	84	39
3	JB 3 - JB 4	2	JB3	JB4	903	836	93	5, 7
4	JB 4 - JB 5	1	JB4	JB5	790	762	96	1, 3
5	JB 5 - JB 6	13	JB5	JB6	412	400	97	43
6	JB 6 - JB 7	4	JB6	JB7	1,080	386	35	13
7	JB 7 - JB 8	3	JB7	JB8	690	361	52	9, 11
8	JB 9 - JB 8	5	JB9	JB8	748	770	103	15, 17
9/10	JB 9 - JB 11	6	JB9	JB11	1,797[1]	752[2]	42	20, 23
11	JB 11 - JB 12	7	JB11	JB12	743	132	18	25, 27
12	JB 12 - JB 13	8	JB12	JB13	733	602	82	29, 30
13	JB 13 - JB 14	14	JB13	JB14	838	212	25	44, 48
14	JB 14 - JB 15	9	JB14	JB15	812	715	88	32
15	JB 16 - JB 15	10	JB16	JB15	623	734	118	35

16	JB17 - JB16	15	JB17	JB16	228	579	254	49
S1	JB16 - SIPHON - CREEK	17	JB 16 SIPHON	CREEK	NA	45	NA	53
X1	U/S XING-D/D SD	16	U/S XING	D/S SD	NA	104	NA	51

(1) GIS surveyed length from JB9 to JB10 is 1,042', and JB10 to JB11 is 755'. JB10 was not accessible.
(2) Segment 9 CCTV length is 21', and Segment 10 CCTV length is 731'.
(3) Percentages greater than 100 indicate overlapping inspection coverage.

B. Survey Coverage and Pipe Details

The CCTV assessment of the mainline was carried out from May 5th to May 8th, 2026. Based on the updated GPS survey, the DMWC mainline length is estimated to be approximately 12,142 feet. Of this total, 8,788 feet were successfully inspected by CCTV, representing approximately 72 percent coverage. Sections that could not be surveyed were obstructed by debris, roots, or rocks, preventing the rover's continued passage. Although the inspected segments exhibited generally similar pipe characteristics, the uninspected segments remain a data gap that should be considered when prioritizing rehabilitation and future inspection efforts. All line segments inspected were constructed of 36-inch concrete, except for the segment between JB 16 and 17, which consisted of an 18-inch PVC liner. Table 1 provides a detailed breakdown of the percentage of the pipeline inspected.

C. Inspection Findings

No collapses or major deformations were observed in the 8,788 feet of pipeline surveyed. However, several conditions were observed that indicate localized structural deterioration and should be considered when prioritizing rehabilitation.

Thin roots were found intruding through pipe joints in multiple segments. Between JB 8 and JB 9, a root pile was identified to be approximately 282 feet from JB 8, and a longitudinal crack was observed along the top of the pipe with thin roots intruding through the crack. The root pile spanned the full pipe circumference and obstructed approximately 50 percent of the pipe cross-section.

In Segment 9/10, the CCTV inspection also documented a hole with soil visible at approximately 580 feet, extending from the 8 o'clock to 10 o'clock position. This observation indicates a localized breach in the pipe wall and is a structurally significant condition supporting targeted replacement rather than cleaning alone.

In Segment 16, the inspected pipe consists of an existing 18-inch PVC liner installed within a larger host pipe. The host pipe diameter is unknown. The CCTV inspection documented lining failure with bulging at approximately 30 feet, extending from the 4 o'clock to 8 o'clock position. Because this segment has already been lined and the existing liner is now showing signs of failure, this condition suggests that localized removal and replacement are warranted.

Cobbles and debris were present in all pipeline segments, and the section from JB 12 to JB 15 contained approximately 1 inch of fine sediment, likely due to the segment being a low point in the line.

V. CCTV SURVEY OF NORTH AND SOUTH SIPHONS

A. Survey Methodology

The north and south siphons are part of the pipeline system that crosses beneath Butte Creek to serve landowners on the west side. The north siphon extends east-west, connecting at JB 9. There are three separate risers on this line: one located on the creek side of the east levee and two situated on either side of the west levee. The south siphon originates at JB 16 and runs southwest to a riser positioned on the creek side of the west levee.

The CCTV survey for these siphon crossings was conducted by GPRS using the same tethered rover and rotating camera used on the mainline. Geosyntec personnel also provided supervision throughout the siphon inspections. The rover was either lowered directly into a junction box connected to the siphon or inserted into the siphon riser itself. From there, it navigated through the pipe, recording video along the way. In cases where the rover could not traverse the entire crossing, the distance covered and the nature of the obstruction encountered were documented. An additional attempt was made to access the crossing from the opposite side to improve coverage and inspection results.

B. Survey Coverage and Pipe Details

The CCTV assessment of the siphons and crossings was conducted on May 8, 2026. For consistency with the inspection tables, the south siphon originating at JB 16 is identified as S1, while the crossing associated with the JB 9 siphon connection is identified as X1. In Table 1, SD refers to the downstream storm drain structure associated with the X1 crossing. The total estimated length of these features was approximately 960 feet. Of this total, 149 feet were successfully inspected, representing approximately 16 percent coverage.

Because only a limited portion of the siphon and crossing facilities could be inspected, the overall condition of these features remains largely unknown. This uncertainty is significant because the siphons are among the least accessible and potentially highest-consequence components of the DMWC conveyance system. Limited visibility, standing water, sediment accumulation, and physical obstructions prevented the rover from traversing substantial portions of the pipelines and reduced the quality of the video observations.

Additional investigation would be required to fully characterize the condition of these facilities. Potential approaches include dewatering and cleaning followed by repeat CCTV inspection, or the use of sonar and/or laser profiling technologies capable of evaluating submerged pipe sections where dewatering is not practical. These supplemental investigations are not included in the current ROM cost estimate and would require a separate follow-on effort if DMWC elects to further evaluate the siphons and crossings prior to rehabilitation design.

The siphon and crossing facilities are generally constructed of 36-inch reinforced concrete pipe (RCP). The only exception observed during the CCTV inspection was Segment 16, which consists of an 18-inch PVC liner installed within an existing host pipe assumed to be the original 36-inch

pipe. Because only a limited portion of the siphon and crossing facilities could be inspected, available information on pipe materials and dimensions remains subject to confirmation through future investigation. Because only a limited portion of the siphon and crossing facilities could be inspected, available information on pipe materials and dimensions remains subject to confirmation through future investigation.

C. Inspection Findings

The CCTV inspection of the siphon crossings revealed no collapses or major deformations within the surveyed portion of the pipeline. Both crossing pipes contained sediment, filling approximately 30% of their interior space. During the survey, it was noted that the south crossing pipe was observable from the creek shore and did not exhibit any visible signs of breakage. The north crossing pipe was not clearly visible in the creek.

VI. RECOMMENDATIONS FOR IMPROVED RELIABILITY AND FLOW

Based on the CCTV inspection findings, field observations, and reported system performance concerns, the following actions are recommended to improve conveyance reliability, reduce debris- and root-related restrictions, and address segments where leakage is confirmed or suspected. Because quantitative flow-loss data were not available from the March 2026 field effort, the recommendations below should be considered planning-level and should be refined after targeted leakage confirmation and/or flow monitoring.

A. Leakage Evidence and Water-Savings Basis

The current assessment identified several segments where leakage is either confirmed, suspected, or cannot be ruled out based on available evidence. The evidence basis includes DMWC operator-reported leakage concerns, Geosyntec field observations during the GPS survey, and CCTV-observed defects that provide potential pathways for exfiltration, including open cracks, joint deterioration, root intrusion, and localized pipe-wall breaches. Available evidence is qualitative rather than flow-measured; therefore, the leakage assessment should be used to support prioritization, but not as a final water-savings calculation.

Table 2. Leakage Evidence and Water-Savings Basis by Segment.

Segment	Leakage Classification	Evidence Basis
Segment 4, JB4–JB5	Suspected	CCTV-observed circumferential cracking and evidence of leaks were noted
Segment 8, JB9–JB8	Suspected	Root intrusion/cracking and evidence of leaks were noted
Segment 9/10, JB9–JB11	Confirmed/suspected structural breach	CCTV-observed hole with soil visible at approximately 580 ft
Segment 15, JB16–JB15	Suspected	Circumferential cracking and evidence of leaks were noted

Segment 16, JB17–JB16	Confirmed structural lining failure	CCTV-observed liner bulging/failure near 30 ft
Siphon/crossing segments	Unknown	Limited inspection coverage; submerged/obstructed condition

A planning-level recoverable-loss estimate in acre-feet per year was not developed as part of this assessment because the available velocity measurements were incomplete and conditions were not suitable for quantifying segment-specific conveyance losses. To support Component 5 comparison on a dollars-per-acre-foot basis, DMWC could develop a planning-level water-savings estimate using one or more of the following approaches: (1) paired flow measurements at upstream and downstream junction boxes during representative delivery conditions; or (2) a temporary weir/flume or acoustic Doppler measurements at selected high-priority segments. Until such data are collected, the benefit case for implementation funding should be framed around risk reduction, conveyance reliability, protection of existing water supplies, and the need to quantify recoverable losses during the next phase.

For future grant applications or Component 5 benefit-cost comparisons, the recommended next step is to pair targeted repair design with a leakage-confirmation monitoring effort so that the project can be expressed both as an infrastructure reliability project and as a recoverable water-savings project in acre-feet per year.

The following actions are recommended in priority order to address observed structural defects, suspected leakage pathways, debris, and root-related flow restrictions, and the remaining data gaps needed to support a future recoverable-loss estimate in acre-feet per year.

1. Confirm leakage and develop a recoverable loss estimate for the high-priority suspected/confirmed leakage segments.
2. Clean the mainline and remove debris/root obstructions to restore access and improve follow-up inspection quality.
3. Perform targeted structural repairs/replacements where CCTV confirms wall breach, lining failure, or severe cracking.
4. Slipline selected leaking/cracked/root-intruded segments where hydraulic capacity remains acceptable.
5. Reinspect repaired and previously obstructed segments to refine the water-savings and cost-effectiveness estimate.

Sliplining should be evaluated on a segment-specific basis because installation of a liner within the existing 36-inch host pipe would reduce the internal diameter and may offset some or all of the hydraulic benefit gained from a smoother pipe wall. While HDPE or similar liner materials typically have lower roughness than older concrete pipe, the reduced cross-sectional area could decrease conveyance capacity, particularly in reaches where the system is already experiencing flow restrictions from sediment, debris, roots, or existing hydraulic controls. Therefore, sliplining should be advanced only for segments where a planning-level hydraulic check confirms that post-

lining capacity remains acceptable under representative delivery conditions. Where capacity is marginal or where structural defects are localized, open-cut replacement or targeted point repair may provide a more appropriate rehabilitation approach.

Diversion-structure debris source control should be treated as a key Phase 2 implementation item because cleaning alone is unlikely to prevent recurrence of sediment and debris accumulation, particularly in the low-point reaches between JB 12 and JB 15 and within the siphons. DMWC should inspect the diversion structure, siphons, and low-point mainline reaches at the start and end of each irrigation season, with interim inspections after high-flow events, and clean accumulated sediment/debris as needed. DMWC should be identified as the responsible O&M party unless another entity is designated through future project agreements. Key CCTV observations and corresponding tiered rehabilitation recommendations are summarized in Table 3.

Table 3. Key CCTV Observations and Tiered Rehabilitation Recommendations

DMWC Pipe Segment	Key CCTV notes (selected)	Tiered Recommendation
1	MSA@650ft Survey Abandoned / JB 1 Joint breaking at 276' from JB2	Clean, replace 16' section (2-8' lengths)
2	MSA@900ft Survey Abandoned/ran out of cable going to JB 3	Clean only
3	MSA@782ft Survey Abandoned/stopping point at JB 4 / JB 4 TO JB 3; MSA@54ft Survey Abandoned/boulders	Clean only
4	CC@331ft Crack Circumferential from 4 o'clock to 8 o'clock; MSA@762ft Survey Abandoned / JB 5; OBR@296ft Obstacles Rocks, 5% of cross-sectional area; MSA@300ft Survey Abandoned/unable to pass	Clean and slip-line (leaking)
5	MSA@400ft Survey Abandoned / JB 5	Clean only
6	MSA@388ft Survey Abandoned / unable to pass rocks	Clean only
7	MSA@258ft Survey Abandoned / unable to pass concrete; MSA@103ft Survey Abandoned / unable to pass debris	Clean and root removal
8	MSA@487ft Survey Abandoned / from JB8	Clean and root removal; slip-line (leaking)
9&10	HSV@580ft Hole Soil Visible from 8 o'clock to 10 o'clock / JB 10; MSA@731ft Survey Abandoned/unable to pass; MSA@21ft Survey Abandoned/unable to pass rocks	Segment 9: clean only Segment 10, replace 16' section (2-8' lengths)
11	MSA@52ft Survey Abandoned / unable to pass; MSA@76ft Survey Abandoned / unable to pass	Clean only
12	MSA@103ft Survey Abandoned / at stopping point; MSA@602ft Survey Abandoned / heavy silt at bottom	Clean only
13	MSA@850ft Survey Abandoned / JB 13 video overlap; JB 13 TO JB 14; MSA@212ft Survey Abandoned / under water	Clean and root removal
14	MSA@713ft Survey Abandoned / under water; JB 15 TO JB 14	Clean and root removal
15	CC@165ft Crack Circumferential from 3 o'clock to 9 o'clock; MSA@734ft Survey Abandoned / unable to proceed	Clean and root removal; slip-line (leaking)
16	LFBU@30ft Lining Failure Bulges from 4 o'clock to 8 o'clock; MSA@571ft Survey Abandoned / under water; JB 16 to JB 17	Clean, replace 16' section (2-8' lengths)
S1	MSA@45ft Survey Abandoned / pipe full of water	Clean only
X1	MSA@104ft Survey Abandoned / pipe full of water	Clean only

Abbreviations: MSA-survey abandoned, CC-circumferential crack, OBR-obstacles/rocks, HSV-hole, visible soil, LFBU-liner failure, bulging

VII. ROM COST ESTIMATE

Attachment C presents a planning-level rough order-of-magnitude (ROM) cost estimate for the rehabilitation of the DMWC mainline conveyance system and is intended to support preliminary budgeting. The estimate is based on available CCTV inspection results, field survey information, and planning-level assumptions regarding the extent of mainline cleaning, root removal, sliplining, limited open-cut replacement, and minor junction box rehabilitation. The estimate does not include all potential future improvements identified in the recommendations above, such as diversion-structure modifications, siphon dewatering, sonar/laser profiling, or a dedicated leakage-confirmation/flow-monitoring program. The ROM does include inspection as a soft cost allowance, consistent with Attachment C; this allowance is intended to cover construction-phase inspection and limited post-cleaning/reinspection support needed to refine repair limits. Diversion-structure debris source control is not included in the current ROM and should either be carried as a separate capital item or added as a conceptual allowance during the next estimate update.

Using these assumptions, the total project cost summarized in Attachment C is estimated to range from approximately $2.7 million to $4.5 million, with a most likely value of approximately $3.4 million, inclusive of direct construction costs, engineering and permitting, construction management and inspection, and contingency. Consistent with an AACE Class 4/5 estimate, these values are subject to refinement as rehabilitation limits are confirmed and additional field verification is completed.

The open-cut replacement quantity used in the ROM estimate is a planning-level allowance rather than a direct sum of the discrete replacement locations identified in the CCTV segment table. The segment table identifies approximately 50 feet of replacement based on observed defects in the inspected portions of the pipeline. The ROM estimate assumes a larger open-cut allowance of approximately 10 percent of the mainline length to account for uninspected or partially inspected reaches, access constraints, potential hidden defects behind debris/root obstructions, and the uncertainty appropriate for an AACE Class 4/5 estimate. The portion of the mainline not inspected by CCTV should be carried as an explicit ROM risk item, as defects in uninspected or obstructed footage could increase the extent of required cleaning, sliplining, or open-cut replacement, and shift the final project cost toward the upper end of the estimated range.

The most likely estimate of approximately $3.4 million is therefore driven by the assumed rehabilitation program, including full-system cleaning, root removal, selected sliplining, limited open-cut replacement allowance, minor junction box rehabilitation, engineering/permitting, management, and contingency, not solely by the currently observed 50 feet of replacement. This allowance should be refined after cleaning and re-inspection of obstructed or uninspected segments.

The ROM estimate is based on current-year dollars with no escalation beyond the estimate date. The low and high values reflect the expected uncertainty for an AACE Class 4/5 estimate and were

developed by applying contingency and quantity uncertainties to the major rehabilitation items. Major cost drivers include approximately 12,000 feet of mainline cleaning, selected root removal, allowances for sliplining and open-cut replacement, minor junction box rehabilitation, contingency, and soft costs, including engineering, permitting, construction management, and inspection. The inspection allowance is included in soft costs, consistent with Attachment C, and is intended to cover construction-phase inspection and limited post-cleaning/reinspection support; it does not include a separate leakage-confirmation or flow-monitoring program. Construction is assumed to occur during the non-irrigation season, when the mainline can be taken out of service; therefore, temporary flow diversion is not assumed, and no interruption to DMWC deliveries is anticipated under that construction-window assumption. Major ROM quantities and unit-cost assumptions are summarized in Table 4.

Table 4. ROM Estimate Major Quantity and Unit-Cost Basis

Item	Planning Quantity	Unit Cost Basis
Mainline cleaning	Approx. 12,000 LF	Planning-level contractor/unit-cost allowance
Root removal	Allowance	Based on observed root intrusion locations
Sliplining	Approx. 20% of mainline	ROM allowance; subject to hydraulic confirmation
Open-cut replacement	Approx. 10% of mainline	ROM allowance for observed and unknown defects
Junction box rehabilitation	Minor allowance	Localized repairs only
Engineering, permitting, construction management, and inspection	Soft cost allowance	ROM allowance covers construction-phase inspection and limited post-cleaning/reinspection support; excludes dedicated leakage-confirmation monitoring or flow measurement

The planning quantities and unit-cost bases summarized in Table 4 were used to develop the low, most likely, and high ROM cost scenarios shown in Table 5.

Table 5. ROM Estimate Cost Scenarios

Cost Scenario	Total Project Cost
Low	$2.7 million
Most Likely	$3.4 million
High	$4.5 million

The cost scenarios are intended for planning and comparison purposes only and should not be interpreted as final design or bid values. The most likely value represents the current planning basis using the rehabilitation allowances summarized above, including soft costs for engineering, permitting, construction management, and inspection. The low and high values reflect uncertainty associated with

uninspected or obstructed reaches, final rehabilitation limits, constructability, and whether additional future-phase work, such as diversion-structure debris source control, siphon/crossing investigation, leakage confirmation, or flow monitoring, is added to the project scope. The estimate should be updated after cleaning, limited reinspection, and confirmation of the selected repair approach.

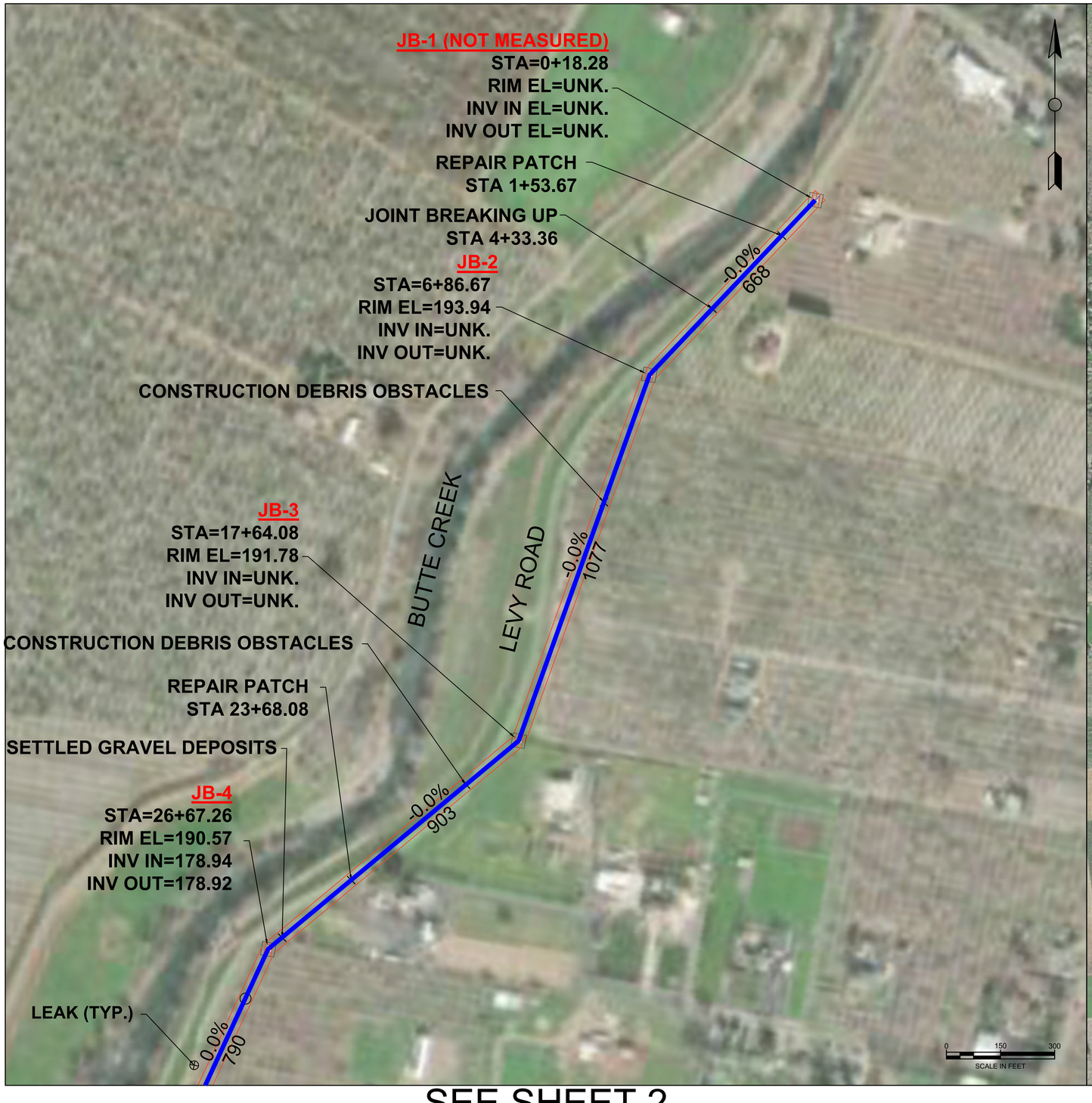
* * * * *

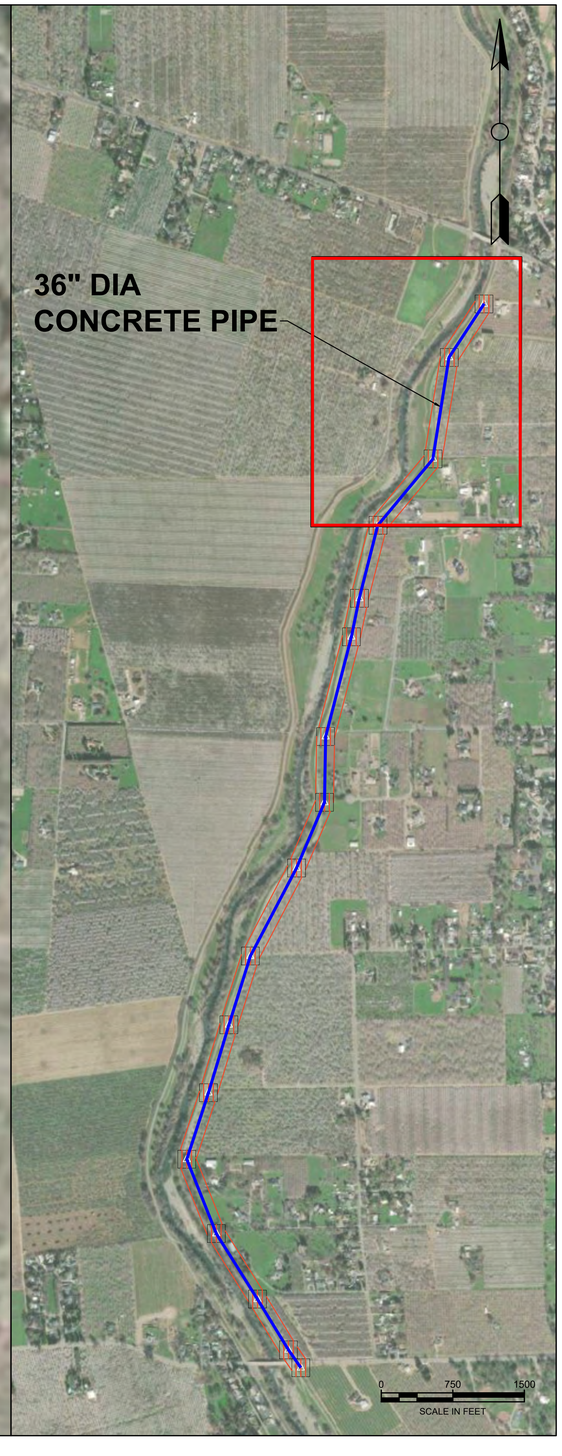
ATTACHMENT A
GPS SURVEY DATA AND MAPS

DMWC Mainline Condition Assessment
GPS Survey Summary

Survey Date: March 18, 2026

DMWC Pipe Segment	Estimated Segment Length (ft)	Estimated Inspection Length (ft)	% Segment Inspected	Segment No.	Survey Point Description	Latitude	Longitude	Velocity of Flow (Bottom)	Velocity of Flow (Middle)	Velocity of Flow (Top)	Average Velocity of Flow	RIM Ortho Ht. (ft)	Depth to Invert (ft)	Depth to Flow (ft)	Depth to Ground (ft)	Notes
JB-1 - JB-2	668	650	97%	1	Upstream Pipe	NA	NA									Unable to survey the junction box due to the adjacent property owner.
					Downstream Pipe	NA	NA									Unable to survey the junction box due to the adjacent property owner.
JB-2 - JB-3	1,077	900	84%	2	Upstream Pipe	39.67485549	-121.7791654			0.4	0.4	193.985		4.2	0.76	Flow backed up in junction box. Could not observe pipe
					Downstream Pipe	39.67484407	-121.7791721			0.6	0.6	193.896		4.19	1.09	Flow backed up in junction box. Could not observe pipe
JB-3 - JB-4	903	836	93%	3	Upstream Pipe	39.67193567	-121.779782					191.817		2.47	4.39	Gate down in box. No flow collected. Flow above top of pipe.
					Downstream Pipe	39.67192514	-121.7797863					191.748		4.5	4.42	No flow collected. Flow above top of pipe
JB-4 - JB-5	790	762	96%	4	Upstream Pipe	39.67003009	-121.7818344	0.4	1.4	1.4	1.07	190.583	11.63	9.69	2.18	
					Downstream Pipe	39.67002047	-121.7818412	0.8	0.14	0.16	0.37	190.56	11.65	9.85	3.23	Sediment in bottom of pipe. Potential leak observed.
JB-5 - JB-6	412	400	97%	5	Upstream Pipe	39.66793046	-121.7825332	0.8	0.8	0.8	0.8	189.975	13.62	9.67	4.6	
					Downstream Pipe	39.66791748	-121.7825381					189.928	13.64	9.84	4	Flow could not be collected.
JB-6 - JB-7	1,080	383	35%	6	Upstream Pipe	39.66682218	-121.782828	1.4	2	2.4	1.93	184.41	8.55	7.42	2.79	In float. Canopy cover
					Downstream Pipe	39.66681042	-121.7828521	1.4	2.4	2.4	2.07	185.109	8.52	7.48	2.72	
JB-7 - JB-8	690	361	52%	7	Upstream Pipe	39.66395323	-121.783805	0.6	0.8	0.2	0.53	181.073	8.55	5.01	3.85	
					Downstream Pipe	39.66394125	-121.7838079	0.6	0.8	0.4	0.6	181.053	9.51	4.93	3.44	
JB-8 - JB-9	748	770	103%	8	Upstream Pipe	39.66205941	-121.7838576	0.4	0.6	0.4	0.47	179.495	9.06	2.5	3.12	
					Downstream Pipe	39.66204841	-121.7838532	0.4	0.8	0.4	0.53	179.524	9.58	3.5	3.53	
JB-9 - JB-10	1,042	21	2%	9	Upstream Pipe	39.66017375	-121.7848953					178.307	10.84	7.92	5.48	Broad crested weir. 3 ft wide and flow depth over weir 0.4
					Downstream Pipe	39.66016094	-121.7849101					178.387			5.25	Flow meter malfunction
JB-10 - JB-11	755	731	97%	10	Upstream Pipe	39.65764301	-121.7866255					175.038	9.18	7.56	2.83	Flow moving fast through box. Screen present.
					Downstream Pipe	39.65763114	-121.7866317					175.073	9.35	8.71	3.18	Flow meter malfunction
JB-11 - JB-12	743	132	18%	11	Upstream Pipe	39.65566433	-121.7874313					172.376	8.97	6.73	3.44	0.56 ft/s measured manually upstream to downstream
					Downstream Pipe	39.65565253	-121.7874366					172.501	9.05	6.85	3.71	Flow meter malfunction
JB-12 - JB-13	733	602	82%	12	Downstream Pipe	39.65371049	-121.7881965					171.05	8.43	5.43	3.92	Flow meter malfunction
					Upstream Pipe	39.65369912	-121.7882025					171.034	9.38	5.44	3.71	Flow meter malfunction
JB-13 - JB-14	838	212	25%	13	Downstream Pipe	39.65179834	-121.7890103					169.97	8.77	4.5	2.59	Flow meter malfunction
					Upstream Pipe	39.65178585	-121.7890161					170.267	9.08	4.8	2.96	Flow meter malfunction
JB-14 - JB-15	812	715	88%	14	Upstream Pipe	39.64965885	-121.7879239					169.861	9.04	4.37	3.54	No flow collected due to gates being closed.
					Downstream Pipe	39.64964652	-121.787915					169.858	9.01	4.3	4	No flow collected due to gates being closed.
JB-15 - JB-16	623	734	118%	15	Upstream Pipe	39.64776772	-121.7863957	0.2	0.8		0.50	167.041	10.55	1.65	4.68	Flow is above pipes. Could not obtain flow for velocity top.
					Downstream Pipe	39.64775518	-121.7863904					167.16	10.59	0.64	5.38	Box plug leaking. Leak approx.15 ft south of plug. Flowmeter likely not working.
JB-16 - JB-17	228	579	254%	16	Upstream Pipe	39.64629912	-121.7852452					166.331	10.3	1.32	5.21	Weir width 4.03, depth of flow 0.28
					Downstream Pipe	NA	NA									Could not measure downstream pipe due to weir and box cover.
NA	NA	NA		17	Upstream Pipe	39.64578411	-121.7847871					166.389	10.71	9.69	4.26	Flow meter malfunction
					Downstream Pipe	NA	NA									Could not measure downstream pipes due to gates closed in front of them.
NA	NA	NA		NA	Other Observations	39.66824763	-121.7825452					192.741				Leaks observed. Large holes at base of levy slope
NA	NA	NA		NA	Other Observations	39.6688218	-121.7823906					193.125				Leaks observed. Hole present at bottom of levy slope
NA	NA	NA		NA	Other Observations	39.66904908	-121.7823359					193.687				Leaks observed. Hole present at bottom of levy slope
NA	NA	NA		NA	Other Observations	39.64947385	-121.7879566					173.195				Siphon location
NA	NA	NA		NA	Other Observations	39.65916995	-121.7858627					174.414				Offline vent. Bottom is 7.70 and depth to ground is 2.50.
NA	NA	NA		NA	Other Observations	39.66026606	-121.7850712					183.552				Siphon location. Pipe broken in stream
NA	NA	NA		NA	Other Observations	39.64619478	-121.7854673					167.903				Siphon location
NA	NA	NA		NA	Other Observations	39.64617543	-121.7854538					168.01				Siphon location





SEE SHEET 2

General Notes

JB-2: Flow backed up in junction box. Could not observe pipe
JB-3:
INV IN - Gate down in box. No flow collected. Flow above top of pipe.
INV OUT - No flow collected. Flow above top of pipe

No.	Revision/Issue	Date

Firm Name and Address
GEOSYNTEC CONSULTANTS
1111 BROADWAY SUITE 600
OAKLAND, CA 94607

Project Name and Address
DMWC Pipeline Condition
Oroville-Chico Hwy
& Estates Drive
Durham, CA 95938

Project	Sheet
DMWC	
Date: 6/2/2026	
Scale: 1" = 150'	26006451

SEE SHEET 1

CIRCUMFERENTIAL CRACK
STA 31+26.48

LEAK (TYP.)

JB-5
STA=34+57.48
RIM EL=189.95
INV IN=176.33
INV OUT=176.31

JB-6
STA=38+69.95
RIM EL=184.76
INV IN=176.21
INV OUT=176.24

CONSTRUCTION DEBRIS OBSTACLE

JB-7
STA=49+49.84
RIM EL=181.06
INV IN=172.51
INV OUT=171.55

ROOT JOINT STA
54+00.00

JB-8
STA=56+39.63
RIM EL=179.51
INV IN=170.45
INV OUT=169.93

LONGITUDINAL CRACK
START STA 56+91.63

LONGITUDINAL CRACK FINISH
STA 57+20.63

ROOT JOINT, CONSTRUCTION DEBRIS OBSTACLE, REPAIR PATCHES, AND BALL BARRELL ROOTS

BUTTE CREEK LEVY ROAD

0.0% 790
0.0% 412
-0.0% 1080
0.1% 690
0.1% 748

0 150 300
SCALE IN FEET

36" DIA
CONCRETE PIPE

0 750 1500
SCALE IN FEET

SEE SHEET 3

General Notes

Leaks observed between JB-4 and JB-5 as large holes at bottom of levy slope. Approximate locations recorded during surveying.

No.	Revision/Issue	Date

Firm Name and Address
GEOSYNTEC CONSULTANTS
1111 BROADWAY SUITE 600
OAKLAND, CA 94607

Project Name and Address
DMWC Pipeline Condition
Oroville-Chico Hwy
& Estates Drive
Durham, CA 95938

Project	Sheet
DMWC	26006451
Date: 6/2/2026	
Scale: 1" = 150'	

ProjectedPoints_20260316.dwg
6/2/2026
SHEET 2

SEE SHEET 2

SIPHON (TYP.)

JB-9
STA=63+87.40
RIM EL=178.35
INV IN=167.51
INV OUT=UNK.

JB-10
STA=74+29.31
RIM EL=175.06
INV IN=165.88
INV OUT=165.71

CONSTRUCTION DEBRIS
OBSTACLES AND REPAIR PATCHES

VISIBLE SOIL HOLE
STA 76+04.86

BUTTE CREEK
LEVY ROAD

-0.1%
1042

0.0%
756

JB-11
STA=81+84.86
RIM EL=172.44
INV IN=163.47
INV OUT=163.39

CONSTRUCTION DEBRIS OBSTACLE

JB-12
STA=89+28.40
RIM EL=171.04
INV IN=161.66
INV OUT=162.61

0.0%
744

REPAIR PATCH

JB-13
STA=96+61.81
RIM EL=170.12 INV
IN=161.04 INV
OUT=161.35

-0.1%
733

ROOT JOINTS AND
PATCH REPAIRS

0 150 300
SCALE IN FEET

36" DIA
CONCRETE PIPE

0 750 1500
SCALE IN FEET

SEE SHEET 4

General Notes

No.	Revision/Issue	Date

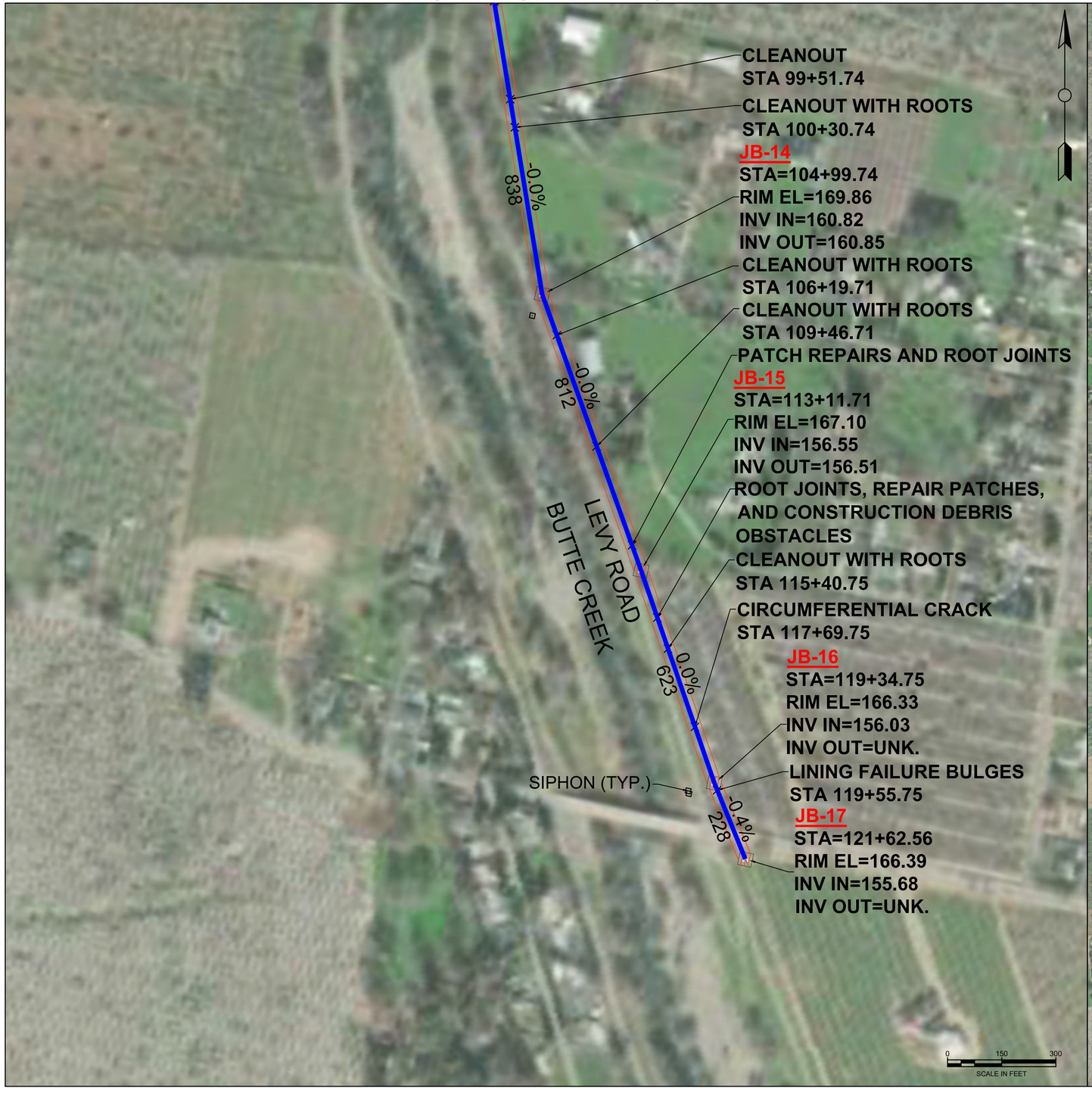
Firm Name and Address
GEOSYNTEC CONSULTANTS
1111 BROADWAY SUITE 600
OAKLAND, CA 94607

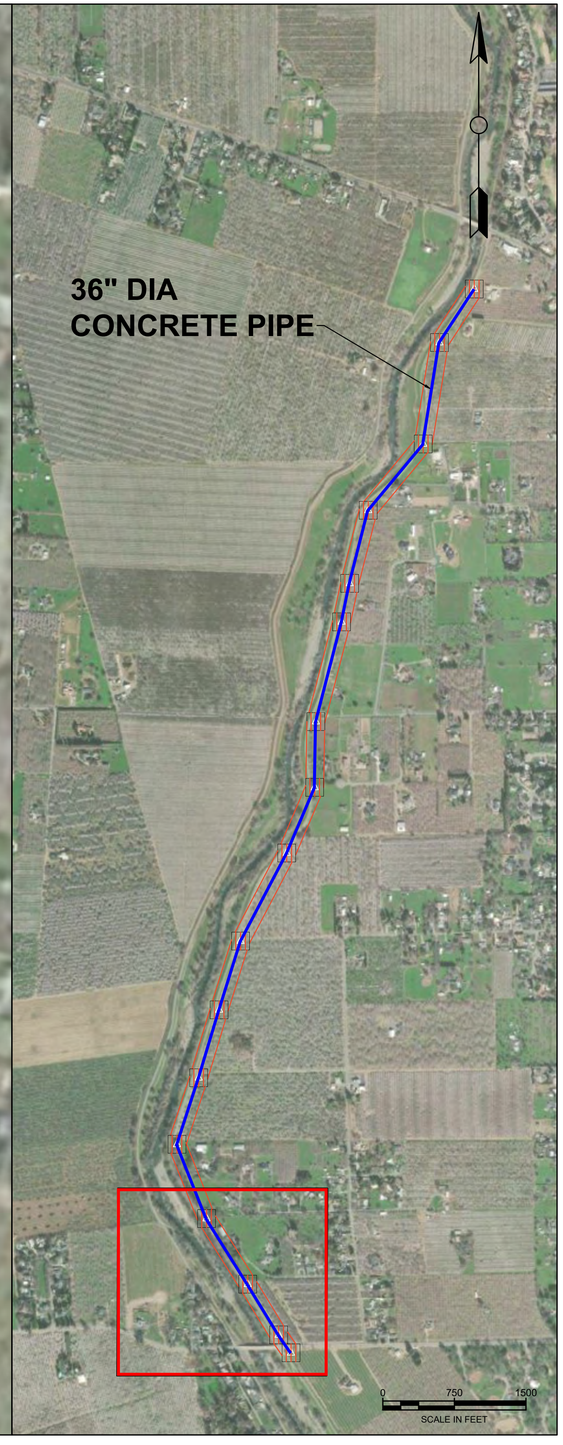
Project Name and Address
DMWC Pipeline Condition
Oroville-Chico Hwy
& Estates Drive
Durham, CA 95938

Project	Sheet
DMWC	26006451
Date: 6/2/2026	
Scale: 1" = 150'	

ProjectedPoints_20260316.dwg
6/2/2026
SHEET 3

SEE SHEET 3





General Notes

JB-16: Flow could not be collected downstream
JB-17: Flow could not be collected downstream

No.	Revision/Issue	Date

Firm Name and Address

GEOSYNTEC CONSULTANTS
1111 BROADWAY SUITE 600
OAKLAND, CA 94607

Project Name and Address

DMWC Pipeline Condition
Oroville-Chico Hwy
& Estates Drive
Durham, CA 95938

Project	Sheet
DMWC	26006451
Date: 6/2/2026	
Scale: 1" = 150'	

ProjectedPoints_20260316.dwg 6/2/2026 SHEET 4

ATTACHMENT B
CCTV REPORT

WINCAN

WEB PROJECT
CLICK TO OPEN

Project

Project	909129 Geosyntec
	5/5/2026

WINCAN

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909129 Geosyntec		**5/5/2026**

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WINCAN

Project Information

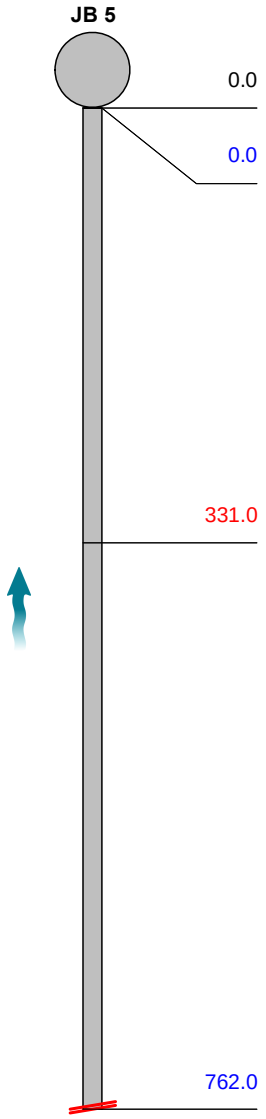
Project		
909129 Geosyntec		**5/5/2026**

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/5/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 4 TO JB 5**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Upstream**		**762.0 '**	**762.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 4**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 5**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:5751 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point / JB5	00:00:00		
0.0	MWL	Water Level, 5% of the vertical dimension	00:00:02		
331.0	CC	Crack Circumferential from 4 o'clock to 8 o'clock	00:03:19	1	S1
762.0	MSA	Survey Abandoned / JB 5	PRESET:0		

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
1100	0000	1100	1.0	0.0	1.0	1.0	0.0	1.0

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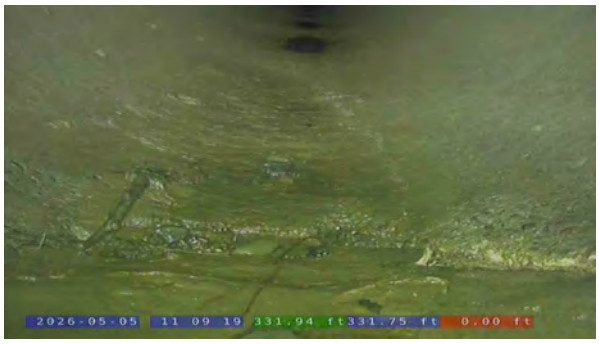
Section Pictures - 5/5/2026 - JB 4 TO JB 5

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/5/2026**	**JB 4 TO JB 5**	**1**



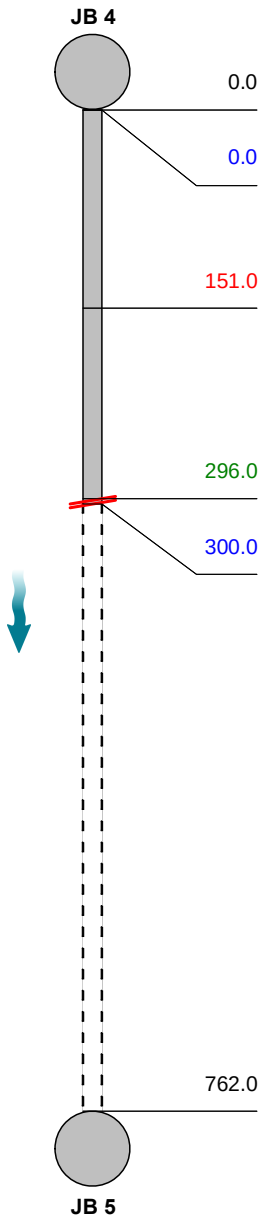
1, 00:03:19, 331.00ft
Crack Circumferential from 4 o'clock to 8 o'clock

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/5/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 4 TO JB 5**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Downstream**		**762.0 '**	**300.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 4**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 5**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:5751 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point	00:00:00		
0.0	MWL	Water Level, 5% of the vertical dimension	00:00:02		
151.0	RPP	Repair Patch at 12 o'clock / REPAIRED HOLE	00:07:31	1	
296.0	OBR	Obstacles Rocks, 5% of cross sectional area at 6 o'clock	00:14:42	2	M2
300.0	MSA	Survey Abandoned / UNAABLE TO PASS ROCK.COLLECT FROM OTHER DIRECTION	00:17:48		
762.0		End of pipe			

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	2100	2100	0.0	2.0	2.0	0.0	2.0	2.0

WINCAN

Section Pictures - 5/5/2026 - JB 4 TO JB 5

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/5/2026**	**JB 4 TO JB 5**	**1**

1, 00:07:31, 151.00ft
Repair Patch at 12 o'clock / REPAIRED HOLE

2, 00:14:42, 296.00ft
Obstacles Rocks, 5% of cross sectional area at 6 o'clock

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/7/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 4 TO JB 3**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Downstream**		**782.0 '**	**782.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 3**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 4**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					

1:5902 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point	00:00:00		
0.0	MWL	Water Level, 5% of the vertical dimension	00:00:02		
189.0	OBN	Obstacles Construction Debris, 20% of cross sectional area from 5 o'clock to 7 o'clock	00:05:28	1	M3
439.0	MGO	General Observation / V3	00:13:13	2	
487.0	OBN	Obstacles Construction Debris, 10% of cross sectional area from 5 o'clock to 7 o'clock	00:15:08	3	M2
604.0	RPP	Repair Patch at 12 o'clock / PATCH REPAIR	00:20:00	4	
782.0	MSA	Survey Abandoned / AT STOPPING POINT FROM JB 4	PRESET:0		

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3121	3121	0.0	5.0	5.0	0.0	2.5	2.5

WINCAN

Section Pictures - 5/7/2026 - JB 4 TO JB 3

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/7/2026**	**JB 4 TO JB 3**	**2**

1, 00:05:28, 189.00ft
Obstacles Construction Debris, 20% of cross sectional area from 5 o'clock to 7 o'clock

2, 00:13:13, 439.00ft
General Observation / V3

3, 00:15:08, 487.00ft
Obstacles Construction Debris, 10% of cross sectional area from 5 o'clock to 7 o'clock

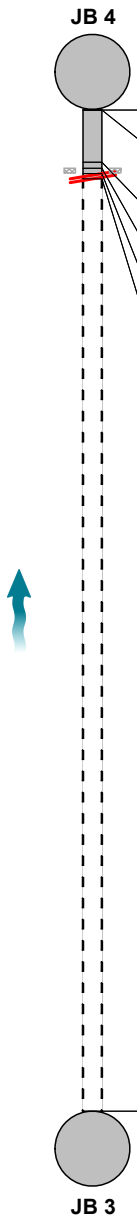
4, 00:20:00, 604.00ft
Repair Patch at 12 o'clock / PATCH REPAIR

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/5/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 4 TO JB 3**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Upstream**		**782.0 '**	**54.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 3**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 4**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:5902 Distance		Code	Observation	Counter	Photo	Grade
0.0		ADP	Discharge Point	00:00:00		
0.0		MWL	Water Level, 10% of the vertical dimension	00:00:01		
41.0		MWL	Water Level, 20% of the vertical dimension	00:01:53		
46.0	S01	DSGV	Deposits Settled Gravel, 5% of cross sectional area from 4 o'clock to 8 o'clock, Start	00:00:00	1, 2	M2
50.0	F01	DSGV	Deposits Settled Gravel, 5% of cross sectional area from 5 o'clock to 7 o'clock, Finish	00:03:20		M2
54.0		MSA	Survey Abandoned / BOULDERS	00:03:39		
782.0			End of pipe			

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	2100	2100	0.0	2.0	2.0	0.0	2.0	2.0

WINCAN

Section Pictures - 5/5/2026 - JB 4 TO JB 3

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/5/2026**	**JB 4 TO JB 3**	**2**

1, 00:00:00, 46.00ft
Deposits Settled Gravel, 5% of cross sectional area from 4 o'clock to 8 o'clock, Start

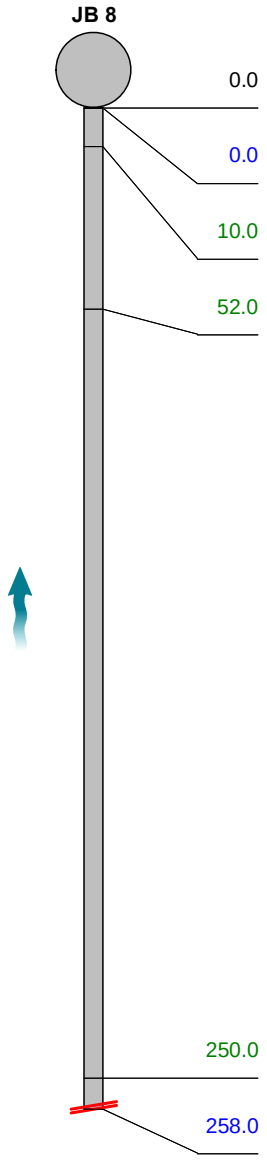
2, 00:00:00, 46.00ft
Deposits Settled Gravel, 5% of cross sectional area from 4 o'clock to 8 o'clock, Start

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/6/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 7 TO JB 8**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Upstream**		**258.0 '**	**258.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 7**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 8**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



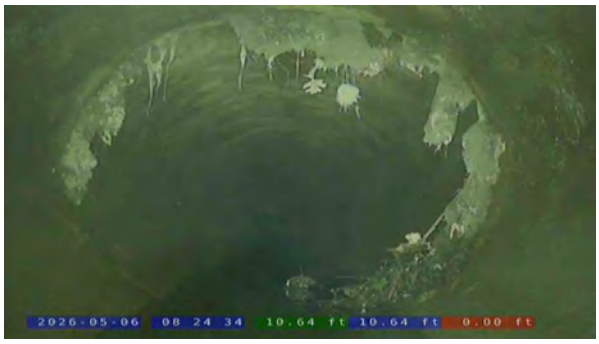
1:1948 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point	00:00:00		
0.0	MWL	Water Level, 5% of the vertical dimension	00:00:02		
10.0	RMJ	Roots Medium Joint from 8 o'clock to 5 o'clock, 5% lost, within 8 inch	00:00:45	1	M3
52.0	OBN	Obstacles Construction Debris, 15% of cross sectional area from 5 o'clock to 7 o'clock	00:02:24	2, 3	M3
250.0	RMJ	Roots Medium Joint from 9 o'clock to 12 o'clock, 5% lost, within 8 inch	00:08:06		M3
258.0	MSA	Survey Abandoned / unable to pass concrete	PRESET:0	4	

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3300	3300	0.0	9.0	9.0	0.0	3.0	3.0

WINCAN

Section Pictures - 5/6/2026 - JB 7 TO JB 8

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/6/2026**	**JB 7 TO JB 8**	**3**



1, 00:00:45, 10.00ft
Roots Medium Joint from 8 o'clock to 5 o'clock, 5% lost, within 8 inch

2, 00:02:24, 52.00ft
Obstacles Construction Debris, 15% of cross sectional area from 5 o'clock to 7 o'clock

3, 00:02:24, 52.00ft
Obstacles Construction Debris, 15% of cross sectional area from 5 o'clock to 7 o'clock

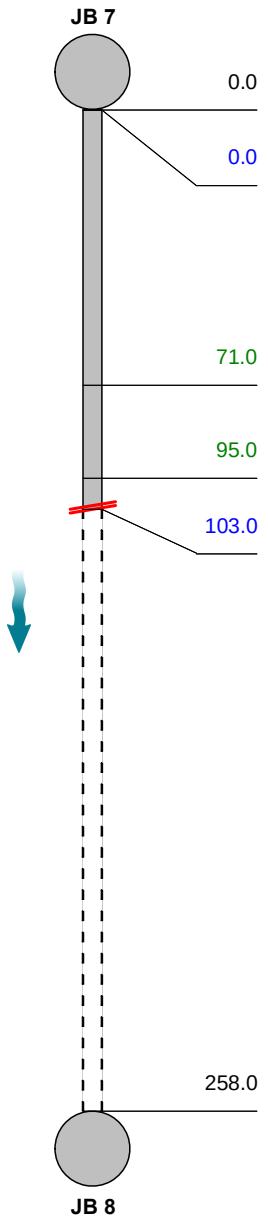
4, PRESET:0, 258.00ft
Survey Abandoned / unable to pass concrete

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/5/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 7 TO JB 8**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Downstream**		**258.0 '**	**103.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 7**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 8**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:1948 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point	00:00:00		
0.0	MWL	Water Level, 5% of the vertical dimension	00:00:02		
71.0	OBN	Obstacles Construction Debris, 5% of cross sectional area from 5 o'clock to 7 o'clock	00:02:44		M2
95.0	OBN	Obstacles Construction Debris, 20% of cross sectional area from 4 o'clock to 8 o'clock	00:04:16	1, 2	M3
103.0	MSA	Survey Abandoned / UNABLE TO PASS DEBRIS.. WILL CONTINUE FROM OTHER SIDE	00:05:59		
258.0		End of pipe			

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3121	3121	0.0	5.0	5.0	0.0	2.5	2.5

WINCAN

Section Pictures - 5/5/2026 - JB 7 TO JB 8

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/5/2026**	**JB 7 TO JB 8**	**3**

1, 00:04:16, 95.00ft
Obstacles Construction Debris, 20% of cross sectional area from 4 o'clock to 8 o'clock

2, 00:04:16, 95.00ft
Obstacles Construction Debris, 20% of cross sectional area from 4 o'clock to 8 o'clock

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/5/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 7 TO JB 6**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Upstream**		**388.0 '**	**388.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 6**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 7**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					

1:2929	Distance	Code	Observation	Counter	Photo	Grade
	0.0	ADP	Discharge Point	00:00:00		
	0.0	MWL	Water Level, 5% of the vertical dimension	00:00:01		
	383.0	OBN	Obstacles Construction Debris, 20% of cross sectional area from 5 o'clock to 7 o'clock	00:15:03	1	M3
	388.0	MSA	Survey Abandoned / UNABLE TO PASS ROCK..WILL CONTINUE FROM OTHER SIDE	PRESET:0		

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3100	3100	0.0	3.0	3.0	0.0	3.0	3.0

WINCAN

Section Pictures - 5/5/2026 - JB 7 TO JB 6

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/5/2026**	**JB 7 TO JB 6**	**4**

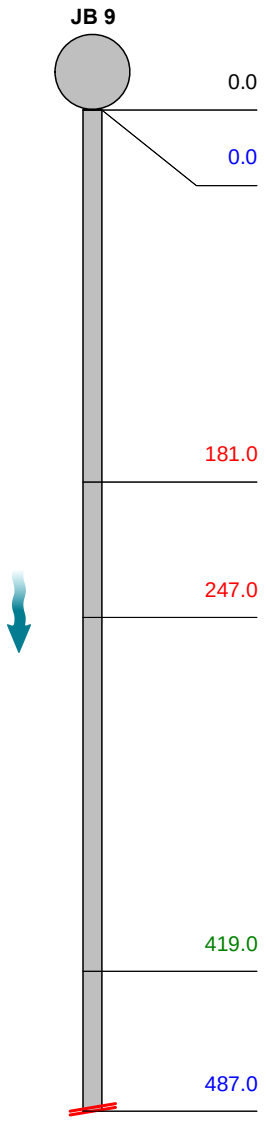
1, 00:15:03, 383.00ft
Obstacles Construction Debris, 20% of cross sectional area
from 5 o'clock to 7 o'clock

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/6/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 8 TO JB 9**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Downstream**		**487.0 '**	**487.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 9**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 8**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:3676	Distance	Code	Observation	Counter	Photo	Grade
	0.0	ADP	Discharge Point	00:00:00		
	0.0	MWL	Water Level, 5% of the vertical dimension	00:00:08		
	181.0	RPP	Repair Patch at 12 o'clock / PATCH WORK	00:05:09	1	
	247.0	RPP	Repair Patch at 12 o'clock / PATCH WORK	00:07:06	2	
	419.0	OBN	Obstacles Construction Debris, 10% of cross sectional area from 5 o'clock to 7 o'clock	00:12:44	3	M2
	487.0	MSA	Survey Abandoned / AT STOPPING POINT FROM JB 8	00:15:14	4	

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	2100	2100	0.0	2.0	2.0	0.0	2.0	2.0

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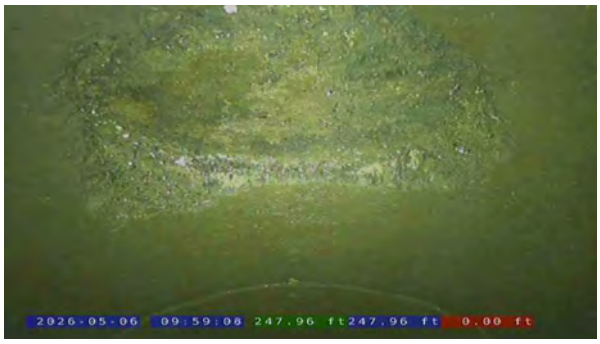
Section Pictures - 5/6/2026 - JB 8 TO JB 9

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/6/2026**	**JB 8 TO JB 9**	**5**

1, 00:05:09, 181.00ft
Repair Patch at 12 o'clock / PATCH WORK



2, 00:07:06, 247.00ft
Repair Patch at 12 o'clock / PATCH WORK

3, 00:12:44, 419.00ft
Obstacles Construction Debris, 10% of cross sectional area from 5 o'clock to 7 o'clock

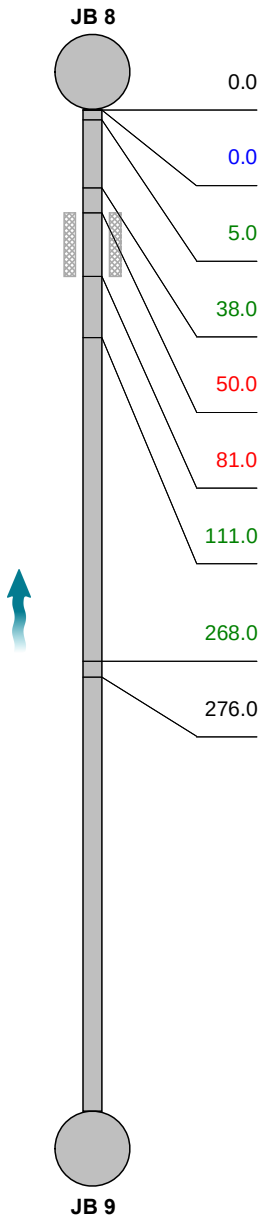
4, 00:15:14, 487.00ft
Survey Abandoned / AT STOPPING POINT FROM JB 8

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/6/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 8 TO JB 9**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Upstream**		**487.0 '**	**276.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 9**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 8**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:3676 Distance		Code	Observation	Counter	Photo	Grade
0.0		ADP	Discharge Point	00:00:00		
0.0		MWL	Water Level, 5% of the vertical dimension	00:00:03		
5.0		RMJ	Roots Medium Joint from 12 o'clock to 12 o'clock, 50% lost, within 8 inch	00:00:24	1	M3
38.0		RMB	Roots Medium Barrell from 1 o'clock to 6 o'clock, 30% lost	00:01:56	2, 3	M4
50.0	S01	CL	Crack Longitudinal at 12 o'clock, Start	00:03:00	4	S2
81.0	F01	CL	Crack Longitudinal at 12 o'clock, Finish	00:05:18		S2
111.0		OBN	Obstacles Construction Debris, 40% of cross sectional area from 4 o'clock to 8 o'clock	00:06:11	5	M5
268.0		RBB	Roots Ball Barrell from 3 o'clock to 9 o'clock, 55% lost	00:11:25	6	M5
276.0		ACOM	Cleanout Mainline / CO	00:12:08		

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
2600	5241	5241	12.0	17.0	29.0	2.0	4.3	2.9

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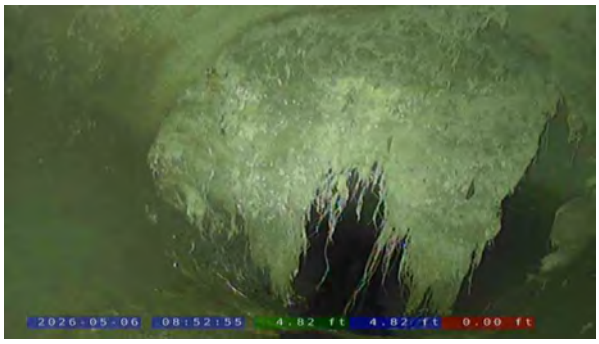
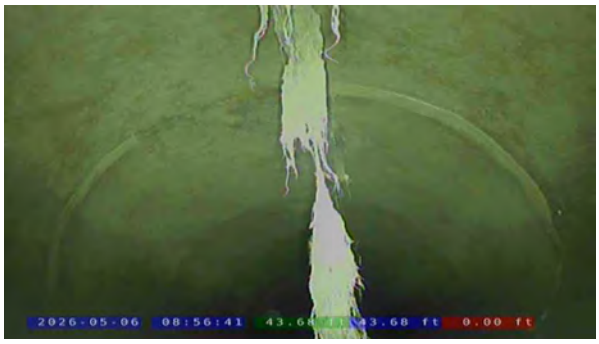
Section Pictures - 5/6/2026 - JB 8 TO JB 9

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/6/2026**	**JB 8 TO JB 9**	**5**



1, 00:00:24, 5.00ft
Roots Medium Joint from 12 o'clock to 12 o'clock, 50% lost, within 8 inch

2, 00:01:56, 38.00ft
Roots Medium Barrell from 1 o'clock to 6 o'clock, 30% lost



3, 00:01:56, 38.00ft
Roots Medium Barrell from 1 o'clock to 6 o'clock, 30% lost

4, 00:03:00, 50.00ft
Crack Longitudinal at 12 o'clock, Start

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Section Pictures - 5/6/2026 - JB 8 TO JB 9

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/6/2026**	**JB 8 TO JB 9**	**5**

5, 00:06:11, 111.00ft
Obstacles Construction Debris, 40% of cross sectional area from 4 o'clock to 8 o'clock

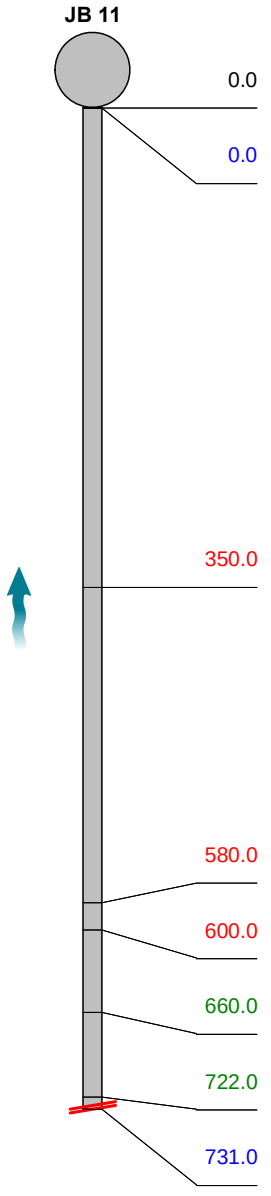
6, 00:11:25, 268.00ft
Roots Ball Barrell from 3 o'clock to 9 o'clock, 55% lost

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/6/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 9 TO JB 10 TO JB 11**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Upstream**		**731.0 '**	**731.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 9**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 11**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:5517 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point	00:00:00		
0.0	MWL	Water Level, 5% of the vertical dimension	00:00:01		
350.0	RPP	Repair Patch at 12 o'clock / PATCH REPAIR	00:11:20	1	
580.0	HSV	Hole Soil Visible from 8 o'clock to 10 o'clock / JB 10	00:20:04	2	S5
600.0	RPP	Repair Patch at 12 o'clock / REPAIR PATCH	00:21:12	3	
660.0	OBN	Obstacles Construction Debris, 5% of cross sectional area from 5 o'clock to 7 o'clock	00:23:40	4	M2
722.0	OBN	Obstacles Construction Debris, 10% of cross sectional area from 5 o'clock to 7 o'clock	00:26:25	5	M2
731.0	MSA	Survey Abandoned / UNABLE TO PASS HEAVY DEBRIS..UP TO JB 9	PRESET:0		

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
5100	2200	5122	5.0	4.0	9.0	5.0	2.0	3.0

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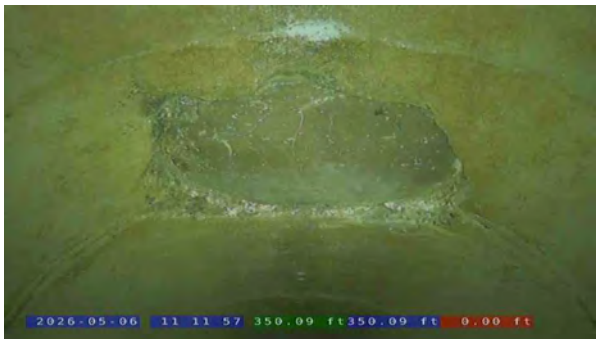
Section Pictures - 5/6/2026 - JB 9 TO JB 10 TO JB 11

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/6/2026**	**JB 9 TO JB 10 TO JB 11**	**6**



1, 00:11:20, 350.00ft
Repair Patch at 12 o'clock / PATCH REPAIR

2, 00:20:04, 580.00ft
Hole Soil Visible from 8 o'clock to 10 o'clock / JB 10

3, 00:21:12, 600.00ft
Repair Patch at 12 o'clock / REPAIR PATCH

4, 00:23:40, 660.00ft
Obstacles Construction Debris, 5% of cross sectional area from 5 o'clock to 7 o'clock

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Section Pictures - 5/6/2026 - JB 9 TO JB 10 TO JB 11

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/6/2026**	**JB 9 TO JB 10 TO JB 11**	**6**

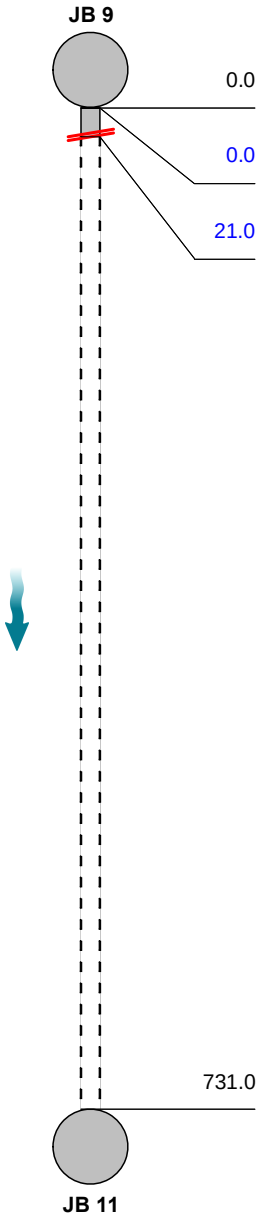
5, 00:26:25, 722.00ft
Obstacles Construction Debris, 10% of cross sectional area
from 5 o'clock to 7 o'clock

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/6/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 9 TO JB 10 TO JB 11**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Downstream**		**731.0 '**	**21.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 9**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 11**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:5517	Distance	Code	Observation	Counter	Photo	Grade
	0.0	ADP	Discharge Point	00:00:00		
	0.0	MWL	Water Level, 5% of the vertical dimension	00:00:02		
	21.0	MSA	Survey Abandoned / ROCK UNABLE TO PASS	00:01:56	1	
	731.0		End of pipe			

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

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Section Pictures - 5/6/2026 - JB 9 TO JB 10 TO JB 11

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/6/2026**	**JB 9 TO JB 10 TO JB 11**	**6**

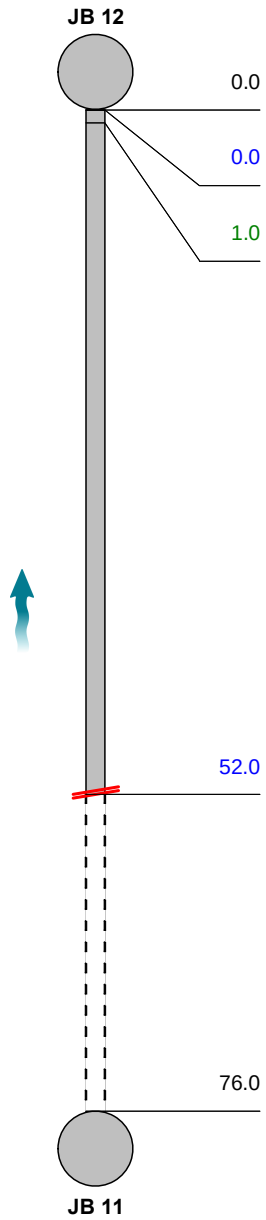
1, 00:01:56, 21.00ft
Survey Abandoned / ROCK UNABLE TO PASS

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/6/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 11 TO JB 12**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Upstream**		**76.0 '**	**52.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 11**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 12**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:574 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point	00:00:00		
0.0	MWL	Water Level, 5% of the vertical dimension	00:00:02		
1.0	OBN	Obstacles Construction Debris, 10% of cross sectional area from 5 o'clock to 7 o'clock	00:00:20	1	M2
52.0	MSA	Survey Abandoned / UANBLE TO PASS DEBRIS..GOING TO JB 11	00:03:08	2	
76.0		End of pipe			

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	2100	2100	0.0	2.0	2.0	0.0	2.0	2.0

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Section Pictures - 5/6/2026 - JB 11 TO JB 12

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/6/2026**	**JB 11 TO JB 12**	**7**

1, 00:00:20, 1.00ft
Obstacles Construction Debris, 10% of cross sectional area from 5 o'clock to 7 o'clock

2, 00:03:08, 52.00ft
Survey Abandoned / UANBLE TO PASS DEBRIS..GOING TO JB 11

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/6/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 11 TO JB 12**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Downstream**		**76.0 '**	**76.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 11**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 12**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					

1:574	Distance	Code	Observation	Counter	Photo	Grade
	0.0	ADP	Discharge Point	00:00:00		
	0.0	MWL	Water Level, 5% of the vertical dimension	00:00:01		
	11.0	OBN	Obstacles Construction Debris, 5% of cross sectional area from 5 o'clock to 7 o'clock	00:00:52	1, 2	M2
	63.0	OBN	Obstacles Construction Debris, 25% of cross sectional area from 5 o'clock to 7 o'clock	00:03:20	3	M4
	76.0	MSA	Survey Abandoned / UNABLE TO PASS HEAVY DEBRIS..WILL CONTINUE FROM OTHER SIDE	PRESET:0		

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	4121	4121	0.0	6.0	6.0	0.0	3.0	3.0

WINCAN

Section Pictures - 5/6/2026 - JB 11 TO JB 12

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/6/2026**	**JB 11 TO JB 12**	**7**

1, 00:00:52, 11.00ft
Obstacles Construction Debris, 5% of cross sectional area
from 5 o'clock to 7 o'clock

2, 00:00:52, 11.00ft
Obstacles Construction Debris, 5% of cross sectional area
from 5 o'clock to 7 o'clock

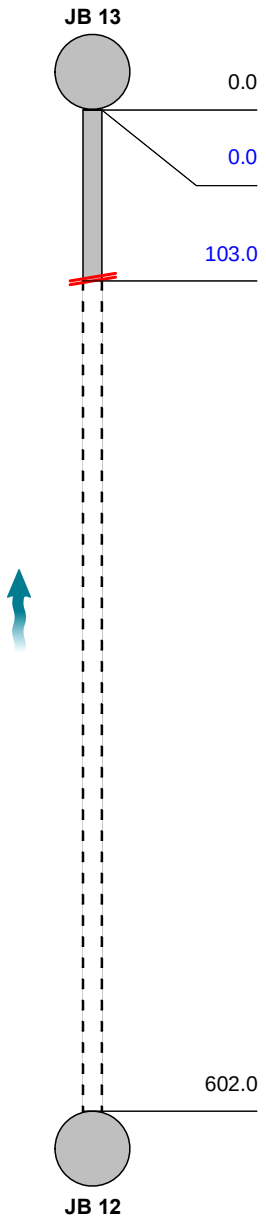
3, 00:03:20, 63.00ft
Obstacles Construction Debris, 25% of cross sectional area
from 5 o'clock to 7 o'clock

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/6/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 12 TO JB 13**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Upstream**		**602.0 '**	**103.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 12**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 13**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:4544 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point	00:00:00		
0.0	MWL	Water Level, 30% of the vertical dimension	00:00:02		
103.0	MSA	Survey Abandoned / AT STOPPING POINT	00:04:48		
602.0		End of pipe			

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/6/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 12 TO JB 13**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Downstream**		**602.0 '**	**602.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 12**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 13**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					

1:4544	Distance	Code	Observation	Counter	Photo	Grade
	0.0	ADP	Discharge Point	00:00:00		
	0.0	MWL	Water Level, 5% of the vertical dimension	00:00:01		
	0.0	OBN	Obstacles Construction Debris, 20% of cross sectional area from 4 o'clock to 8 o'clock	00:00:03	1	M3
	290.0	RPP	Repair Patch at 12 o'clock / REPAIR PATCH	00:12:10	2	
	602.0	MSA	Survey Abandoned / HEAVY SILT AT BOTTOM WHEELS SLIPPING..WILL CONTINUE AT OTHER SIDE	00:28:16	3	

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3100	3100	0.0	3.0	3.0	0.0	3.0	3.0

WINCAN

Section Pictures - 5/6/2026 - JB 12 TO JB 13

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/6/2026**	**JB 12 TO JB 13**	**8**

1, 00:00:03, 0.00ft
Obstacles Construction Debris, 20% of cross sectional area from 4 o'clock to 8 o'clock

2, 00:12:10, 290.00ft
Repair Patch at 12 o'clock / REPAIR PATCH

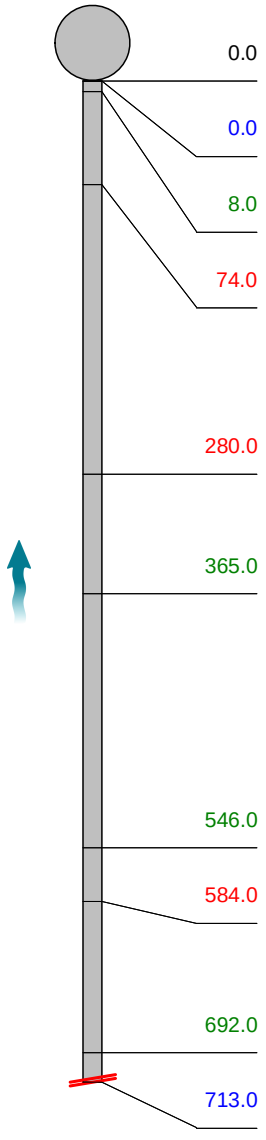
3, 00:28:16, 602.00ft
Survey Abandoned / HEAVY SILT AT BOTTOM WHEELS SLIPPING..WILL CONTINUE AT OTHER SIDE

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/6/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 15 TO JB 14**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Upstream**		**713.0 '**	**713.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 14**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 15**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:5382 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point	00:00:00		
0.0	MWL	Water Level, 5% of the vertical dimension	00:00:04		
8.0	RMJ	Roots Medium Joint from 10 o'clock to 2 o'clock, 10% lost, within 8 inch	00:00:30	1	M3
74.0	RPP	Repair Patch at 12 o'clock / PATCH REPAIR	00:02:57	2	
280.0	RPP	Repair Patch at 12 o'clock / PATCH REPAIR	00:09:01	3	
365.0	RMJ	Roots Medium Joint at 12 o'clock, 5% lost, within 8 inch / CLEAN OUT	00:12:46	4	M3
546.0	RMJ	Roots Medium Joint from 9 o'clock to 11 o'clock, 5% lost, within 8 inch	00:18:41	5	M3
584.0	RPP	Repair Patch at 12 o'clock / PATCH REPAIR	00:19:57		
692.0	RMJ	Roots Medium Joint at 12 o'clock, 5% lost, within 8 inch / CLEAN OUT WITH ROOT INTRUSTION	00:23:42	6	M3
713.0	MSA	Survey Abandoned / UNDER WATER	PRESET:0		

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3400	3400	0.0	12.0	12.0	0.0	3.0	3.0

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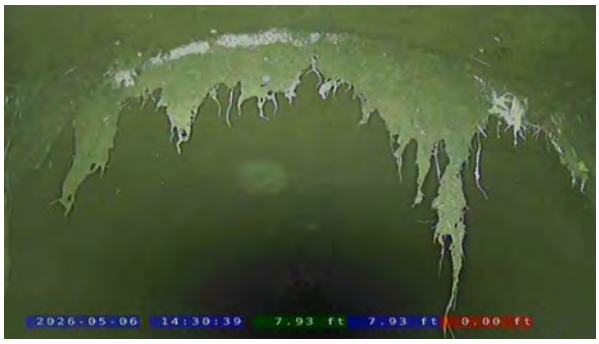
Section Pictures - 5/6/2026 - JB 15 TO JB 14

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/6/2026**	**JB 15 TO JB 14**	**9**



1, 00:00:30, 8.00ft
Roots Medium Joint from 10 o'clock to 2 o'clock, 10% lost, within 8 inch

2, 00:02:57, 74.00ft
Repair Patch at 12 o'clock / PATCH REPAIR

3, 00:09:01, 280.00ft
Repair Patch at 12 o'clock / PATCH REPAIR

4, 00:12:46, 365.00ft
Roots Medium Joint at 12 o'clock, 5% lost, within 8 inch / CLEAN OUT

WINCAN

Section Pictures - 5/6/2026 - JB 15 TO JB 14

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/6/2026**	**JB 15 TO JB 14**	**9**

5, 00:18:41, 546.00ft
Roots Medium Joint from 9 o'clock to 11 o'clock, 5% lost, within 8 inch

6, 00:23:42, 692.00ft
Roots Medium Joint at 12 o'clock, 5% lost, within 8 inch / CLEAN OUT WITH ROOT INTRUSTION

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/7/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 15 TO JB 16**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Downstream**		**734.0 '**	**734.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 16**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 15**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					

1:5540 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point	00:00:00		
0.0	MWL	Water Level, 5% of the vertical dimension	00:00:02		
165.0	CC	Crack Circumferential from 3 o'clock to 9 o'clock	00:05:51	1, 2	S1
267.0	RMJ	Roots Medium Joint from 8 o'clock to 4 o'clock, 5% lost, within 8 inch	00:10:07	3	M3
279.0	RMJ	Roots Medium Joint from 7 o'clock to 10 o'clock, 5% lost, within 8 inch	00:10:41	4	M3
394.0	RMJ	Roots Medium Joint from 8 o'clock to 4 o'clock, 10% lost, within 8 inch / CLEAN OUT WITH ROOTS	00:14:13	5	M3
453.0	RMJ	Roots Medium Joint at 12 o'clock, 5% lost, within 8 inch	00:17:09	6	M3
582.0	RMJ	Roots Medium Joint from 9 o'clock to 4 o'clock, 5% lost, within 8 inch	00:22:48	7	M3
651.0	RPP	Repair Patch at 12 o'clock / PATCH REPAIR	00:25:36	8	
688.0	RMJ	Roots Medium Joint from 11 o'clock to 1 o'clock, 5% lost, within 8 inch	00:27:21	9	M3
730.0	OBN	Obstacles Construction Debris, 25% of cross sectional area from 5 o'clock to 7 o'clock	00:29:37	10	M4
734.0	MSA	Survey Abandoned / UNABLE TO GO ANY FURTHER WHEEL SLIP TOO MUDDY	PRESET:0	11, 12	

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
1100	4136	4136	1.0	22.0	23.0	1.0	3.1	2.9

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Section Pictures - 5/7/2026 - JB 15 TO JB 16

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/7/2026**	**JB 15 TO JB 16**	**10**

1, 00:05:51, 165.00ft
Crack Circumferential from 3 o'clock to 9 o'clock

2, 00:05:51, 165.00ft
Crack Circumferential from 3 o'clock to 9 o'clock

3, 00:10:07, 267.00ft
Roots Medium Joint from 8 o'clock to 4 o'clock, 5% lost, within 8 inch

4, 00:10:41, 279.00ft
Roots Medium Joint from 7 o'clock to 10 o'clock, 5% lost, within 8 inch

WINCAN

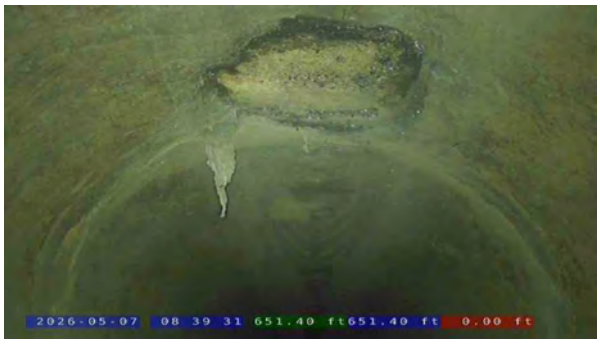
Section Pictures - 5/7/2026 - JB 15 TO JB 16

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/7/2026**	**JB 15 TO JB 16**	**10**

5, 00:14:13, 394.00ft
Roots Medium Joint from 8 o'clock to 4 o'clock, 10% lost, within 8 inch / CLEAN OUT WITH ROOTS

6, 00:17:09, 453.00ft
Roots Medium Joint at 12 o'clock, 5% lost, within 8 inch

7, 00:22:48, 582.00ft
Roots Medium Joint from 9 o'clock to 4 o'clock, 5% lost, within 8 inch



8, 00:25:36, 651.00ft
Repair Patch at 12 o'clock / PATCH REPAIR

WINCAN

Section Pictures - 5/7/2026 - JB 15 TO JB 16

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/7/2026**	**JB 15 TO JB 16**	**10**

9, 00:27:21, 688.00ft
Roots Medium Joint from 11 o'clock to 1 o'clock, 5% lost, within 8 inch

10, 00:29:37, 730.00ft
Obstacles Construction Debris, 25% of cross sectional area from 5 o'clock to 7 o'clock

11, PRESET:0, 734.00ft
Survey Abandoned / UNABLE TO GO ANY FURTHER WHEEL SLIP TOO MUDDY

12, PRESET:0, 734.00ft
Survey Abandoned / UNABLE TO GO ANY FURTHER WHEEL SLIP TOO MUDDY

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/7/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 2 TO JB 3**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Downstream**		**900.0 '**	**900.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 2**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 3**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					

1:6793 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point	00:00:00		
0.0	MWL	Water Level, 5% of the vertical dimension	00:00:00		
375.0	OBN	Obstacles Construction Debris, 15% of cross sectional area from 5 o'clock to 7 o'clock	00:04:28	1, 2	M3
534.0	MGO	General Observation / V2	00:10:03	3	
601.0	OBN	Obstacles Construction Debris, 20% of cross sectional area from 5 o'clock to 7 o'clock	00:11:58	4	M3
900.0	MSA	Survey Abandoned / RAN OUT OF CABLE GOIN TO JB 3	00:21:44		

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3200	3200	0.0	6.0	6.0	0.0	3.0	3.0

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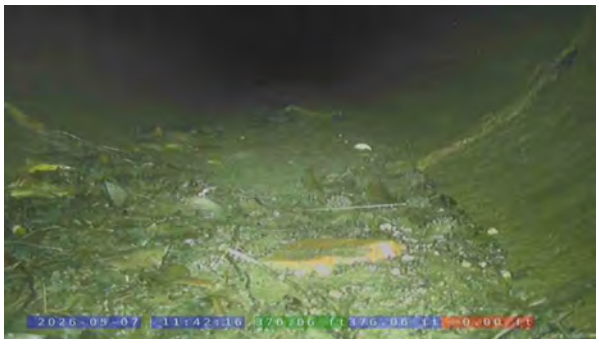
Section Pictures - 5/7/2026 - JB 2 TO JB 3

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/7/2026**	**JB 2 TO JB 3**	**11**



1, 00:04:28, 375.00ft
Obstacles Construction Debris, 15% of cross sectional area from 5 o'clock to 7 o'clock

2, 00:04:28, 375.00ft
Obstacles Construction Debris, 15% of cross sectional area from 5 o'clock to 7 o'clock

3, 00:10:03, 534.00ft
General Observation / V2

4, 00:11:58, 601.00ft
Obstacles Construction Debris, 20% of cross sectional area from 5 o'clock to 7 o'clock

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/7/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 2 TO JB 1**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Downstream**		**650.0 '**	**650.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 2**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 1**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					

1:4906 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point	00:00:00		
0.0	MWL	Water Level, 5% of the vertical dimension	00:00:01		
2.0	RFJ	Roots Fine Joint from 8 o'clock to 1 o'clock, within 8 inch	00:00:35	1	M1
276.0	MGO	General Observation / JOINT BREAKING UP	00:08:27	2	
533.0	RPP	Repair Patch at 12 o'clock / PATCH REPAIR	00:15:30		
650.0	MSA	Survey Abandoned / JB 1	PRESET:0		

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	1100	1100	0.0	1.0	1.0	0.0	1.0	1.0

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Section Pictures - 5/7/2026 - JB 2 TO JB 1

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/7/2026**	**JB 2 TO JB 1**	**12**

1, 00:00:35, 2.00ft
Roots Fine Joint from 8 o'clock to 1 o'clock, within 8 inch

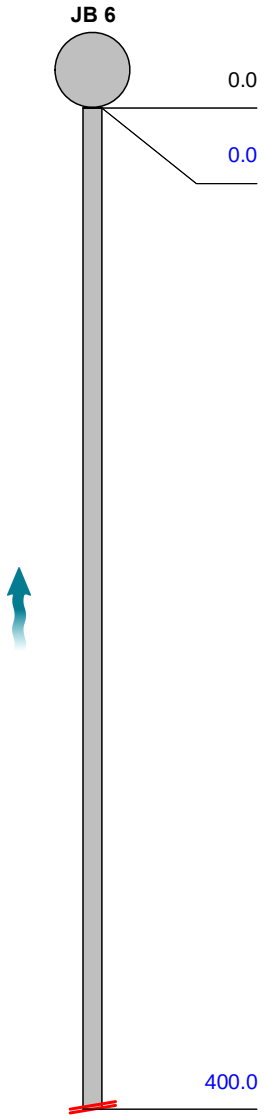
2, 00:08:27, 276.00ft
General Observation / JOINT BREAKING UP

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/7/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 6 TO JB 5**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Upstream**		**400.0 '**	**400.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 5**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 6**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:3019	Distance	Code	Observation	Counter	Photo	Grade
	0.0	ADP	Discharge Point	00:00:00		
	0.0	MWL	Water Level, 5% of the vertical dimension	00:00:04		
	400.0	MSA	Survey Abandoned / JB 5	PRESET:0		

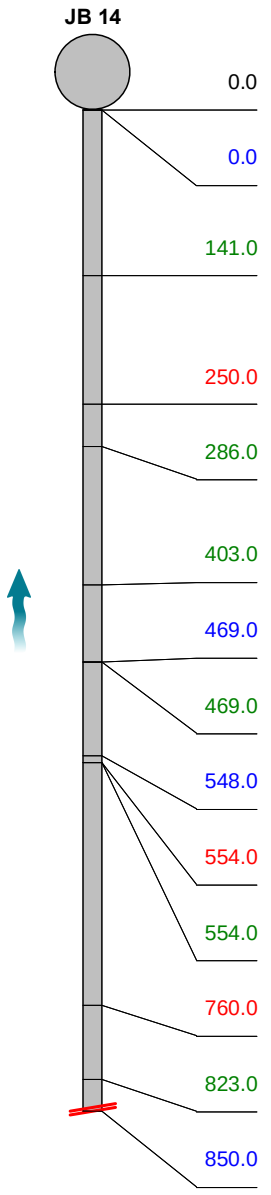
QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0000	0.0	0.0	0.0	0.0	0.0	0.0

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/8/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 13 TO JB 14**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Upstream**		**850.0 '**	**850.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 13**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 14**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:6416 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point			
0.0	MWL	Water Level, 20% of the vertical dimension	00:00:00		
141.0	RMJ	Roots Medium Joint from 11 o'clock to 1 o'clock, 5% lost, within 8 inch	00:04:44	1	M3
250.0	RPP	Repair Patch at 12 o'clock / PATCH REPAIR	00:07:39	2	
286.0	RMJ	Roots Medium Joint from 12 o'clock to 4 o'clock, 5% lost, within 8 inch	00:09:12	3	M3
403.0	RMJ	Roots Medium Joint from 2 o'clock to 10 o'clock, 5% lost, within 8 inch	00:14:17	4	M3
469.0	MGO	General Observation / CLEAN OUT	00:17:25	5	
469.0	RMJ	Roots Medium Joint at 12 o'clock, 5% lost, within 8 inch	00:17:29	6	M3
548.0	MGO	General Observation / CLEAN OUT	00:20:40	7	
554.0	RPP	Repair Patch at 12 o'clock / PATCH REPAIR	00:21:12	8	
554.0	RMJ	Roots Medium Joint at 12 o'clock, 5% lost, within 8 inch	00:21:37	9	M3
760.0	RPP	Repair Patch at 12 o'clock / PATCH REPAIR	00:28:34	10	
823.0	RMJ	Roots Medium Joint from 9 o'clock to 3 o'clock, 5% lost, within 8 inch	00:31:28	11	M3
850.0	MSA	Survey Abandoned / JB 13 VIDEO OVERLAP	PRESET:0		

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3600	3600	0.0	18.0	18.0	0.0	3.0	3.0

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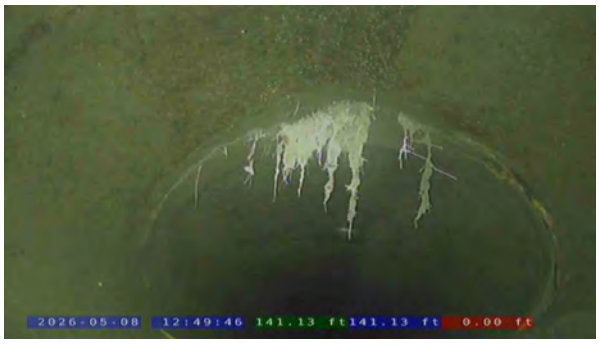
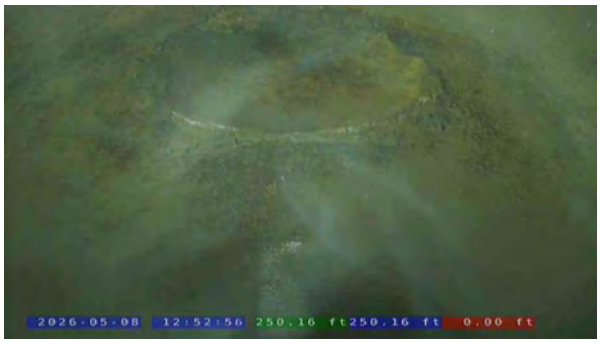
Section Pictures - 5/8/2026 - JB 13 TO JB 14

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/8/2026**	**JB 13 TO JB 14**	**14**



1, 00:04:44, 141.00ft
Roots Medium Joint from 11 o'clock to 1 o'clock, 5% lost, within 8 inch



2, 00:07:39, 250.00ft
Repair Patch at 12 o'clock / PATCH REPAIR

3, 00:09:12, 286.00ft
Roots Medium Joint from 12 o'clock to 4 o'clock, 5% lost, within 8 inch

4, 00:14:17, 403.00ft
Roots Medium Joint from 2 o'clock to 10 o'clock, 5% lost, within 8 inch

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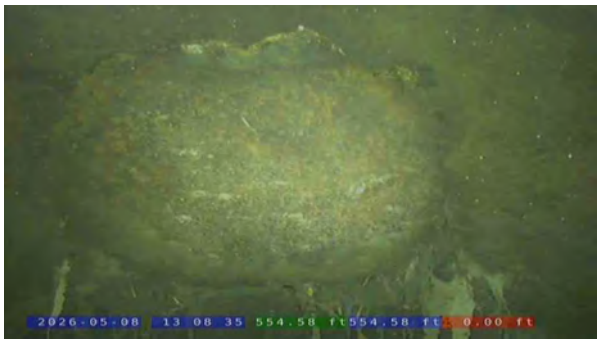
Section Pictures - 5/8/2026 - JB 13 TO JB 14

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/8/2026**	**JB 13 TO JB 14**	**14**

5, 00:17:25, 469.00ft
General Observation / CLEAN OUT

6, 00:17:29, 469.00ft
Roots Medium Joint at 12 o'clock, 5% lost, within 8 inch

7, 00:20:40, 548.00ft
General Observation / CLEAN OUT



8, 00:21:12, 554.00ft
Repair Patch at 12 o'clock / PATCH REPAIR

WINCAN

Section Pictures - 5/8/2026 - JB 13 TO JB 14

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/8/2026**	**JB 13 TO JB 14**	**14**

9, 00:21:37, 554.00ft
Roots Medium Joint at 12 o'clock, 5% lost, within 8 inch

10, 00:28:34, 760.00ft
Repair Patch at 12 o'clock / PATCH REPAIR

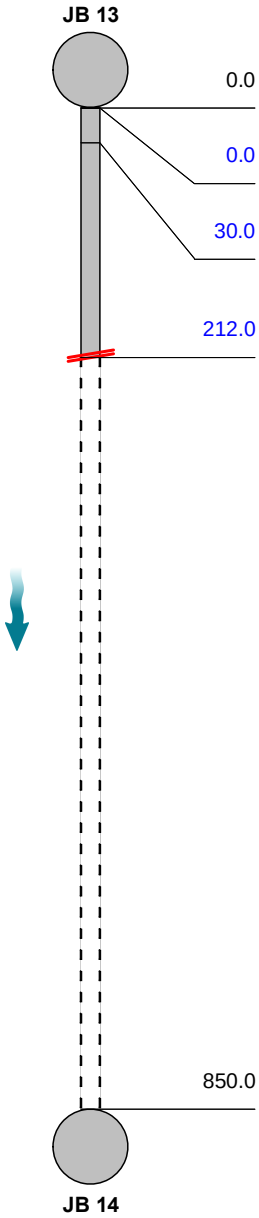
11, 00:31:28, 823.00ft
Roots Medium Joint from 9 o'clock to 3 o'clock, 5% lost, within 8 inch

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/7/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 13 TO JB 14**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Downstream**		**850.0 '**	**212.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 13**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**JB 14**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:6416 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point	00:00:00		
0.0	MWL	Water Level, 25% of the vertical dimension	00:00:03		
30.0	MWM	Water Mark, 50% of the vertical dimension	00:01:18		M4
212.0	MSA	Survey Abandoned / UNDER WATER	PRESET:0		
850.0		End of pipe			

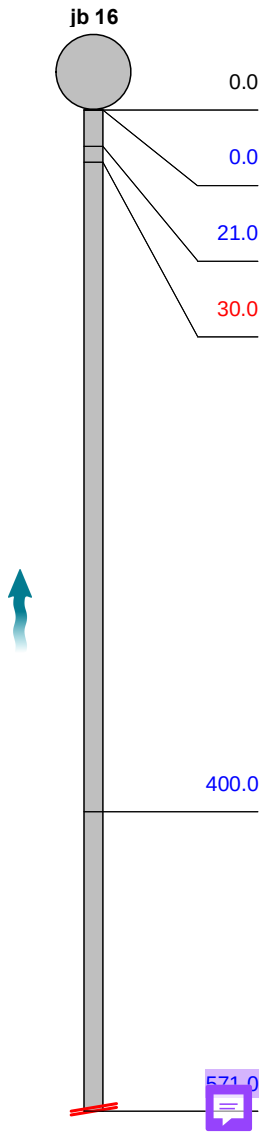
QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	4100	4100	0.0	4.0	4.0	0.0	4.0	4.0

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/7/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**jb 16 to jb 17**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Upstream**		**571.0 '**	**571.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**jb17**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**jb 16**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Reinforced Concrete Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					



1:4310 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point	00:00:00		
0.0	MWL	Water Level, 20% of the vertical dimension	00:00:01		
21.0	MWM	Water Mark, 40% of the vertical dimension	00:01:30		
30.0	LFBU	Lining Failure Bulges from 4 o'clock to 8 o'clock	00:02:23	1, 2	S3
400.0	MWM	Water Mark, 50% of the vertical dimension	00:23:41		M4
571.0	MSA	Survey Abandoned / UNDER WATER	PRESET:0		

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
3100	4100	4131	3.0	4.0	7.0	3.0	4.0	3.5

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Section Pictures - 5/7/2026 - jb 16 to jb 17

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/7/2026**	**jb 16 to jb 17**	**15**

1, 00:02:23, 30.00ft
Lining Failure Bulges from 4 o'clock to 8 o'clock

2, 00:02:23, 30.00ft
Lining Failure Bulges from 4 o'clock to 8 o'clock

WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/8/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**UPSTREAM CROSSING**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Downstream**		**104.0 '**	**104.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**UPSTREAM CROSSING**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**DOWN STREAM SD**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Corrugated Metal Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			
Additional Info:					

1:785 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point	00:00:00		
0.0	MWL	Water Level, 5% of the vertical dimension	00:00:02		
3.0	OBN	Obstacles Construction Debris, 10% of cross sectional area from 4 o'clock to 8 o'clock	00:00:37	1	M2
61.0	OBN	Obstacles Construction Debris, 45% of cross sectional area from 4 o'clock to 8 o'clock	00:03:34		M5
73.0	RMJ	Roots Medium Joint from 8 o'clock to 4 o'clock, 35% lost, within 8 inch	00:04:24		M3
76.0	MMC	Material Change, Concrete pipe (non reinforced) / MATERIAL CHANGE	00:04:40		
104.0	MWM	Water Mark, 85% of the vertical dimension	00:06:13	2	M5
104.0	MSA	Survey Abandoned / PIPE FULL OF WATER UNABLE GO ANY FURTHER	00:06:57		

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	5231	5231	0.0	15.0	15.0	0.0	3.8	3.8

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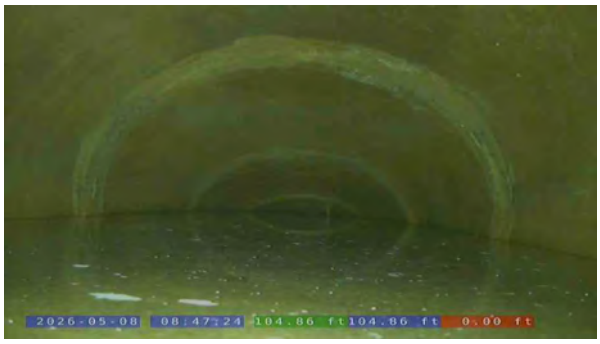
Section Pictures - 5/8/2026 - UPSTREAM CROSSING

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/8/2026**	**UPSTREAM CROSSING**	**16**

1, 00:00:37, 3.00ft
Obstacles Construction Debris, 10% of cross sectional area from 4 o'clock to 8 o'clock



2, 00:06:13, 104.00ft
Water Mark, 85% of the vertical dimension

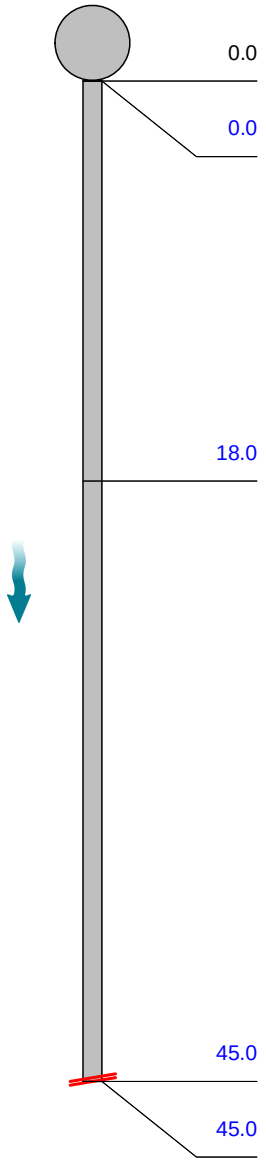
WINCAN

Inspection report

Date:	Work Order:	Weather:	Surveyed By:	Certificate Number:	Pipe Segment Ref.:
5/8/2026			**JAKHARIE MURPHY**	**P0035782-012022**	**JB 16 SIPHON TO CREEK**
Year laid:	Pre-cleaning:	Direction:	Pipe Joint Length:	Total Length:	Length Surveyed:
	No Pre-Cleaning	**Downstream**		**45.0 '**	**45.0 '**

City:	**DURHAM**	Drainage Area:		Upstream MH:	**JB 16 SIPHON**
Street:	**DURHAM DAYTON HWY**	Media Label:		Up Rim to Invert:	
Location Code:		Flow Control:		Downstream MH:	**CREEK**
Location Details:		Sheet Number:		Down Rim to Invert:	
Pipe shape:	**Circular**	Sewer Use:		Total gallons used:	**0.0**
Pipe size:	**36 "**	Sewer Category:	**SEC**	Joints passed:	**0**
Pipe material:	**Corrugated Metal Pipe**	Purpose:		Joints failed:	**0**
Lining Method:		Owner:			

Additional Info:



1:340 Distance	Code	Observation	Counter	Photo	Grade
0.0	ADP	Discharge Point	00:00:00		
0.0	MWL	Water Level, 5% of the vertical dimension	00:00:02		
18.0	MMC	Material Change, Concrete pipe (non reinforced) / MATERIAL CHANGE	00:02:15	1	
45.0	MWM	Water Mark, 85% of the vertical dimension	00:05:00	2	M5
45.0	MSA	Survey Abandoned / PIPE FULL OF WATER	00:05:04		

QSR	QMR	QOR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	5100	5100	0.0	5.0	5.0	0.0	5.0	5.0

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Section Pictures - 5/8/2026 - JB 16 SIPHON TO CREEK

City	Street	Date	Lateral Segment Reference	Nr.
DURHAM	**DURHAM DAYTON HWY**	**5/8/2026**	**JB 16 SIPHON TO CREEK**	**17**

1, 00:02:15, 18.00ft
Material Change, Concrete pipe (non reinforced) / MATERIAL CHANGE

2, 00:05:00, 45.00ft
Water Mark, 85% of the vertical dimension

ATTACHMENT C
ROM COST ESTIMATE

Geosyntec consultants

1111 Broadway, 6th Floor
Oakland, California 94607
PH 510.285.2700
www.geosyntec.com

Attachment C

Date: June 9, 2026
To: File

From: Mike Rudd, PE, C51806
Subject: **ROM Cost Estimate, DMWC Mainline Rehabilitation**
Geosyntec Project Number: SFO154C

This attachment presents a rough order-of-magnitude (ROM) planning-level preliminary cost estimate to support the accompanying memorandum regarding the rehabilitation of the Durham Mutual Water Company's (DMWC) mainline conveyance system. The estimate is based on available CCTV inspection results, recent field survey information, and planning-level assumptions regarding the extent of required cleaning, root removal, structural rehabilitation, and pipe replacement. The proposed rehabilitation approach prioritizes non-structural maintenance for the majority of the pipeline, while targeted segments are assumed to require sliplining with an HDPE liner or open-cut replacement. Based on these assumptions, the total project cost is estimated to range from approximately $2.7 million to $4.5 million, with a most likely value of approximately $3.4 million, inclusive of allowances for construction, engineering and permitting, construction management, and contingency. Given the age of the system and the limited ability to fully verify pipe condition before construction, further refinement of this estimate is recommended following development of a reach-level rehabilitation plan and additional field verification.

1. PURPOSE

This attachment presents a planning-level (rough order-of-magnitude) cost estimate for rehabilitation of DMWC's primary conveyance pipeline, based on available CCTV inspection results and updated rehabilitation assumptions.

2. PROJECT DESCRIPTION

The project consists of the rehabilitation of an approximately 12,000 linear foot, 36-inch reinforced concrete pipeline extending from the Butte Creek diversion structure. The system includes 17 junction boxes with turnout valves serving adjacent users. The system was constructed in the early 1900s and exhibits deterioration, including sediment and debris accumulation, root intrusion, and localized structural distress.

3. BASIS OF QUANTITIES

The quantities presented in the table below were developed based on interpretation of the CCTV inspection results and field survey data, combined with planning-level assumptions regarding the extent

of required cleaning, root removal, structural rehabilitation, and pipe replacement. The percentage-based approach reflects the estimated distribution of observed defects across the system and is intended to provide a reasonable allocation of rehabilitation methods for planning and budgeting.

Item	Percentage	Quantity
Pipeline cleaning (36-inch)	90%	10,800 LF
Root removal (36-inch)	30%	3,600 LF
Sliplining with HDPE liner (36-inch)	20%	2,400 LF
Open-cut replacement (36-inch pipe)	10%	1,200 LF
Junction box rehabilitation (minor)	N/A	17 EA

4. UNIT COST SUMMARY

The unit costs presented herein were developed using a combination of publicly available benchmarks for large-diameter pipeline installation and rehabilitation, industry reference guidance, and professional engineering judgment, adjusted for project-specific conditions. Sliplining costs were derived using typical installed-cost relationships that account for access, installation, and grouting requirements beyond material cost alone.

The selected unit cost ranges reflect primary cost drivers such as pipe condition, installation method, and labor requirements, and were further reduced to account for favorable site assumptions, including excellent access, no utility conflicts, no flow diversion, and excavation limited to native soils.

Consistent with standard estimating practice for an AACE Class 4/5 estimate, unit cost ranges (low/mid/high) are provided to capture uncertainty in scope definition, construction means and methods, and site variability at this stage of project development.

Item	Unit	Low Unit Cost ($)	Mid Unit Cost ($)	High Unit Cost ($)
Pipeline cleaning (36-inch)	LF	7	12	20
Root removal (36-inch)	LF	9	18	30
Sliplining with HDPE liner (36-inch)	LF	475	575	725
Open-cut replacement (36-inch pipe)	LF	225	275	375
Junction box rehabilitation (minor)	EA	2,500	2,500	2,500

5. COST ESTIMATE SUMMARY

The table below summarizes the direct construction cost subtotal for the assumed rehabilitation quantities and unit costs. The total project cost shown beneath the table includes additional "soft-cost" allowances for engineering design and permitting, construction management and inspection, and contingency to account for uncertainties inherent in planning-level estimates, such as variability in subsurface conditions, actual pipe condition encountered during rehabilitation, and potential changes in construction means and methods.

Item	Low ($)	Most Likely ($)	High ($)
Pipeline cleaning (36-inch)	75,600	129,600	216,000
Root removal (36-inch)	32,400	64,800	108,000
Sliplining with HDPE liner (36-inch)	1,140,000	1,380,000	1,740,000
Open-cut replacement (36-inch pipe)	270,000	330,000	450,000
Junction box rehabilitation (minor)	42,500	42,500	42,500
Direct construction subtotal	1,560,500	1,946,900	2,556,500

Soft Cost Allowance	Low ($)	Most Likely ($)	High ($)
Engineering design and permitting	234,000	292,000	383,000
Construction management and inspection	156,000	195,000	256,000
Contingency	780,000	966,100	1,304,500
Total soft costs and contingency	**1,170,000**	**1,453,100**	**1,943,500**

Total Estimated Project Cost: Low $2.7M, Most Likely $3.4M, High $4.5M.

6. ASSUMPTIONS

- Sliplining is assumed for approximately 20 percent of the pipeline length as a ROM cost allowance, generally corresponding to the currently identified candidate segments with suspected leakage, cracking, or root intrusion; however, final sliplining limits are subject to cleaning, follow-up inspection, constructability review, and confirmation that the reduced internal diameter would not adversely affect required conveyance capacity.
- Open-cut replacement is assumed to be limited to approximately 10 percent of the total pipeline length.
- Pipeline cleaning and root removal are assumed to address the majority of non-structural defects.
- Junction boxes are assumed to require only minor rehabilitation.
- Flow diversion is assumed not to be required during construction.
- Subsurface conditions are assumed to be generally uniform along the project corridor.

7. EXCLUSIONS

- Full reconstruction of junction boxes.
- Major valve replacement.
- Pipeline upsizing or horizontal realignment.
- Major upgrades to the diversion structure.
- Extensive bypass pumping systems.
- Groundwater dewatering systems.
- Right-of-way acquisition.

* * * * *

Appendix C - Permits

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

Environmental Health Division
202 Mira Loma Drive
Oroville, California 95965
T: 530.552.3880
F: 530.538.5339
buttecounty.net/publichealth

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☒ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** CPT-5

Well Location: -121.855228, 39.684660 **Cross Street:** S. Comance Creek/E Dayton Rd **APN:** 039-090-082-000

Township: unincorporated **Range:** **Section:**

Owner Name: Julia Violich **Telephone No.** 916-637-8341

Owner Mailing Address: P O BOX 875 Kentfield CA **Zip** 94914

C-57 Contractor ConeTech **Telephone No.** 1-925-849-2989

C-57 Mailing Address: 506 De Carlo Ave **Zip** 94801 **License #:** 1049248

Consultant Name: Geosyntec Consulting -Mike van den Eden **Telephone No.** 916-637-8341

Consultant Mailing Address: 3043 Gold Canal Dr, Suite 100, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☐ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☒ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 75 ft
Diameter of Borehole 2 in
Well Casing Diameter
Multiple Casings (#)

Comments: Six CPT borings will be to 75 ft, two CPT borings will be to 100 ft

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X [signature] **Title/Company** Principal

Print Name Michael van den Encden **Date** August 29, 2025

DEPARTMENT USE ONLY

Application Approved By: [signature] Date issued: 8/29/2025

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ✓ *WC* ✓ *Waiver* _____ *C-57 Letter of Authorization* _____ *Encroachment Document* _____

Fees Received 459 – Receipt # 14775071 Date Paid 8/6/25 Received by _____

Call Time/Call Date/Seal ID# _____/_____/_____ **Date/Time Ready** _____/_____

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

Environmental Health Division
202 Mira Loma Drive
Oroville, California 95965
T: 530.552.3880
F: 530.538.5339
buttecounty.net/publichealth

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☒ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** CPT-6

Well Location: -121.855228, 39.684660 **Cross Street:** S. Comance Creek/E Dayton Rd **APN:** 039-090-082-000

Township: unincorporated **Range:** **Section:**

Owner Name: Julia Violich **Telephone No.** 916-637-8341

Owner Mailing Address: P O BOX 875 Kentfield CA **Zip** 94914

C-57 Contractor ConeTech **Telephone No.** 1-925-849-2989

C-57 Mailing Address: 506 De Carlo Ave **Zip** 94801 **License #:** 1049248

Consultant Name: Geosyntec Consulting -Mike van den Eden **Telephone No.** 916-637-8341

Consultant Mailing Address: 3043 Gold Canal Dr, Suite 100, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☐ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☒ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 75 ft
Diameter of Borehole 2 in
Well Casing Diameter
Multiple Casings (#)

Comments: Six CPT borings will be to 75 ft, two CPT borings will be to 100 ft

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X [signature] **Title/Company** Principal

Print Name Michael van den Encden **Date** August 29, 2025

DEPARTMENT USE ONLY

Application Approved By: [signature] Date issued: 8/29/2025

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ✓ *WC* ✓ *Waiver* _____ *C-57 Letter of Authorization* _____ *Encroachment Document* _____

Fees Received 459 – Receipt # 147756171 Date Paid 8/6/25 Received by _____

Call Time/Call Date/Seal ID# _____/_____/_____ **Date/Time Ready** _____/_____

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

Environmental Health Division
202 Mira Loma Drive
Oroville, California 95965
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APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☒ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** CPT-7

Well Location: -121.855228, 39.684660 **Cross Street:** S. Comance Creek/E Dayton Rd **APN:** 039-090-081-000

Township: unincorporated **Range:** **Section:**

Owner Name: Julia Violich **Telephone No.** 916-637-8341

Owner Mailing Address: P O BOX 875 Kentfield CA **Zip** 94914

C-57 Contractor ConeTech **Telephone No.** 1-925-849-2989

C-57 Mailing Address: 506 De Carlo Ave **Zip** 94801 **License #:** 1049248

Consultant Name: Geosyntec Consulting -Mike van den Eden **Telephone No.** 916-637-8341

Consultant Mailing Address: 3043 Gold Canal Dr, Suite 100, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☐ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☒ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 75 ft
Diameter of Borehole 2 in
Well Casing Diameter
Multiple Casings (#)

Comments: Six CPT borings will be to 75 ft, two CPT borings will be to 100 ft

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X _____ **Title/Company** Principal

Print Name Michael van den Encden **Date** August 29, 2025

DEPARTMENT USE ONLY

Application Approved By: _____ Date issued: 8/29/25

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 / *WC* / *Waiver* _____ *C-57 Letter of Authorization* _____ *Encroachment Document* _____

Fees Received 459- Receipt # 14775017 Date Paid 8/6/25 Received by _____

Call Time/Call Date/Seal ID# _____/_____/_____ **Date/Time Ready** _____/_____

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

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APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☒ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** CPT-8

Well Location: -121.855228, 39.684660 **Cross Street:** S. Comance Creek/E Dayton Rd **APN:** 039-090-082-000

Township: unincorporated **Range:** **Section:**

Owner Name: Julia Violich **Telephone No.** 916-637-8341

Owner Mailing Address: P O BOX 875 Kentfield CA **Zip** 94914

C-57 Contractor ConeTech **Telephone No.** 1-925-849-2989

C-57 Mailing Address: 506 De Carlo Ave **Zip** 94801 **License #:** 1049248

Consultant Name: Geosyntec Consulting -Mike van den Eden **Telephone No.** 916-637-8341

Consultant Mailing Address: 3043 Gold Canal Dr, Suite 100, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring
☐ GW Extraction
☐ Vapor Extraction
☐ Dual Phase Extraction
☐ Air/Ozone Sparge
☒ Other (CPT, Geoprobe, Hydropunch)
☐ Boring (Geo/Env)
☐ Boring (Hydrologic)

CONSTRUCTION SPECIFICATIONS

Boring Depth 75 ft
Diameter of Borehole 2 in
Well Casing Diameter
Multiple Casings (#)

Comments: Six CPT borings will be to 75 ft, two CPT borings will be to 100 ft

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X [signature] **Title/Company** Principal

Print Name Michael van den Encden **Date** August 29, 2025

DEPARTMENT USE ONLY

Application Approved By: [signature] Date issued: 8/29/25

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ✓ *WC* ✓ *Waiver* _____ *C-57 Letter of Authorization* _____ *Encroachment Document* _____

Fees Received 459- Receipt # 14775071 Date Paid 8/16/25 Received by _____

Call Time/Call Date/Seal ID# _____/_____/_____ **Date/Time Ready** _____/_____

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

Environmental Health Division
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APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☒ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** CPT-1

Well Location: -121.855228, 39.684660 **Cross Street:** S. Comance Creek/E Dayton Rd **APN:** 039-090-081-000

Township: unincorporated **Range:** **Section:**

Owner Name: Julia Violich **Telephone No.** 916-637-8341

Owner Mailing Address: P O BOX 875 Kentfield CA **Zip** 94914

C-57 Contractor ConeTech **Telephone No.** 1-925-849-2989

C-57 Mailing Address: 506 De Carlo Ave **Zip** 94801 **License #:** 1049248

Consultant Name: Geosyntec Consulting -Mike van den Eden **Telephone No.** 916-637-8341

Consultant Mailing Address: 3043 Gold Canal Dr, Suite 100, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☐ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☒ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 75 ft
Diameter of Borehole 2 in
Well Casing Diameter
Multiple Casings (#)

Comments: Six CPT borings will be to 75 ft, two CPT borings will be to 100 ft

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

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Signed X _____ **Title/Company** Principal

Print Name Michael van den Encden **Date** August 29, 2025

DEPARTMENT USE ONLY

Application Approved By: _____ Date issued: 8/29/25

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ✓ *WC* ✓ *Waiver* _____ *C-57 Letter of Authorization* _____ *Encroachment Document* _____

Fees Received 459- Receipt # 14775017 Date Paid 8/6/25 Received by _____

Call Time/Call Date/Seal ID# _____/_____/_____ **Date/Time Ready** _____/_____

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

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APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☒ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** CPT-2

Well Location: -121.855228, 39.684660 **Cross Street:** S. Comance Creek/E Dayton Rd **APN:** 039-090-081-000

Township: unincorporated **Range:** **Section:**

Owner Name: Julia Violich **Telephone No.** 916-637-8341

Owner Mailing Address: P O BOX 875 Kentfield CA **Zip** 94914

C-57 Contractor ConeTech **Telephone No.** 1-925-849-2989

C-57 Mailing Address: 506 De Carlo Ave **Zip** 94801 **License #:** 1049248

Consultant Name: Geosyntec Consulting -Mike van den Eden **Telephone No.** 916-637-8341

Consultant Mailing Address: 3043 Gold Canal Dr, Suite 100, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☐ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☒ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 75 ft
Diameter of Borehole 2 in
Well Casing Diameter
Multiple Casings (#)

Comments: Six CPT borings will be to 75 ft, two CPT borings will be to 100 ft

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

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Signed X [signature] **Title/Company** Principal

Print Name Michael van den Encden **Date** August 29, 2025

DEPARTMENT USE ONLY

Application Approved By: [signature] Date issued: 8/29/25

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ___ */WC* ___ *Waiver* ___ *C-57 Letter of Authorization* ___ *Encroachment Document* ___

Fees Received 459 Receipt # 14775171 Date Paid 8/6/25 Received by _____

Call Time/Call Date/Seal ID# _____/_____/_____ **Date/Time Ready** _____/_____

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

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APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☒ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** CPT-3

Well Location: -121.855228, 39.684660 **Cross Street:** S. Comance Creek/E Dayton Rd **APN:** 039-090-082-000

Township: unincorporated **Range:** **Section:**

Owner Name: Julia Violich **Telephone No.** 916-637-8341

Owner Mailing Address: P O BOX 875 Kentfield CA **Zip** 94914

C-57 Contractor ConeTech **Telephone No.** 1-925-849-2989

C-57 Mailing Address: 506 De Carlo Ave **Zip** 94801 **License #:** 1049248

Consultant Name: Geosyntec Consulting -Mike van den Eden **Telephone No.** 916-637-8341

Consultant Mailing Address: 3043 Gold Canal Dr, Suite 100, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☐ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☒ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 75 ft
Diameter of Borehole 2 in
Well Casing Diameter
Multiple Casings (#)

Comments: Six CPT borings will be to 75 ft, two CPT borings will be to 100 ft

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X _____ **Title/Company** Principal

Print Name Michael van den Encden **Date** August 29, 2025

DEPARTMENT USE ONLY

Application Approved By: _____ Date issued: 8/29/25

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ✓ *WC* ✓ *Waiver* ____ *C-57 Letter of Authorization* ____ *Encroachment Document* ____

Fees Received 459 - Receipt # 14775171 Date Paid 8/6/25 Received by _____

Call Time/Call Date/Seal ID# ____/____/____ **Date/Time Ready** ____/____

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

Environmental Health Division
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APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☒ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** CPT-4

Well Location: -121.855228, 39.684660 **Cross Street:** S. Comance Creek/E Dayton Rd **APN:** 039-090-082-000

Township: unincorporated **Range:** **Section:**

Owner Name: Julia Violich **Telephone No.** 916-637-8341

Owner Mailing Address: P O BOX 875 Kentfield CA **Zip** 94914

C-57 Contractor ConeTech **Telephone No.** 1-925-849-2989

C-57 Mailing Address: 506 De Carlo Ave **Zip** 94801 **License #:** 1049248

Consultant Name: Geosyntec Consulting -Mike van den Eden **Telephone No.** 916-637-8341

Consultant Mailing Address: 3043 Gold Canal Dr, Suite 100, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☐ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☒ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 75 ft
Diameter of Borehole 2 in
Well Casing Diameter
Multiple Casings (#)

Comments: Six CPT borings will be to 75 ft, two CPT borings will be to 100 ft

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X _____ **Title/Company** Principal

Print Name Michael van den Encden **Date** August 29, 2025

DEPARTMENT USE ONLY

Application Approved By: _____ Date issued: 8/29/25

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ✓ *WC* ✓ *Waiver* _____ *C-57 Letter of Authorization* _____ *Encroachment Document* _____

Fees Received 459 - Receipt # 14775071 Date Paid 8/6/25 Received by _____

Call Time/Call Date/Seal ID# _____/_____/_____ **Date/Time Ready** _____/_____

EH-MWSB-25-000703

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

Environmental Health Division
202 Mira Loma Drive
Oroville, California 95965
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F: 530.538.5339
buttecounty.net/publichealth

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☒ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** CPT-2

Well Location: -121.909205, 39.805954 **Cross Street:** Garden Brook Dr/ Golden State Hwy **APN:** 047-440-014-000

Township: unincorporated **Range:** **Section:**

Owner Name: Butte County **Telephone No.** 530-552-3880

Owner Mailing Address: 25 County Center Dr, Oroville California **Zip** 95965

C-57 Contractor ConeTech **Telephone No.** 1-925-849-2989

C-57 Mailing Address: 506 De Carlo Ave **Zip** 94801 **License #:** 1049248

Consultant Name: Geosyntec Consulting -Mike van den Eden **Telephone No.** 916-637-8341

Consultant Mailing Address: 3043 Gold Canal Dr, Suite 100, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☐ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☒ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 75 ft
Diameter of Borehole 2 in
Well Casing Diameter
Multiple Casings (#)

Comments: two CPT borings will be to 75 ft

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X [signature] **Title/Company** Principal

Print Name Michael van den Enden **Date** Aug 26, 2025

DEPARTMENT USE ONLY

Application Approved By: [signature] Date issued: 8/28/25

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ✓ *WC* ✓ *Waiver* _____ *C-57 Letter of Authorization* _____ *Encroachment Document* _____

Fees Received 459 Receipt # 14775375 Date Paid 8/6/25 Received by _____

Call Time/Call Date/Seal ID# _____/_____/_____ **Date/Time Ready** _____/_____

EH-MW SB-25-000703

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

Environmental Health Division
202 Mira Loma Drive
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buttecounty.net/publichealth

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☒ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** CPT-1

Well Location: -121.909205, 39.805954 **Cross Street:** Garden Brook Dr/ Golden State Hwy **APN:** 047-440-014-000

Township: unincorporated **Range:** **Section:**

Owner Name: Butte County **Telephone No.** 530-552-3880

Owner Mailing Address: 25 County Center Dr, Orville CA **Zip** 95965

C-57 Contractor ConeTech **Telephone No.** 1-925-849-2989

C-57 Mailing Address: 506 De Carlo Ave **Zip** 94801 **License #:** 1049248

Consultant Name: Geosyntec Consulting -Mike van den Eden **Telephone No.** 916-637-8341

Consultant Mailing Address: 3043 Gold Canal Dr, Suite 100, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☐ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☒ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 75 ft
Diameter of Borehole 2 in
Well Casing Diameter
Multiple Casings (#)

Comments: two CPT borings will be to 75 ft

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X [signature] **Title/Company** Principal

Print Name Michael van den Enden **Date** Aug 26, 2025

DEPARTMENT USE ONLY

Application Approved By: Adrienne Walker Date issued: 8/28/25

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ✓ *WC* ✓ *Waiver* _____ *C-57 Letter of Authorization* _____ *Encroachment Document* _____

Fees Received 459 - Receipt # 14775315 Date Paid 8/6/25 Received by _____

Call Time/Call Date/Seal ID# _____/_____/_____ **Date/Time Ready** _____/_____

EH-MWSB-25-000855

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

Environmental Health Division
202 Mira Loma Drive
Oroville, California 95965
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buttecounty.net/publichealth

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☒ **New Well** ☐ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** MW-1

Well Location: 2001 Dayton Rd Chico 95926 39.809452,-121.936075 **Cross Street:** S. Comance Creek/E Dayton Rd **APN:** 039-090-081-000

Township: unicorporated **Range:** **Section:**

Owner Name: Julia Violich **Telephone No.** 916-637-8341

Owner Mailing Address: PO Box 875 Kentfield CA **Zip** 94914

C-57 Contractor Cascade Drilling LP **Telephone No.** 1-425-527-9700

C-57 Mailing Address: PO Box 1184, Woodinville, WA **Zip** 98072 **License #:** 1058336

Consultant Name: Geosyntec Consulting -Mike van den Eden **Telephone No.** 916-637-8341

Consultant Mailing Address: 3043 Gold Canal Dr, Suite 100, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☒ Monitoring ☐ Dual Phase Extraction ☐ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☐ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 70 ft
Diameter of Borehole 6 in
Well Casing Diameter 2-inch
Multiple Casings (#) 1 casing

Comments: 2 sonic borings to 70' bgs, with one converted to a 2" monitoring well.Monitoring well will be screened from 55' bgs to 70' bgs.

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X Michael van den Enden **Title/Company** Principal

Print Name Michael van den Enden **Date** Oct 15, 2025

DEPARTMENT USE ONLY

Application Approved By: Adrienne Wilson Date issued: 10/23/25

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ____ *WC* ____ *Waiver* ____ *C-57 Letter of Authorization* ____ *Encroachment Document* ____

Fees Received 736.00 Receipt # 15136048 Date Paid 10/16/25 Received by EJ

10-16-25 POSTED ES

Call Time/Call Date/Seal ID# ____/____/____ **Date/Time Ready** ____/____

EH-MWSB-25-000856

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

Environmental Health Division
202 Mira Loma Drive
Oroville, California 95965
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F: 530.538.5339
buttecounty.net/publichealth

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☒ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** SB-1

Well Location: 39.809452,-121.936075 **Cross Street:** S. Comance Creek/E Dayton Rd **APN:** 039-090-081-000

Township: unicorporated **Range:** **Section:**

Owner Name: Julia Violich **Telephone No.** 916-637-8341

Owner Mailing Address: PO Box 875 Kentfield CA **Zip** 94914

C-57 Contractor Cascade Drilling LP **Telephone No.** 1-425-527-9700

C-57 Mailing Address: PO Box 1184, Woodinville, WA **Zip** 98072 **License #:** 1058336

Consultant Name: Geosyntec Consulting -Mike van den Eden **Telephone No.** 916-637-8341

Consultant Mailing Address: 3043 Gold Canal Dr, Suite 100, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring
☐ GW Extraction
☐ Vapor Extraction
☐ Dual Phase Extraction
☐ Air/Ozone Sparge
☐ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

☒ Boring (Geo/Env)
☐ Boring (Hydrologic)
Boring Depth 70 ft
Diameter of Borehole 4 in
Well Casing Diameter
Multiple Casings (#)

Comments: 2 sonic borings to 70' bgs, with one converted to a 2" monitoring well.Monitoring well will be screened from 55' bgs to 70' bgs.

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X Michael van den Enden **Title/Company** Principal

Print Name Michael van den Enden **Date** Oct 15, 2025

DEPARTMENT USE ONLY

Application Approved By: Adrian Valle Date issued: 10/23/25

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ____ *WC* ____ *Waiver* ____ *C-57 Letter of Authorization* ____ *Encroachment Document* ____

10-16-25 Fees Received 536.00 Receipt # 15130048 Date Paid 10/16/25 Received by EL

POSTED

Call Time/Call Date/Seal ID# ____/____/____ **Date/Time Ready** ____/____

EH-MWSB-26-0015

BUTTE COUNTY ENVIRONMENTAL HEALTH
JAN 12 2025
202 MIRA LOMA DRIVE OROVILLE, CA

Butte County PUBLIC HEALTH
Public Health Department
Environmental Health Division
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Oroville, California 95965
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buttecounty.net/publichealth

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☒ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** SB-1

Well Location: 7918 Adobe Rd, Durham, CA **Cross Street:** Nelson Rd **APN:** 039-159-043

Township: Durham **Range:** **Section:**

Owner Name: Washington George Revocable Trust **Telephone No.** (530) 521-6909

Owner Mailing Address: 330 W 5th Street, Chico CA **Zip** 95928

C-57 Contractor Geocentric Drilling Inc **Telephone No.** (916) 304-2665

C-57 Mailing Address: 1980 S River Rd, Suite E, West Sacramento CA **Zip** 95691 **License #:** 1073146

Consultant Name: Geosyntec Consulting - Mike van den Enden **Telephone No.** 916-637-8341

Consultant Mailing Address: 11020 White Rock Rd, Suite 120, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction
☐ GW Extraction ☐ Air/Ozone Sparge
☐ Vapor Extraction ☐ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

☒ Boring (Geo/Env) ☐ Boring (Hydrologic)
Boring Depth 60 ft
Diameter of Borehole 4 in
Well Casing Diameter
Multiple Casings (#)

Comments: 2 sonic borings to 60' bgs,

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X _____ **Title/Company** Principal

Print Name Michael van den Enden **Date** 1/8/2026

DEPARTMENT USE ONLY

Application Approved By: Mostondimore Yger Date issued: 1/12/2026

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ____ *WC* ____ *Waiver* ____ *C-57 Letter of Authorization* ____ *Encroachment Document* ____

Fees Received $536.00 Receipt # 15540590 Date Paid 1/12/26 Received by DW

Call Time/Call Date/Seal ID# ____/____/____ **Date/Time Ready** ____/1/12/26

POSTED DW

EH-MWSB-26-0015

BUTTE COUNTY ENVIRONMENTAL HEALTH
JAN 12 2025
202 MIRA LOMA DRIVE OROVILLE, CA

Public Health Department
Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

Environmental Health Division
202 Mira Loma Drive
Oroville, California 95965
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buttecounty.net/publichealth

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☒ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** SB-2

Well Location: 7918 Adobe Rd, Durham, CA **Cross Street:** Nelson Rd Adobe Rd **APN:** 039-159-043

Township: Durham **Range:** **Section:**

Owner Name: Washington George Revocable Trust **Telephone No.** (530) 521-6909

Owner Mailing Address: 330 W 5th Street, Chico CA **Zip** 95928

C-57 Contractor Geocentric Drilling Inc **Telephone No.** (916) 304-2665

C-57 Mailing Address: 1980 S River Rd, Suite E, West Sacramento CA **Zip** 95691 **License #:** 1073146

Consultant Name: Geosyntec Consulting - Mike van den Enden **Telephone No.** 916-637-8341

Consultant Mailing Address: 11020 White Rock Rd, Suite 120, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction
☐ GW Extraction ☐ Air/Ozone Sparge
☐ Vapor Extraction ☐ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

☒ Boring (Geo/Env) ☐ Boring (Hydrologic)
Boring Depth 60 ft
Diameter of Borehole 4 in
Well Casing Diameter
Multiple Casings (#)

Comments: 2 sonic borings to 60' bgs,

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X _____ **Title/Company** Principal

Print Name Michael van den Enden **Date** 1/8/2026

DEPARTMENT USE ONLY

Application Approved By: Kristen Moore Date issued: 1/12/2026

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ____ *WC* ____ *Waiver* ____ *C-57 Letter of Authorization* ____ *Encroachment Document* ____

Fees Received $536.00 Receipt # 1554059 Date Paid 1/12/26 Received by DW

Call Time/Call Date/Seal ID# ____/____/____ **Date/Time Ready** ____/1/12/26

POSTED DW

EH-MWSB-26-0016

BUTTE COUNTY
ENVIRONMENTAL HEALTH
JAN 12 2025
OROVILLE, CA

Public Health Department
202 MIRA LOMA DRIVE
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Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☒ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** SB-3

Well Location: 7918 Adobe Rd, Durham, CA **Cross Street:** Nelson Rd / Adobe Rd **APN:** 039-210-021

Township: Durham **Range:** **Section:**

Owner Name: Washington George Revocable Trust **Telephone No.** (530) 521-6909

Owner Mailing Address: 330 W 5th Street, Chico CA **Zip** 95928

C-57 Contractor Geocentric Drilling Inc **Telephone No.** (916) 304-2665

C-57 Mailing Address: 1980 S River Rd, Suite E, West Sacramento CA **Zip** 95691 **License #:** 1073146

Consultant Name: Geosyntec Consulting - Mike van den Enden **Telephone No.** 916-637-8341

Consultant Mailing Address: 11020 White Rock Rd, Suite 120, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☒ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☐ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 60 ft
Diameter of Borehole 4 in
Well Casing Diameter
Multiple Casings (#)

Comments: 2 sonic borings to 60' bgs, one converted to Monitoring well

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X _____ **Title/Company** Principal

Print Name Michael van den Enden **Date** 1/8/2026

DEPARTMENT USE ONLY

Application Approved By: Kathondinovic Vgar Date issued: 1/12/2026

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ____ *WC* ____ *Waiver* ____ *C-57 Letter of Authorization* ____ *Encroachment Document* ____

Fees Received $536.00 Receipt # 15540590 Date Paid 1/12/26 Received by DW

Call Time/Call Date/Seal ID# ____/____/____ **Date/Time Ready** ____/____

1/12/26
POSTED
DW

EH-MWSB-26-0029

BUTTE COUNTY ENVIRONMENTAL HEALTH
JAN 12 2025
202 MIRA LOMA DRIVE OROVILLE, CA

Butte County PUBLIC HEALTH
Public Health Department
Environmental Health Division
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Oroville, California 95965
T: 530.552.3880
F: 530.538.5339
buttecounty.net/publichealth

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☒ **New Well** ☐ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** WP-MW01

Well Location: 7918 Adobe Rd, Durham, CA **Cross Street:** Nelson Rd / Adobe Rd **APN:** 039-210-021

Township: Durham **Range:** **Section:**

Owner Name: Washington George Revocable Trust **Telephone No.** (530) 521-6909

Owner Mailing Address: 330 W 5th Street, Chico CA **Zip** 95928

C-57 Contractor Geocentric Drilling Inc **Telephone No.** (916) 304-2665

C-57 Mailing Address: 1980 S River Rd, Suite E, West Sacramento CA **Zip** 95691 **License #:** 1073146

Consultant Name: Geosyntec Consulting - Mike van den Enden **Telephone No.** 916-637-8341

Consultant Mailing Address: 11020 White Rock Rd, Suite 120, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☒ Monitoring ☐ Dual Phase Extraction ☐ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☐ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 60 ft
Diameter of Borehole 4 in
Well Casing Diameter 2 in
Multiple Casings (#)

Comments: 2 sonic borings to 60' bgs, one converted to Monitoring well

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X [signature] **Title/Company** Principal

Print Name Michael van den Enden **Date** 1/8/2026

DEPARTMENT USE ONLY

Application Approved By: Kostandinovic Igor Date issued: 1/12/2026

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ____ *WC* ____ *Waiver* ____ *C-57 Letter of Authorization* ____ *Encroachment Document* ____

Fees Received $736.00 Receipt # 15540590 Date Paid 1/12/26 Received by DW

Call Time/Call Date/Seal ID# ____/____/____ **Date/Time Ready** ____/____

1/13/26
POSTED
DW

EH-MWSB-25-000870

BUTTE COUNTY
ENVIRONMENTAL HEALTH
Public Health Department
OCT 16 2025
202 MIRA LOMA DRIVE
OROVILLE, CA
Environmental Health Division
202 Mira Loma Drive
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T: 530.552.3880
F: 530.538.5339
buttecounty.net/publichealth

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ New Well ☒ Boring ☐ Destruction **Well or Soil Boring ID #** SB-3

Well Location: 4873 Anita Rd Chico 95973 39.809452,-121.936075 **Cross Street:** Anita Rd/CA HWY 99 **APN:** 047-130-184-000

Township: Chico **Range:** **Section:**

Owner Name: Darren Rice **Telephone No.** 916-637-8341

Owner Mailing Address: 4873 ANITA RD CHICO CA **Zip** 95973-9759

C-57 Contractor Cascade Drilling LP **Telephone No.** 1-425-527-9700

C-57 Mailing Address: PO Box 1184, Woodinville, WA **Zip** 98072 **License #:** 1058336

Consultant Name: Geosyntec Consulting -Mike van den Eden **Telephone No.** 916-637-8341

Consultant Mailing Address: 3043 Gold Canal Dr, Suite 100, Rancho Cordova CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☒ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☐ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 50 ft
Diameter of Borehole 4 in
Well Casing Diameter
Multiple Casings (#)

Comments:

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X _____ **Title/Company** Principal

Print Name Michael van den Enden **Date** Oct 9, 2025

DEPARTMENT USE ONLY

Application Approved By: _____ Date issued: 10/23/2025

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ____ *WC* ____ *Waiver* ____ *C-57 Letter of Authorization* ____ *Encroachment Document* ____

Fees Received $536.00 Receipt # 15138410 Date Paid 10/16/25 Received by DW

10-17-25 POSTED

Call Time/Call Date/Seal ID# ____/____/____ **Date/Time Ready** ____/____

EH-MWSB-26-0267

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

Environmental Health Division
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Oroville, California 95965
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buttecounty.net/publichealth

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ New Well ☑ Boring ☐ Destruction **Well or Soil Boring ID #** SB-1

Well Location: 13872 CA-99, Chico, CA **Cross Street:** Garden Brook Dr **APN:** 047-440-012-000

Township: unincorporated **Range:** **Section:**

Owner Name: George Nicolaus **Telephone No.** 530-521-2175

Owner Mailing Address: 66 Marybill Ranch Rd, Chico, CA **Zip** 95928

C-57 Contractor Penecore Drilling **Telephone No.** 530-661-3600

C-57 Mailing Address: 220 N East St, Woodland, CA **Zip** 95776 **License #:** 906899

Consultant Name: Geosyntec Consultants Inc - Zack Laforet **Telephone No.** 916-287-2945

Consultant Mailing Address: 11020 White Rock Rd, Ste 120, Rancho Cordova, CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☑ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☐ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 50ft
Diameter of Borehole 4in
Well Casing Diameter
Multiple Casings (#)

Comments:

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X _____ **Title/Company** Professional / Geosyntec

Print Name Zack Laforet **Date** 3/31/26

DEPARTMENT USE ONLY

Application Approved By: Kostandinovic Igor Date issued: 4/3/2026

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ____ *WC* ____ *Waiver* ____ *C-57 Letter of Authorization* ____ *Encroachment Document* ____

Fees Received $536.00 Receipt # 15956494 Date Paid 4/2/26 Received by DW

Call Time/Call Date/Seal ID# ____/____/____ **Date/Time Ready** ____/____

4/3/26 POSTED DW

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

Environmental Health Division
202 Mira Loma Drive
Oroville, California 95965
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F: 530.538.5339
buttecounty.net/publichealth

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☑ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** SB-2

Well Location: 13872 CA-99, Chico, CA **Cross Street:** Garden Brook Dr **APN:** 047-440-012-000

Township: unincorporated **Range:** **Section:**

Owner Name: George Nicolaus **Telephone No.** 530-521-2175

Owner Mailing Address: 66 Marybill Ranch Rd, Chico, CA **Zip** 95928

C-57 Contractor Penecore Drilling **Telephone No.** 530-661-3600

C-57 Mailing Address: 220 N East St, Woodland, CA **Zip** 95776 **License #:** 906899

Consultant Name: Geosyntec Consultants Inc - Zack Laforet **Telephone No.** 916-287-2945

Consultant Mailing Address: 11020 White Rock Rd, Ste 120, Rancho Cordova, CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☑ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☐ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 50ft
Diameter of Borehole 4in
Well Casing Diameter
Multiple Casings (#)

Comments:

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X _____ **Title/Company** Professional / Geosyntec

Print Name Zack Laforet **Date** 3/31/26

DEPARTMENT USE ONLY

Application Approved By: _____ Date issued: 4/3/2026

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ____ *WC* ____ *Waiver* ____ *C-57 Letter of Authorization* ____ *Encroachment Document* ____

Fees Received $536.00 Receipt # 15956494 Date Paid 4/2/26 Received by DW

Call Time/Call Date/Seal ID# ____/____/____ **Date/Time Ready** ____/____

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

Environmental Health Division
202 Mira Loma Drive
Oroville, California 95965
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buttecounty.net/publichealth

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☑ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** SB-3

Well Location: 13872 CA-99, Chico, CA **Cross Street:** Garden Brook Dr **APN:** 047-440-012-000

Township: unincorporated **Range:** **Section:**

Owner Name: George Nicolaus **Telephone No.** 530-521-2175

Owner Mailing Address: 66 Marybill Ranch Rd, Chico, CA **Zip** 95928

C-57 Contractor Penecore Drilling **Telephone No.** 530-661-3600

C-57 Mailing Address: 220 N East St, Woodland, CA **Zip** 95776 **License #:** 906899

Consultant Name: Geosyntec Consultants Inc - Zack Laforet **Telephone No.** 916-287-2945

Consultant Mailing Address: 11020 White Rock Rd, Ste 120, Rancho Cordova, CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☑ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☐ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 50ft
Diameter of Borehole 4in
Well Casing Diameter
Multiple Casings (#)

Comments:

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X _____ **Title/Company** Professional / Geosyntec

Print Name Zack Laforet **Date** 3/31/26

DEPARTMENT USE ONLY

Application Approved By: Kostondinsmc for Date issued: 4/3/2026

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ____ *WC* ____ *Waiver* ____ *C-57 Letter of Authorization* ____ *Encroachment Document* ____

Fees Received $536.00 Receipt # 15956494 Date Paid 4/2/26 Received by DW

Call Time/Call Date/Seal ID# ____/____/____ **Date/Time Ready** ____/____

EH-MWSB-26-0268 DW

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

Environmental Health Division
202 Mira Loma Drive
Oroville, California 95965
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buttecounty.net/publichealth

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ New Well ☑ Boring ☐ Destruction **Well or Soil Boring ID #** SB-4

Well Location: 13872 CA-99, Chico, CA **Cross Street:** Garden Brook Dr **APN:** 047-440-003-000

Township: unincorporated **Range:** **Section:**

Owner Name: George Nicolaus **Telephone No.** 530-521-2175

Owner Mailing Address: 66 Marybill Ranch Rd, Chico, CA **Zip** 95928

C-57 Contractor Penecore Drilling **Telephone No.** 530-661-3600

C-57 Mailing Address: 220 N East St, Woodland, CA **Zip** 95776 **License #:** 906899

Consultant Name: Geosyntec Consultants Inc - Zack Laforet **Telephone No.** 916-287-2945

Consultant Mailing Address: 11020 White Rock Rd, Ste 120, Rancho Cordova, CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☑ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☐ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 50ft
Diameter of Borehole 4in
Well Casing Diameter
Multiple Casings (#)

Comments:

NOTE: PERMIT APPLICATION SHALL INCLUDE ALL REQUIRED SUBMITTALS AND PERMITTEE SHALL FOLLOW ALL REQUIRED PERMIT CONDITIONS LISTED ON THE BACK OF THE PEMIT APPLICATION. PERMIT EXPIRES ONE (1) YEAR FROM DATE ISSUED.

I hereby certify that I have prepared this application and that the work will be done in accordance with Butte County Ordinances, Rules, and Regulations and all applicable California State Laws.

Signed X _____ **Title/Company** Professional / Geosyntec

Print Name Zack Laforet **Date** 3/31/26

DEPARTMENT USE ONLY

Application Approved By: Kostandinovic for Date issued: 4/3/2026

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ____ *WC* ____ *Waiver* ____ *C-57 Letter of Authorization* ____ *Encroachment Document* ____

Fees Received $536.00 Receipt # 15956494 Date Paid 4/2/26 Received by DW

Call Time/Call Date/Seal ID# ____/____/____ **Date/Time Ready** ____/____

4/3/26 POSTED DW

EH-MWSB-26-0269 DW

Public Health Department

Monica Soderstrom, RN, PHN, Director
Dr. Jarett Beaudoin, MD, MPH, Health Officer

Environmental Health Division
202 Mira Loma Drive
Oroville, California 95965
T: 530.552.3880
F: 530.538.5339
buttecounty.net/publichealth

APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☑ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** SB-1

Well Location: 3746 Keefer Rd, Chico, CA **Cross Street:** Hicks Lane **APN:** APN: 047-700-003-000

Township: unincorporated **Range:** **Section:**

Owner Name: Riolo Family Trust **Telephone No.** 916-591-4293

Owner Mailing Address: 3746 Keefer Rd, Chico, CA **Zip** 95973

C-57 Contractor Penecore Drilling **Telephone No.** 530-661-3600

C-57 Mailing Address: 220 N East St, Woodland, CA **Zip** 95776 **License #:** 906899

Consultant Name: Geosyntec Consultants Inc - Zack Laforet **Telephone No.** 916-287-2945

Consultant Mailing Address: 11020 White Rock Rd, Ste 120, Rancho Cordova, CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☑ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☐ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 50ft
Diameter of Borehole 4in
Well Casing Diameter
Multiple Casings (#)

Comments:

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Print Name Zack Laforet **Date** 03/31/2026

DEPARTMENT USE ONLY

Application Approved By: Kristandmorec for Date issued: 4/3/2026

Grout Inspection By: _____ Date: _____ Well Final Approval: _____ Date: _____

Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

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Fees Received $536.00 Receipt # 15956494 Date Paid 4/3/26 Received by DW

Call Time/Call Date/Seal ID# ____/____/____ **Date/Time Ready** ____/____

4/3/26 POSTED DW

EH-MWSB-26-0270 DW

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Call Time/Call Date/Seal ID# ____/____/____ **Date/Time Ready** ____/____

4/3/26 POSTED DW

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APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☑ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** SB-3

Well Location: 3746 Keefer Rd, Chico, CA **Cross Street:** Hicks Lane **APN:** APN: 047-700-004-000

Township: unincorporated **Range:** **Section:**

Owner Name: Riolo Family Trust **Telephone No.** 916-591-4293

Owner Mailing Address: 3746 Keefer Rd, Chico, CA **Zip** 95973

C-57 Contractor Penecore Drilling **Telephone No.** 530-661-3600

C-57 Mailing Address: 220 N East St, Woodland, CA **Zip** 95776 **License #:** 906899

Consultant Name: Geosyntec Consultants Inc - Zack Laforet **Telephone No.** 916-287-2945

Consultant Mailing Address: 11020 White Rock Rd, Ste 120, Rancho Cordova, CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☑ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☐ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

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Diameter of Borehole 4in
Well Casing Diameter
Multiple Casings (#)

Comments:

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Print Name Zack Laforet **Date** 03/31/2026

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Application Approved By: Kostondinovic Igor Date issued: 4/3/2026

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Destruction Inspection: _____ Date: _____ DWR Well Log Receipt Date: _____

C-57 ____ *WC* ____ *Waiver* ____ *C-57 Letter of Authorization* ____ *Encroachment Document* ____

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APPLICATION FOR ENVIRONMENTAL INVESTIGATION WELL PERMIT or AUTHORITY TO CONSTRUCT AN EXPLORATION HOLE (BORING)

☐ **New Well** ☑ **Boring** ☐ **Destruction** **Well or Soil Boring ID #** SB-2

Well Location: 3746 Keefer Rd, Chico, CA **Cross Street:** Hicks Lane **APN:** APN: 047-700-004-000

Township: unincorporated **Range:** **Section:**

Owner Name: Riolo Family Trust **Telephone No.** 916-591-4293

Owner Mailing Address: 3746 Keefer Rd, Chico, CA **Zip** 95973

C-57 Contractor Penecore Drilling **Telephone No.** 530-661-3600

C-57 Mailing Address: 220 N East St, Woodland, CA **Zip** 95776 **License #:** 906899

Consultant Name: Geosyntec Consultants Inc - Zack Laforet **Telephone No.** 916-287-2945

Consultant Mailing Address: 11020 White Rock Rd, Ste 120, Rancho Cordova, CA **Zip** 95670

TYPE OF WELL/BORING

☐ Monitoring ☐ Dual Phase Extraction ☑ Boring (Geo/Env)
☐ GW Extraction ☐ Air/Ozone Sparge ☐ Boring (Hydrologic)
☐ Vapor Extraction ☐ Other (CPT, Geoprobe, Hydropunch)

CONSTRUCTION SPECIFICATIONS

Boring Depth 50ft
Diameter of Borehole 4in
Well Casing Diameter _____
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Comments: _____

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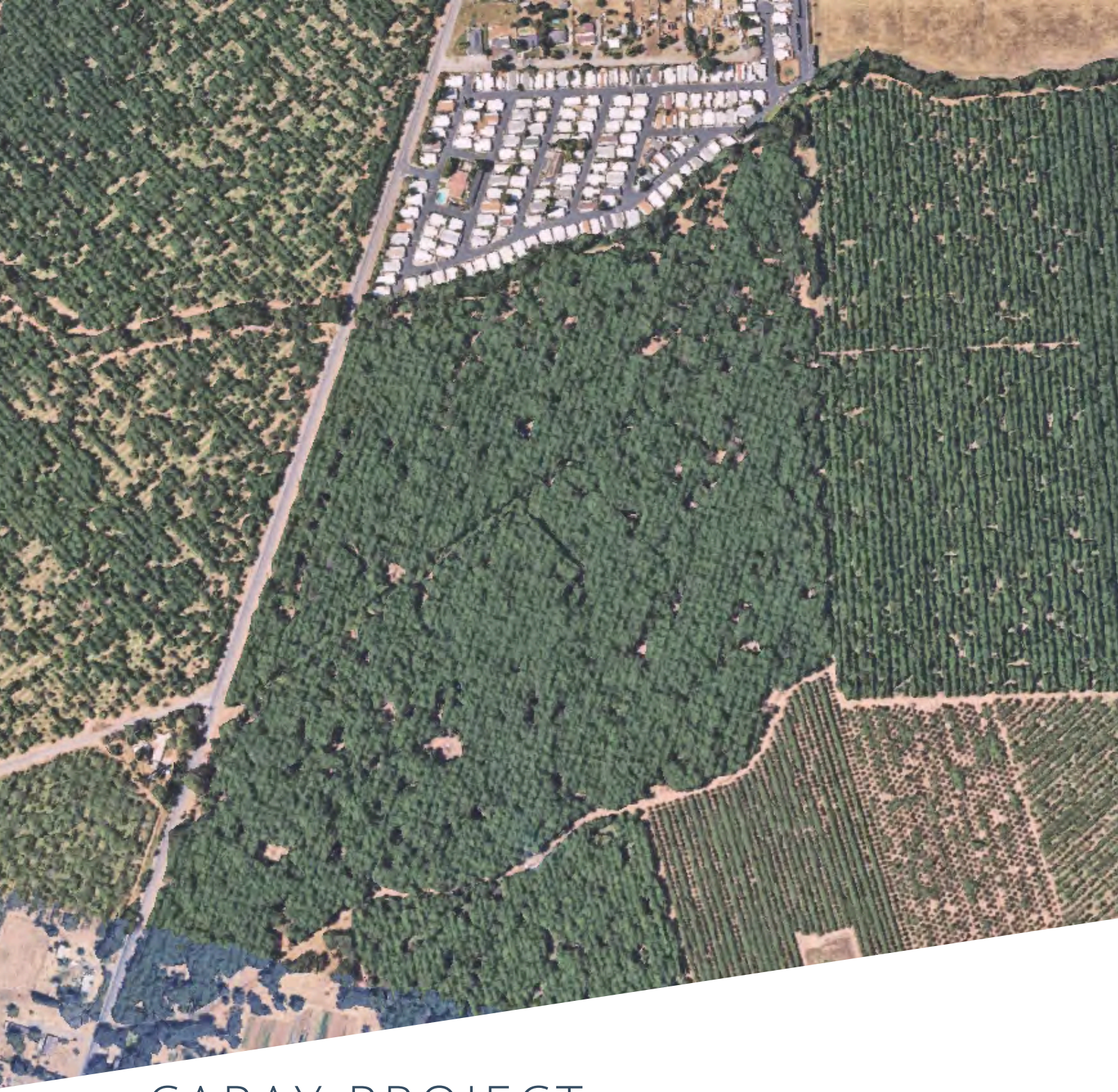
Appendix D – tTEM Reports

Site S1



CAPAY PROJECT GROUNDWATER MAPPING REPORT

JULY 18, 2025// PREPARED BY
GROUNDWATERMAPS

REPORT

- **Objective:** To determine the suitability of the Capay project area to surface groundwater recharge.

- **Methods:**
  - DWR Aerial Electromagnetic Survey
  - Soil Agricultural Groundwater Banking Index (SAGBI)
  - NRCS Soil Map
  - California Statewide Groundwater Elevation Monitoring (CASGEM)
  - TTem Towable Electromagnetic Survey
    - Survey Conducted by GroundWaterMaps- Nathan Azevedo
      - Survey Dates- June 23, 2025
      - Survey Location- Dayton Rd/ Rogers Ave, Chico, CA 95973
- **Results:**
  a. The DWR AEM survey flew near the project area but data was removed due to interference caused by infrastructure in the surrounding Chico area.
  b. The Soil Agricultural Groundwater Banking Index SAGBI and NRCS Soil Map deem the project area as to having moderately good groundwater recharge suitability.
  c. California Statewide Groundwater Elevation Monitoring (CASGEM) reported depth to groundwater at 66 feet at a nearby monitoring well on June 10th 2025
  d. The TTem survey appears to reveal resistive surface geologic material that appears conducive to surface groundwater recharge.
     i. The highest quantity of resistive surface geologic material appears concentrated in the southeast portion of the project area
     ii. A 10 meter impeding clay layer does appear to span the project area but this clay layer appears to be broken in many areas by resistive material that should allow for surface recharge to infiltrate to the deeper aquifer system

- **Conclusion:**
  - Although AEM data was not available for the project area, the TTem survey did reveal a high quantity of resistive geologic material that should deem the project area suitable to surface groundwater recharge. An impeding clay layer just below the water table does appear to be broken by resistive sands and gravels that should allow for surface recharge to infiltrate into the deeper aquifer system.

NOTES

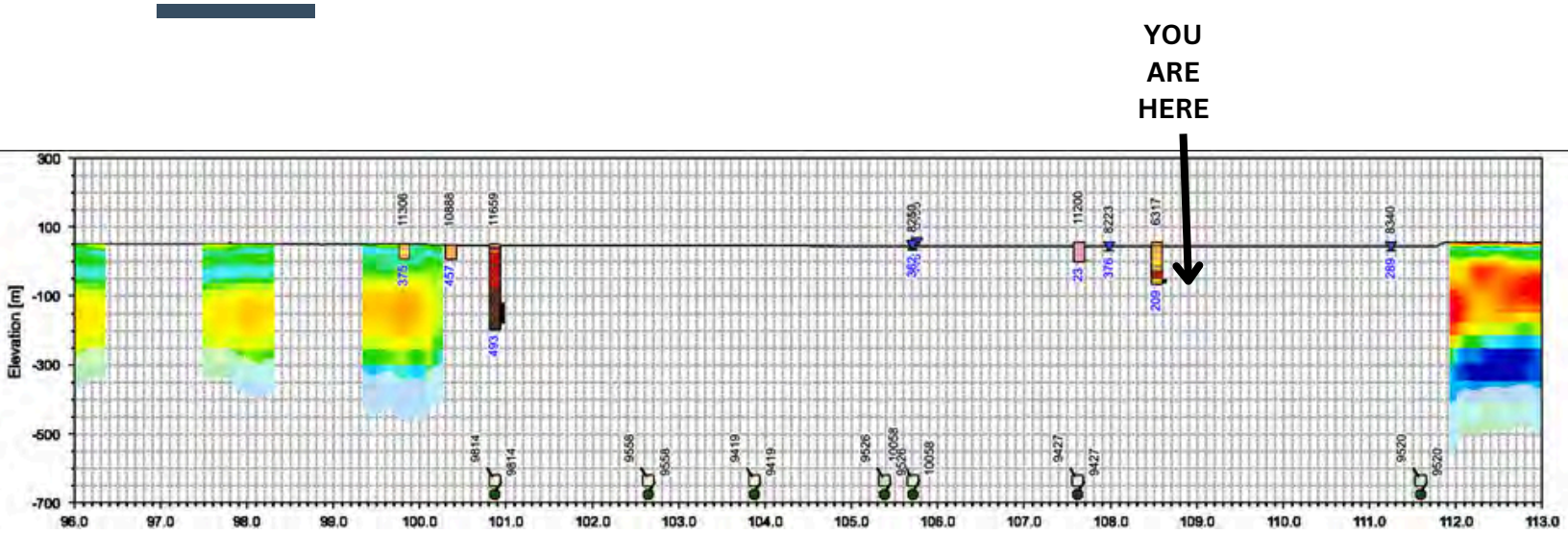
- Depth of Investigation as seen on page 7 ranged from 50-80m with increasing DOI in resistive materials in the South East of the project area

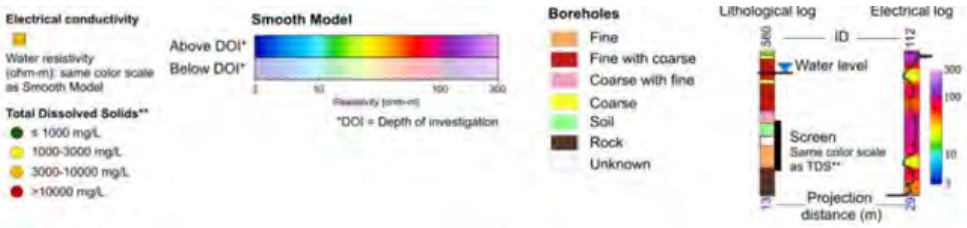
- Although the geology is resistive at values typical to geology conducive to groundwater recharge, lahar type materials have been known to be cemented in the region which may reduce the sites permeability. Further study may be needed to confirm permeability

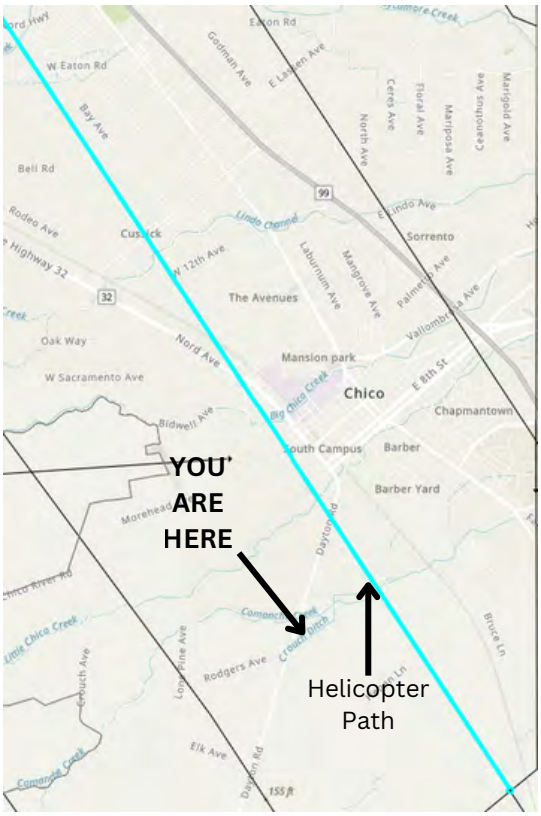
- Due to interference from power lines, data was removed from the project area as seen on page 8. Residual values on page 6 greater than 1 depict the models decreased confidence in the data and were therefore removed

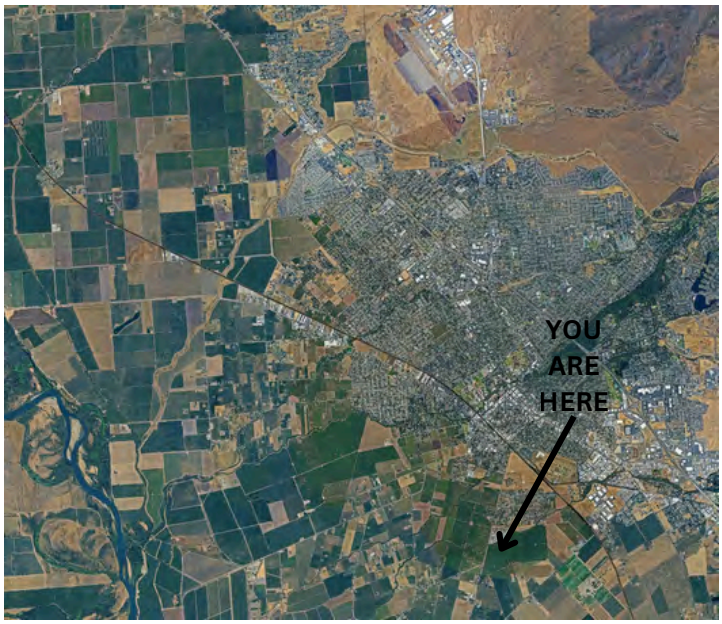
- Depth to groundwater per (CASGEM) was 66 feet on June 10th 2025 as seen in groundwater monitoring well data on page 9

DWR AEM HELICOPTER REPORT





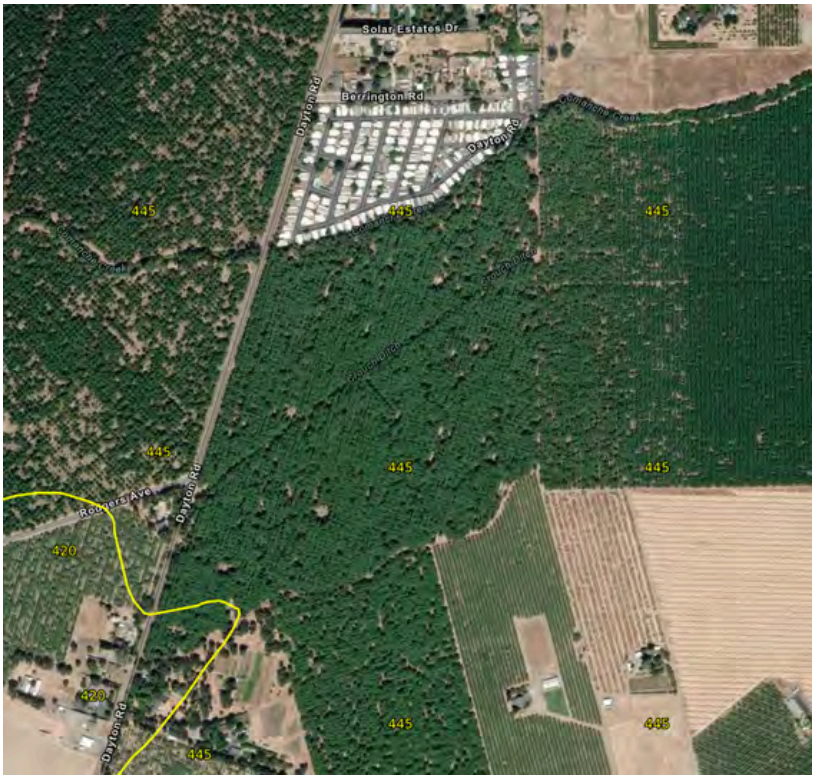


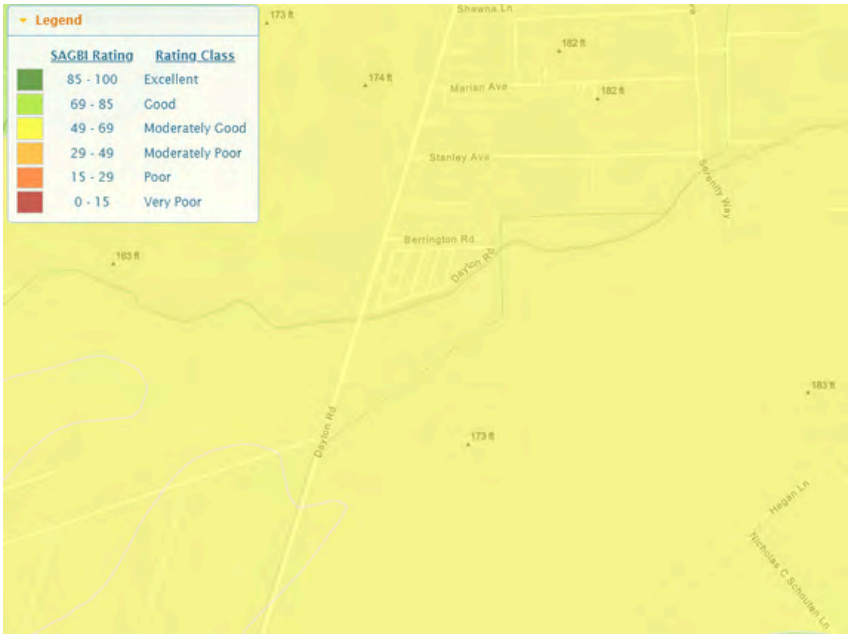


NRCS SOIL MAP/ GROUNDWATER RECHARGE SUITABILITY INDEX

SOILS:

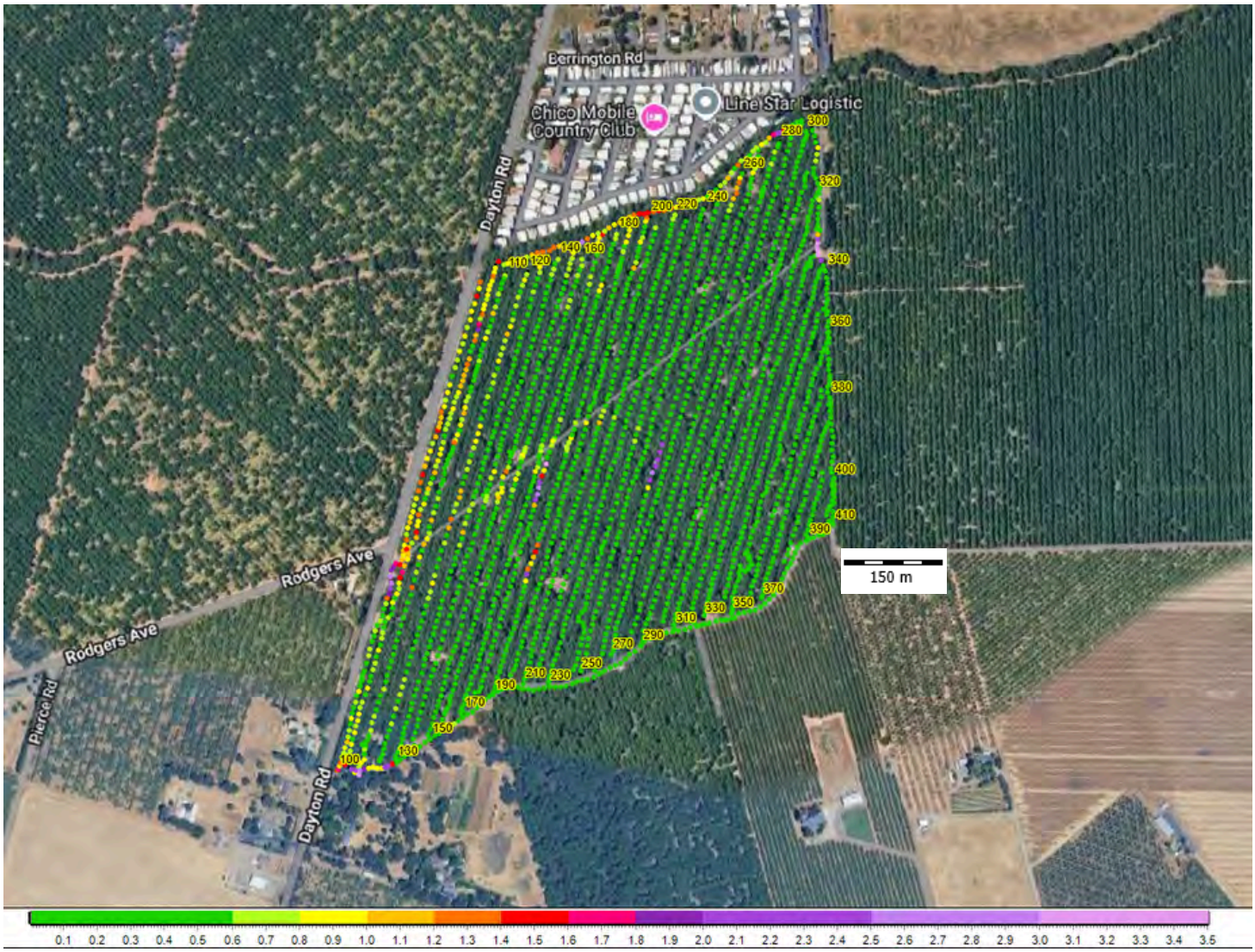
- **CHICO- FAN REMNANTS (445)**
- **CONEJO- ALLUVIAL FANS (420)**



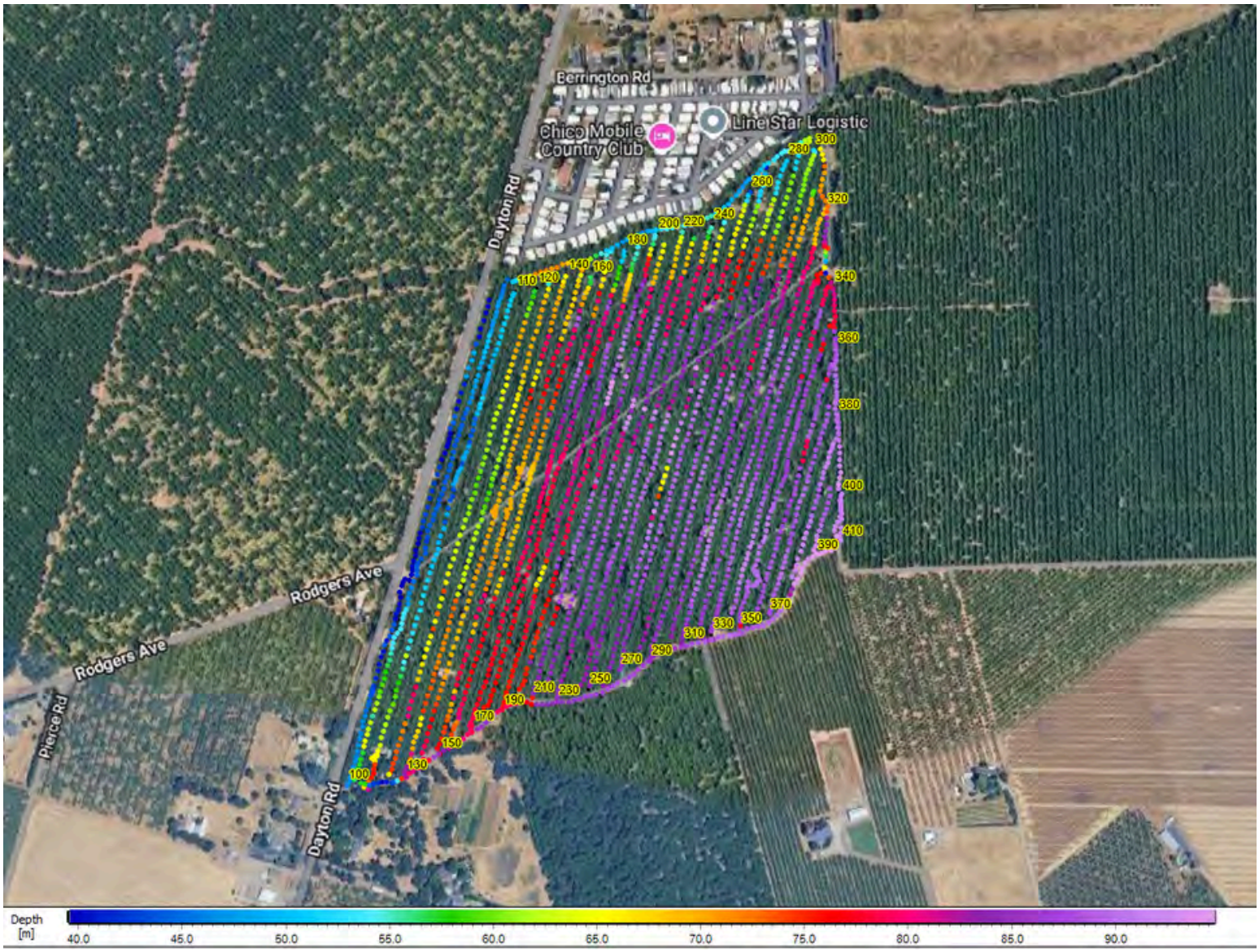


TTEM TRAVERSE LINES

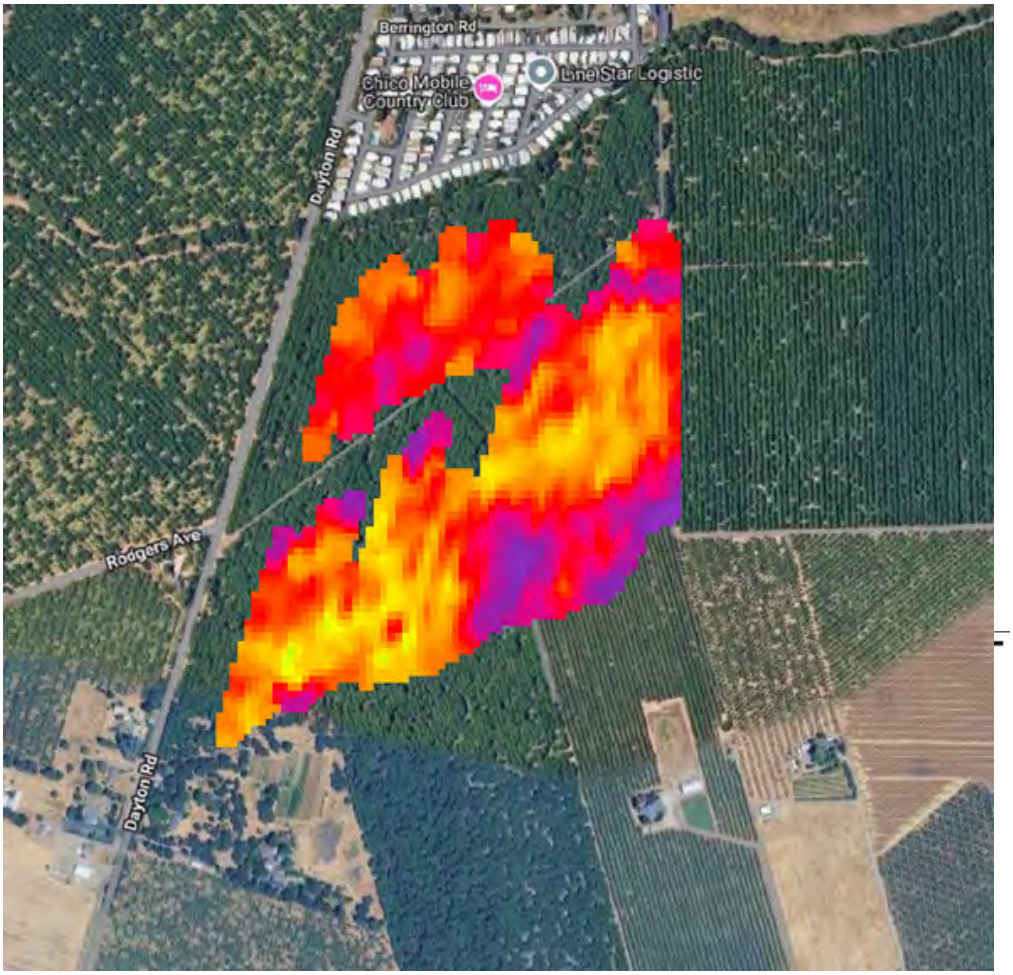
DATA RESIDUAL



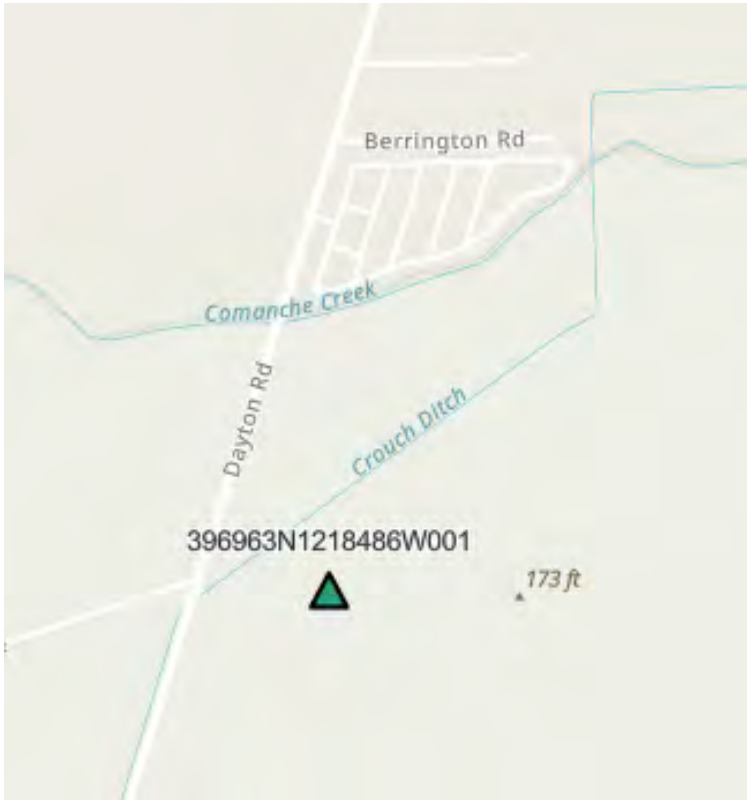
DEPTH OF INVESTIGATION



DATA REMOVED



CALIFORNIA STATEWIDE GROUNDWATER ELEVATION MONITORING (CASGEM)- LOCAL MONITORING WELL



LEGEND

Legend:
Above Water Table

- Blue- Clay
- Green- Clay
- Yellow- Sandy Clay
- Orange- Sand
- Red- Coarse Sand
- Purple- Gravel

Legend:
Below Water Table

- Blue- Clay
- Green- Sandy clay
- Yellow- Sand
- Orange- Coarse Sand
- Red- Gravel
- Purple- Coarse Gravel

- Black- Likely bad data/Noise

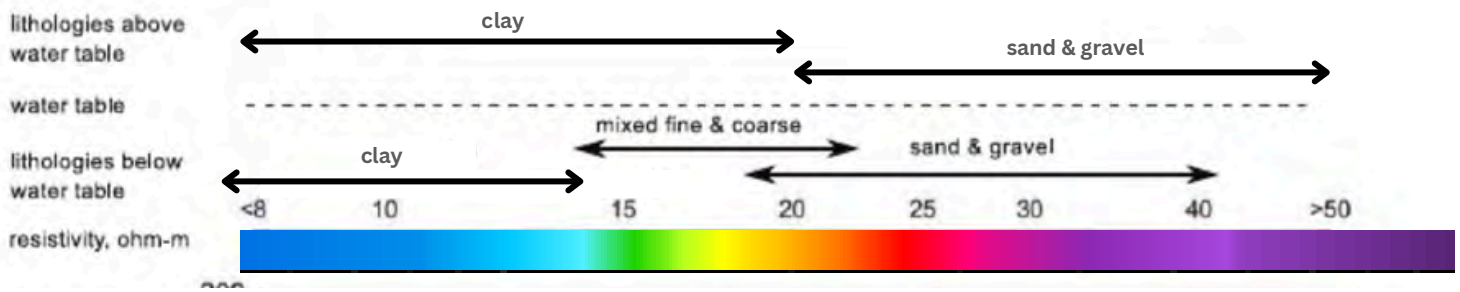


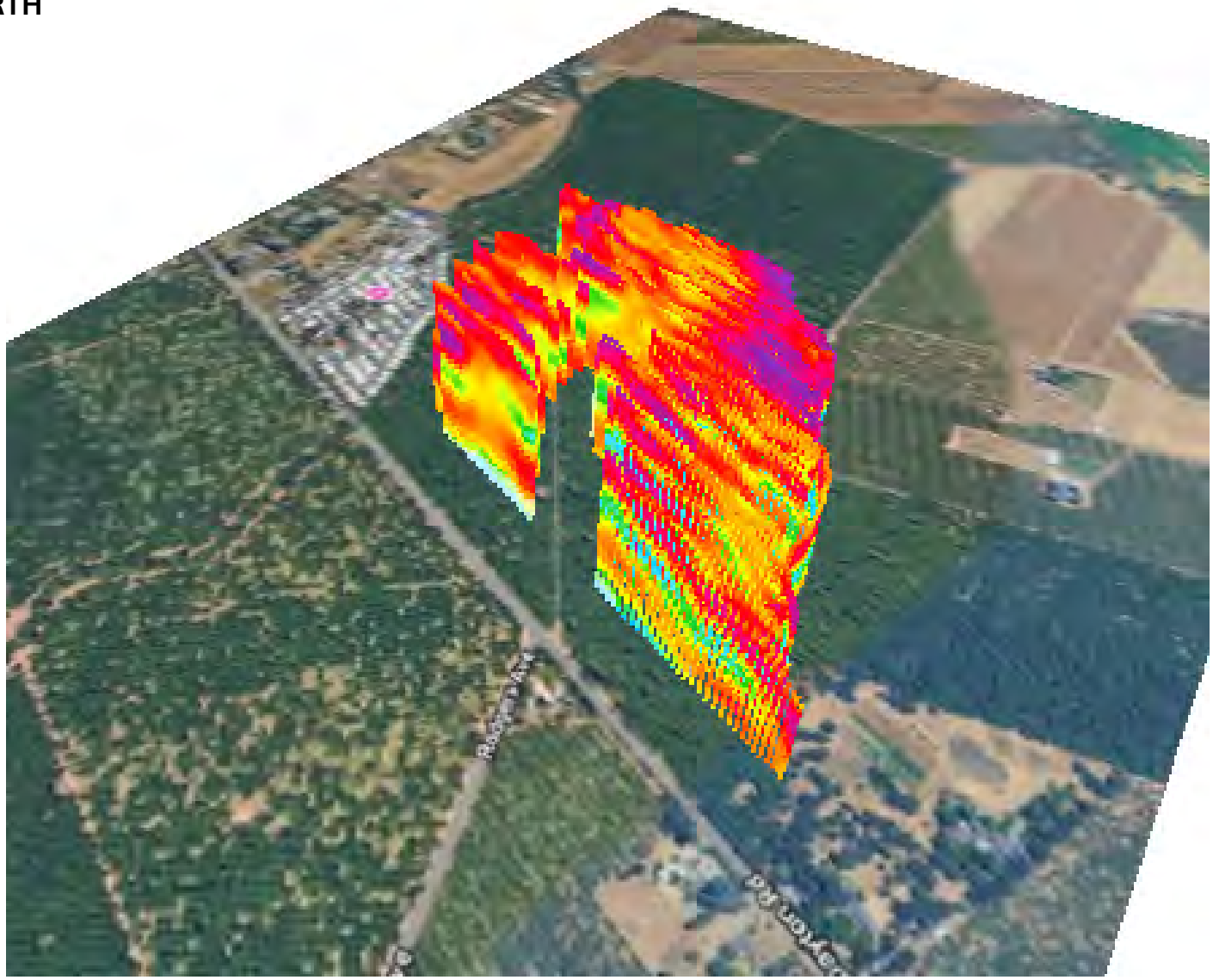
Table 2
Range of Resistivity Values Determined for the Lithologic Units Using Method 2 and from the Histogram of All Resistivity Values in the Resistivity Model

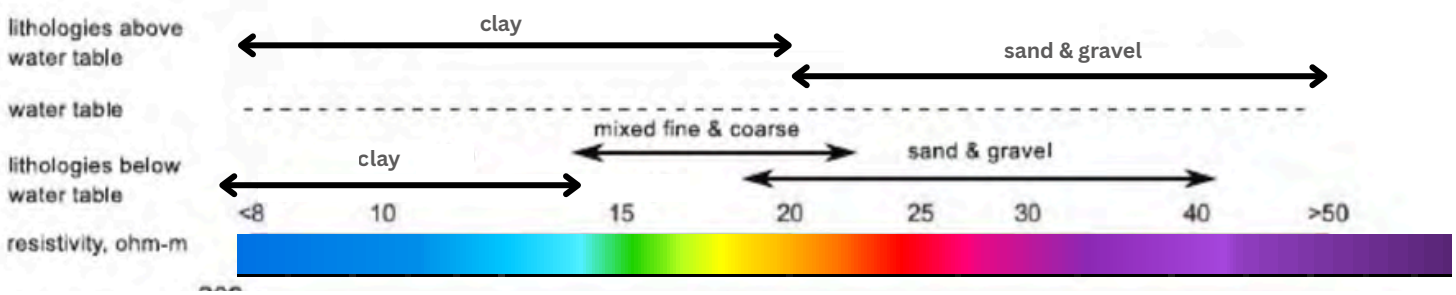
Resistivity Range (Ω m)		Interpreted Lithology
Above the water table		
8	20	Clay
21	150	Sand and gravel
Below the water table		
6	14	Clay
12	22	Mixed fine and coarse
17	43	Sand and gravel

KNIGHT, R., SMITH, R., ASCH, T., ABRAHAM, J., CANNIA, J., VIEZZOLI, A., & FOGG, G. (2018). MAPPING AQUIFER SYSTEMS WITH AIRBORNE ELECTROMAGNETICS IN THE CENTRAL VALLEY OF CALIFORNIA. GROUND WATER, 56(6), 893–908. HTTPS://DOI.ORG/10.1111/GWAT.12656

3D VIEW- WEST TO EAST

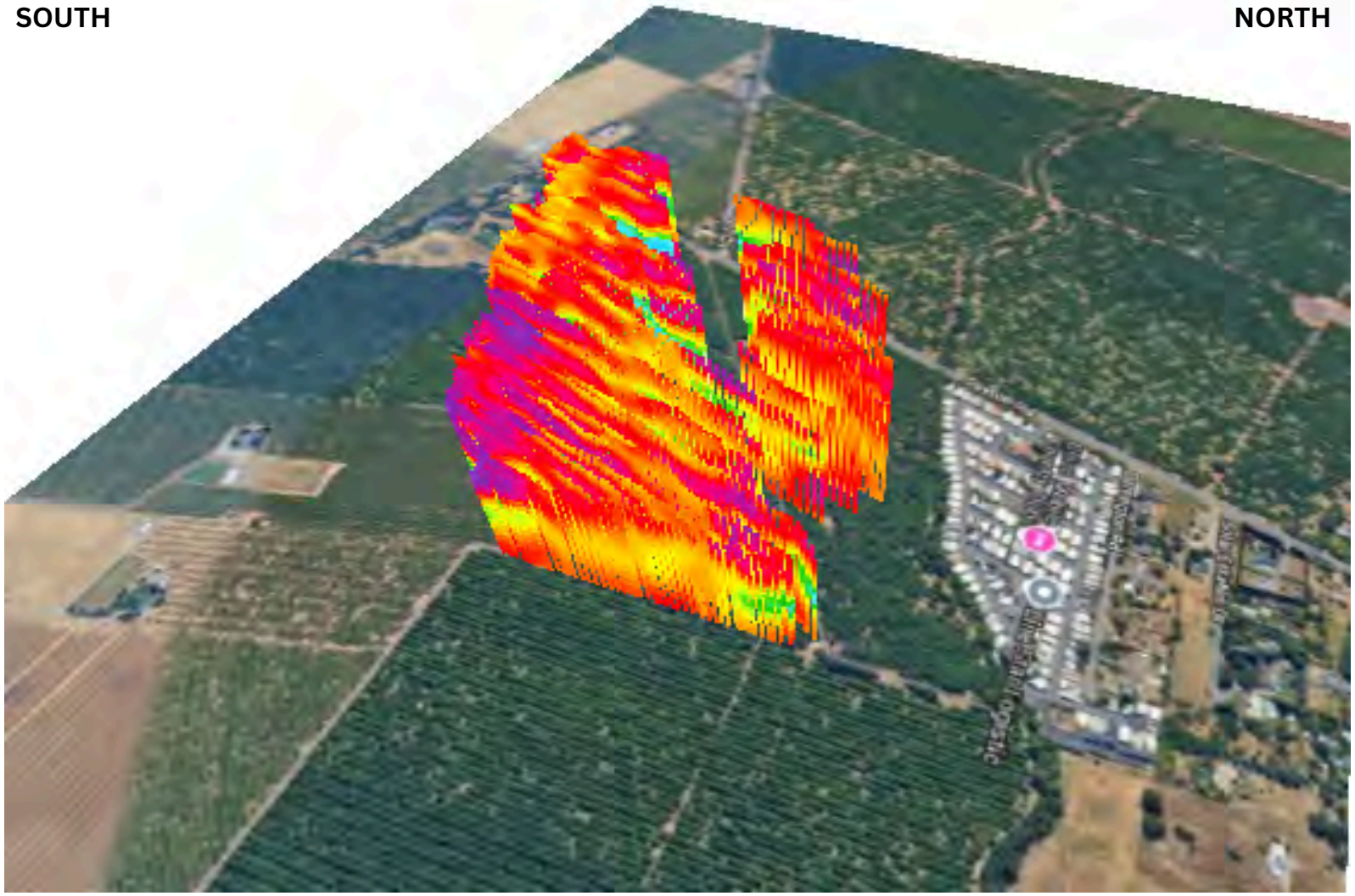
NORTH **SOUTH**

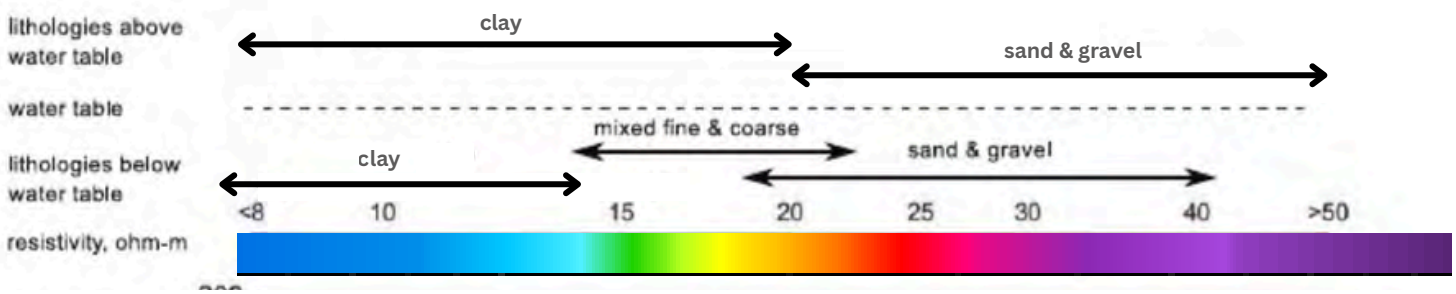




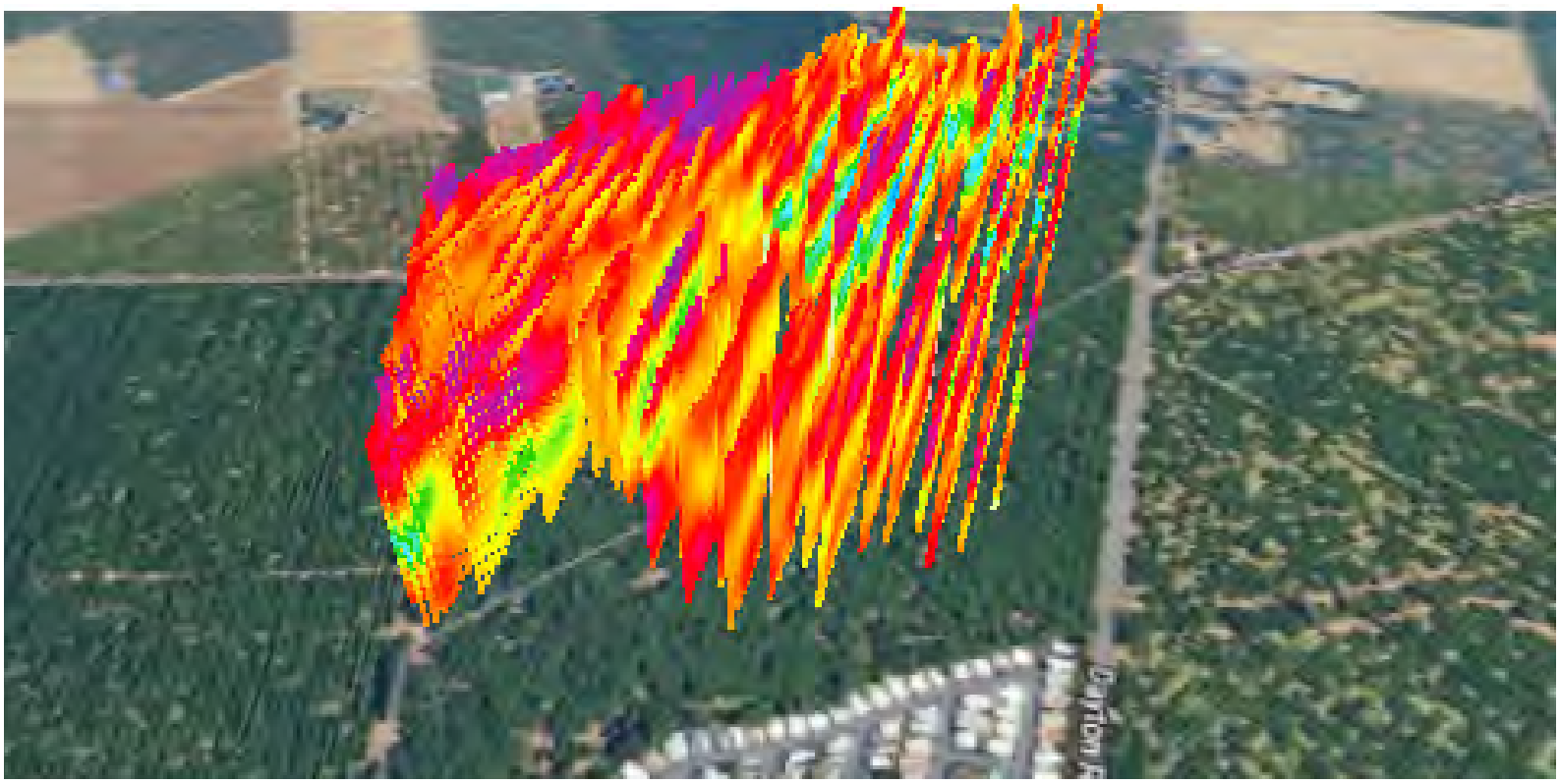
3D VIEW- EAST TO WEST

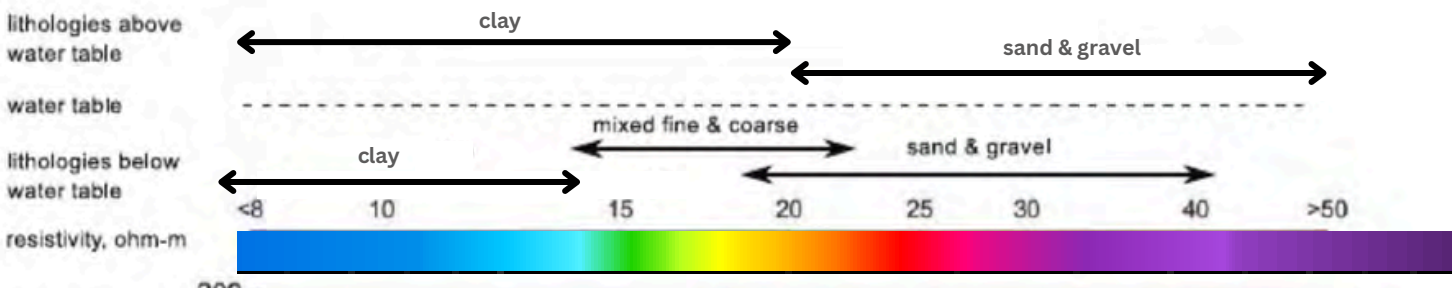
SOUTH **NORTH**



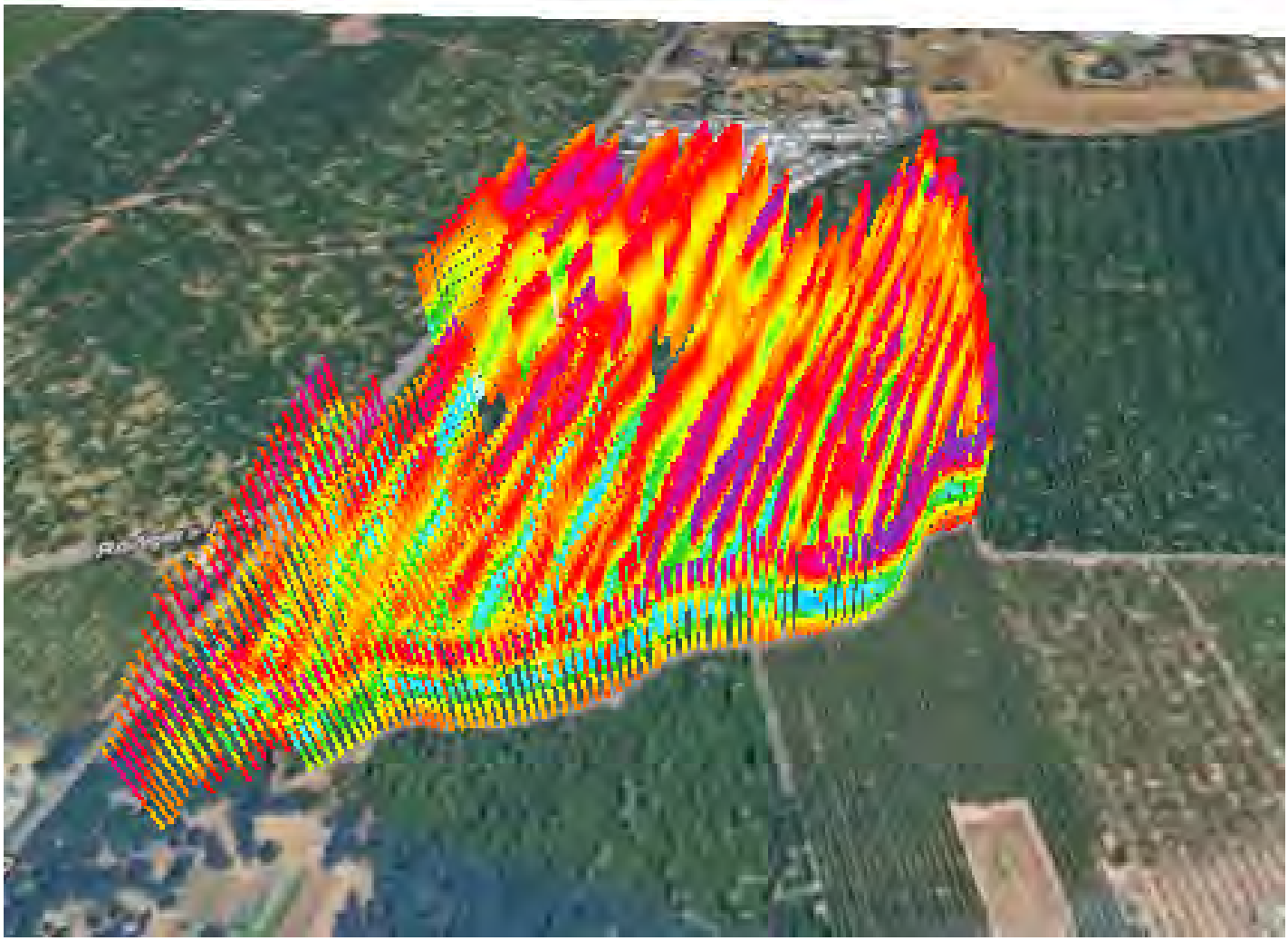


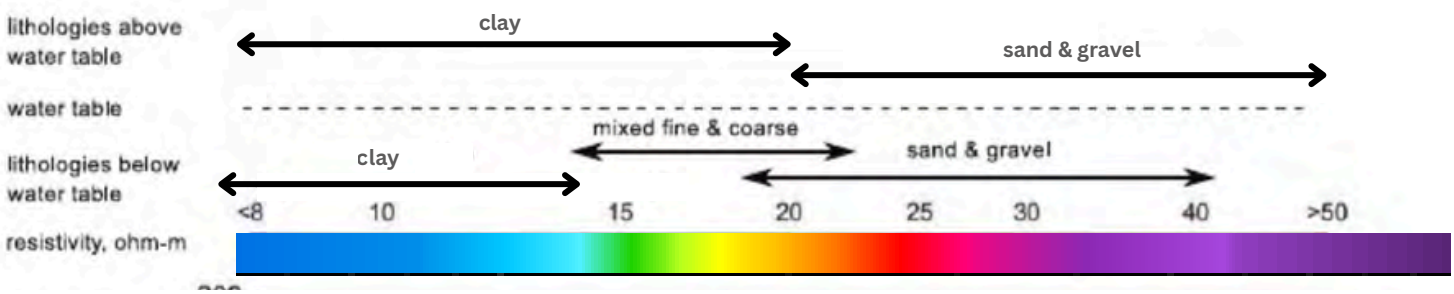
3D VIEW- NORTH TO SOUTH



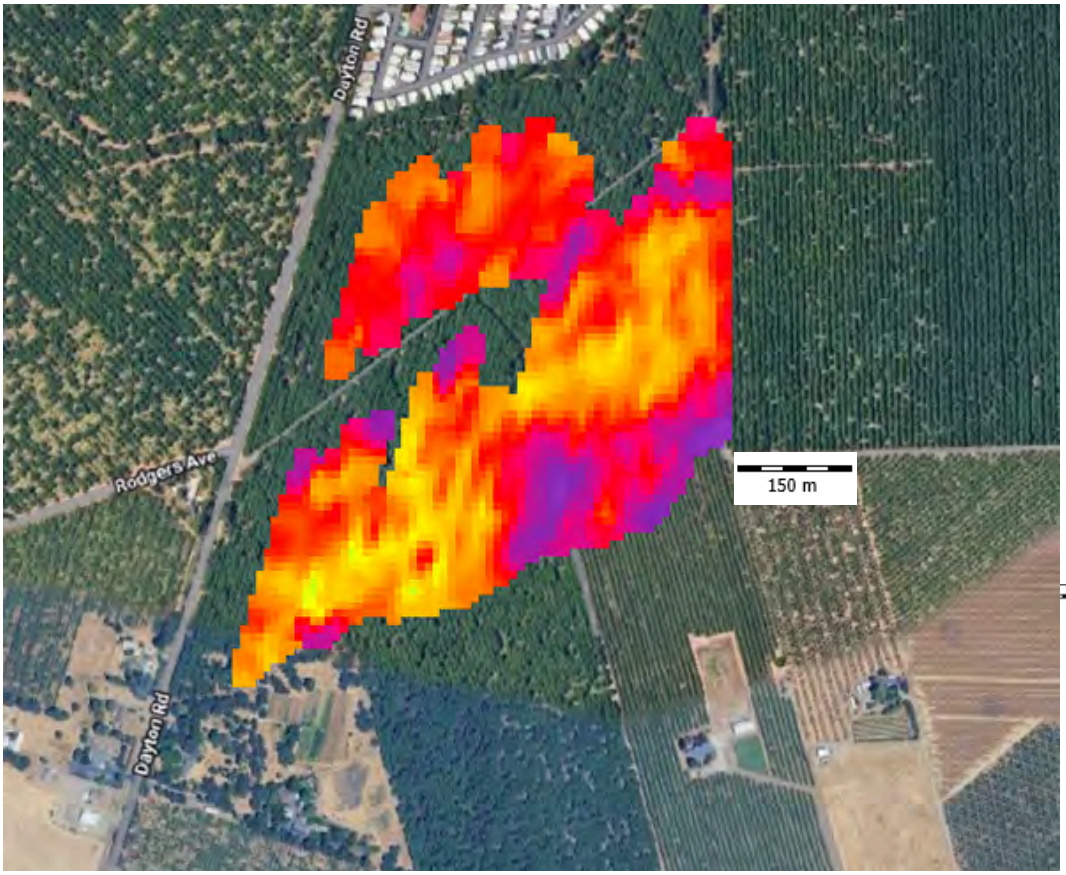


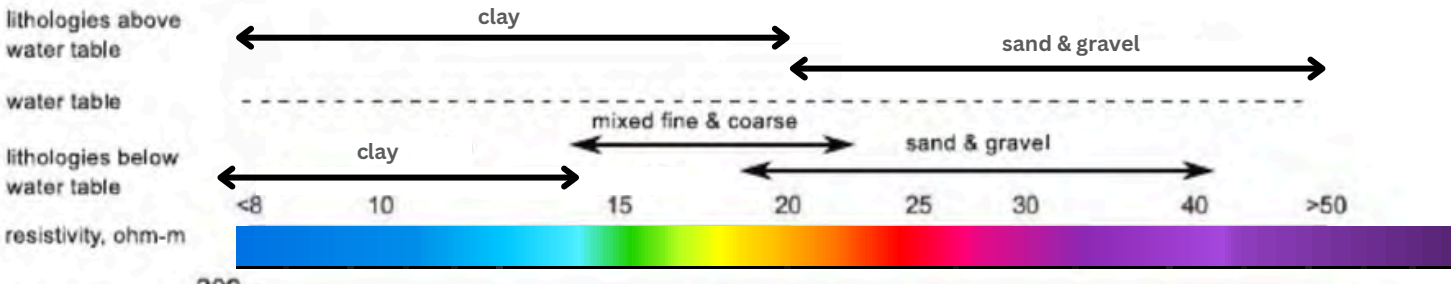
3D VIEW- SOUTH TO NORTH



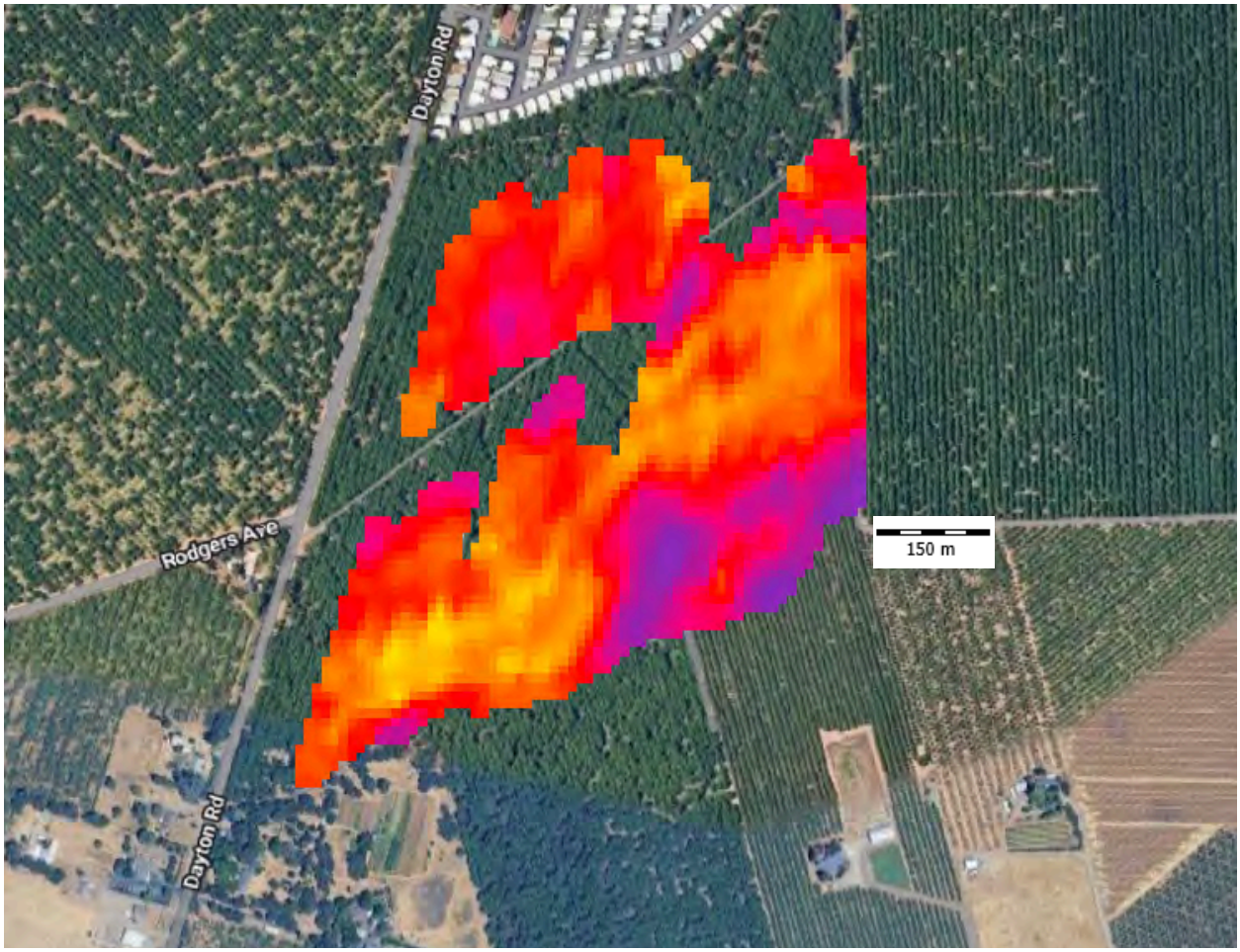


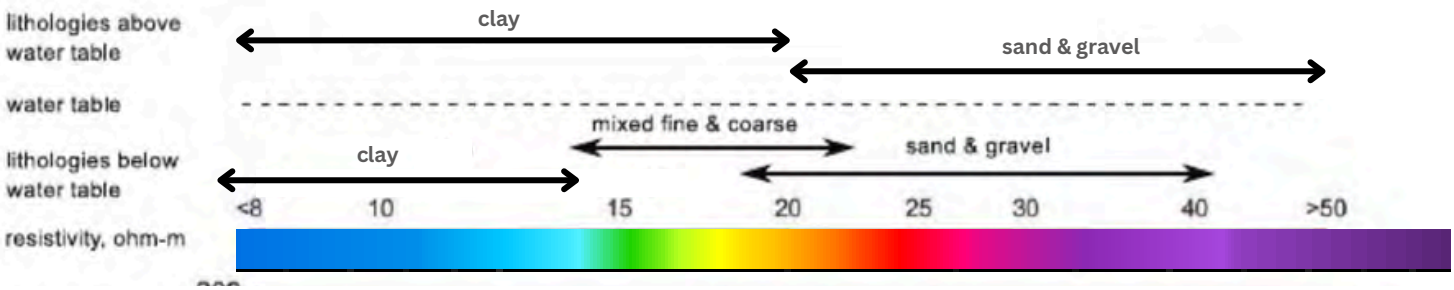
DEPTH SLICES- 0 FT



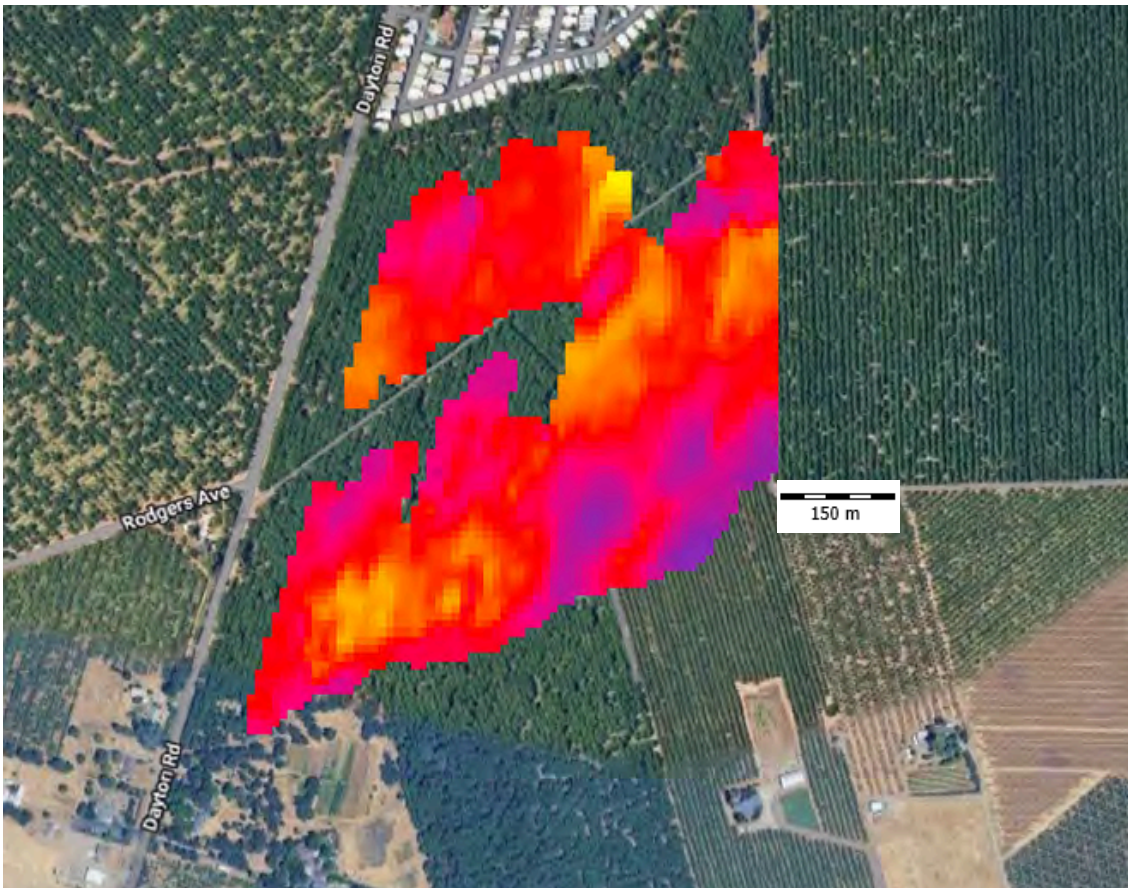


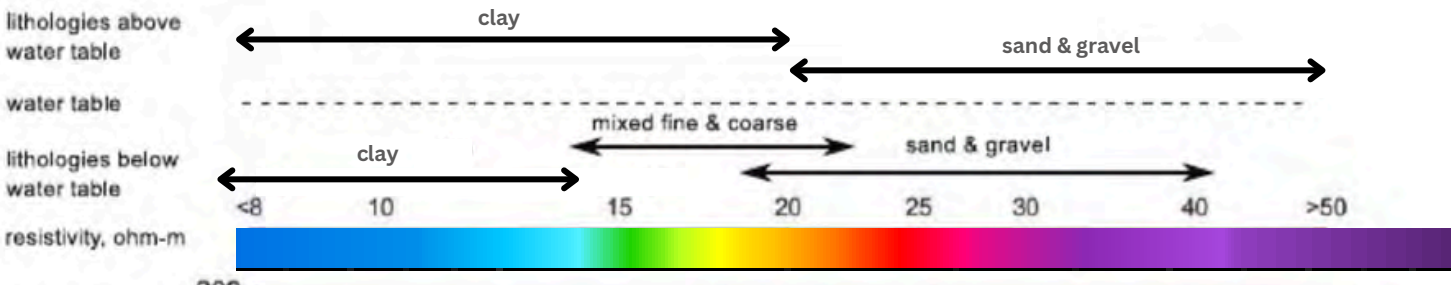
DEPTH SLICES- 10 FT



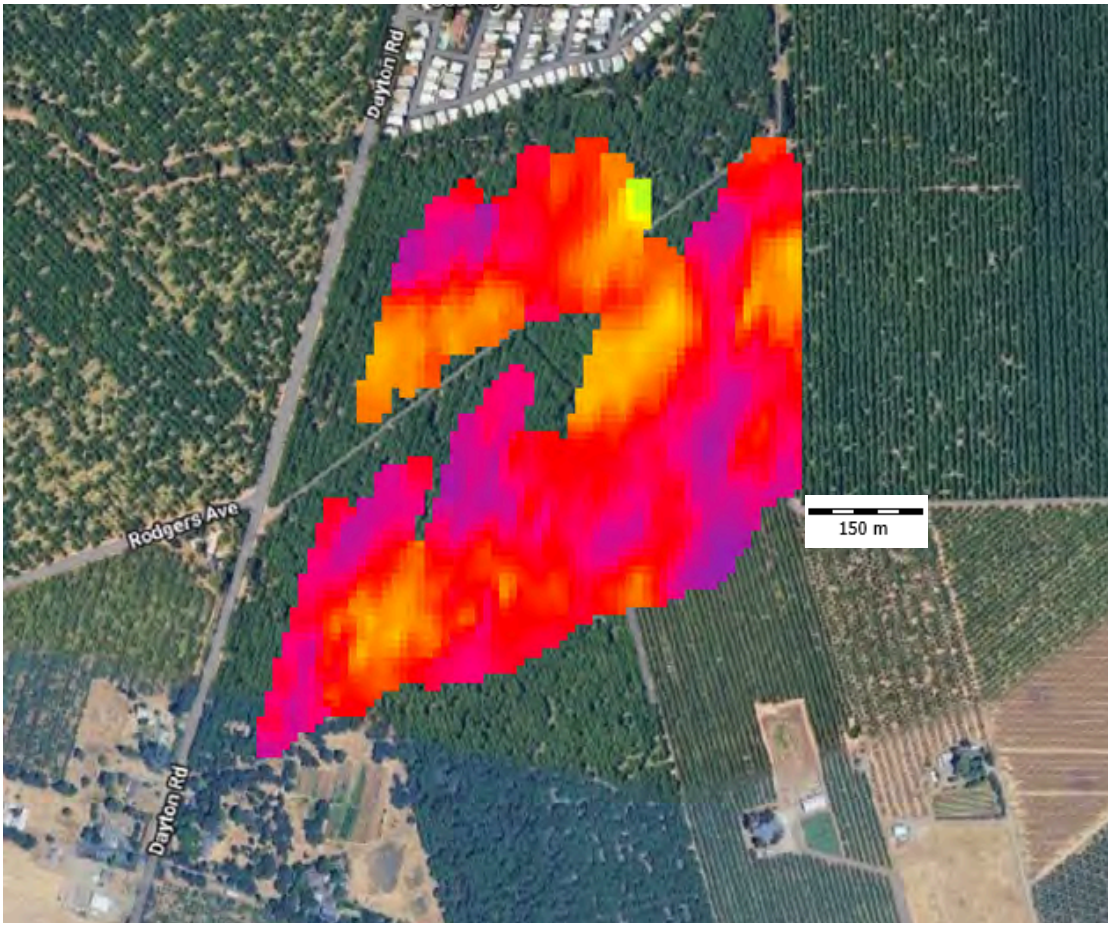


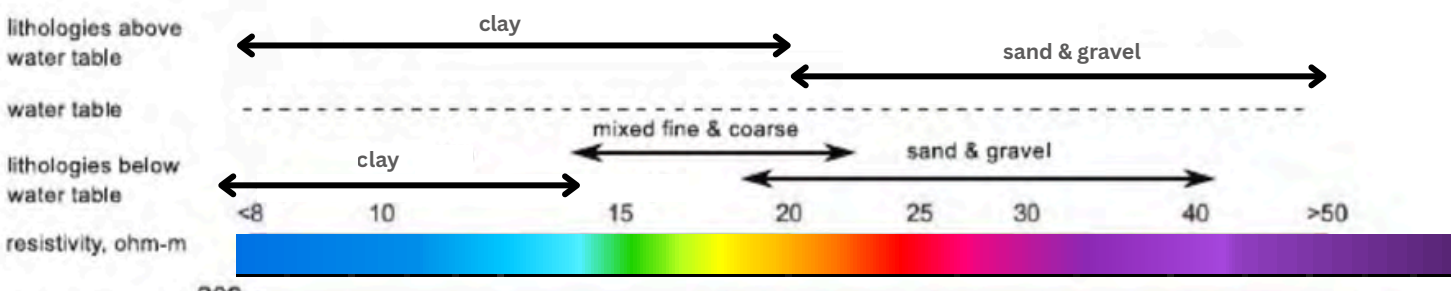
DEPTH SLICES- 20 FT



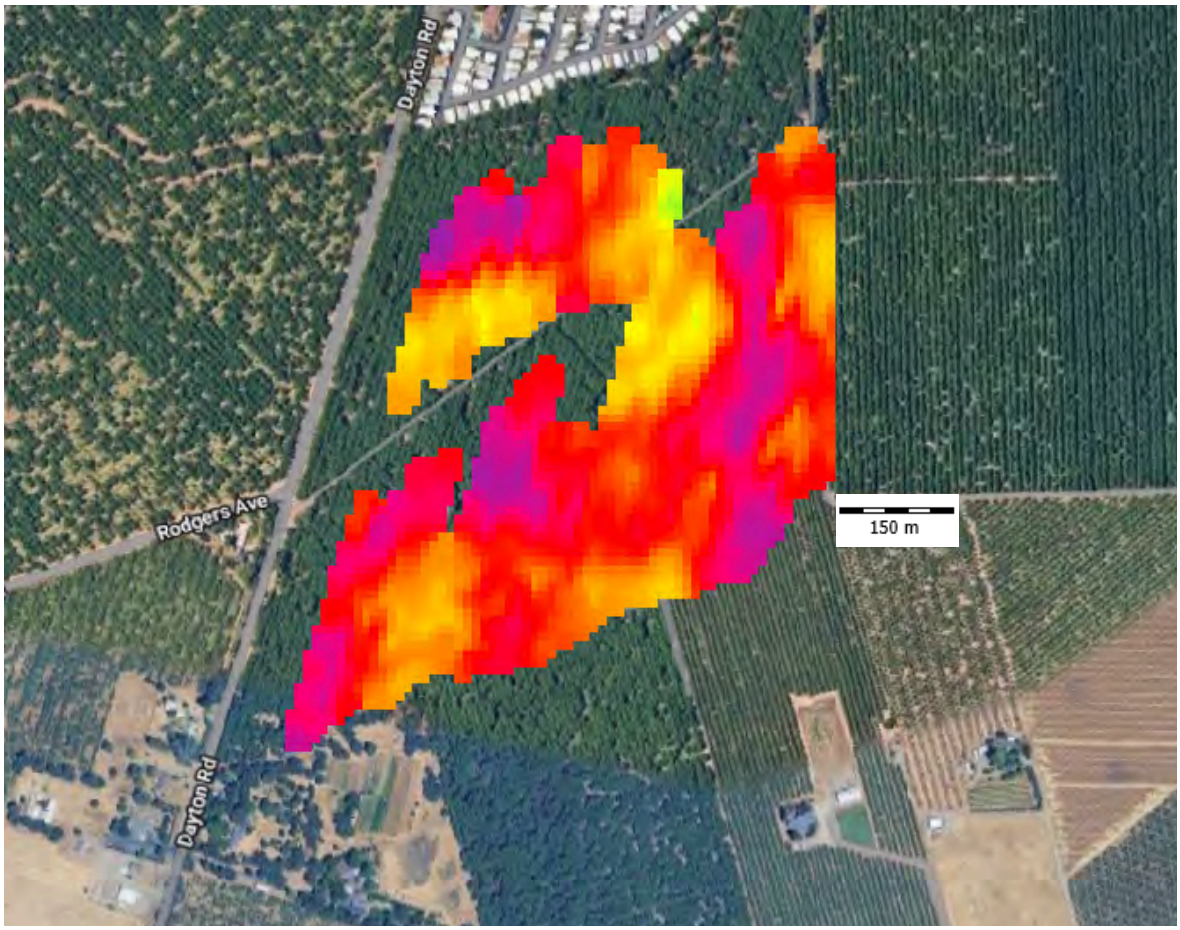


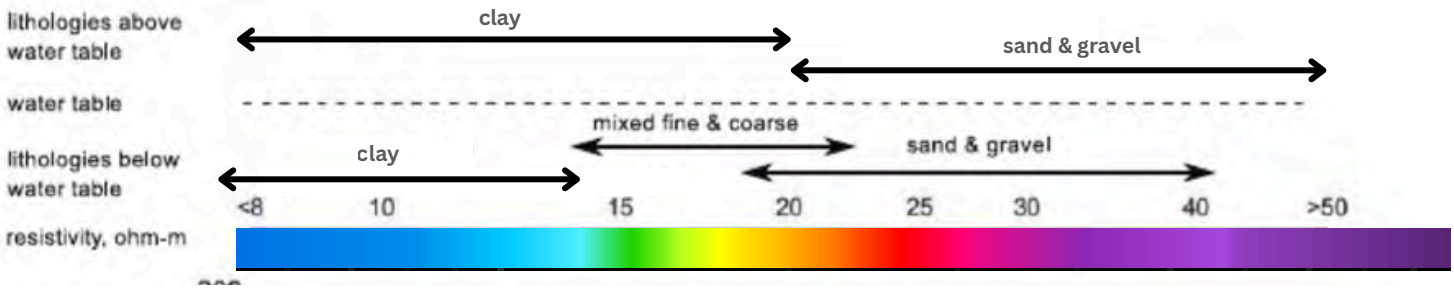
DEPTH SLICES- 30 FT



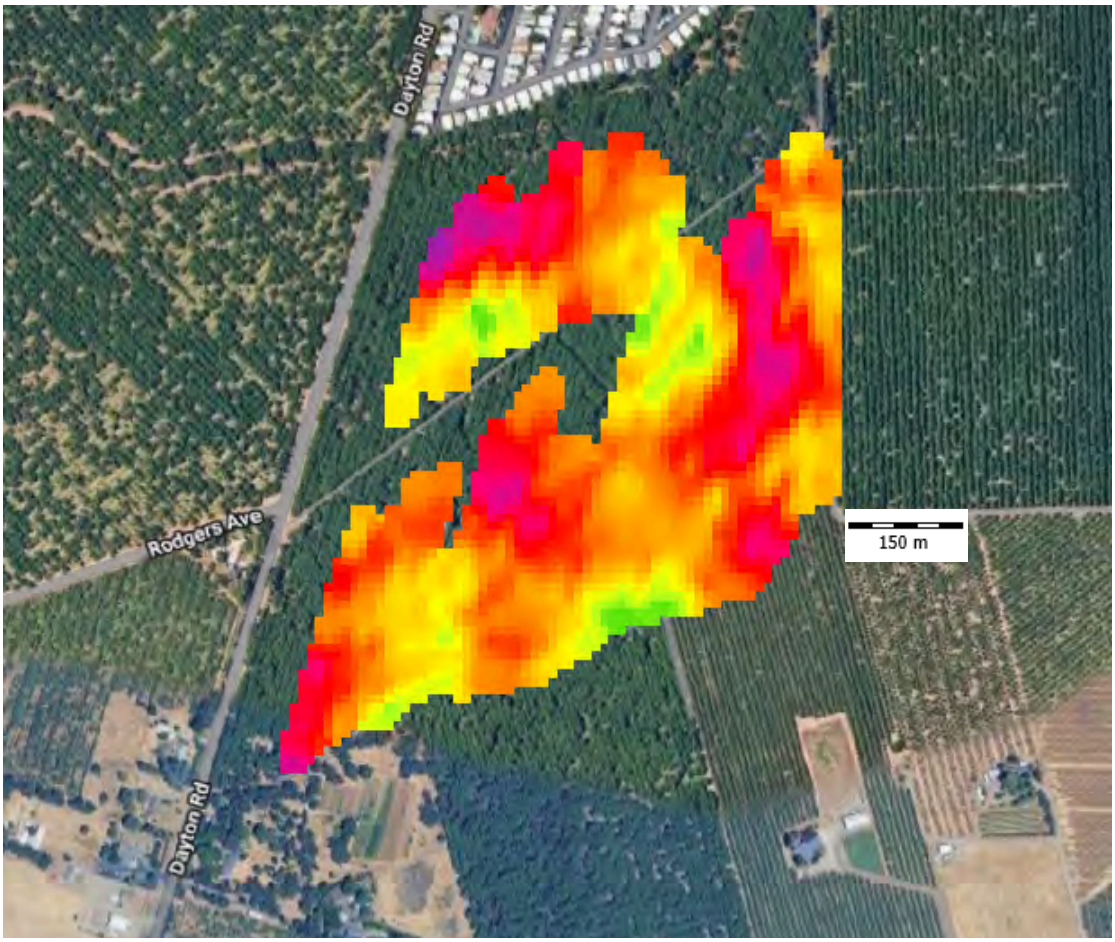


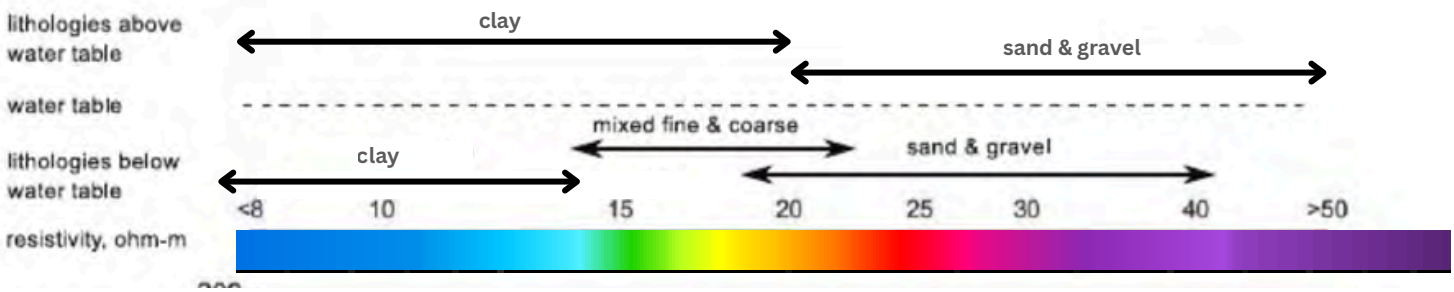
DEPTH SLICES- 40 FT



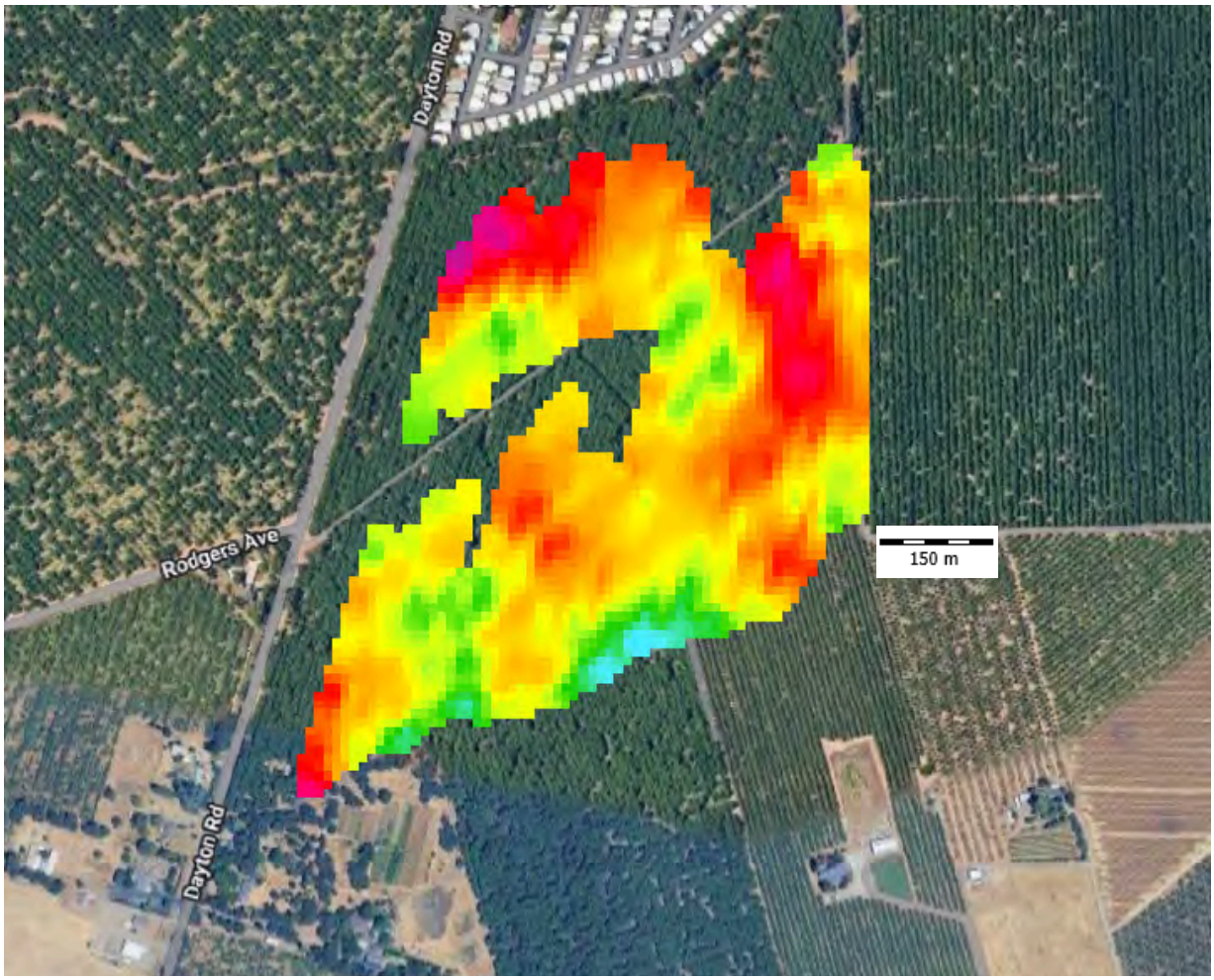


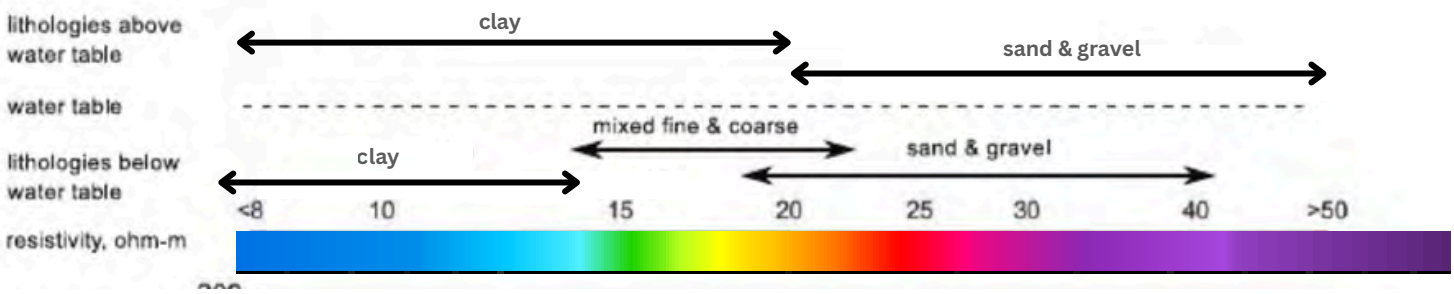
DEPTH SLICES- 50 FT



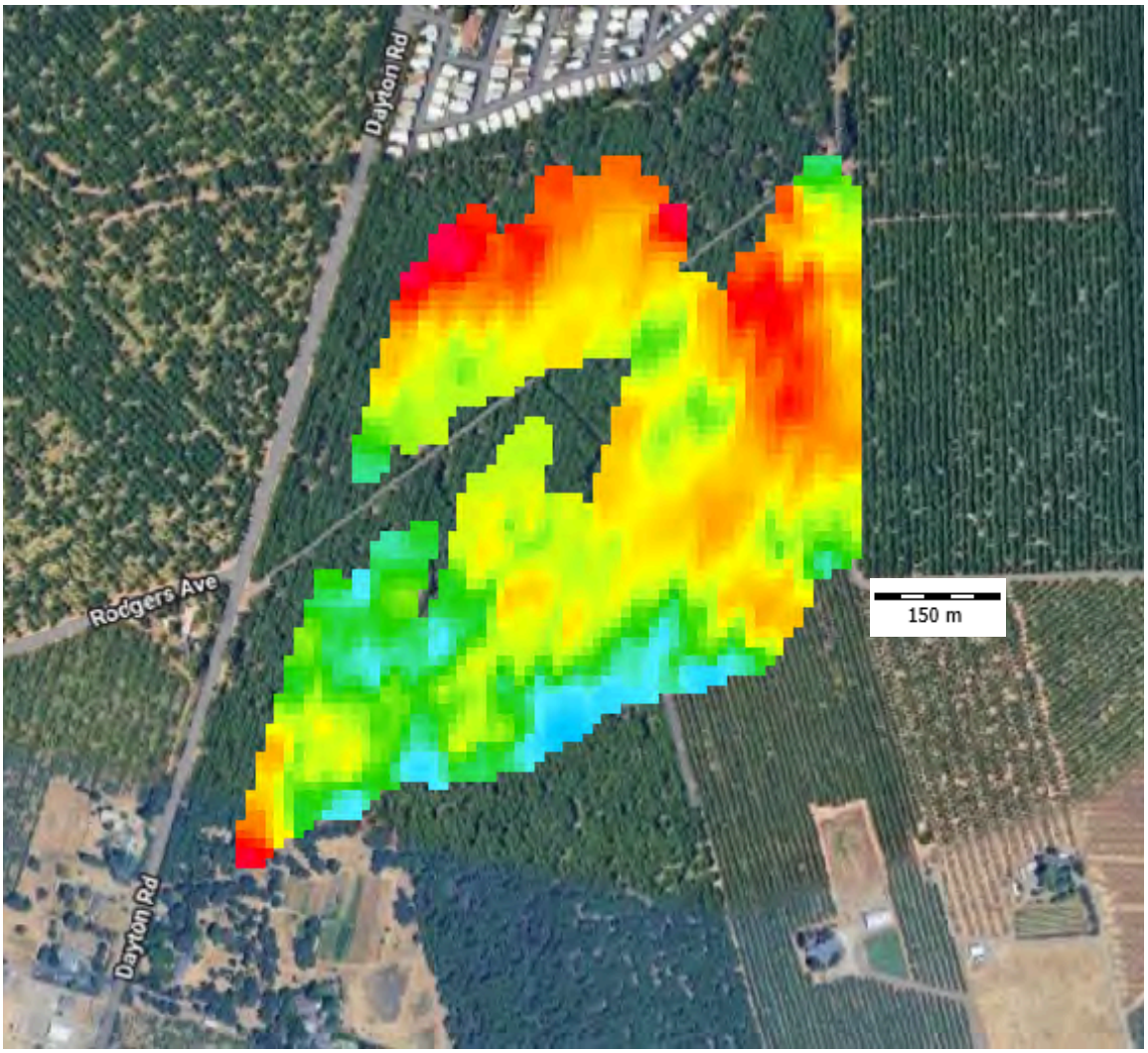


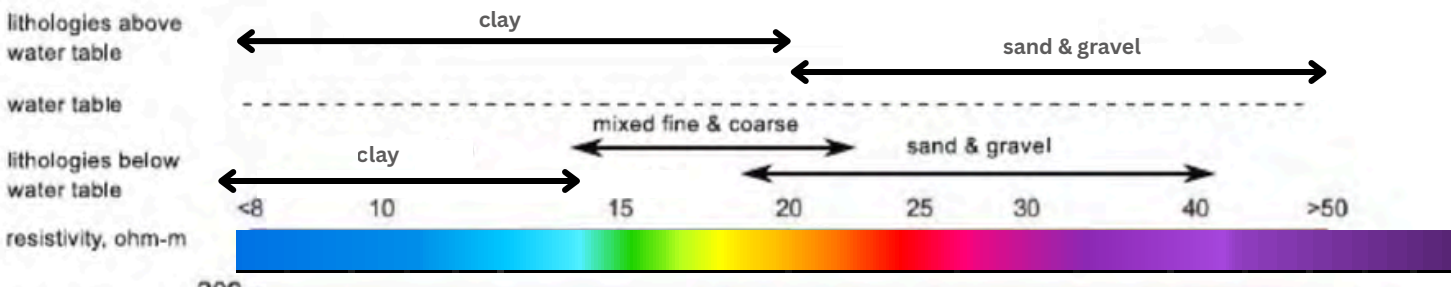
DEPTH SLICES- 60 FT



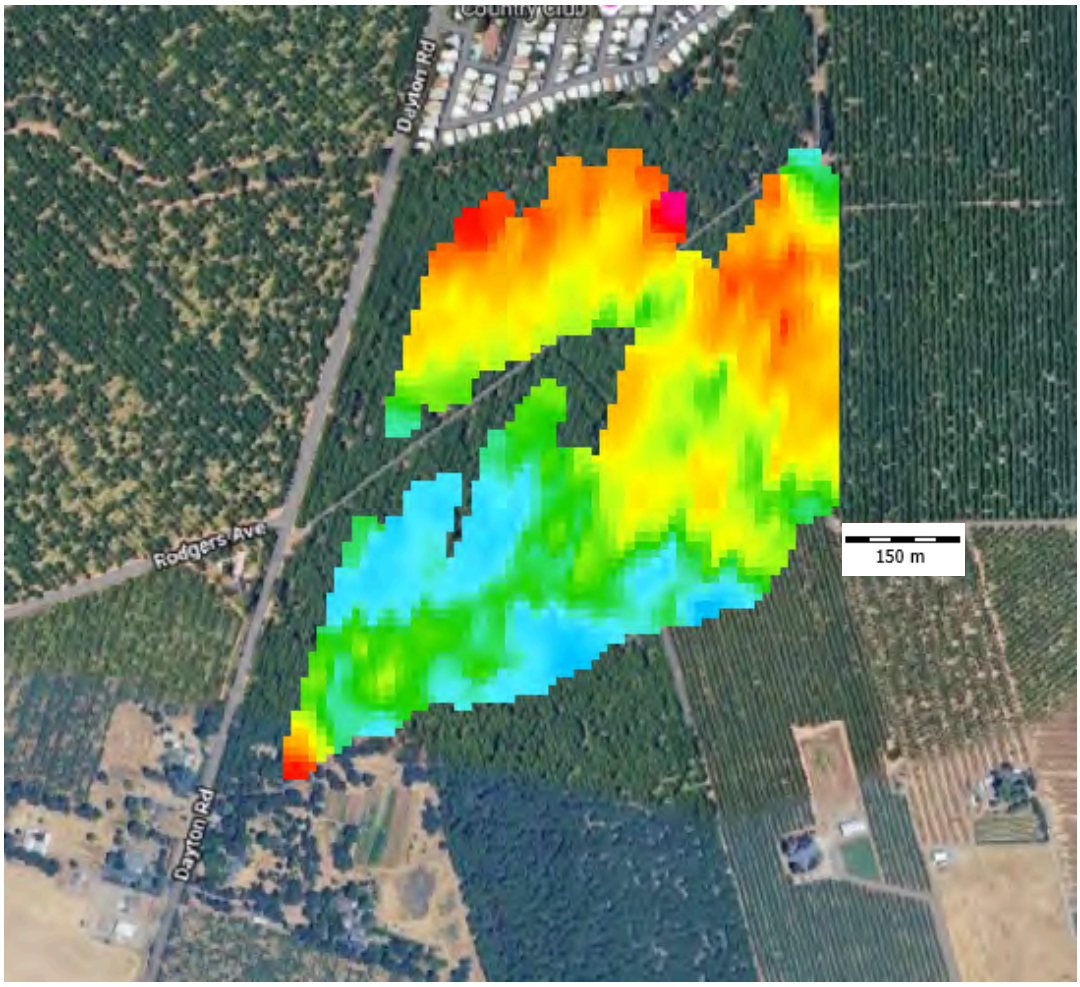


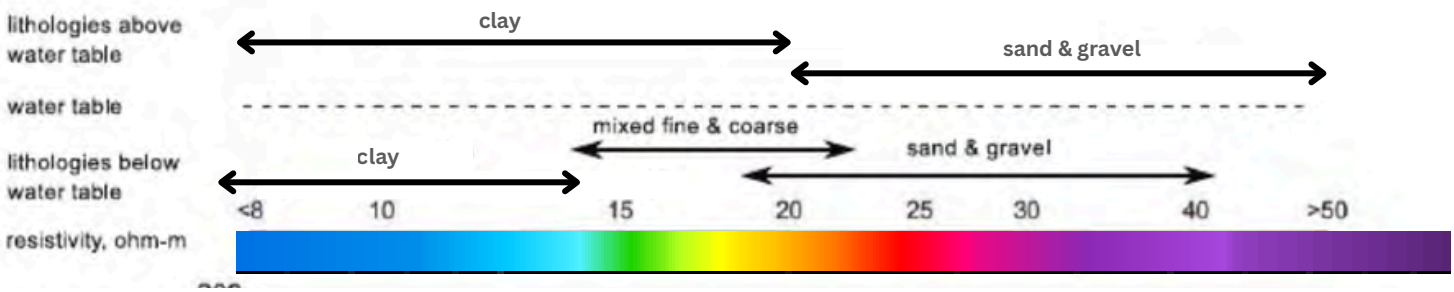
DEPTH SLICES- 70 FT (WATER TABLE)



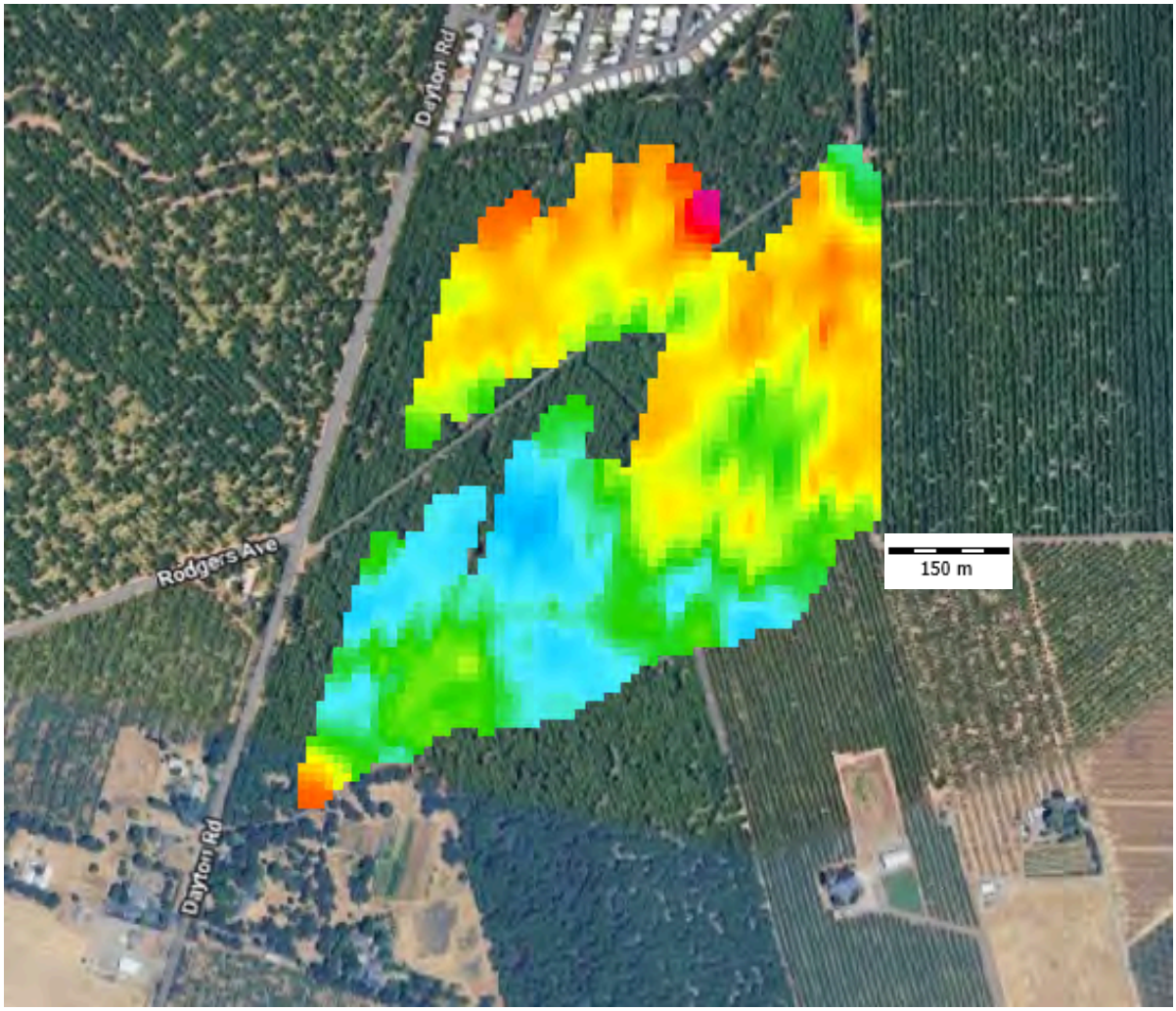


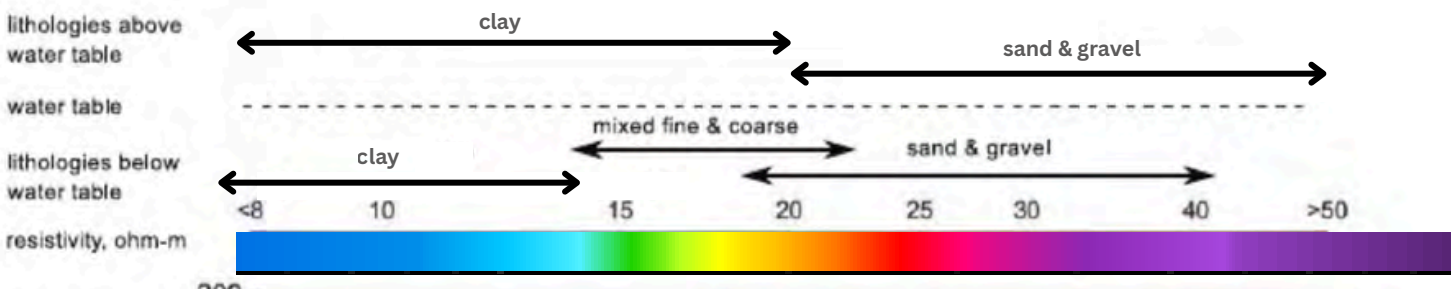
DEPTH SLICES- 80 FT



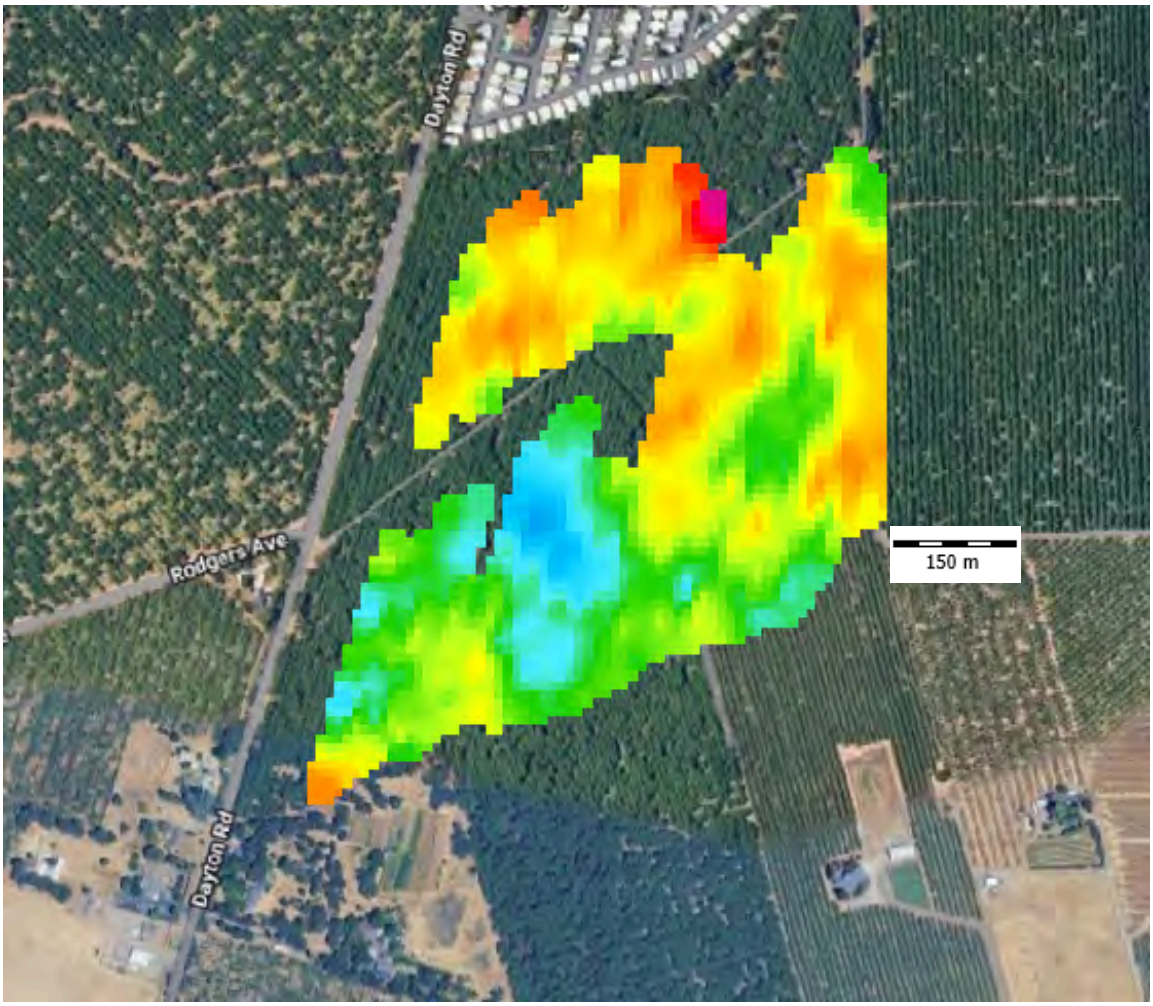


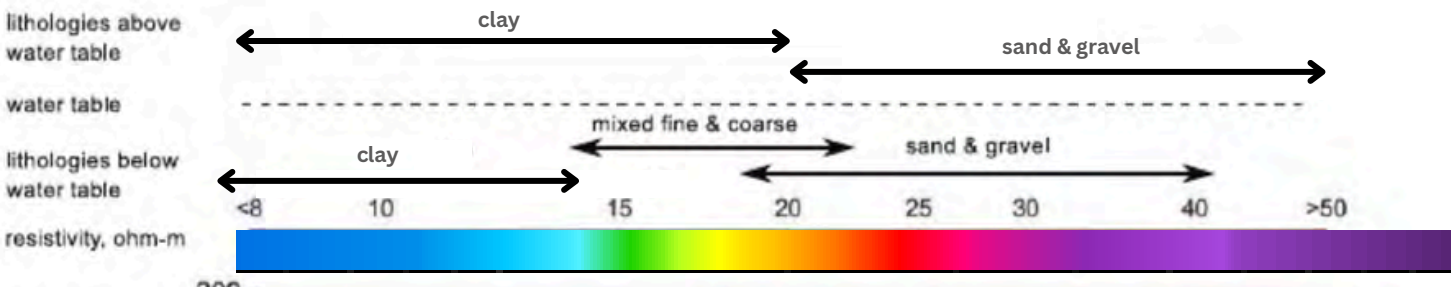
DEPTH SLICES- 90 FT



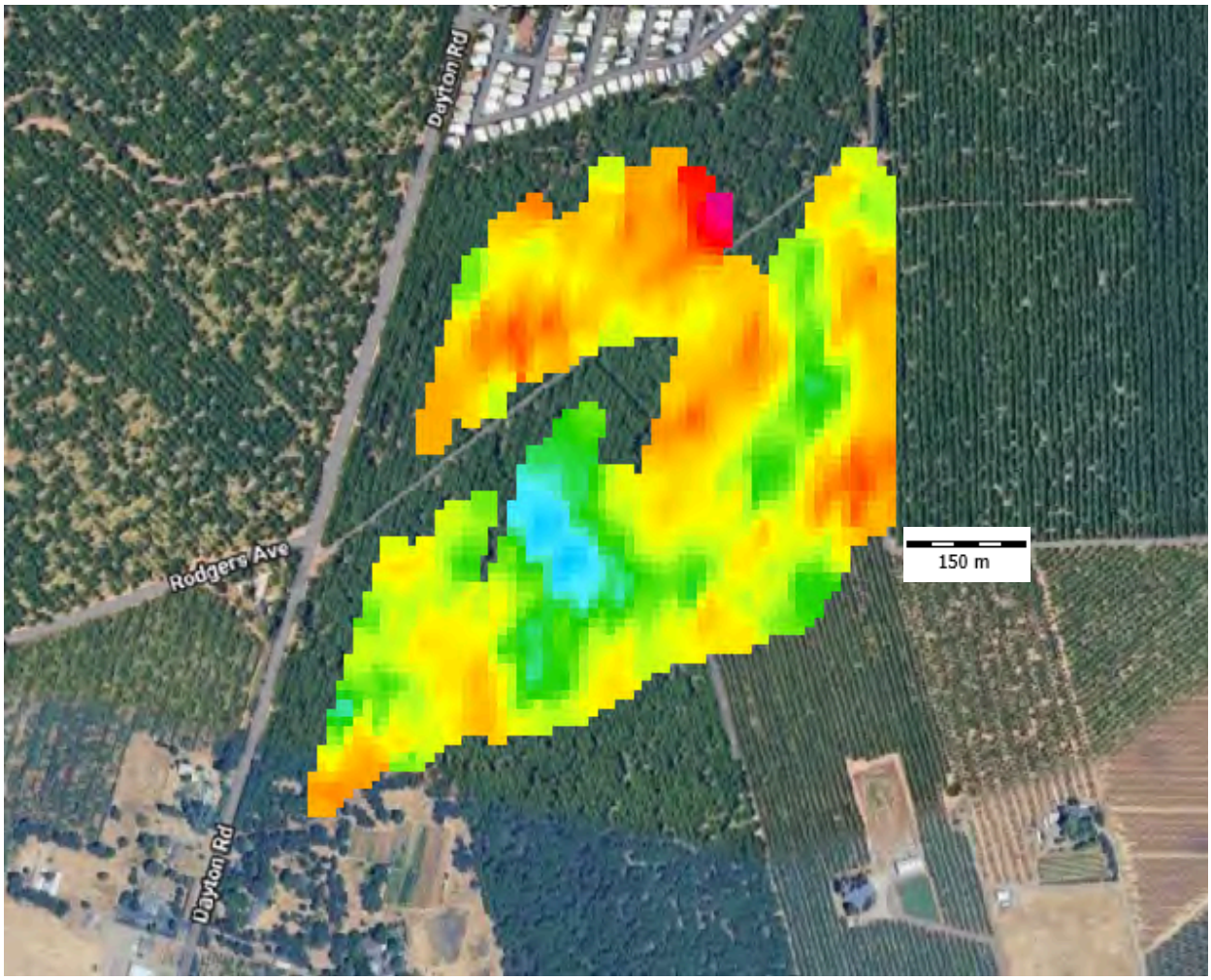


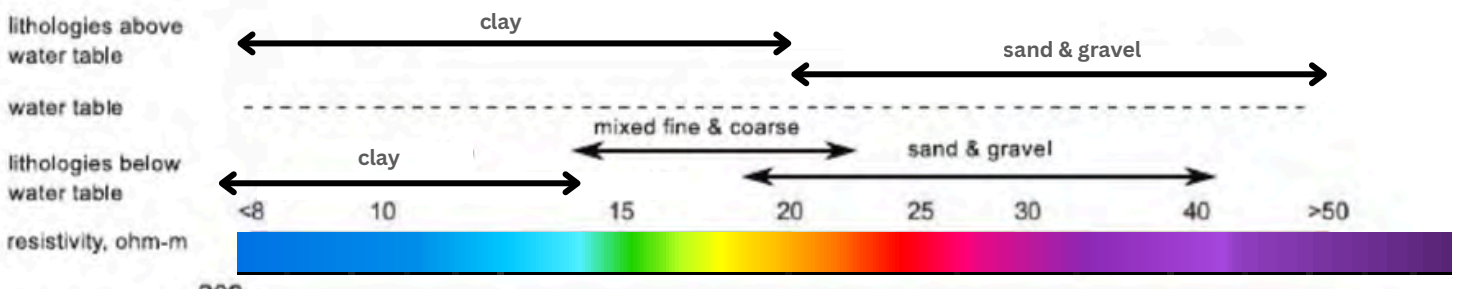
DEPTH SLICES- 100 FT



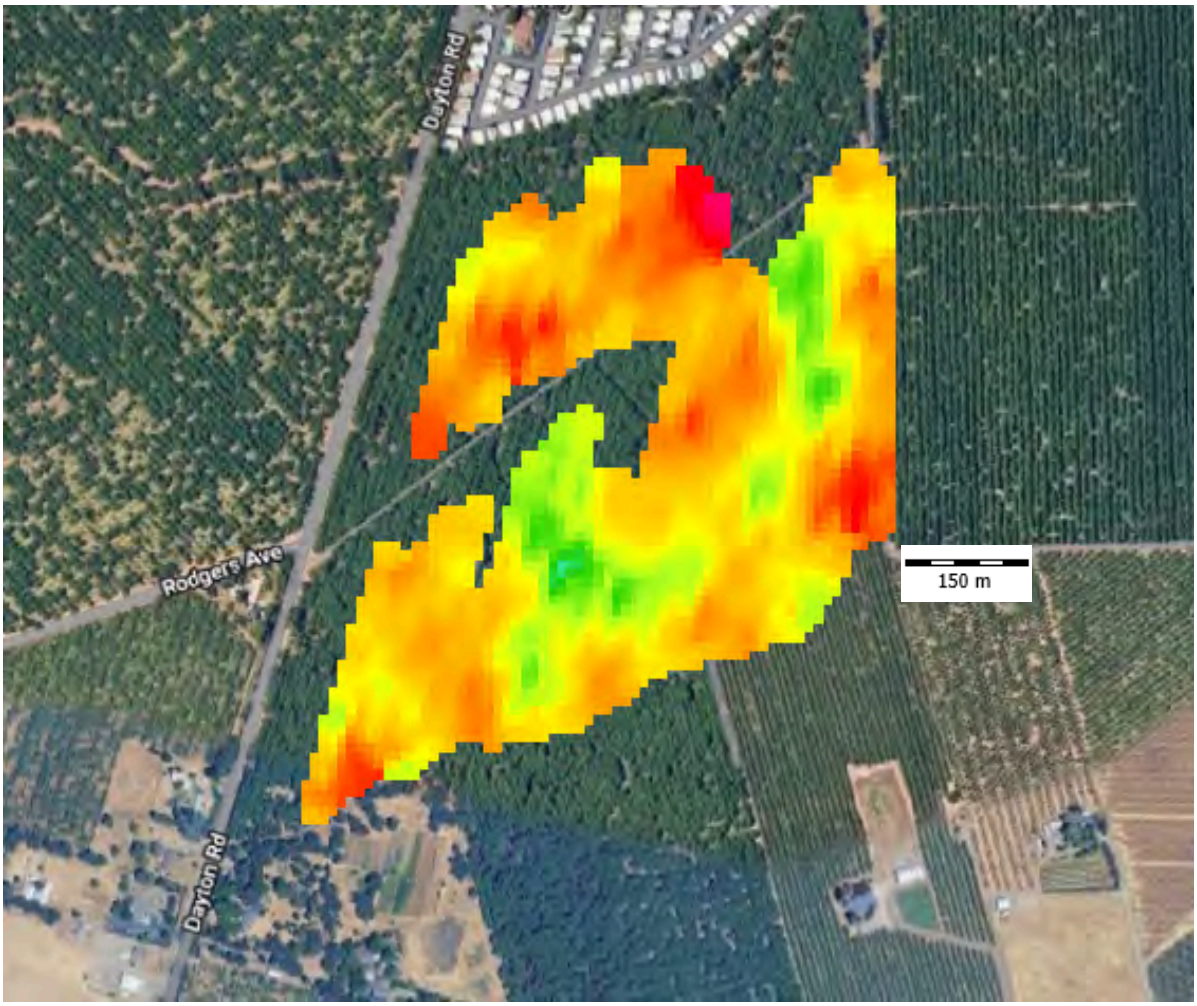


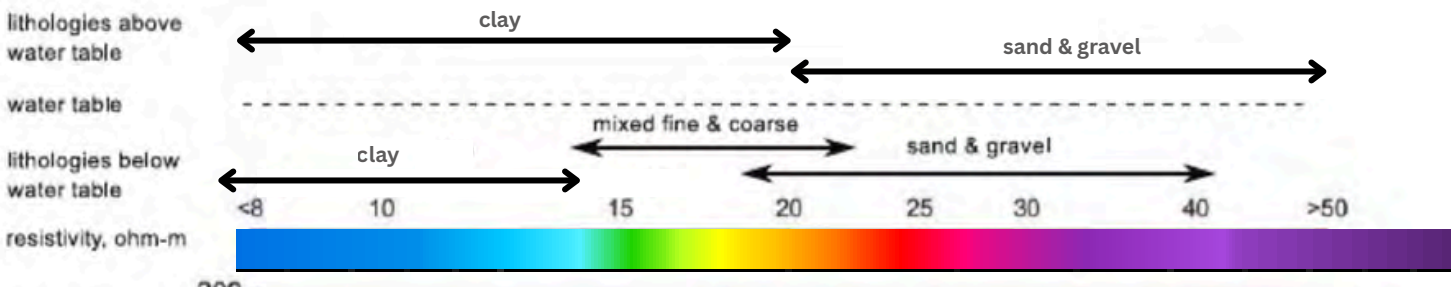
DEPTH SLICES- 110 FT



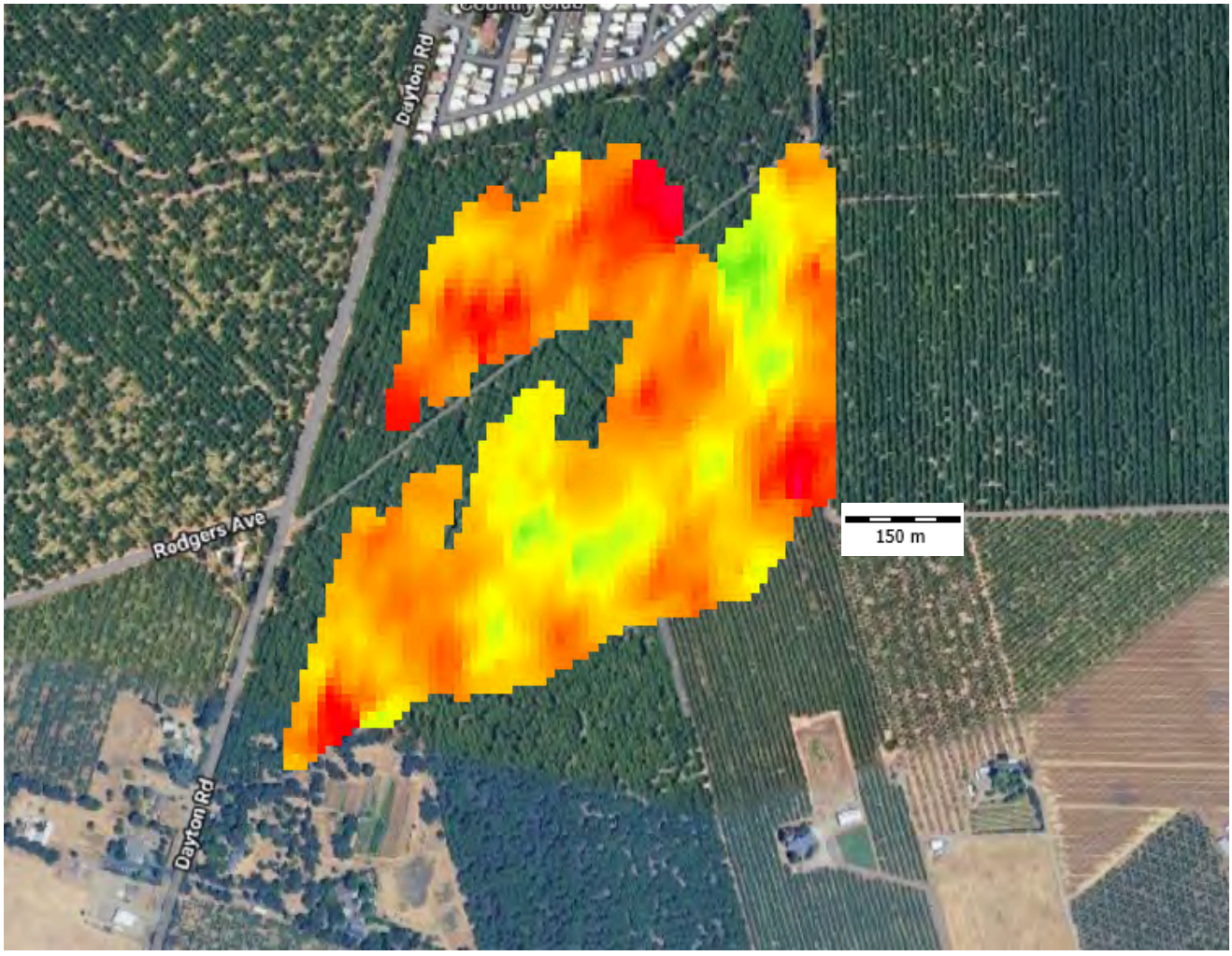


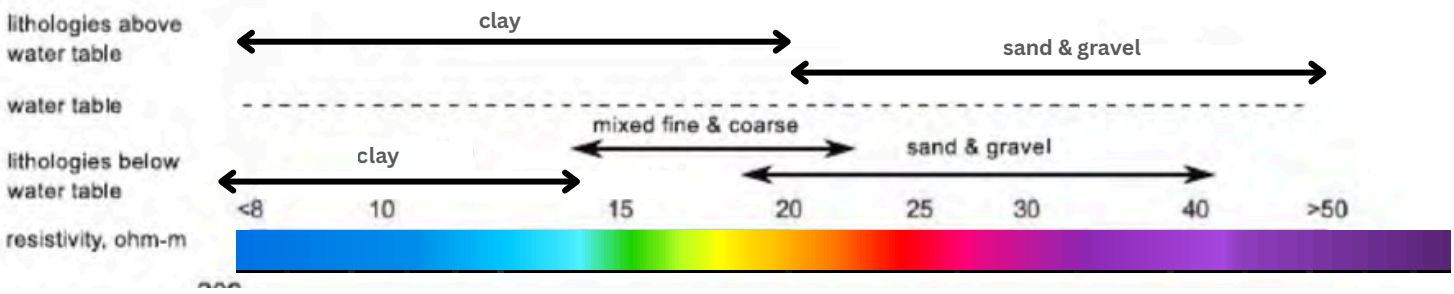
DEPTH SLICES- 120 FT



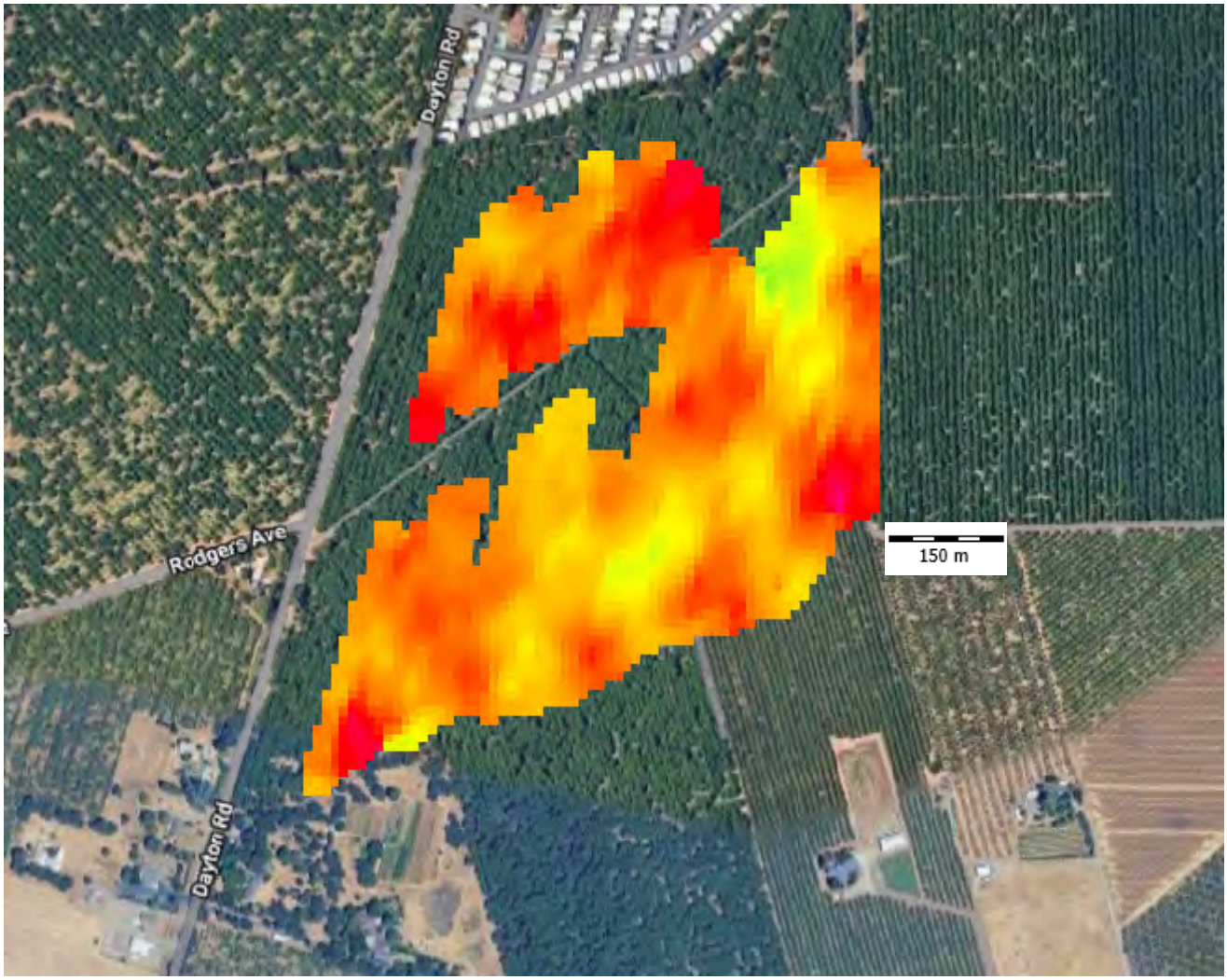


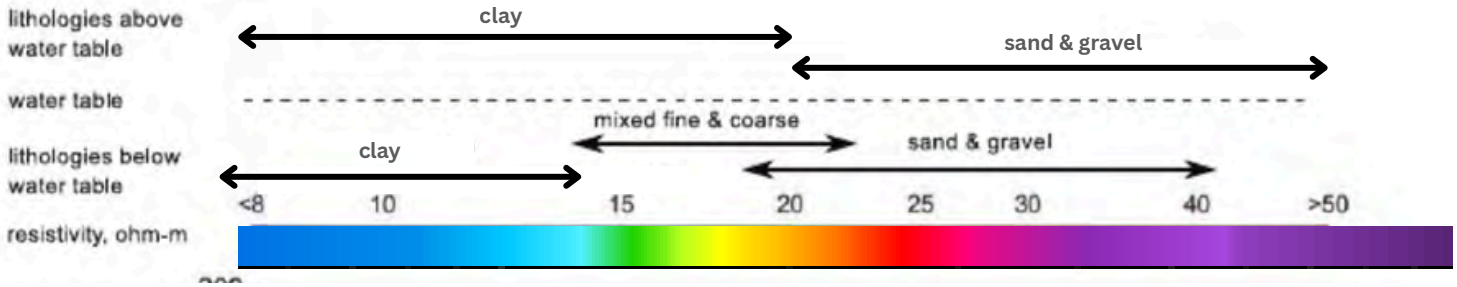
DEPTH SLICES- 130 FT



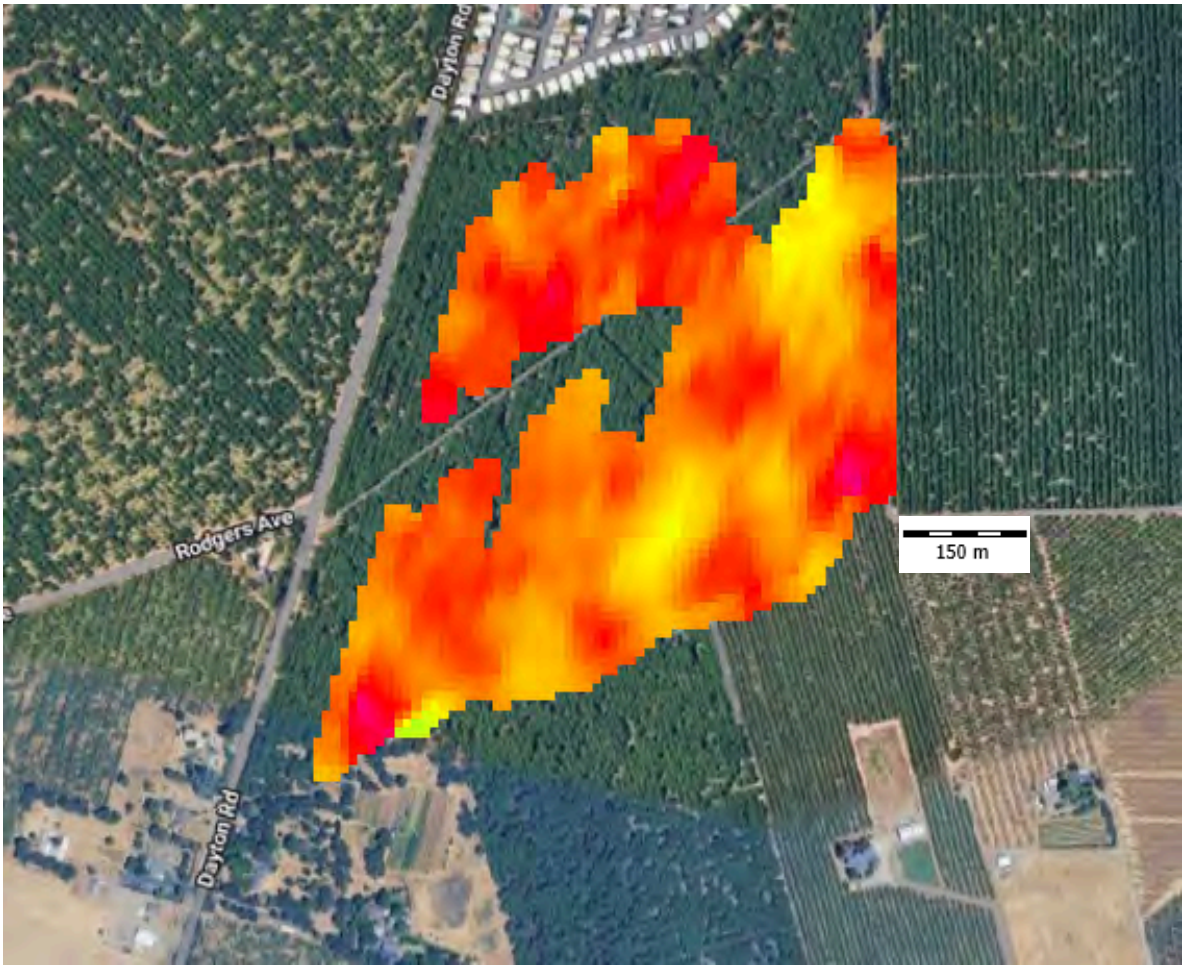


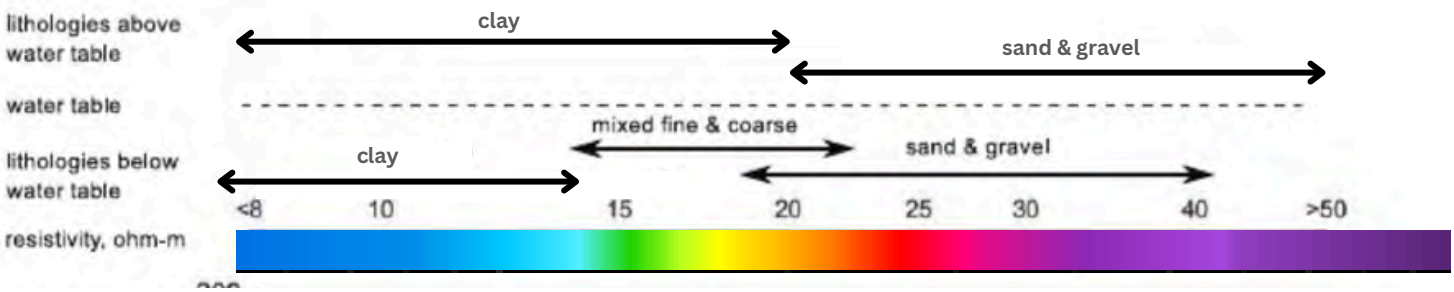
DEPTH SLICES- 140 FT



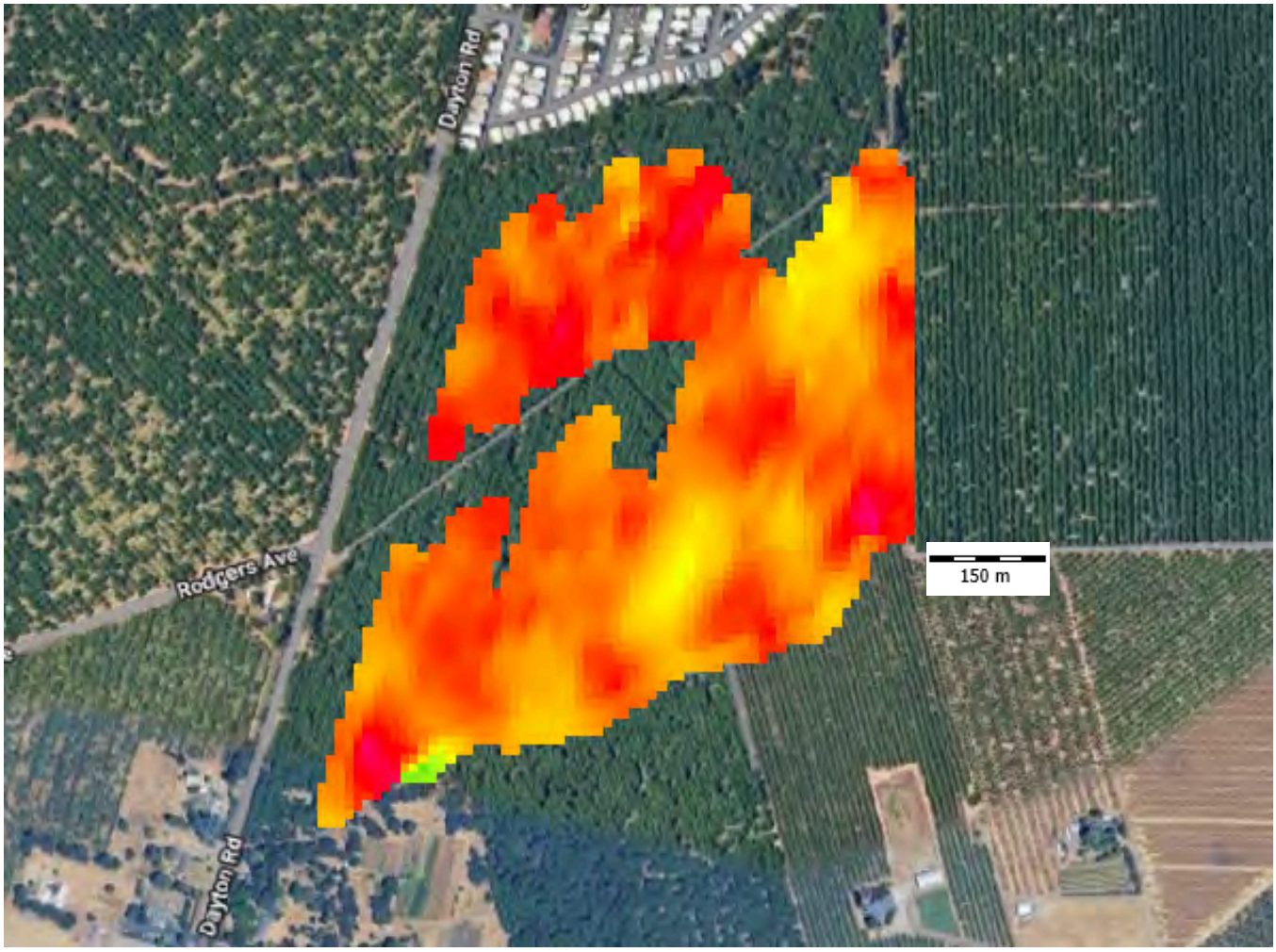


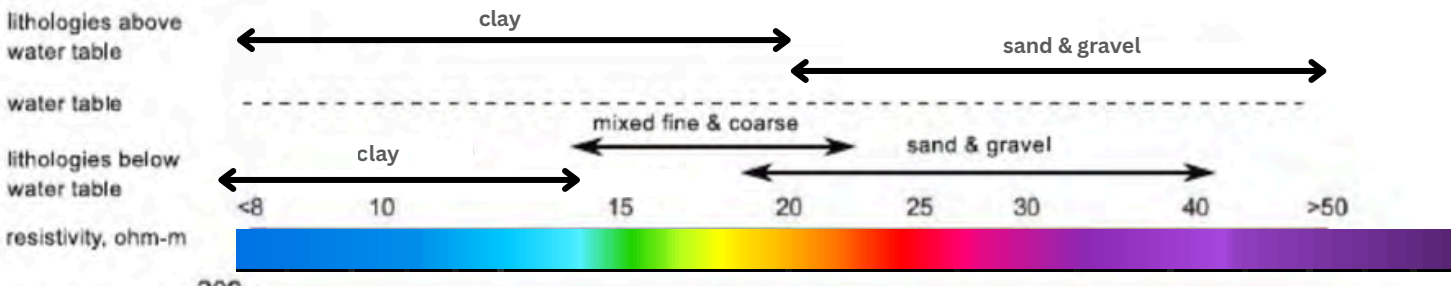
DEPTH SLICES- 150 FT



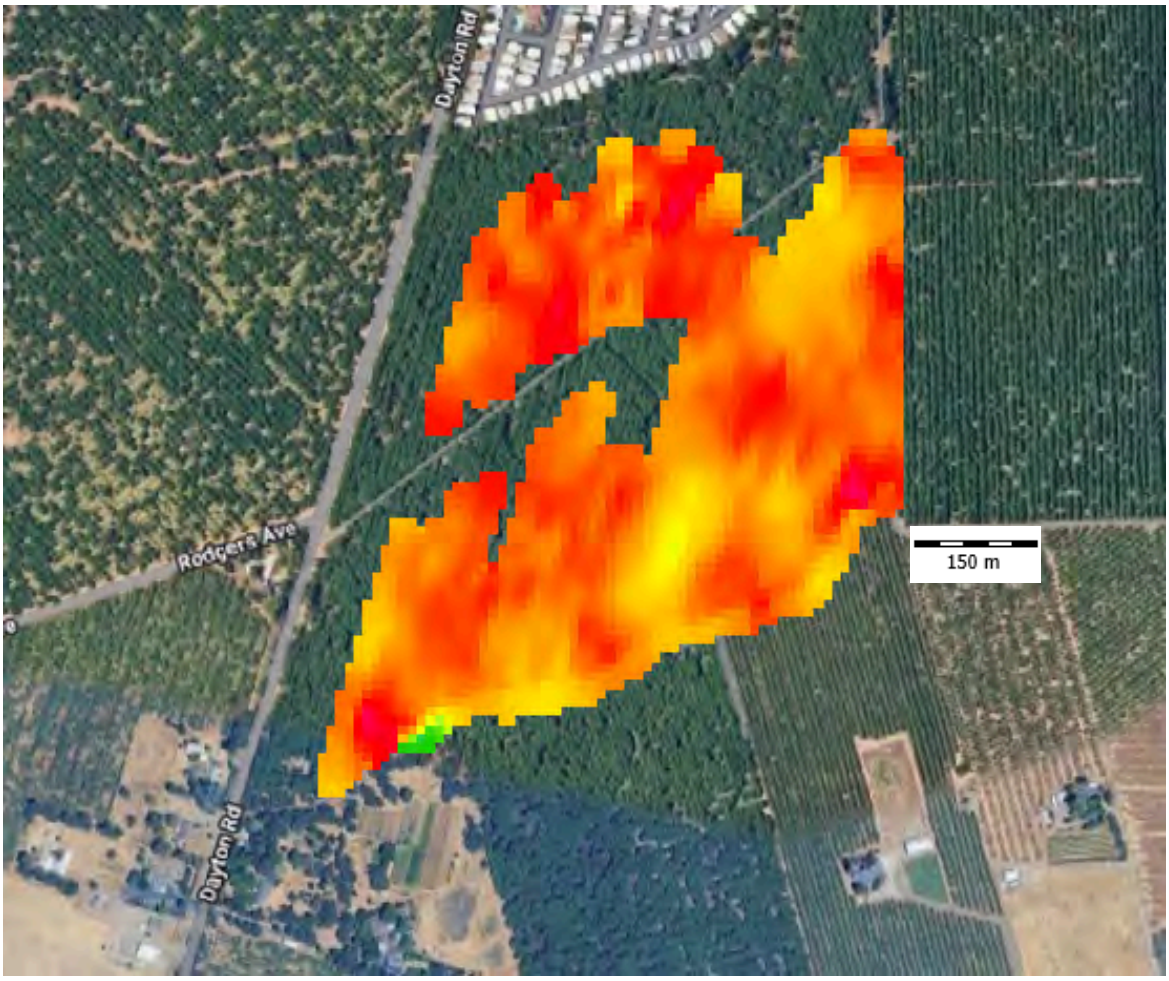


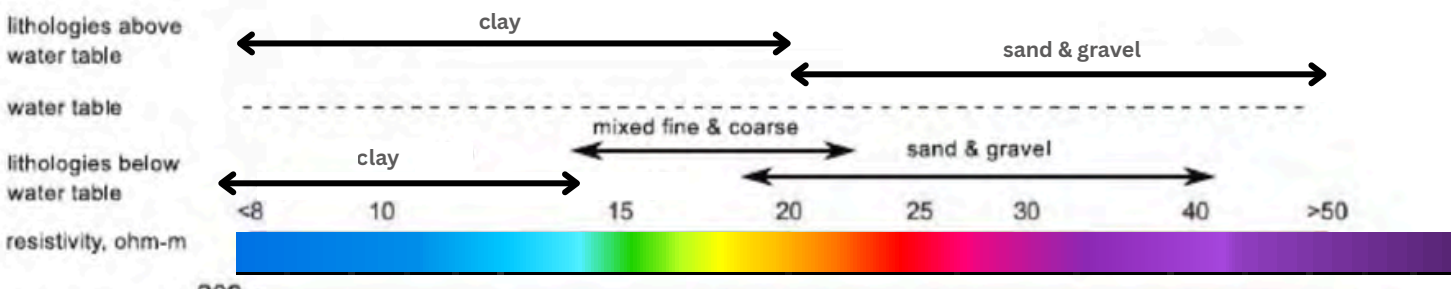
DEPTH SLICES- 160 FT



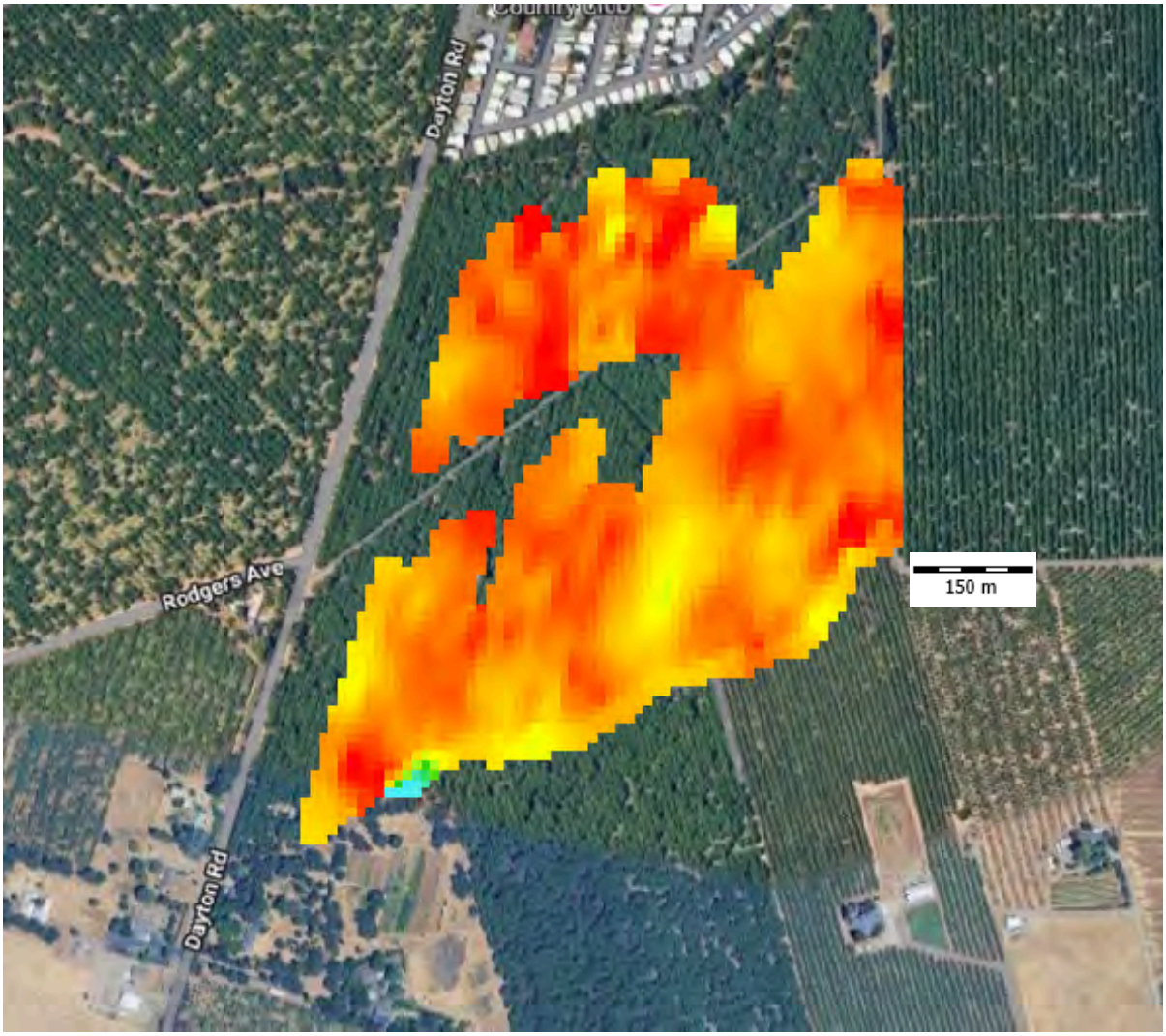


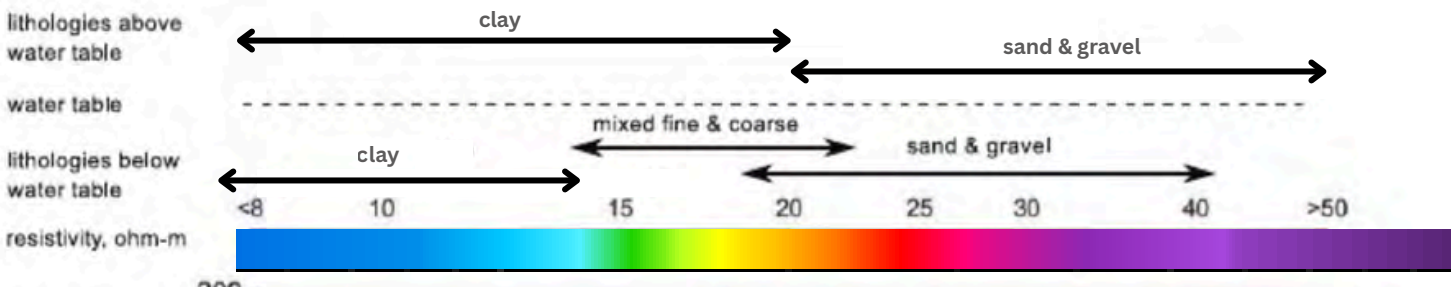
DEPTH SLICES- 170 FT



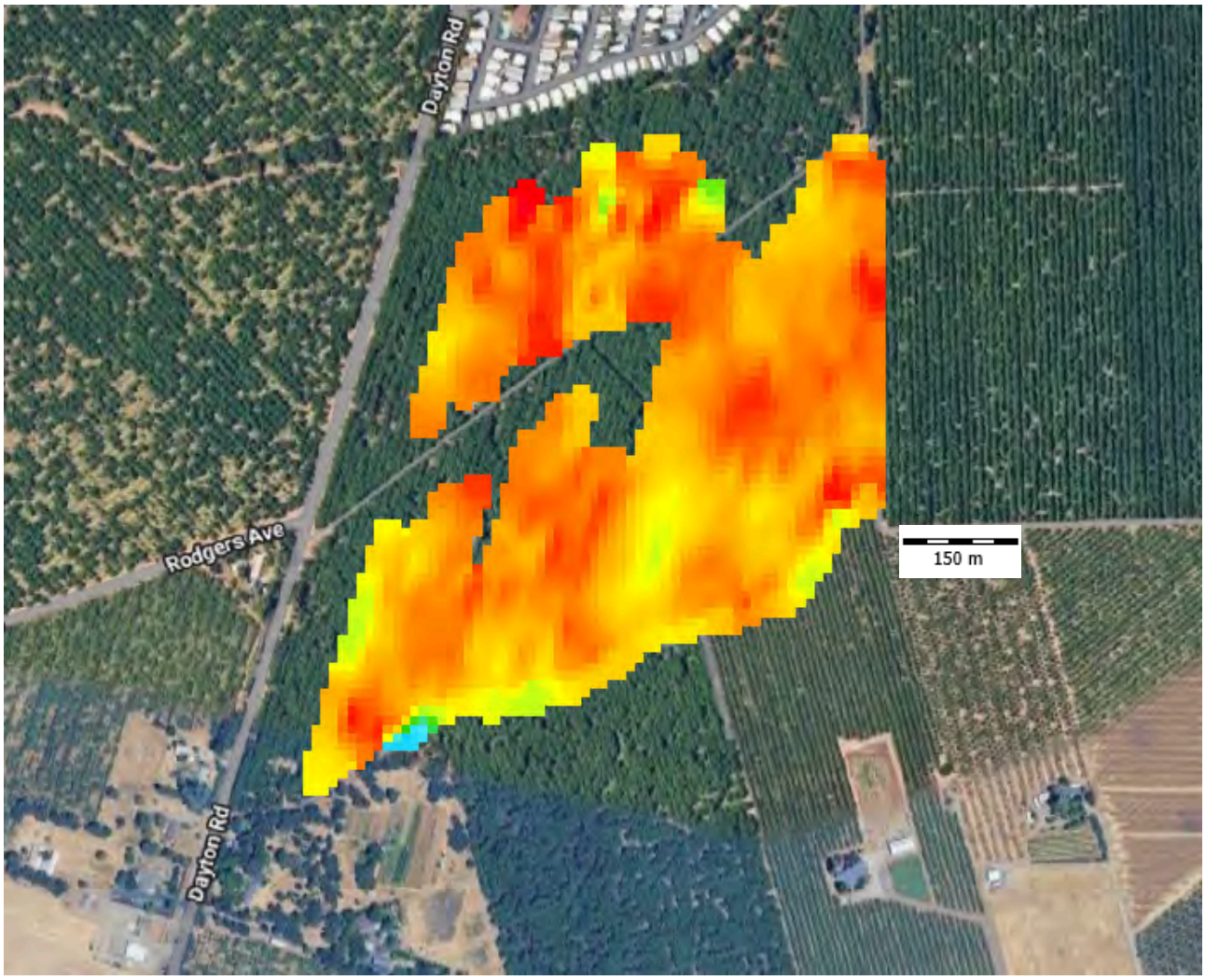


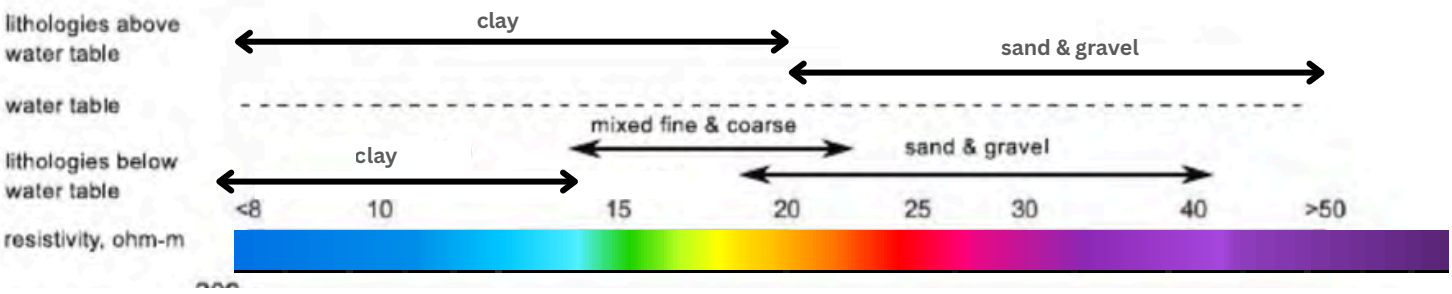
DEPTH SLICES- 180 FT



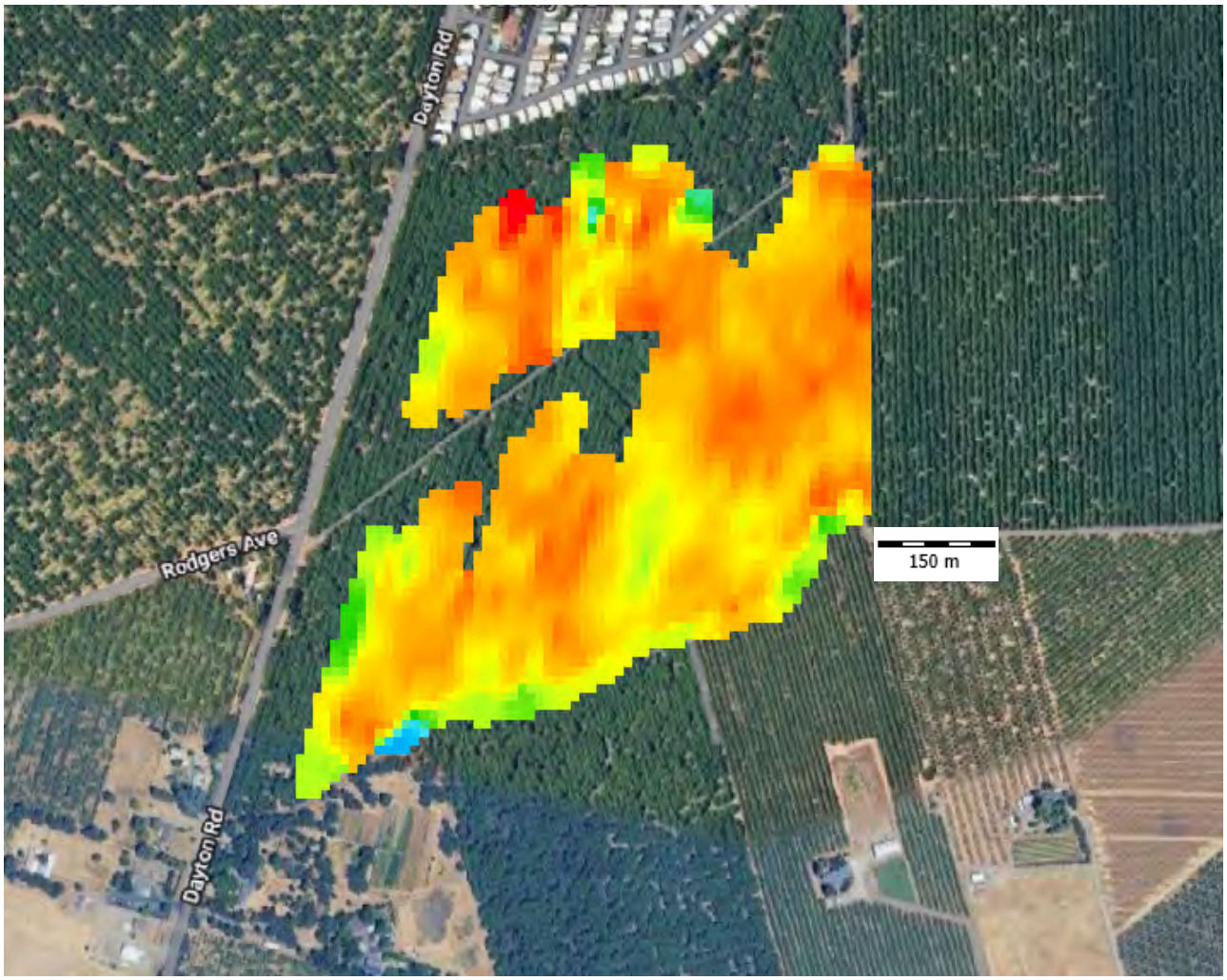


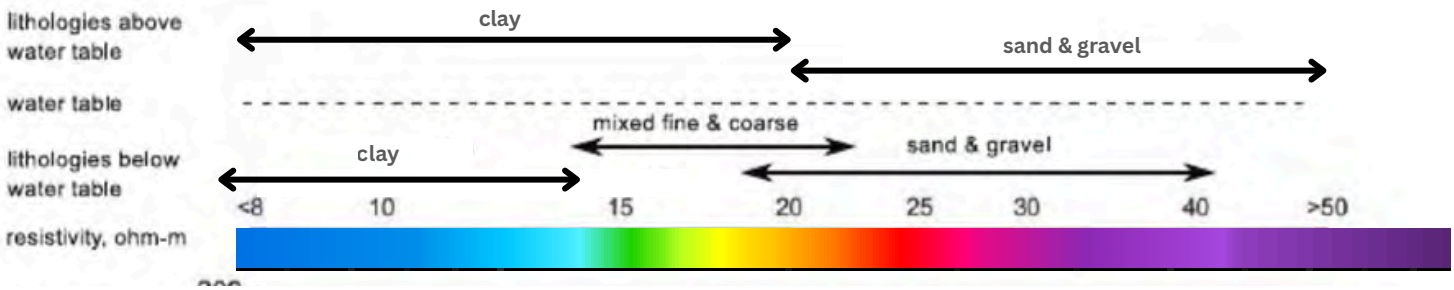
DEPTH SLICES- 190 FT



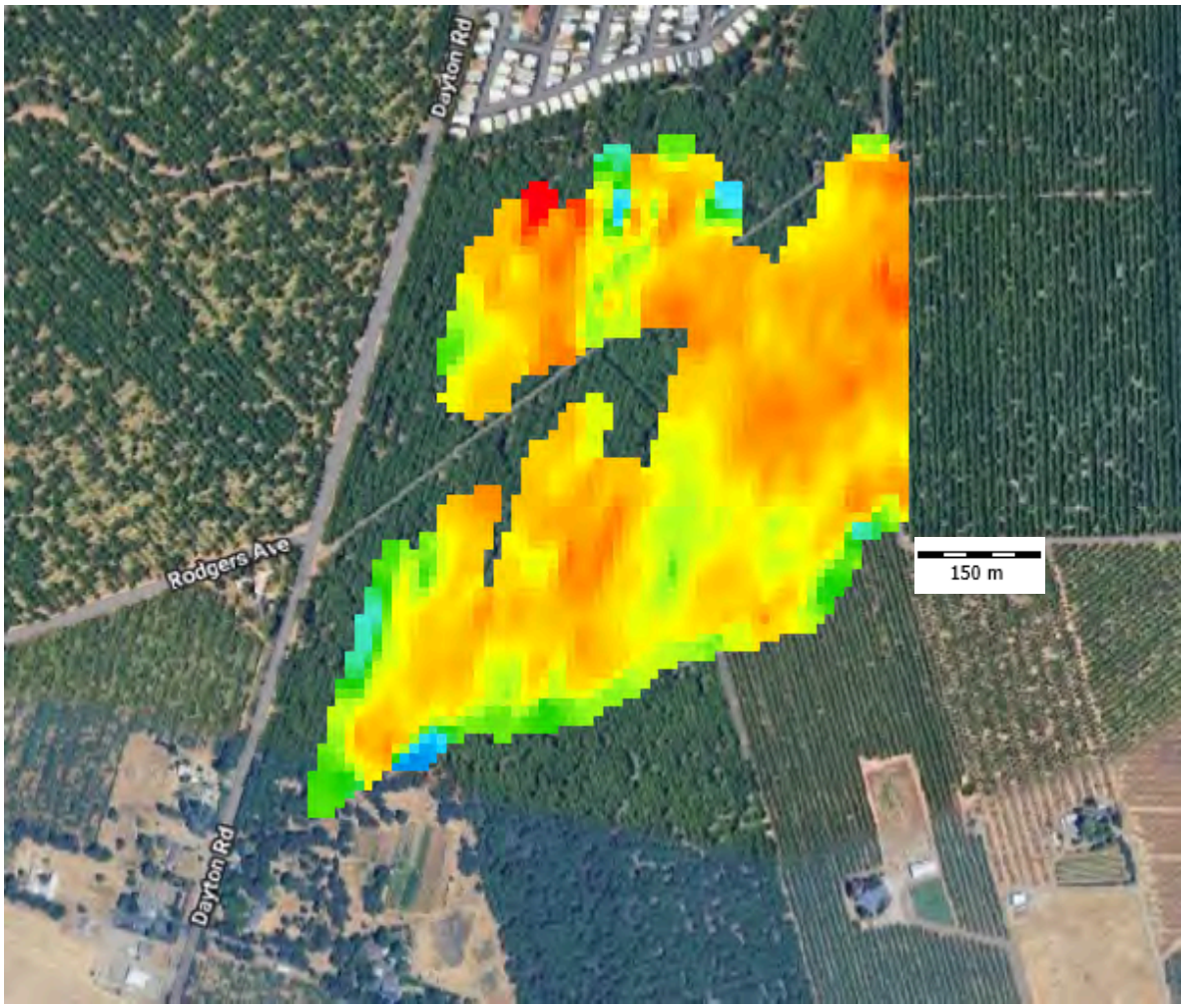


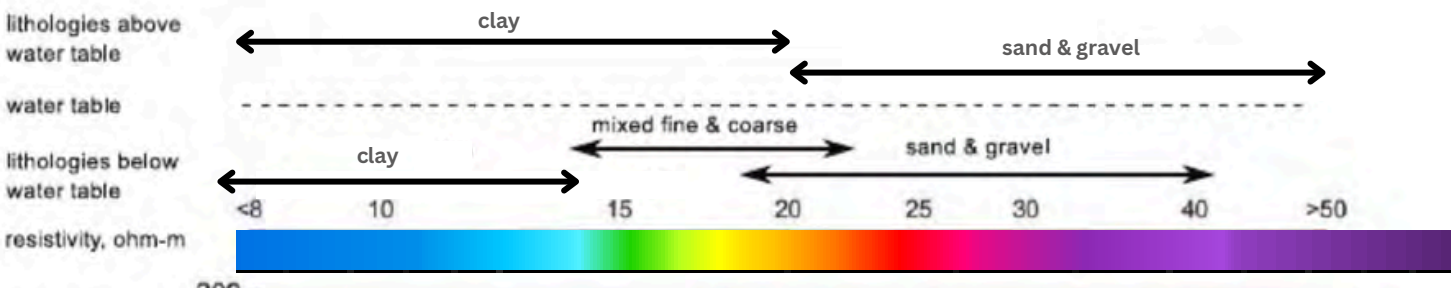
DEPTH SLICES- 200 FT



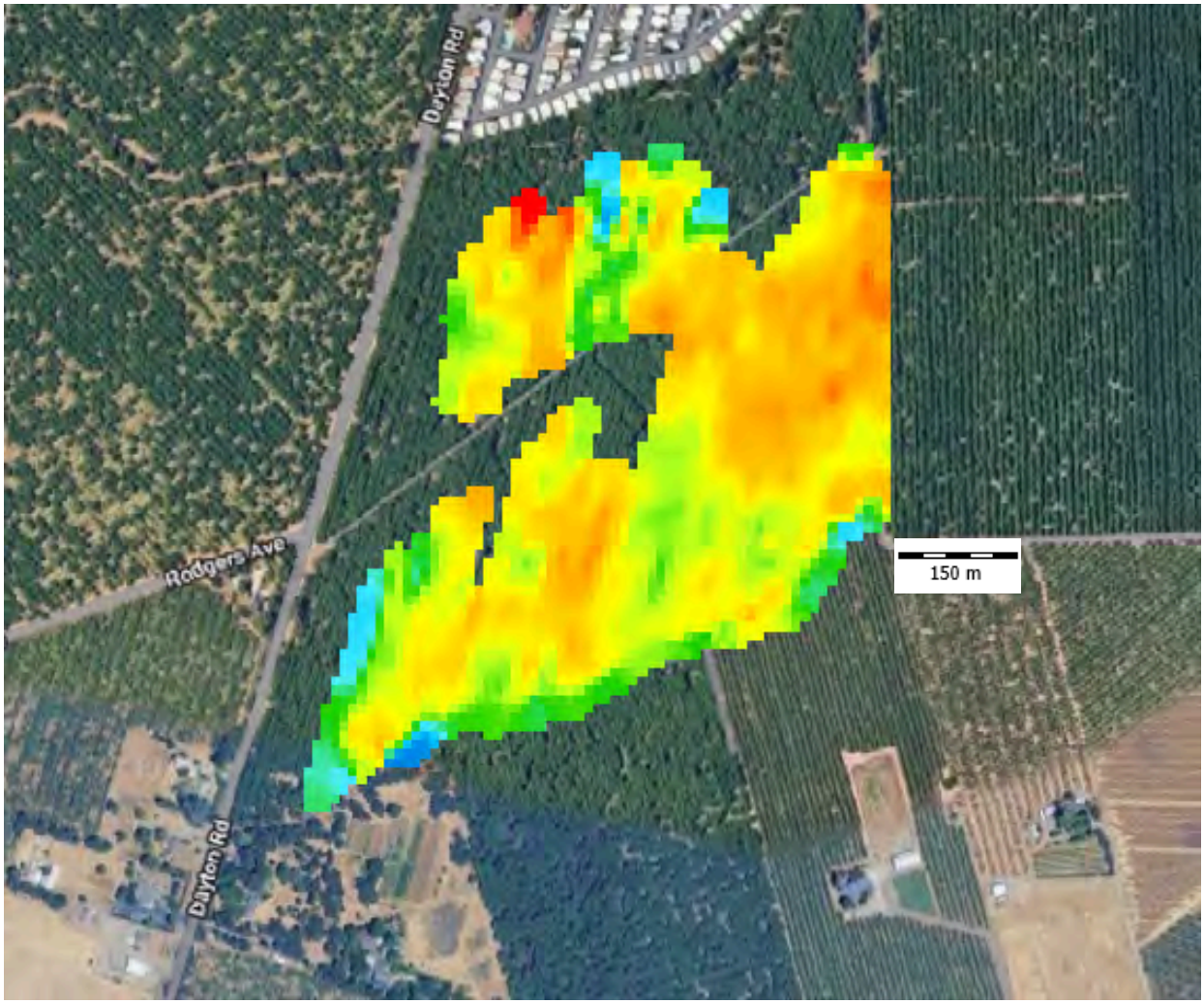


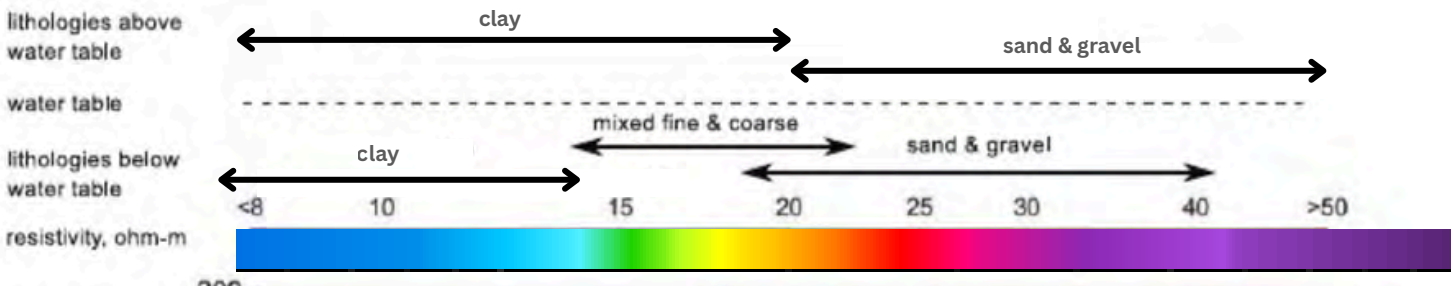
DEPTH SLICES- 210 FT



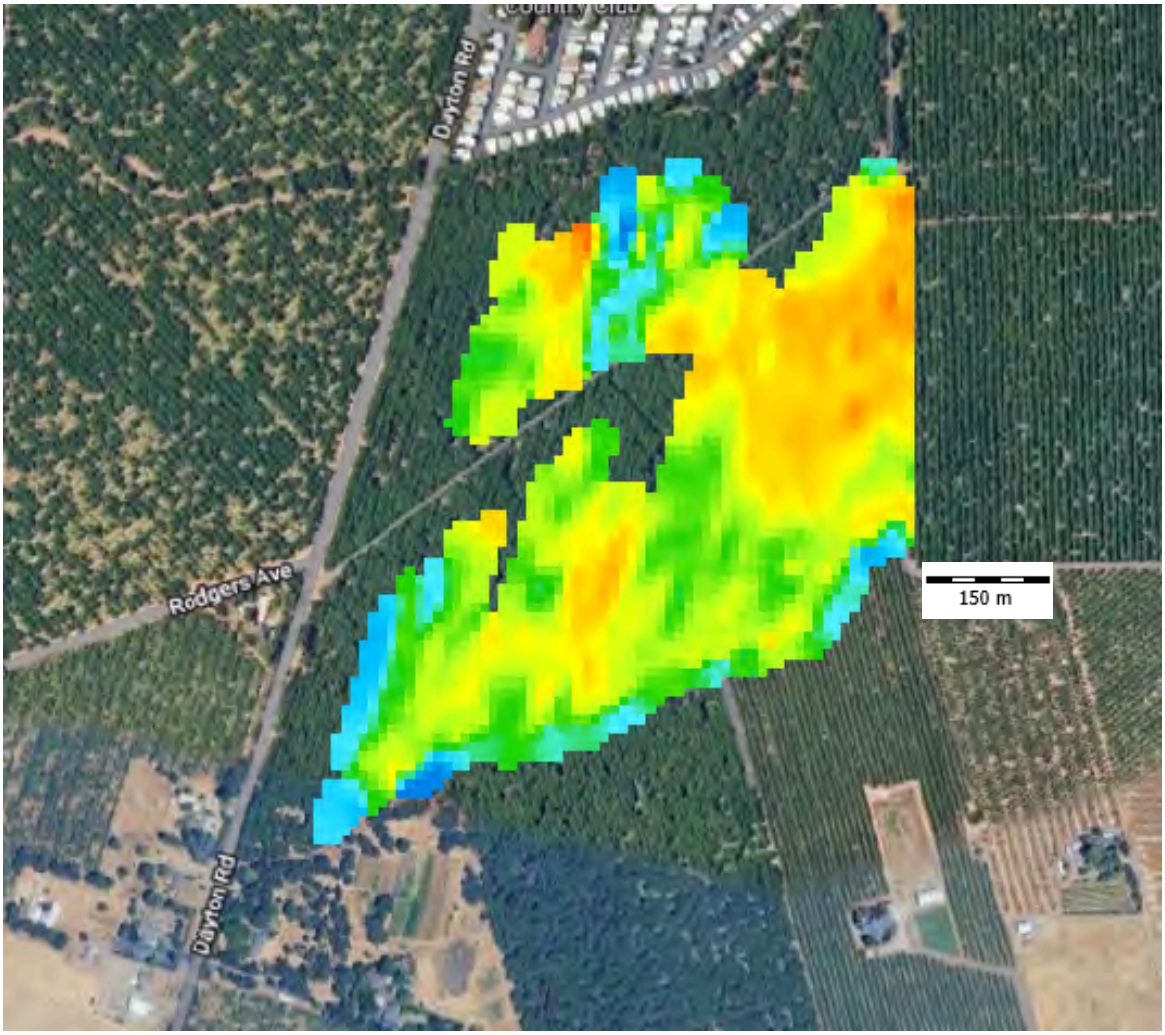


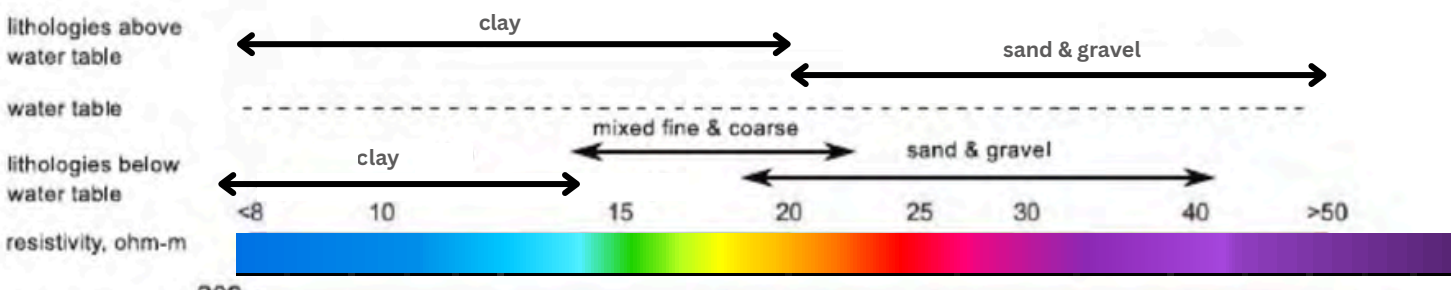
DEPTH SLICES- 220 FT



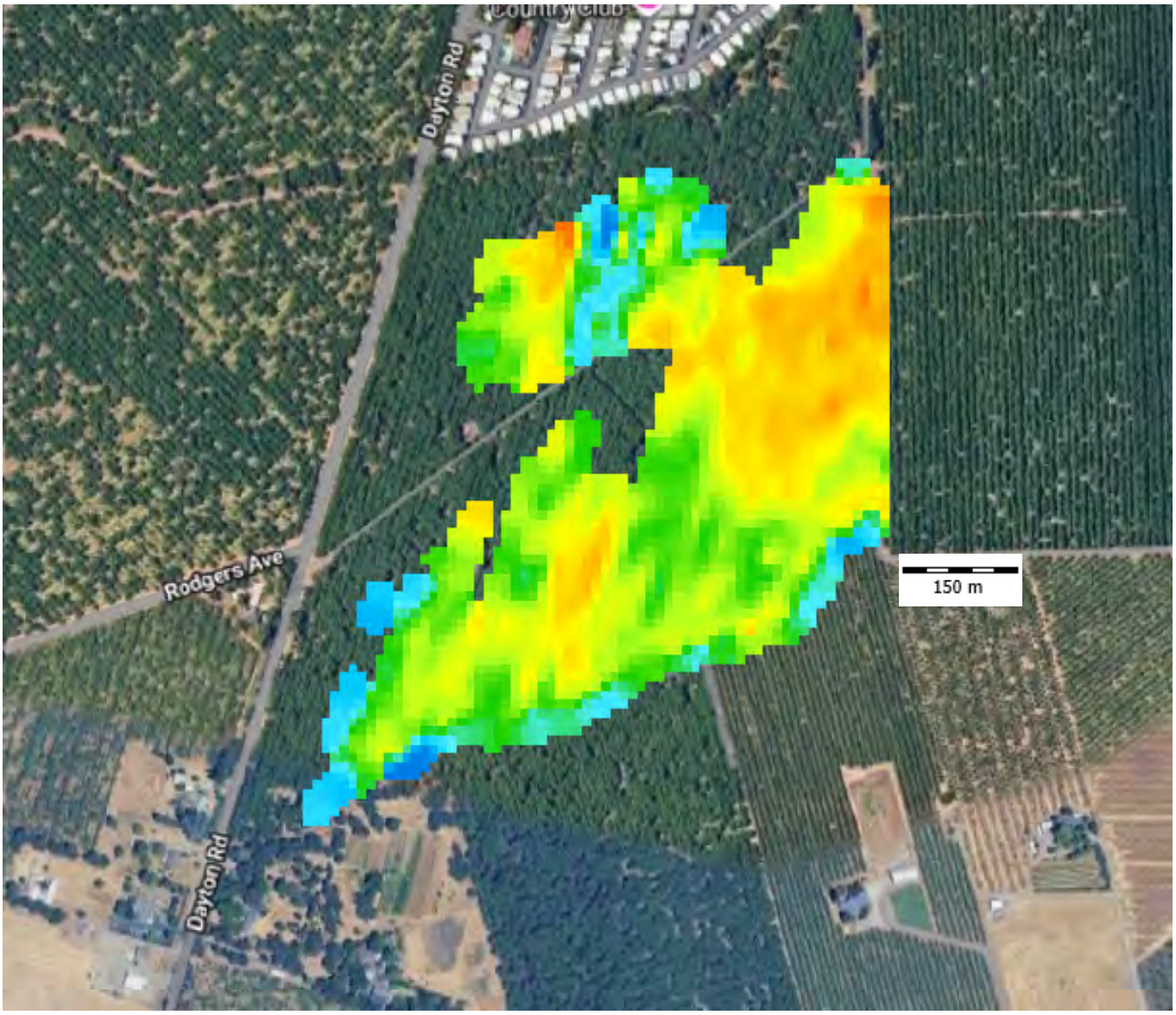


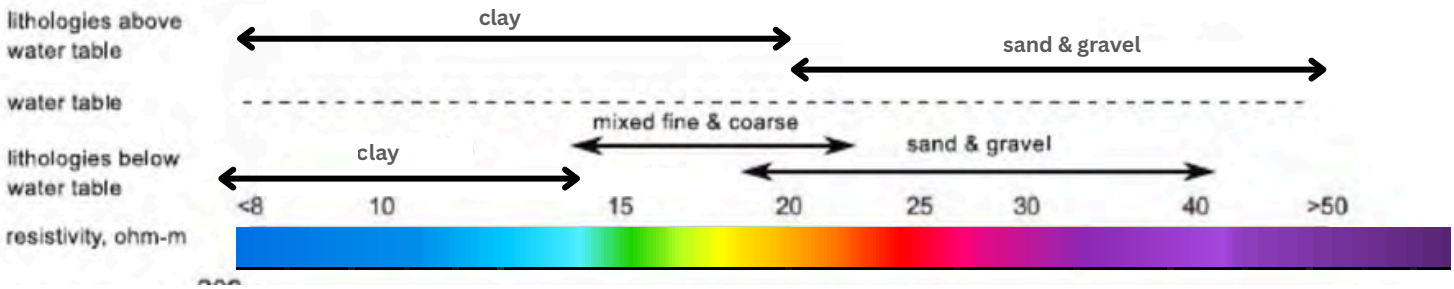
DEPTH SLICES- 230 FT



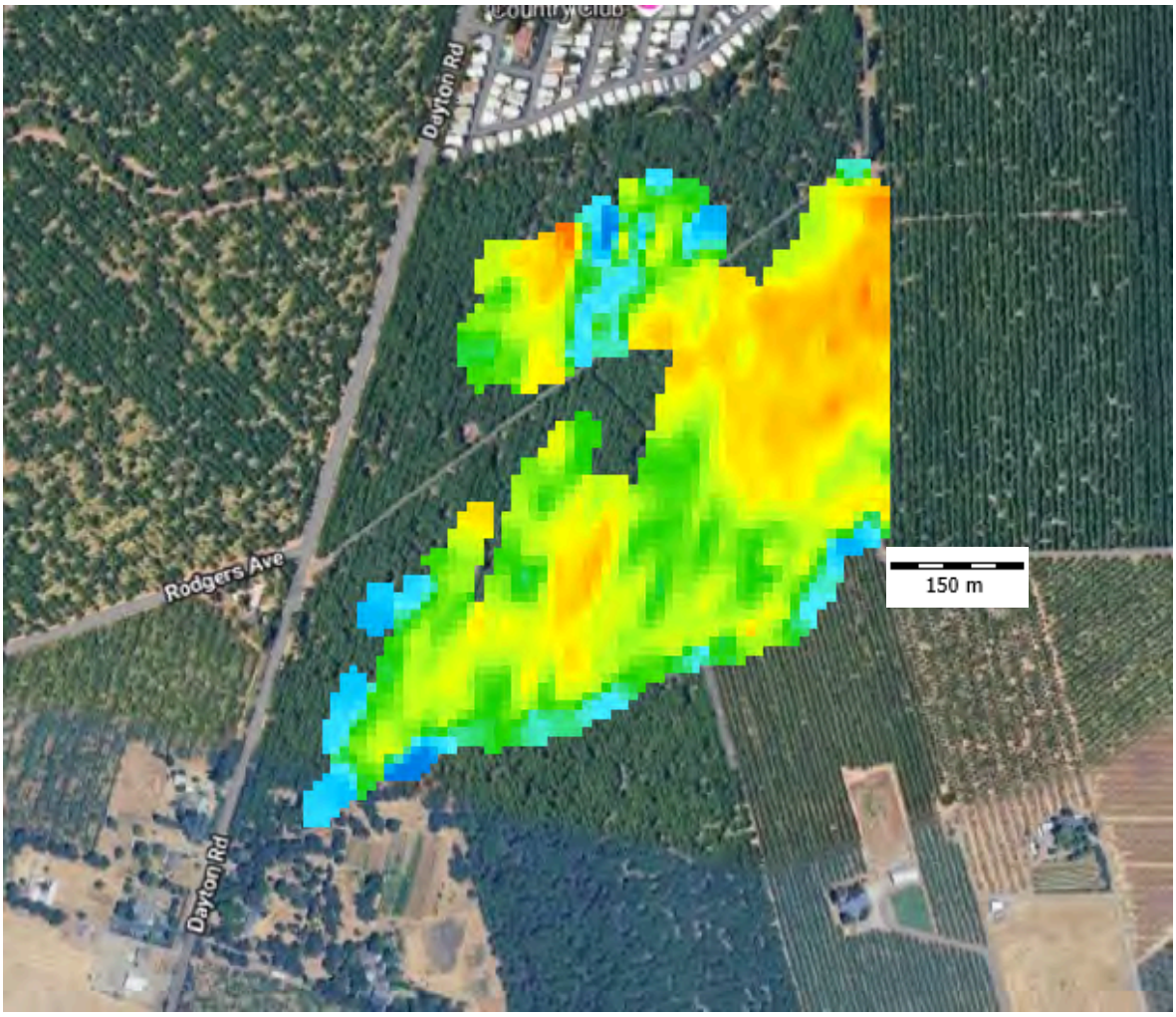


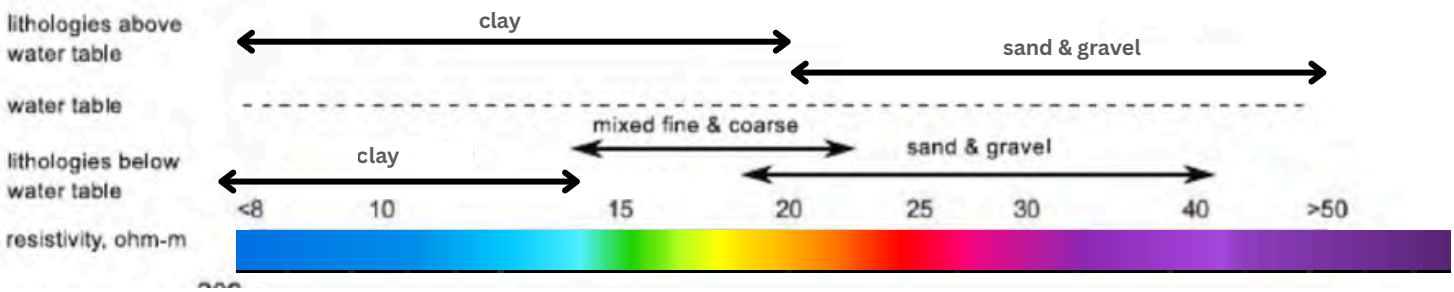
DEPTH SLICES- 240 FT



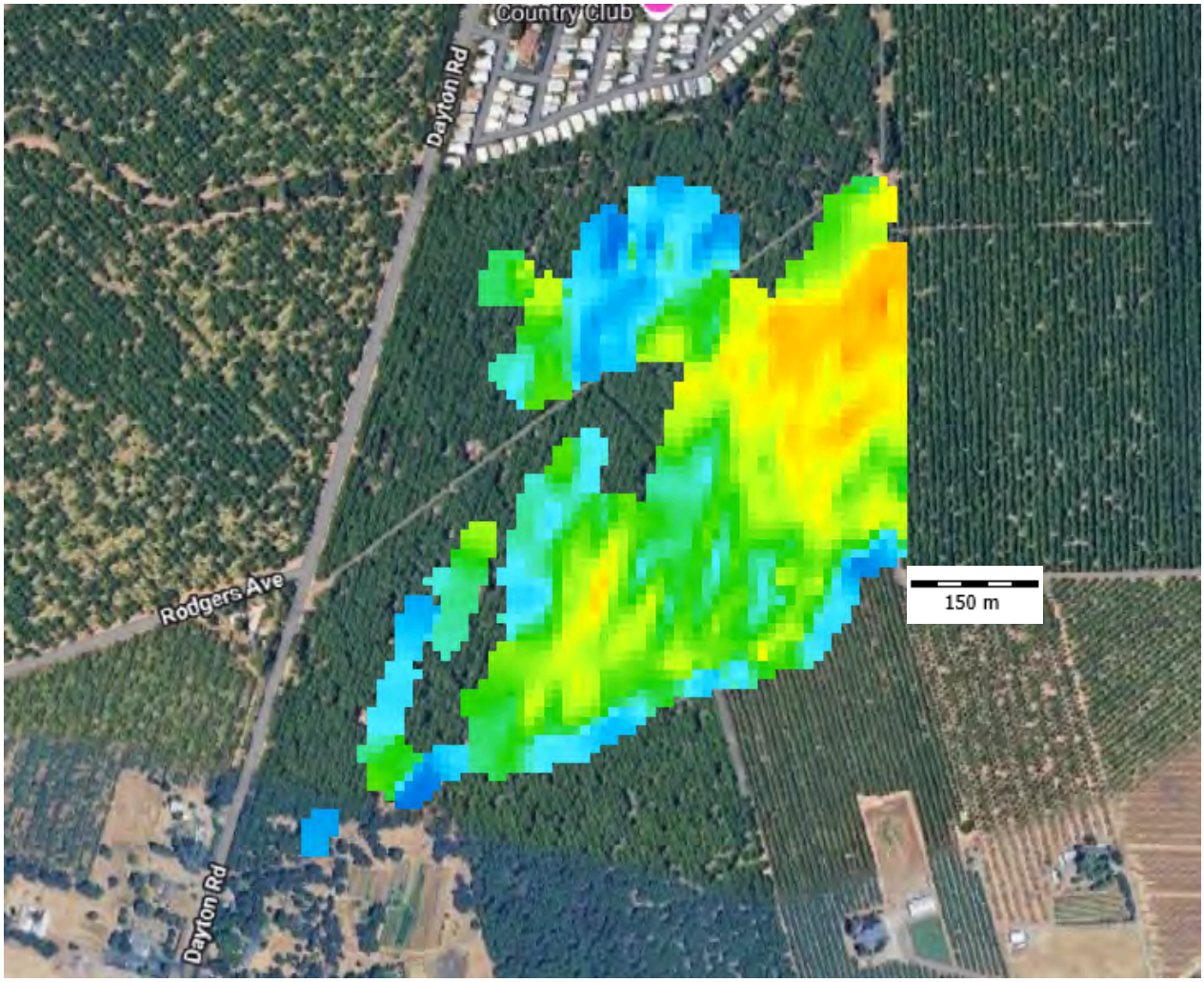


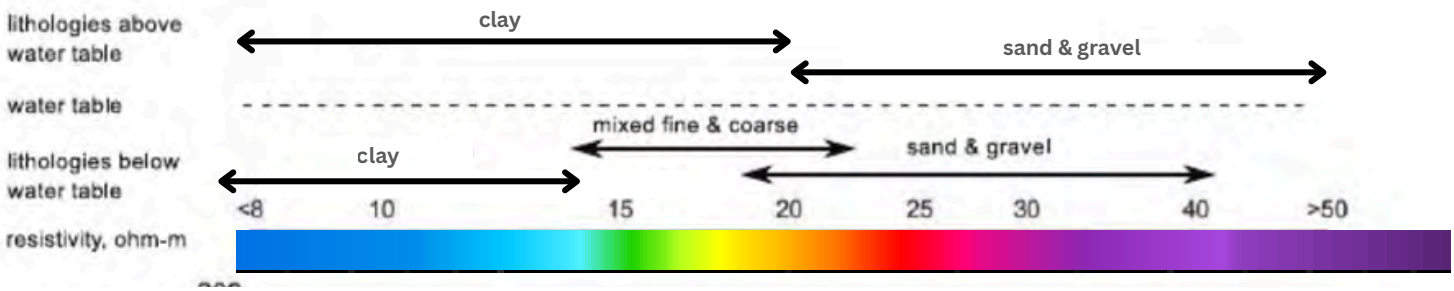
DEPTH SLICES- 250 FT



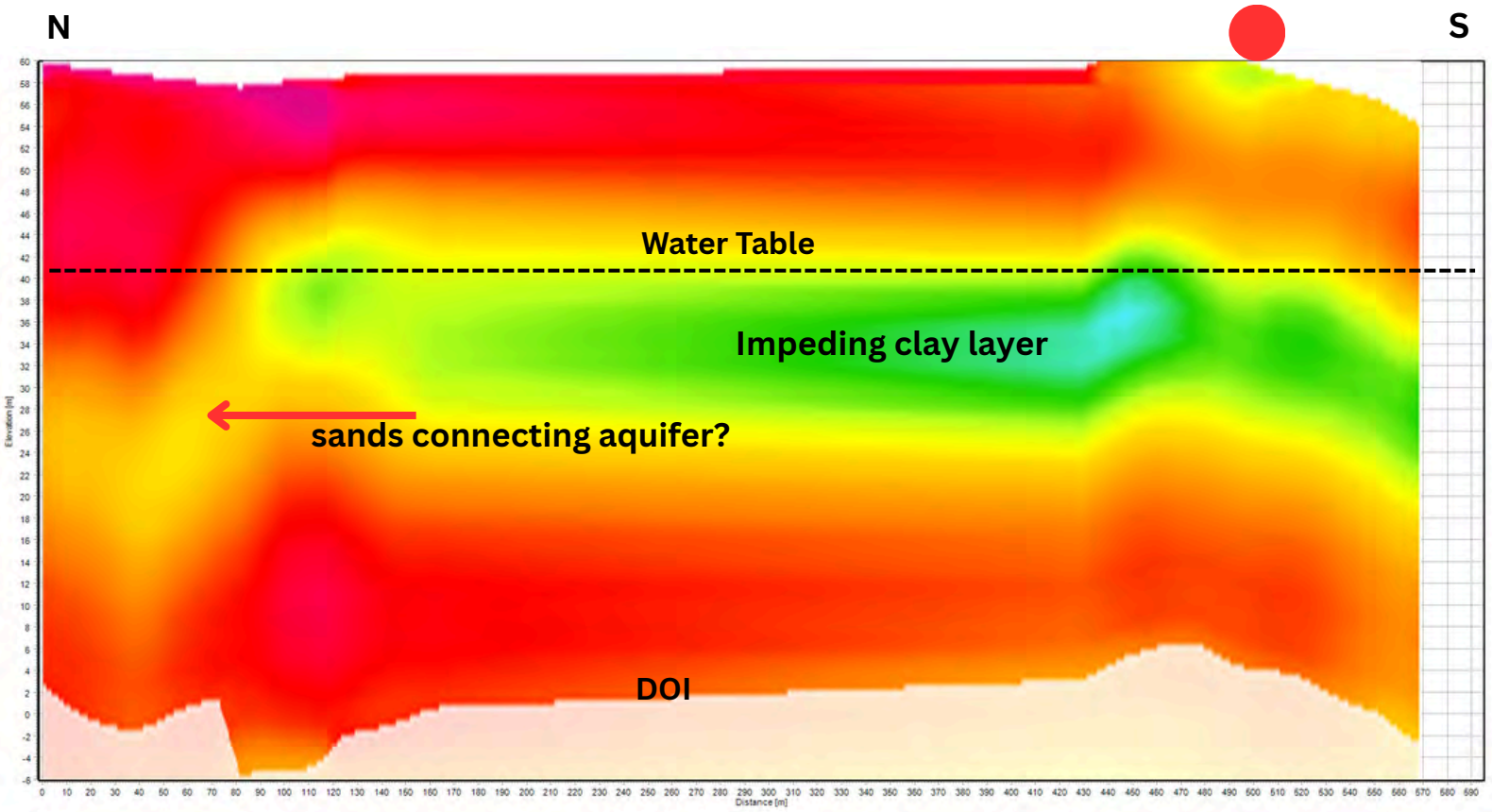


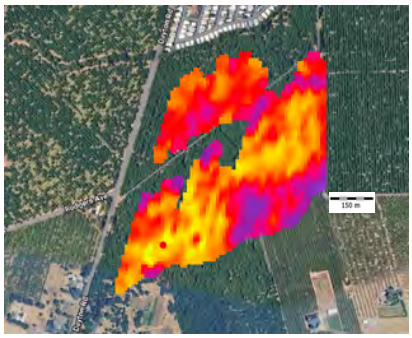
DEPTH SLICES- 260 FT



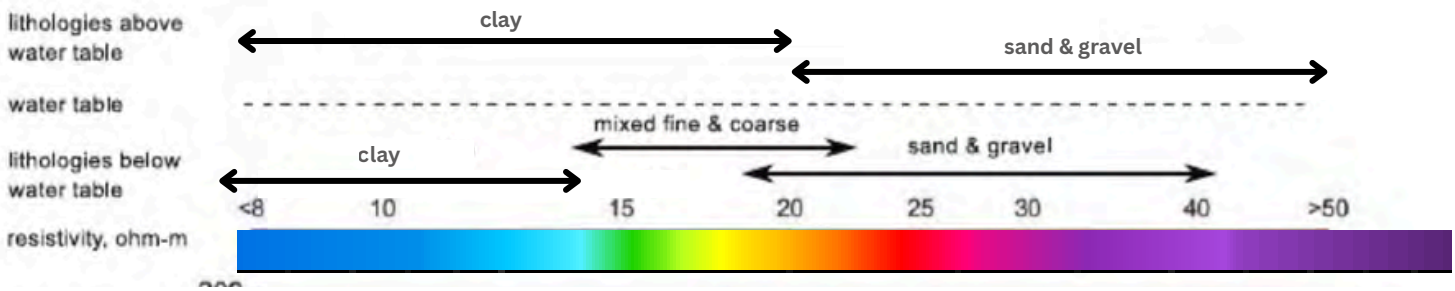


2D CROSS SECTION- PRO_180

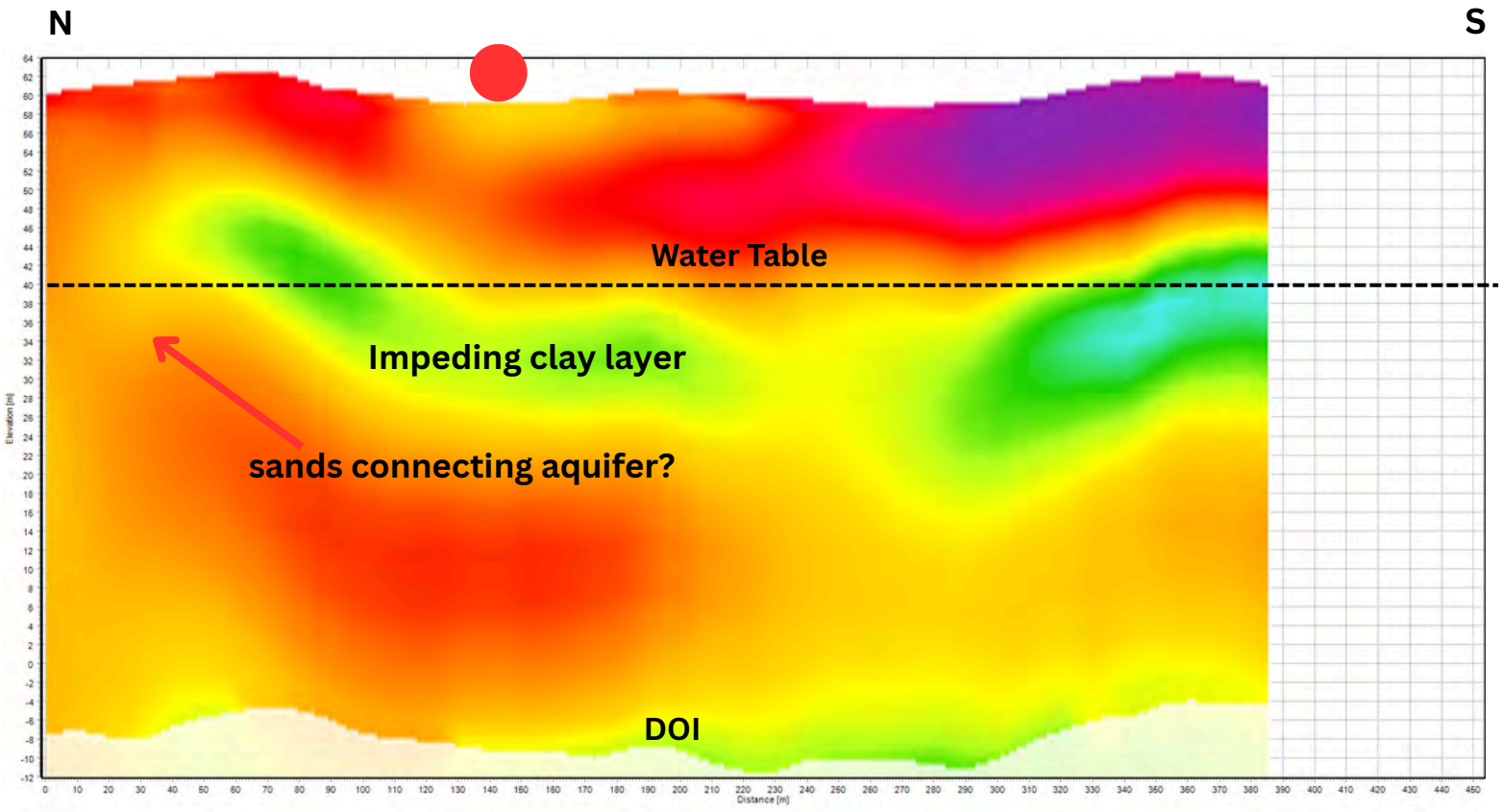


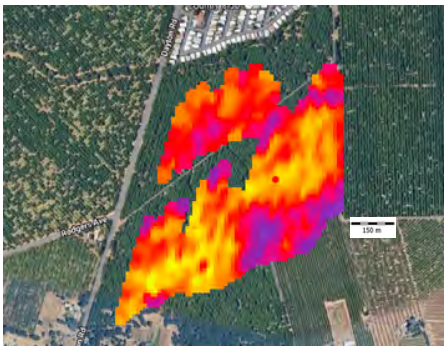


Surface



2D CROSS SECTION- PRO_300





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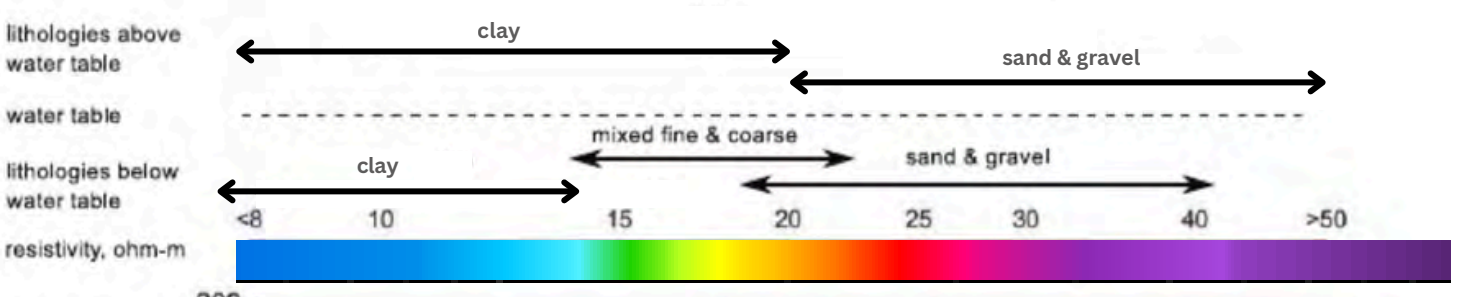

2D CROSS SECTION- PRO_360

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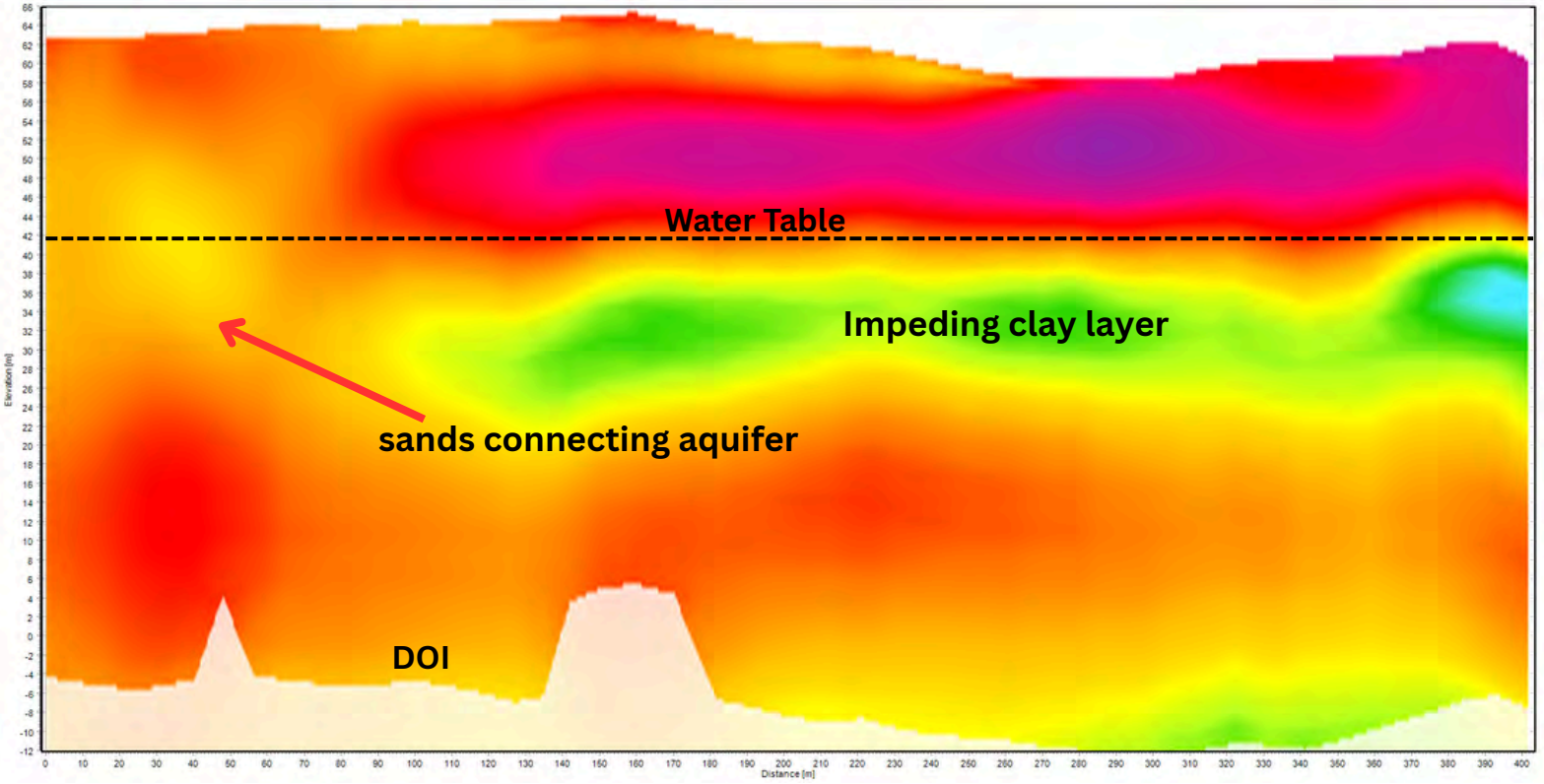

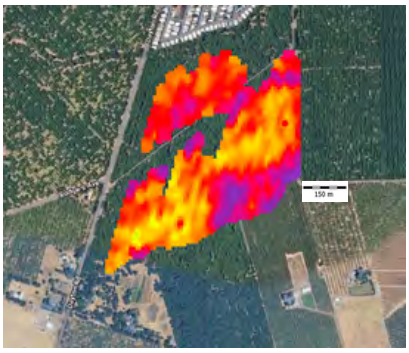

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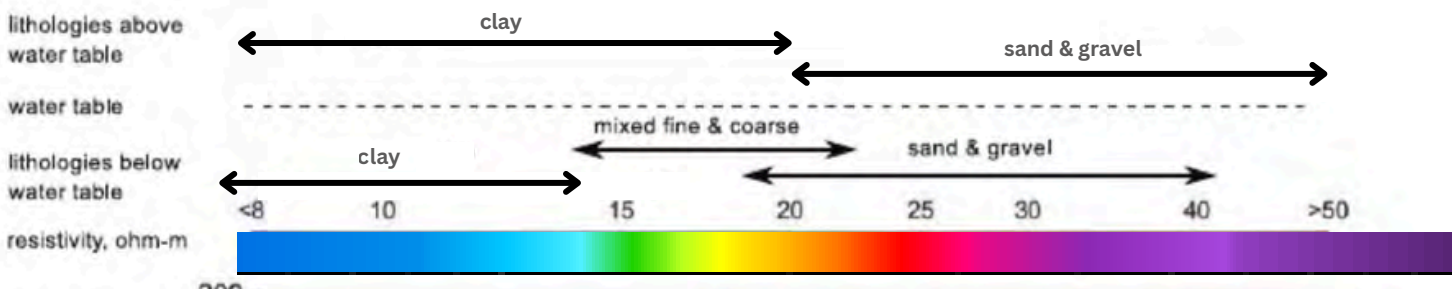

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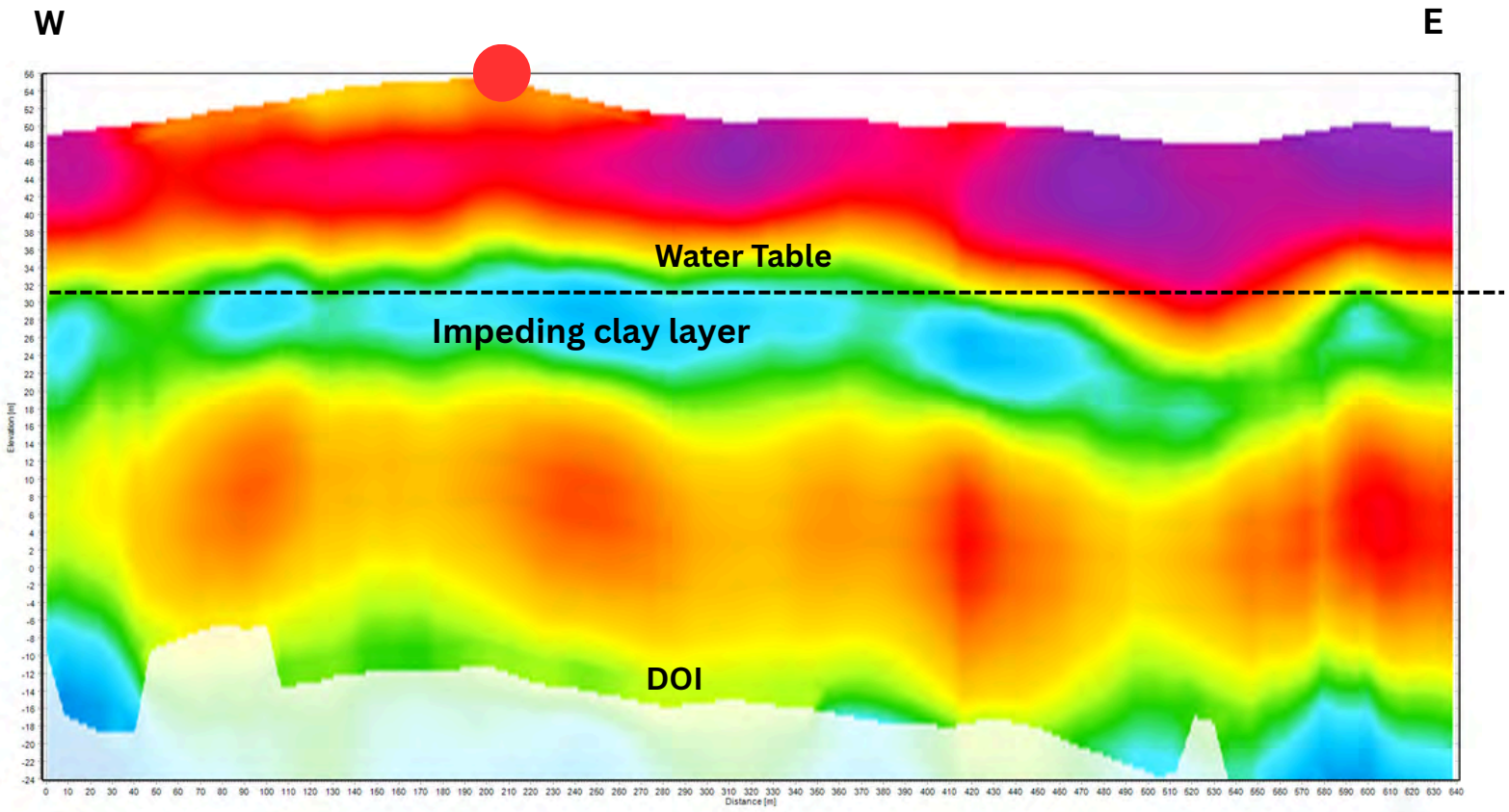

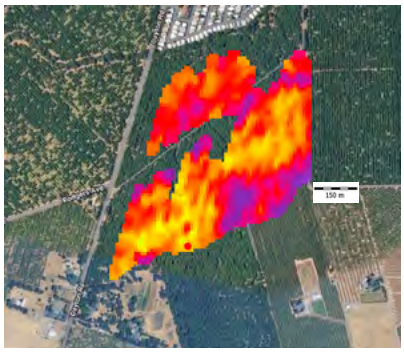

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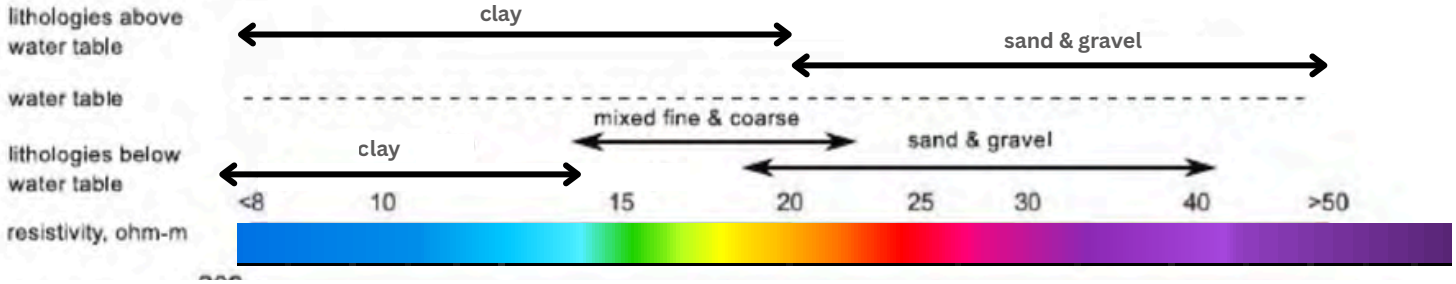

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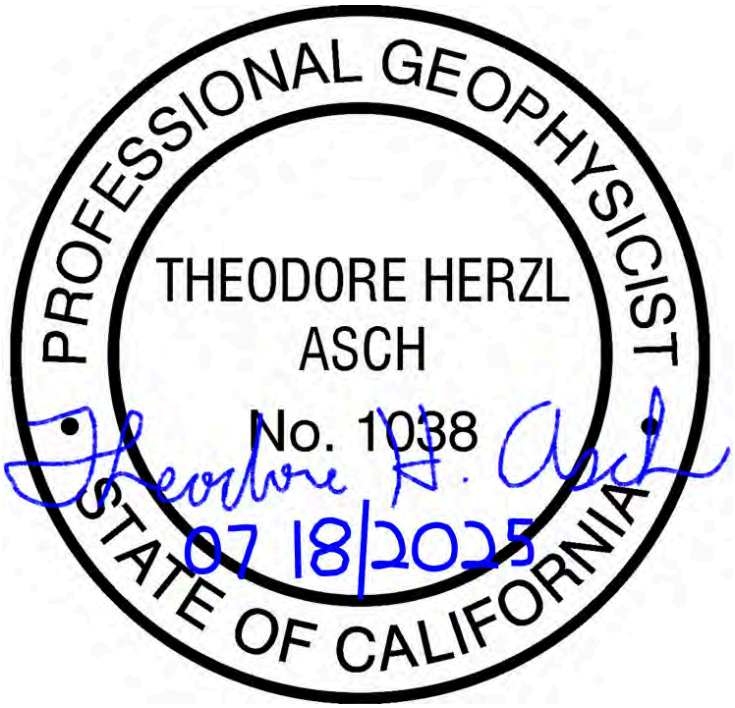
- Walkinshaw, M., O'Geen, A. T., & Beaudette, D. E. (2023, October 1). Soil Properties [Interactive web map]. California Soil Resource Lab, University of California, Davis. https://casoilresource.lawr.ucdavis.edu/gmap/

DELIVERABLES-

- Zip File dropbox link (ttemcapaydatafiles.zip)
  - Capay Groundwater Mapping Report .pdf
  - Workbench file folder (ttemdatacapay)
  - Workbench ttem set up files .gex & .tfi
  - Raw ttem data files .lin & .skb (ttem capay raw data)
  - Inversion data xyz files .xyz in array (capay inversion xyz)
  - Inversion data excel file (capay_SCI01.csv)

STATE OF CALIFORNIA PROFESSIONAL GEOPHYSICIST STAMP



GROUNDWATERMAPS-

GroundWaterMaps

Groundwater Aquifer Mapping

Contact:
Nathan Azevedo

(530) 717-0679

Maxwell, CA

nathan@groundwatermaps.com

Site N5

NICOLAUS PROJECT GROUNDWATER MAPPING REPORT

AUG 10, 2025// PREPARED BY GROUNDWATERMAPS

REPORT

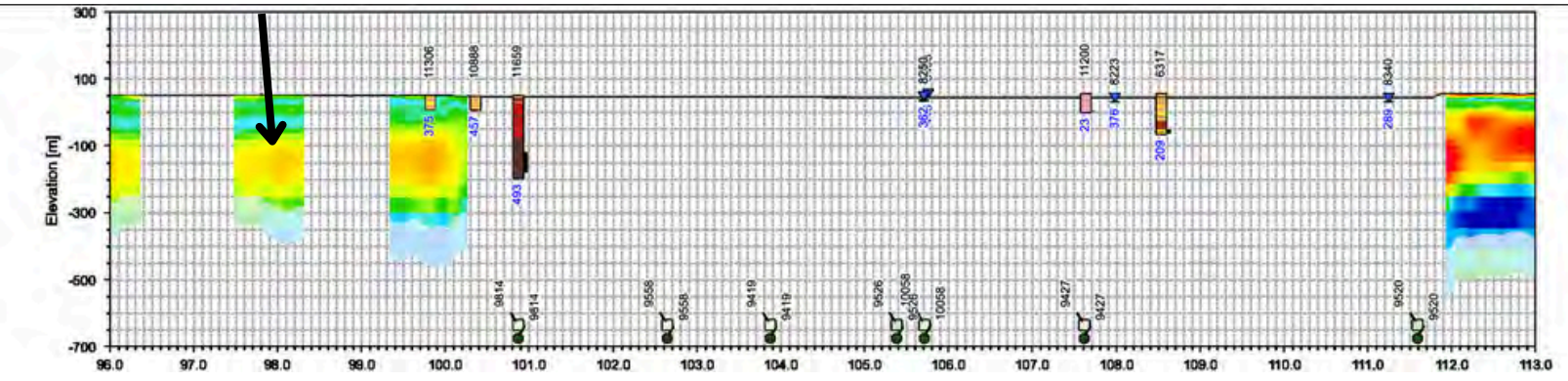
- **Objective:** To determine the suitability of the Nicolaus project area to surface groundwater recharge.

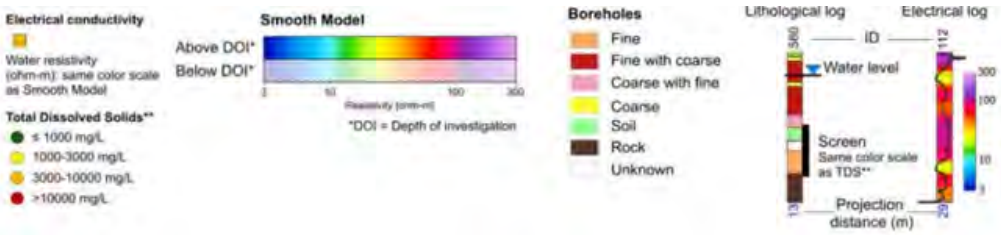
- **Methods:**
  - DWR Aerial Electromagnetic Survey
  - Soil Agricultural Groundwater Banking Index (SAGBI)
  - NRCS Soil Map
  - California Statewide Groundwater Elevation Monitoring (CASGEM)
  - TTem Towable Electromagnetic Survey
    - Survey Conducted by GroundWaterMaps- Nathan Azevedo
      - Survey Dates- July 21, 2025
      - Survey Location- 13816 CA-99, Chico, CA 95973
- **Results:**
  a. The DWR AEM survey that passed near the Nicolaus project area revealed resistive geology in the near surface followed by a impeding clay layer capping a deeper aquifer system.
  b. Besides geology directly along Keefer Slough, the Soil Agricultural Groundwater Banking Index SAGBI and NRCS Soil Map deem the project area as to having poor groundwater recharge suitability.
  c. California Statewide Groundwater Elevation Monitoring (CASGEM) reported depth to groundwater at 75 feet at a nearby monitoring well on July 7th 2025
  d. The TTem survey appears to agree with the findings of the DWR AEM survey revealing resistive geology in the near surface followed by a impeding clay layer capping a deeper aquifer system.
     i. Unlike the (SAGBI) data, the near surface resistive geologic material likely conducive to groundwater recharge appears shallow but pervasive throughout the survey area as seen in pages 15-18 of this report and not solely concentrated near Keefer Slough.
     ii. The surface geology rests atop a impeding clay layer approximately 50 feet thick that is pervasive and unbroken throughout the entire survey area and is distinct on pages 42-47 and pages 24-27 of this report. This clay layer will directly impede recharge from suitable surface geology into the deeper aquifer system below the water table.
- **Conclusion:**
  - Although the AEM and TTem surveys reveal resistive geology in the near surface suitable to groundwater recharge, a pervasive 50 ft clay layer appears to be impeding recharge into the deeper aquifer system at this Nicolaus survey location.

NOTES

- Depth of Investigation as seen on page 7 ranged from 45-80m
- Although the geology is resistive at values typical to geology conducive to groundwater recharge, lahar type materials have been known to be cemented in the region which may reduce the sites permeability. Further study may be needed to confirm permeability
- Due to interference from power lines, data was removed from the project area as seen on page 6. Residual values above 1 depict the models decreased confidence in the data and were removed
- Depth to groundwater (water table) per (CASGEM) was 75 feet on July 7th, 2025 as seen in groundwater monitoring well data on page 9

DWR AEM HELICOPTER REPORT

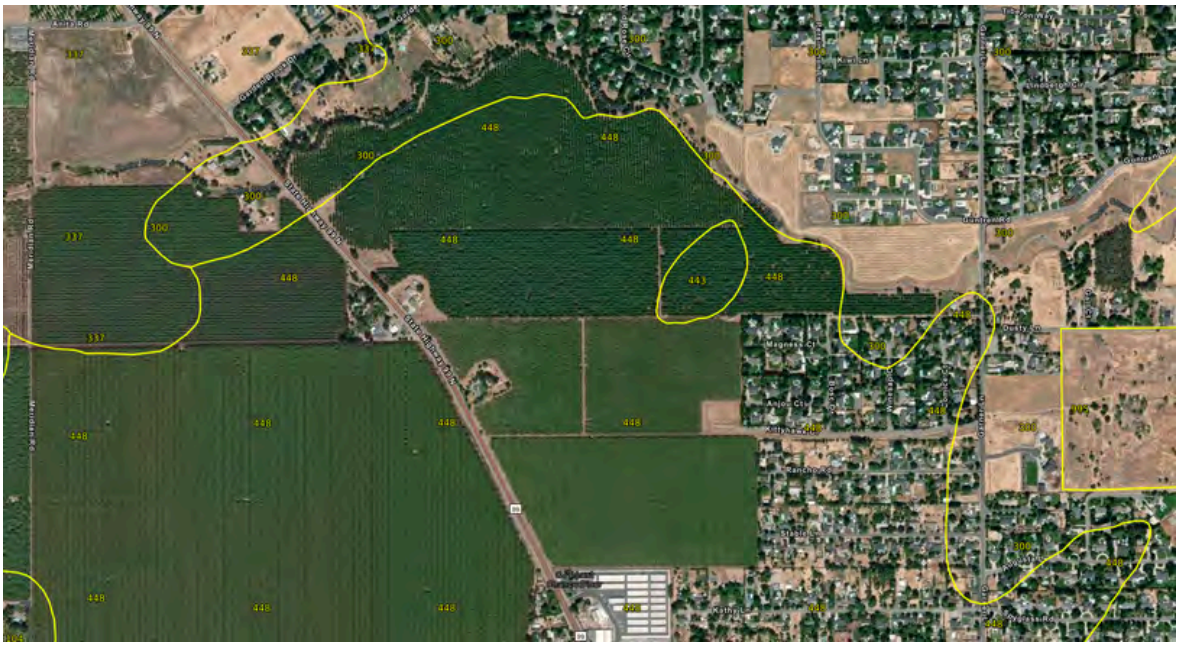


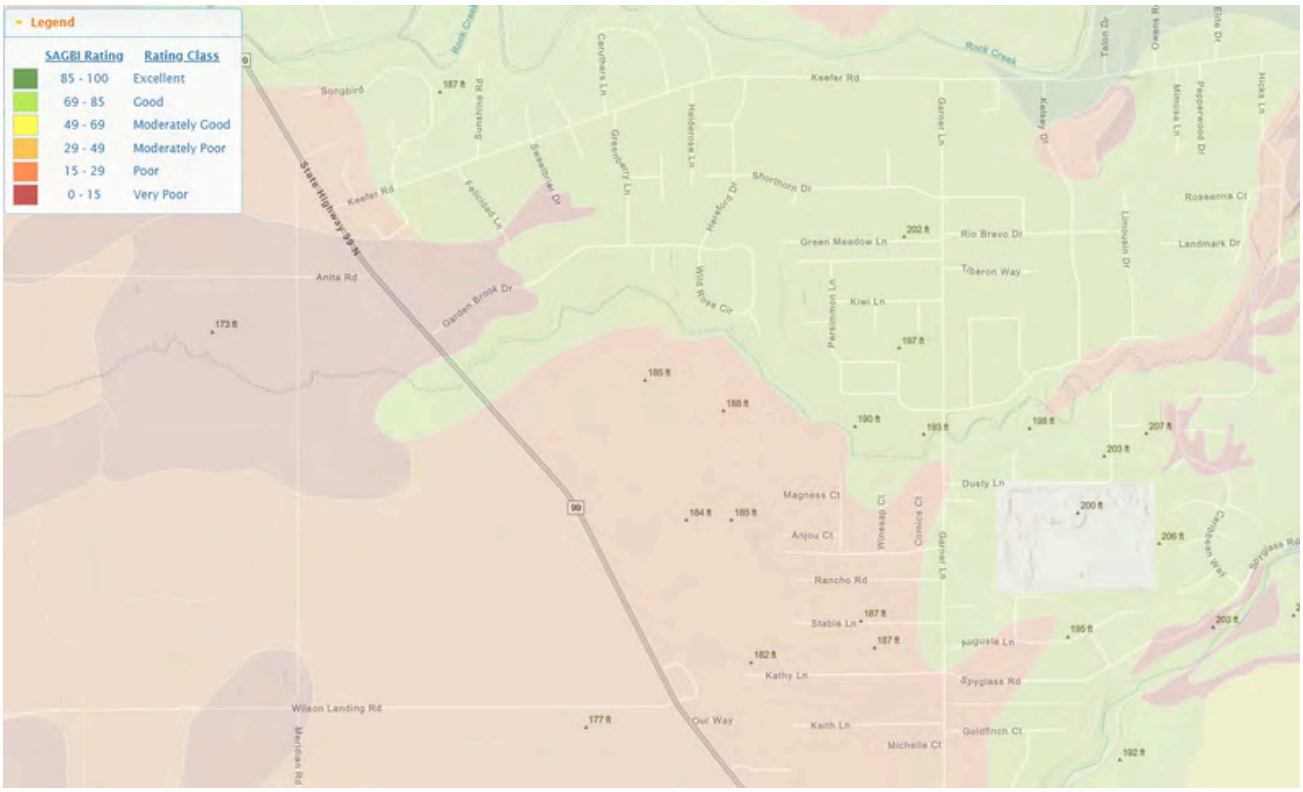


NRCS SOIL MAP/ GROUNDWATER RECHARGE SUITABILITY INDEX

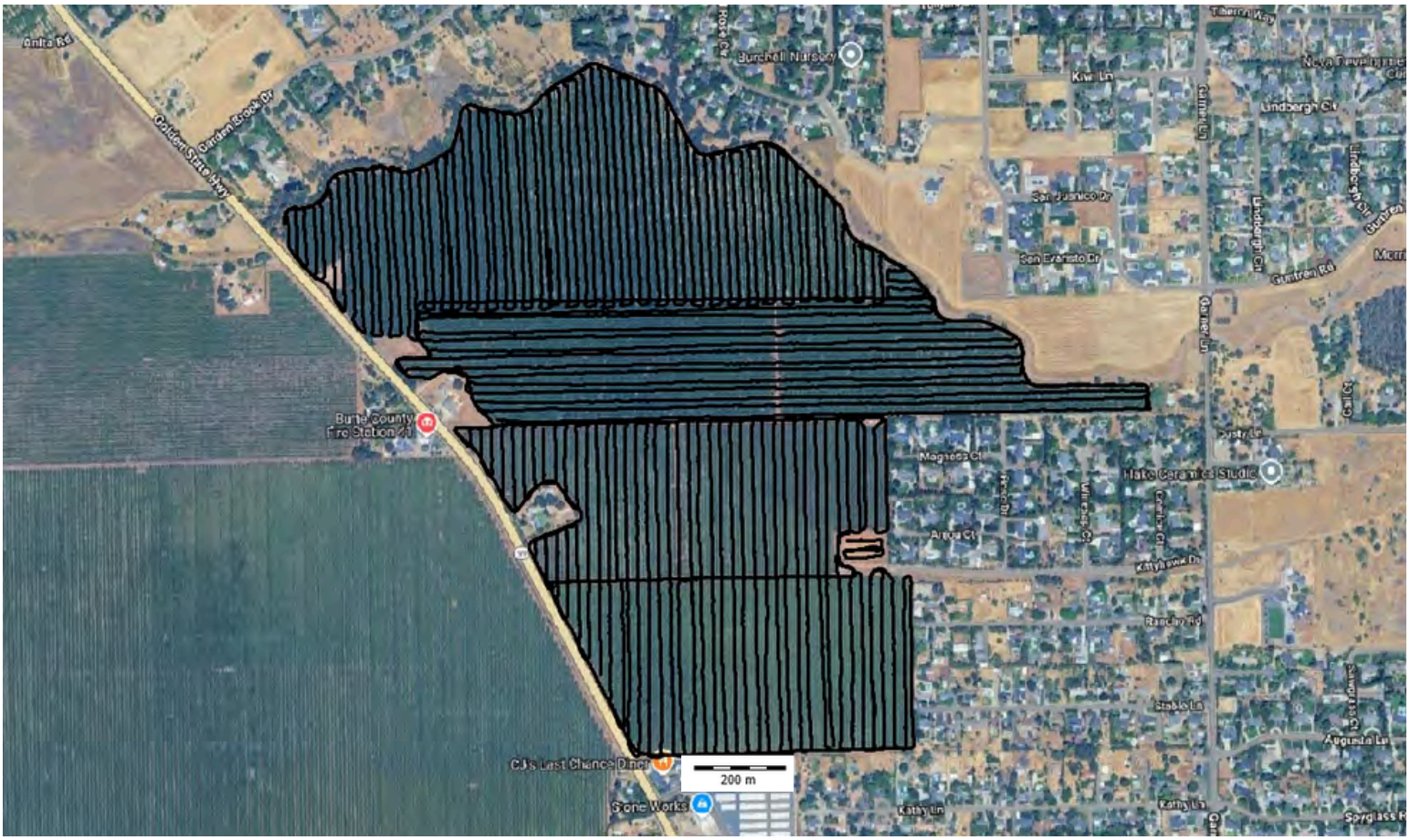
SOILS:

- **HAPLOXEROLLS- ALLUVIAL FANS (448)**
- **DURIXEROLLS- ALLUVIAL FANS (443)**
- **REDSLUFF-FAN REMNANTS (300)**

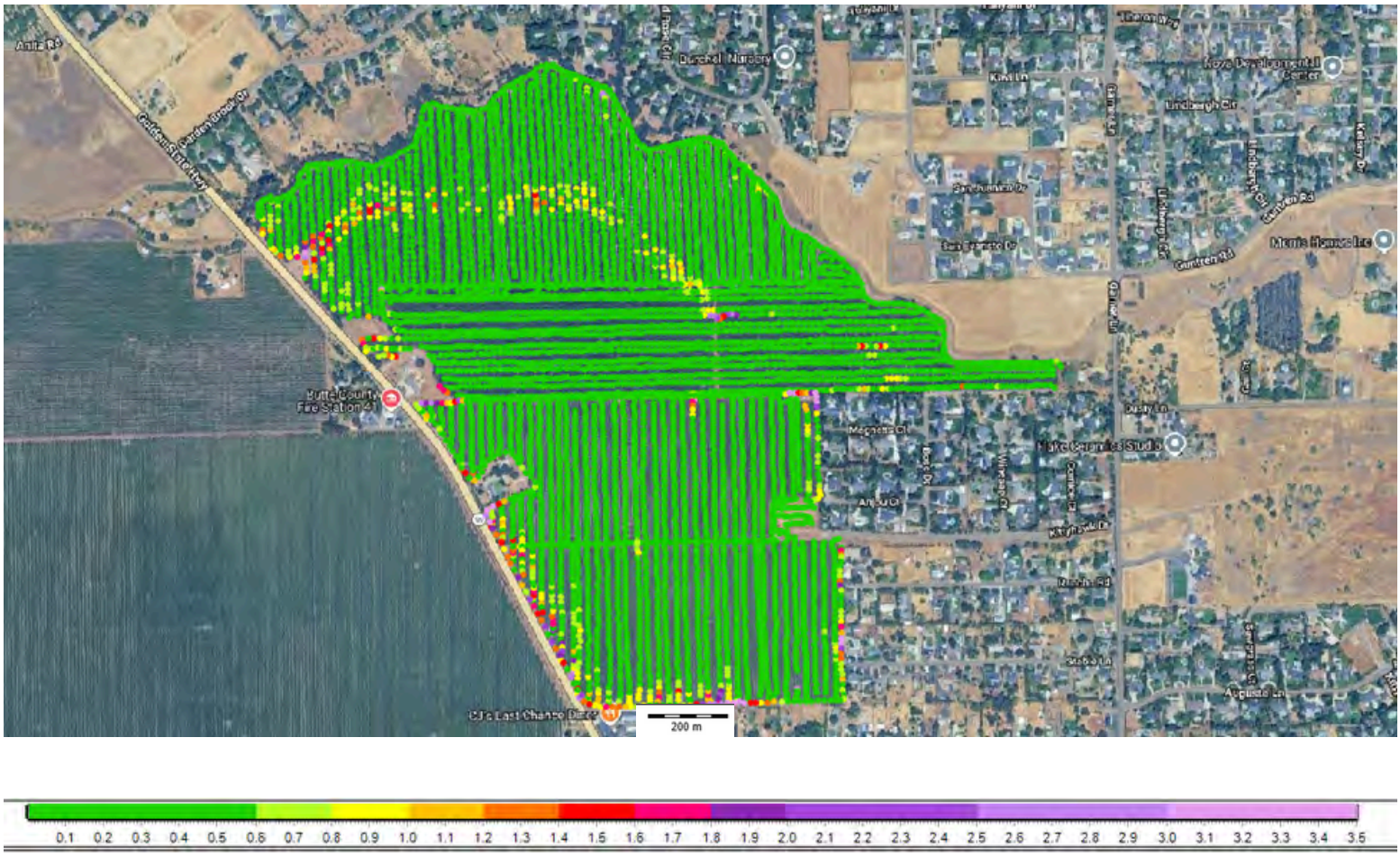




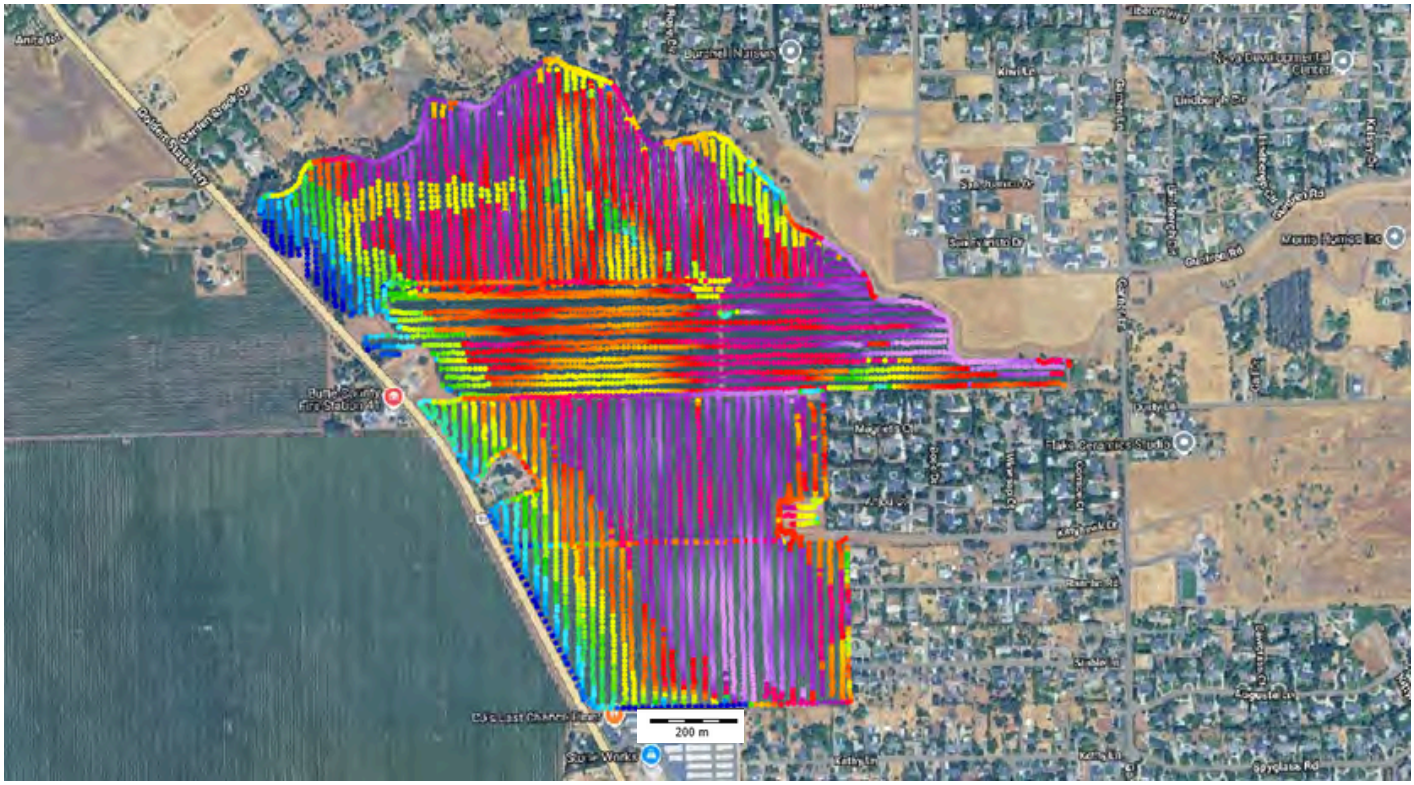
TTEM TRAVERSE LINES



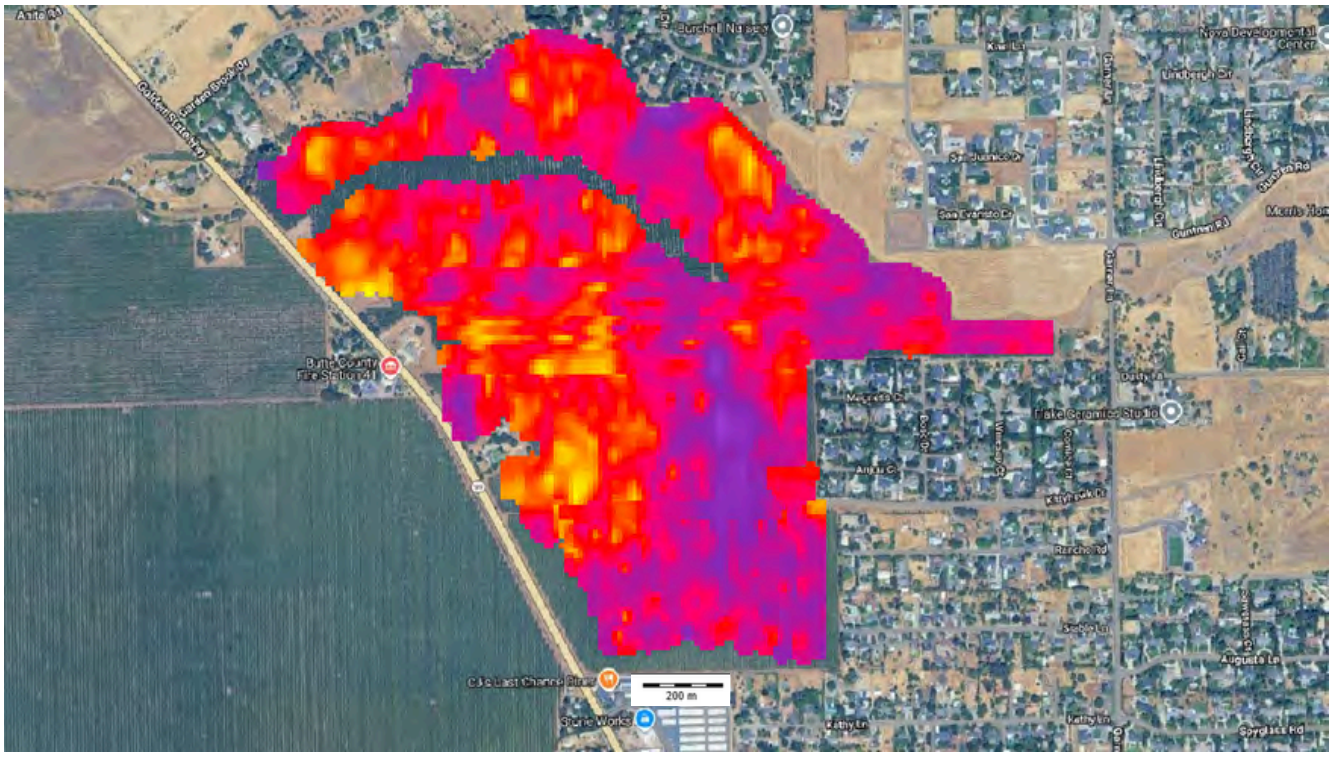
DATA RESIDUAL



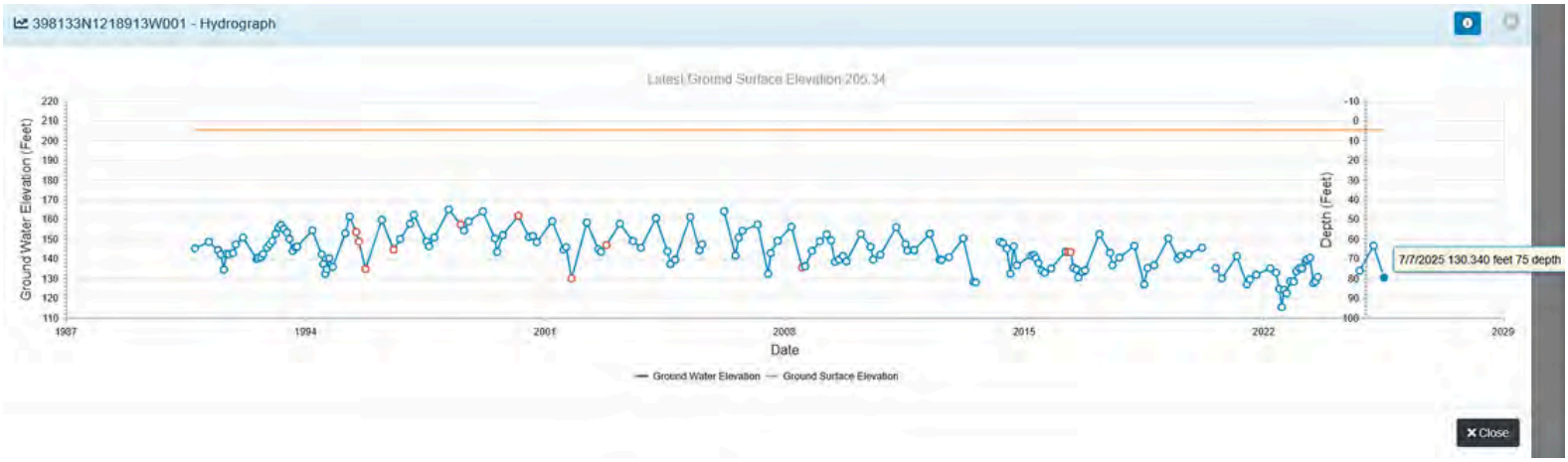
DEPTH OF INVESTIGATION-

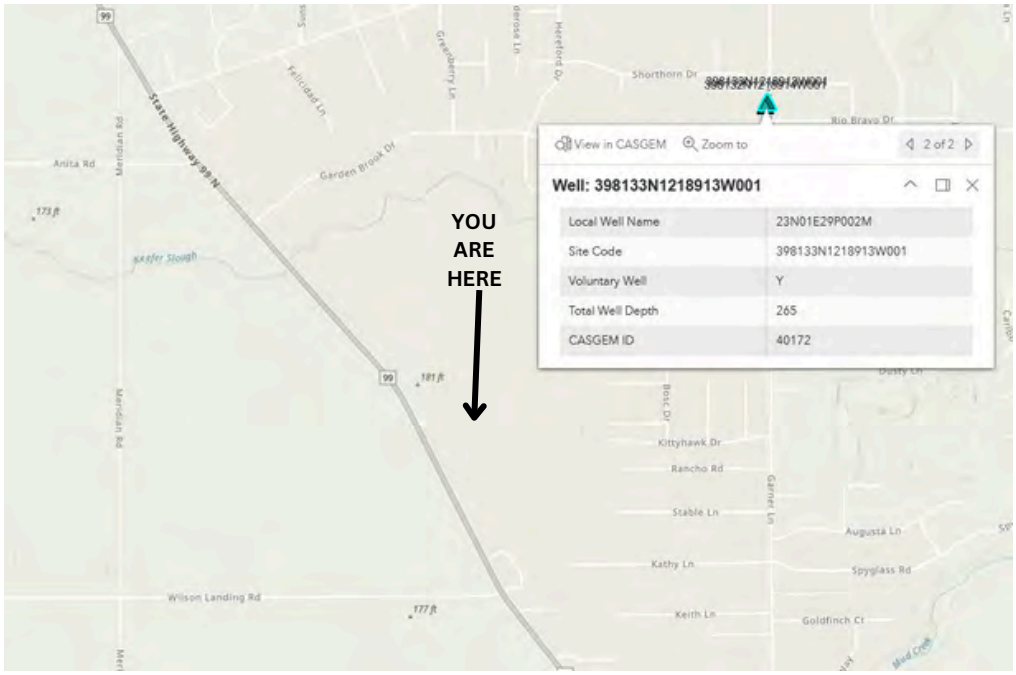


DATA REMOVED



CALIFORNIA STATEWIDE GROUNDWATER ELEVATION MONITORING (CASGEM)- LOCAL MONITORING WELL





LEGEND

Legend:
Above Water Table

- Blue- Clay
- Green- Clay
- Yellow- Sandy Clay
- Orange- Sand
- Red- Coarse Sand
- Purple- Gravel

Legend:
Below Water Table

- Blue- Clay
- Green- Sandy clay
- Yellow- Sand
- Orange- Coarse Sand
- Red- Gravel
- Purple- Coarse Gravel

- Black- Likely Bad data/Noise

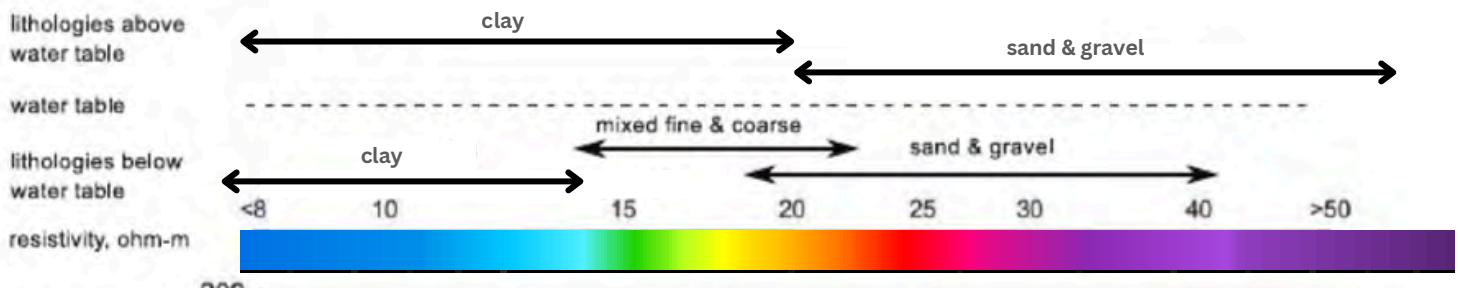


Table 2
Range of Resistivity Values Determined for the Lithologic Units Using Method 2 and from the Histogram of All Resistivity Values in the Resistivity Model

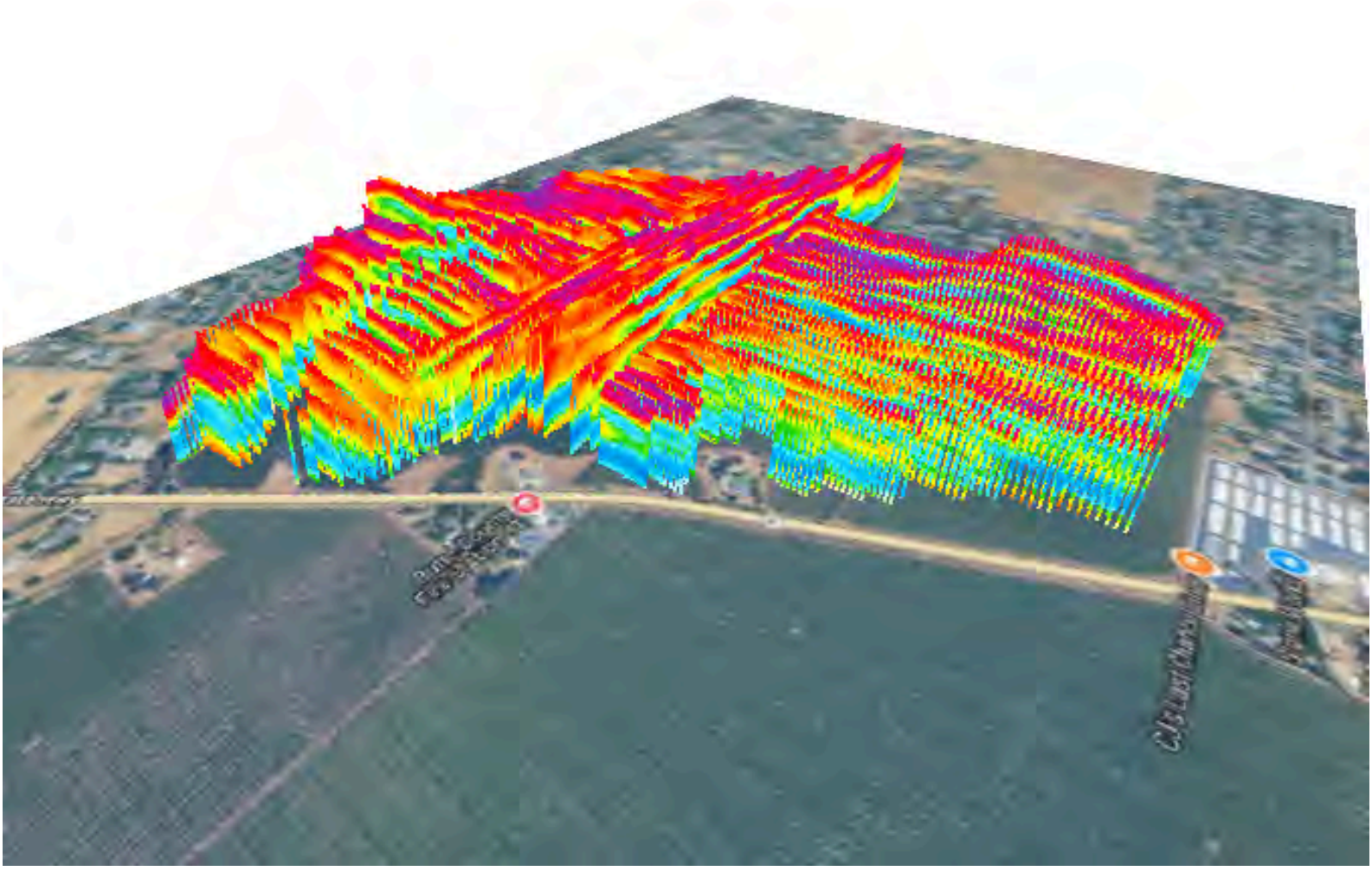
Resistivity Range (Ω m)		Interpreted Lithology
Above the water table		
8	20	Clay
21	150	Sand and gravel
Below the water table		
6	14	Clay
12	22	Mixed fine and coarse
17	43	Sand and gravel

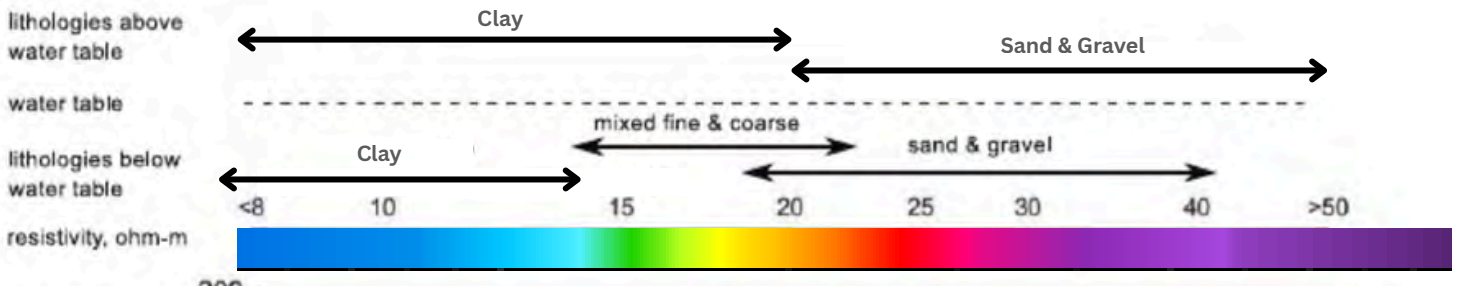
KNIGHT, R., SMITH, R., ASCH, T., ABRAHAM, J., CANNIA, J., VIEZZOLI, A., & FOGG, G. (2018). MAPPING AQUIFER SYSTEMS WITH AIRBORNE ELECTROMAGNETICS IN THE CENTRAL VALLEY OF CALIFORNIA. GROUND WATER, 56(6), 893–908. HTTPS://DOI.ORG/10.1111/GWAT.12656

3D VIEW- WEST TO EAST

NORTH

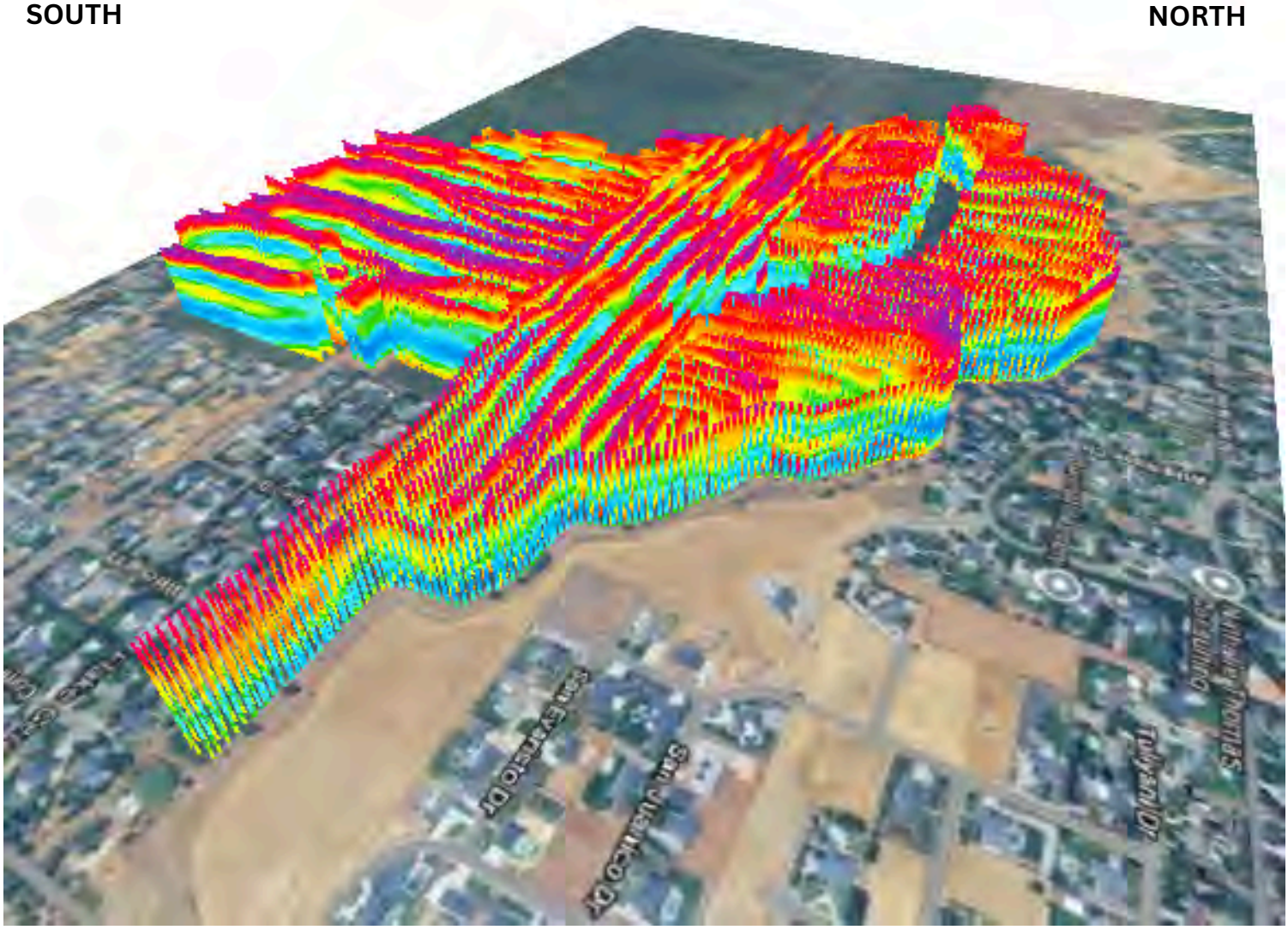
SOUTH

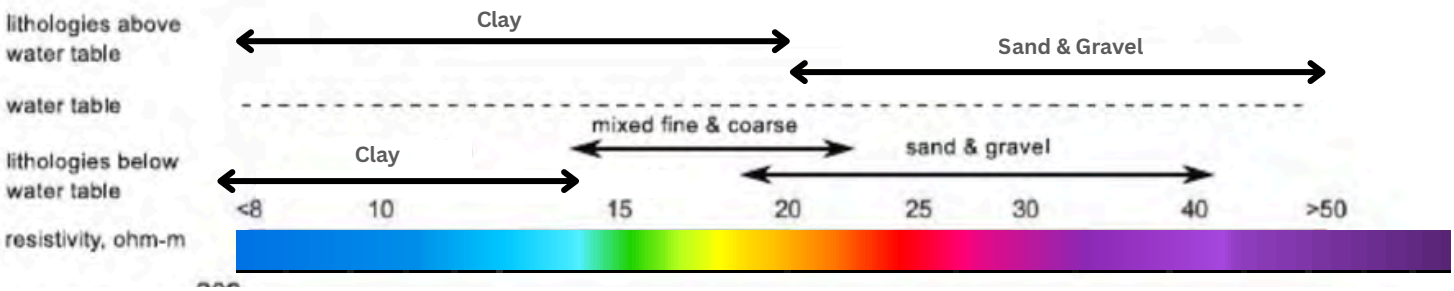




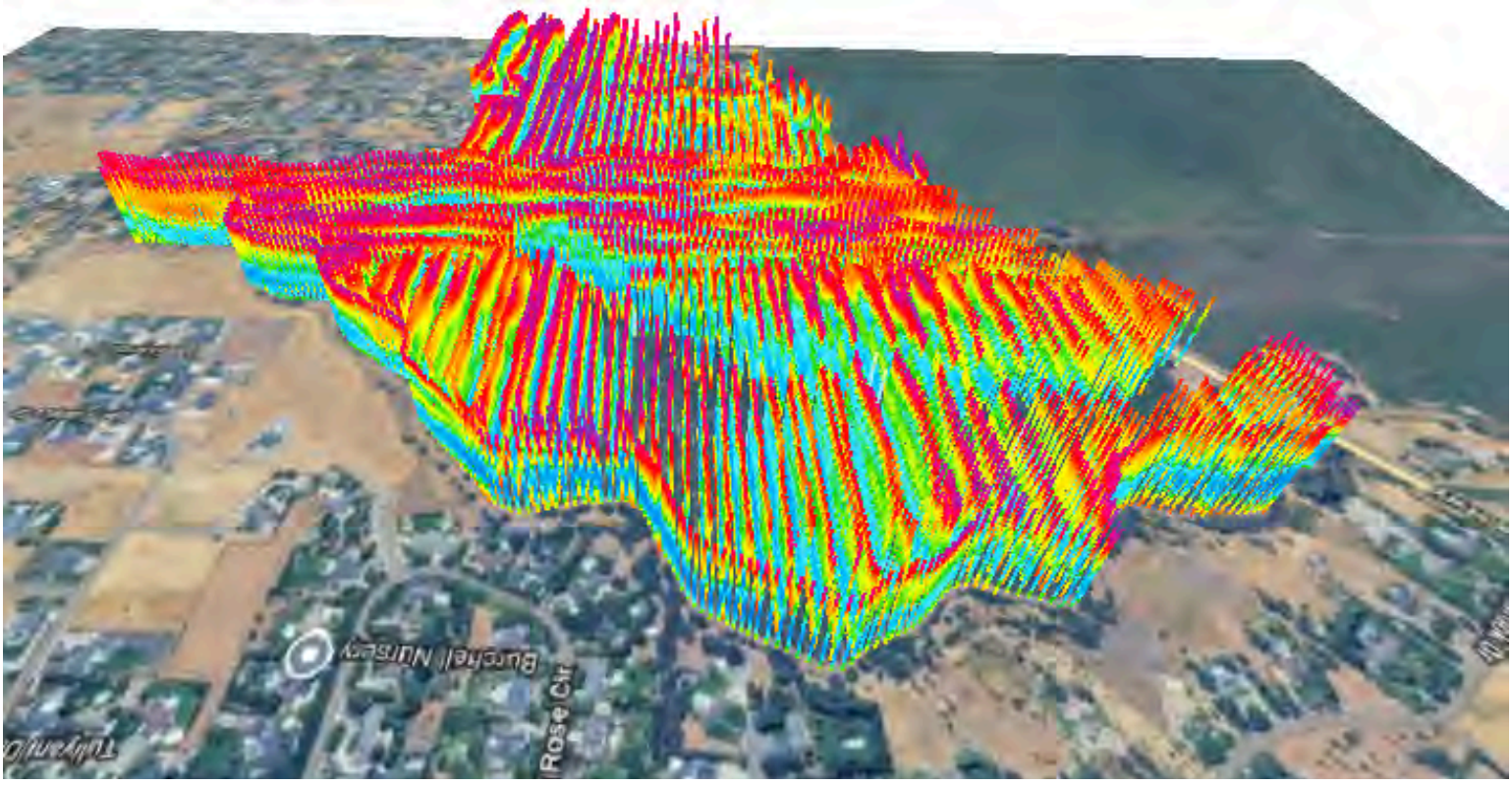
3D VIEW- EAST TO WEST

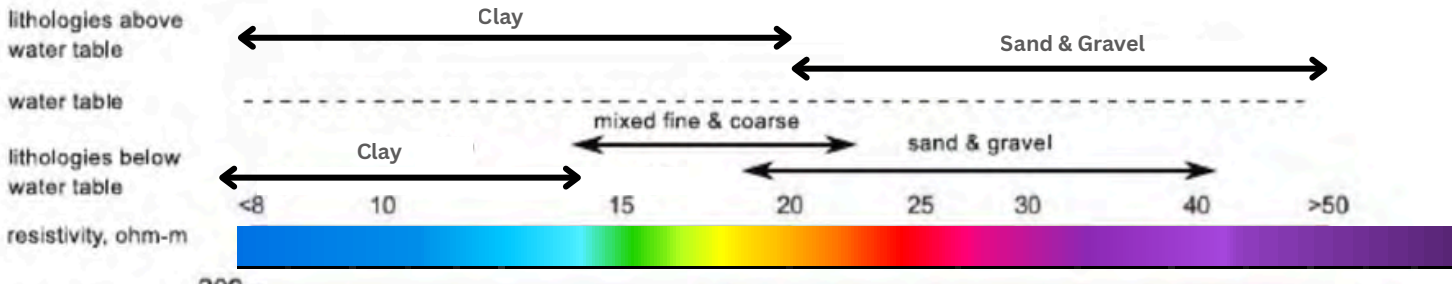
SOUTH **NORTH**



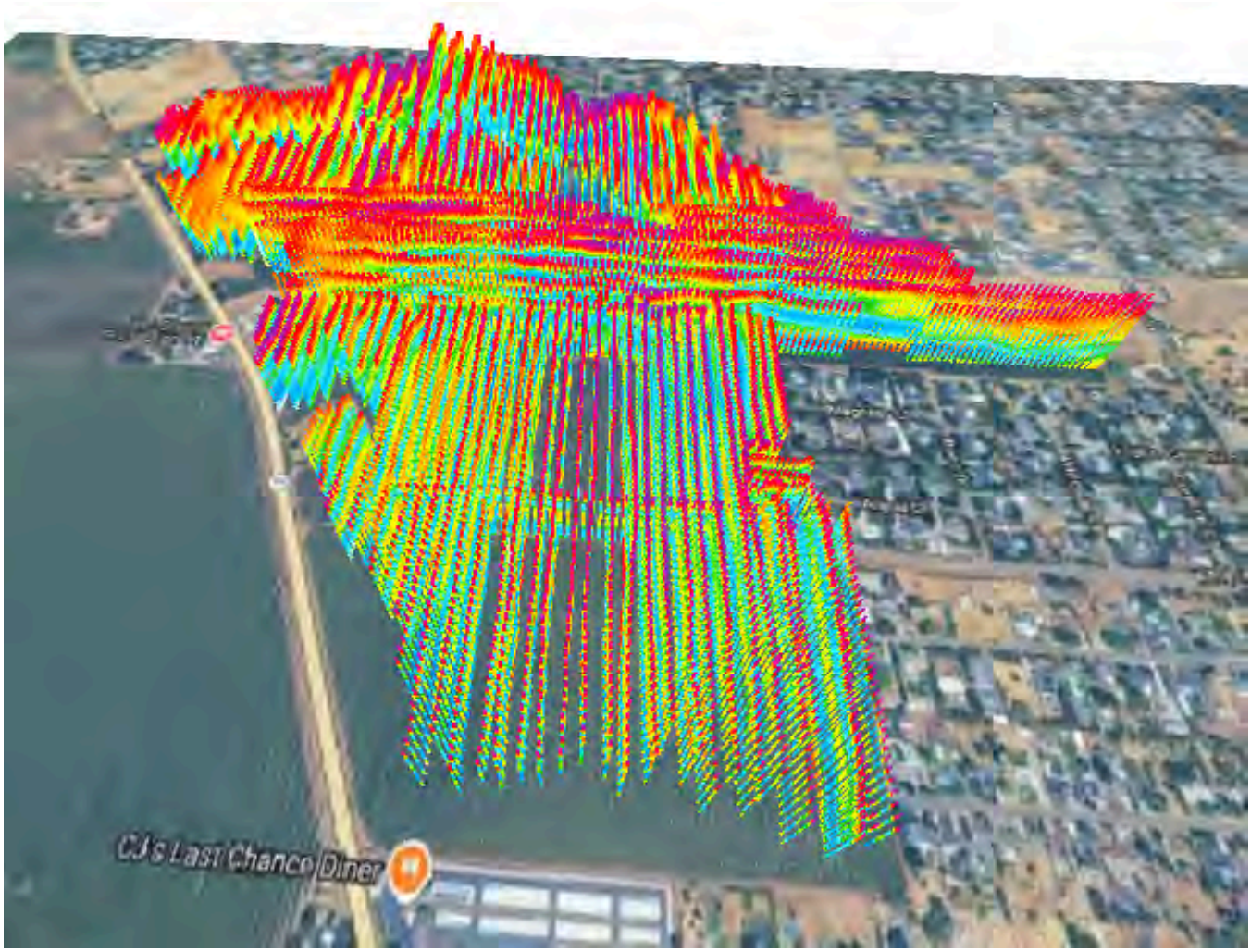


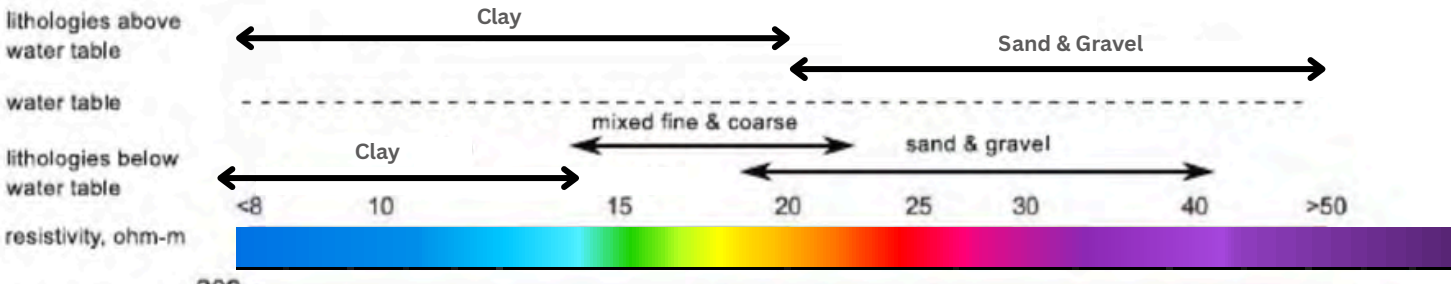
3D VIEW- NORTH TO SOUTH



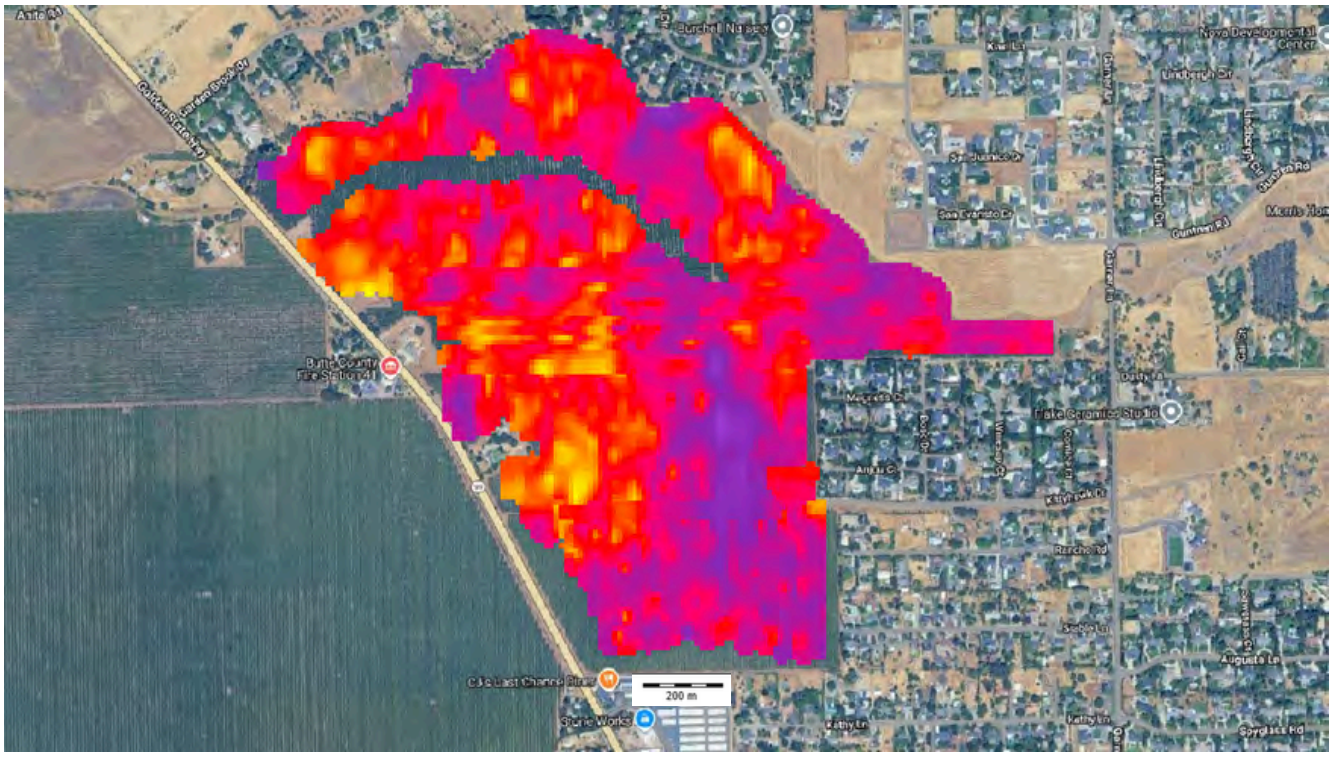


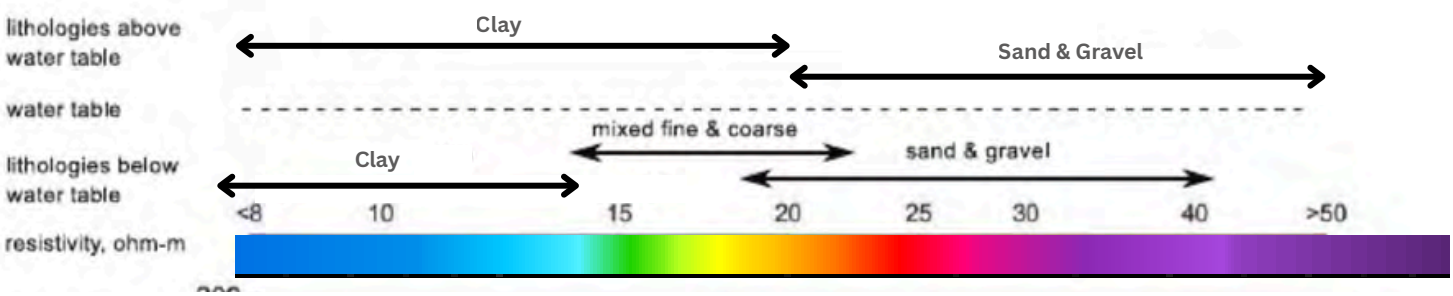
3D VIEW- SOUTH TO NORTH



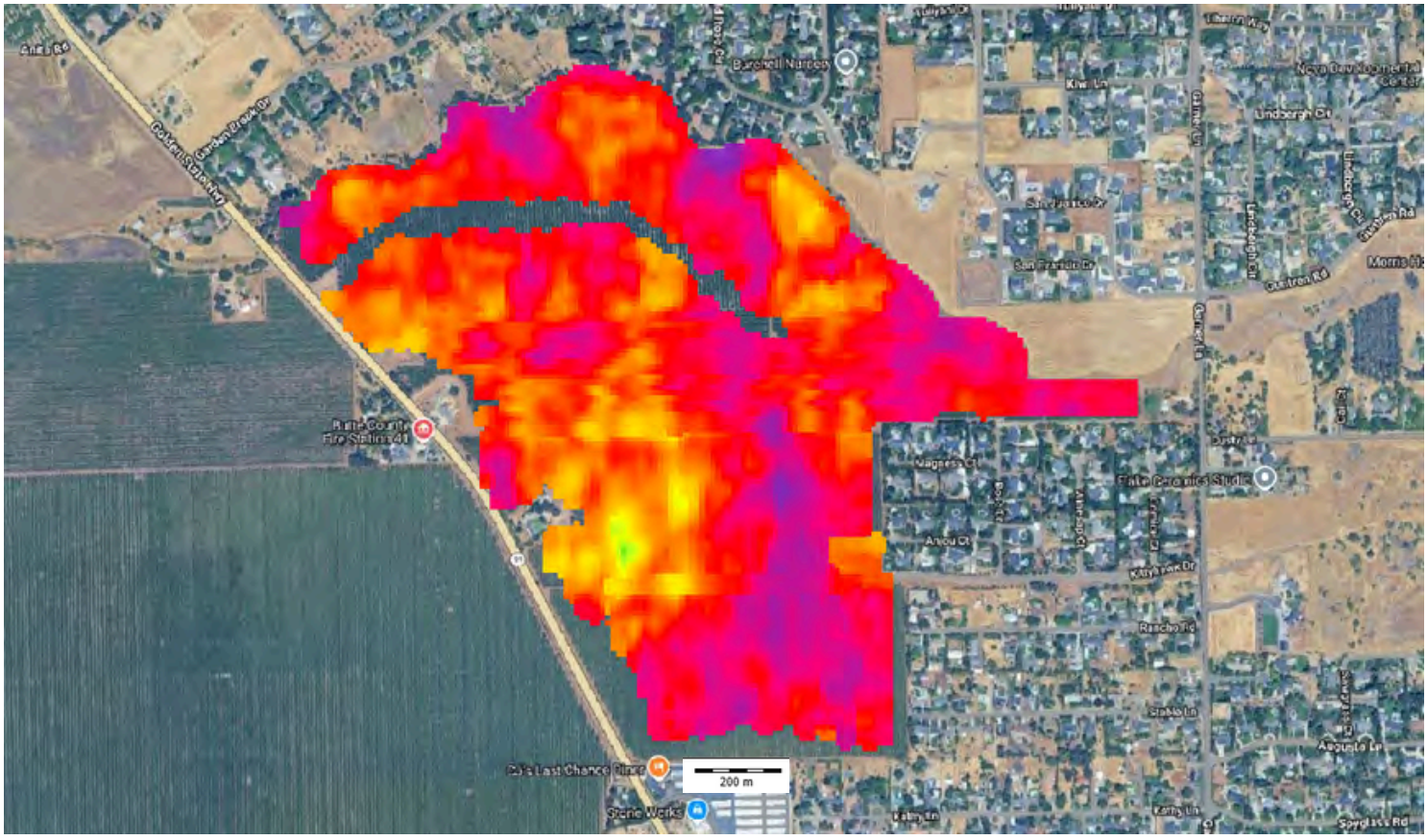


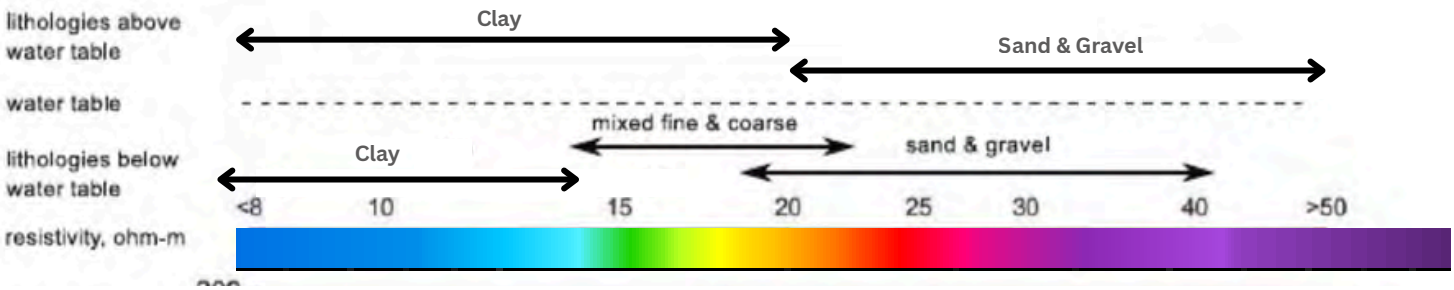
DEPTH SLICES- 0 FT





DEPTH SLICES- 10 FT





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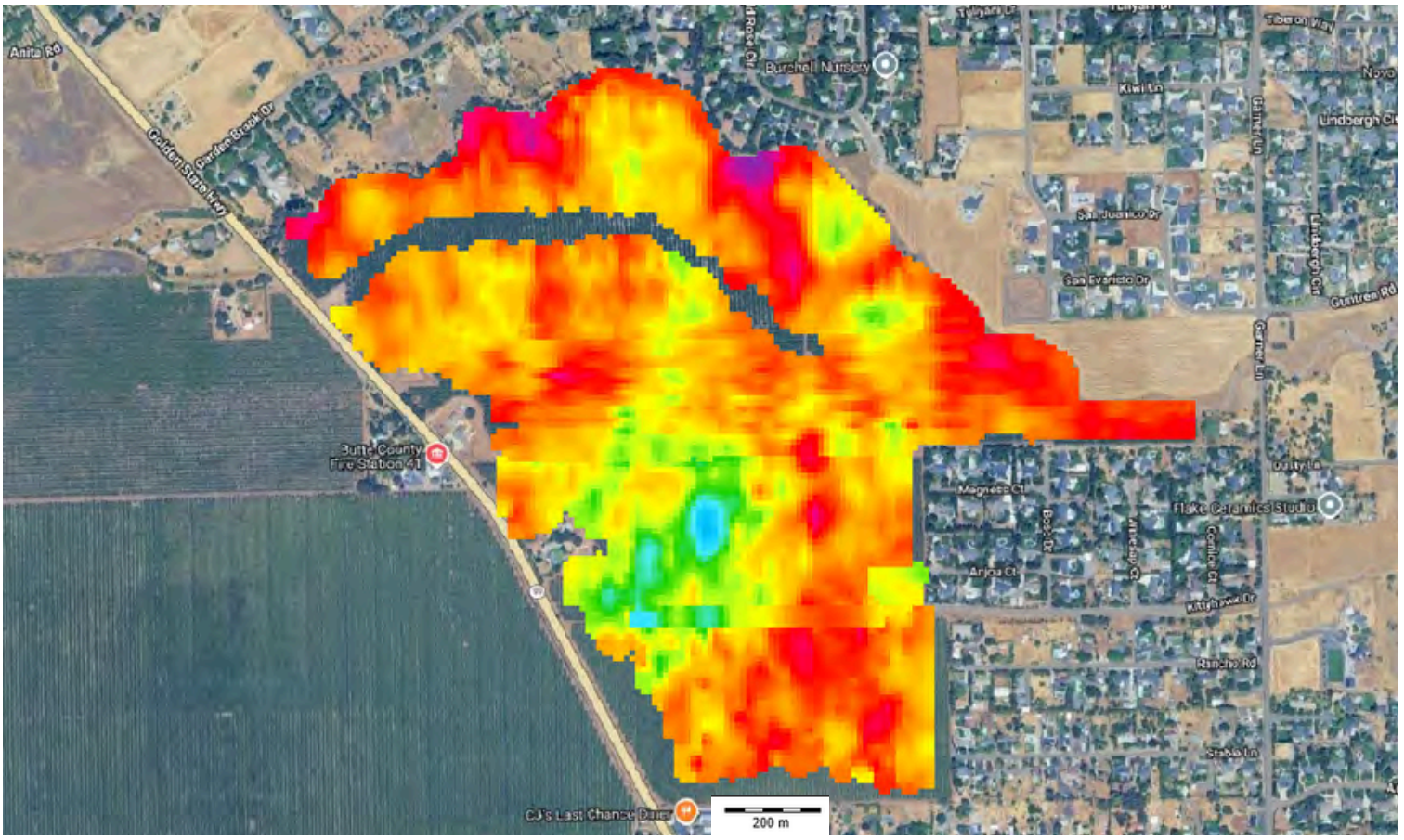
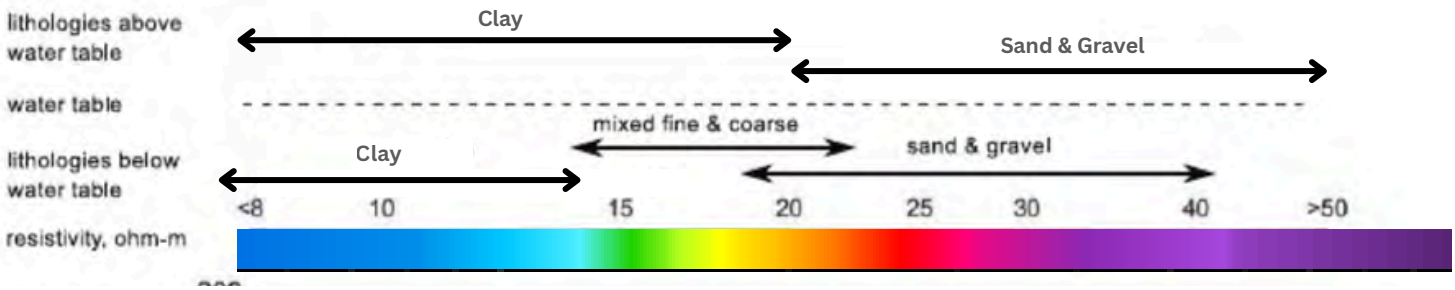
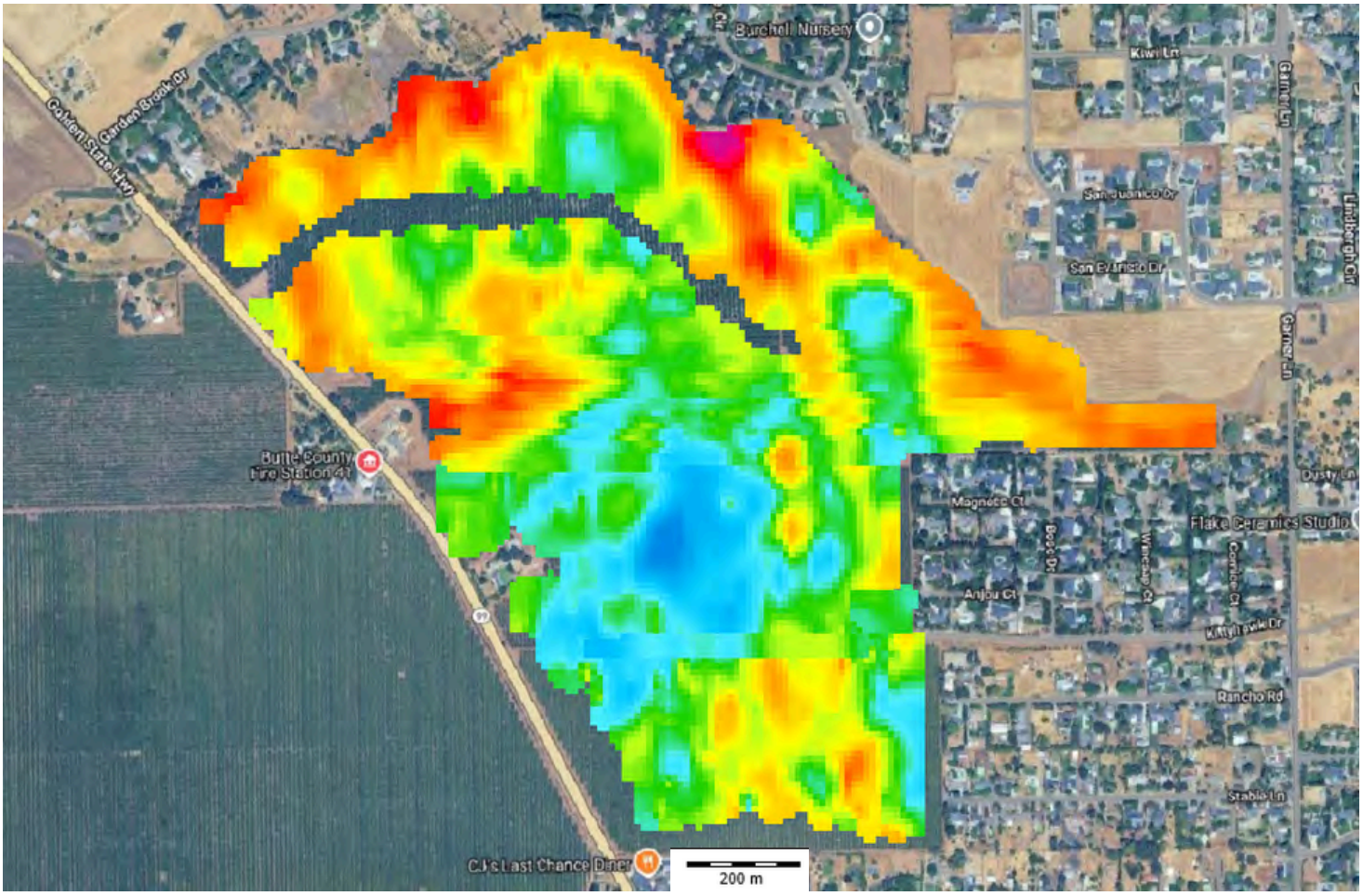
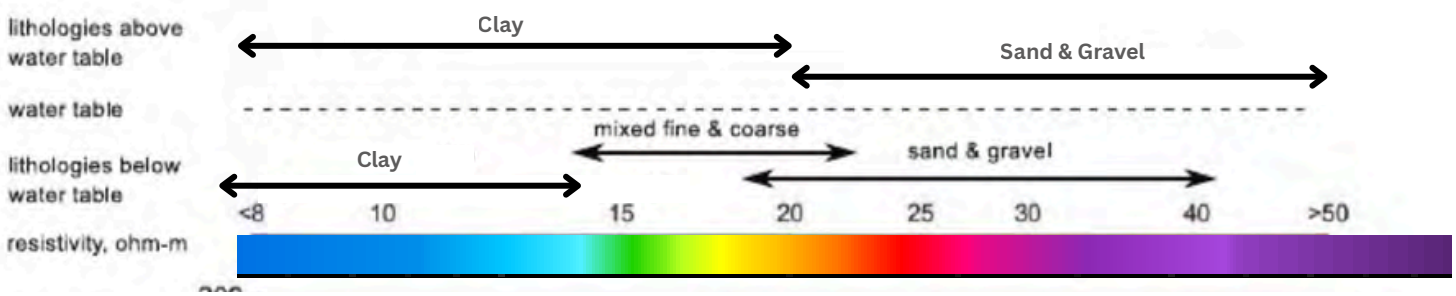




DEPTH SLICES- 30 FT





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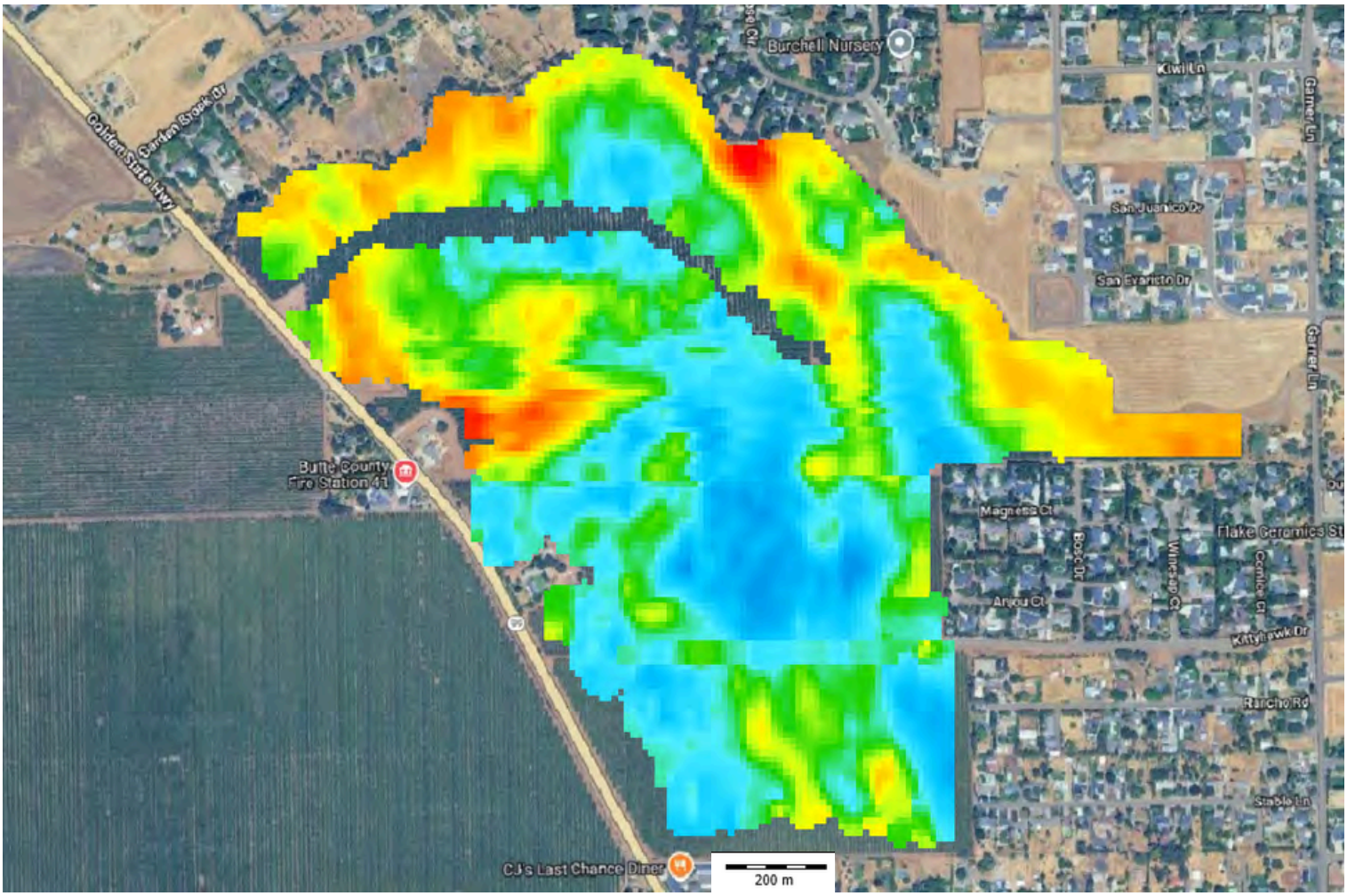
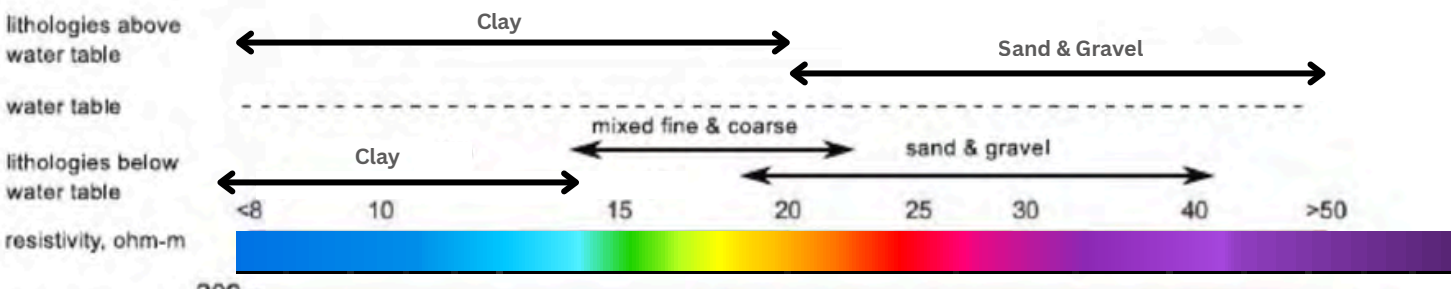
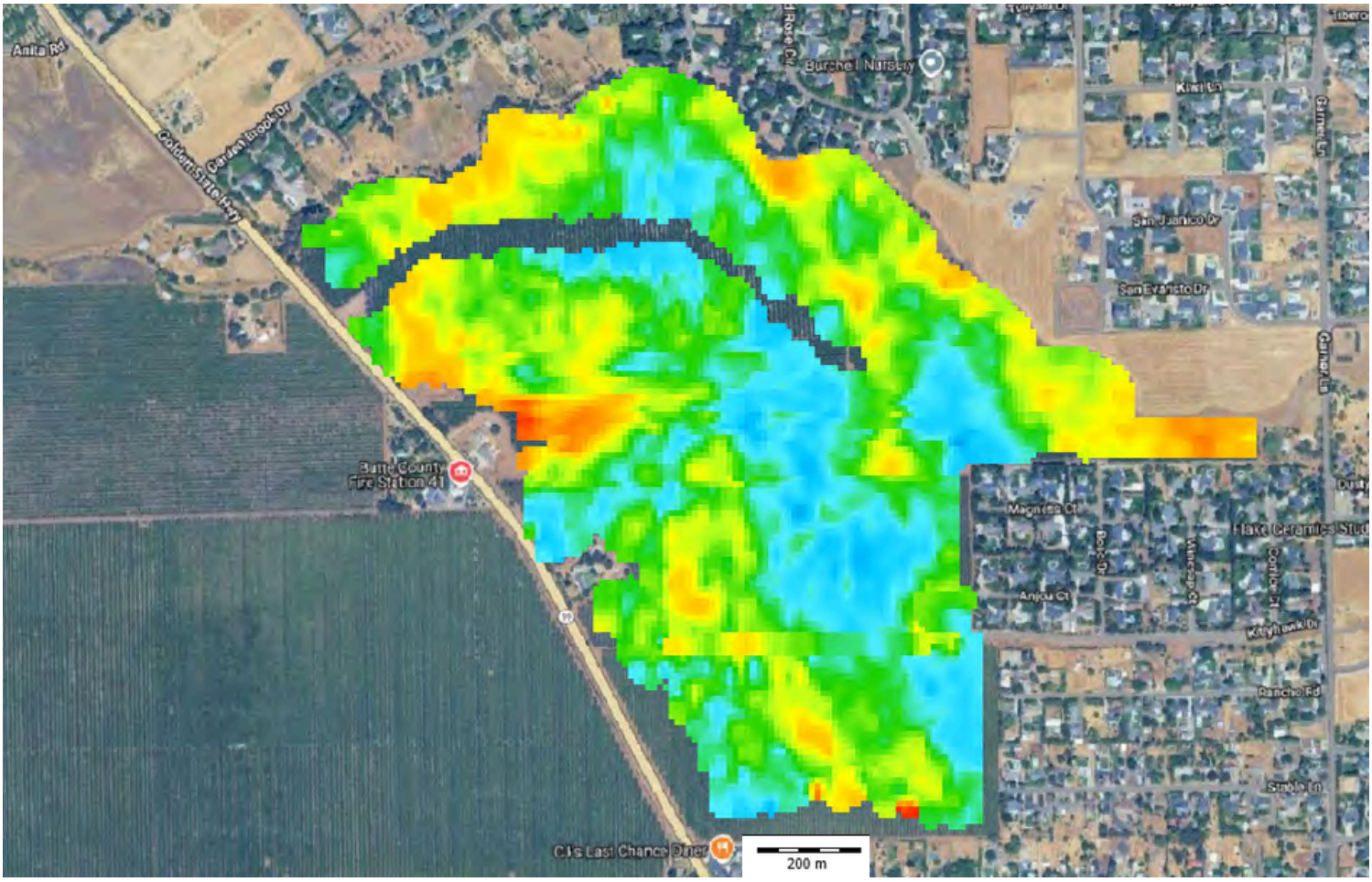
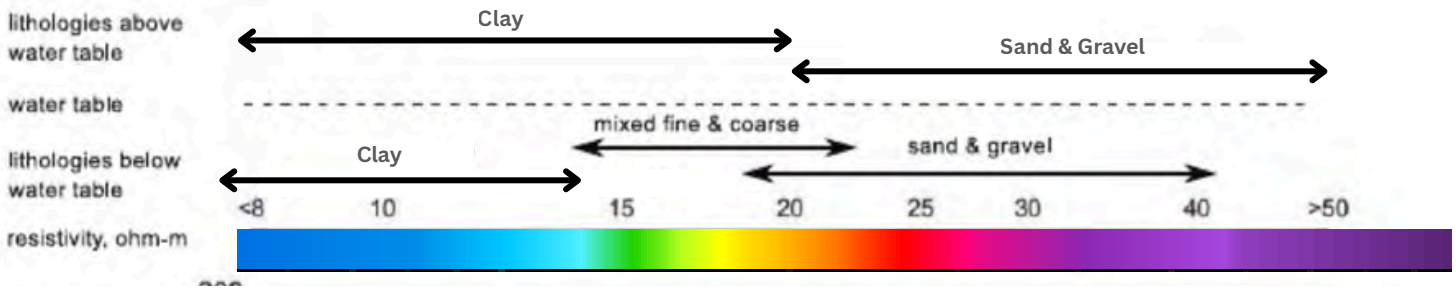


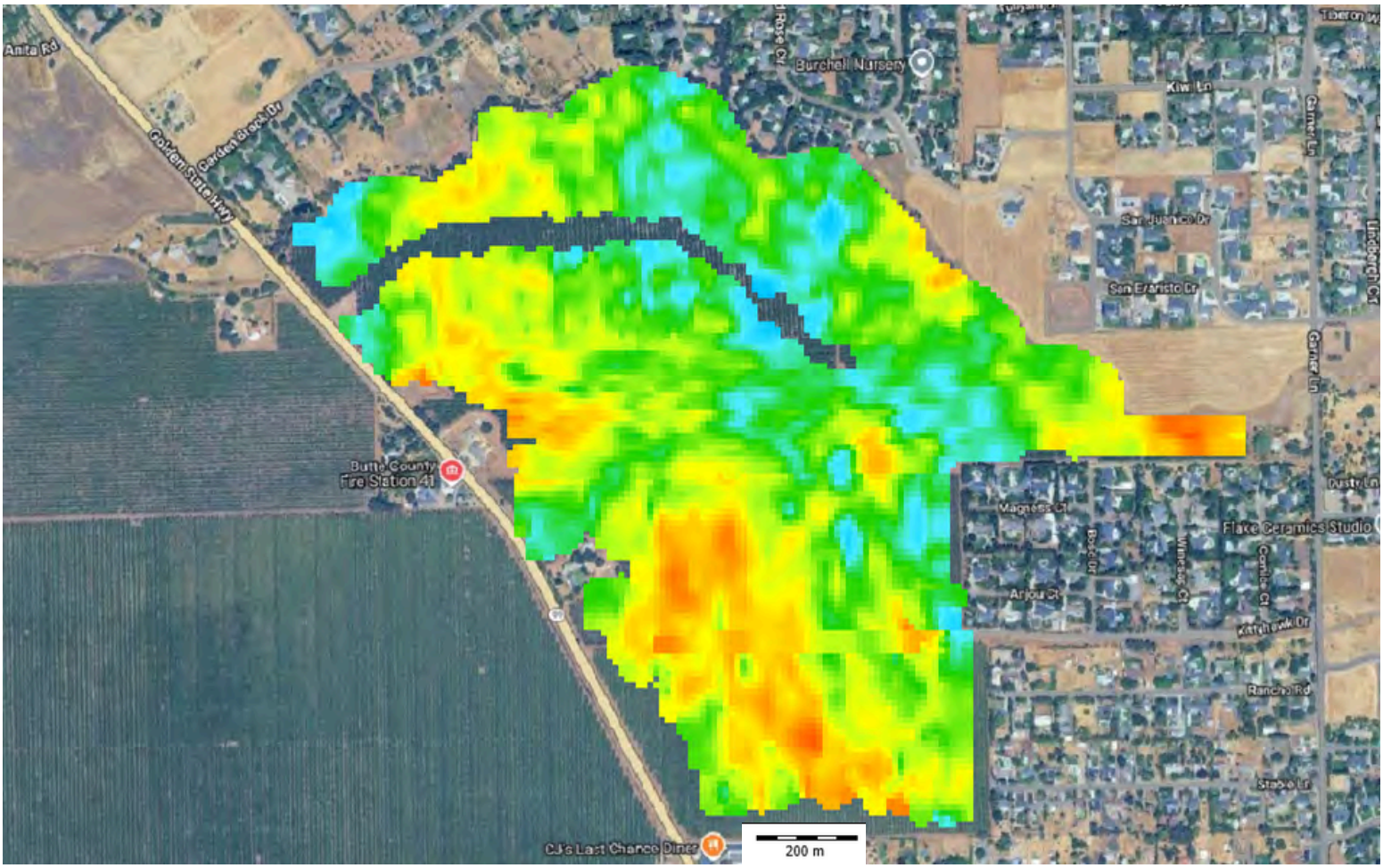


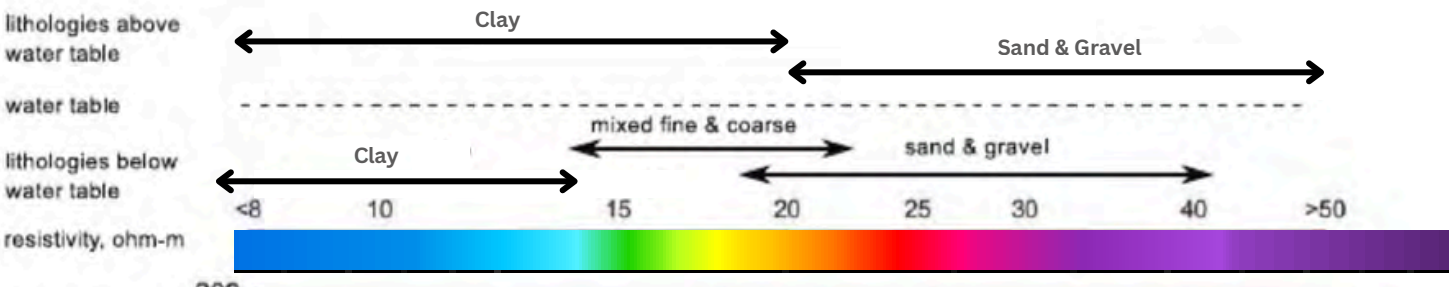
DEPTH SLICES- 50 FT



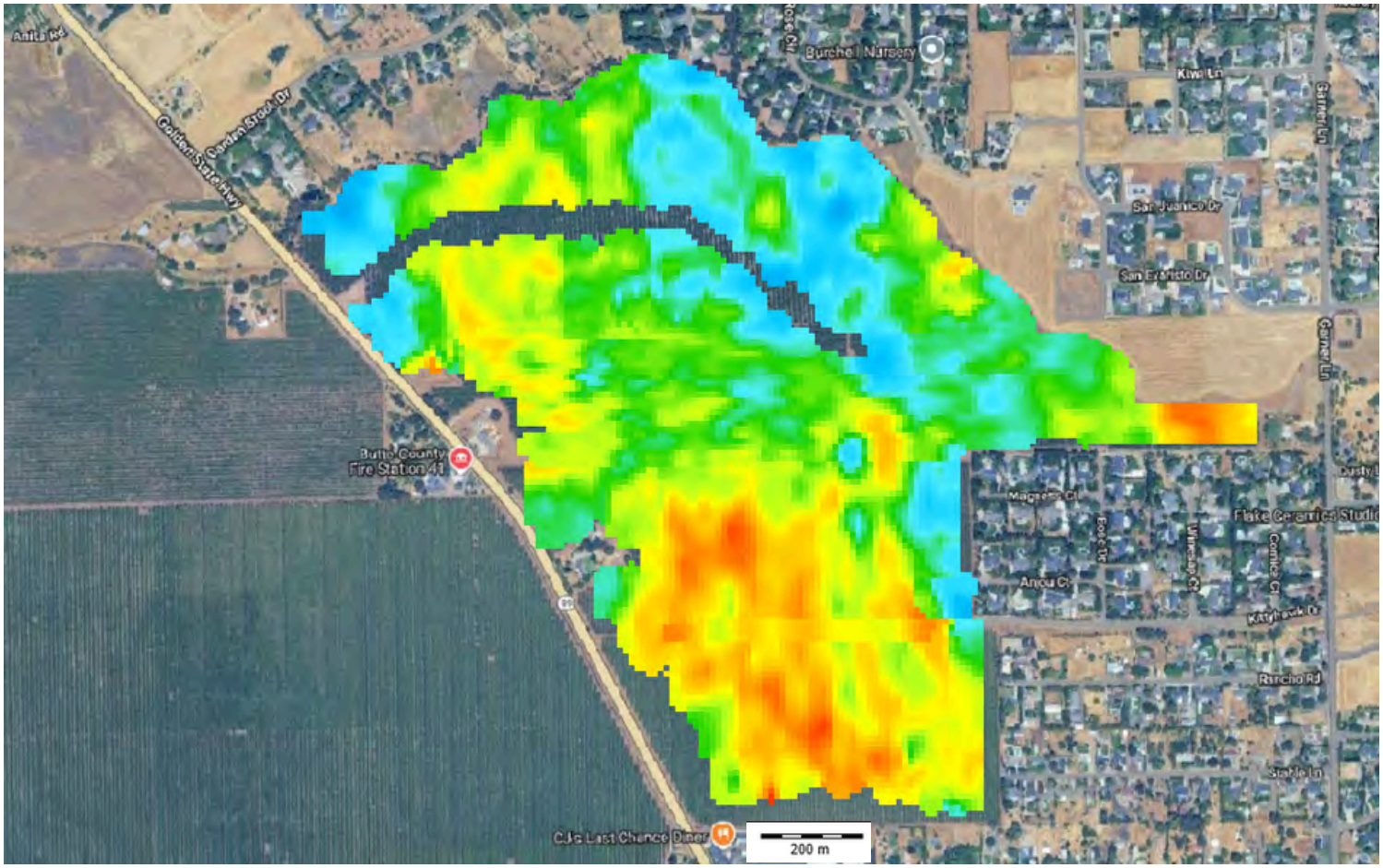


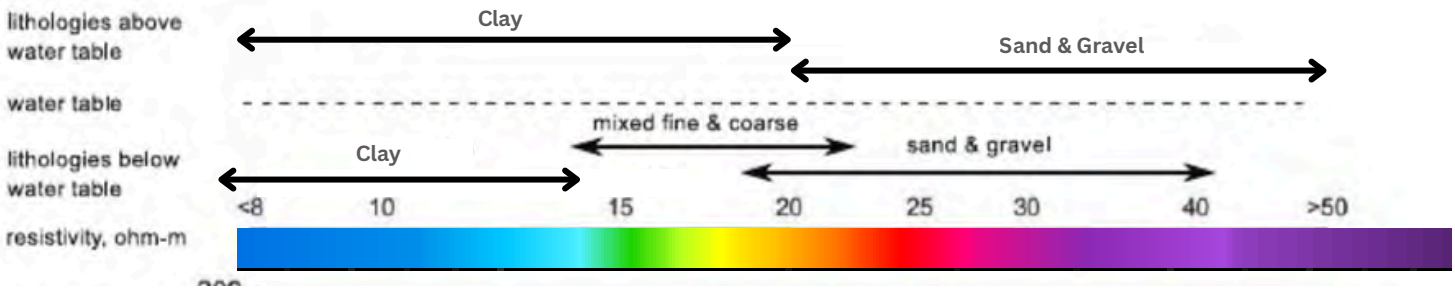
DEPTH SLICES- 60 FT



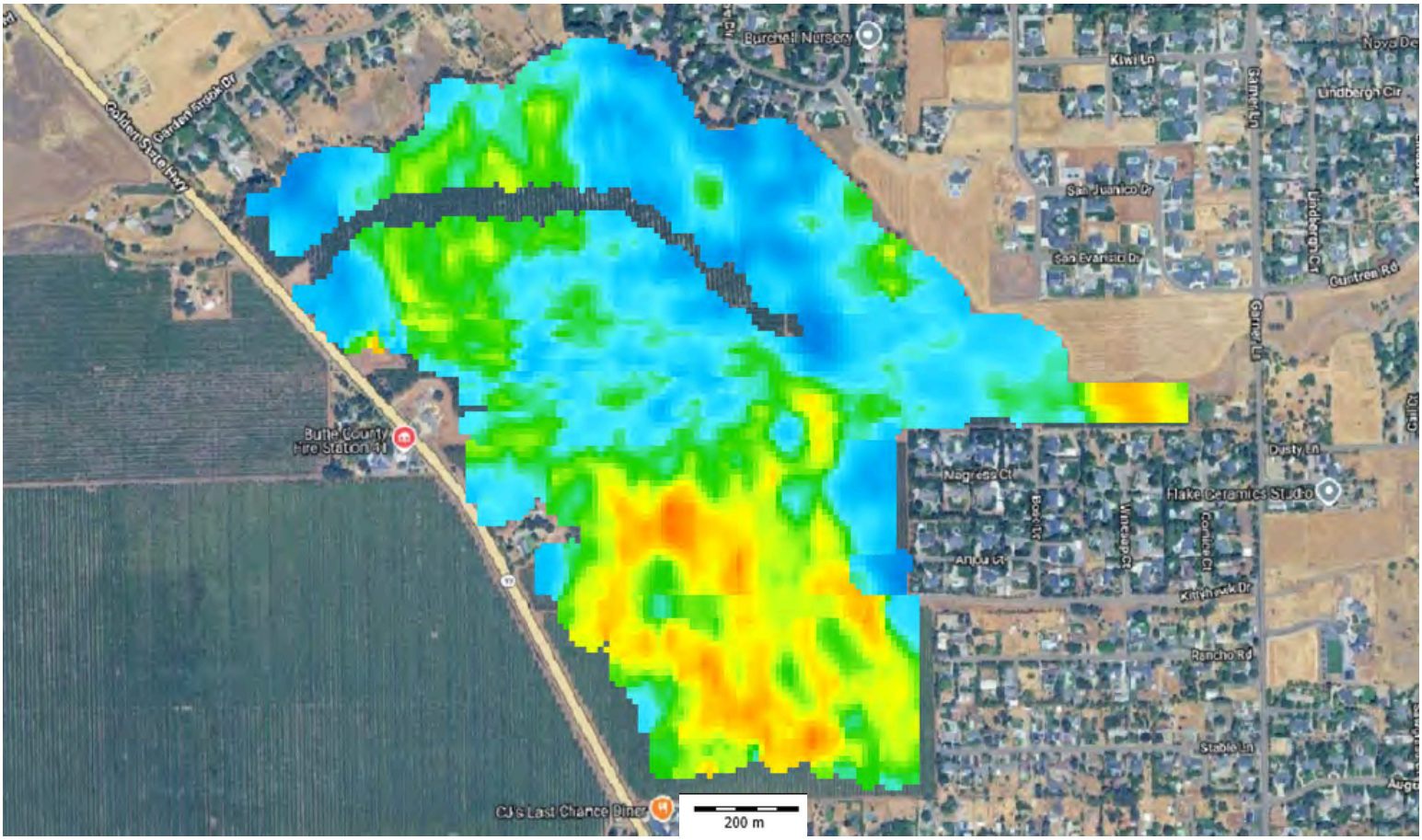


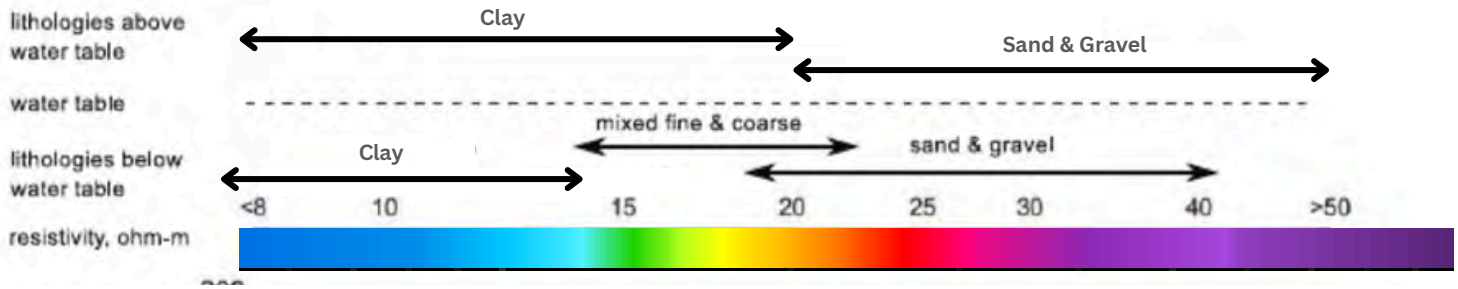
DEPTH SLICES- 70 FT



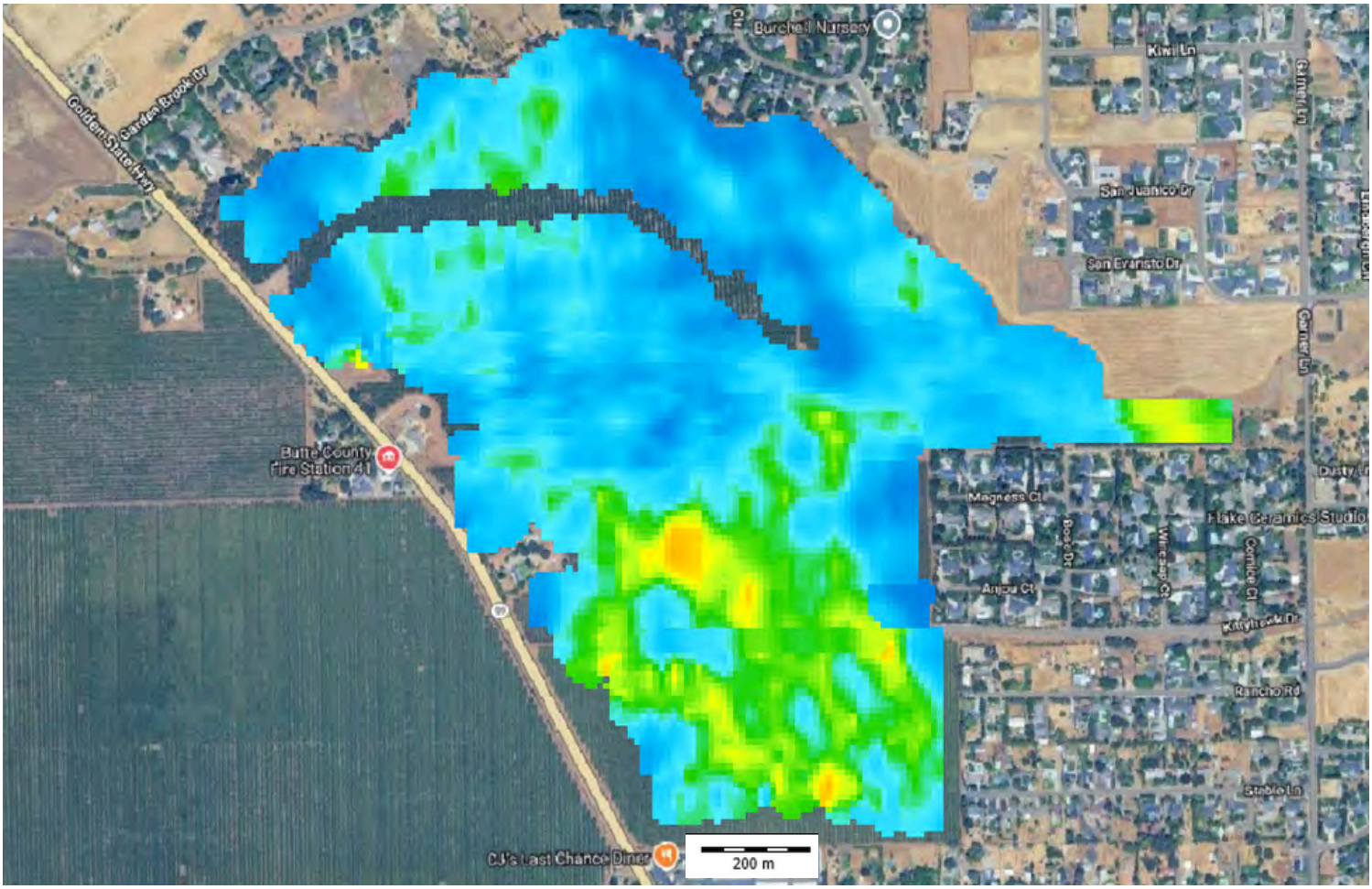


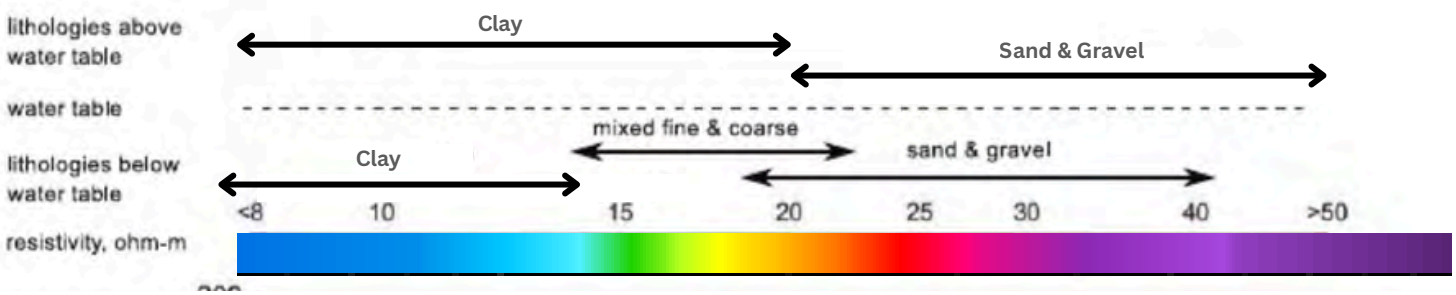
DEPTH SLICES- 80 FT (WATER TABLE)



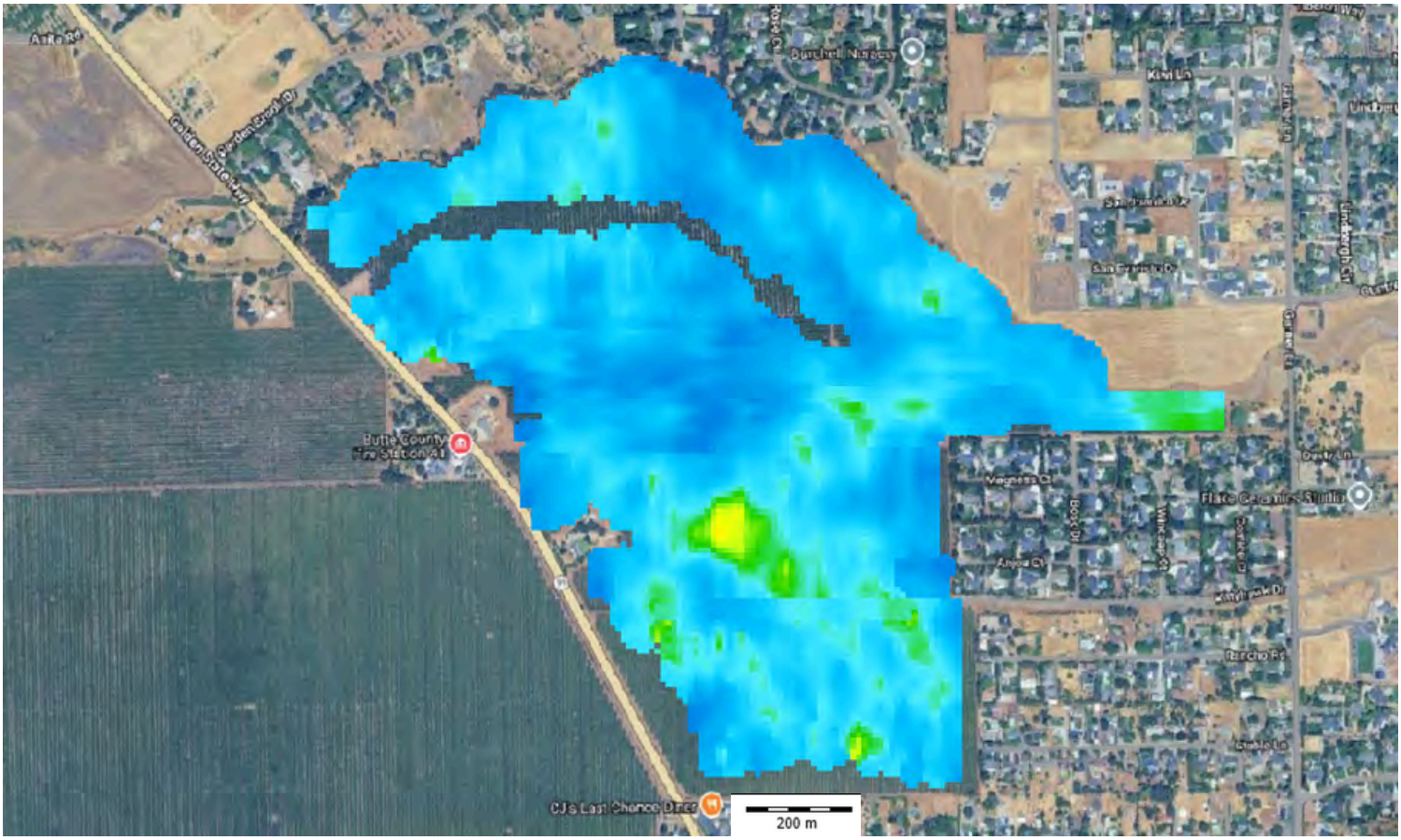


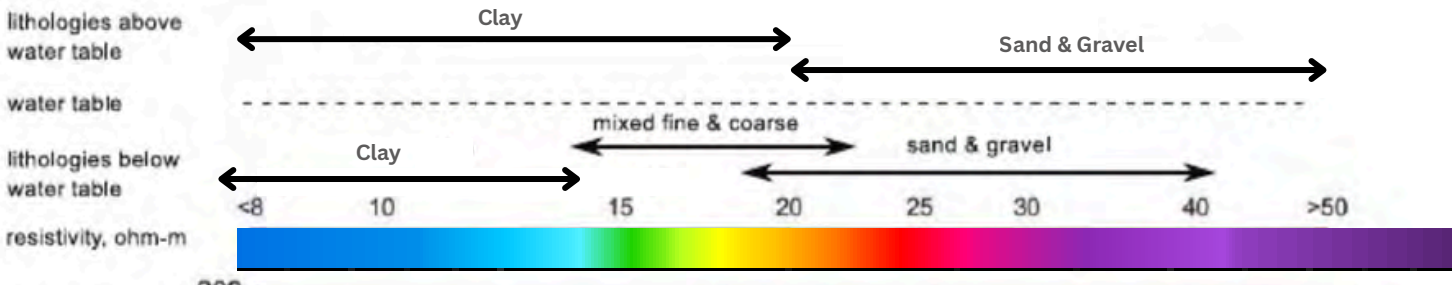
DEPTH SLICES- 90 FT



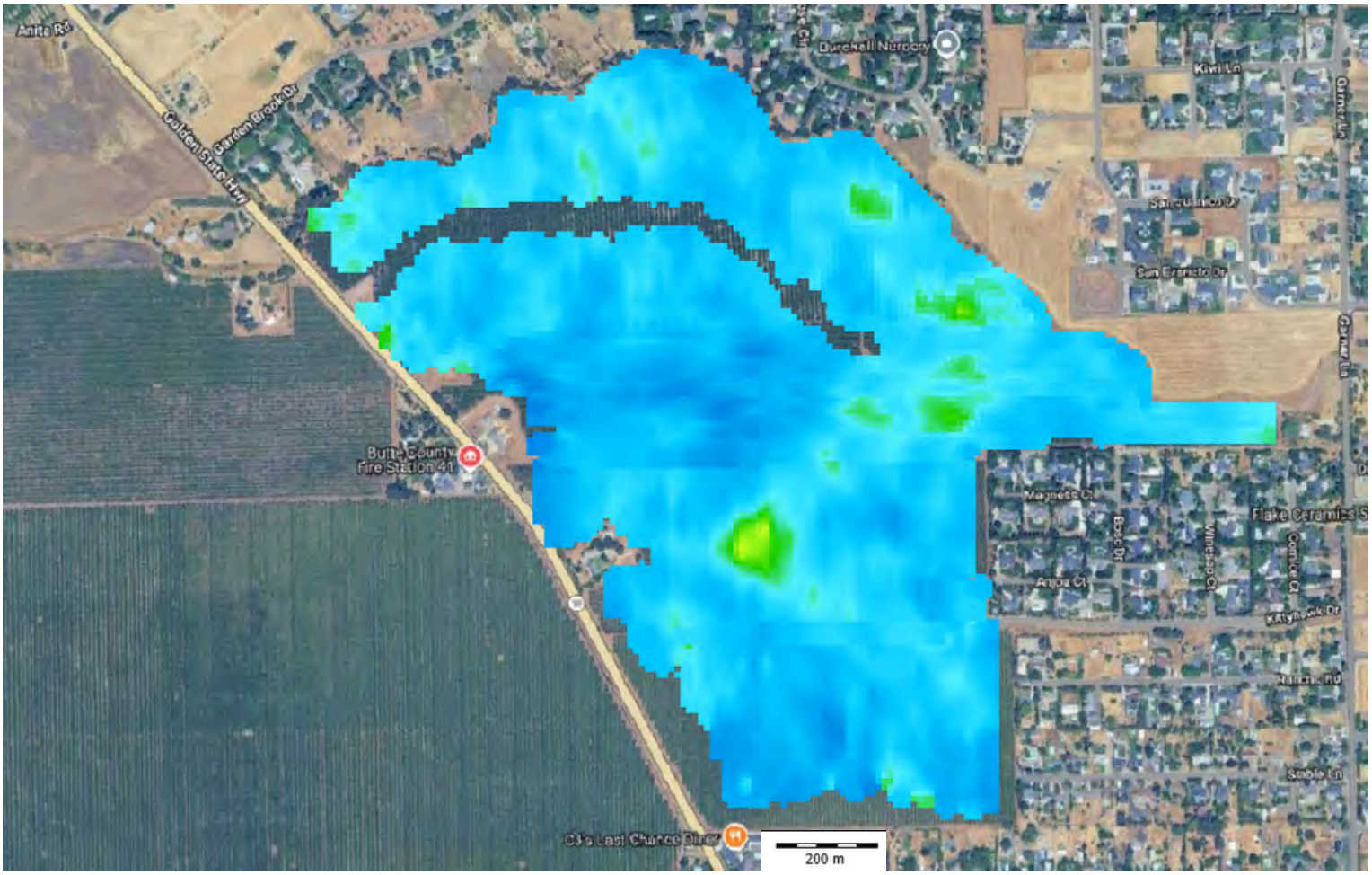


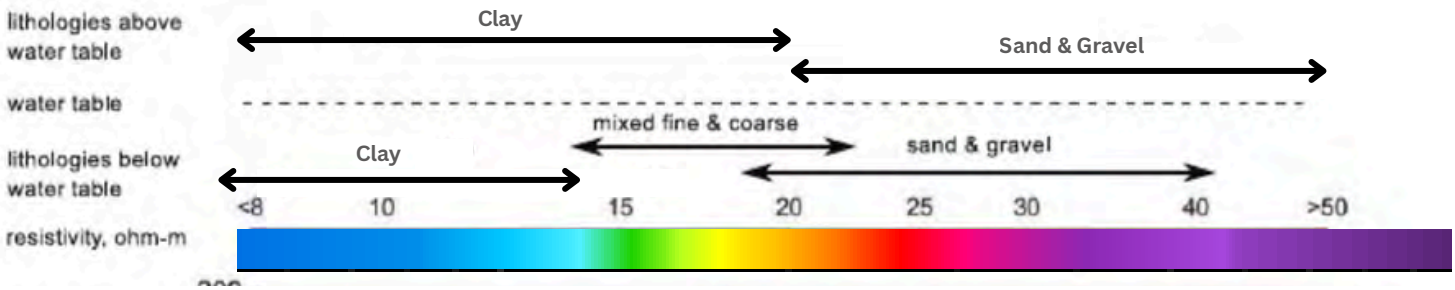
DEPTH SLICES- 100 FT



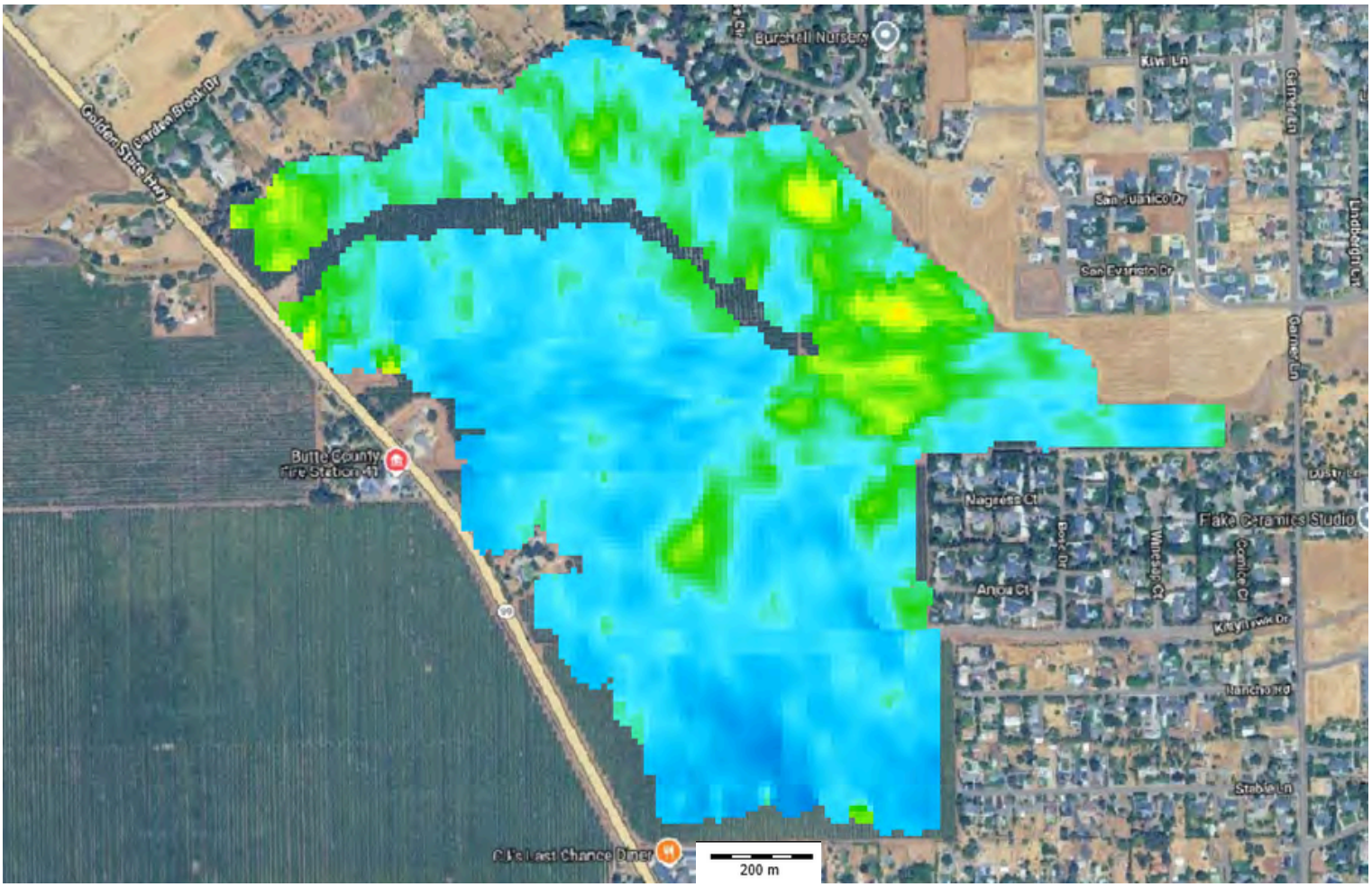


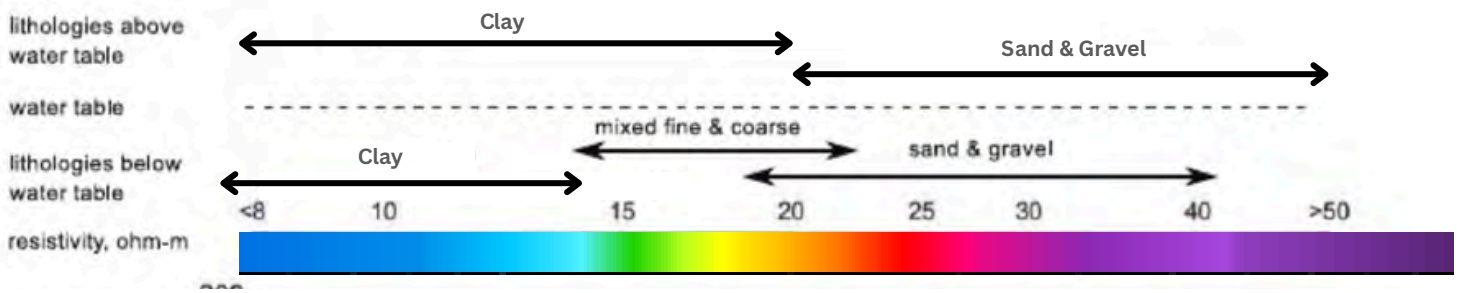
DEPTH SLICES- 110 FT



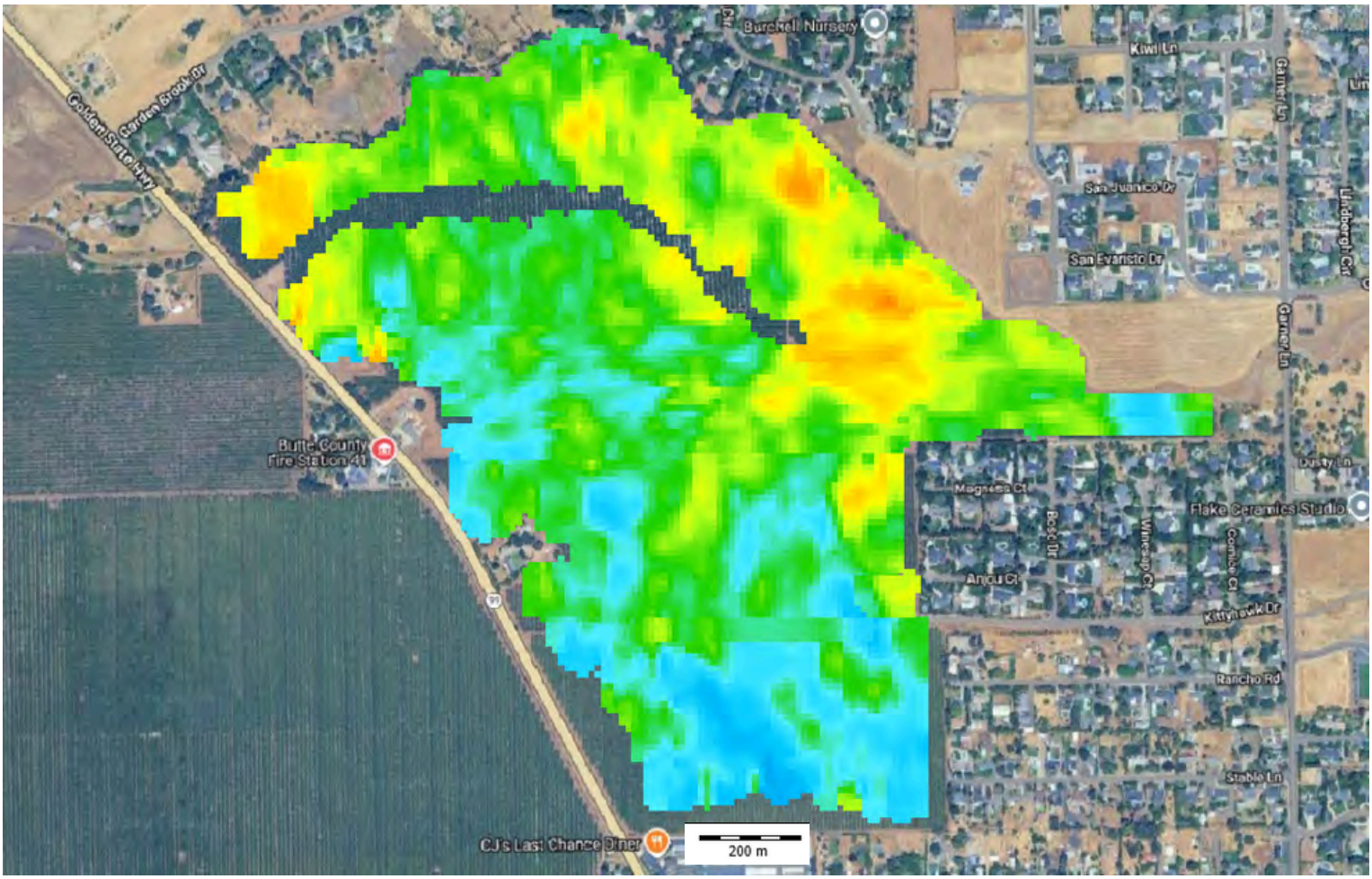


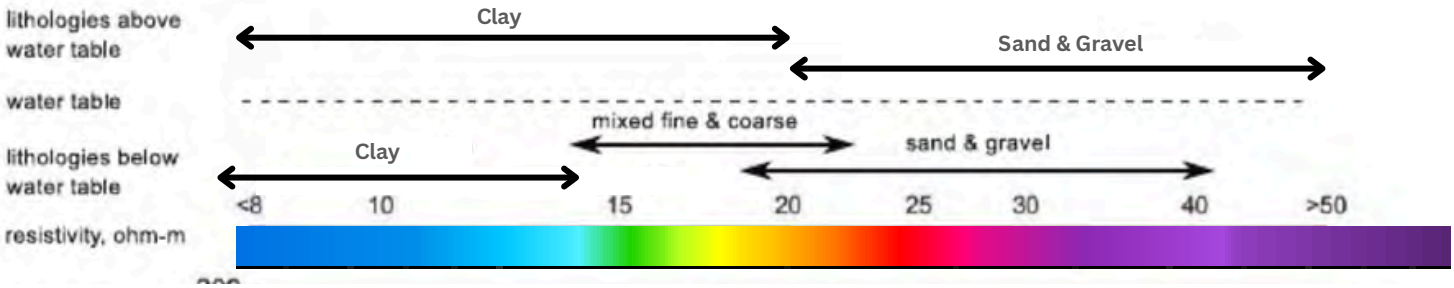
DEPTH SLICES- 120 FT



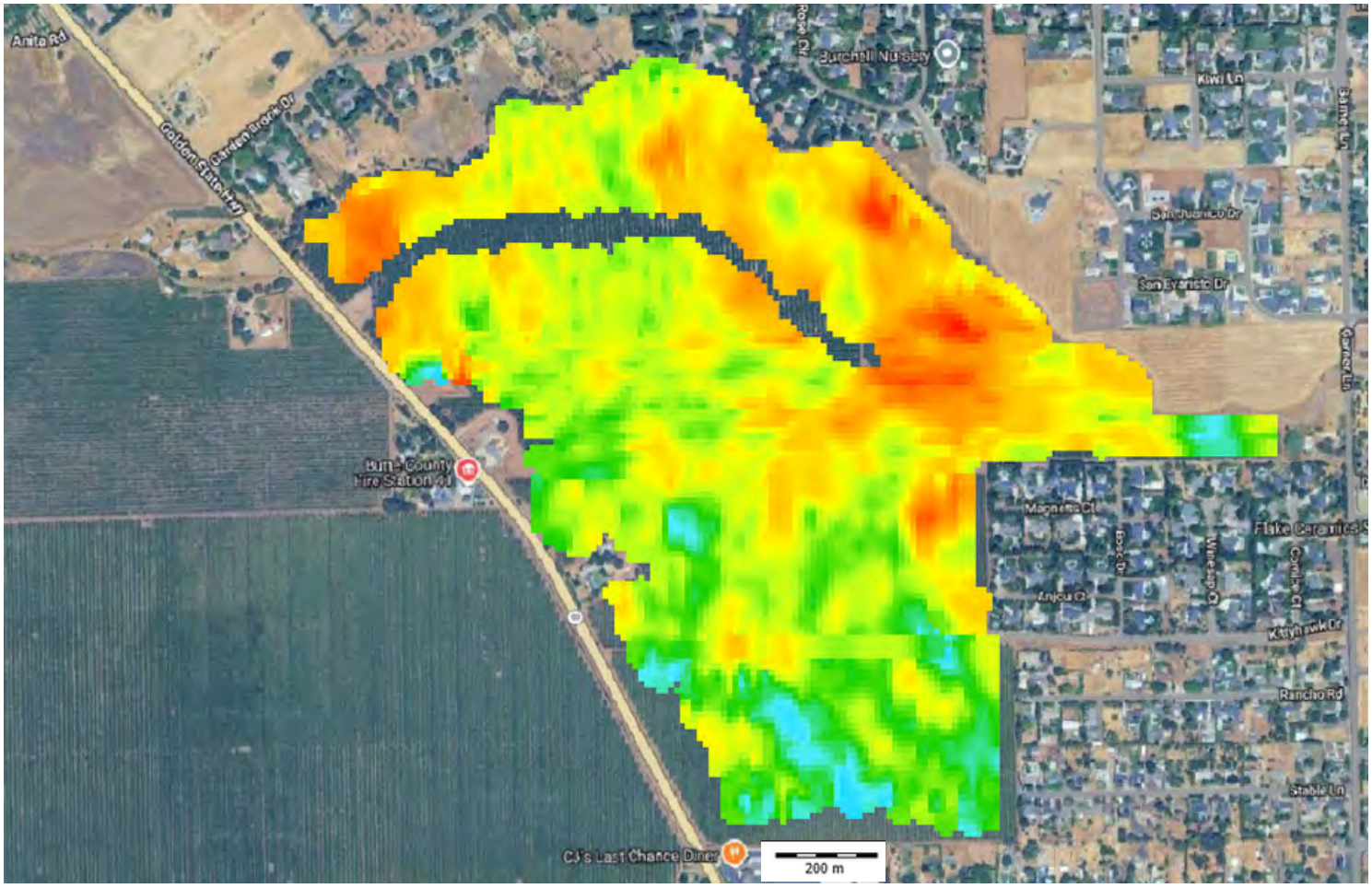


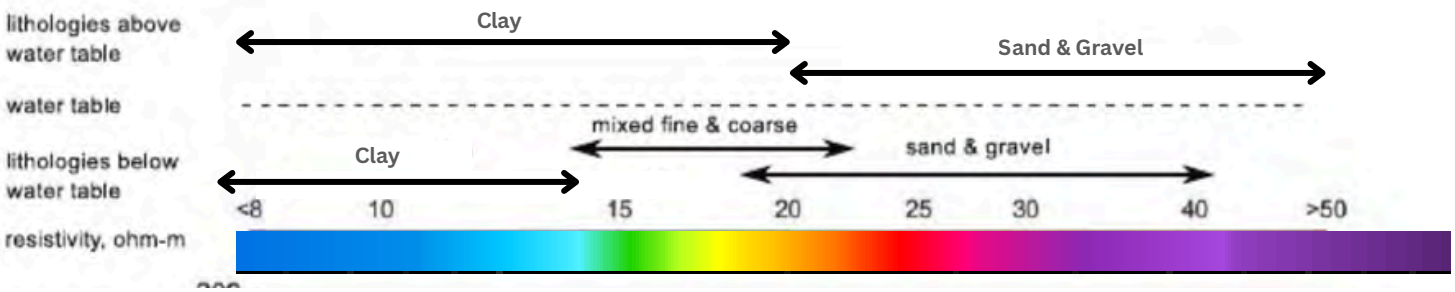
DEPTH SLICES- 130 FT



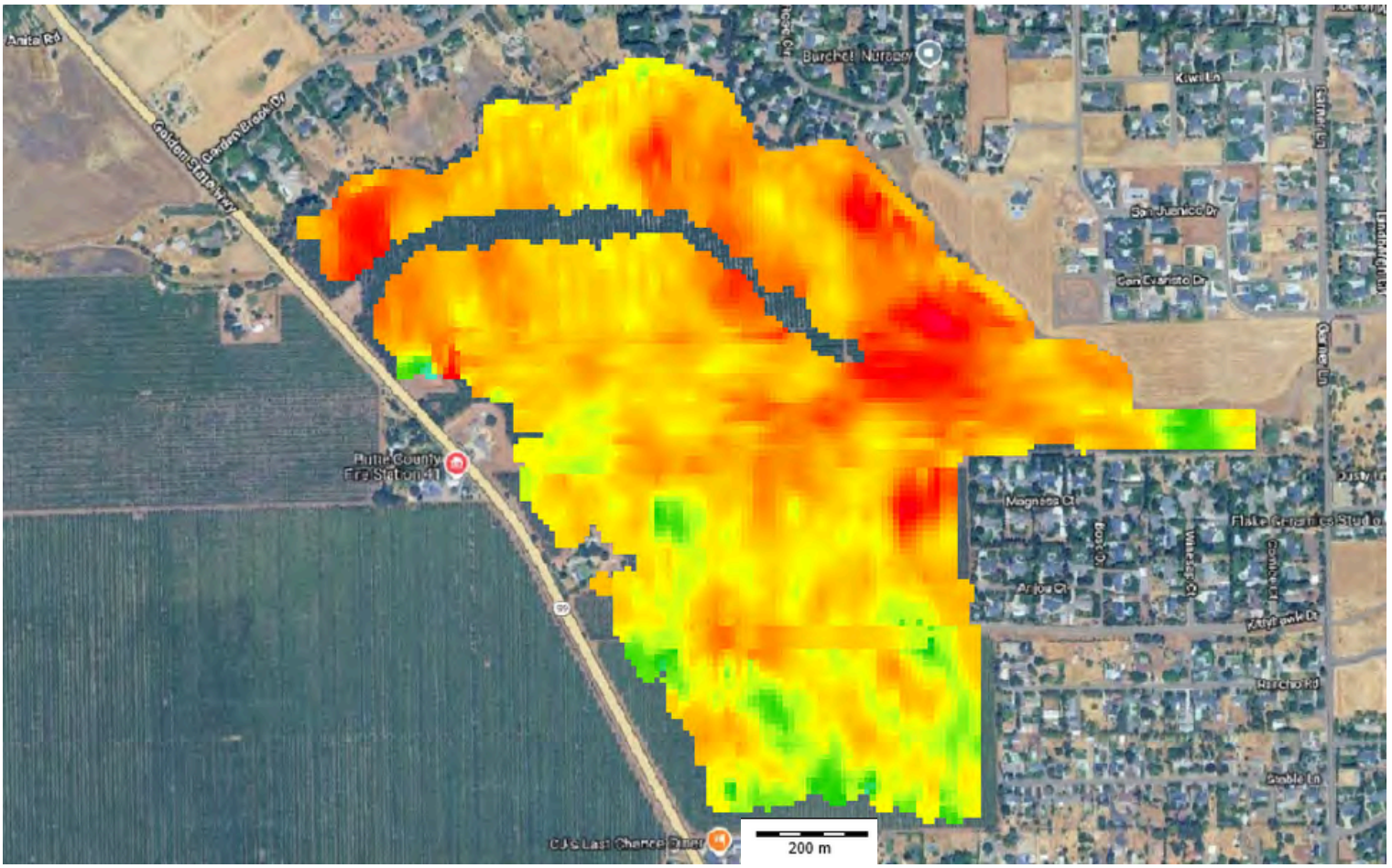


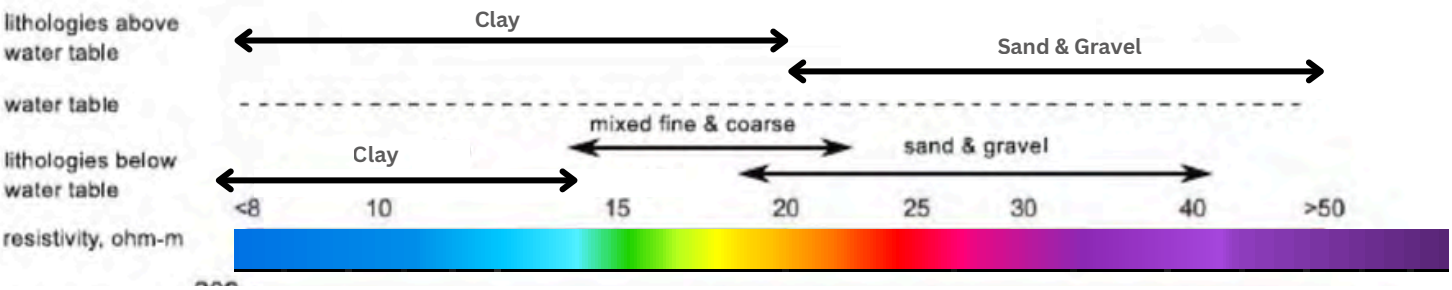
DEPTH SLICES- 140 FT



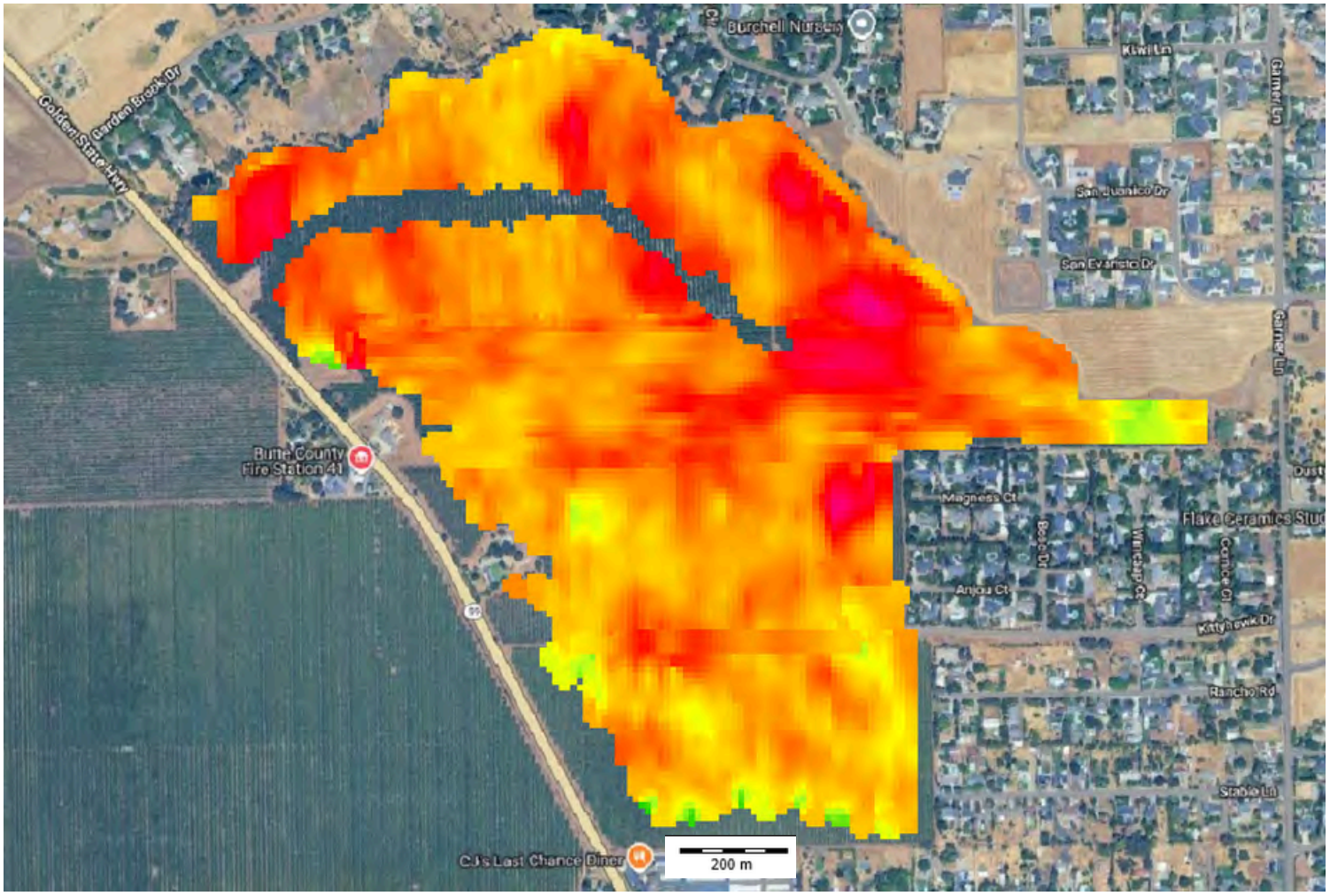


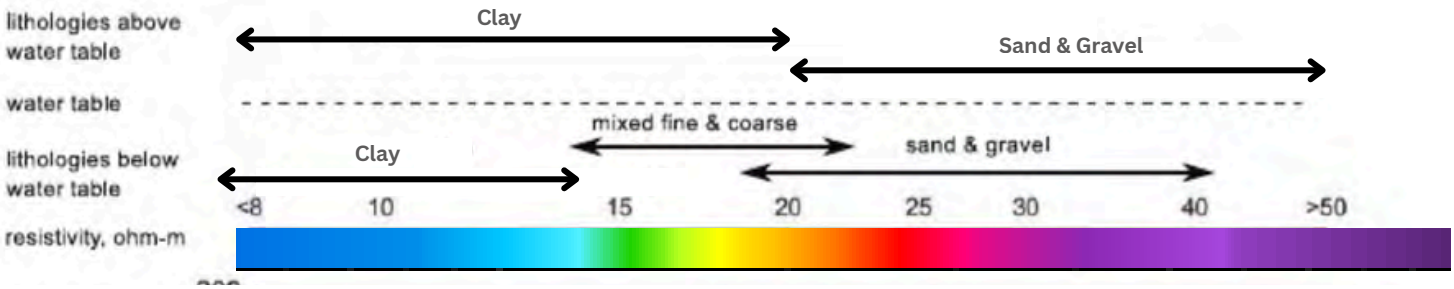
DEPTH SLICES- 150 FT



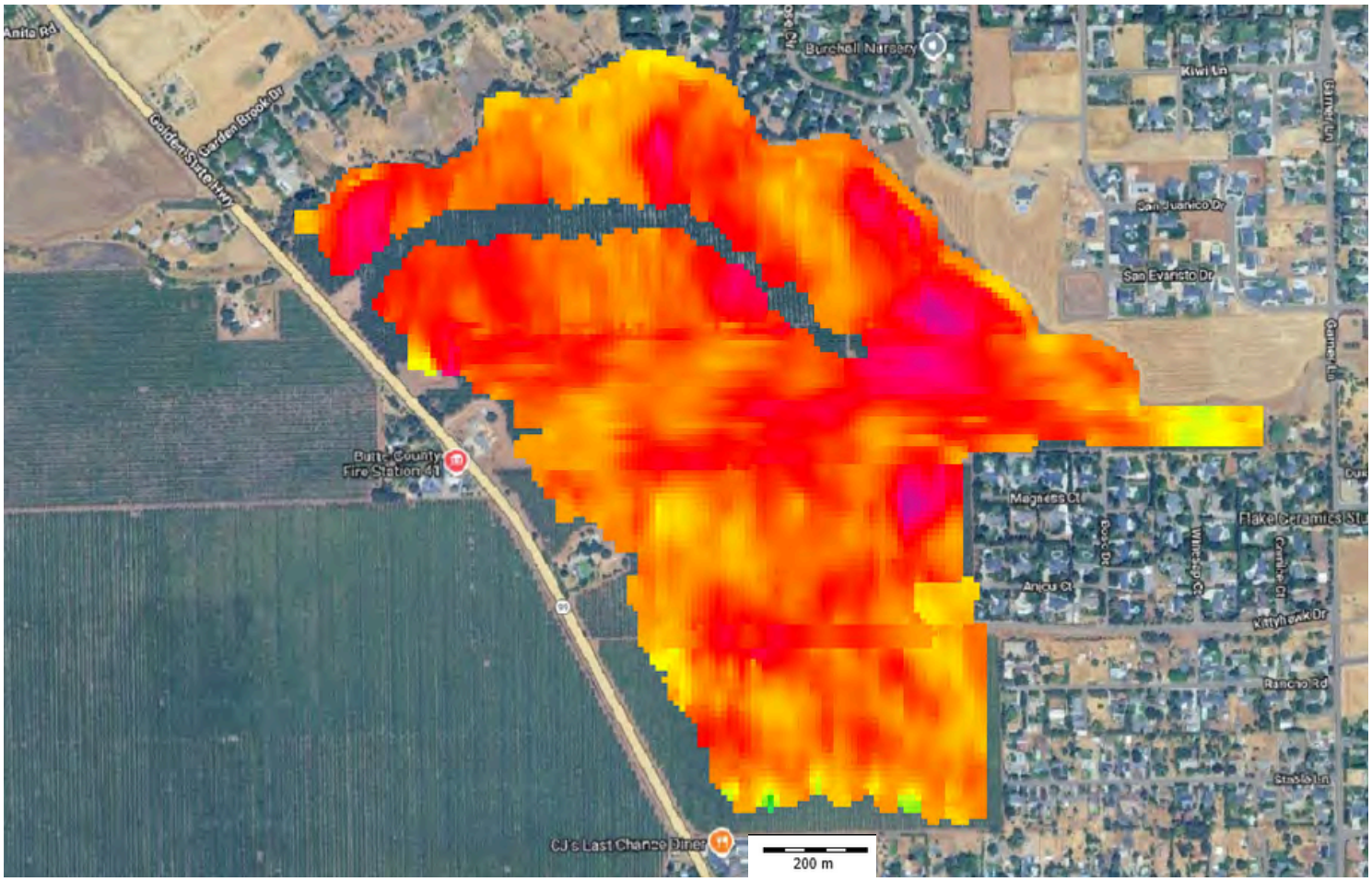


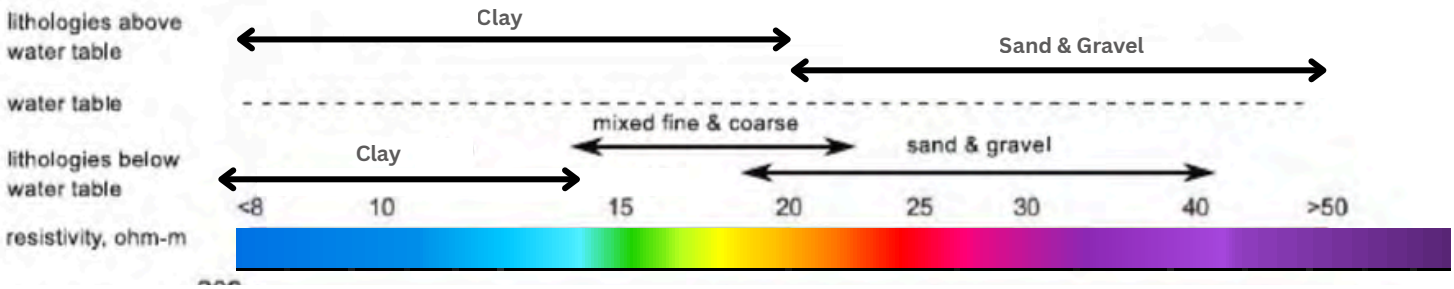
DEPTH SLICES- 160 FT



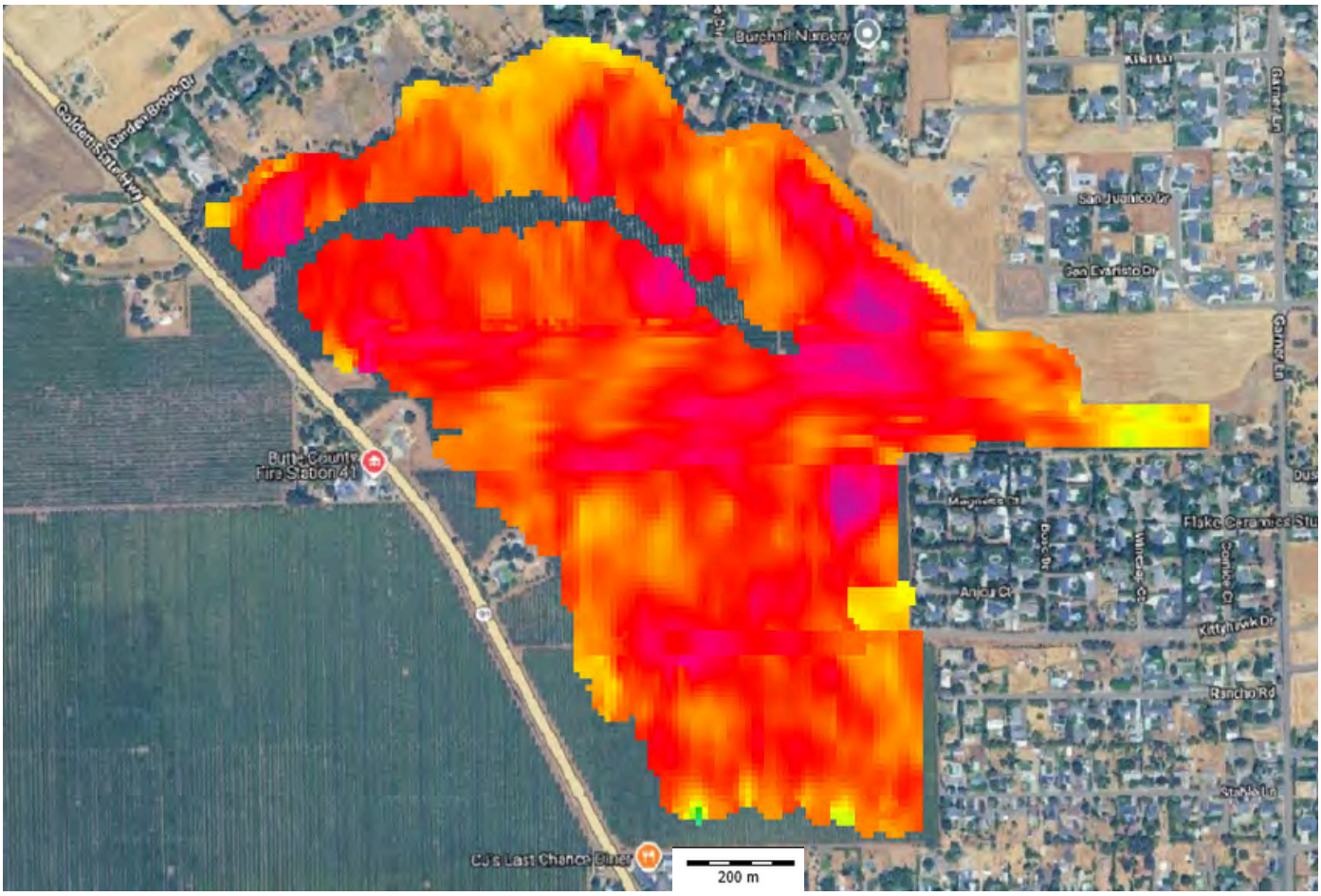


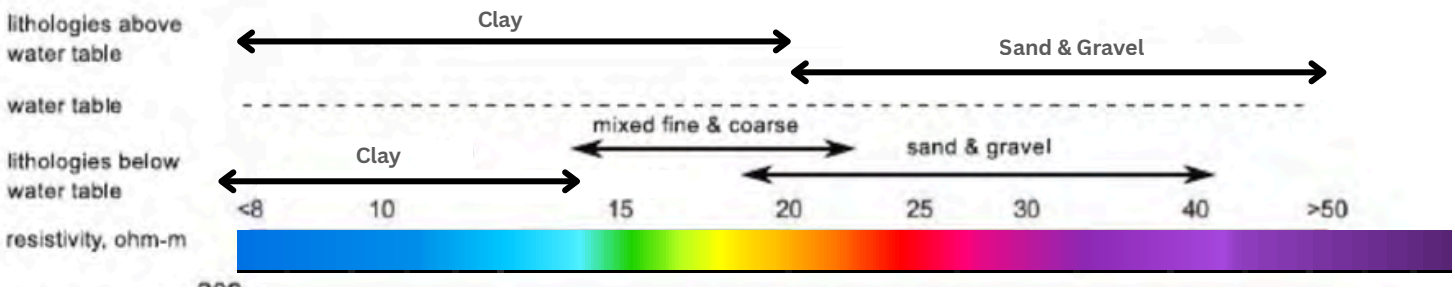
DEPTH SLICES- 170 FT



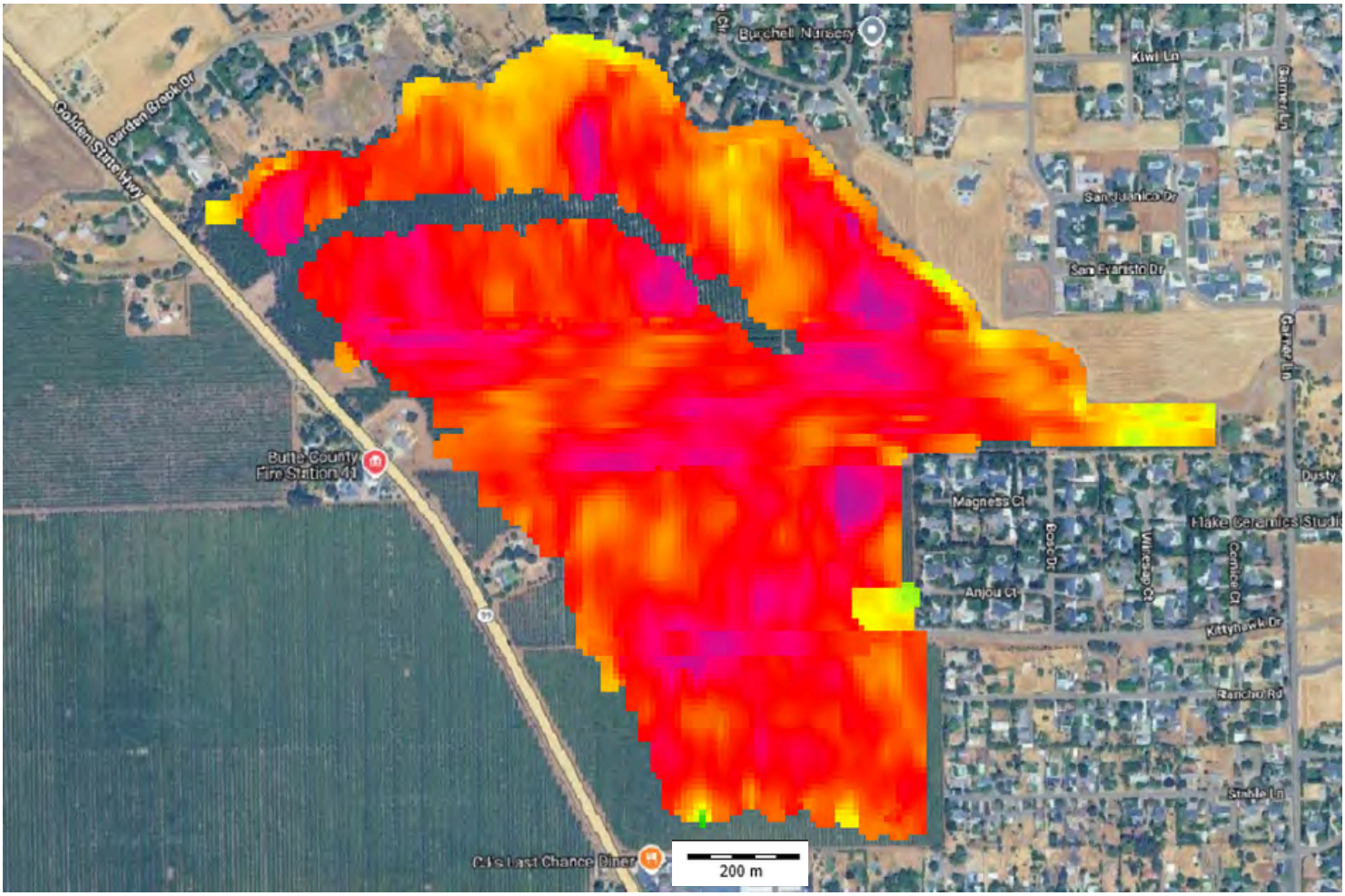


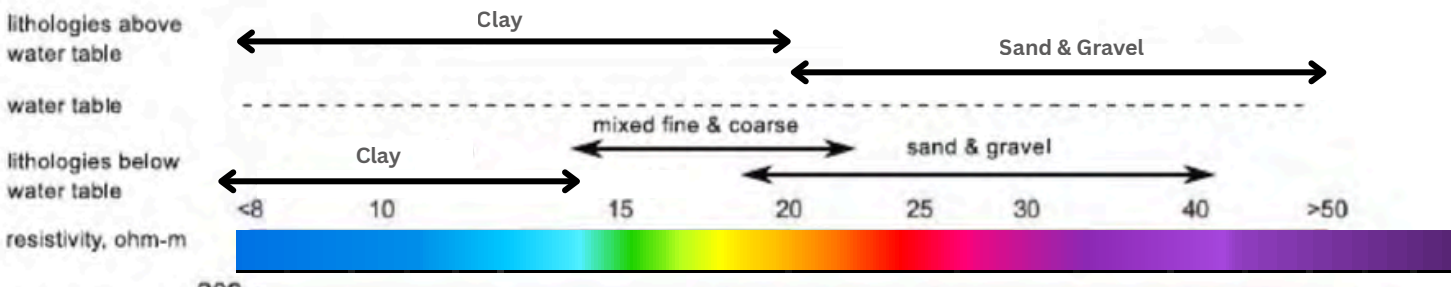
DEPTH SLICES- 180 FT



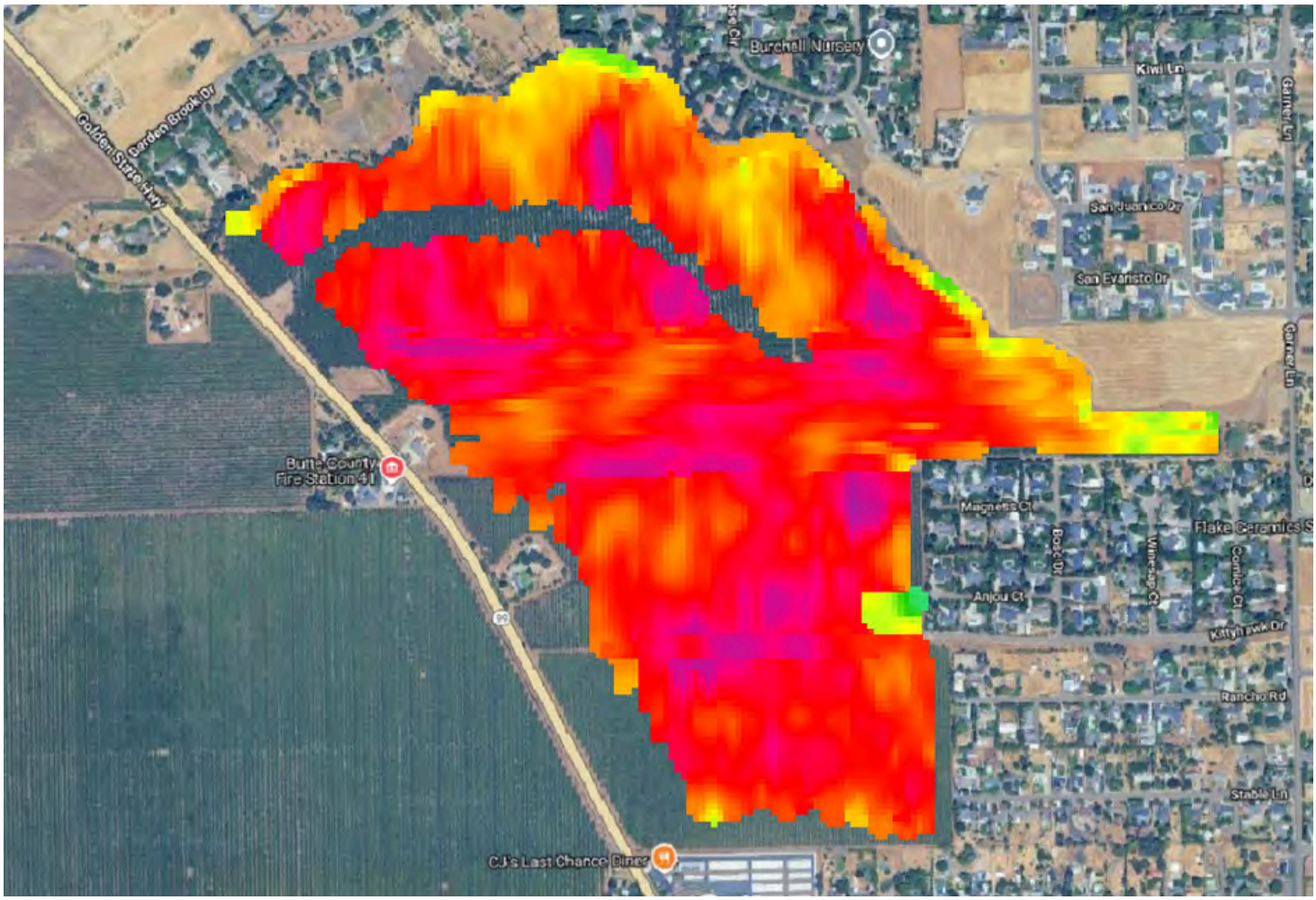


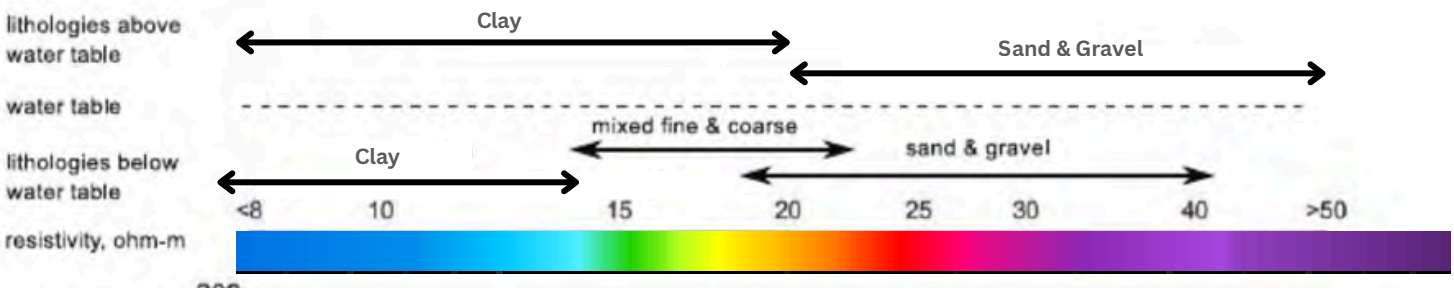
DEPTH SLICES- 190 FT



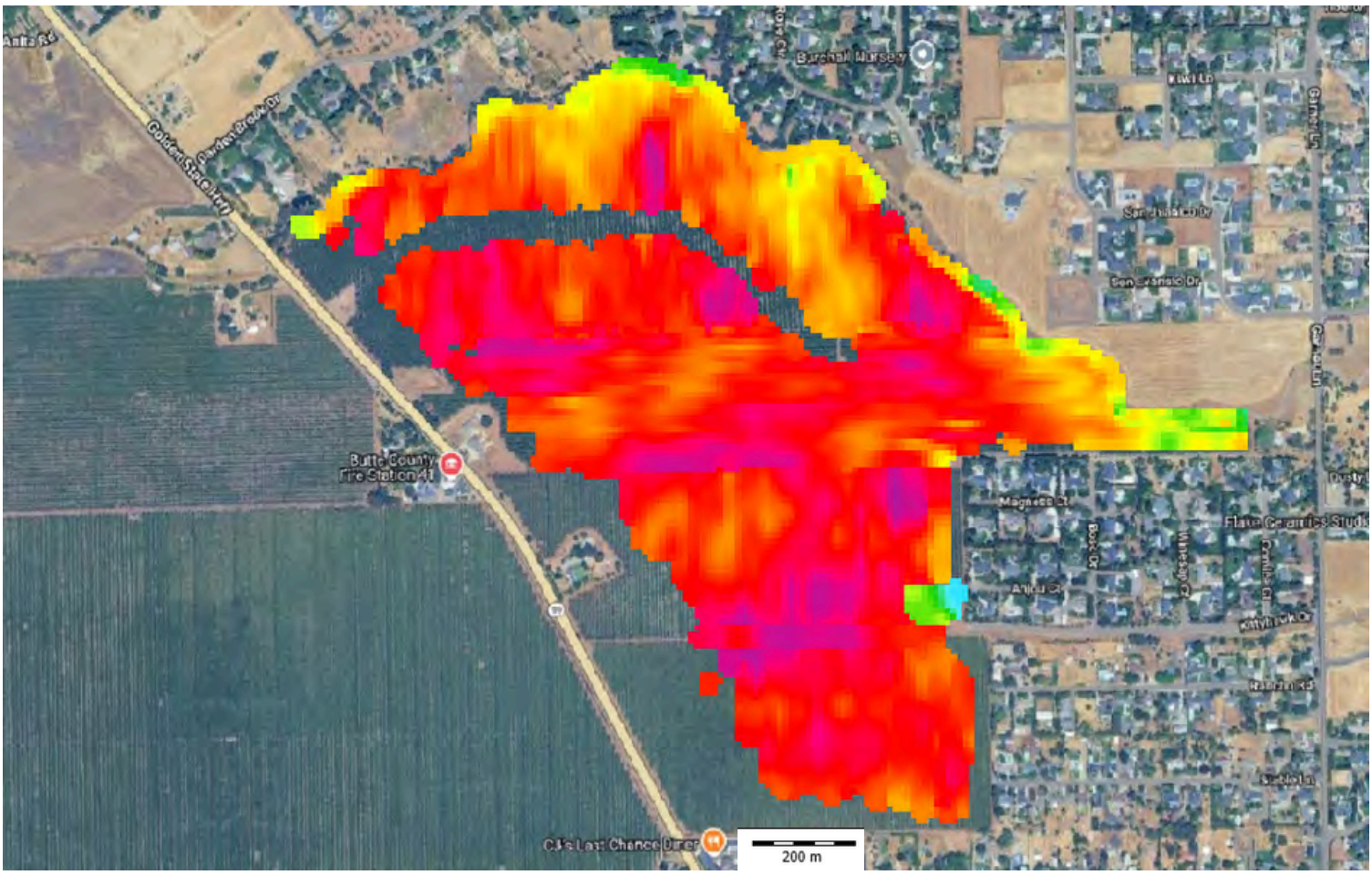


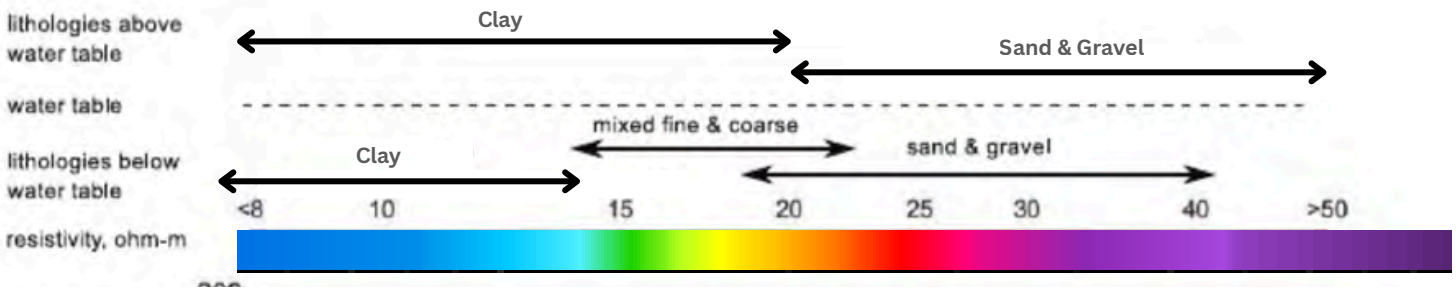
DEPTH SLICES- 200 FT



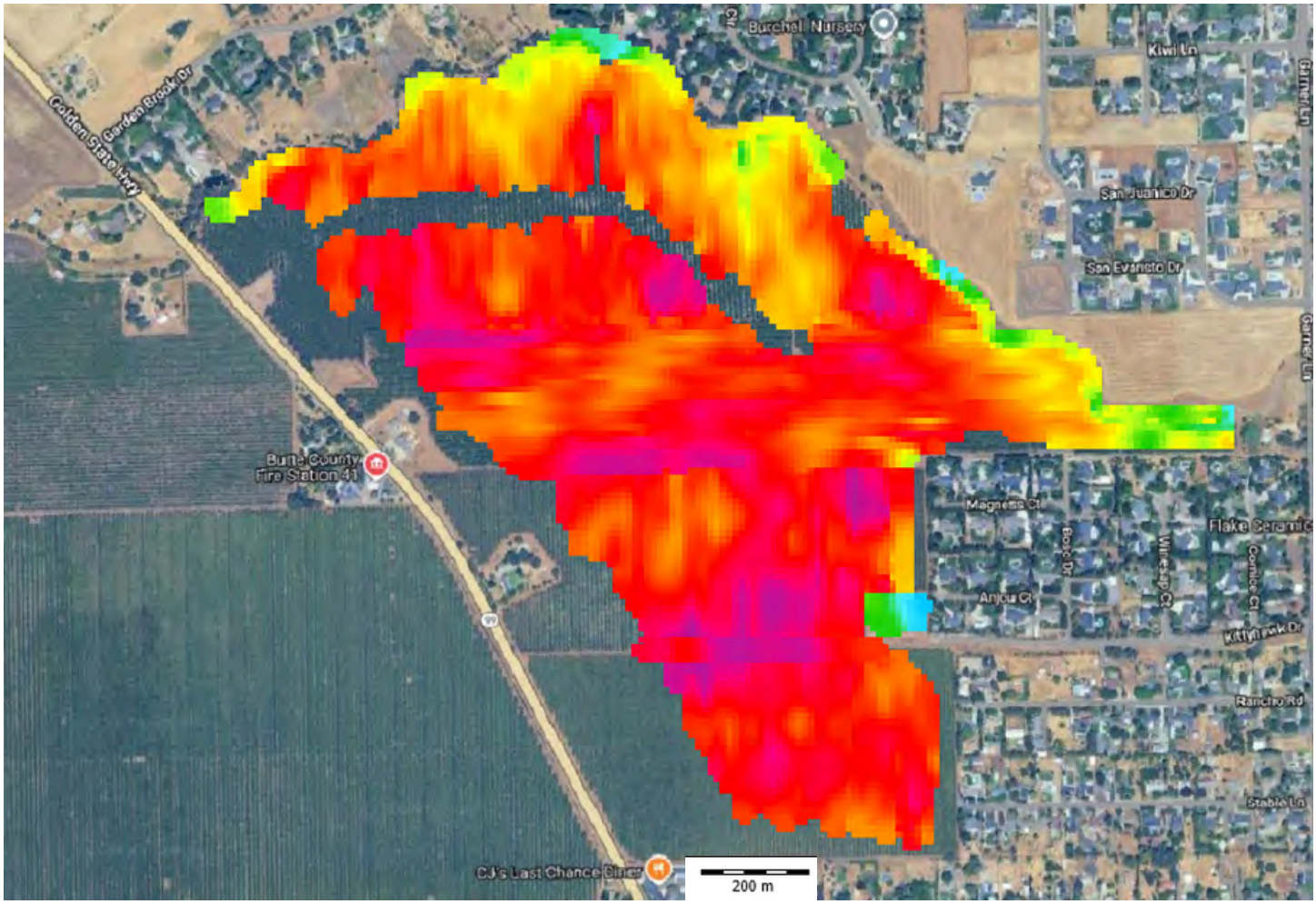


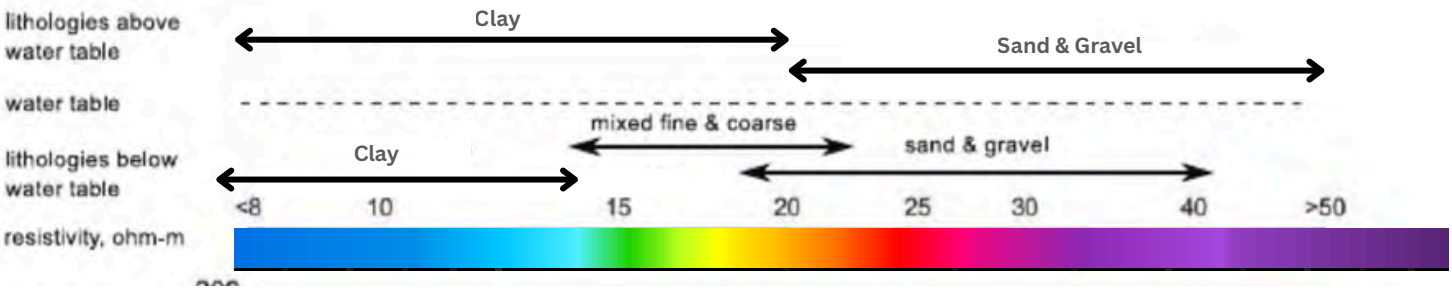
DEPTH SLICES- 210 FT



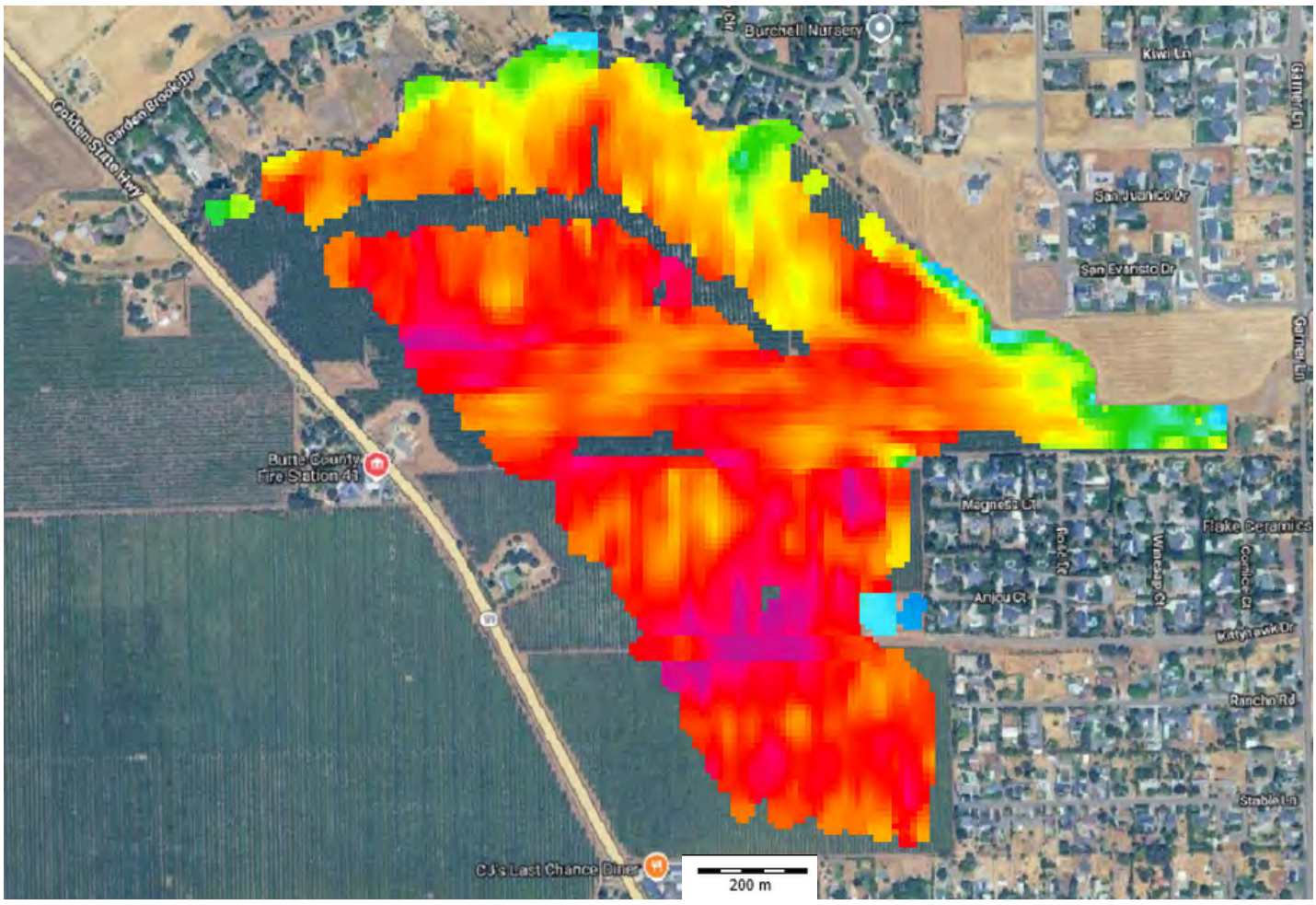


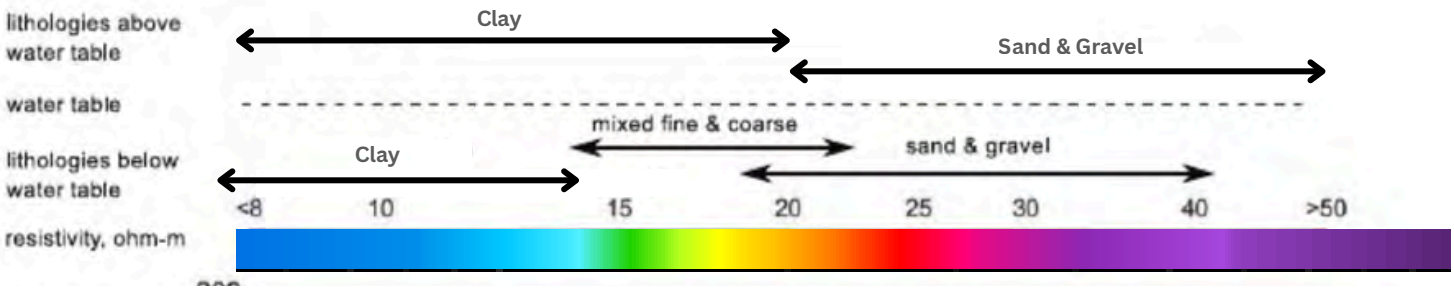
DEPTH SLICES- 220 FT



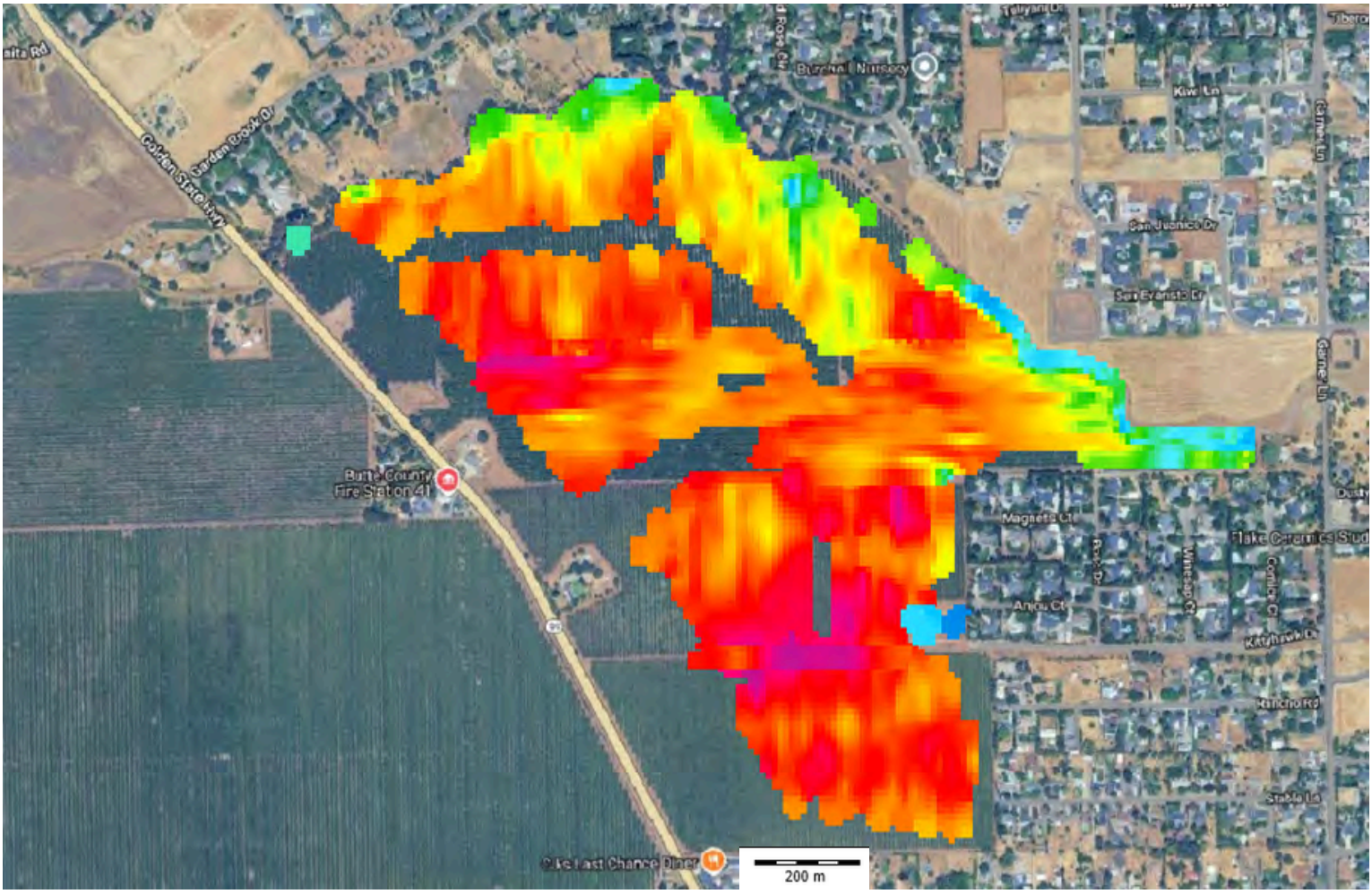


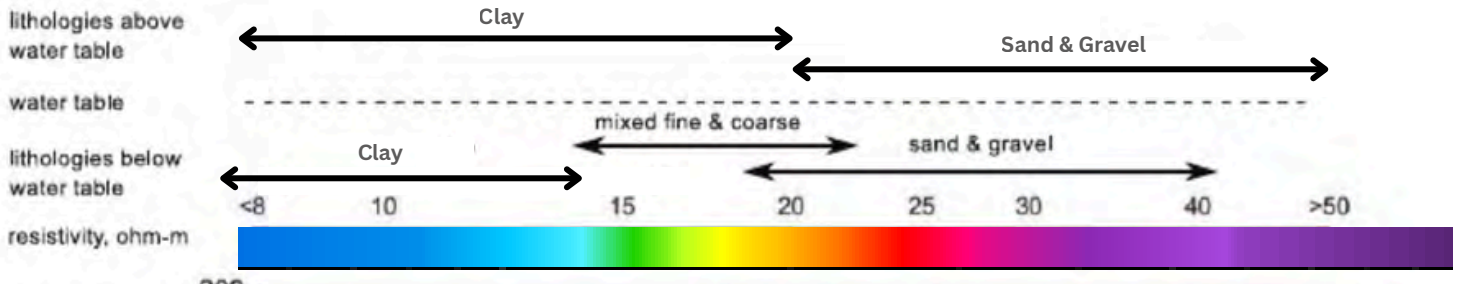
DEPTH SLICES- 230 FT



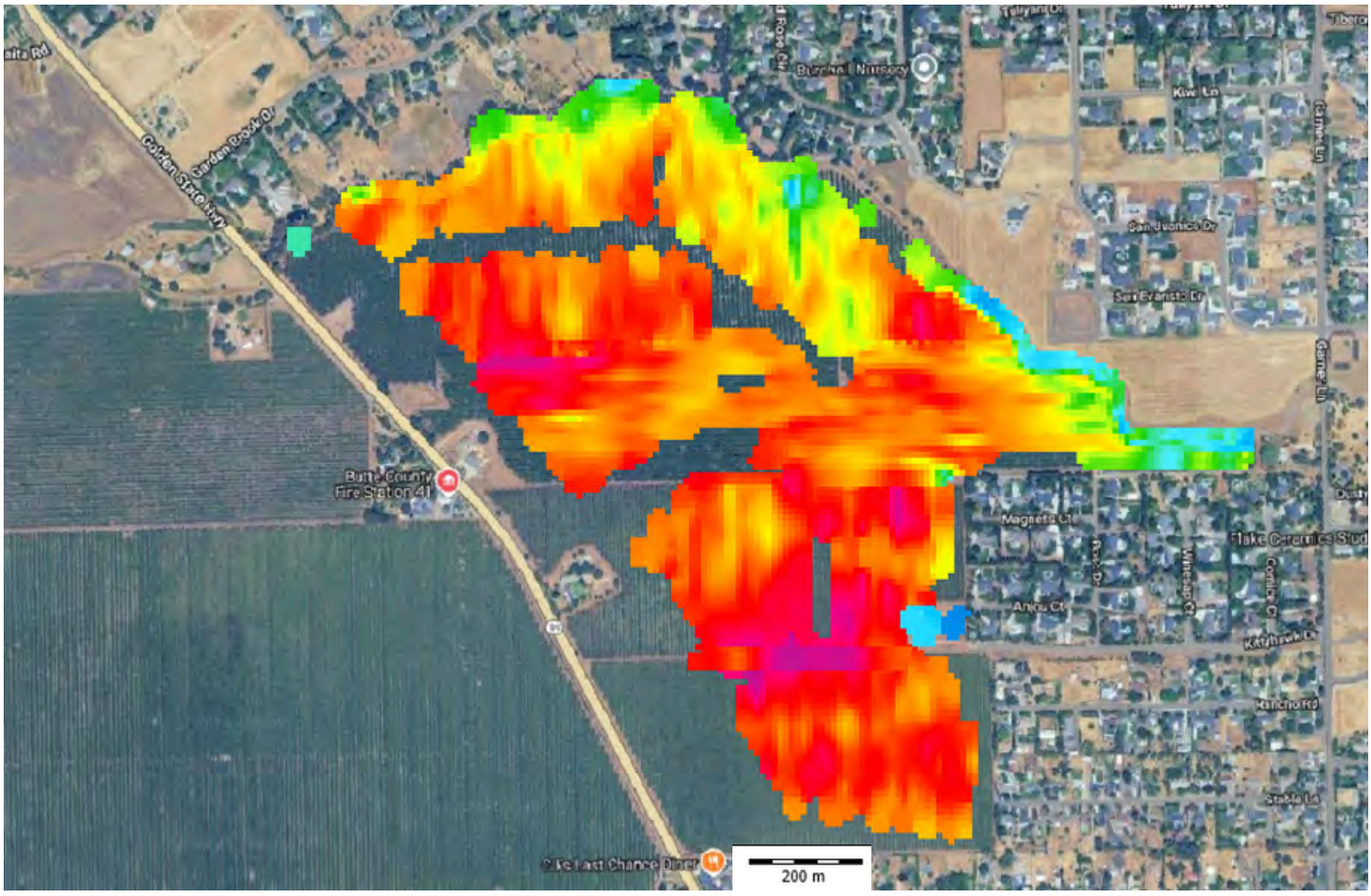


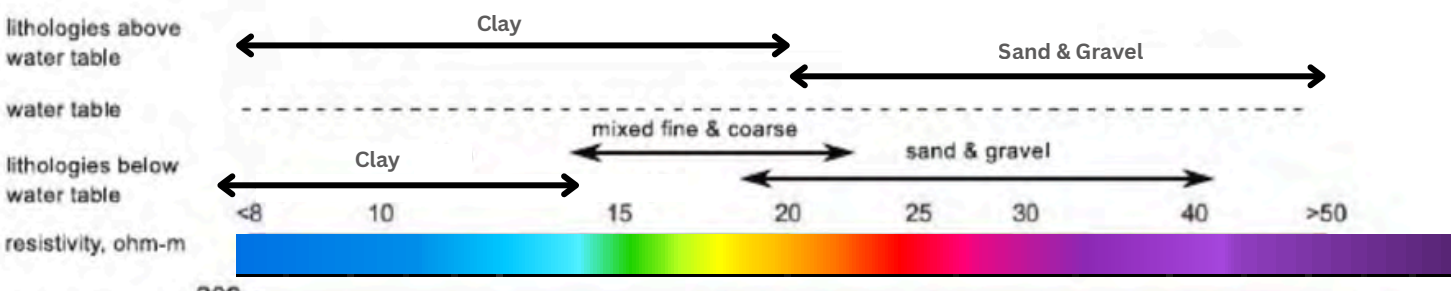
DEPTH SLICES- 240 FT





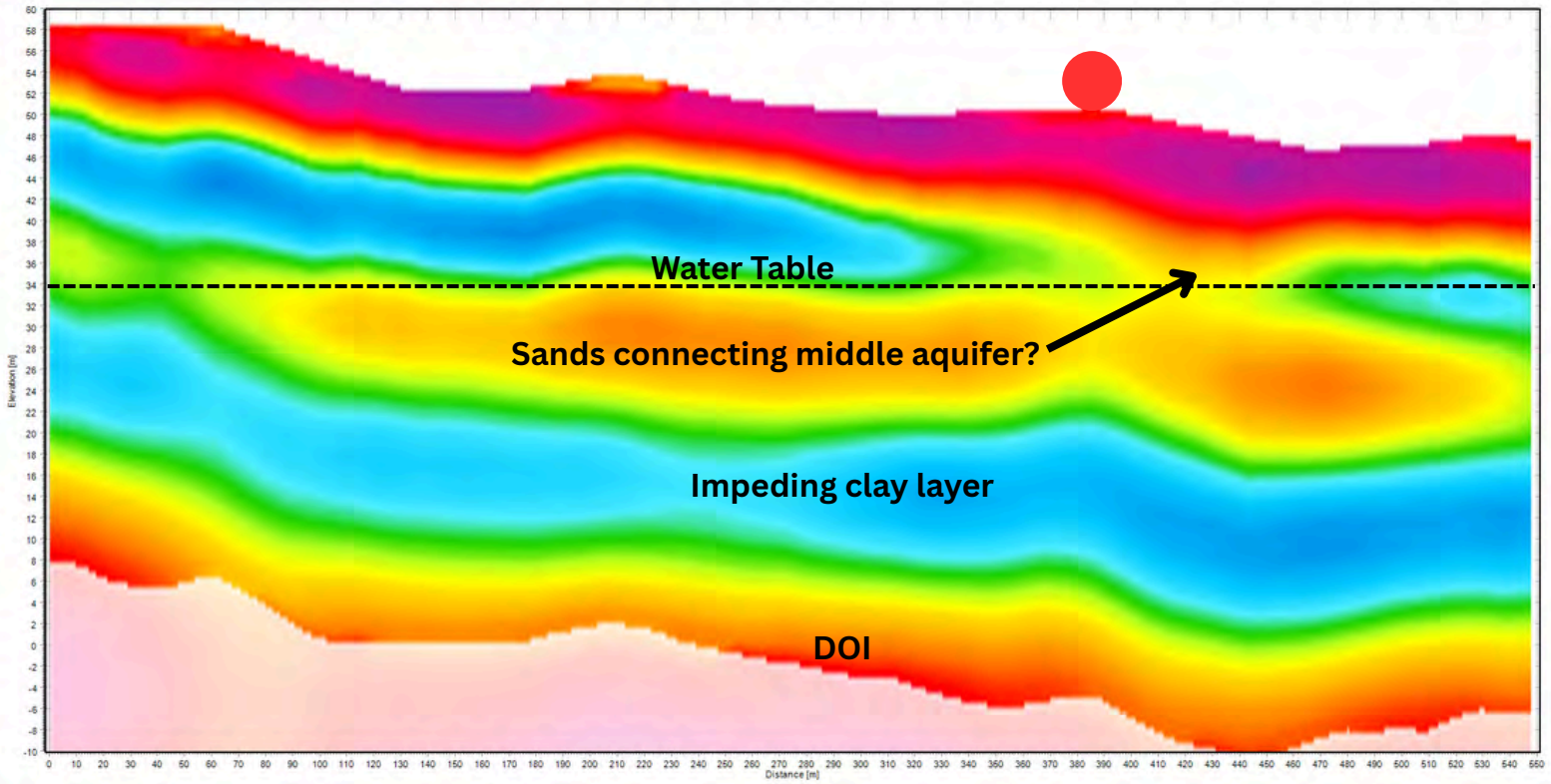
DEPTH SLICES- 250 FT

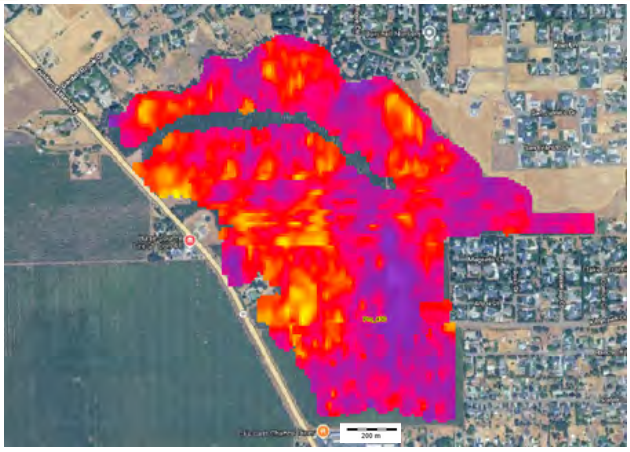




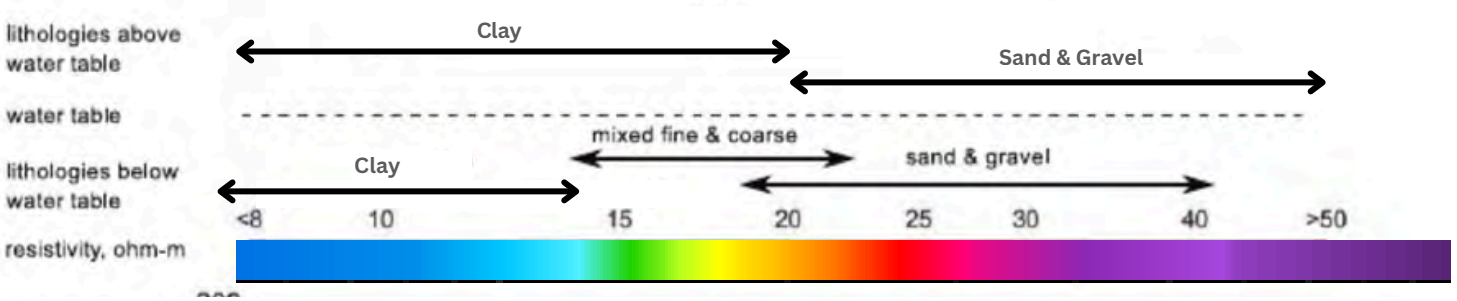
2D CROSS SECTION- PRO_430

N **S**





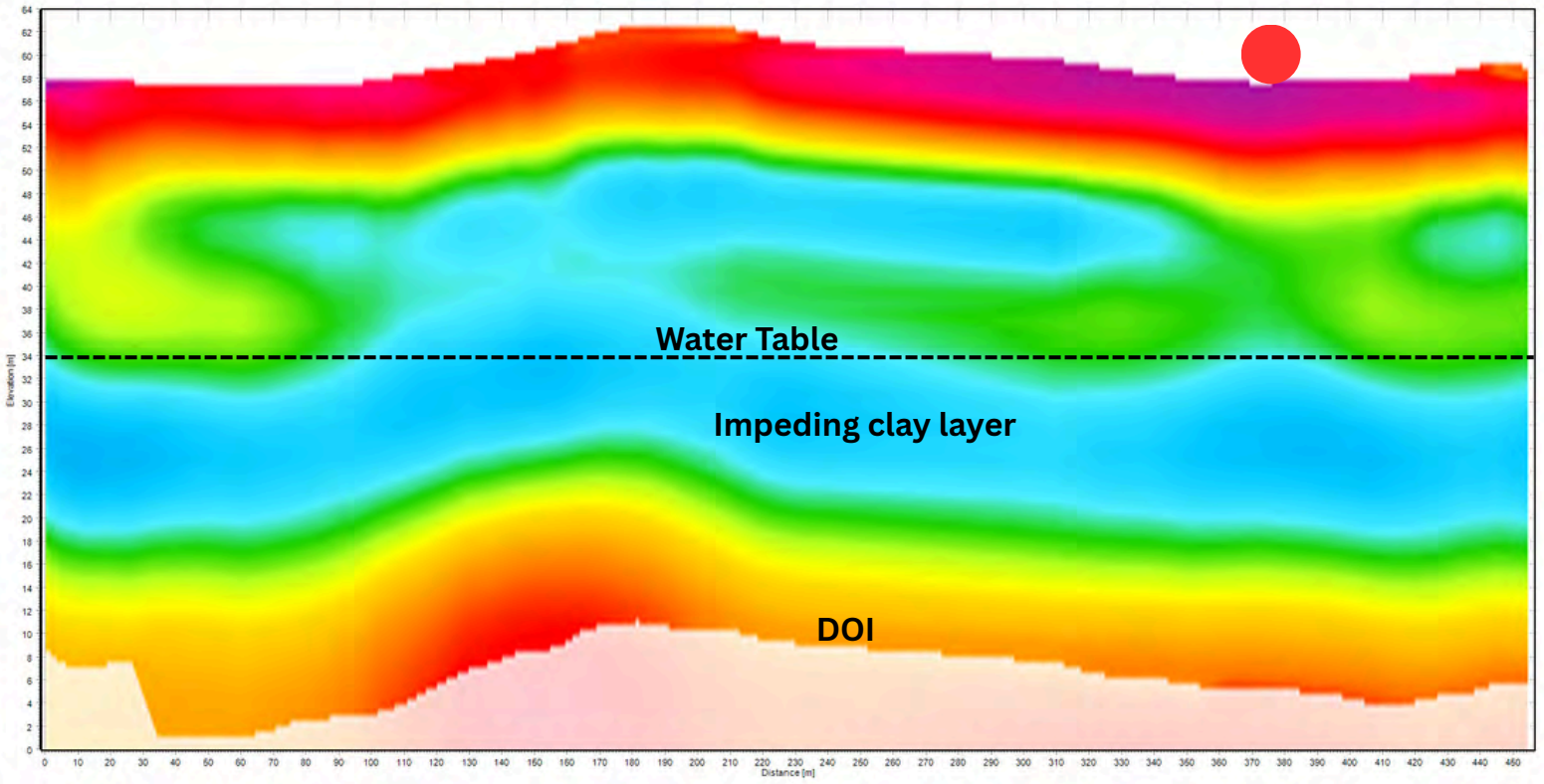
Surface

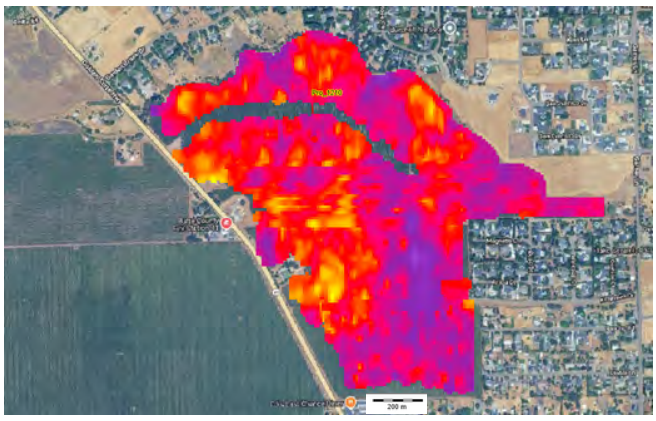


2D CROSS SECTION- PRO_1210

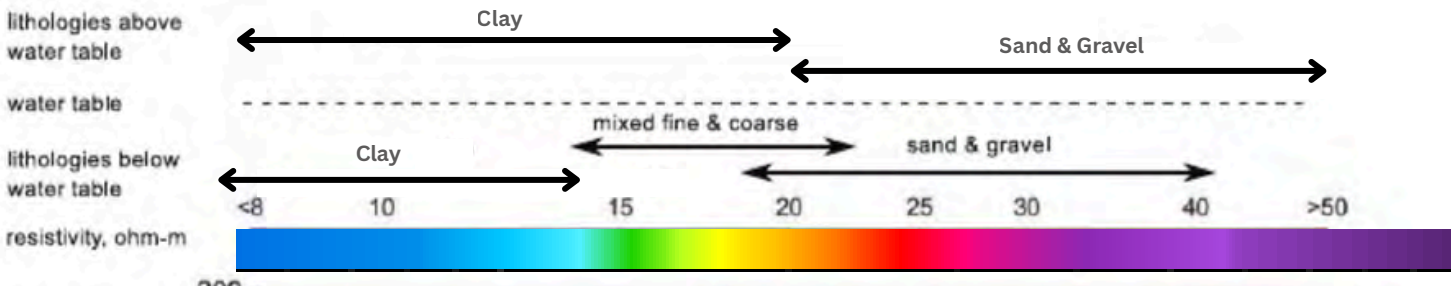
W

E



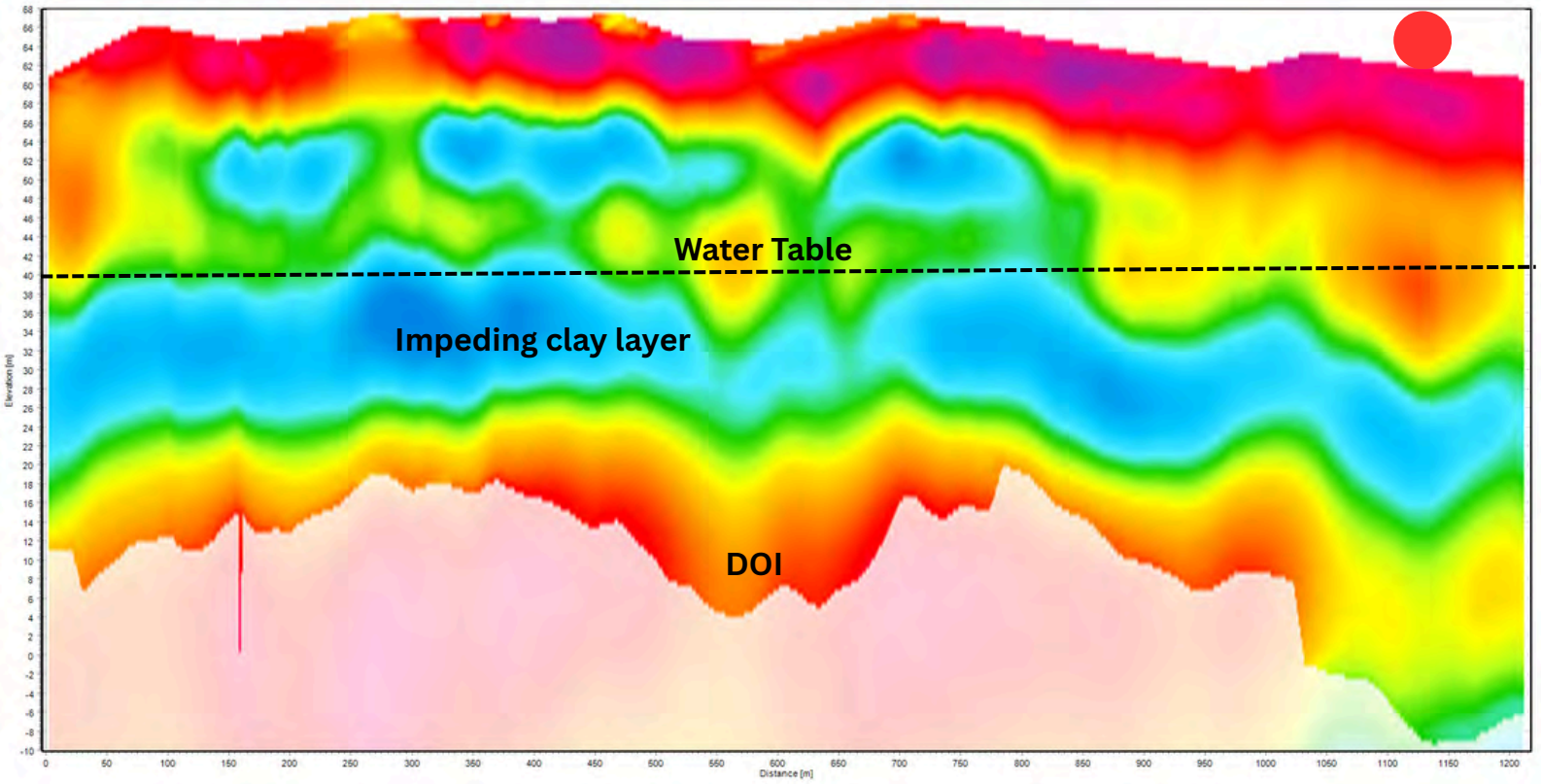


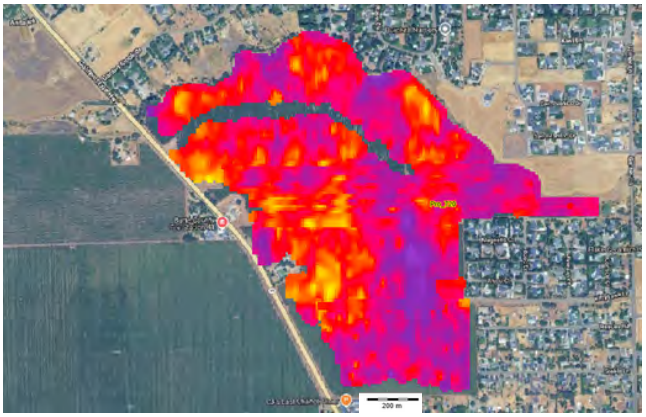
Surface



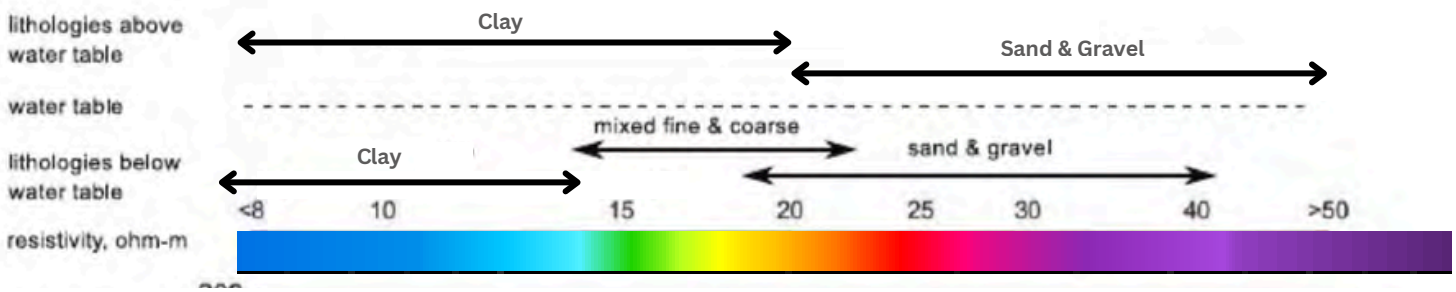
2D CROSS SECTION- PRO_720

W E

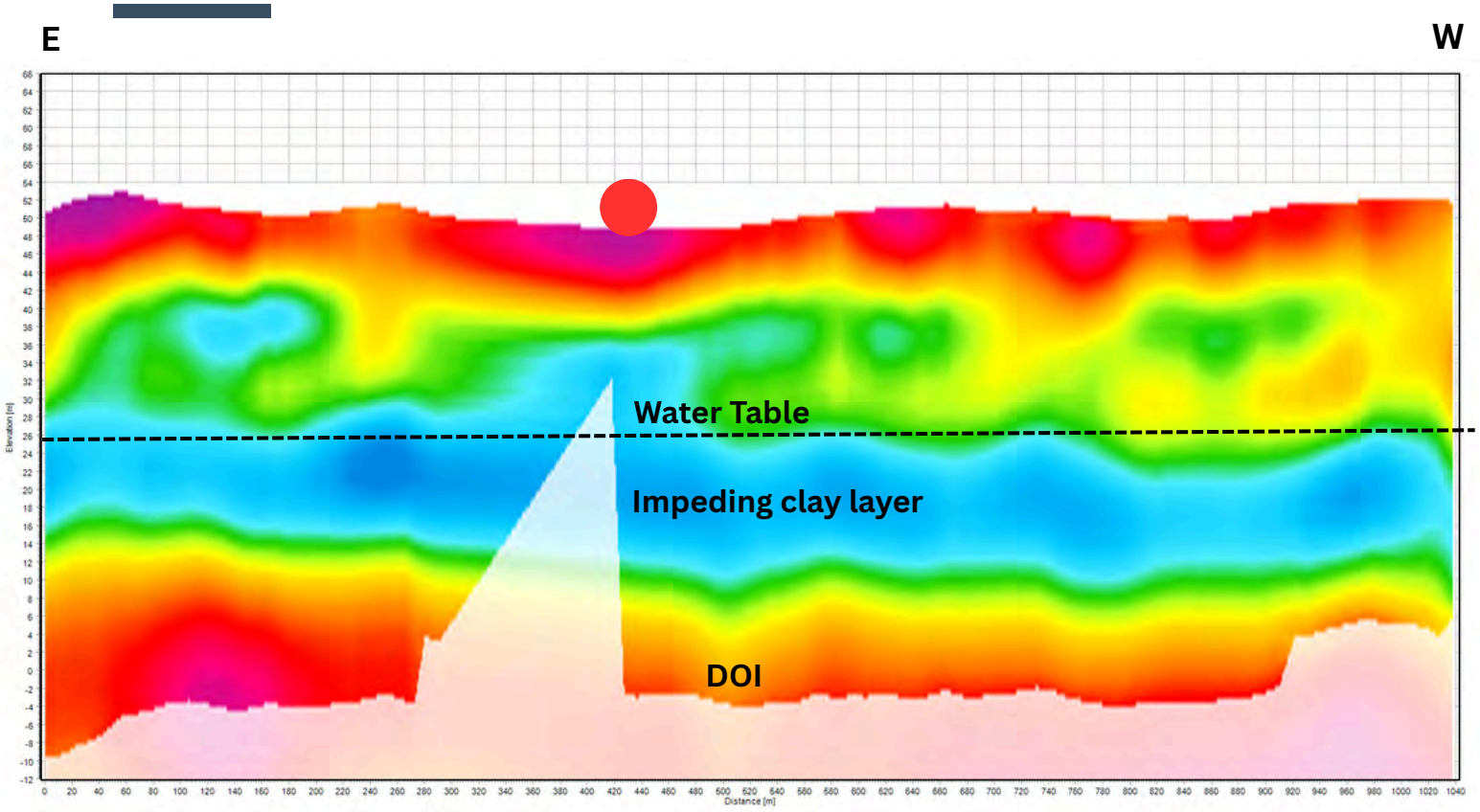


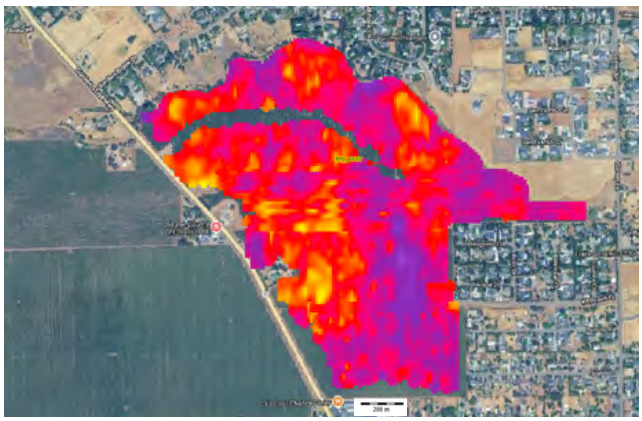


Surface

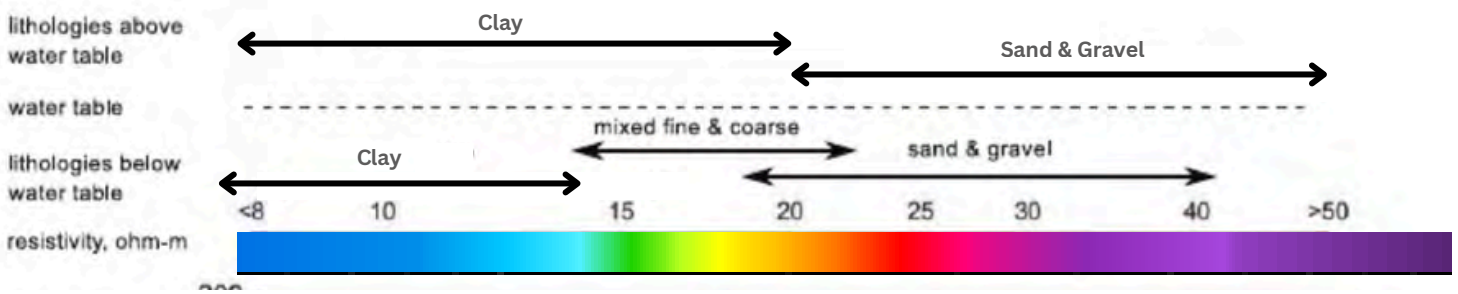


2D CROSS SECTION- PRO_1610



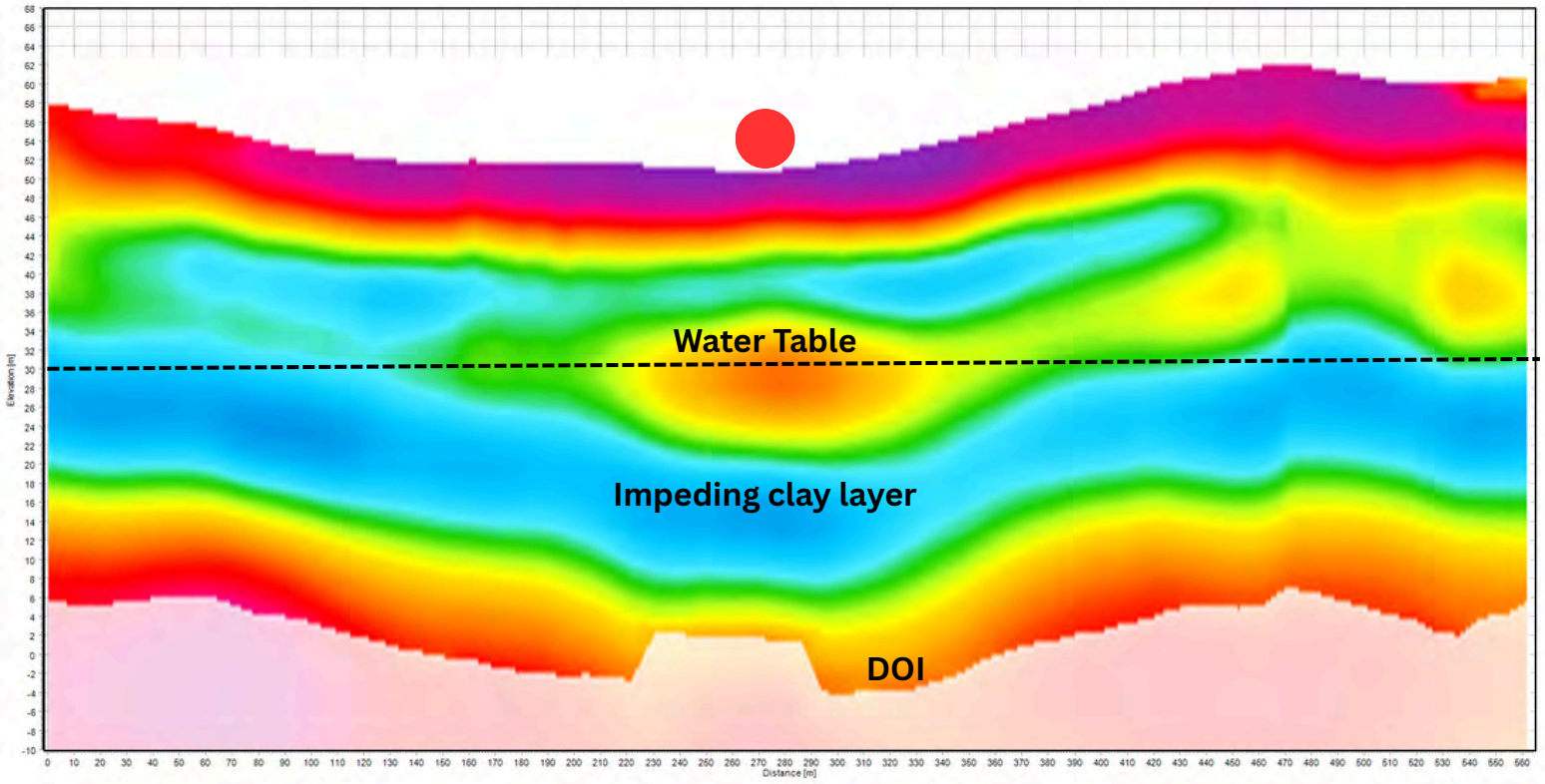


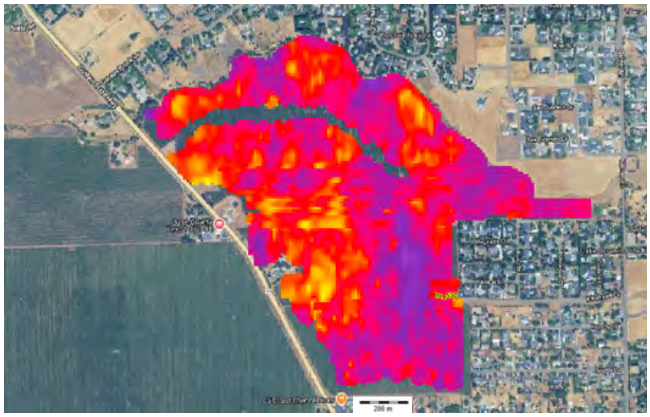
Surface



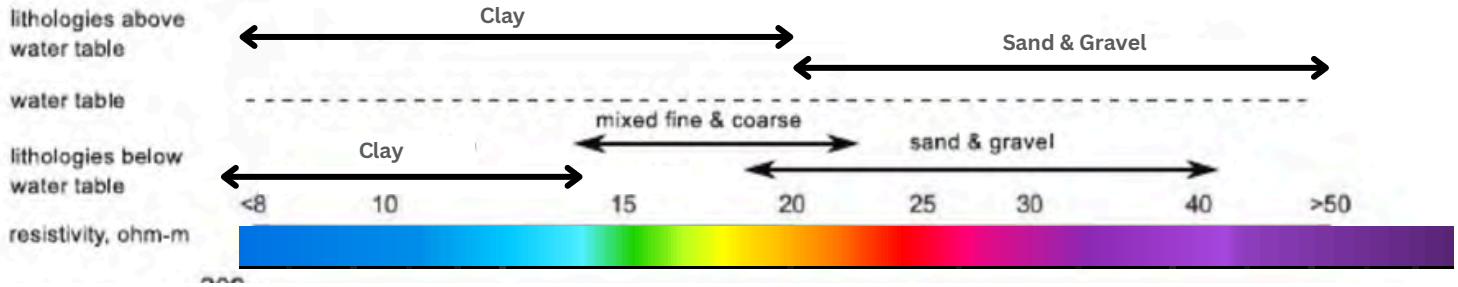
2D CROSS SECTION- PRO_530

N S



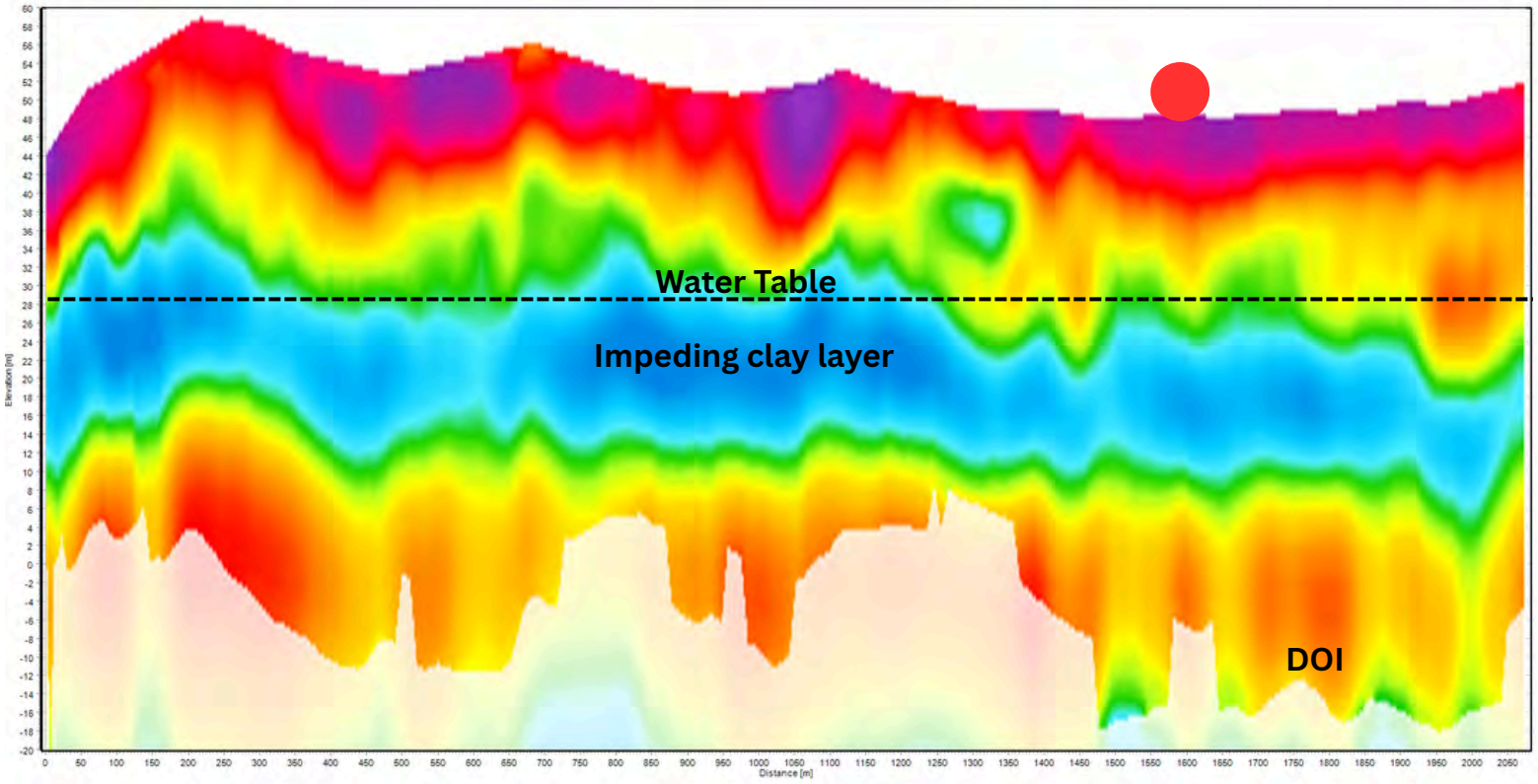


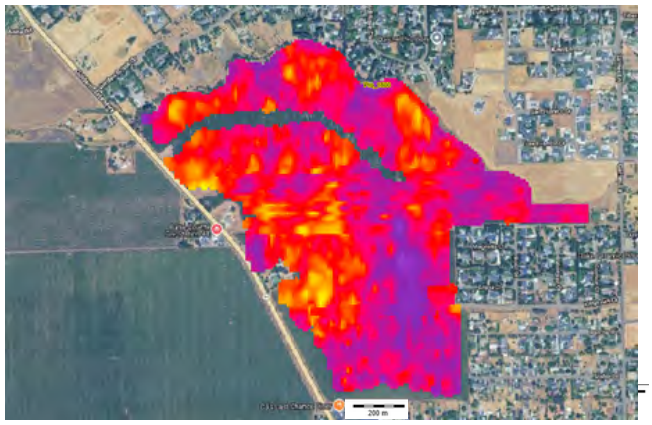
Surface



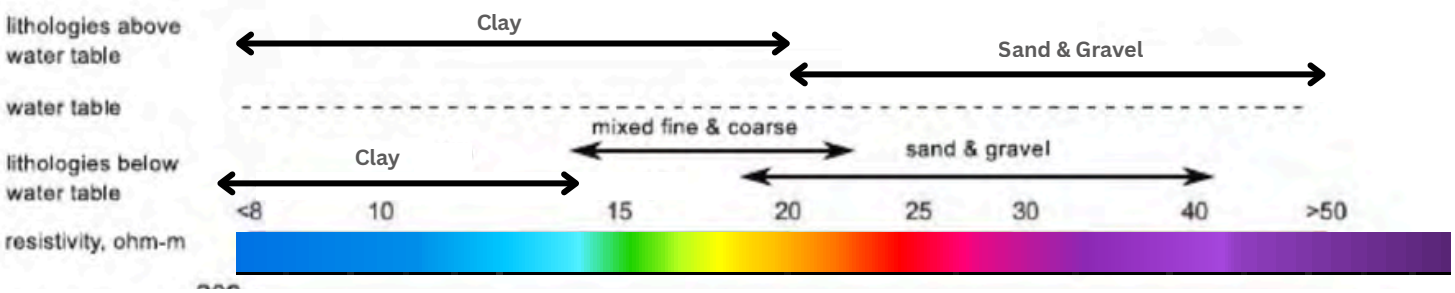
2D CROSS SECTION- PRO_1600

W E





Surface



REFERENCES-

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DELIVERABLES-

- Zip File dropbox link (ttemdatanicolaus.zip)
  - Nicolaus Groundwater Mapping Report.pdf
  - Workbench file folder (ttemdatanicolaus)
  - Workbench ttem set up files .gex & .tfi
  - Raw ttem data files .lin & .skb (nicolaus ttem raw data)
  - Inversion data xyz files (nicolaus inversion xyz)
  - Inversion data excel file (nicolaus_SCI01_inv.csv)

STATE OF CALIFORNIA PROFESSIONAL GEOPHYSICIST STAMP

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(720) 415-7312

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Groundwater Aquifer Mapping

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Maxwell, CA

nathan@groundwatermaps.com

Site N4

RICE PROJECT GROUNDWATER MAPPING REPORT

JULY 18, 2025// PREPARED BY
GROUNDWATERMAPS

REPORT

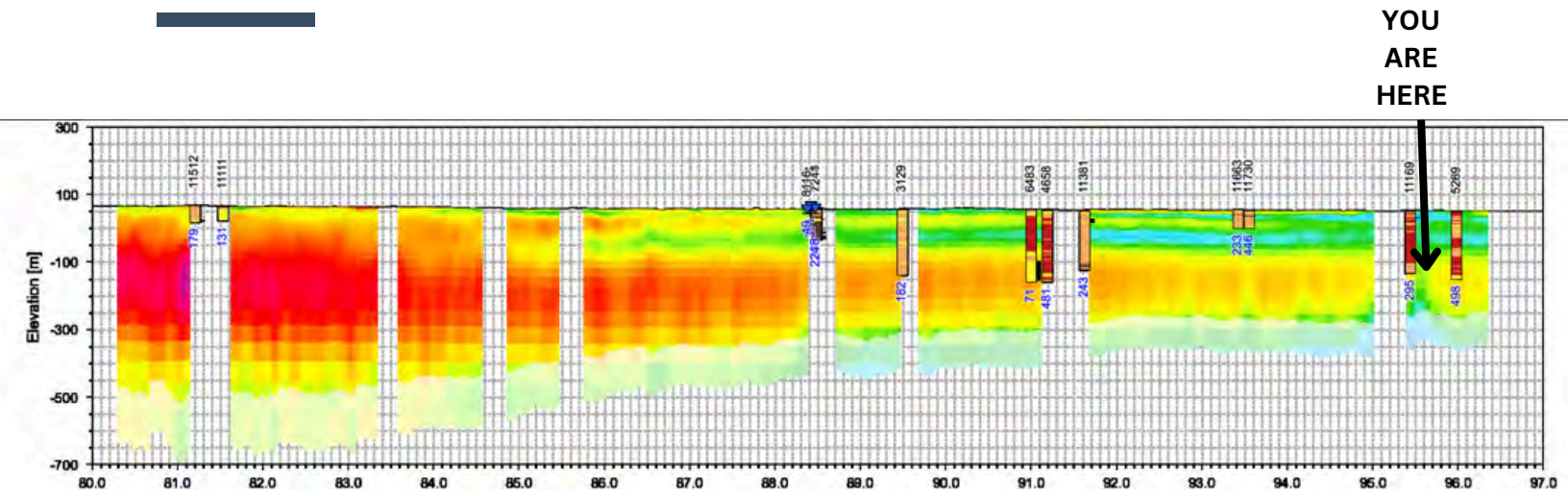
- **Objective:** To determine the suitability of the Rice project area to surface groundwater recharge.

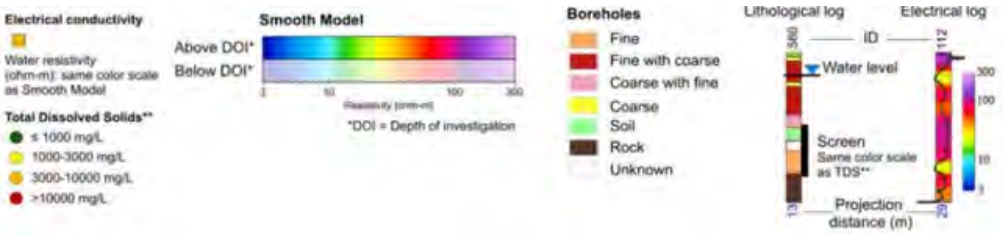
- **Methods:**
  - DWR Aerial Electromagnetic Survey
  - Soil Agricultural Groundwater Banking Index (SAGBI)
  - NRCS Soil Map
  - California Statewide Groundwater Elevation Monitoring (CASGEM)
  - TTem Towable Electromagnetic Survey
    - Survey Conducted by GroundWaterMaps- Nathan Azevedo
      - Survey Dates- June 21, 22, & 27 2025
      - Survey Location- 5209 Anita Rd, Chico, CA 95973
- **Results:**
  a. The DWR AEM survey that crossed the Rice project area revealed resistive geology of a moderately deep aquifer system at approximately 100m depth. Data from the AEM survey appears inconclusive that the project area is suitable to surface recharge or that the site consists of resistive geology connecting the surface and deeper aquifer system.
  b. Besides geology directly along Rock Creek, the Soil Agricultural Groundwater Banking Index SAGBI and NRCS Soil Map deem the project area as to having poor to very poor groundwater recharge suitability
  c. California Statewide Groundwater Elevation Monitoring (CASGEM) reported depth to groundwater at 37 feet at a nearby monitoring well on June 10th 2025
  d. The TTem survey appears to reveal a shallow aquifer system of resistive geologic material that appears conducive to surface groundwater recharge.
     i. The resistive materials appear concentrated near Rock Creek with decreasing resistivity and suitability to recharge as one travels west and east away from Rock Creek
     ii. The surface aquifer system appears to strengthen and possibly connect to a deeper highly resistive aquifer system below Rock Creek though more studies may be needed to determine this conclusively.
- **Conclusion:**
  - Although the AEM and SAGBI surveys deemed the project area as poor or inconclusive as to having geology suitable to surface groundwater recharge, the TTem survey did reveal a high quantity of resistive geologic material that should deem a portion of the project area suitable to groundwater recharge. The quantity and depth of resistive geology suitable for surface recharge appears concentrated near Rock Creek and decreases away from the creek as in the AEM and SAGBI surveys.

NOTES

- Depth of Investigation as seen on page 7 ranged from 50-80m with increasing DOI in resistive materials along Rock Creek
- Although the geology is resistive at values typical to geology conducive to groundwater recharge, lahar type materials have been known to be cemented in the region which may reduce the sites permeability. Further study may be needed to confirm permeability
- Due to interference from power lines, data was removed from the project area as seen on page 6. Residual values above 1 depict the models decreased confidence in the data and were removed
- Depth to groundwater per (CASGEM) was 37 feet on June 10th as seen in groundwater monitoring well data on page 9

DWR AEM HELICOPTER REPORT

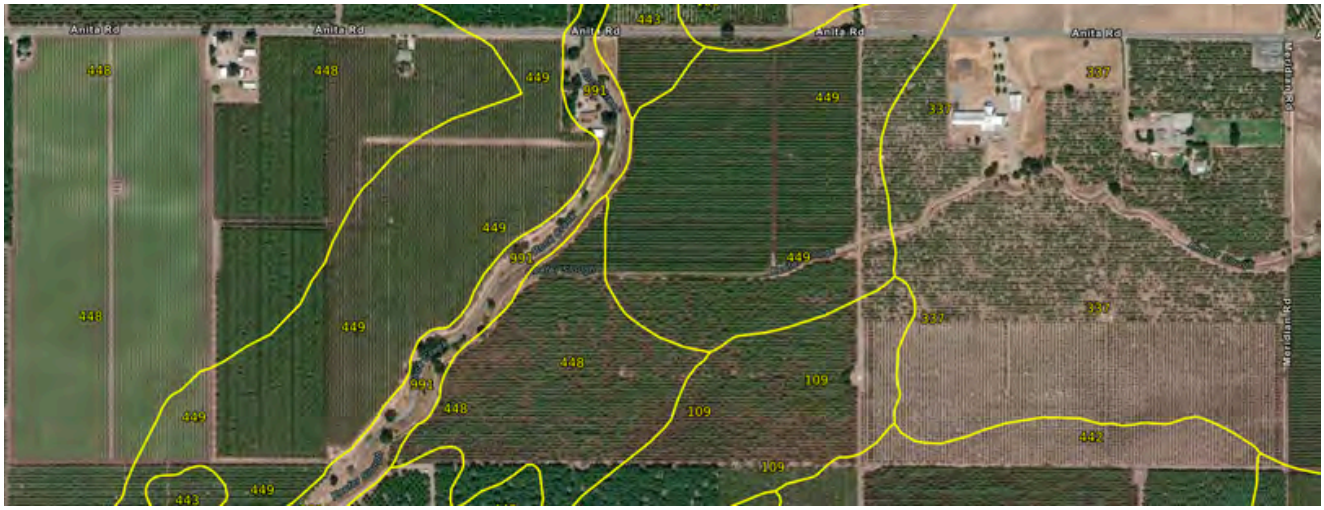


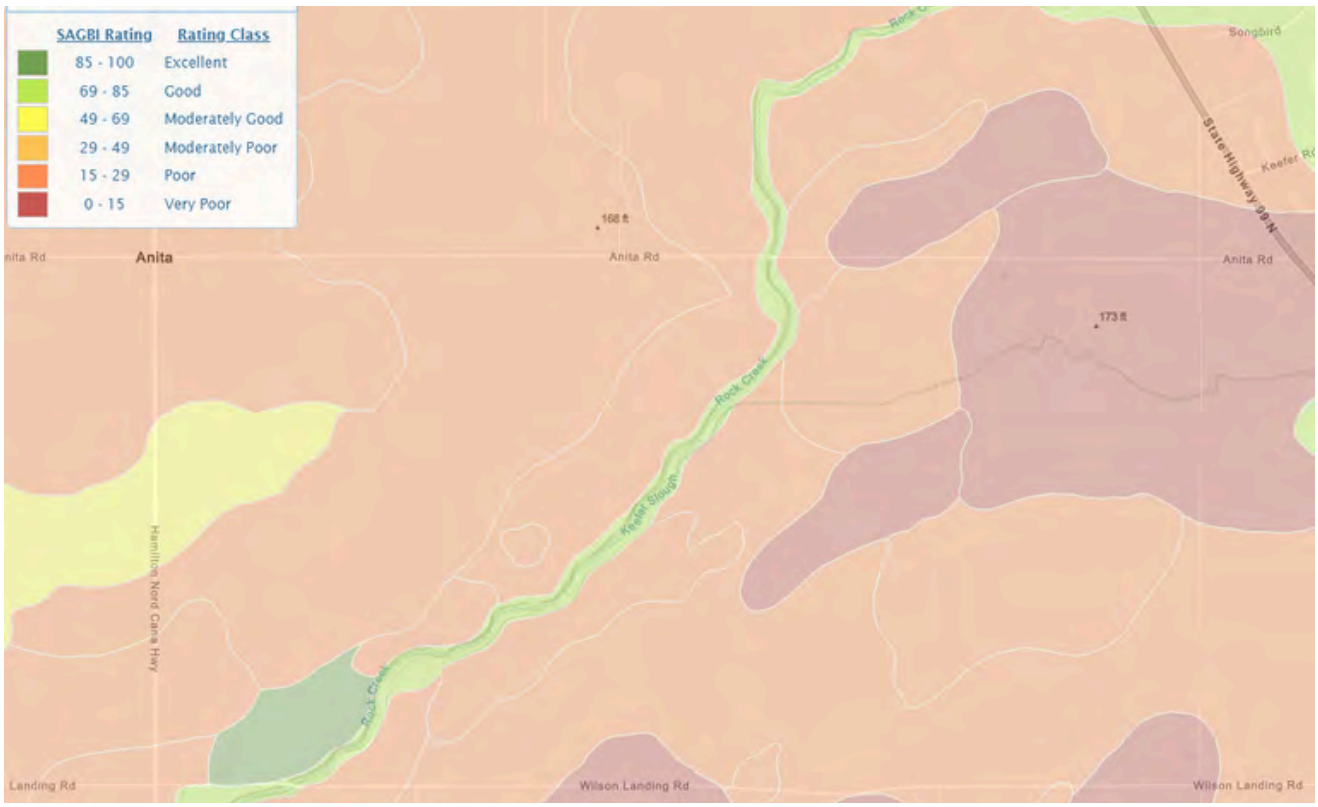


NRCS SOIL MAP/ GROUNDWATER RECHARGE SUITABILITY INDEX

SOILS:

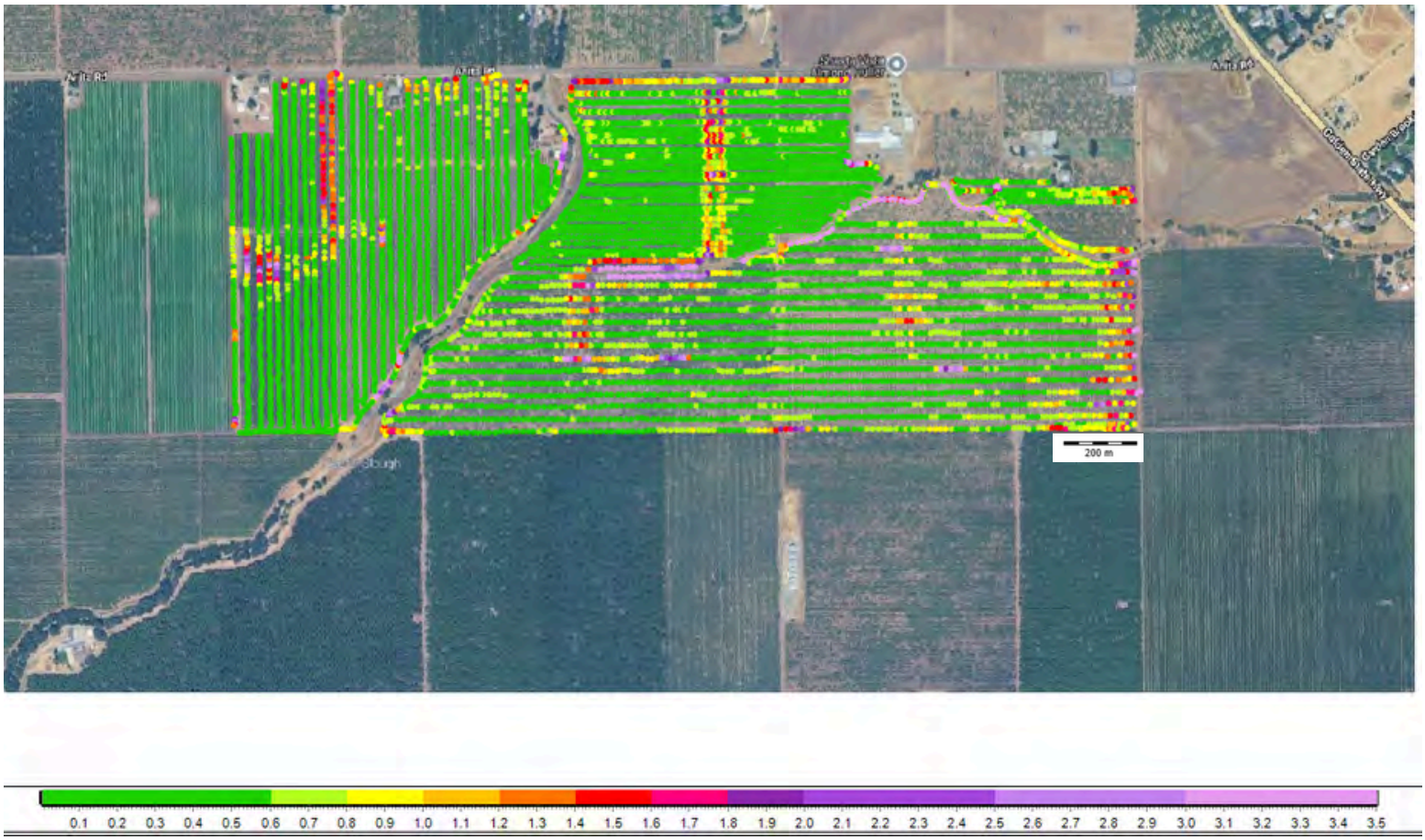
- **HAPLOXEROLLS- ALLUVIAL FANS (448)(449)**
- **XEROFLUVENTS- FLOOD PLAINS (991)**
- **GALT-FAN REMNANTS (337)**
- **BOSQUEJO- BASIN FLOORS (109)**
- **DURIXEROLLS- ALLUVIAL FANS(442)**



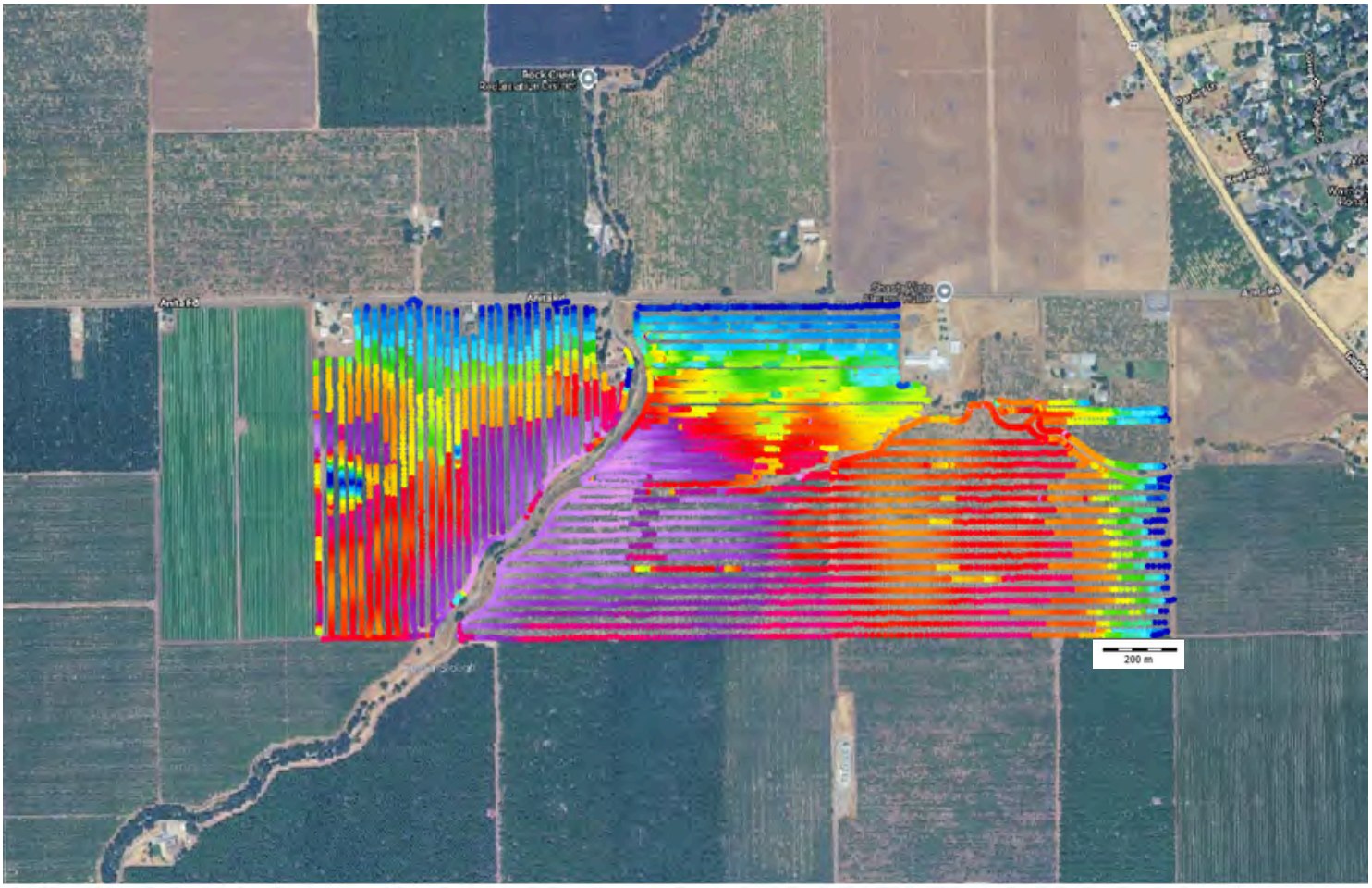


TTEM TRAVERSE LINES

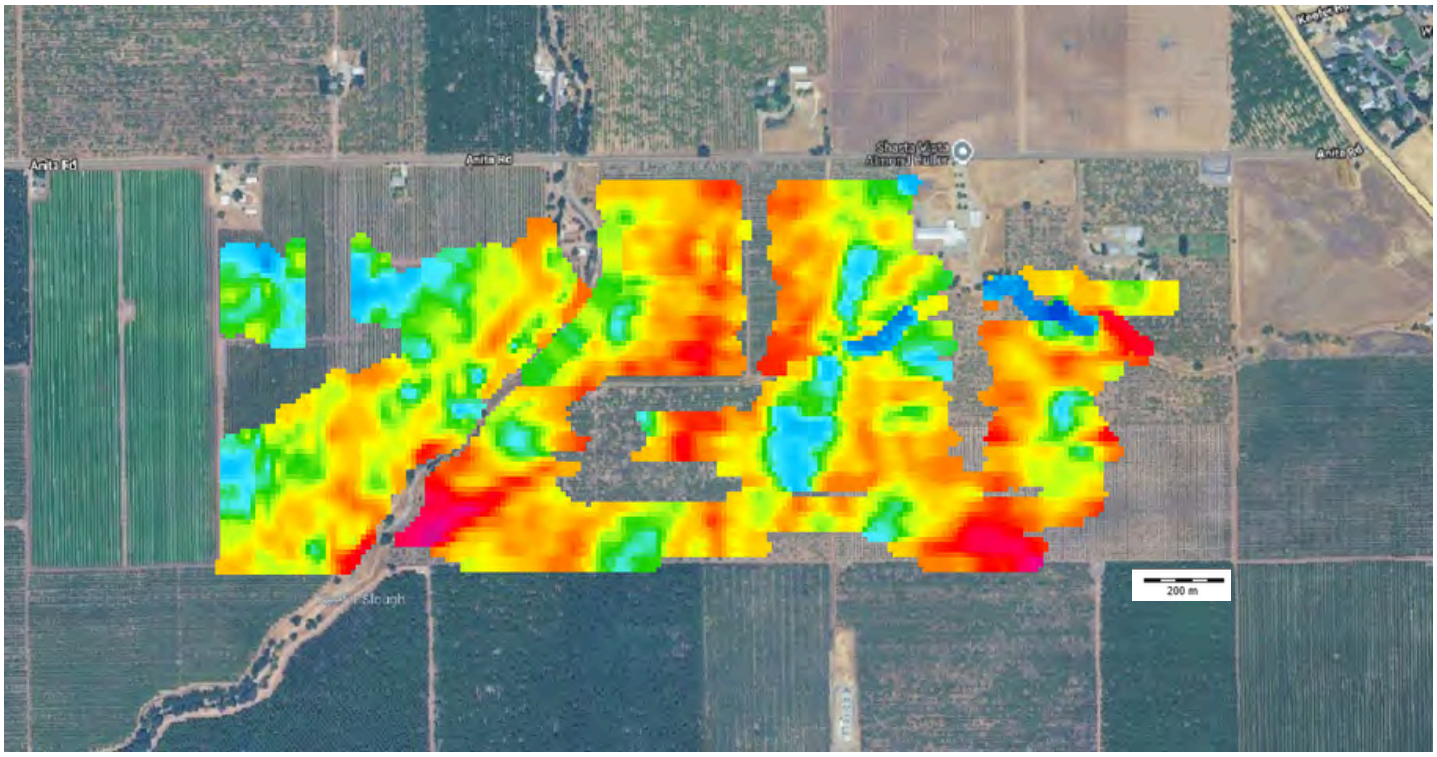
DATA RESIDUAL



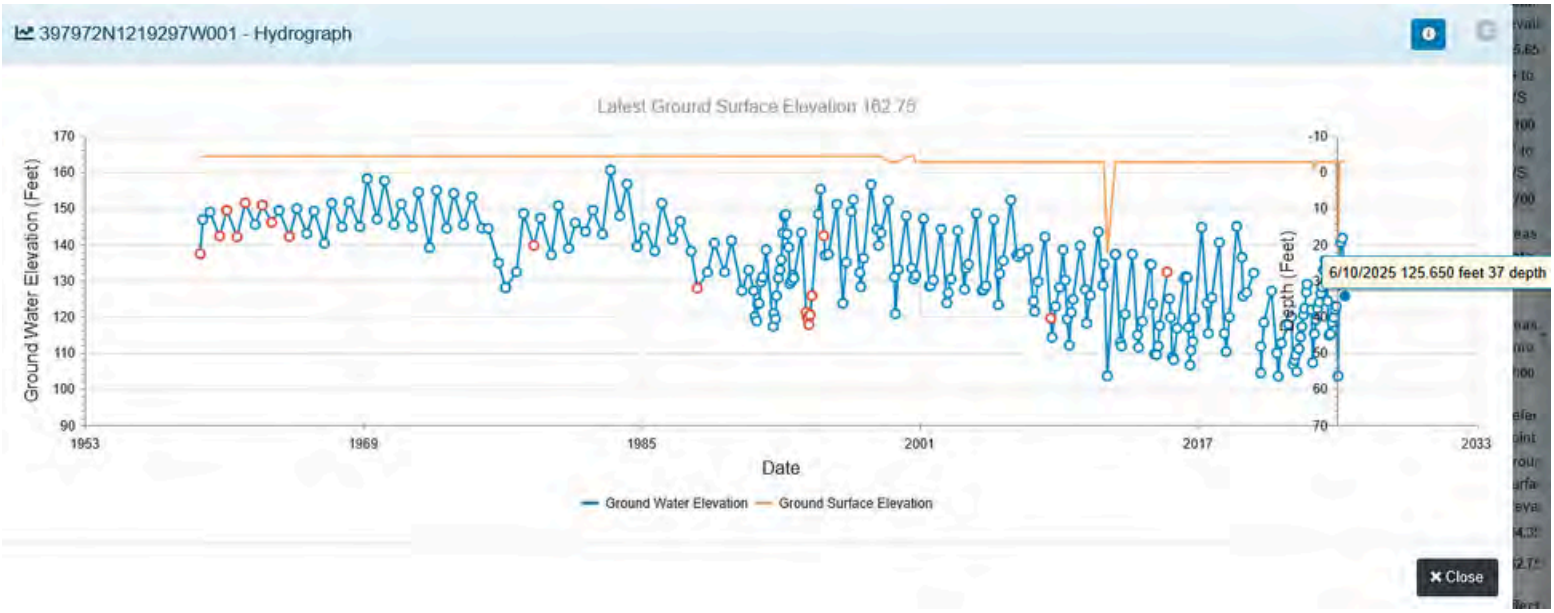
DEPTH OF INVESTIGATION-



DATA REMOVED



CALIFORNIA STATEWIDE GROUNDWATER ELEVATION MONITORING (CASGEM)- LOCAL MONITORING WELL



LEGEND

Legend:
Above Water Table

- Blue- Clay
- Green- Clay
- Yellow- Sandy Clay
- Orange- Sand
- Red- Coarse Sand
- Purple- Gravel

Legend:
Below Water Table

- Blue- Clay
- Green- Sandy clay
- Yellow- Sand
- Orange- Coarse Sand
- Red- Gravel
- Purple- Coarse Gravel

- Black- Likely Bad data/Noise

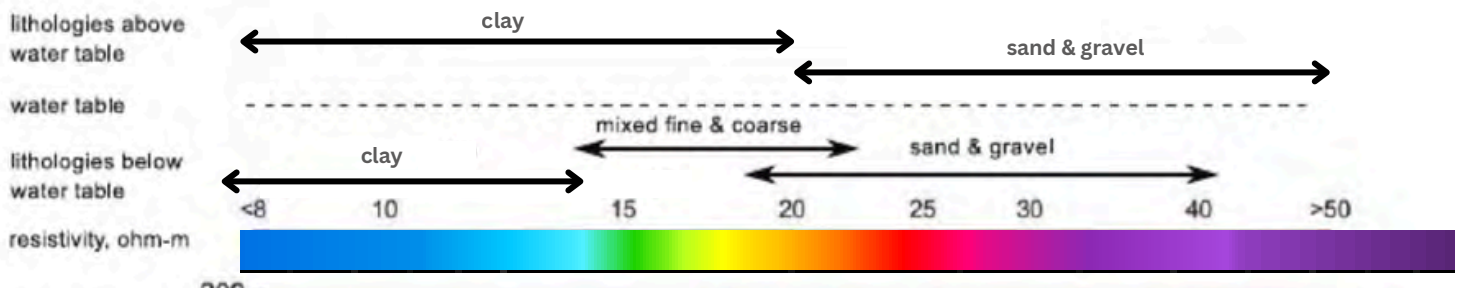


Table 2
Range of Resistivity Values Determined for the Lithologic Units Using Method 2 and from the Histogram of All Resistivity Values in the Resistivity Model

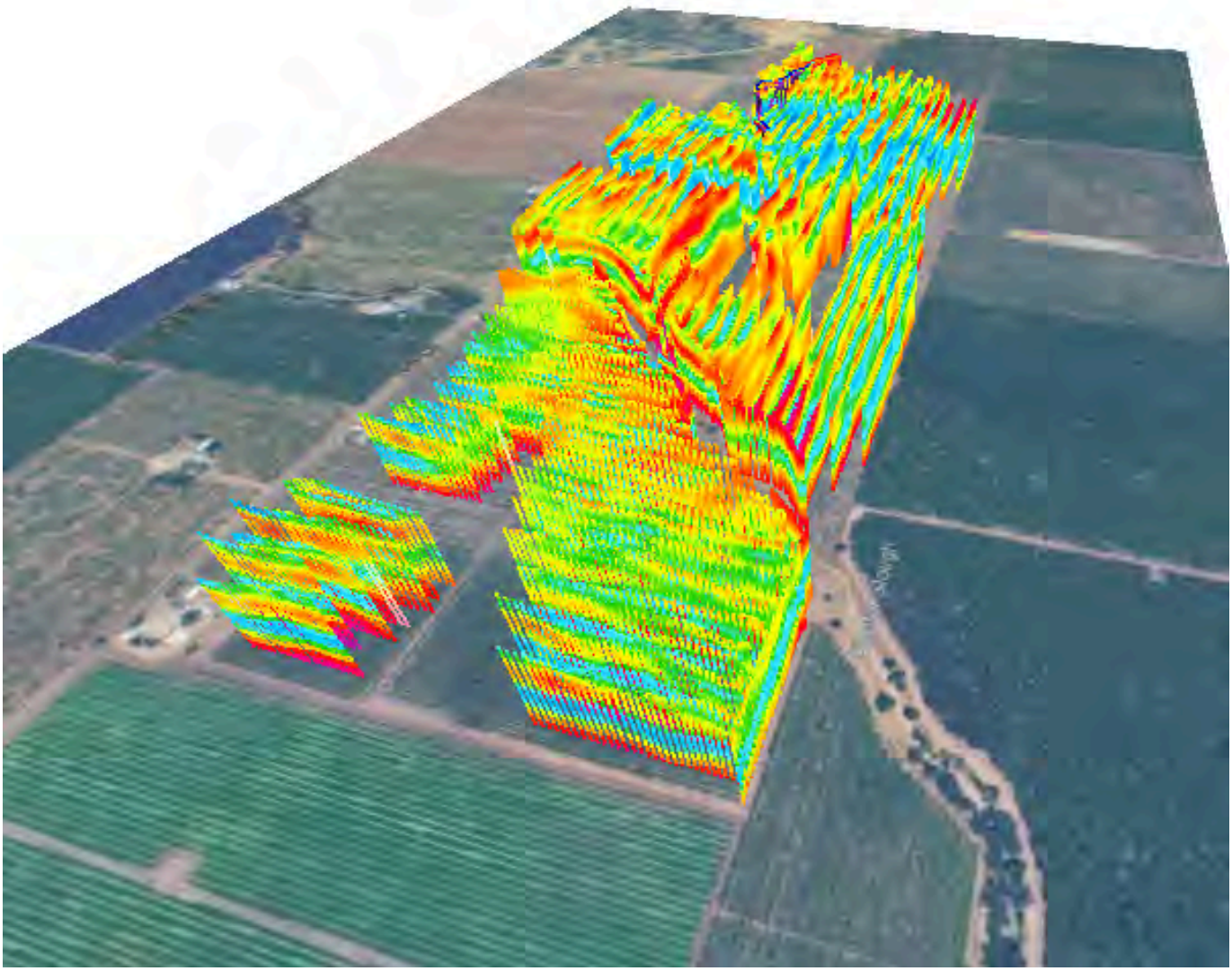
Resistivity Range (Ω m)		Interpreted Lithology
Above the water table		
8	20	Clay
21	150	Sand and gravel
Below the water table		
6	14	Clay
12	22	Mixed fine and coarse
17	43	Sand and gravel

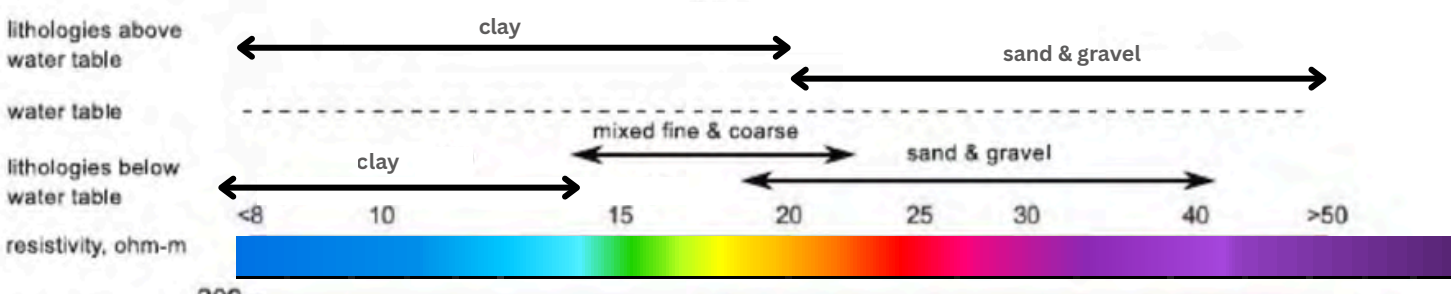
KNIGHT, R., SMITH, R., ASCH, T., ABRAHAM, J., CANNIA, J., VIEZZOLI, A., & FOGG, G. (2018). MAPPING AQUIFER SYSTEMS WITH AIRBORNE ELECTROMAGNETICS IN THE CENTRAL VALLEY OF CALIFORNIA. GROUND WATER, 56(6), 893–908. HTTPS://DOI.ORG/10.1111/GWAT.12656

3D VIEW- WEST TO EAST

NORTH

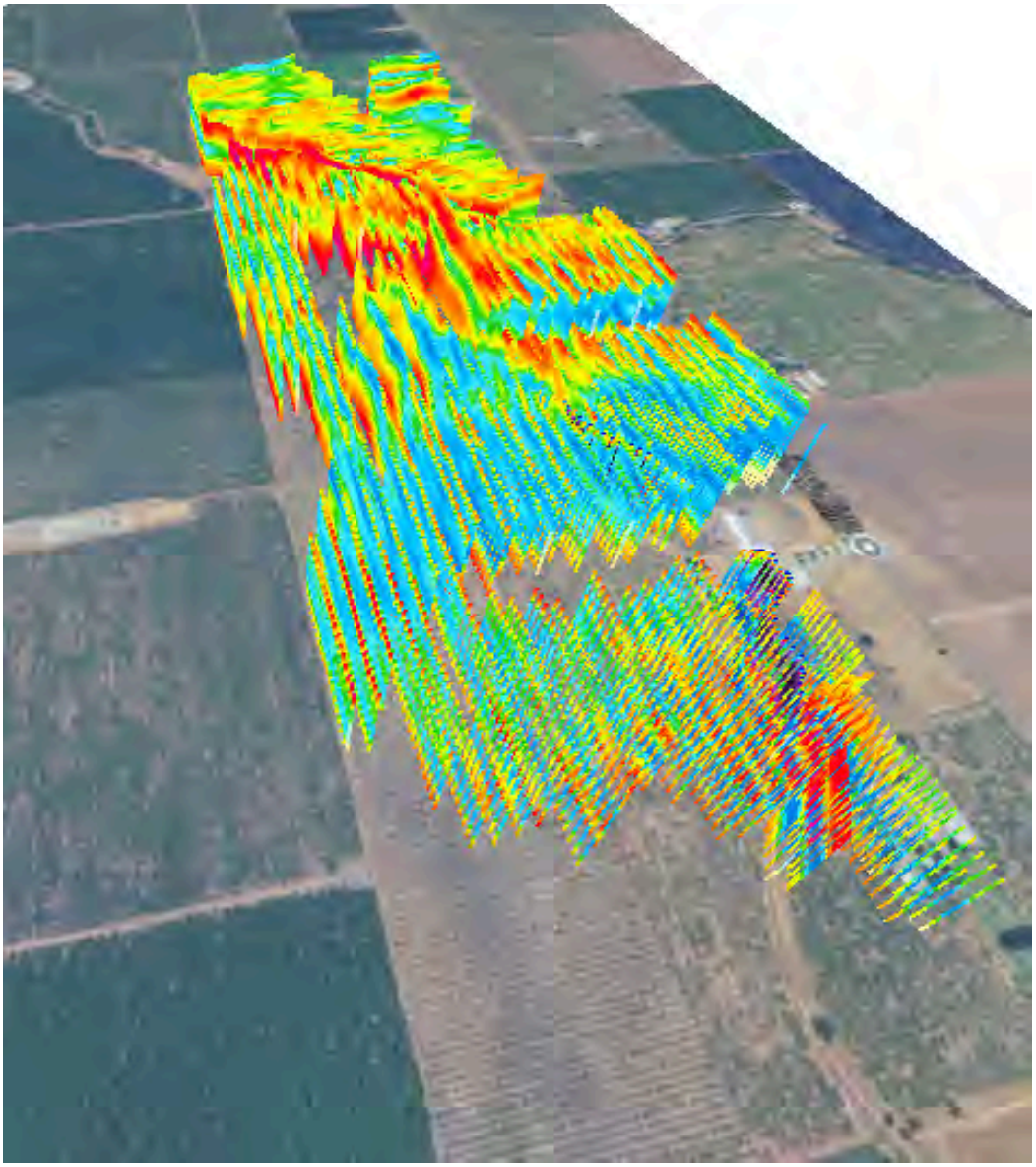
SOUTH

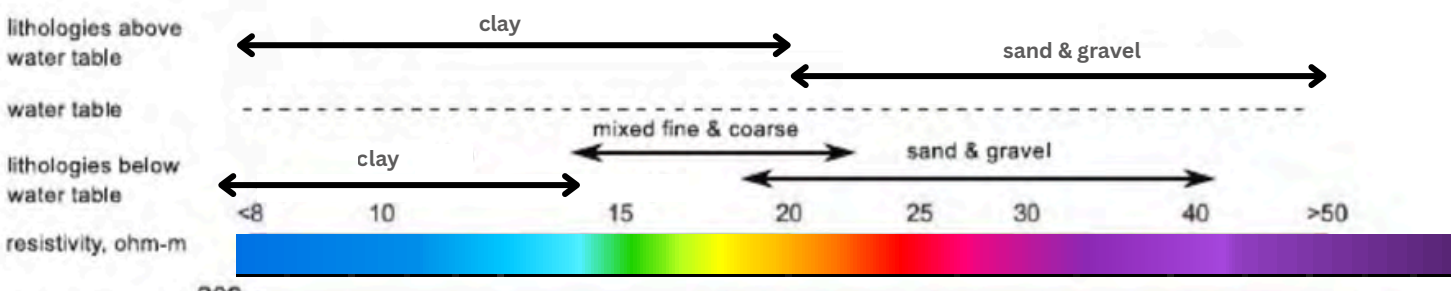




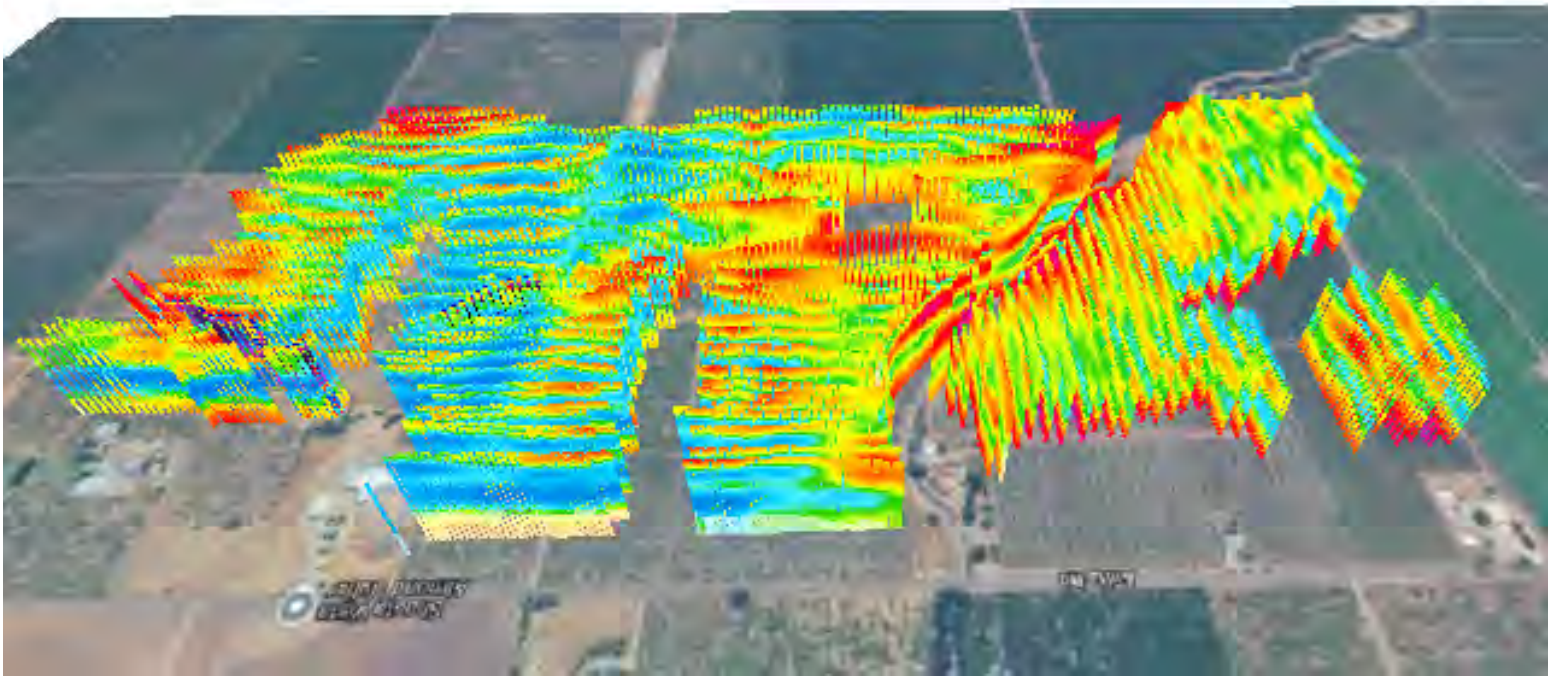
3D VIEW- EAST TO WEST

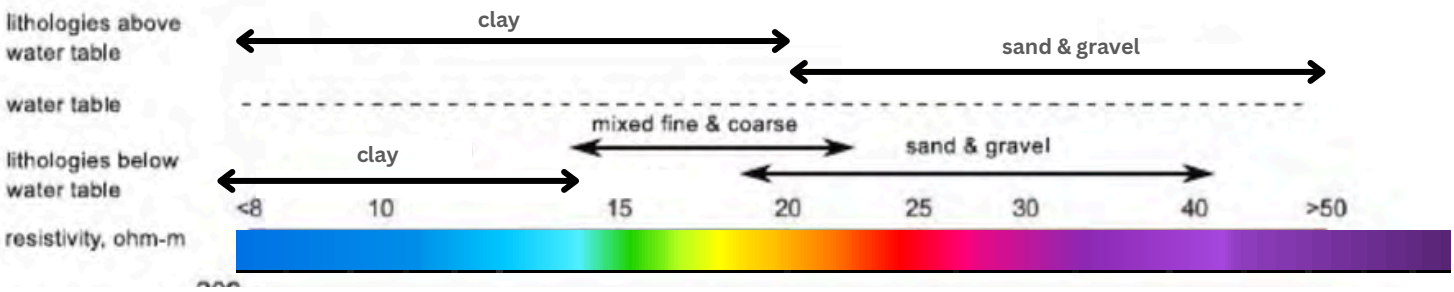
SOUTH **NORTH**



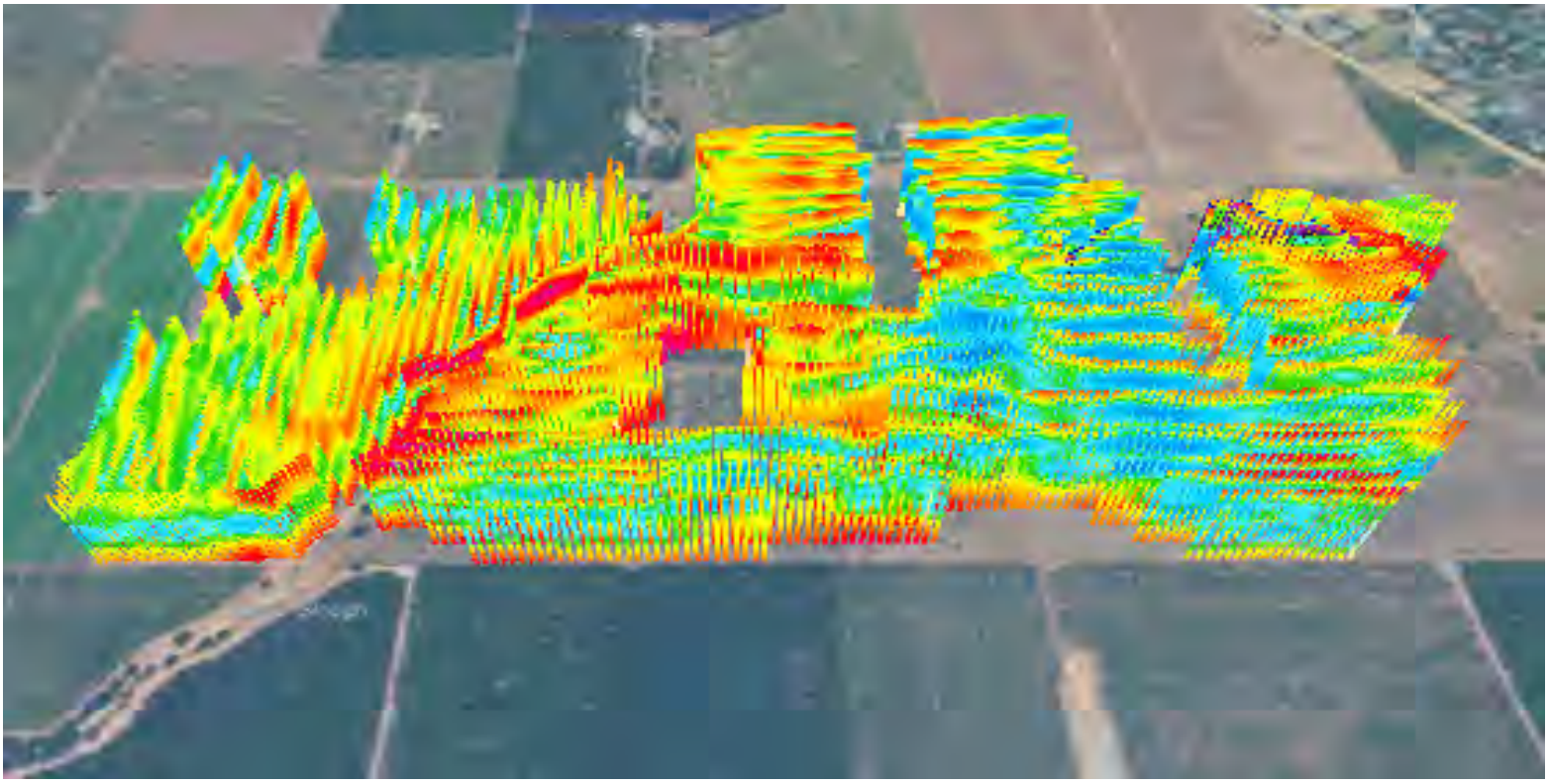


3D VIEW- NORTH TO SOUTH

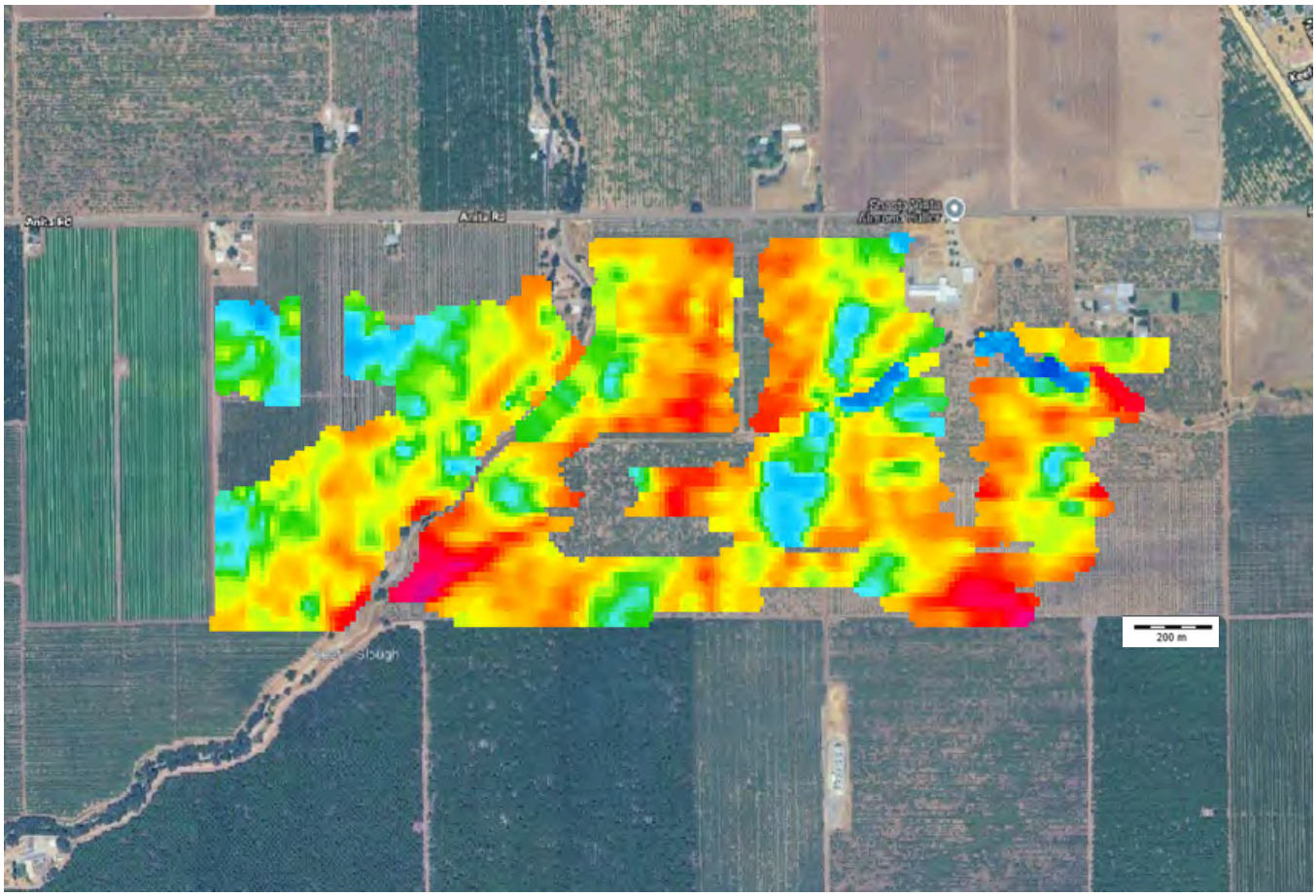


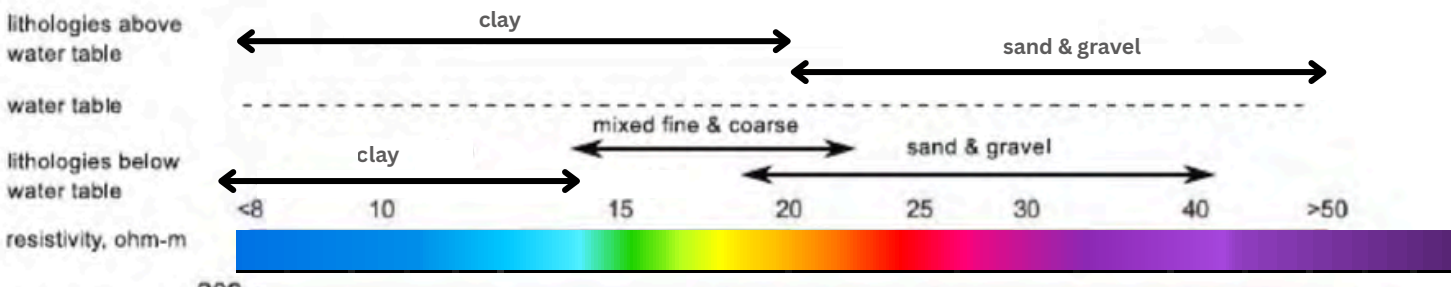


3D VIEW- SOUTH TO NORTH

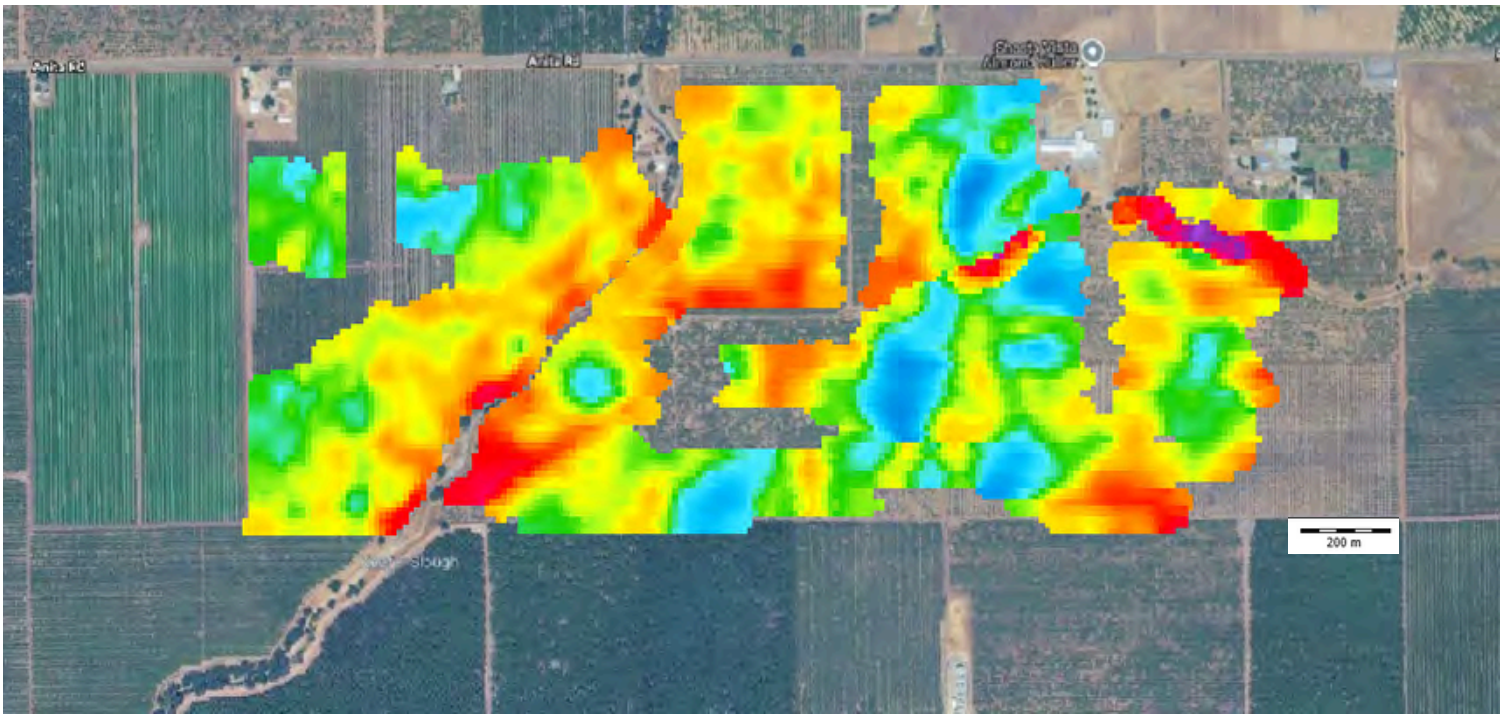


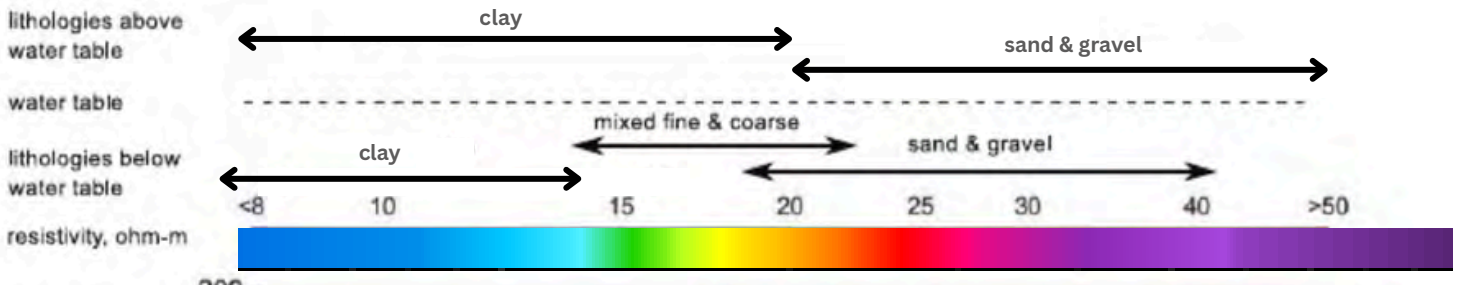
DEPTH SLICES- 0 FT





DEPTH SLICES- 10 FT





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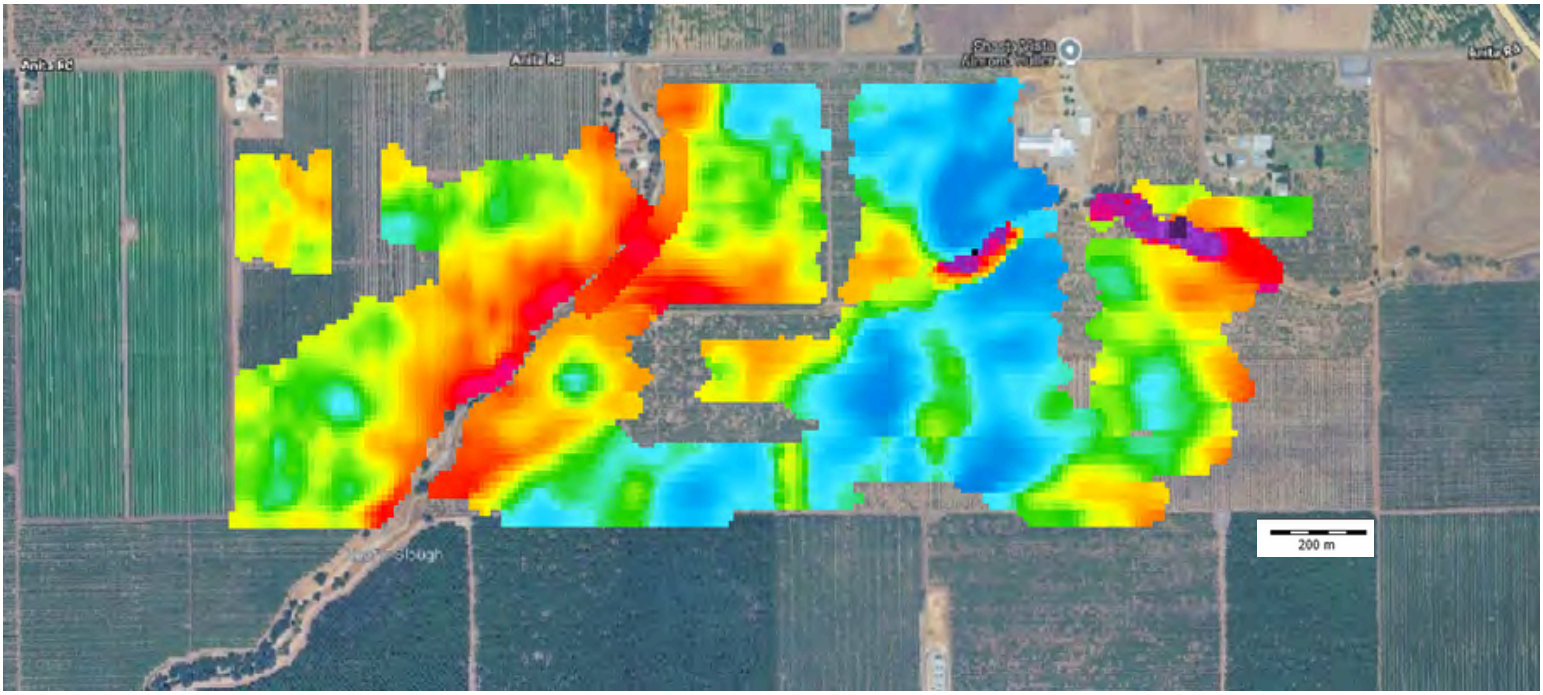

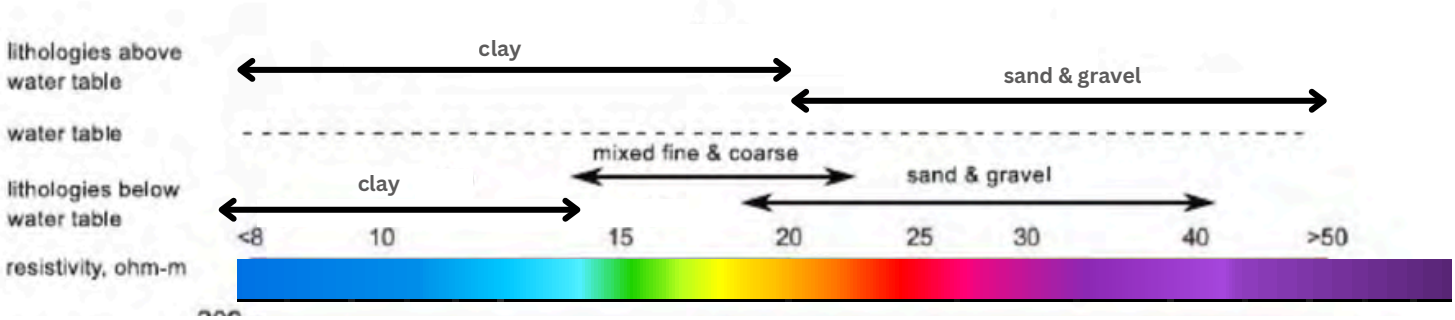

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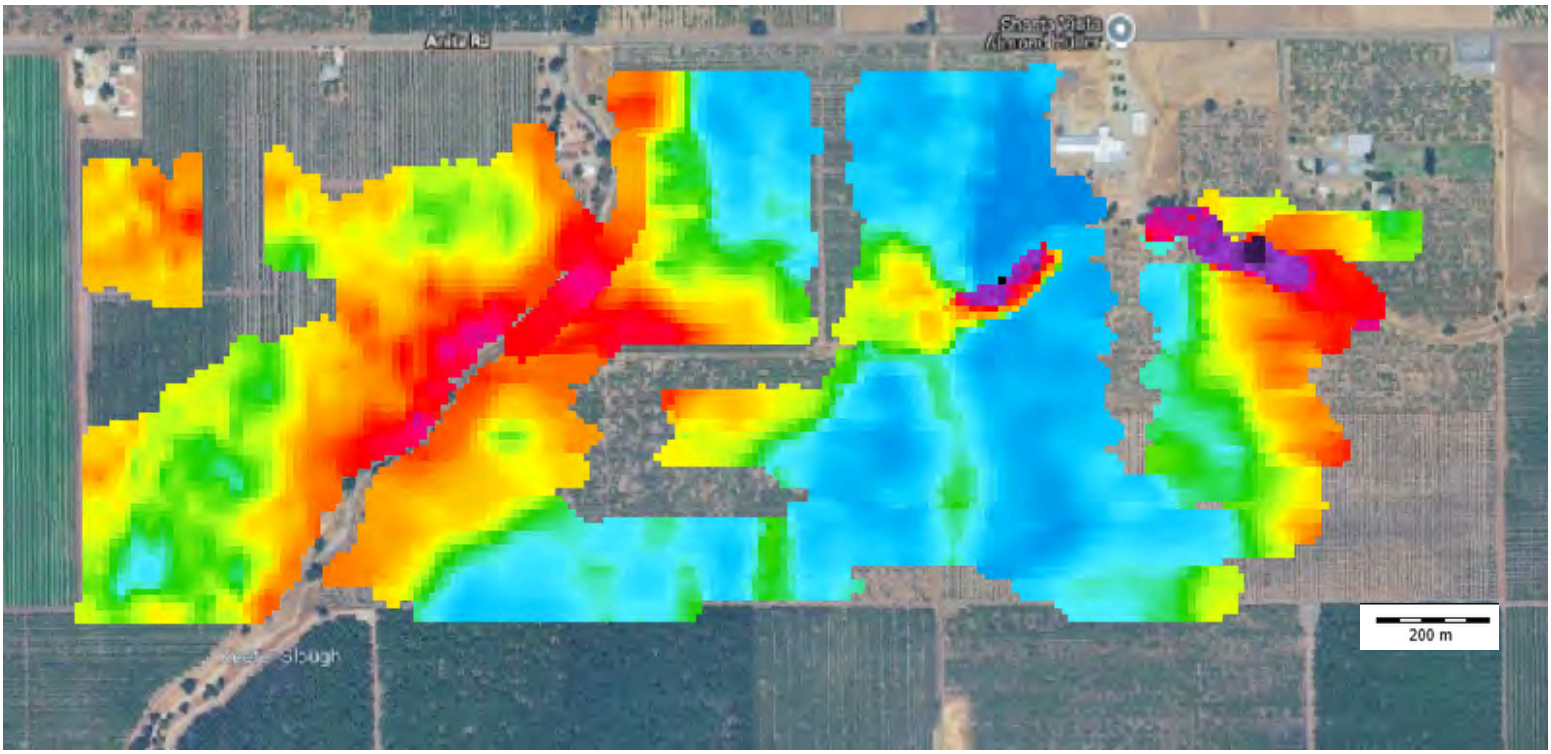
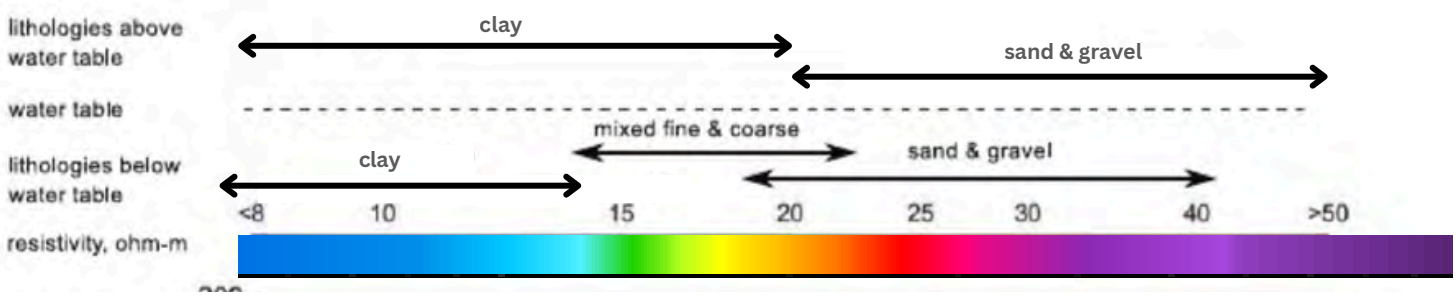
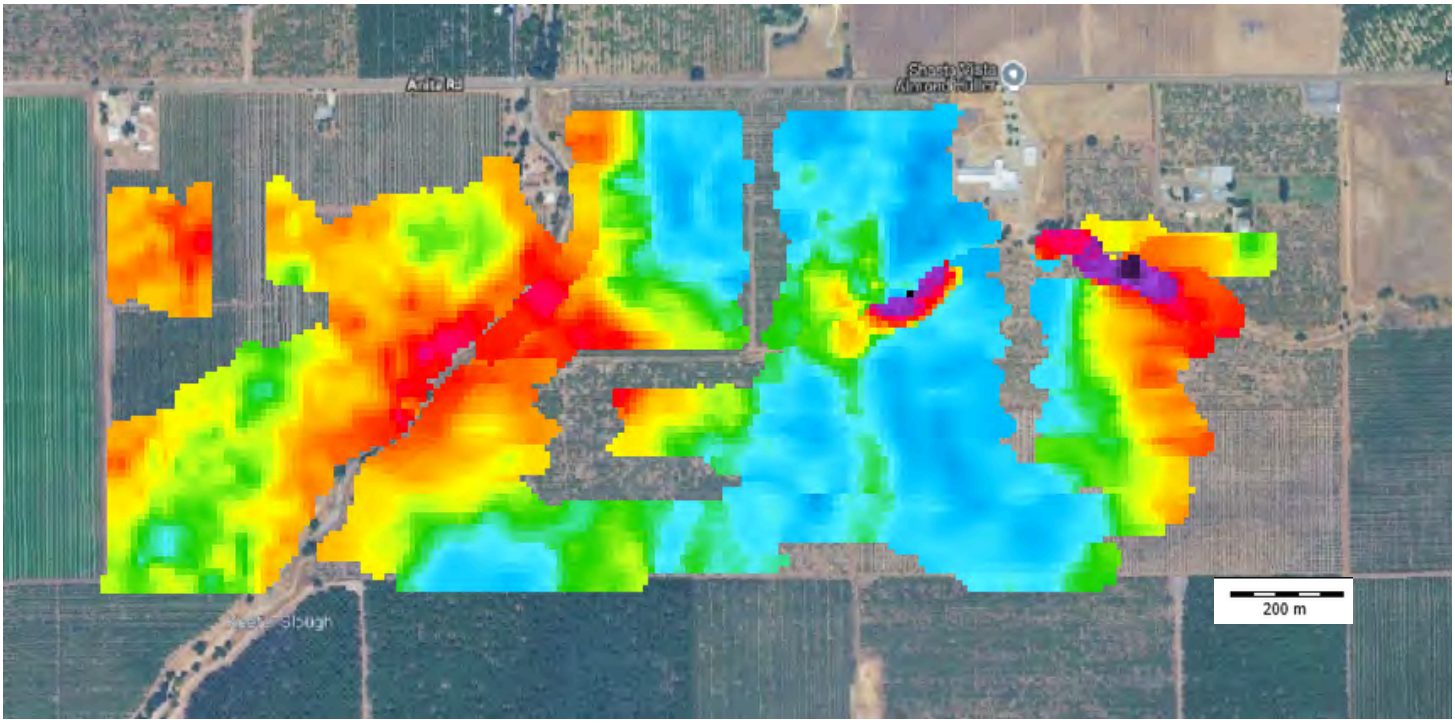
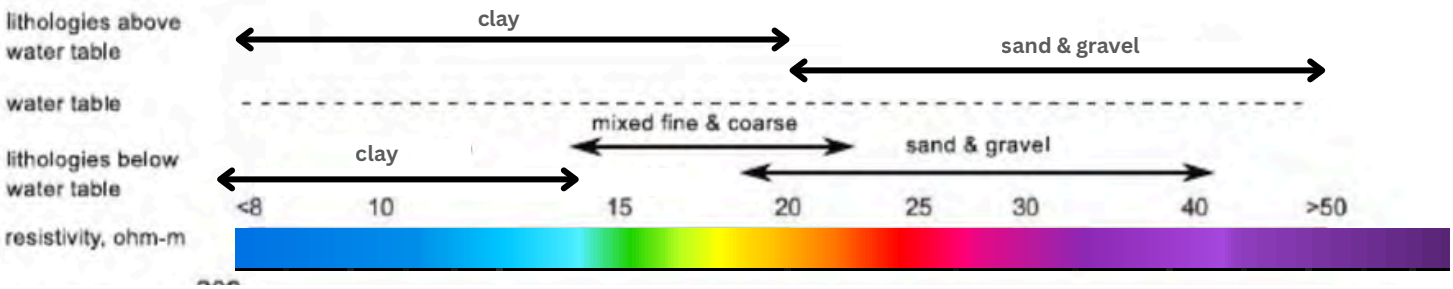




DEPTH SLICES- 40 FT (WATER TABLE)





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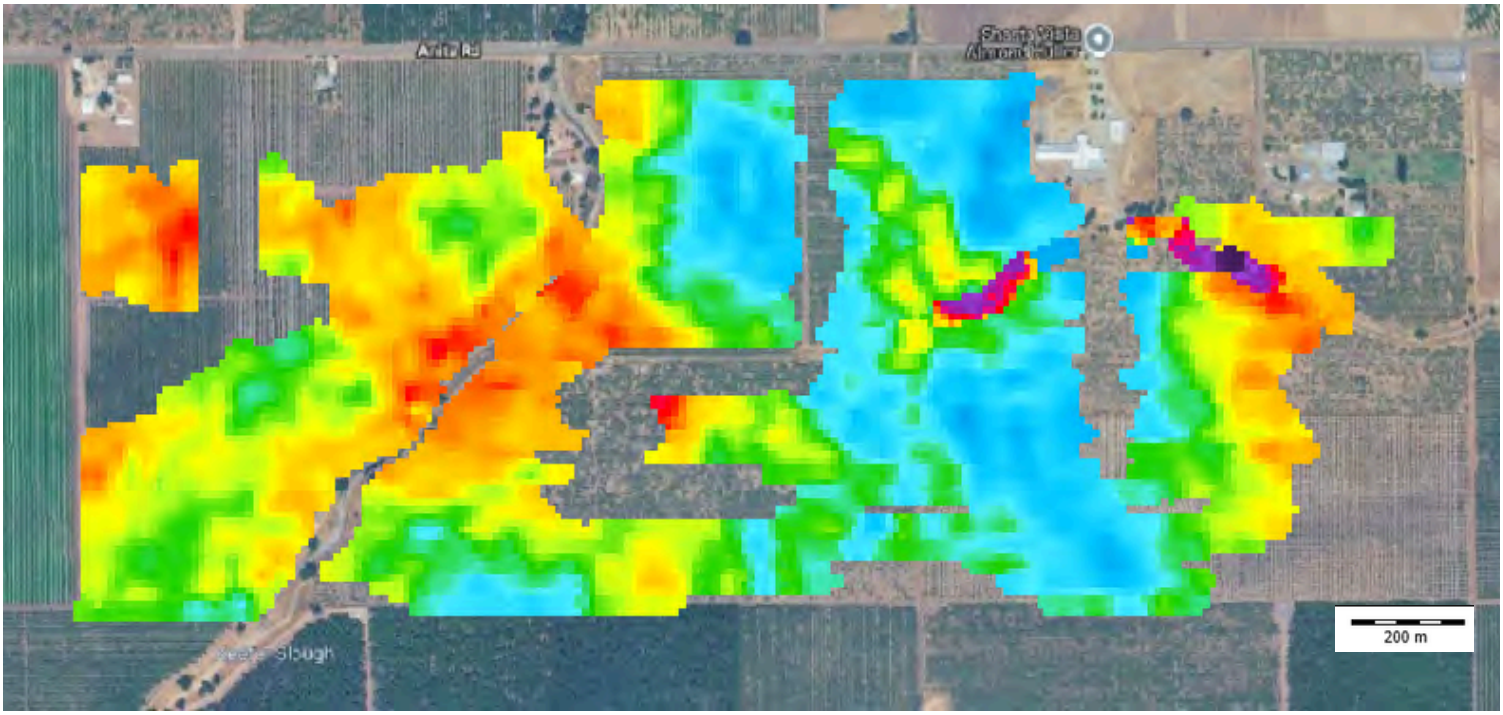

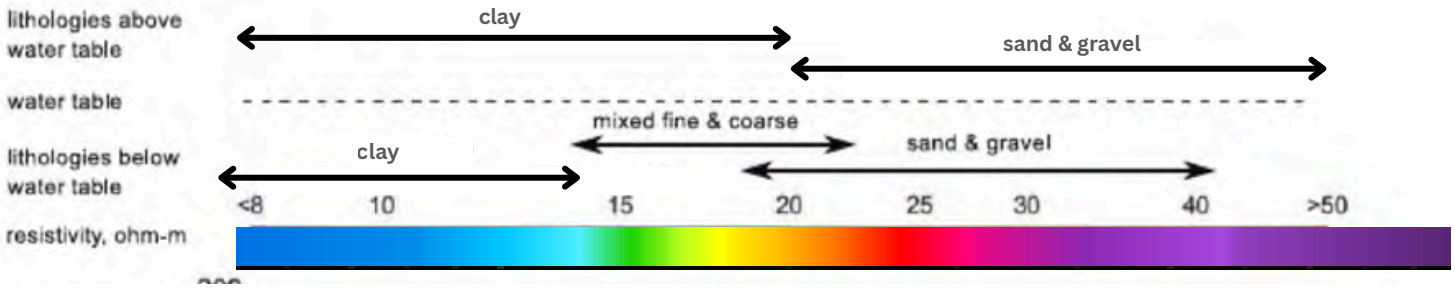

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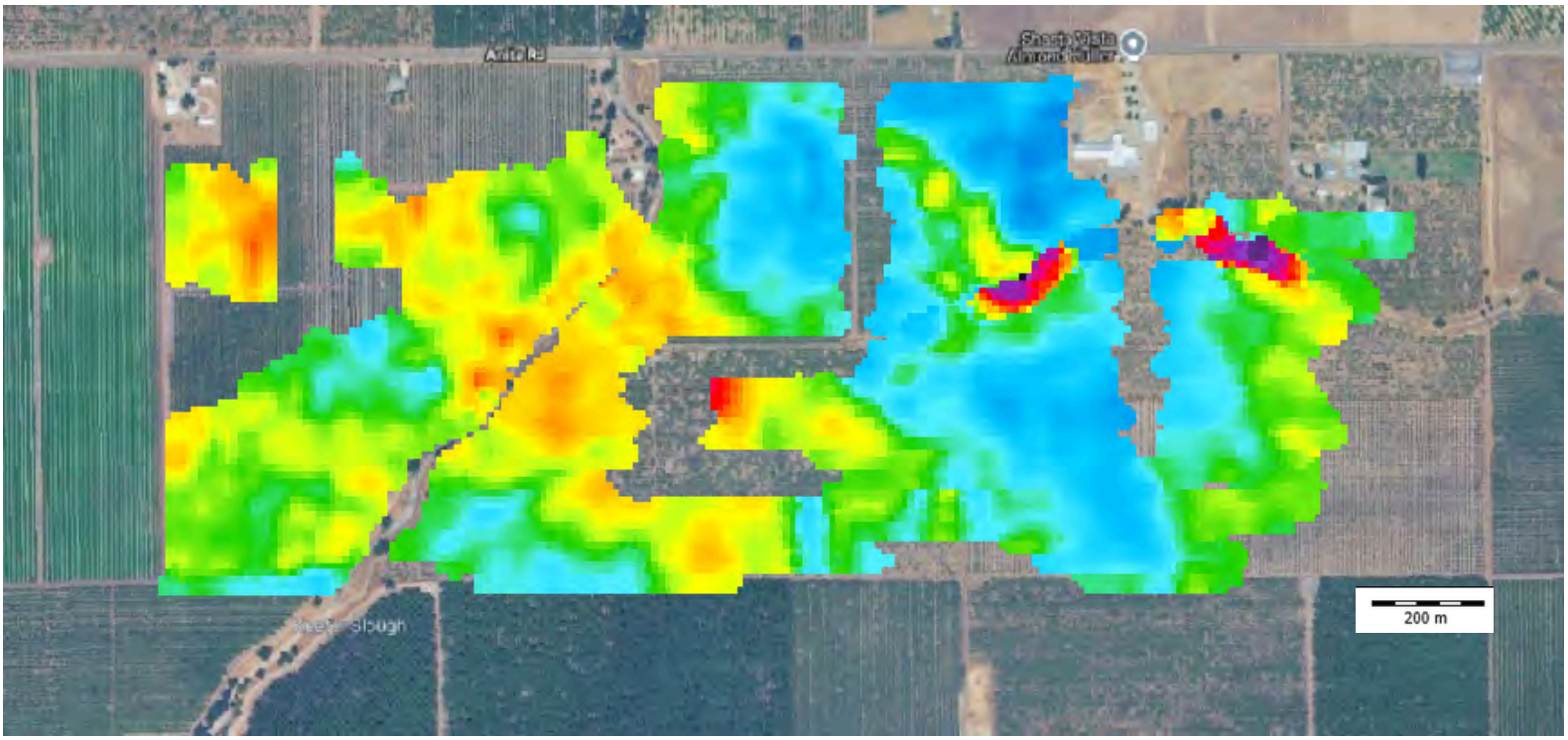

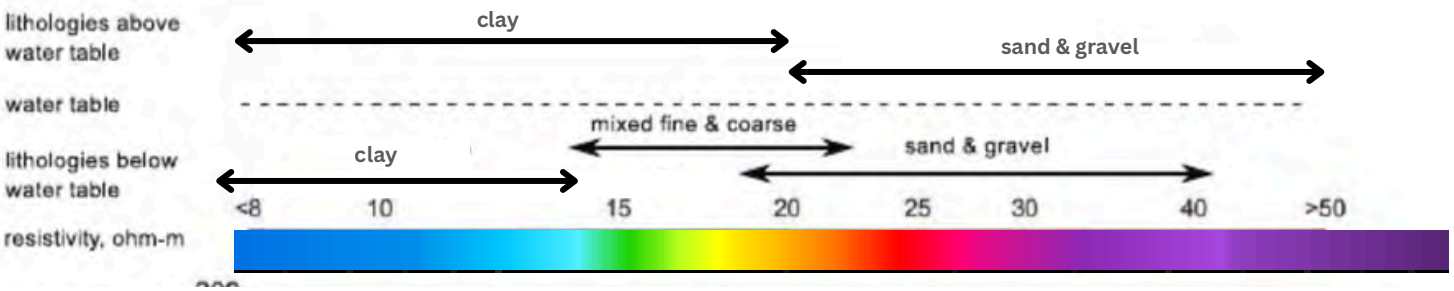

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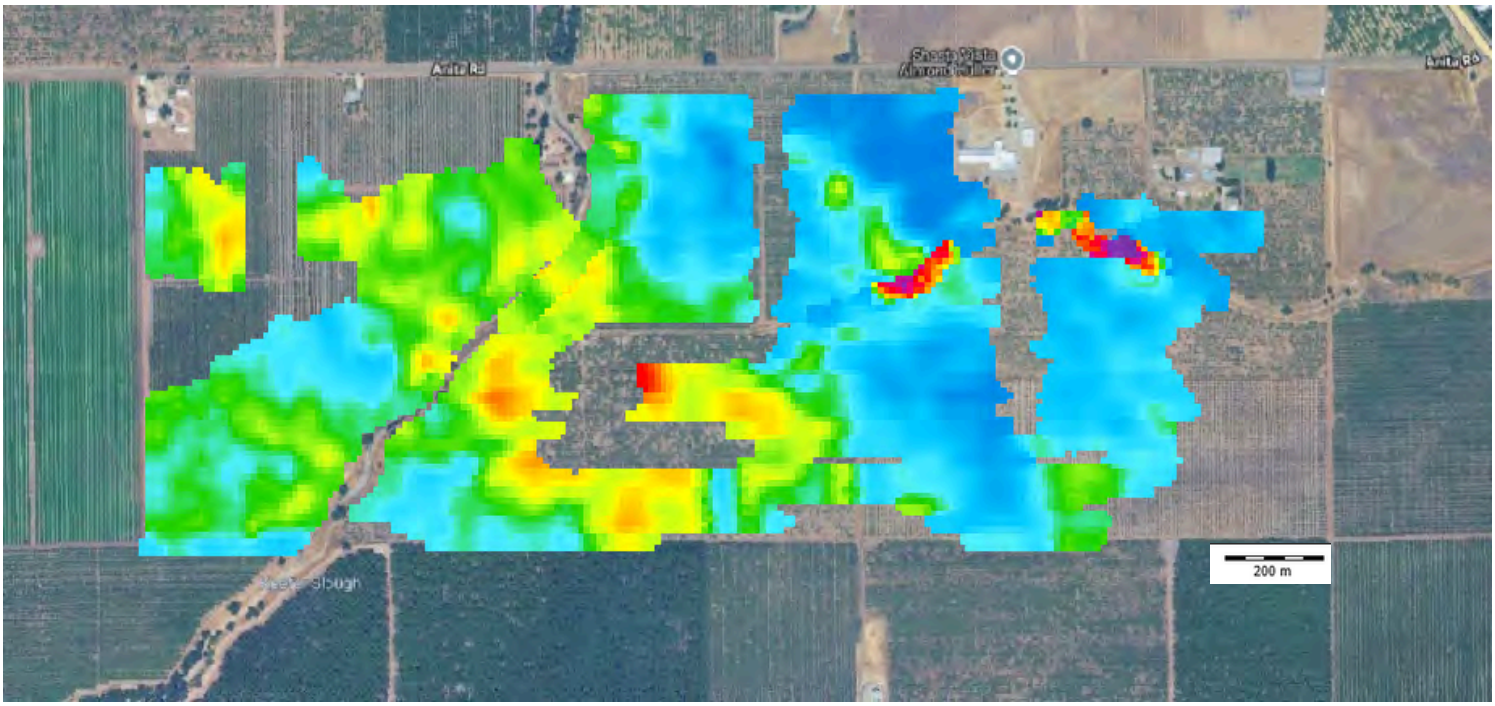

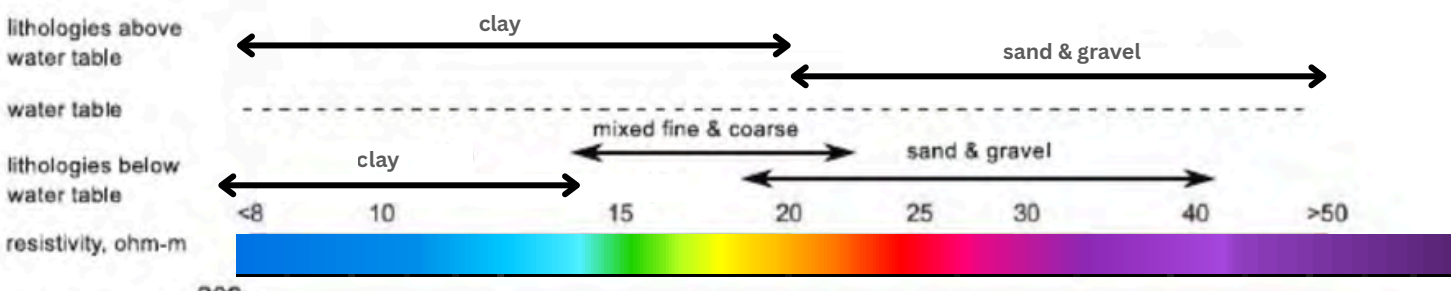

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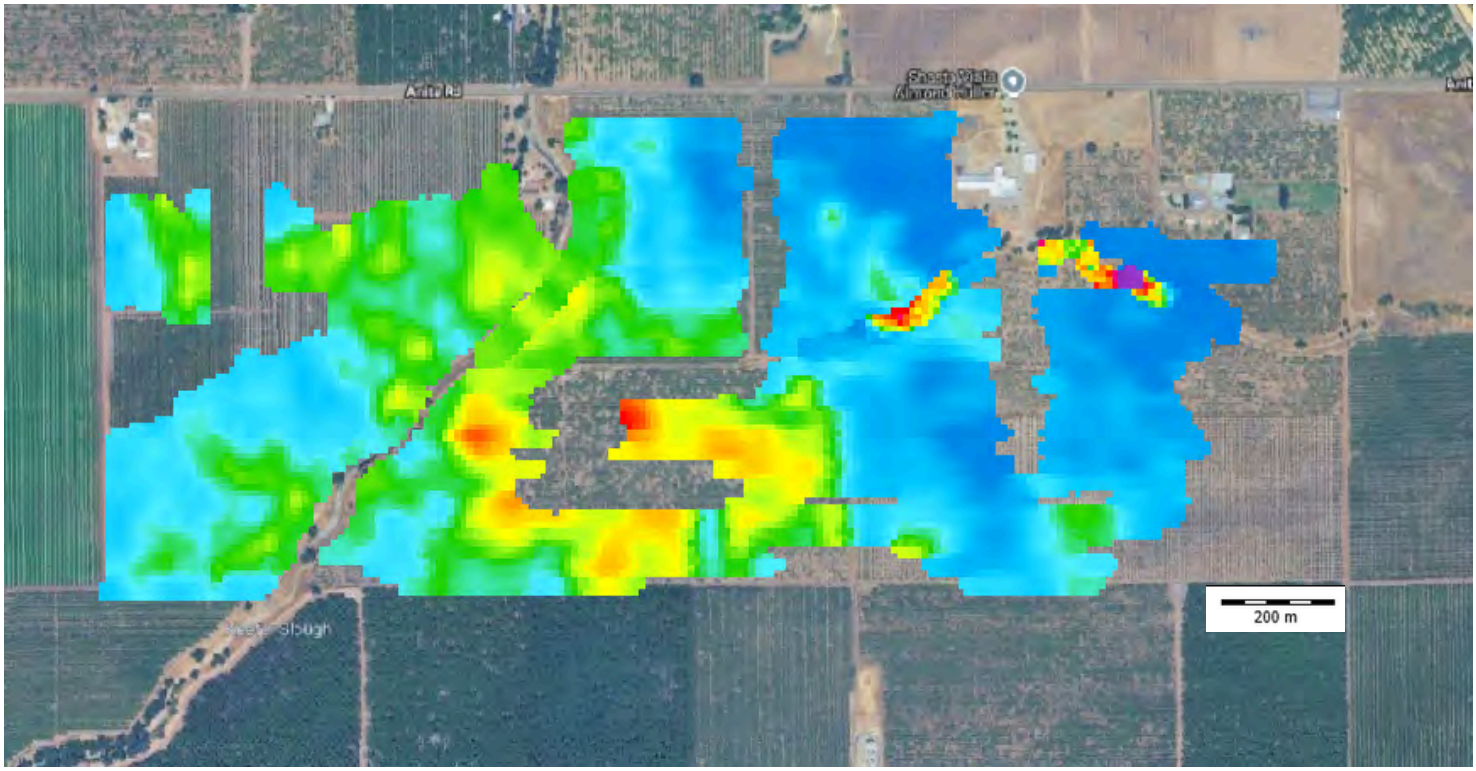
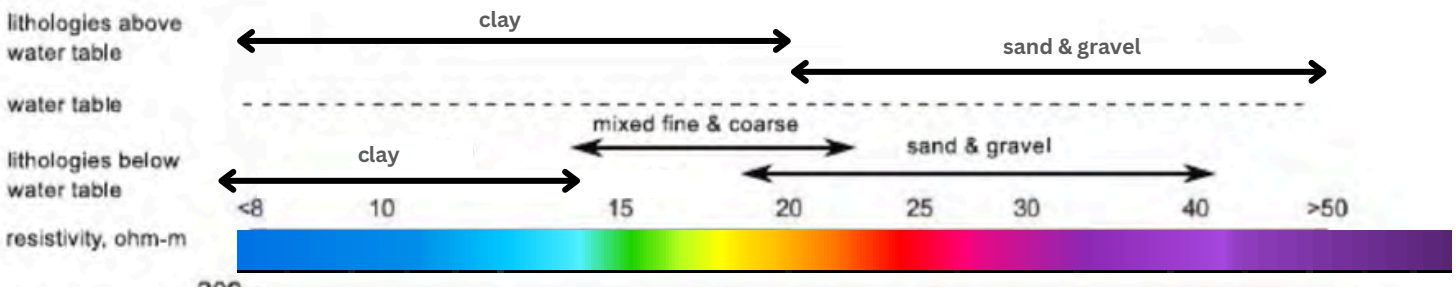
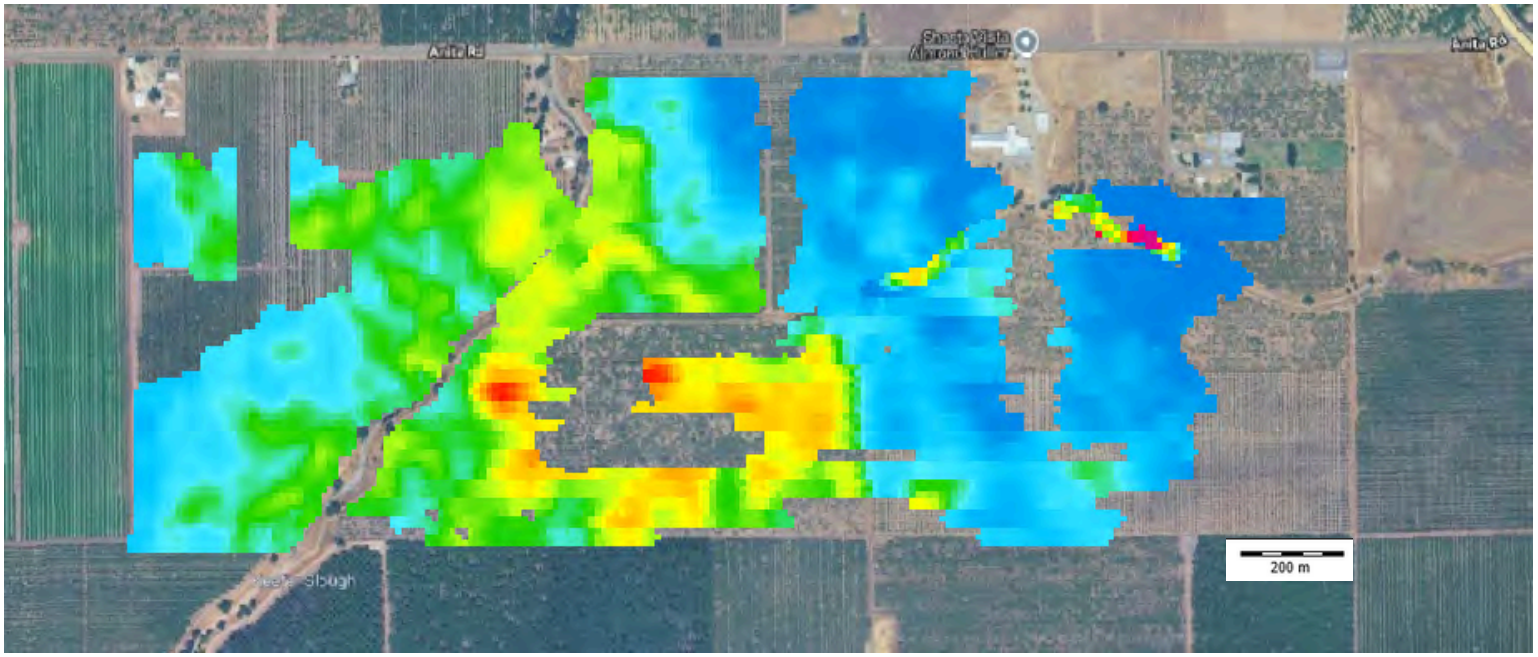
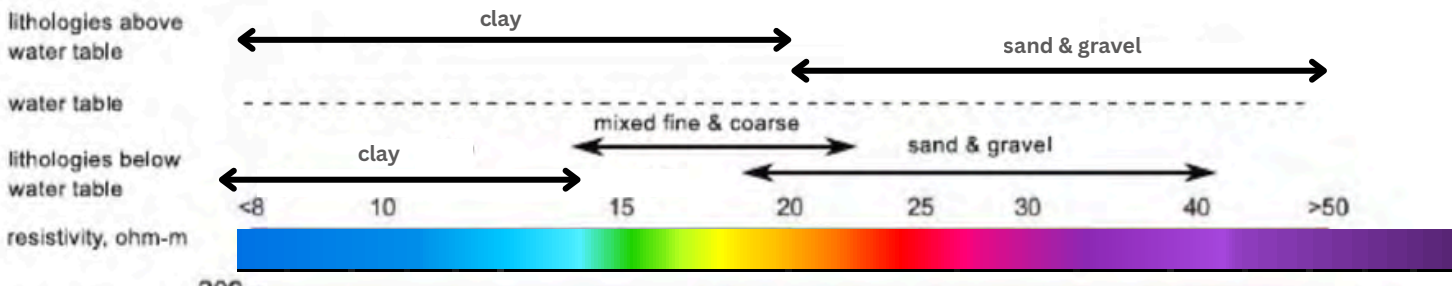


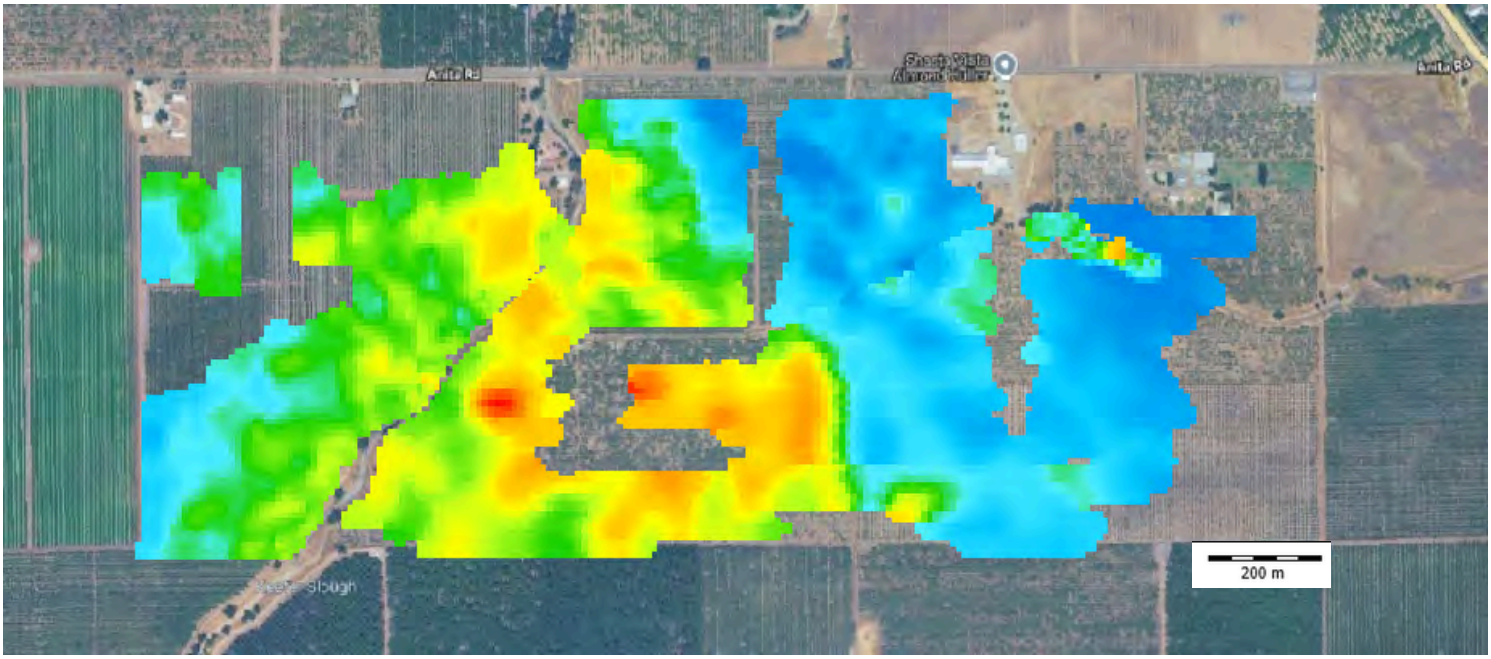


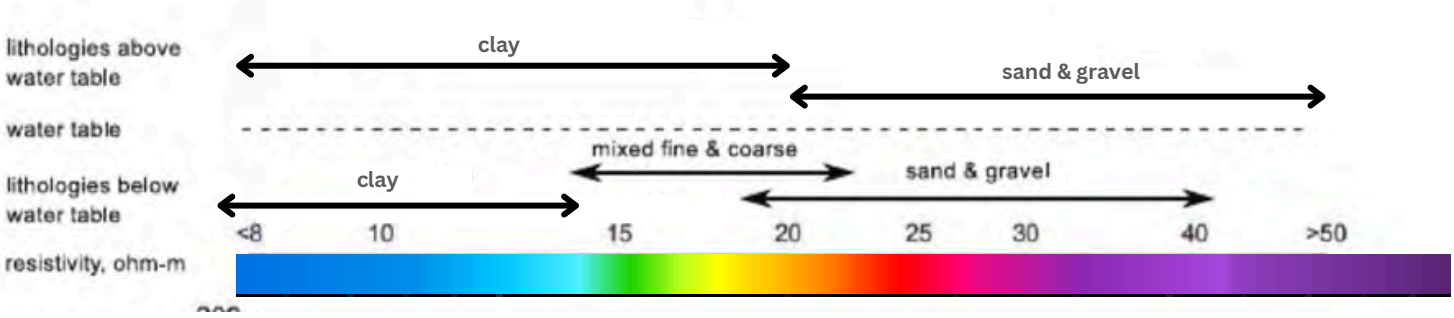
DEPTH SLICES- 90 FT



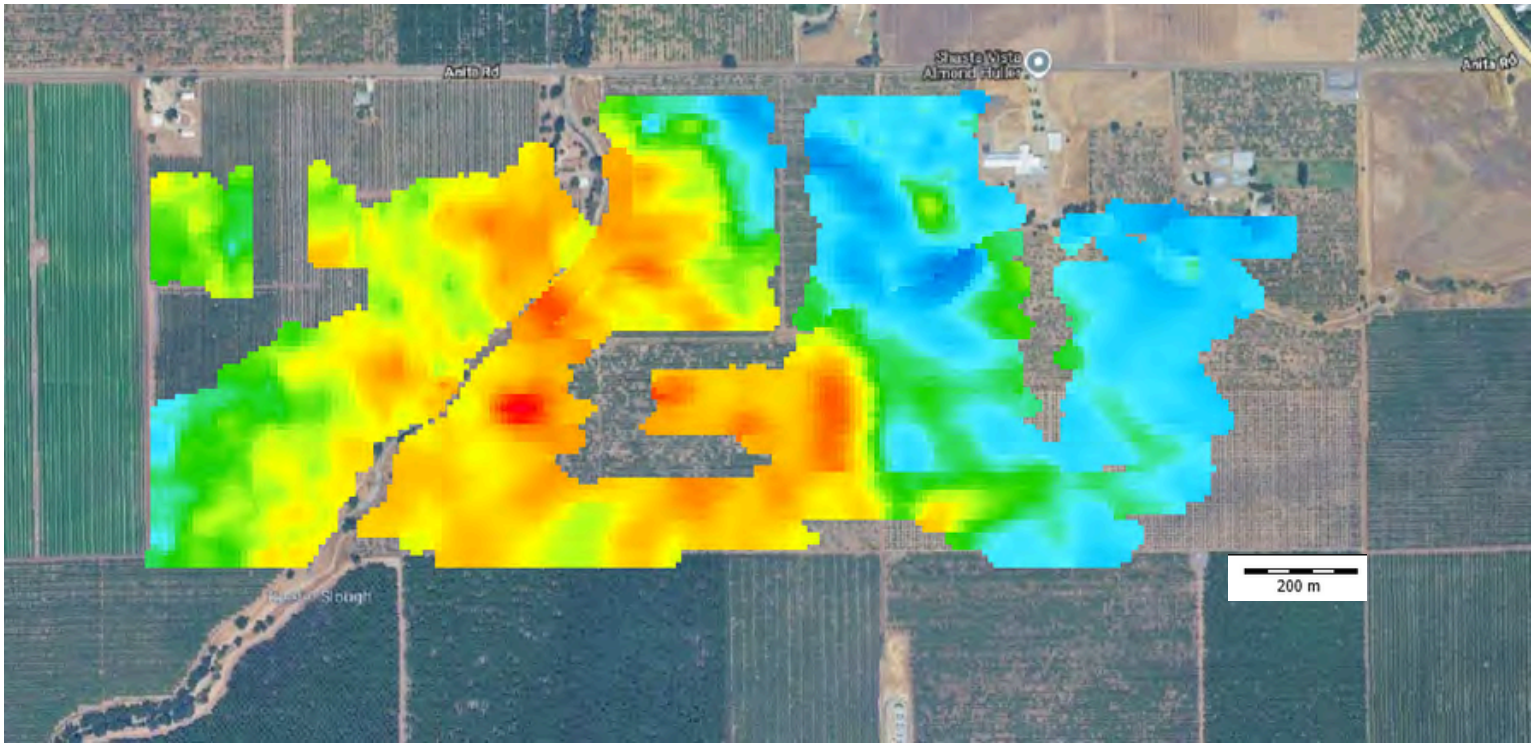


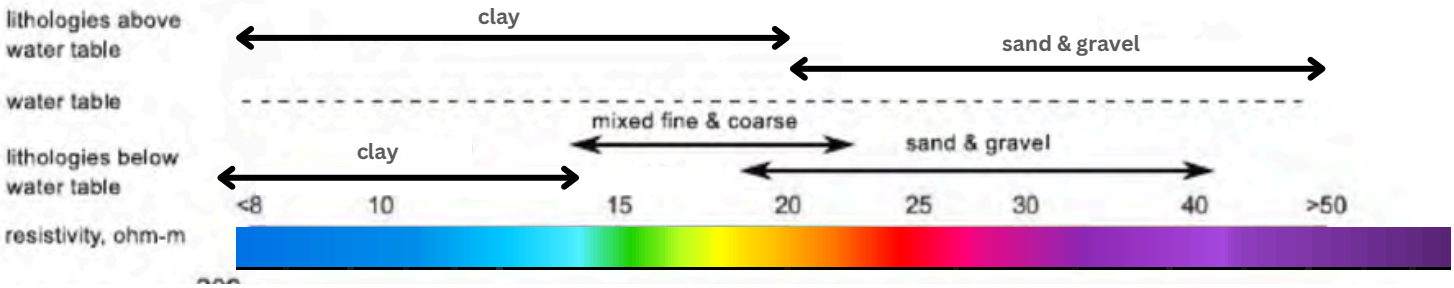
DEPTH SLICES- 100 FT



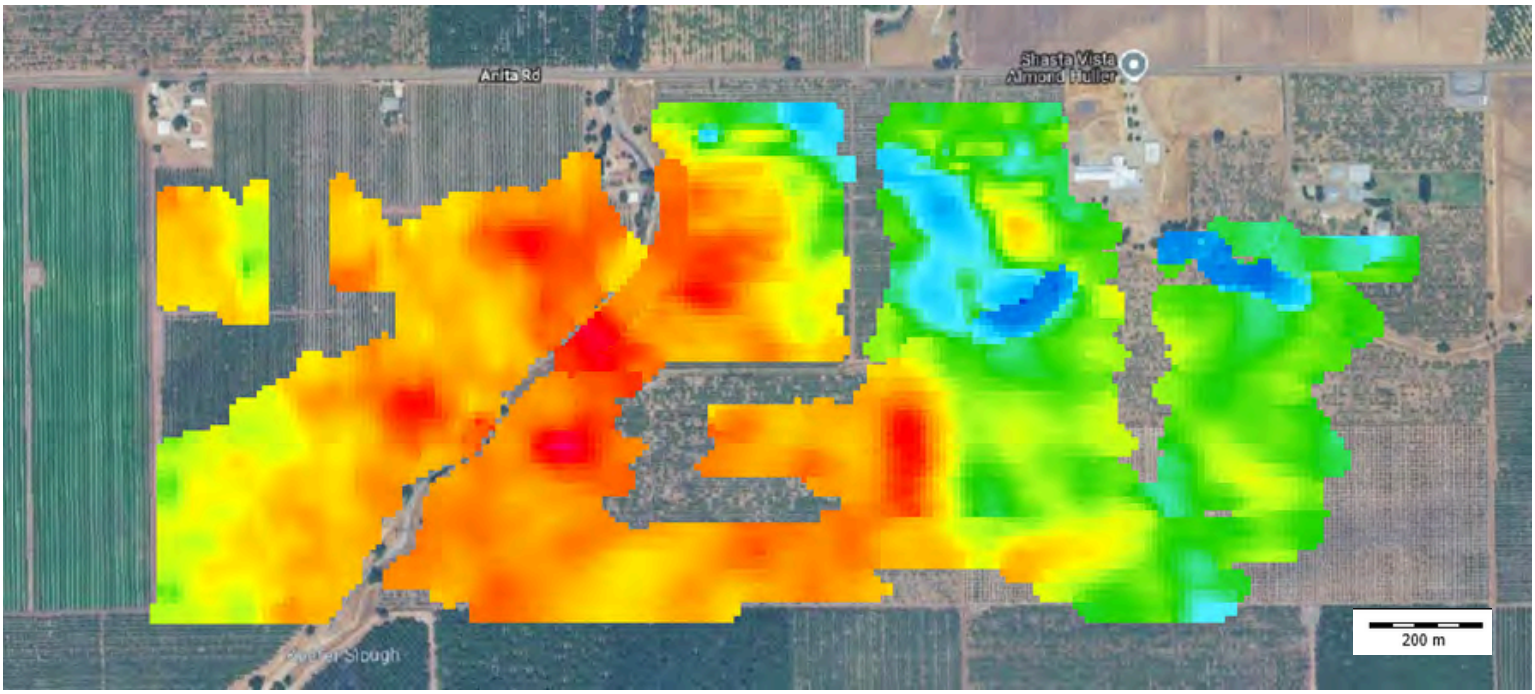


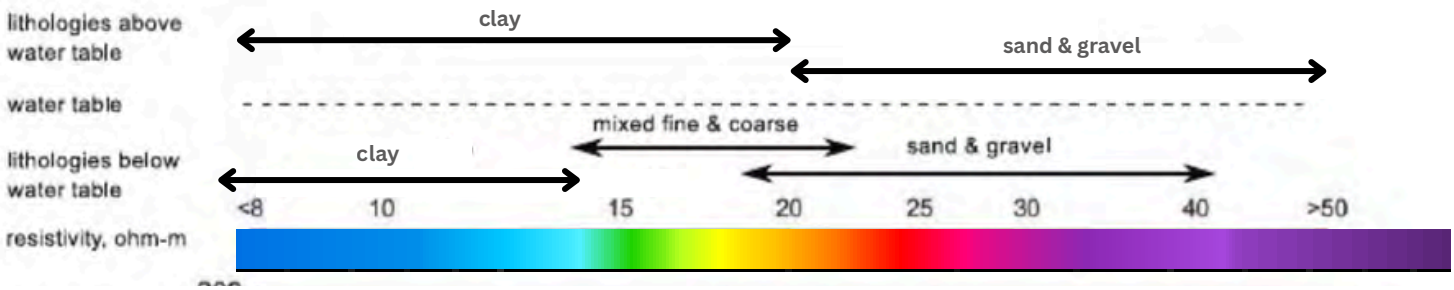
DEPTH SLICES- 110 FT



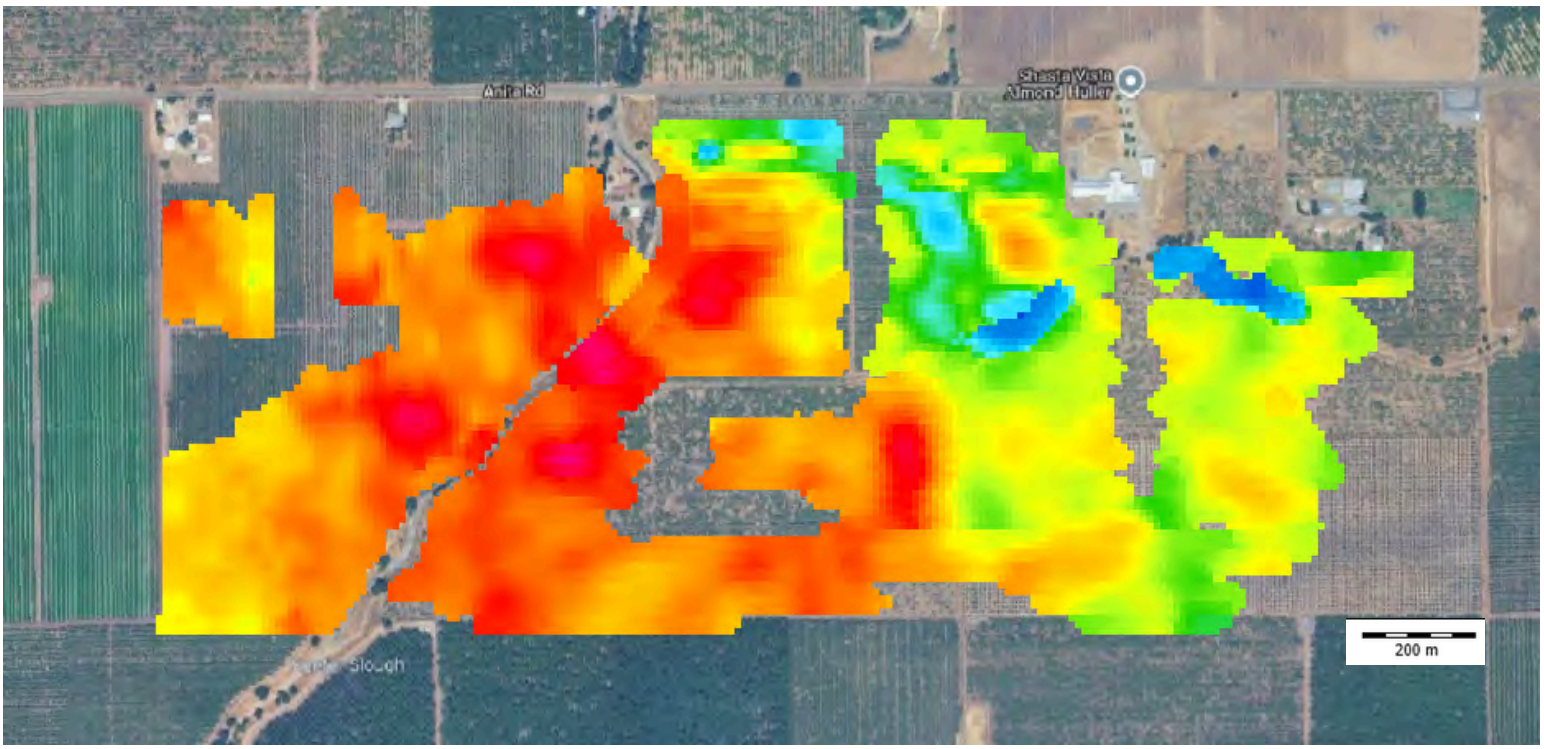


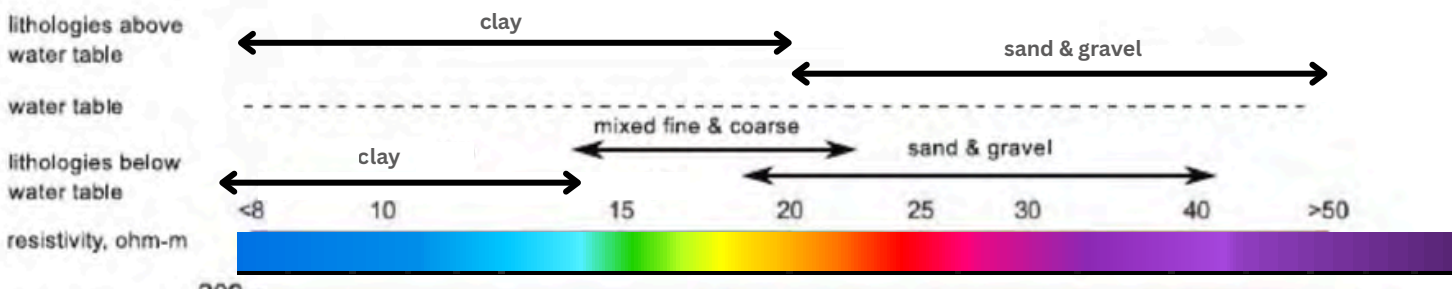
DEPTH SLICES- 120 FT





DEPTH SLICES- 130 FT





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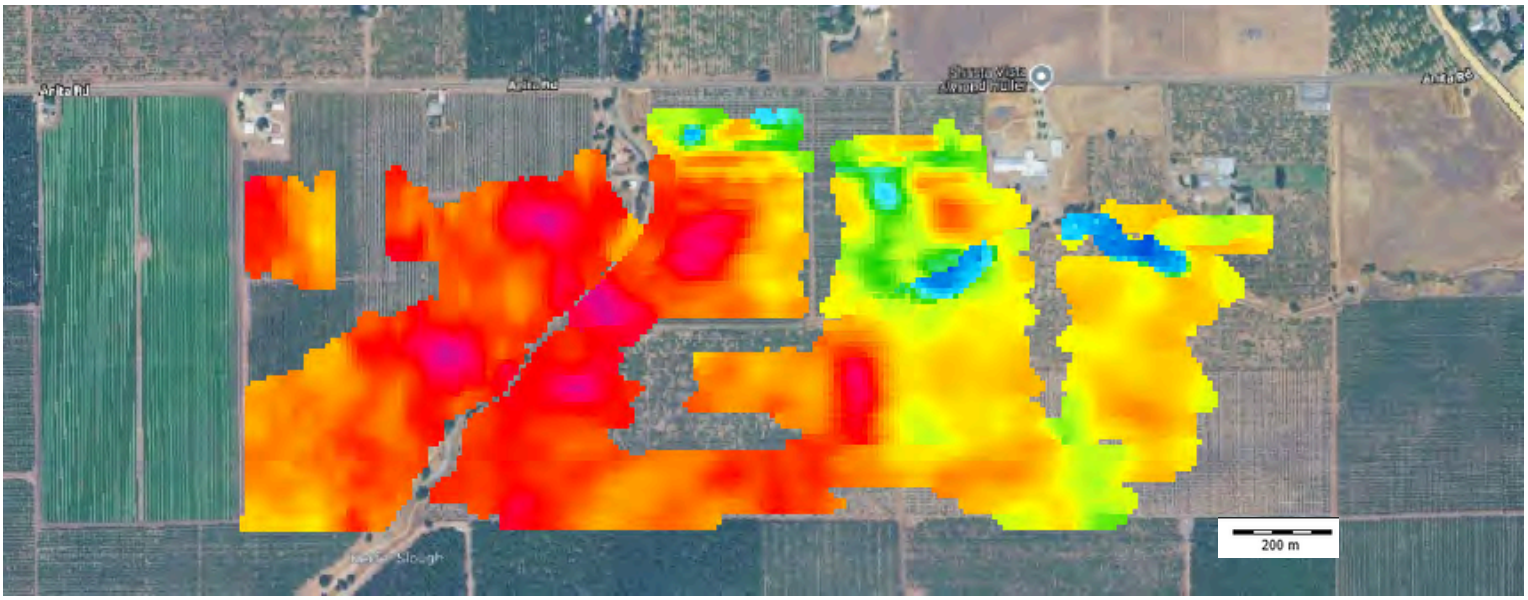

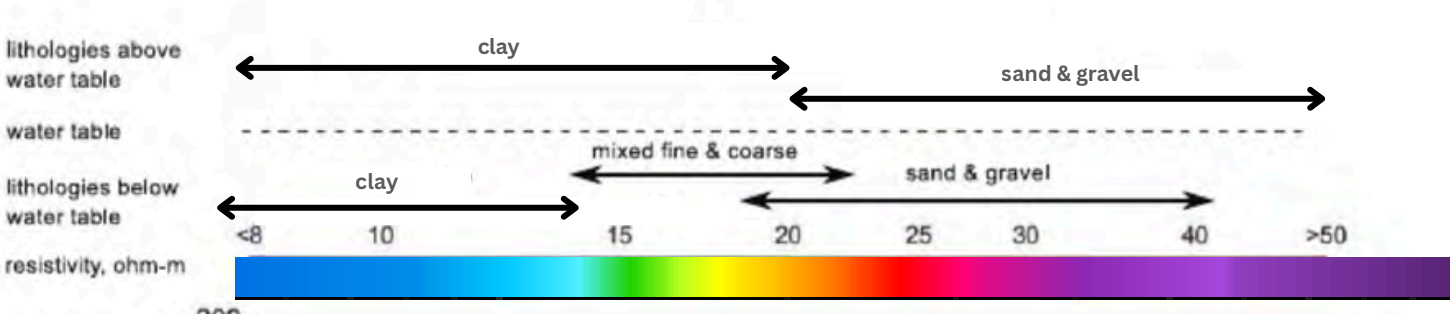

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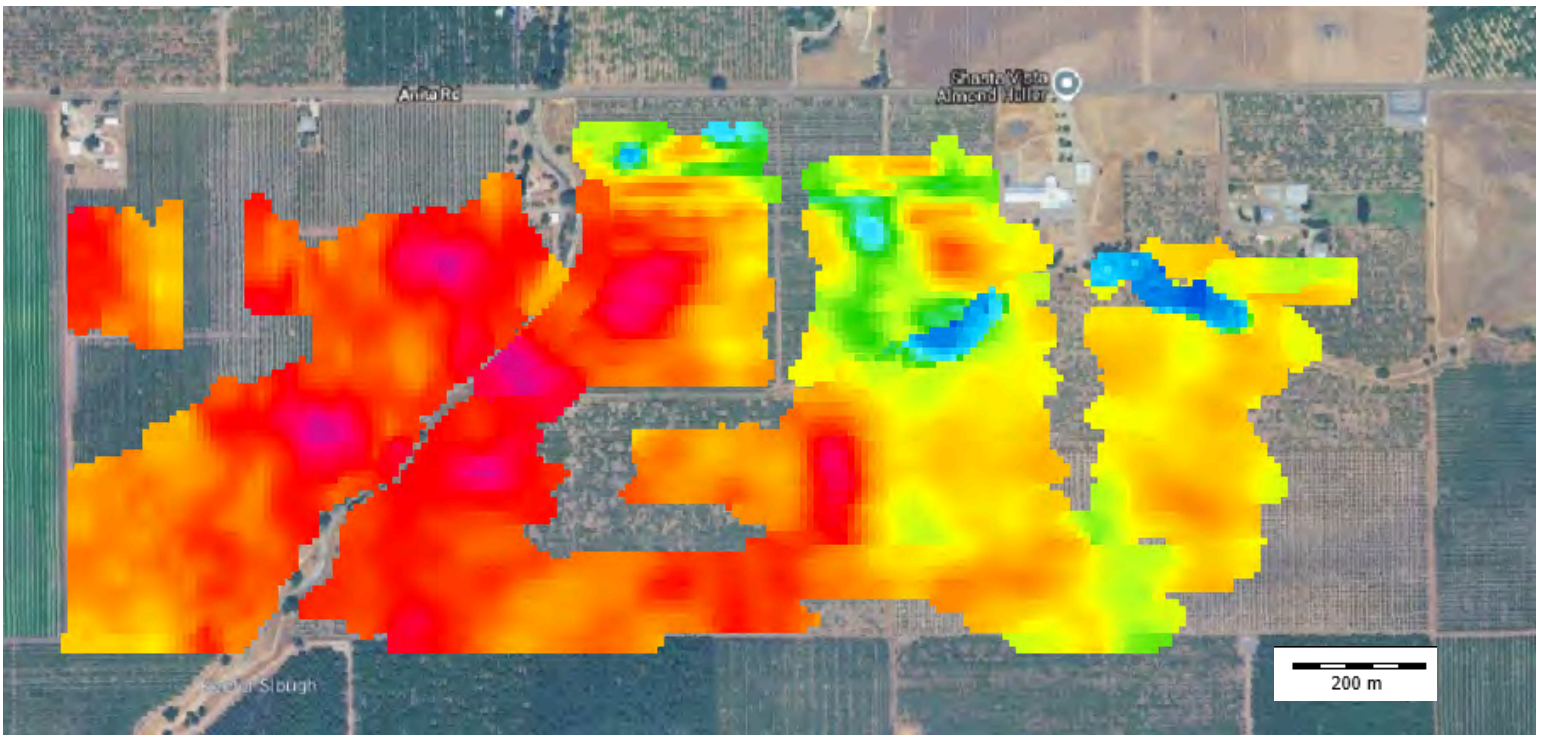

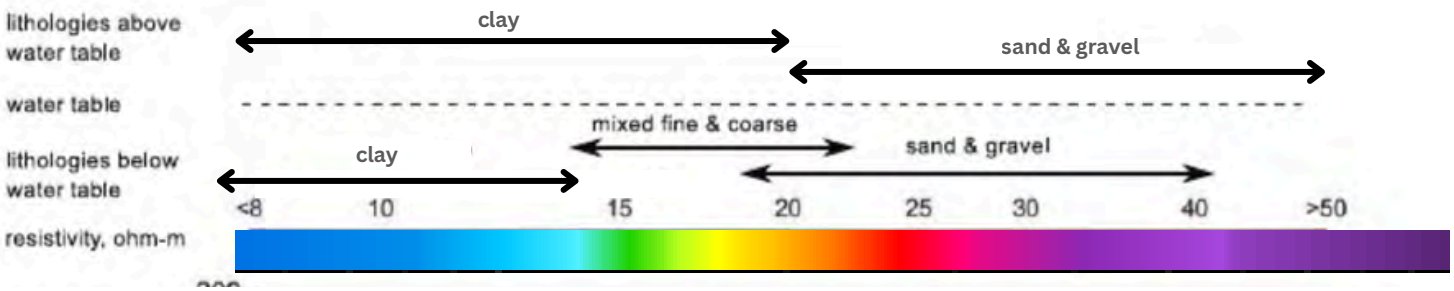

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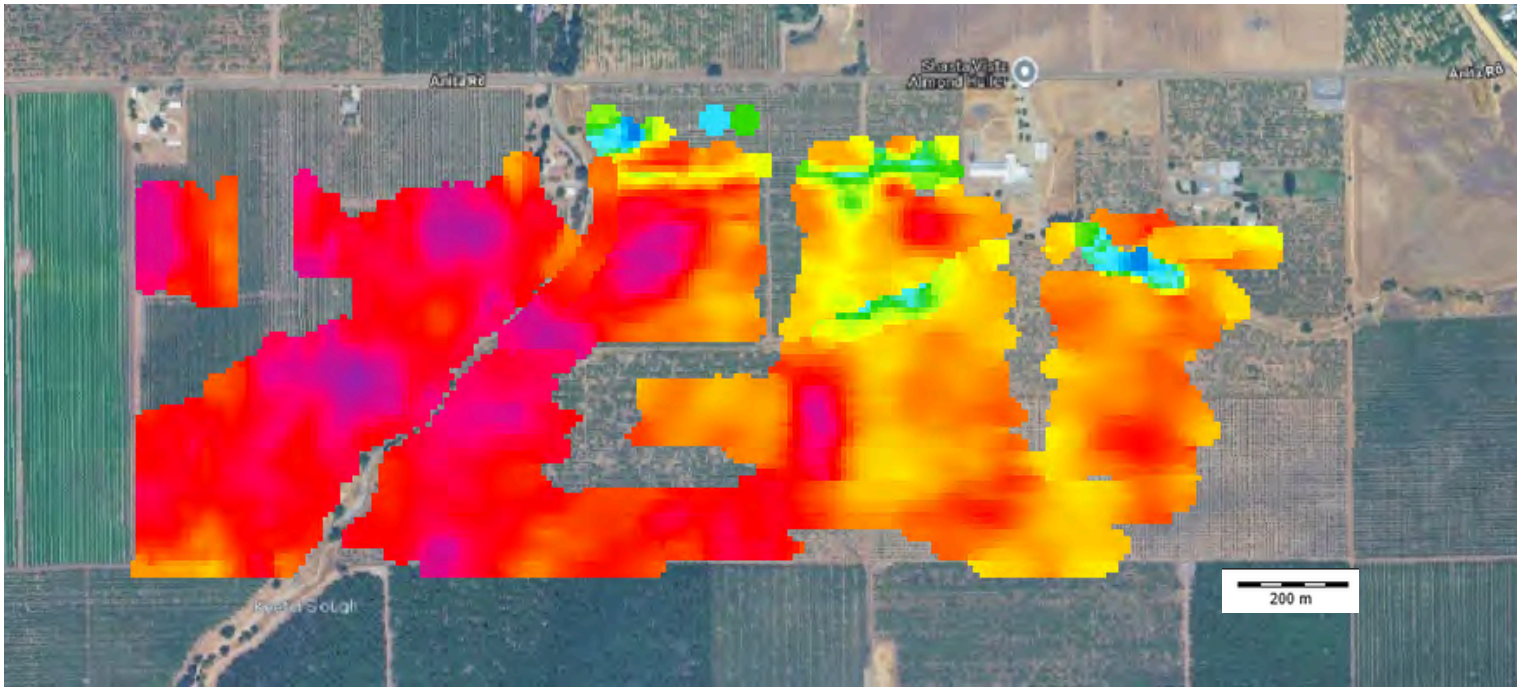

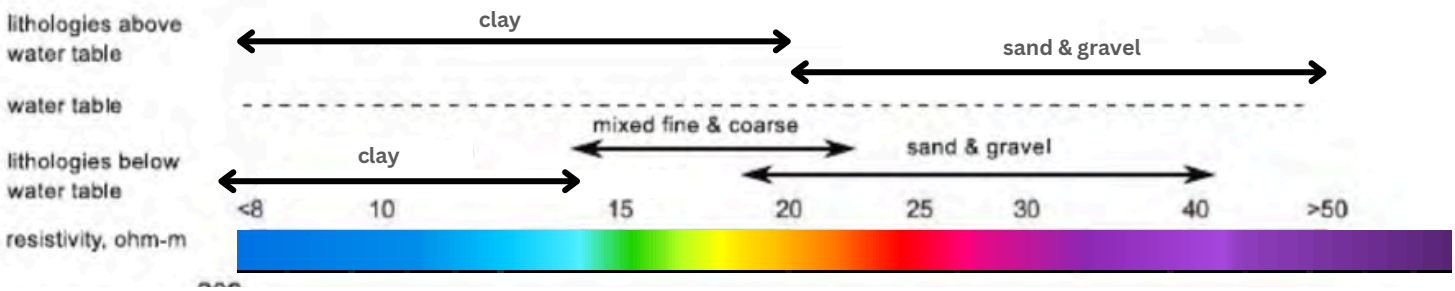

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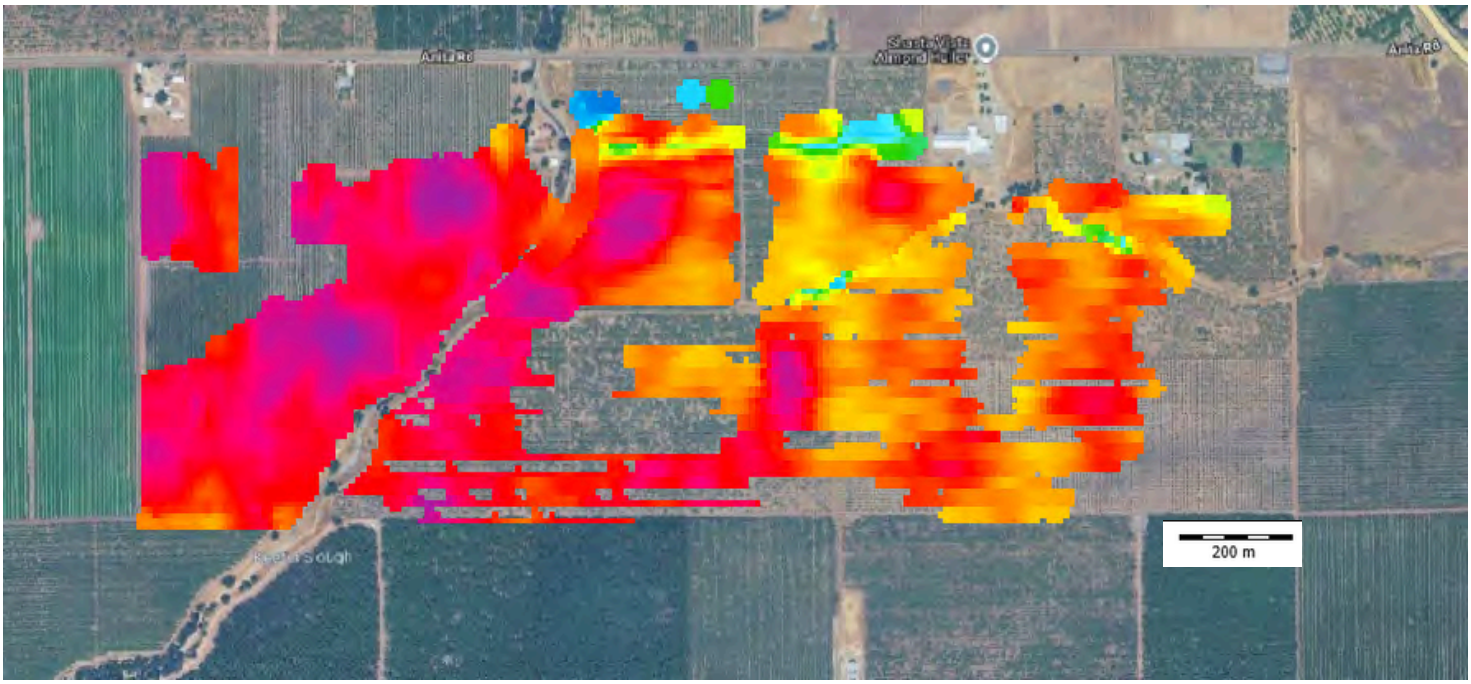

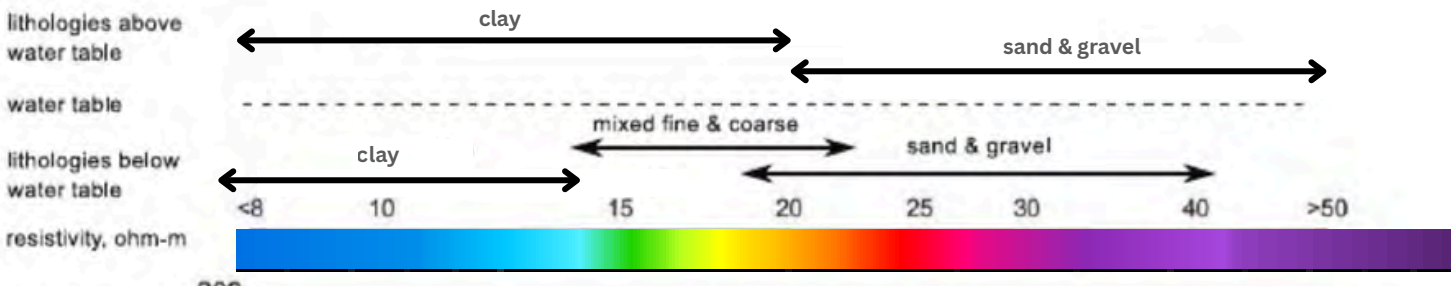

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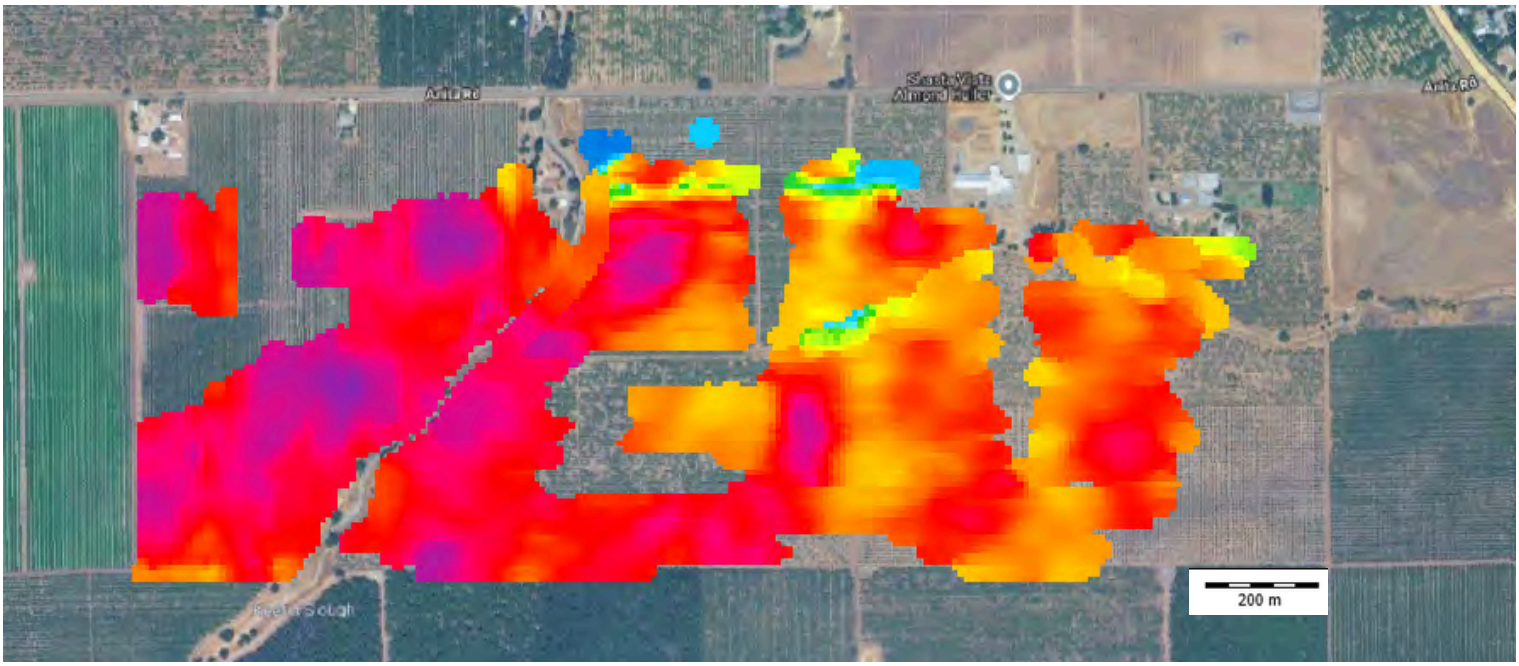

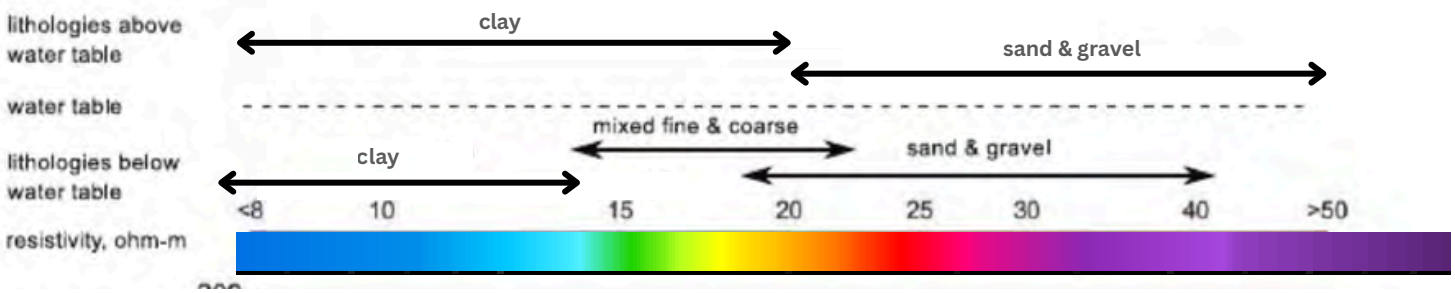

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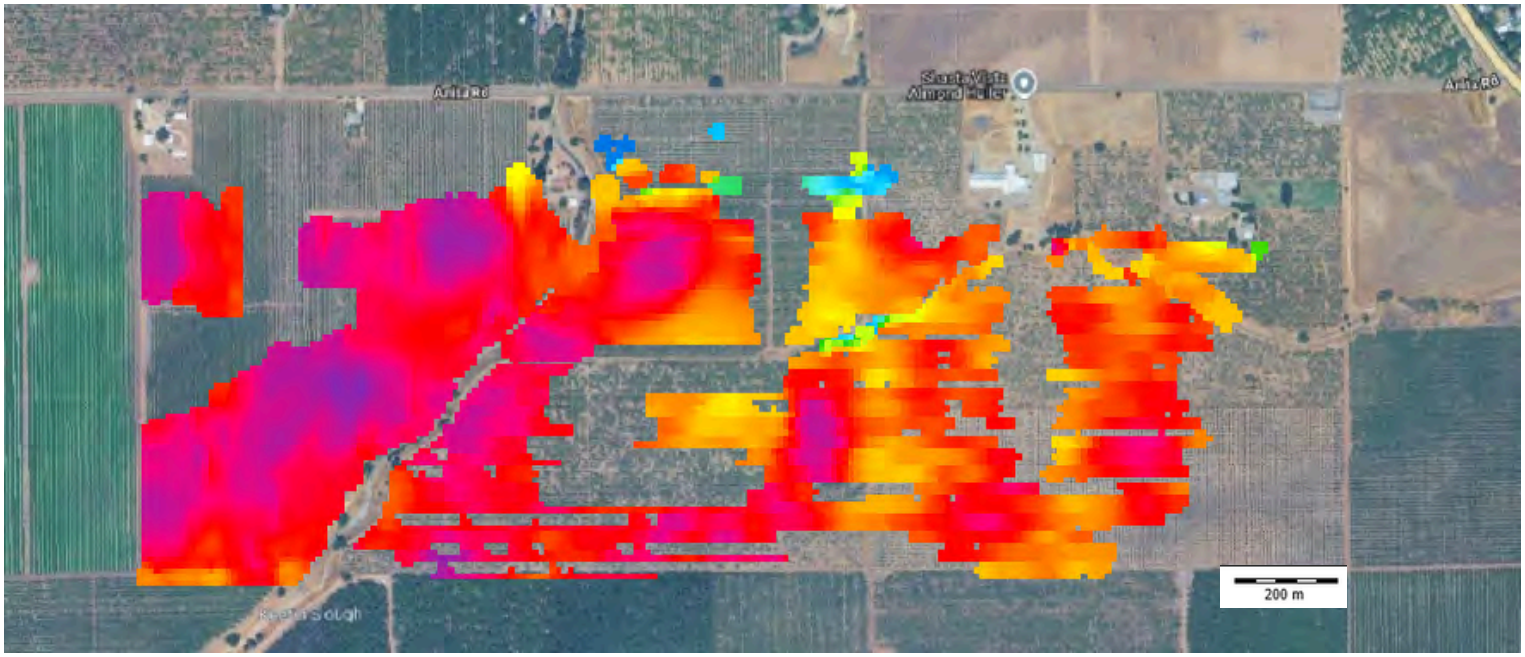

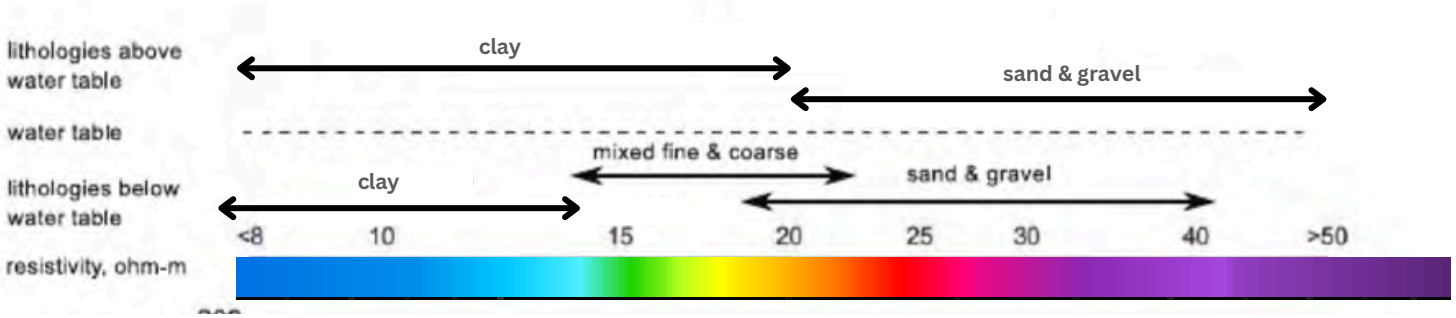

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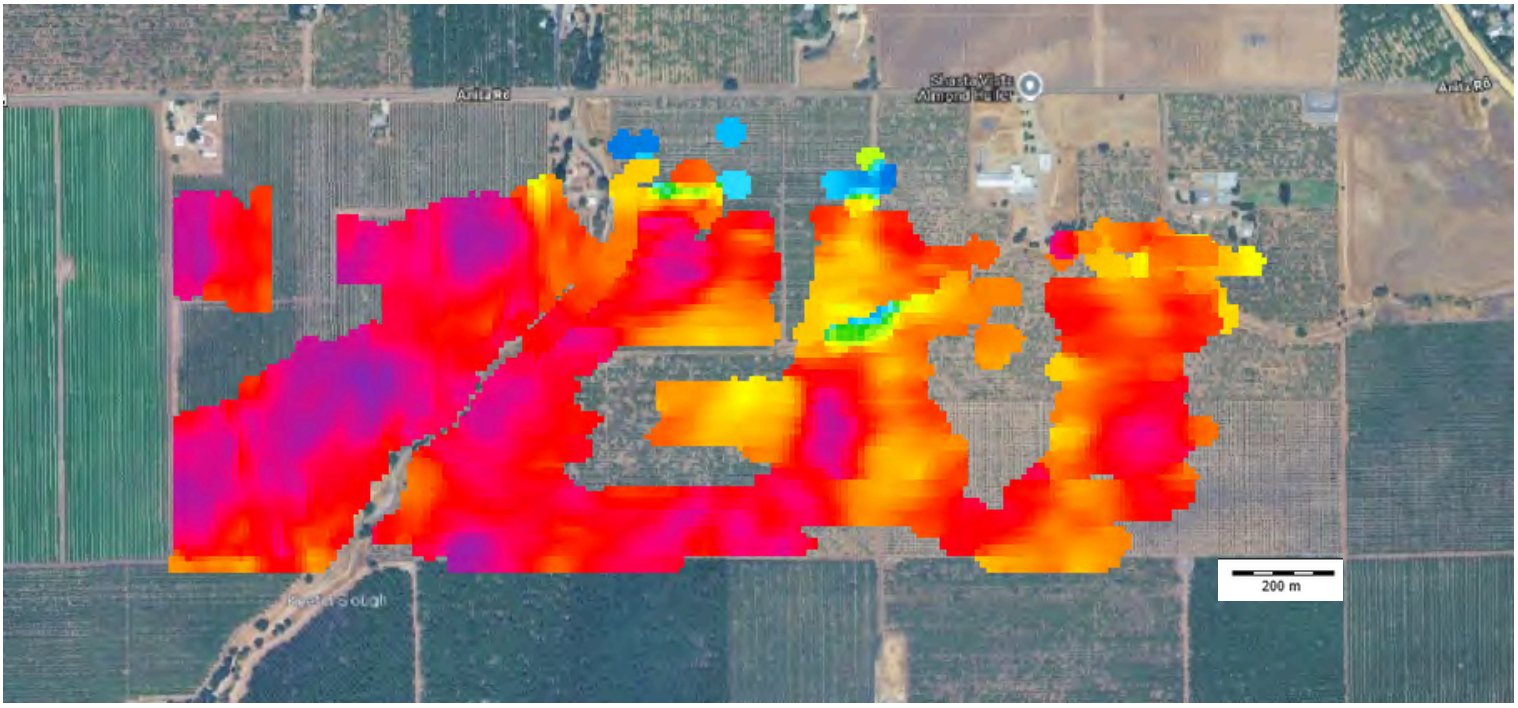

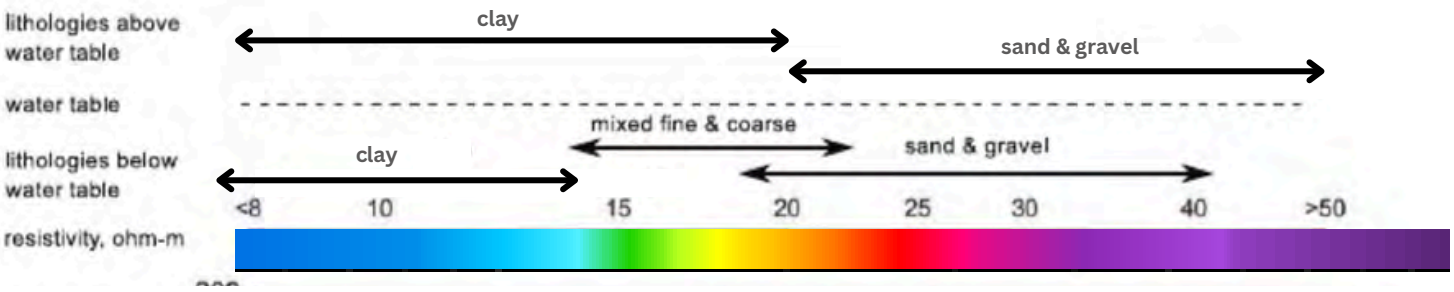

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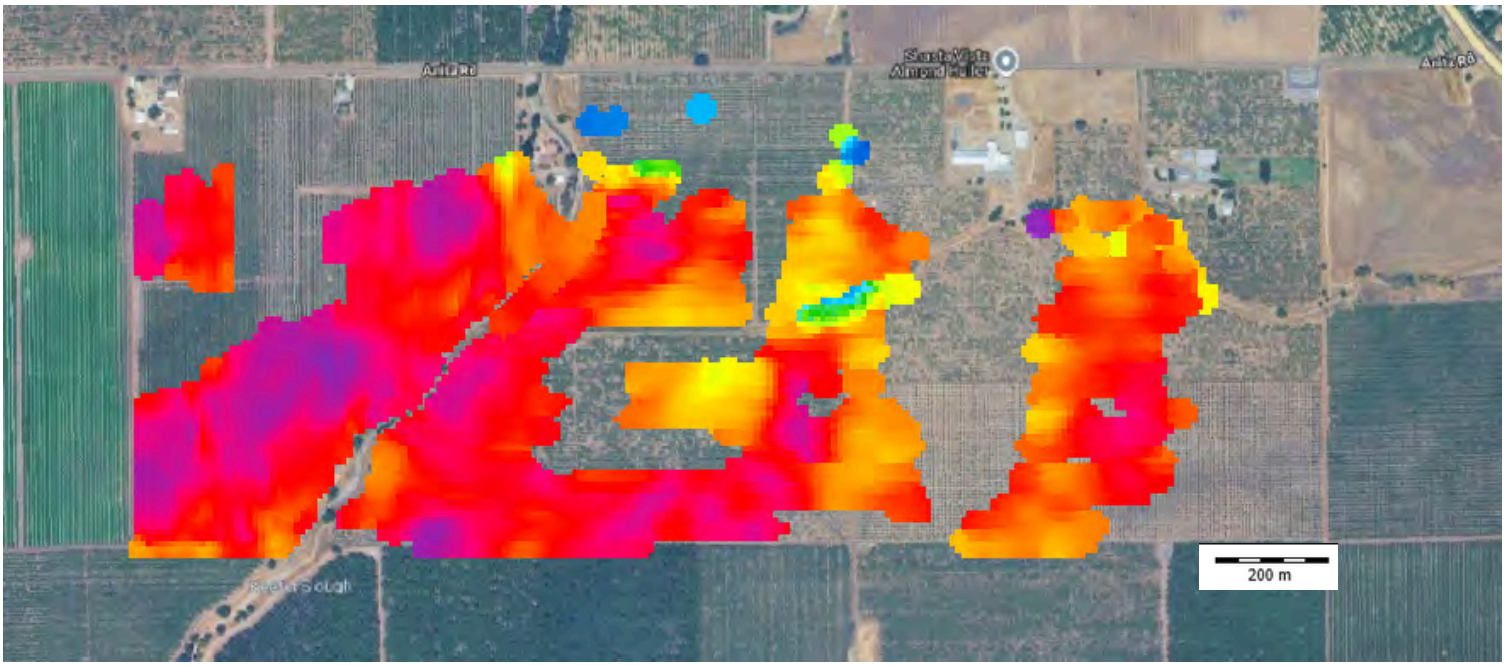

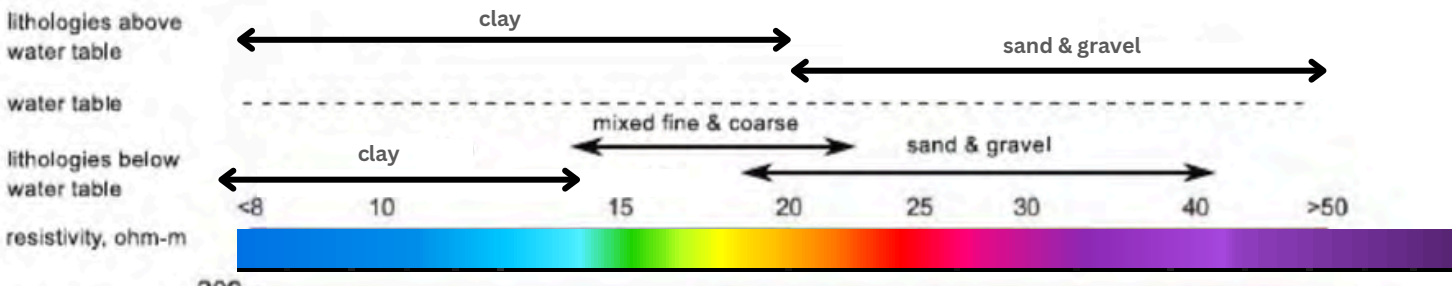

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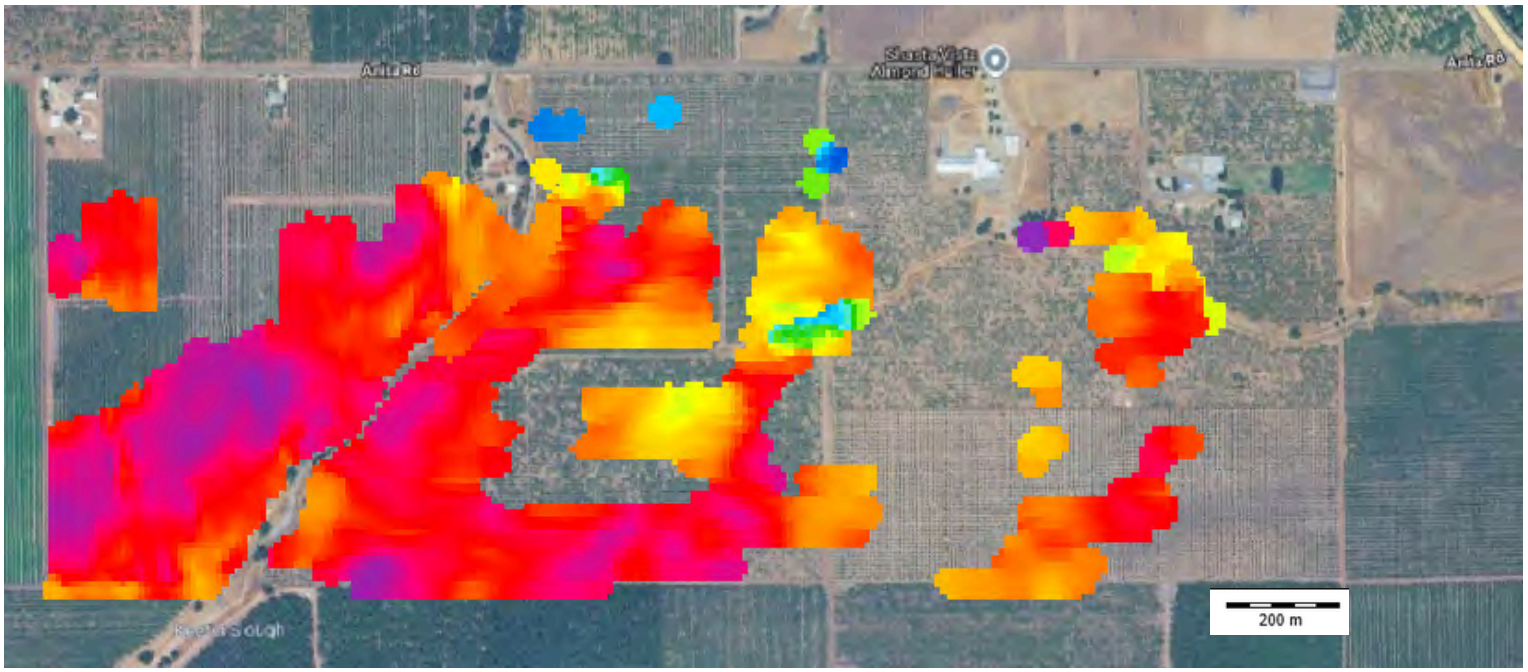

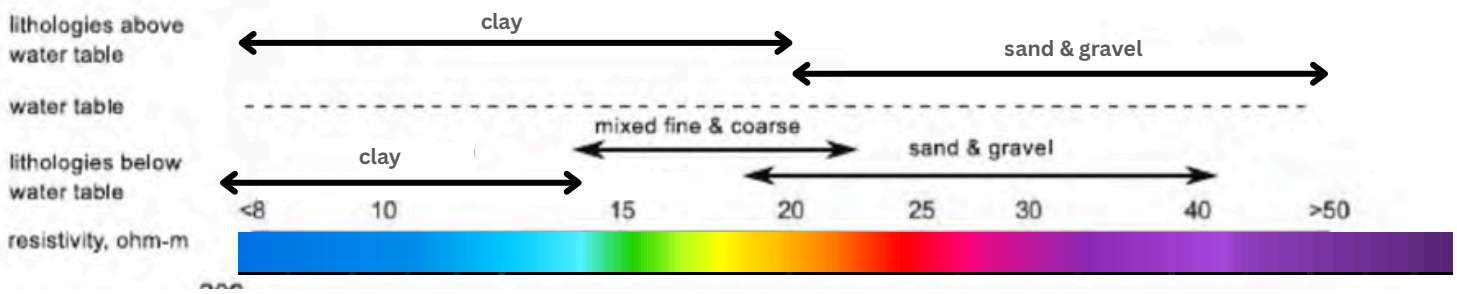

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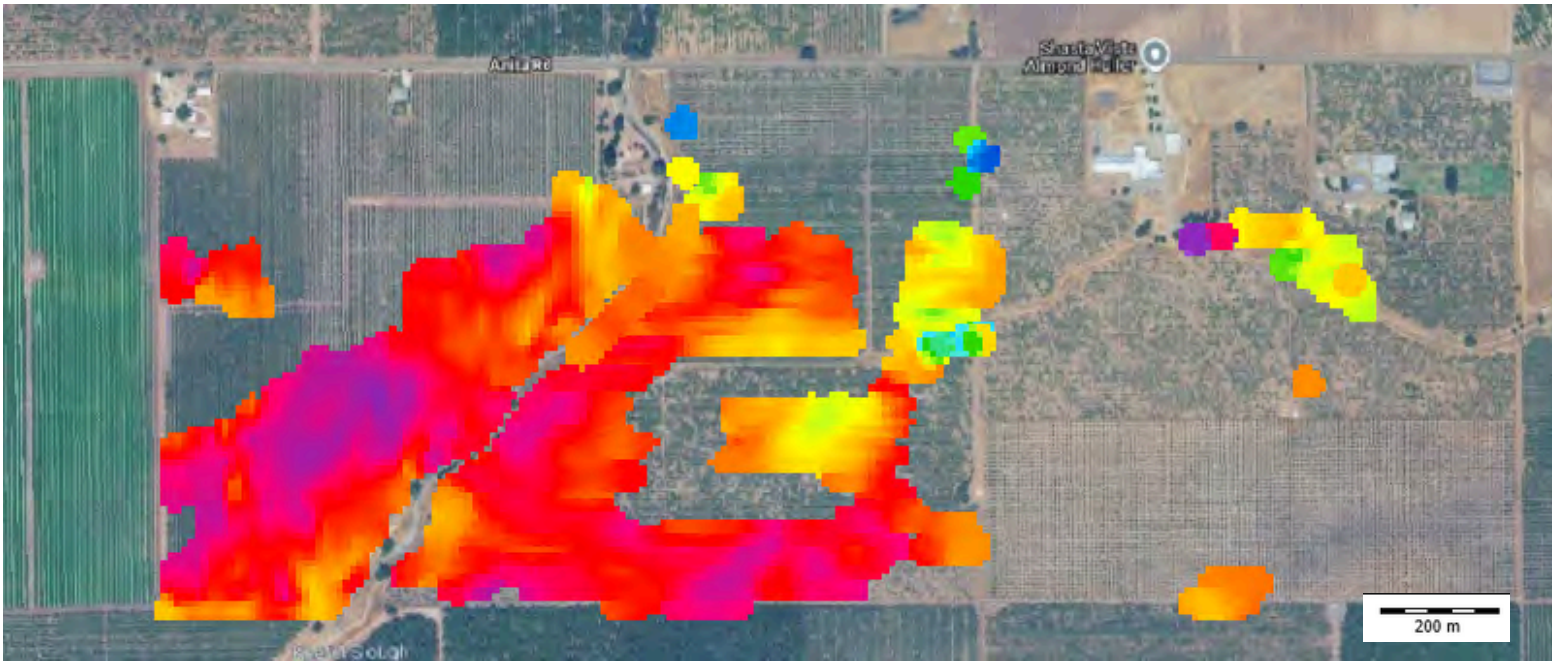

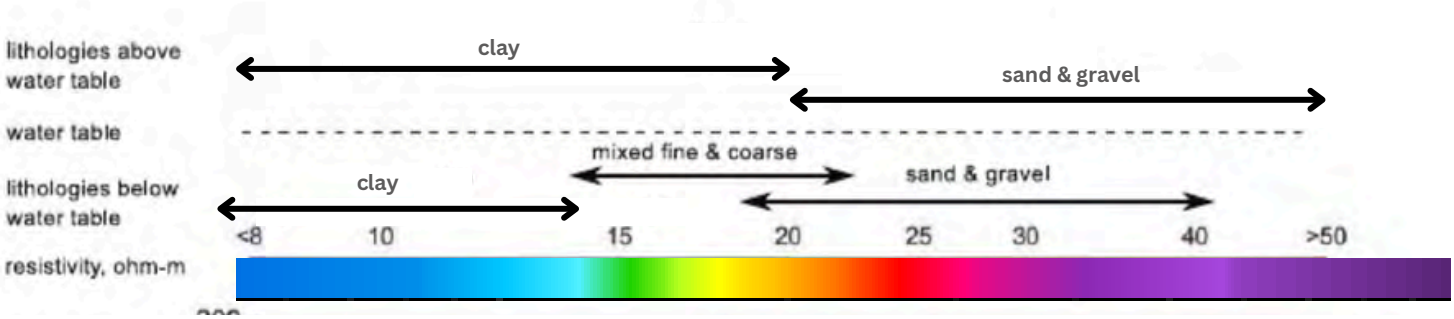

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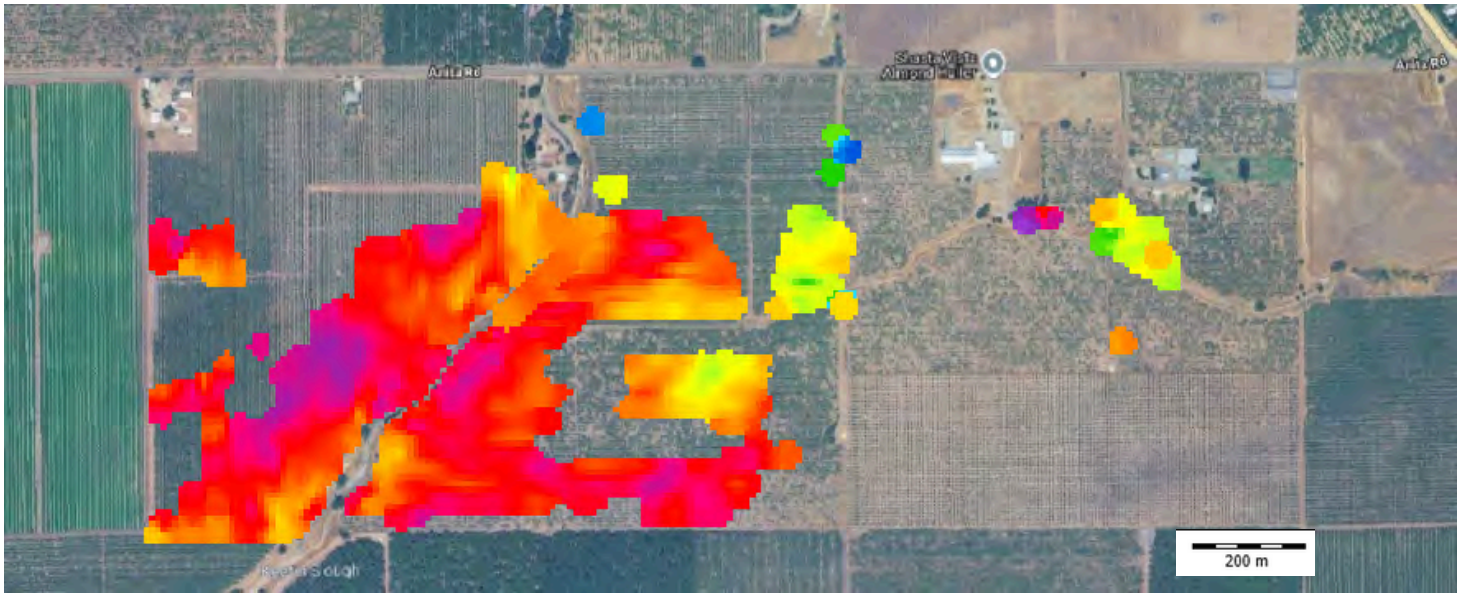

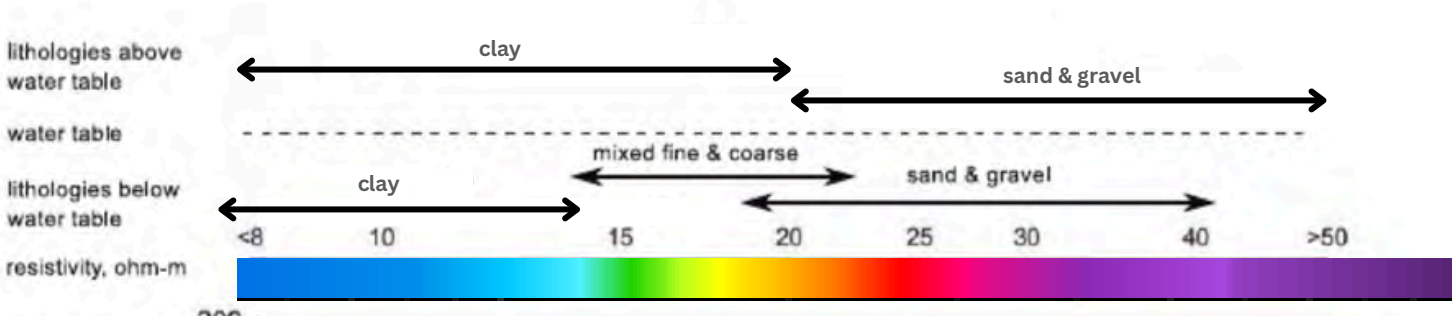

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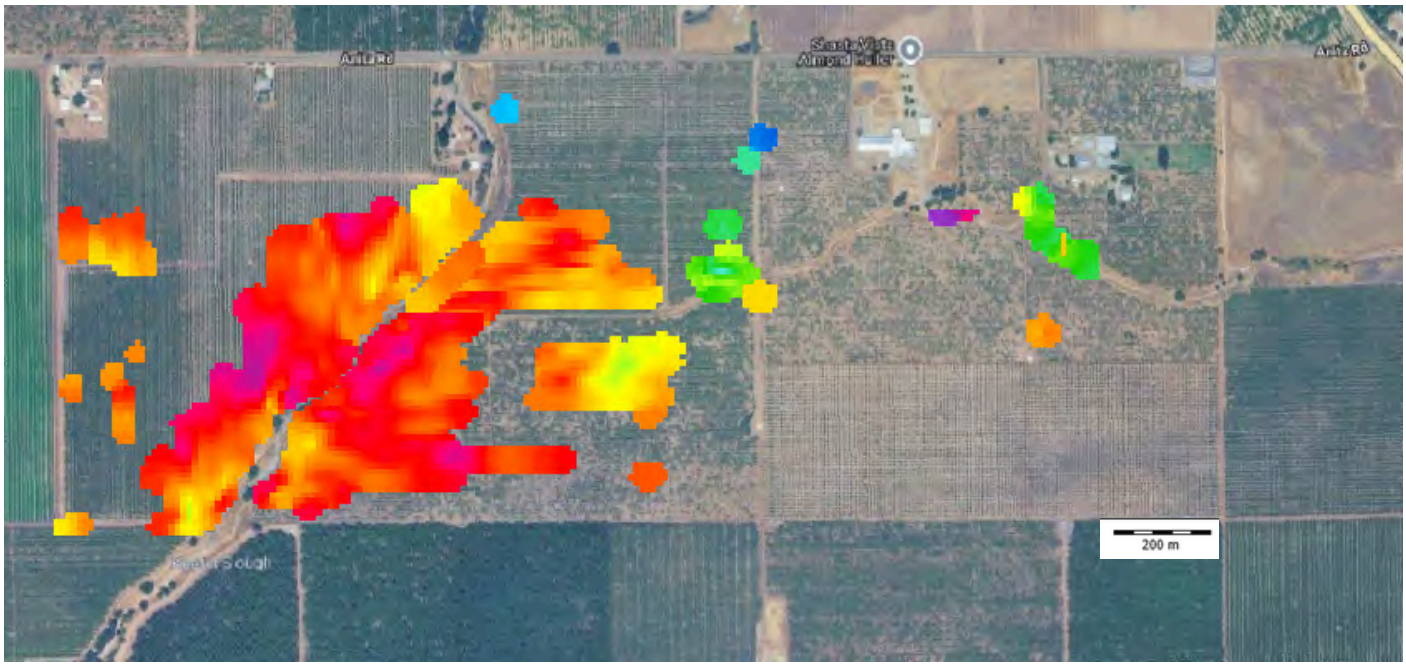

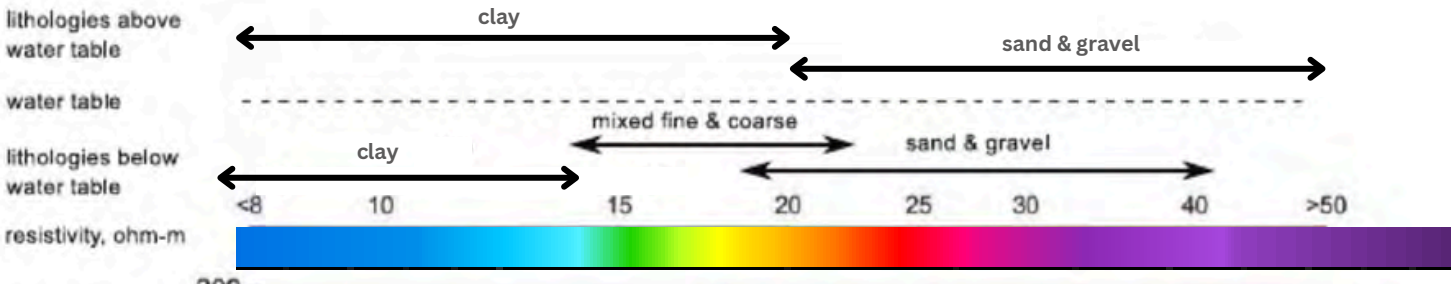

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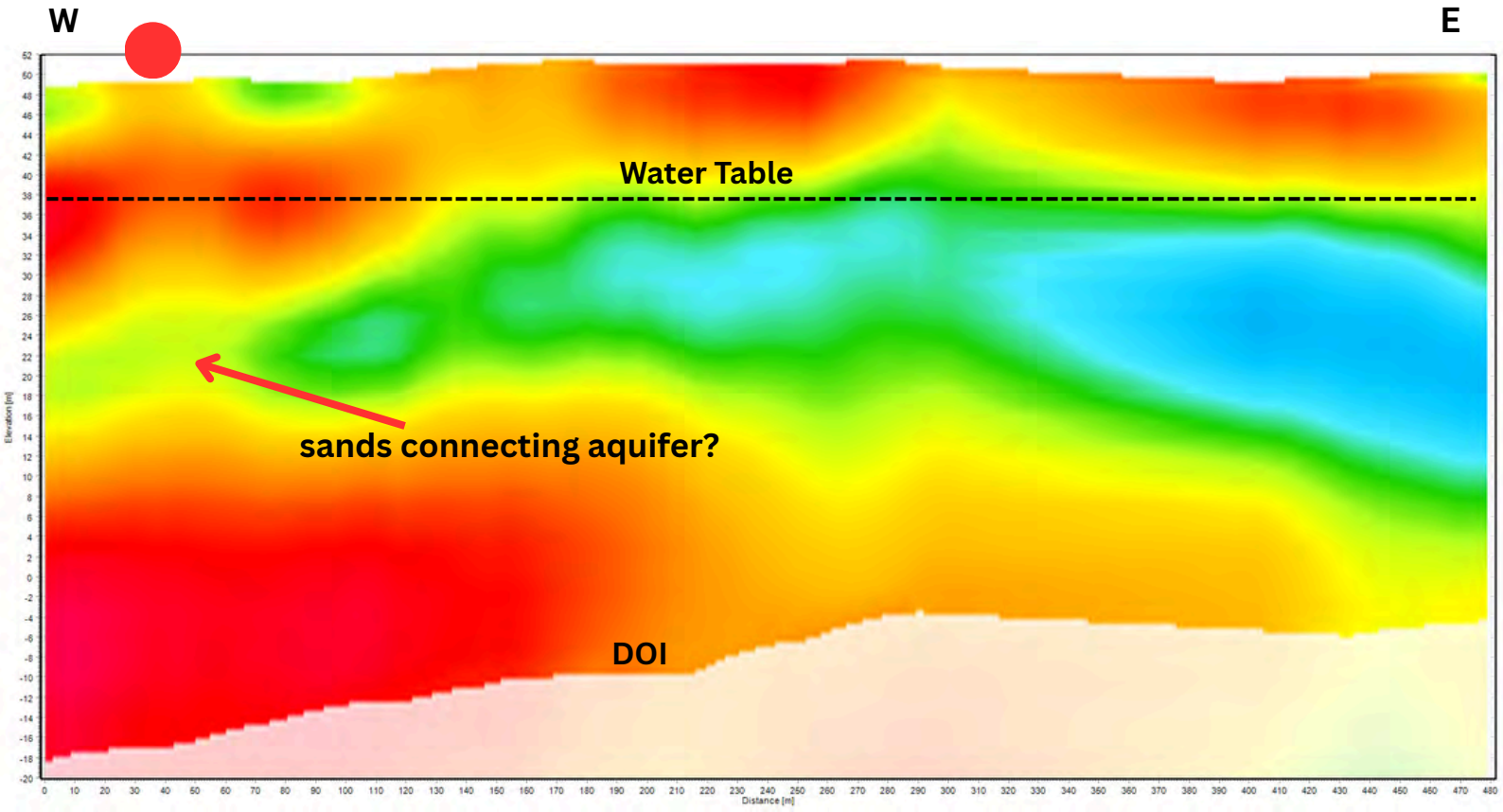

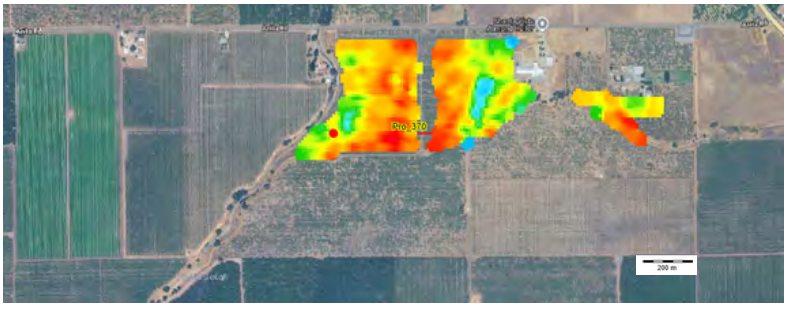

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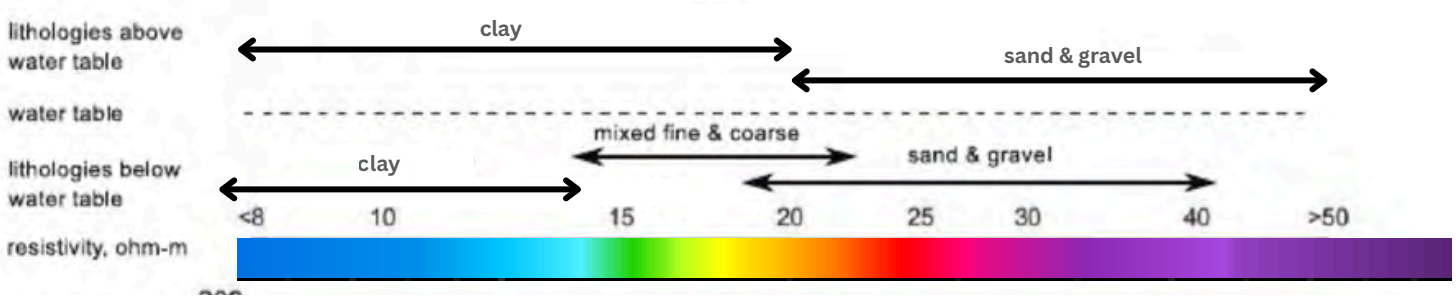

2D CROSS SECTION- PRODAY2_130

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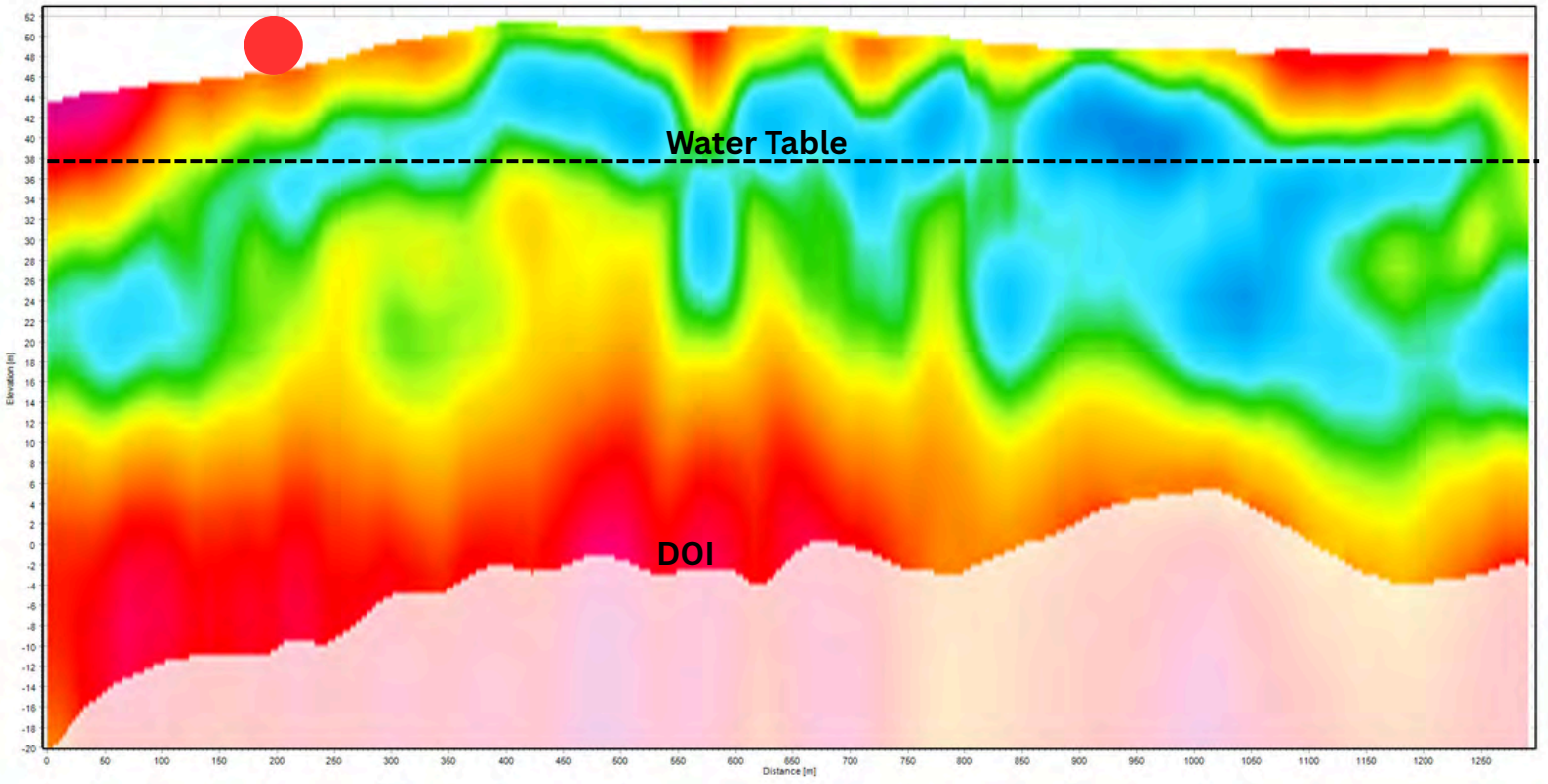

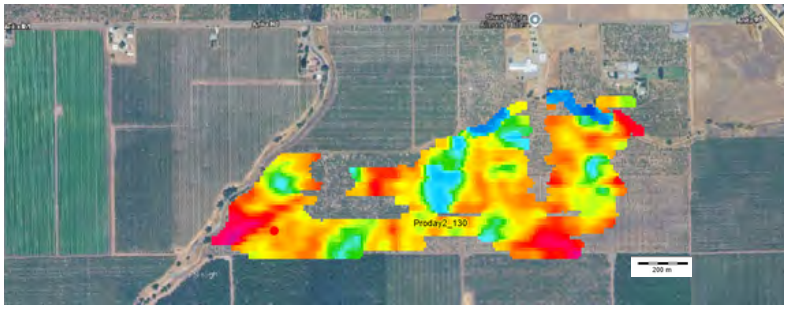

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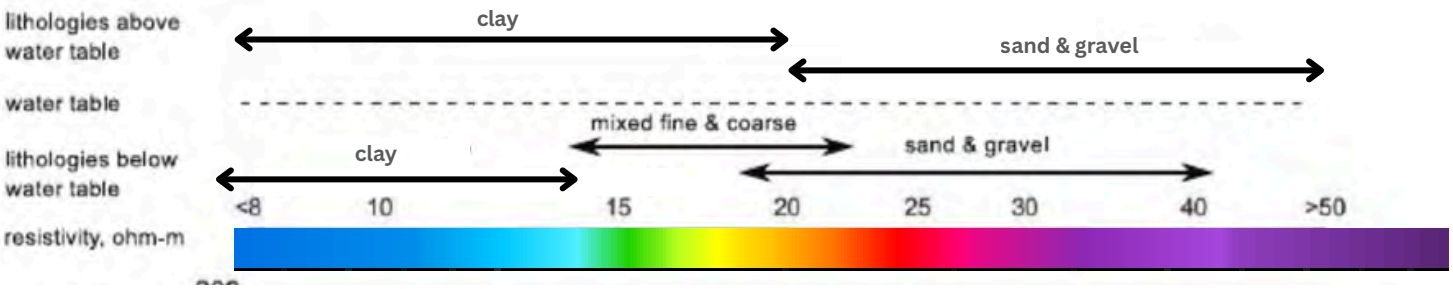

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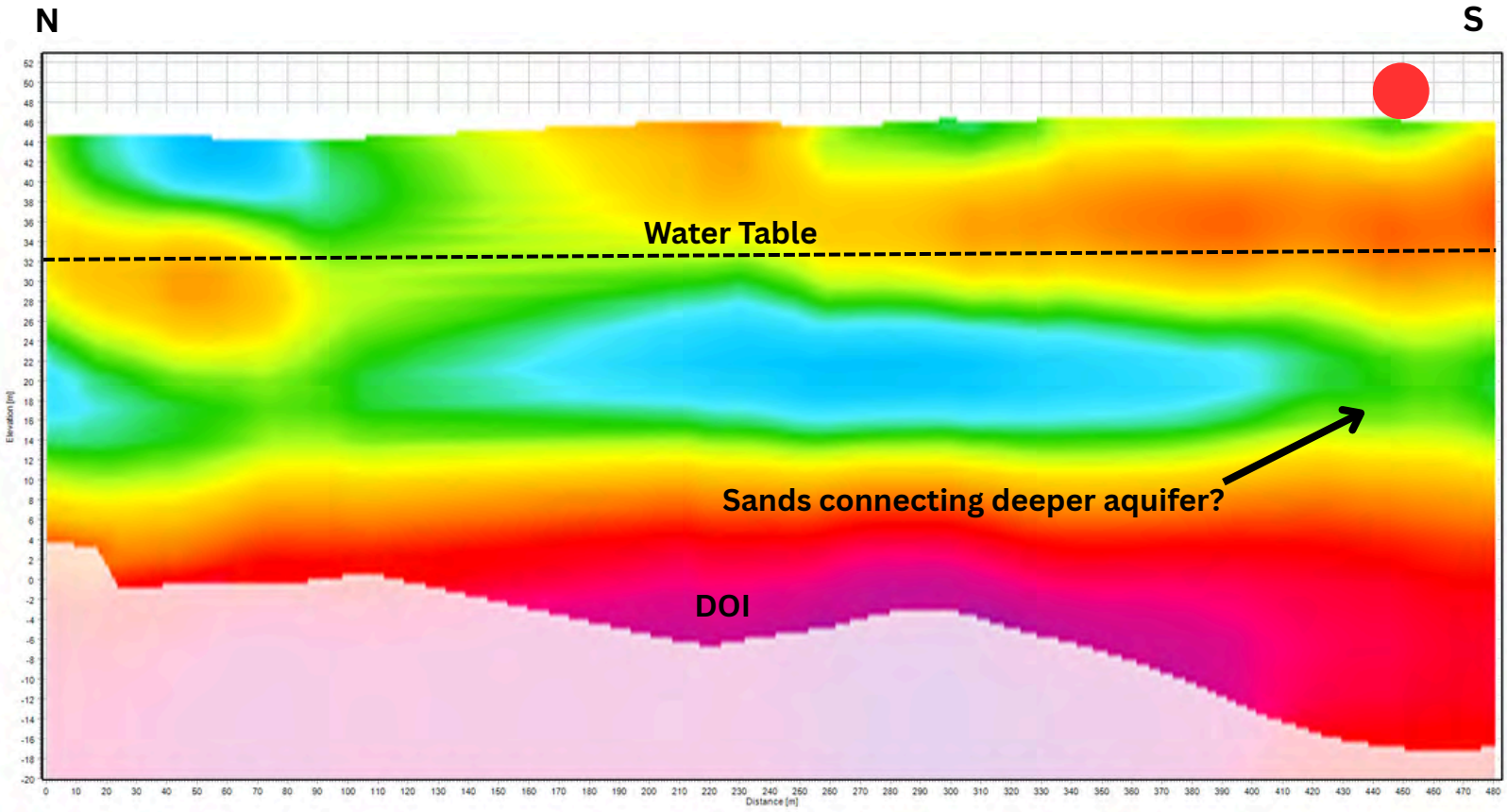

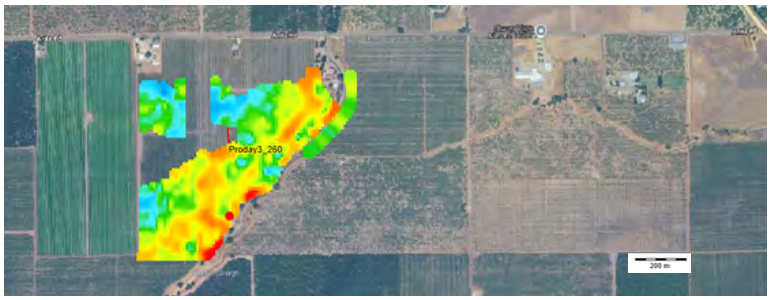

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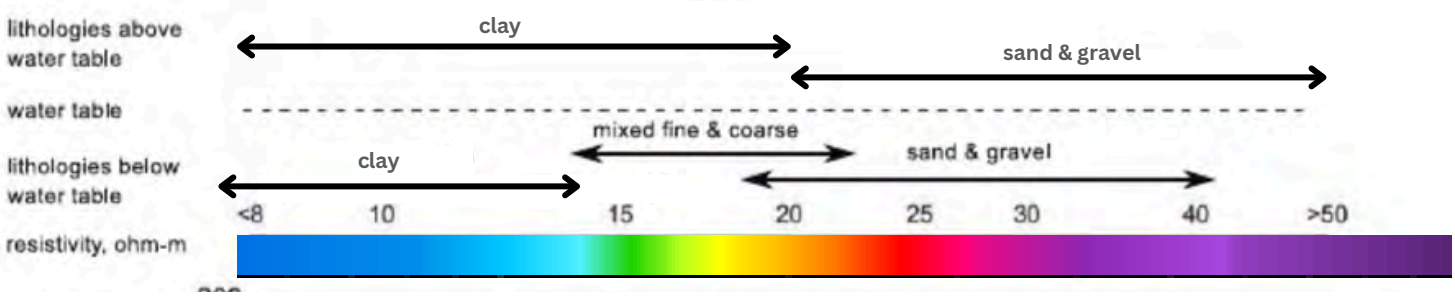

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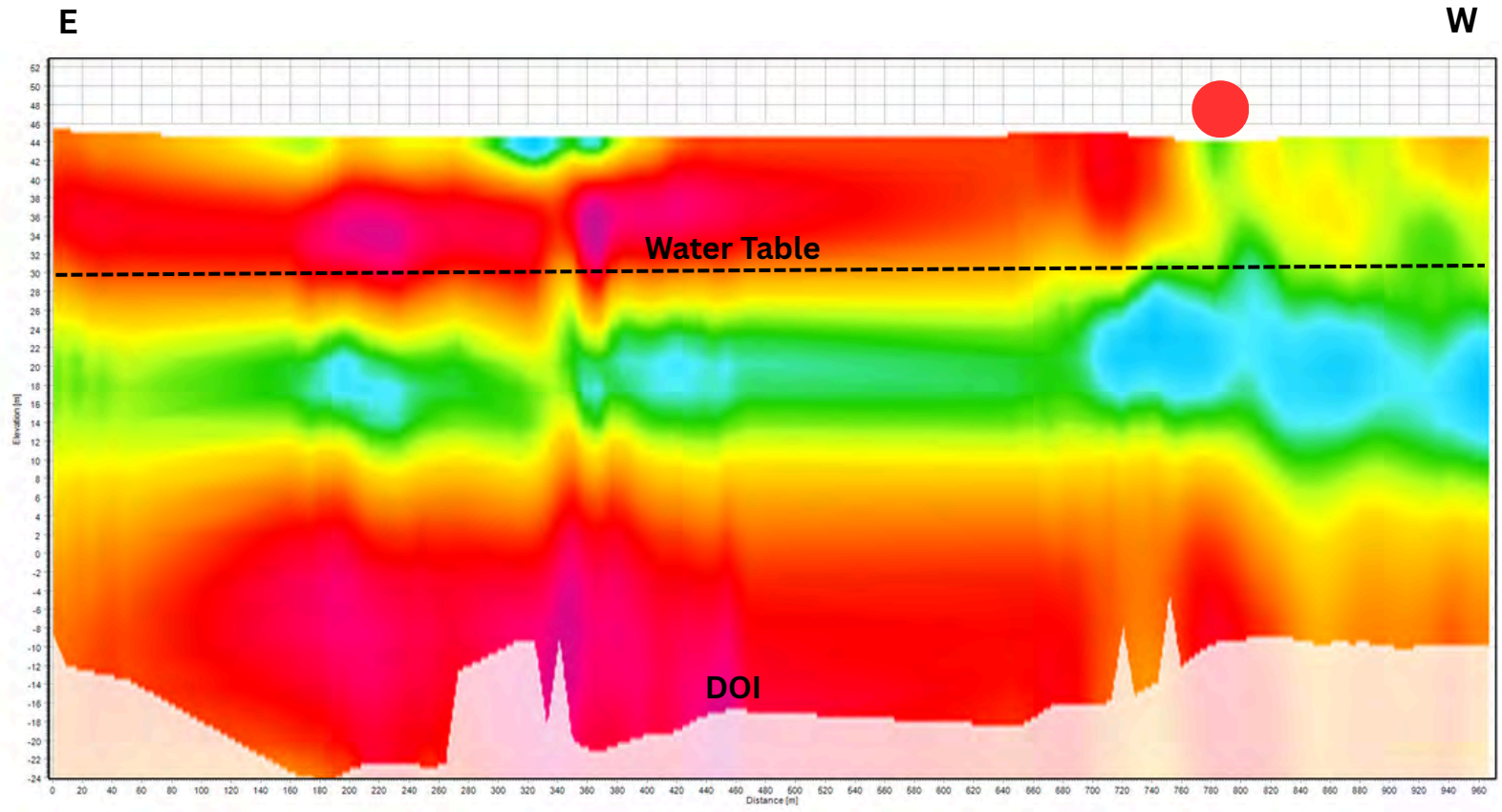

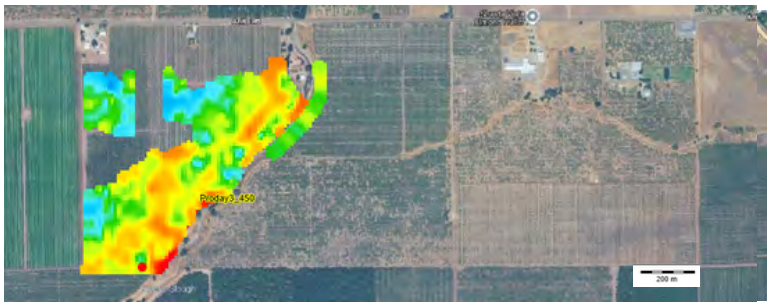

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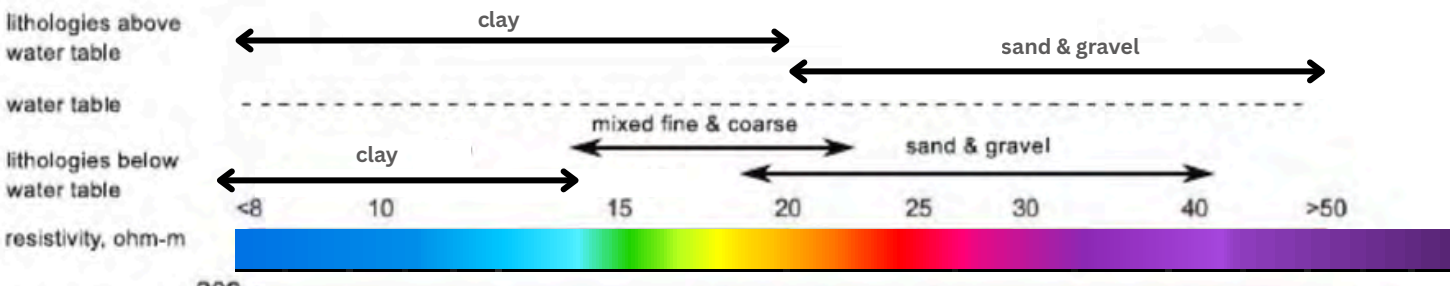

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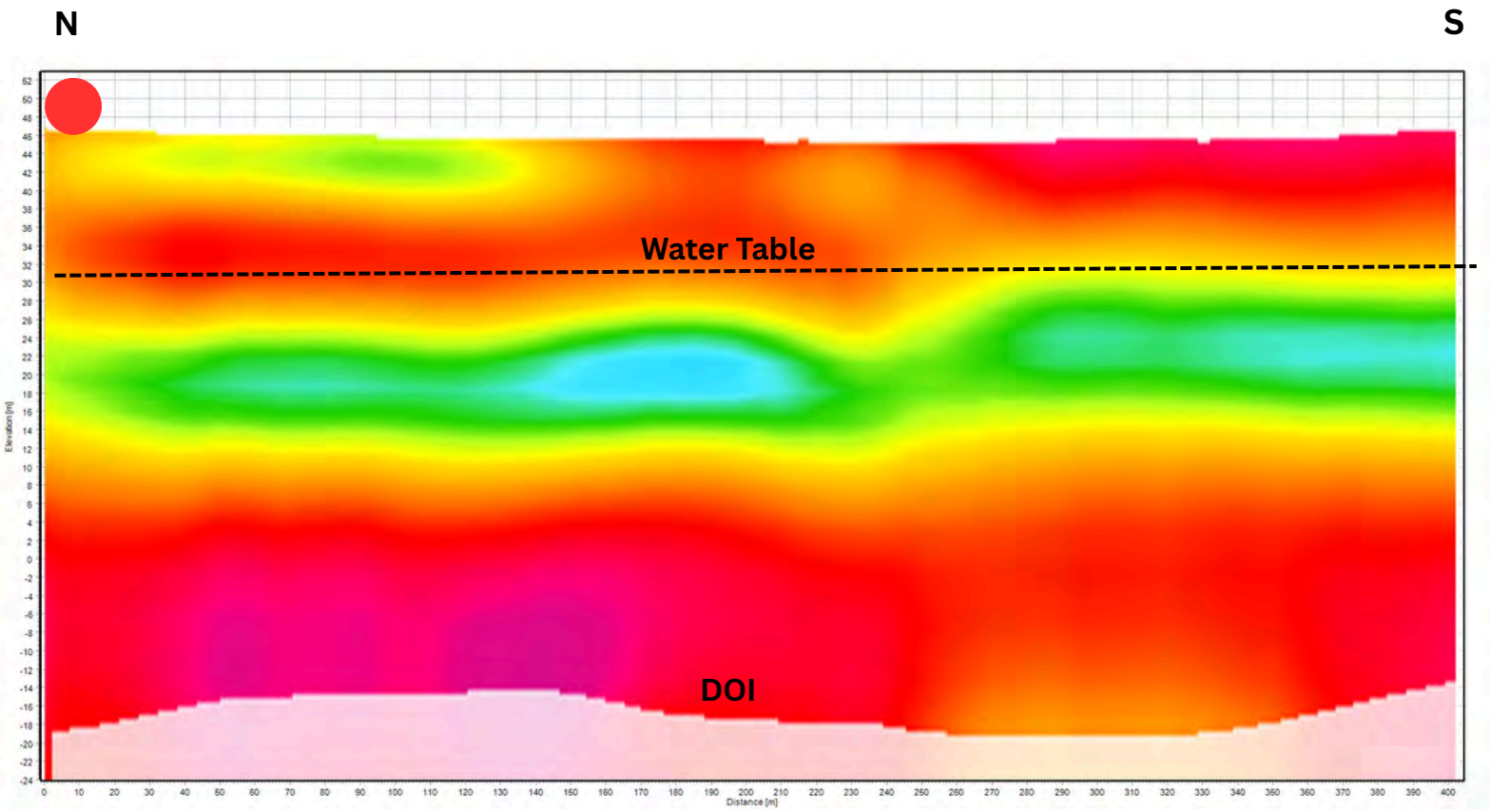

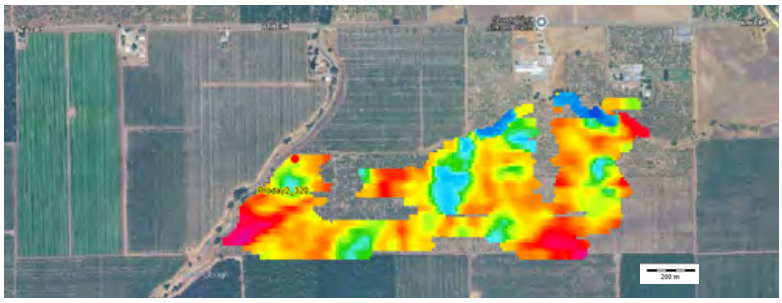

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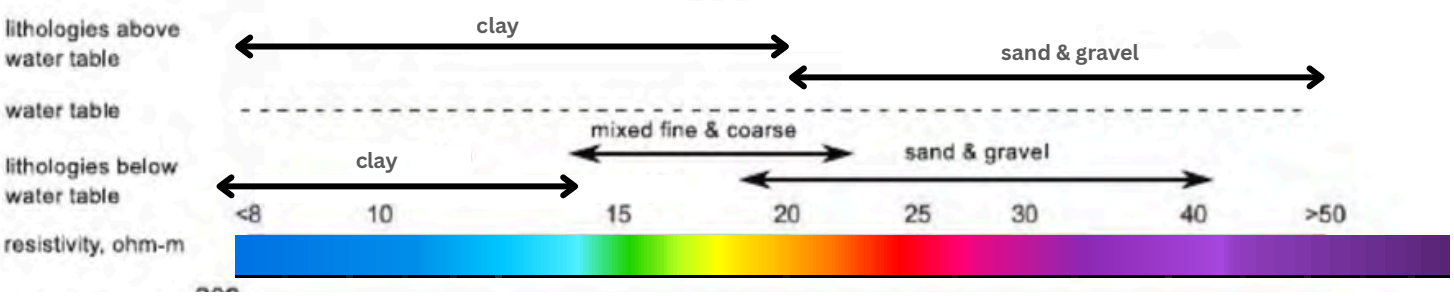

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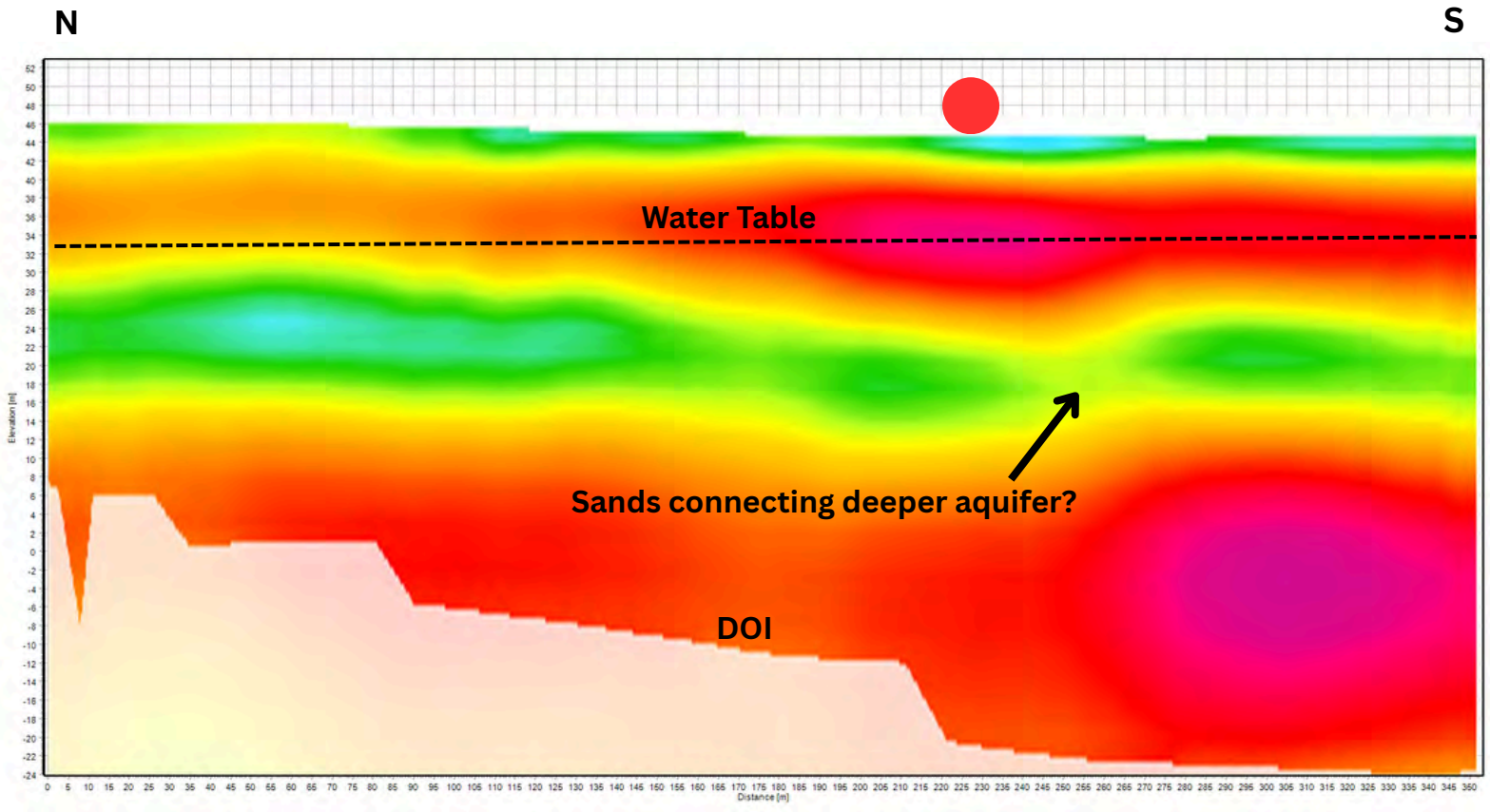

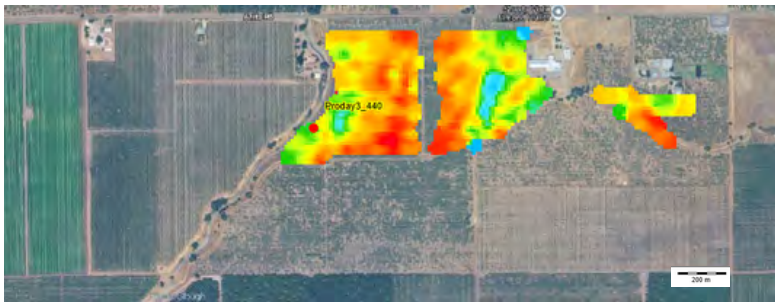

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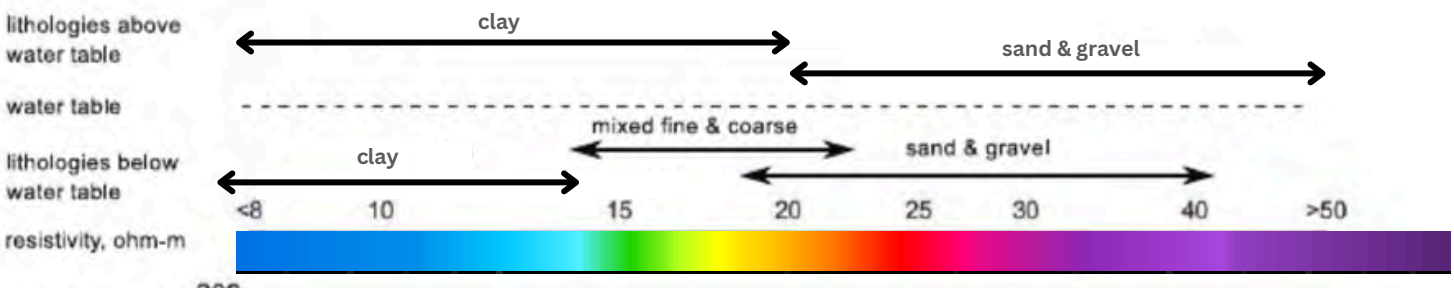

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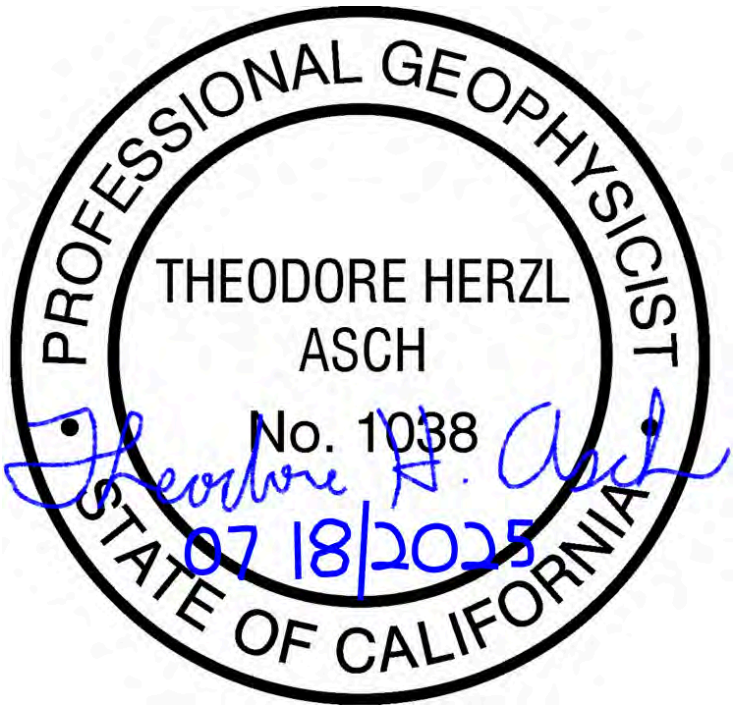
DELIVERABLES-

- Zip File dropbox link (ttemdatarice.zip)
  - Rice Groundwater Mapping Report.pdf
  - Workbench file folder (ttemdatarice1)
  - Workbench ttem set up files .gex & .tfi
  - Raw ttem data files .lin & .skb (rice ttem raw data day 1, rice ttem raw data day 2, rice ttem raw data day 3)
  - Inversion data xyz files (rice sci inversion xyz final)
  - Inversion data excel file (Rice_SCI04.csv)

STATE OF CALIFORNIA PROFESSIONAL GEOPHYSICIST STAMP



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GroundWaterMaps

Groundwater Aquifer Mapping

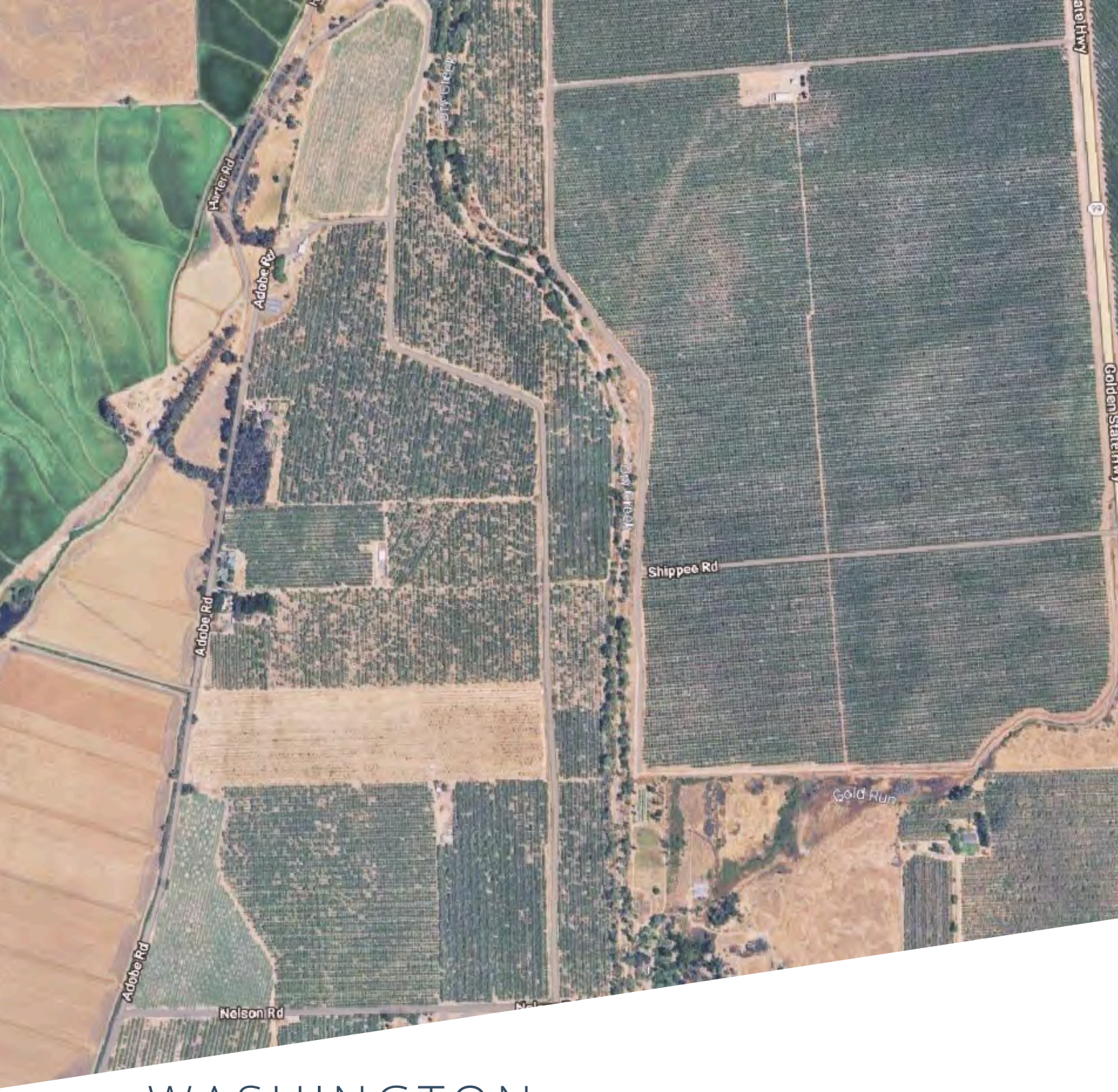
Contact:
Nathan Azevedo

(530) 717-0679

Maxwell, CA

nathan@groundwatermaps.com

Site S6



WASHINGTON GROUNDWATER MAPPING REPORT

JAN 5, 2026// PREPARED BY
GROUNDWATERMAPS

REPORT

- **Objective:** To determine the suitability of the Washington project area to surface groundwater recharge.

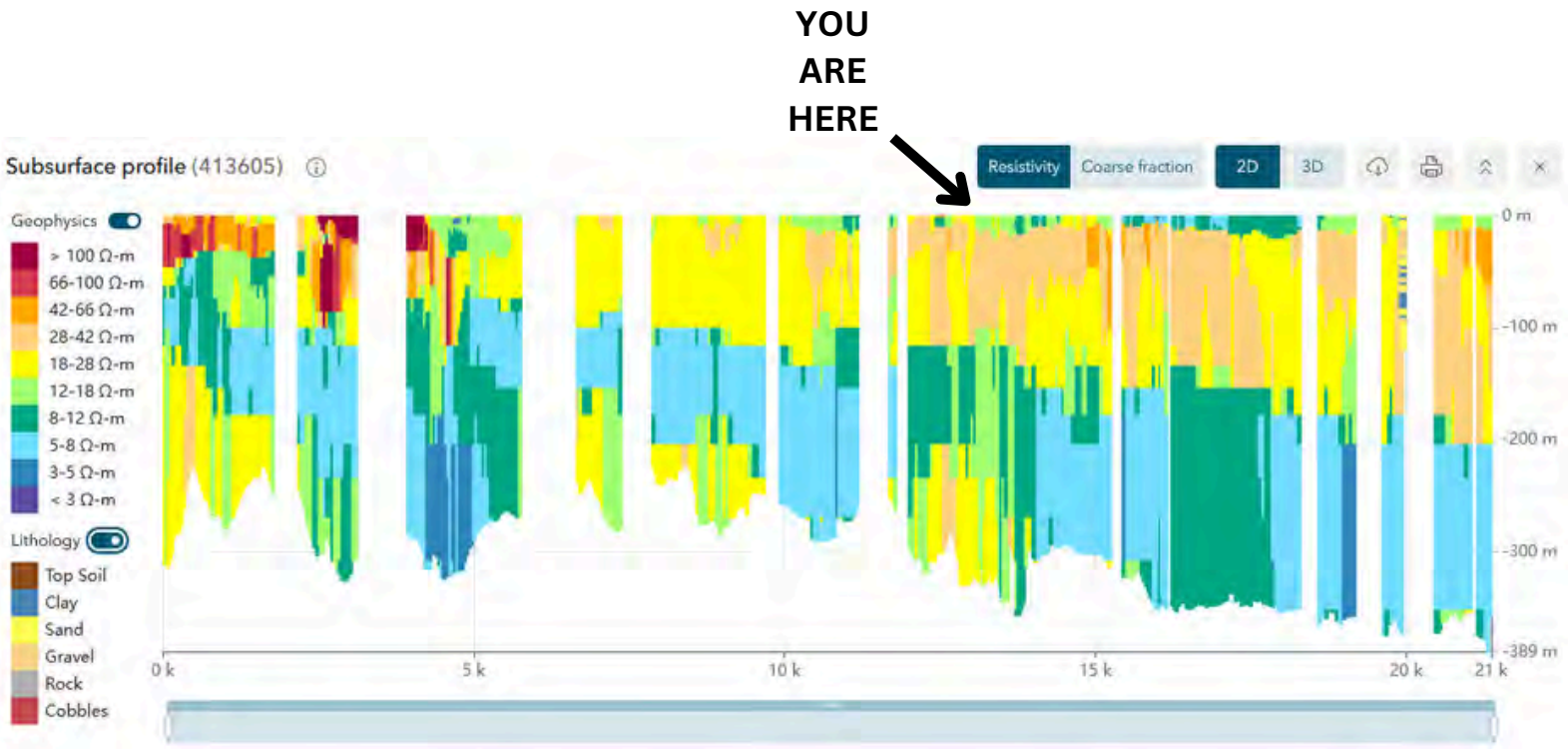
- **Methods:**
  - DWR Aerial Electromagnetic Survey
  - Soil Agricultural Groundwater Banking Index (SAGBI)
  - NRCS Soil Map
  - California Statewide Groundwater Elevation Monitoring (CASGEM)
  - TTem Towable Electromagnetic Survey
    - Survey Conducted by GroundWaterMaps- Nathan Azevedo
      - Survey Dates- December 18, 2025
      - Survey Location- 7786 Adobe Rd, Durham, CA 95938
- **Results:**
  a. The DWR AEM survey (page 3) that passed near the Washington project area revealed resistive (sand/gravel) geology in the near surface that should deem the nearby study area conducive to surface groundwater recharge.
  b. The Soil Agricultural Groundwater Banking Index (SAGBI) (page 6) identifies the project area as to having “poor” groundwater recharge suitability. Though the NRCS Soil Map (page 4) identifies the survey area as to having geology with ksat values (page 5) consistent with soil types suitable to groundwater recharge.
  c. Local California Statewide Groundwater Elevation Monitoring (CASGEM) data reveals depth to groundwater at 59 feet. (page 11)
  d. Though the TTem survey revealed a conductive clay layer impeding groundwater recharge throughout much of the survery area (page 18-21, 46-47), the survey also identified an area in the center of the project area with resistive geology that appears to break through the impeding clay layer and should allow groundwater recharge into the deeper aquifer system. (page 17-43, 44-45)

- **Conclusion:**
  - The TTem survey revealed a small area in the center portion of the Washington project area as to having resistive geology in the near surface suitable to groundwater recharge.

NOTES

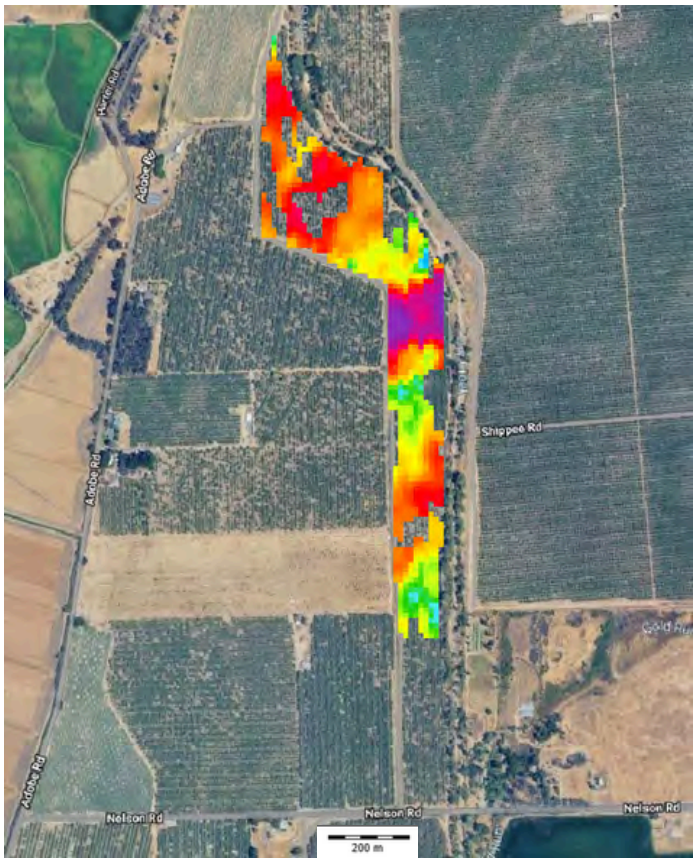
- Depth of Investigation (page 9) ranged from 30-75m.
- Due to interference from power lines, data was removed from the project area as seen on (page 8.) Residual values above 1 depict the models decreased confidence in the data and were removed.
- Depth to groundwater (water table) per (CASGEM) (page 11) is 59 feet.
- This report was reviewed and stamped by Professional Geophysicist Ted Asch, Ph.D., P.Gp. Aqua Geo Frameworks, LLC on Jan , 2026. (Page 50)

DWR AEM HELICOPTER REPORT



NRCS SOIL MAP/SOIL TYPE

- **SOIL:OXYAQUIC XEROFLUVENTS (338)**



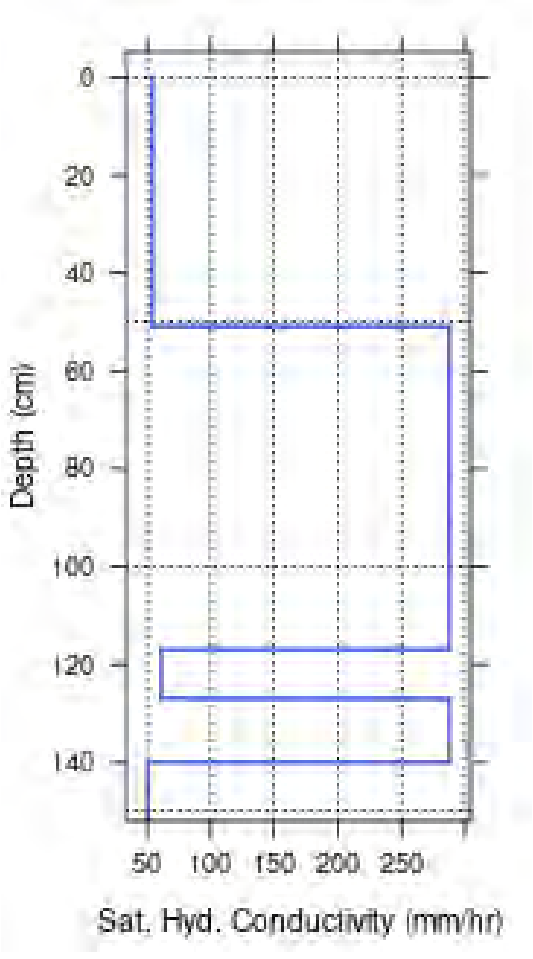
NRCS SATURATED HYDRAULIC CONDUCTIVITY (KSAT) (5 FT DEPTH)

SATURATED HYDRAULIC CONDUCTIVITY (KSAT)

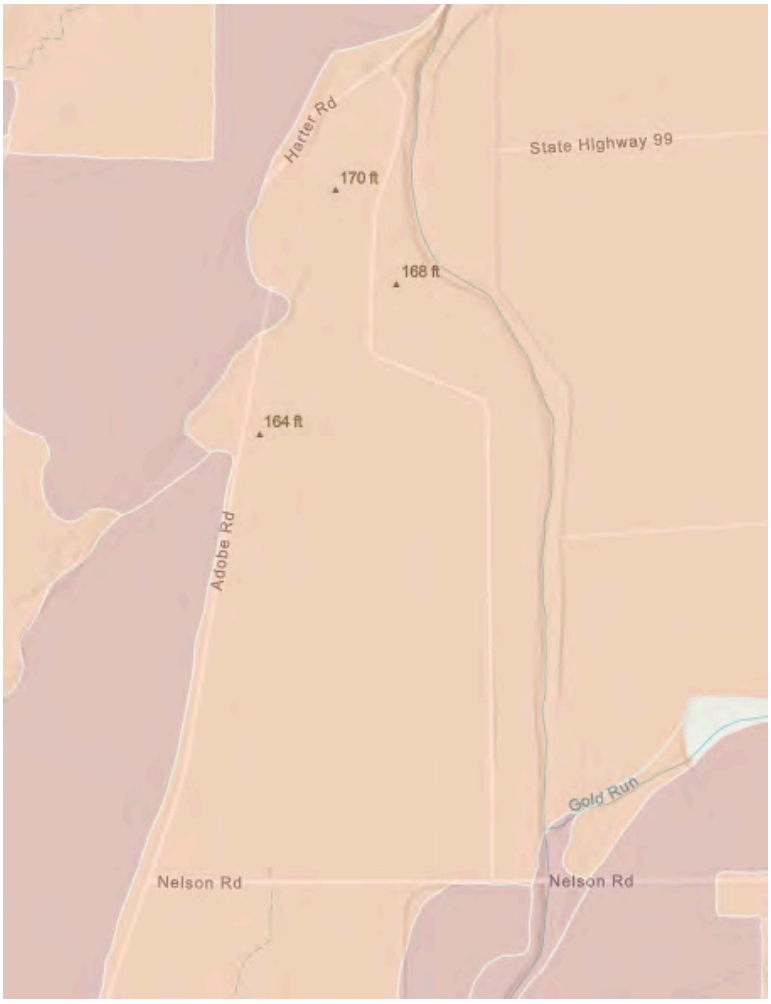
- **"SATURATED HYDRAULIC CONDUCTIVITY" IS THE EASE WITH WHICH PORES OF A SATURATED SOIL TRANSMIT WATER. FORMALLY, IT IS THE PROPORTIONALITY COEFFICIENT THAT EXPRESSES THE RELATIONSHIP OF THE RATE OF WATER MOVEMENT TO HYDRAULIC GRADIENT IN DARCY'S LAW (A LAW THAT DESCRIBES THE RATE OF WATER MOVEMENT THROUGH POROUS MEDIA). IT IS EXPRESSED IN MICROMETERS PER SECOND. TO CONVERT MICROMETERS PER SECOND TO INCHES PER HOUR, MULTIPLY MICROMETERS PER SECOND BY 0.1417. THE HISTORICAL DEFINITION OF "SATURATED HYDRAULIC CONDUCTIVITY" IS THE AMOUNT OF WATER THAT WOULD MOVE VERTICALLY THROUGH A UNIT AREA OF SATURATED SOIL IN UNIT TIME UNDER UNIT HYDRAULIC GRADIENT.**
- **SATURATED HYDRAULIC CONDUCTIVITY IS USED IN SOIL INTERPRETATIONS. IT IS ALSO KNOWN AS KSAT.**

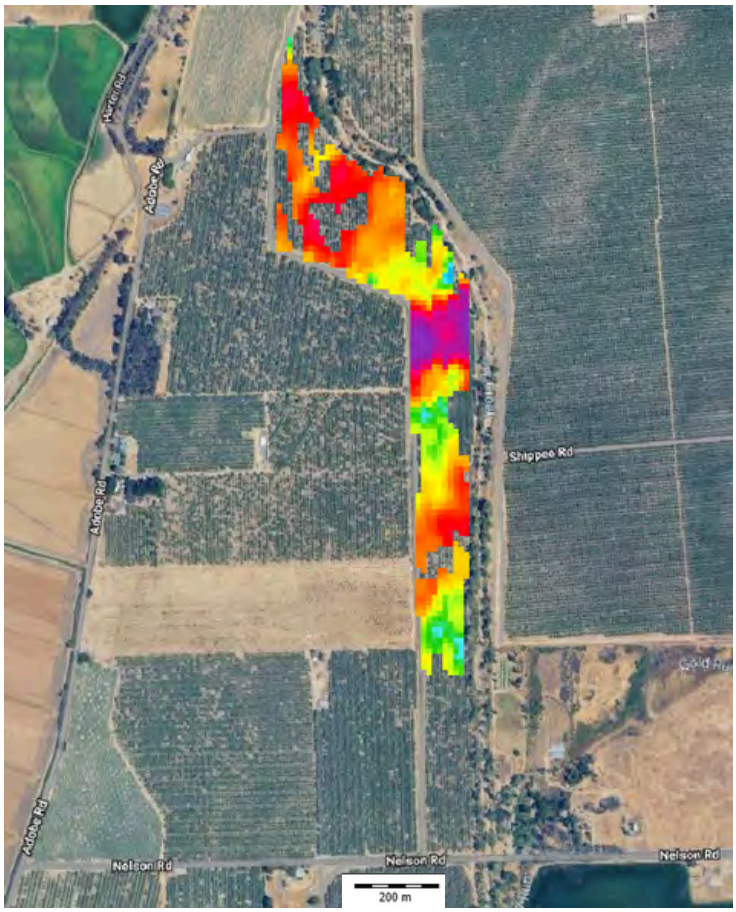
SOILS:

- **OXYAQUIC XEROFLUVENTS (338)**



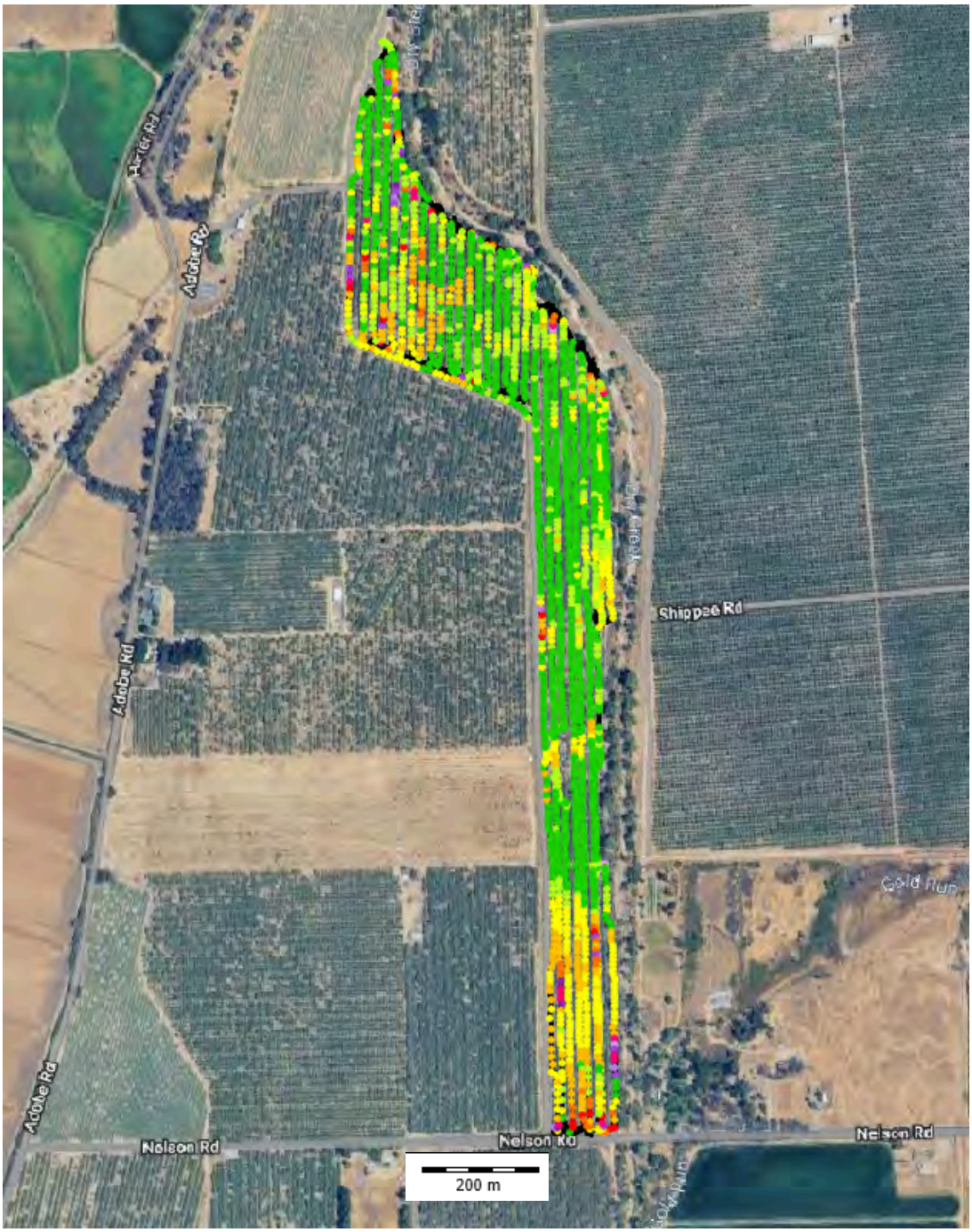
GROUNDWATER RECHARGE SUITABILITY INDEX

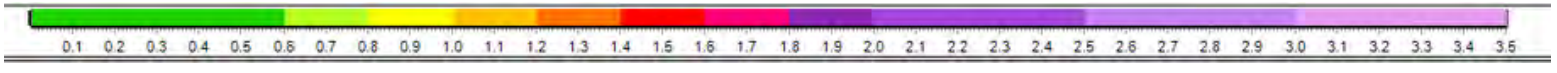




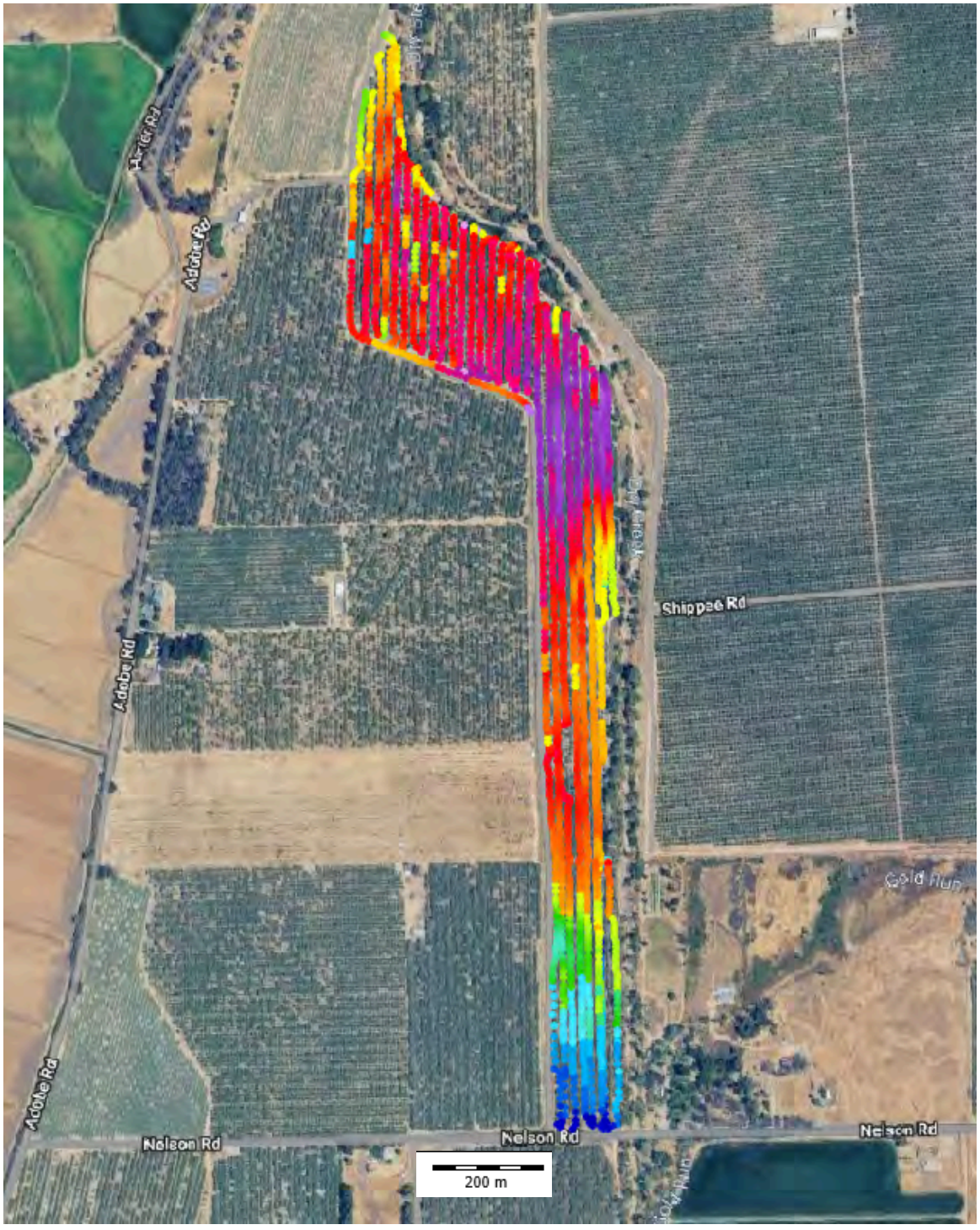
TTEM TRAVERSE LINES

DATA RESIDUAL

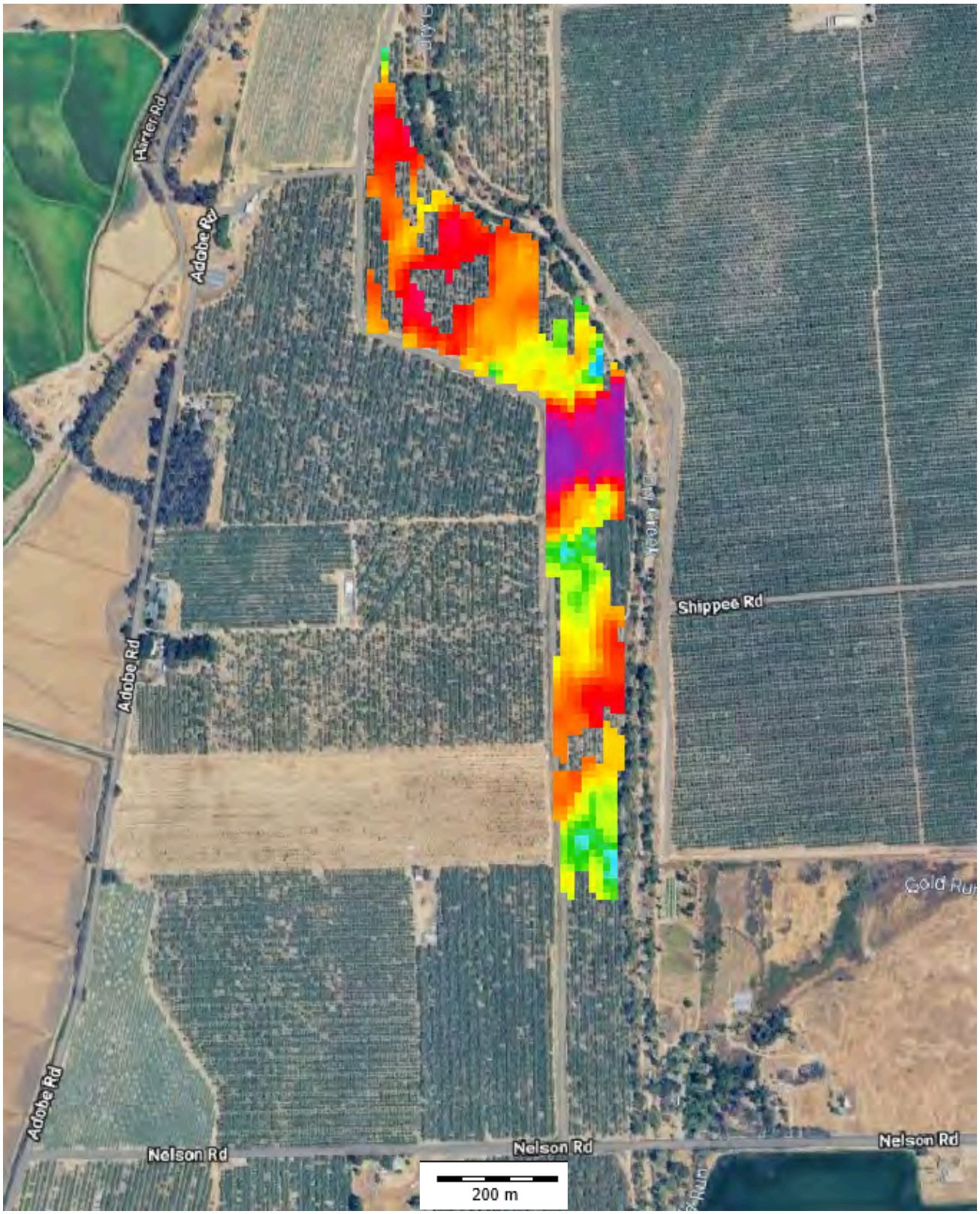




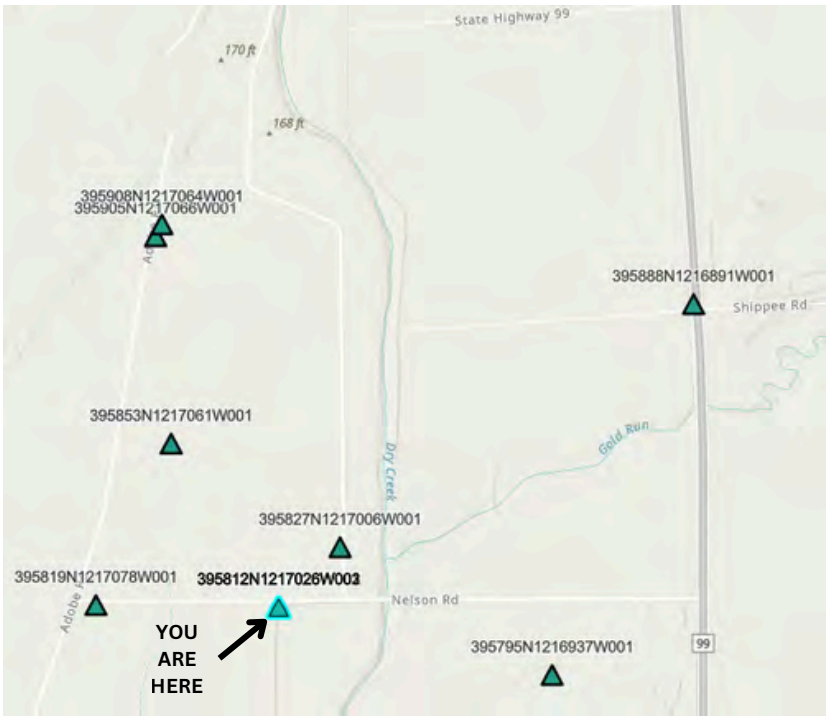
DEPTH OF INVESTIGATION-

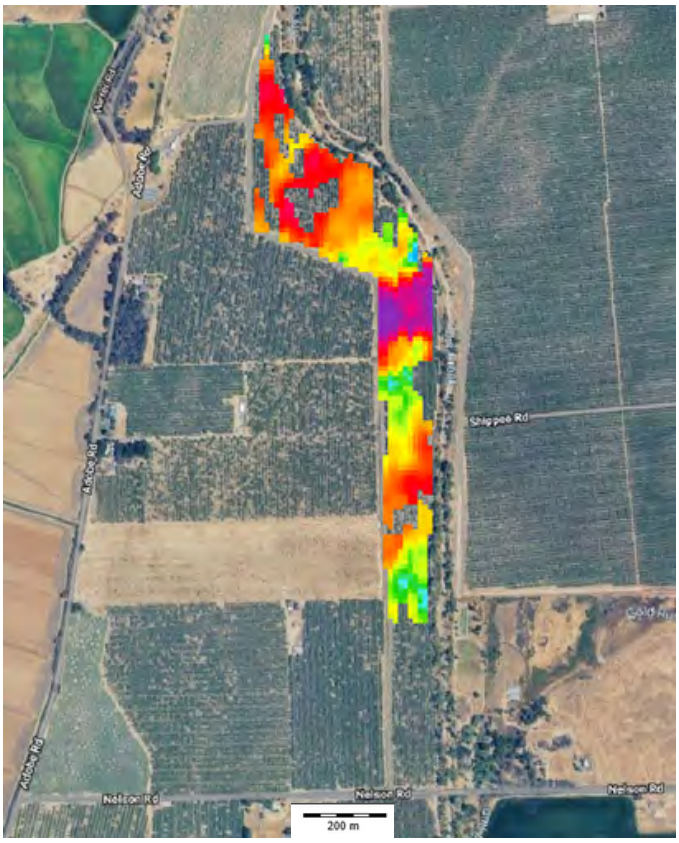


DATA REMOVED



CALIFORNIA STATEWIDE GROUNDWATER ELEVATION MONITORING (CASGEM)- LOCAL MONITORING WELL





LEGEND

Legend:
Above Water Table

- Blue- Clay
- Green- Clay
- Yellow- Sandy Clay
- Orange- Sand
- Red- Coarse Sand
- Purple- Gravel

Legend:
Below Water Table

- Blue- Clay
- Green- Sandy clay
- Yellow- Sand
- Orange- Coarse Sand
- Red- Gravel
- Purple- Coarse Gravel

- Black- Likely Bad data/Noise

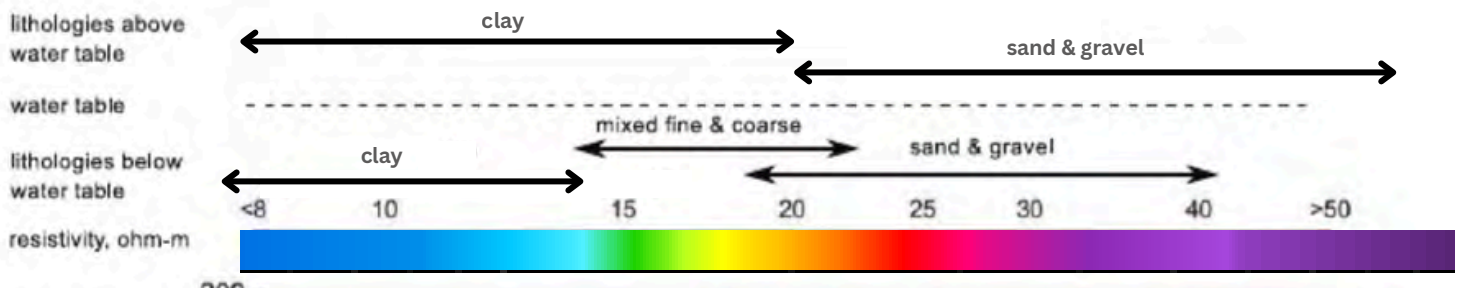


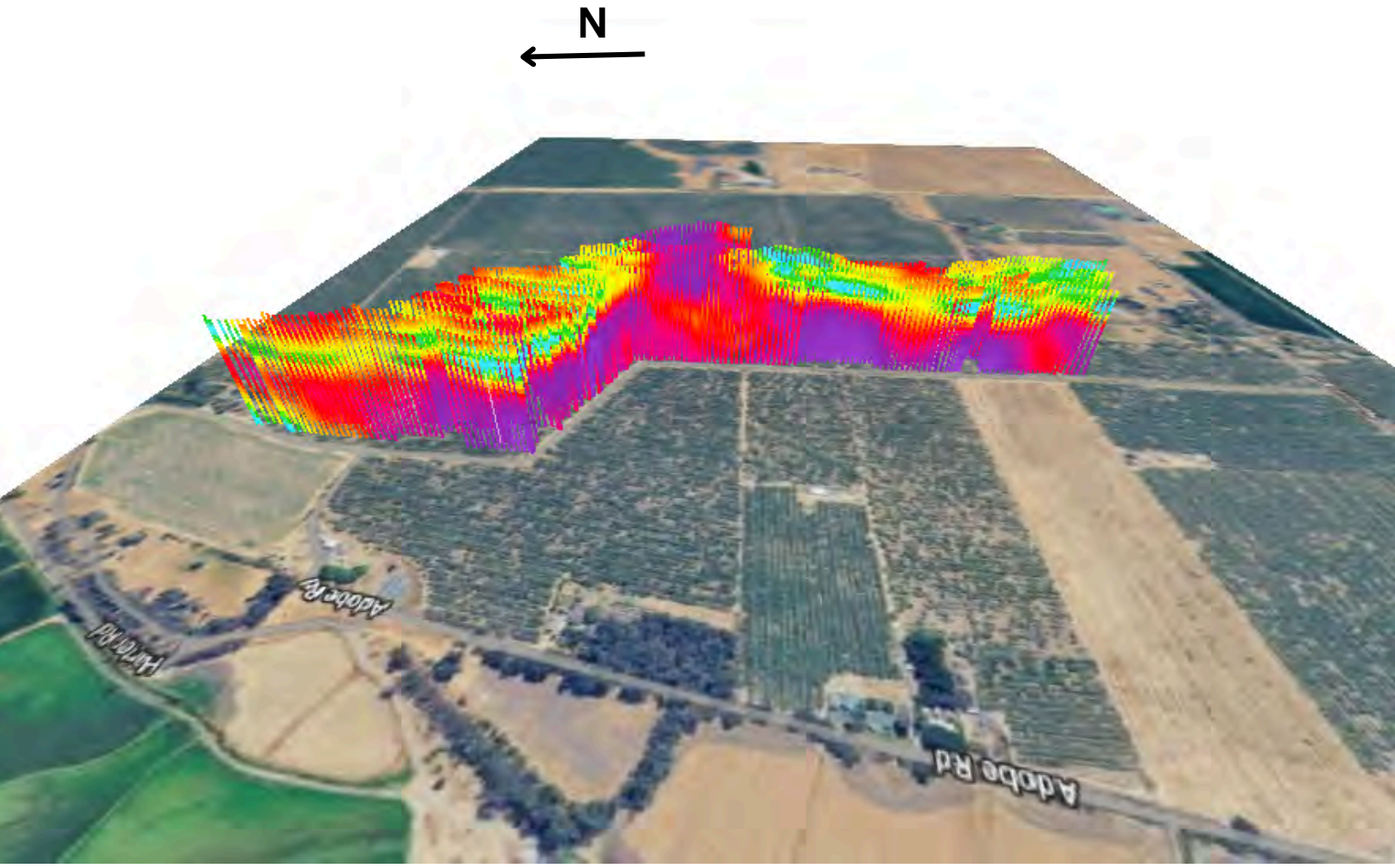
Table 2
Range of Resistivity Values Determined for the Lithologic Units Using Method 2 and from the Histogram of All Resistivity Values in the Resistivity Model

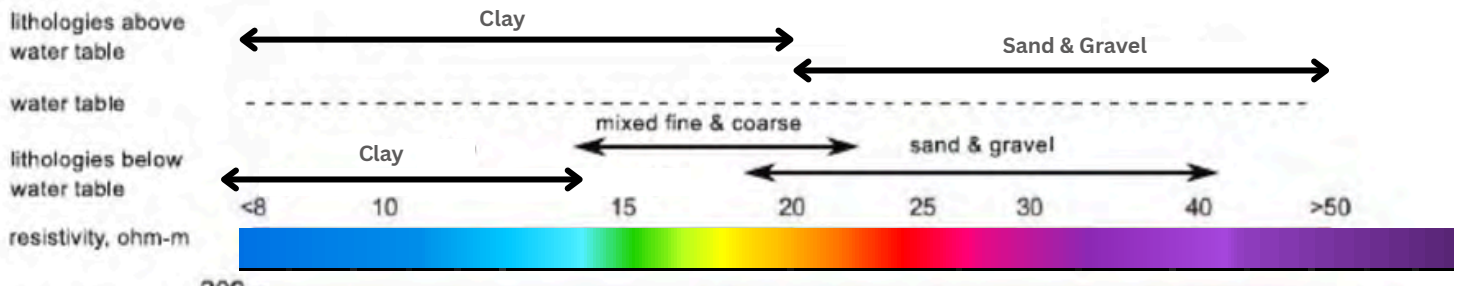
Resistivity Range (Ω m)		Interpreted Lithology
Above the water table		
8	20	Clay
21	150	Sand and gravel
Below the water table		
6	14	Clay
12	22	Mixed fine and coarse
17	43	Sand and gravel

KNIGHT, R., SMITH, R., ASCH, T., ABRAHAM, J., CANNIA, J., VIEZZOLI, A., & FOGG, G. (2018). MAPPING AQUIFER SYSTEMS WITH AIRBORNE ELECTROMAGNETICS IN THE CENTRAL VALLEY OF CALIFORNIA. GROUND WATER, 56(6), 893–908. HTTPS://DOI.ORG/10.1111/GWAT.12656

3D VIEW- WEST TO EAST

NORTH **SOUTH**

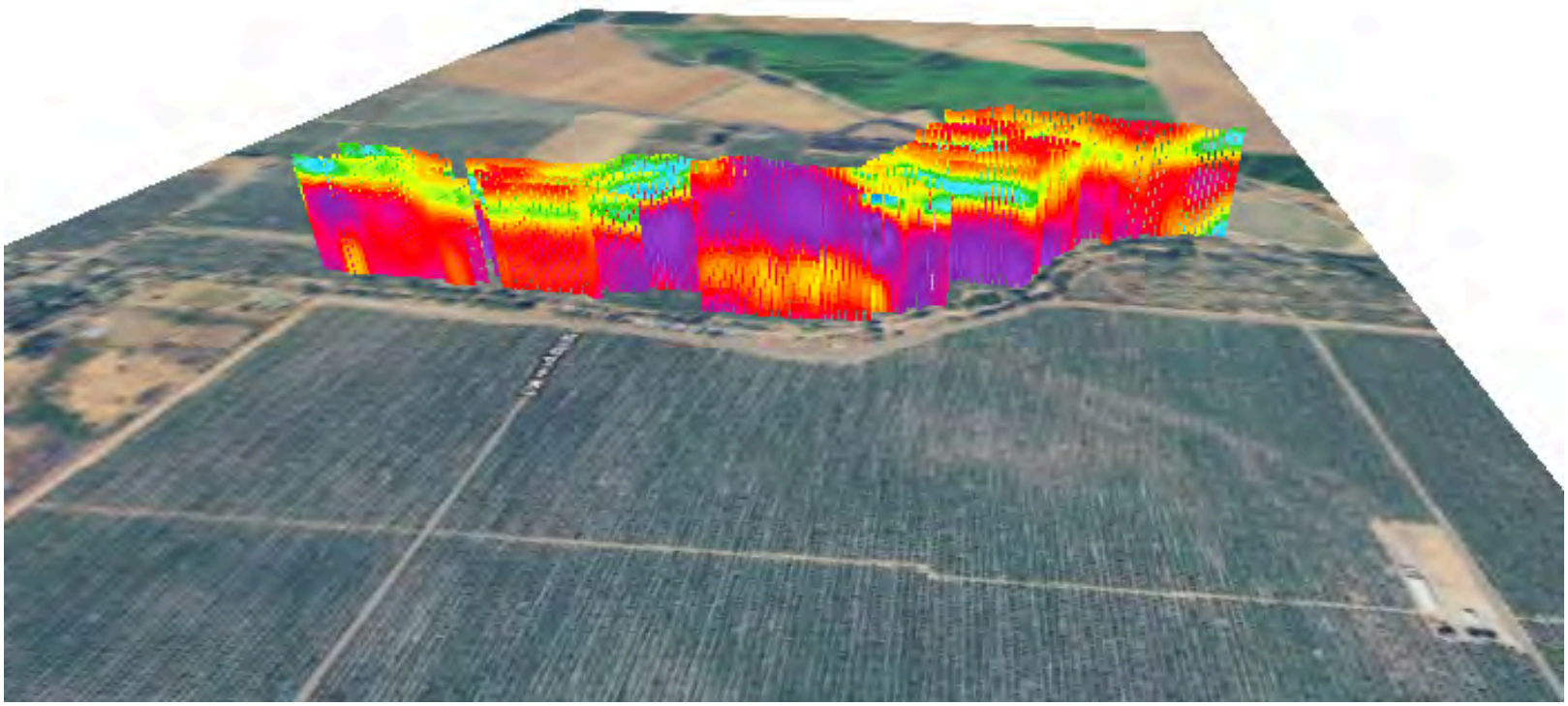


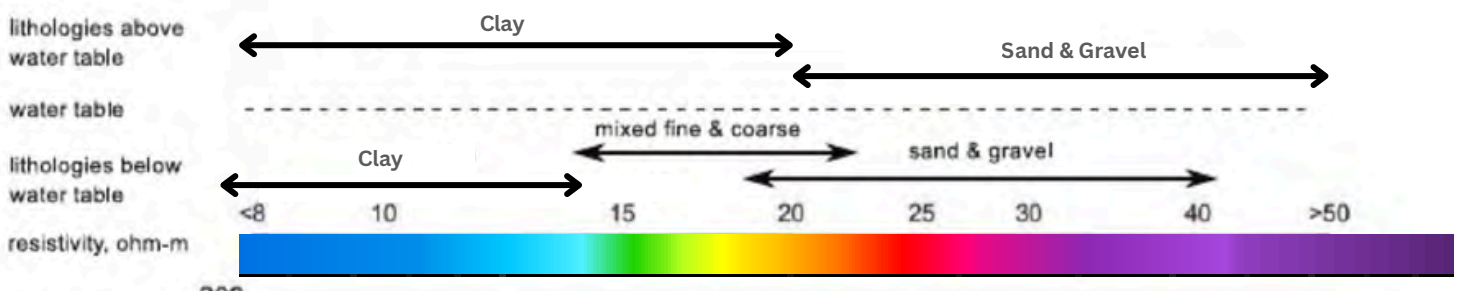


3D VIEW- EAST TO WEST

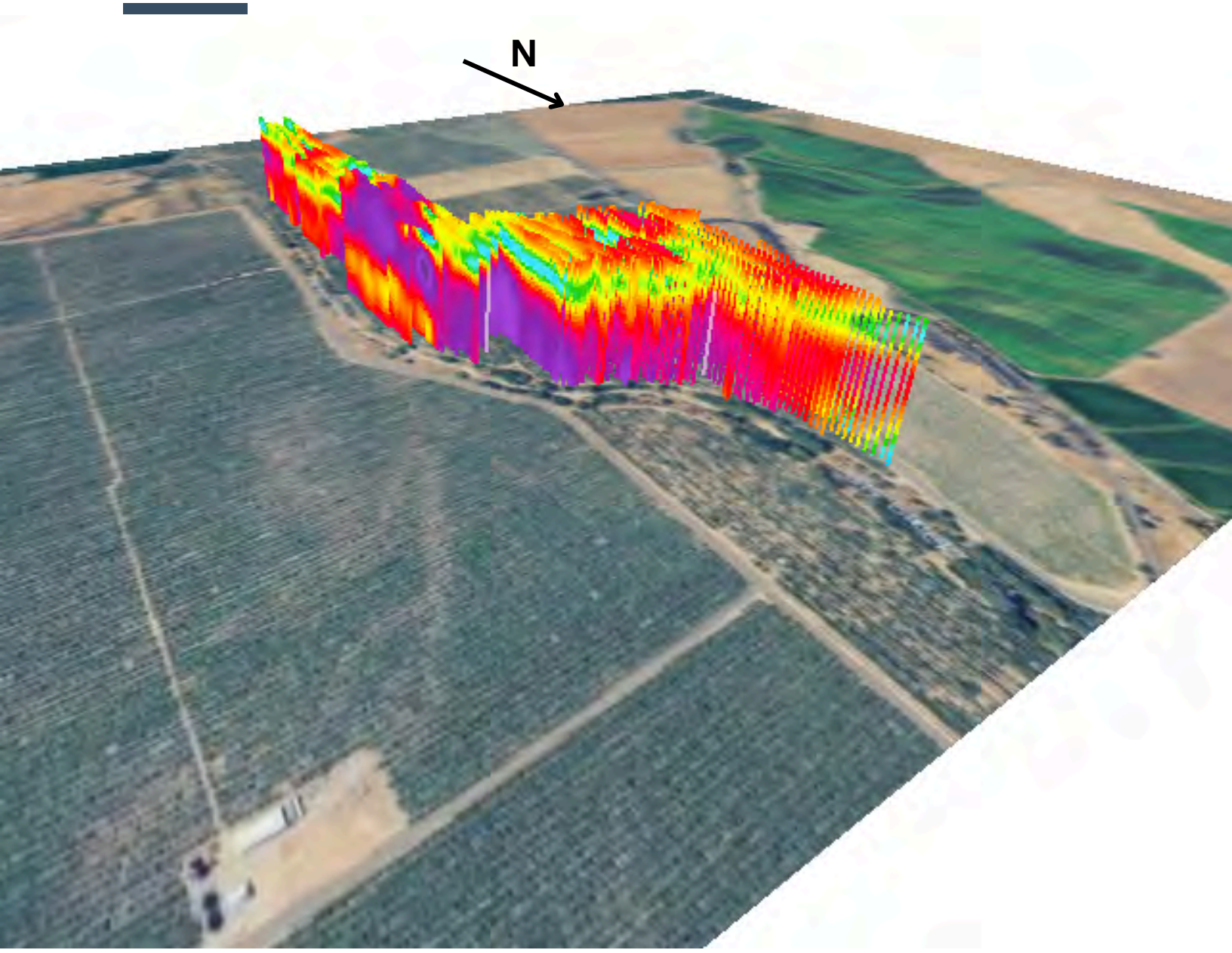
SOUTH **NORTH**

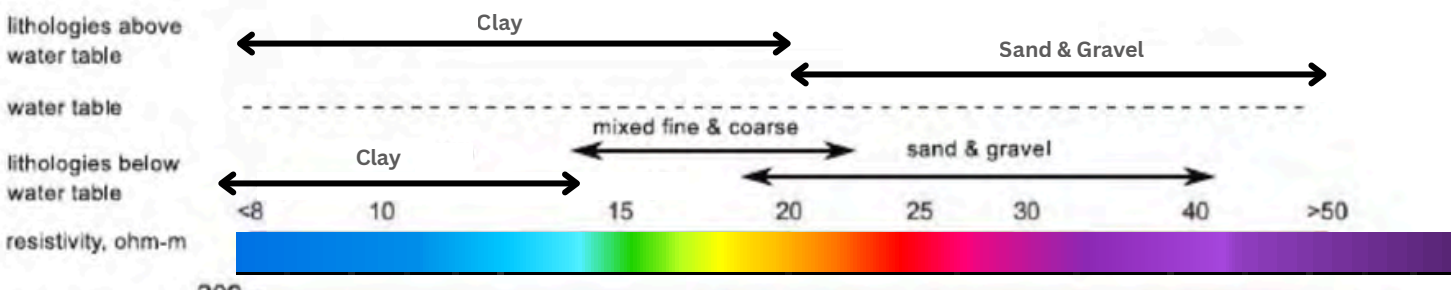
N



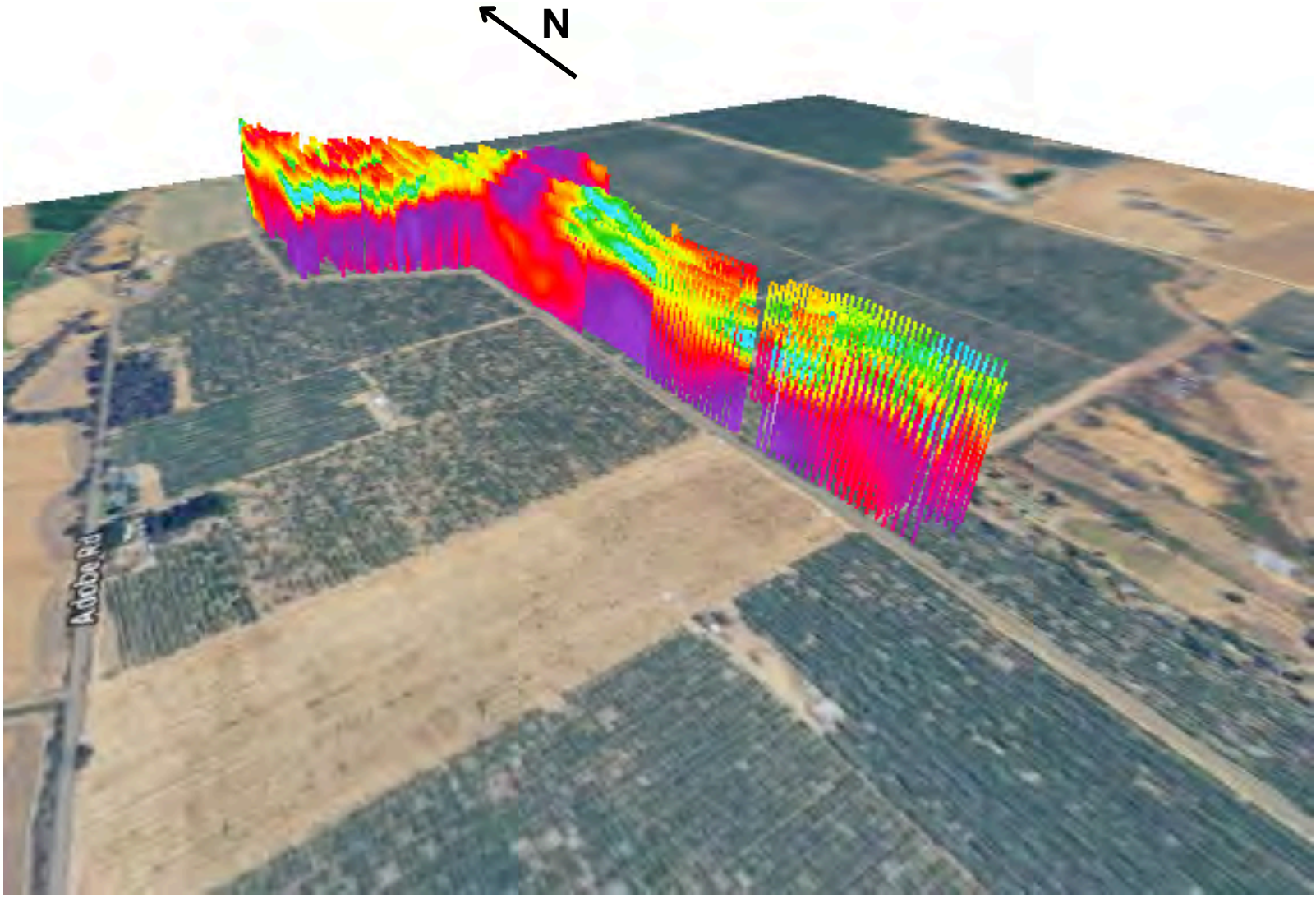


3D VIEW- NORTH TO SOUTH





3D VIEW- SOUTH TO NORTH



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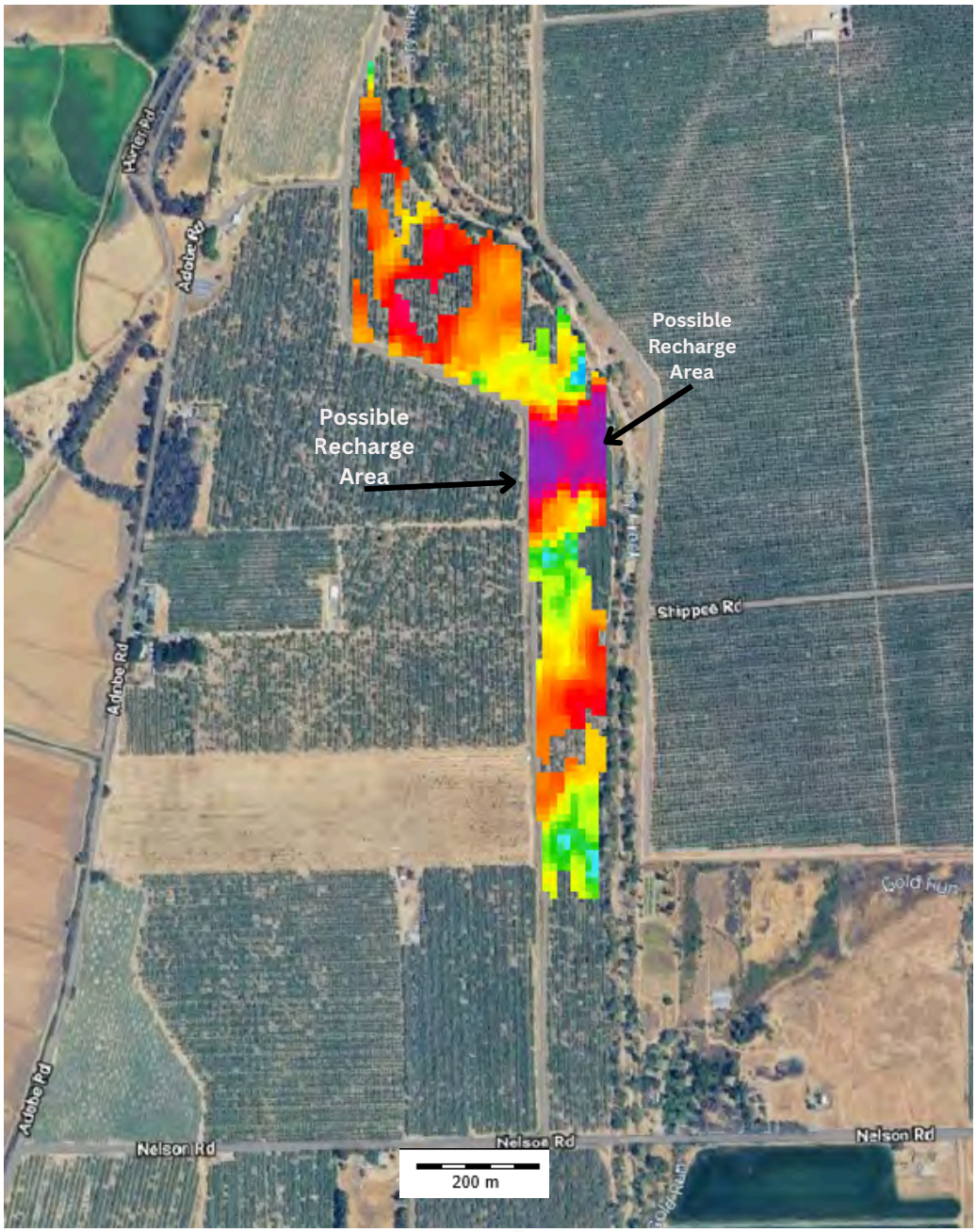

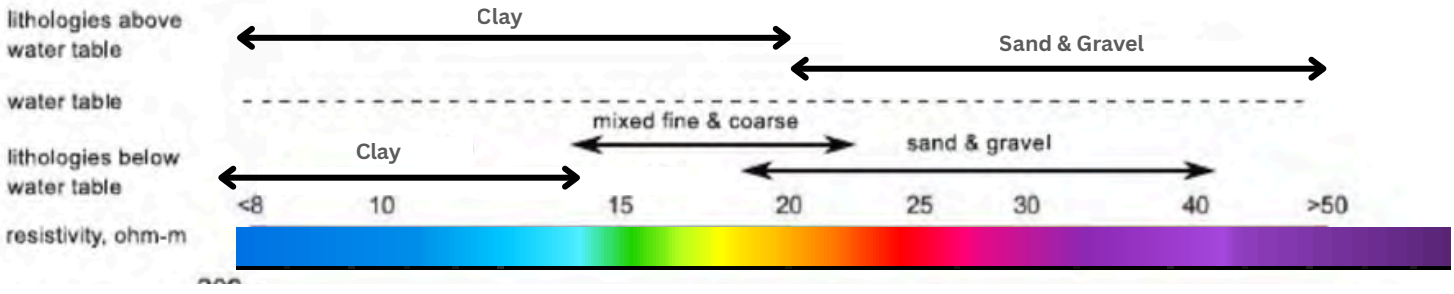

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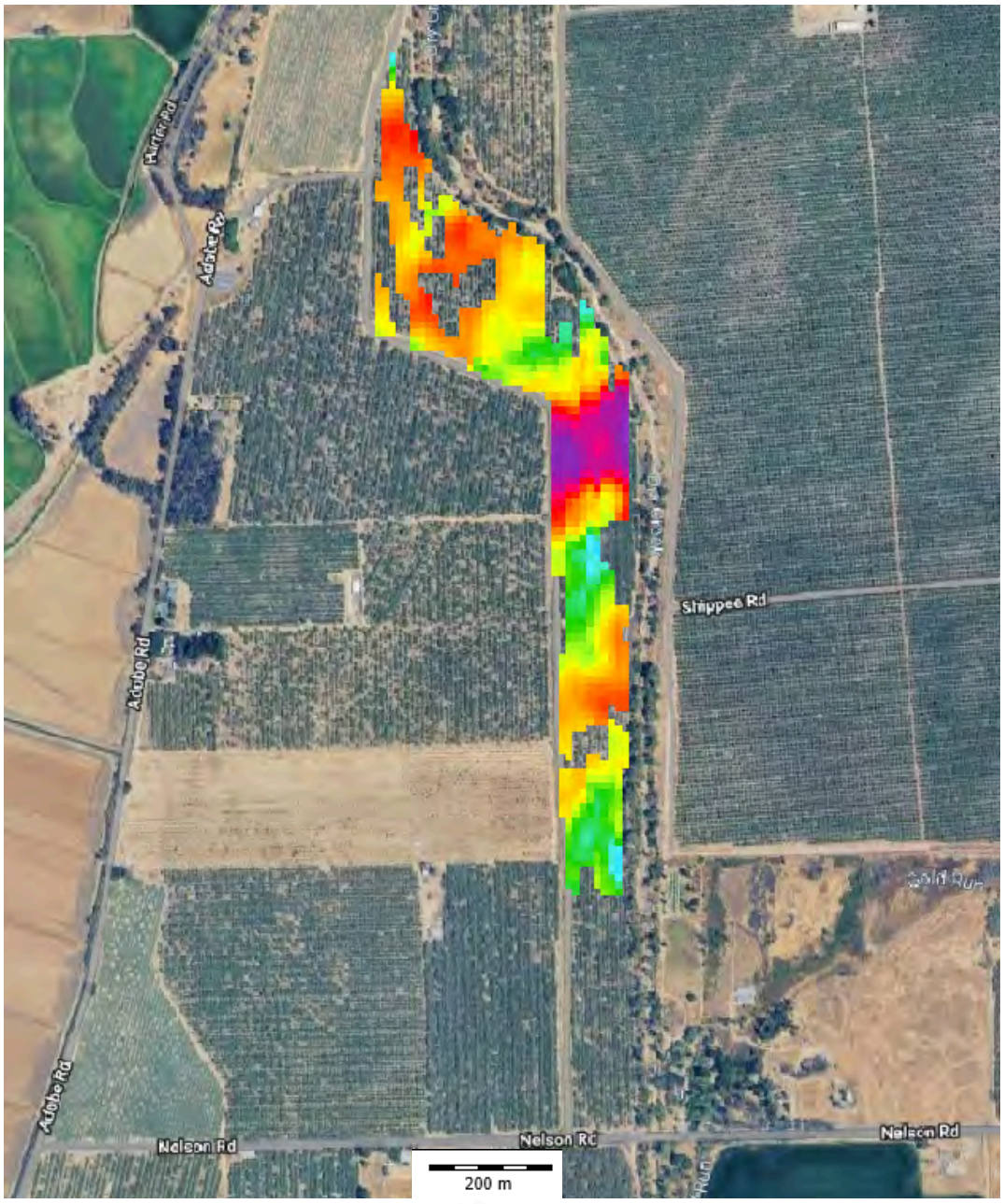

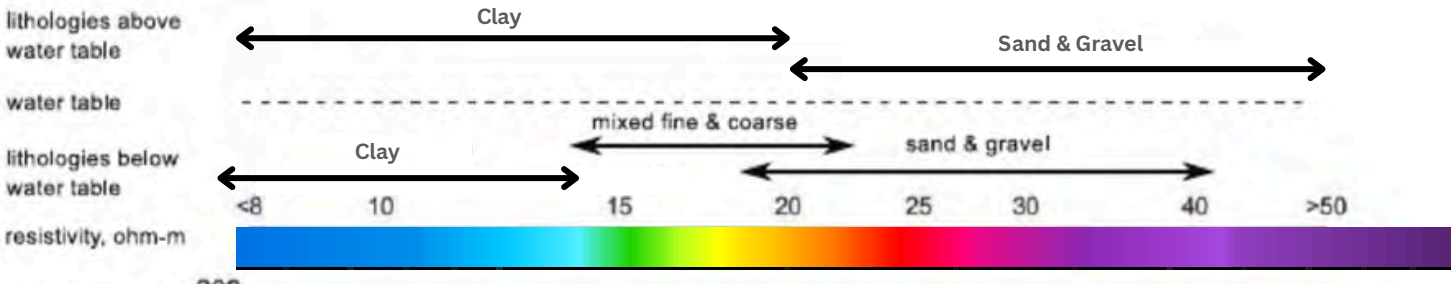

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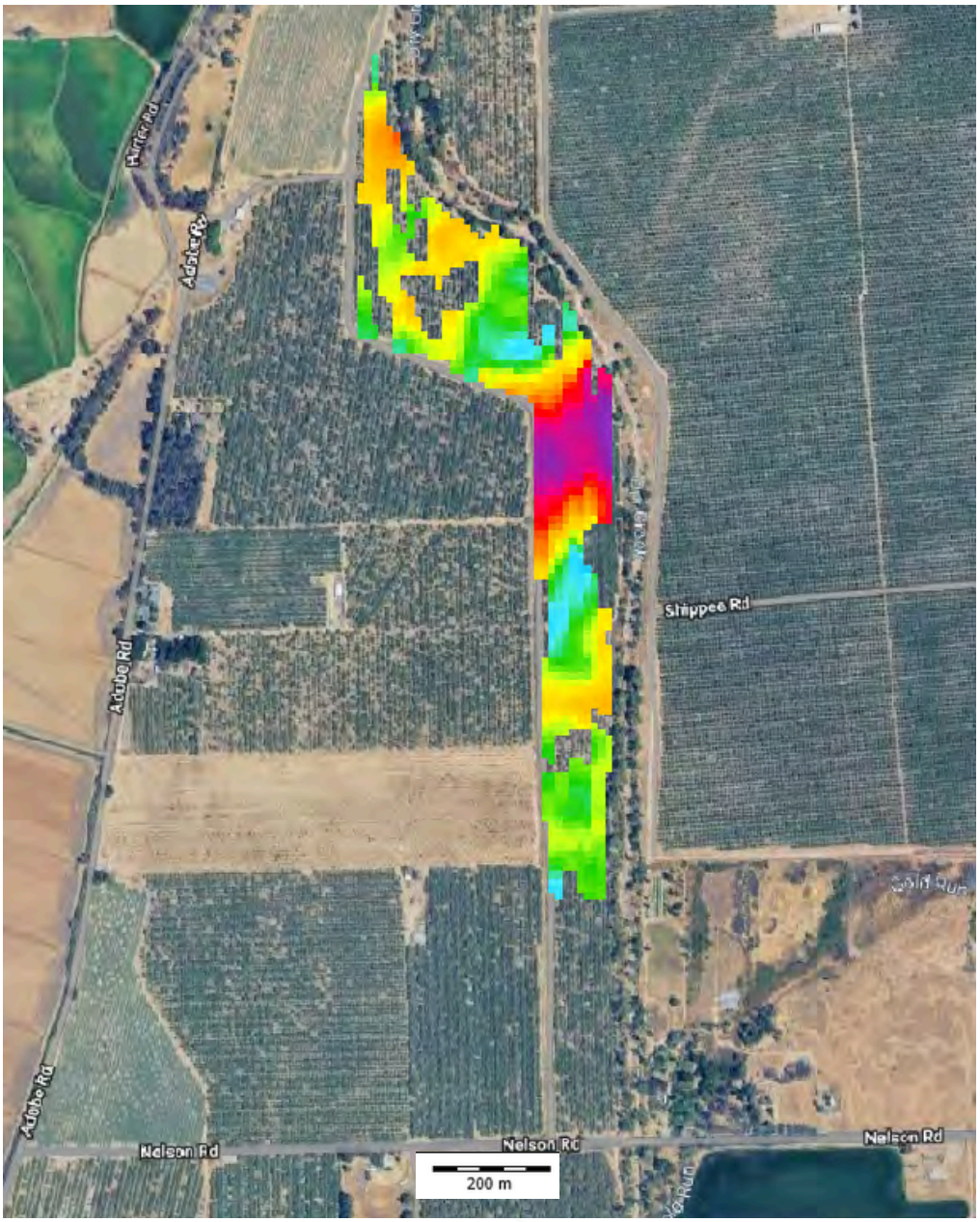

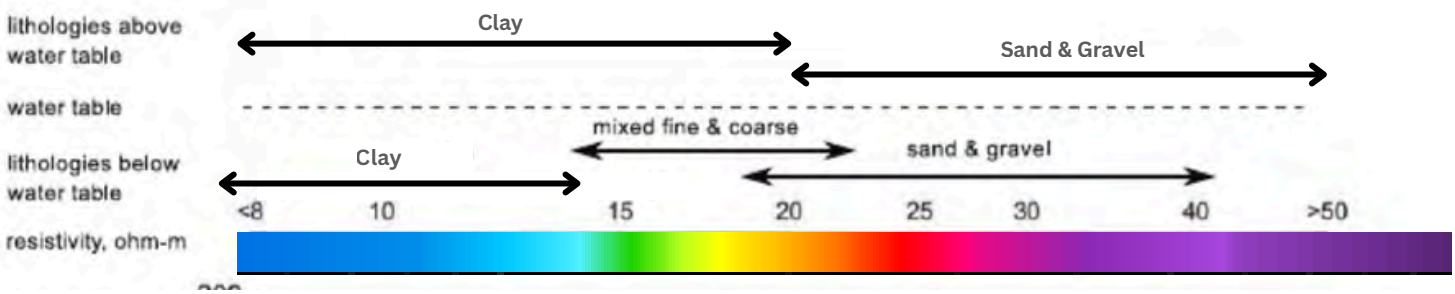

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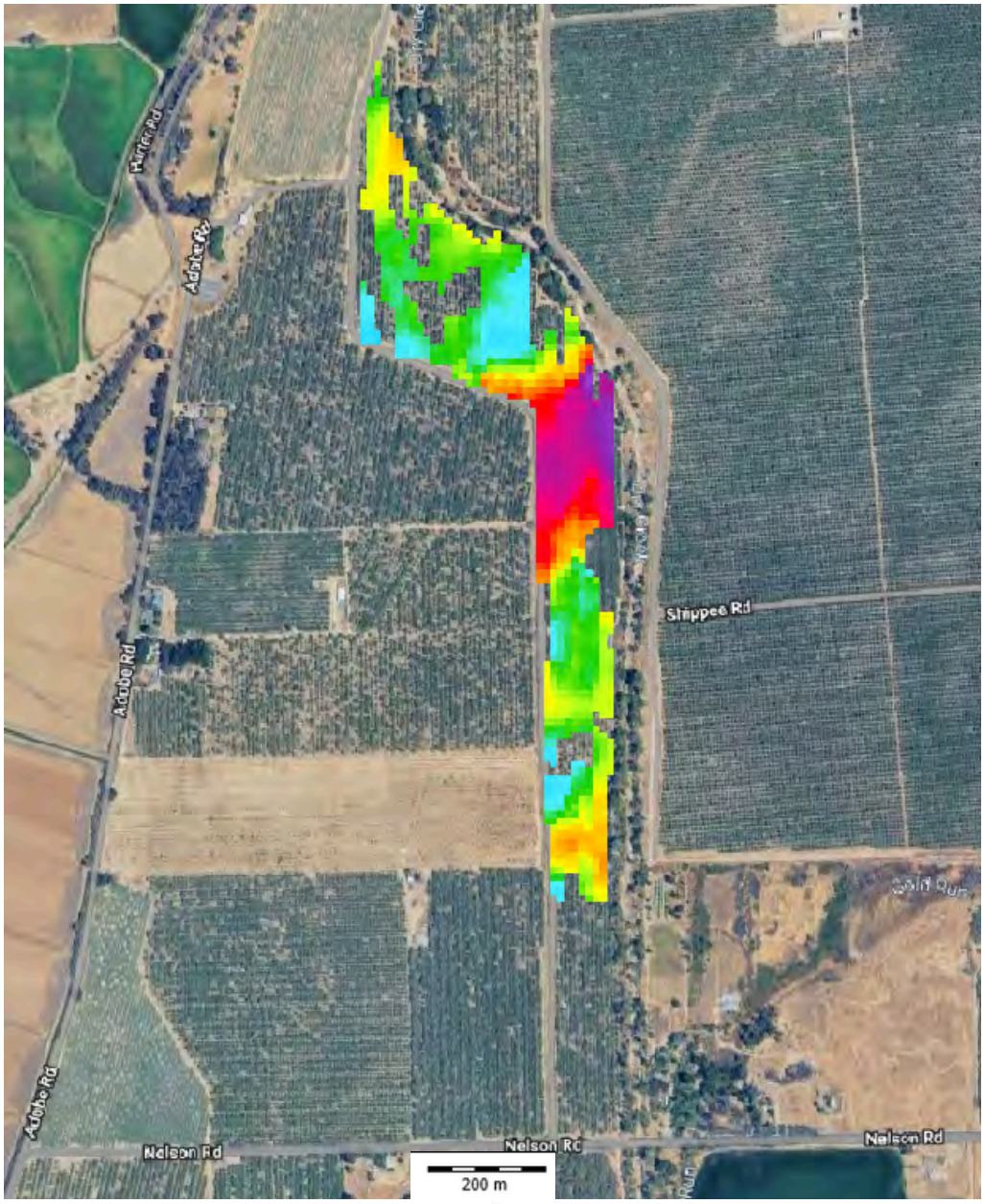
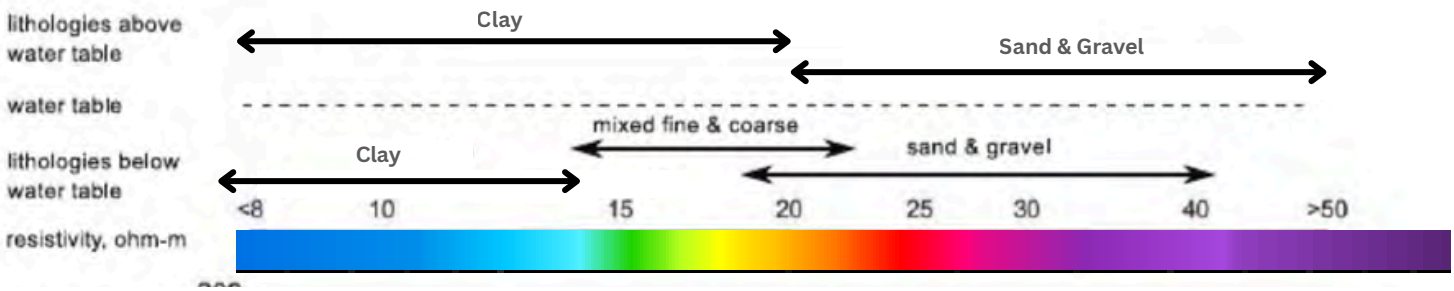
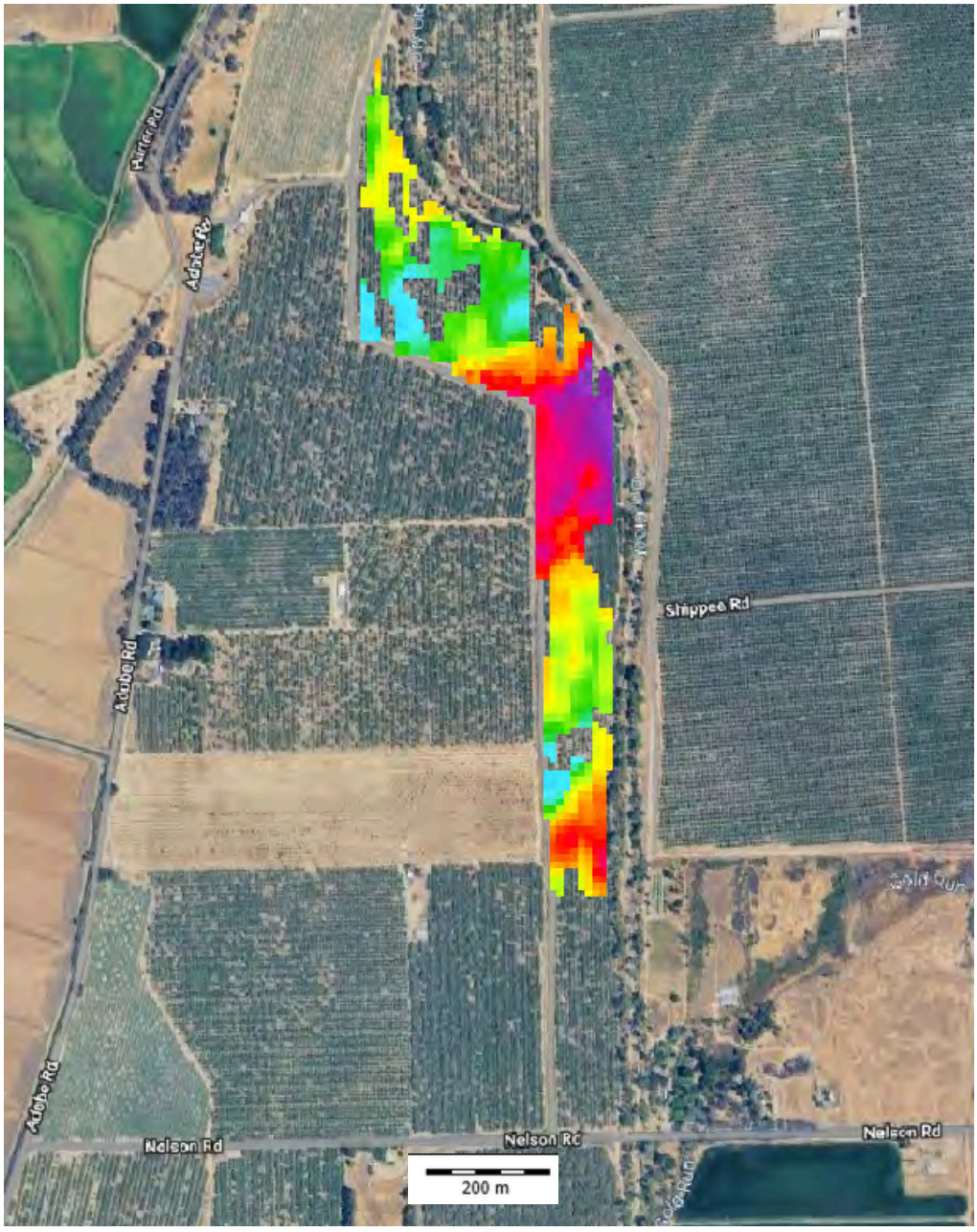
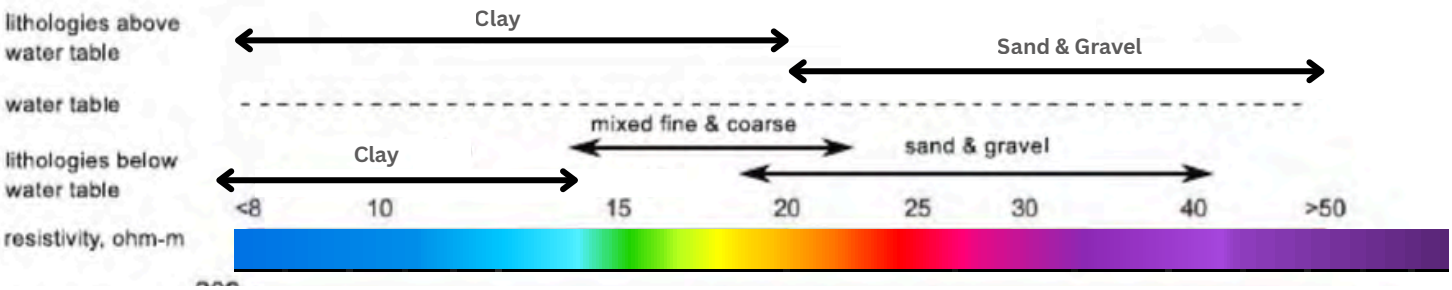


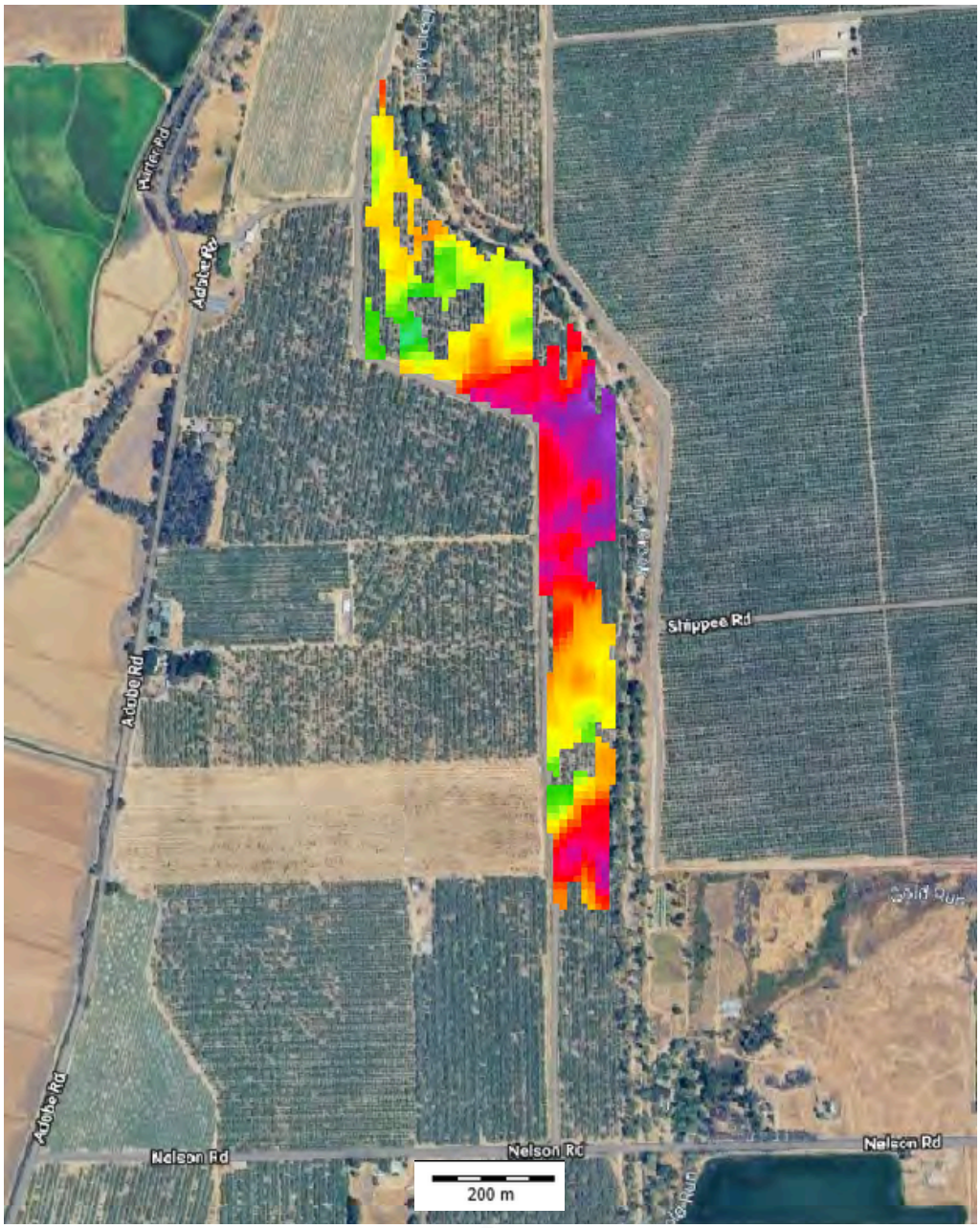


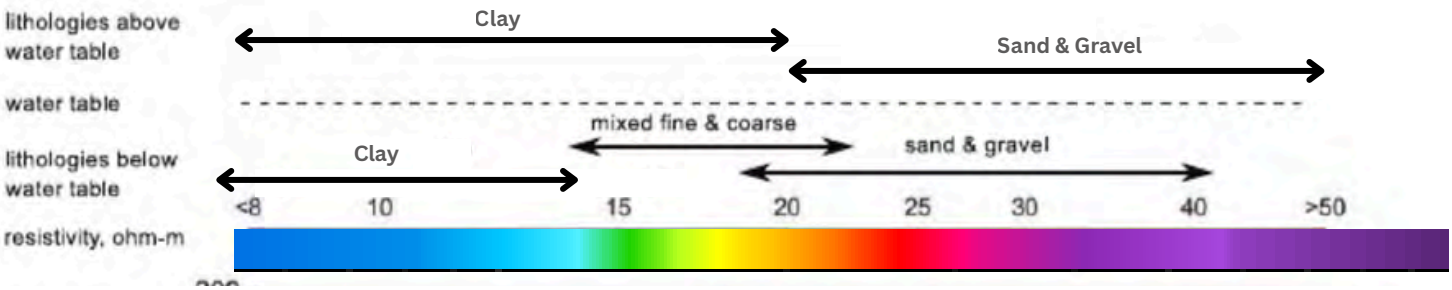
DEPTH SLICES- 40 FT





DEPTH SLICES- 50 FT (WATER TABLE)





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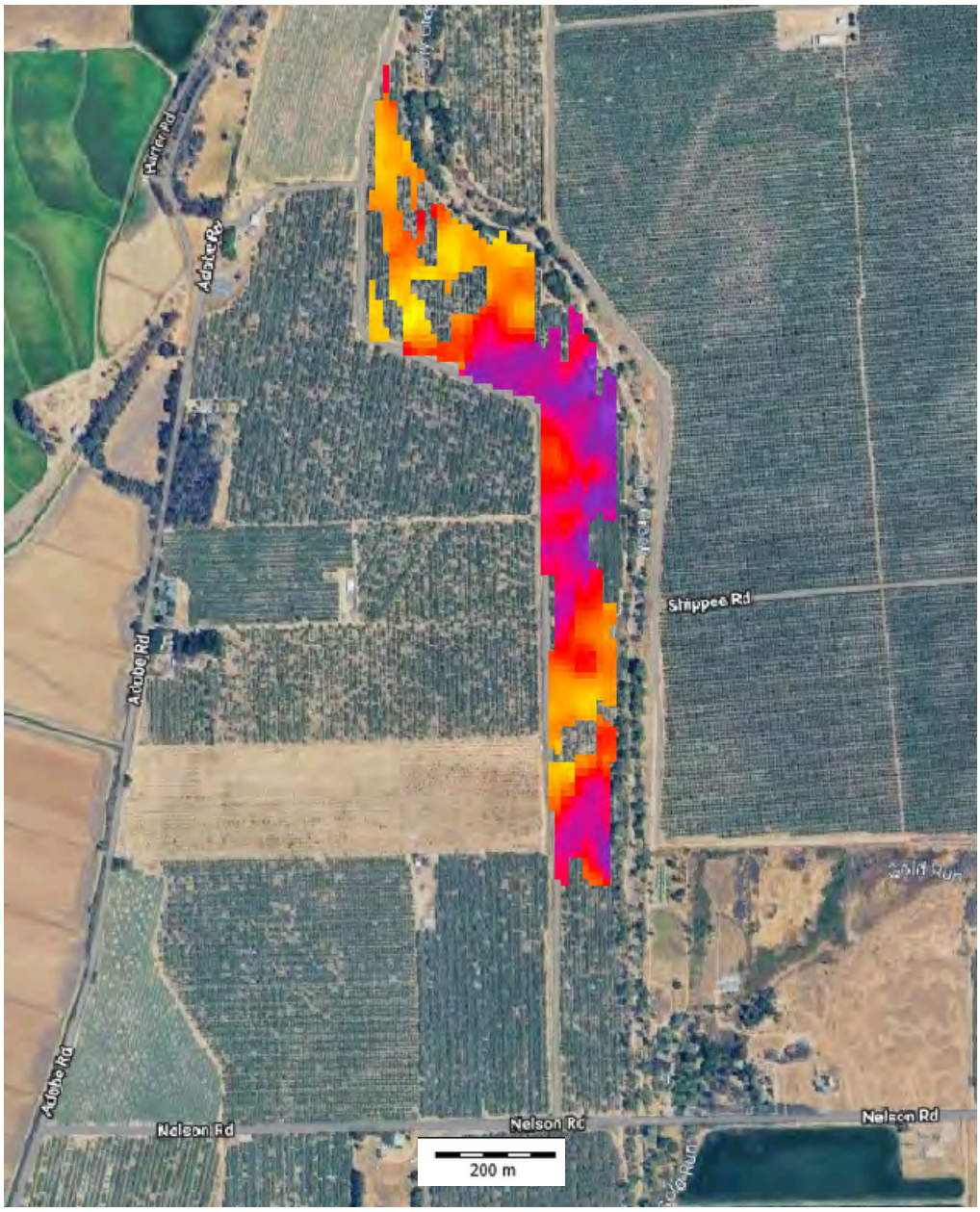

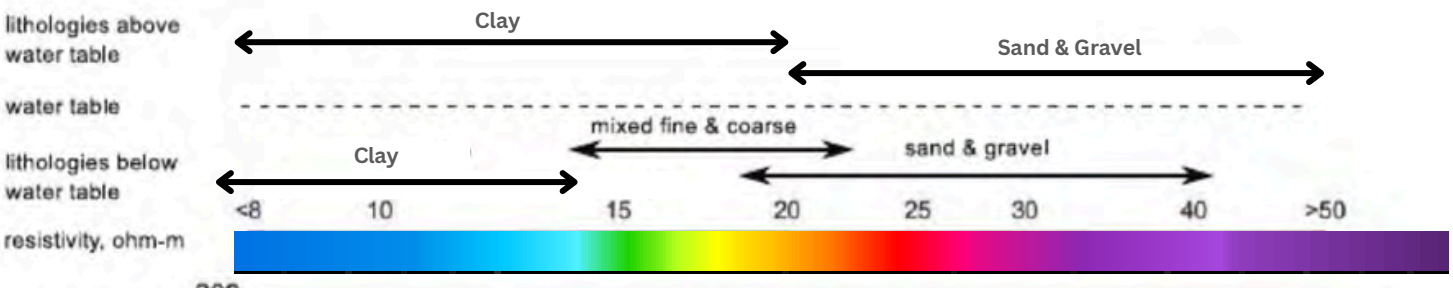

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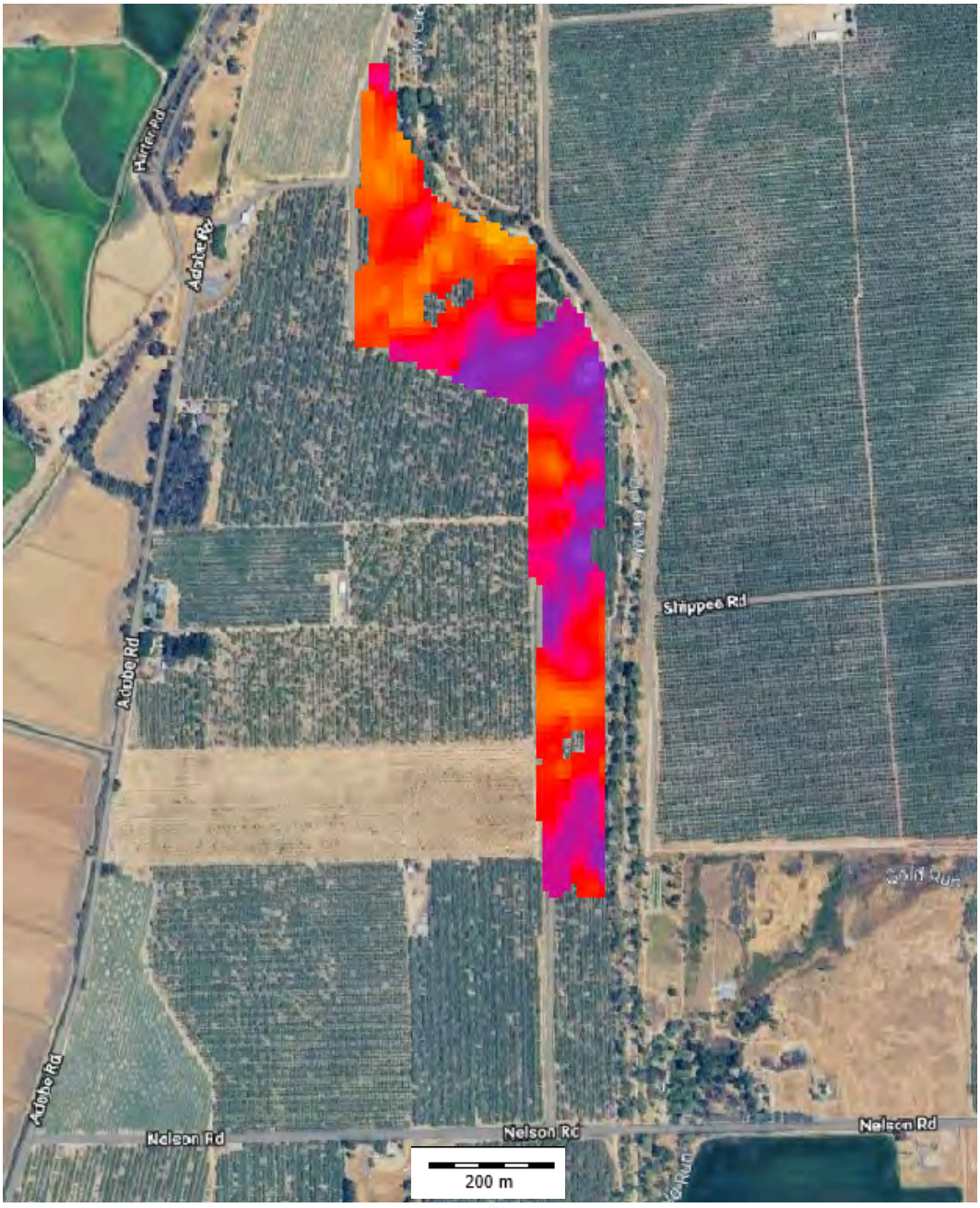

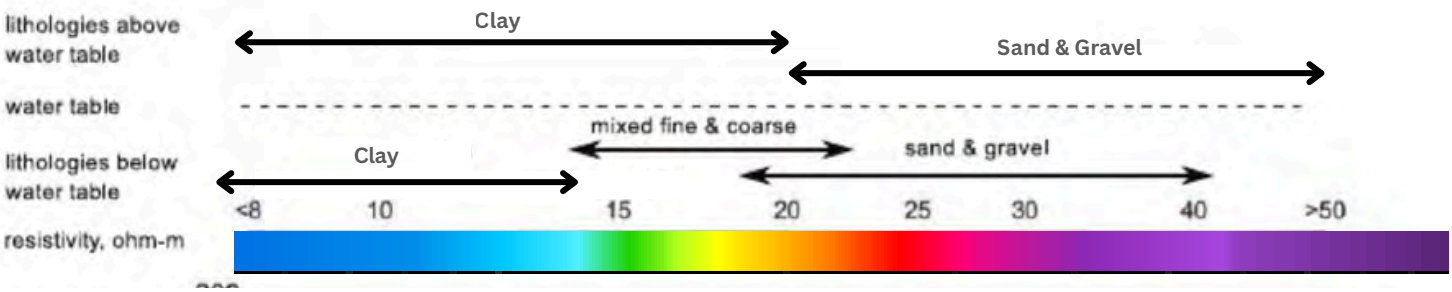

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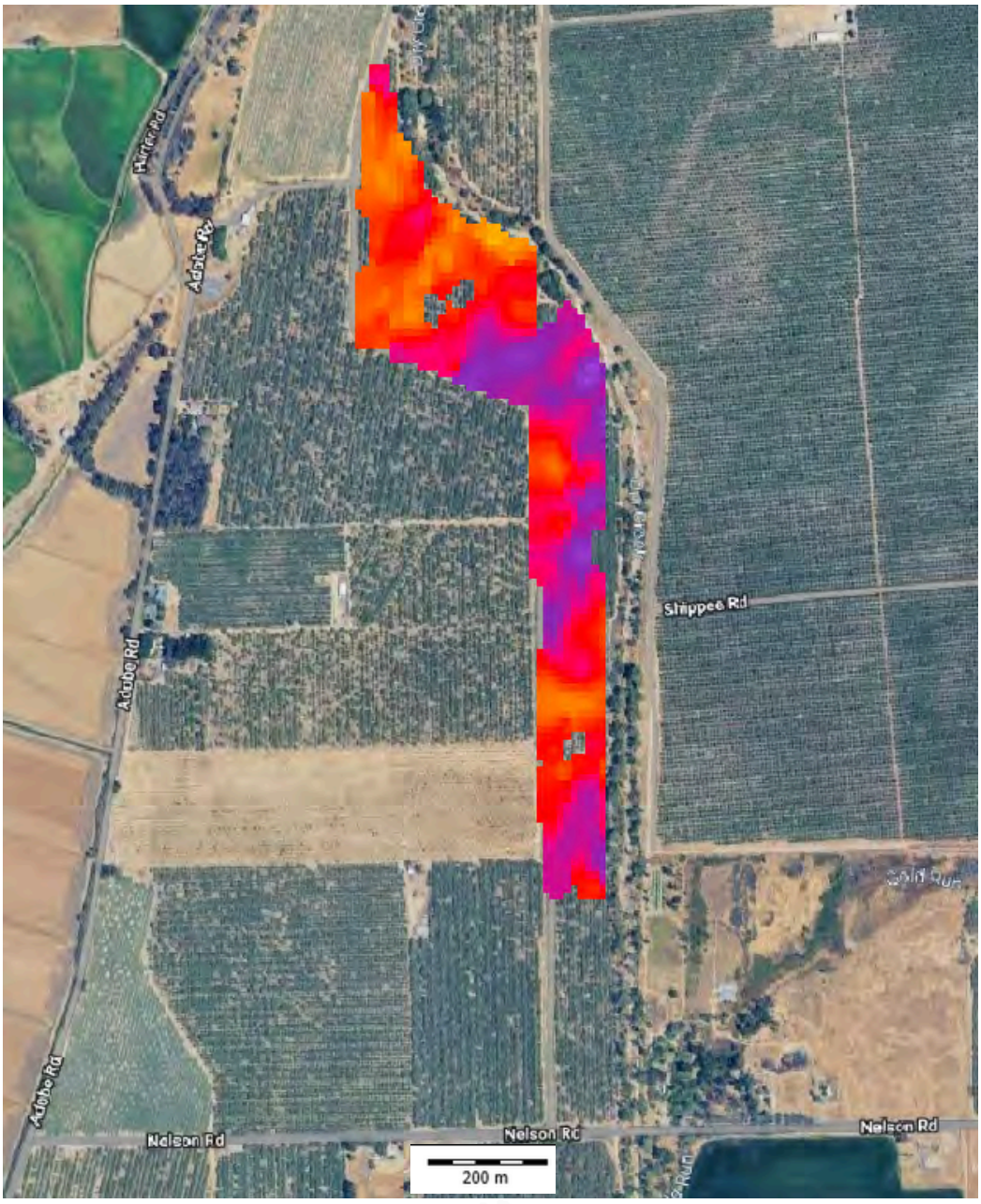

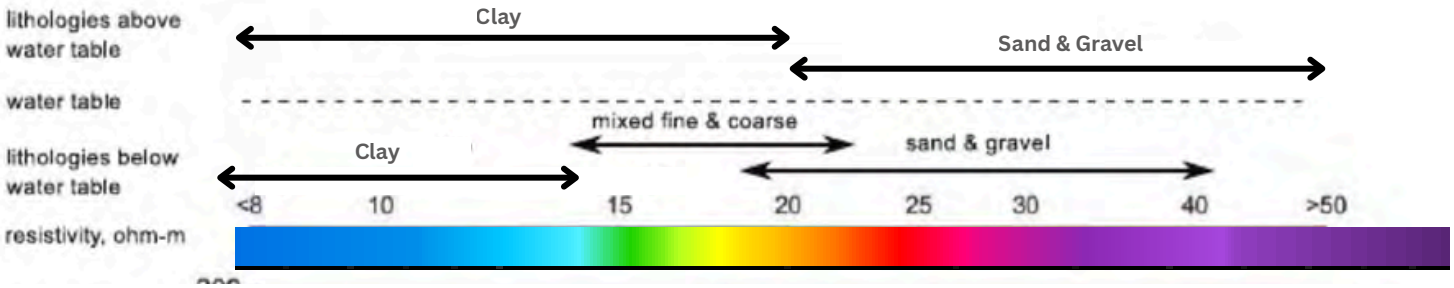

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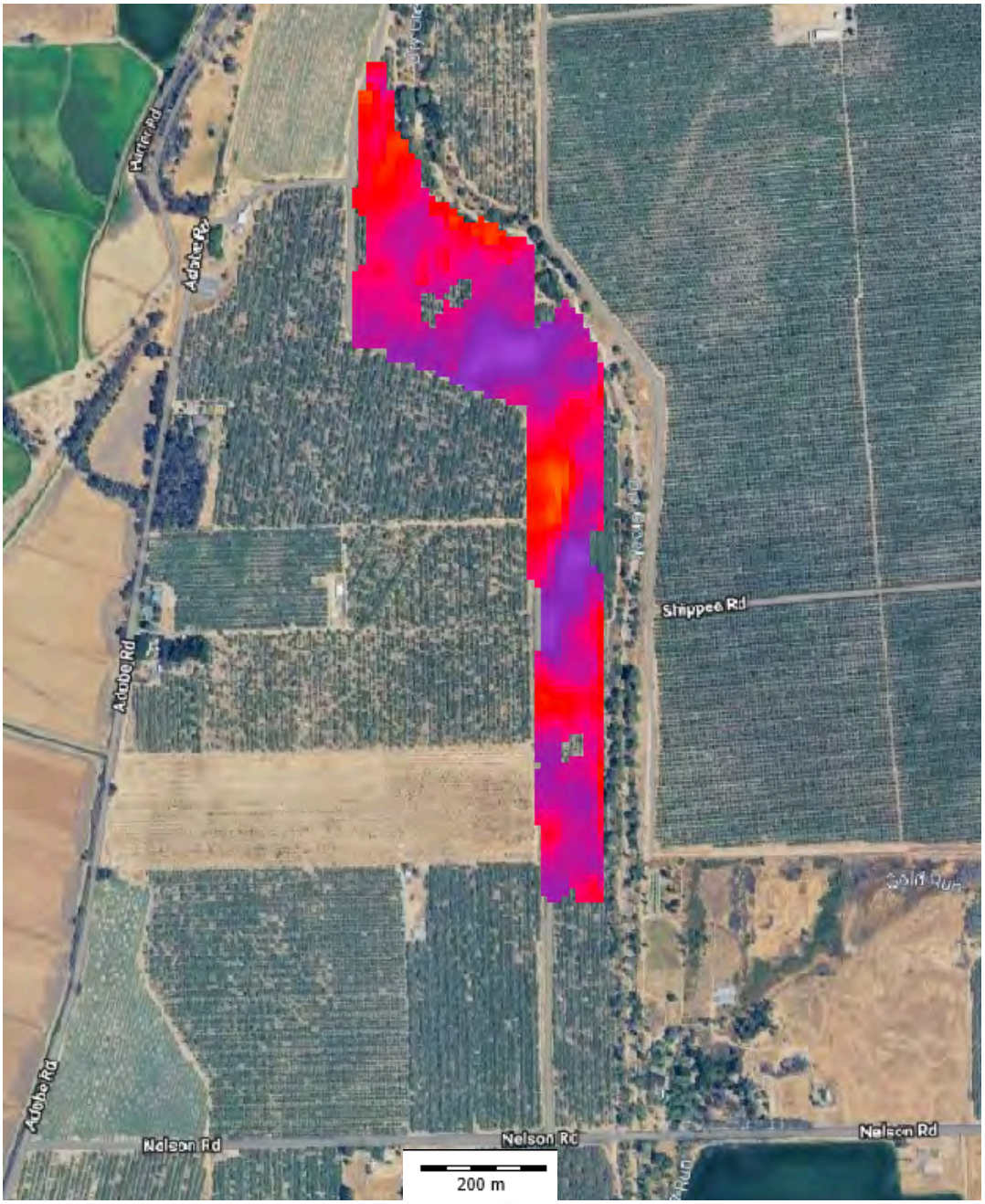

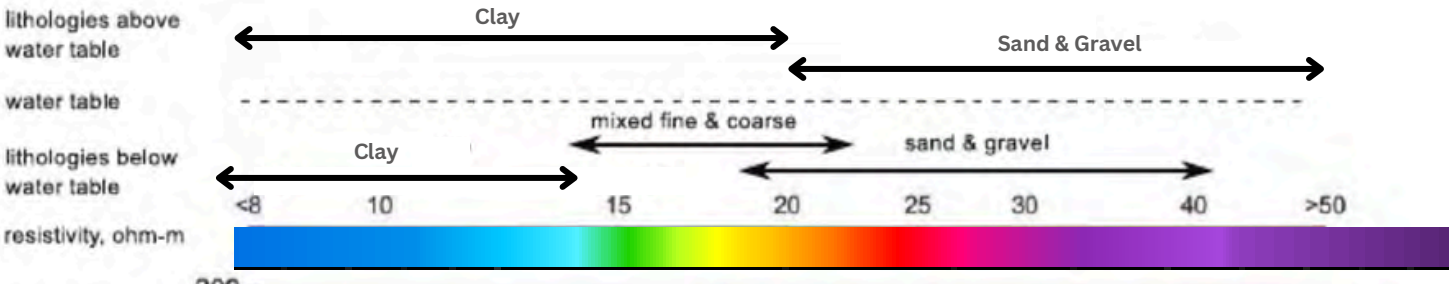

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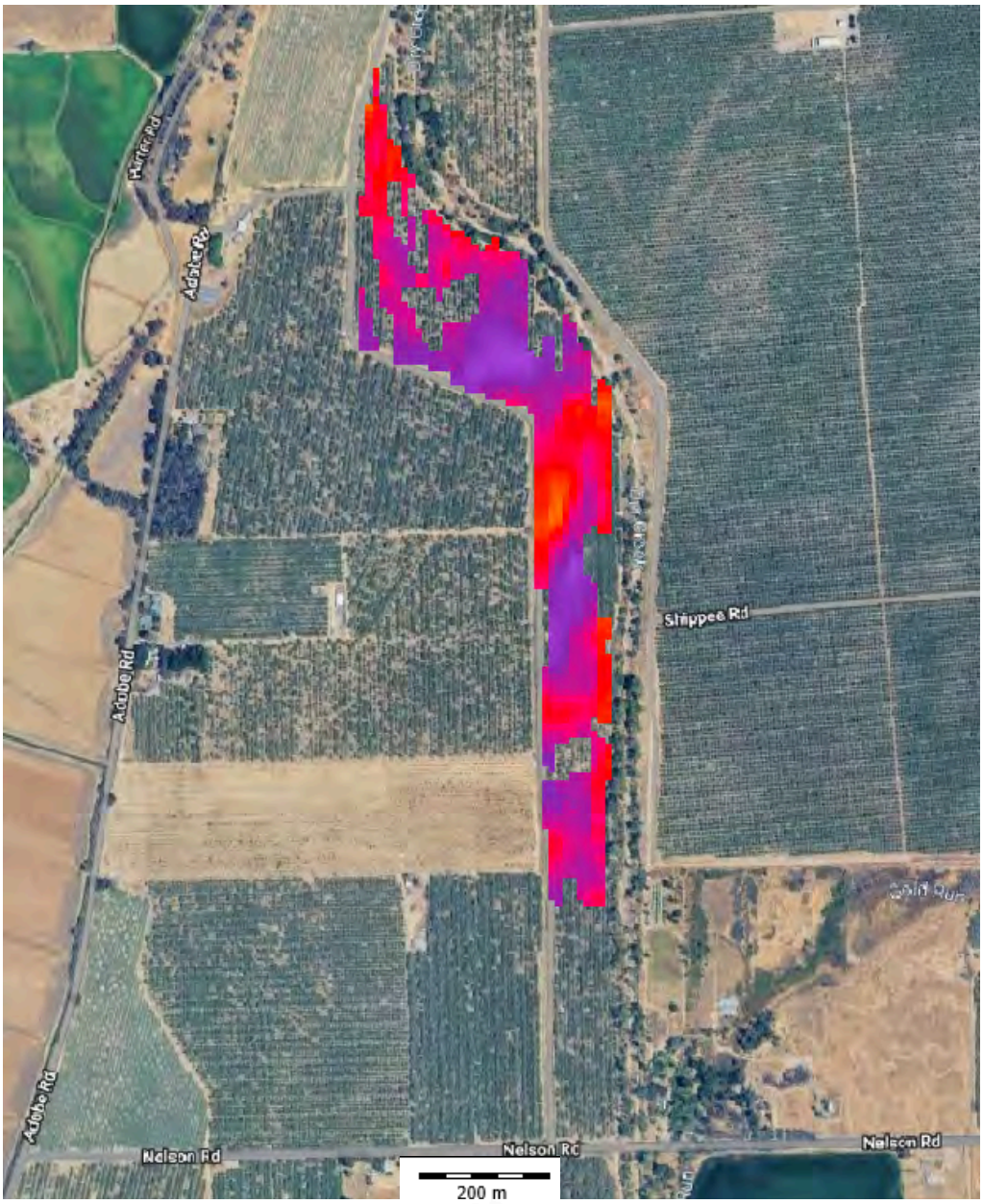

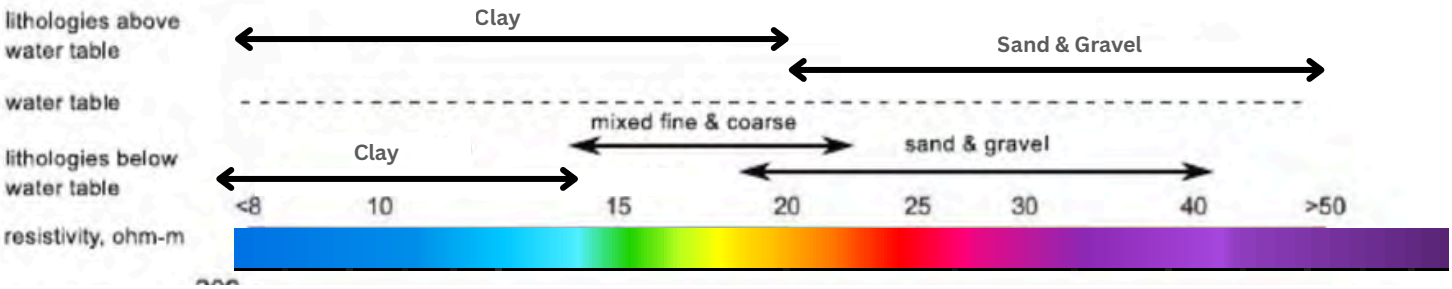

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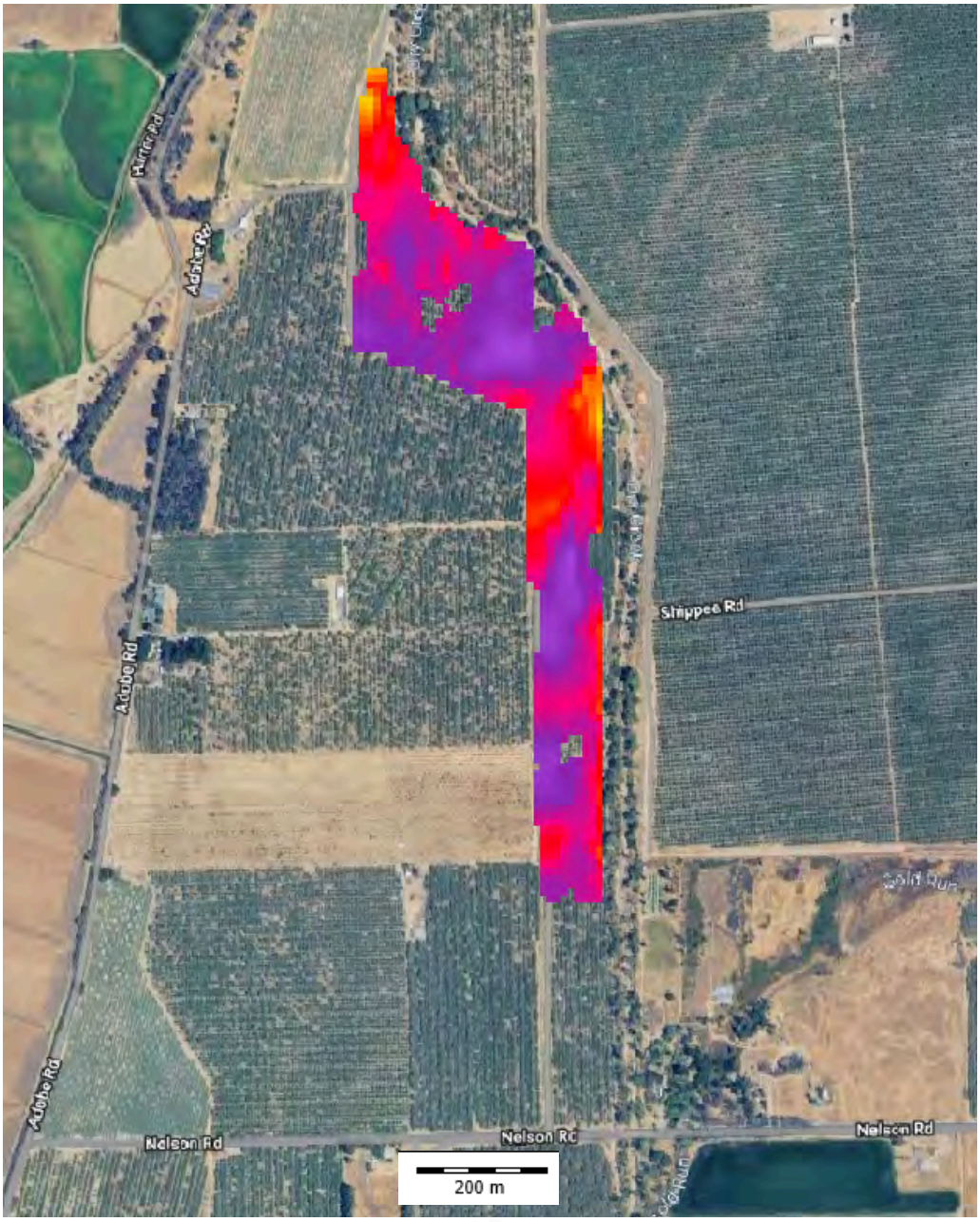

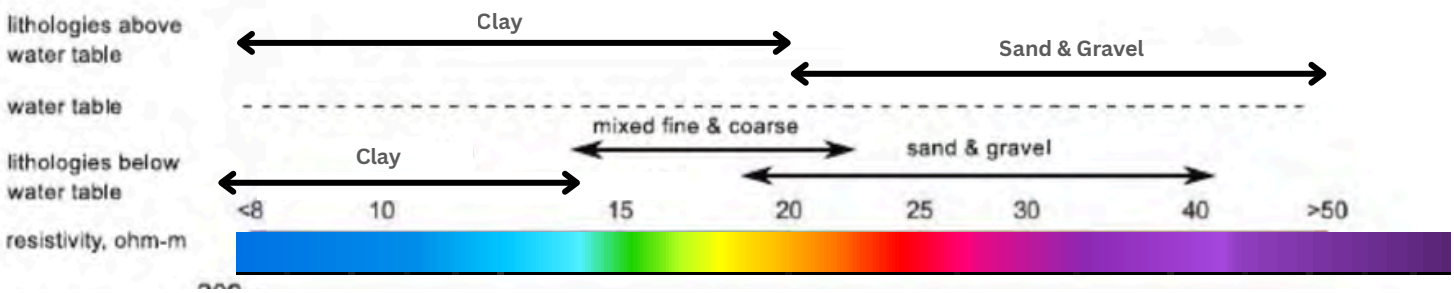

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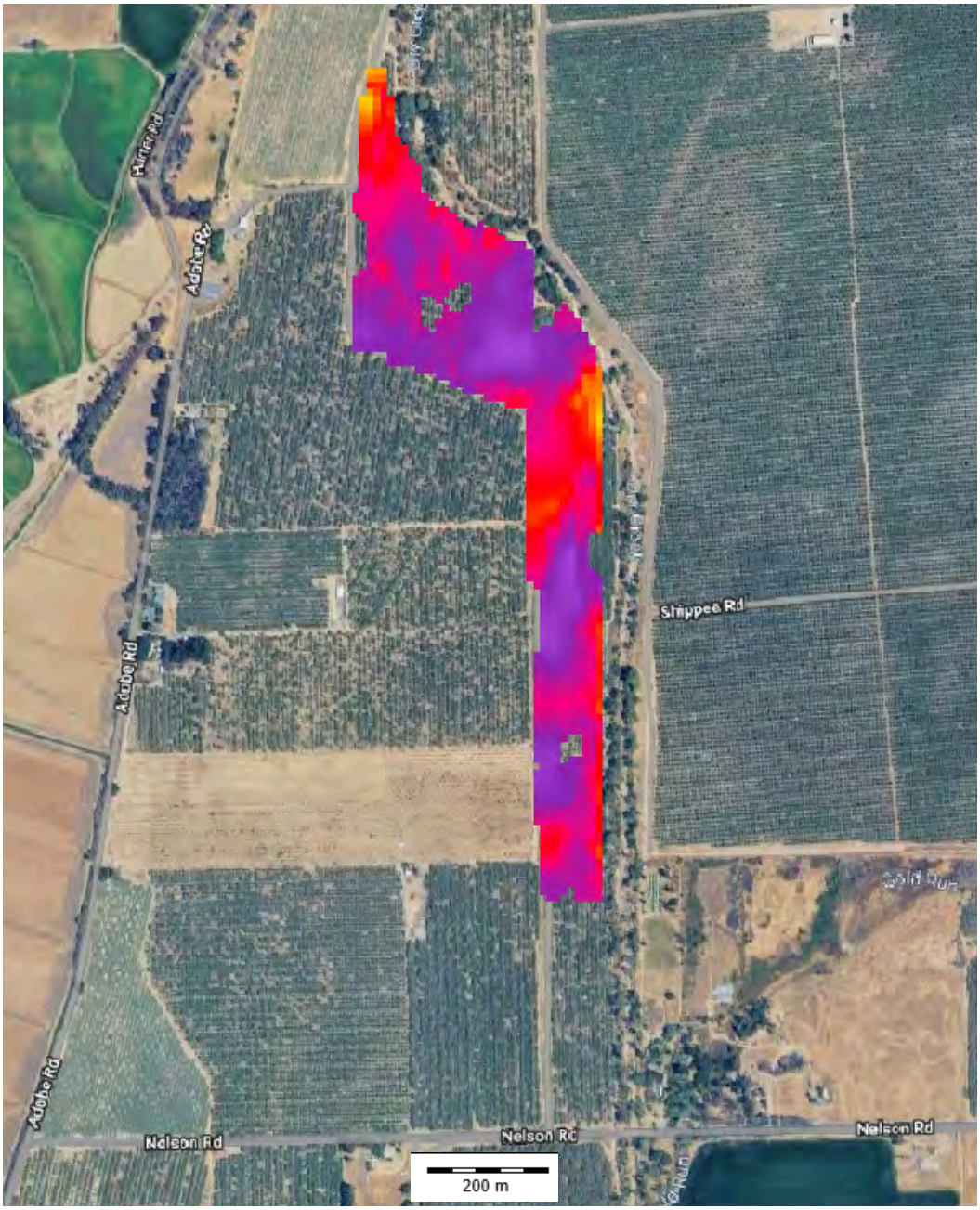

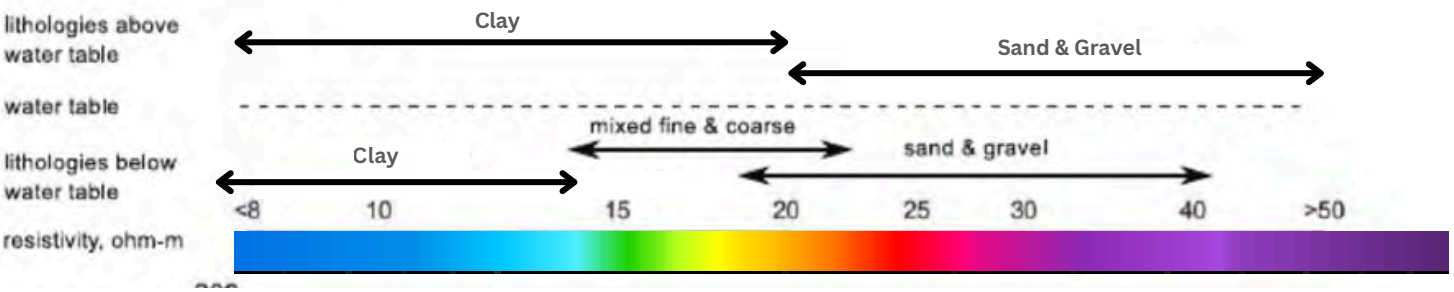

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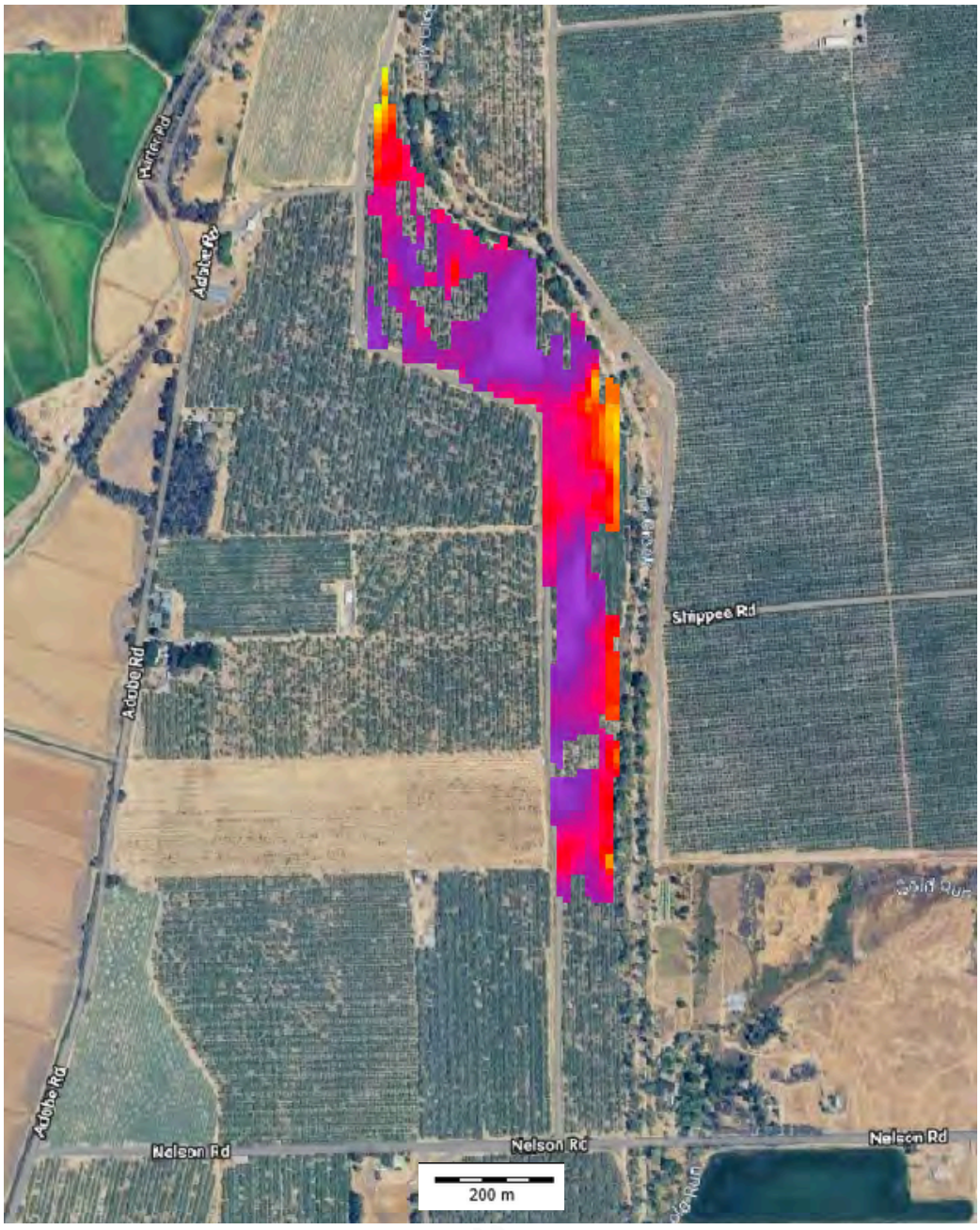

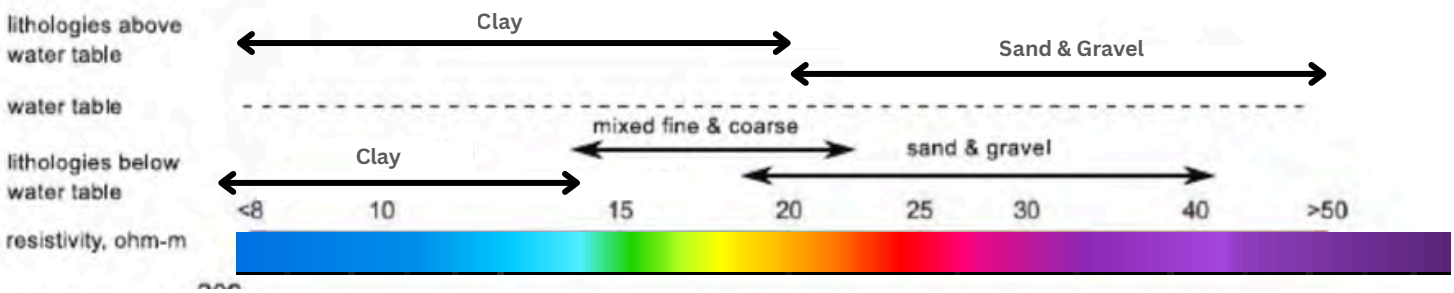

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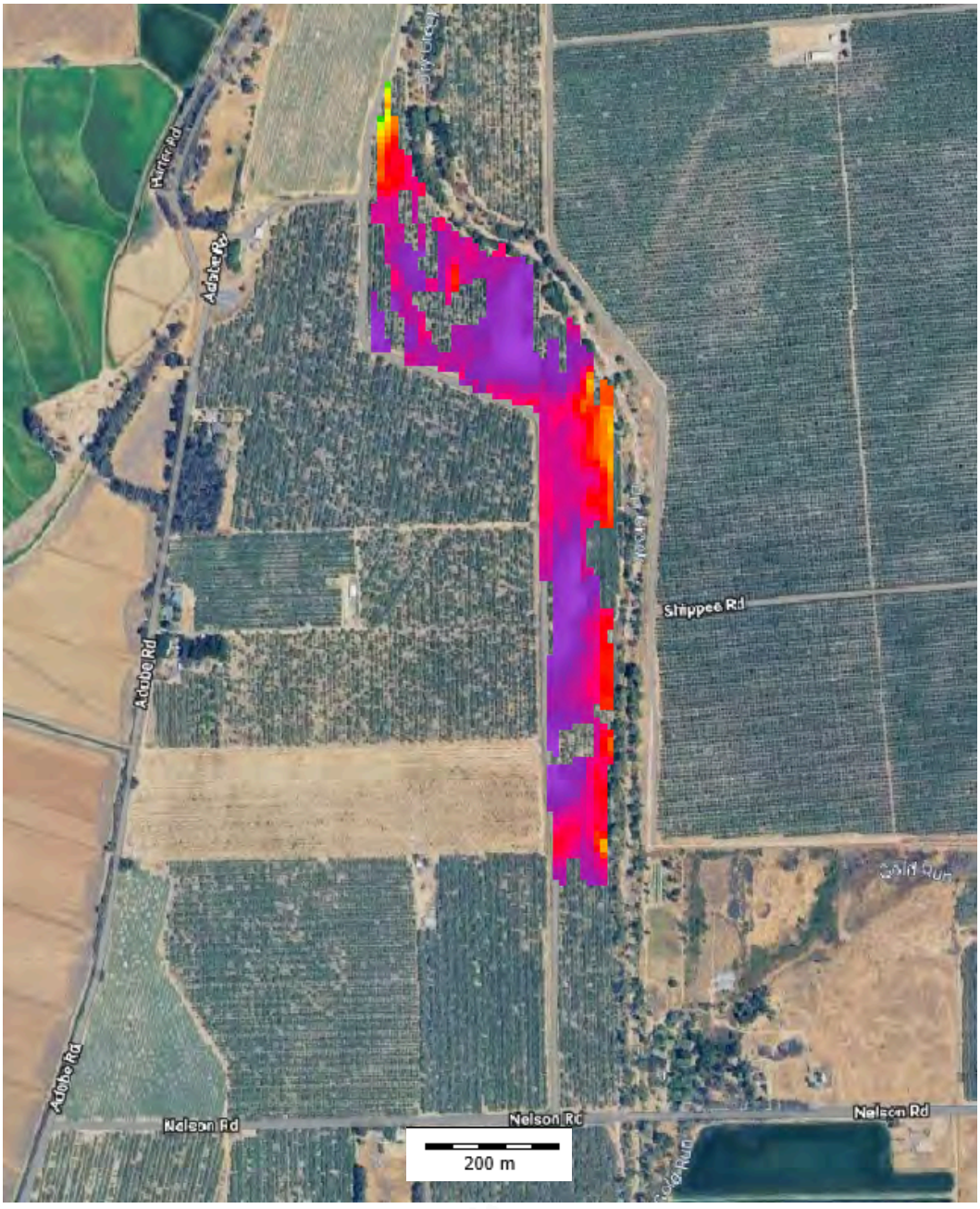

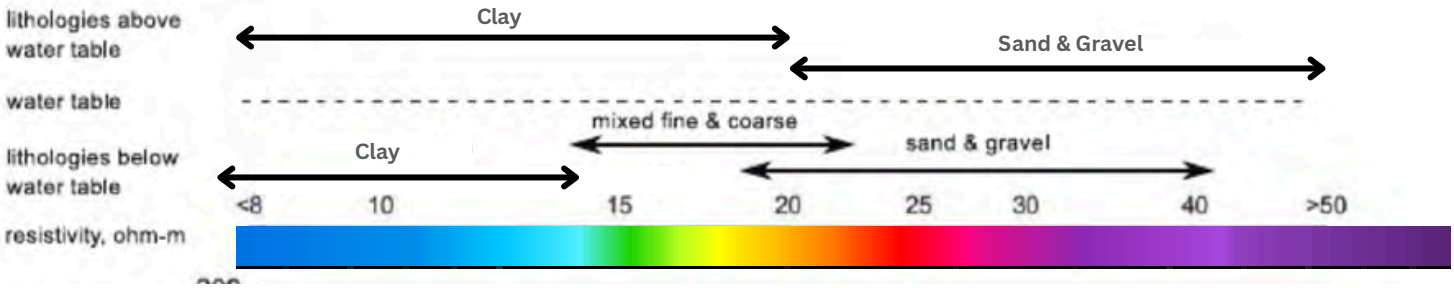

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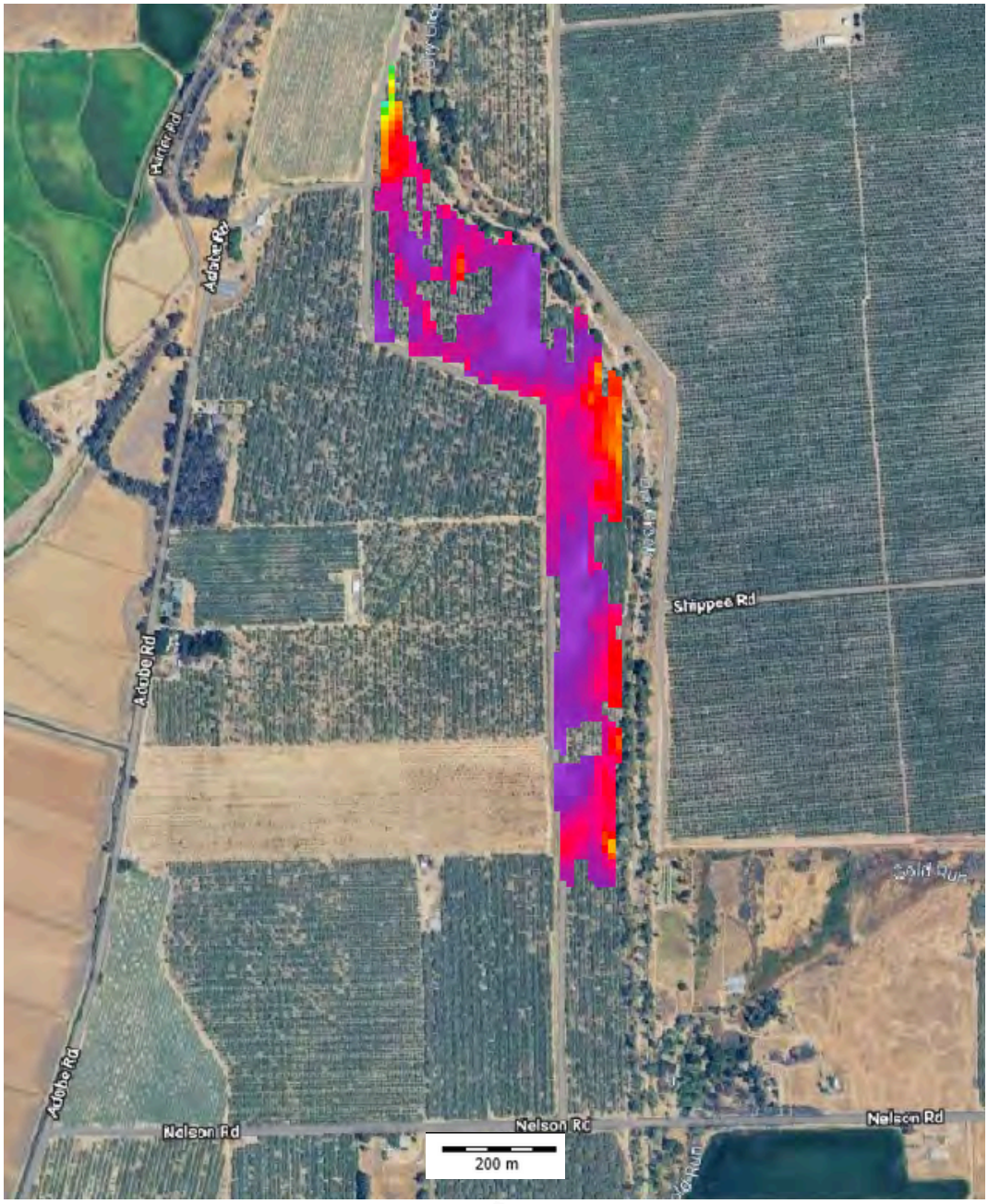

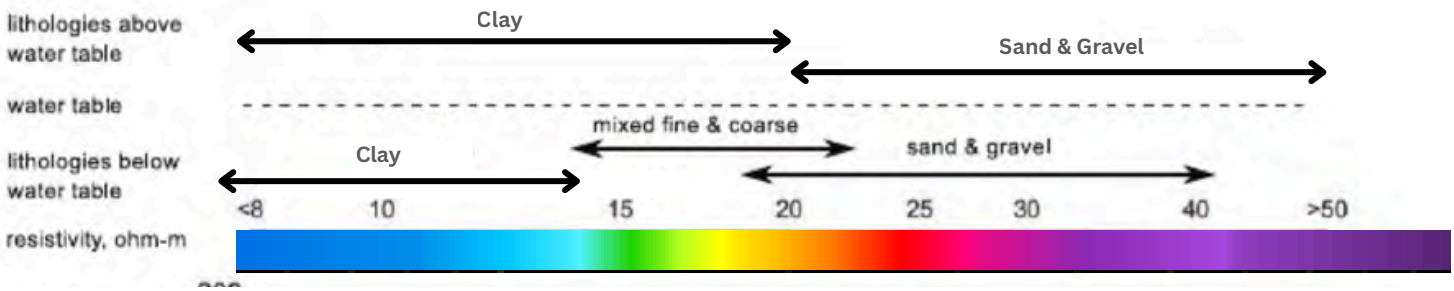

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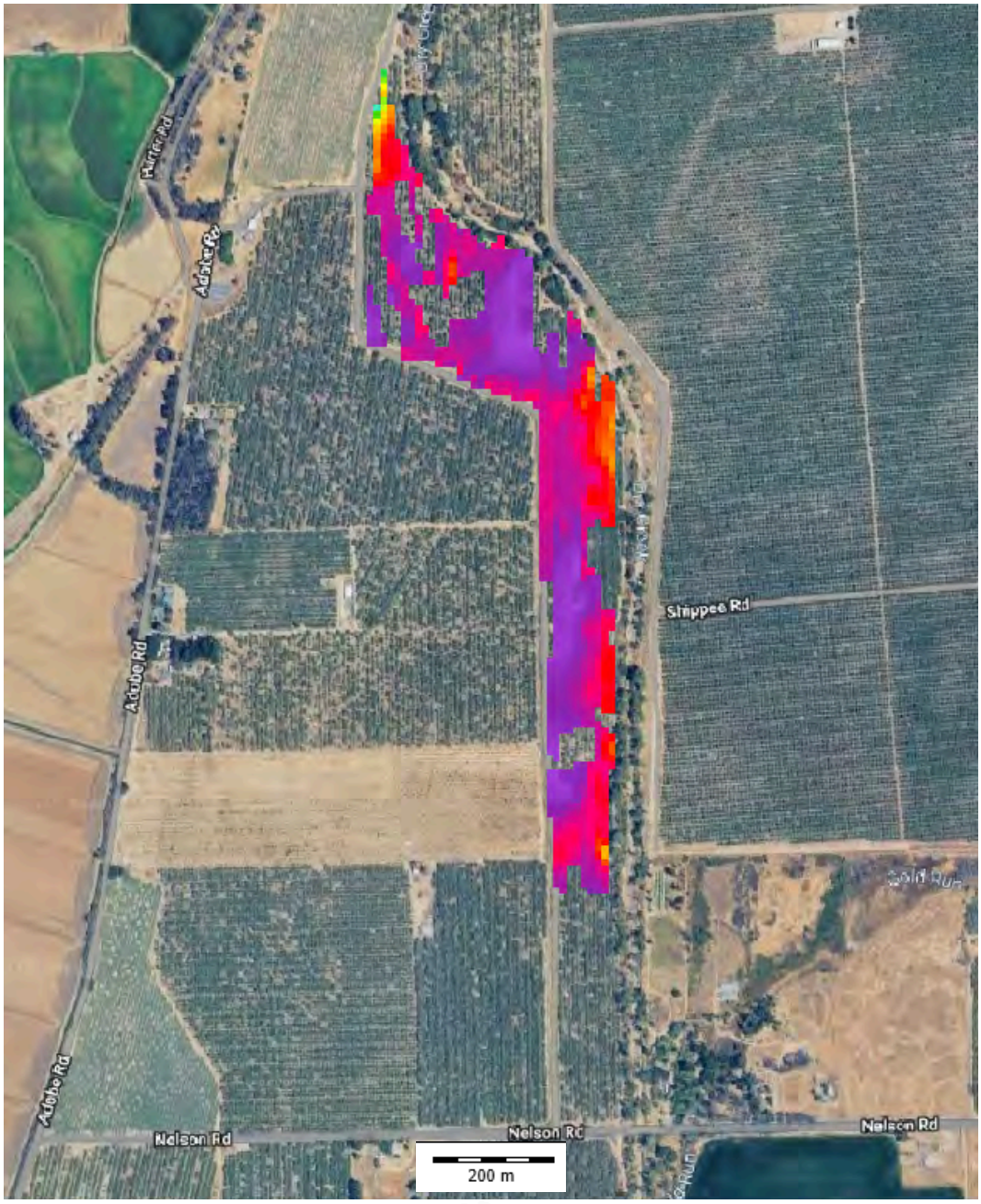

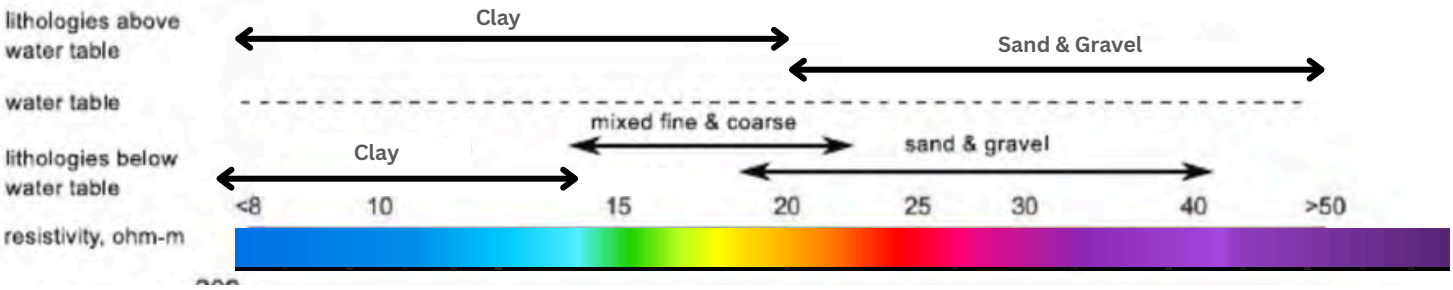

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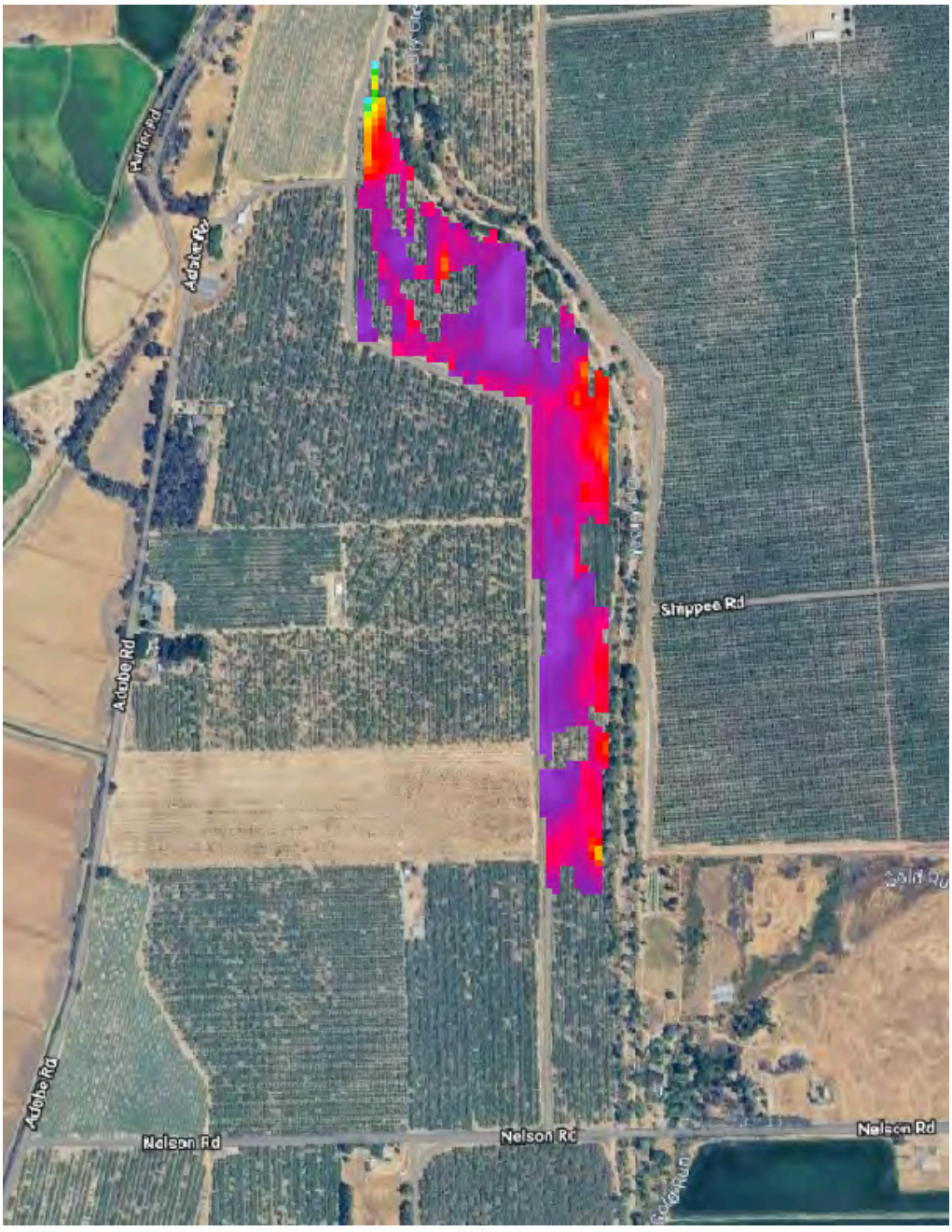

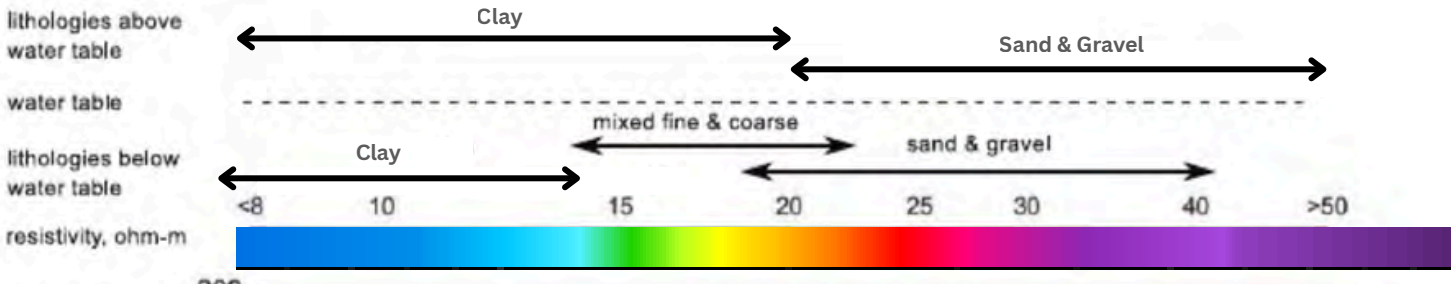

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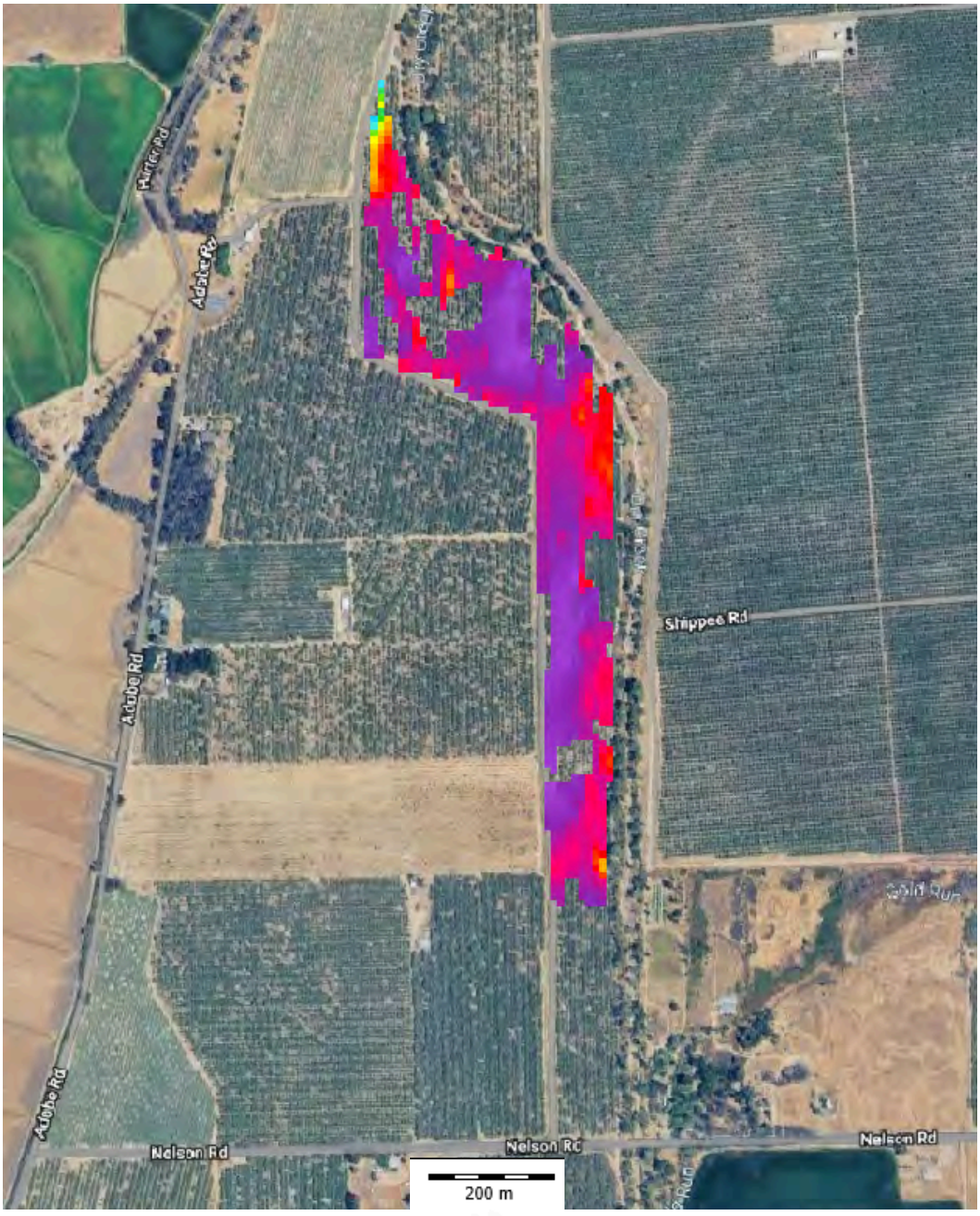

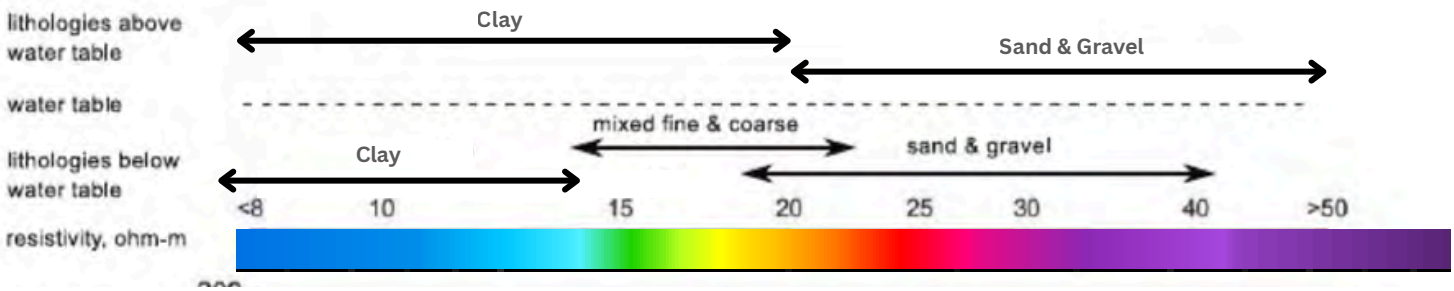

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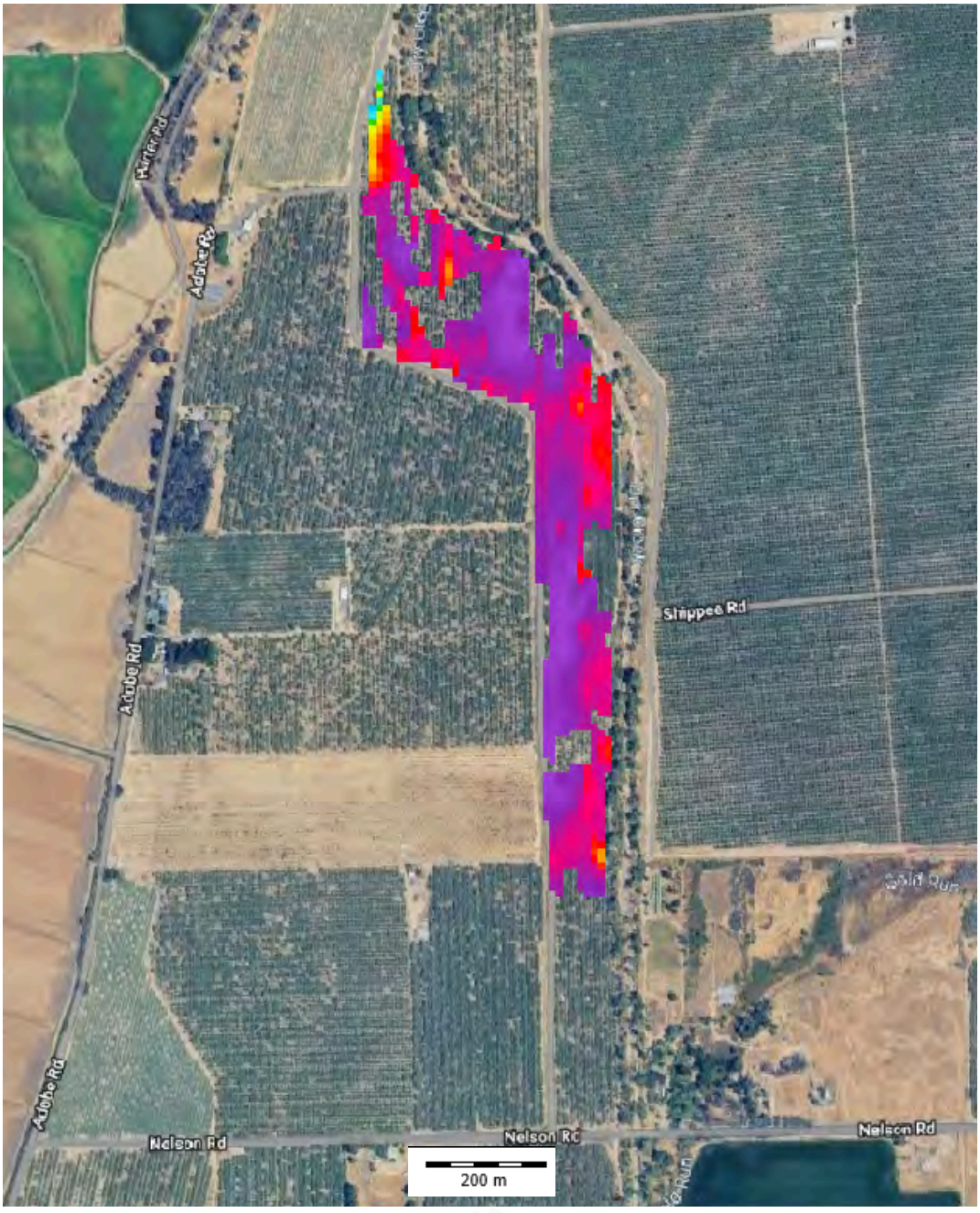

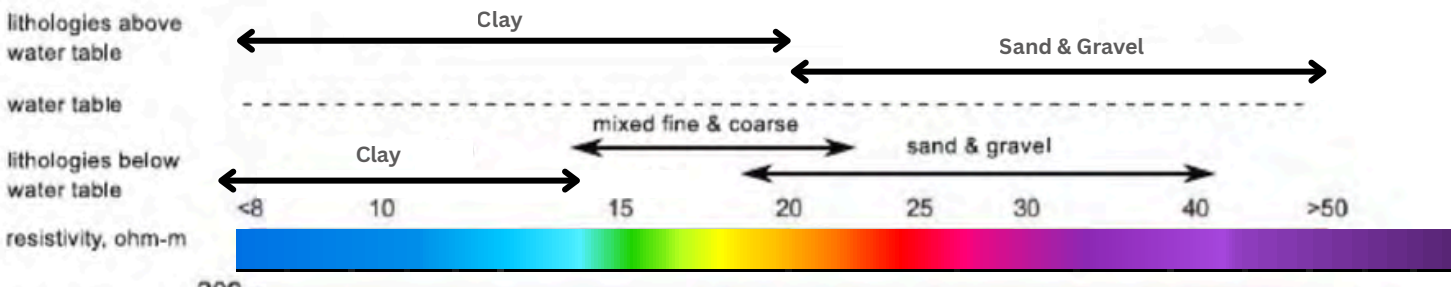

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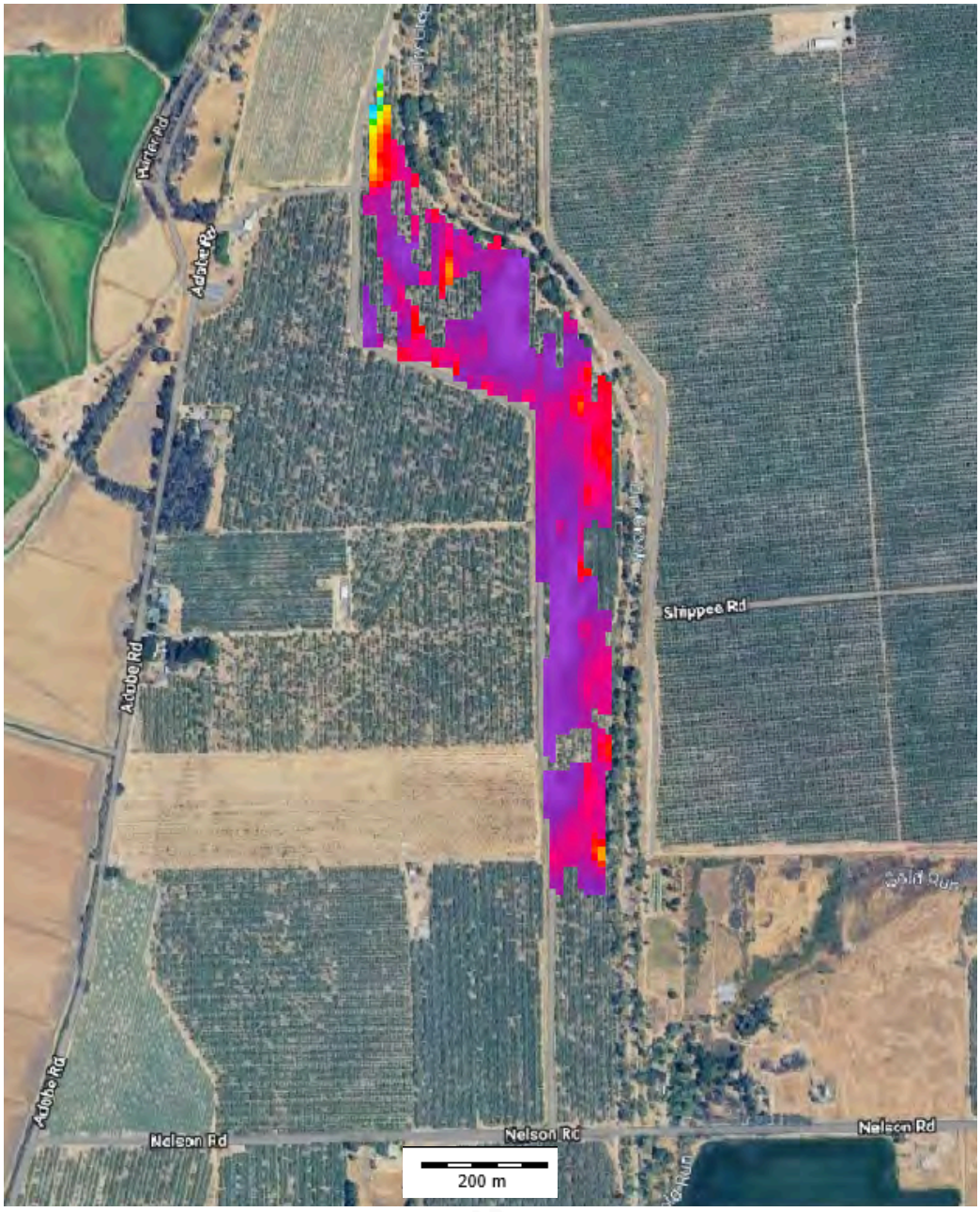

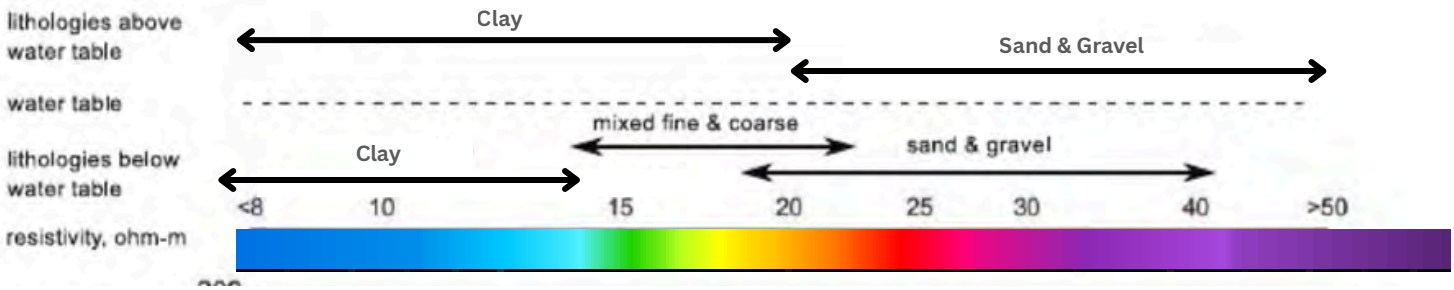

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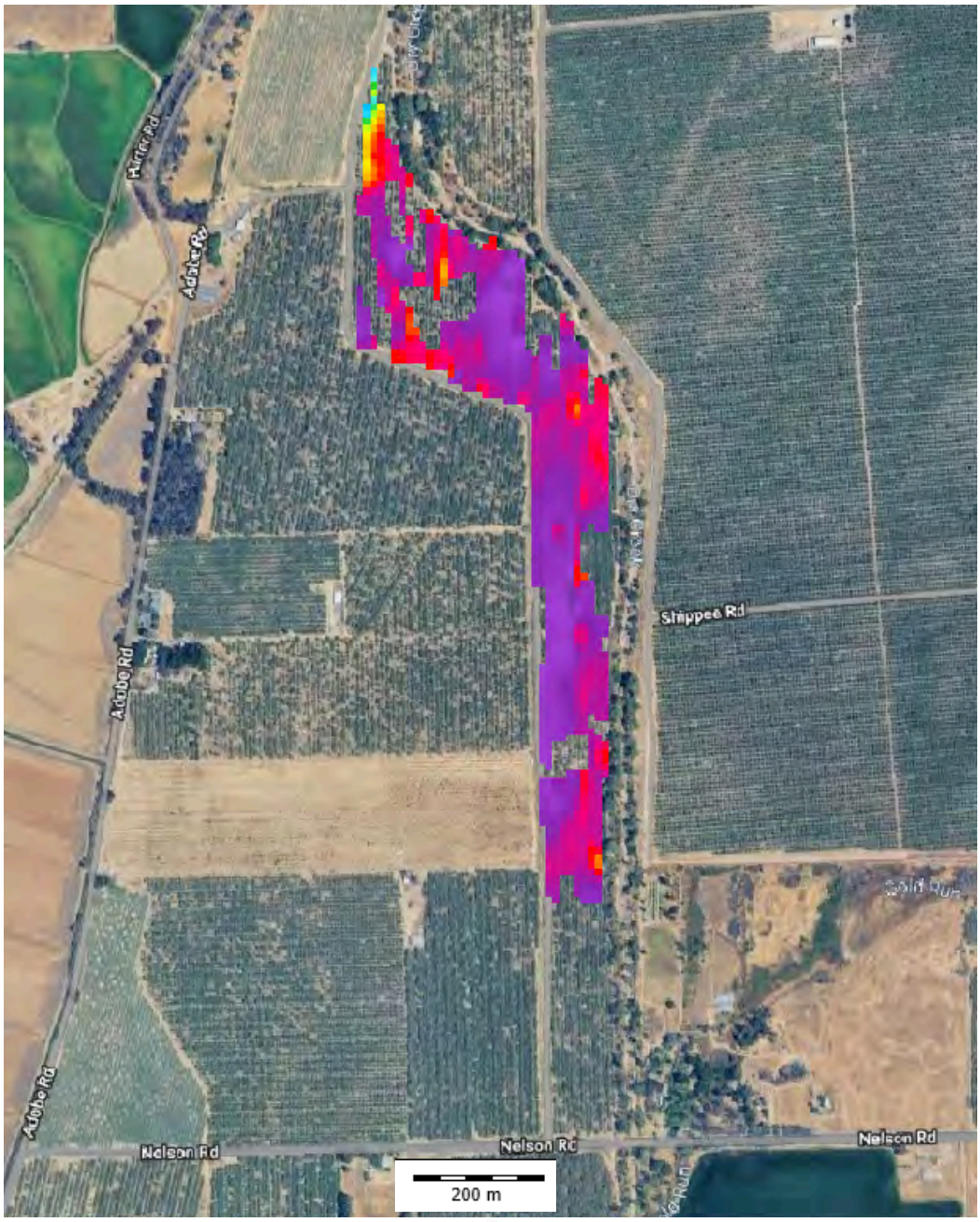

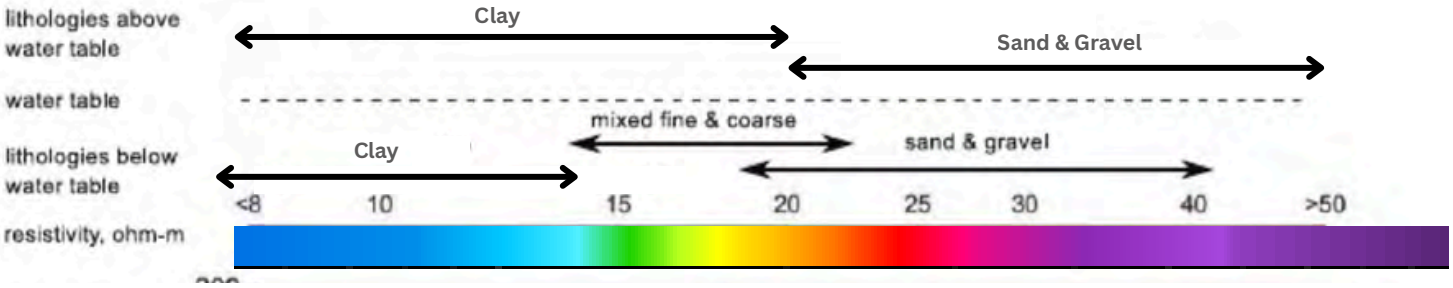

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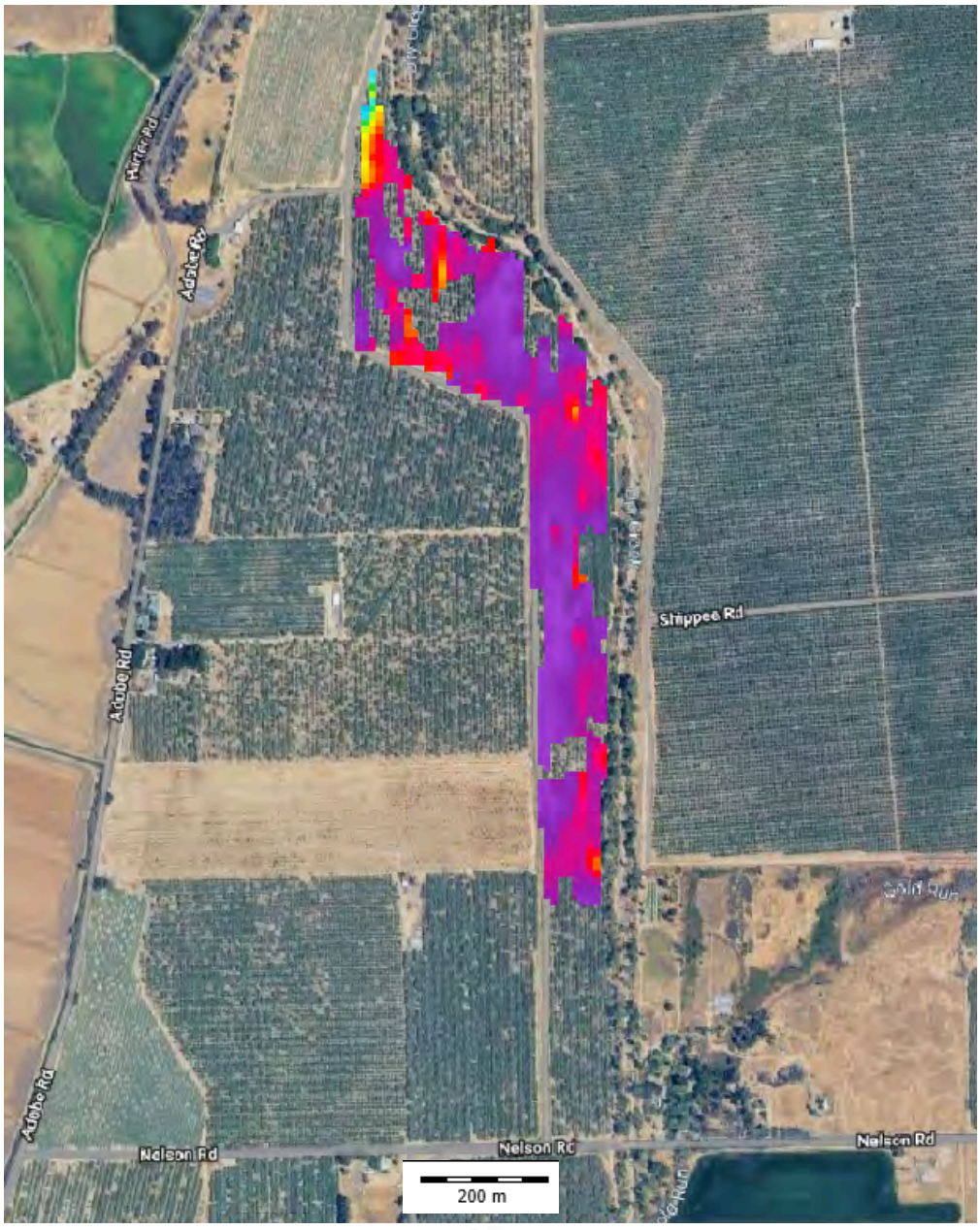

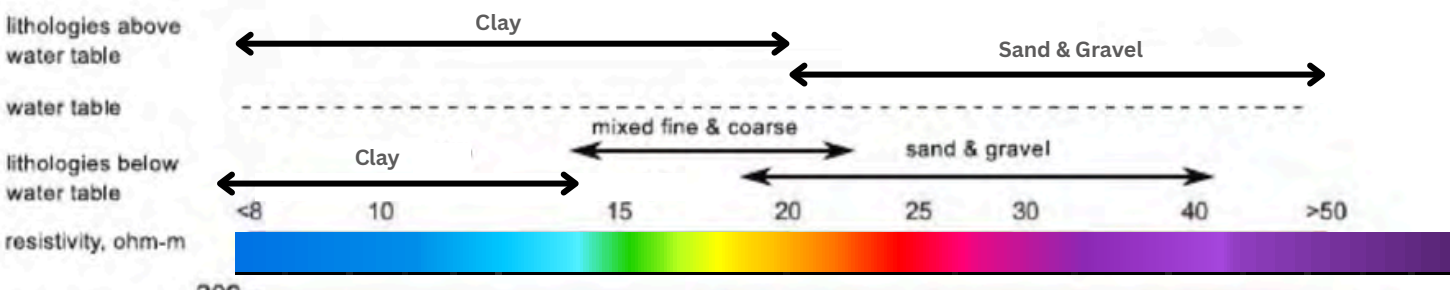

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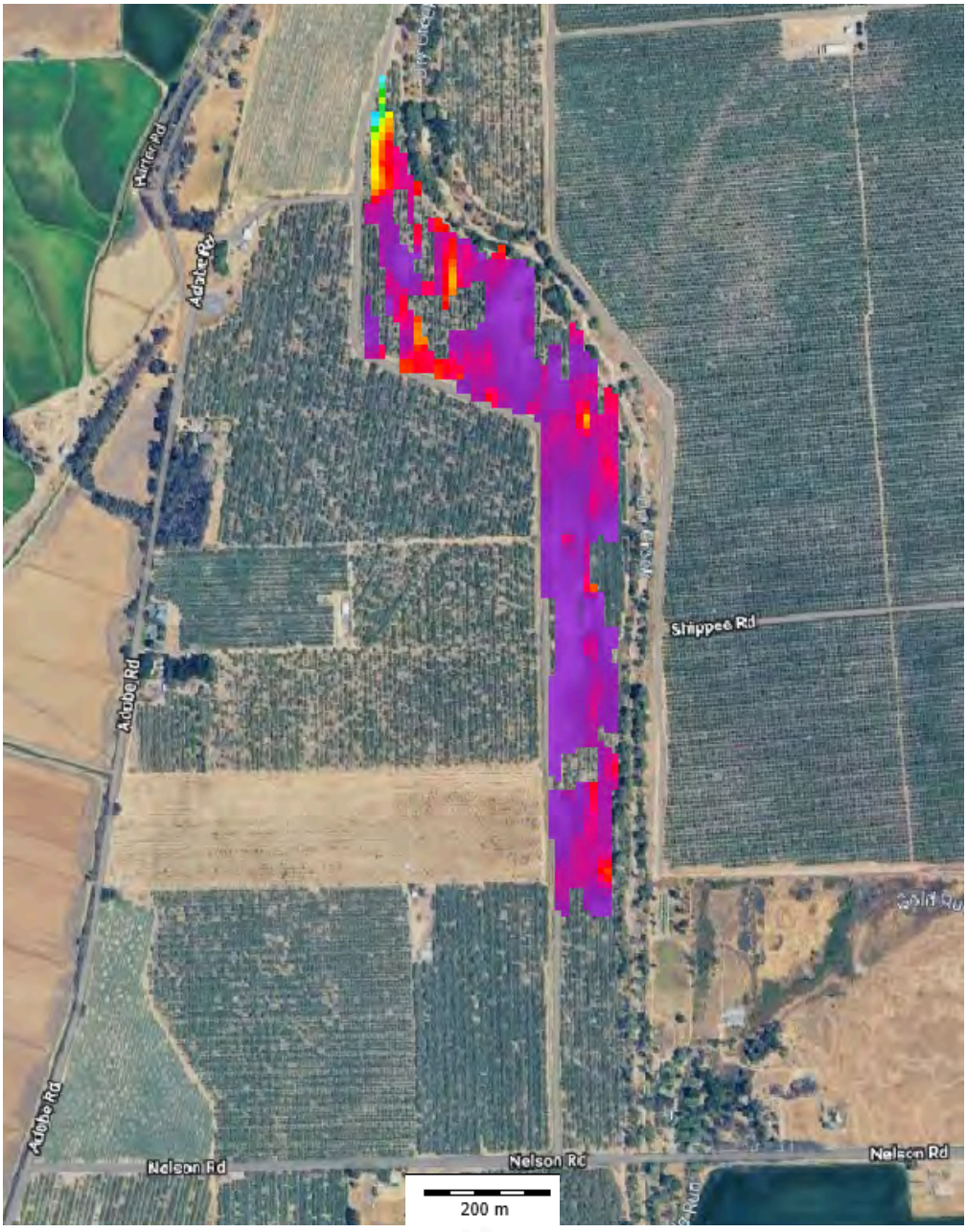
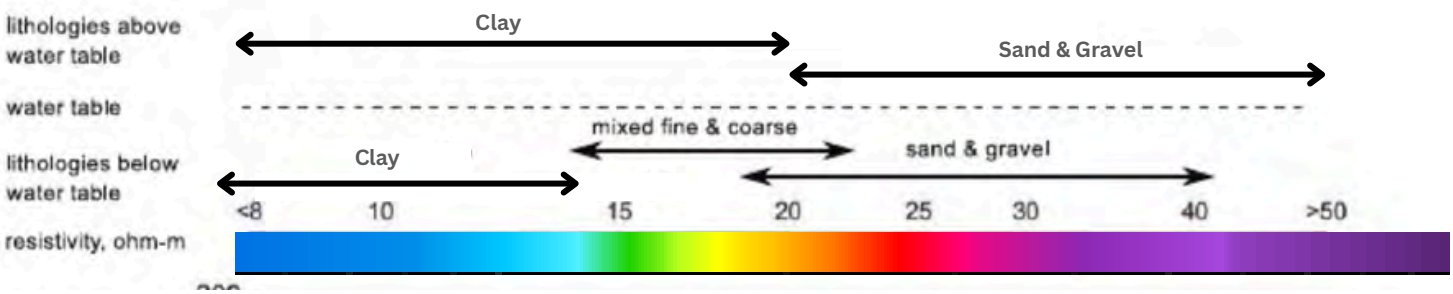
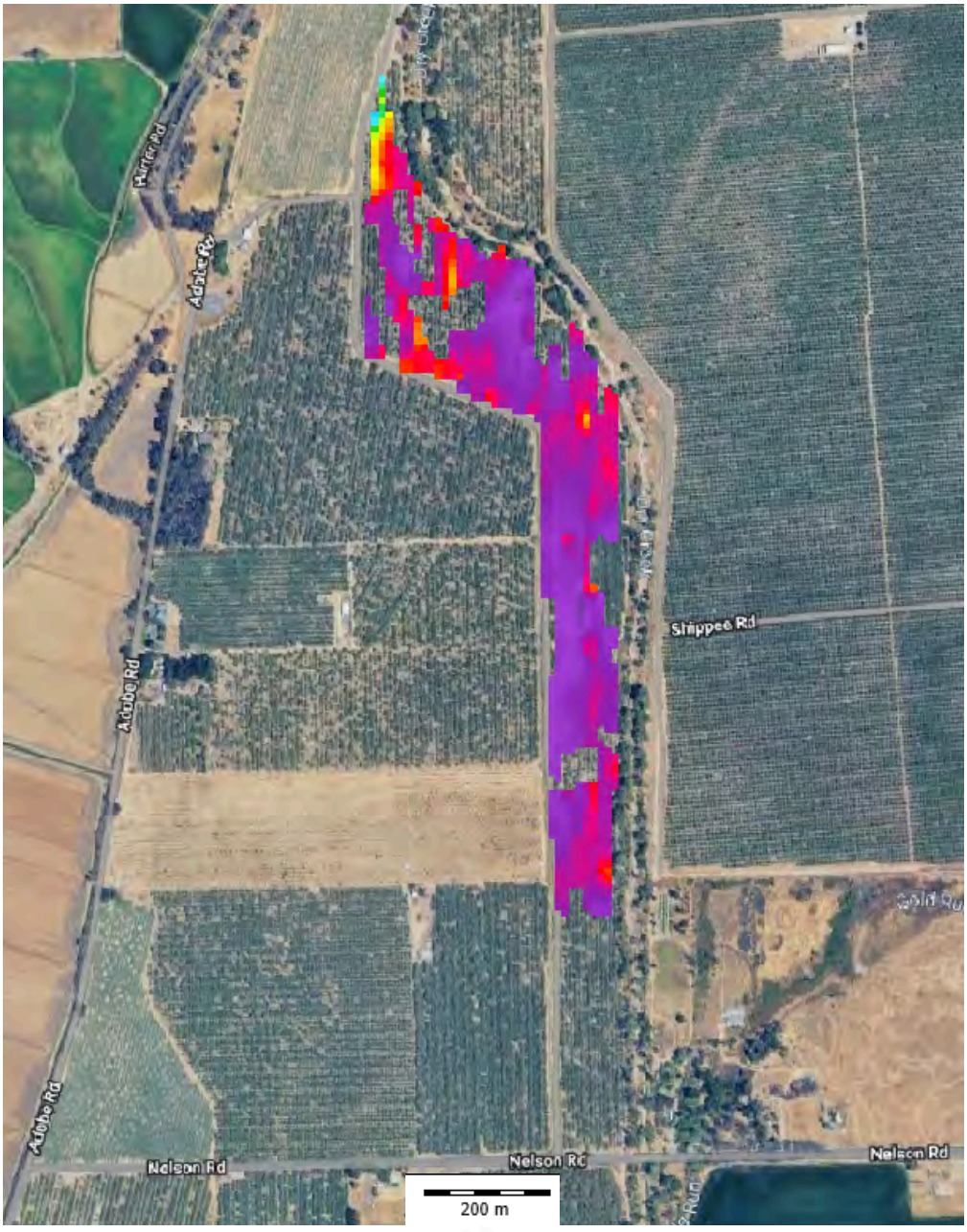
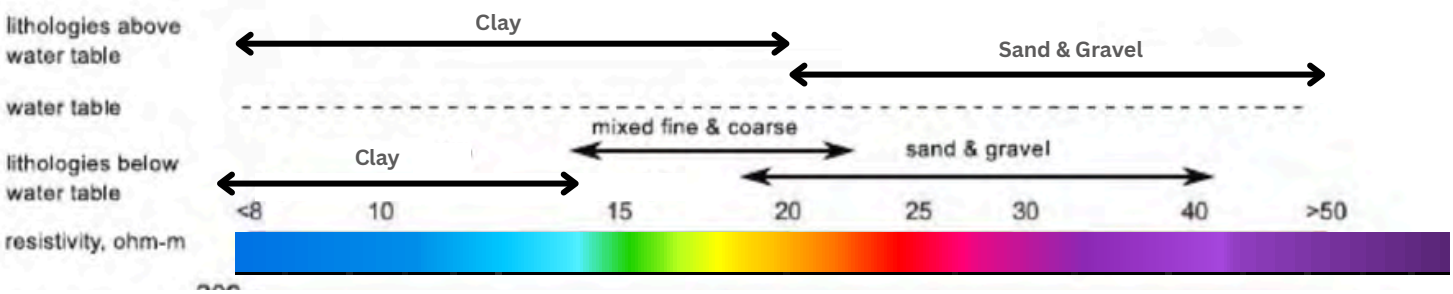




DEPTH SLICES- 240 FT





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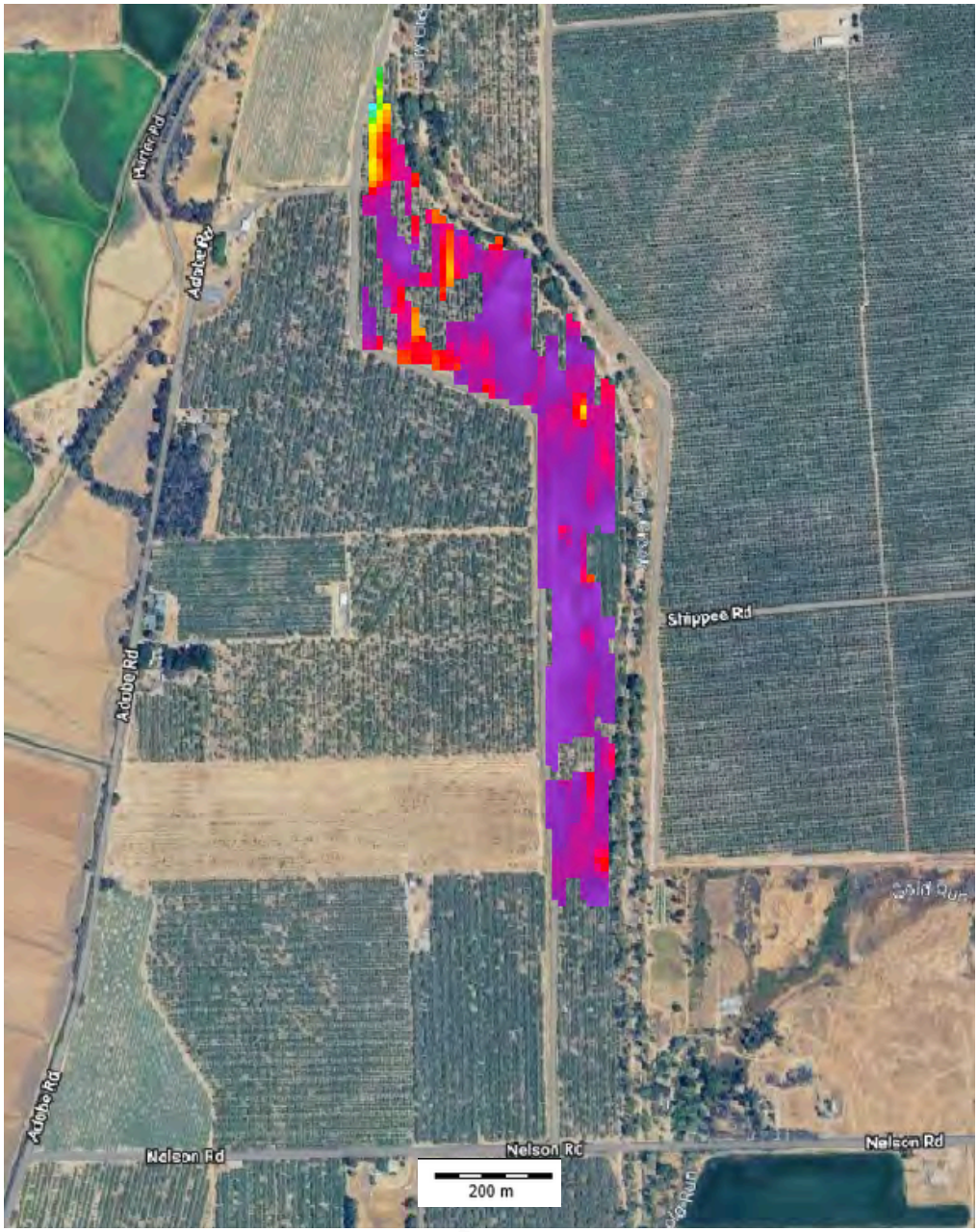

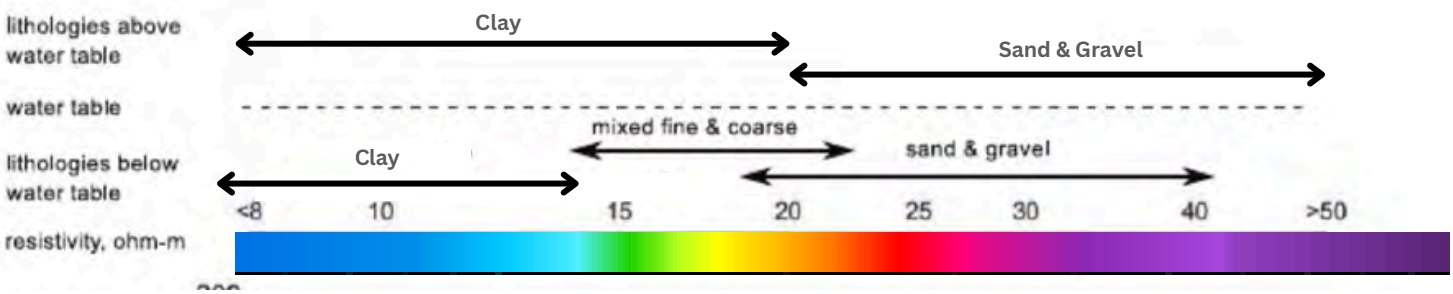

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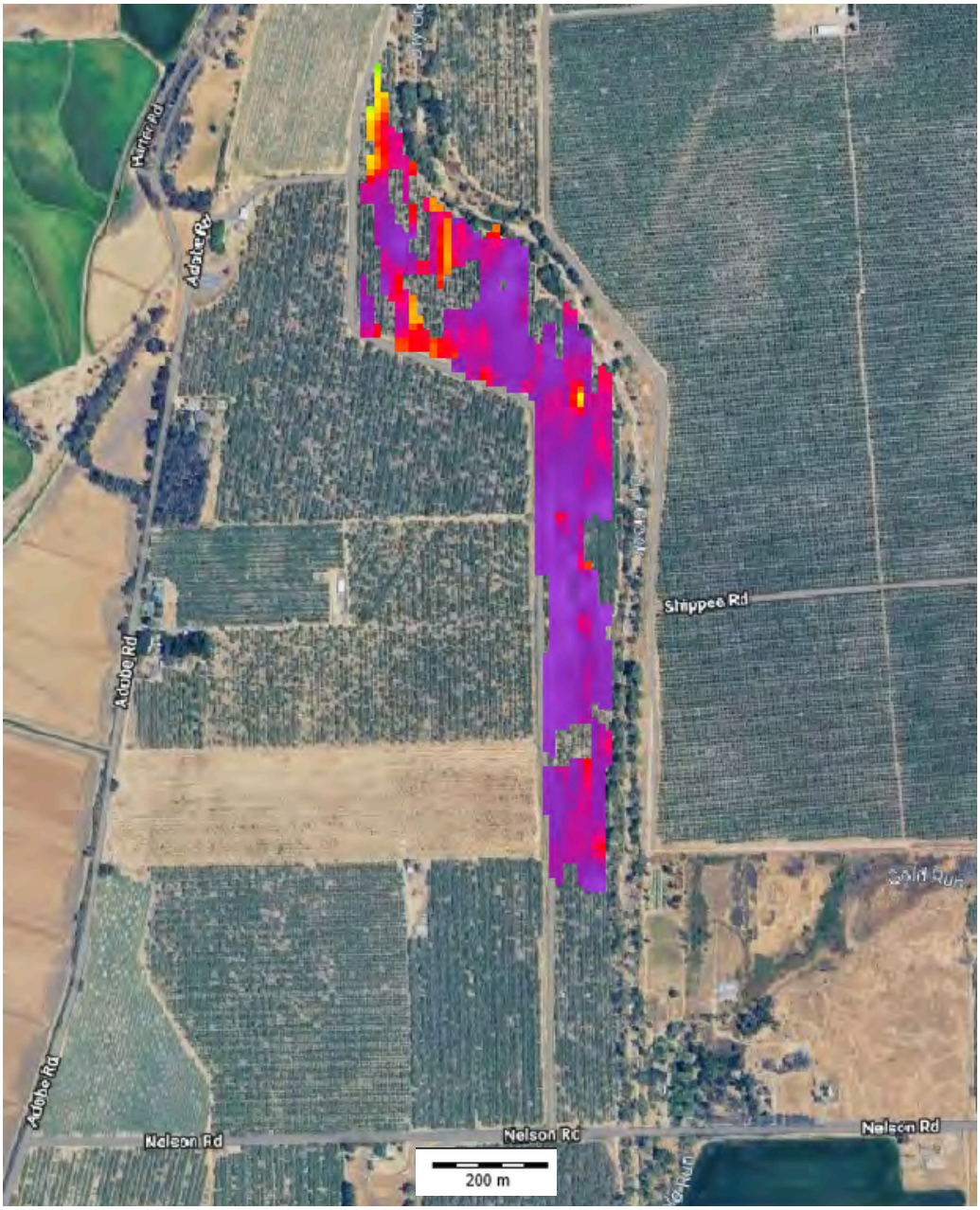
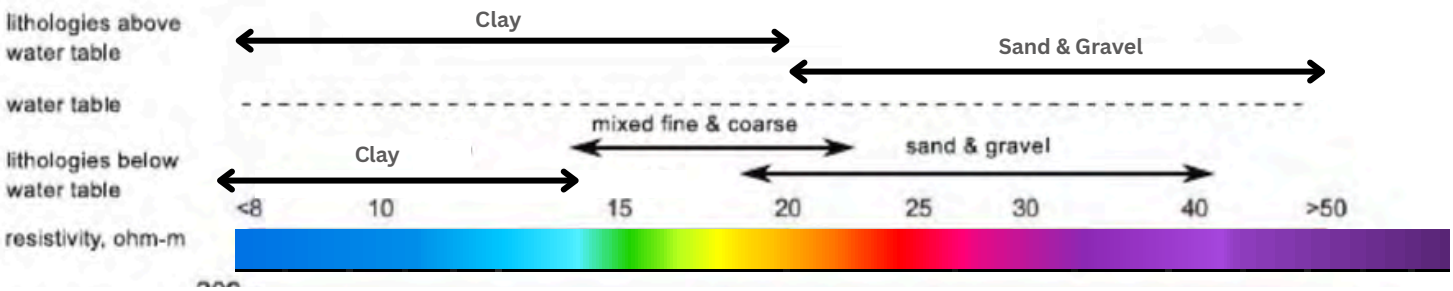
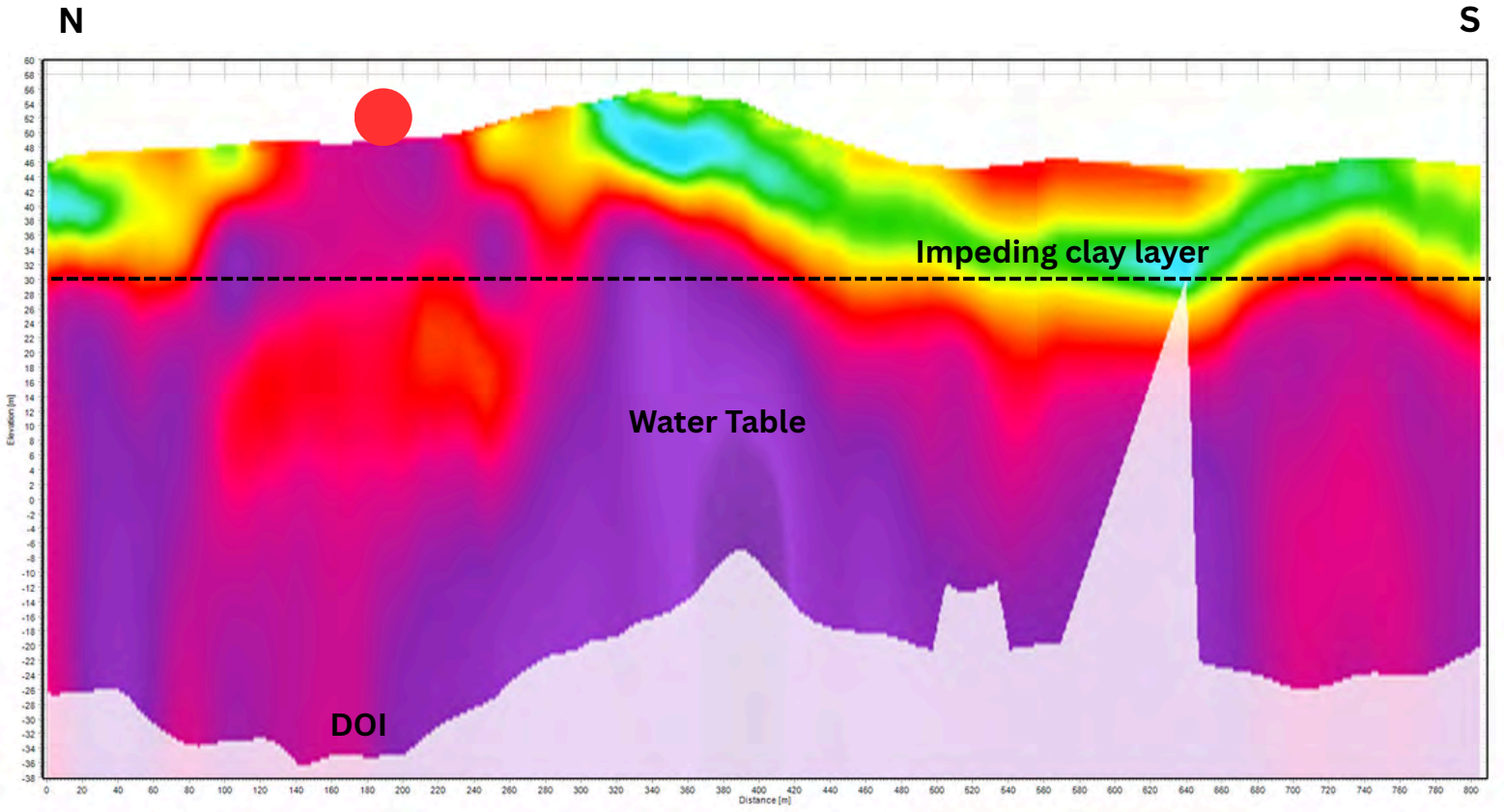
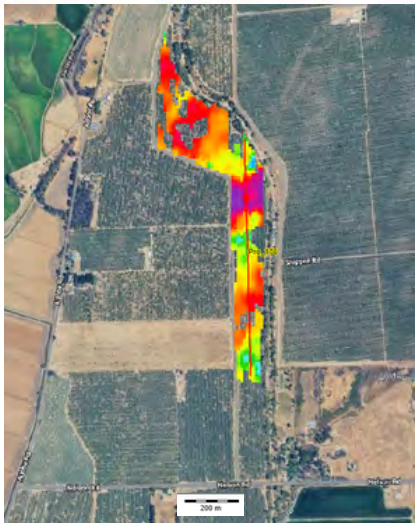




2D CROSS SECTION- PRO_170





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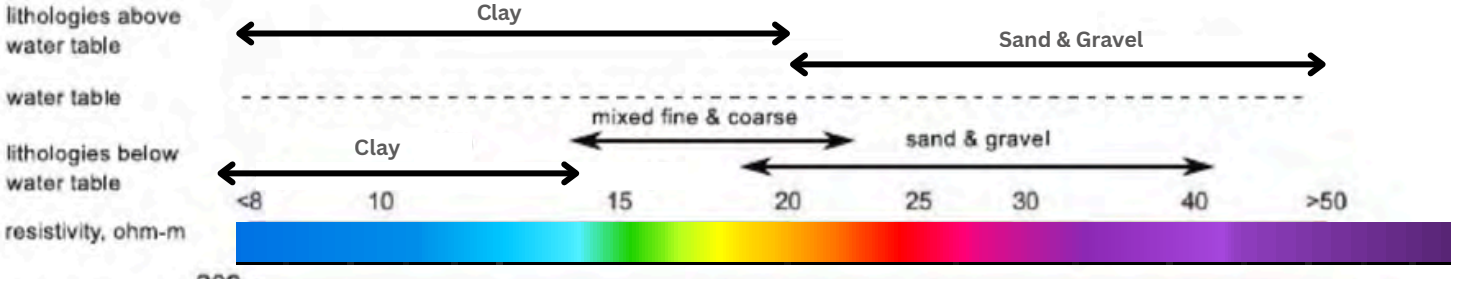

2D CROSS SECTION- PRO_190

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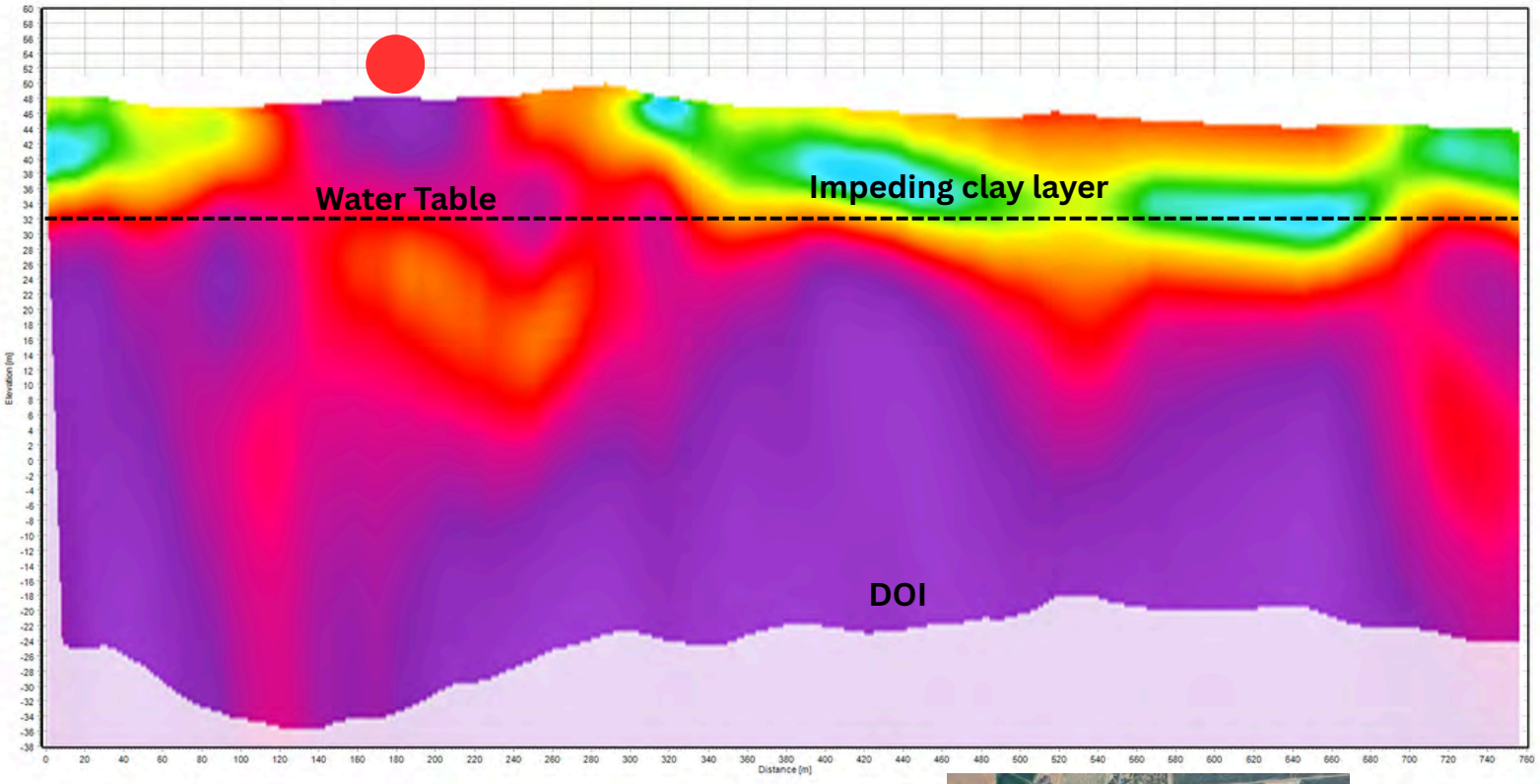

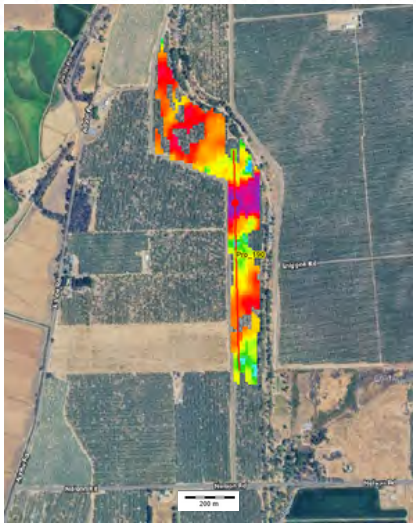

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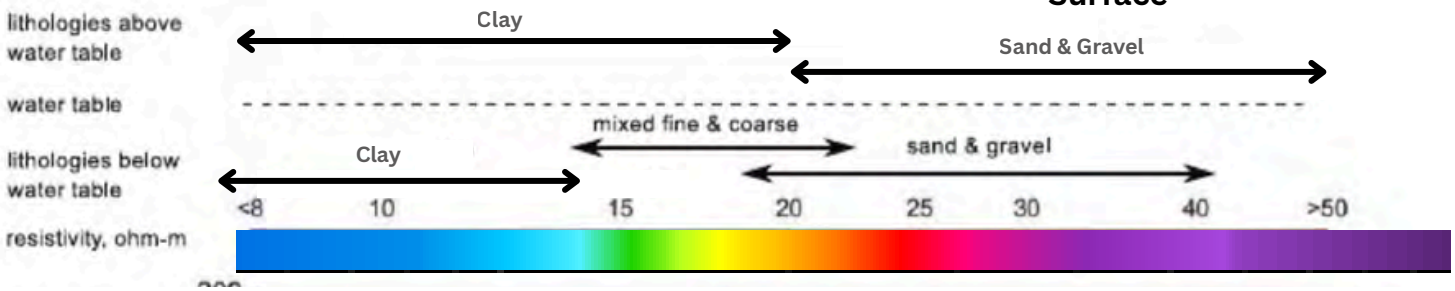

2D CROSS SECTION- PRO_250

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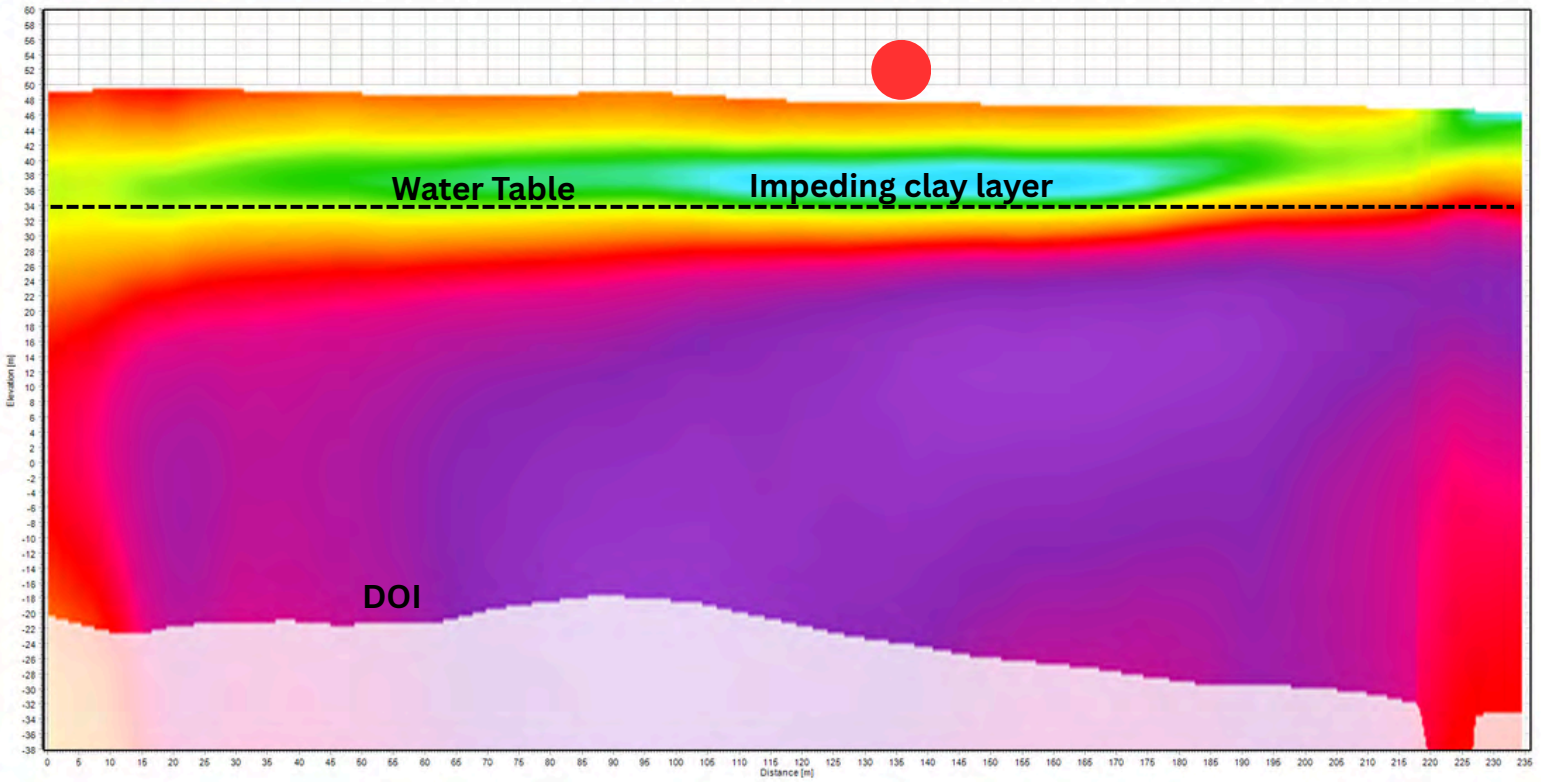

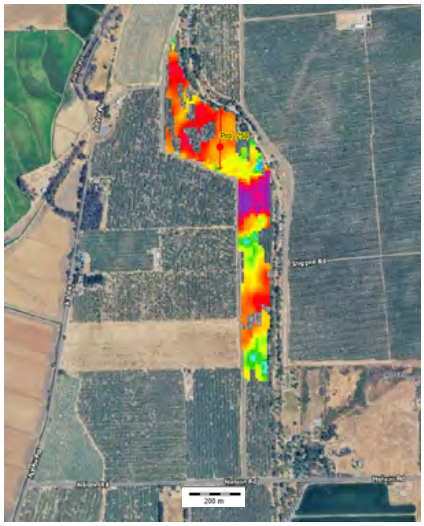

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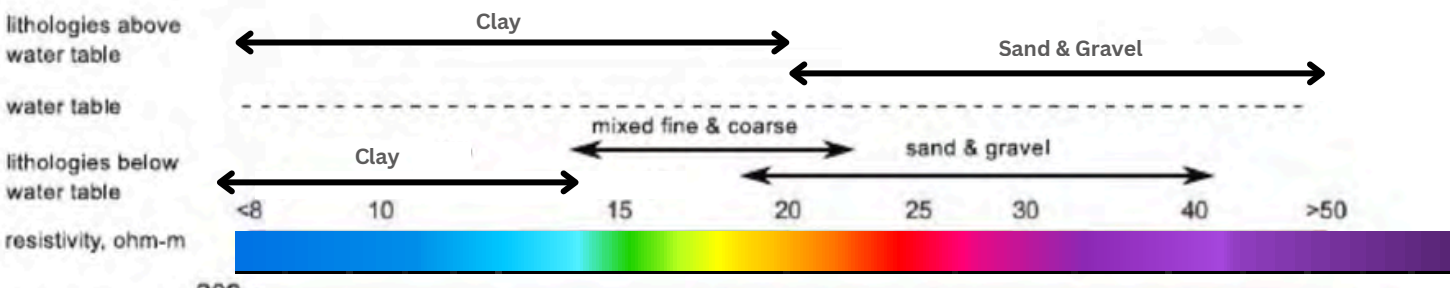

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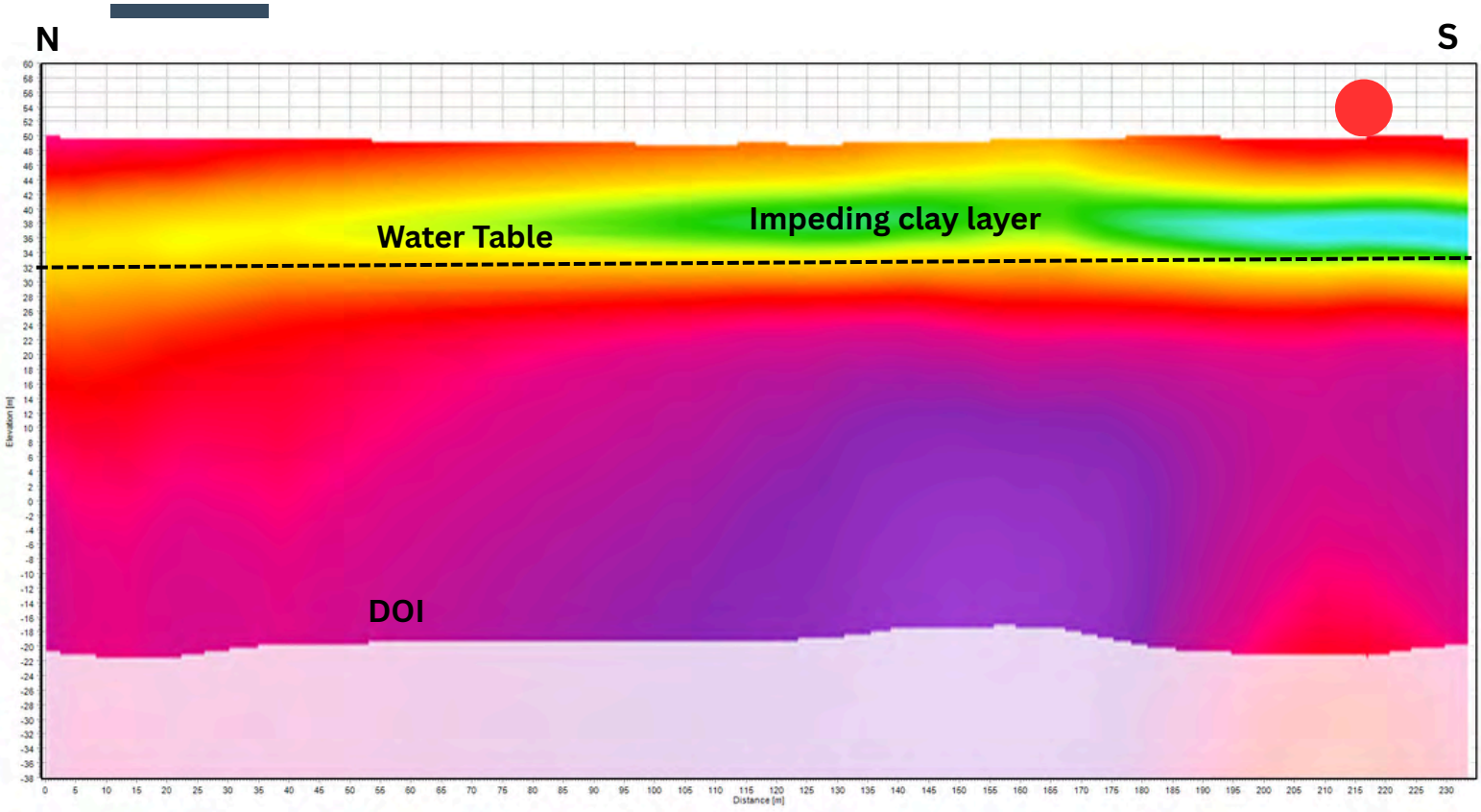

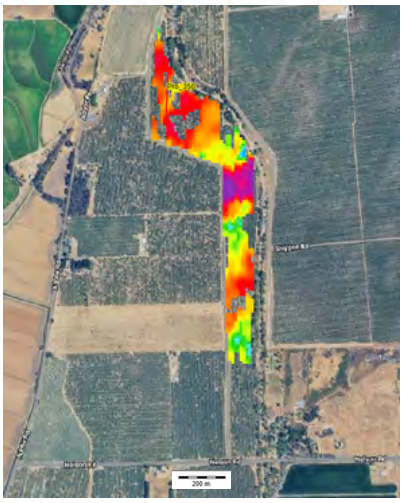

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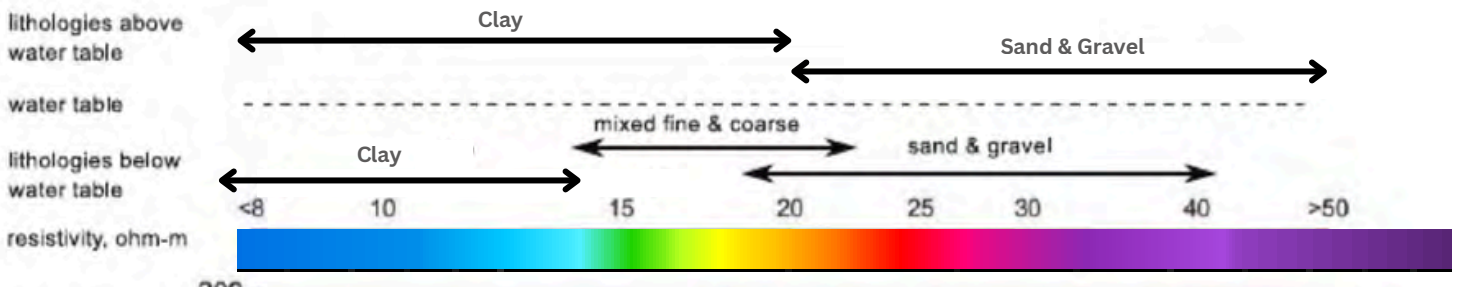

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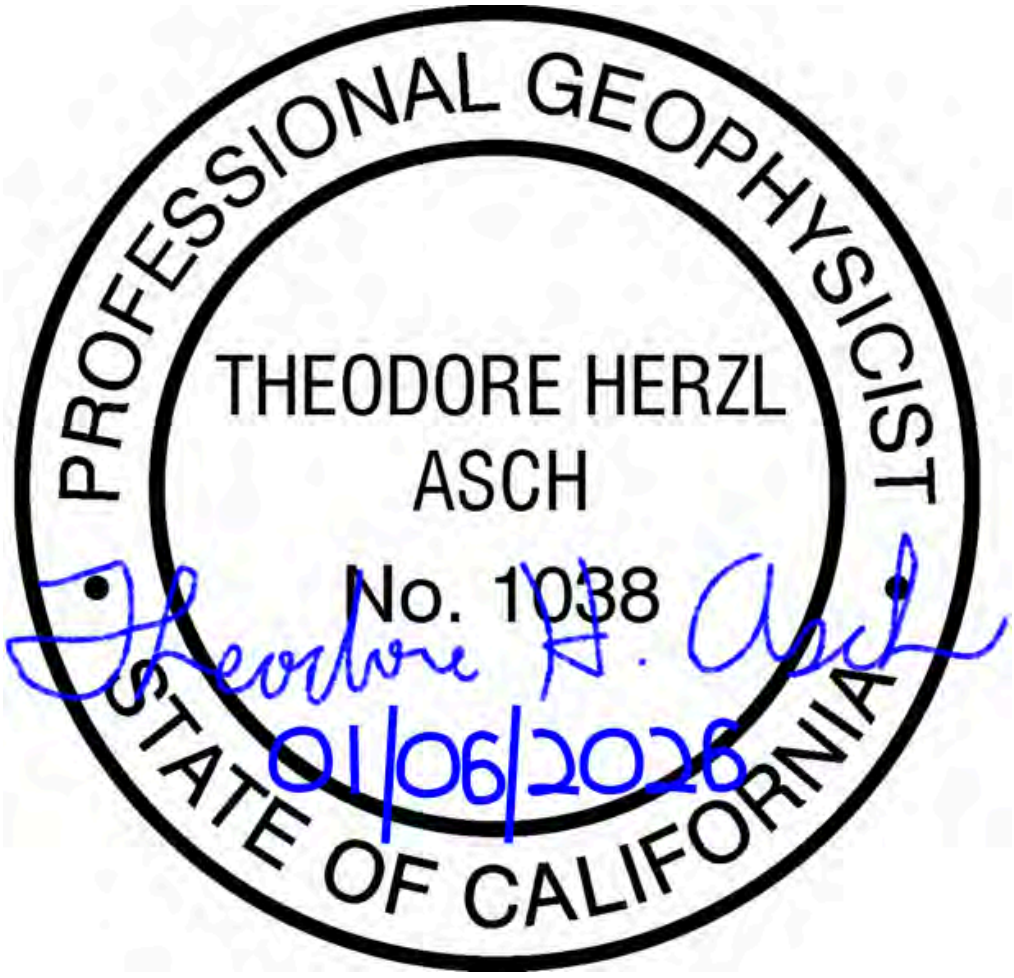
- Walkinshaw, M., O'Geen, A. T., & Beaudette, D. E. (2023, October 1). Soil Properties [Interactive web map]. California Soil Resource Lab, University of California, Davis. https://casoilresource.lawr.ucdavis.edu/gmap/

DELIVERABLES-

- Zip File dropbox link (ttemdatawashington.zip)
  - Washington tTem Mapping Report.pdf
  - Workbench file folder (ttemdatanelsonrd)
  - Workbench ttem set up files .gex & .tfi
  - Raw ttem data files .lin & .skb (nelson rd raw data)
  - Inversion data xyz files (inversion xyz)
  - Inversion data excel file (Washington_SCI.csv)

STATE OF CALIFORNIA PROFESSIONAL GEOPHYSICIST STAMP



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GroundWaterMaps

Groundwater Aquifer Mapping

Contact:
Nathan Azevedo

(530) 717-0679

Maxwell, CA

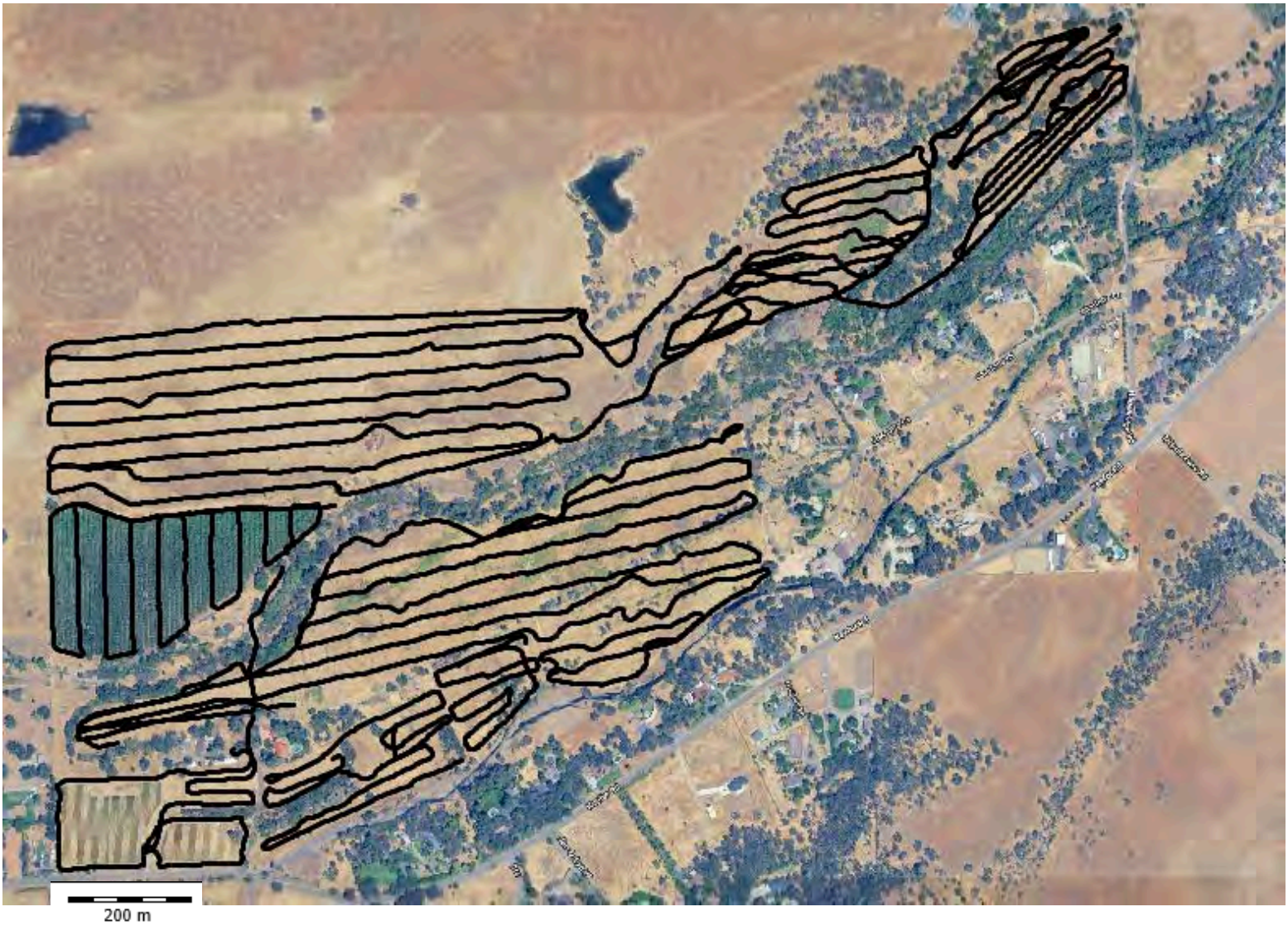
nathan@groundwatermaps.com

Site N6

RIOLO GROUNDWATER MAPPING REPORT

FEB 22, 2026// PREPARED BY GROUNDWATERMAPS

TTEM SURVEY RIOLO



REPORT

- **Objective:** To determine the suitability of the Riolo project area to surface groundwater recharge.

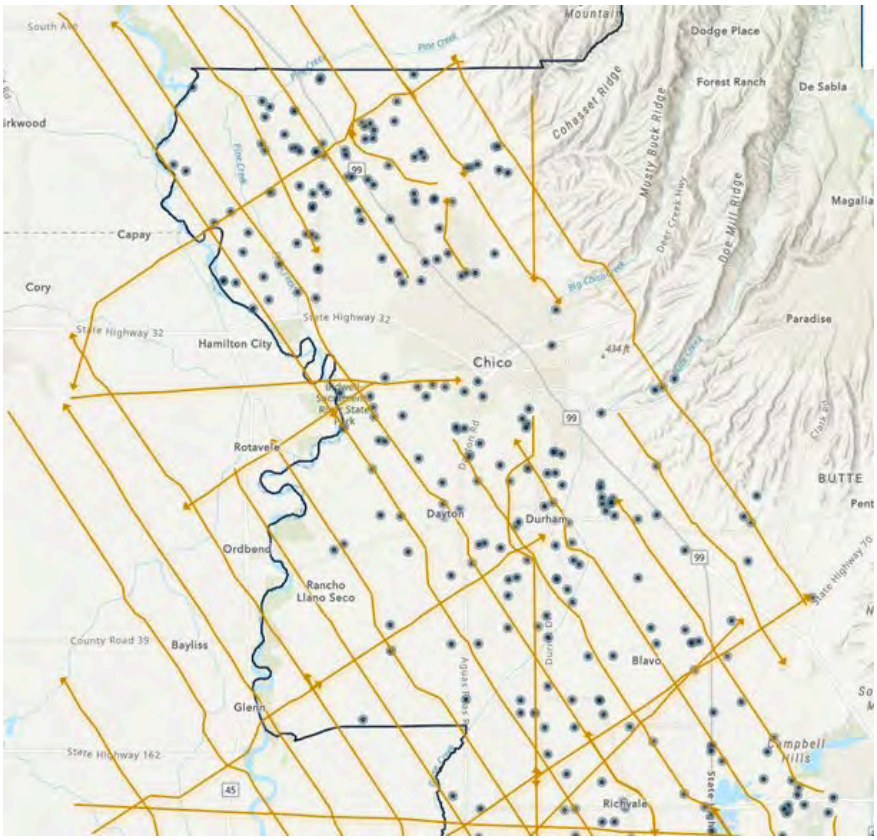
- **Methods:**
  - DWR Aerial Electromagnetic Survey
  - Soil Agricultural Groundwater Banking Index (SAGBI)
  - NRCS Soil Map
  - California Statewide Groundwater Elevation Monitoring (CASGEM)
  - TTem Towable Electromagnetic Survey
    - Survey Conducted by GroundWaterMaps- Nathan Azevedo
      - Survey Dates-February 13, 2025
      - Survey Location- 3746 Keefer Rd, Chico CA 95973
- **Results:**
  a. The DWR AEM survey (page 4) that passed near the Riolo project area revealed resistive (sand/gravel) geology in the near surface that overlies an impeding clay layer which may impede surface groundwater recharge from reaching deeper aquifer systems.
  b. The Soil Agricultural Groundwater Banking Index (SAGBI) (page 7) identifies the project area as to having “excellent” to “good” groundwater recharge suitability. The NRCS Soil Map (page 5) identifies the survey area as to having geology in the very near surface with ksat values (page 6) consistent with soil types suitable to groundwater recharge.
  c. Local California Statewide Groundwater Elevation Monitoring (CASGEM) data reveals depth to groundwater at 68 feet. (page 12)
  d. The tTem survey unfortunately revealed a conductive clay layer impeding groundwater recharge throughout all of the survey area (page 22-38), the clay layer ranges from 40 to 140 feet thick and pervades nearly all of the survey areas. (page 41-46)

- **Conclusion:**
  - Though the AEM, SAGBI, NRCS Soil Map, and even tTem survey revealed resistive geology in the very near surface conducive to groundwater recharge, the tTem survey also revealed a relatively shallow and pervasive impeding clay layer which should deem most if not all the project area not conducive to surface groundwater recharge.

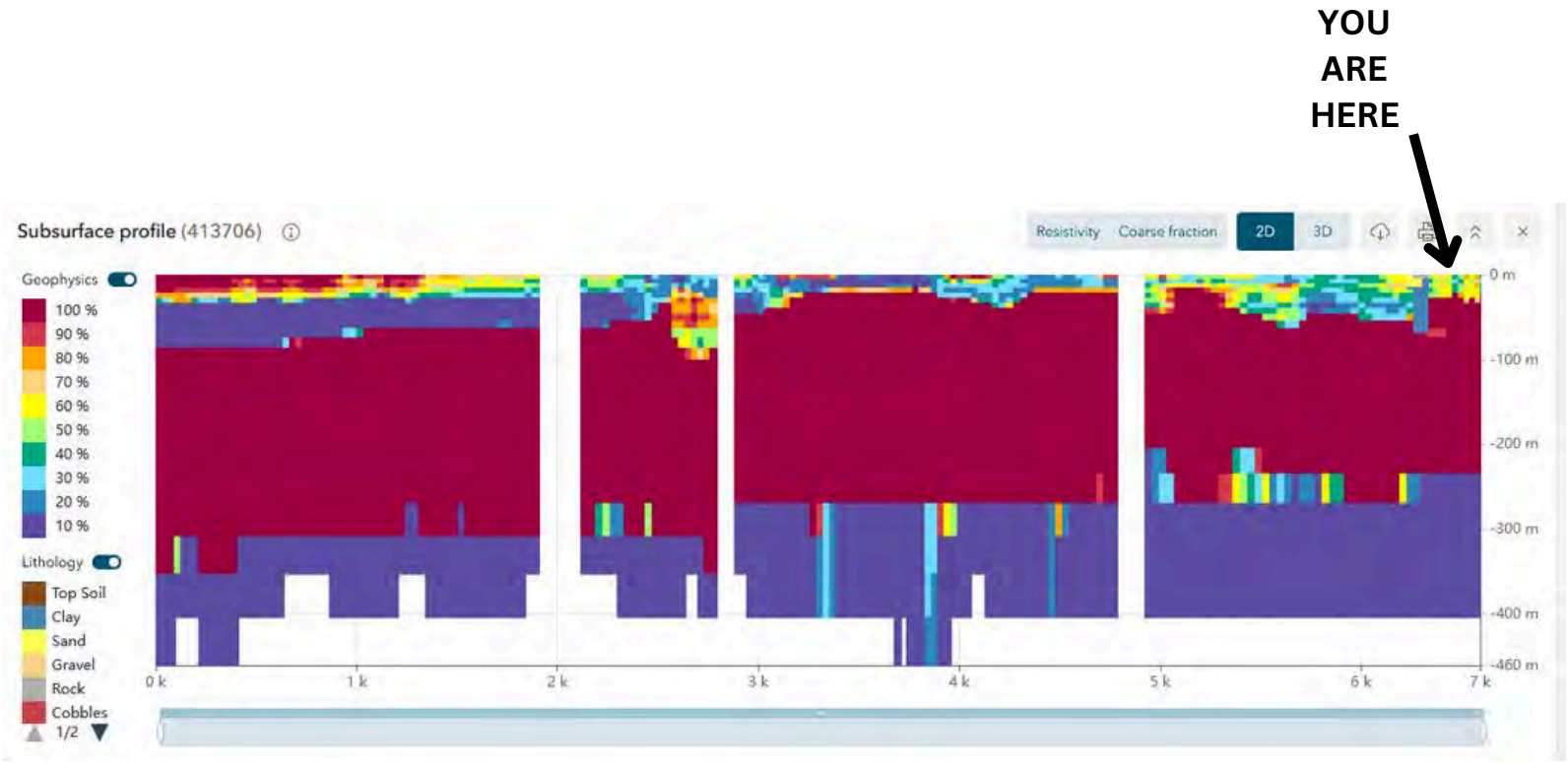
NOTES

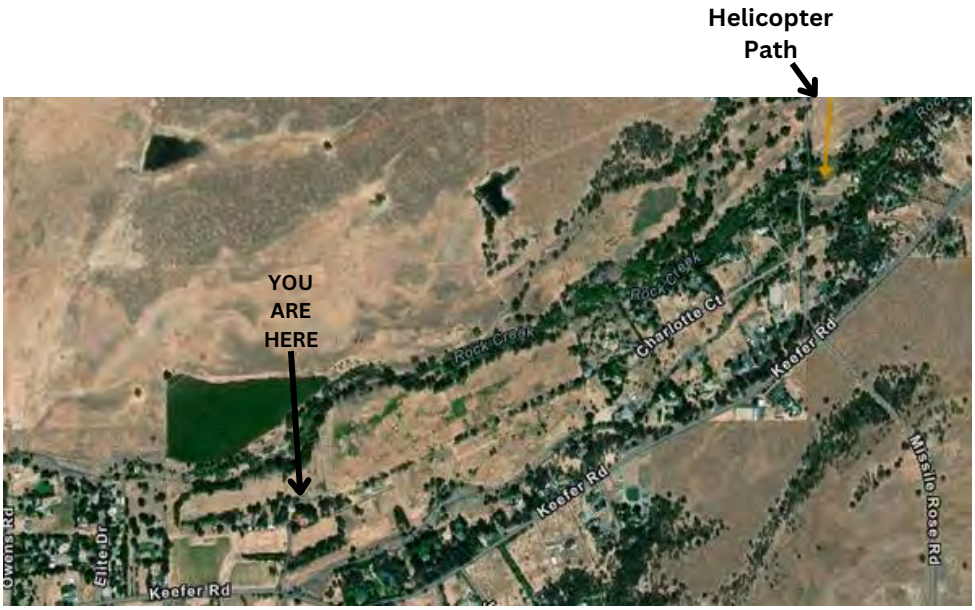
- Depth of Investigation (page 10) ranged from 40-70m.
- Due to interference from power lines, data was removed from the project area as seen on (page 11.) Residual values above 1 depict the models decreased confidence in the data, and values above 1.2 were removed.
- Depth to groundwater (water table) per (CASGEM) (page 12) is 68 feet.
- This report was reviewed and stamped by Professional Geophysicist Ted Asch, Ph.D., P.Gp. Aqua Geo Frameworks, LLC on Feb , 2026. (Page 49)

DWR AEM HELICOPTER REPORT

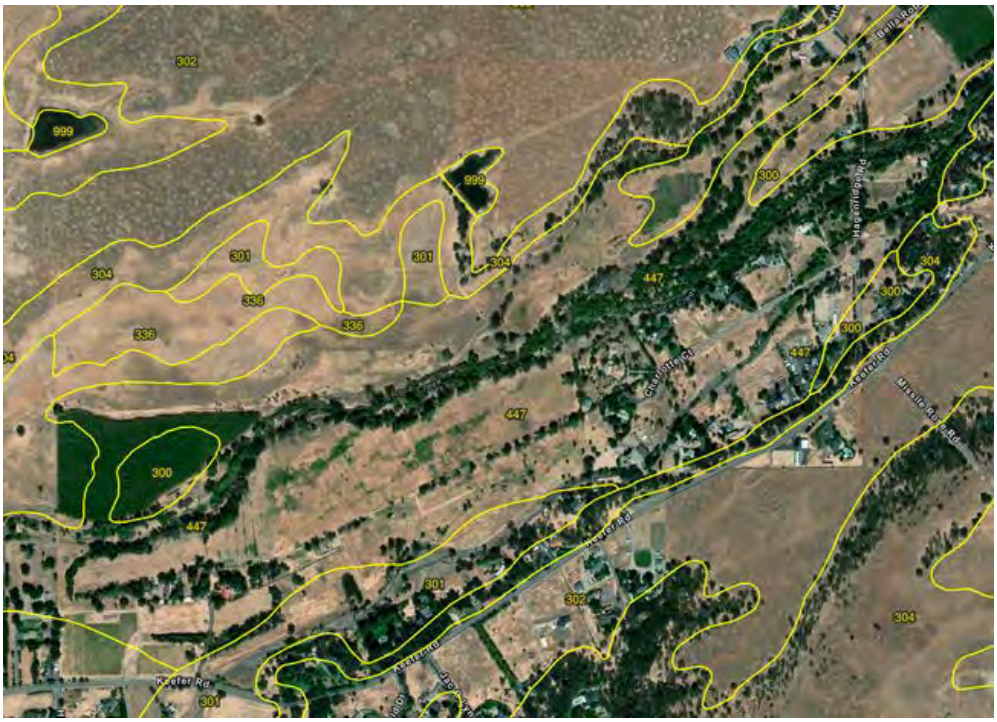


DWR AEM HELICOPTER REPORT

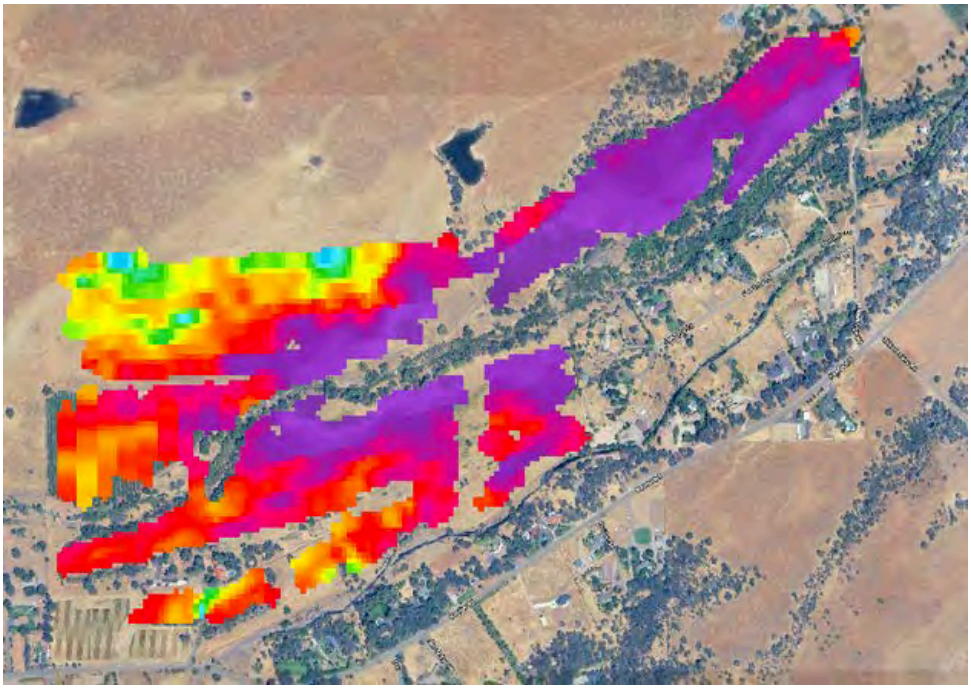




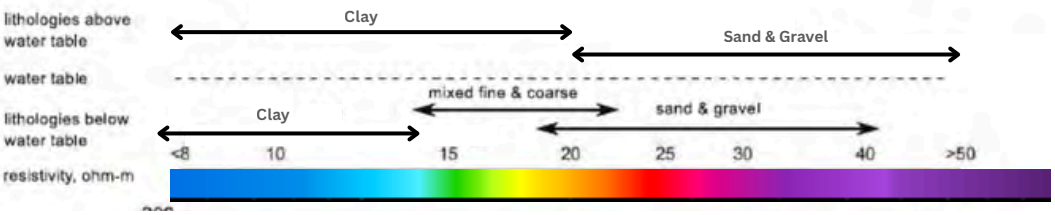
NRCS SOIL MAP/SOIL TYPE



- **SOIL:**
  - **CHARGER- ALLUVIAL FANS (447)**
  - **REDSLUFF- FAN REMNANTS (300)**
  - **GALT- BASIN FLOORS (336)**
  - **REDTUFF- FAN REMNANTS (304)**
  - **WAFAP- STREAM TERRACES (301)**



SURFACE DEPTH SLICE 0-5 FT



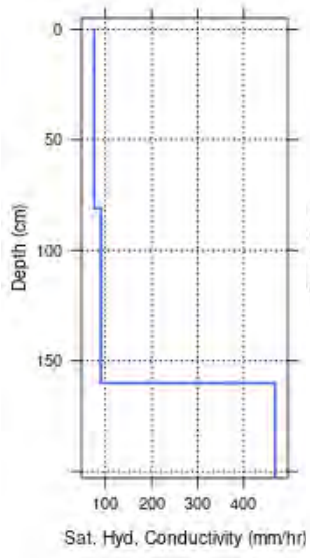
NRCS SATURATED HYDRAULIC CONDUCTIVITY (KSAT) (5 FT DEPTH)

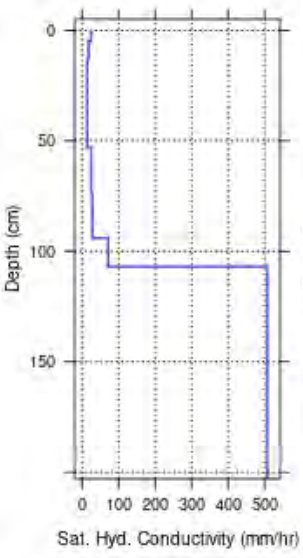
SATURATED HYDRAULIC CONDUCTIVITY (KSAT)

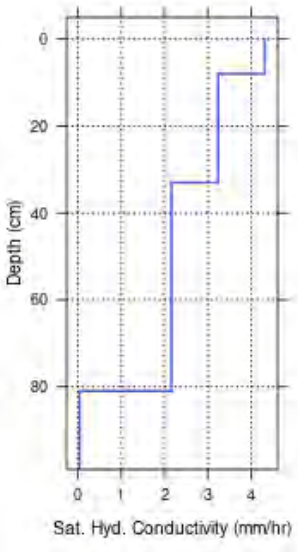
- **"SATURATED HYDRAULIC CONDUCTIVITY" IS THE EASE WITH WHICH PORES OF A SATURATED SOIL TRANSMIT WATER. FORMALLY, IT IS THE PROPORTIONALITY COEFFICIENT THAT EXPRESSES THE RELATIONSHIP OF THE RATE OF WATER MOVEMENT TO HYDRAULIC GRADIENT IN DARCY'S LAW (A LAW THAT DESCRIBES THE RATE OF WATER MOVEMENT THROUGH POROUS MEDIA). IT IS EXPRESSED IN MICROMETERS PER SECOND. TO CONVERT MICROMETERS PER SECOND TO INCHES PER HOUR, MULTIPLY MICROMETERS PER SECOND BY 0.1417. THE HISTORICAL DEFINITION OF "SATURATED HYDRAULIC CONDUCTIVITY" IS THE AMOUNT OF WATER THAT WOULD MOVE VERTICALLY THROUGH A UNIT AREA OF SATURATED SOIL IN UNIT TIME UNDER UNIT HYDRAULIC GRADIENT.**
- **SATURATED HYDRAULIC CONDUCTIVITY IS USED IN SOIL INTERPRETATIONS. IT IS ALSO KNOWN AS KSAT.**

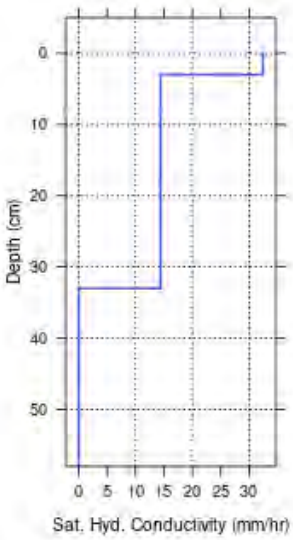
SOILS:

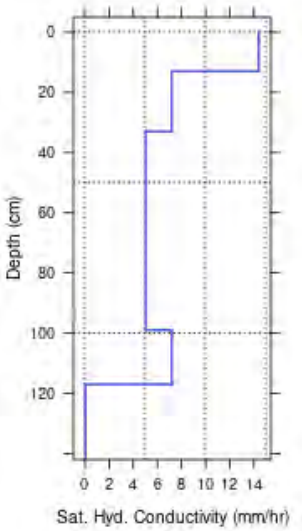
- **CHARGER- ALLUVIAL FANS (447)**
- **REDSLUFF- FAN REMNANTS (300)**
- **GALT- BASIN FLOORS (336)**
- **REDTUFF- FAN REMNANTS (304)**
- **WAFAP- STREAM TERRACES (301)**



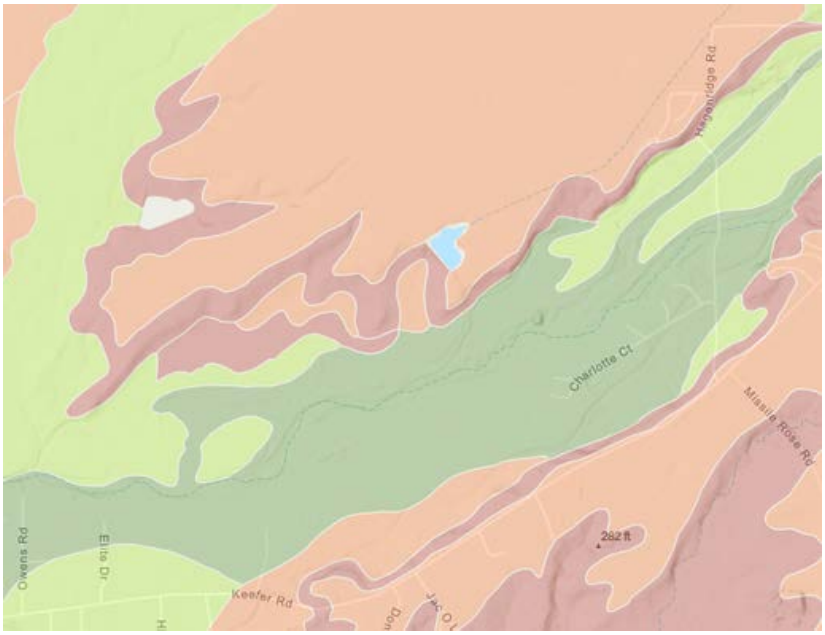


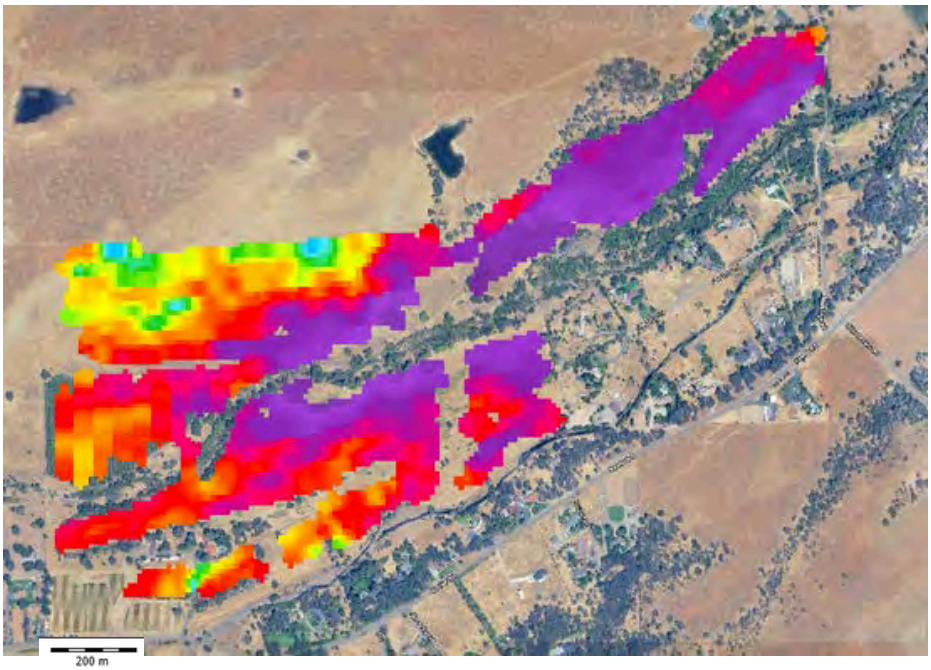




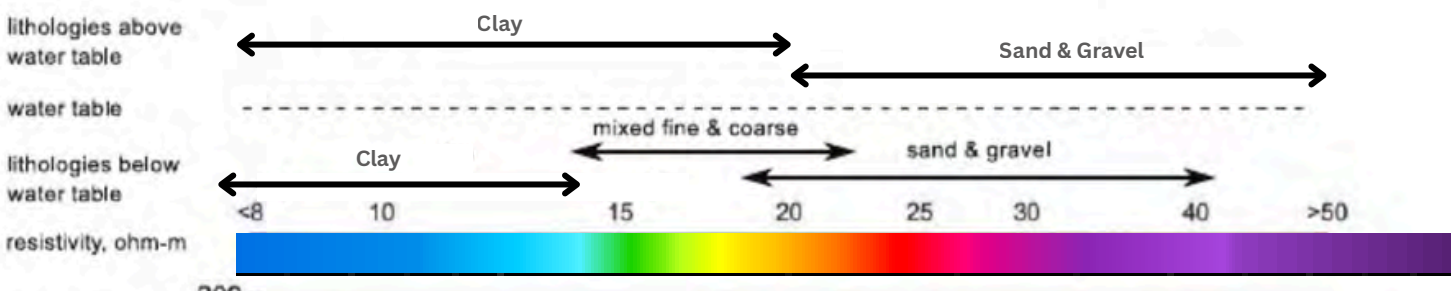


GROUNDWATER RECHARGE SUITABILITY INDEX

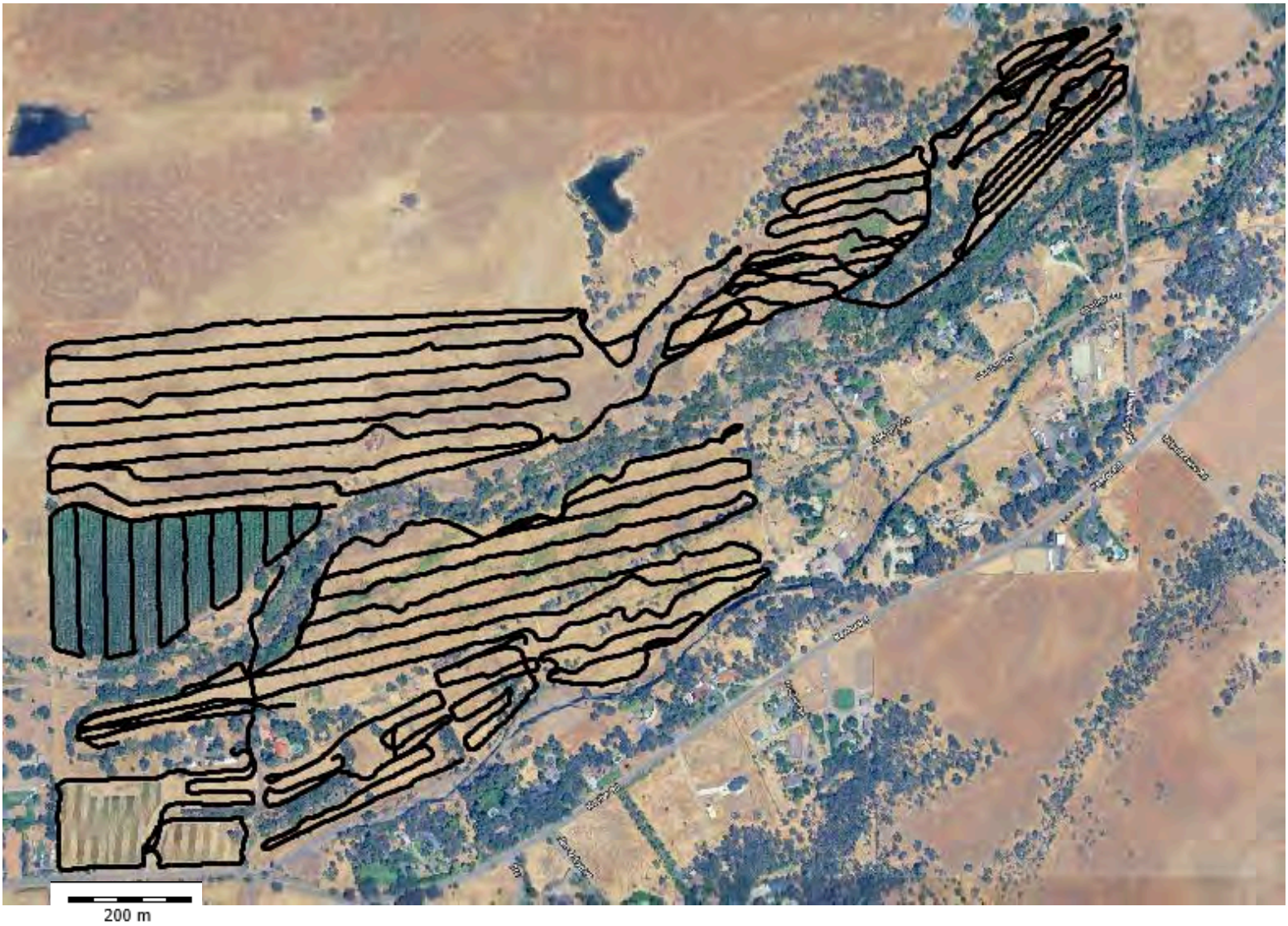




SURFACE DEPTH SLICE 0-5 FT

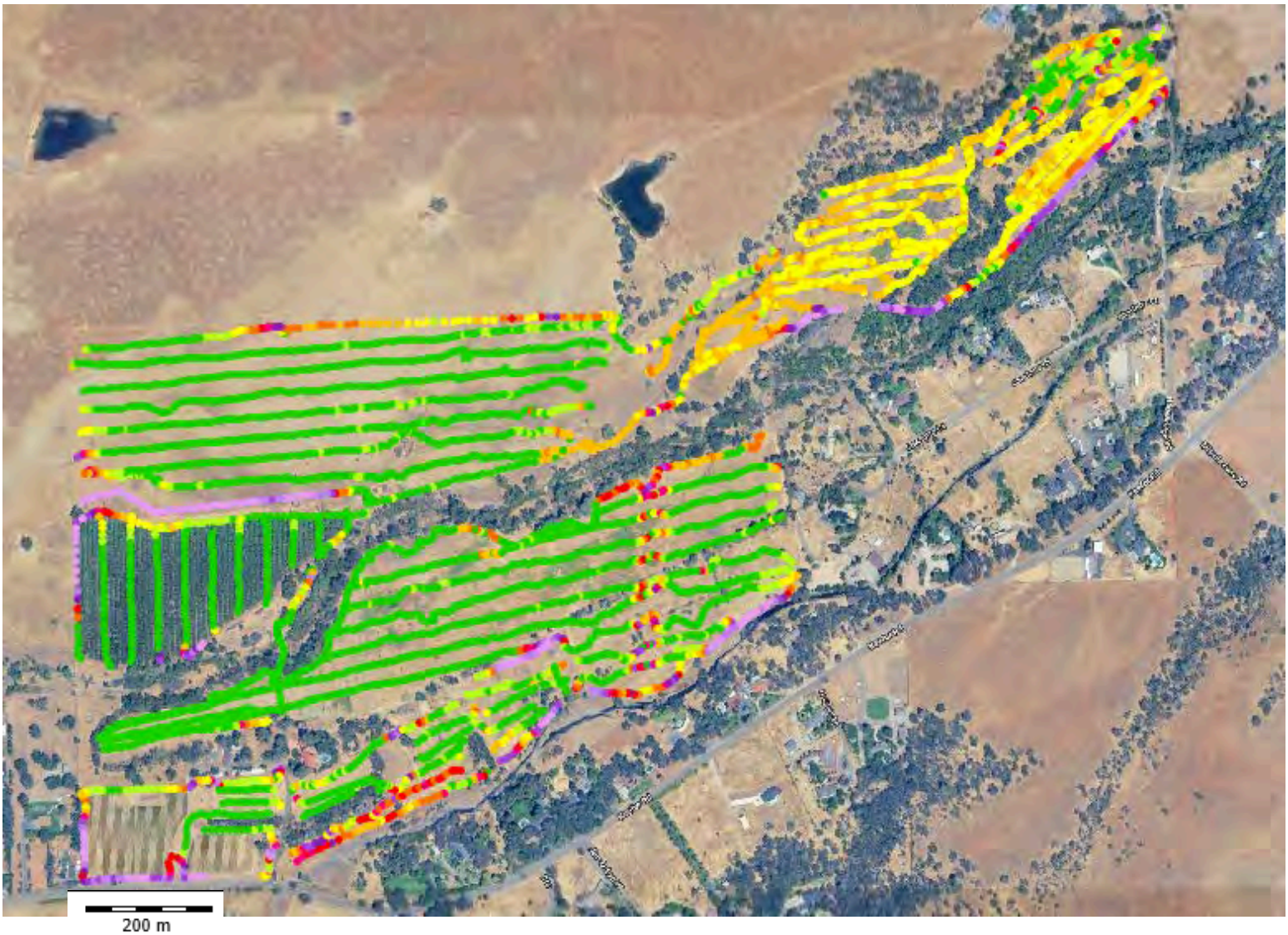


TTEM TRAVERSE LINES

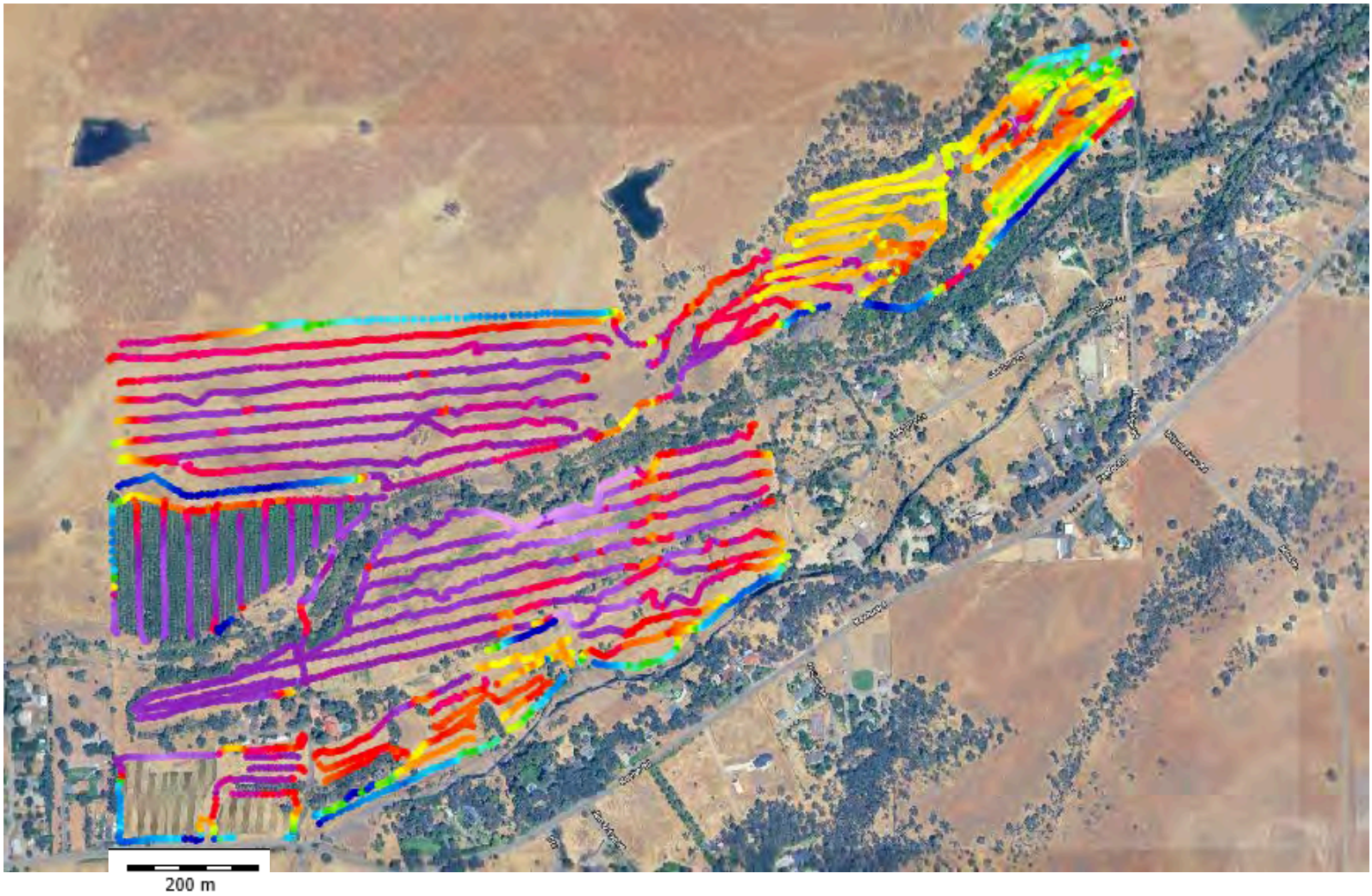


TRANSECT DISTANCE: DISTANCE BETWEEN TRANSECTS RANGED FROM 18M TO 33M BASED ON TERRAIN AND TIME CONSTRAINTS TO COMPLETE SURVEY

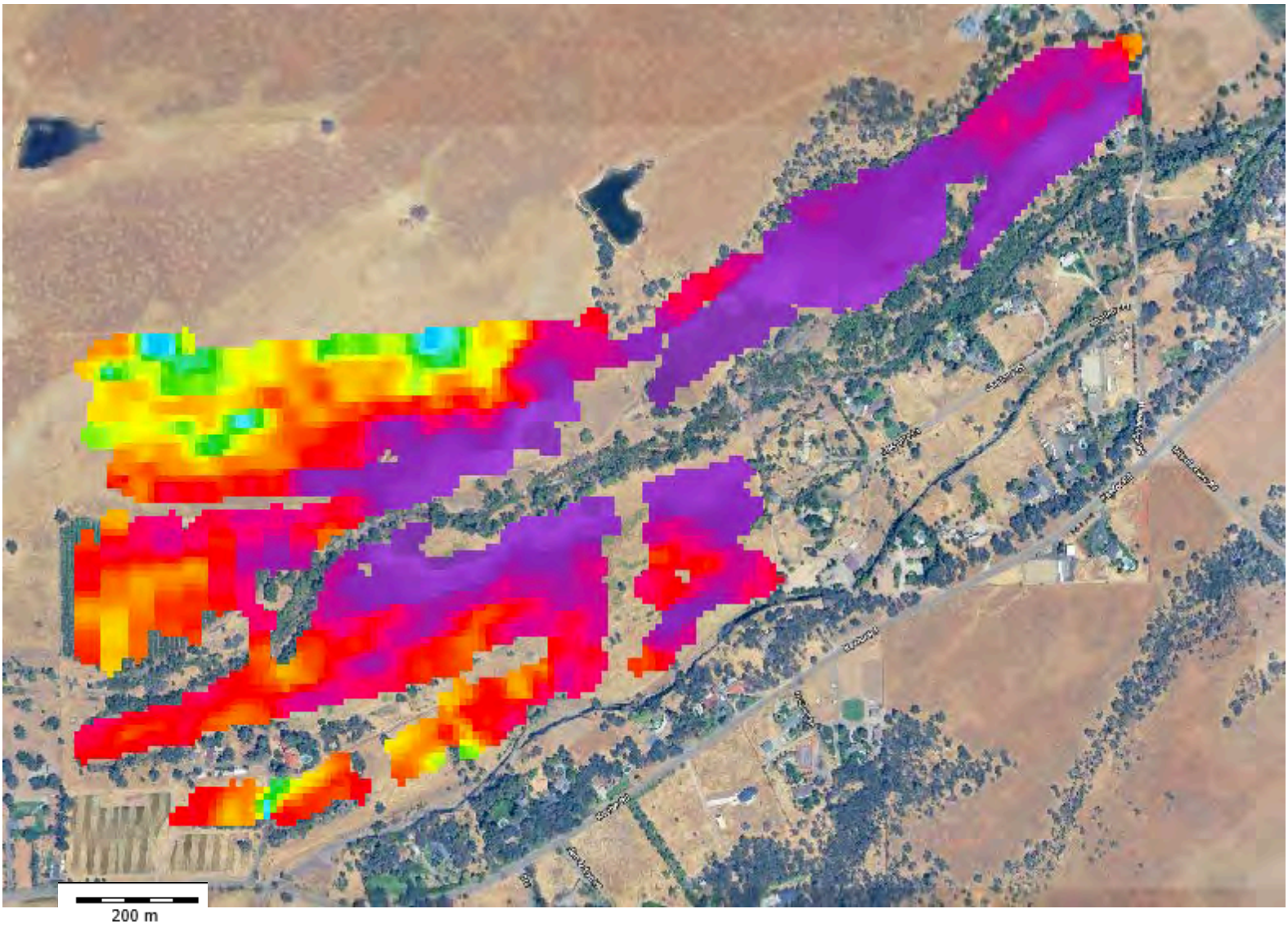
DATA RESIDUAL



DEPTH OF INVESTIGATION-

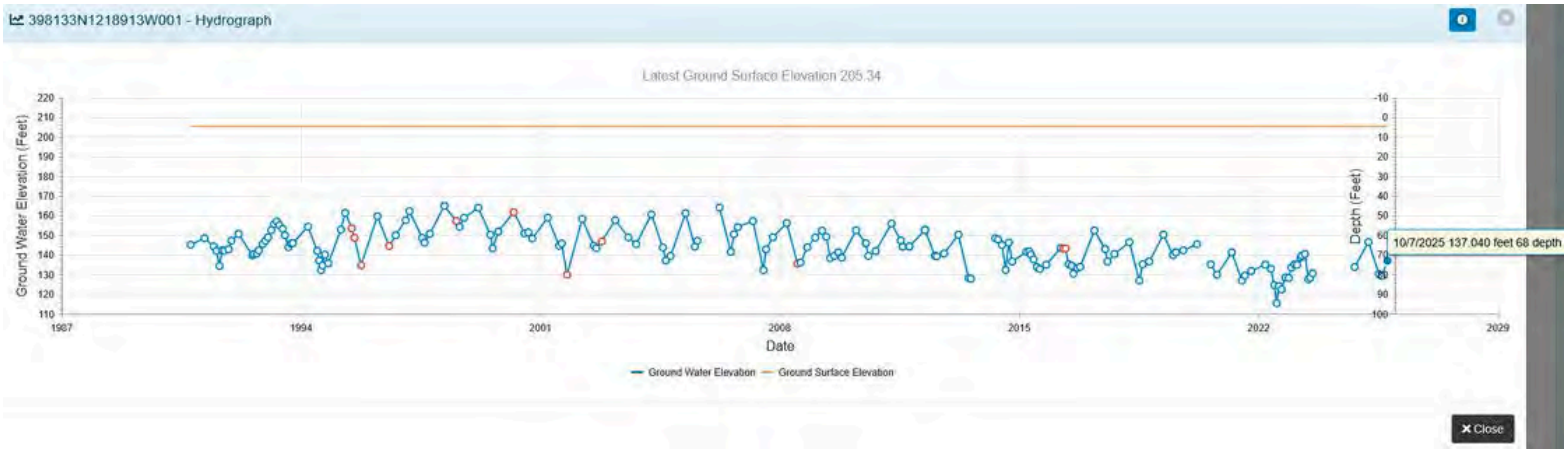


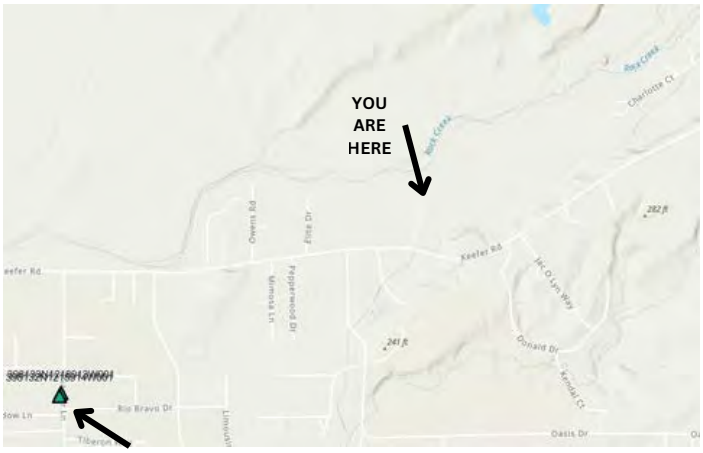
DATA REMOVED

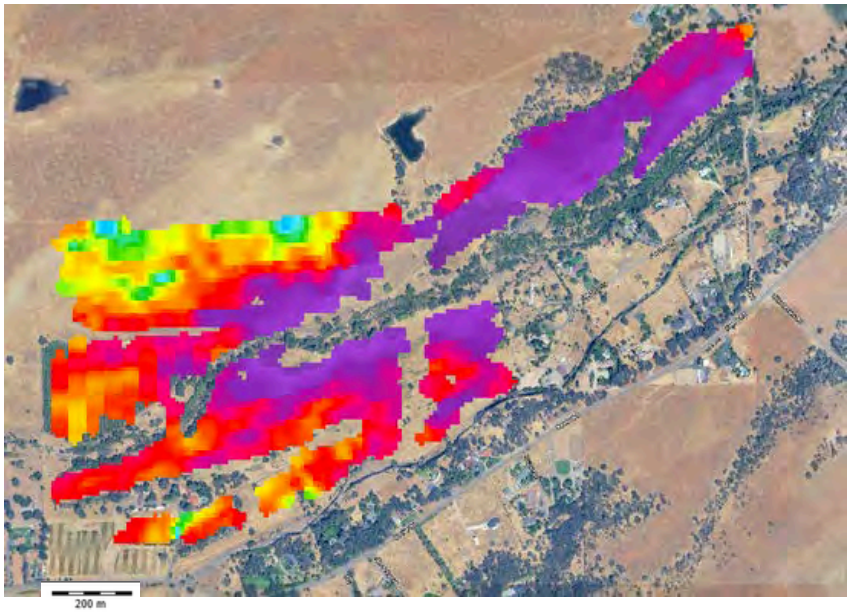


DATA REMOVED IN RELATION TO PAGE 8,9,10

CALIFORNIA STATEWIDE GROUNDWATER ELEVATION MONITORING (CASGEM)- LOCAL MONITORING WELL







LEGEND

Legend:
Above Water Table

- Blue- Clay
- Green- Clay
- Yellow- Sandy Clay
- Orange- Sand
- Red- Coarse Sand
- Purple- Gravel

Legend:
Below Water Table

- Blue- Clay
- Green- Sandy clay
- Yellow- Sand
- Orange- Coarse Sand
- Red- Gravel
- Purple- Coarse Gravel

- Black- Likely Bad data/Noise

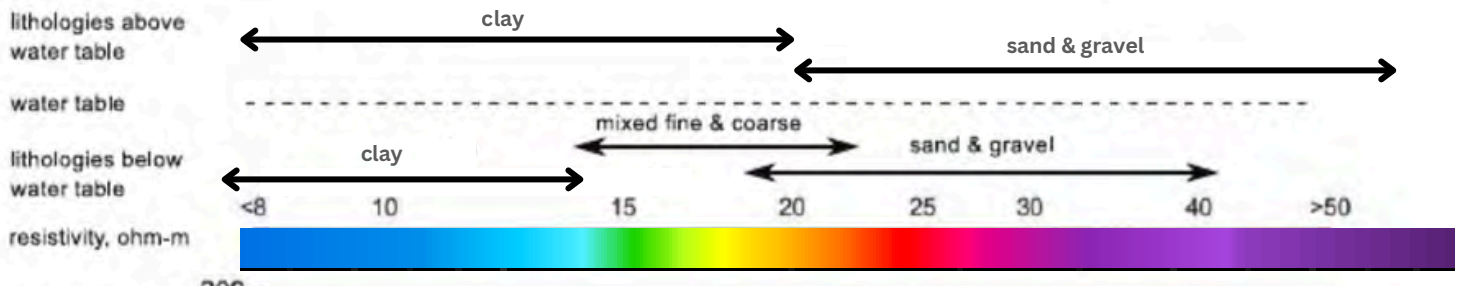


Table 2
Range of Resistivity Values Determined for the Lithologic Units Using Method 2 and from the Histogram of All Resistivity Values in the Resistivity Model

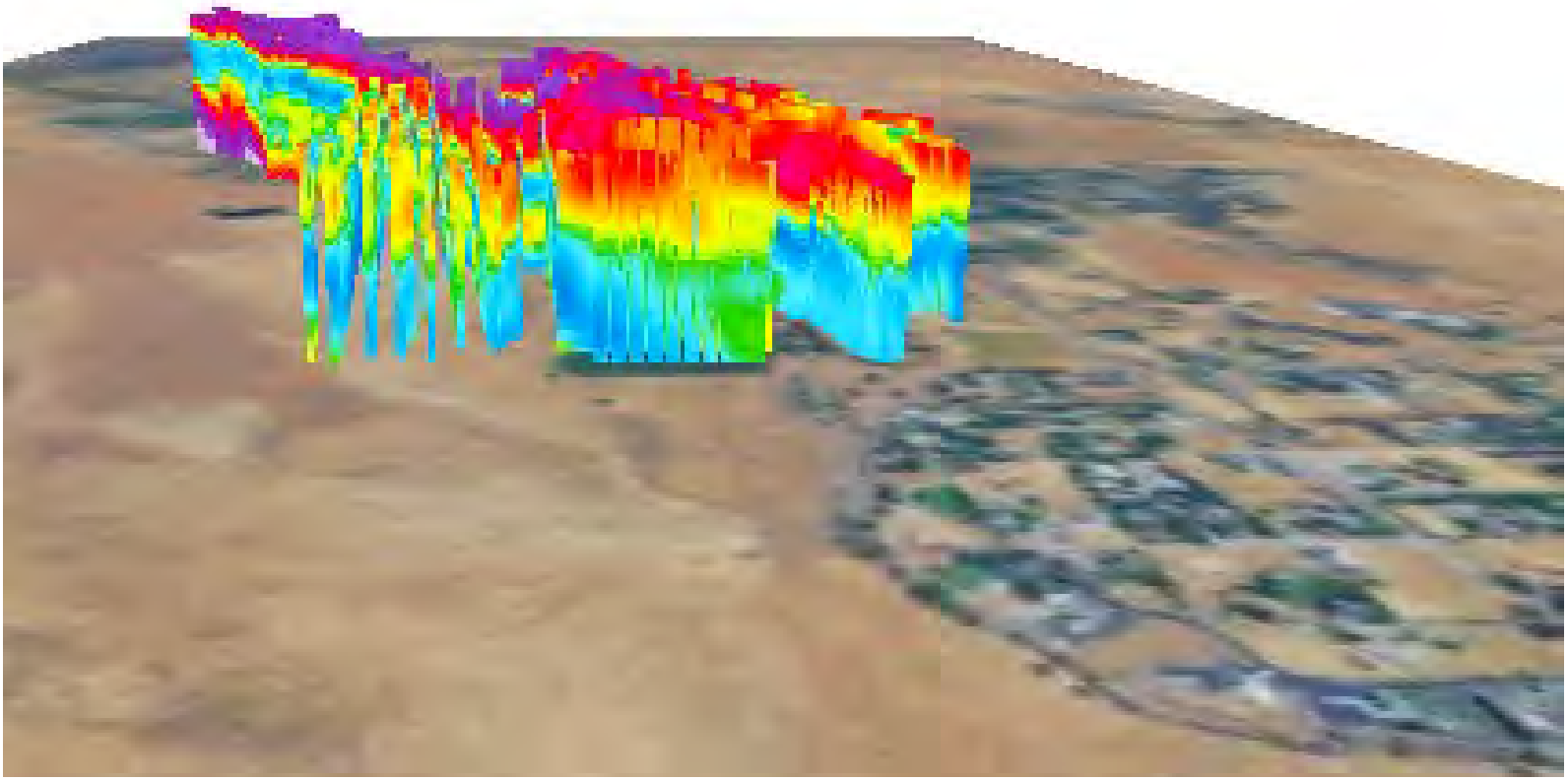
Resistivity Range (Ω m)		Interpreted Lithology
Above the water table		
8	20	Clay
21	150	Sand and gravel
Below the water table		
6	14	Clay
12	22	Mixed fine and coarse
17	43	Sand and gravel

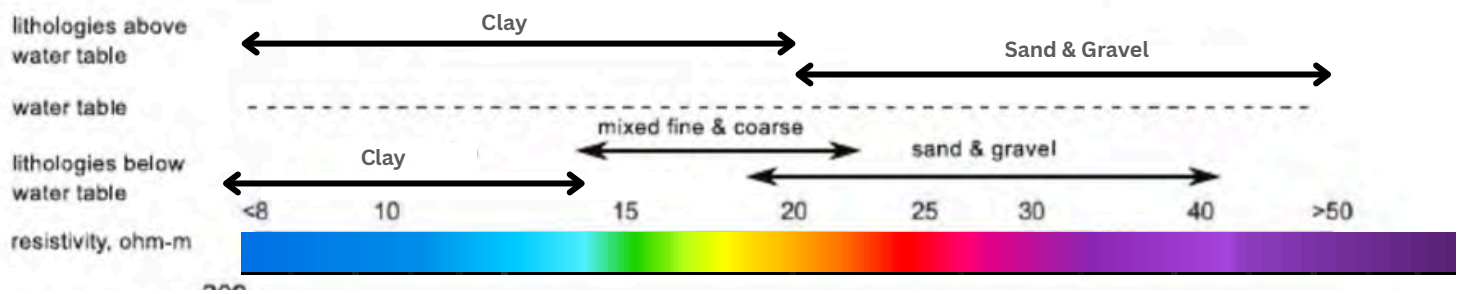
KNIGHT, R., SMITH, R., ASCH, T., ABRAHAM, J., CANNIA, J., VIEZZOLI, A., & FOGG, G. (2018). MAPPING AQUIFER SYSTEMS WITH AIRBORNE ELECTROMAGNETICS IN THE CENTRAL VALLEY OF CALIFORNIA. GROUND WATER, 56(6), 893–908. HTTPS://DOI.ORG/10.1111/GWAT.12656

3D VIEW- WEST TO EAST

NORTH **SOUTH**

N

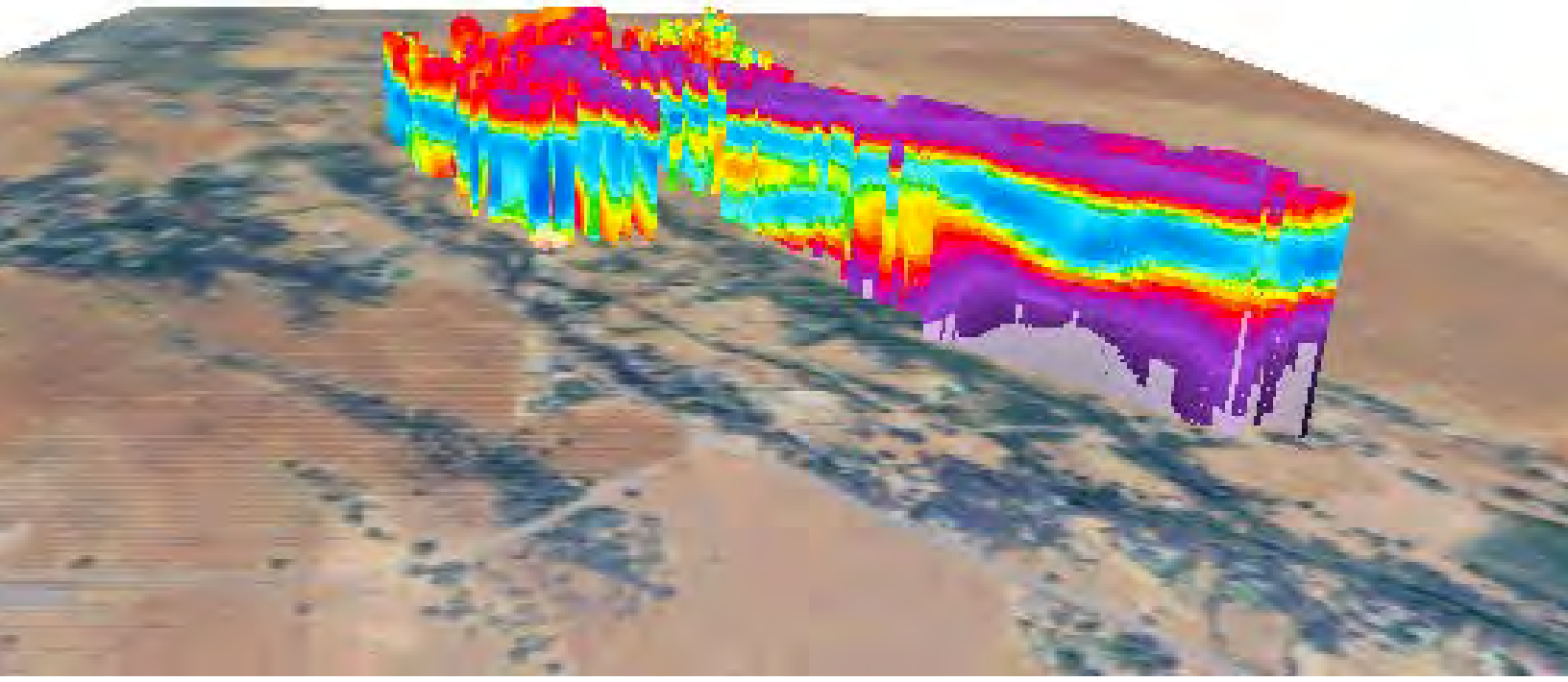


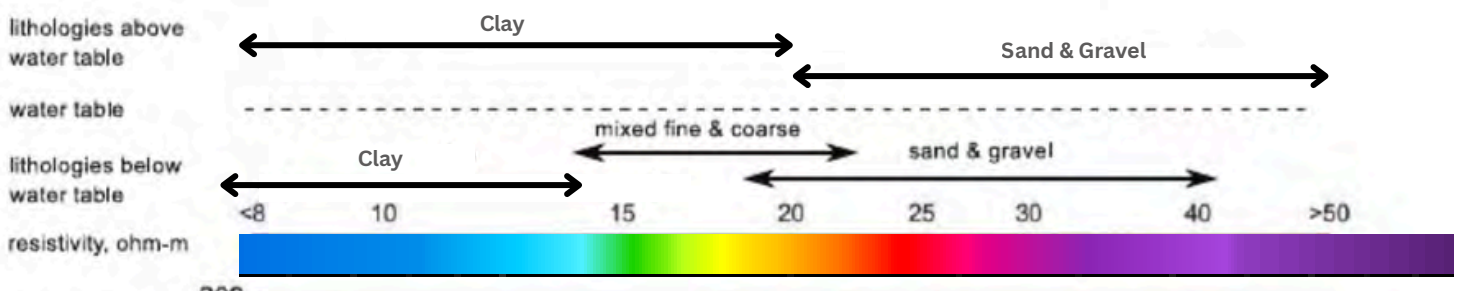


3D VIEW- EAST TO WEST

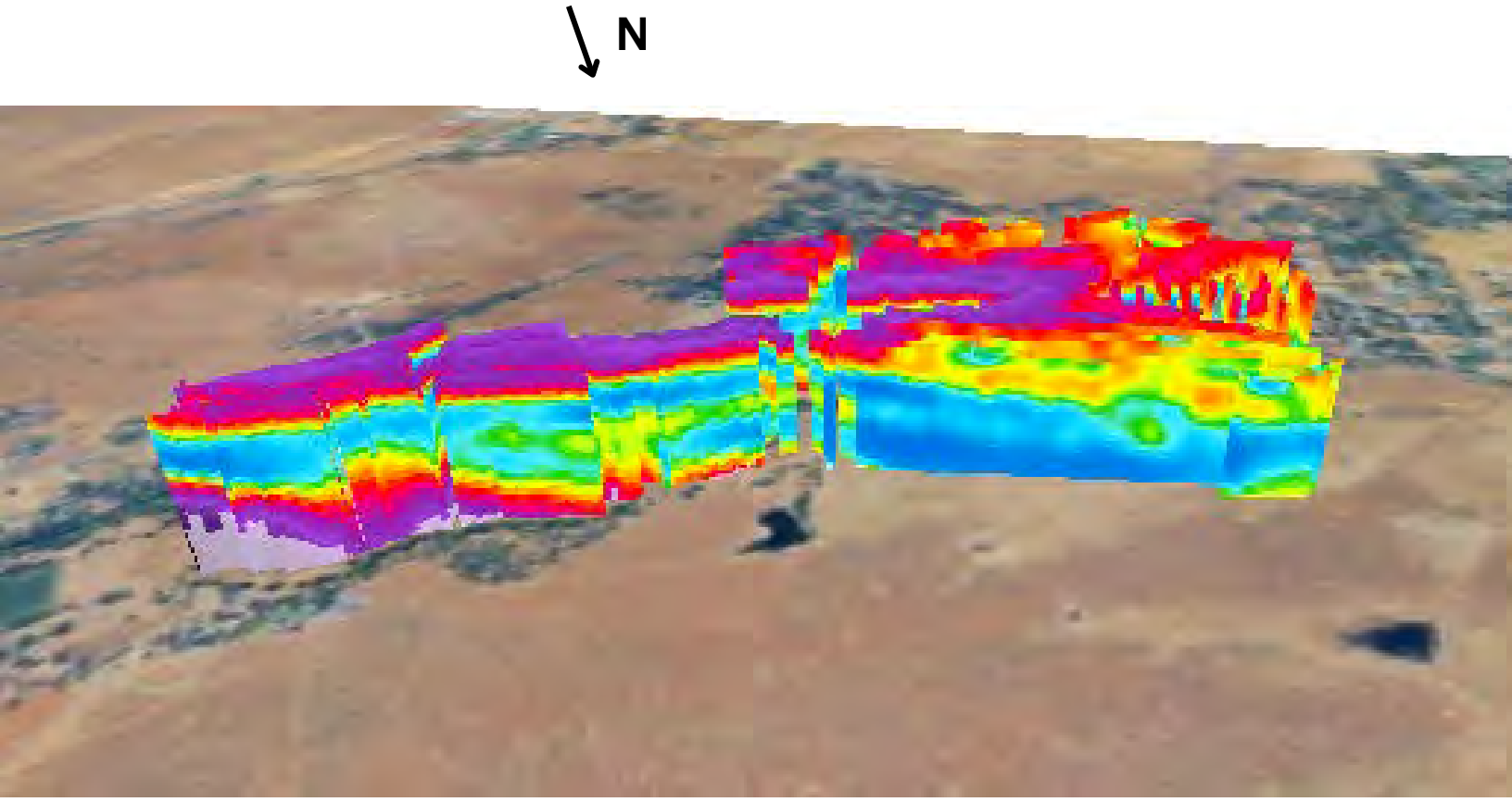
SOUTH **NORTH**

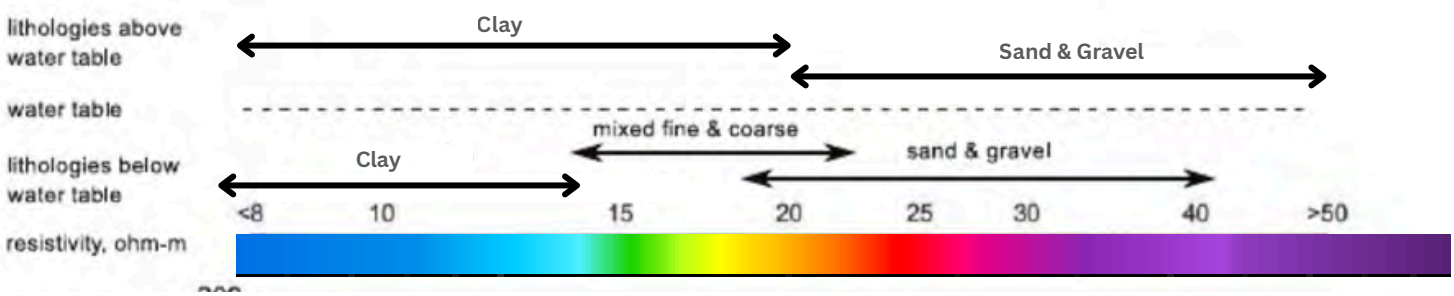
N



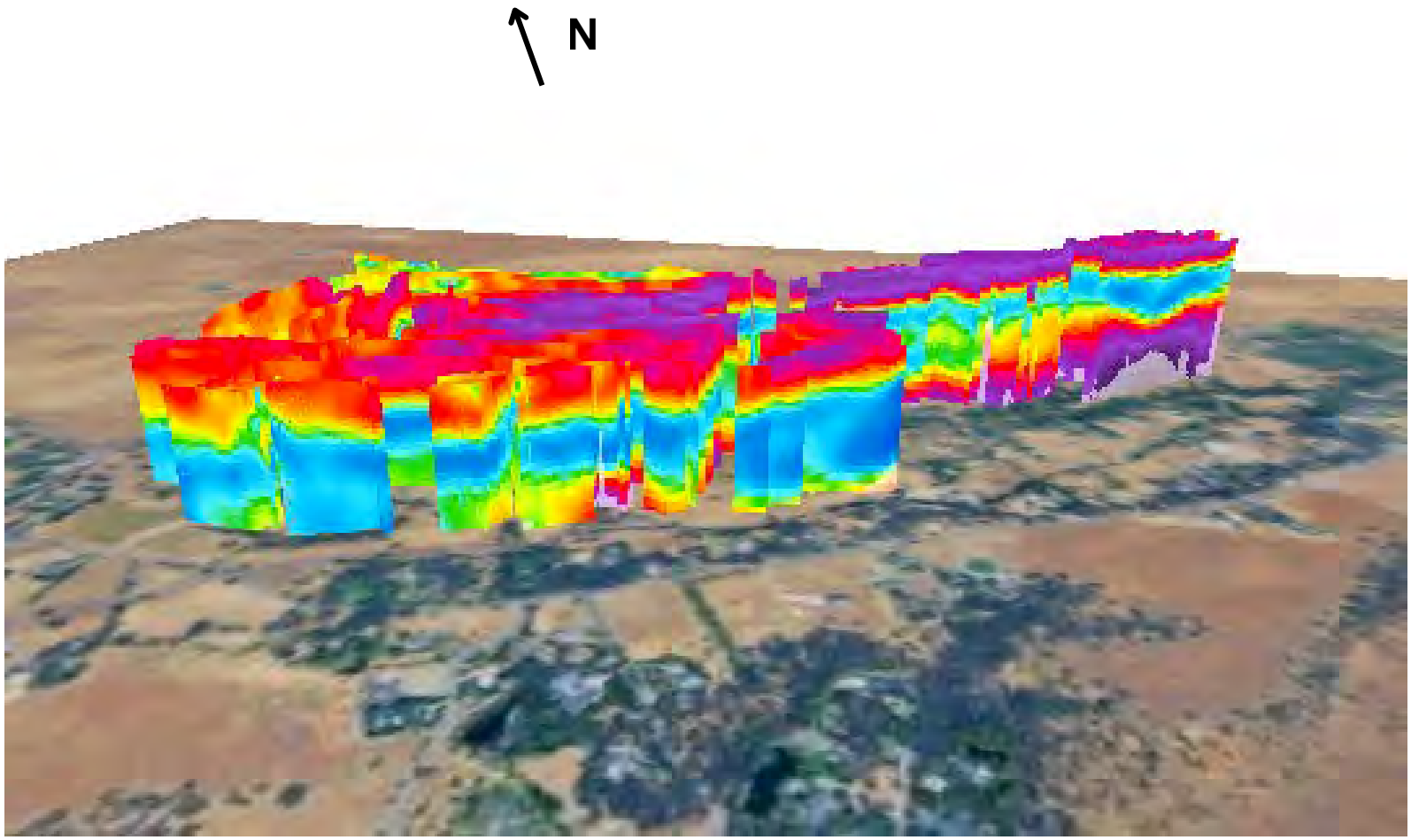


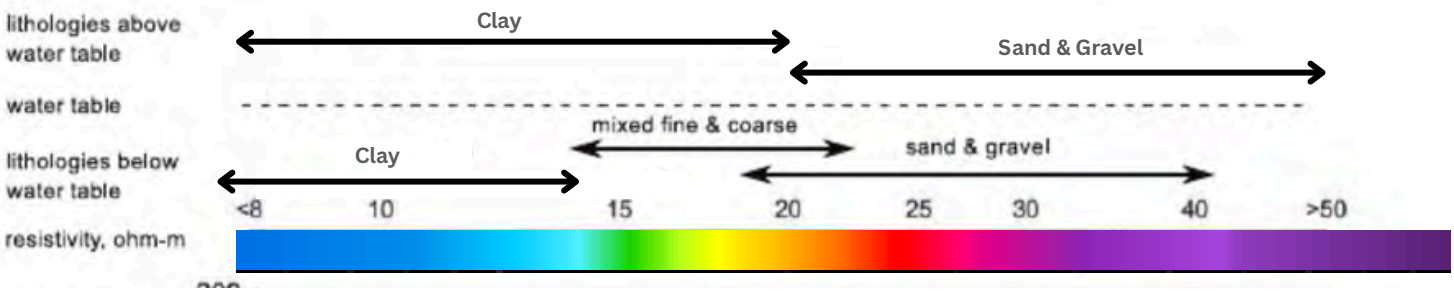
3D VIEW- NORTH TO SOUTH



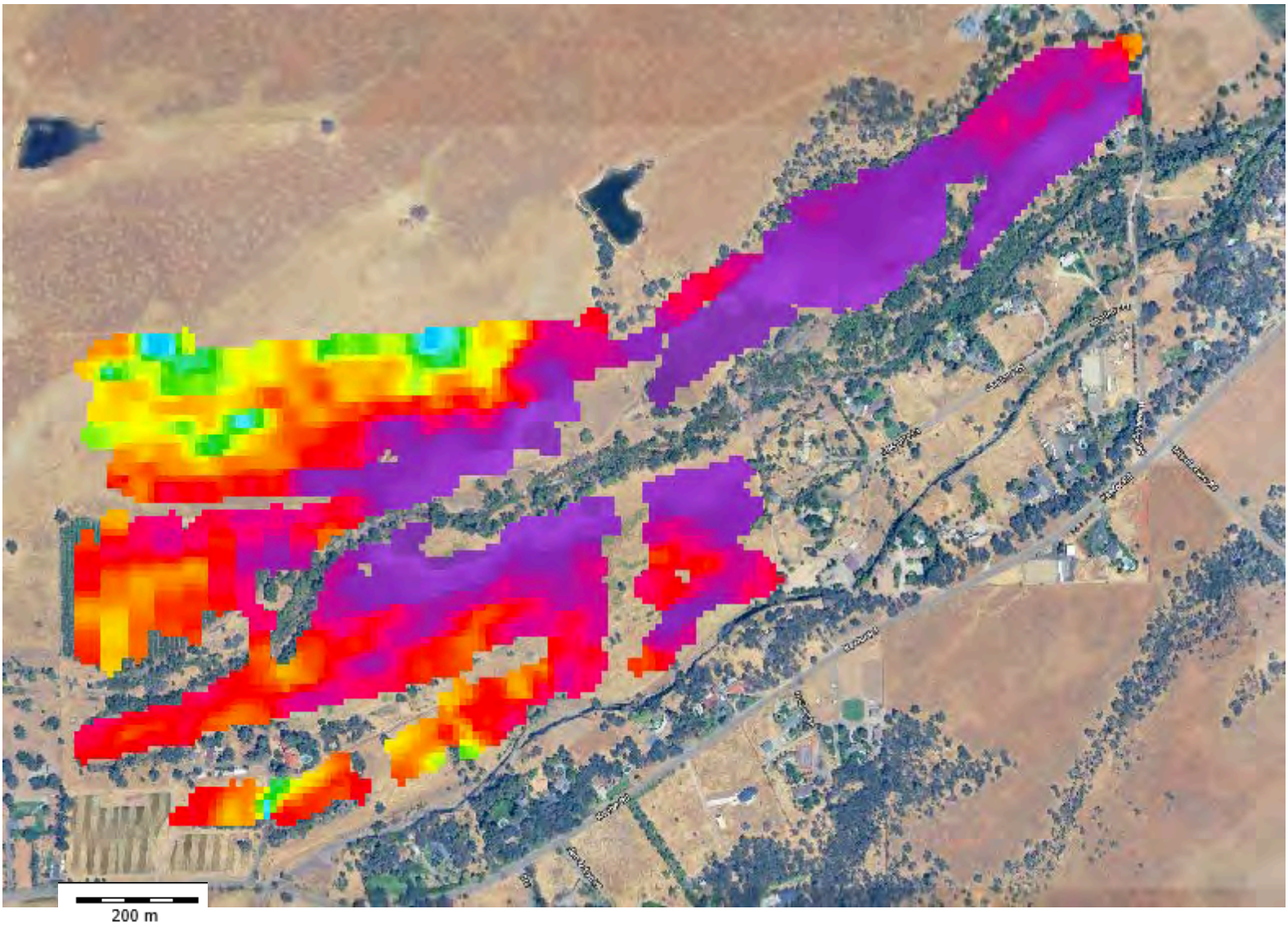


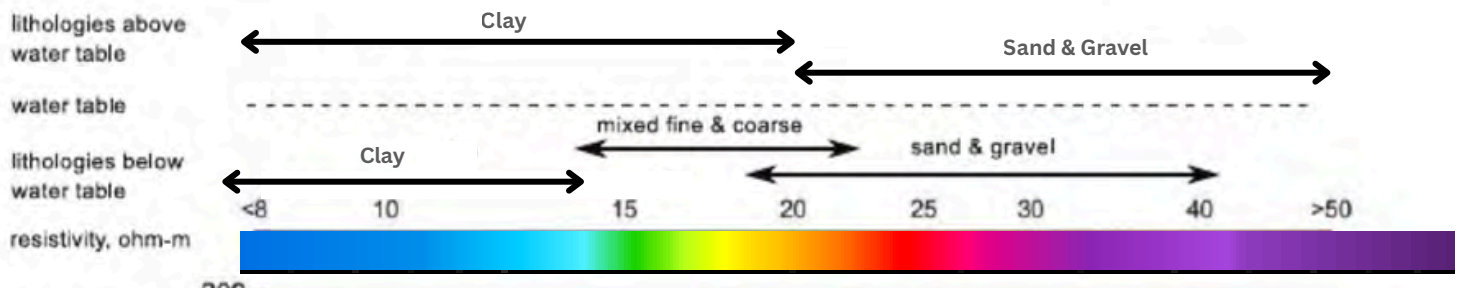
3D VIEW- SOUTH TO NORTH



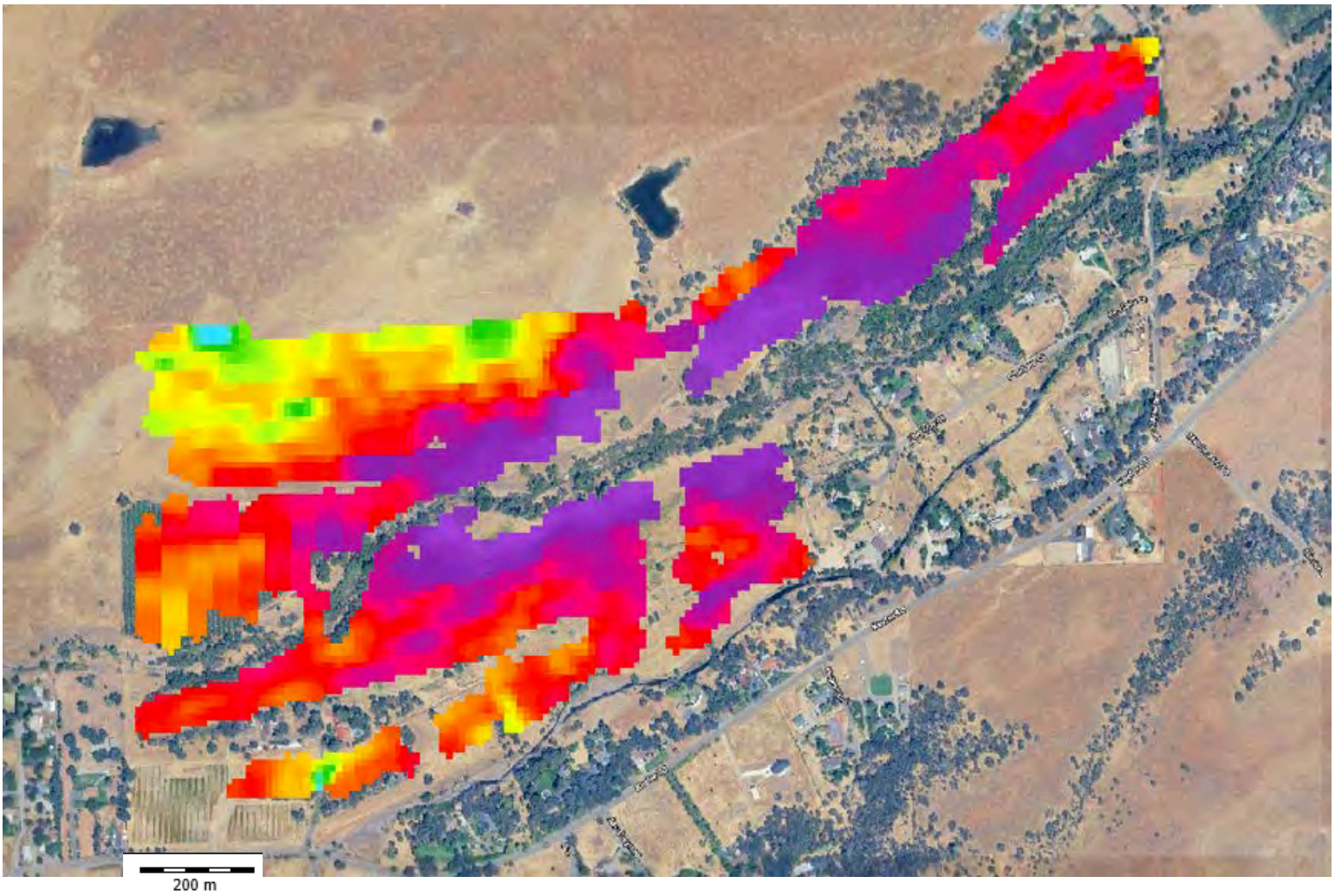


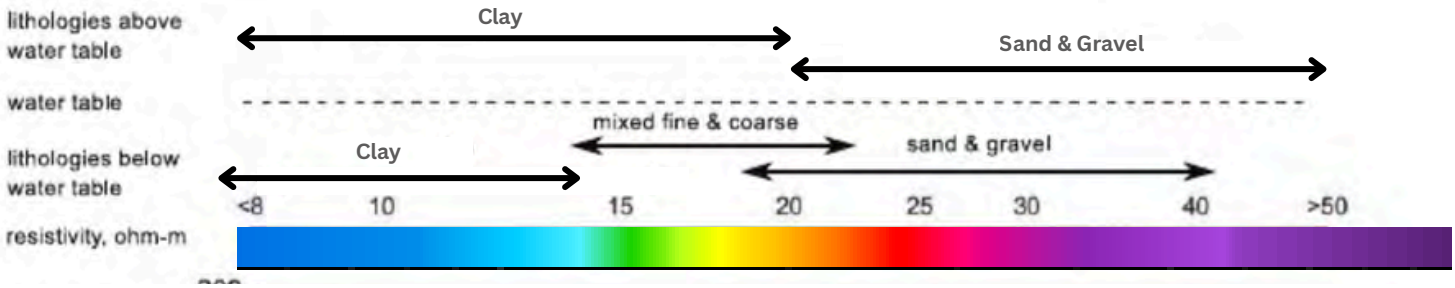
DEPTH SLICES- SURFACE 0-5 FT



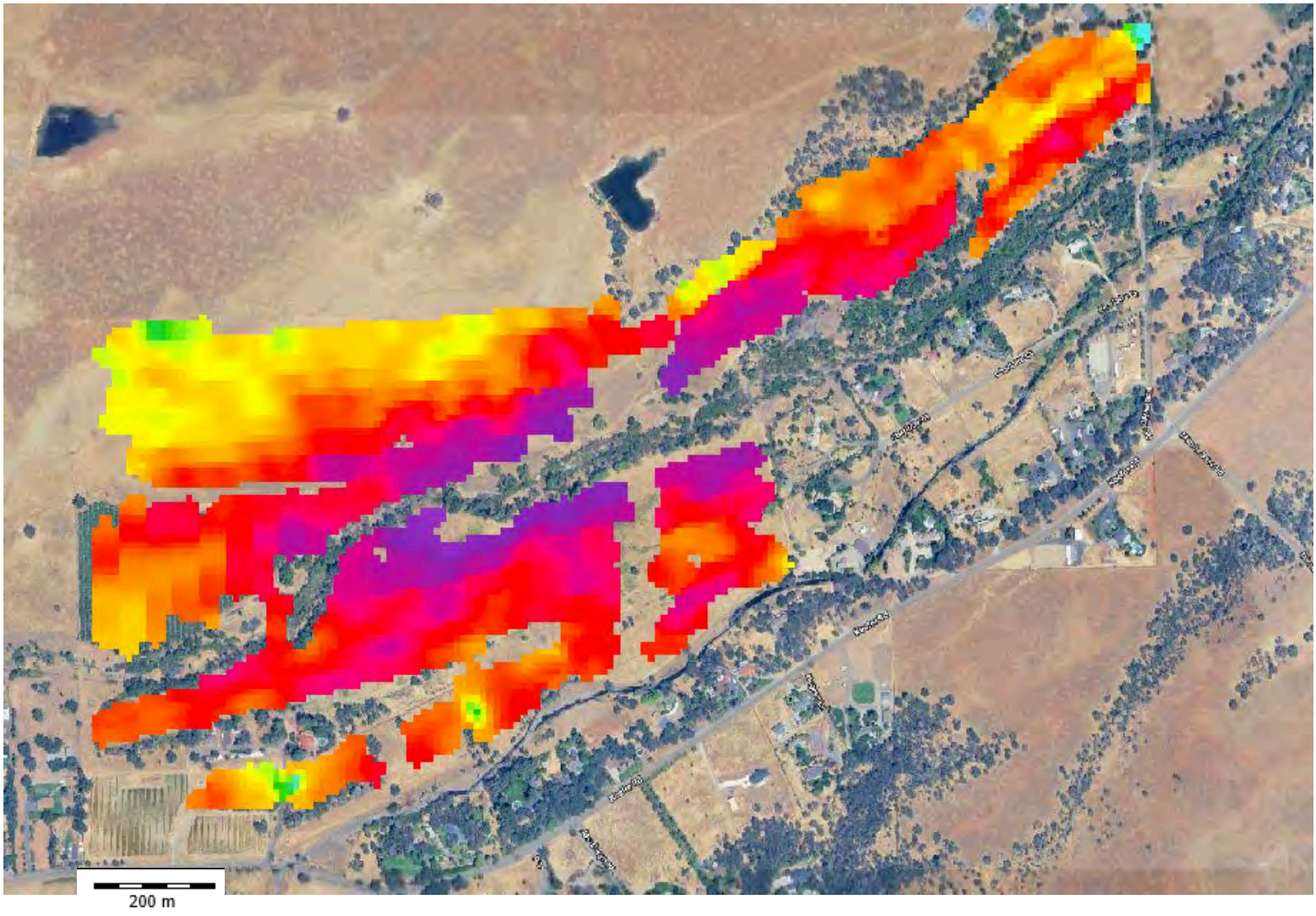


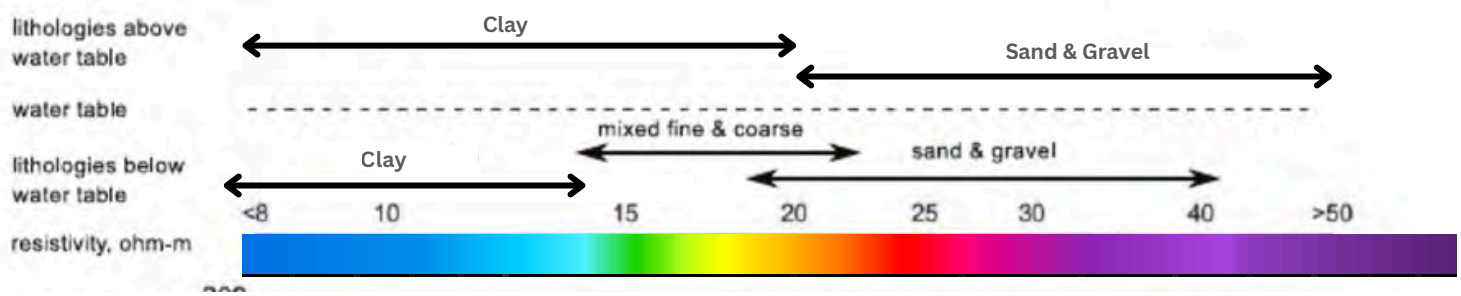
DEPTH SLICES- 10 FT



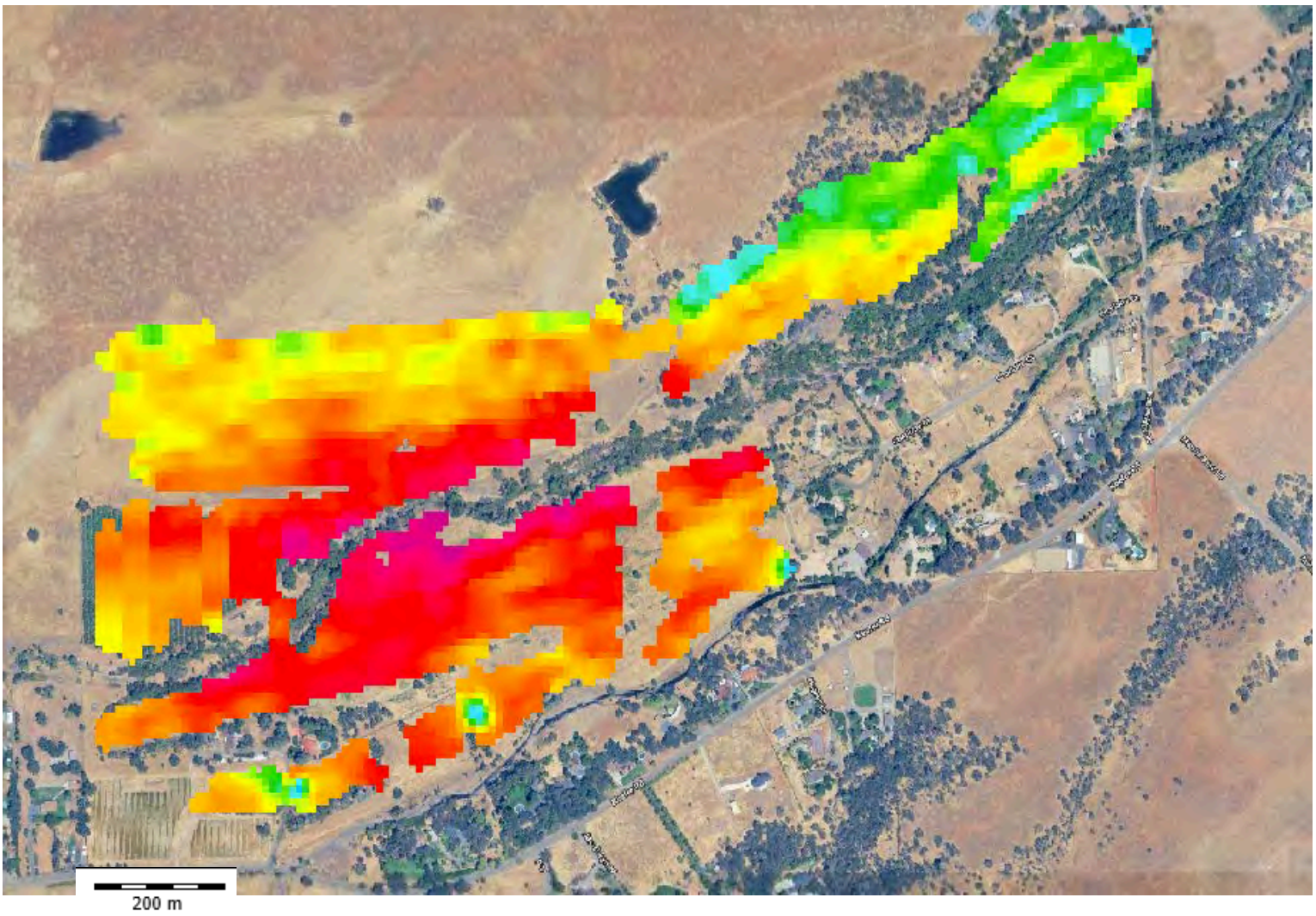


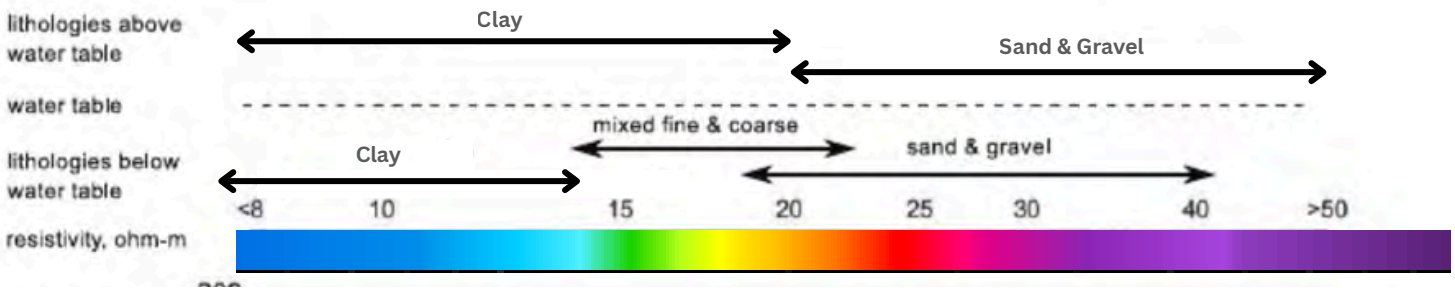
DEPTH SLICES- 20 FT



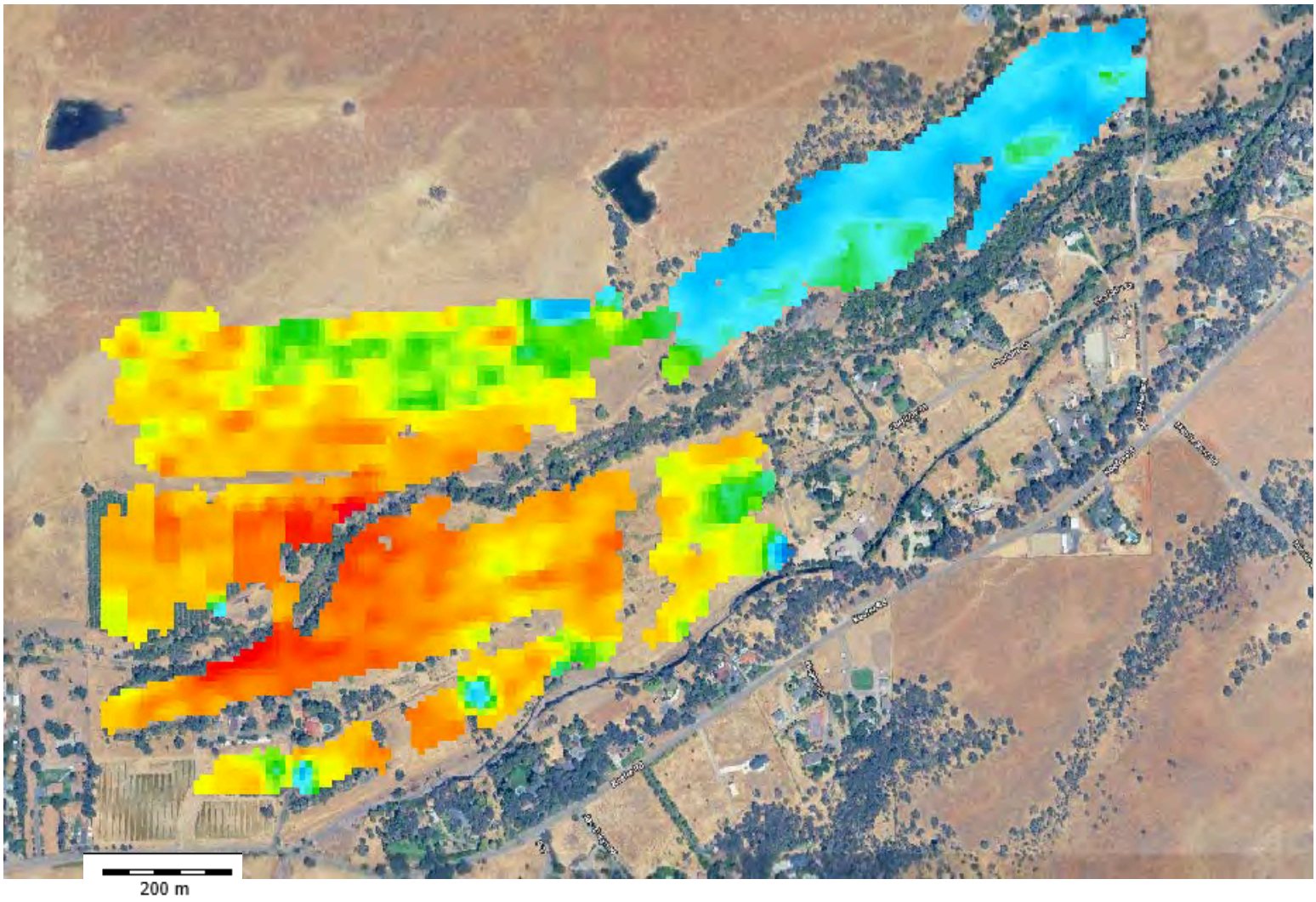


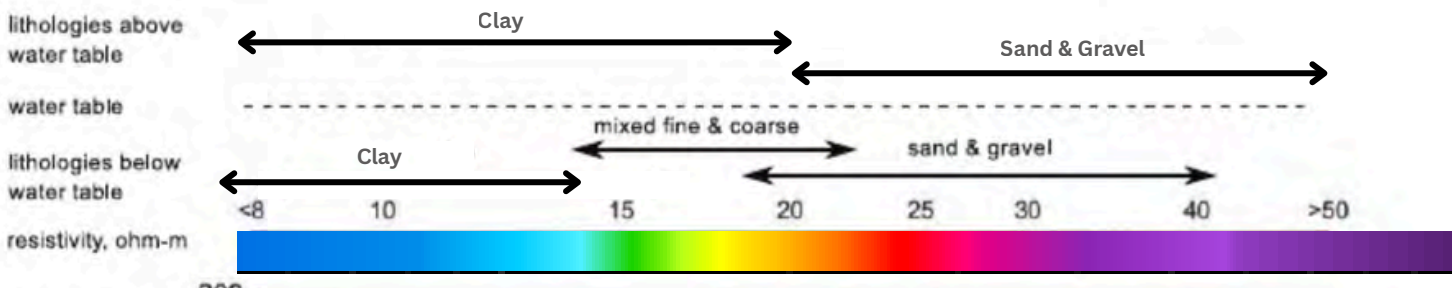
DEPTH SLICES- 30 FT



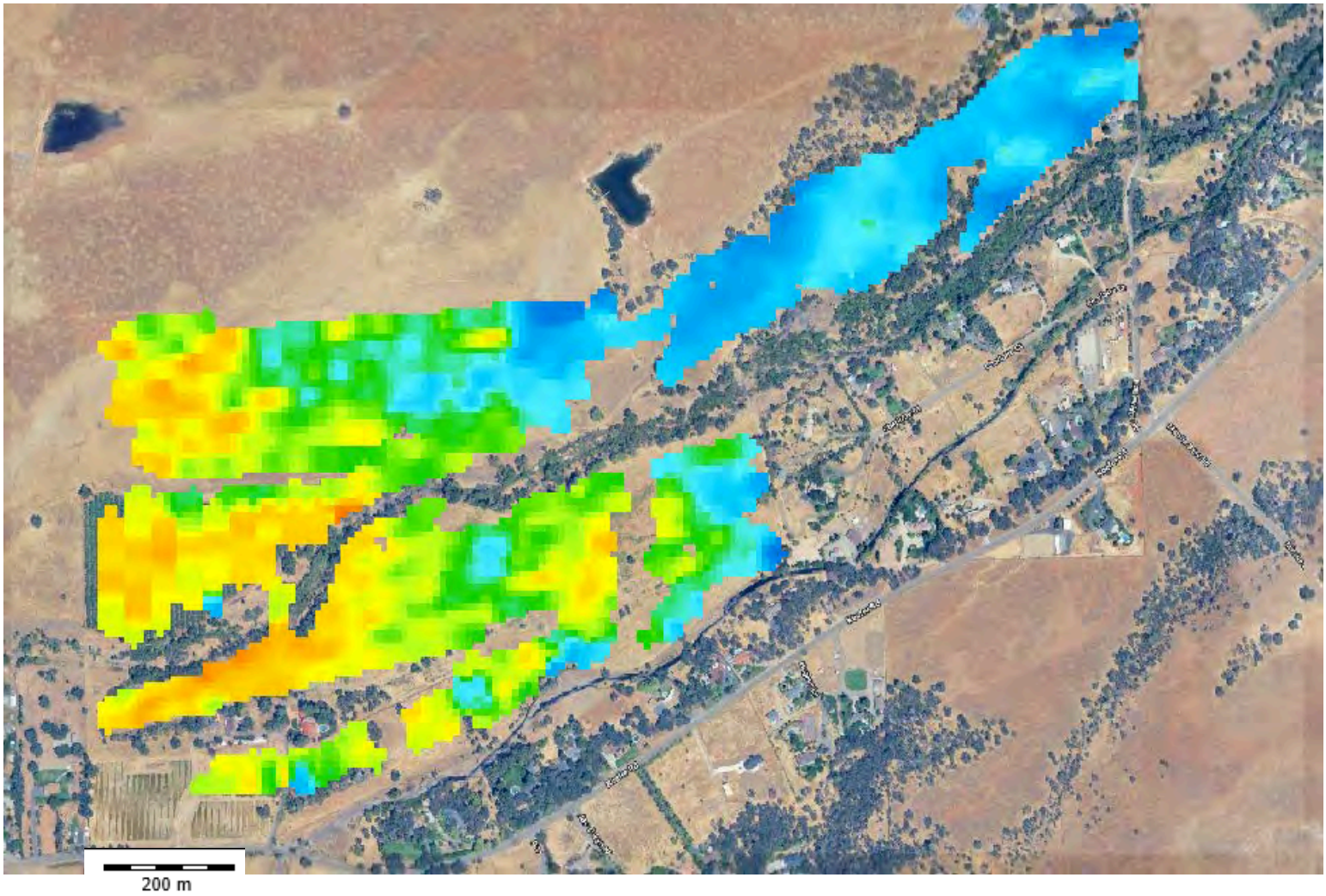


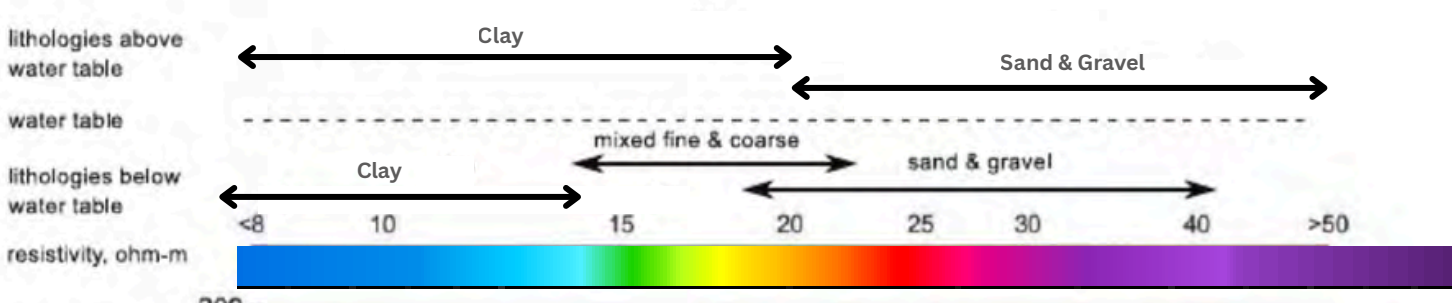
DEPTH SLICES- 40 FT



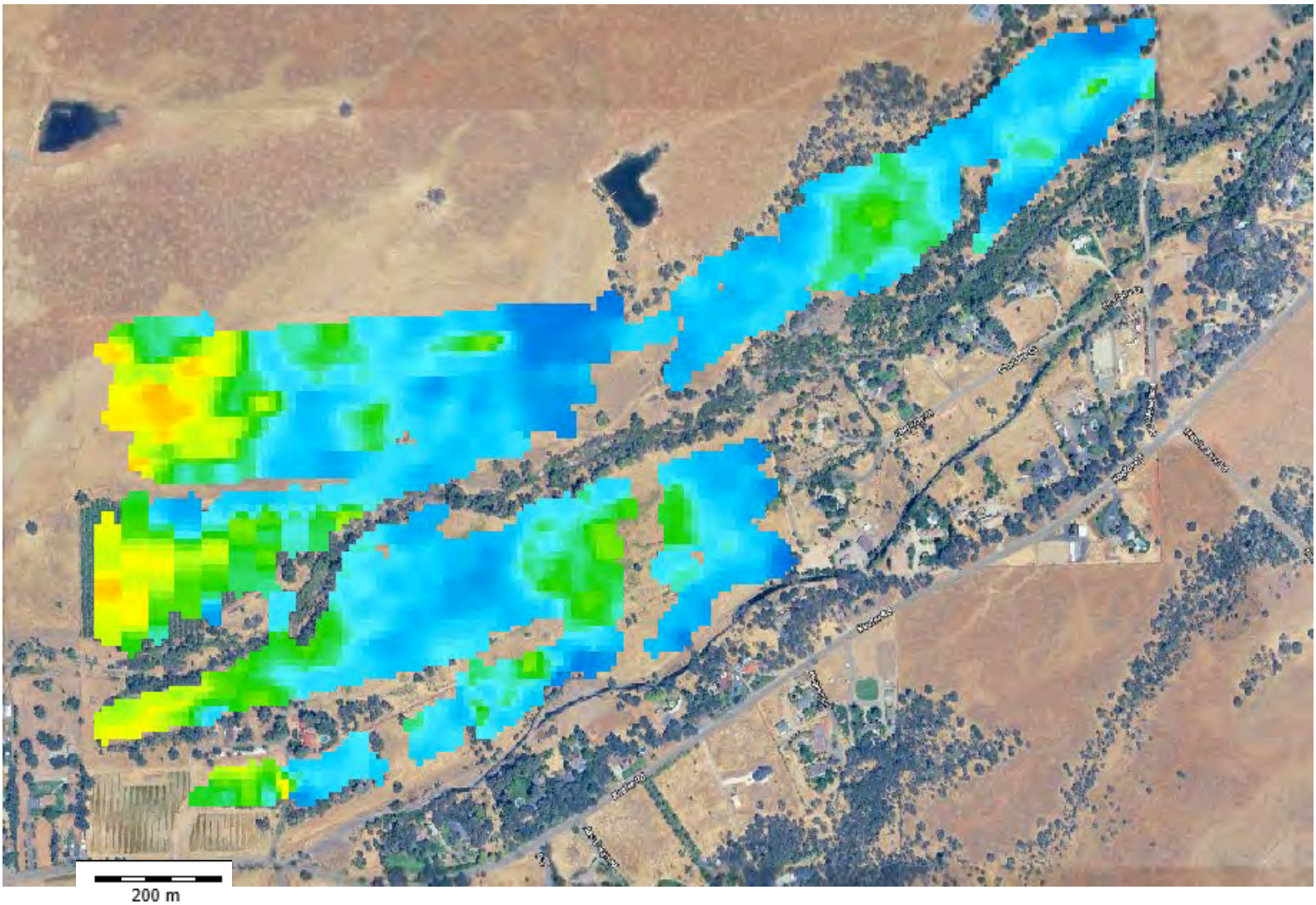


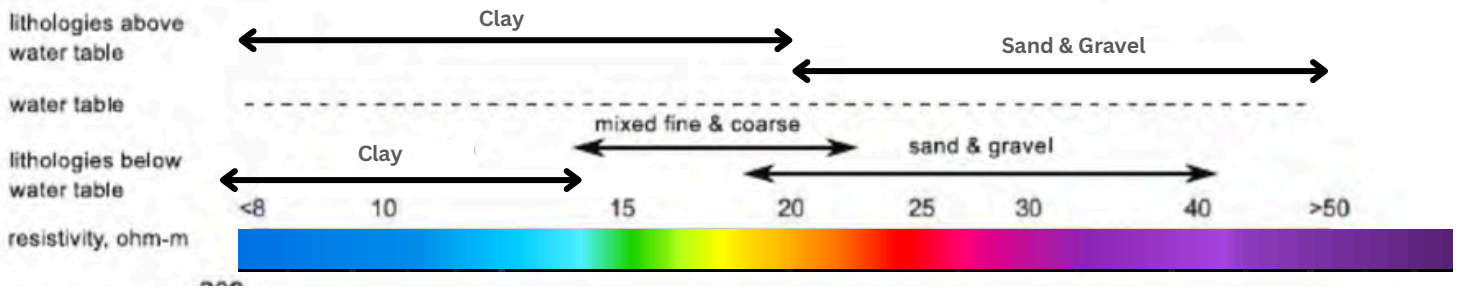
DEPTH SLICES- 50 FT



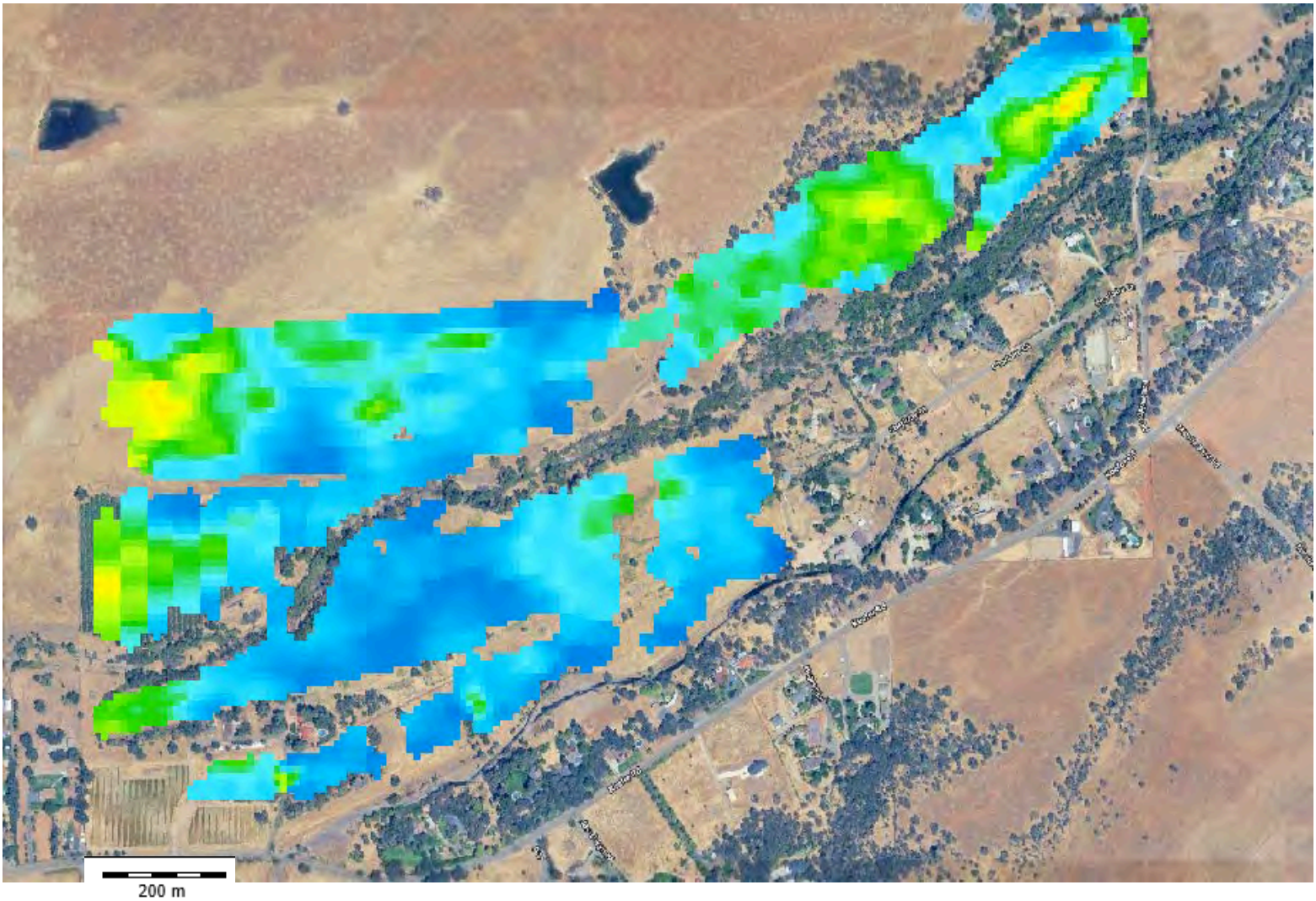


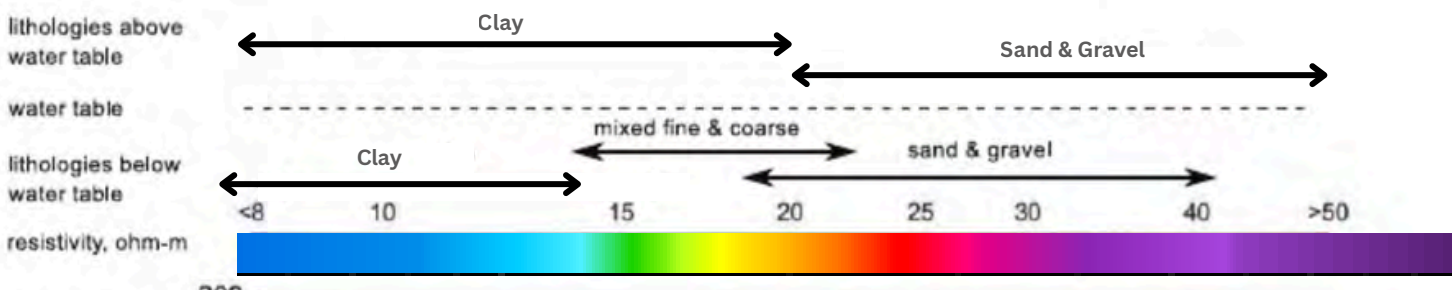
DEPTH SLICES- 60 FT (WATER TABLE)



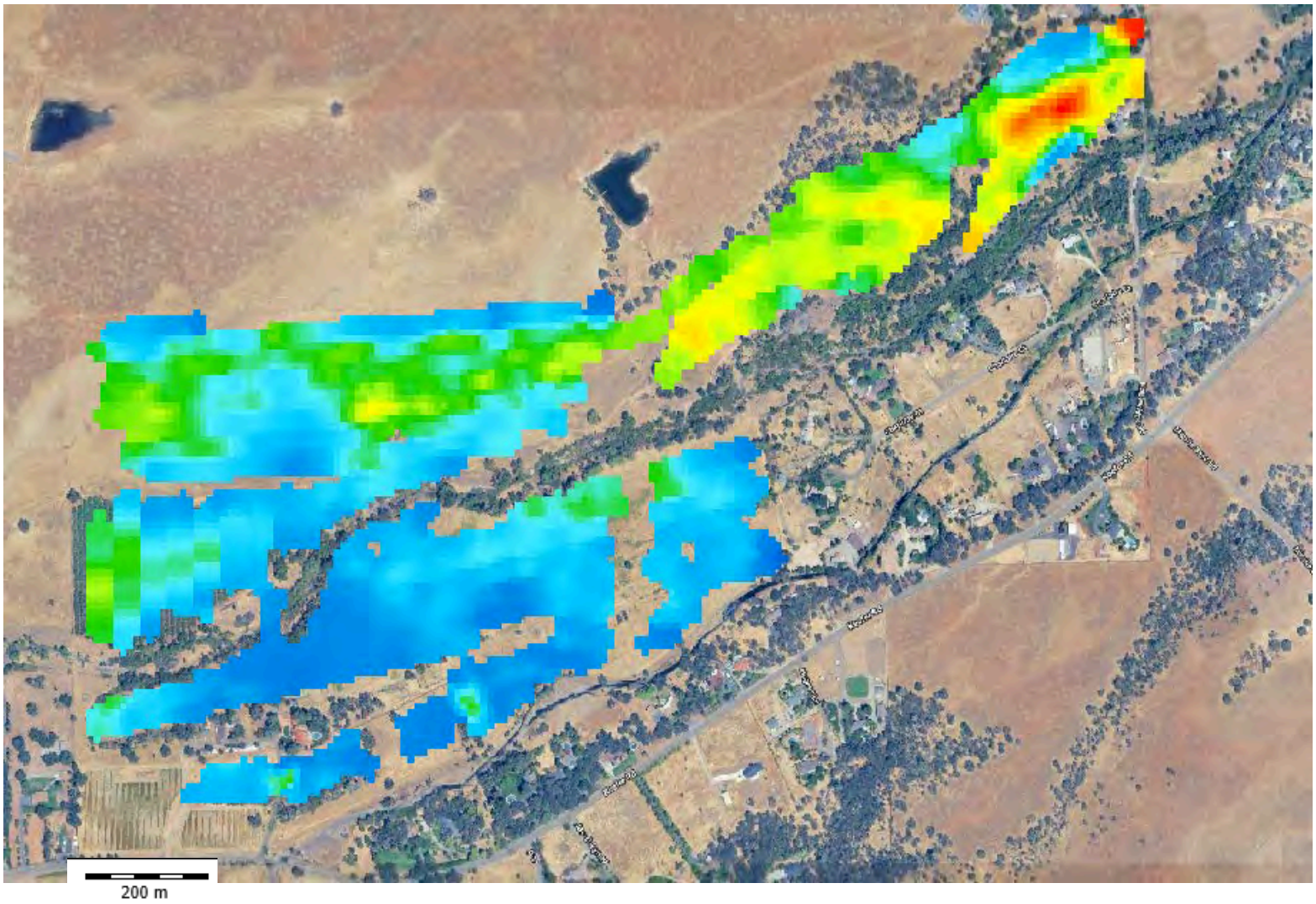


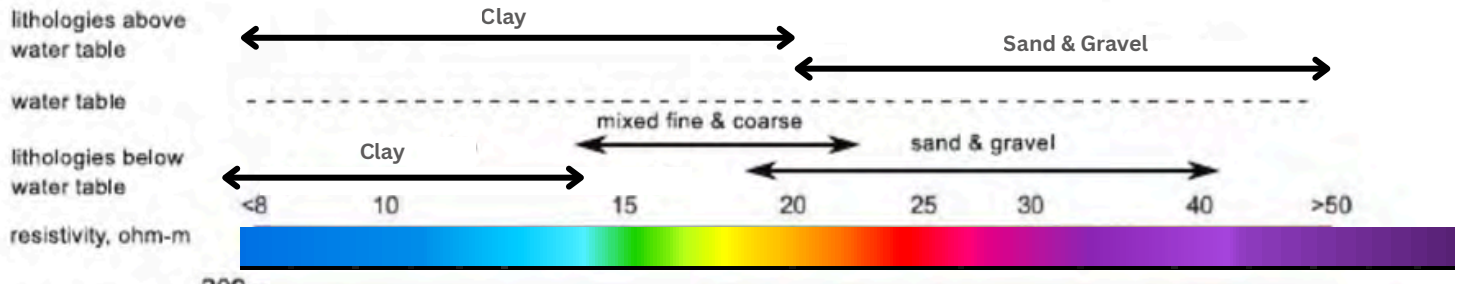
DEPTH SLICES- 70 FT



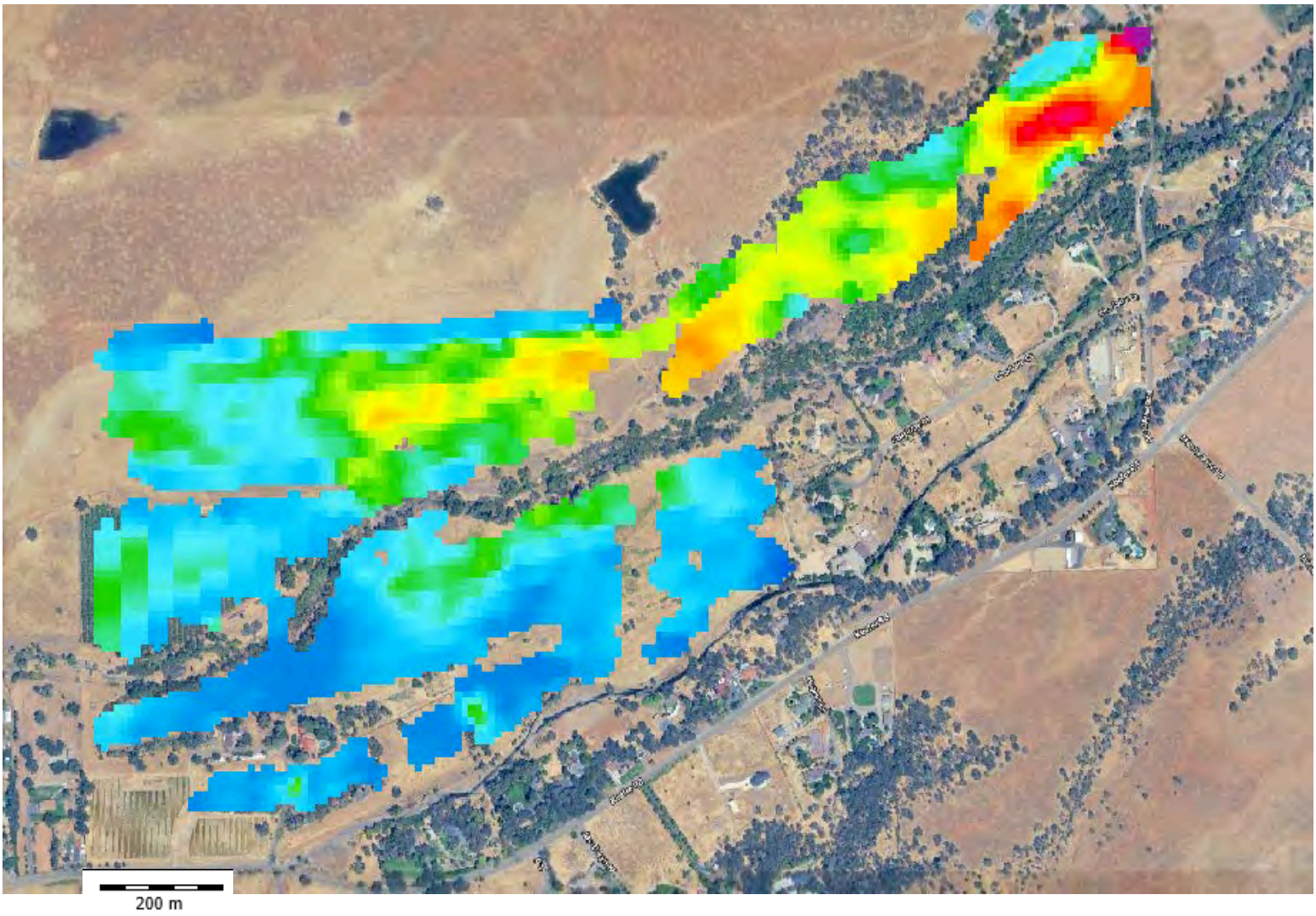


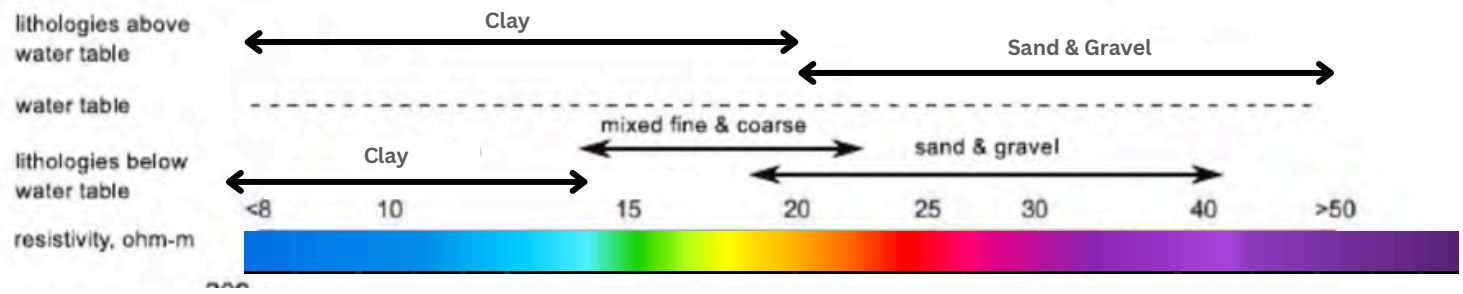
DEPTH SLICES- 80 FT



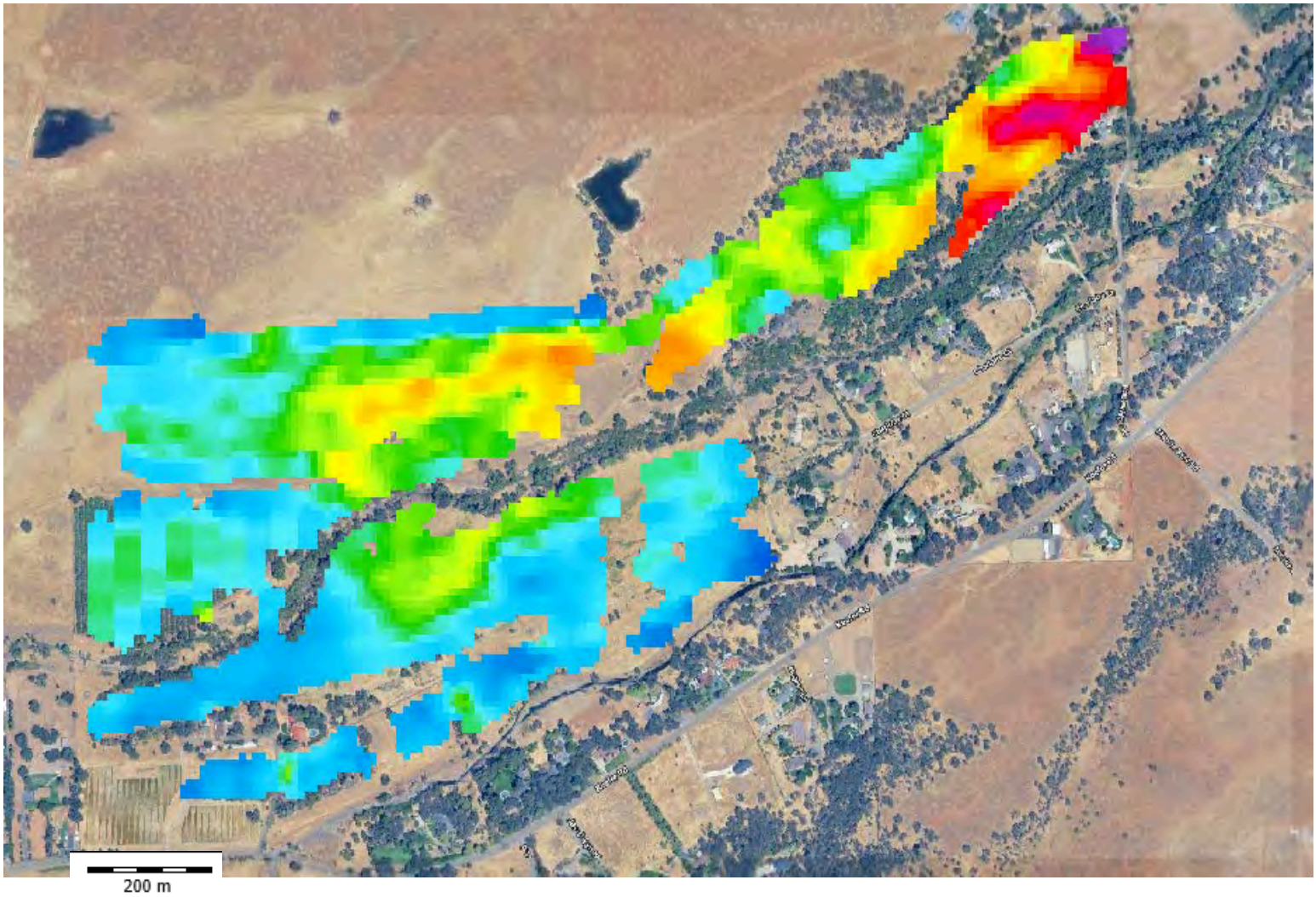


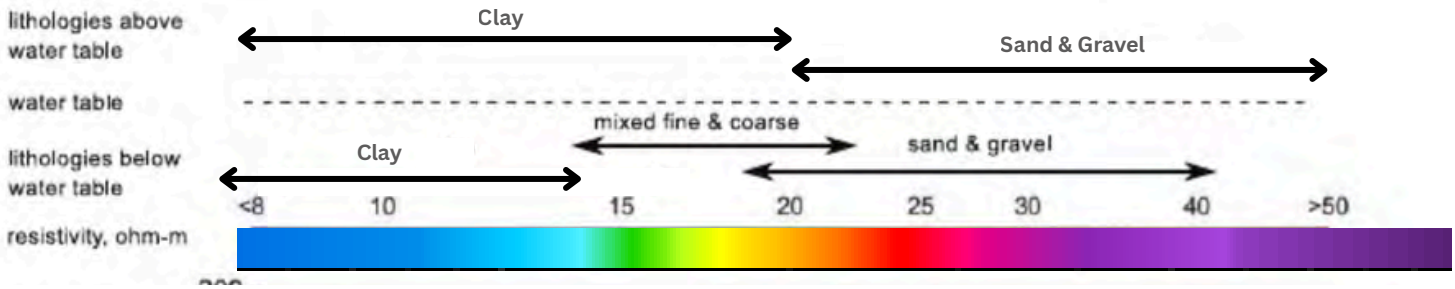
DEPTH SLICES- 90 FT



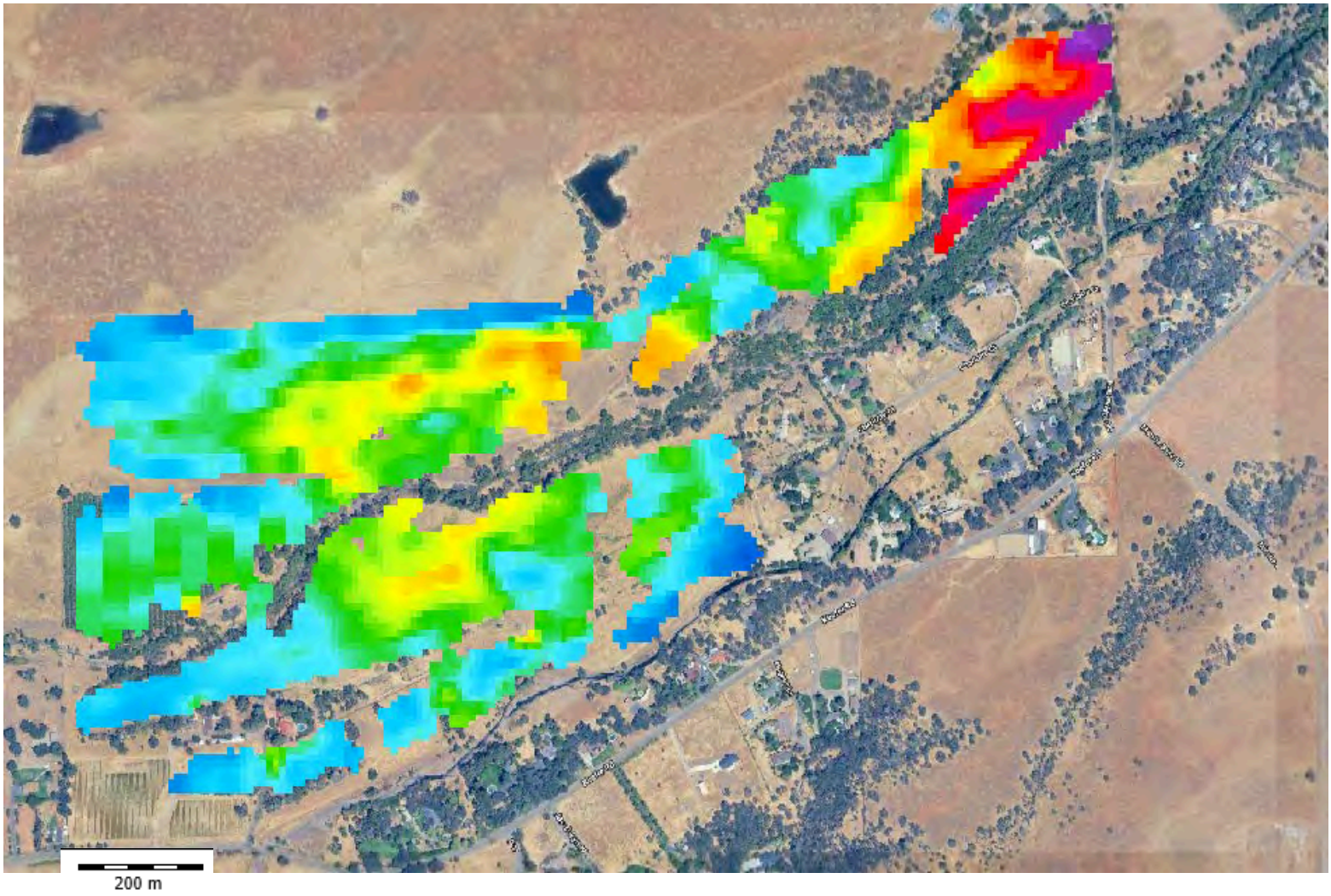


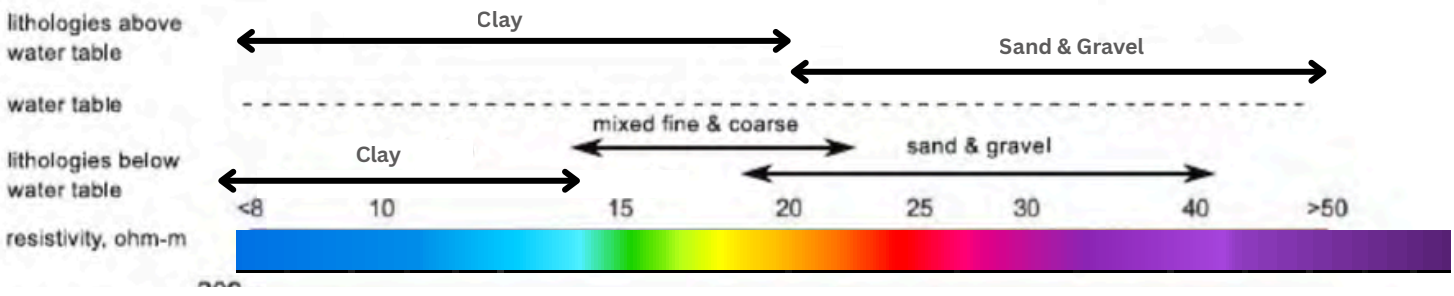
DEPTH SLICES- 100 FT



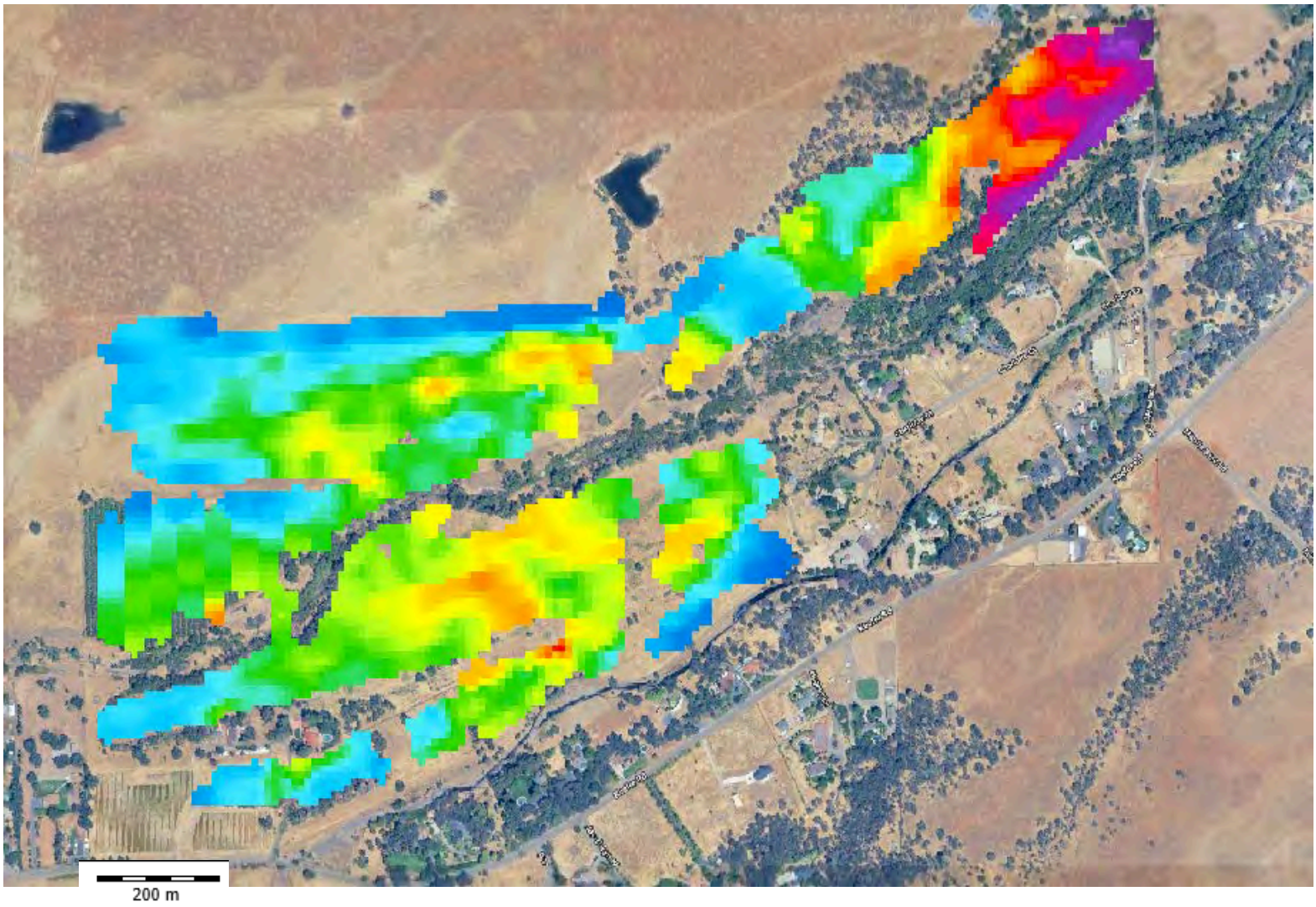


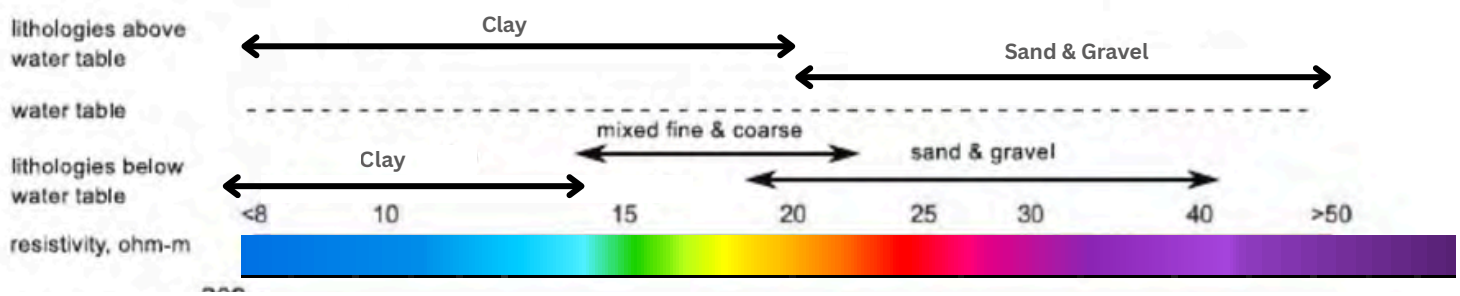
DEPTH SLICES- 110 FT



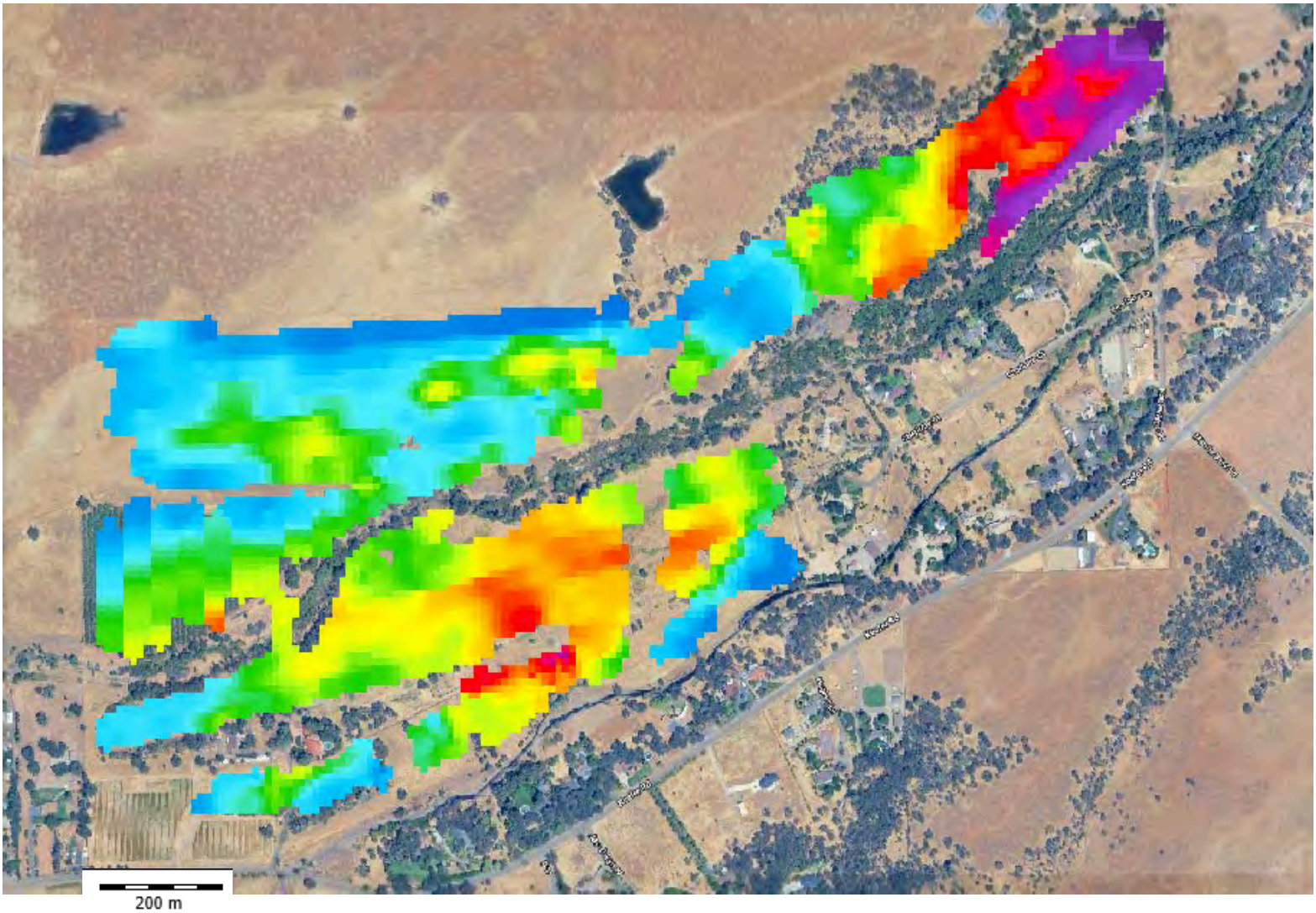


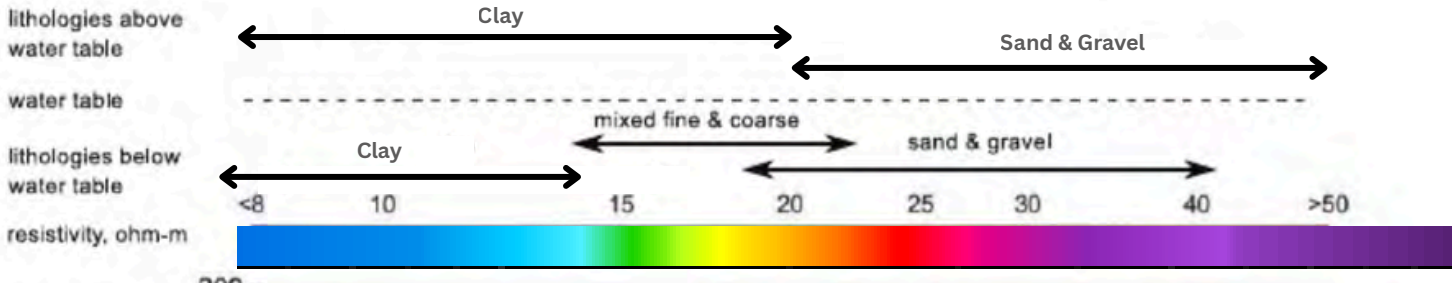
DEPTH SLICES- 120 FT





DEPTH SLICES- 130 FT





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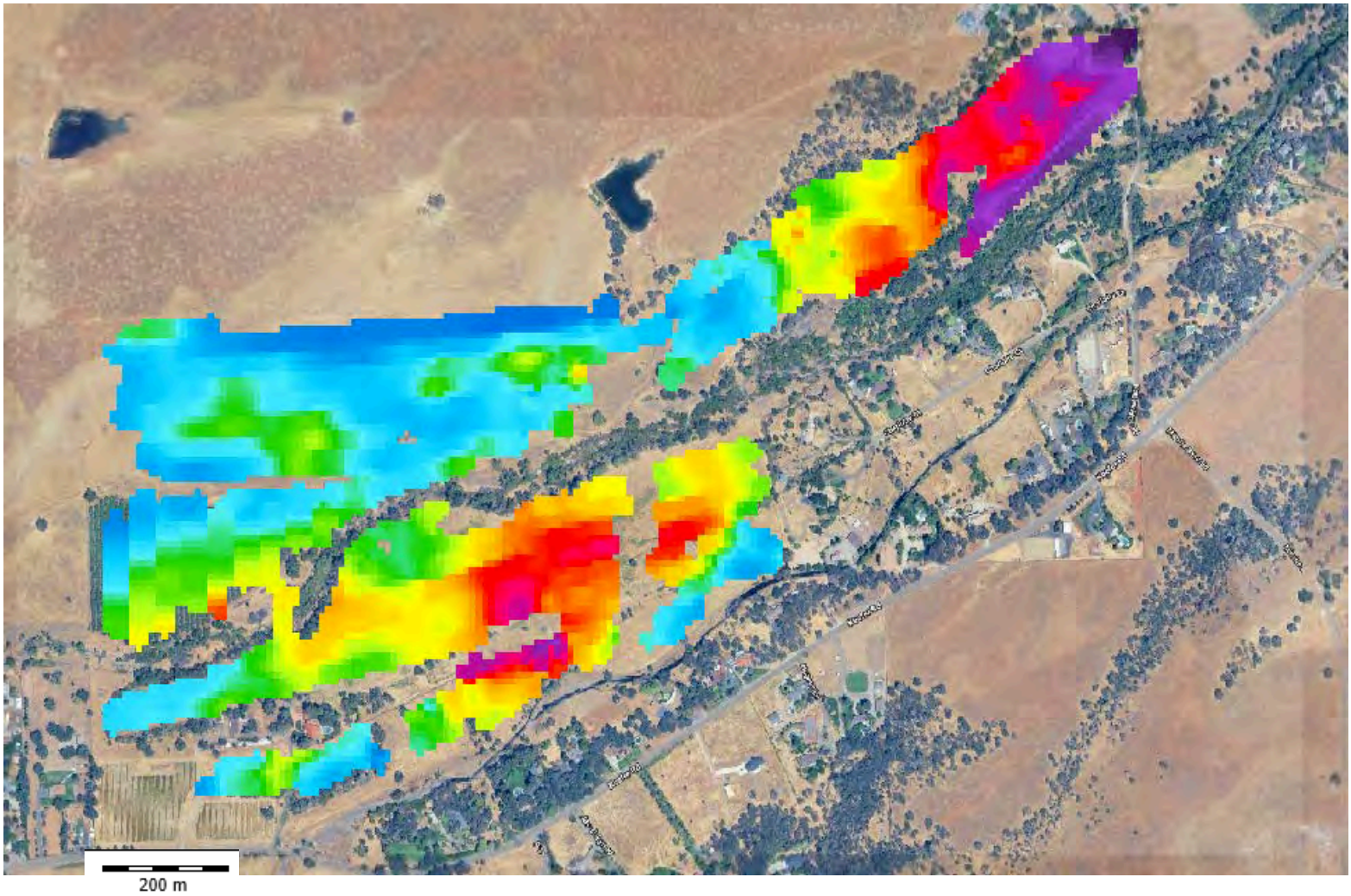

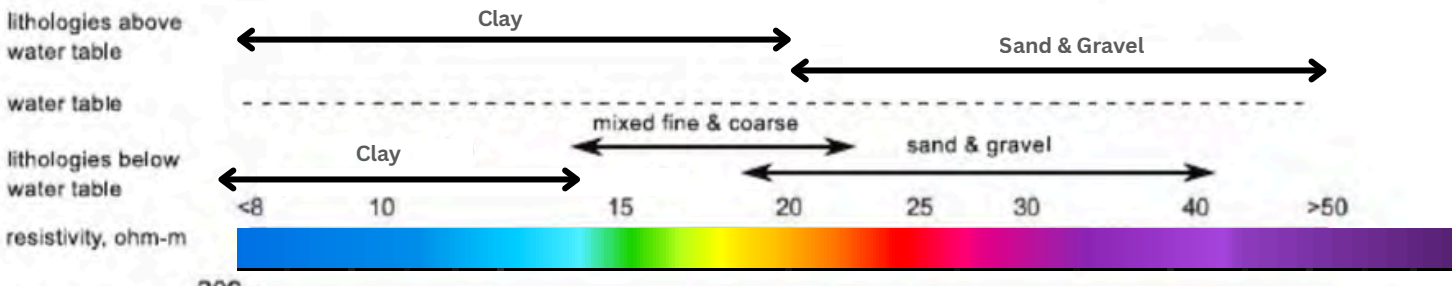

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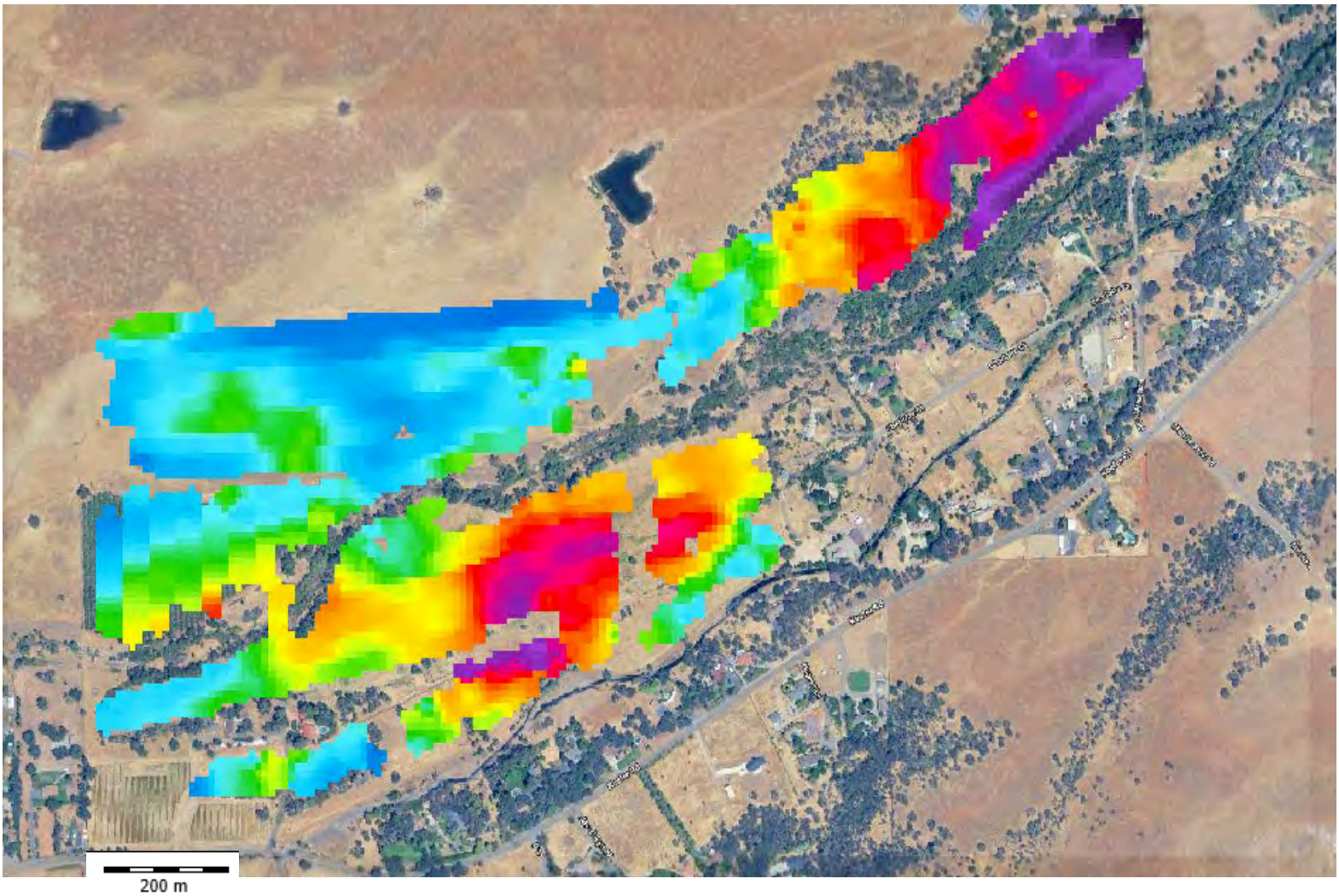

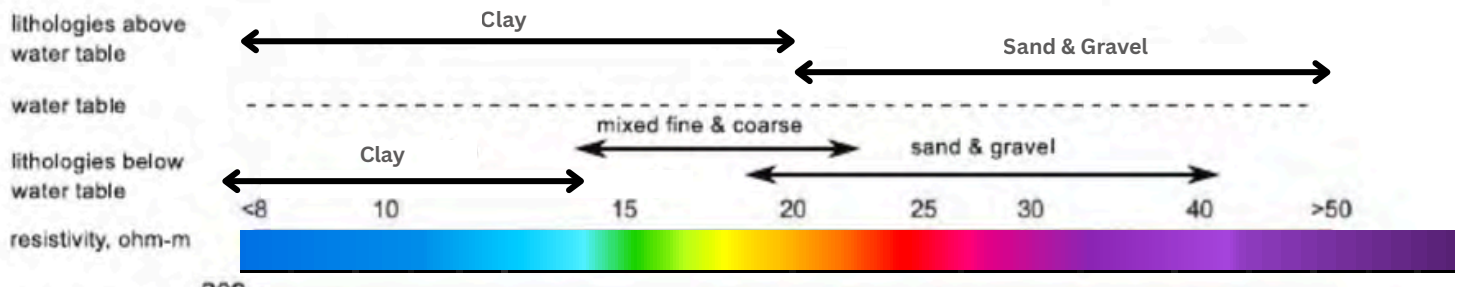

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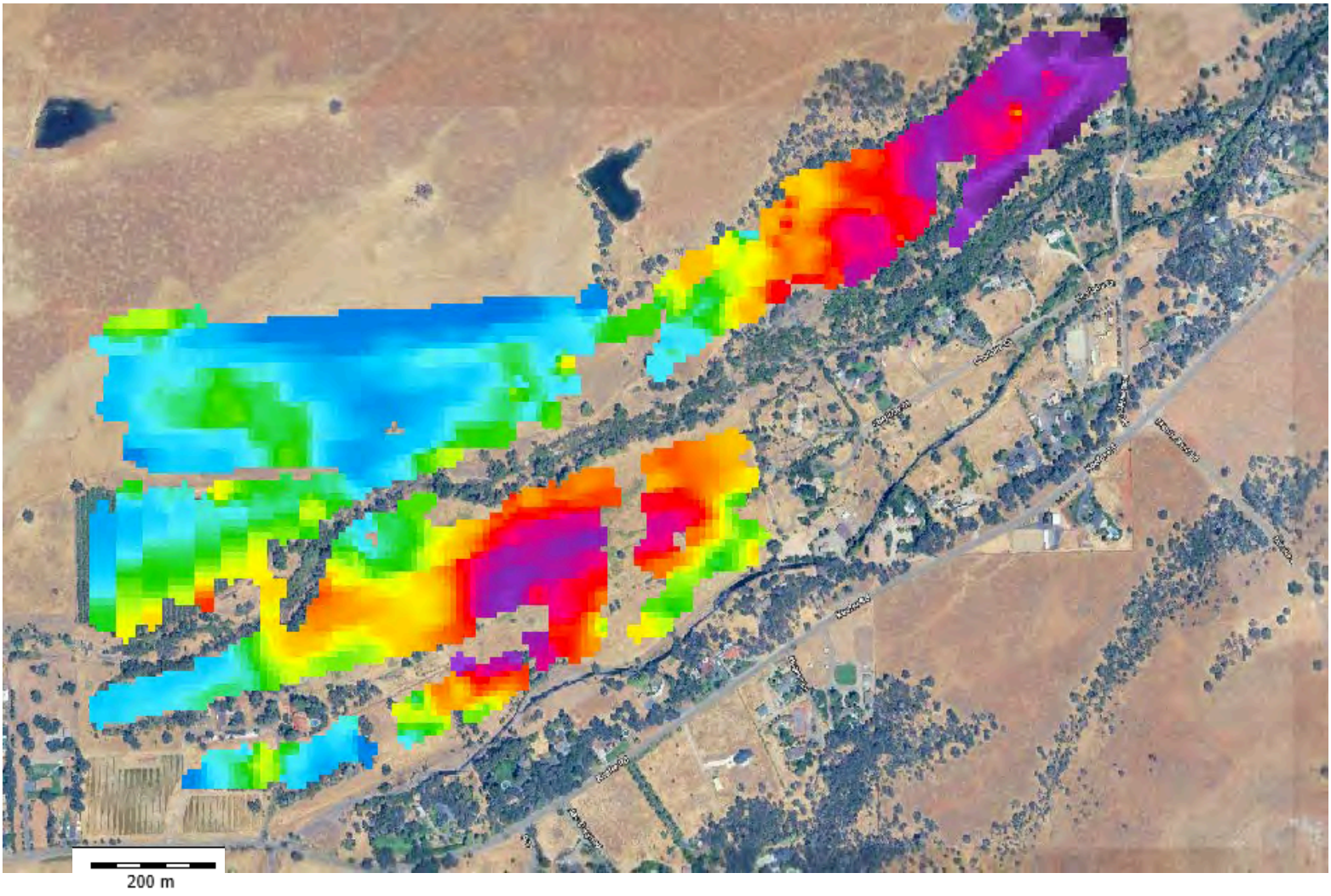

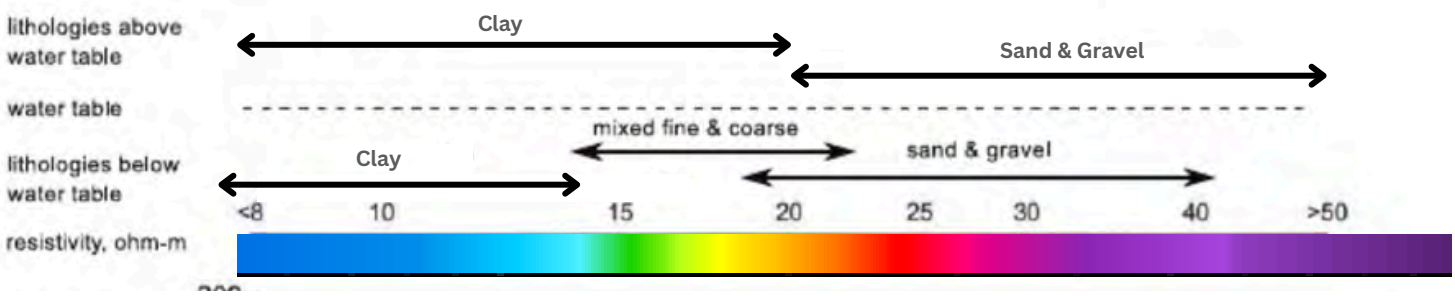

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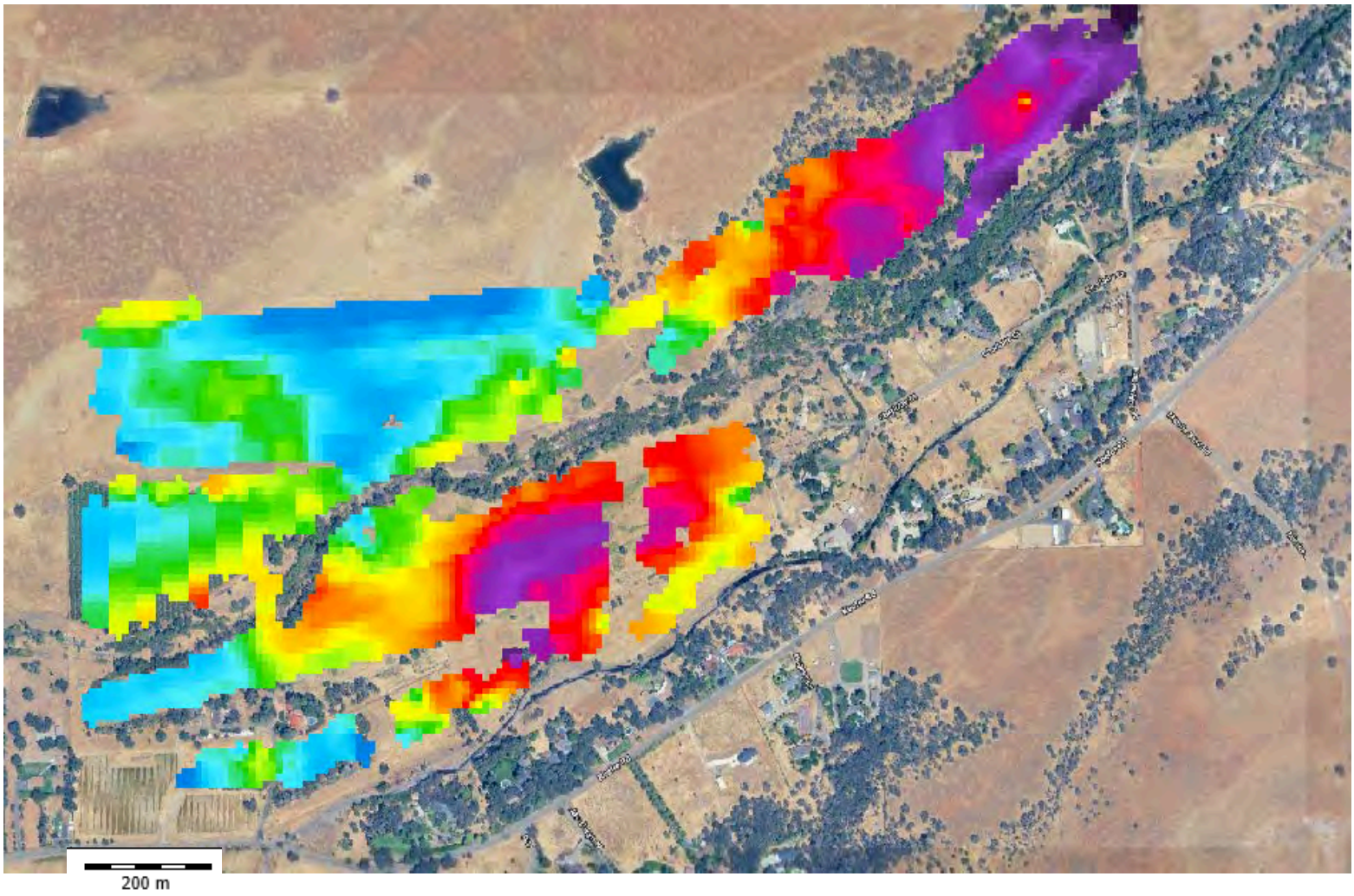

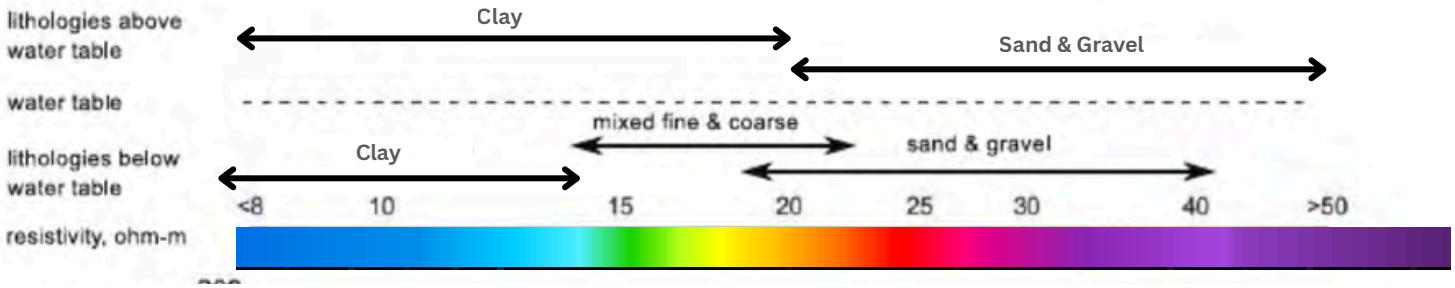

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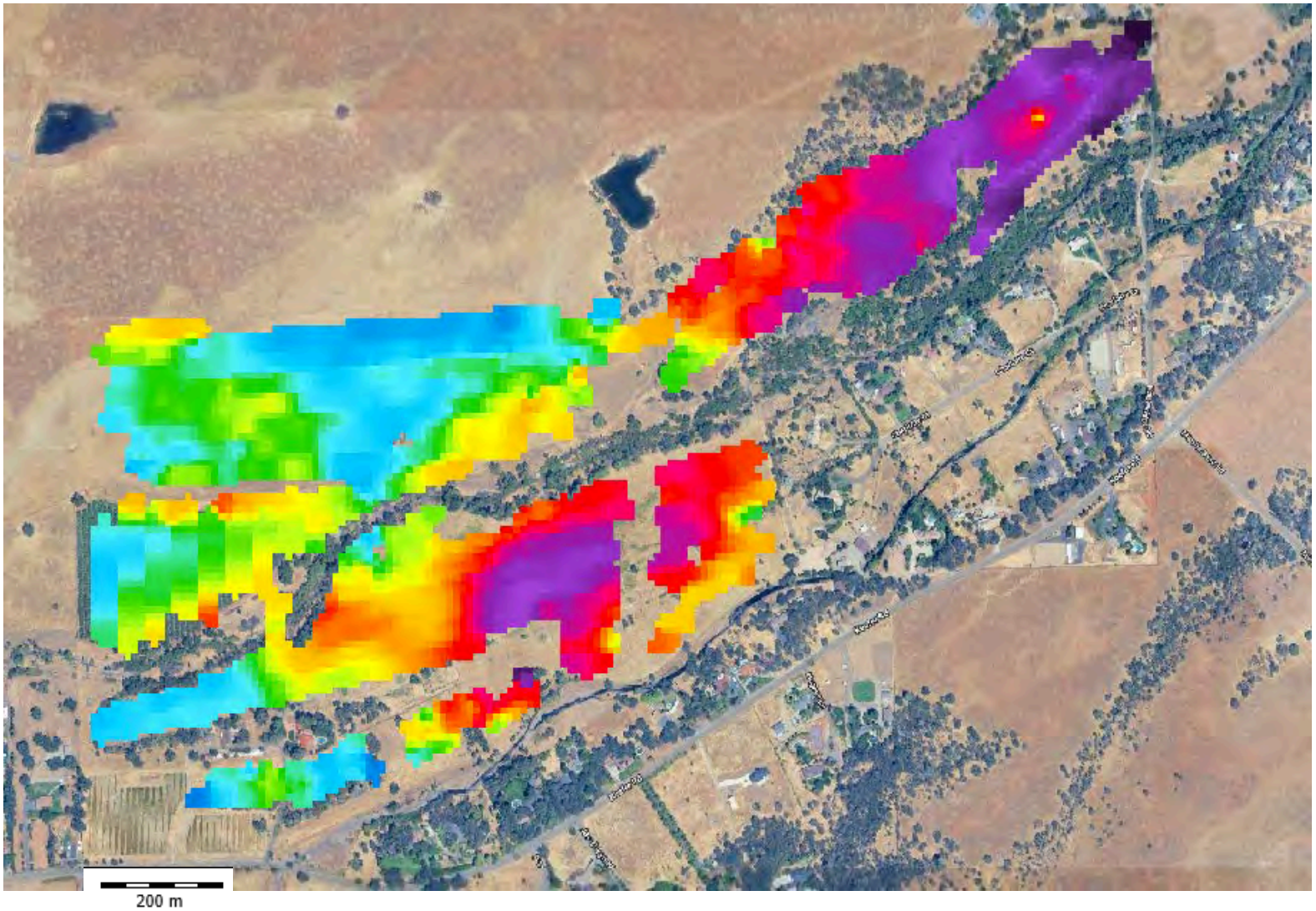

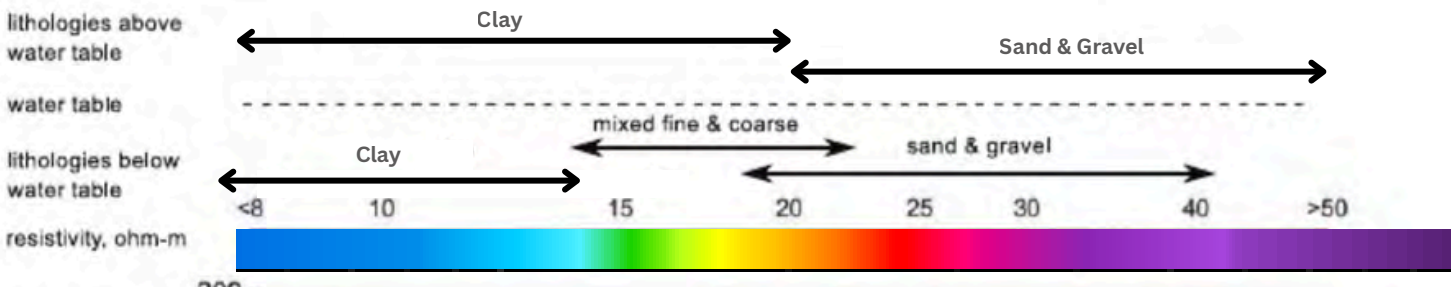

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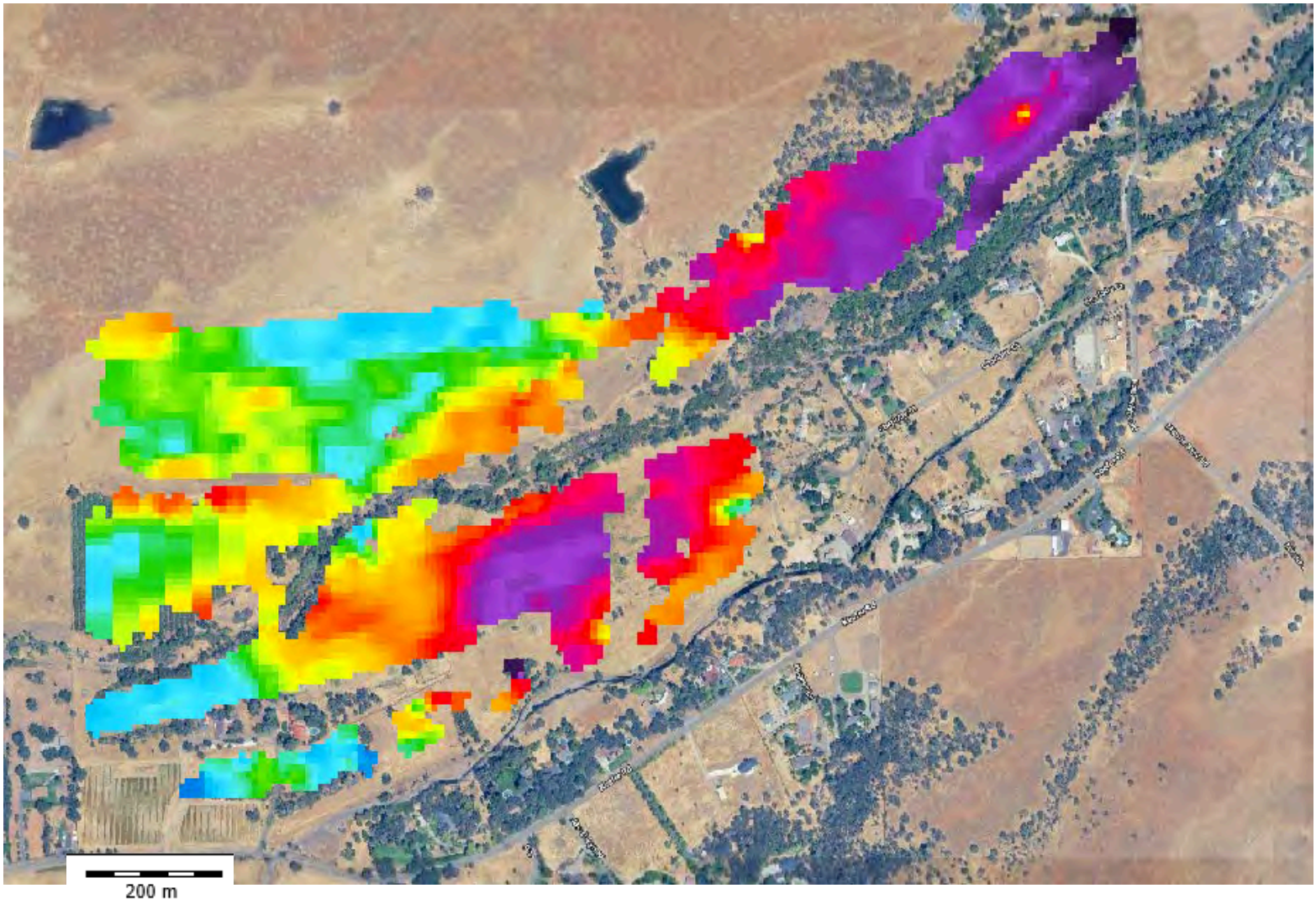

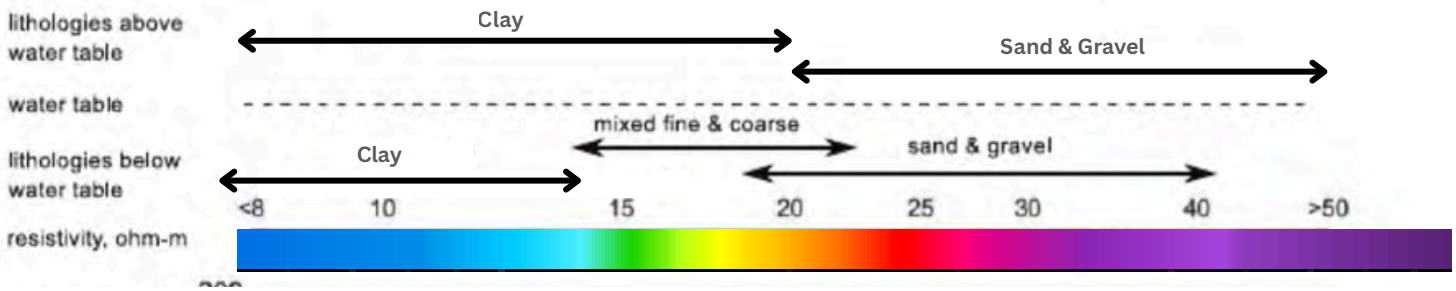

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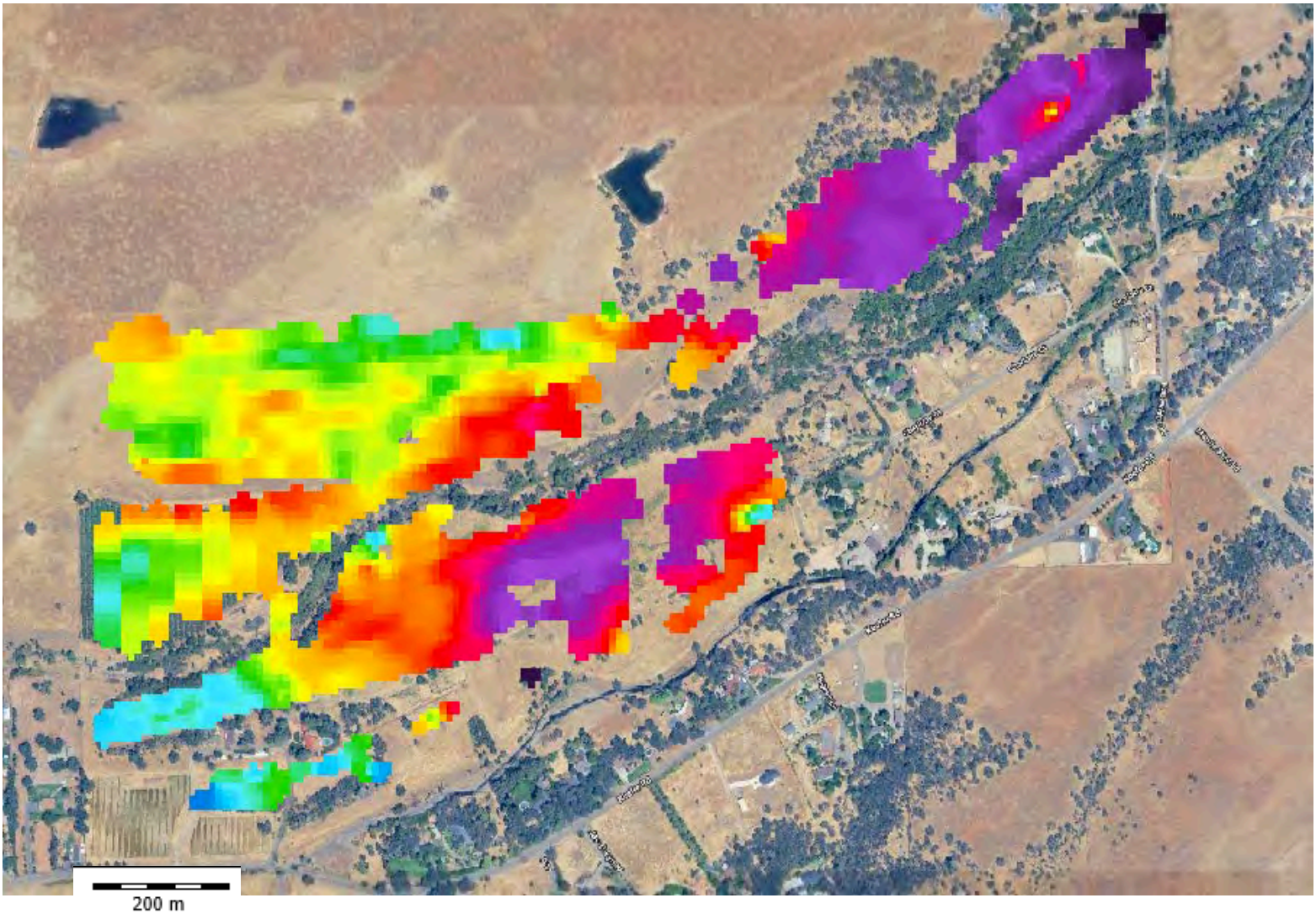

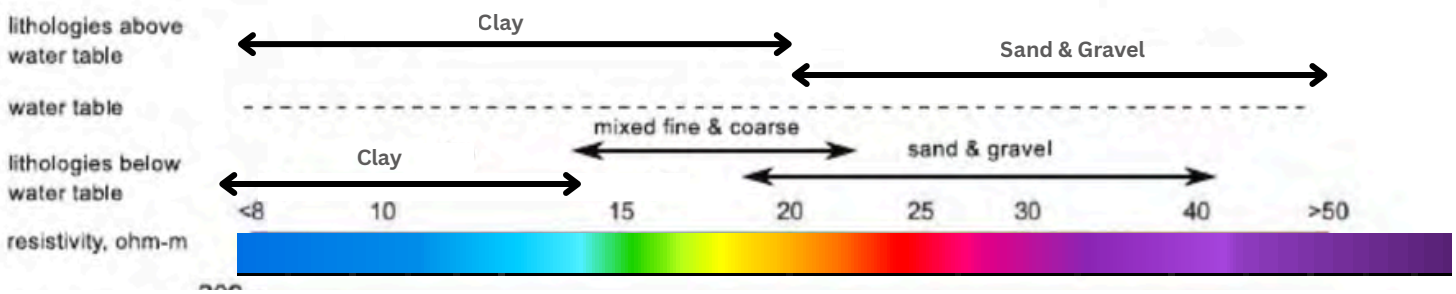

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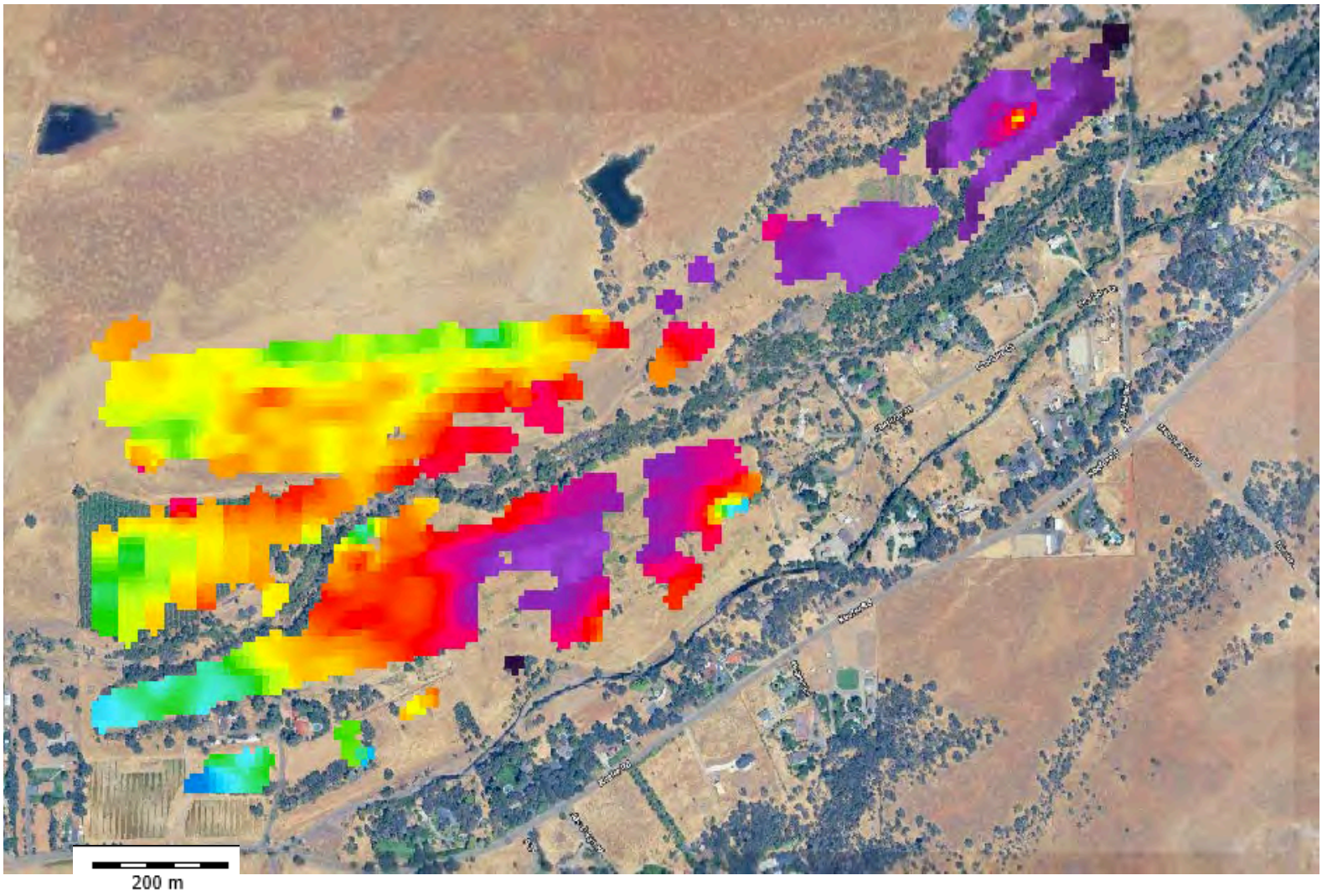

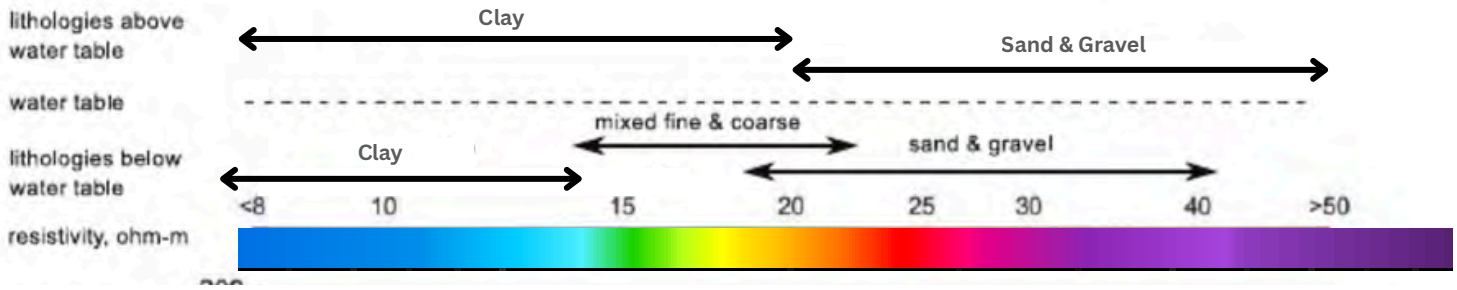

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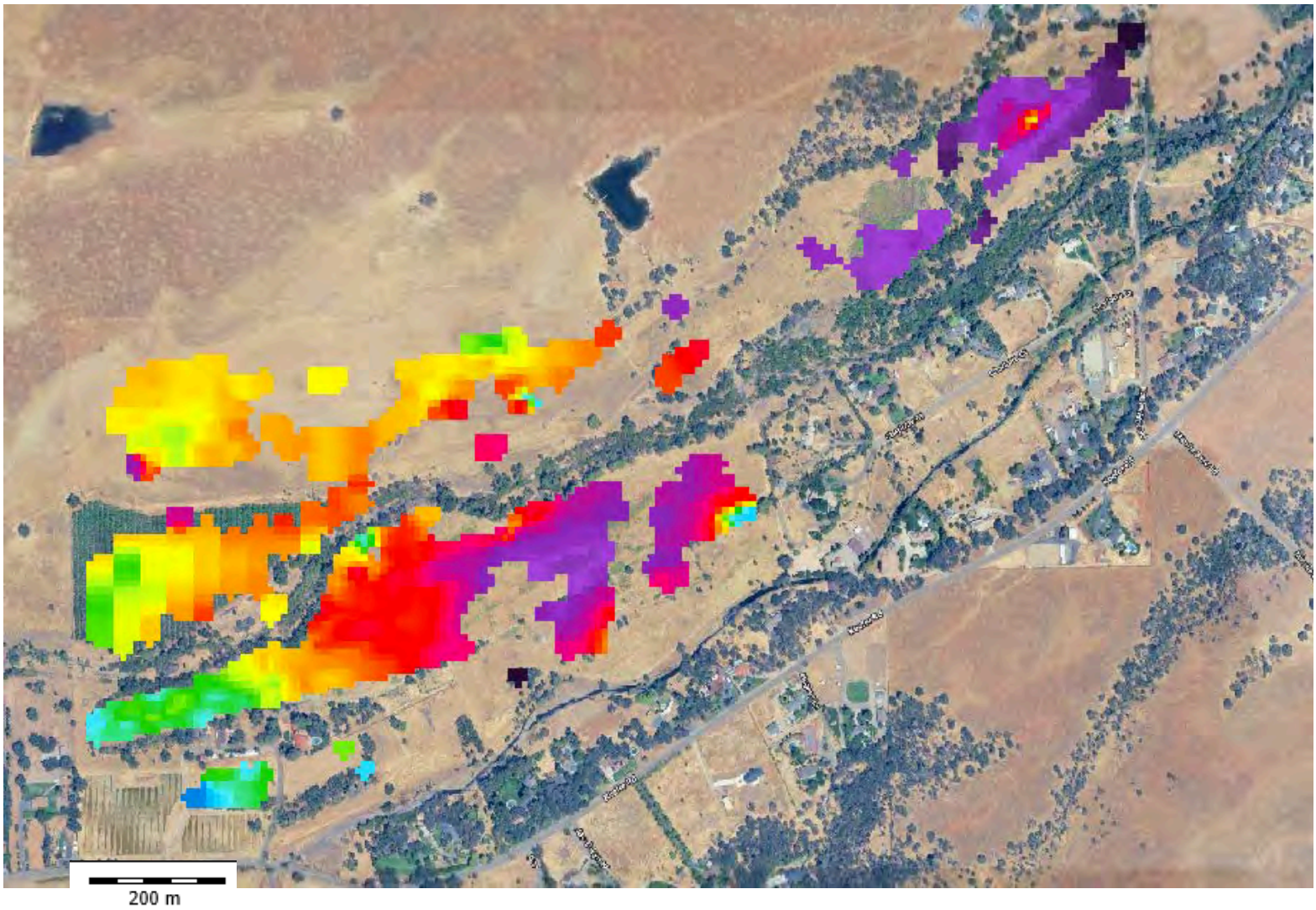
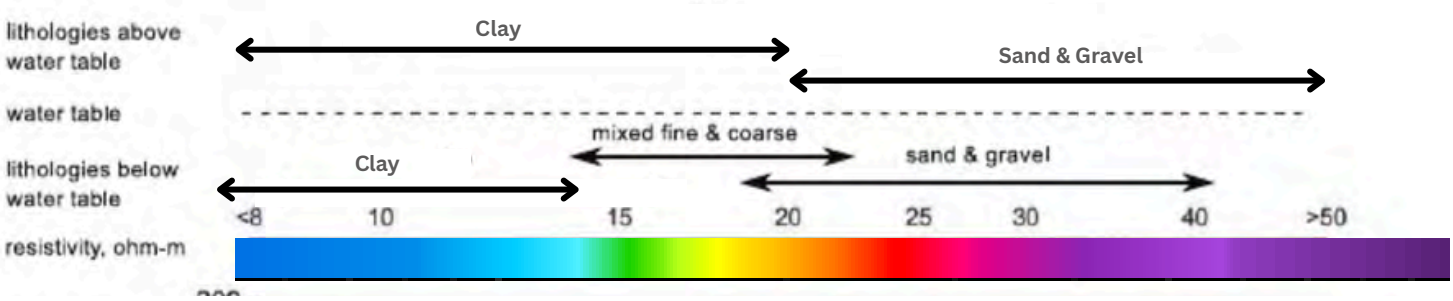
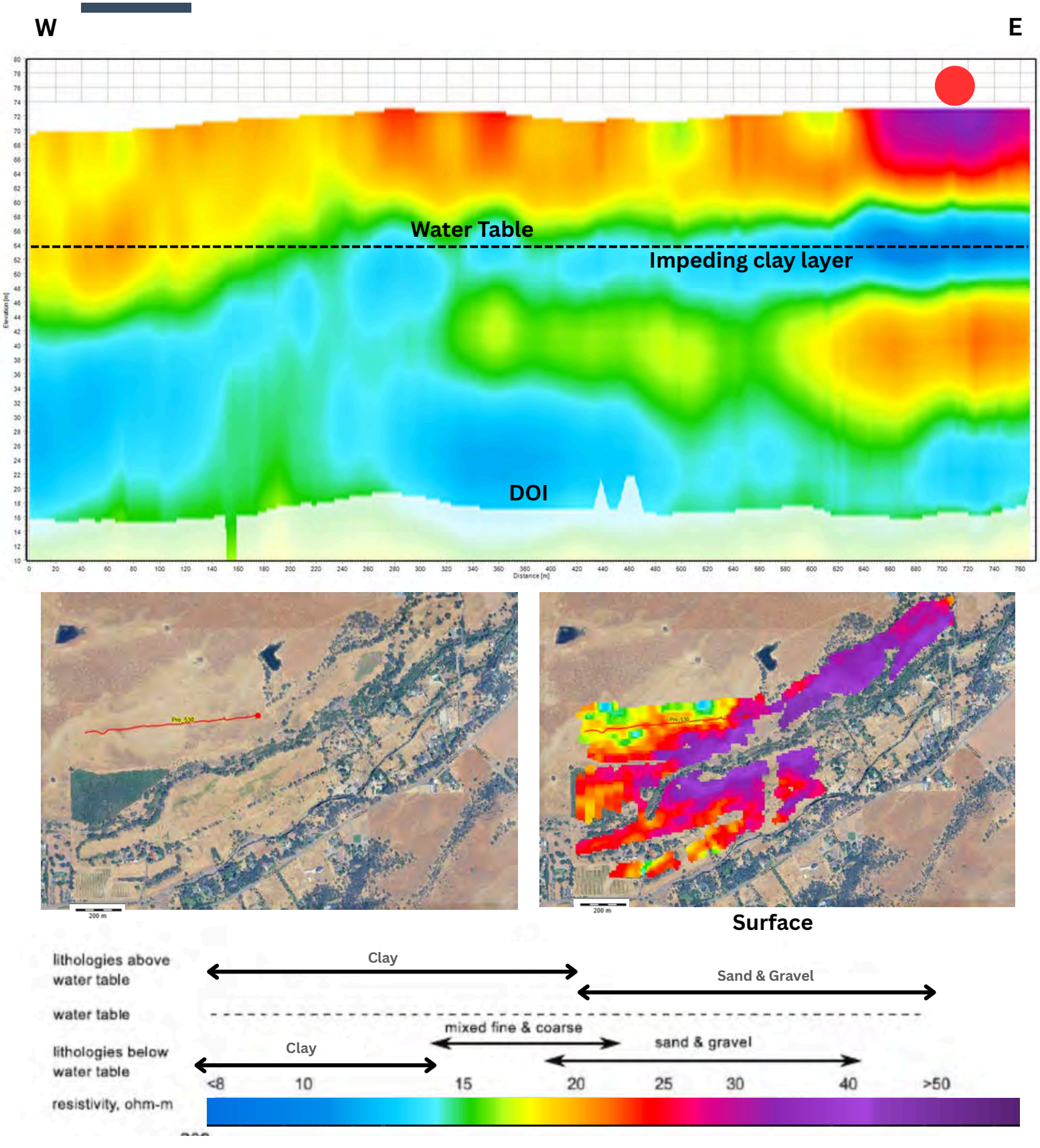




2D CROSS SECTION- PRO_530



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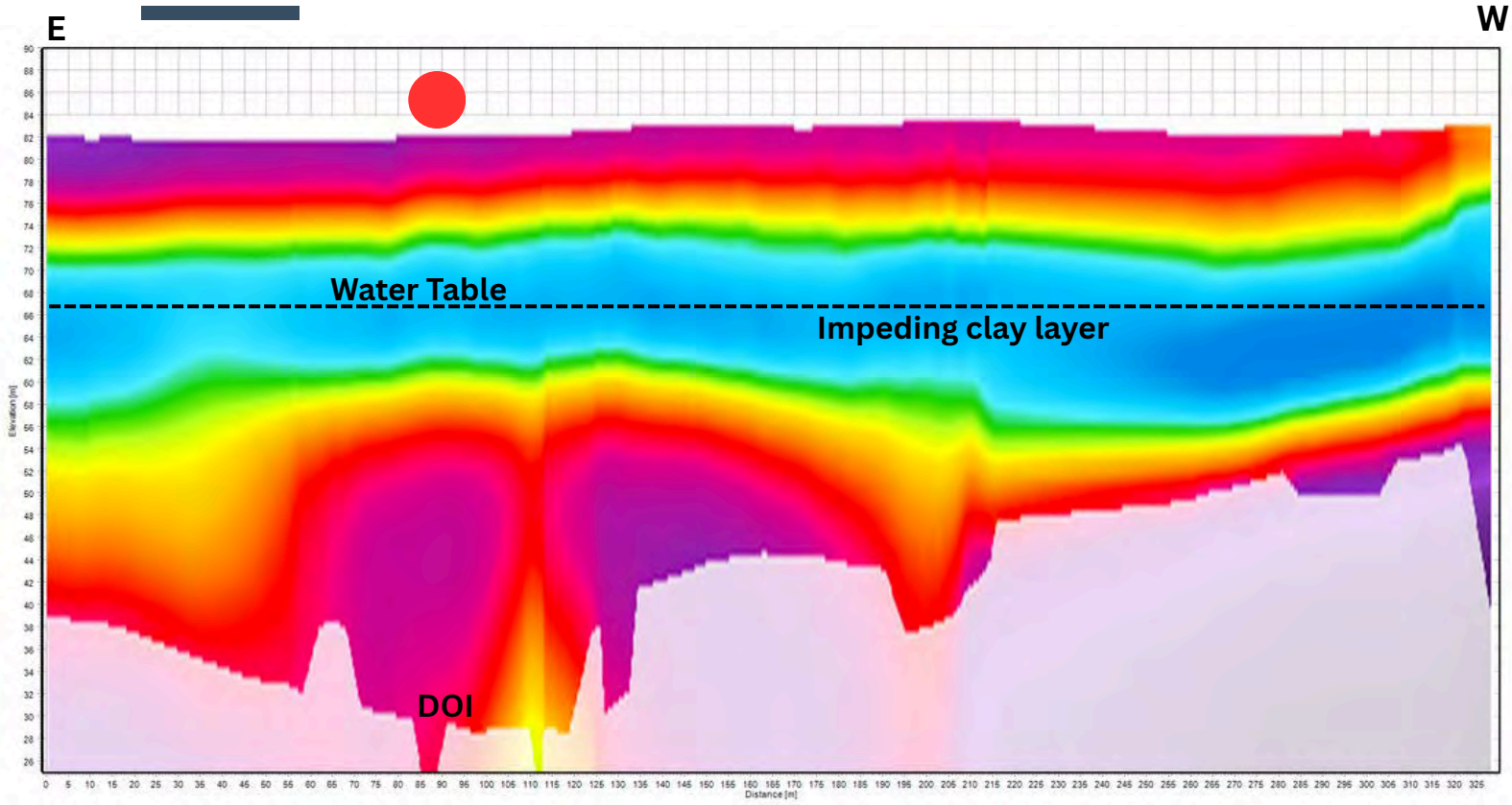

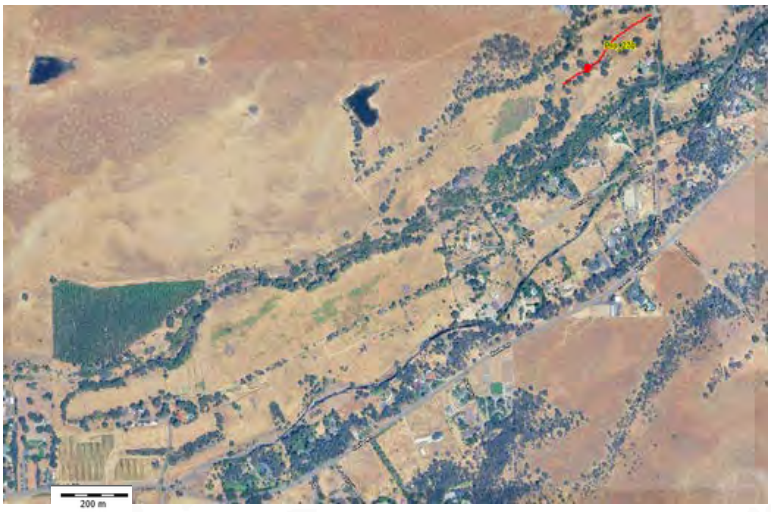

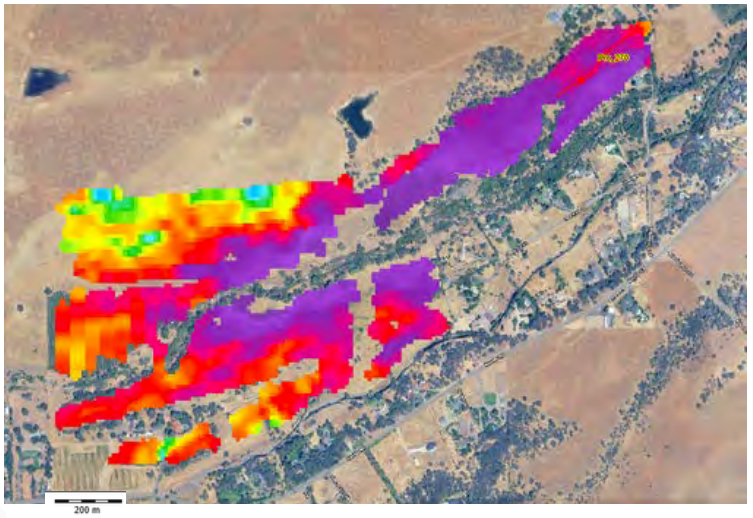

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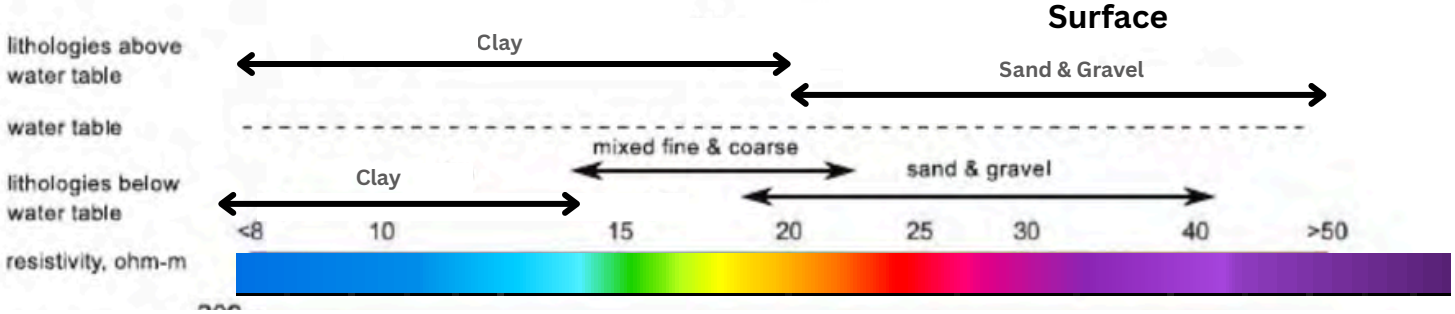
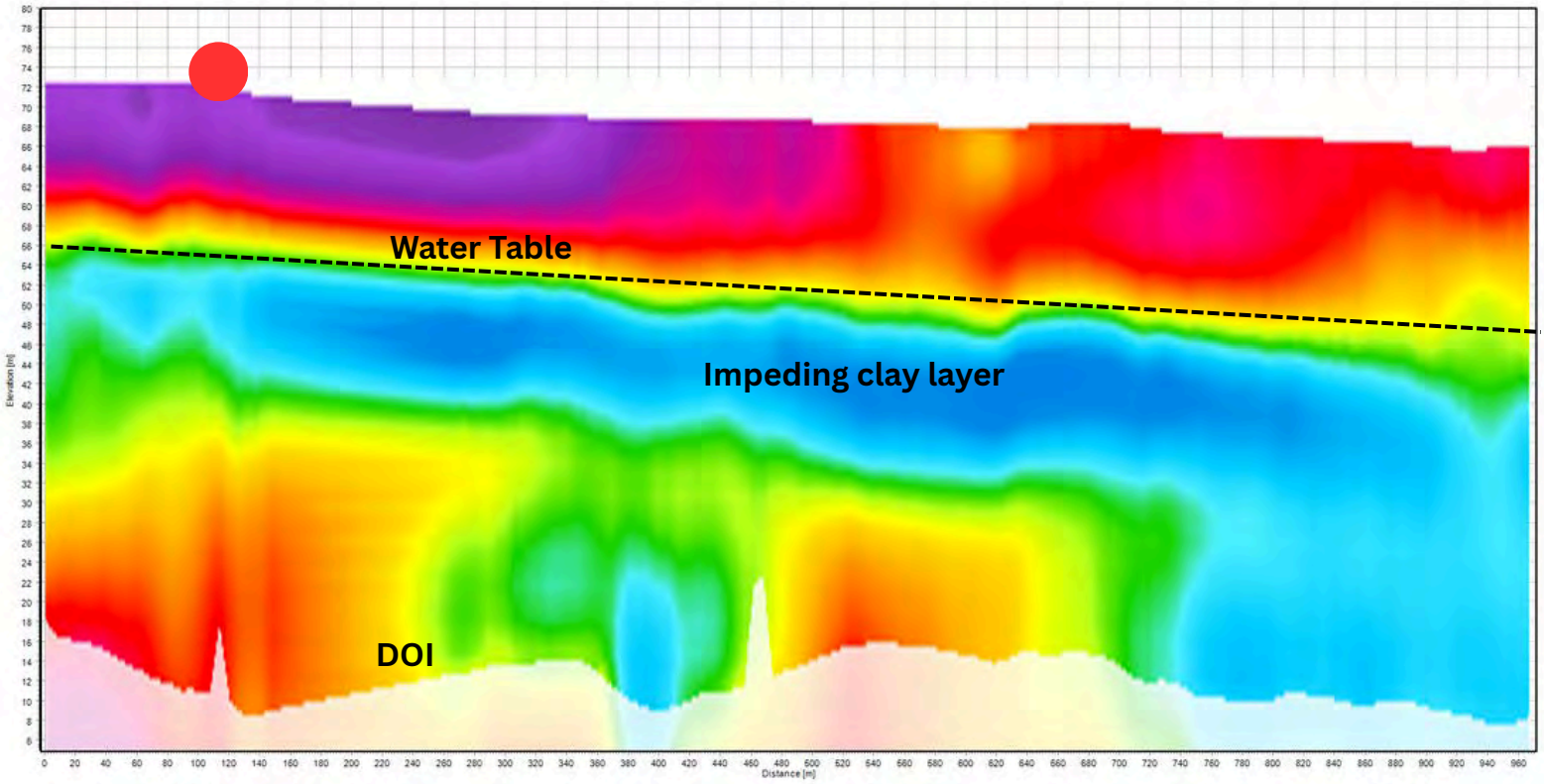
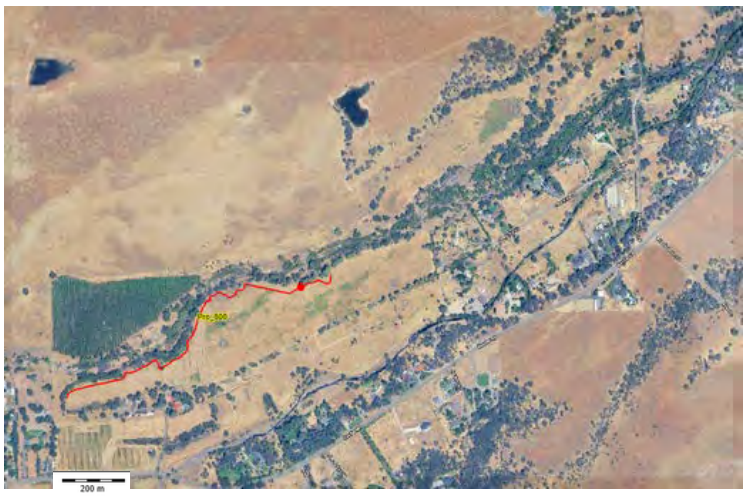
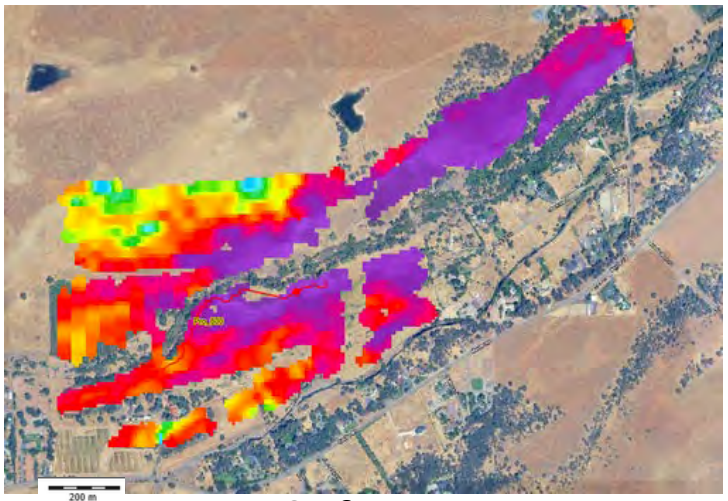


2D CROSS SECTION- PRO_800

E W







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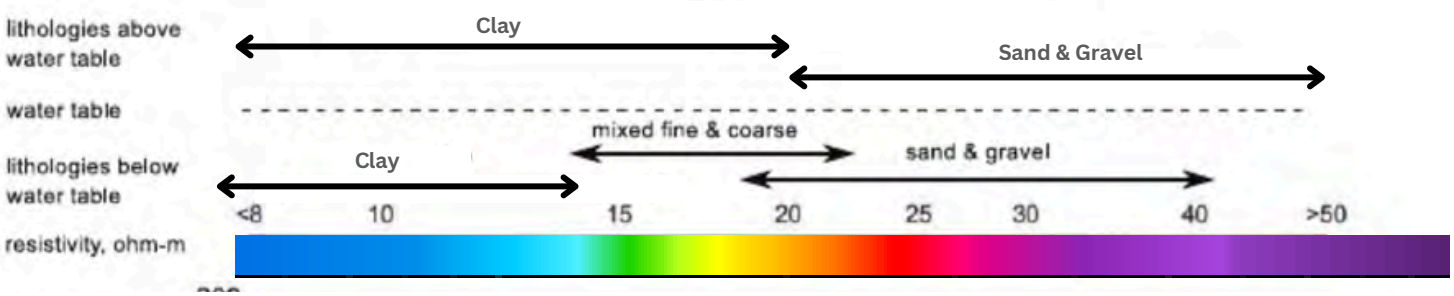
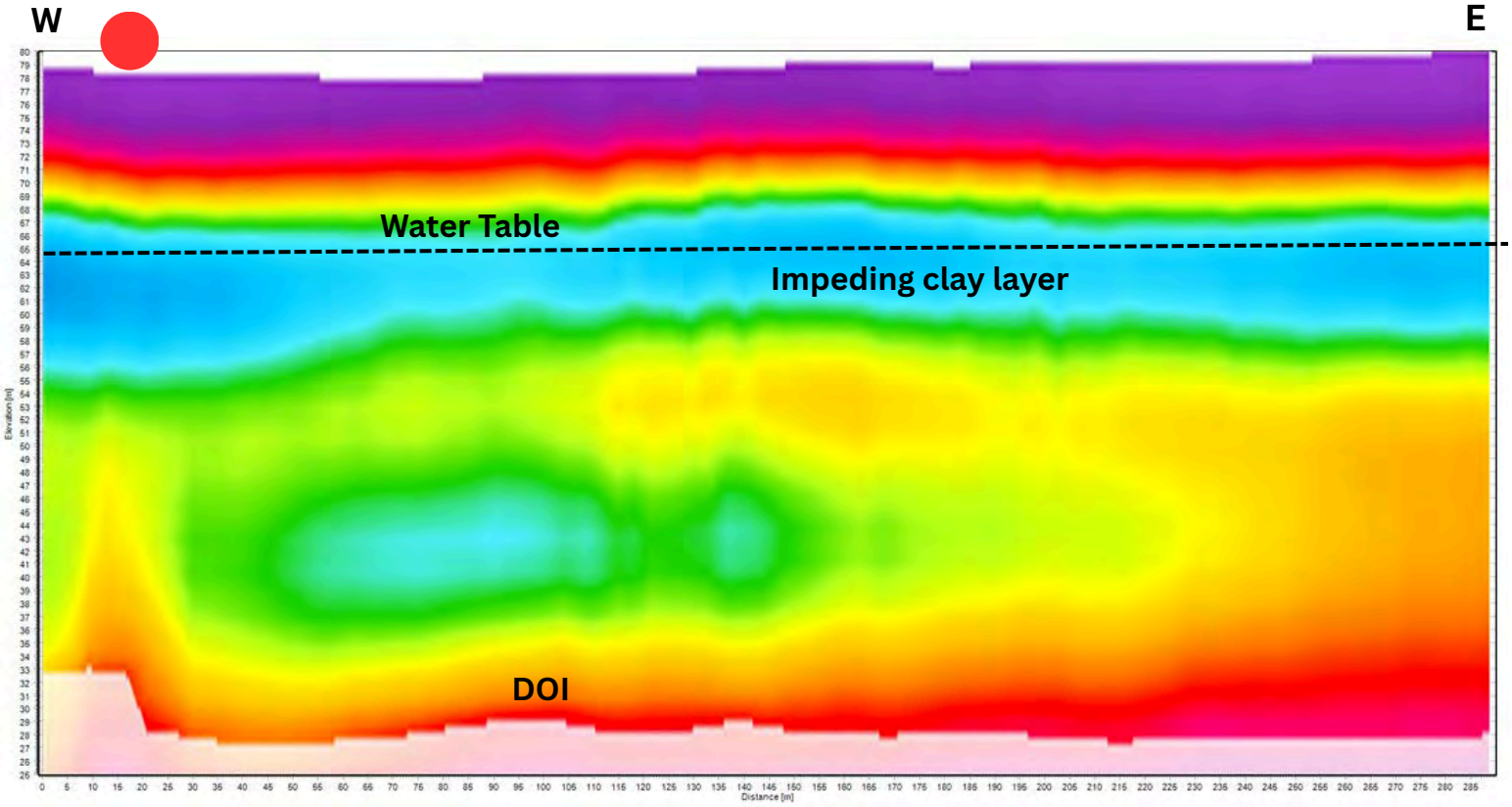
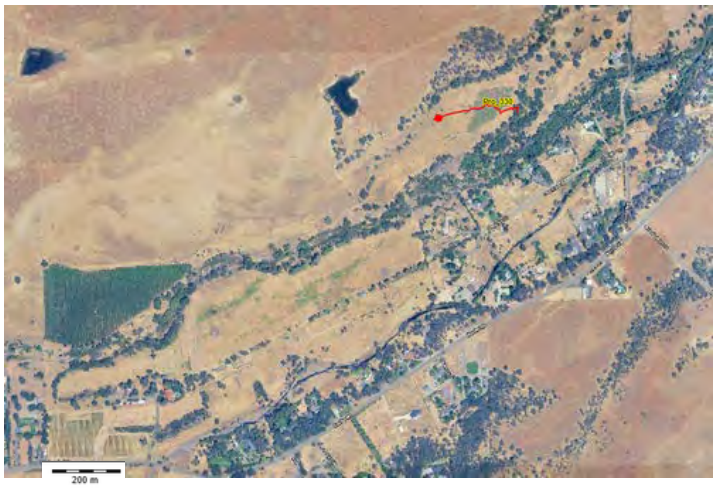
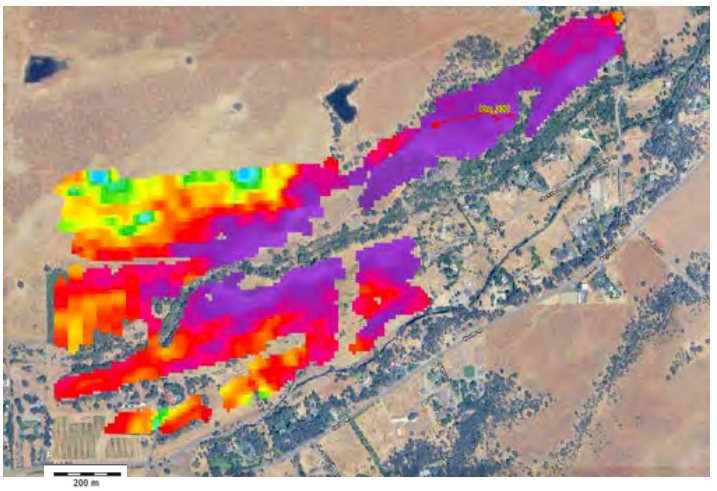


2D CROSS SECTION- PRO_330







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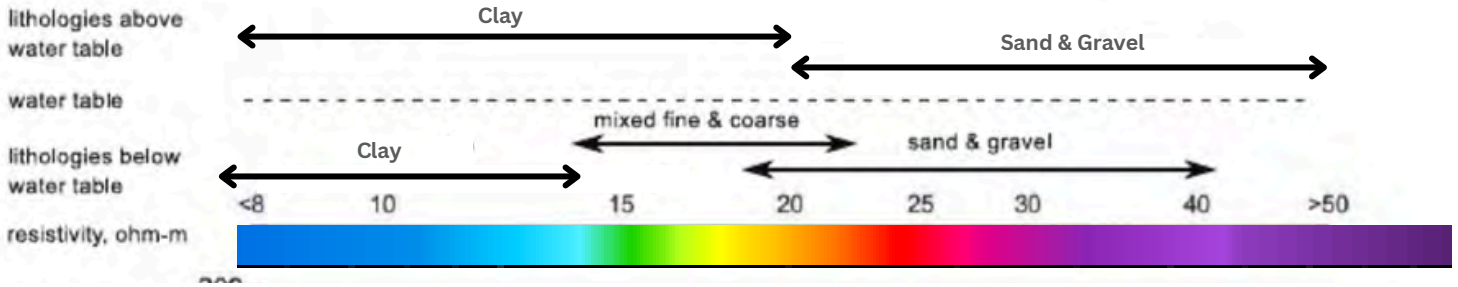
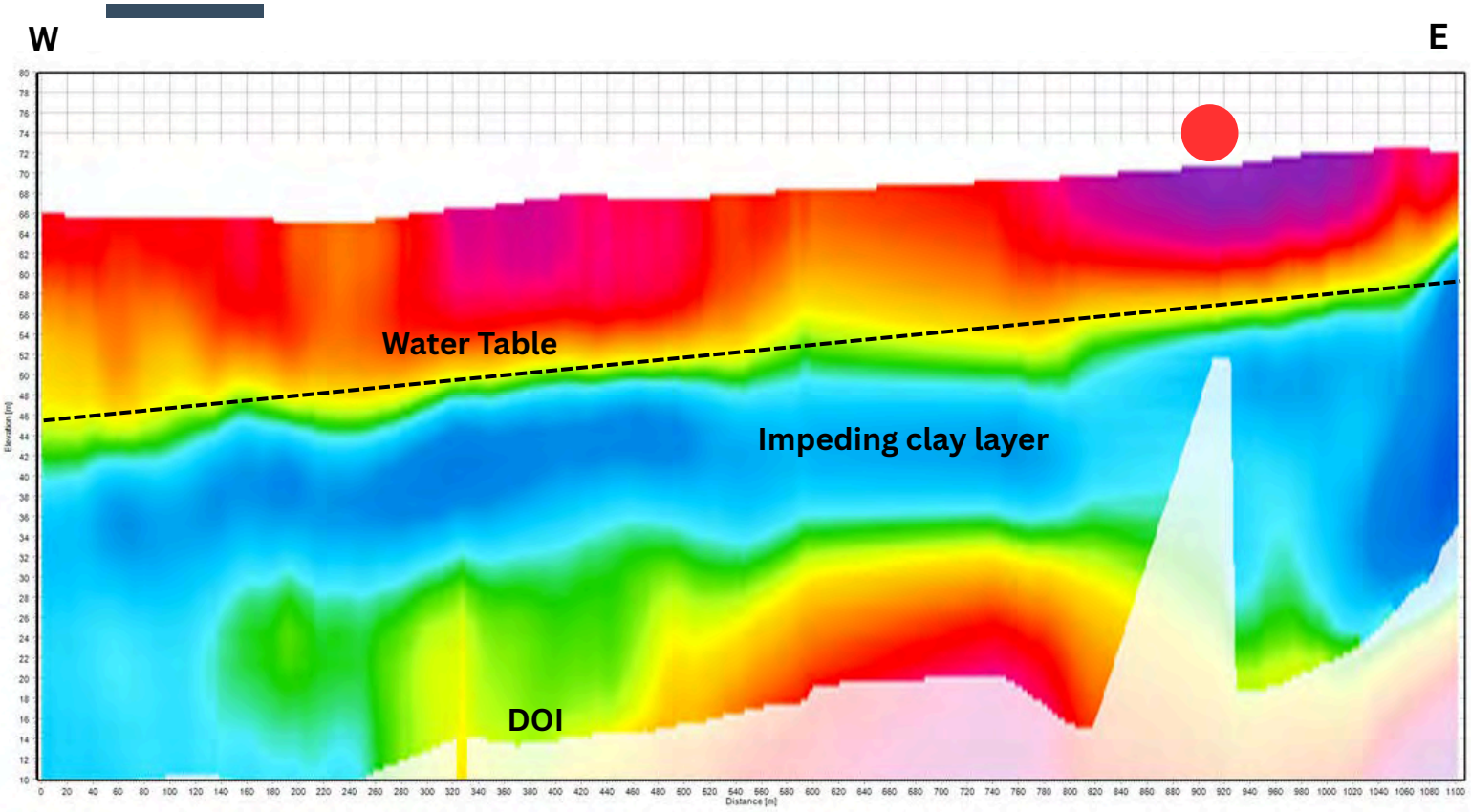
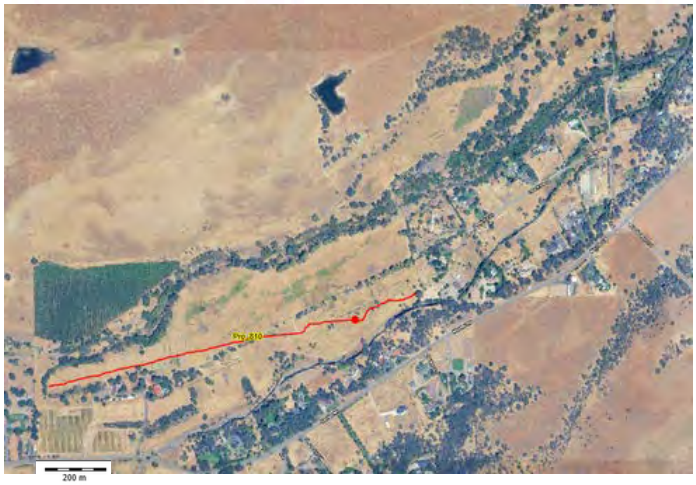
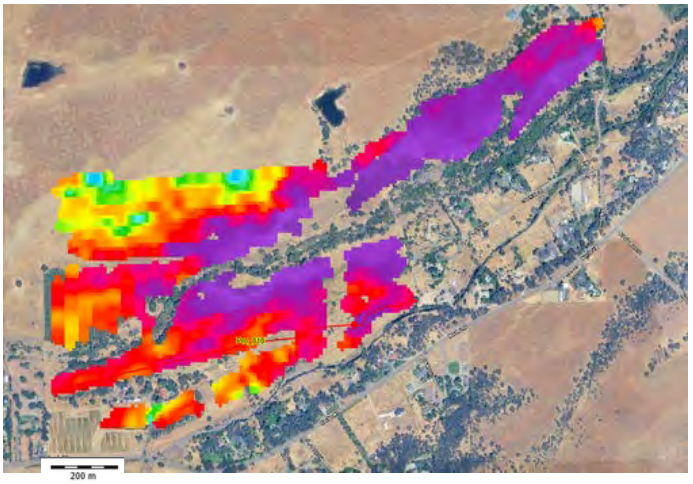


2D CROSS SECTION- PRO_810







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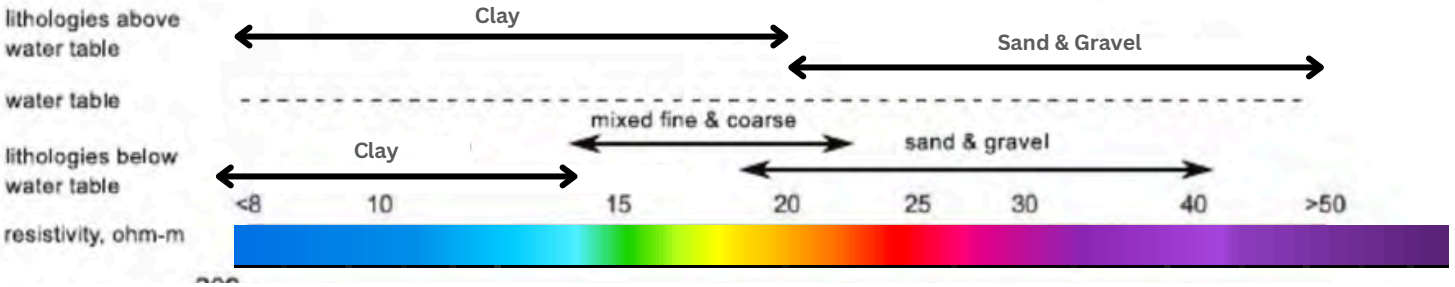

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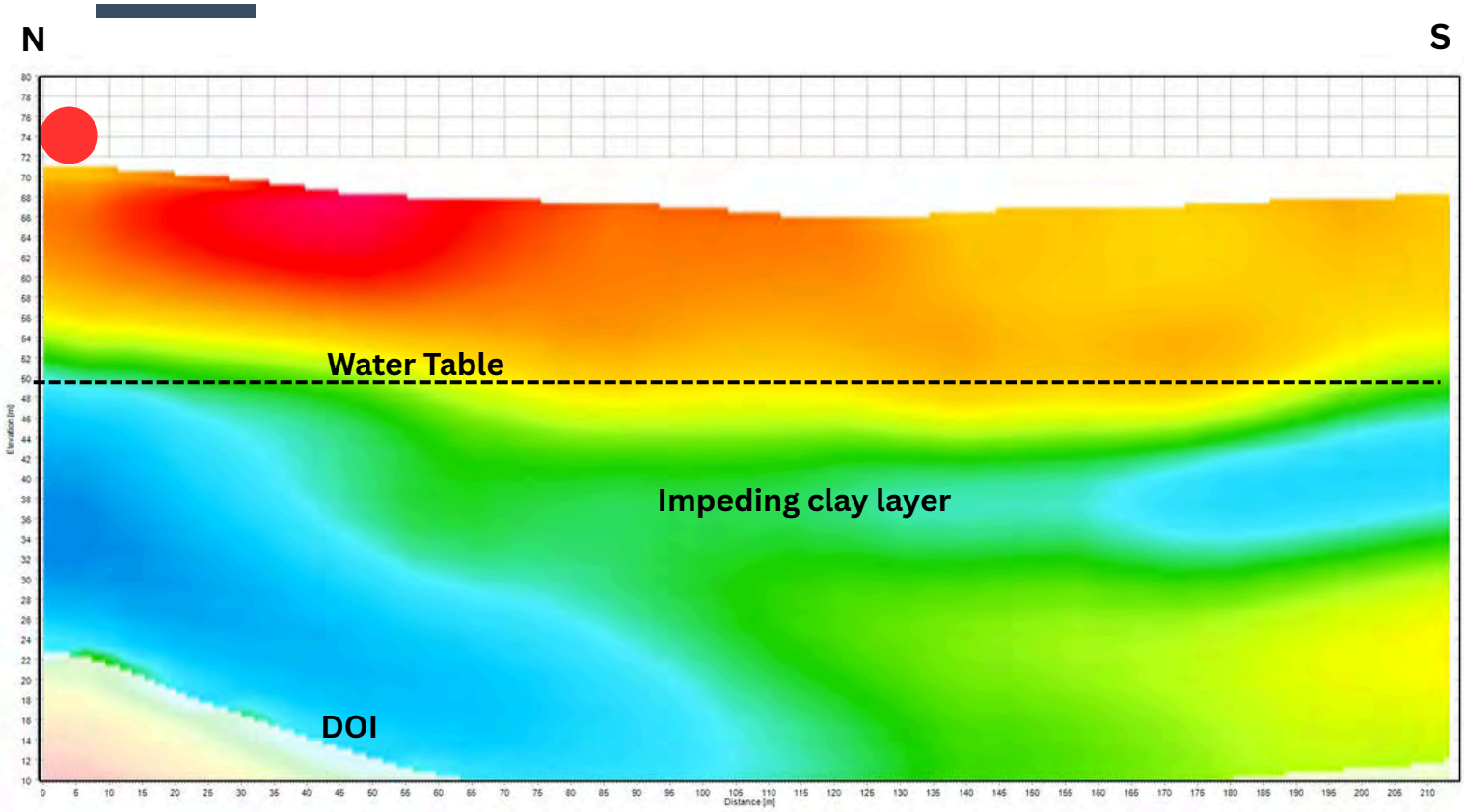

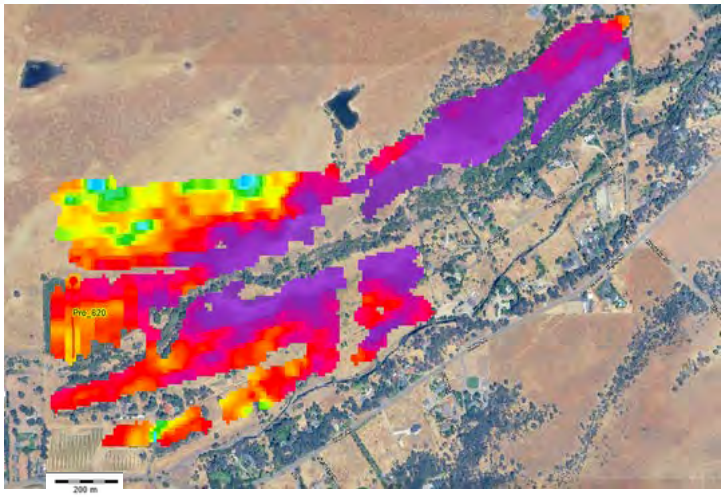

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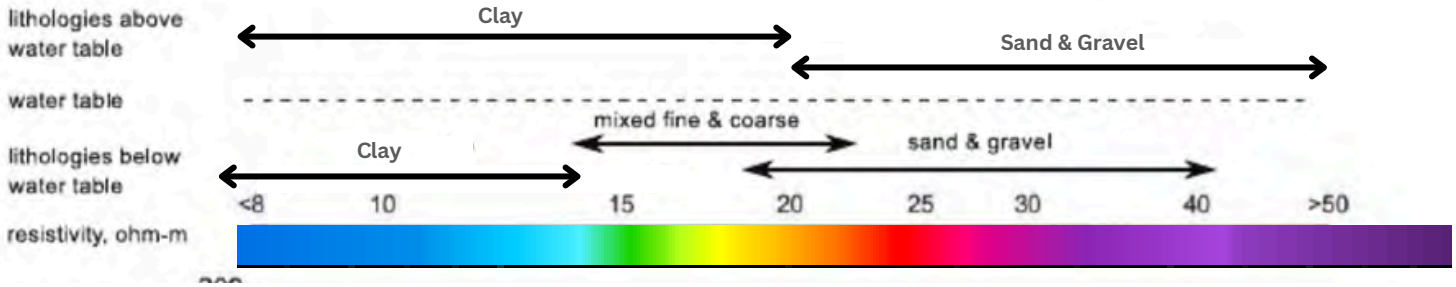

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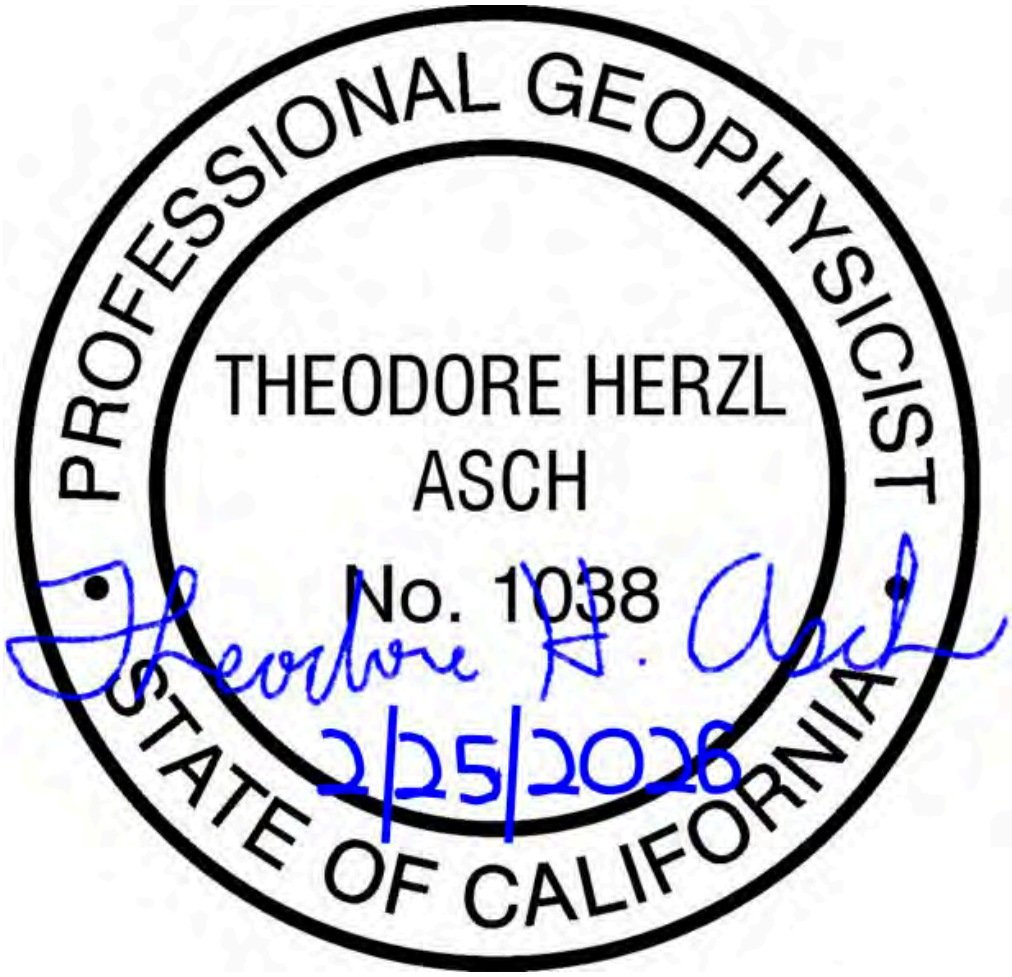
- Walkinshaw, M., O'Geen, A. T., & Beaudette, D. E. (2023, October 1). Soil Properties [Interactive web map]. California Soil Resource Lab, University of California, Davis. https://casoilresource.lawr.ucdavis.edu/gmap/

DELIVERABLES-

- Zip File dropbox link (ttemdatariolo.zip)
  - Riolo tTem Mapping Report.pdf
  - Workbench file folder (riolo)
  - Workbench ttem set up files .gex & .tfi
  - Raw ttem data files .lin & .skb (riolo raw data)
  - Inversion data xyz files (riolo xyz)
  - Inversion data excel file (riolo_SCI.csv)

STATE OF CALIFORNIA PROFESSIONAL GEOPHYSICIST STAMP



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GroundWaterMaps

Groundwater Aquifer Mapping

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(530) 717-0679

Maxwell, CA

nathan@groundwatermaps.com

Site N8

NORD GROUNDWATER MAPPING REPORT

APRIL 1, 2026// PREPARED BY GROUNDWATERMAPS

TTEM SURVEY NORD

REPORT

- **Objective:** To determine the suitability of the Nord project area to surface groundwater recharge.

- **Methods:**
  - DWR Aerial Electromagnetic Survey
  - Soil Agricultural Groundwater Banking Index (SAGBI)
  - NRCS Soil Map
  - California Statewide Groundwater Elevation Monitoring (CASGEM)
  - TTem Towable Electromagnetic Survey
    - Survey Conducted by GroundWaterMaps- Nathan Azevedo
      - Survey Dates- March 27, 2026
      - Survey Location- 4471 Nord Hwy, Chico, CA 95973
- **Results:**
  a. The DWR AEM survey (page 4) that passed near the Nord project area revealed conductive (clay) geology in the near surface that may not be conducive to surface groundwater recharge.
  b. The Soil Agricultural Groundwater Banking Index (SAGBI) (page 7) identifies the project area as to having “very poor” groundwater recharge suitability away from Mud Creek, but “good” groundwater recharge suitability along Mud Creek. The NRCS Soil Map (page 5) identifies the survey area away from Mud Creek as to having geology in the very near surface with ksat values (page 6) not typically conducive to groundwater recharge while ksat values along mud creek are much more consistent with soil types suitable to surface groundwater recharge.
  c. Local California Statewide Groundwater Elevation Monitoring (CASGEM) data reveals depth to groundwater at 23 feet. (page 12)
  d. Unlike the AEM and SAGBI surveys, the tTem survey revealed a shallow resistive gravel/ sand layer away from Mud Creek that may be conducive to surface groundwater recharge though this resistive layer is very shallow and only around 20 feet deep and not pervasive throughout the entire survey area (page 18-20, page 40-42). Mud Creek appears to have a thicker resistive gravel and sand layer (50 feet thick) but this resistive layer appears both capped by a clay layer at the surface and impeded by a clay layer with depth (page 18-39, 43).
- **Conclusion:**
  - The tTem survey revealed a resistive but very shallow gravel and sand layer away from Mud Creek, but this geology was not pervasive across the survey area or with depth and its impact on groundwater recharge would likely be minimal. The tTem survey also revealed a more substantial resistive gravel and sand layer along mud creek, but this geology appears both capped by a clay layer at the surface and impeded by a clay layer with depth and therefore unlikely suitable to surface groundwater recharge.

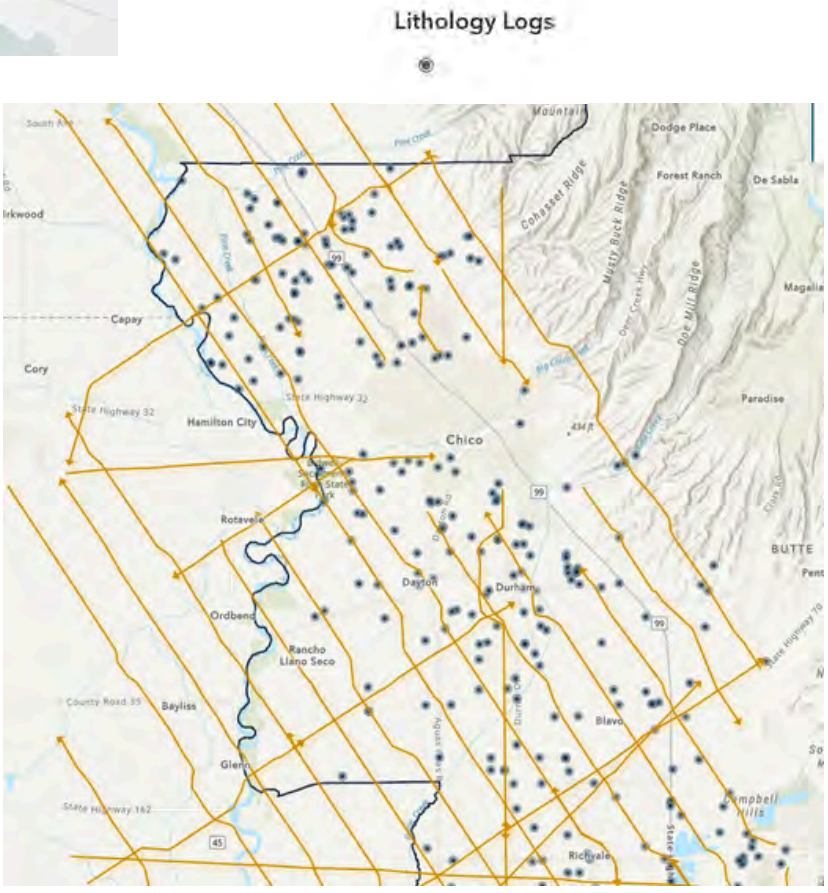
NOTES

- Depth of Investigation (page 10) ranged from 50-70m.
- Due to interference from power lines, data was removed from the project area as seen on (page 11.) Residual values above 1 depict the models decreased confidence in the data, and were removed.
- Depth to groundwater (water table) per (CASGEM) (page 12) is 23 feet.
- This report was reviewed and stamped by Professional Geophysicist Ted Asch, Ph.D., P.Gp. Aqua Geo Frameworks, LLC on April 14, 2026. (Page 46)

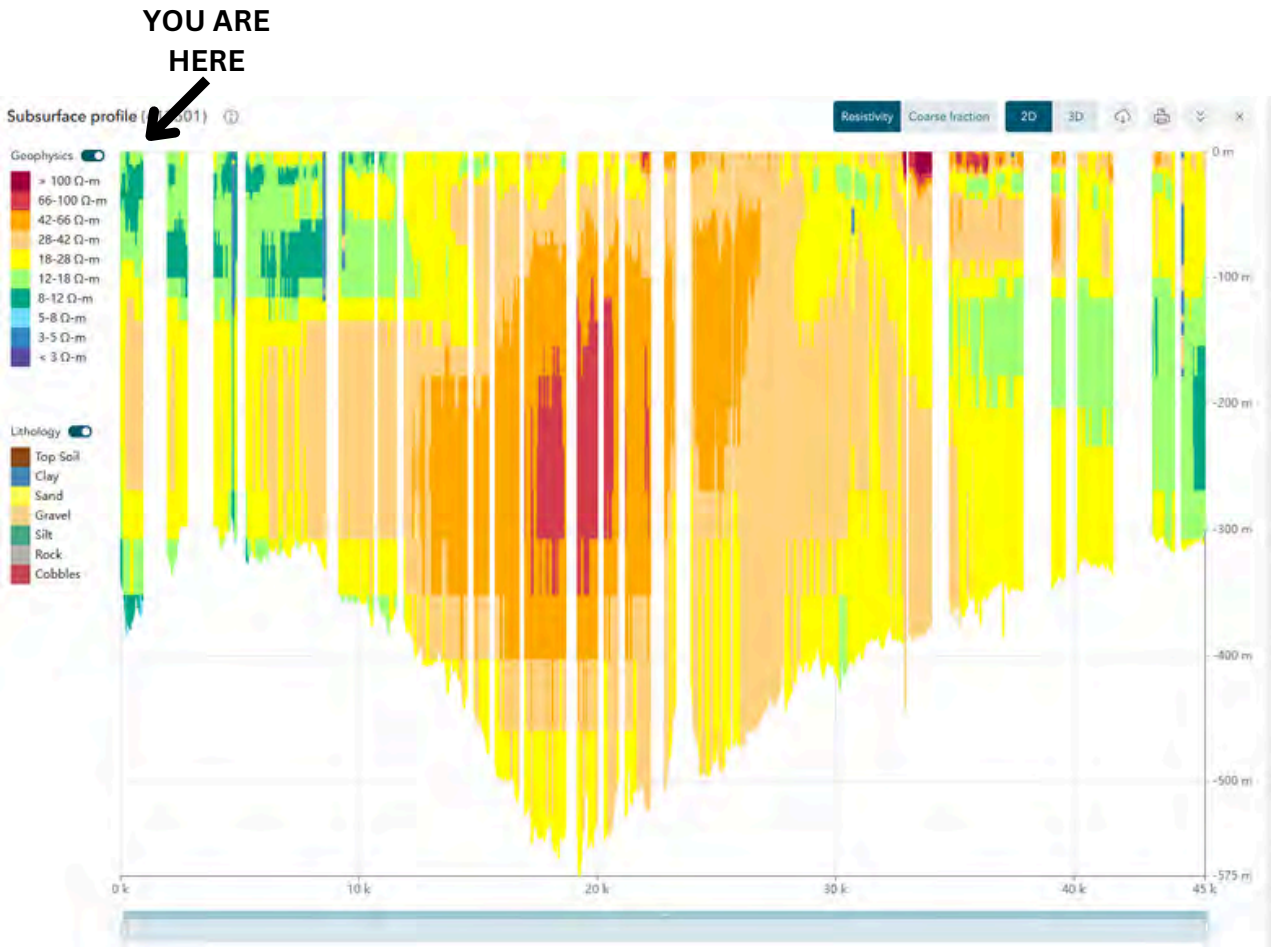
DWR AEM HELICOPTER REPORT

- A HELICOPTER TOWS EQUIPMENT THAT SENDS A MAGNETIC FIELD INTO THE GROUND WHICH GETS TRANSFORMED INTO CURRENT THAT THEN GENERATES A MAGNETIC FIELD RESPONSIVE TO THE GROUND THAT IS THEN MEASURED BY A RECEIVER TOWED BY THE HELICOPTER

- ELECTRICAL RESISTIVITY DATA SHOWS THE DISTRIBUTION OF ELECTRICAL RESISTIVITY VALUES WITHIN THE AQUIFER, WHERE ELECTRICAL RESISTIVITY DESCRIBES A MATERIAL'S ABILITY TO RESIST AN ELECTRIC CURRENT. GENERALLY, MATERIALS WITH HIGHER ELECTRICAL RESISTIVITY VALUES CORRESPOND TO COARSE-GRAIN DOMINATED MATERIALS, LIKE SANDS AND GRAVELS. GENERALLY, MATERIALS WITH LOWER ELECTRICAL RESISTIVITY VALUES CORRESPOND TO FINE-GRAIN DOMINATED MATERIALS, LIKE SILTS AND CLAYS, OR MATERIALS SATURATED WITH FLUIDS THAT HAVE A HIGH CONCENTRATION OF TOTAL DISSOLVED SOLIDS, LIKE BRINE OR SEAWATER.

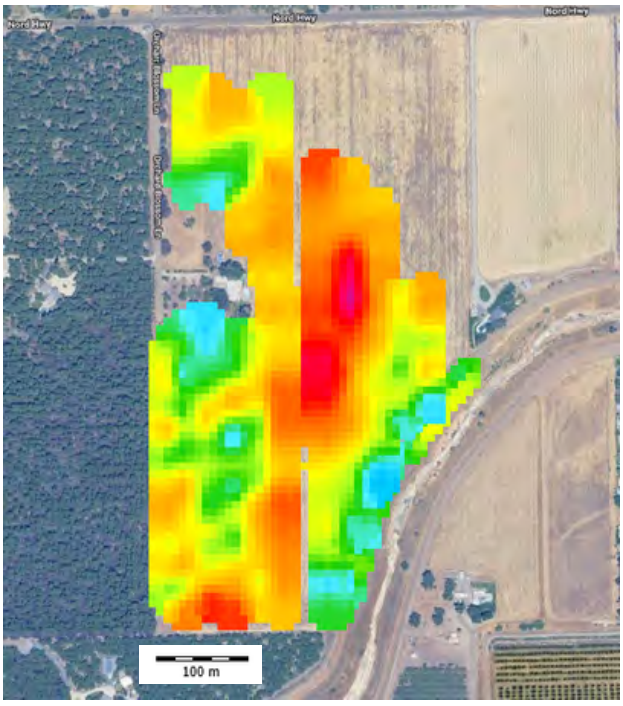


DWR AEM HELICOPTER REPORT

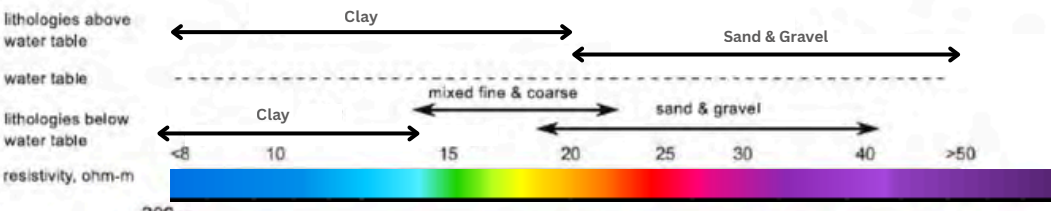


NRCS SOIL MAP/SOIL TYPE

- **SOIL:**
  - **BOSQUEJO- BASIN FLOORS (104)**
  - **XEROFLUVENTS- FLOOD PLAINS (991)**



SURFACE DEPTH SLICE 0-5 FT



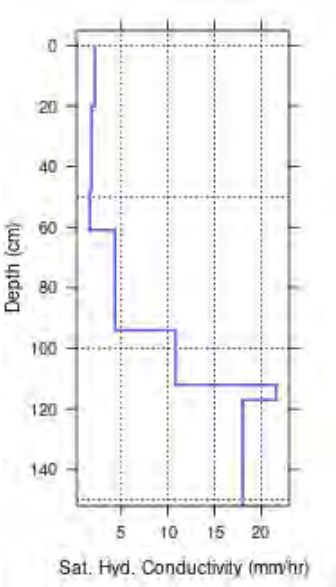
NRCS SATURATED HYDRAULIC CONDUCTIVITY (KSAT) (5 FT DEPTH)

SATURATED HYDRAULIC CONDUCTIVITY (KSAT)

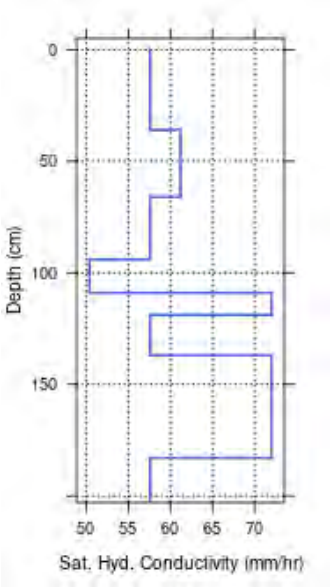
- **"SATURATED HYDRAULIC CONDUCTIVITY" IS THE EASE WITH WHICH PORES OF A SATURATED SOIL TRANSMIT WATER. FORMALLY, IT IS THE PROPORTIONALITY COEFFICIENT THAT EXPRESSES THE RELATIONSHIP OF THE RATE OF WATER MOVEMENT TO HYDRAULIC GRADIENT IN DARCY'S LAW (A LAW THAT DESCRIBES THE RATE OF WATER MOVEMENT THROUGH POROUS MEDIA). IT IS EXPRESSED IN MICROMETERS PER SECOND. TO CONVERT MICROMETERS PER SECOND TO INCHES PER HOUR, MULTIPLY MICROMETERS PER SECOND BY 0.1417. THE HISTORICAL DEFINITION OF "SATURATED HYDRAULIC CONDUCTIVITY" IS THE AMOUNT OF WATER THAT WOULD MOVE VERTICALLY THROUGH A UNIT AREA OF SATURATED SOIL IN UNIT TIME UNDER UNIT HYDRAULIC GRADIENT.**
- **SATURATED HYDRAULIC CONDUCTIVITY IS USED IN SOIL INTERPRETATIONS. IT IS ALSO KNOWN AS KSAT.**

SOILS:

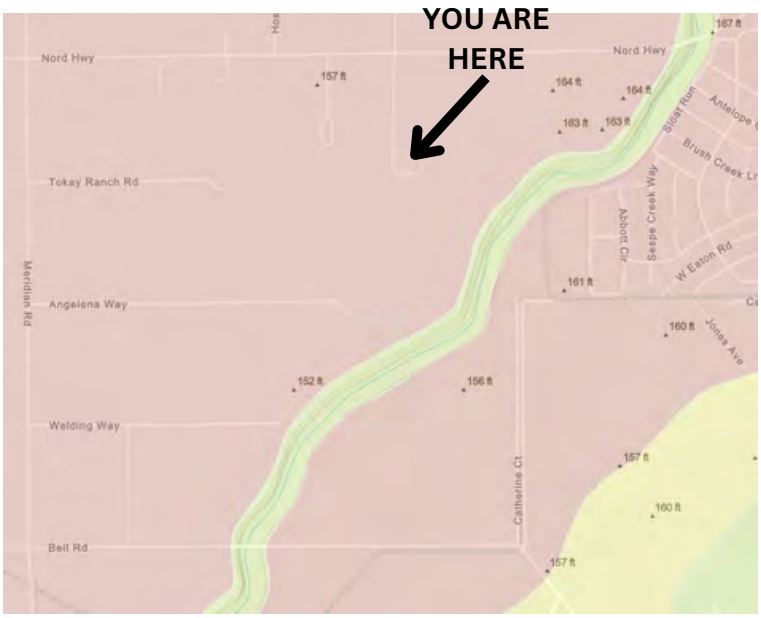
- **BOSQUEJO- BASIN FLOORS (104)**

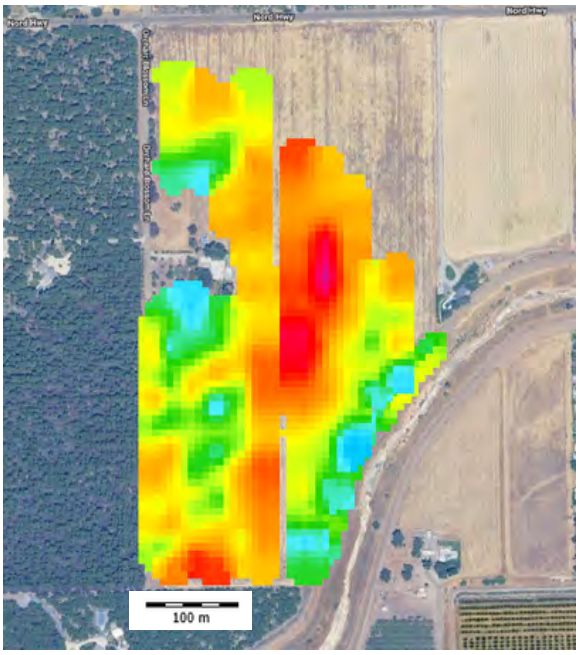


- **XEROFLUVENTS- FLOOD PLAINS (991)**

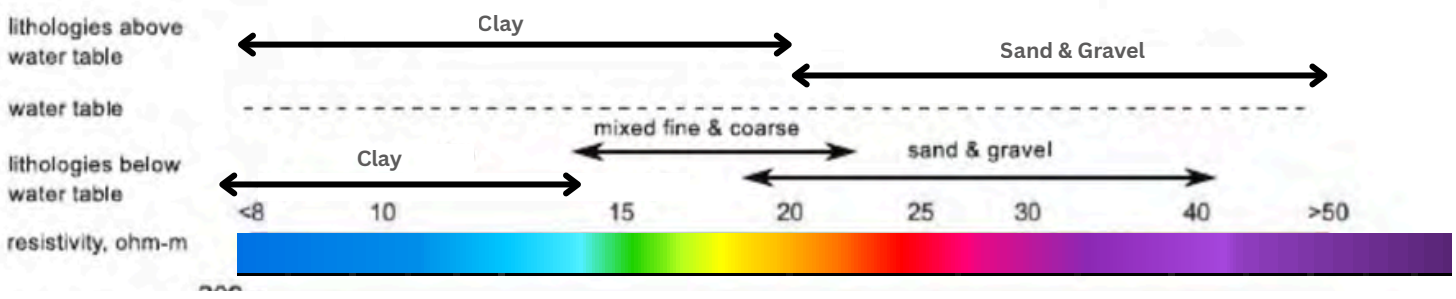


GROUNDWATER RECHARGE SUITABILITY INDEX





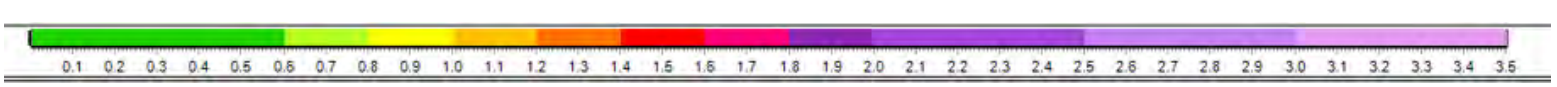
SURFACE DEPTH SLICE 0-5 FT



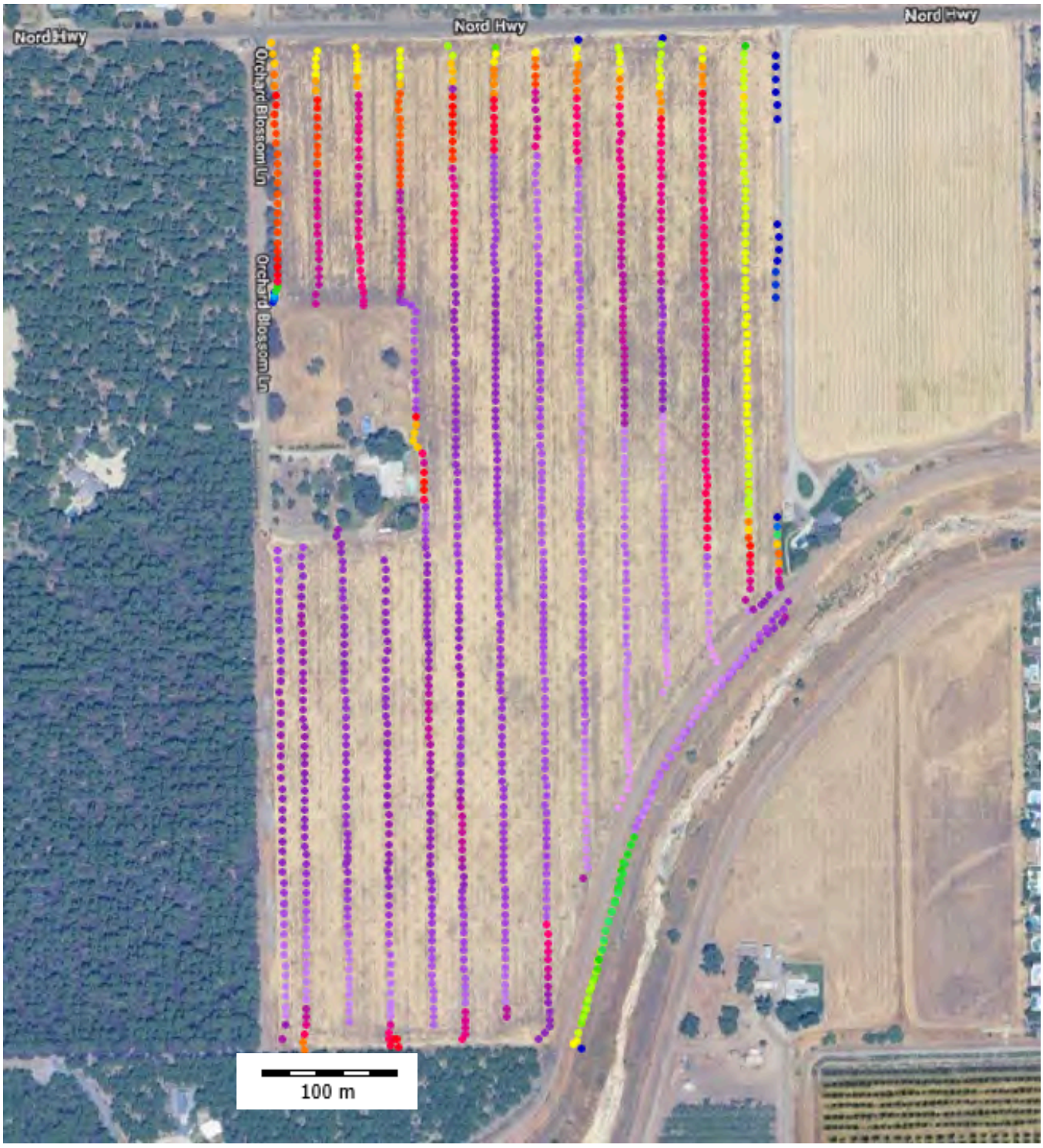
TTEM TRAVERSE LINES

TRANSECT DISTANCE: DISTANCE BETWEEN TRANSECTS WAS 30M

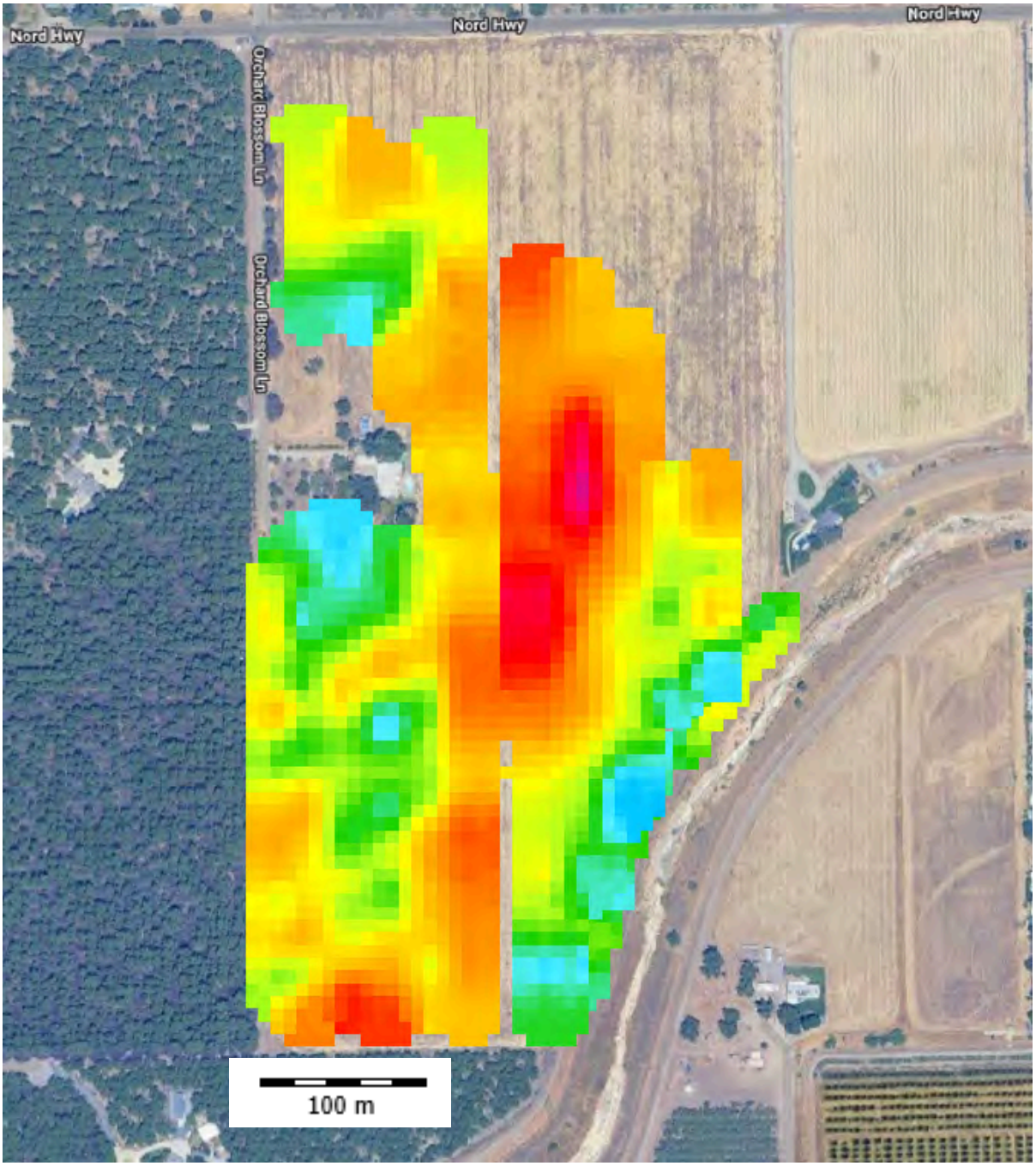
DATA RESIDUAL



DEPTH OF INVESTIGATION-

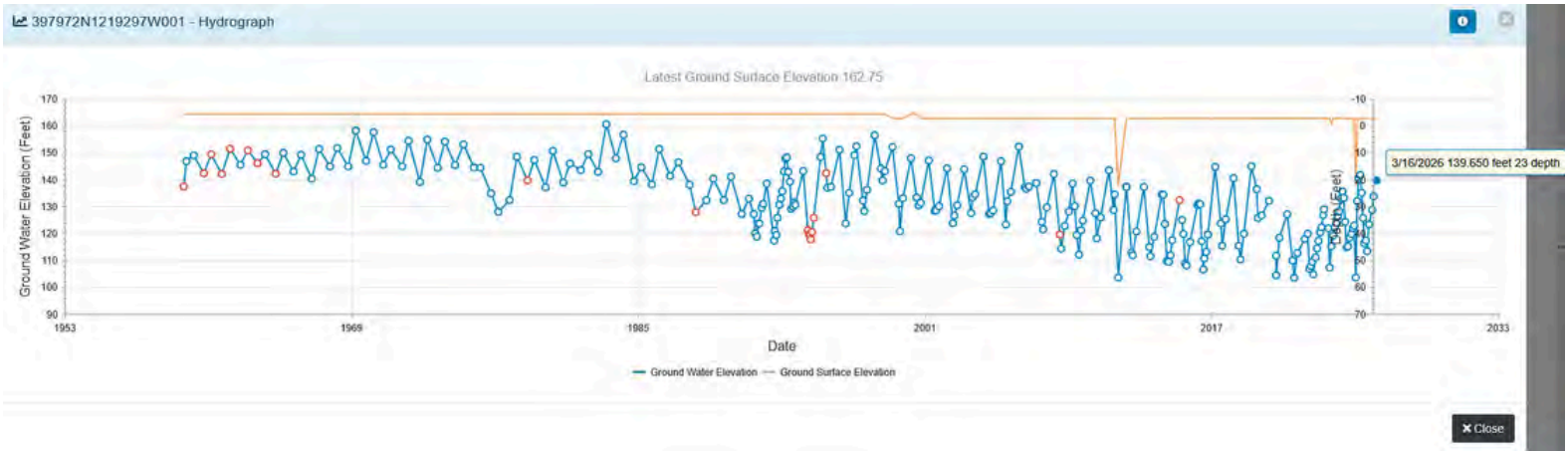


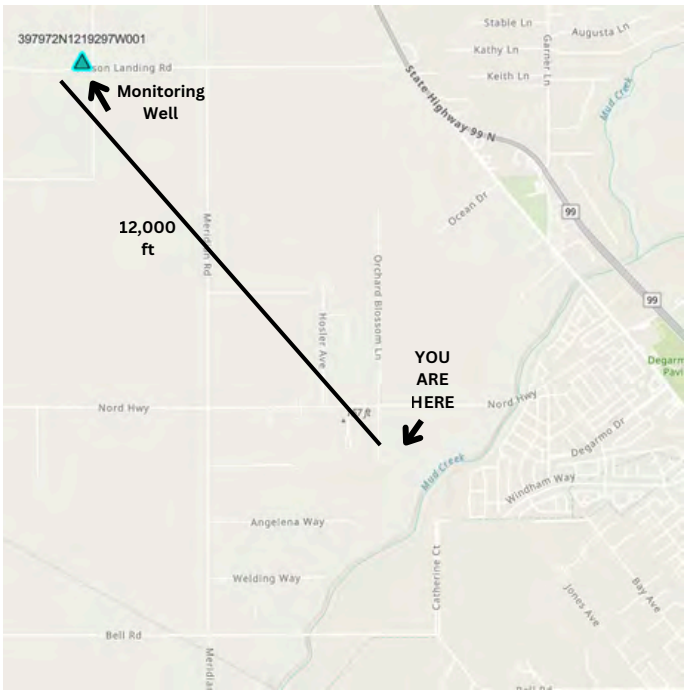
DATA REMOVED

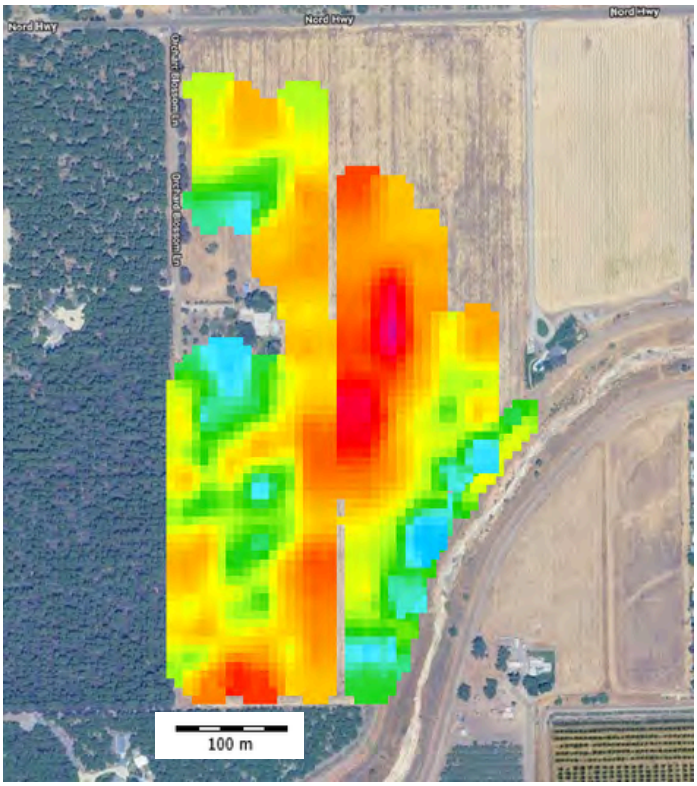


DATA REMOVED IN RELATION TO PAGE 8,9,10

CALIFORNIA STATEWIDE GROUNDWATER ELEVATION MONITORING (CASGEM)- LOCAL MONITORING WELL







LEGEND

Legend:
Above Water Table

- Blue- Clay
- Green- Clay
- Yellow- Sandy Clay
- Orange- Sand
- Red- Coarse Sand
- Purple- Gravel

Legend:
Below Water Table

- Blue- Clay
- Green- Sandy clay
- Yellow- Sand
- Orange- Coarse Sand
- Red- Gravel
- Purple- Coarse Gravel

- Black- Likely Bad data/Noise

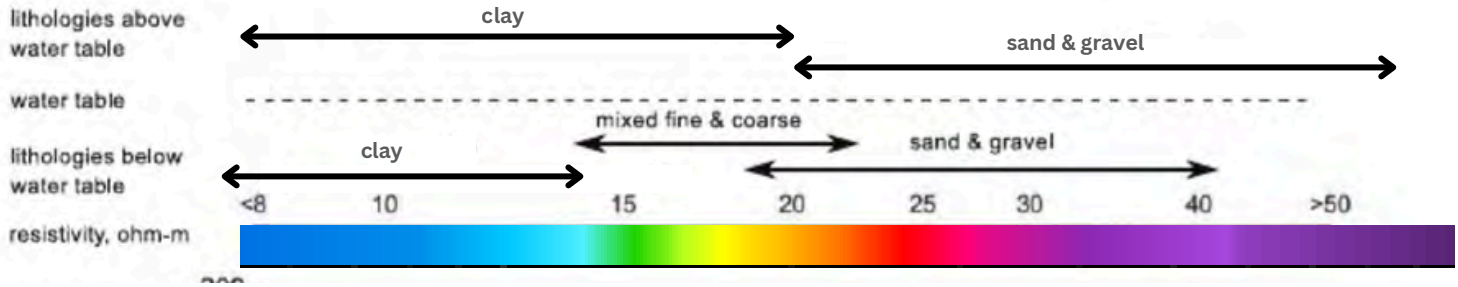


Table 2
Range of Resistivity Values Determined for the Lithologic Units Using Method 2 and from the Histogram of All Resistivity Values in the Resistivity Model

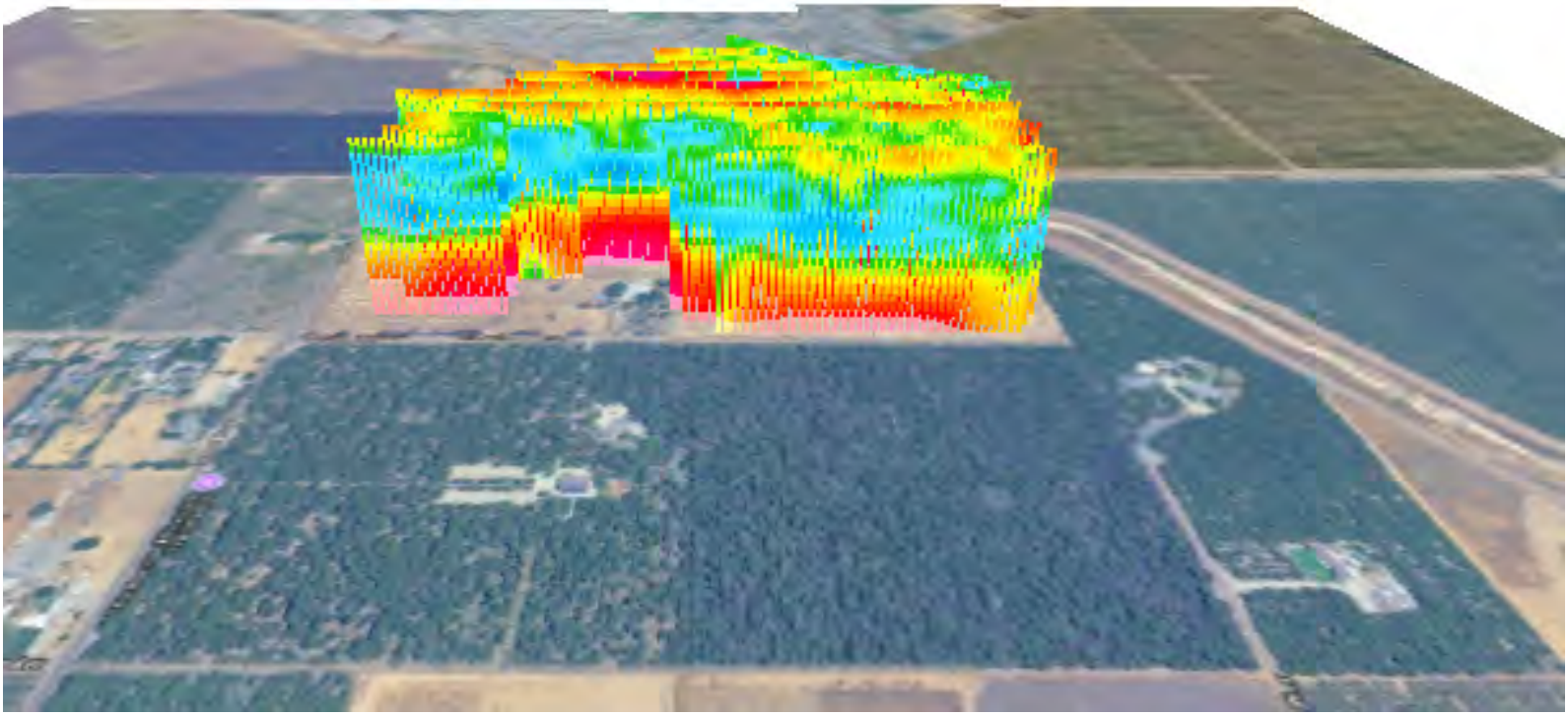
Resistivity Range (Ω m)		Interpreted Lithology
Above the water table		
8	20	Clay
21	150	Sand and gravel
Below the water table		
6	14	Clay
12	22	Mixed fine and coarse
17	43	Sand and gravel

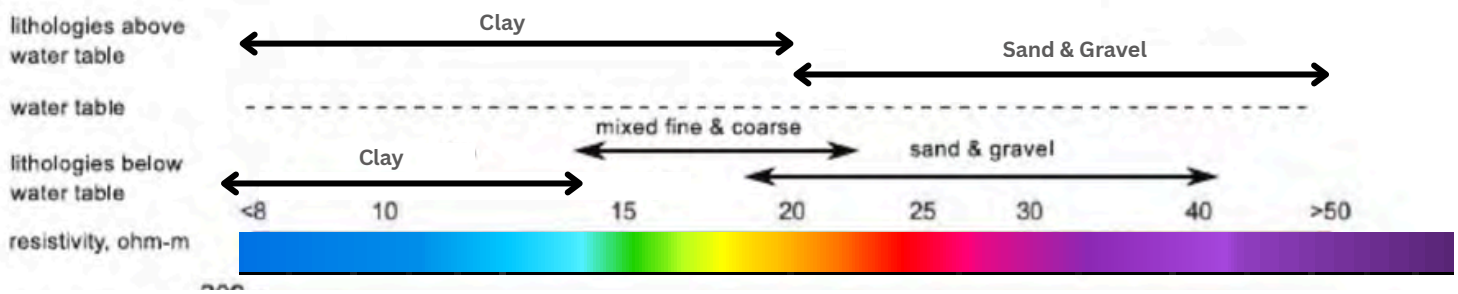
KNIGHT, R., SMITH, R., ASCH, T., ABRAHAM, J., CANNIA, J., VIEZZOLI, A., & FOGG, G. (2018). MAPPING AQUIFER SYSTEMS WITH AIRBORNE ELECTROMAGNETICS IN THE CENTRAL VALLEY OF CALIFORNIA. GROUND WATER, 56(6), 893–908. HTTPS://DOI.ORG/10.1111/GWAT.12656

3D VIEW- WEST TO EAST

NORTH **SOUTH**

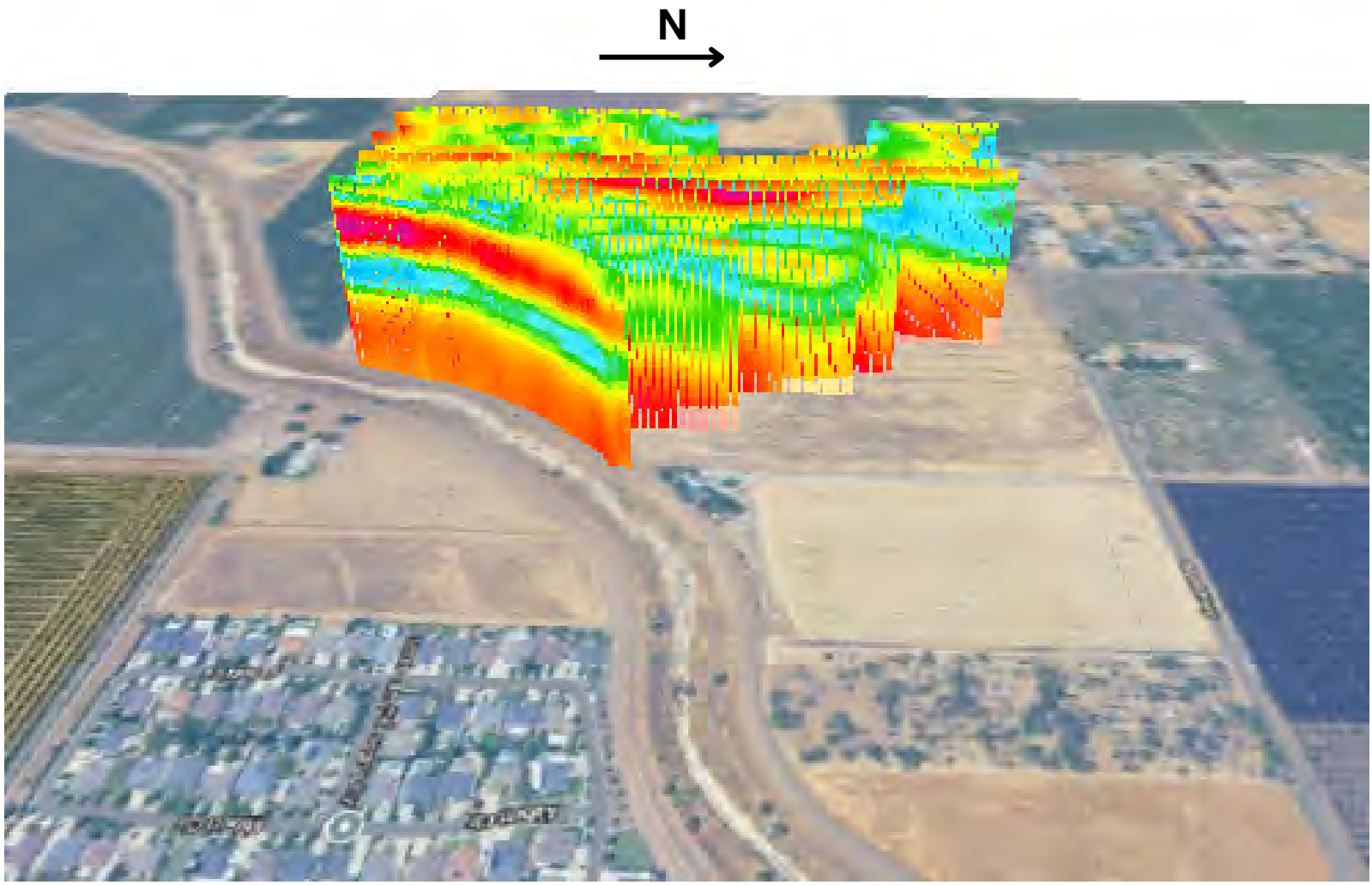
N

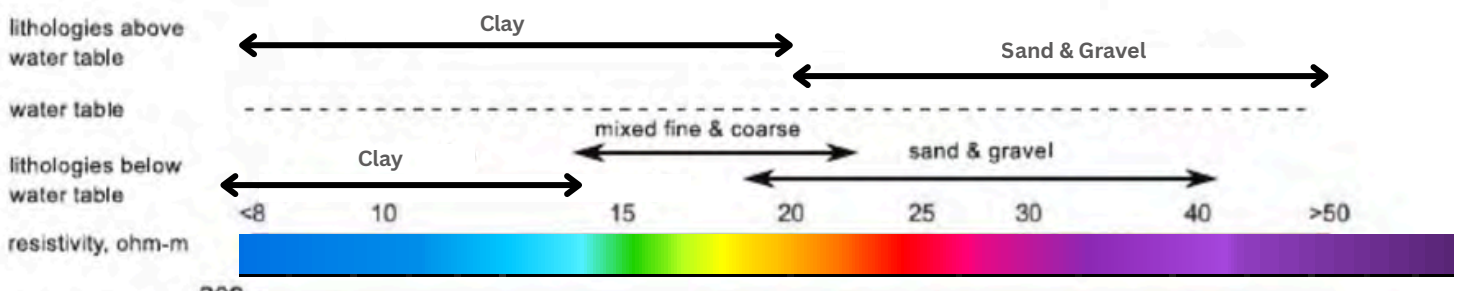




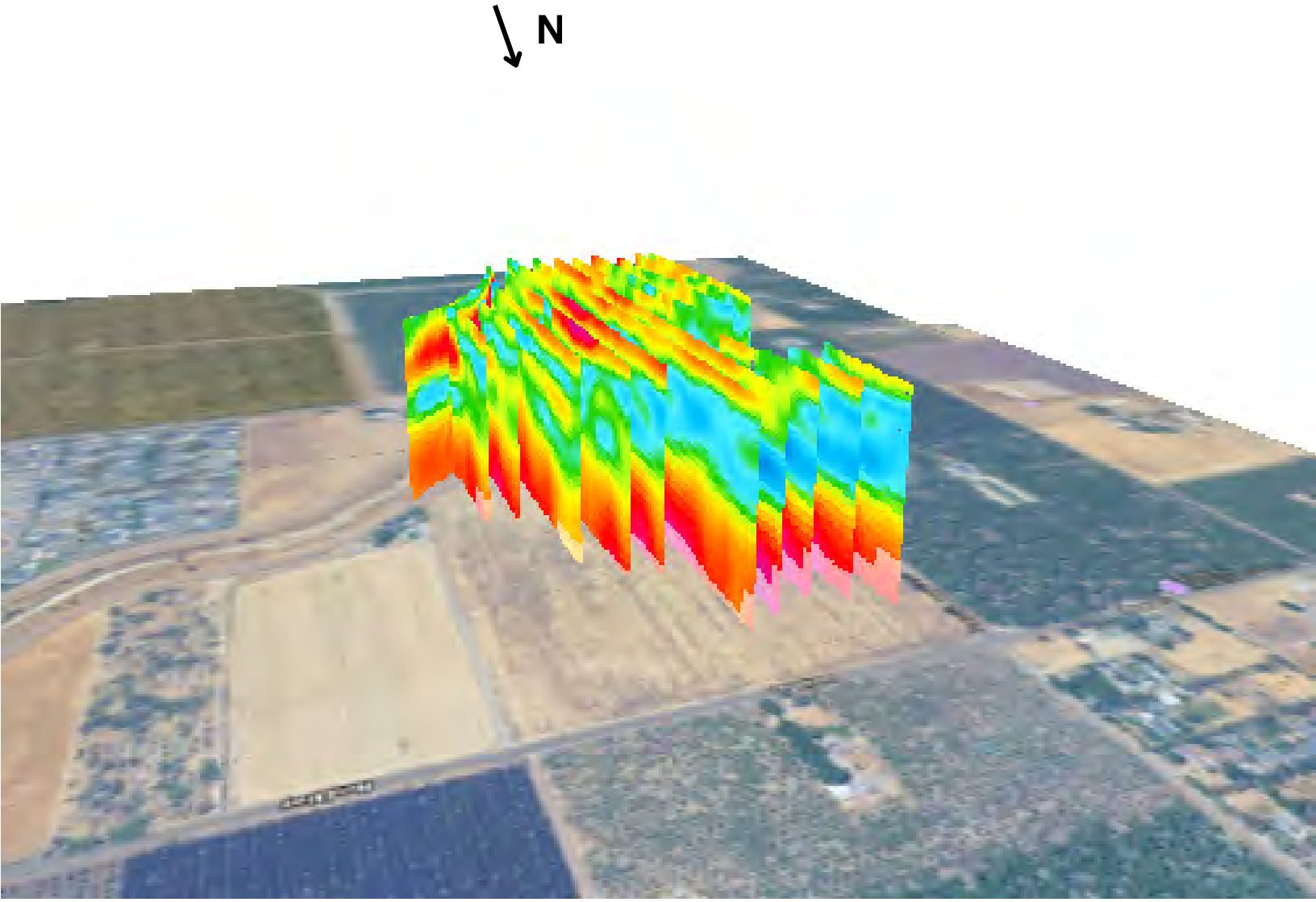
3D VIEW- EAST TO WEST

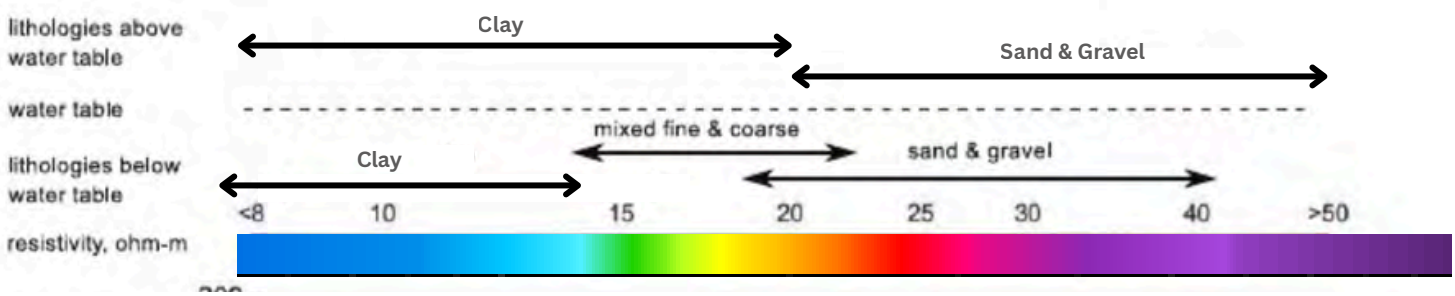
SOUTH **NORTH**



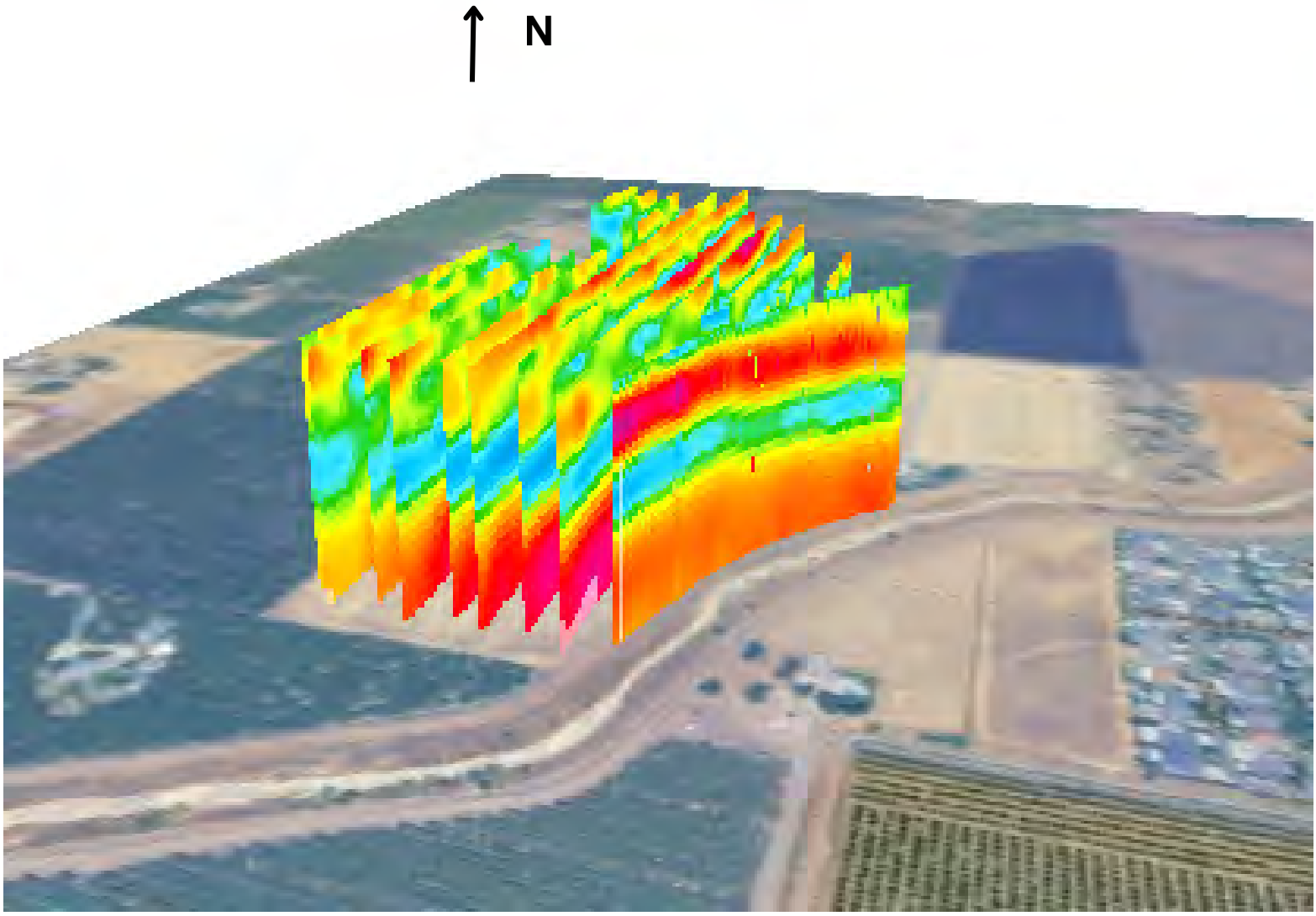


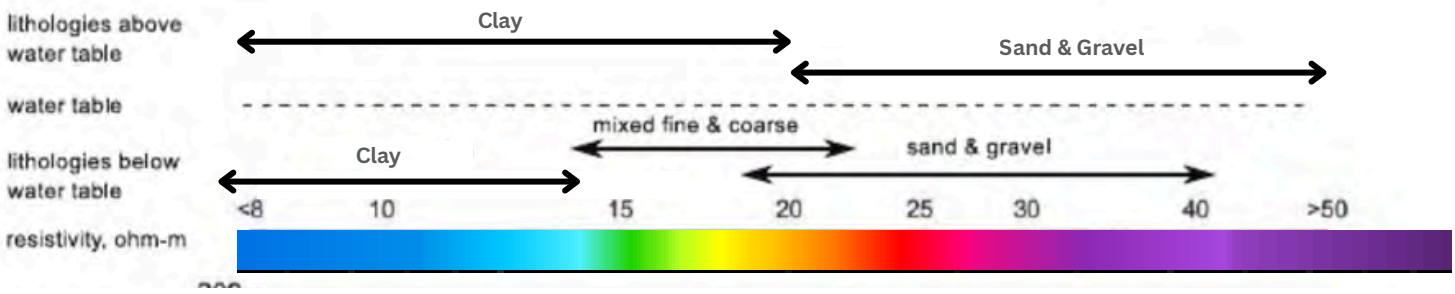
3D VIEW- NORTH TO SOUTH



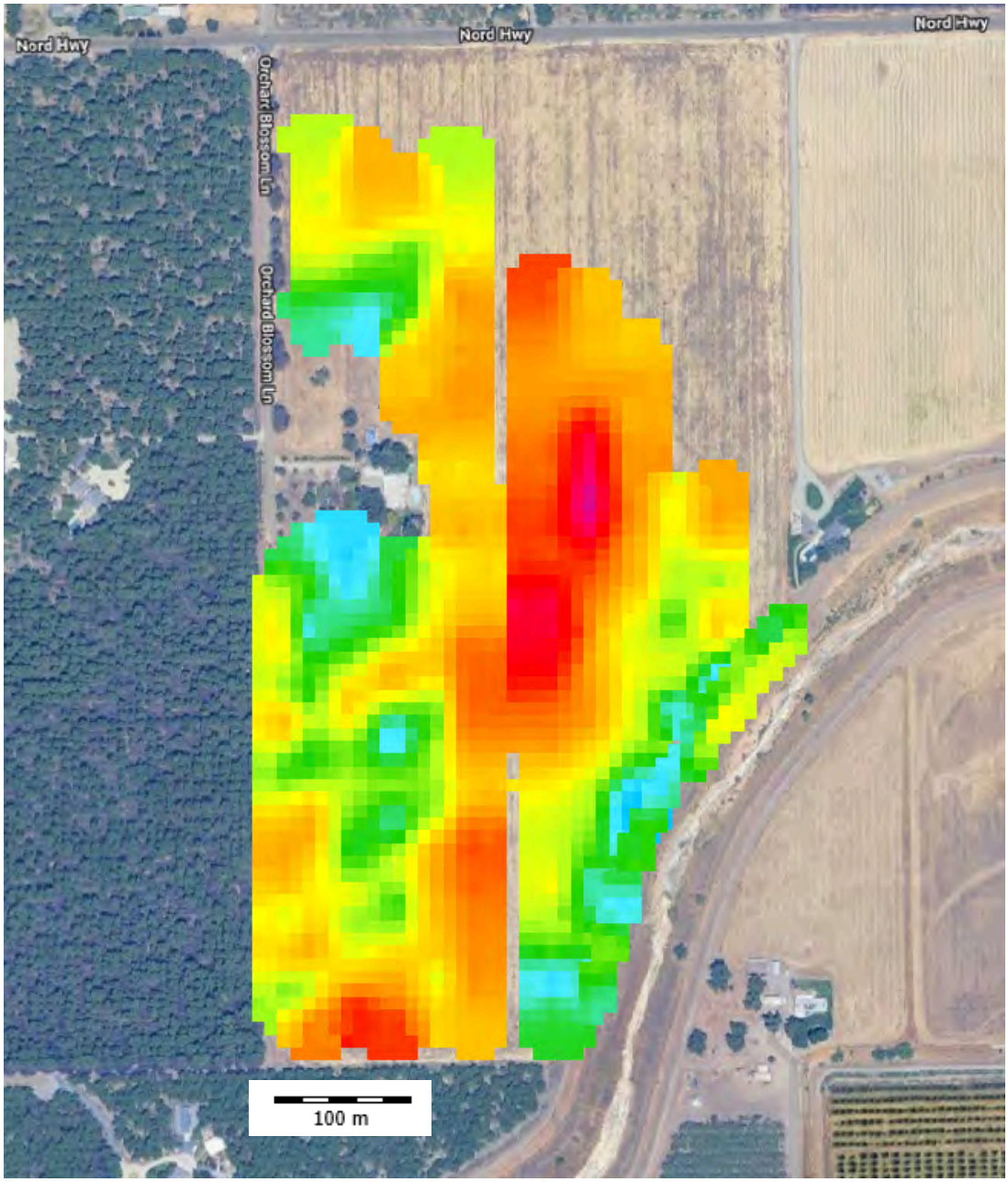


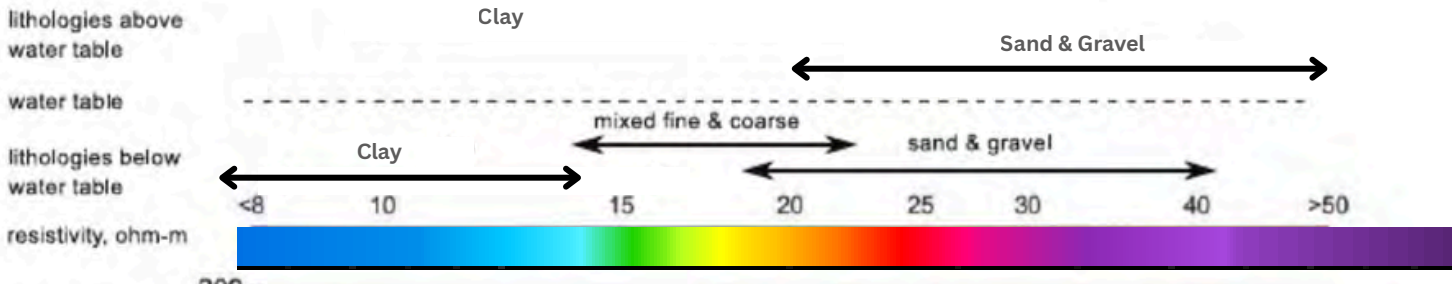
3D VIEW- SOUTH TO NORTH



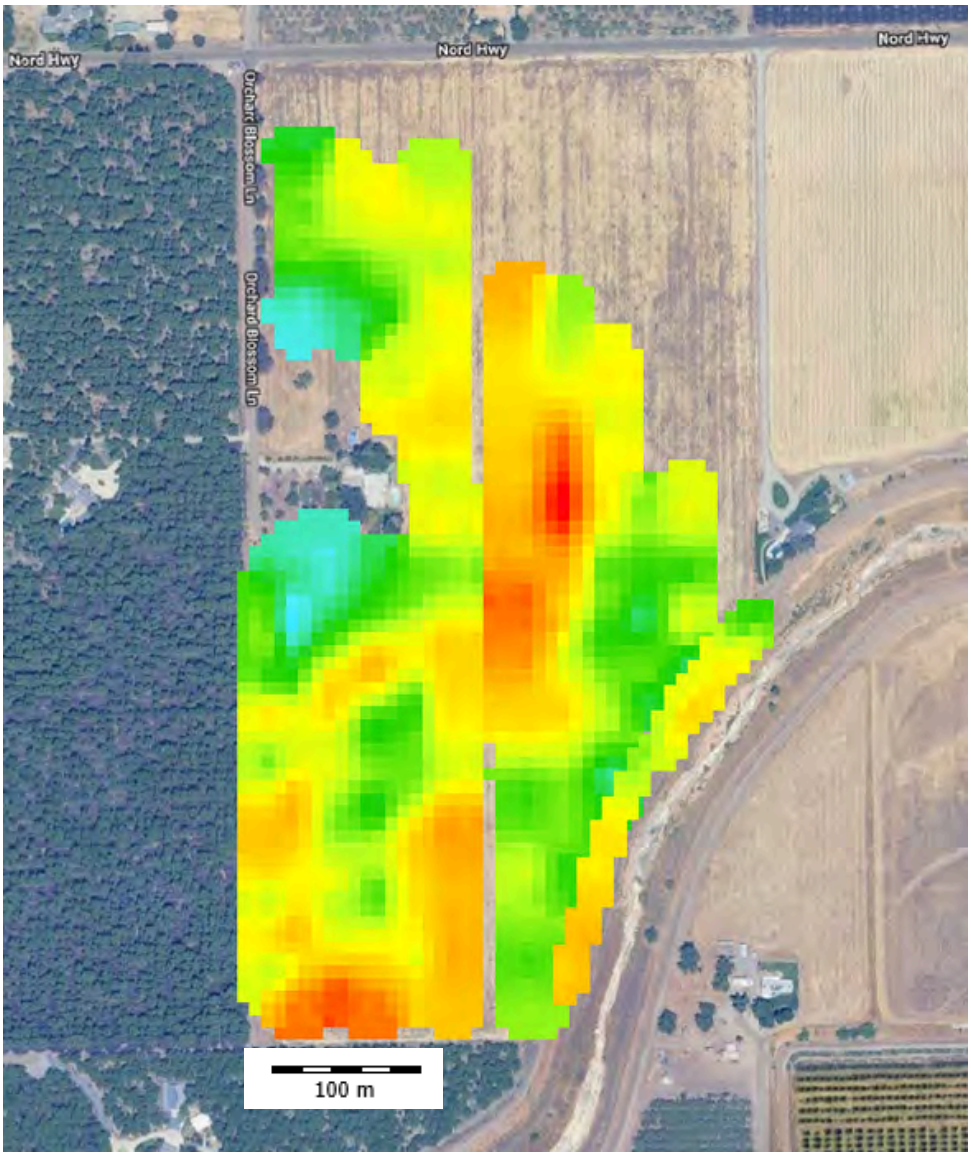


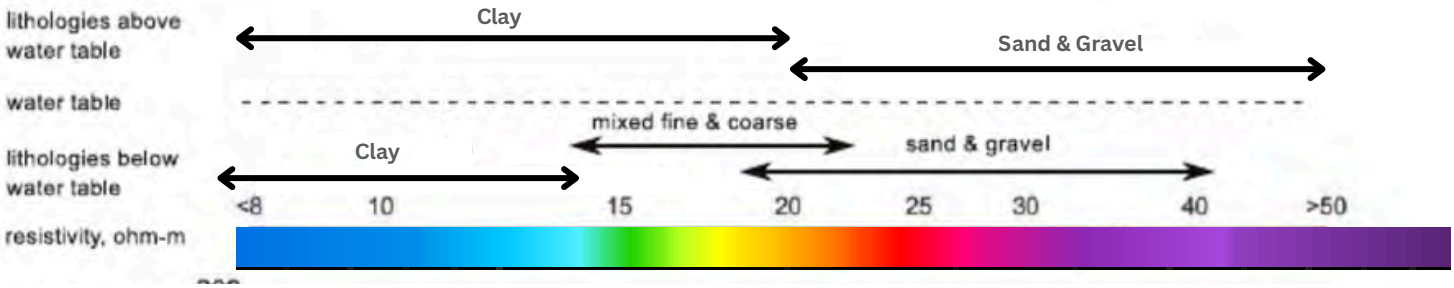
DEPTH SLICES- SURFACE 0-5 FT



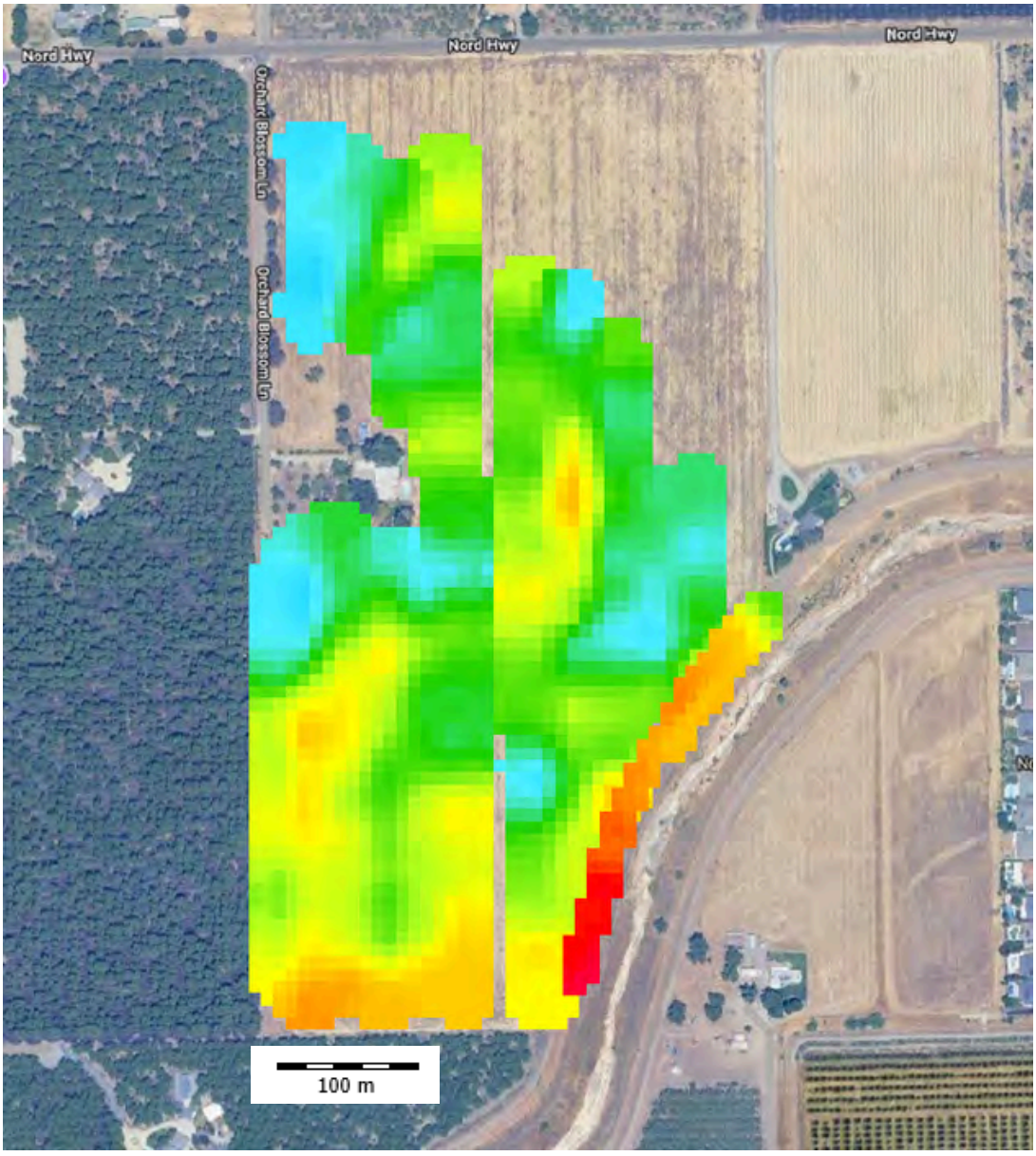


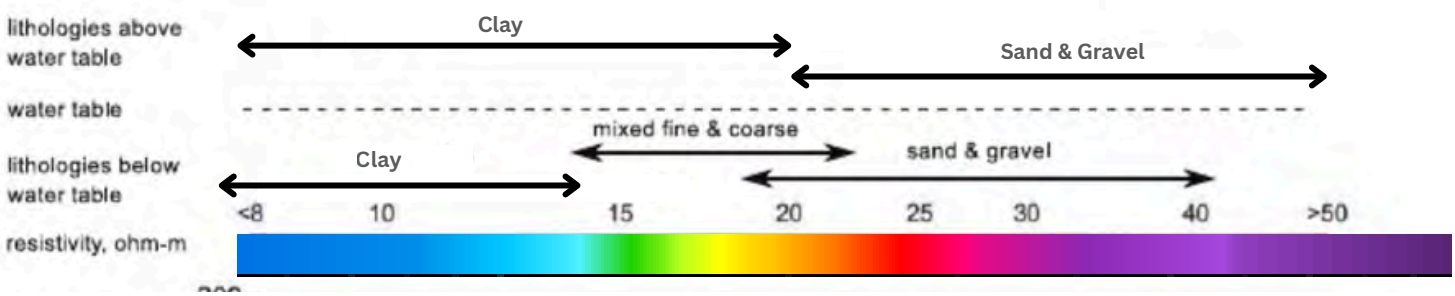
DEPTH SLICES- 10 FT



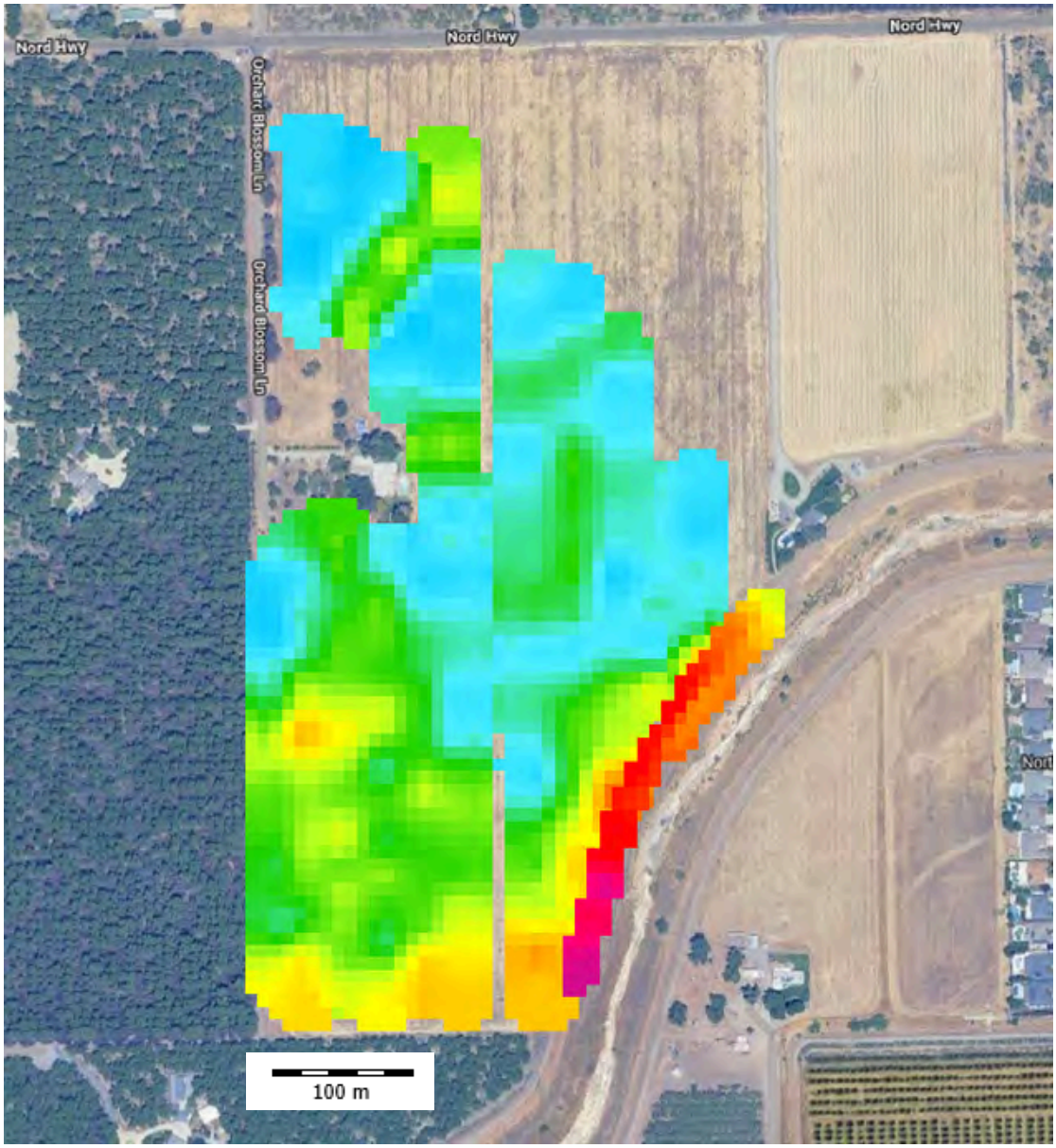


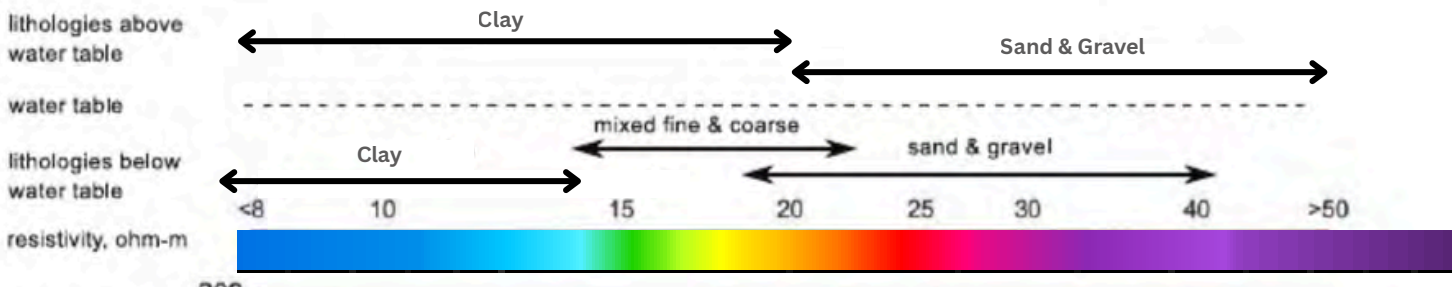
DEPTH SLICES- 20 FT (WATER TABLE)



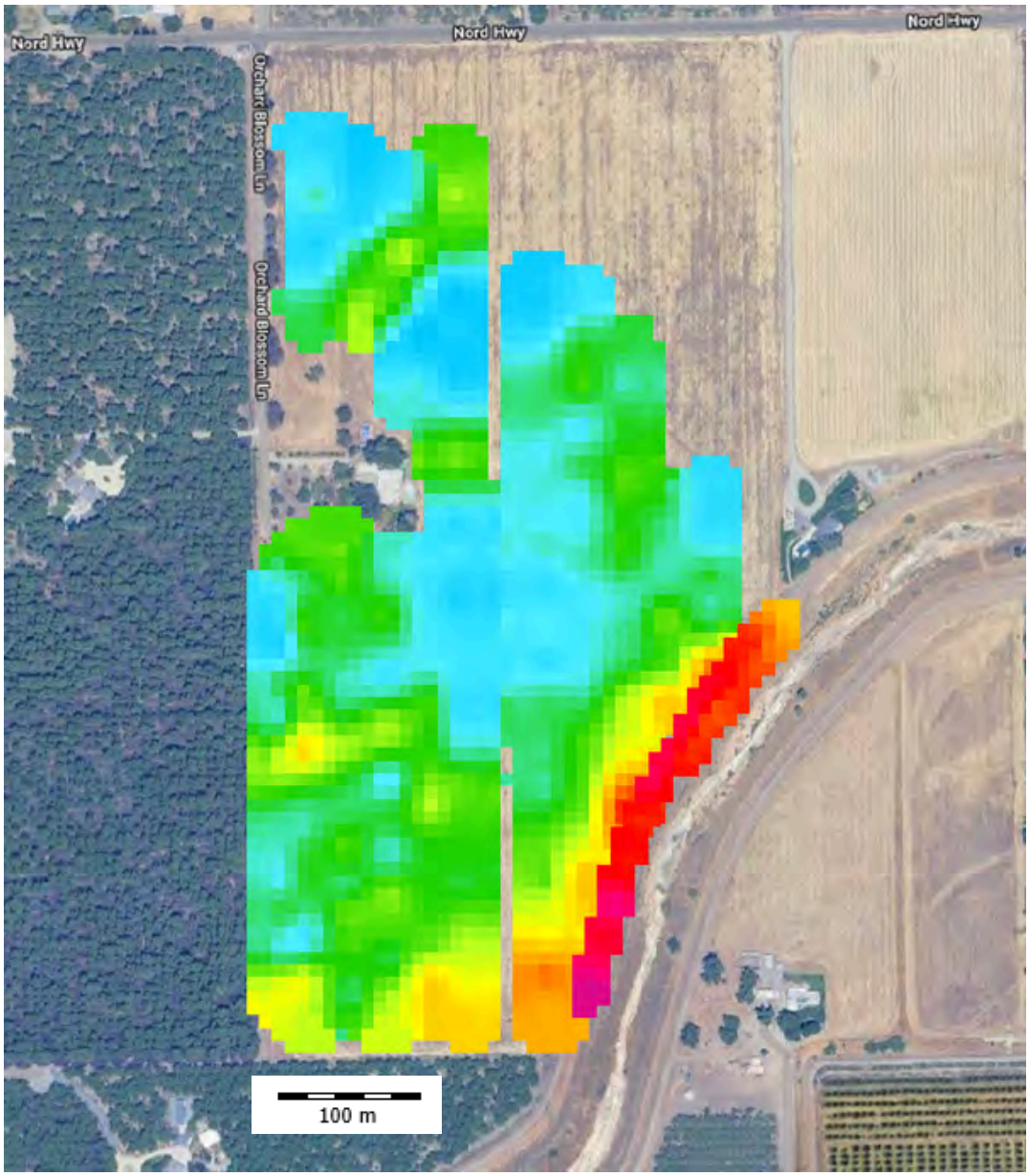


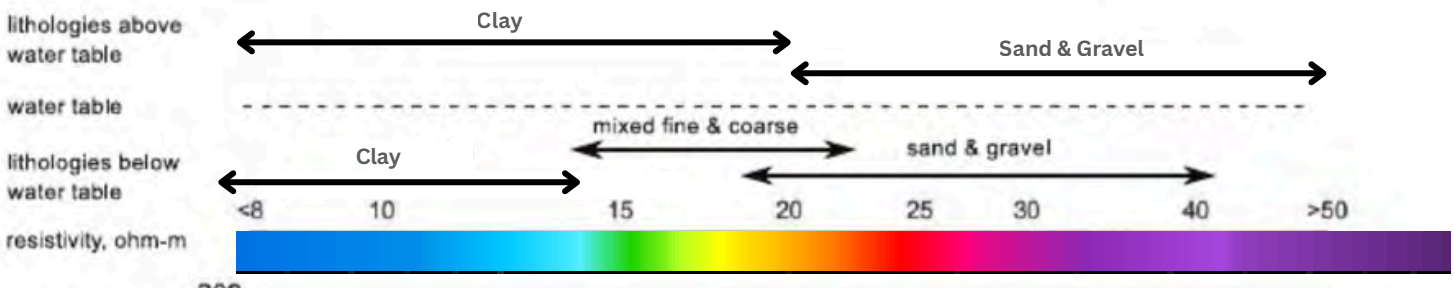
DEPTH SLICES- 30 FT



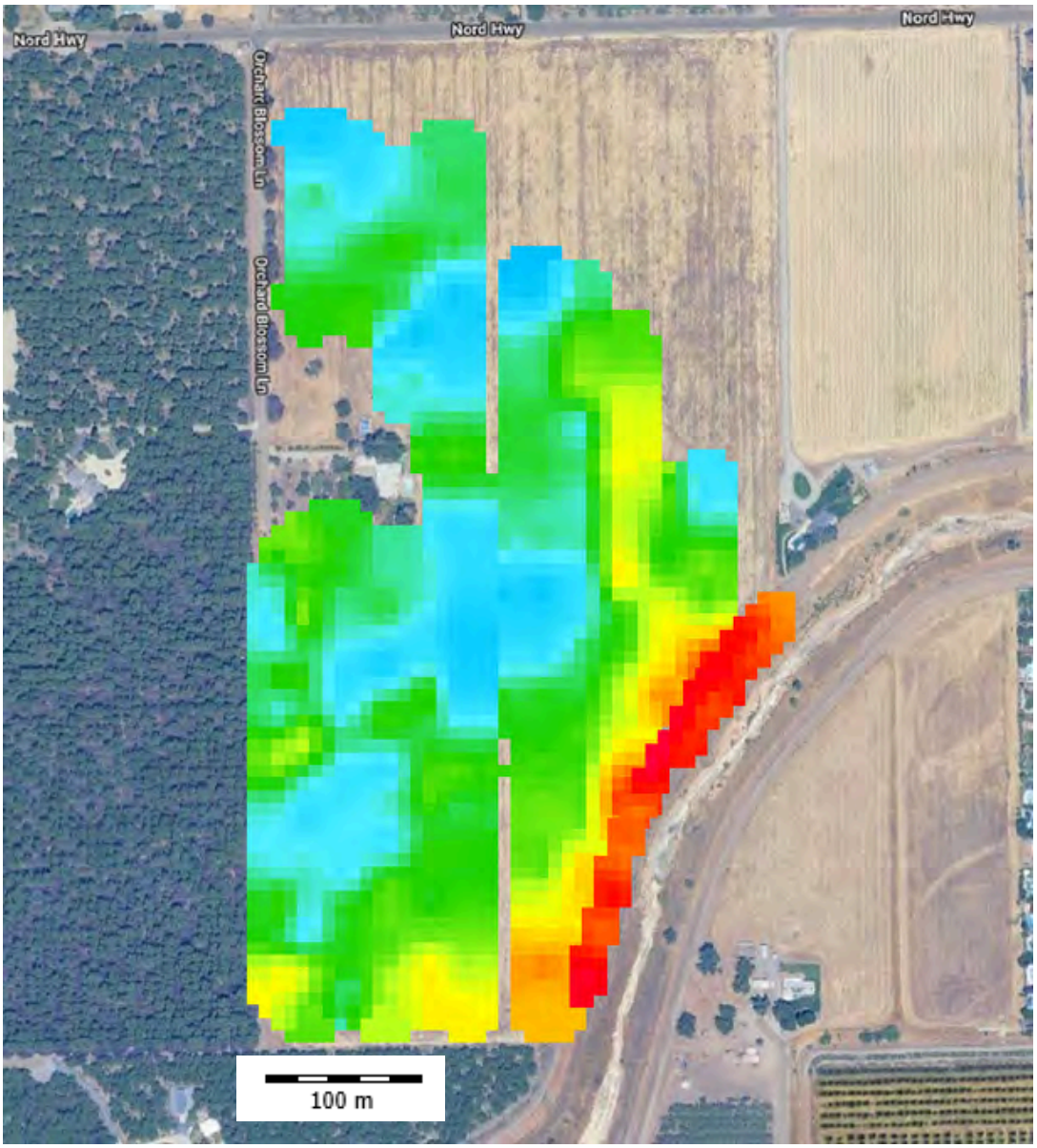


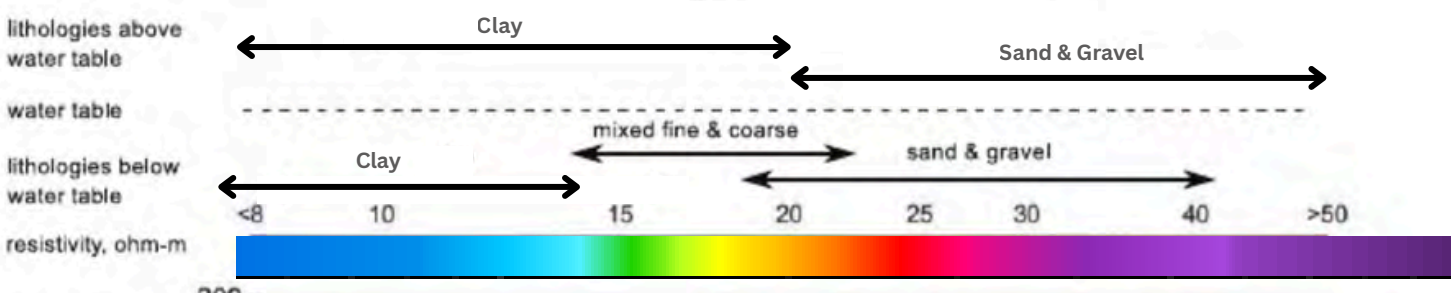
DEPTH SLICES- 40 FT



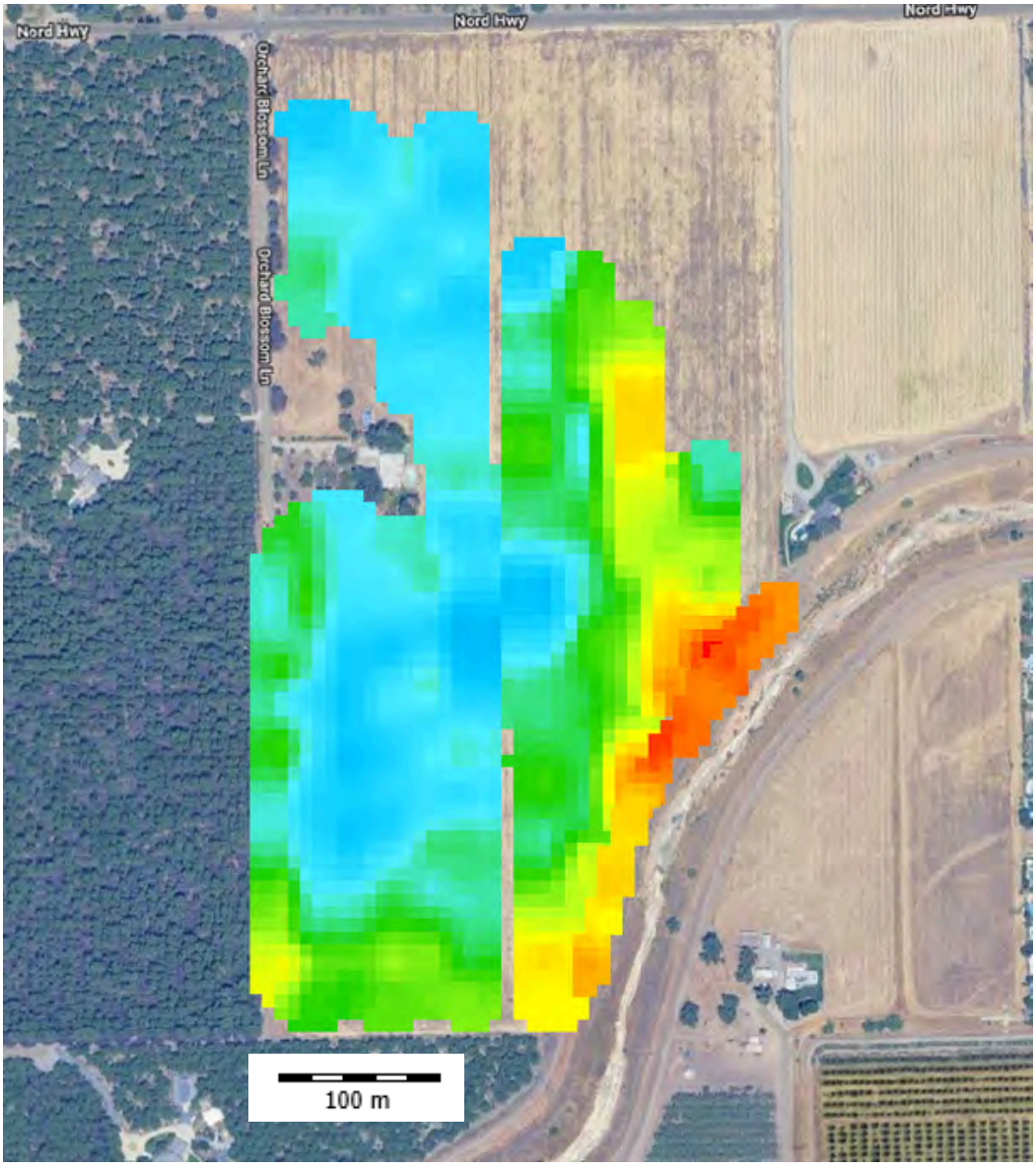


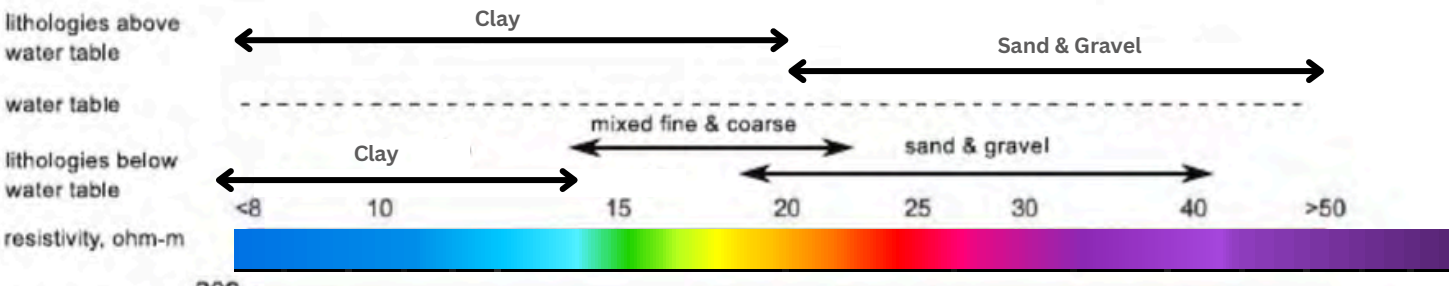
DEPTH SLICES- 50 FT



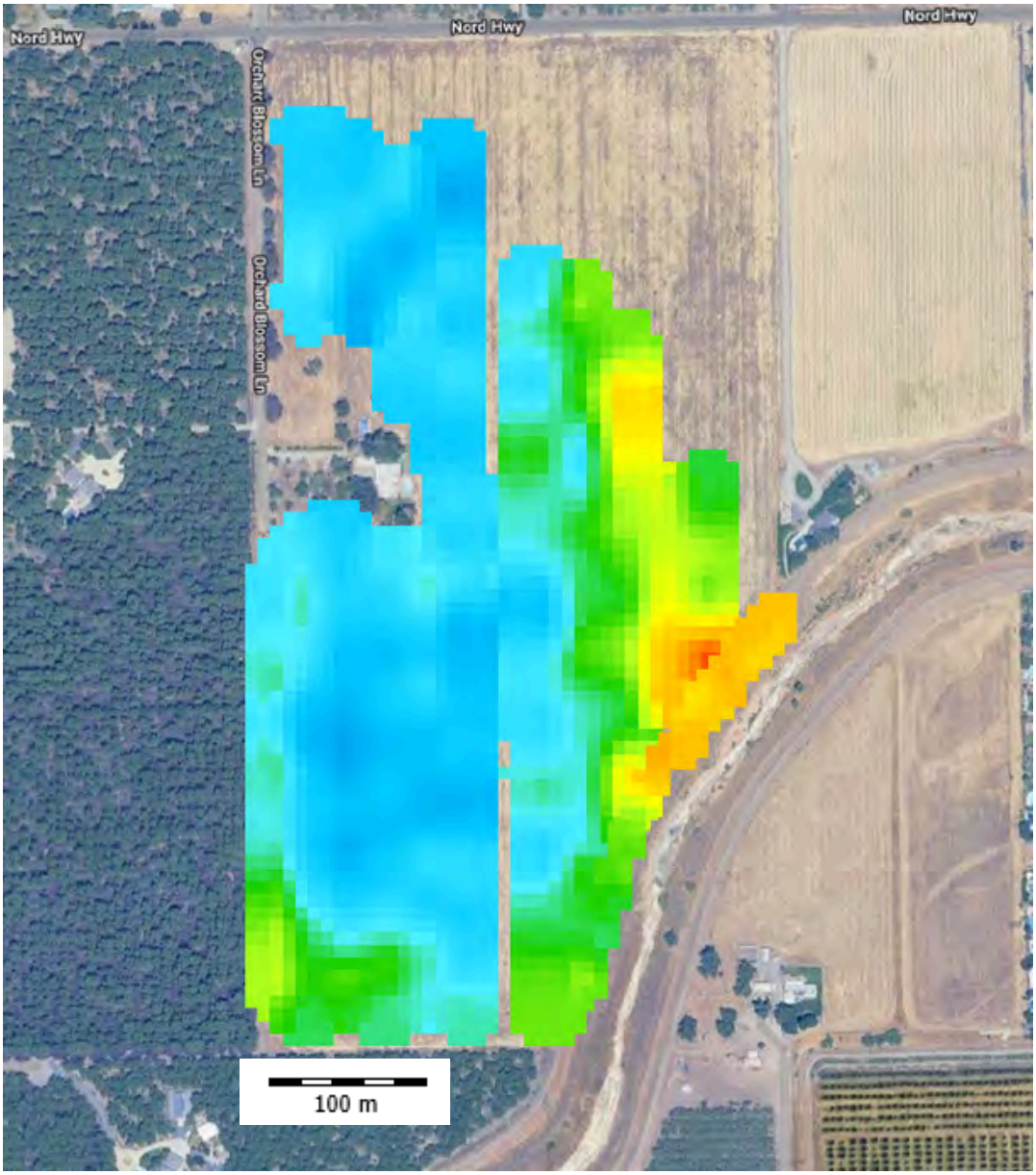


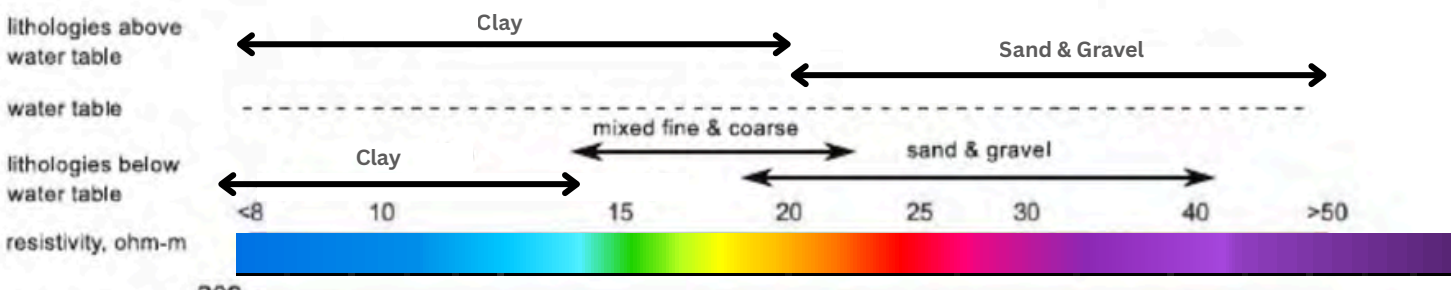
DEPTH SLICES- 60 FT



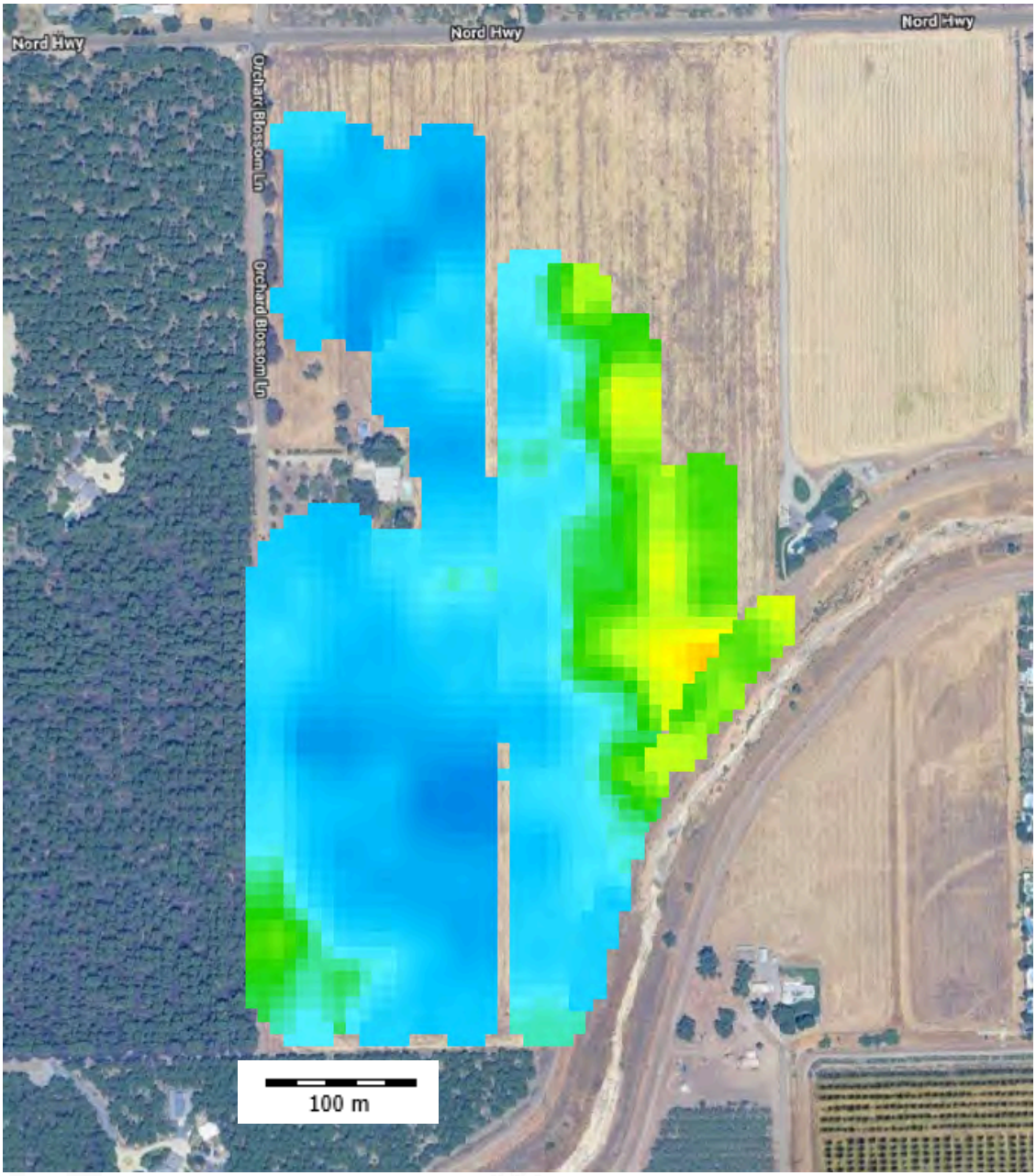


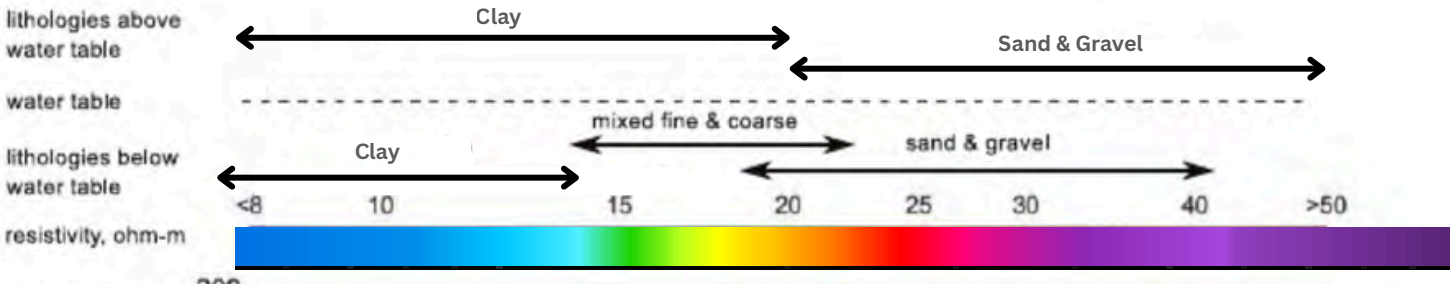
DEPTH SLICES- 70 FT



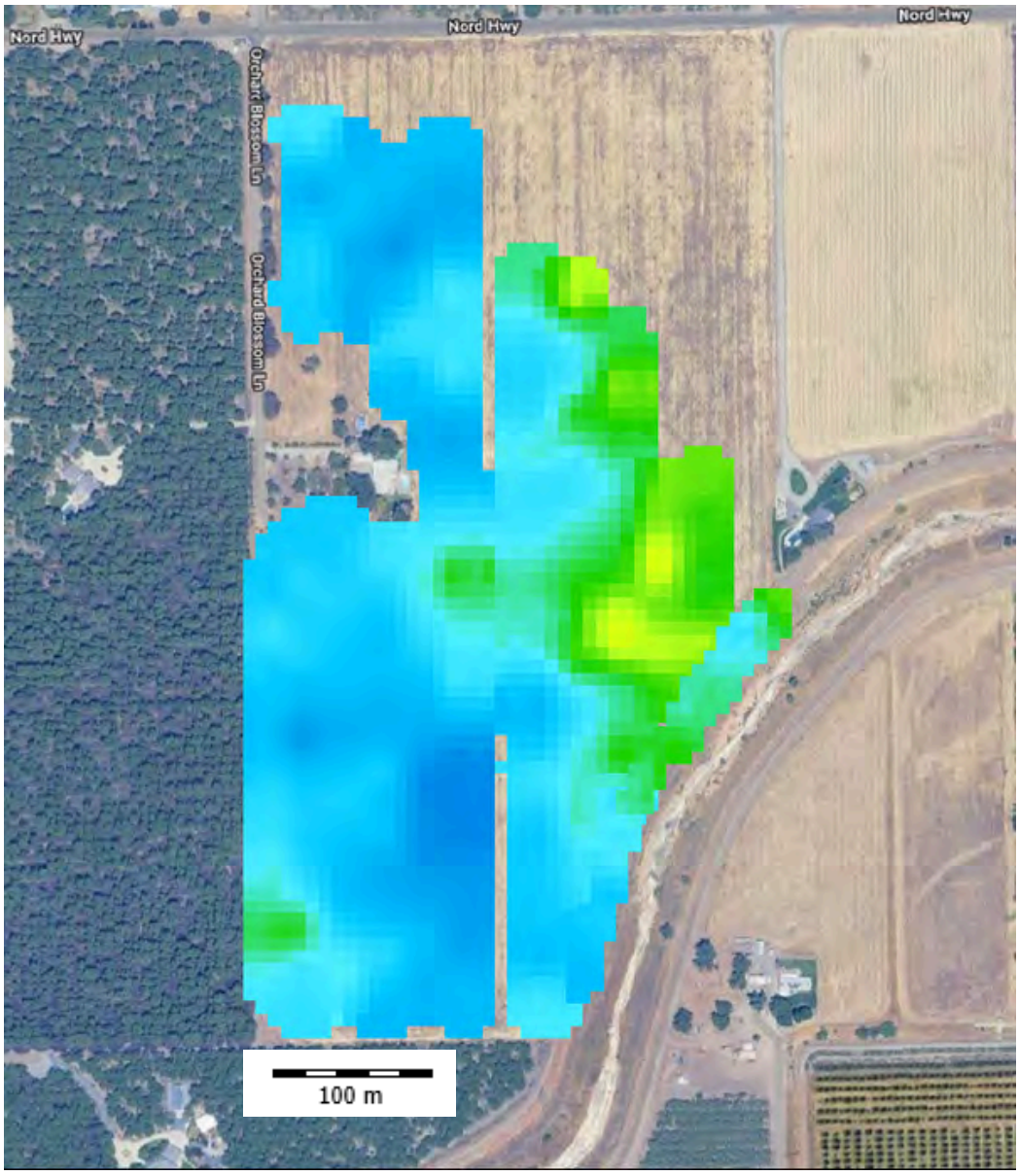


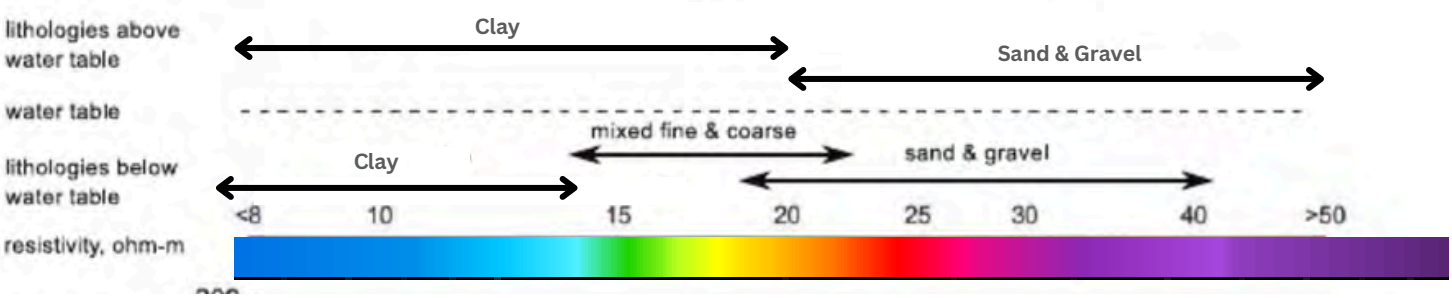
DEPTH SLICES- 80 FT



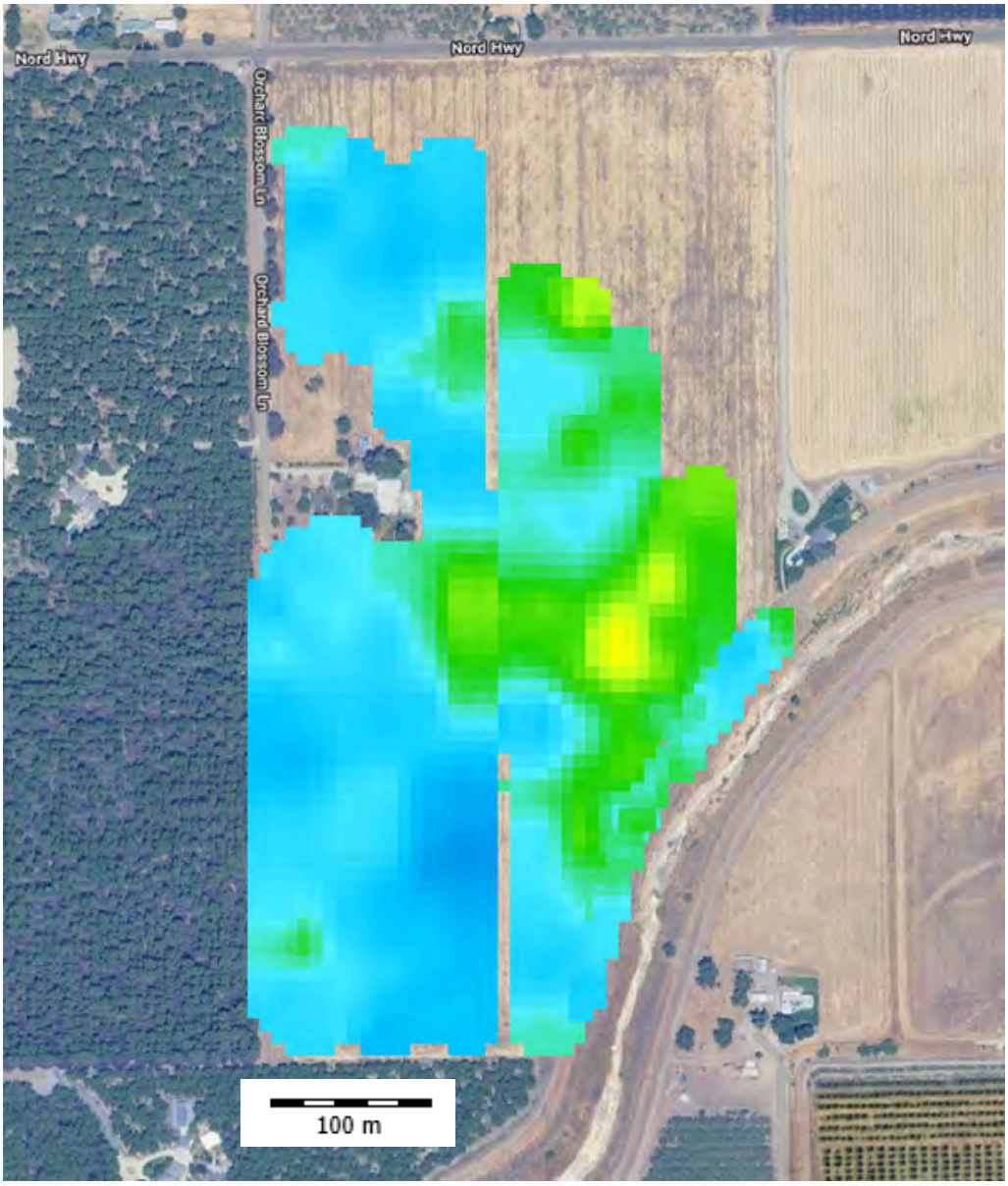


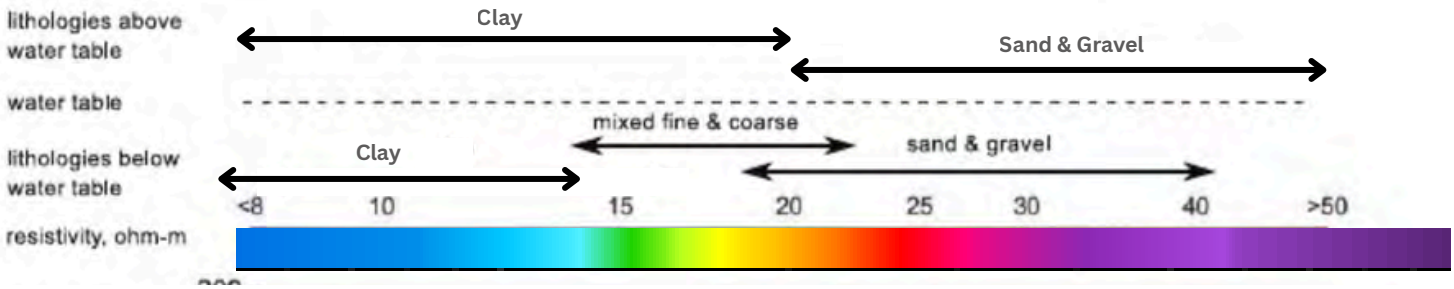
DEPTH SLICES- 90 FT



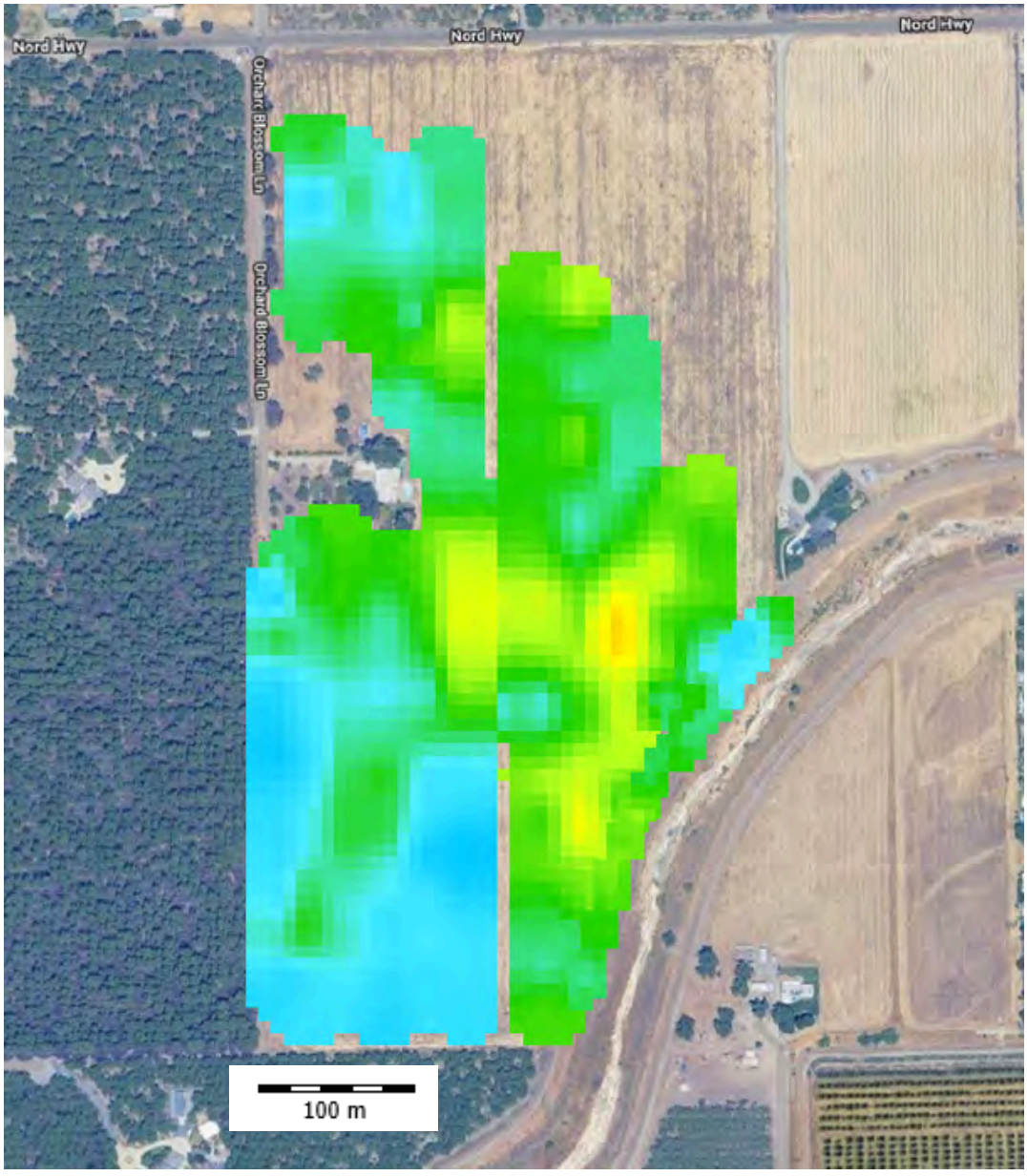


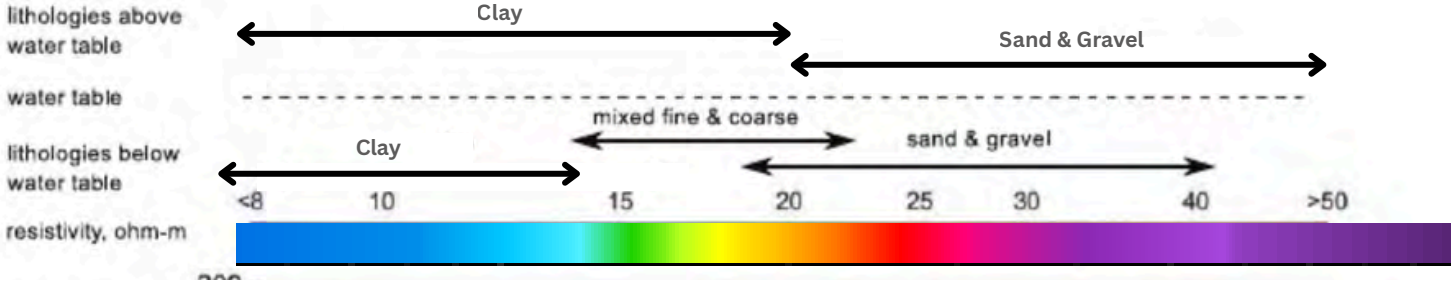
DEPTH SLICES- 100 FT



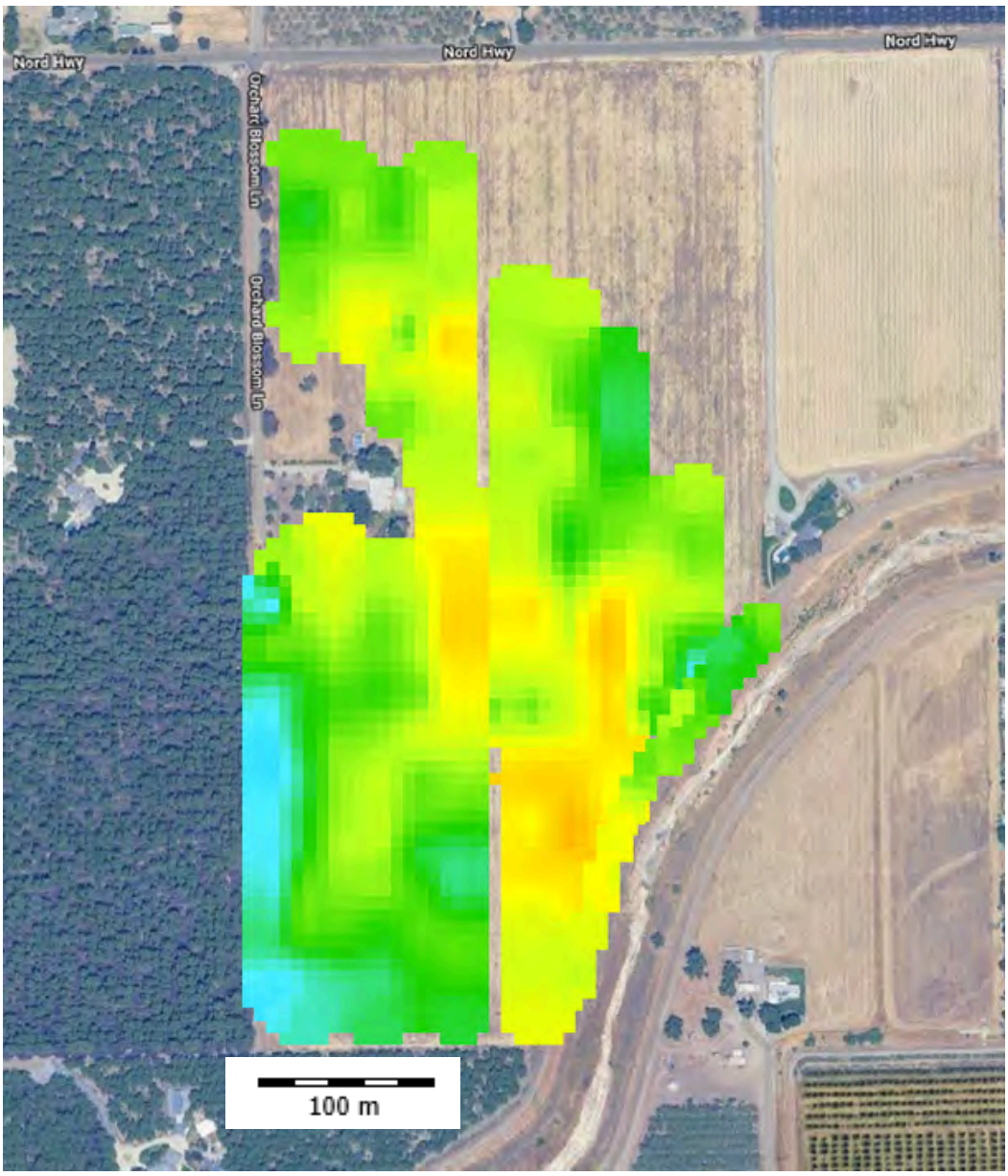


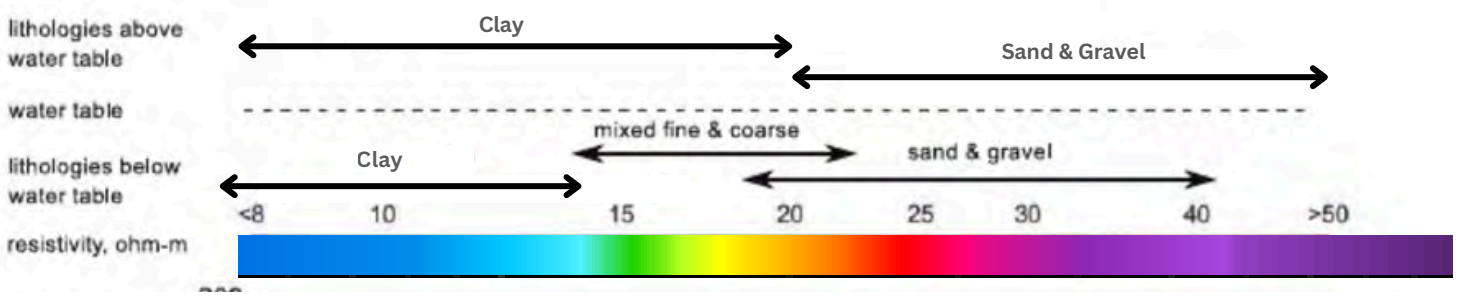
DEPTH SLICES- 110 FT



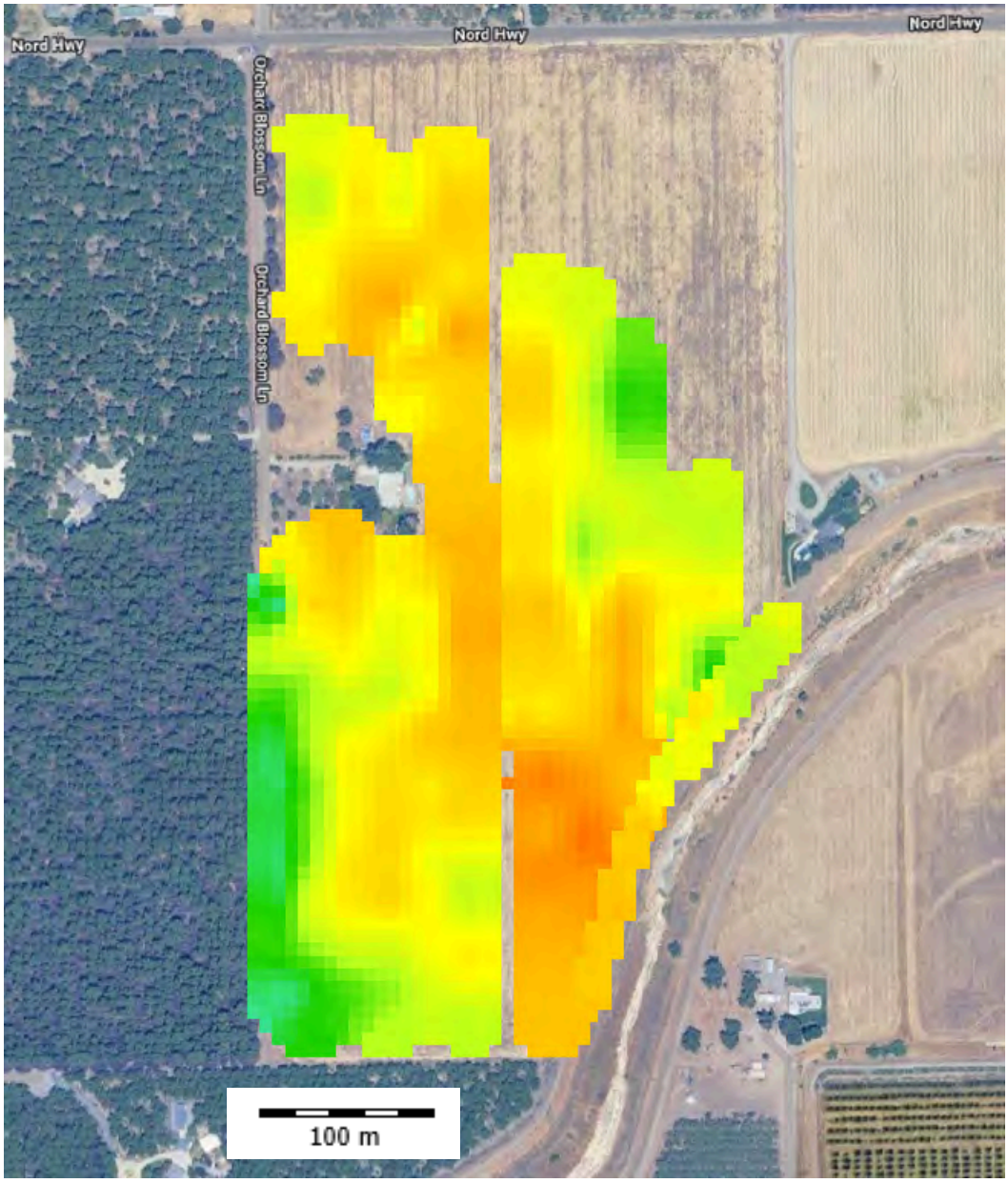


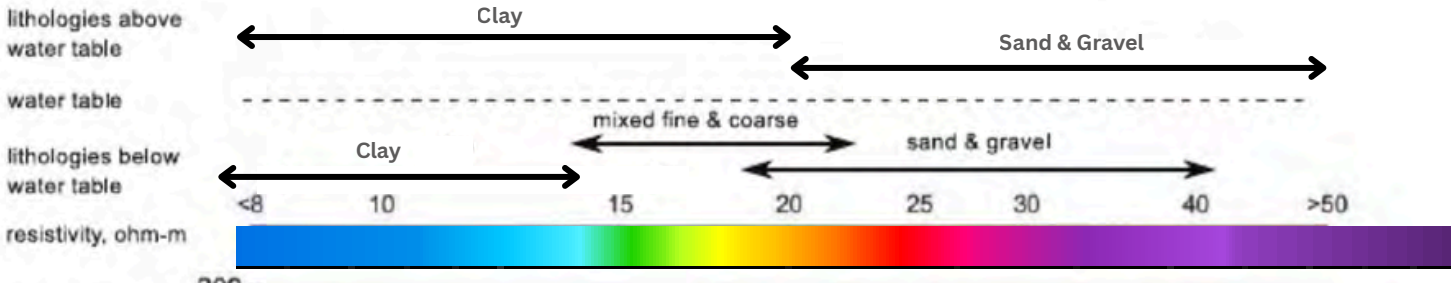
DEPTH SLICES- 120 FT



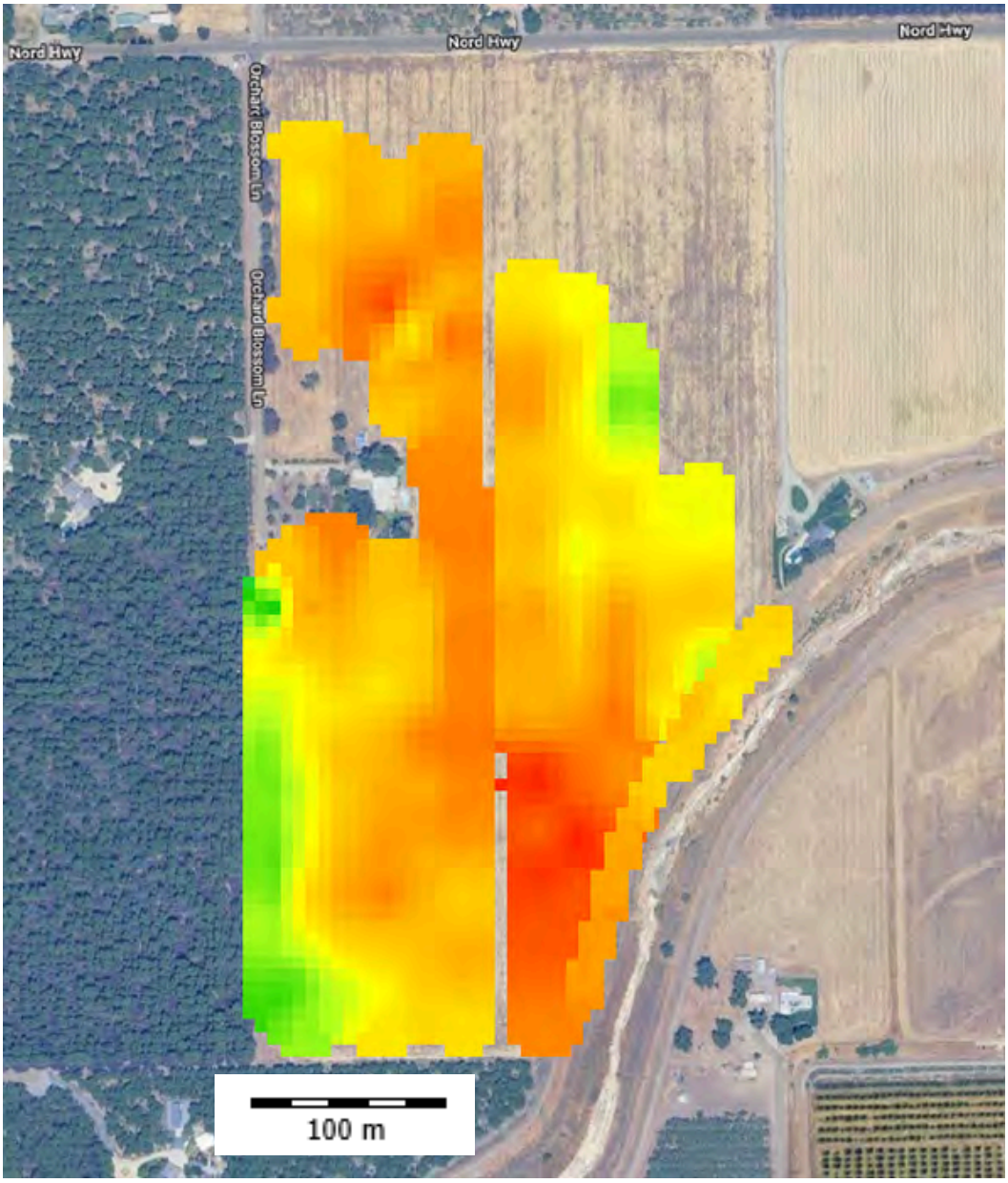


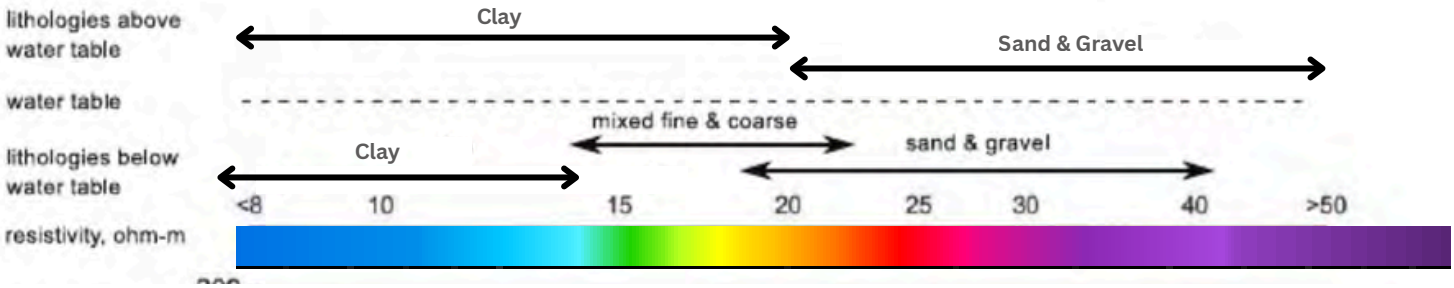
DEPTH SLICES- 130 FT



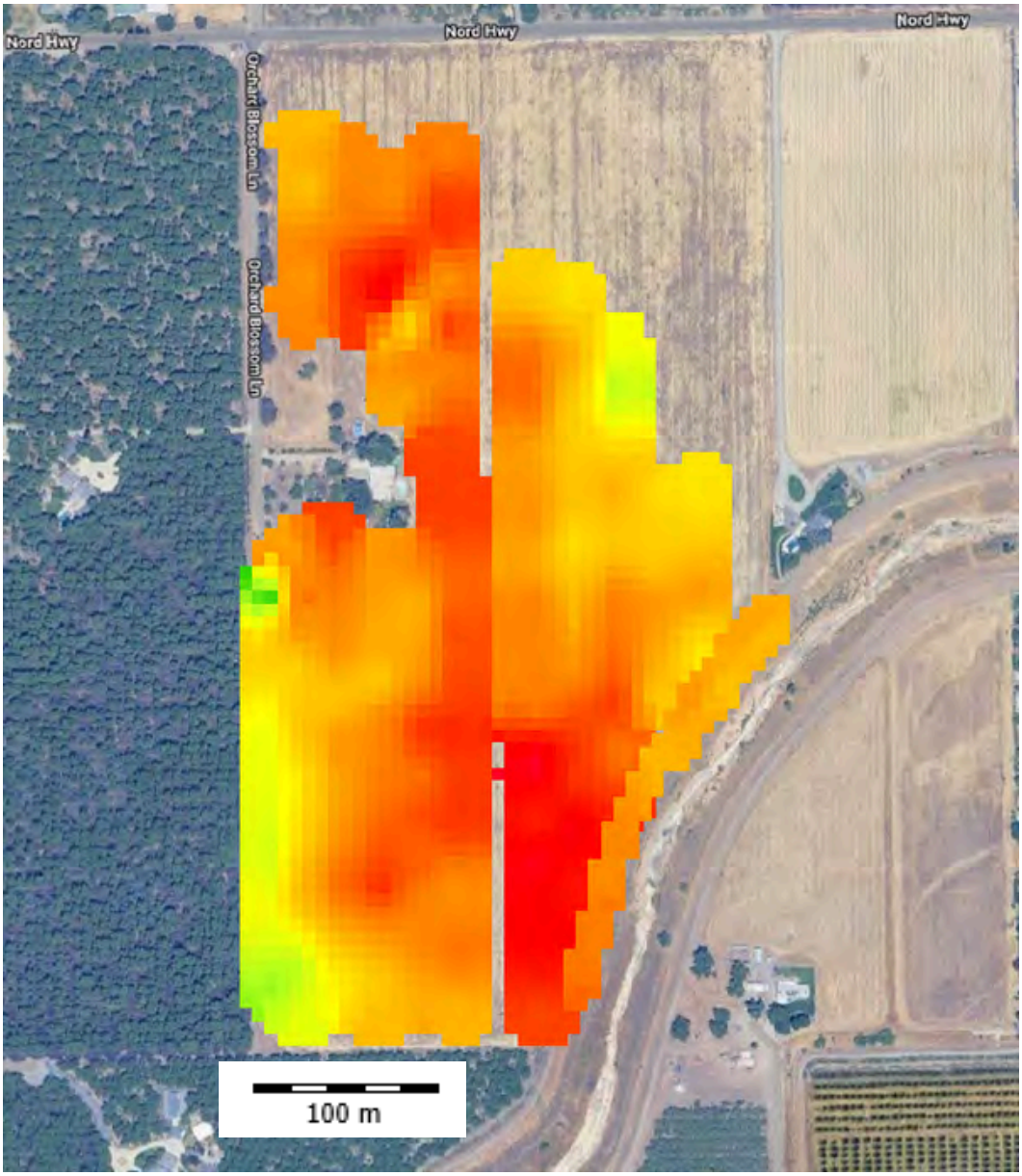


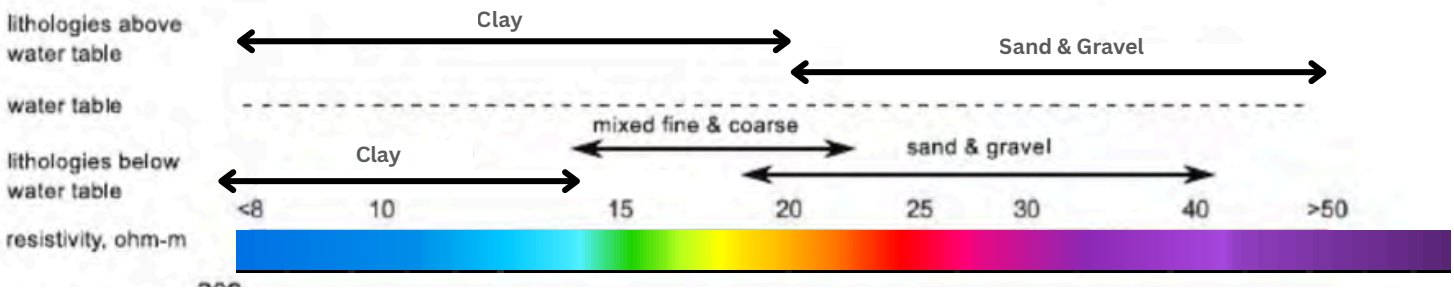
DEPTH SLICES- 140 FT





DEPTH SLICES- 150 FT





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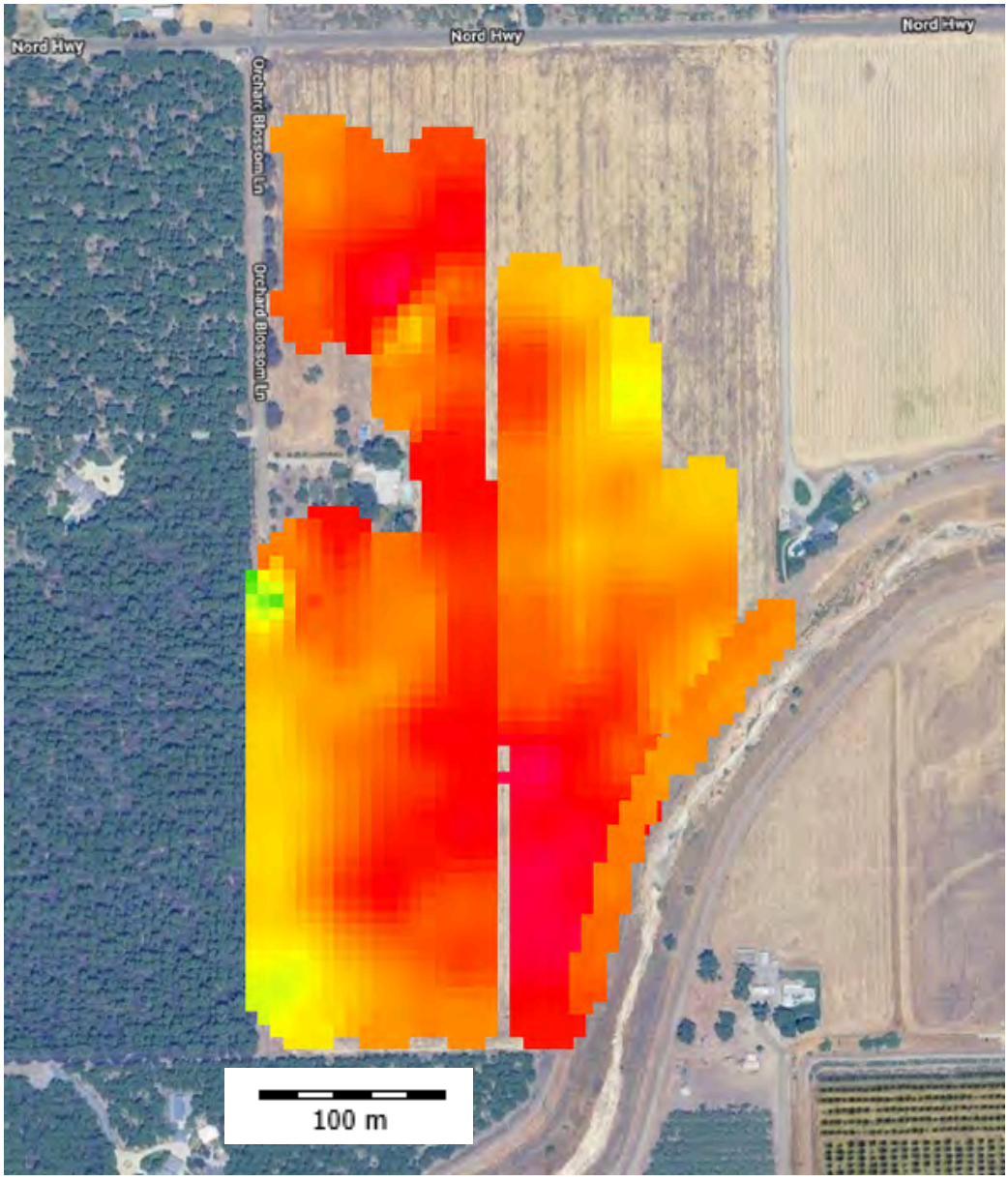

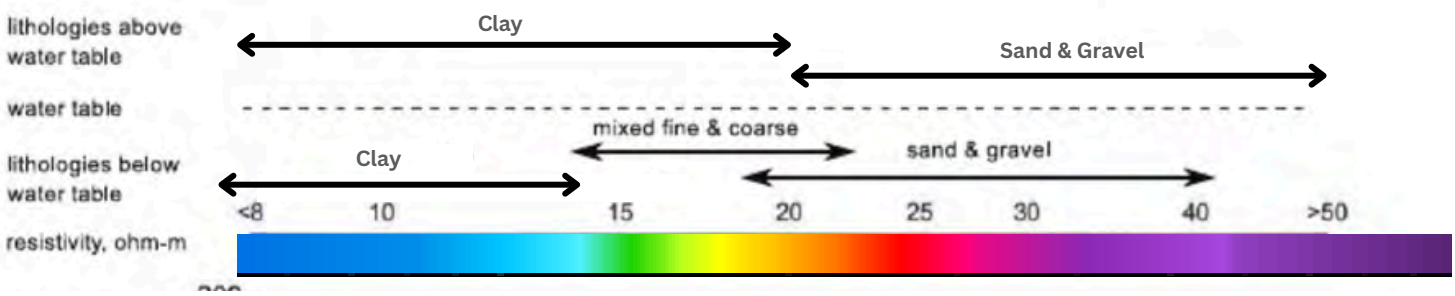

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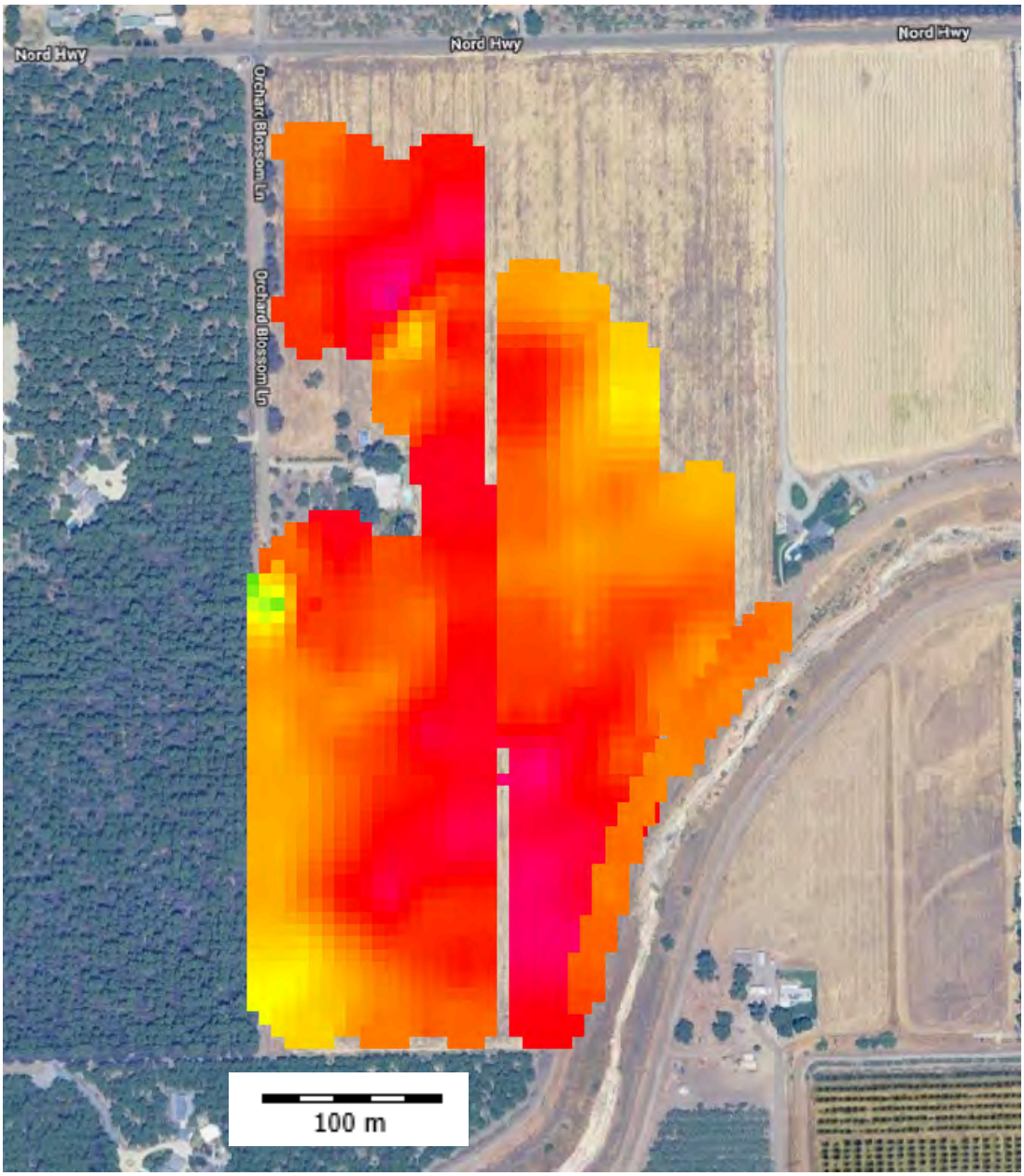

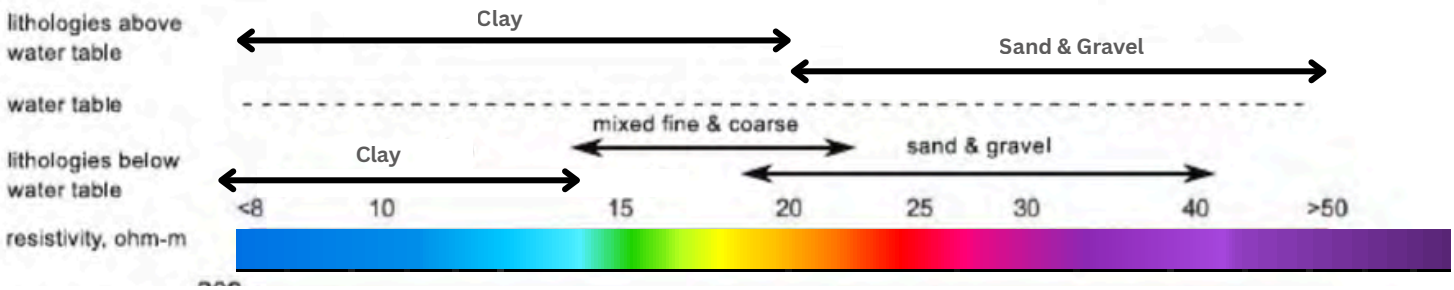

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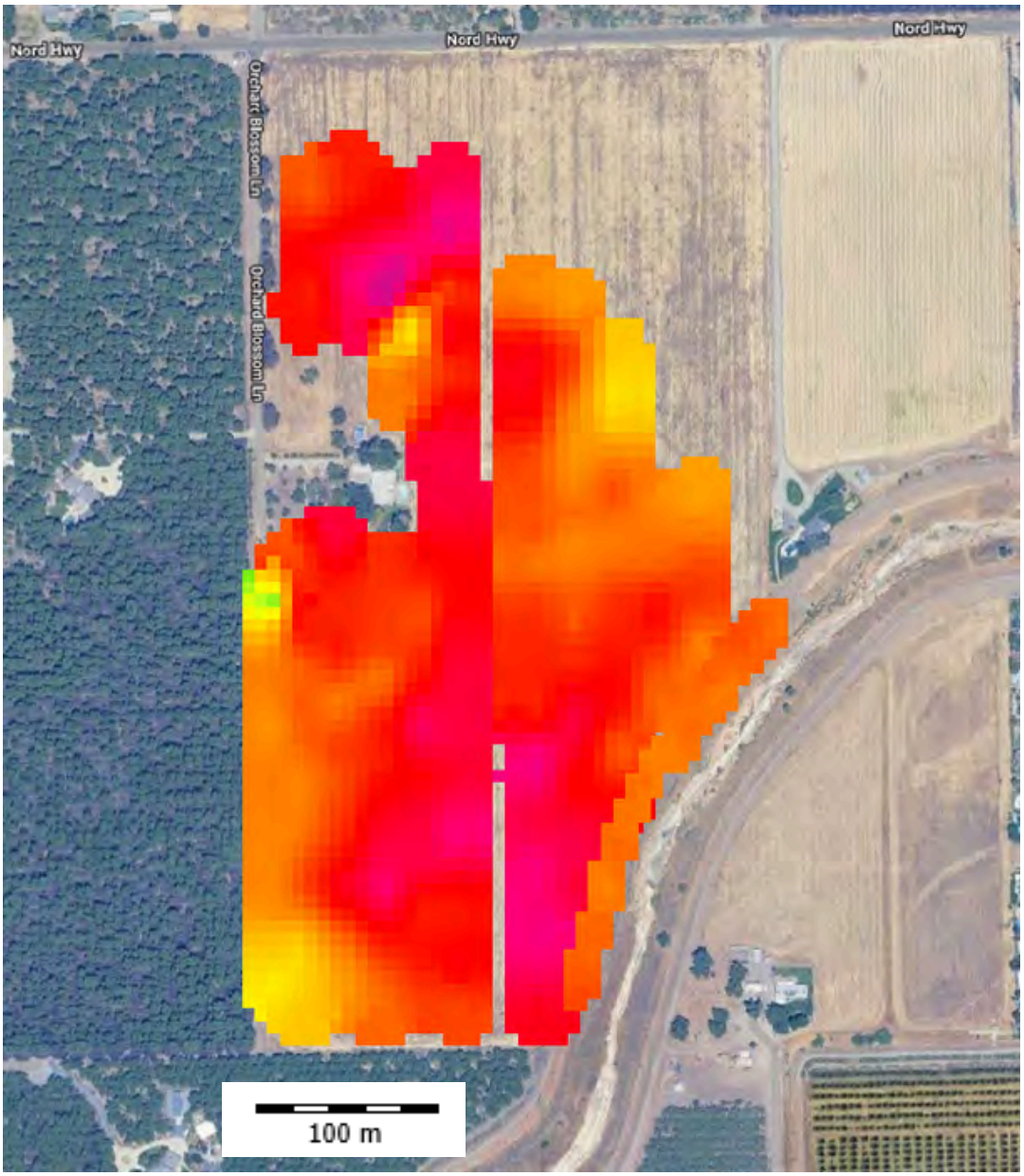

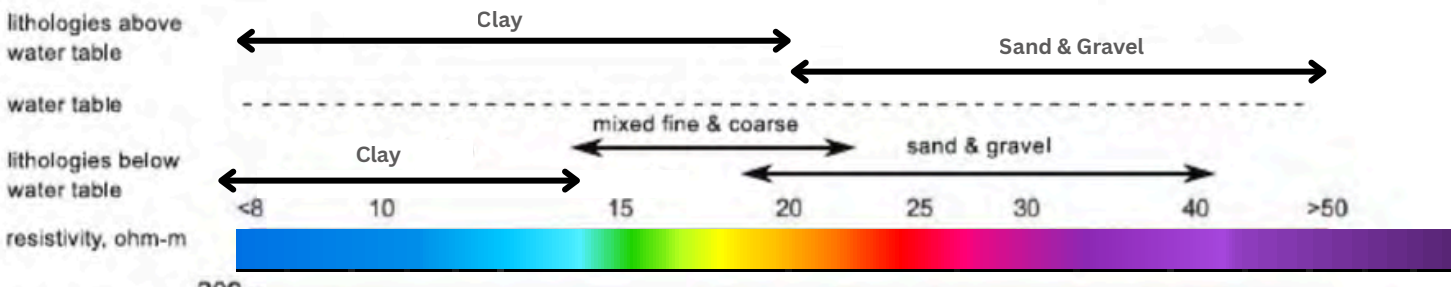

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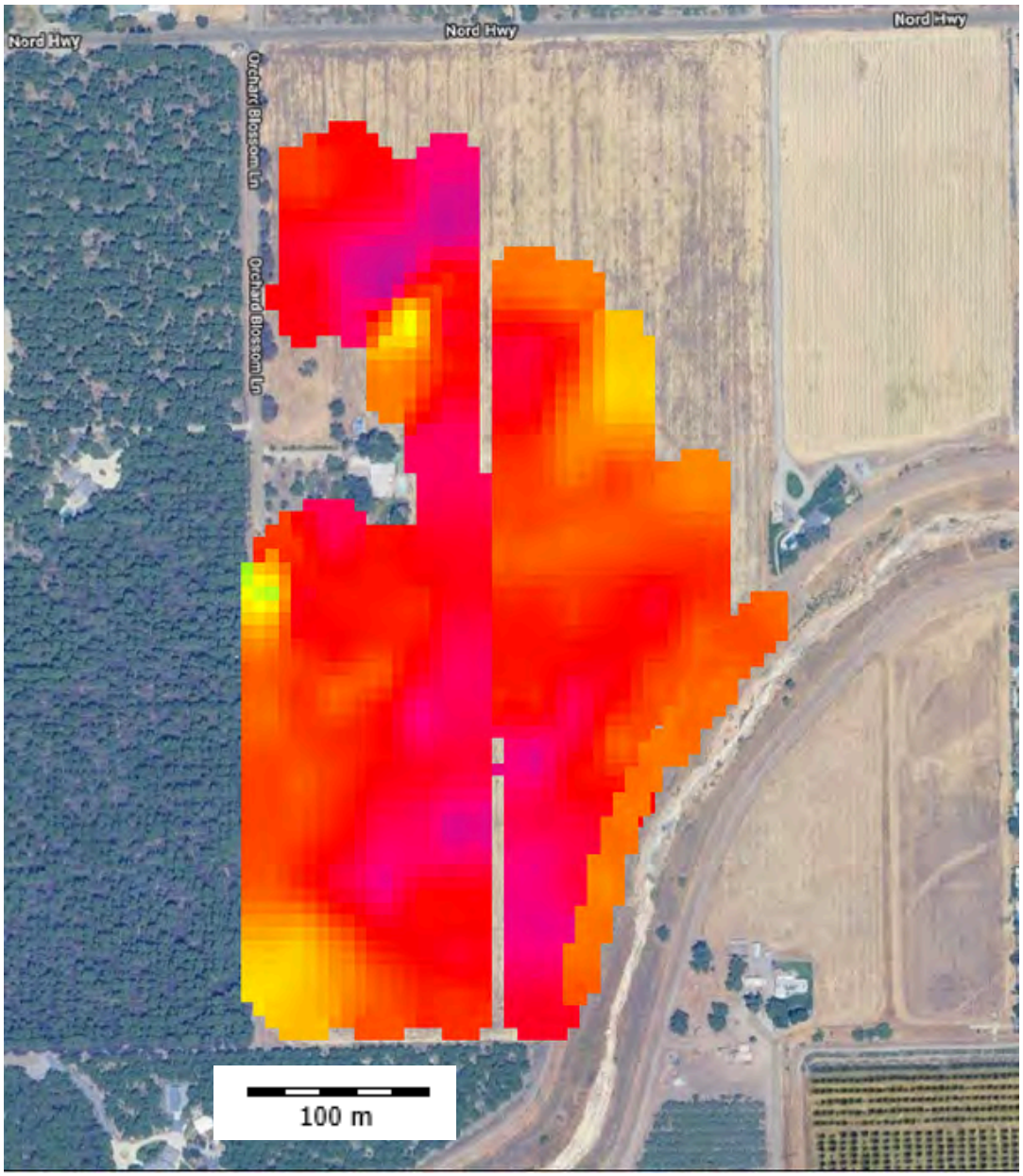

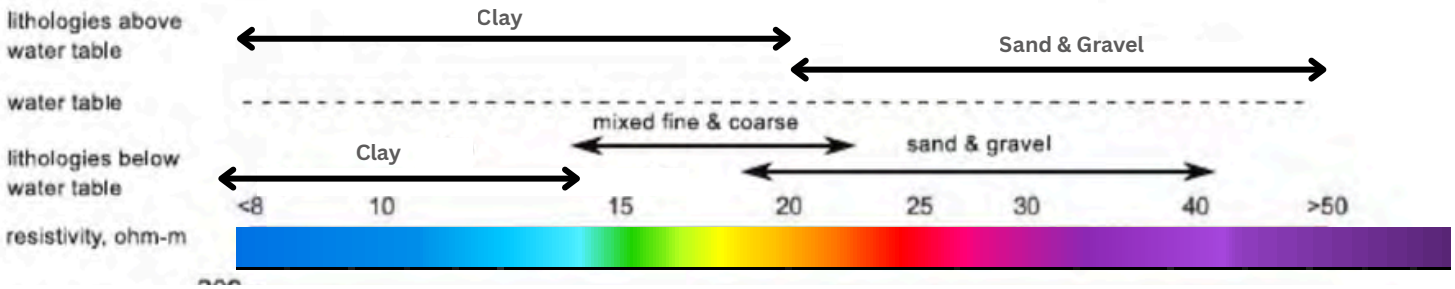

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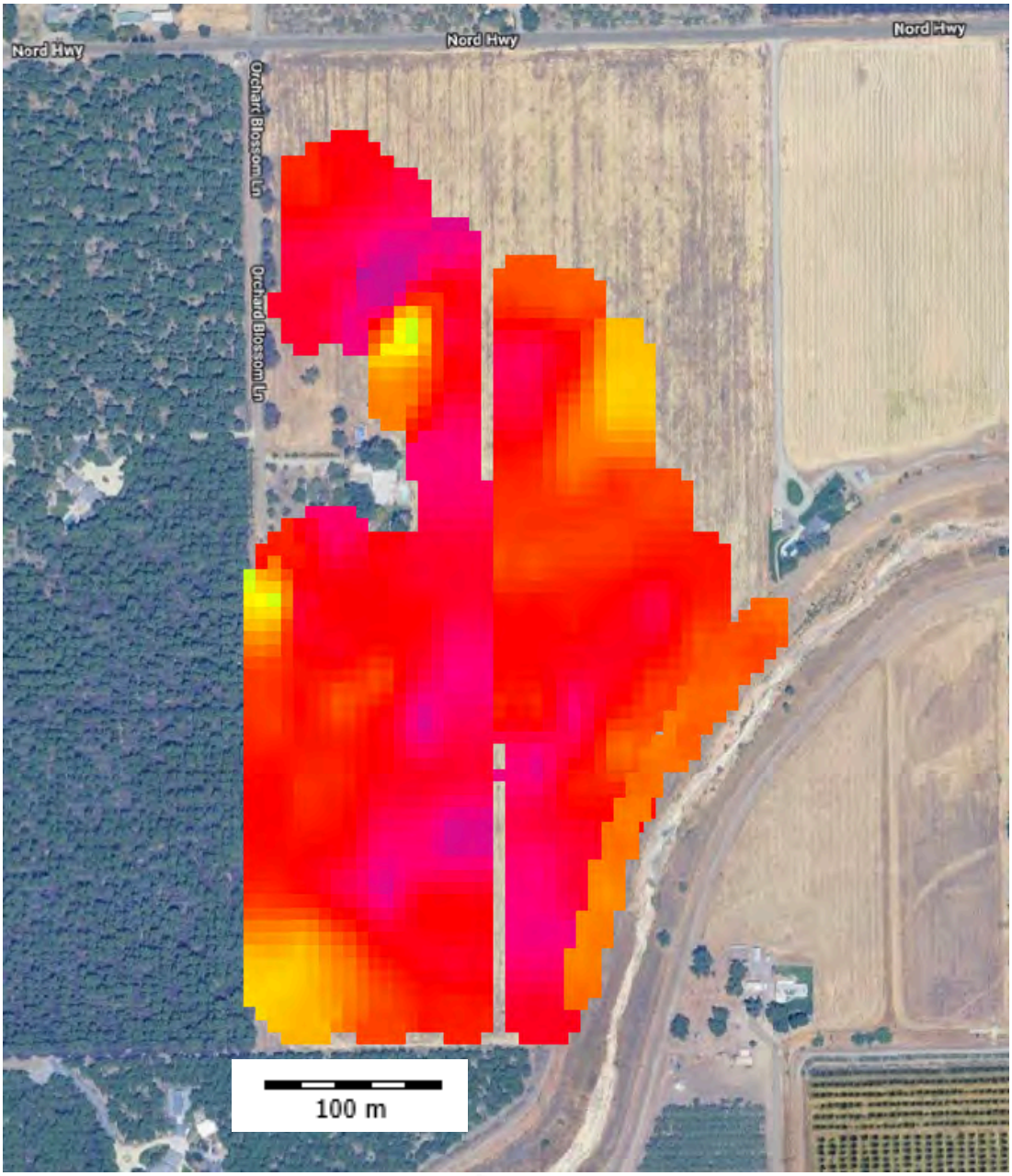

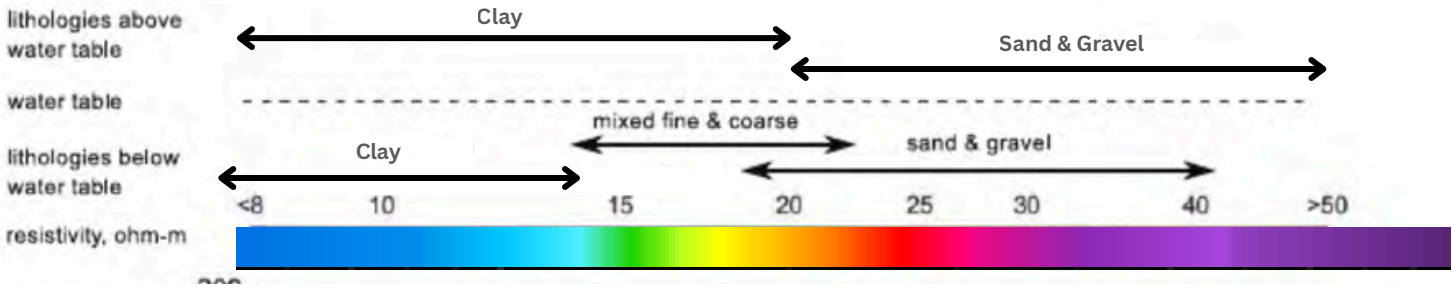

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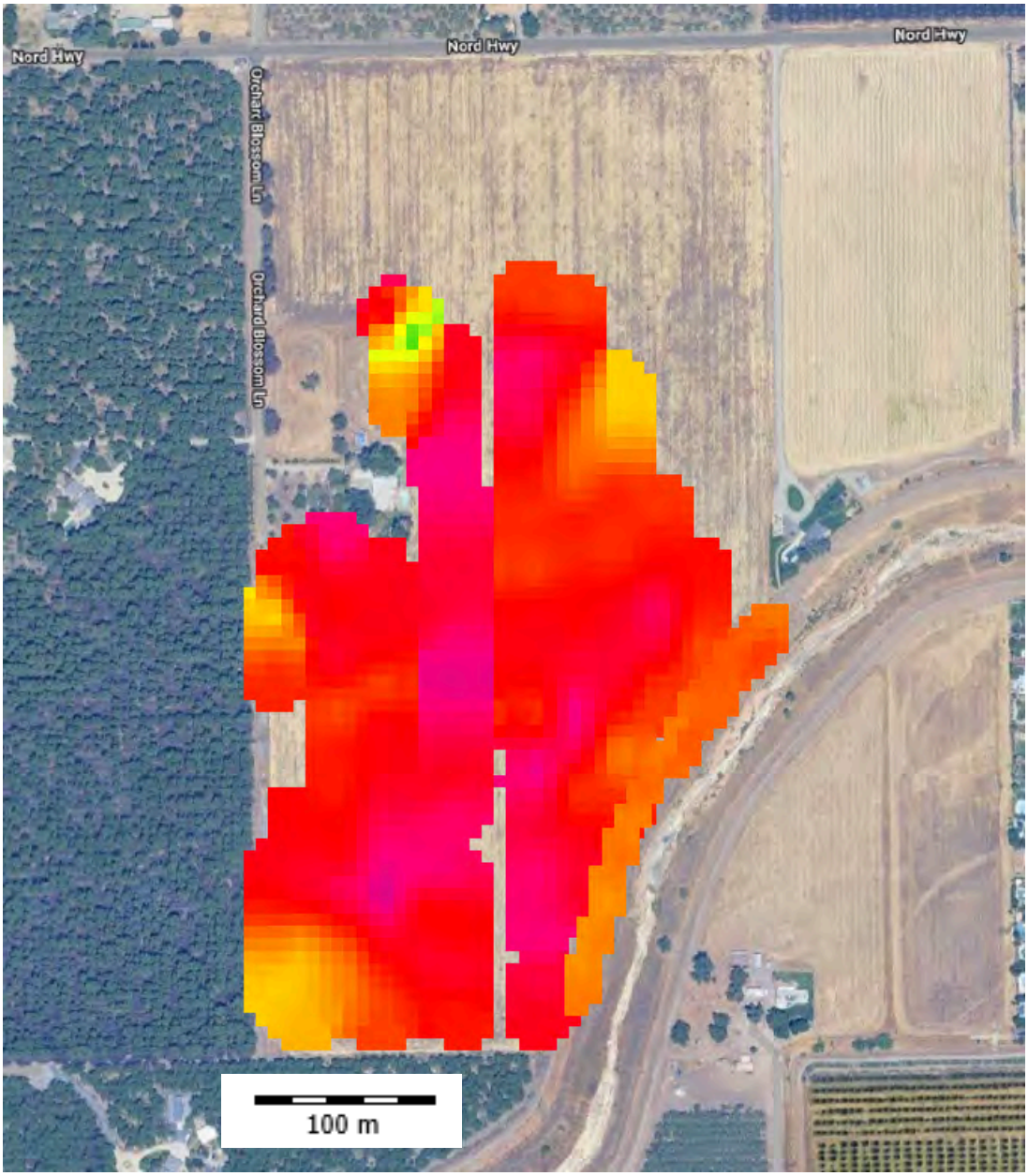

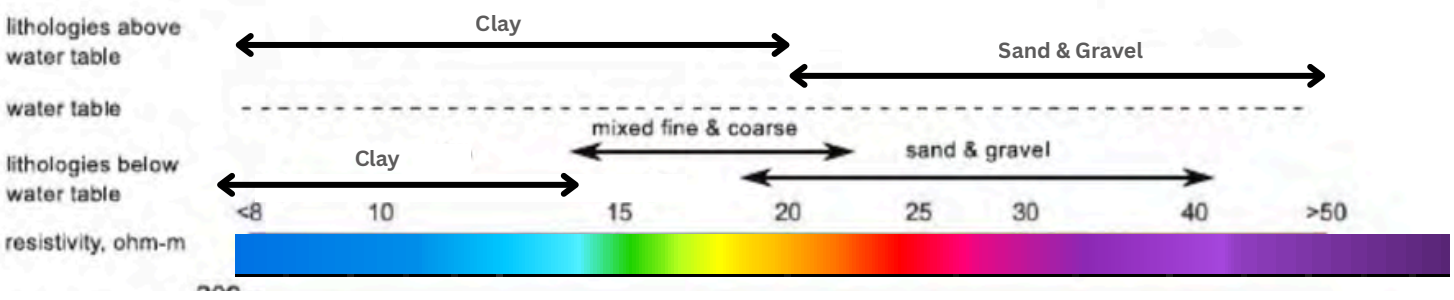

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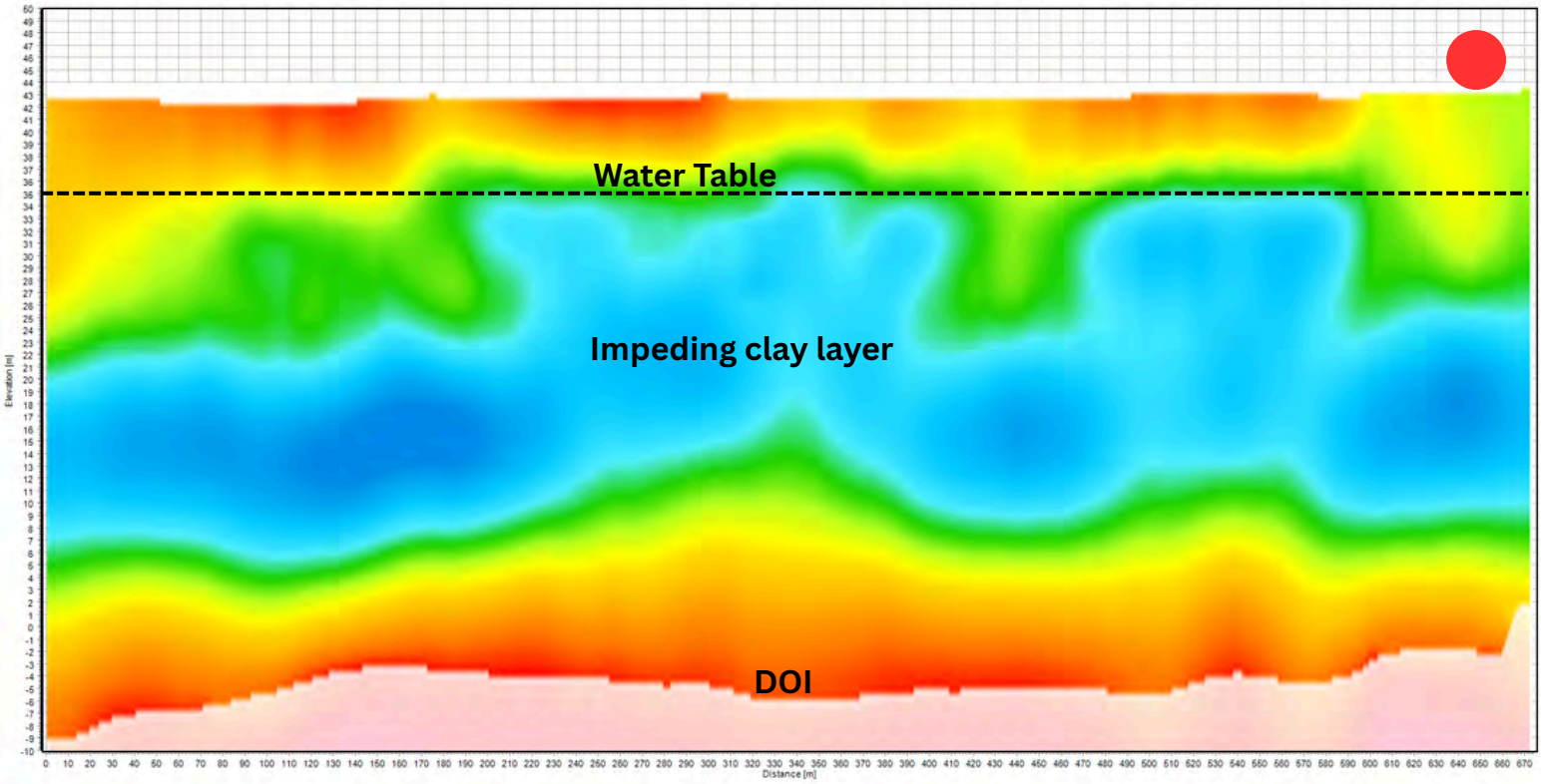

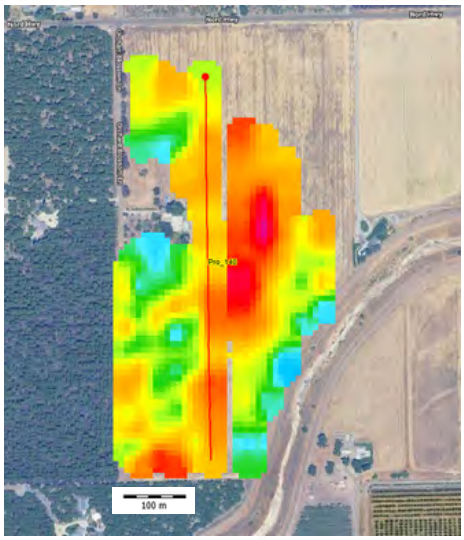

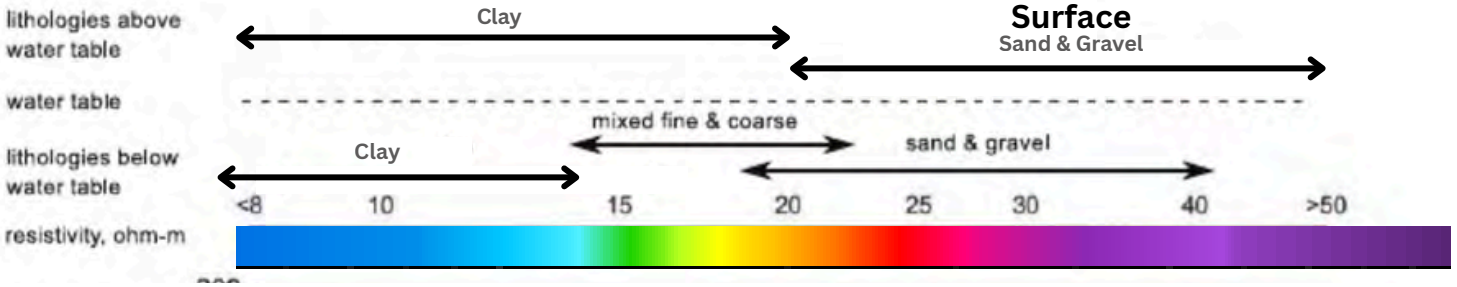

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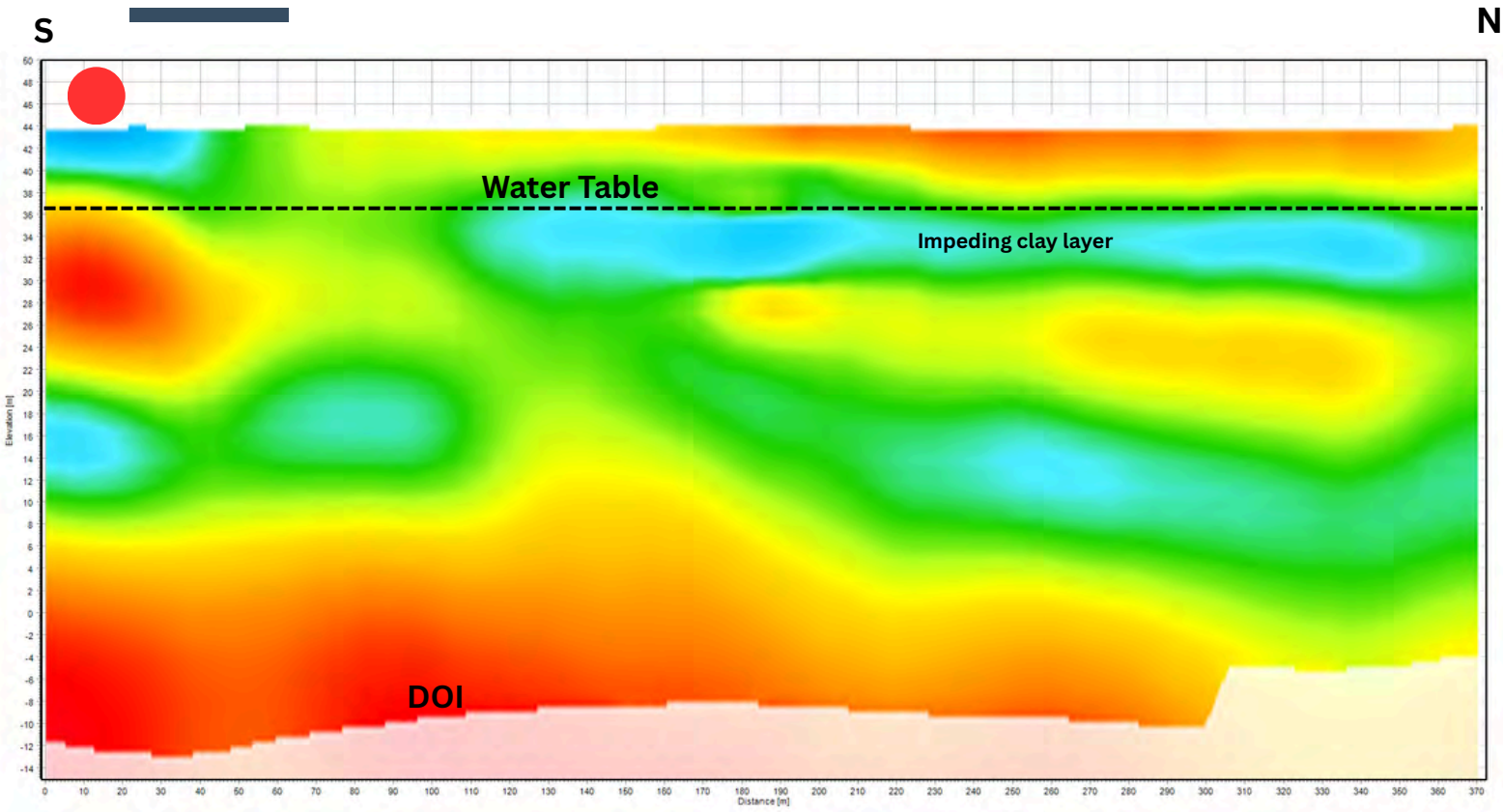
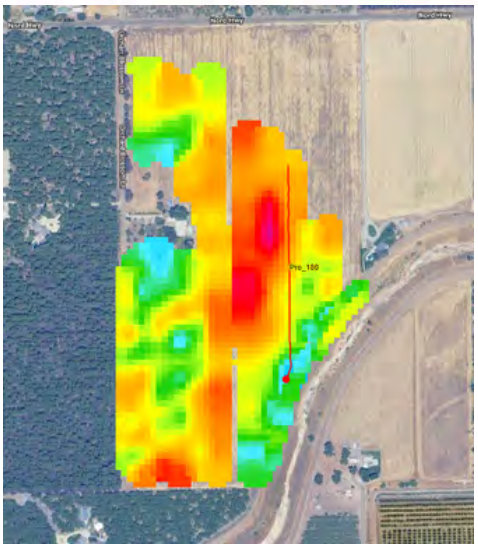
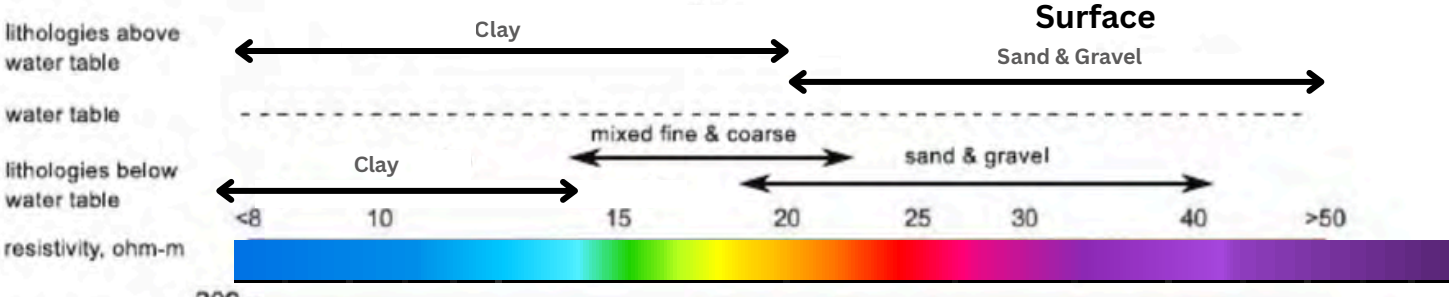
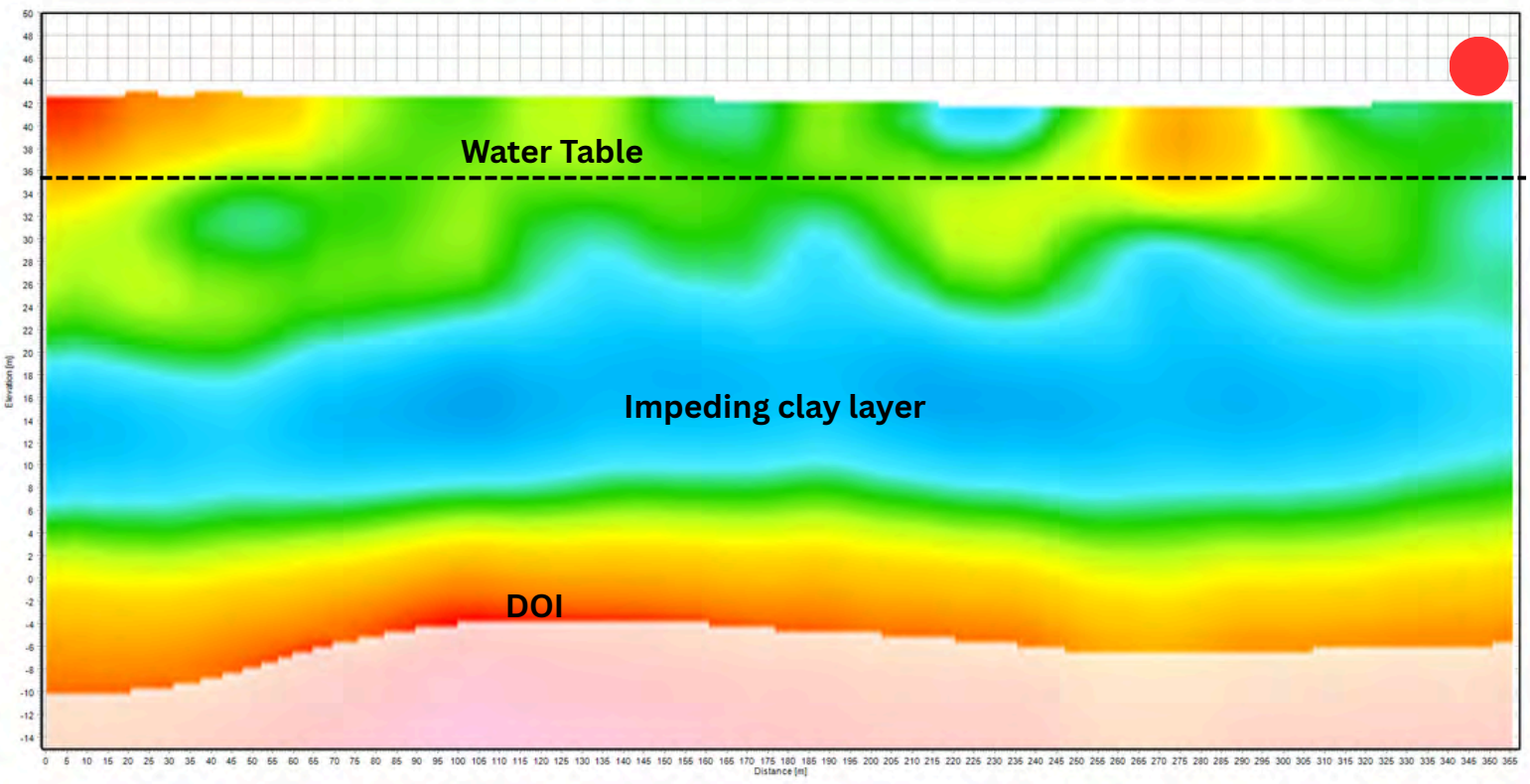


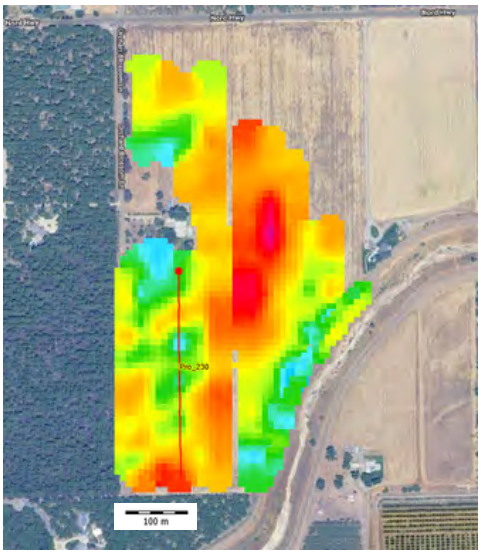




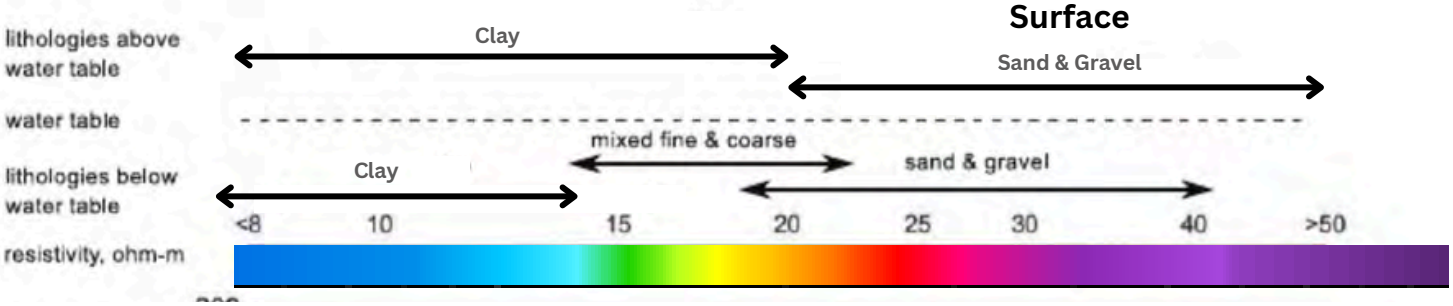
2D CROSS SECTION- PRO_

S N





Surface



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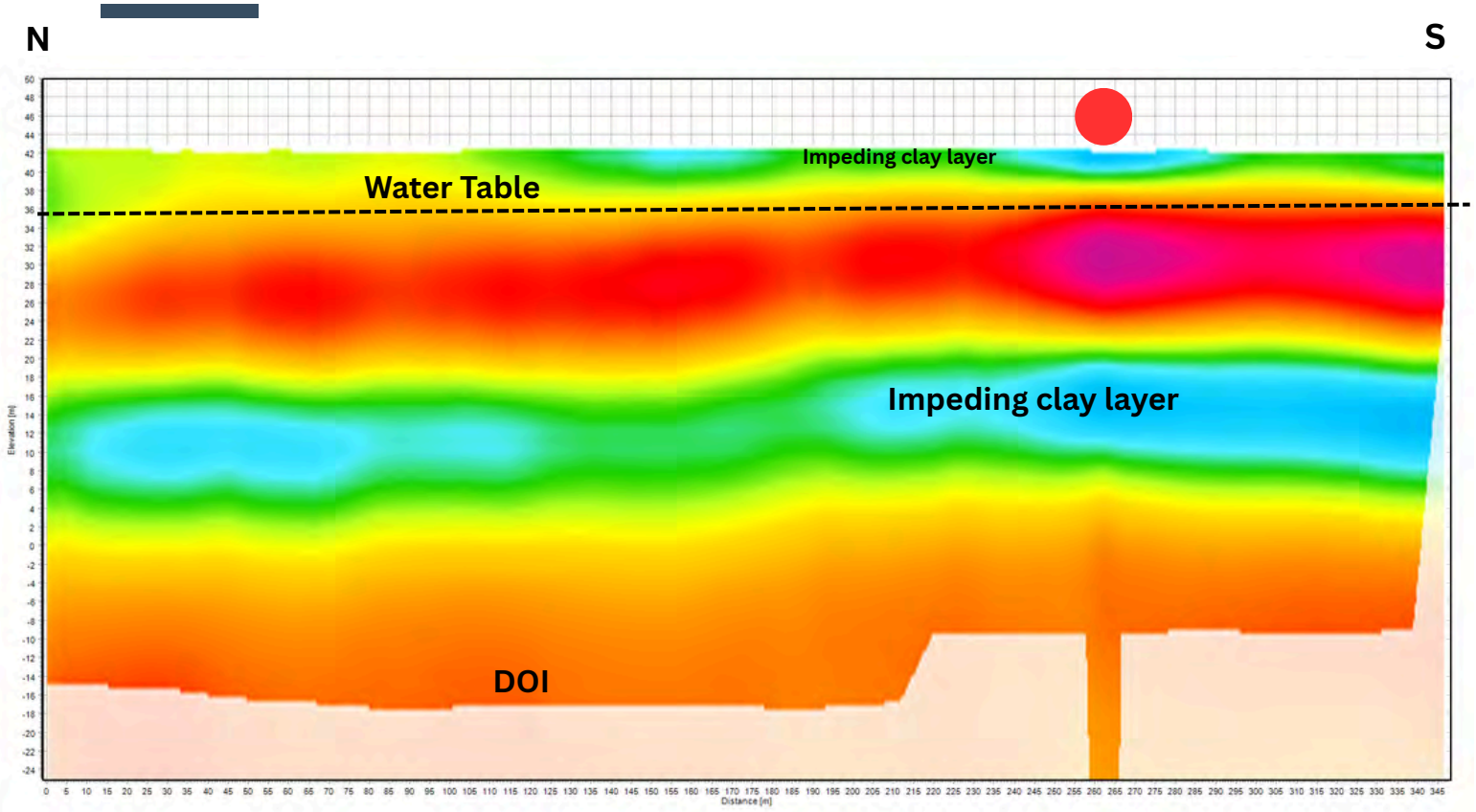

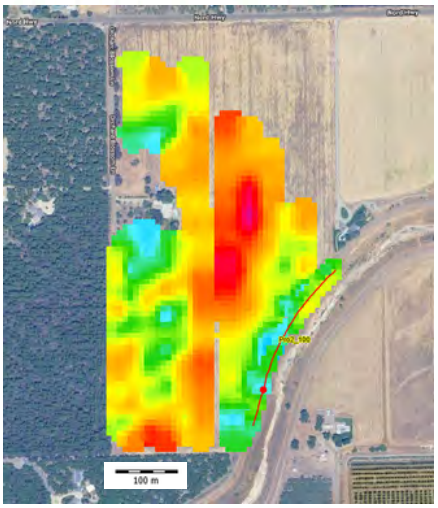

Surface

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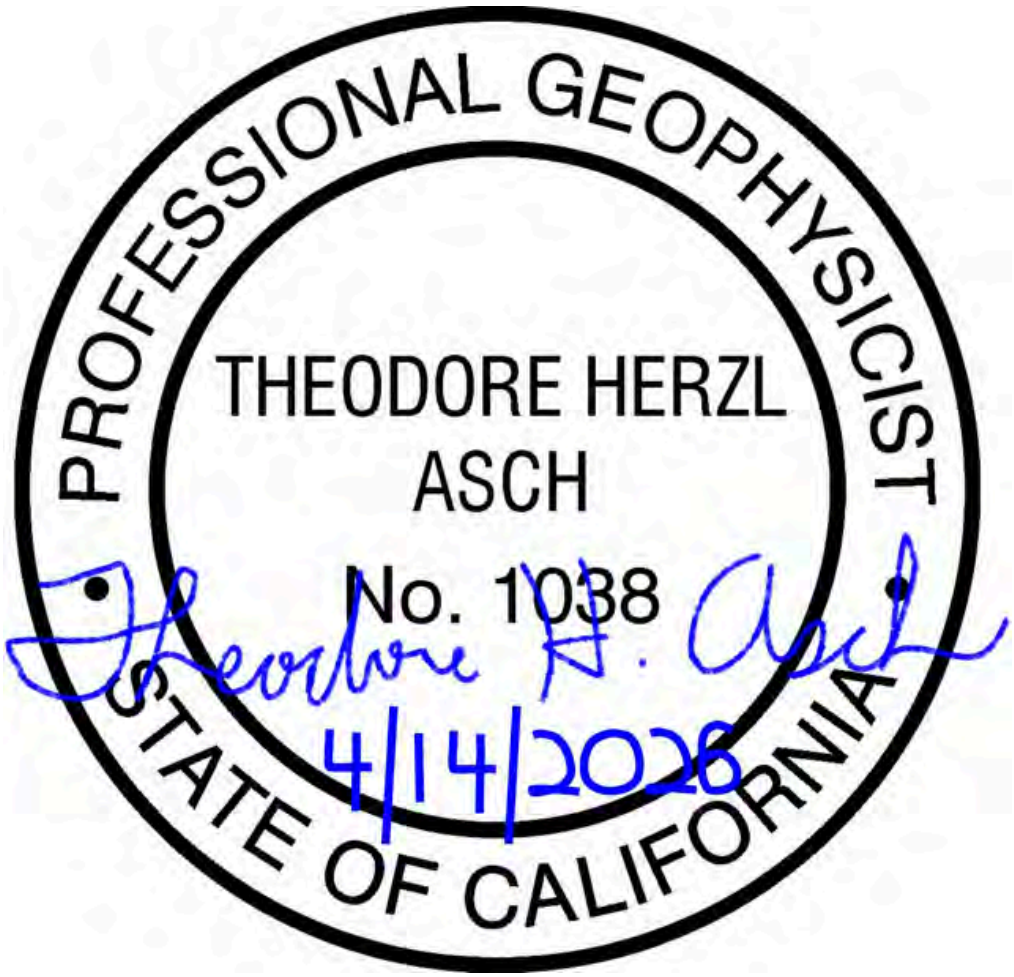
DELIVERABLES-

- Zip File dropbox link (ttemdatanord.zip)
  - Nord tTem Mapping Report.pdf
  - Workbench file folder (nord)
  - Workbench ttem set up files .gex & .tfi
  - Raw ttem data files .lin & .skb (nord raw data)
  - Inversion data xyz files (nord xyz)
  - Inversion data excel file (nord_SCI.csv)

STATE OF CALIFORNIA PROFESSIONAL GEOPHYSICIST STAMP



GROUNDWATERMAPS CONTACT-

GroundWaterMaps

Groundwater Aquifer Mapping

Contact:
Nathan Azevedo

(530) 717-0679

Maxwell, CA

nathan@groundwatermaps.com

Appendix E – ConeTec Report/CPT

PRESENTATION OF SITE INVESTIGATION RESULTS

Vina GSA Component 5

Prepared for:
Geosyntec Consultants, Inc
ConeTec Job No: **25-56-30135**

Project Start Date: 2025-09-03
Project End Date: 2025-09-05
Release Date: 2025-09-19

Report prepared by:
ConeTec, Inc.

506 De Carlo Ave, Richmond, CA 94801
Tel: (510) 357-3677

ConeTecCA@conetec.com
www.conetec.com
www.conetecdataservices.com

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ABOUT THIS REPORT

The attached report presents the findings of the site investigation program.

At the request of: Geosyntec Consultants, Inc.

Conducted by: ConeTec, Inc.

Please be advised that this report, along with all associated data, is subject to the Third-Party Disclaimer and the Client Disclaimer contained in the 'Limitations' section of this report. For further reference, please consult the list of attached documents following the main body of the report.

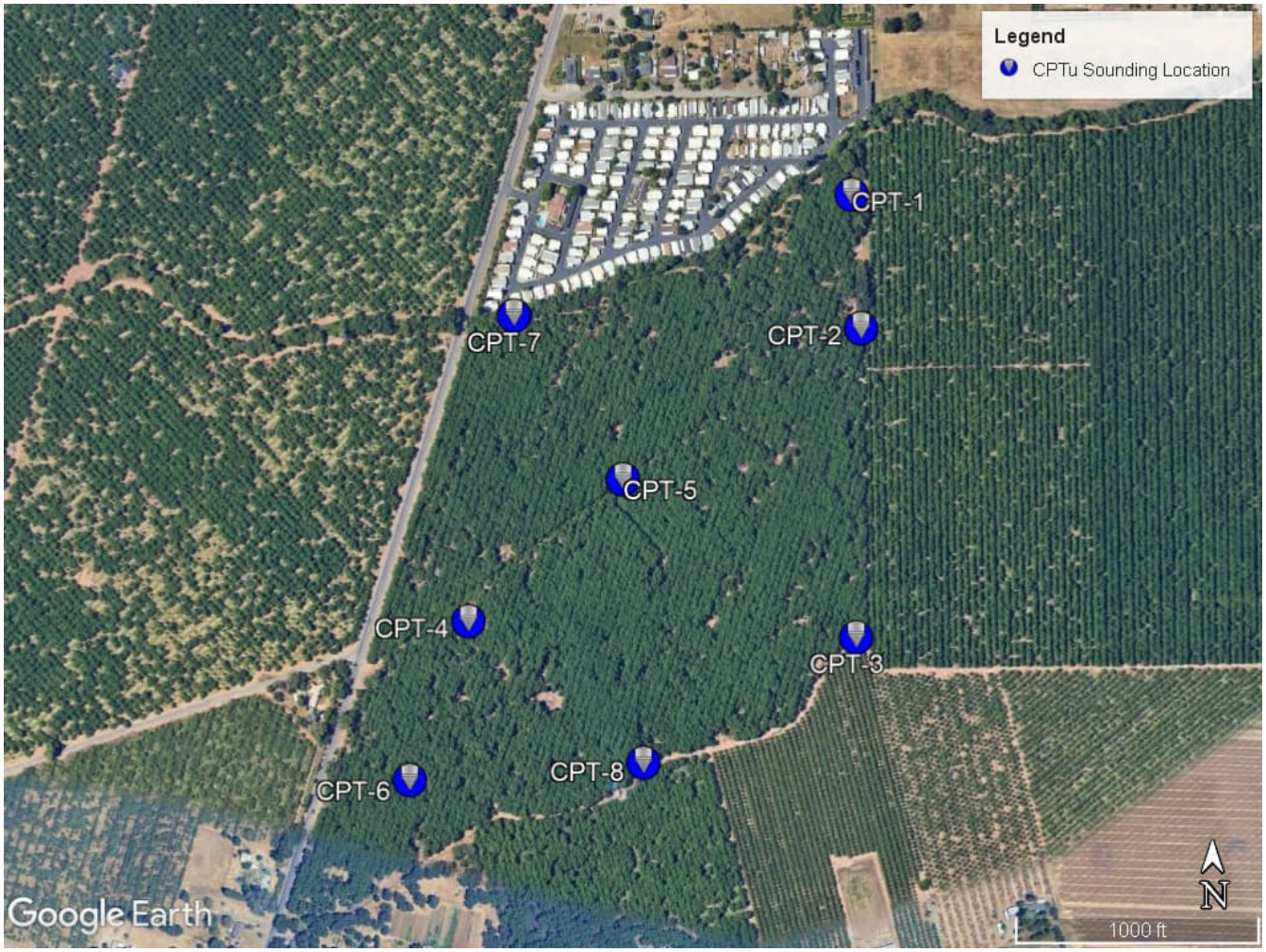
PROJECT	
Client Name	Geosyntec Consultants, Inc
Project Name	Vina GSA Component 5
Test Types	RCPTu/HPT
ConeTec Project Number	25-56-30135
Additional Comments	None

CONTENTS

The following are included in the body of the report:

- Site Map
- Limitations and Closure
- Project Information
- Test Summaries and Plots
- Supporting Documents and Materials

SITE MAP A



All locations are approximate unless otherwise stated in the body of the report.

ConeTec Job Number: 25-56-30135

Client: Geosyntec Consultants, Inc

Project: Vina GSA Component 5

Date: 2025-09-19

SITE MAP B

All locations are approximate unless otherwise stated in the body of the report.

ConeTec Job Number: 25-56-30135

Client: Geosyntec Consultants, Inc

Project: Vina GSA Component 5

Date: 2025-09-19

LIMITATIONS

Third-Party Disclaimer

'Report' refers to this document titled: Vina GSA Component 5

The Report was prepared by ConeTec for: Geosyntec Consultants, Inc

The Report is confidential and may not be distributed to or relied upon by any third parties without the express written consent of ConeTec. Third parties who gain access to the Report do not acquire any rights by virtue of such access. Any use which a third party makes of the Report, or any reliance on or decisions made based on it, are the responsibility of such third parties. ConeTec accepts no responsibility for loss, damage and/or expense, if any, suffered by any third parties as a result of decisions made, or actions taken or not taken, which are in any way based on, or related to, the Report or any portion(s) thereof.

Client Disclaimer

ConeTec was retained by: Geosyntec Consultants, Inc

'Report' refers to this document titled: Vina GSA Component 5

ConeTec was retained to collect and provide the raw data ('Data') which is included in the Report.

ConeTec has collected and reported the Data in accordance with current industry standards. No other warranties, either expressed or implied, with respect to the Data is made by ConeTec. To fully understand the Data included in the Report, reference must be made to the supporting documents and other sources referenced in the Report in their entirety. Other than the Data, the contents of the Report, including any Interpretations, should not be relied upon in any fashion without independent verification. ConeTec is in no way responsible for any loss, damage or expense resulting from the use of, and/or reliance on, such material by any party.

Closure

Thank you for the opportunity to contribute to this project. The equipment utilized, as well as the field procedures followed, fully complied with currently accepted best practice standards.

Report prepared by: Jesse Molloy, Anthony Rasmussen

PROJECT INFORMATION

Rig Utilized		
Description	**Deployment System**	**Test Type**
C02-022 CPT Truck Rig	Twin mounted cylinders	RCPTu/HPT

Coordinates			
Test Type	Number of Locations	GPS Collection Method	EPSG Number
RCPTu/HPT	10	Consumer Grade GPS	32610 (WGS84 / UTM Zone 10 North)

Piezocones Used for this Project						
Cone Description	**Cone Number**	**Cross Sectional Area** (cm^2)	**Sleeve Area** (cm^2)	**Tip Capacity** (bar)	**Sleeve Capacity** (bar)	**Pore Pressure Capacity** (bar)
EC968:T1500F15U35	968	15	225	1500	15	35
The CPTu summary indicates which cone was used for each sounding.						

Cone Penetration Test (CPTu)	
Depth reference	Depths are referenced to the existing ground surface at the time of each test.
Tip and sleeve data offset	0.10 Meters. This has been accounted for in the CPT data files.
Resistivity data offset	0.75 Meters. This has been accounted for in the CPT data files.

Calculated Geotechnical Parameters	
Additional information	The Normalized Soil Behavior Type Chart based on Q_{tn} (SBT Q_{tn}) (Robertson, 2009) was used to classify the soil for this project. A detailed set of calculated CPTu parameters have been generated and are provided in Excel format files in the release folder. The CPTu parameter calculations are based on values of corrected tip resistance (q_t) sleeve friction (f_s) and pore pressure (u_2). Effective stresses are calculated based on unit weights that have been assigned to the individual soil behavior type zones and the assumed equilibrium pore pressure profile. Soils were classified as either drained or undrained based on the Q_{tn} Normalized Soil Behavior Type Chart (Robertson, 2009). Calculations for both drained and undrained parameters were included for materials that classified as silt mixtures (zone 4).

Hydraulic Profiling Tool (HPT)	
Depth reference	Depths are referenced to the existing ground surface at the time of testing.
Depth	HPT data point recorded every 0.05 feet
CPTu tip to HPT data offset	3.33 feet. This has been accounted for in the data files.
Estimated Hydraulic Conductivity (Est. K)	The ratio of the flow to corrected pressure is used to calculate estimated hydraulic conductivity. Estimated hydraulic conductivity is plotted below the assumed phreatic surface.
Corrected HPT Pressure	Calculated by subtracting the absolute hydrostatic pressure from the average HPT pressure at each depth increment.
Additional Comments	Estimated Hydraulic Conductivity was calculated using Geoprobe Systems® Direct Image® software.

Hydraulic Profiling Tool (HPT) and Equipment for this Project	
Component	HPT Probe and Array with Top Dipole
Manufacturer	Geoprobe Systems®
Model Number	K6050
Additional comments	None

REPORT APPENDICES

The appendices listed below are included in the report:

- **Cone Penetration Test (CPTu) Summary and Standard CPTu Plots**
- **CPTu Standard Plots with Reduced Scales**
- **Advanced CPTu Plots with Ic, Su(Nkt), Phi, and N1(60)Ic**
- **Resistivity Cone Penetration Test (RCPTu) Plots**
- **Soil Behavior Type (SBT) Scatter Plots**
- **Pore Pressure Dissipation Test (PPDT) Summary and PPDT Plots**
- **Hydraulic Profiling Tool (HPT) Summary and Plots**
- **HPT PPDT Plots**
- **Supplementary Documents and Materials**

Cone Penetration Test (CPTu) Summary and Standard CPTu Plots

CONETEC

Job No: 25-56-30135
Client: Geosyntec Consultants, Inc
Project: Vina GSA Component 5
Start Date: 2025-09-03
End Date: 2025-09-05

CONE PENETRATION TEST SUMMARY

Sounding ID	File Name	Date	Cone	Cone Area (cm^2)	Assumed Phreatic Surface[1] (ft)	Final Depth (ft)	Northing[2]	Easting[2]	Surface Elevation[3] (ft)	Refer to Notation Number
CPT-1	25-56-30135_RP01	2025-09-03	968:T1500F15U35	15		30.92	4395277	599115	176	4
CPT-2	25-56-30135_RP02	2025-09-03	968:T1500F15U35	15		41.99	4395111	599129	176	4
CPT-3	25-56-30135_RP03	2025-09-04	968:T1500F15U35	15		42.08	4394726	599128	174	4
CPT-4	25-56-30135_RP04	2025-09-04	968:T1500F15U35	15		91.37	4394740	598643	176	4
CPT-5	25-56-30135_RP05	2025-09-04	968:T1500F15U35	15		28.30	4394919	598834	175	4
CPT-6	25-56-30135_RP06	2025-09-04	968:T1500F15U35	15		47.74	4394541	598572	172	4
CPT-7	25-56-30135_RP07	2025-09-03	968:T1500F15U35	15		37.65	4395121	598695	177	4
CPT-8	25-56-30135_RP08	2025-09-04	968:T1500F15U35	15		33.79	4394566	598864	170	4
CPT-B-1	25-56-30135_RP-B01	2025-09-05	968:T1500F15U35	15	7.9	18.04	4406782	593403	175	5
CPT-B-2	25-56-30135_RP-B02	2025-09-05	968:T1500F15U35	15	7.9	17.06	4406795	593353	174	
Totals	10 Soundings					388.94 ft				

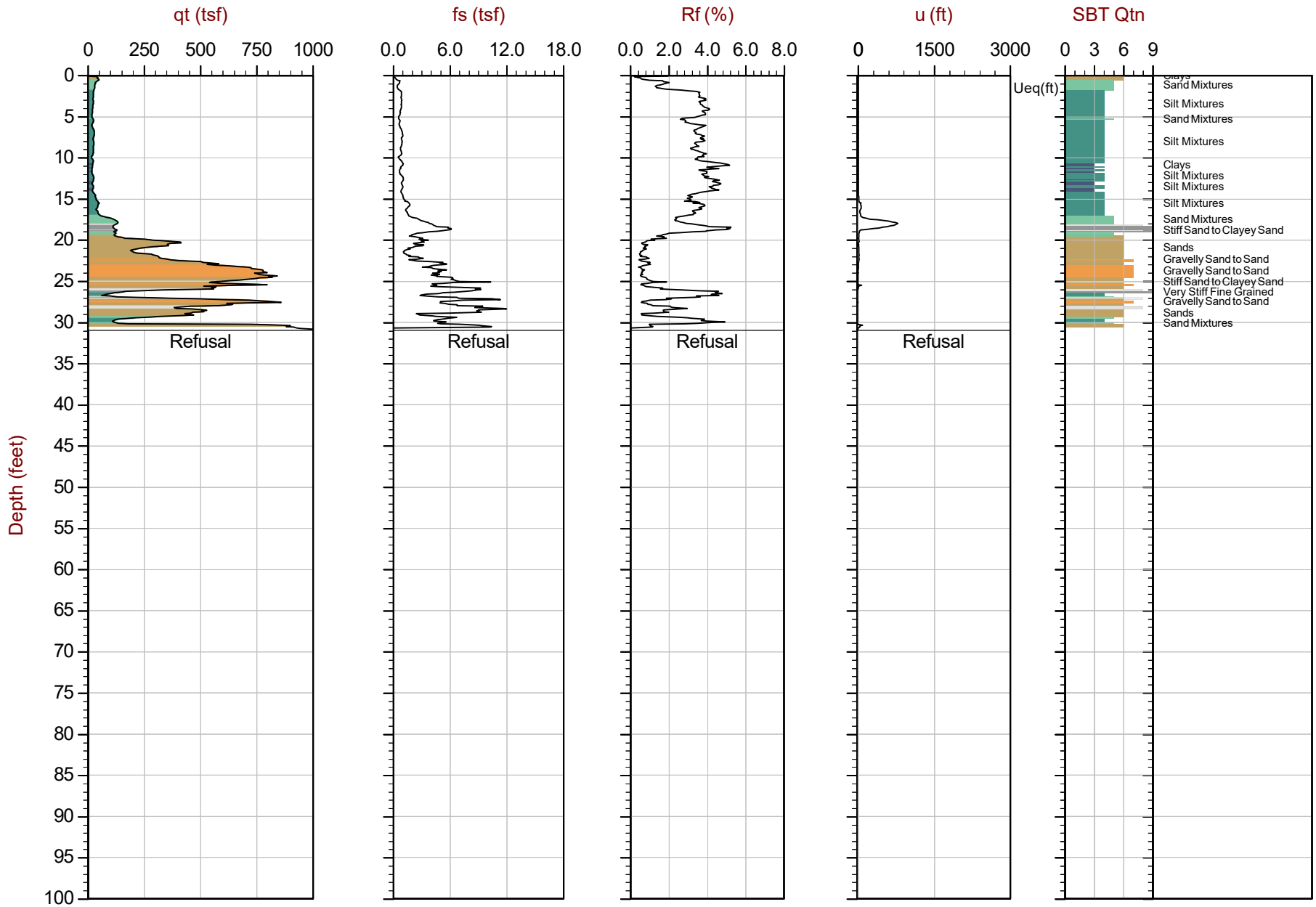
1. The assumed phreatic surface was based off the shallowest pore pressure dissipation tests performed within or nearest the sounding. Hydrostatic conditions were assumed for the calculated parameters.
2. The coordinates were collected using consumer grade GPS. EPSG number: 32610 (WGS84 / UTM Zone 10 North).
3. Elevations are referenced to the ground surface and were acquired from the Google Earth Elevation for the recorded coordinates.
4. The phreatic surface was not determined.
5. The assumed phreatic surface is based on the pore pressure dissipation test results from CPT-B-2.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-03 12:36
Site: Vina GSA Component 5

Sounding: CPT-1
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 9.425 m / 30.92 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4395277m E: 599115m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

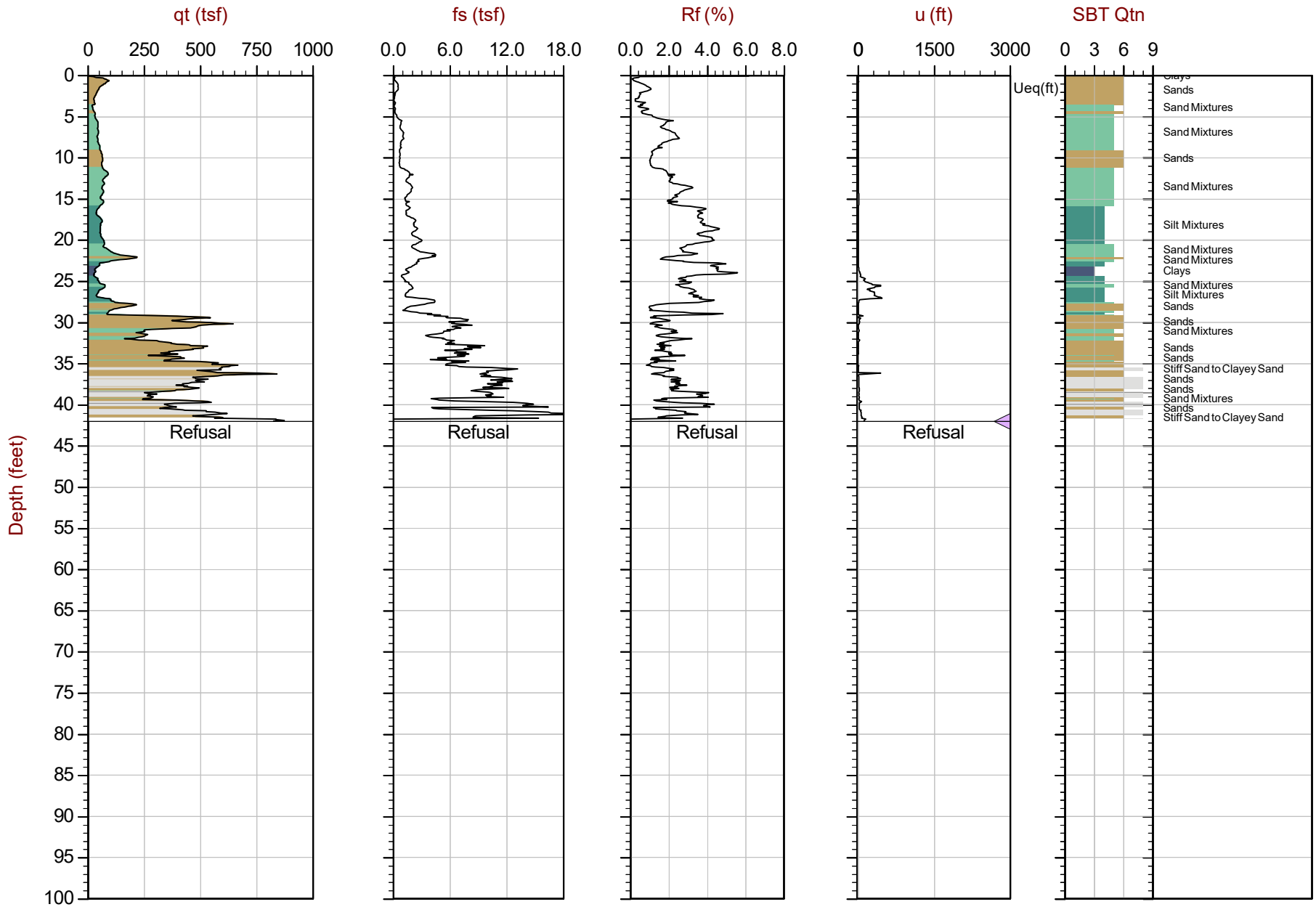
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-03 13:41
Site: Vina GSA Component 5

Sounding: CPT-2
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 12.800 m / 41.99 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4395111m E: 599129m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

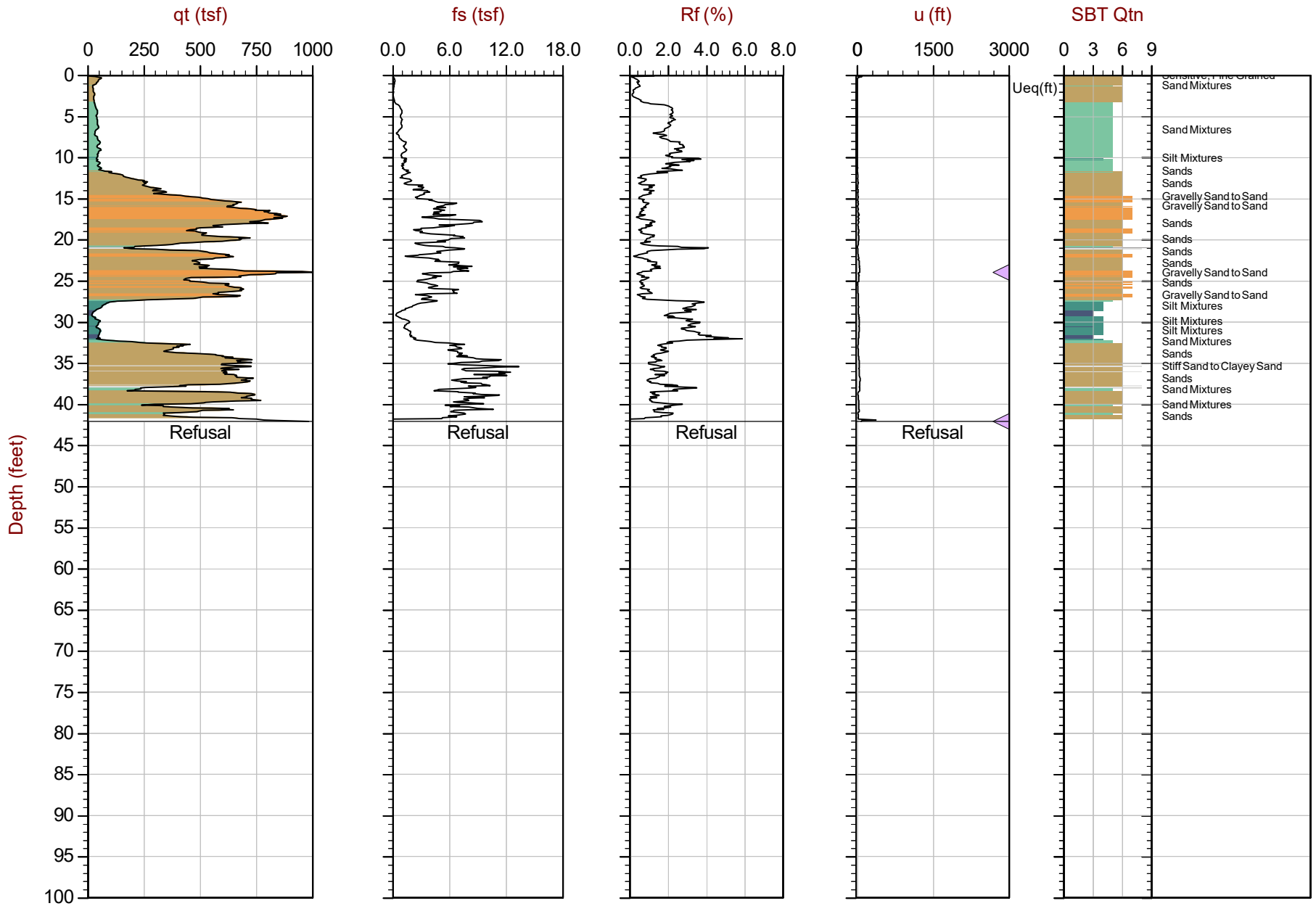
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 07:29
Site: Vina GSA Component 5

Sounding: CPT-3
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 12.825 m / 42.08 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP03.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394726m E: 599128m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

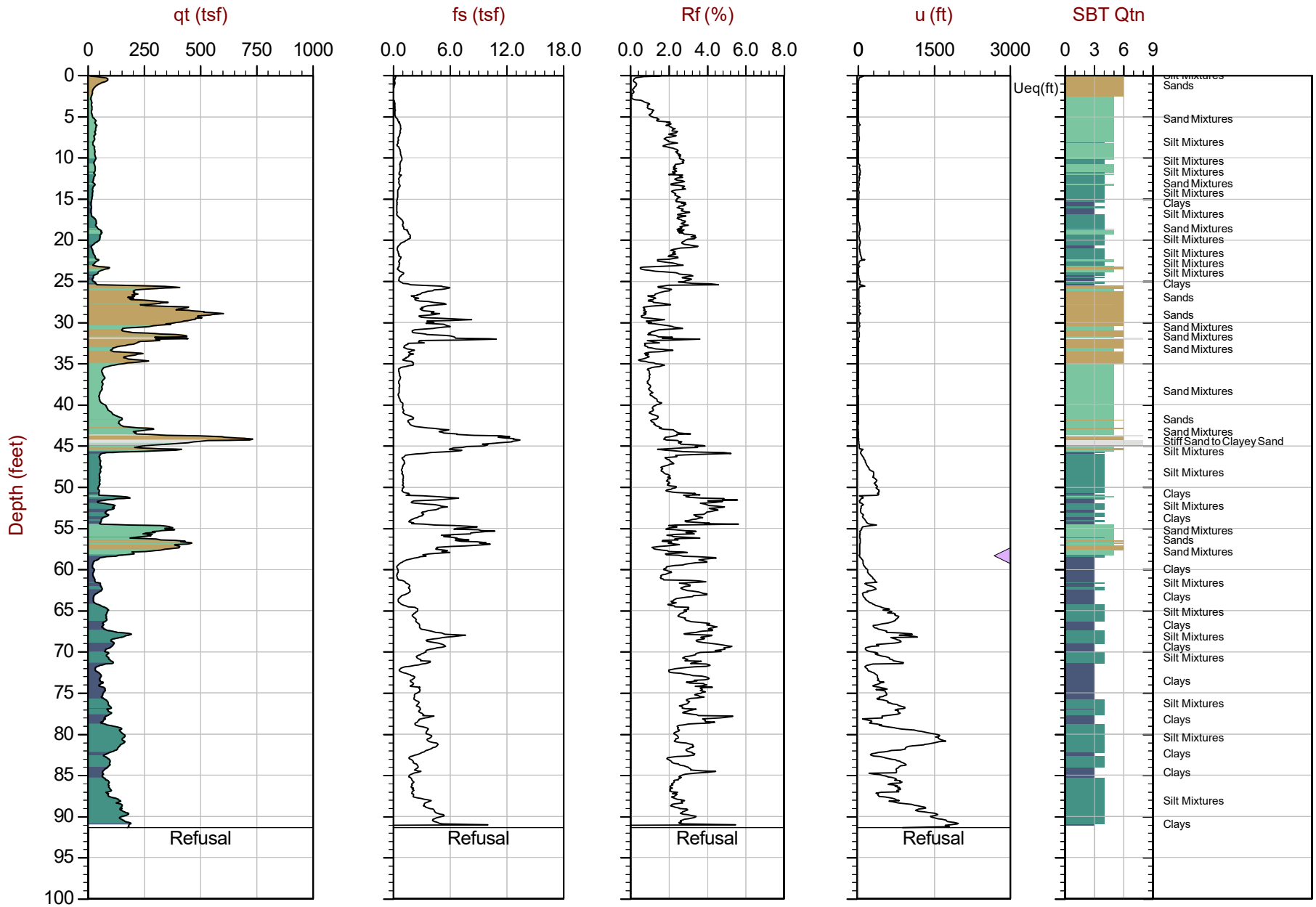
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 10:20
Site: Vina GSA Component 5

Sounding: CPT-4
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 27.850 m / 91.37 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP04.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394740m E: 598643m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

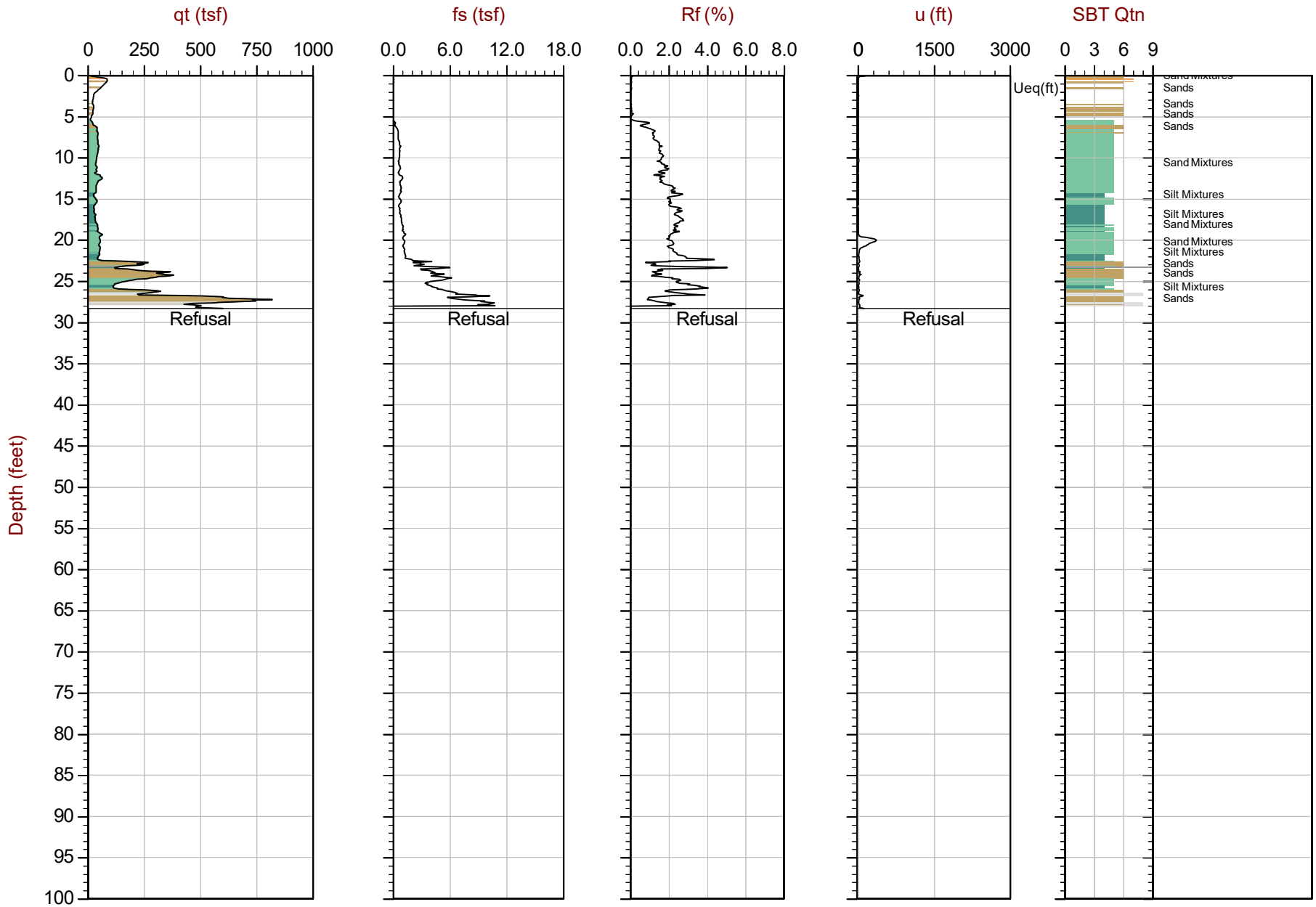
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 13:29
Site: Vina GSA Component 5

Sounding: CPT-5
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 8.625 m / 28.30 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP05.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394919m E: 598834m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

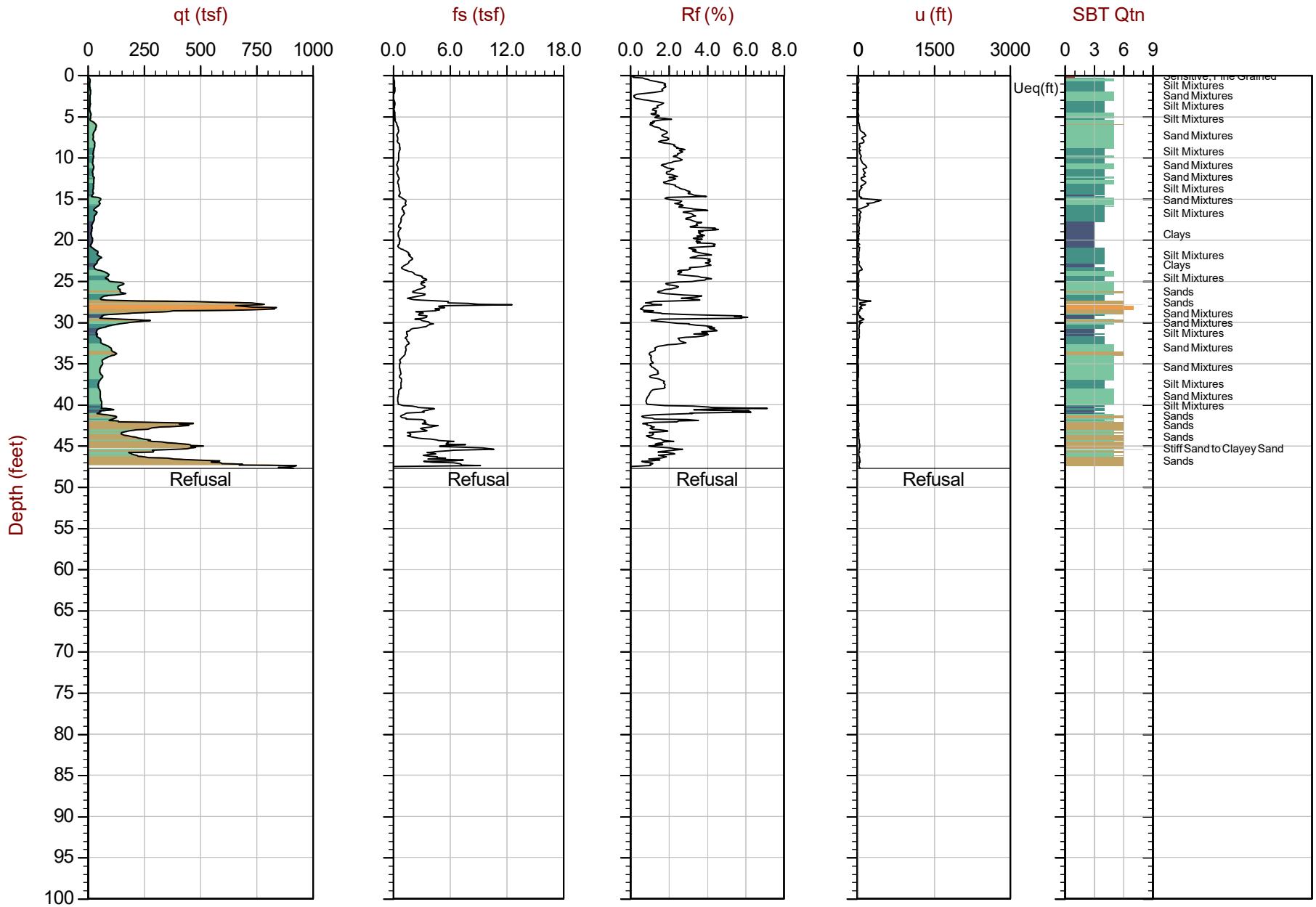
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 12:18
Site: Vina GSA Component 5

Sounding: CPT-6
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 14.550 m / 47.74 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP06.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394541m E: 598572m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

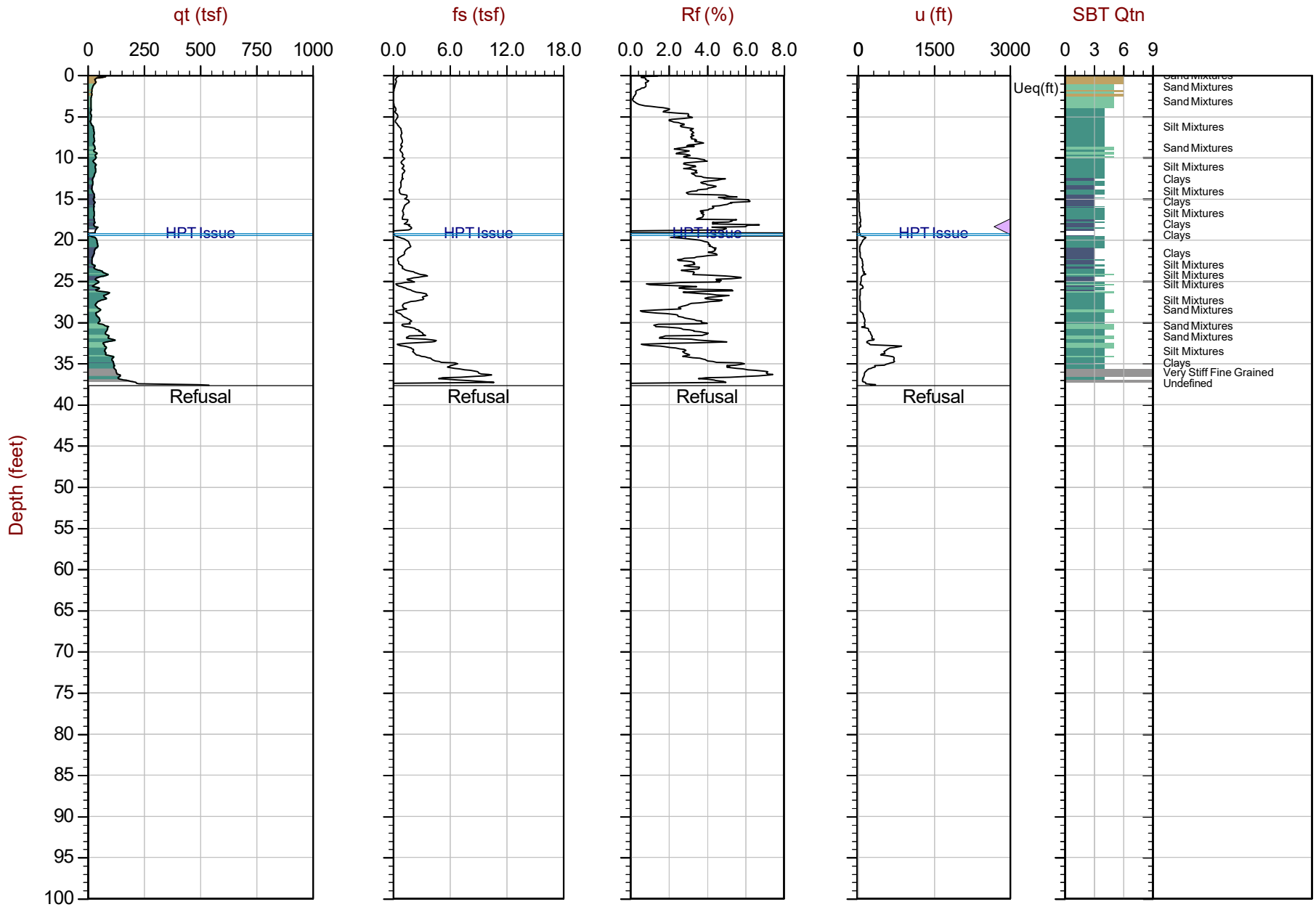
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-03 10:46
Site: Vina GSA Component 5

Sounding: CPT-7
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 11.475 m / 37.65 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP07.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4395121m E: 598695m

Overplot Item: Ueq, Assumed Ueq, Dissipation, Ueq achieved, Dissipation, Ueq not achieved, Dissipation, Ueq assumed, Hydrostatic Line

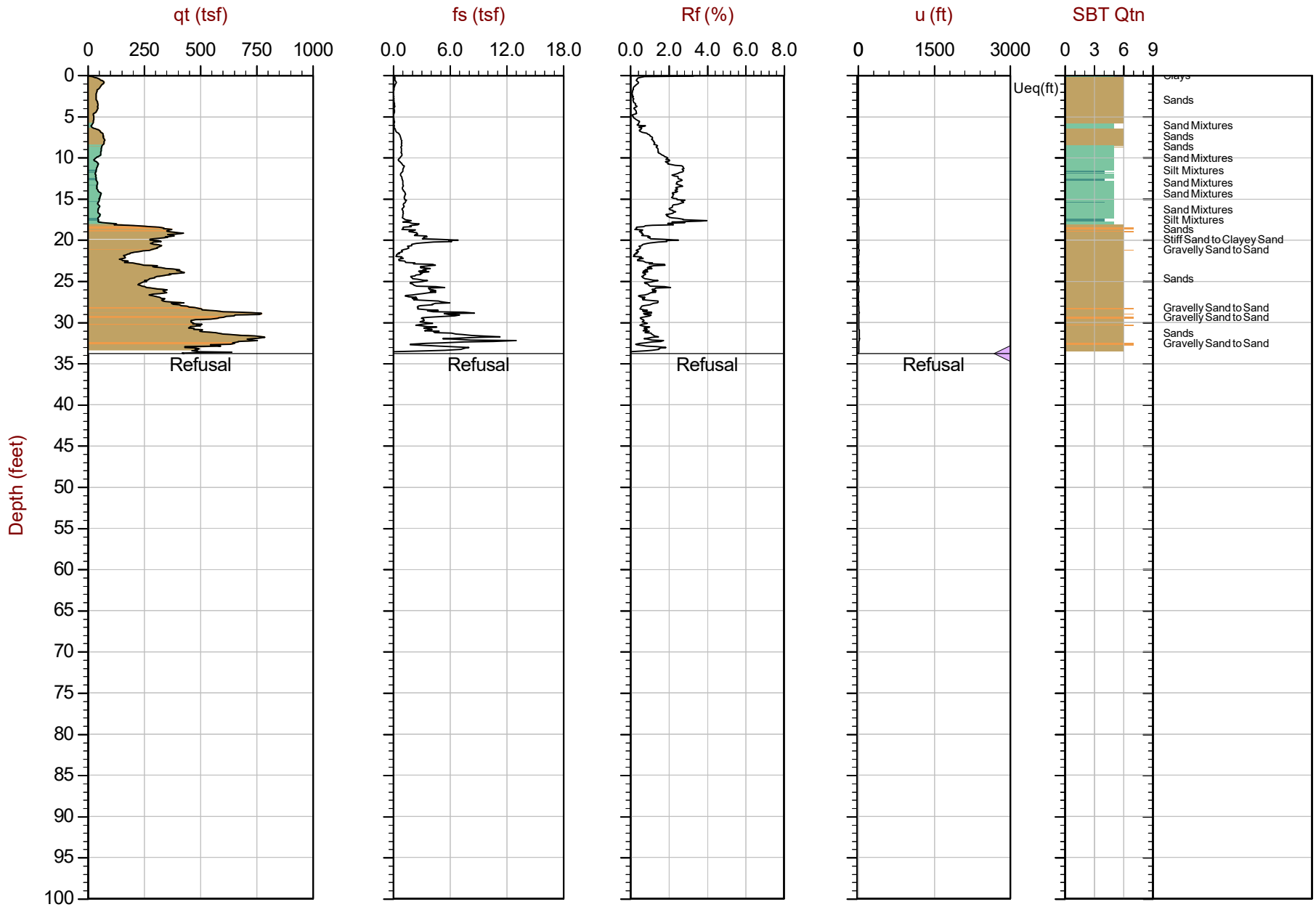
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 09:10
Site: Vina GSA Component 5

Sounding: CPT-8
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 10.300 m / 33.79 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP08.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394566m E: 598864m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

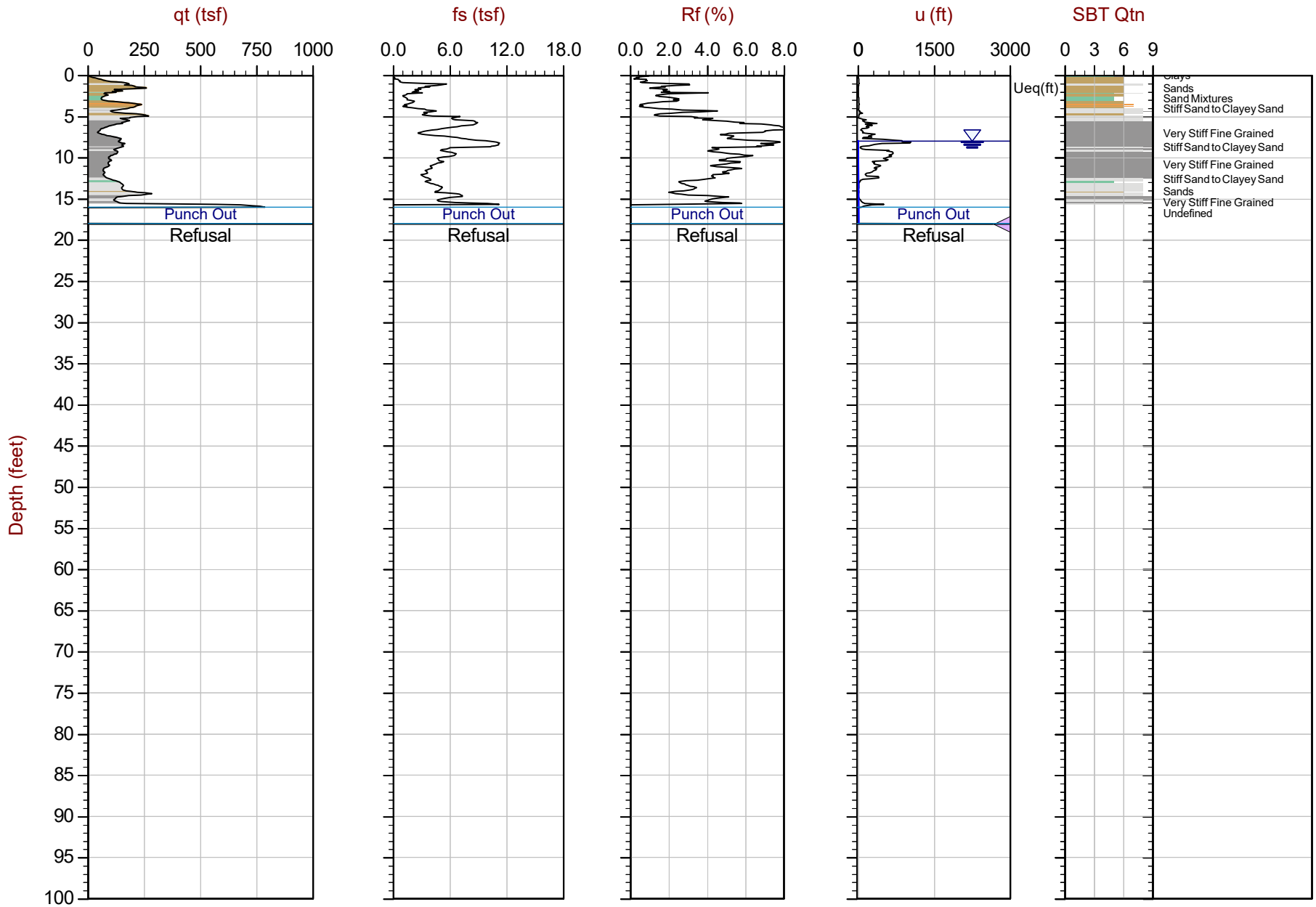
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-05 06:28
Site: Vina GSA Component 5

Sounding: CPT-B-1
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 5.500 m / 18.04 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP-B01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4406782m E: 593403m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

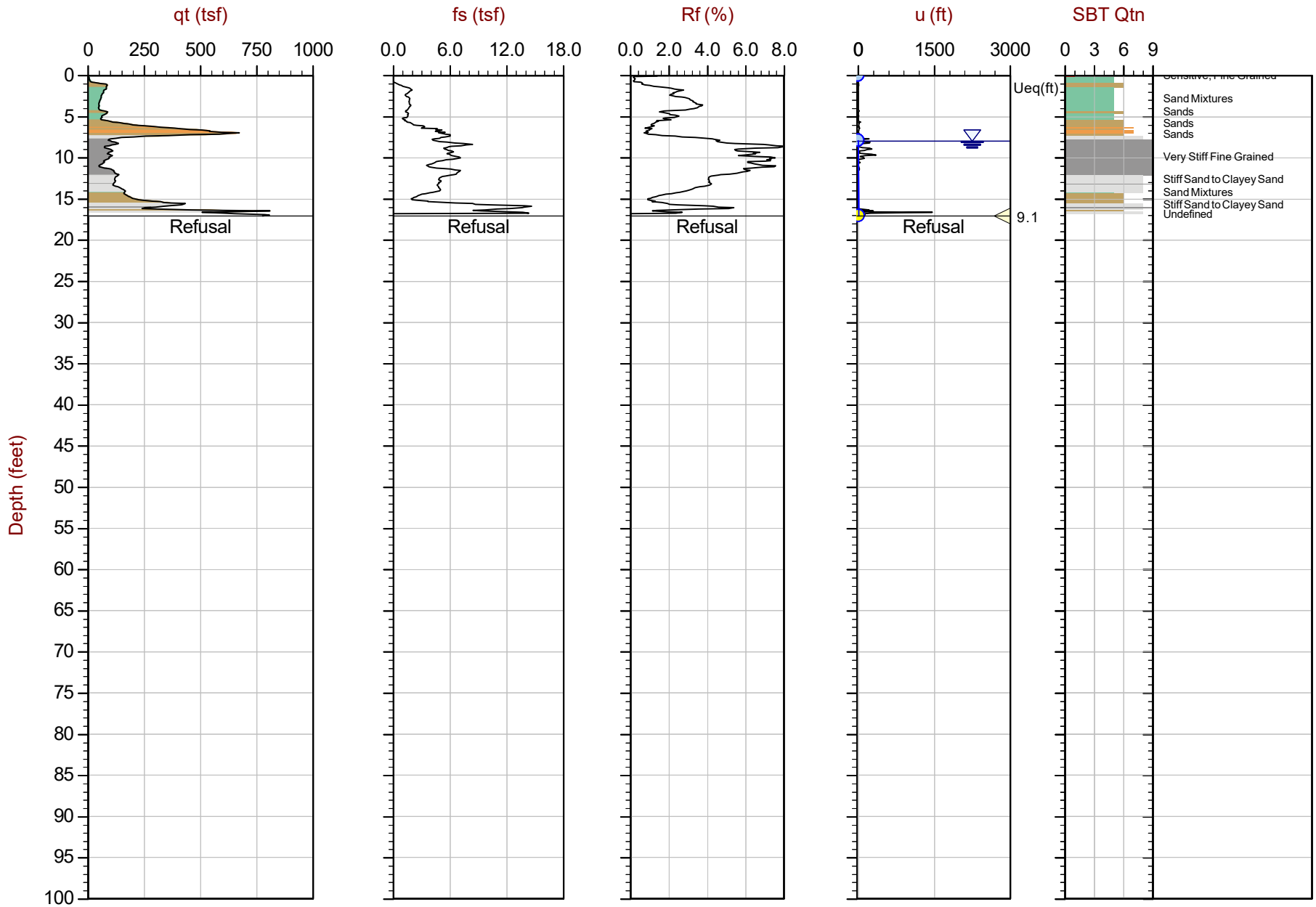
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-05 08:21
Site: Vina GSA Component 5

Sounding: CPT-B-2
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 5.200 m / 17.06 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP-B02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4406795m E: 593353m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Standard Cone Penetration Test Plots with Reduced Scales

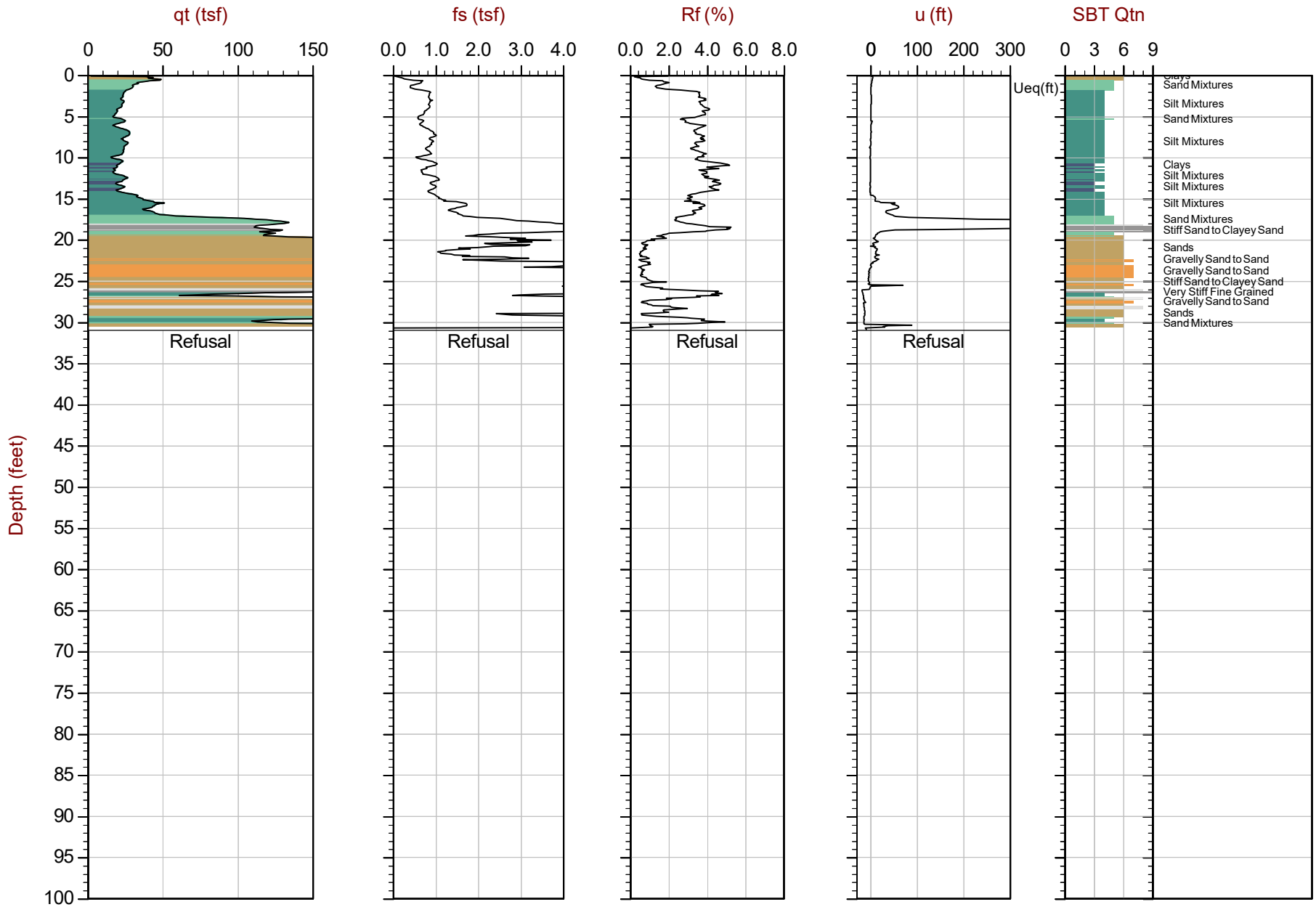
CONETEC

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-03 12:36
Site: Vina GSA Component 5

Sounding: CPT-1
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 9.425 m / 30.92 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4395277m E: 599115m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

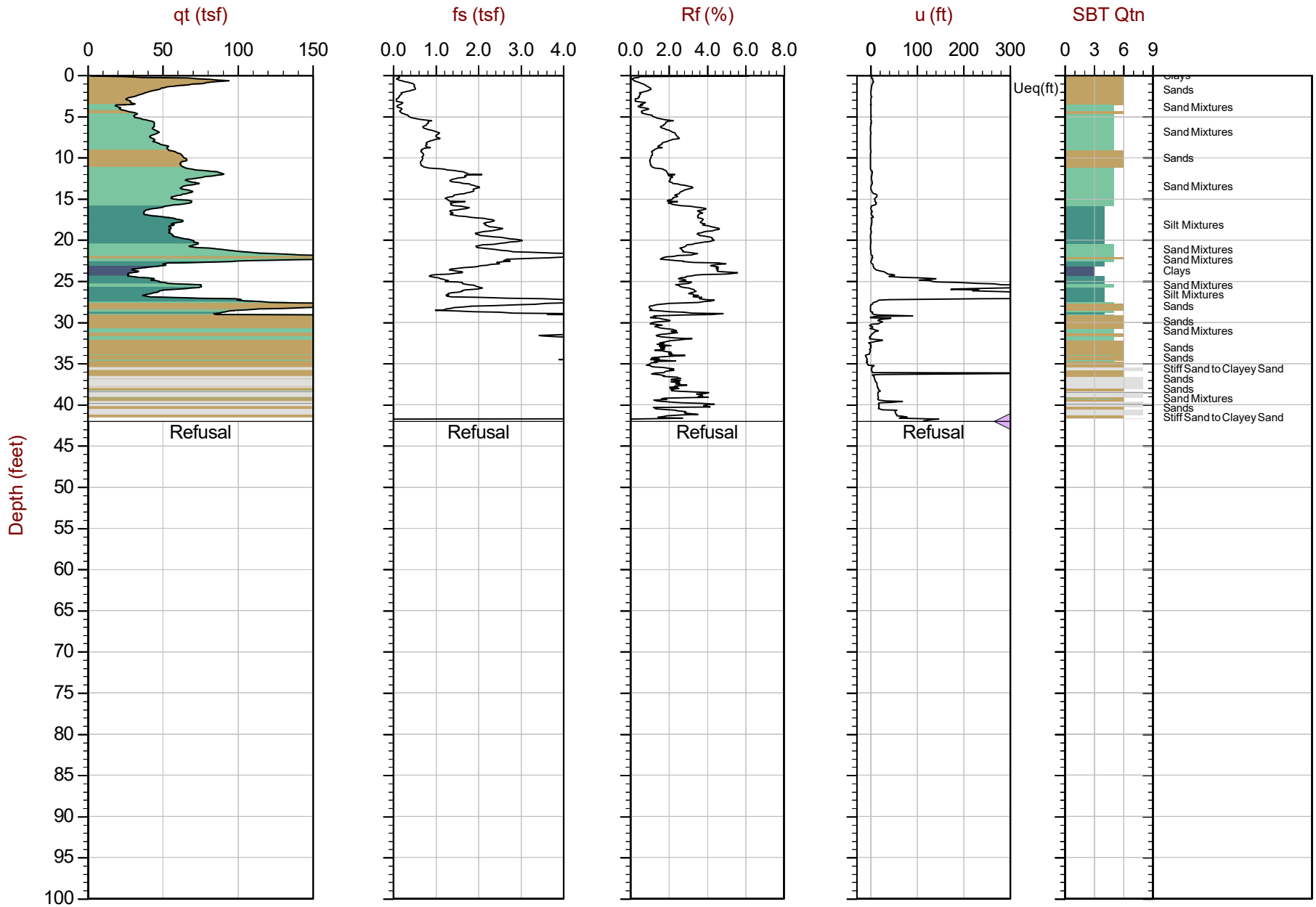
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-03 13:41
Site: Vina GSA Component 5

Sounding: CPT-2
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 12.800 m / 41.99 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4395111m E: 599129m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

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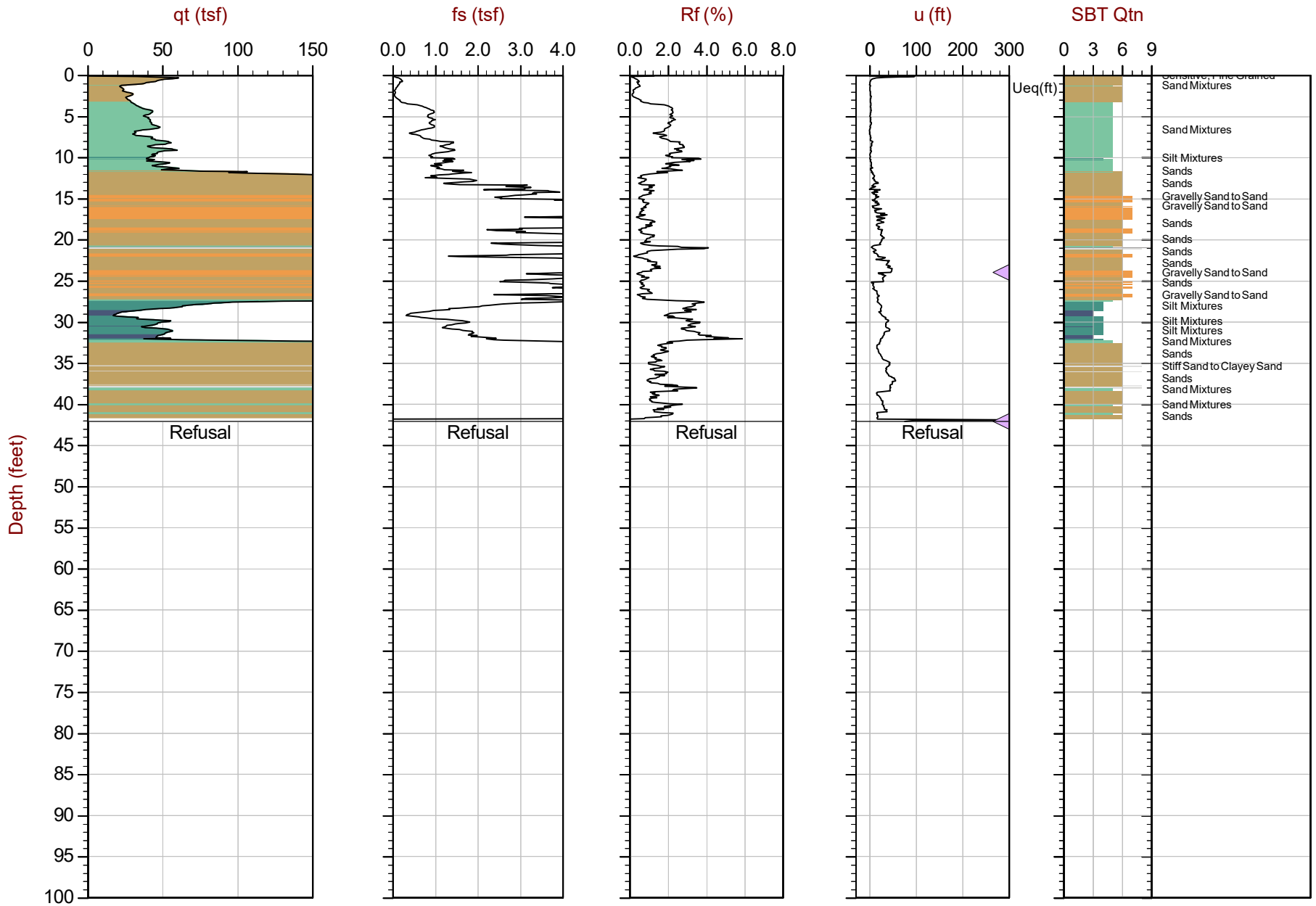
CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 07:29
Site: Vina GSA Component 5

Sounding: CPT-3
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 12.825 m / 42.08 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP03.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394726m E: 599128m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

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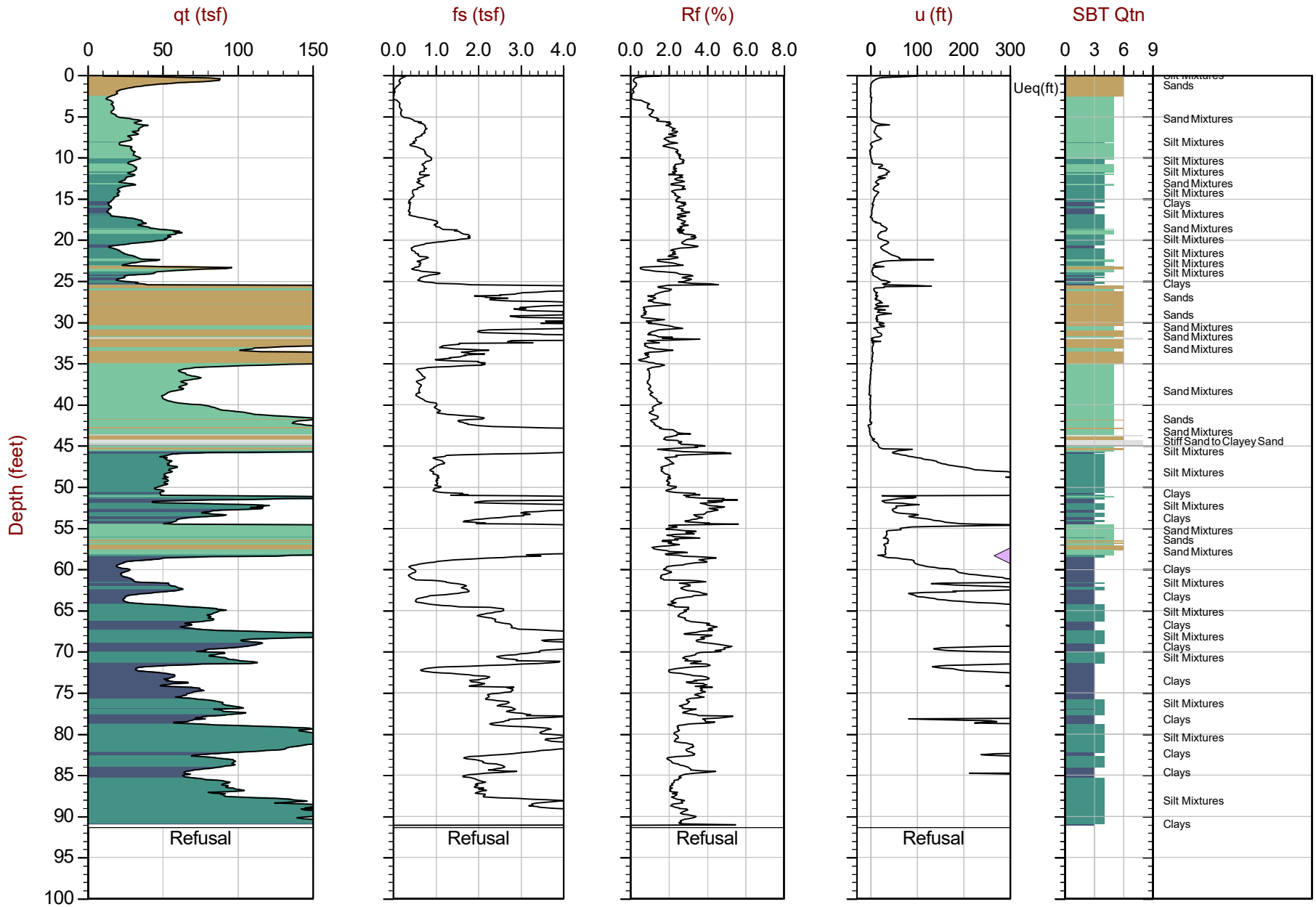
CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 10:20
Site: Vina GSA Component 5

Sounding: CPT-4
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 27.850 m / 91.37 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP04.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394740m E: 598643m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

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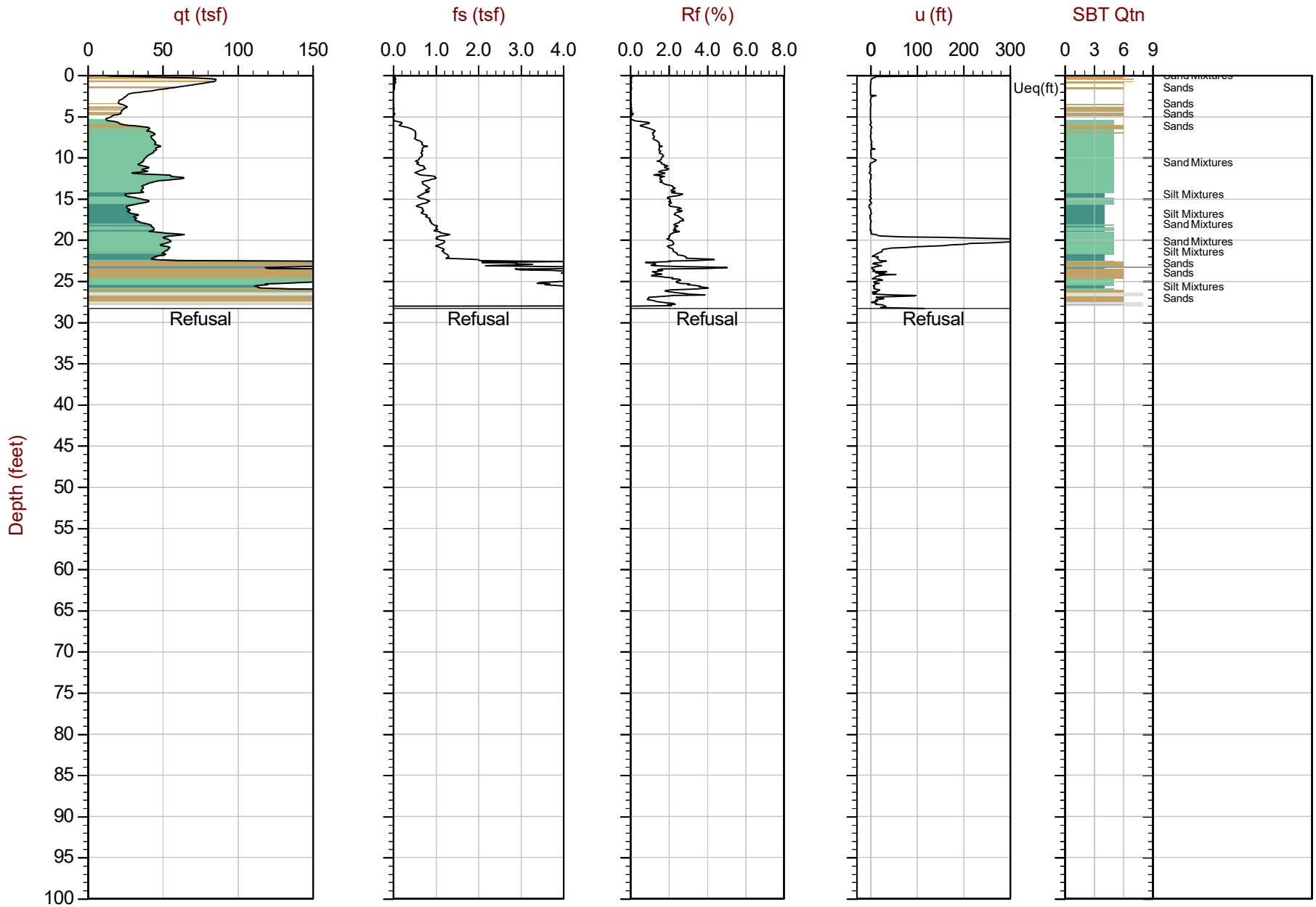
CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 13:29
Site: Vina GSA Component 5

Sounding: CPT-5
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 8.625 m / 28.30 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP05.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394919m E: 598834m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

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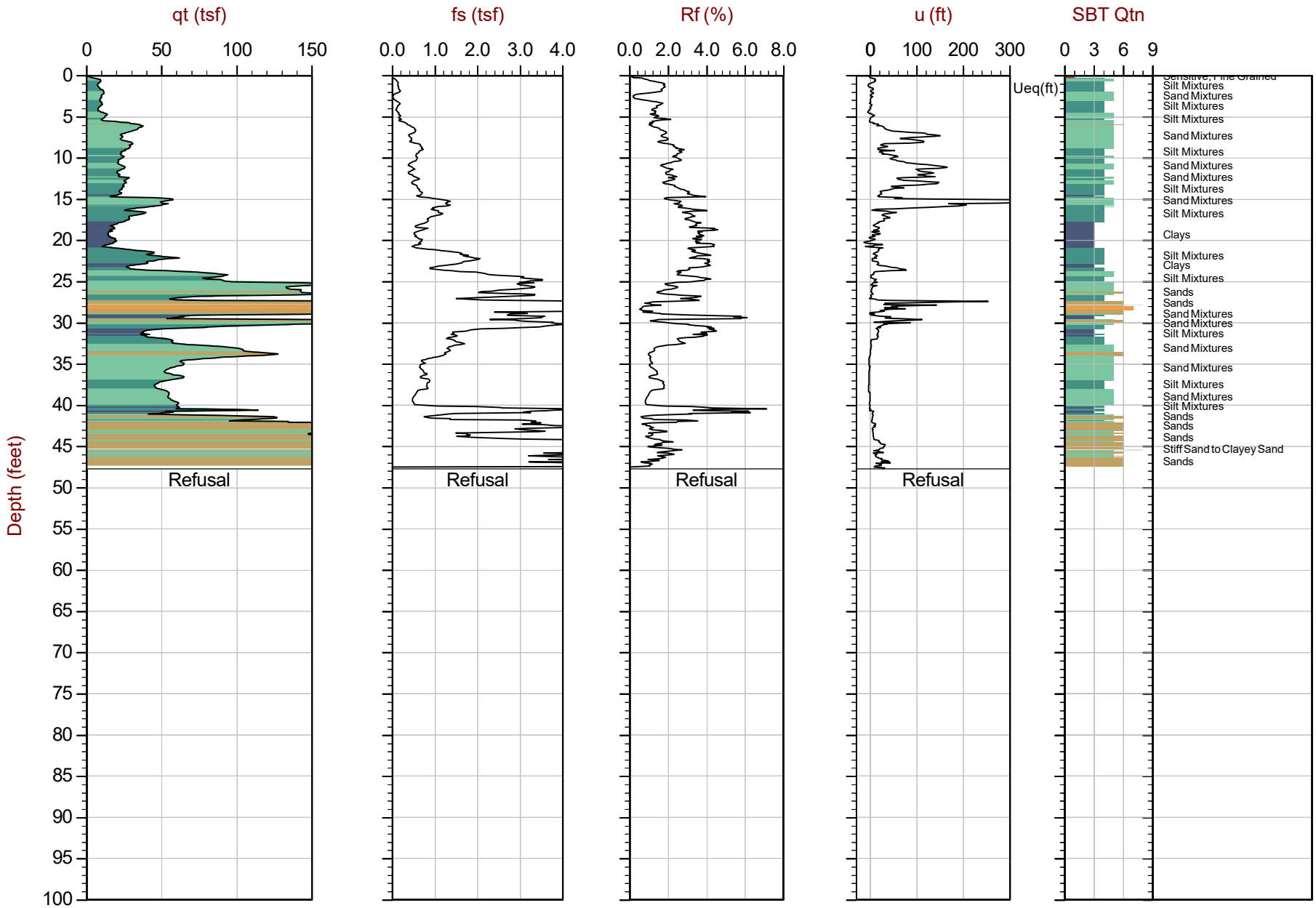
CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 12:18
Site: Vina GSA Component 5

Sounding: CPT-6
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 14.550 m / 47.74 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP06.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394541m E: 598572m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

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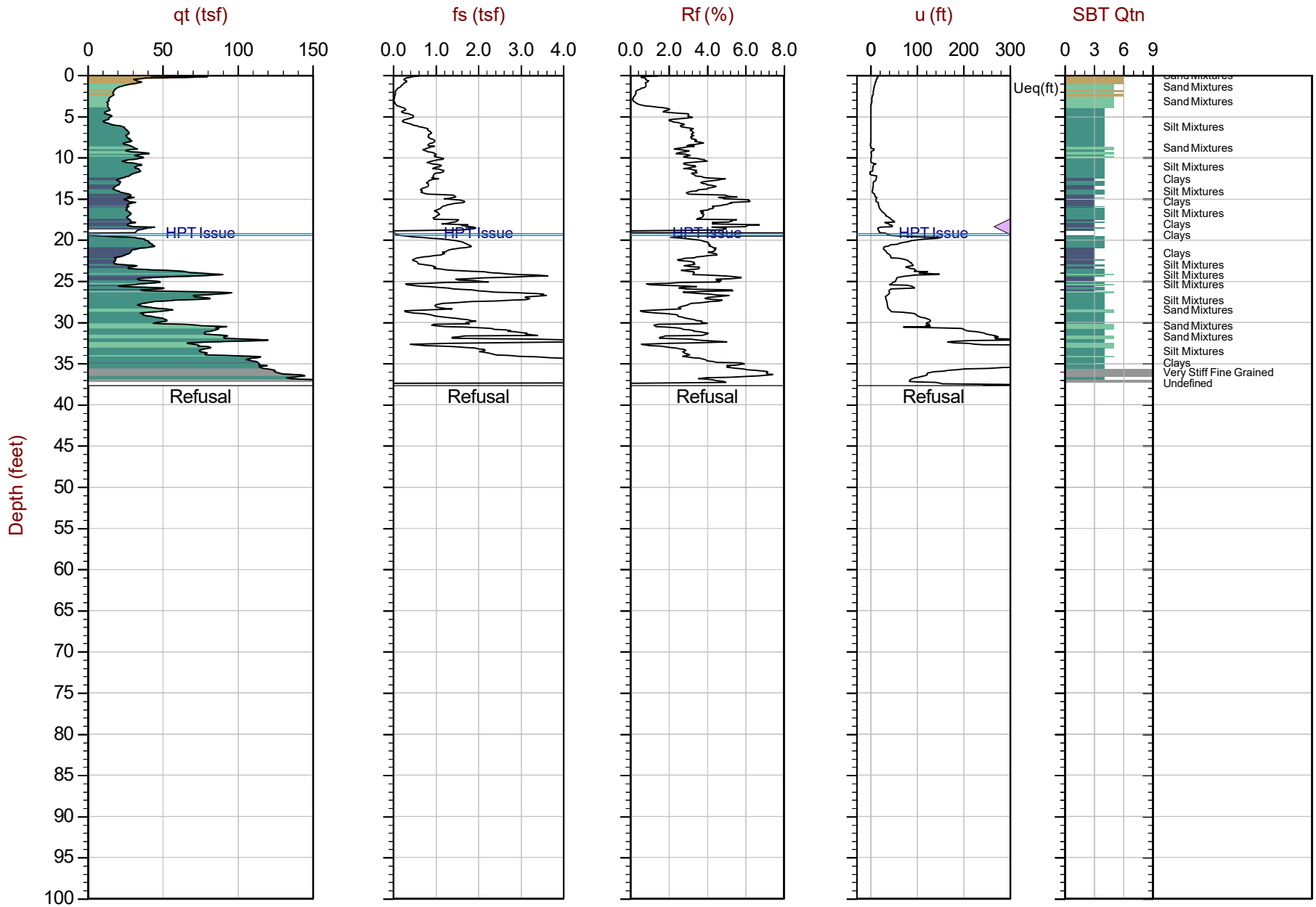
CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-03 10:46
Site: Vina GSA Component 5

Sounding: CPT-7
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 11.475 m / 37.65 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP07.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4395121m E: 598695m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

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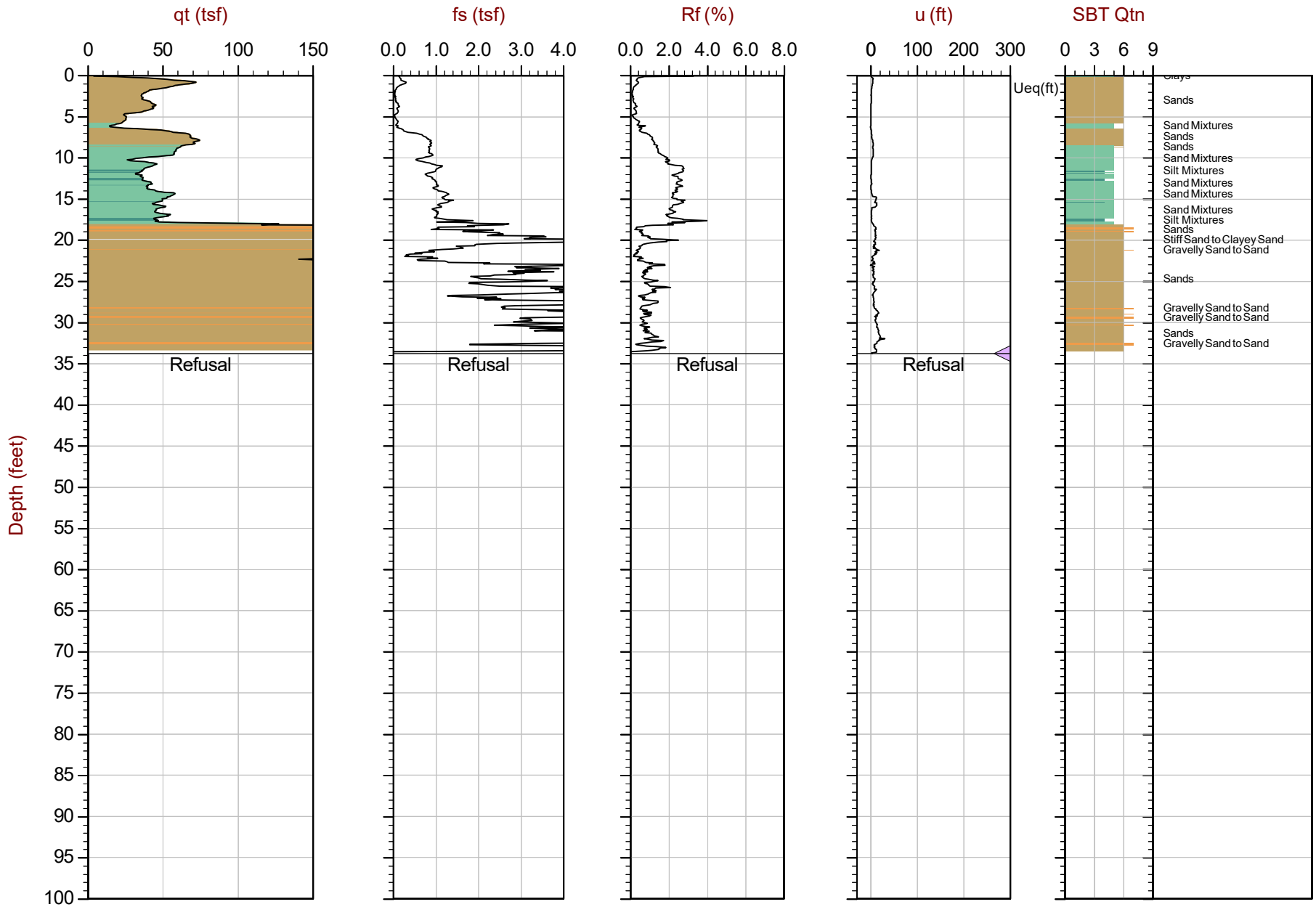
CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 09:10
Site: Vina GSA Component 5

Sounding: CPT-8
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 10.300 m / 33.79 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP08.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394566m E: 598864m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

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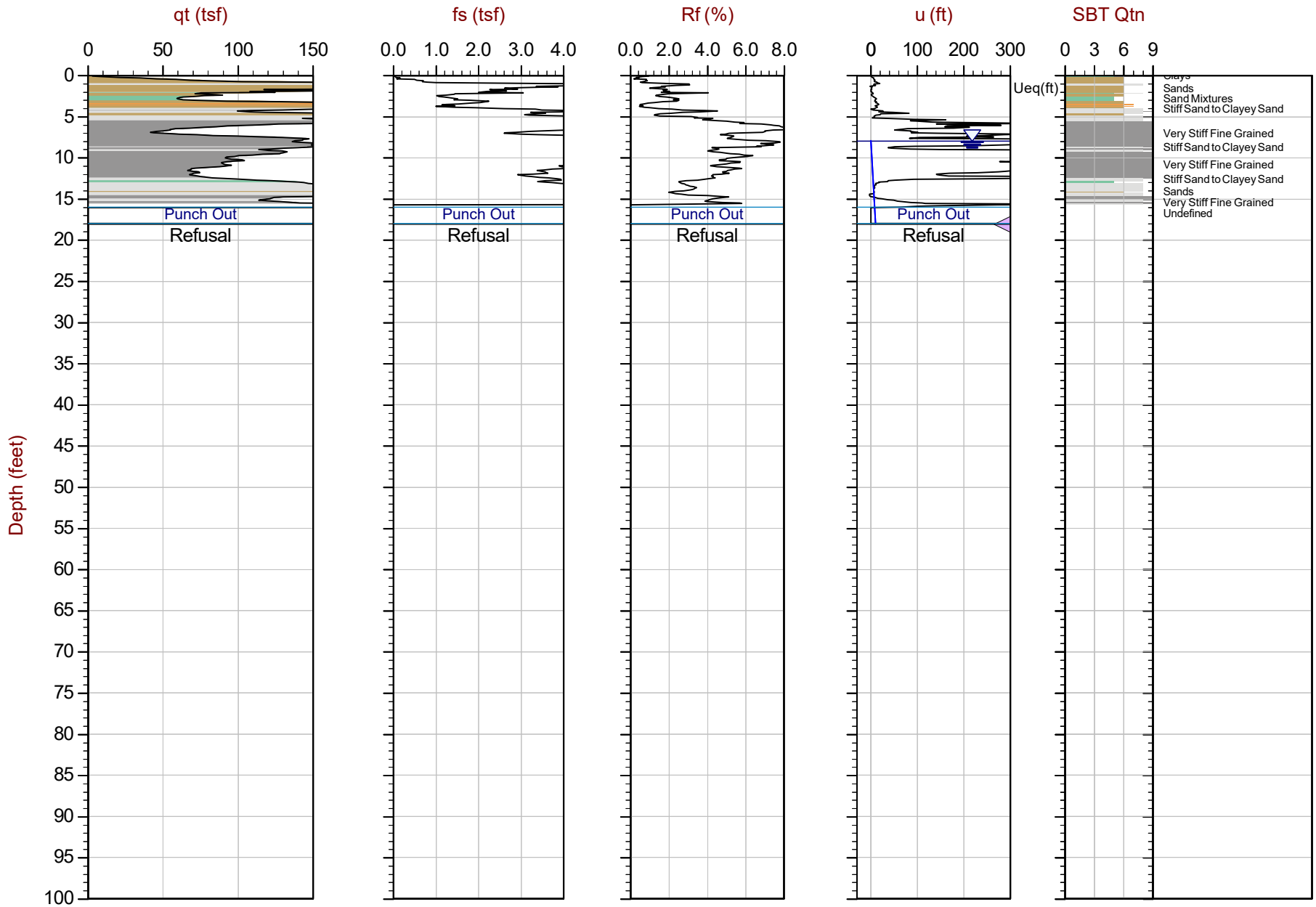
CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-05 06:28
Site: Vina GSA Component 5

Sounding: CPT-B-1
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 5.500 m / 18.04 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP-B01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4406782m E: 593403m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

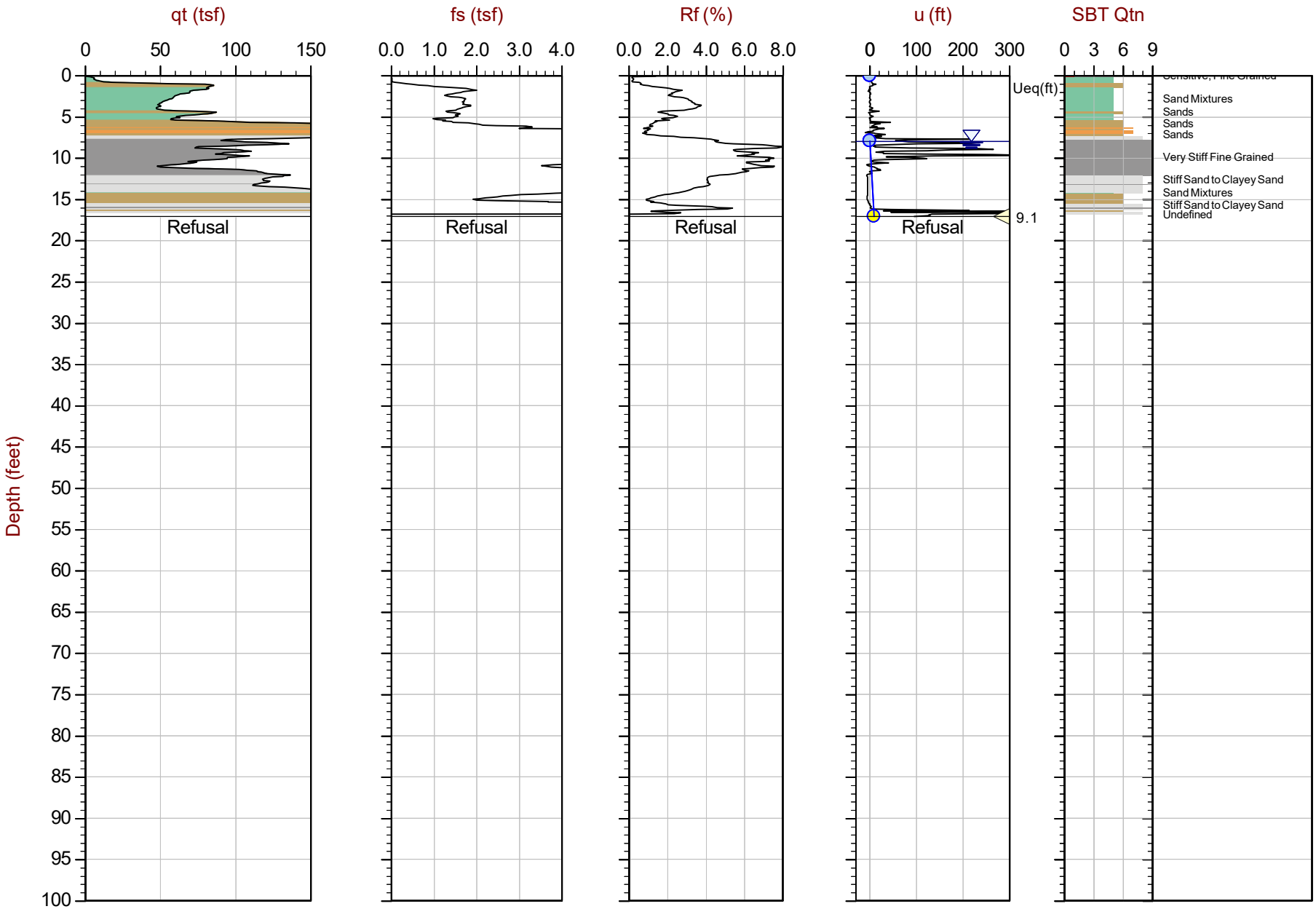
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-05 08:21
Site: Vina GSA Component 5

Sounding: CPT-B-2
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 5.200 m / 17.06 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP-B02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4406795m E: 593353m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Advanced Cone Penetration Test Plots with Ic, Su(Nkt), Phi, and N1(60)Ic

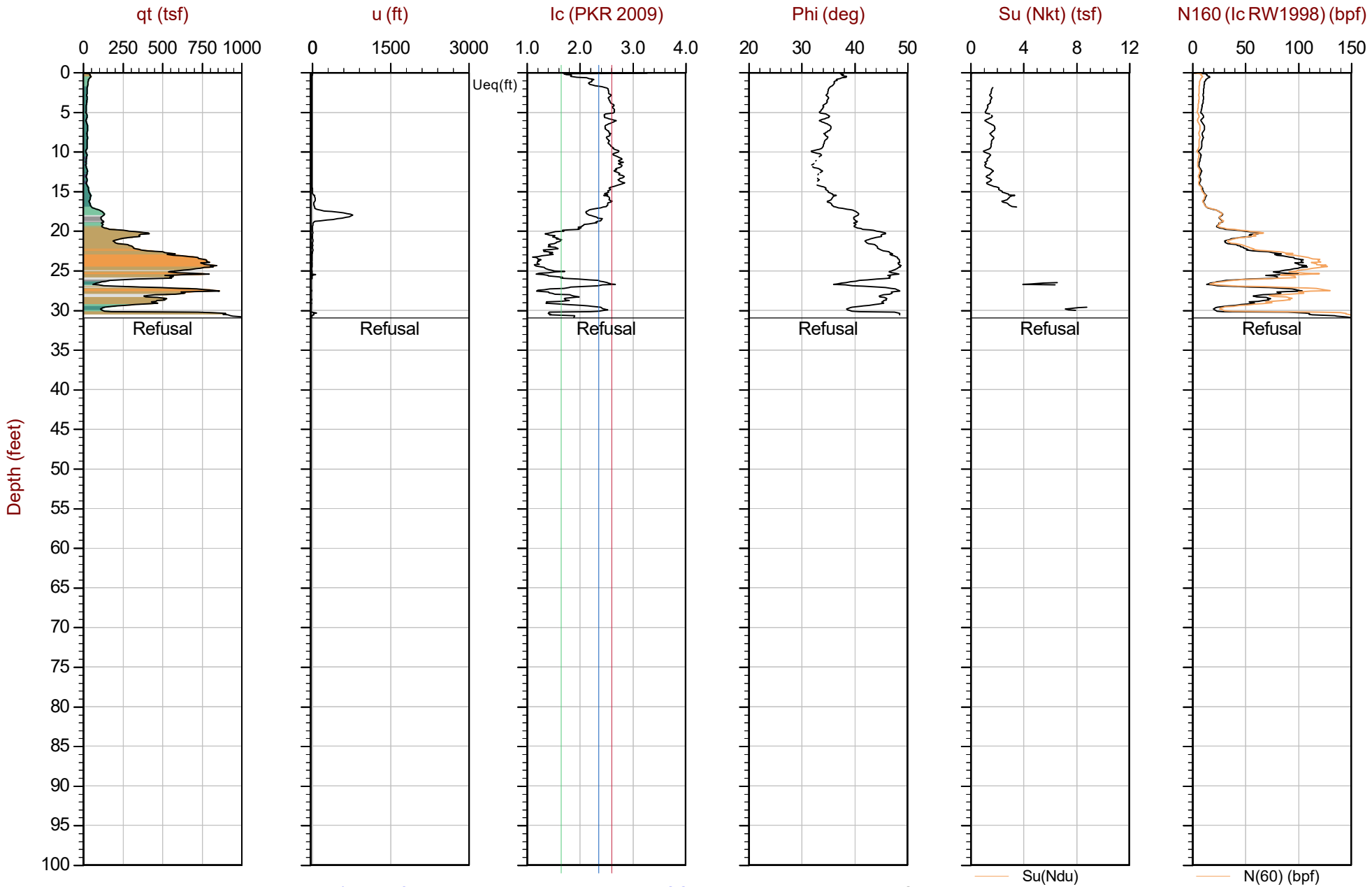
CONETEC

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-03 12:36
Site: Vina GSA Component 5

Sounding: CPT-1
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 9.425 m / 30.92 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP01.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 15.0 / 6.0

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4395277m E: 599115m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

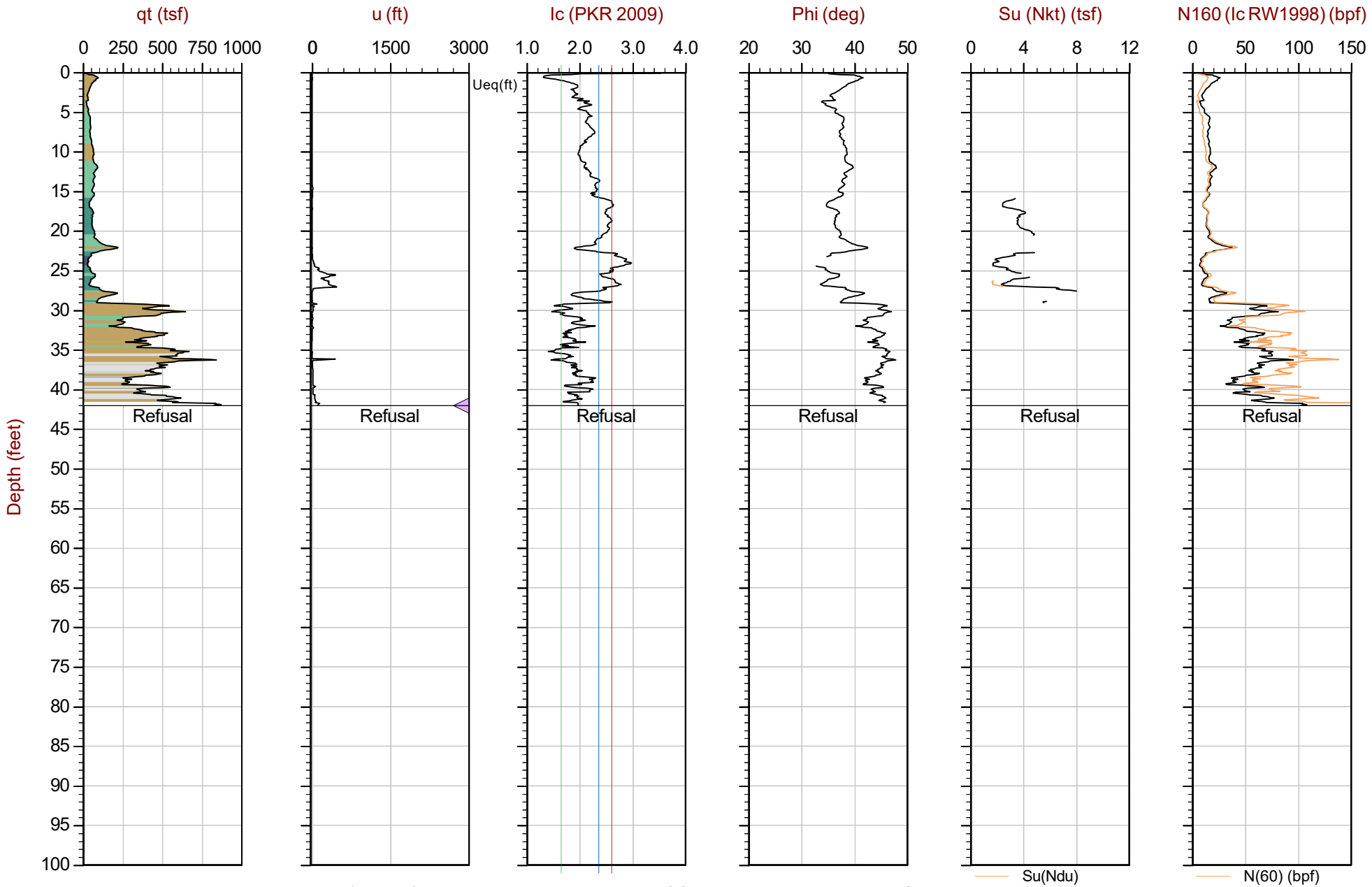
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-03 13:41
Site: Vina GSA Component 5

Sounding: CPT-2
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 12.800 m / 41.99 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP02.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 15.0 / 6.0

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4395111m E: 599129m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

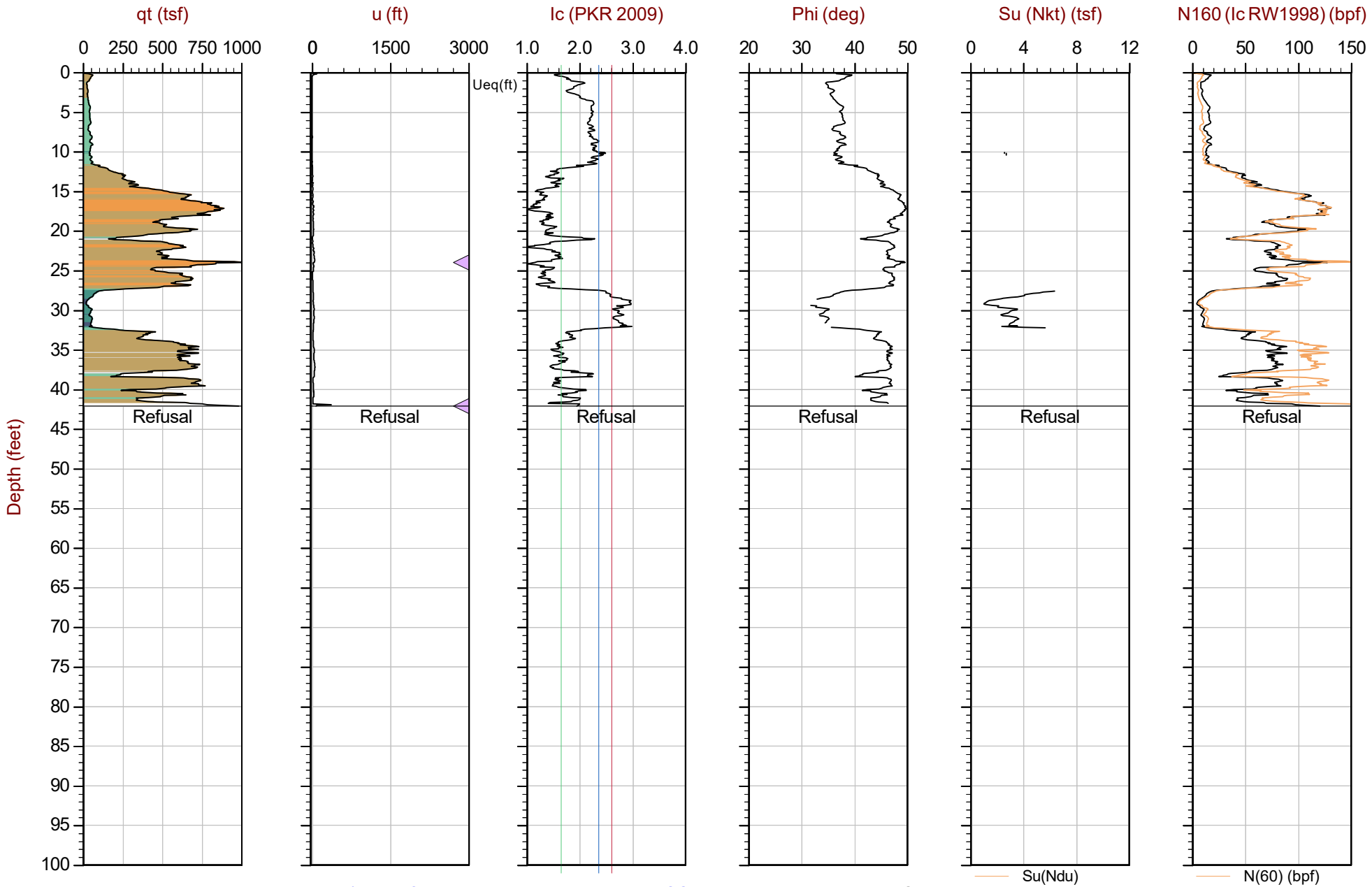
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 07:29
Site: Vina GSA Component 5

Sounding: CPT-3
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 12.825 m / 42.08 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP03.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 15.0 / 6.0

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394726m E: 599128m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

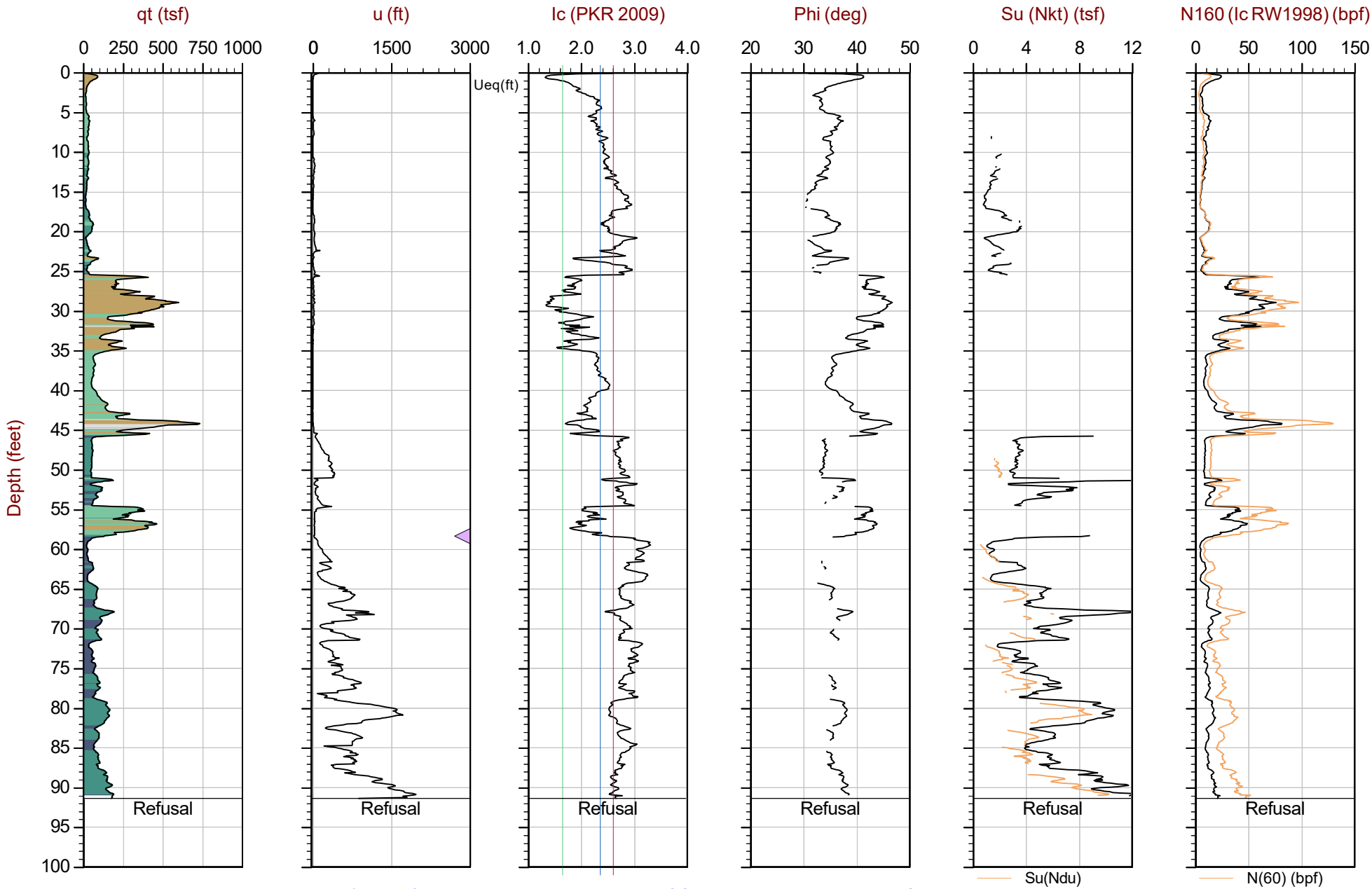
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 10:20
Site: Vina GSA Component 5

Sounding: CPT-4
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 27.850 m / 91.37 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP04.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 15.0 / 6.0

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394740m E: 598643m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

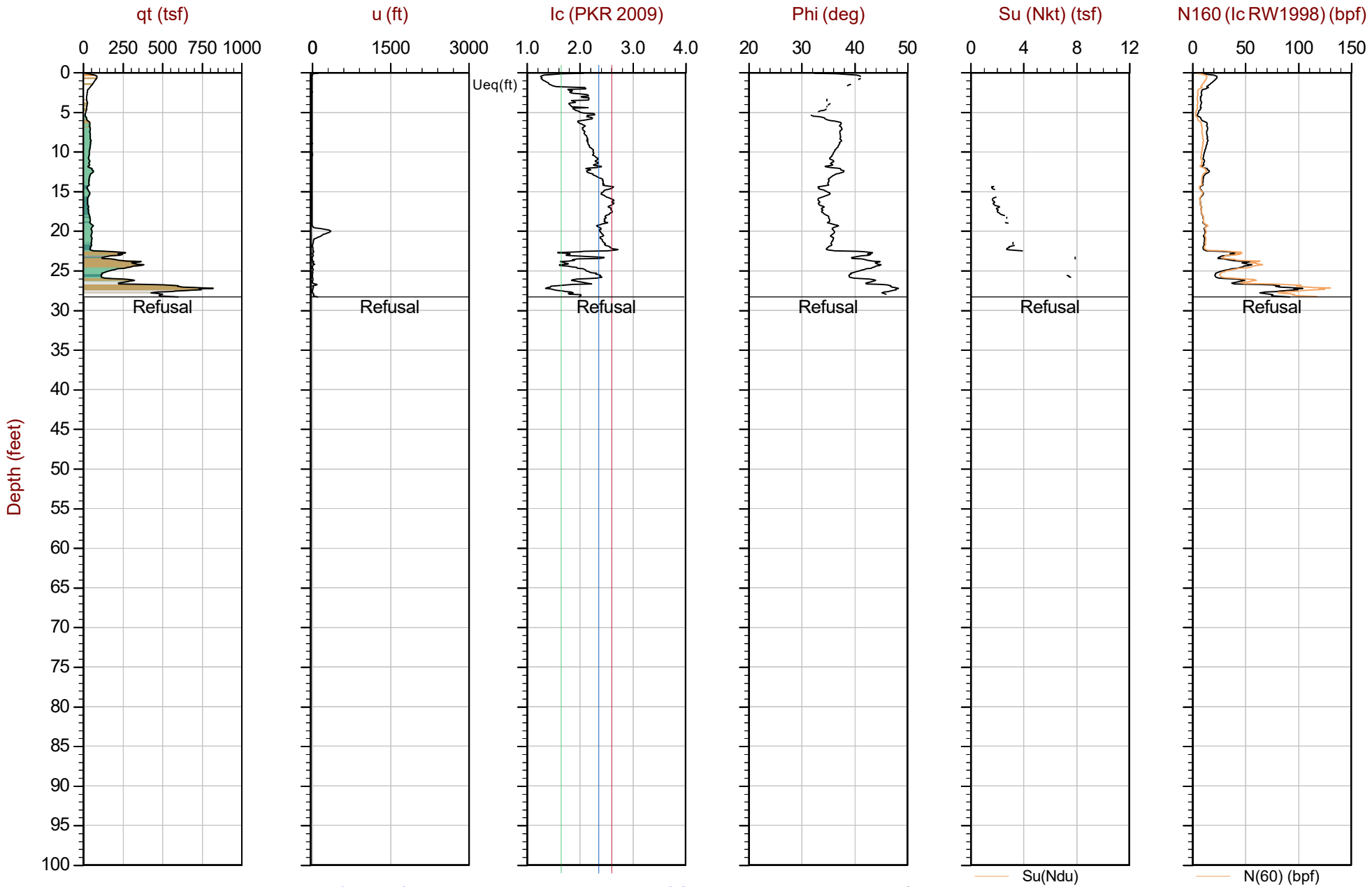
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 13:29
Site: Vina GSA Component 5

Sounding: CPT-5
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 8.625 m / 28.30 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP05.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 15.0 / 6.0

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394919m E: 598834m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

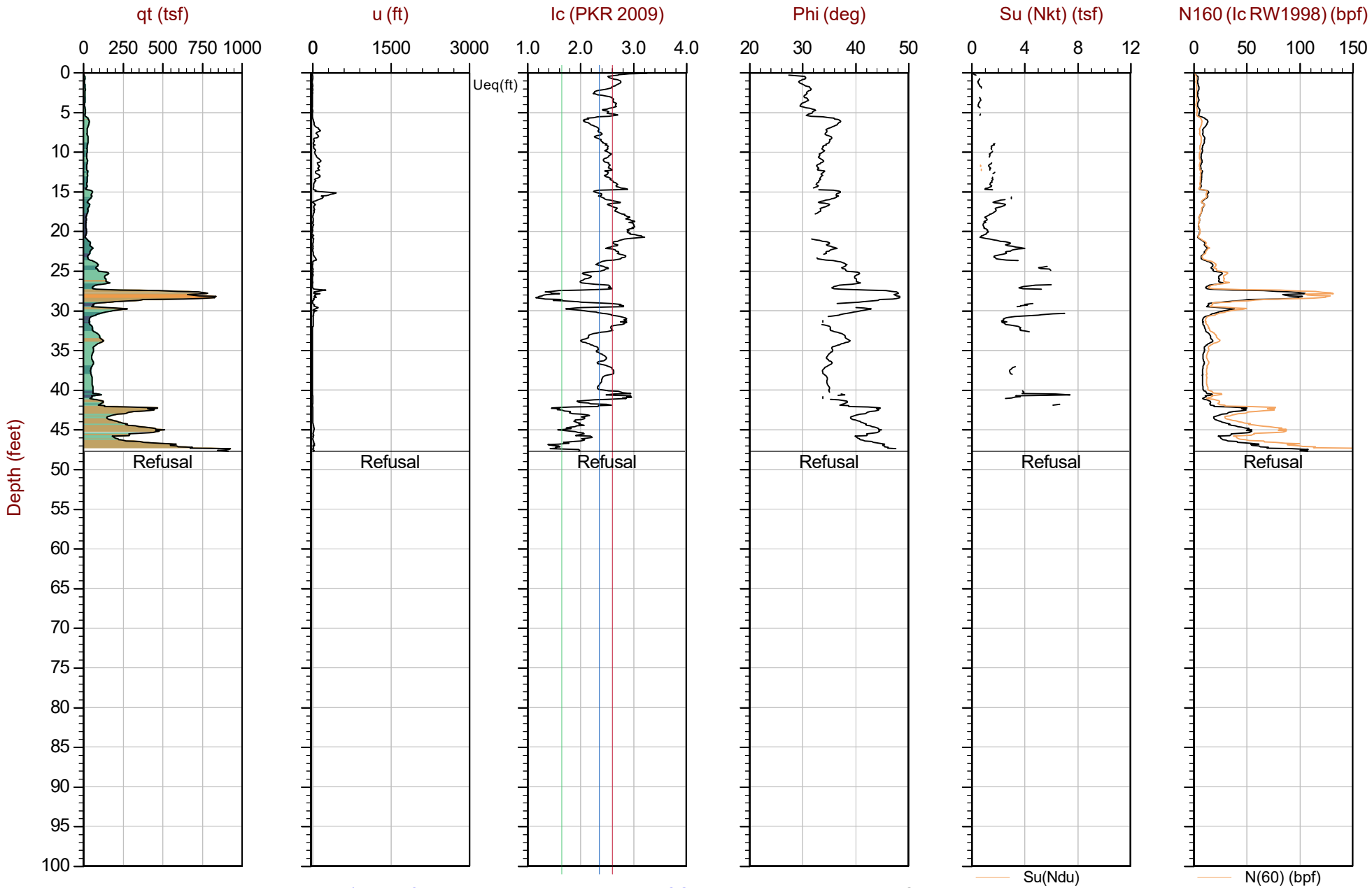
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 12:18
Site: Vina GSA Component 5

Sounding: CPT-6
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 14.550 m / 47.74 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP06.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 15.0 / 6.0

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394541m E: 598572m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

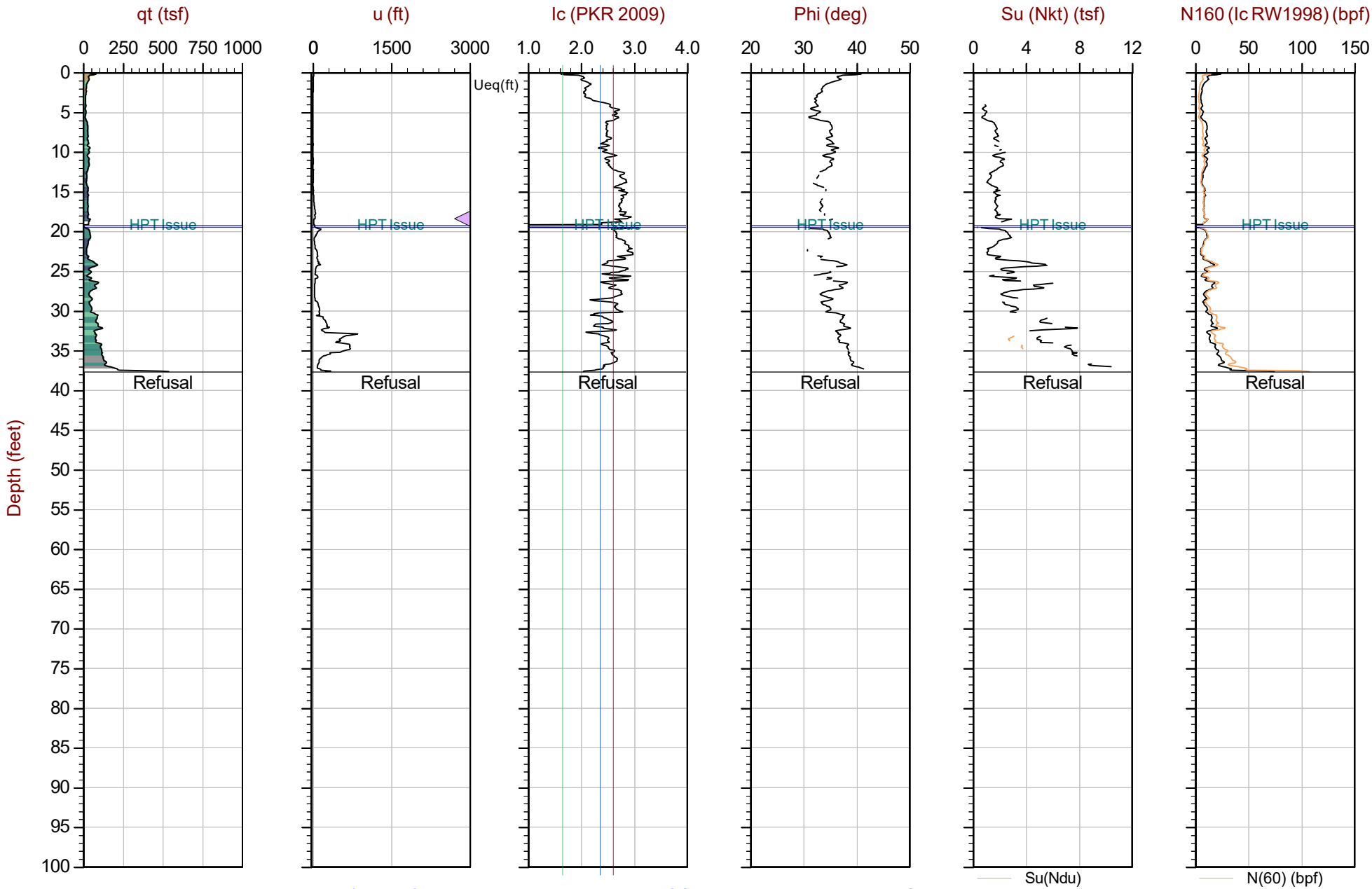
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-03 10:46
Site: Vina GSA Component 5

Sounding: CPT-7
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 11.475 m / 37.65 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP07.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 15.0 / 6.0

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4395121m E: 598695m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

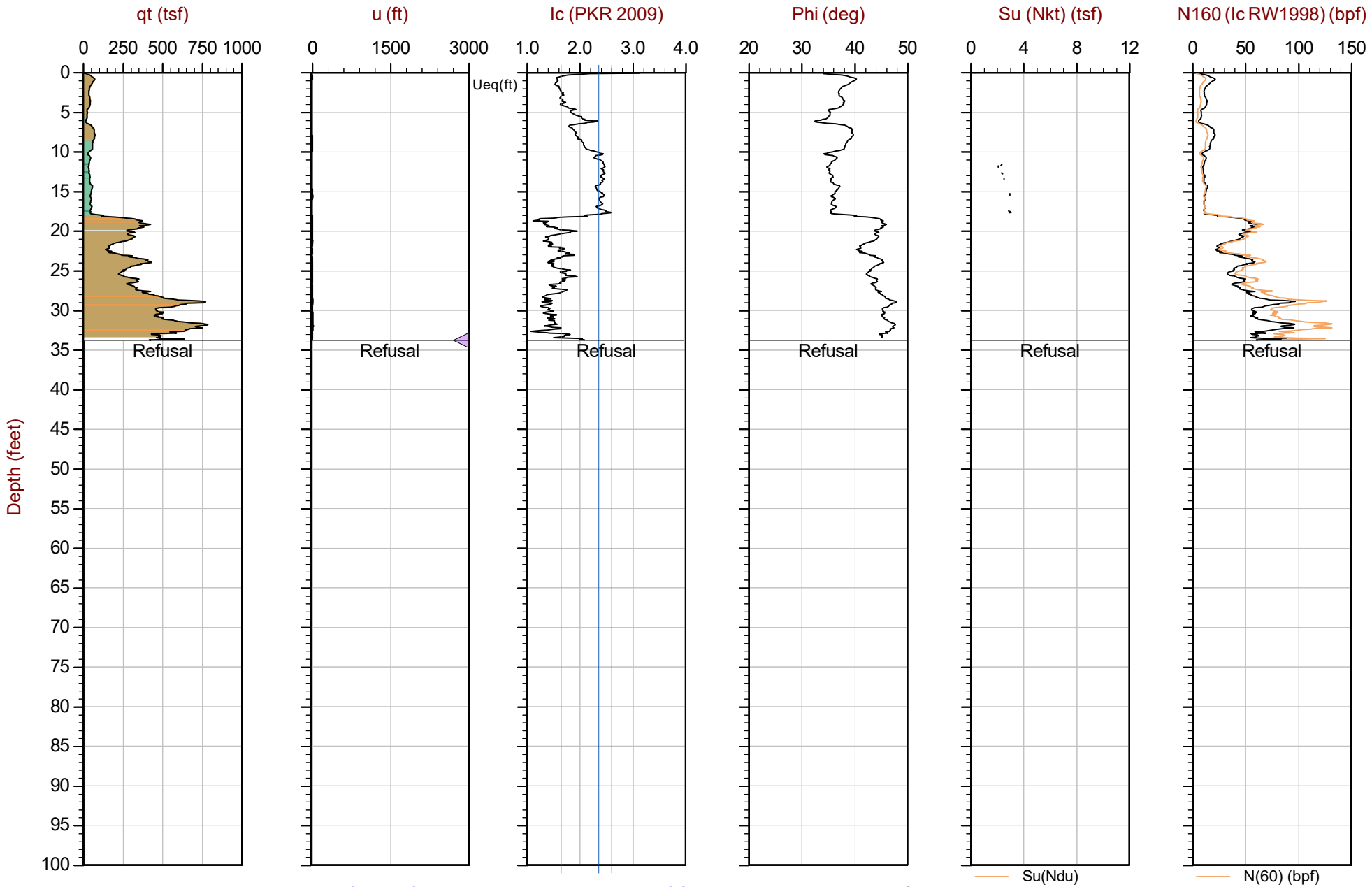
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 09:10
Site: Vina GSA Component 5

Sounding: CPT-8
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 10.300 m / 33.79 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP08.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 15.0 / 6.0

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394566m E: 598864m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

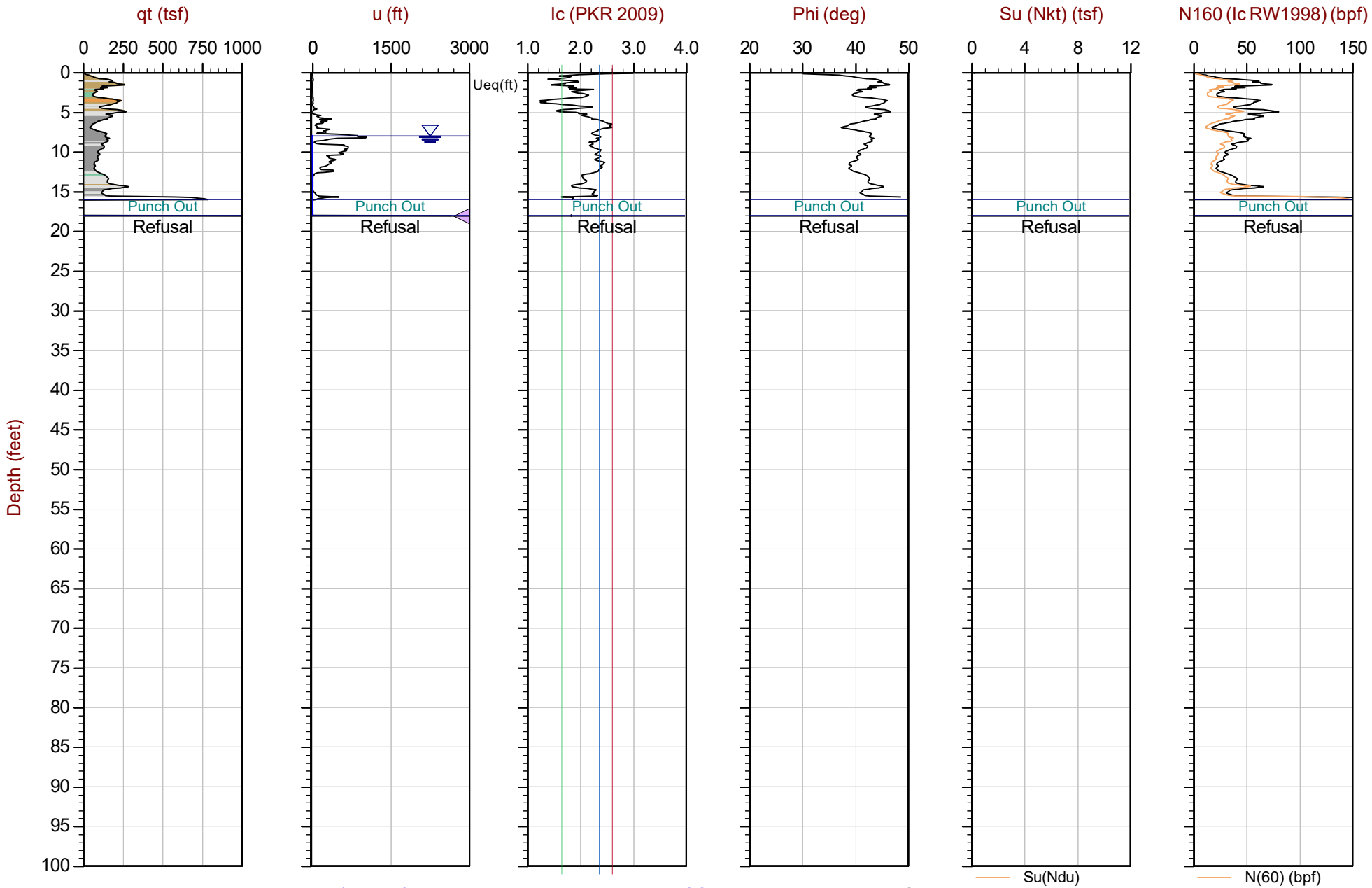
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-05 06:28
Site: Vina GSA Component 5

Sounding: CPT-B-1
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 5.500 m / 18.04 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP-B01.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 15.0 / 6.0

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4406782m E: 593403m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

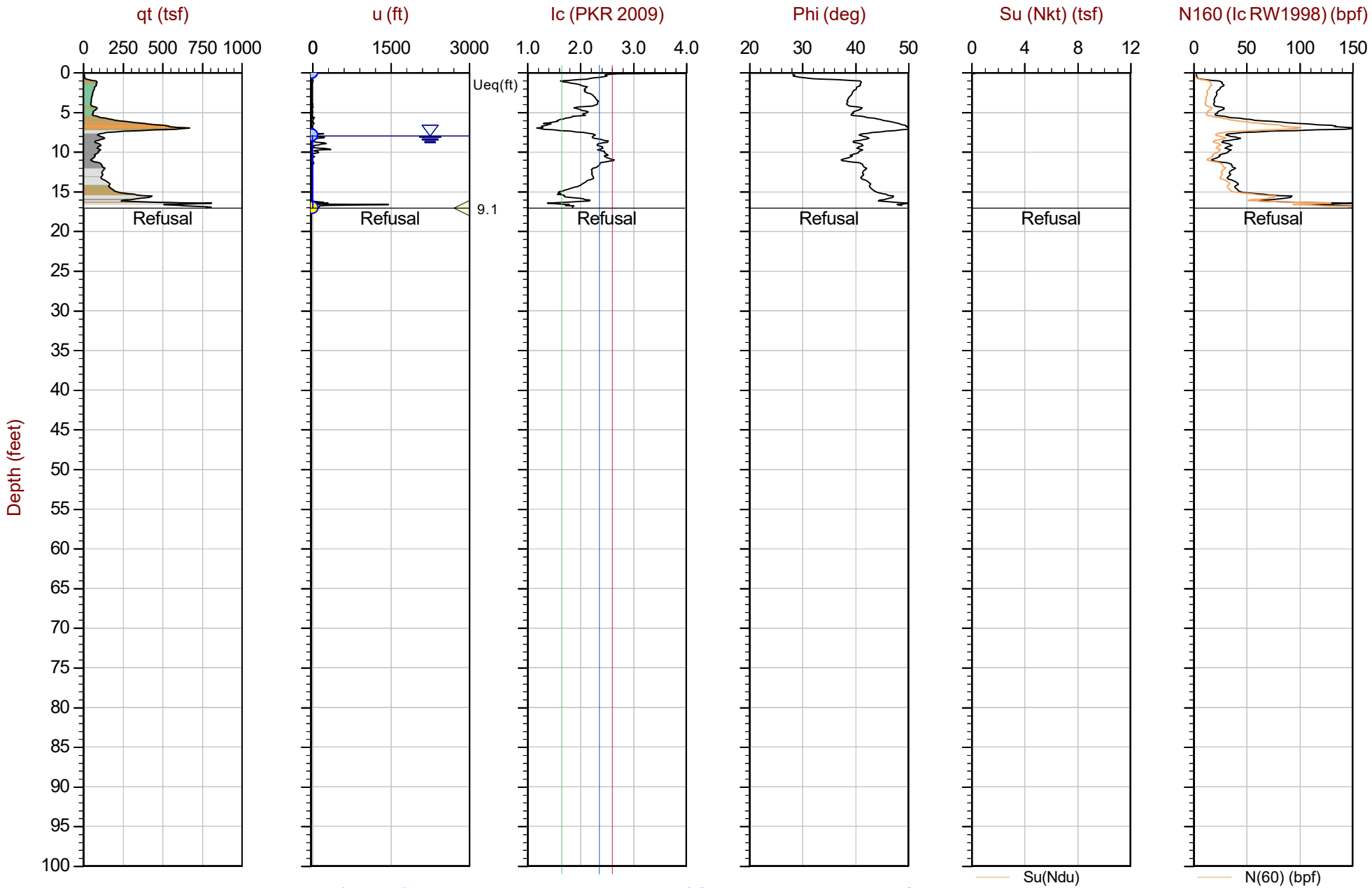
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-05 08:21
Site: Vina GSA Component 5

Sounding: CPT-B-2
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 5.200 m / 17.06 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP-B02.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 15.0 / 6.0

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4406795m E: 593353m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

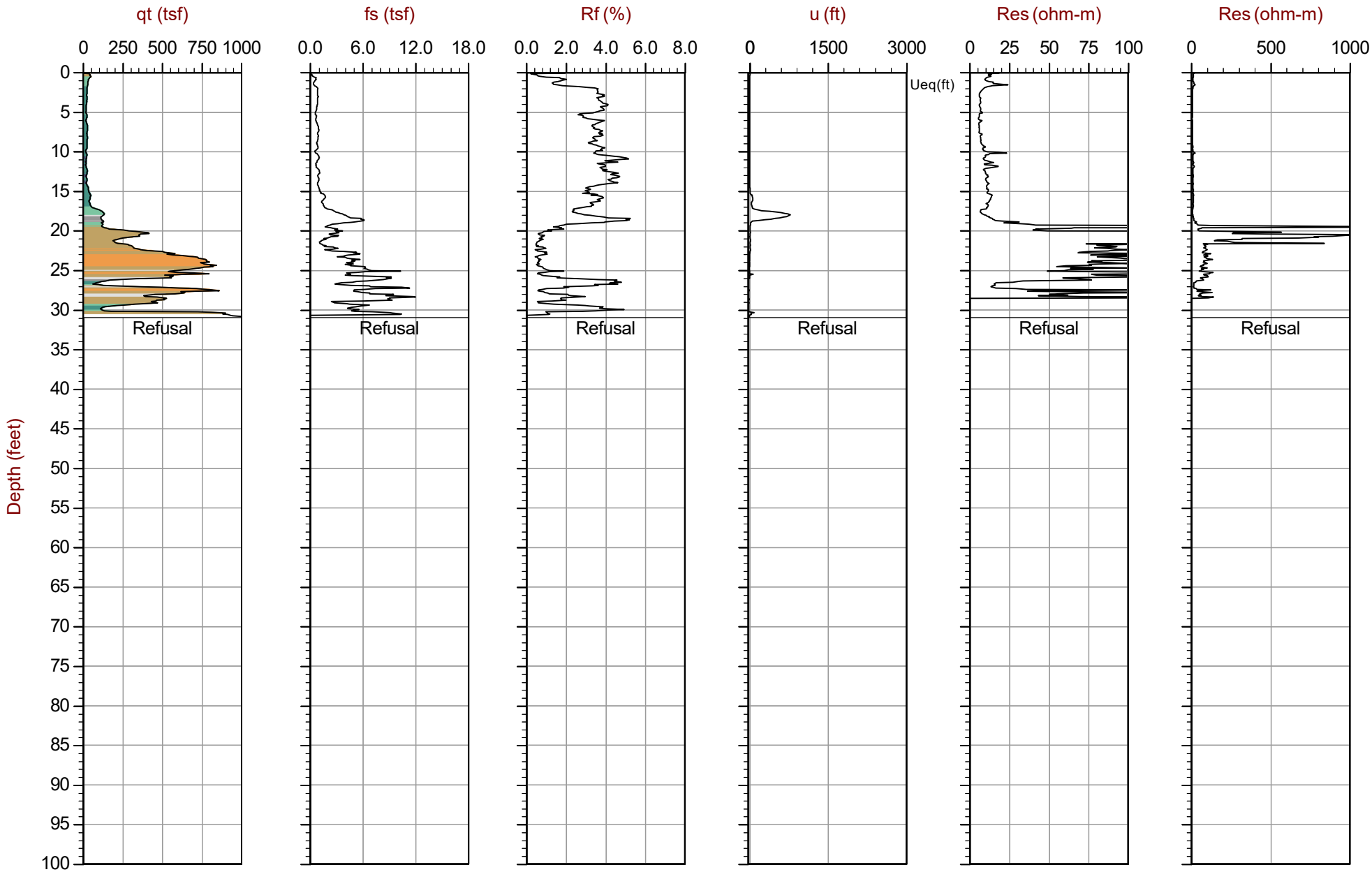
Resistivity CPTu Plots

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-03 12:36
Site: Vina GSA Component 5

Sounding: CPT-1
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 9.425 m / 30.92 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4395277m E: 599115m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

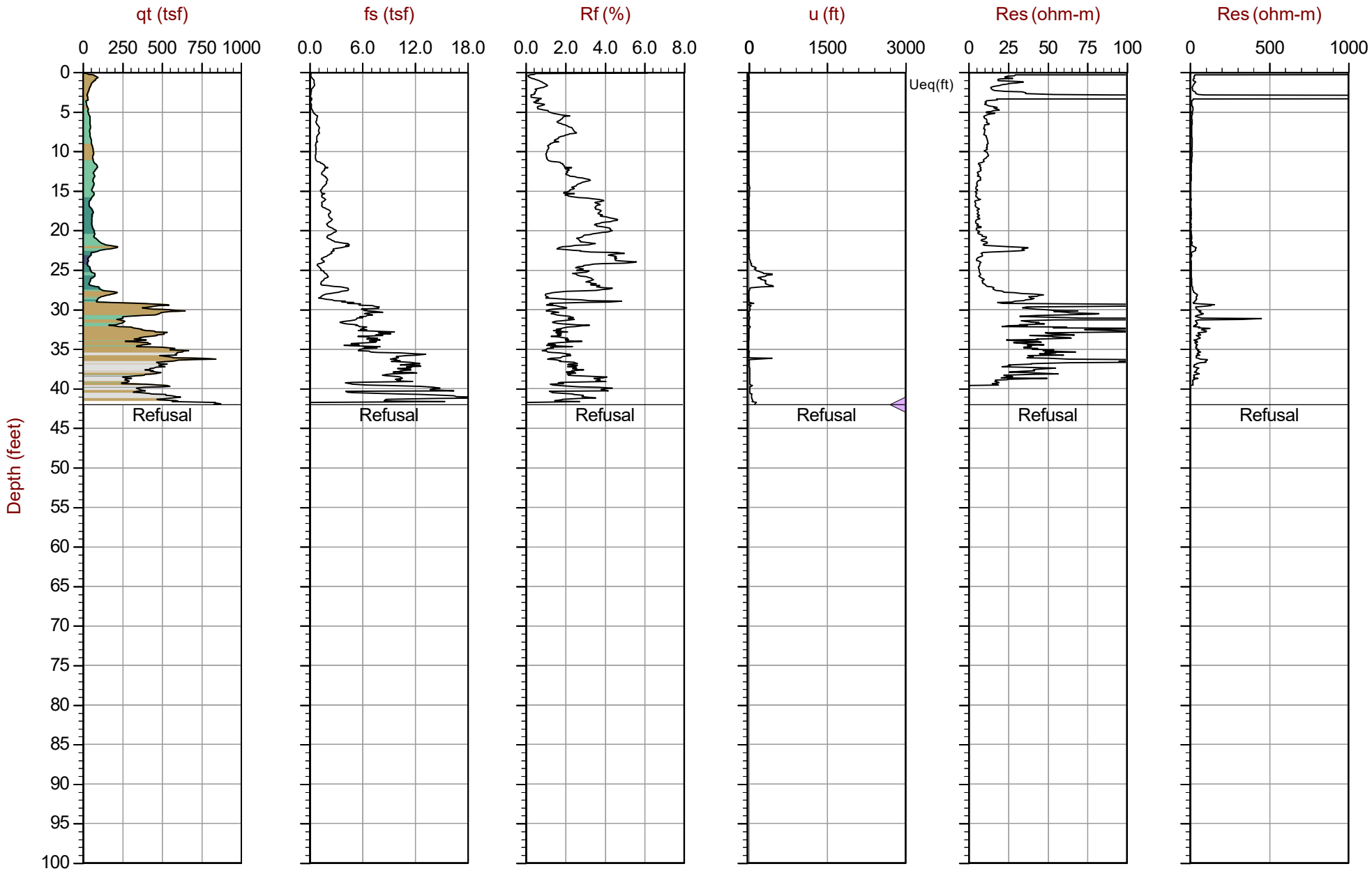
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-03 13:41
Site: Vina GSA Component 5

Sounding: CPT-2
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 12.800 m / 41.99 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4395111m E: 599129m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

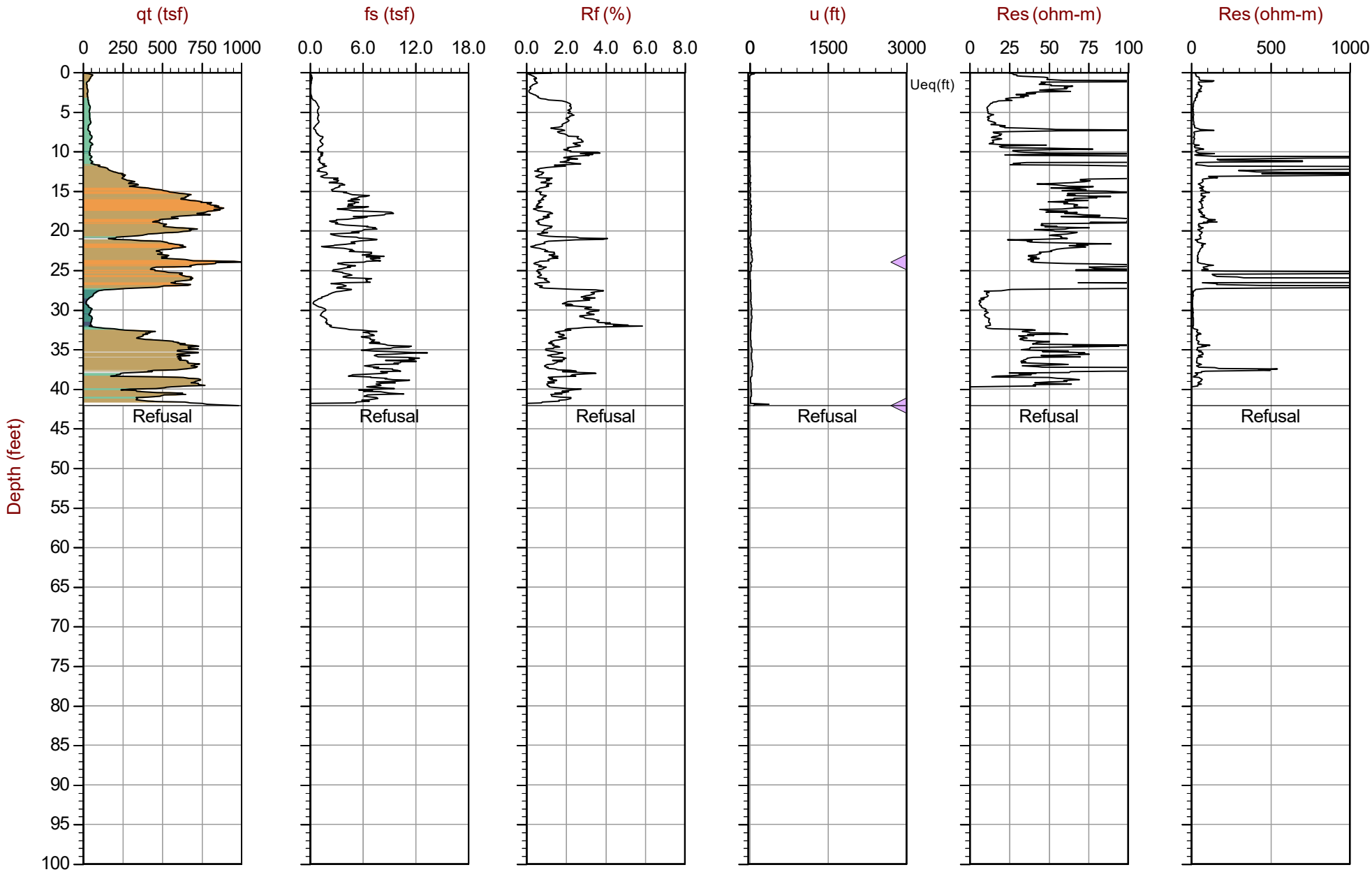
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 07:29
Site: Vina GSA Component 5

Sounding: CPT-3
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 12.825 m / 42.08 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP03.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394726m E: 599128m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

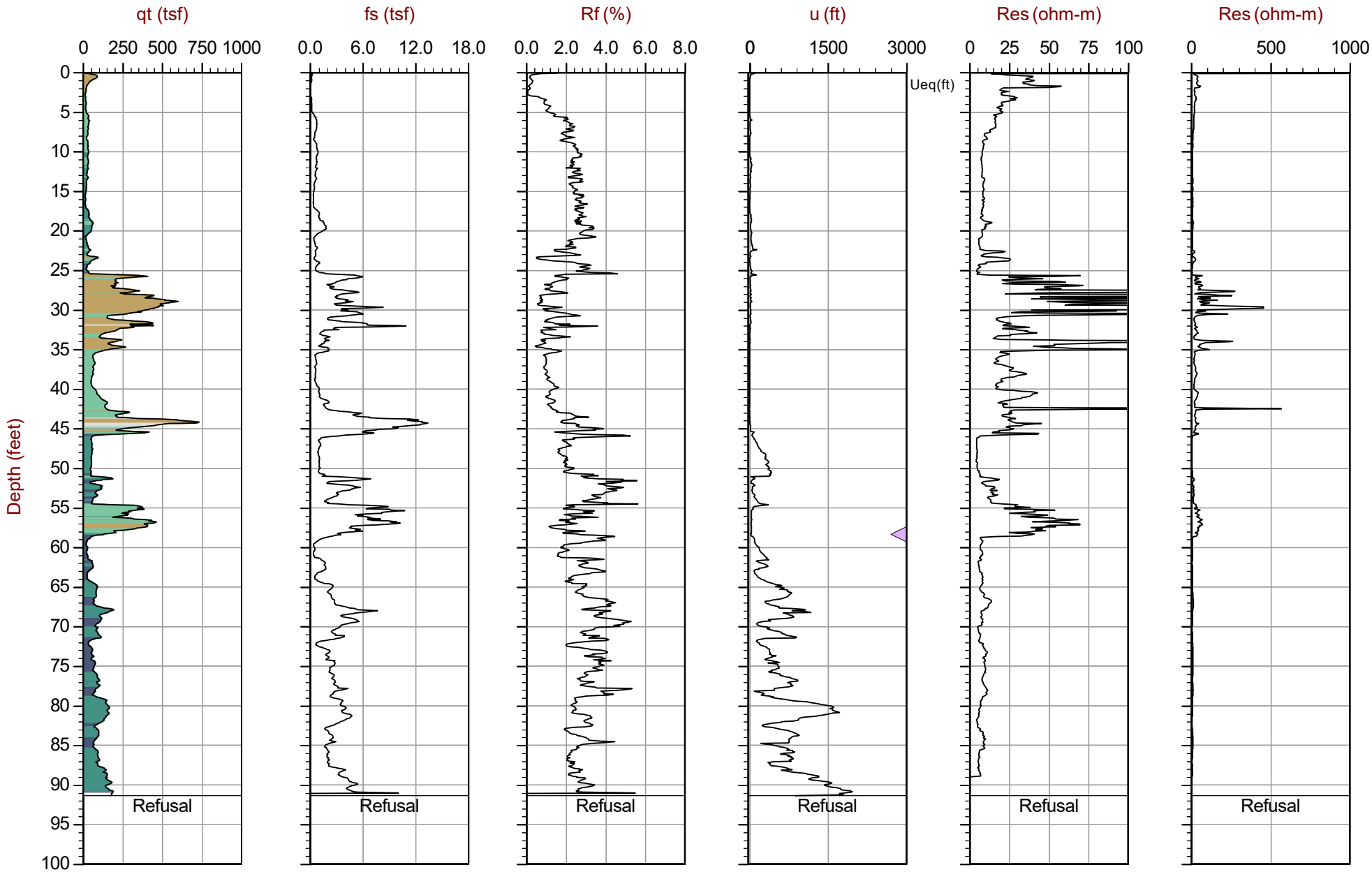
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 10:20
Site: Vina GSA Component 5

Sounding: CPT-4
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 27.850 m / 91.37 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP04.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394740m E: 598643m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

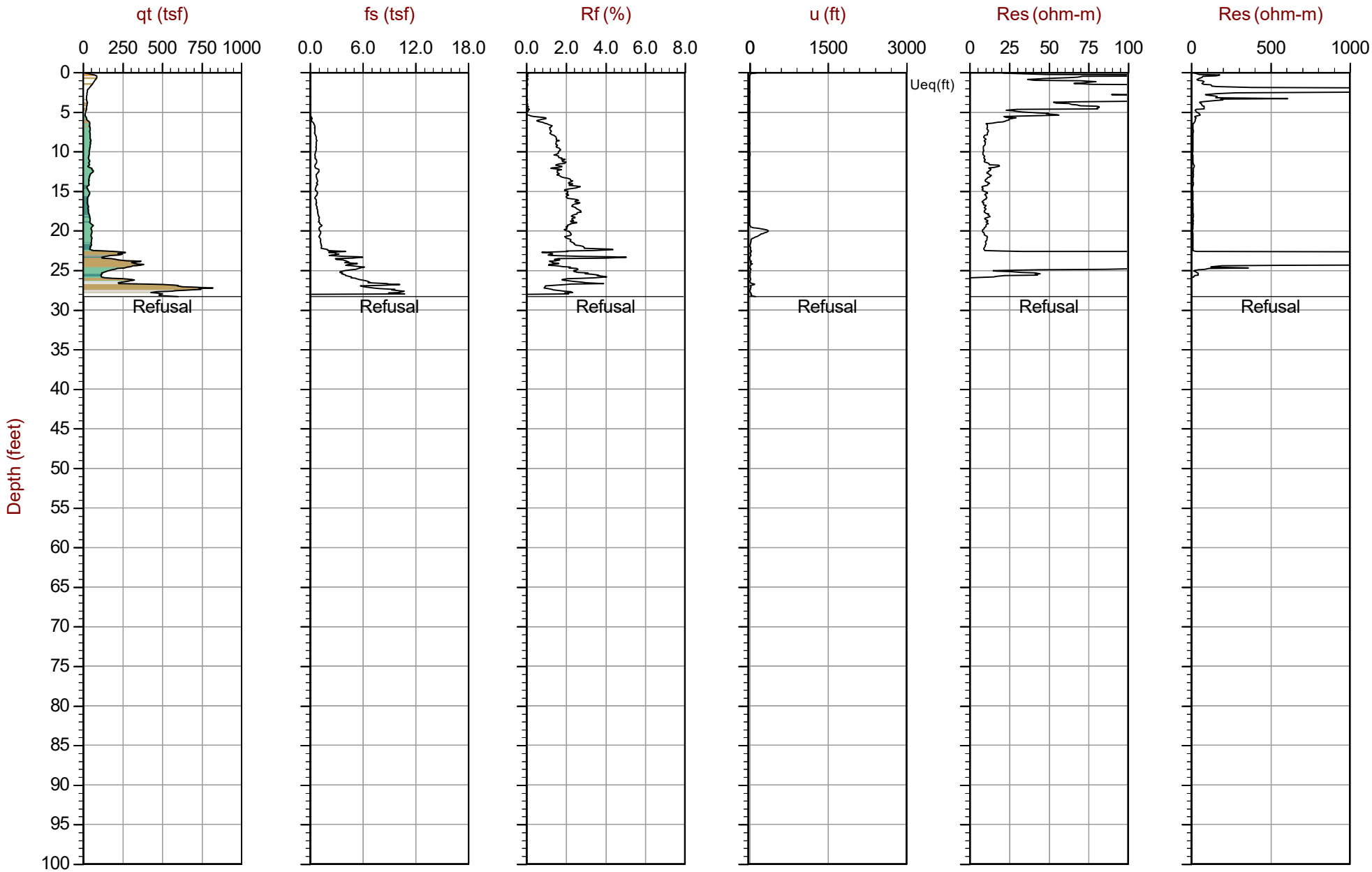
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 13:29
Site: Vina GSA Component 5

Sounding: CPT-5
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 8.625 m / 28.30 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP05.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394919m E: 598834m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

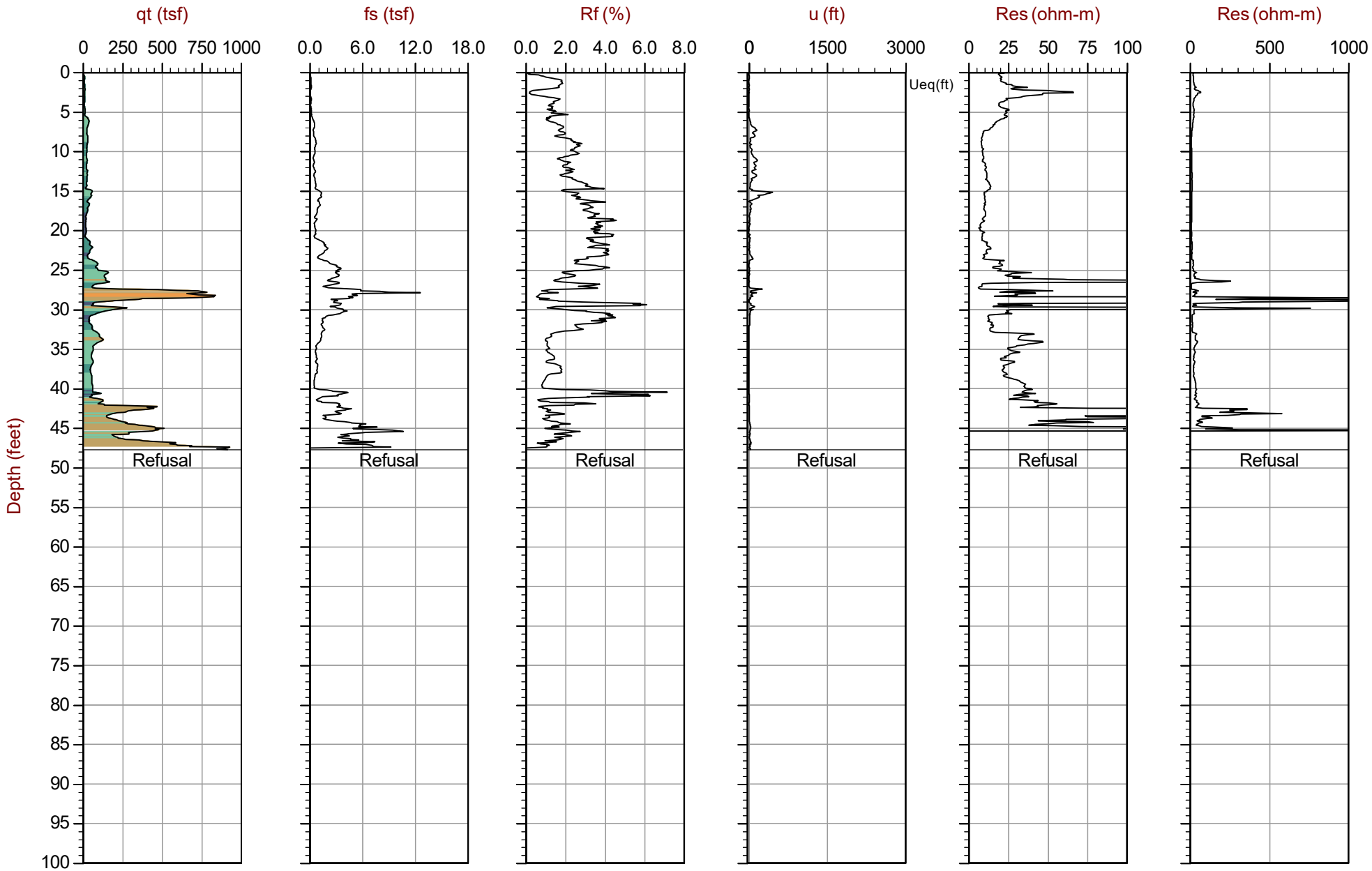
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 12:18
Site: Vina GSA Component 5

Sounding: CPT-6
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 14.550 m / 47.74 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP06.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394541m E: 598572m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

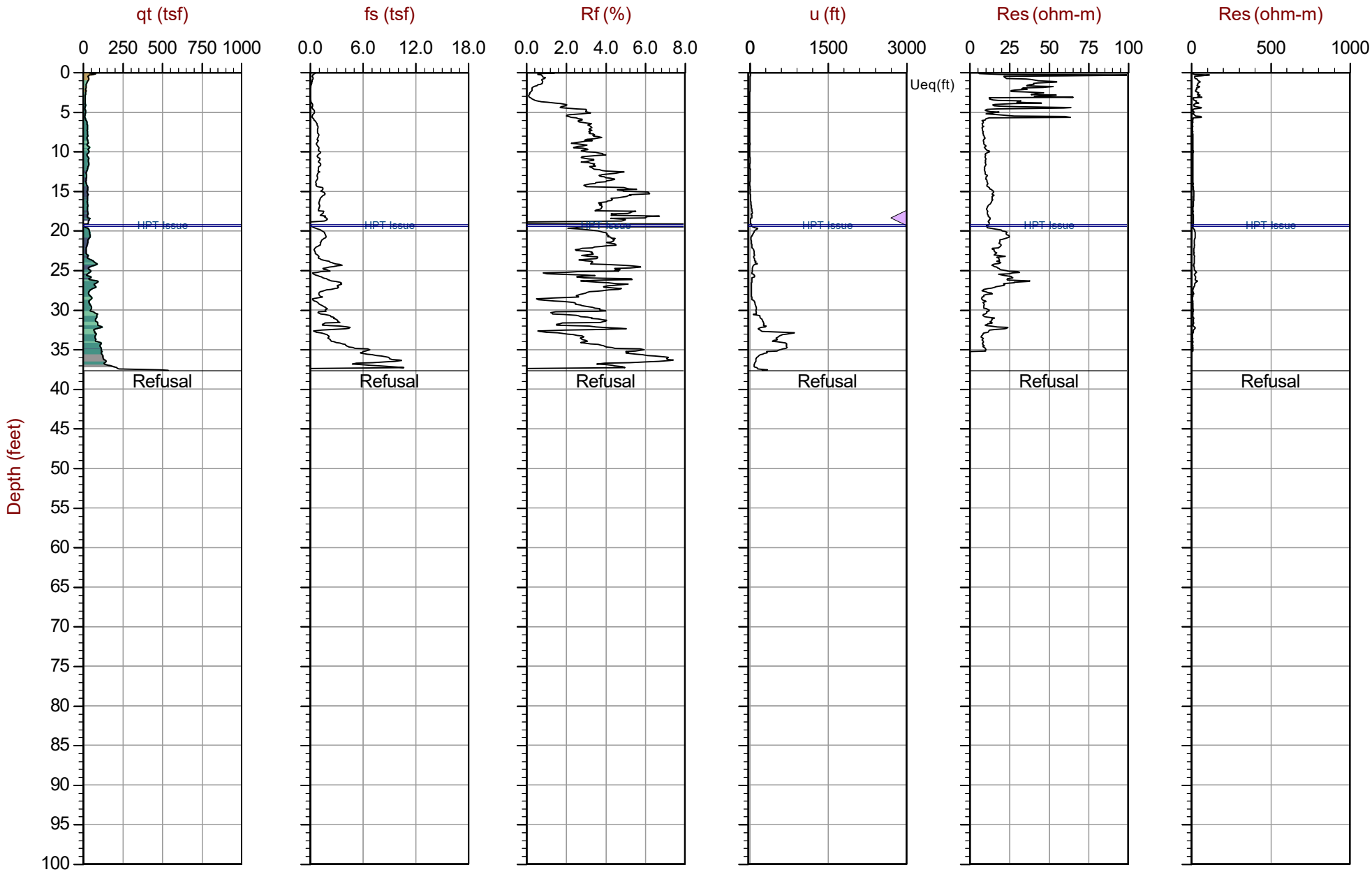
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-03 10:46
Site: Vina GSA Component 5

Sounding: CPT-7
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 11.475 m / 37.65 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP07.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4395121m E: 598695m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

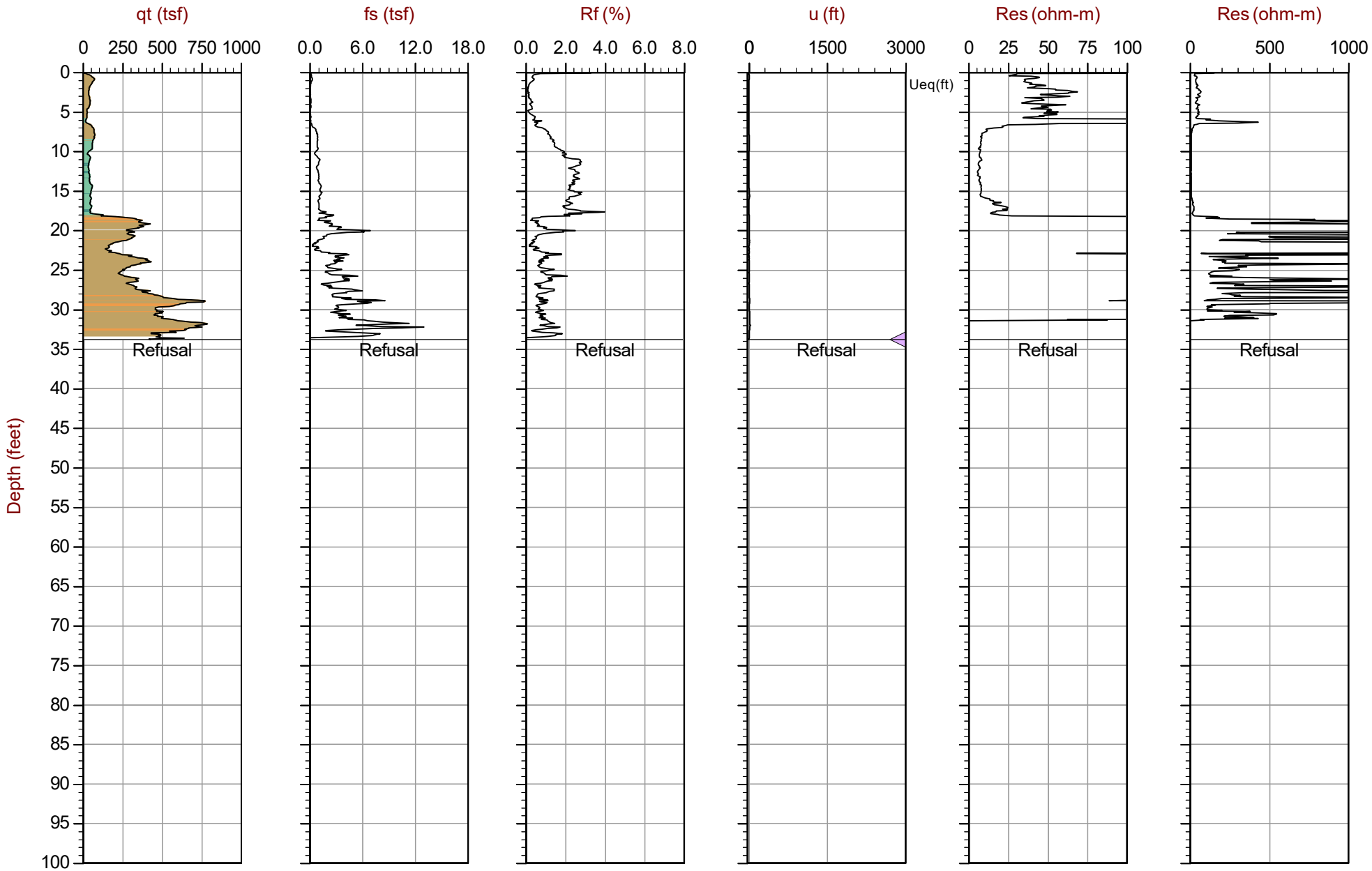
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 09:10
Site: Vina GSA Component 5

Sounding: CPT-8
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 10.300 m / 33.79 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP08.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4394566m E: 598864m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

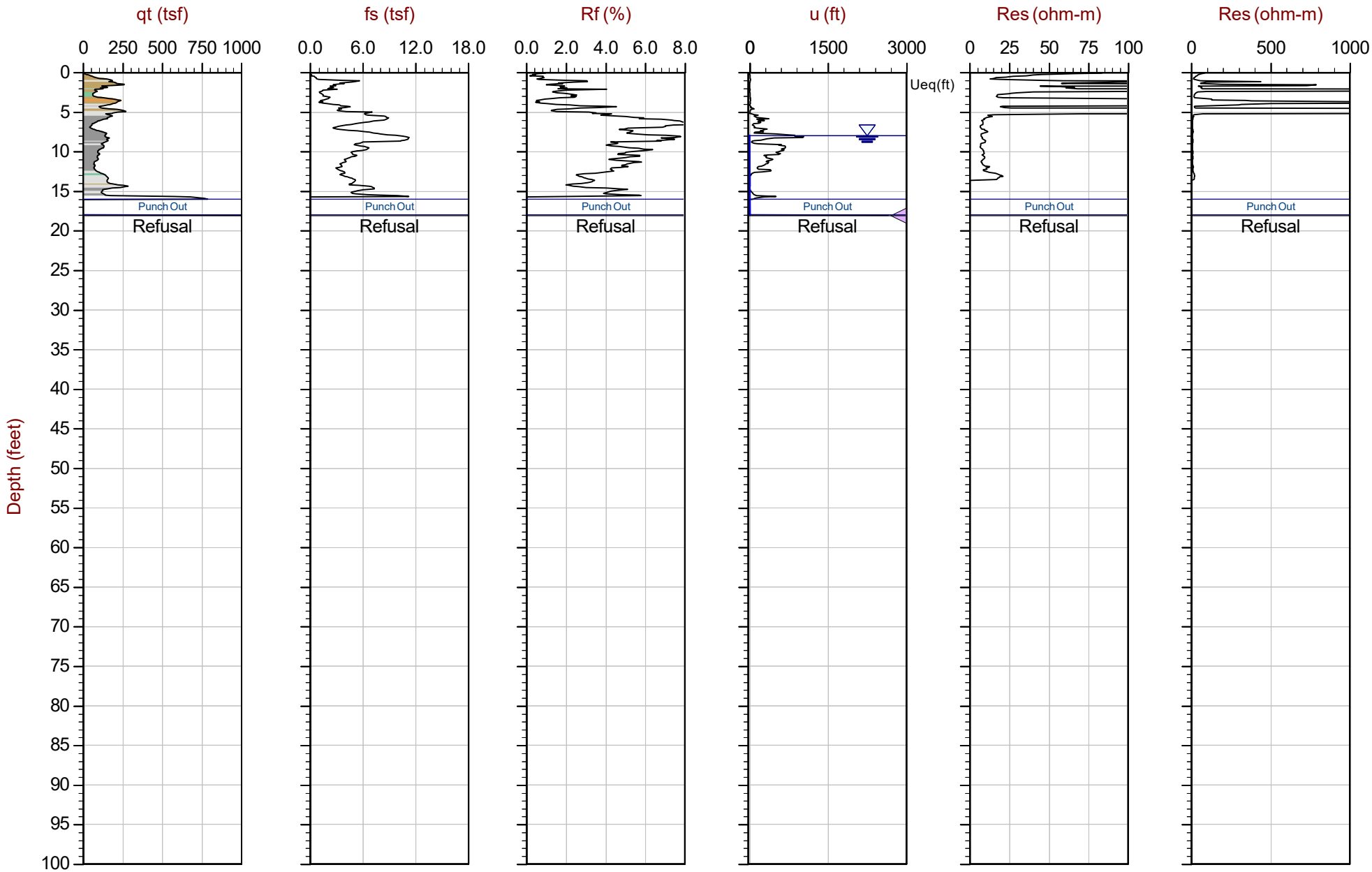
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-05 06:28
Site: Vina GSA Component 5

Sounding: CPT-B-1
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 5.500 m / 18.04 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP-B01.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4406782m E: 593403m

Overplot Item: Ueq Assumed Ueq Dissipation, Ueq achieved Dissipation, Ueq not achieved Dissipation, Ueq assumed Hydrostatic Line

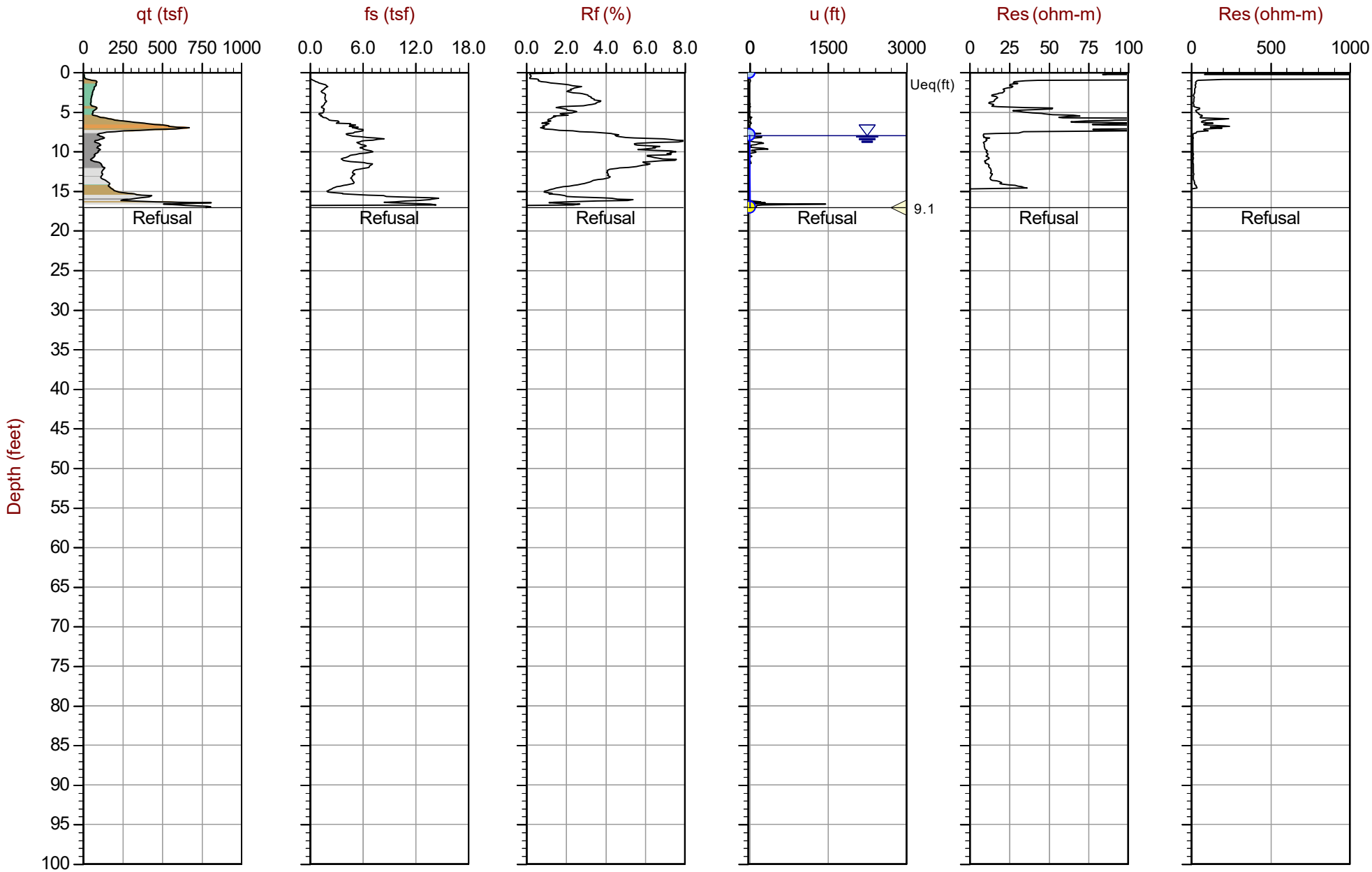
The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-05 08:21
Site: Vina GSA Component 5

Sounding: CPT-B-2
Cone: 968:T1500F15U35 Area=15 cm²



Max Depth: 5.200 m / 17.06 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 25-56-30135_RP-B02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: (UTM Zone 10) N: 4406795m E: 593353m

Overplot Item: Ueq | Assumed Ueq | Dissipation, Ueq achieved | Dissipation, Ueq not achieved | Dissipation, Ueq assumed | Hydrostatic Line

The reported coordinates were acquired from consumer grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

Soil Behavior Type (SBT) Scatter Plots

CONETEC

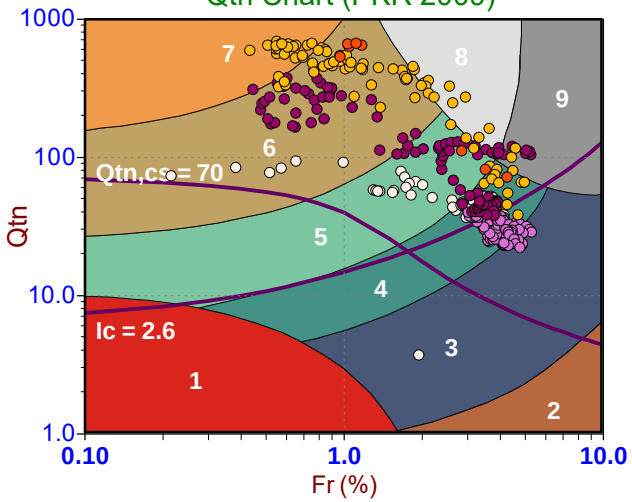
CONETEC

Geosyntec Consultants

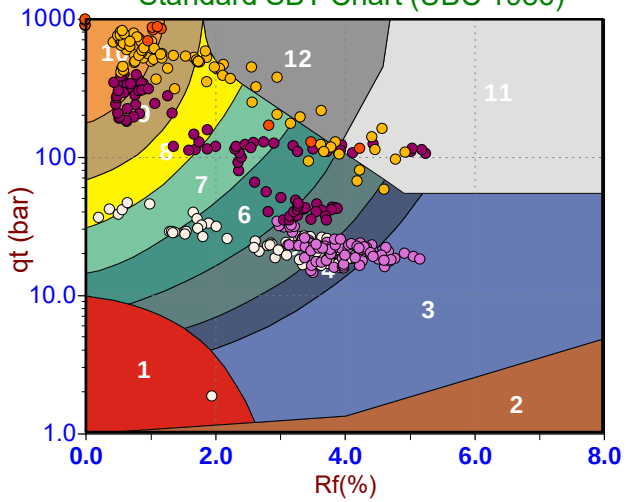
Job No: 25-56-30135
Date: 2025-09-03 12:36
Site: Vina GSA Component 5

Sounding: CPT-1
Cone: 968:T1500F15U35 Area=15 cm²

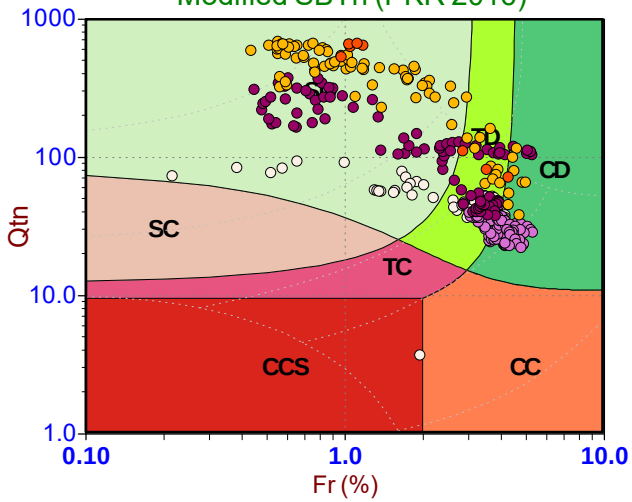
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 7.5 ft
- >7.5 to 15.0 ft
- >15.0 to 22.5 ft
- >22.5 to 30.0 ft
- >30.0 to 37.5 ft
- >37.5 to 45.0 ft
- >45.0 to 52.5 ft
- >52.5 to 60.0 ft
- >60.0 to 67.5 ft
- >67.5 to 75.0 ft
- >75.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

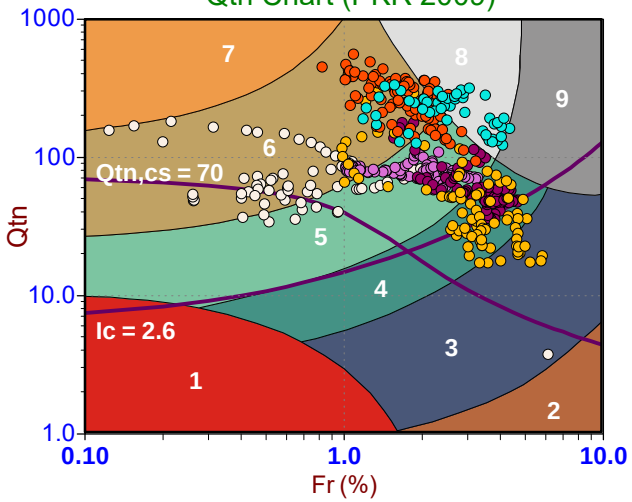
CONETEC

Geosyntec Consultants

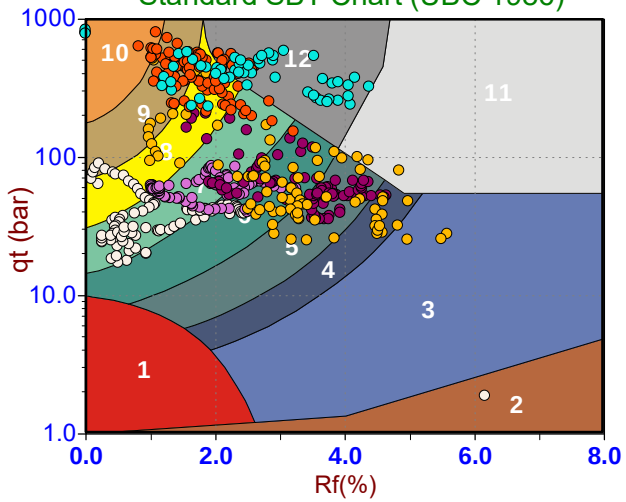
Job No: 25-56-30135
Date: 2025-09-03 13:41
Site: Vina GSA Component 5

Sounding: CPT-2
Cone: 968:T1500F15U35 Area=15 cm²

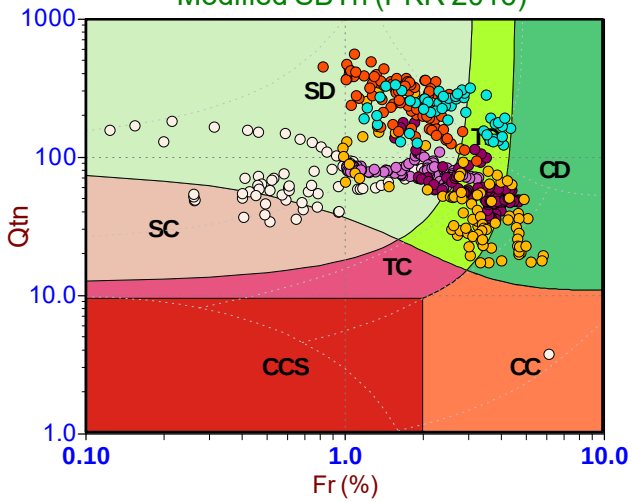
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 7.5 ft
- >7.5 to 15.0 ft
- >15.0 to 22.5 ft
- >22.5 to 30.0 ft
- >30.0 to 37.5 ft
- >37.5 to 45.0 ft
- >45.0 to 52.5 ft
- >52.5 to 60.0 ft
- >60.0 to 67.5 ft
- >67.5 to 75.0 ft
- >75.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

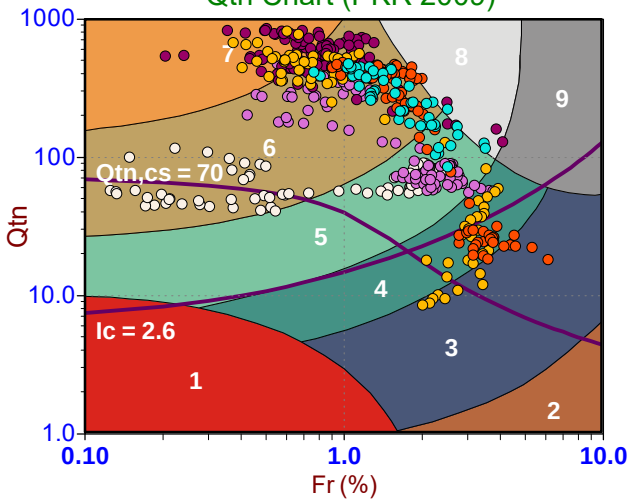
CONETEC

Geosyntec Consultants

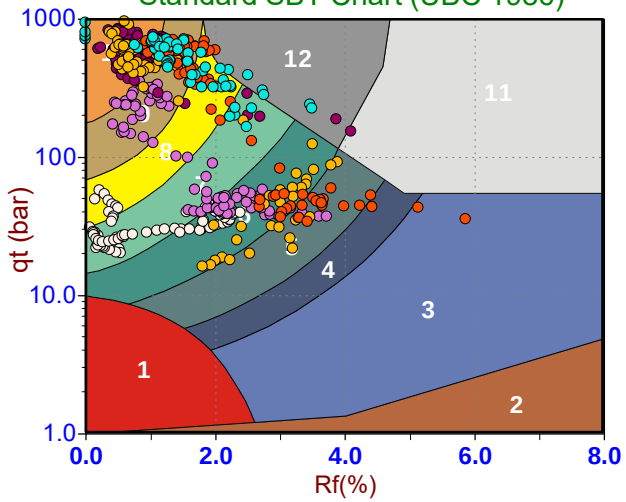
Job No: 25-56-30135
Date: 2025-09-04 07:29
Site: Vina GSA Component 5

Sounding: CPT-3
Cone: 968:T1500F15U35 Area=15 cm²

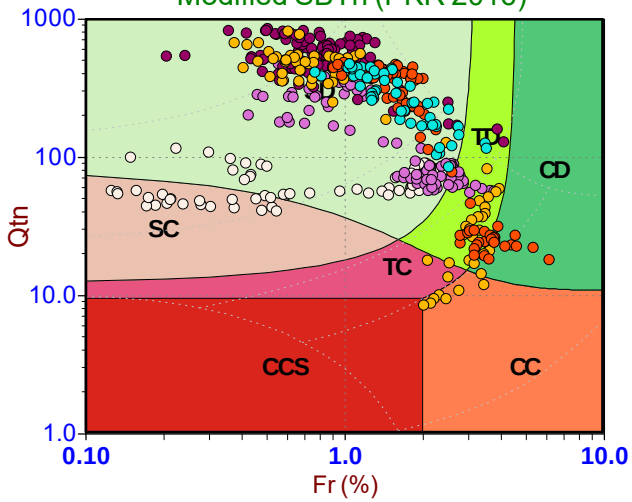
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 7.5 ft
- >7.5 to 15.0 ft
- >15.0 to 22.5 ft
- >22.5 to 30.0 ft
- >30.0 to 37.5 ft
- >37.5 to 45.0 ft
- >45.0 to 52.5 ft
- >52.5 to 60.0 ft
- >60.0 to 67.5 ft
- >67.5 to 75.0 ft
- >75.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

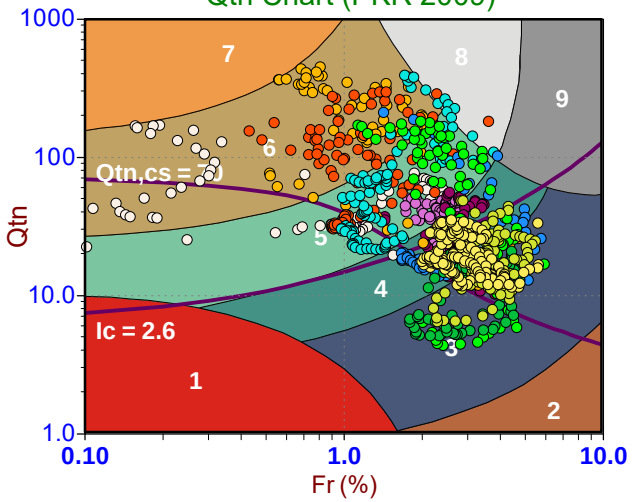
CONETEC

Geosyntec Consultants

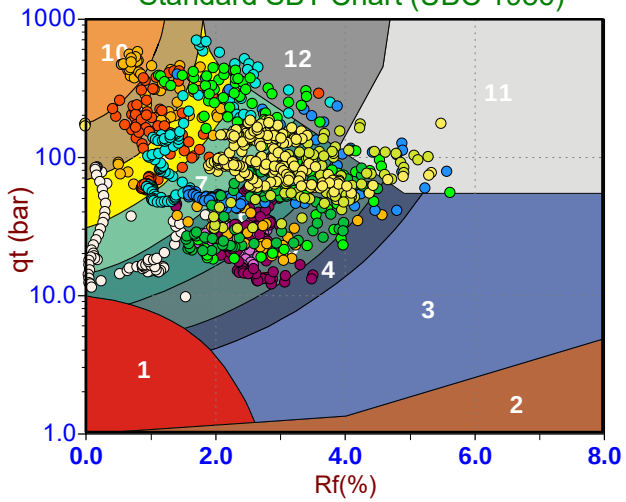
Job No: 25-56-30135
Date: 2025-09-04 10:20
Site: Vina GSA Component 5

Sounding: CPT-4
Cone: 968:T1500F15U35 Area=15 cm²

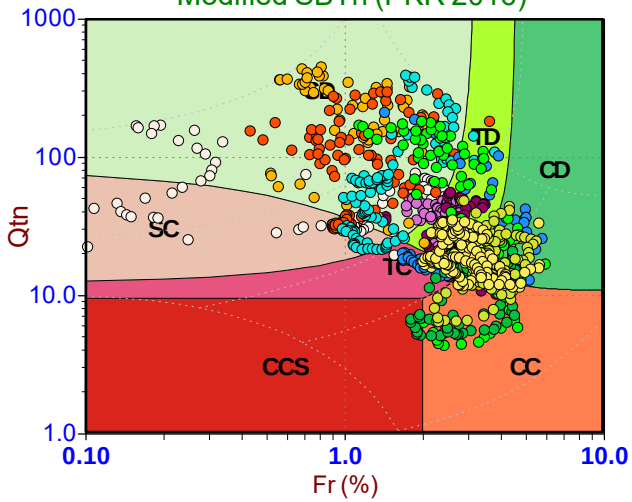
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 7.5 ft
- >7.5 to 15.0 ft
- >15.0 to 22.5 ft
- >22.5 to 30.0 ft
- >30.0 to 37.5 ft
- >37.5 to 45.0 ft
- >45.0 to 52.5 ft
- >52.5 to 60.0 ft
- >60.0 to 67.5 ft
- >67.5 to 75.0 ft
- >75.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

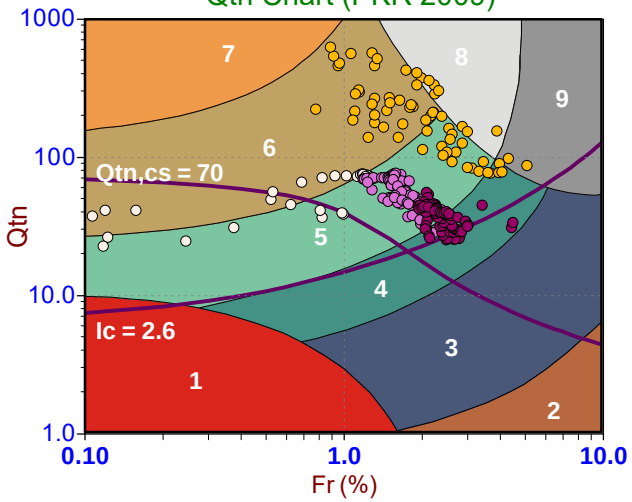
CONETEC

Geosyntec Consultants

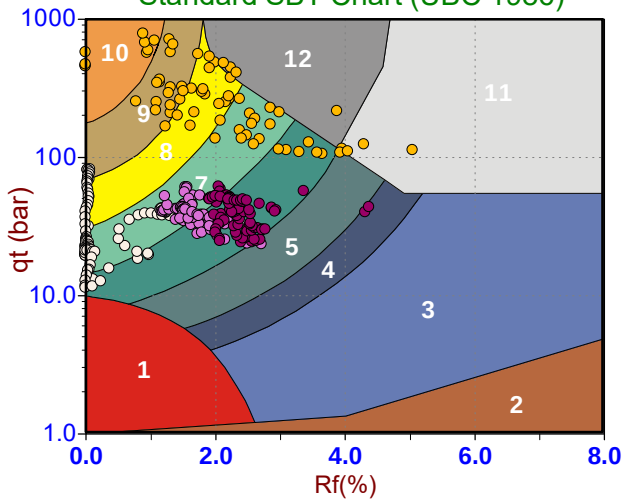
Job No: 25-56-30135
Date: 2025-09-04 13:29
Site: Vina GSA Component 5

Sounding: CPT-5
Cone: 968:T1500F15U35 Area=15 cm²

Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



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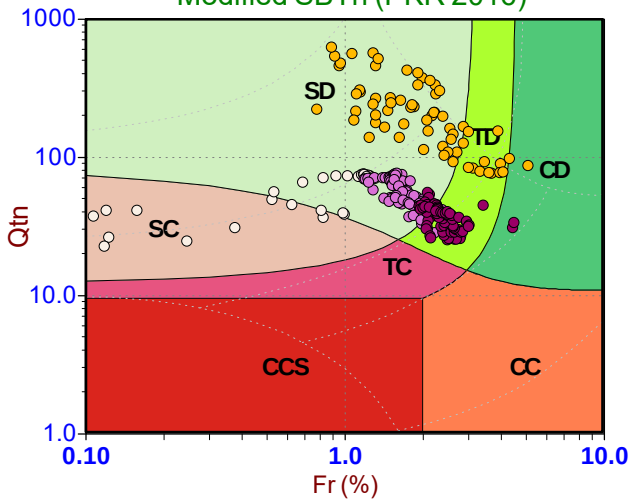


Depth Ranges

- >0.0 to 7.5 ft
- >7.5 to 15.0 ft
- >15.0 to 22.5 ft
- >22.5 to 30.0 ft
- >30.0 to 37.5 ft
- >37.5 to 45.0 ft
- >45.0 to 52.5 ft
- >52.5 to 60.0 ft
- >60.0 to 67.5 ft
- >67.5 to 75.0 ft
- >75.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

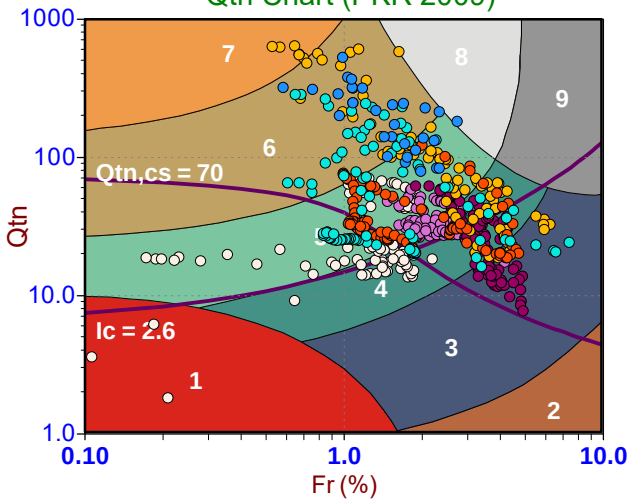
CONETEC

Geosyntec Consultants

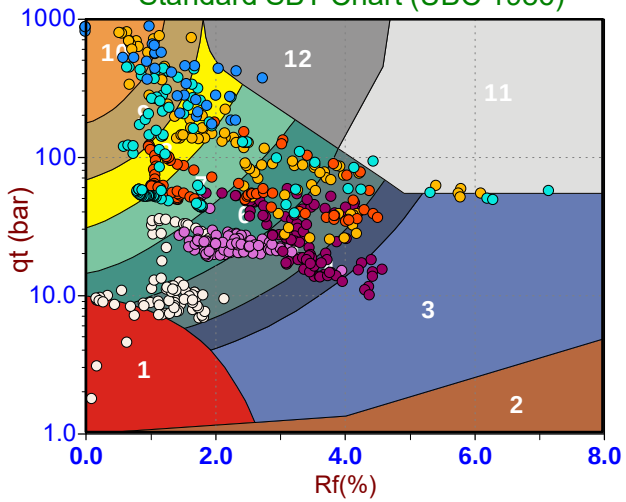
Job No: 25-56-30135
Date: 2025-09-04 12:18
Site: Vina GSA Component 5

Sounding: CPT-6
Cone: 968:T1500F15U35 Area=15 cm²

Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



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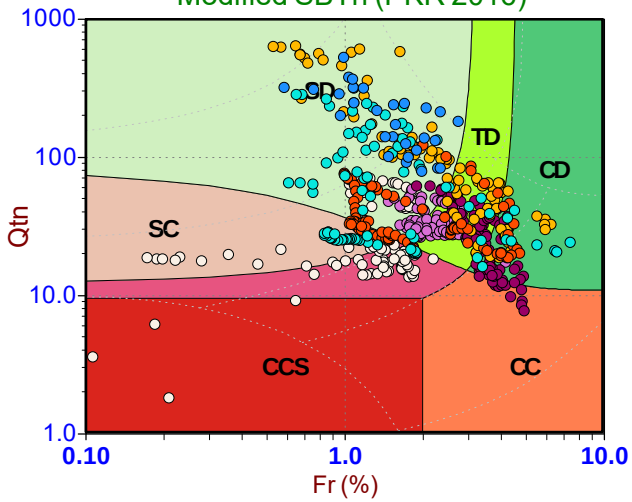


Depth Ranges

- >0.0 to 7.5 ft
- >7.5 to 15.0 ft
- >15.0 to 22.5 ft
- >22.5 to 30.0 ft
- >30.0 to 37.5 ft
- >37.5 to 45.0 ft
- >45.0 to 52.5 ft
- >52.5 to 60.0 ft
- >60.0 to 67.5 ft
- >67.5 to 75.0 ft
- >75.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

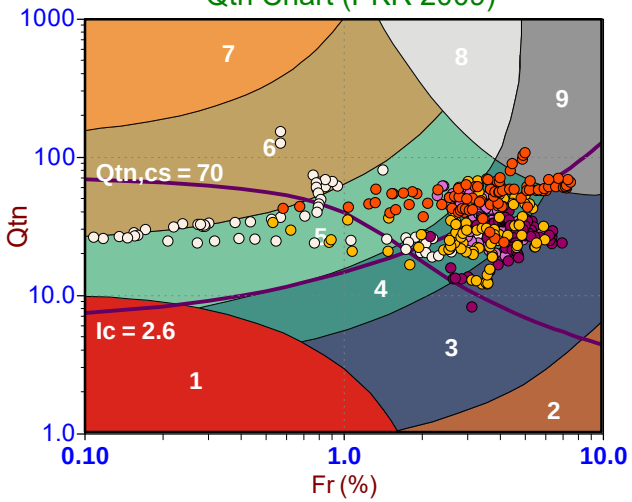
CONETEC

Geosyntec Consultants

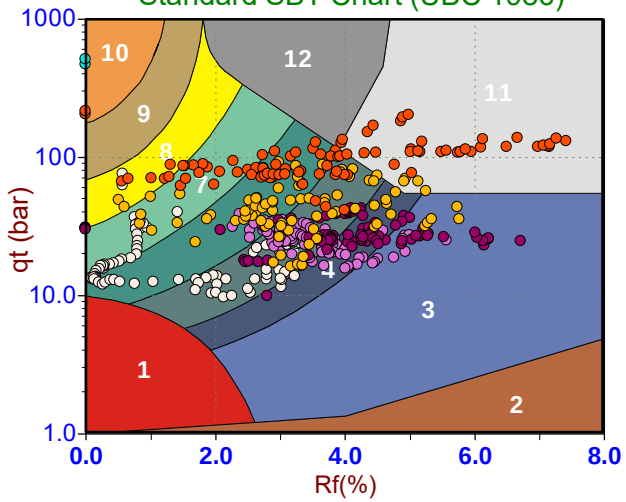
Job No: 25-56-30135
Date: 2025-09-03 10:46
Site: Vina GSA Component 5

Sounding: CPT-7
Cone: 968:T1500F15U35 Area=15 cm²

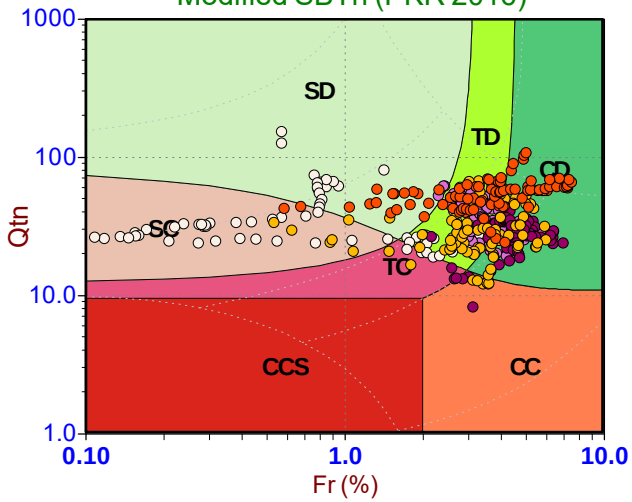
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 7.5 ft
- >7.5 to 15.0 ft
- >15.0 to 22.5 ft
- >22.5 to 30.0 ft
- >30.0 to 37.5 ft
- >37.5 to 45.0 ft
- >45.0 to 52.5 ft
- >52.5 to 60.0 ft
- >60.0 to 67.5 ft
- >67.5 to 75.0 ft
- >75.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

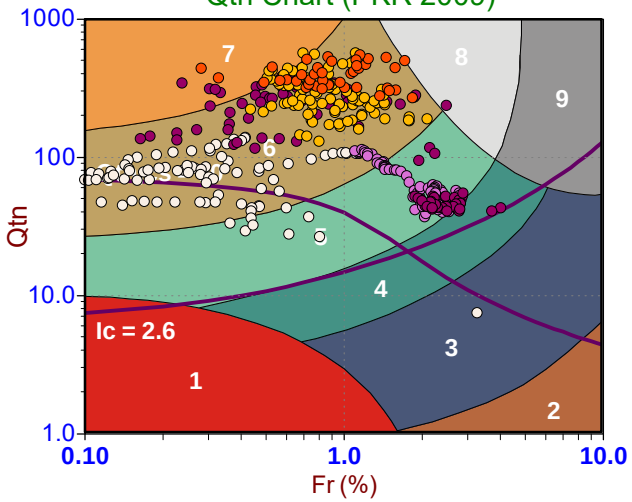
CONETEC

Geosyntec Consultants

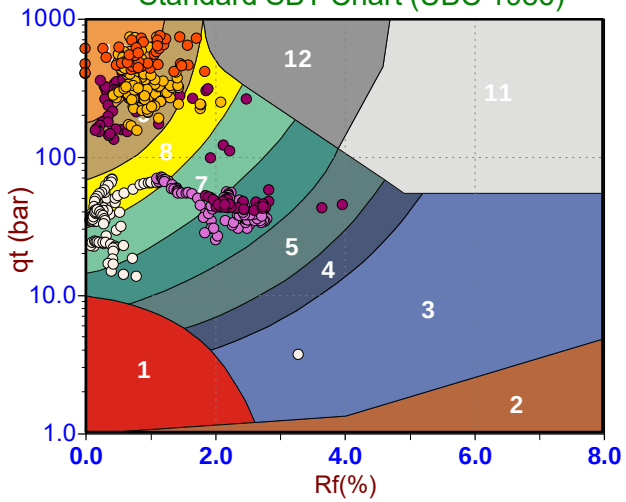
Job No: 25-56-30135
Date: 2025-09-04 09:10
Site: Vina GSA Component 5

Sounding: CPT-8
Cone: 968:T1500F15U35 Area=15 cm²

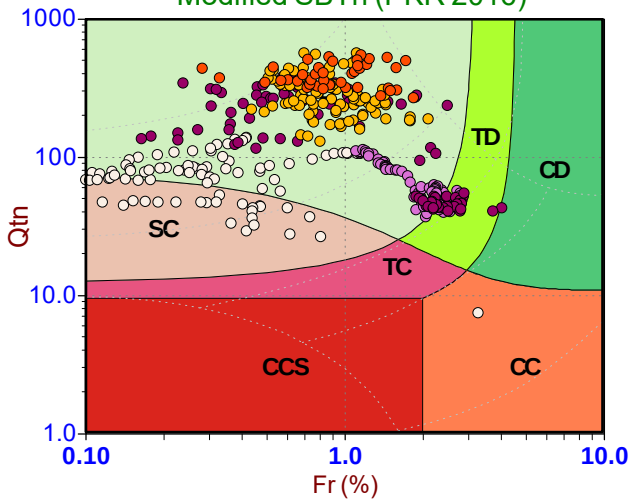
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 7.5 ft
- >7.5 to 15.0 ft
- >15.0 to 22.5 ft
- >22.5 to 30.0 ft
- >30.0 to 37.5 ft
- >37.5 to 45.0 ft
- >45.0 to 52.5 ft
- >52.5 to 60.0 ft
- >60.0 to 67.5 ft
- >67.5 to 75.0 ft
- >75.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

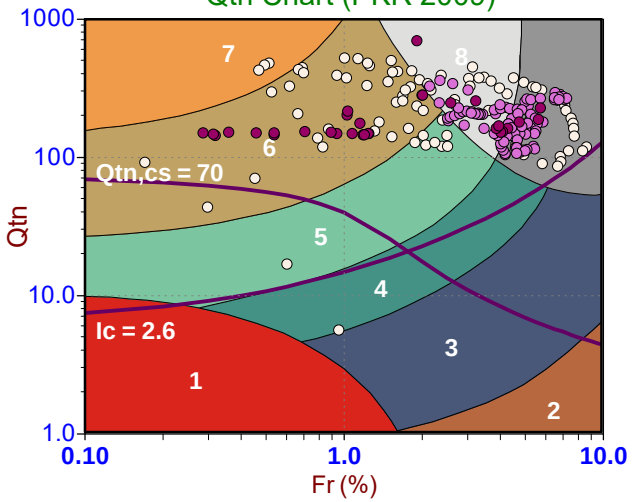
CONETEC

Geosyntec Consultants

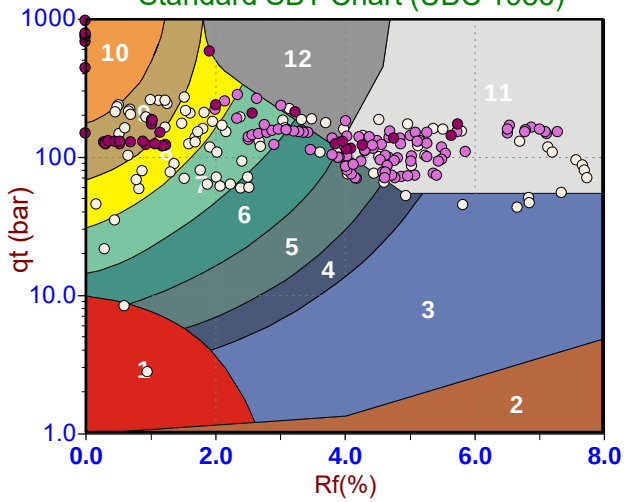
Job No: 25-56-30135
Date: 2025-09-05 06:28
Site: Vina GSA Component 5

Sounding: CPT-B-1
Cone: 968:T1500F15U35 Area=15 cm²

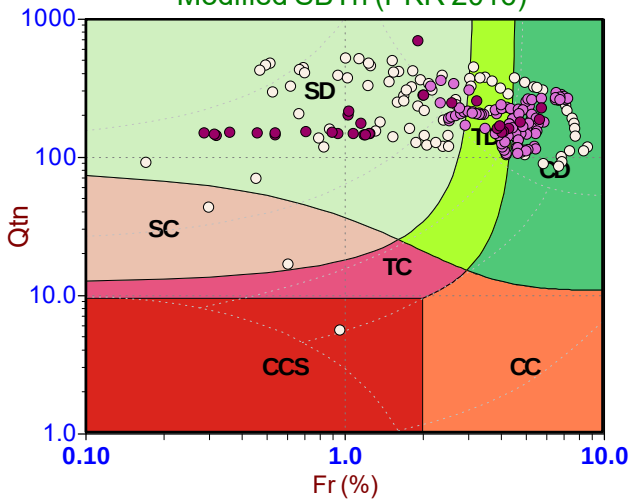
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 7.5 ft
- >7.5 to 15.0 ft
- >15.0 to 22.5 ft
- >22.5 to 30.0 ft
- >30.0 to 37.5 ft
- >37.5 to 45.0 ft
- >45.0 to 52.5 ft
- >52.5 to 60.0 ft
- >60.0 to 67.5 ft
- >67.5 to 75.0 ft
- >75.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

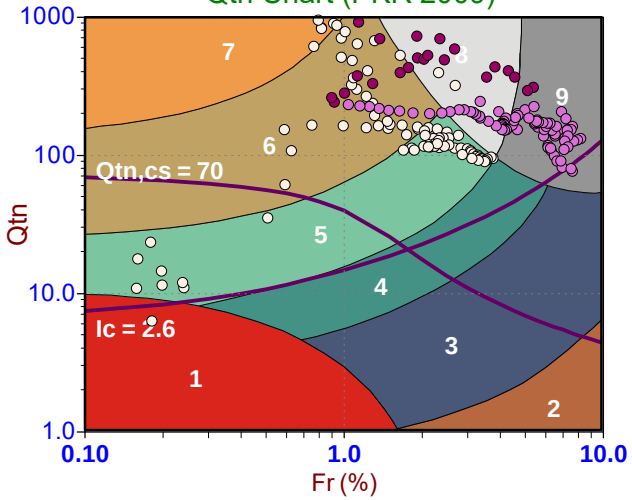
CONETEC

Geosyntec Consultants

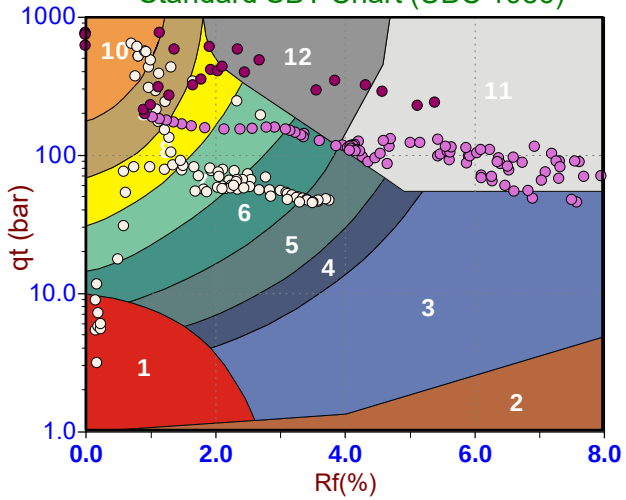
Job No: 25-56-30135
Date: 2025-09-05 08:21
Site: Vina GSA Component 5

Sounding: CPT-B-2
Cone: 968:T1500F15U35 Area=15 cm²

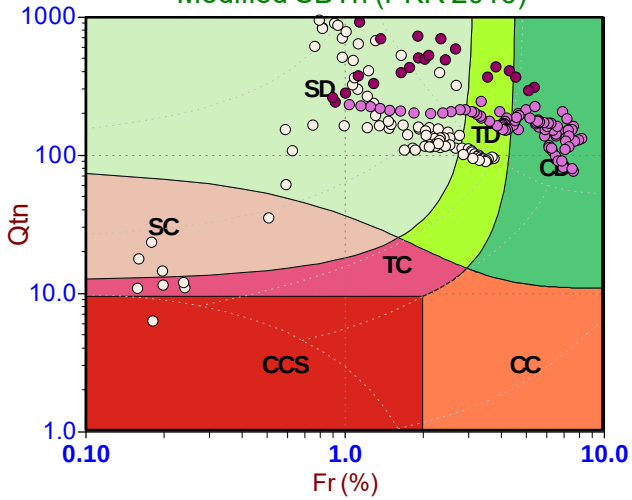
Qtn Chart (PKR 2009)



Standard SBT Chart (UBC 1986)



Modified SBTn (PKR 2016)



Depth Ranges

- >0.0 to 7.5 ft
- >7.5 to 15.0 ft
- >15.0 to 22.5 ft
- >22.5 to 30.0 ft
- >30.0 to 37.5 ft
- >37.5 to 45.0 ft
- >45.0 to 52.5 ft
- >52.5 to 60.0 ft
- >60.0 to 67.5 ft
- >67.5 to 75.0 ft
- >75.0 ft

Legend

- Sensitive, Fine Grained
- Organic Soils
- Clays
- Silt Mixtures
- Sand Mixtures
- Sands
- Gravelly Sand to Sand
- Stiff Sand to Clayey Sand
- Very Stiff Fine Grained

Legend

- Sensitive Fines
- Organic Soil
- Clay
- Silty Clay
- Clayey Silt
- Silt
- Sandy Silt
- Silty Sand/Sand
- Sand
- Gravelly Sand
- Stiff Fine Grained
- Cemented Sand

Legend

- CCS (Cont. sensitive clay like)
- CC (Cont. clay like)
- TC (Cont. transitional)
- SC (Cont. sand like)
- CD (Dil. clay like)
- TD (Dil. transitional)
- SD (Dil. sand like)

Pore Pressure Dissipation Test (PPD) Summary and PPD Plots

CONETEC

Job No:	25-56-30135
Client:	Geosyntec Consultants, Inc
Project:	Vina GSA Component 5
Start Date:	2025-09-03
End Date:	2025-09-05

CPTu PORE PRESSURE DISSIPATION SUMMARY

Sounding ID	File Name	Cone Area (cm^2)	Duration (s)	Test Depth (ft)	Estimated Equilibrium Pore Pressure U_{eq} (ft)	Calculated Phreatic Surface (ft)	Corresponding HPT Test Depth (ft)	Refer to Notation Number
CPT-2	25-56-30135_RP02	15	300	41.99	Not Achieved		38.6	
CPT-3	25-56-30135_RP03	15	440	23.95	Not Achieved		20.6	
CPT-3	25-56-30135_RP03	15	555	42.08	Not Achieved		38.8	
CPT-4	25-56-30135_RP04	15	1000	58.32	Not Achieved		55.0	
CPT-4	25-56-30135_RP04	15	1000	91.37	Not Achieved		88.1	
CPT-7	25-56-30135_RP07	15	525	18.37	Not Achieved			1
CPT-8	25-56-30135_RP08	15	400	33.79	Not Achieved		30.4	
CPT-B-1	25-56-30135_RP-B01	15	820	18.04	Not Achieved			1
CPT-B-2	25-56-30135_RP-B02	15	800	17.06	9.1	7.9	13.8	
Totals			97 min					

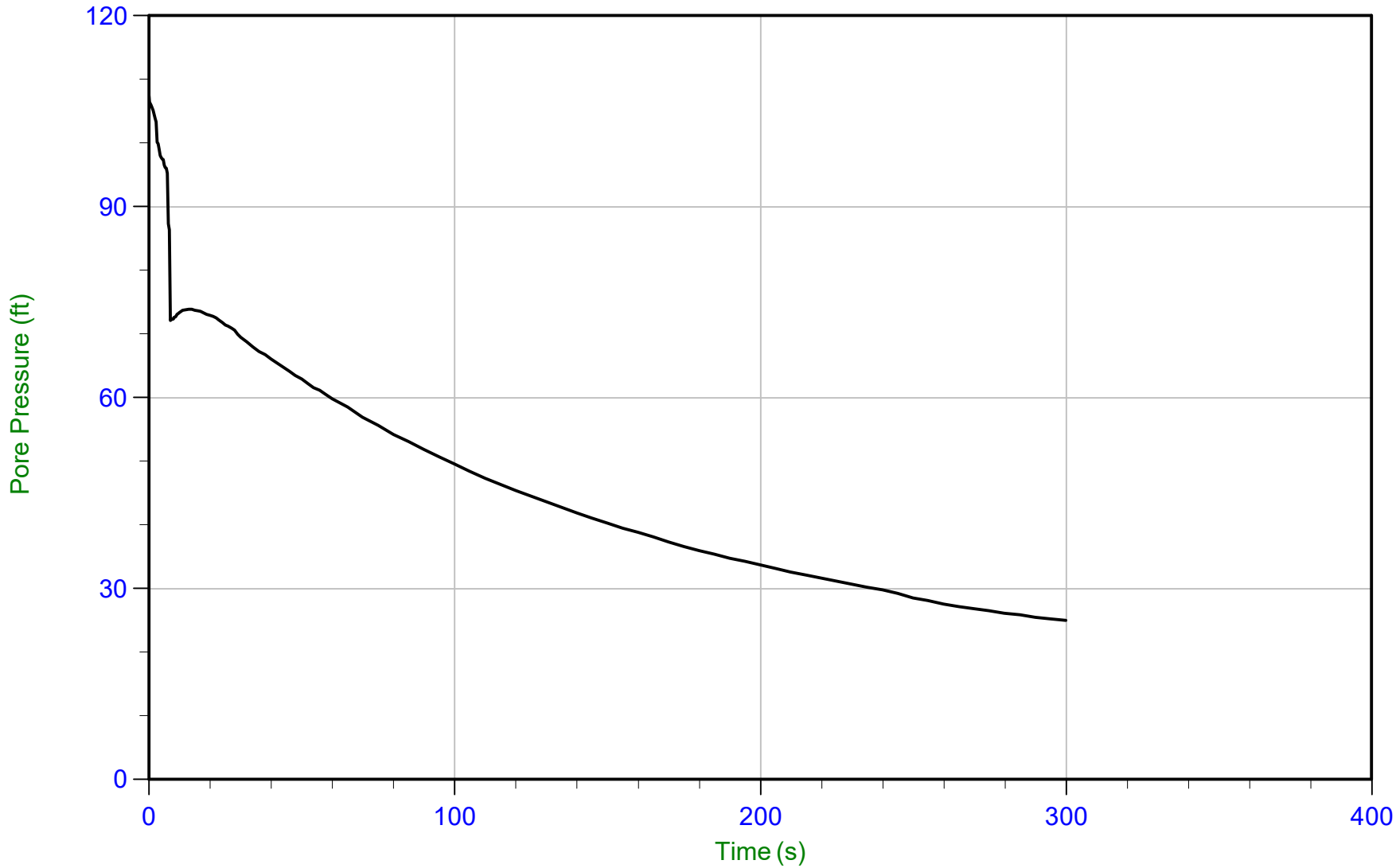
1. HPT pore pressure dissipation test was not performed.

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-03 13:41
Site: Vina GSA Component 5

Sounding: CPT-2
Cone: 968:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 25-56-30135_RP02.PPF2
Depth: 12.800 m / 41.994 ft
Duration: 300.0 s

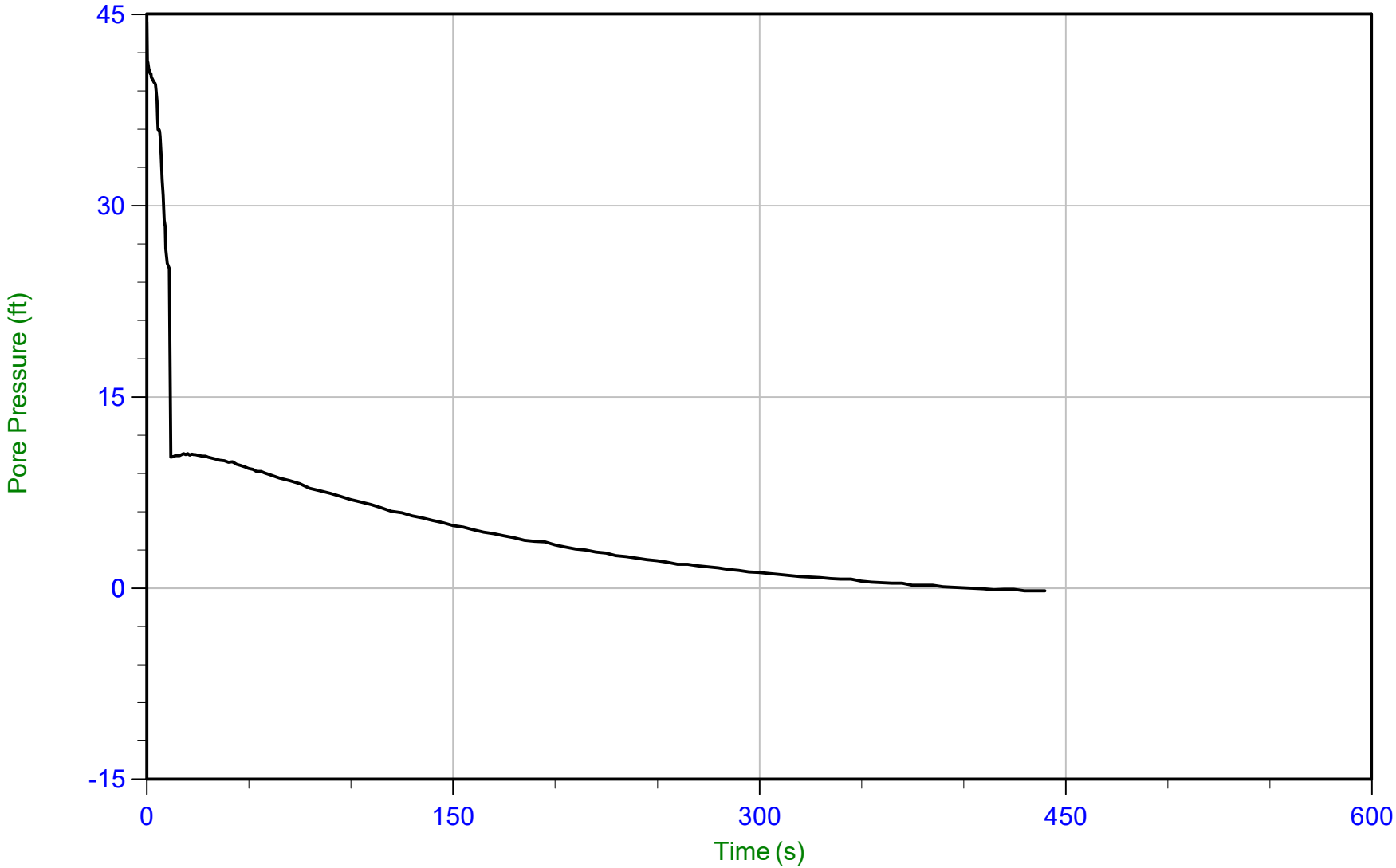
u Min: 25.0 ft
u Max: 107.4 ft
u Final: 25.0 ft

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 07:29
Site: Vina GSA Component 5

Sounding: CPT-3
Cone: 968:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 25-56-30135_RP03.PPF2
Depth: 7.300 m / 23.950 ft
Duration: 440.0 s

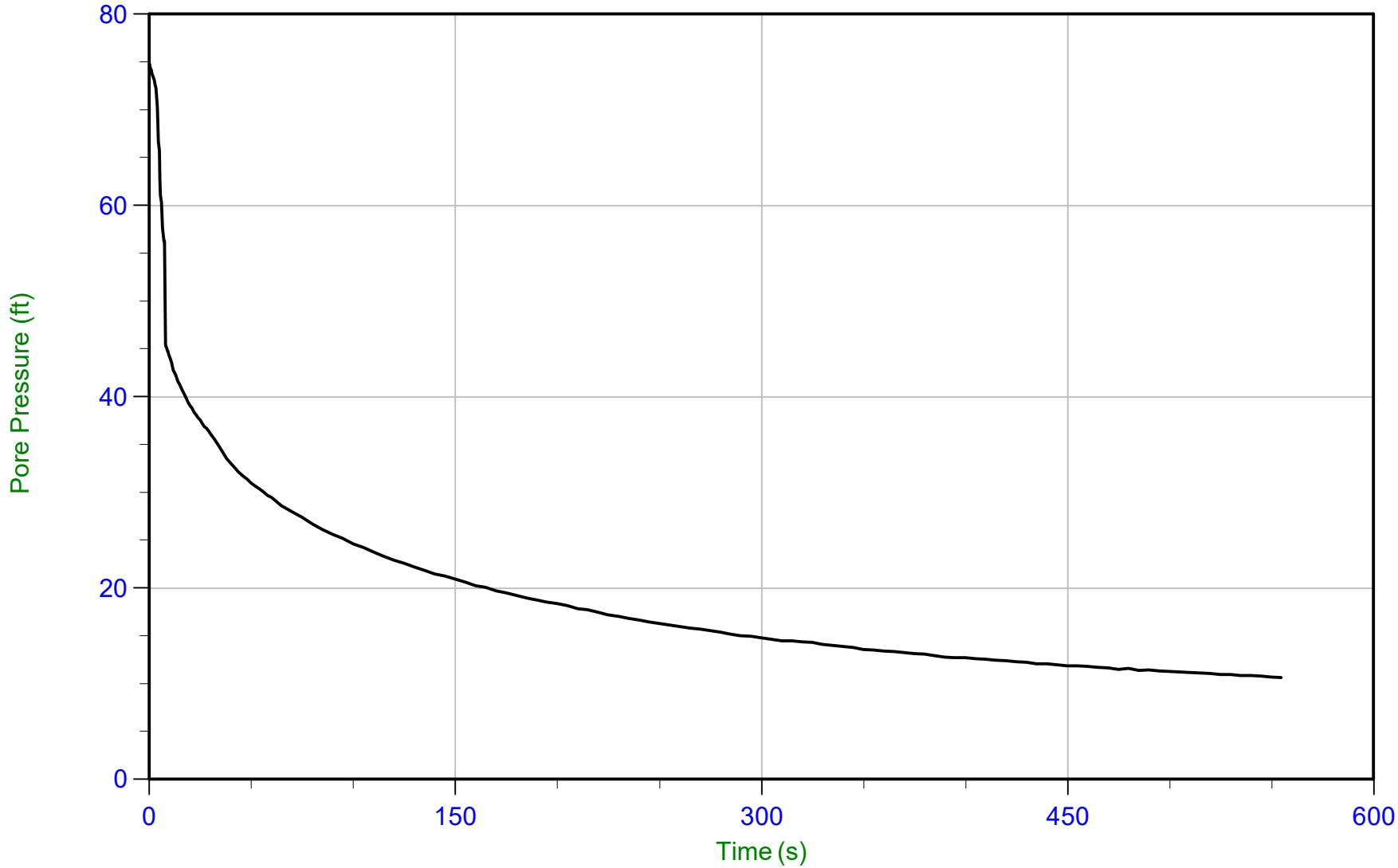
u Min: -0.2 ft
u Max: 44.4 ft
u Final: -0.2 ft

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 07:29
Site: Vina GSA Component 5

Sounding: CPT-3
Cone: 968:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 25-56-30135_RP03.PPF2
Depth: 12.825 m / 42.076 ft
Duration: 555.0 s

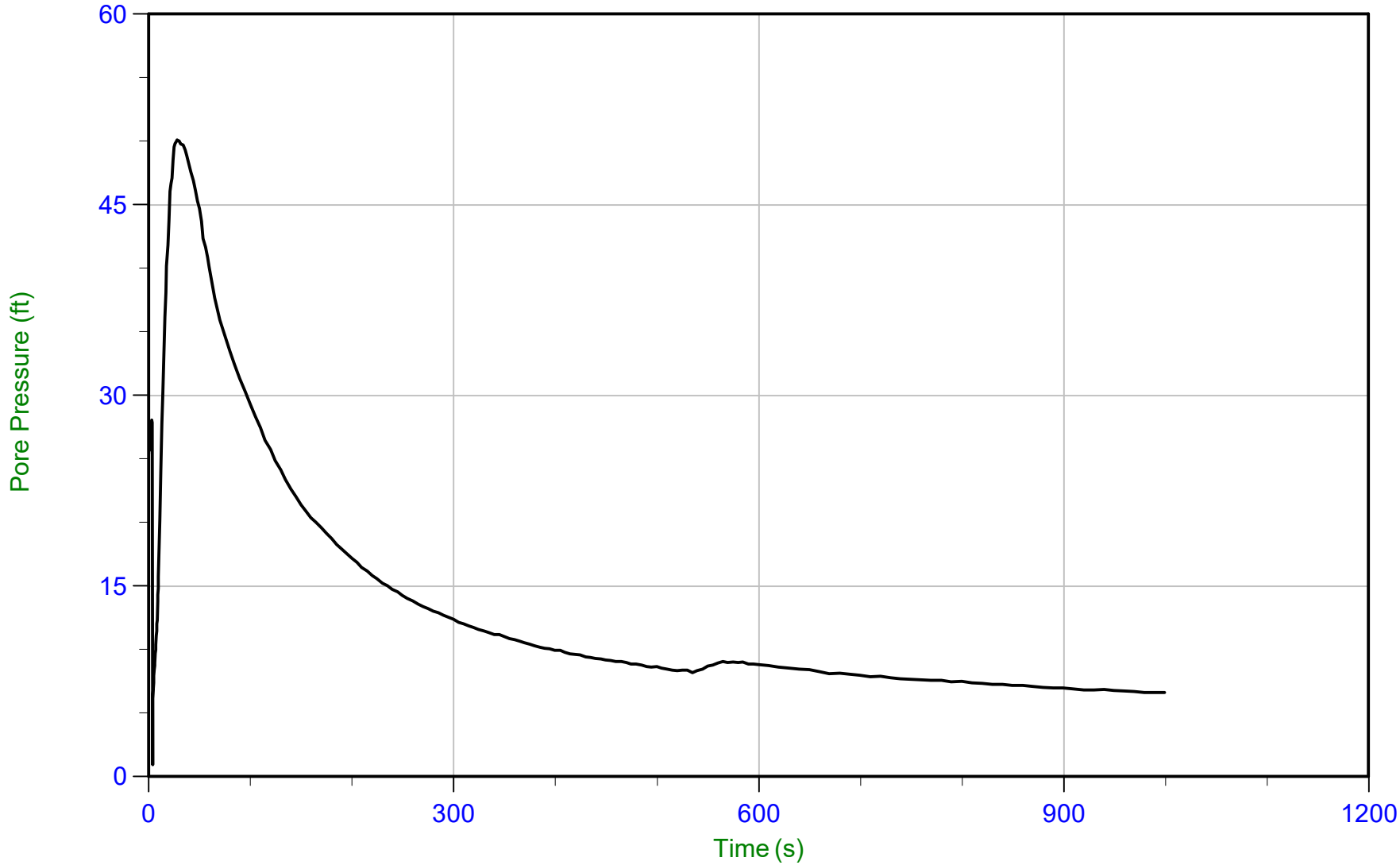
u Min: 10.7 ft
u Max: 74.8 ft
u Final: 10.7 ft

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 10:20
Site: Vina GSA Component 5

Sounding: CPT-4
Cone: 968:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 25-56-30135_RP04.PPF2
Depth: 17.775 m / 58.316 ft
Duration: 1000.0 s

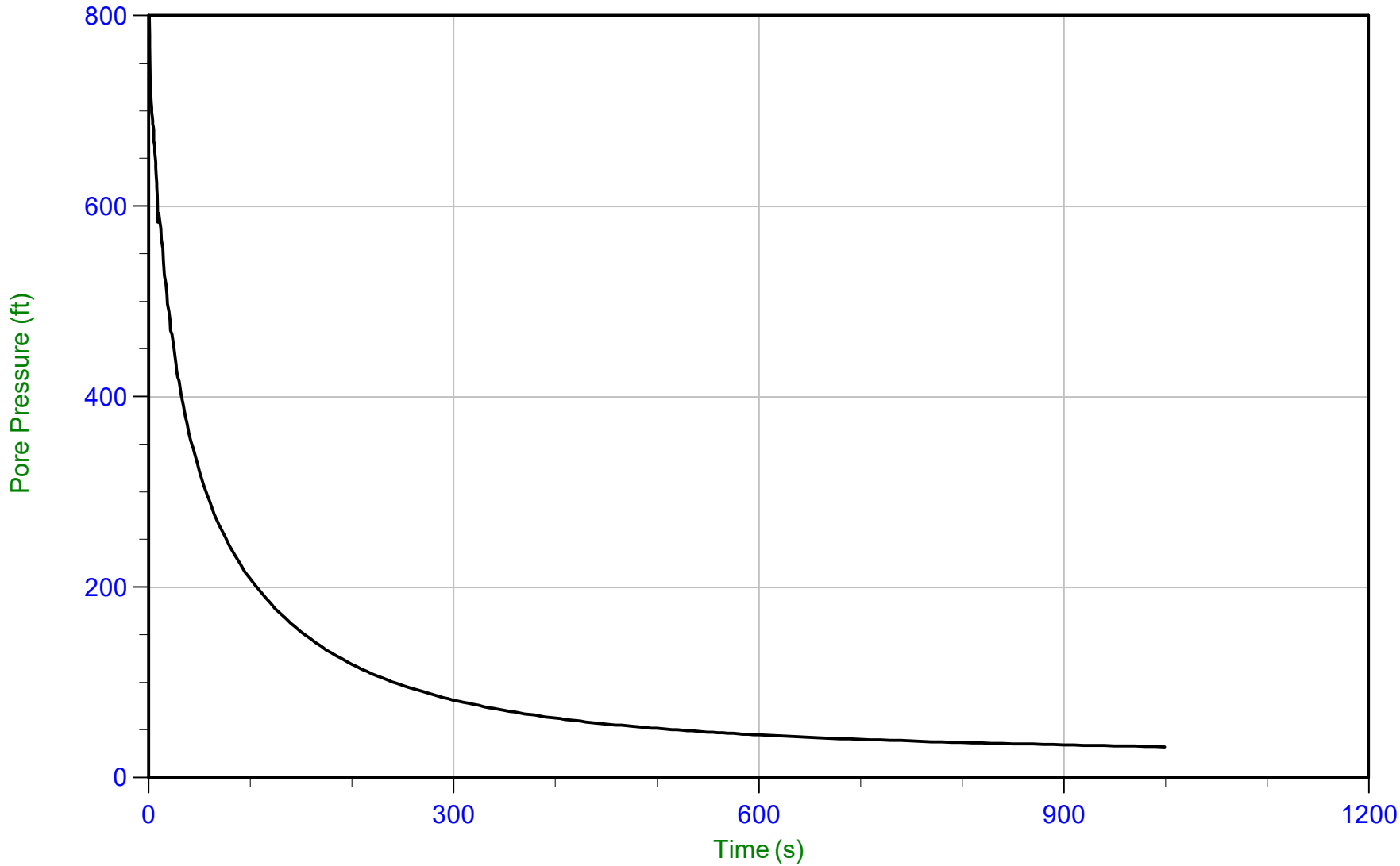
u Min: 0.9 ft
u Max: 50.1 ft
u Final: 6.6 ft

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 10:20
Site: Vina GSA Component 5

Sounding: CPT-4
Cone: 968:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 25-56-30135_RP04.PPF2
Depth: 27.850 m / 91.370 ft
Duration: 1000.0 s

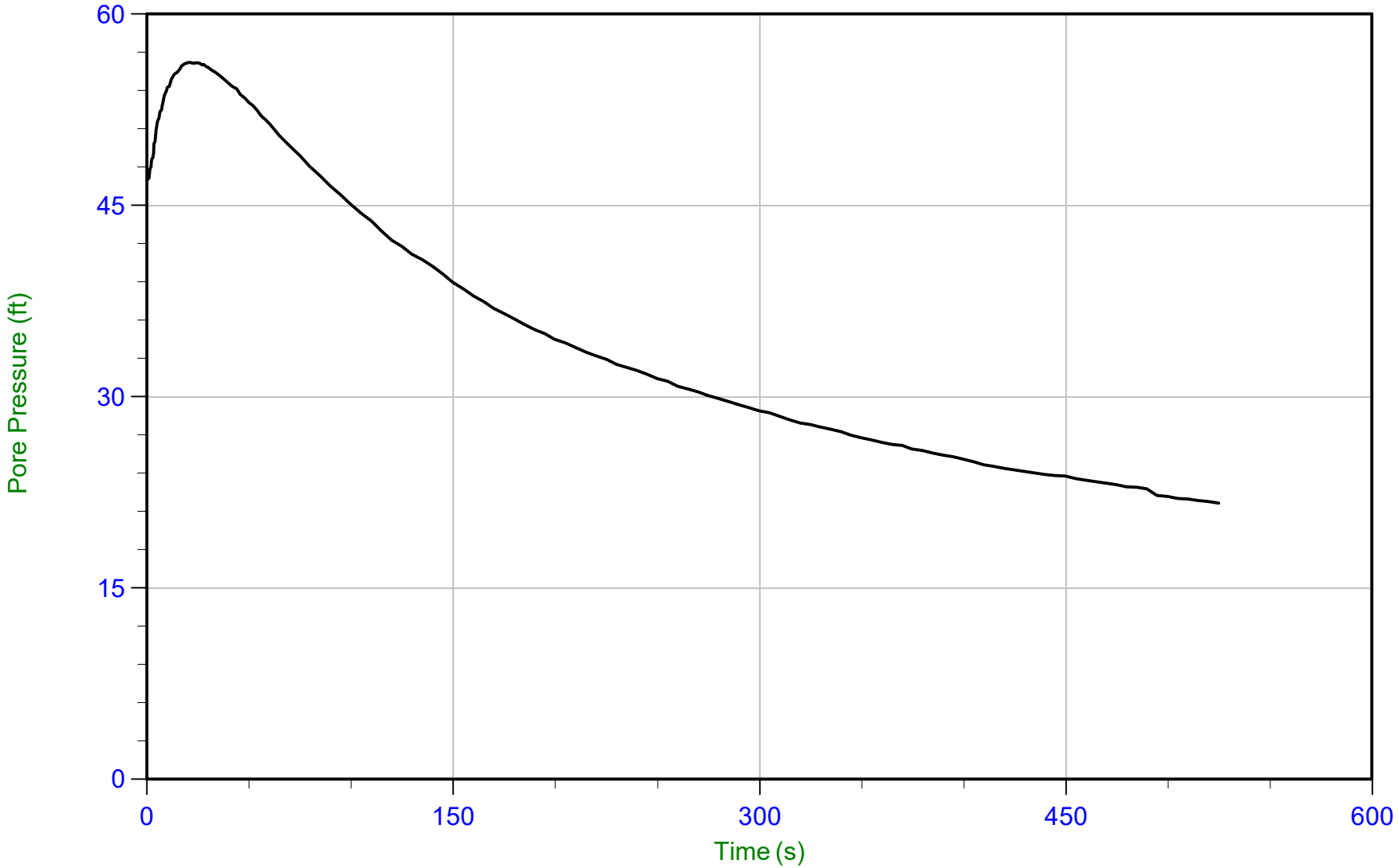
u Min: 32.5 ft
u Max: 860.0 ft
u Final: 32.5 ft

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-03 10:46
Site: Vina GSA Component 5

Sounding: CPT-7
Cone: 968:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 25-56-30135_RP07.PPF2
Depth: 5.600 m / 18.372 ft
Duration: 525.0 s

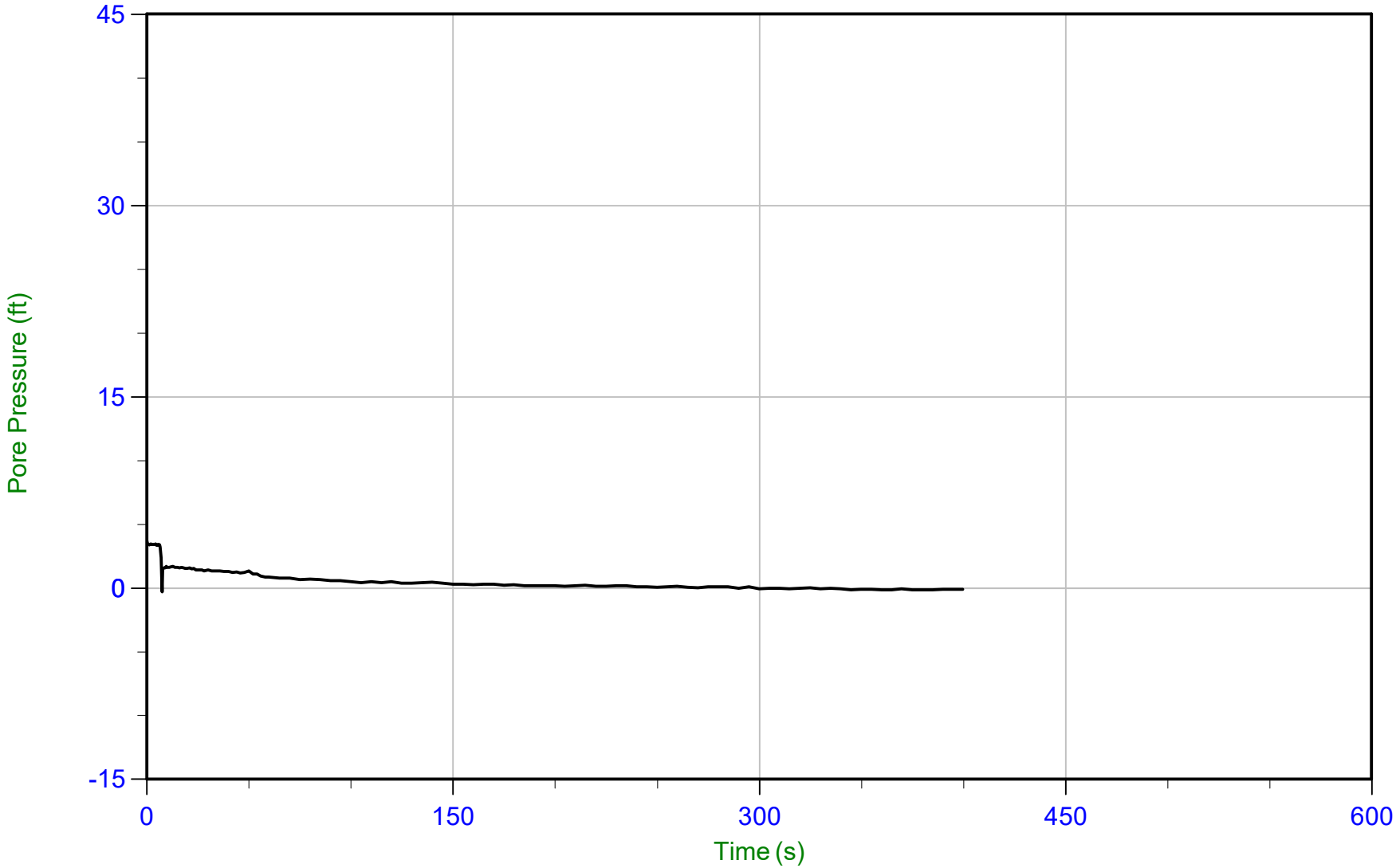
u Min: 21.7 ft
u Max: 56.2 ft
u Final: 21.7 ft

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-04 09:10
Site: Vina GSA Component 5

Sounding: CPT-8
Cone: 968:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 25-56-30135_RP08.PPF2
Depth: 10.300 m / 33.792 ft
Duration: 400.0 s

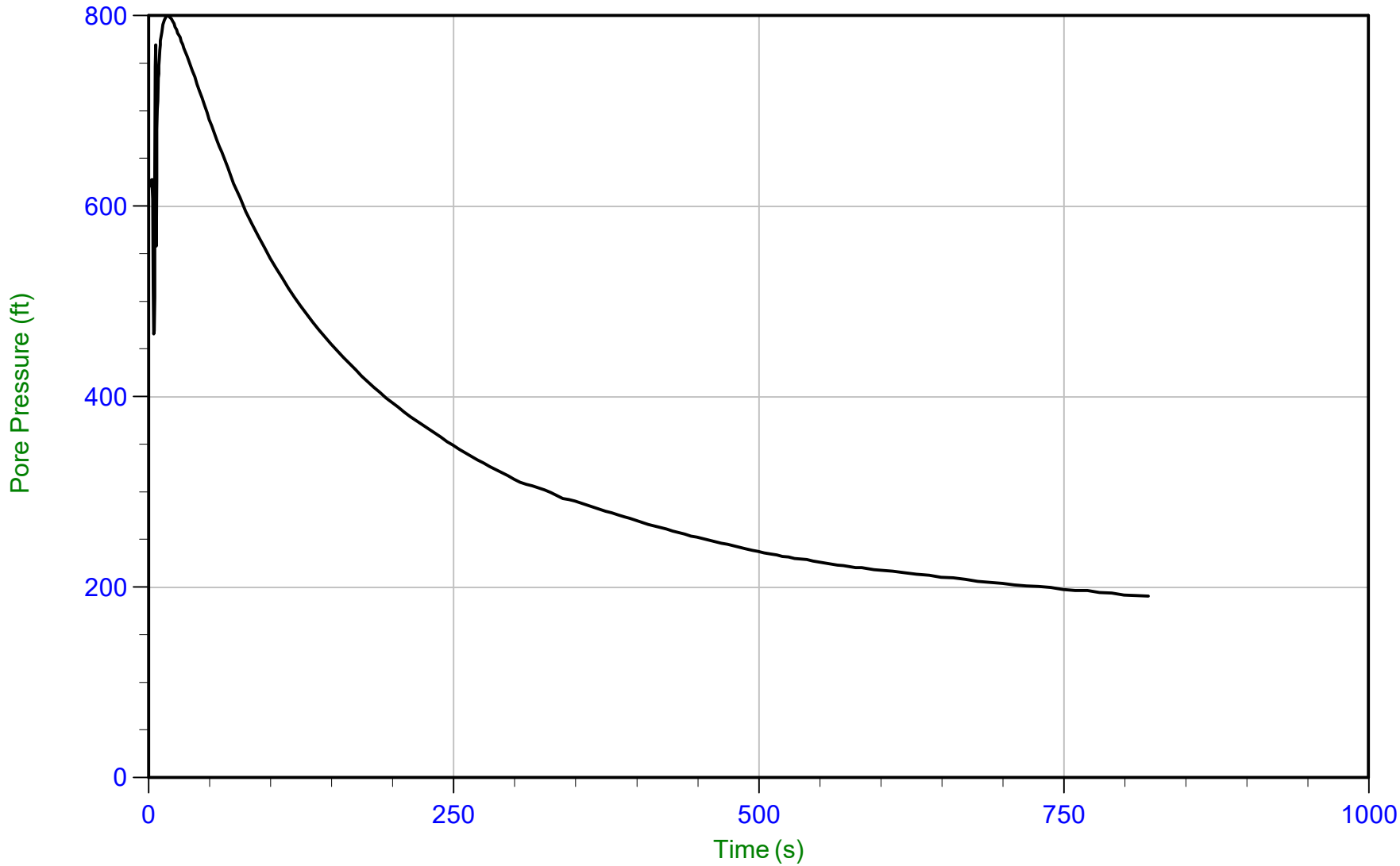
u Min: -0.3 ft
u Max: 3.7 ft
u Final: -0.1 ft

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-05 06:28
Site: Vina GSA Component 5

Sounding: CPT-B-1
Cone: 968:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 25-56-30135_RP-B01.PPF2
Depth: 5.500 m / 18.044 ft
Duration: 820.0 s

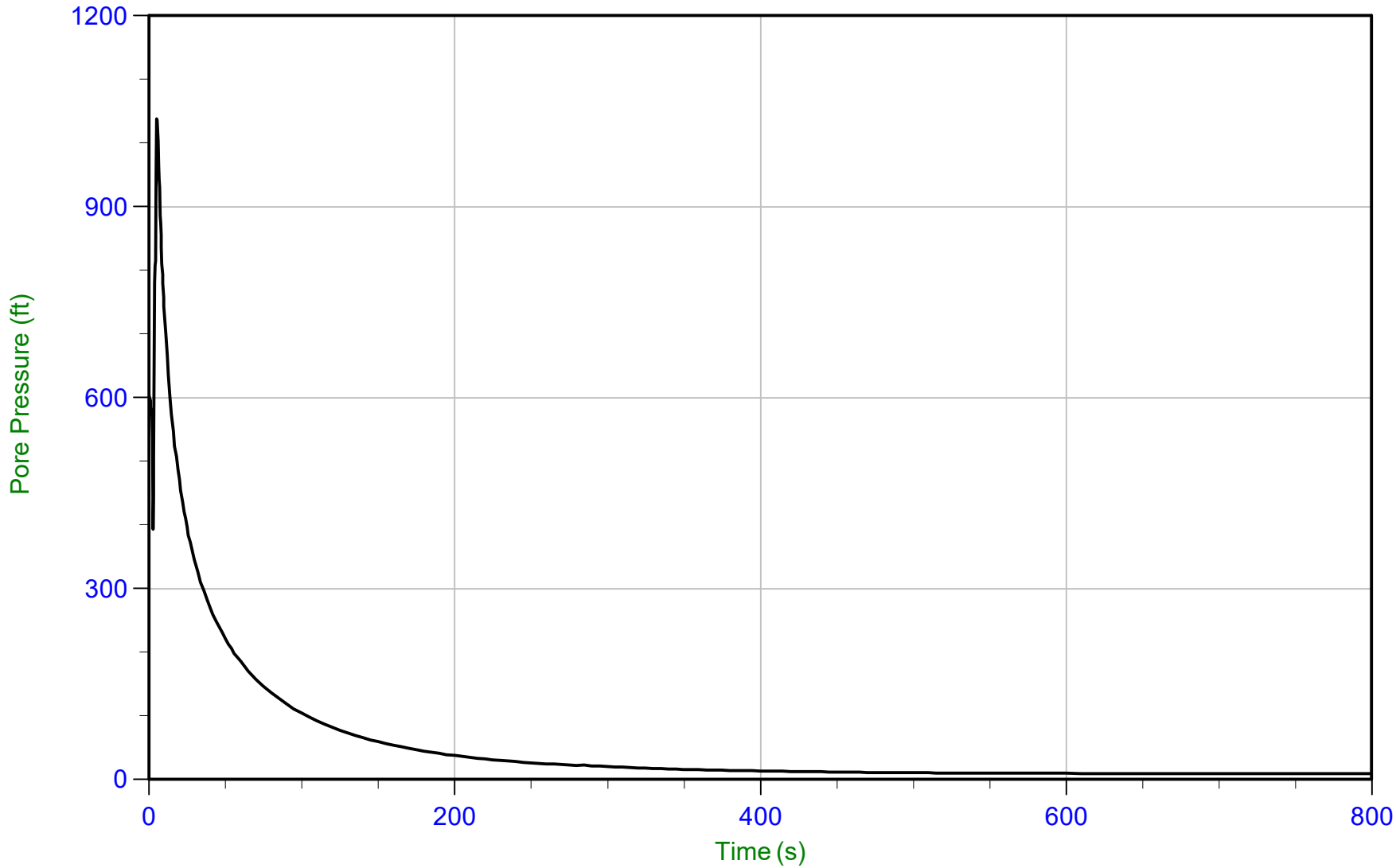
u Min: 190.5 ft
u Max: 799.9 ft
u Final: 190.5 ft

CONETEC

Geosyntec Consultants

Job No: 25-56-30135
Date: 2025-09-05 08:21
Site: Vina GSA Component 5

Sounding: CPT-B-2
Cone: 968:T1500F15U35 Area=15 cm²



Trace Summary:

Filename: 25-56-30135_RP-B02.PPF2
Depth: 5.200 m / 17.060 ft
Duration: 800.0 s

u Min: 9.1 ft
u Max: 1038.0 ft
u Final: 9.2 ft

WT: 2.42 m / 7.95 ft
Ueq: 9.1 ft

Hydraulic Profiling Tool (HPT) Summary and Plots

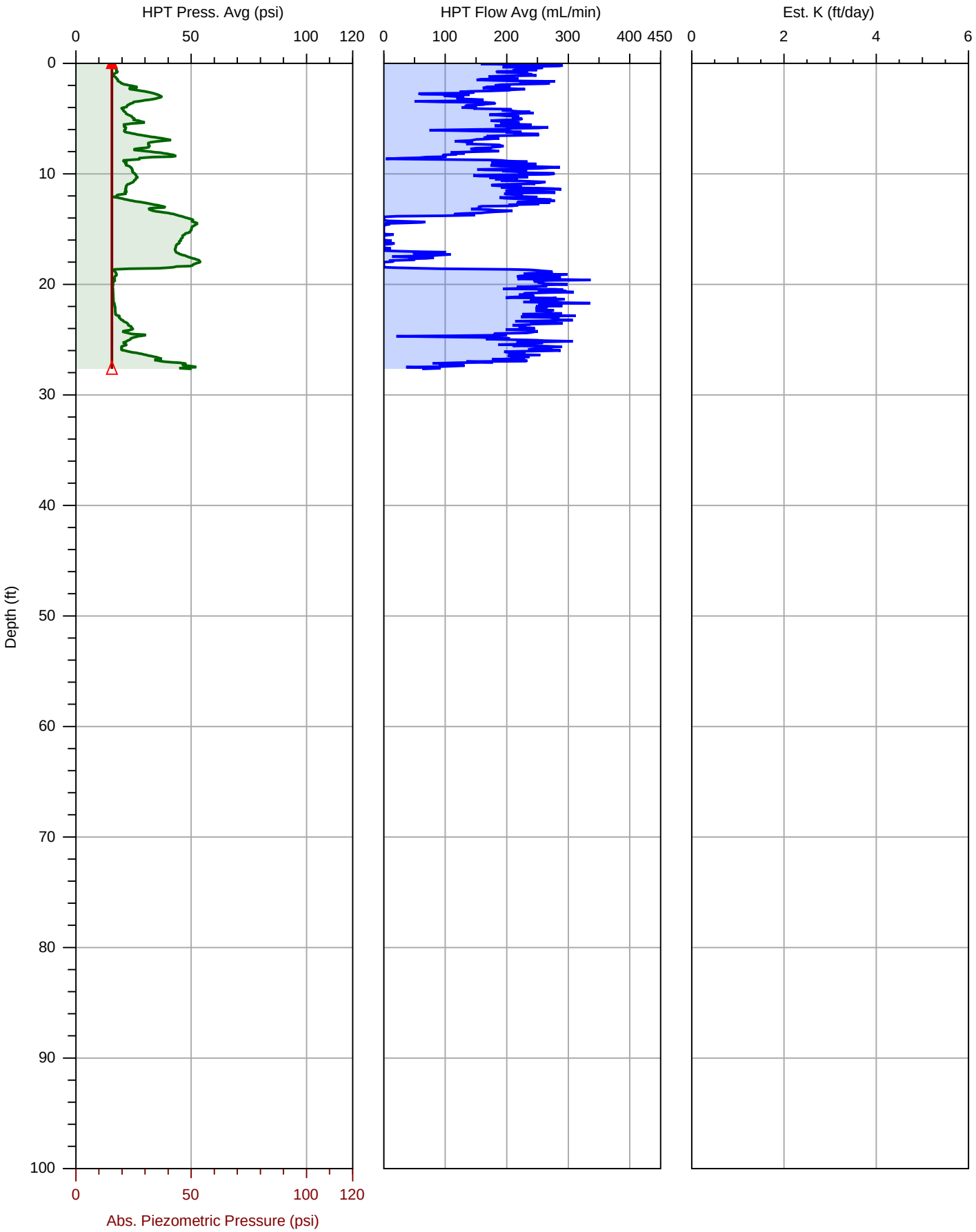
CONETEC

Job No:	25-56-30135
Client:	Geosyntec Consultants, Inc
Project:	Vina GSA Component 5
Start Date:	2025-09-03
End Date:	2025-09-05

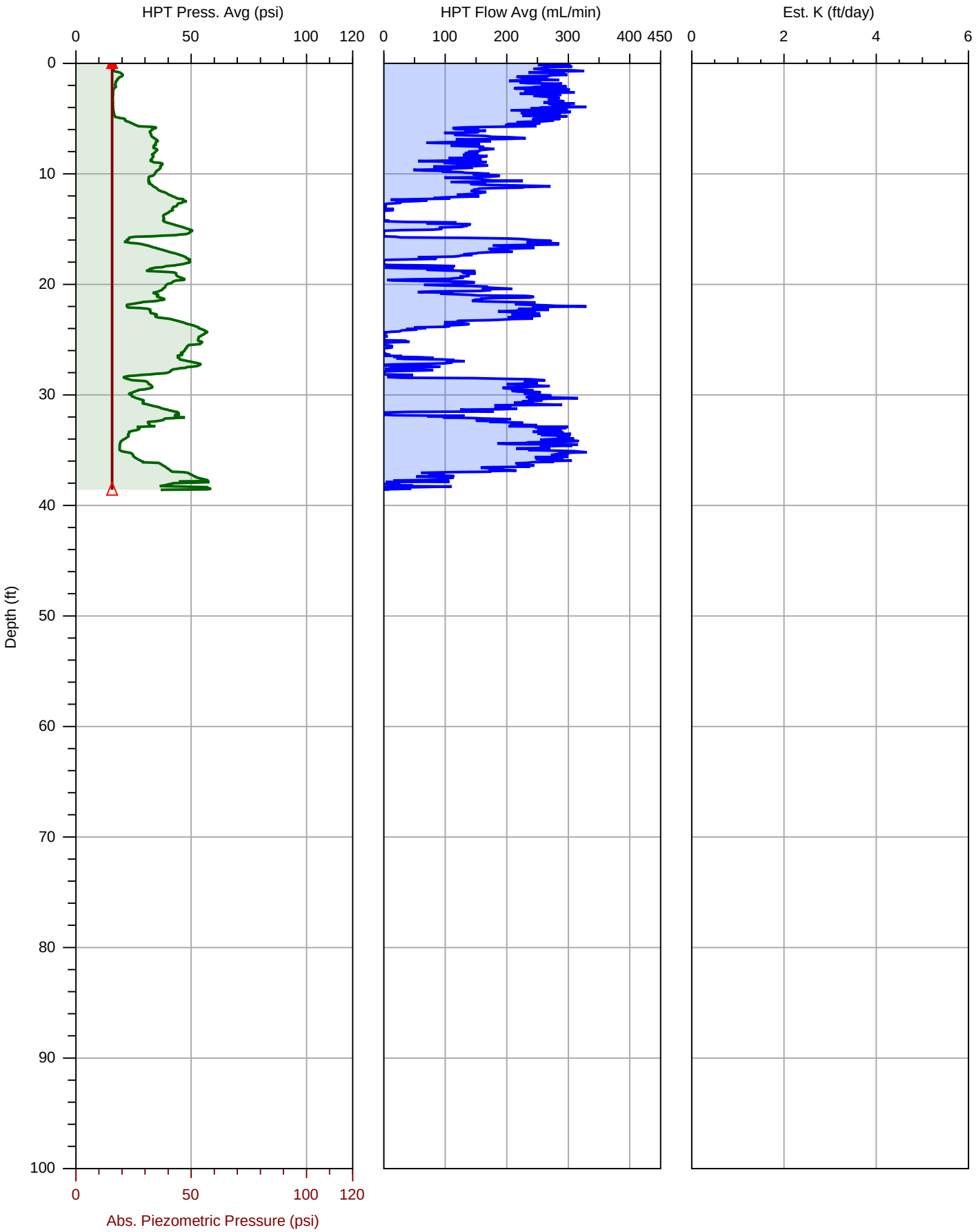
HYDRAULIC PROFILING TOOL (HPT) SUMMARY

HPT Sounding ID	HPT File Name	Companion CPT Sounding ID	Date	Absolute Hydrostatic Pressure (psi)	Assumed Phreatic Surface[1] (ft)	Final Depth[2] (ft)	Northing[3]	Easting[3]	Refer to Notation Number
HPT-01	25-56-30135_HPT-01	CPT-1	2025-09-03	15.589		27.65	4395277	599115	4
HPT-02	25-56-30135_HPT-02	CPT-2	2025-09-03	15.705		38.60	4395111	599129	4
HPT-03	25-56-30135_HPT-03	CPT-3	2025-09-04	15.410		38.75	4394726	599128	4
HPT-04	25-56-30135_HPT-04	CPT-4	2025-09-04	15.475		88.00	4394740	598643	4
HPT-05	25-56-30135_HPT-05	CPT-5	2025-09-04	15.495		25.00	4394919	598834	4
HPT-06	25-56-30135_HPT-06	CPT-6	2025-09-04	15.512		44.45	4394541	598572	4
HPT-07	25-56-30135_HPT-07	CPT-7	2025-09-03	15.473		34.30	4395121	598695	4
HPT-08	25-56-30135_HPT-08	CPT-8	2025-09-04	15.490		30.40	4394566	598864	4
HPT-B-01	25-56-30135_HPT-B-01	CPT-B-1	2025-09-05	15.416	7.9	14.65	4406782	593403	5
HPT-B-02	25-56-30135_HPT-B-02	CPT-B-2	2025-09-05	15.400	7.9	13.75	4406795	593353	
Totals	10 Soundings					355.55 ft			

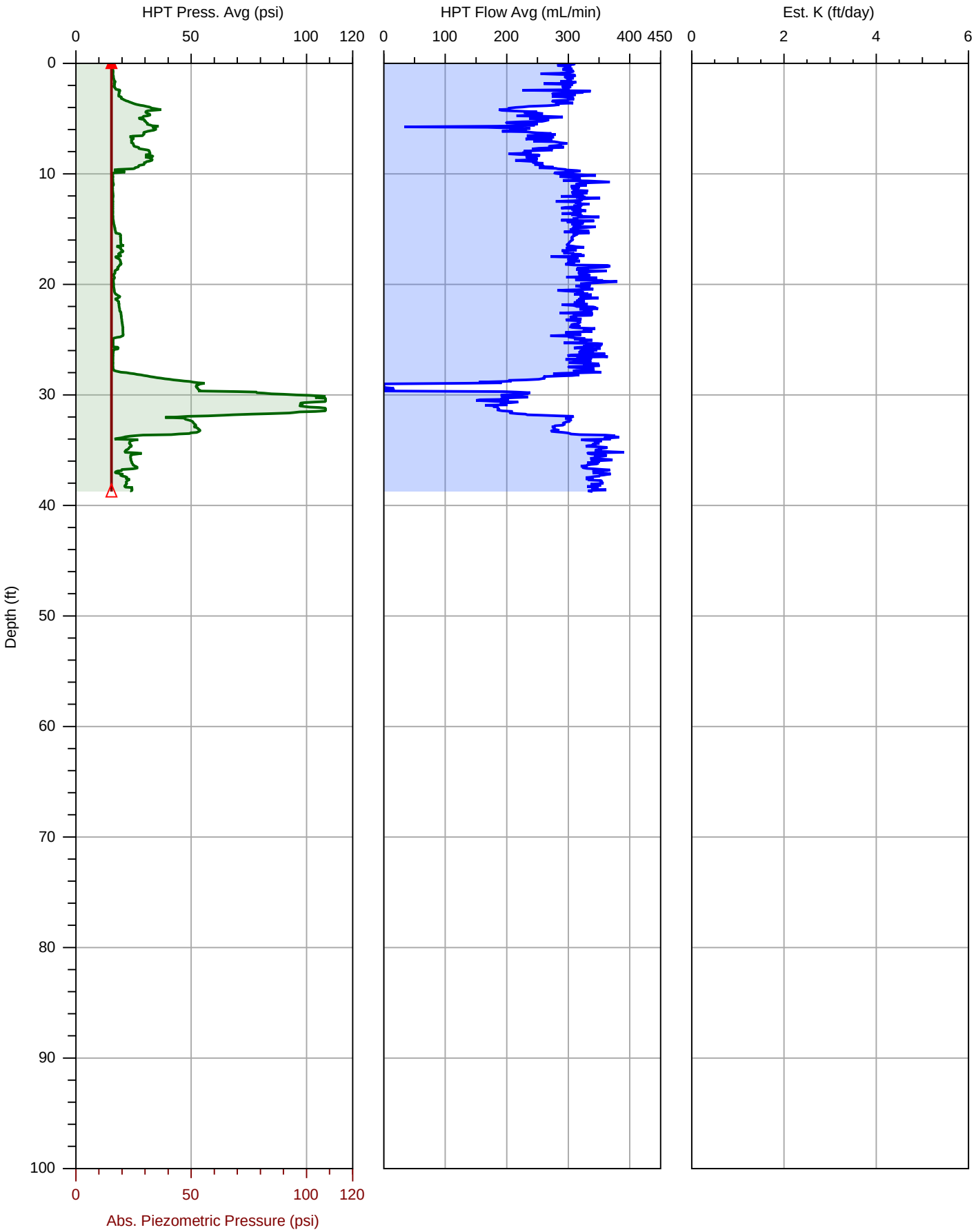
1. The assumed phreatic surface from the CPT pore pressure dissipation tests are used with the HPT data to determine the hydraulic conductivity.
2. Final depth of HPT data is 3.33ft lagging CPT data due to tool assembly requirements. HPT data and CPT data are collected by separate depth encoders, small differences can occur.
3. The coordinates were collected using consumer grade GPS equipment with an accuracy of ±30 feet. EPSG number: 32610 (WGS84 / UTM Zone 10 North).
4. The assumed phreatic surface was not determined.
5. The assumed phreatic surface is based on pore pressure dissipation test results from CPT-B-2.



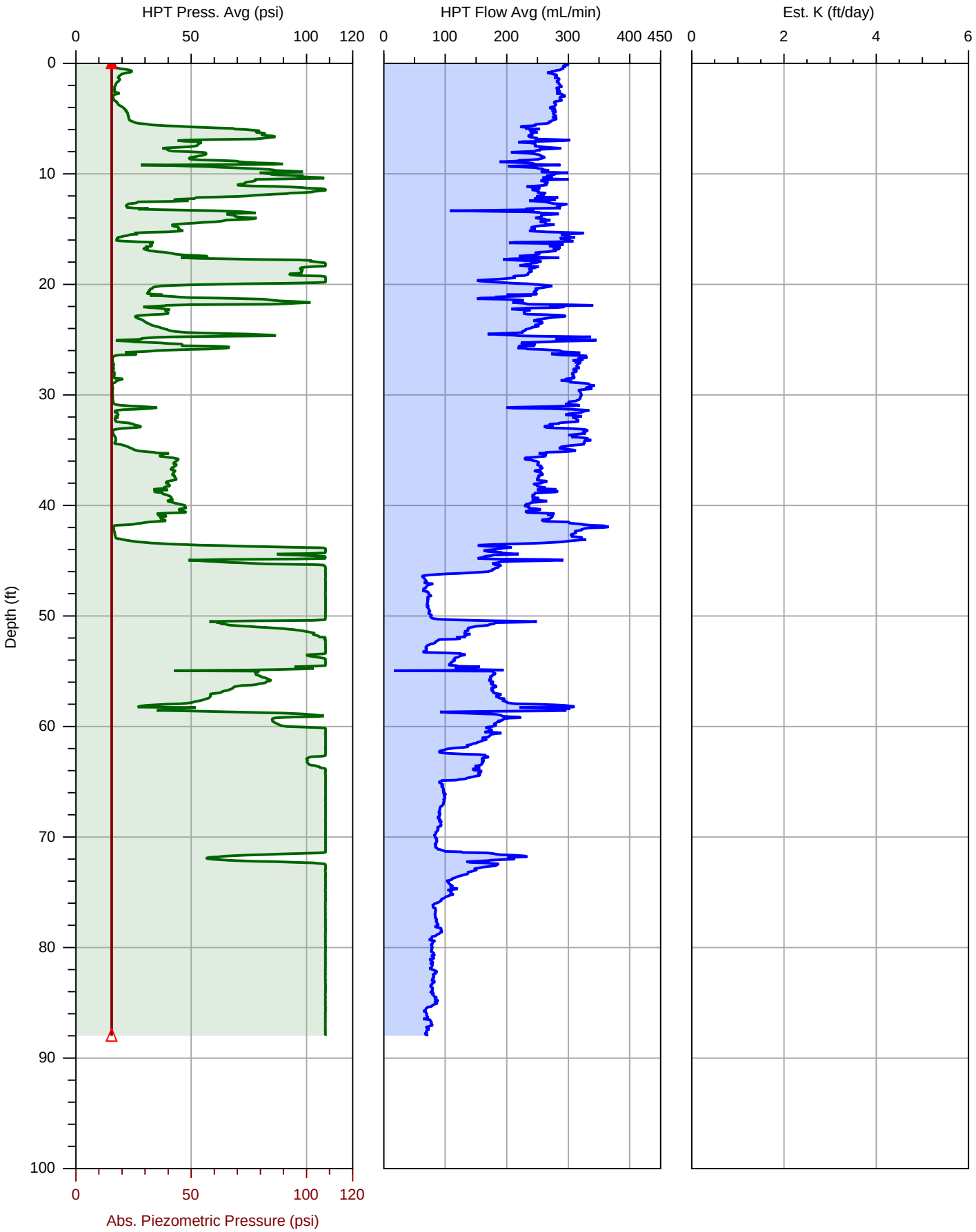
		File: 25-56-30135_HPT-01.HPT
Company: ConeTec	Sounding: HPT-01	Date: 9/3/2025
Project ID: Vina GSA Component 5	Client: Geosyntec Consultants, Inc	Location: N: 4395277m E: 599115m



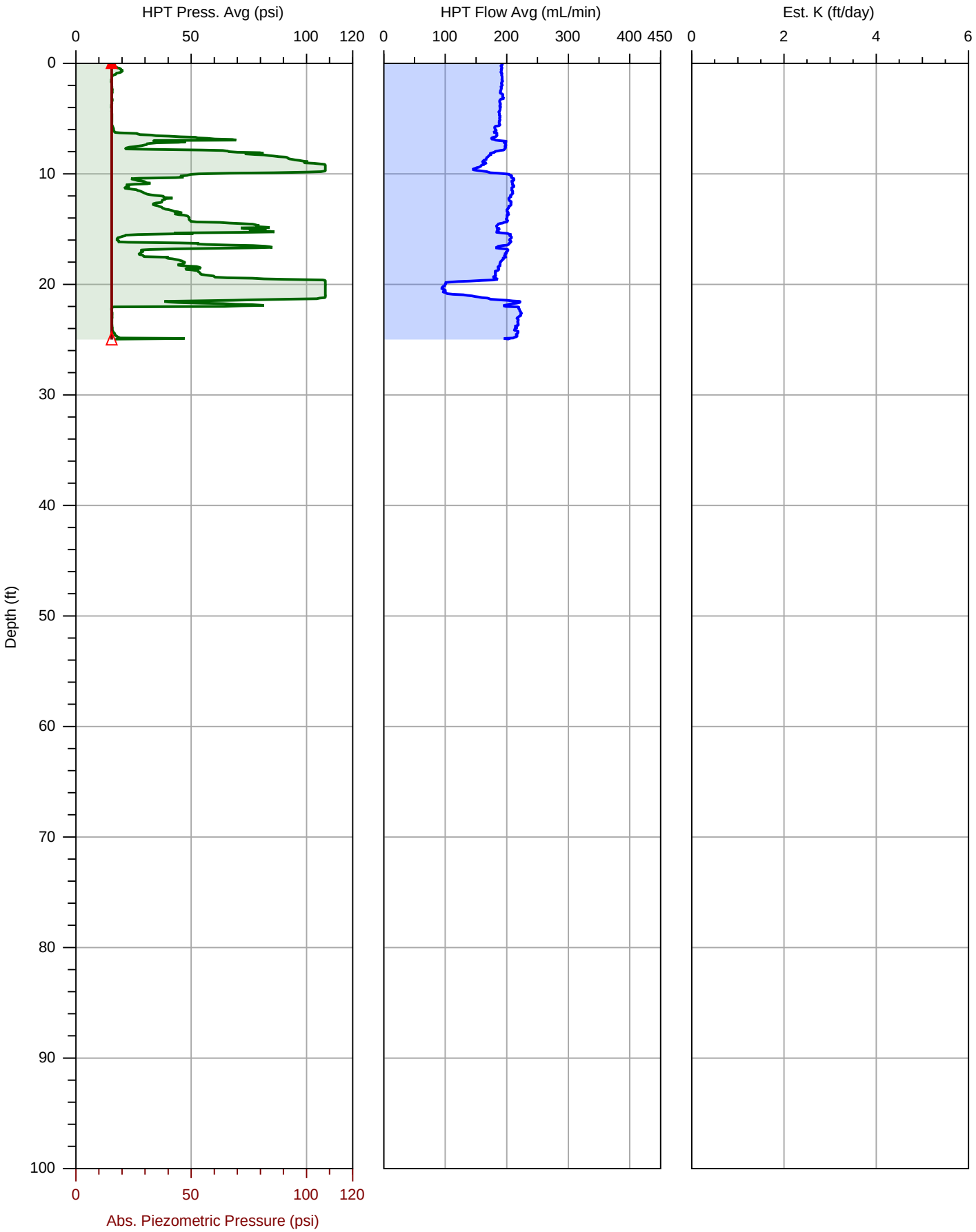
		File: 25-56-30135_HPT-02.HPT
Company: ConeTec	Sounding: HPT-02	Date: 9/3/2025
Project ID: Vina GSA Component 5	Client: Geosyntec Consultants, Inc	Location: N: 4395111m E: 599129m



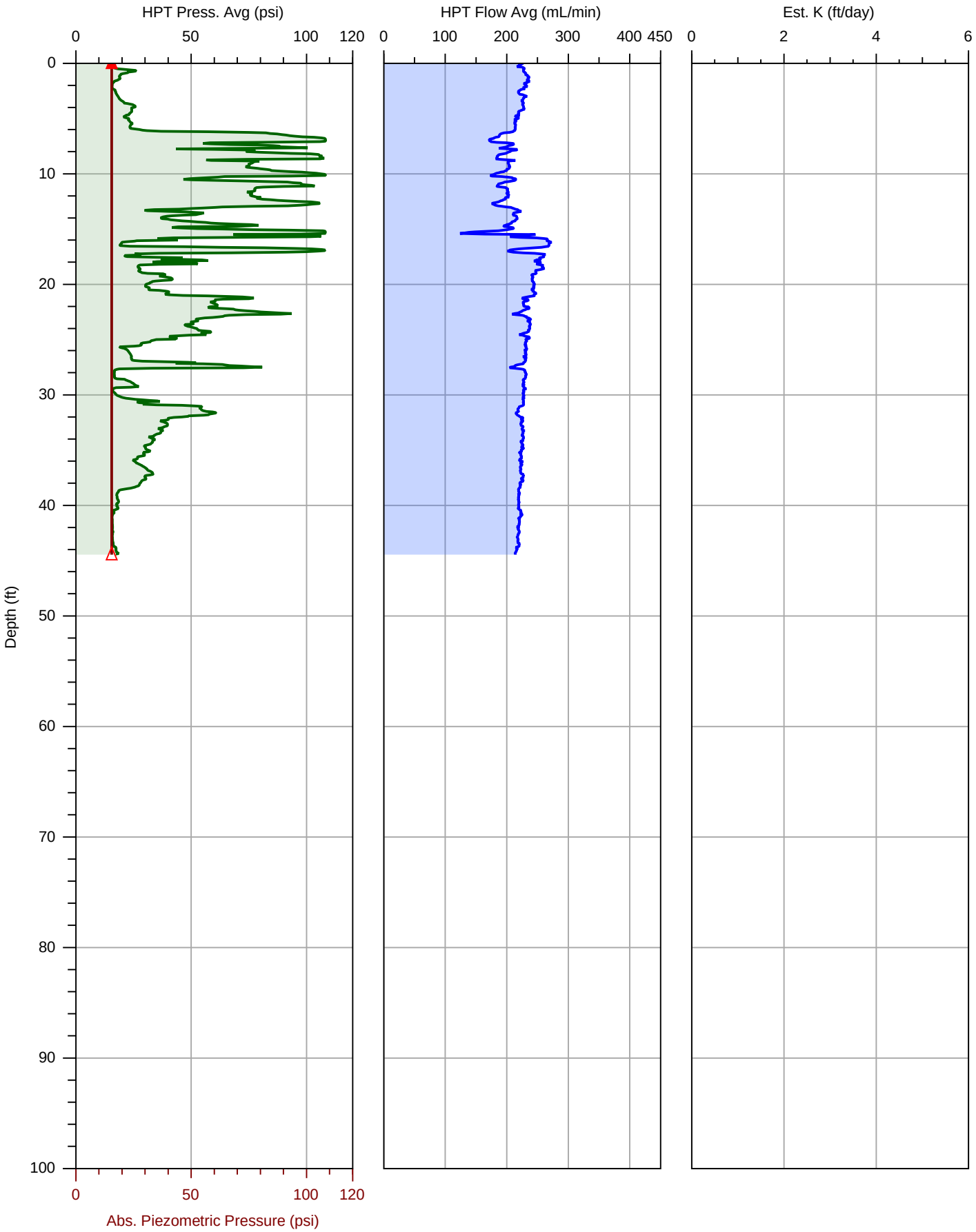
			File: 25-56-30135_HPT-03.HPT
Company: ConeTec		Sounding: HPT-03	Date: 9/4/2025
Project ID: Vina GSA Component 5		Client: Geosyntec Consultants, Inc	Location: N: 4394726m E: 599128m



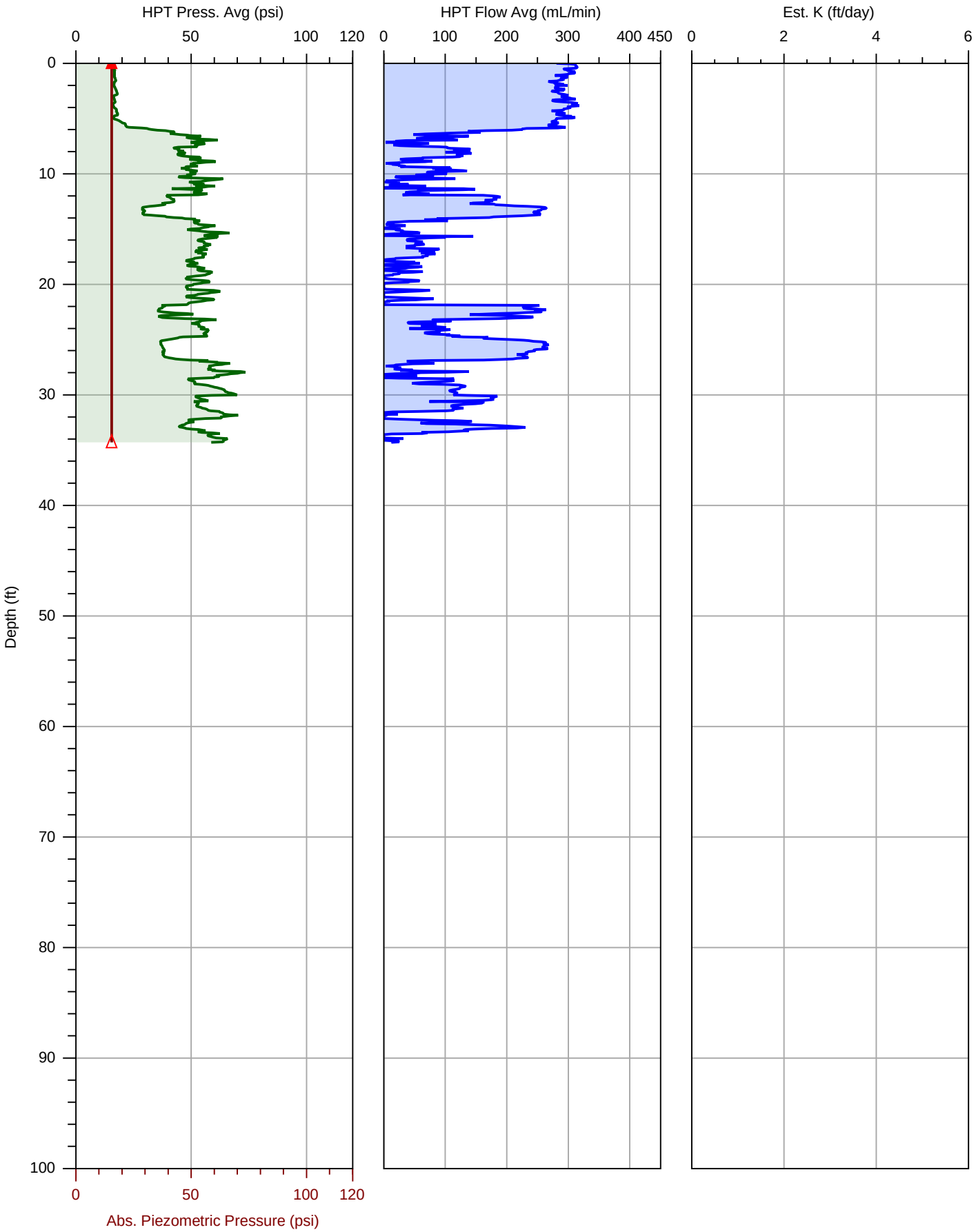
		File: 25-56-30135_HPT-04.HPT
Company: ConeTec	Sounding: HPT-04	Date: 9/4/2025
Project ID: Vina GSA Component 5	Client: Geosyntec Consultants, Inc	Location: N: 4394740m E: 598643m



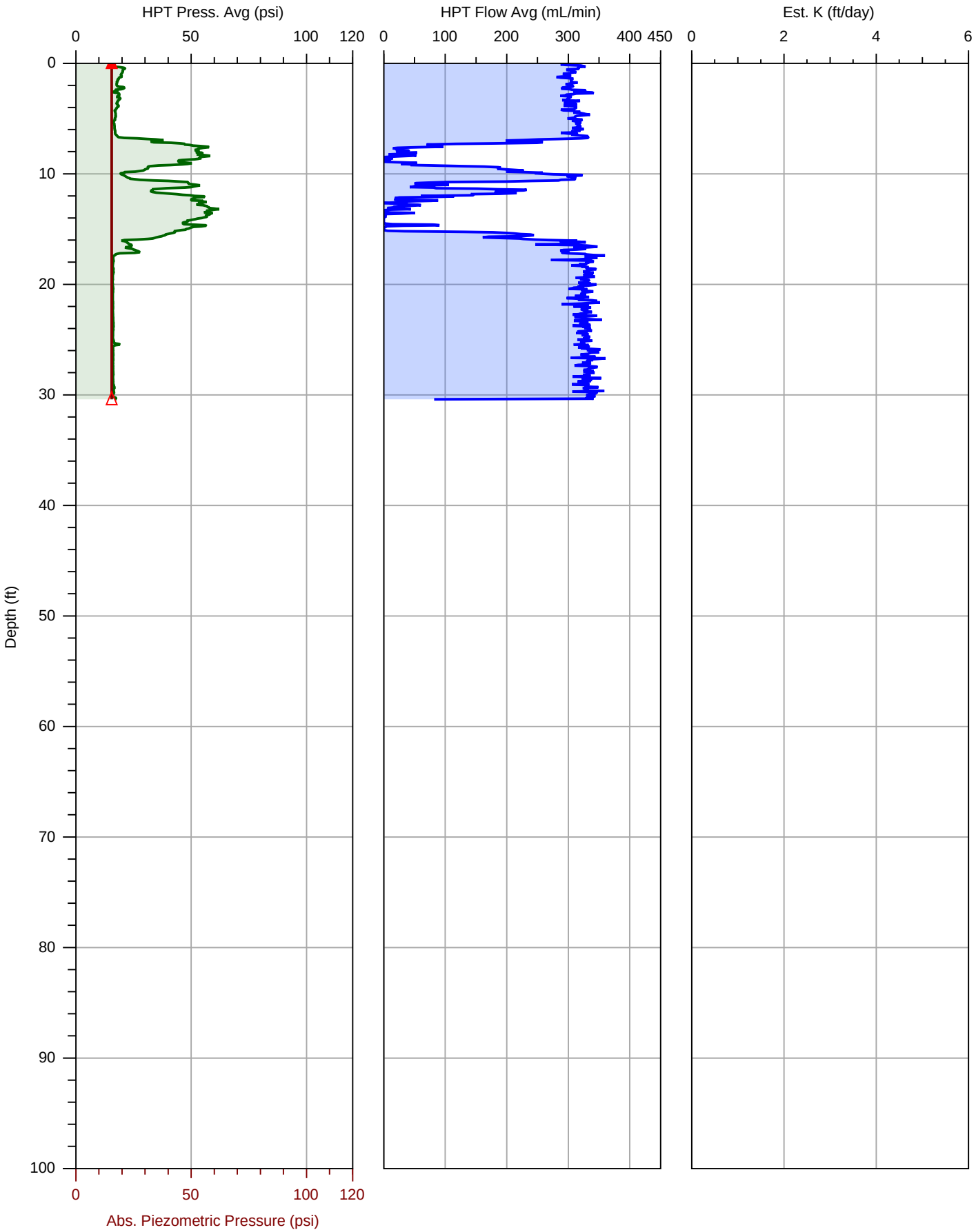
			File: 25-56-30135_HPT-05.HPT
Company: ConeTec		Sounding: HPT-05	Date: 9/4/2025
Project ID: Vina GSA Component 5		Client: Geosyntec Consultants, Inc	Location: N: 4394919m E: 598834m



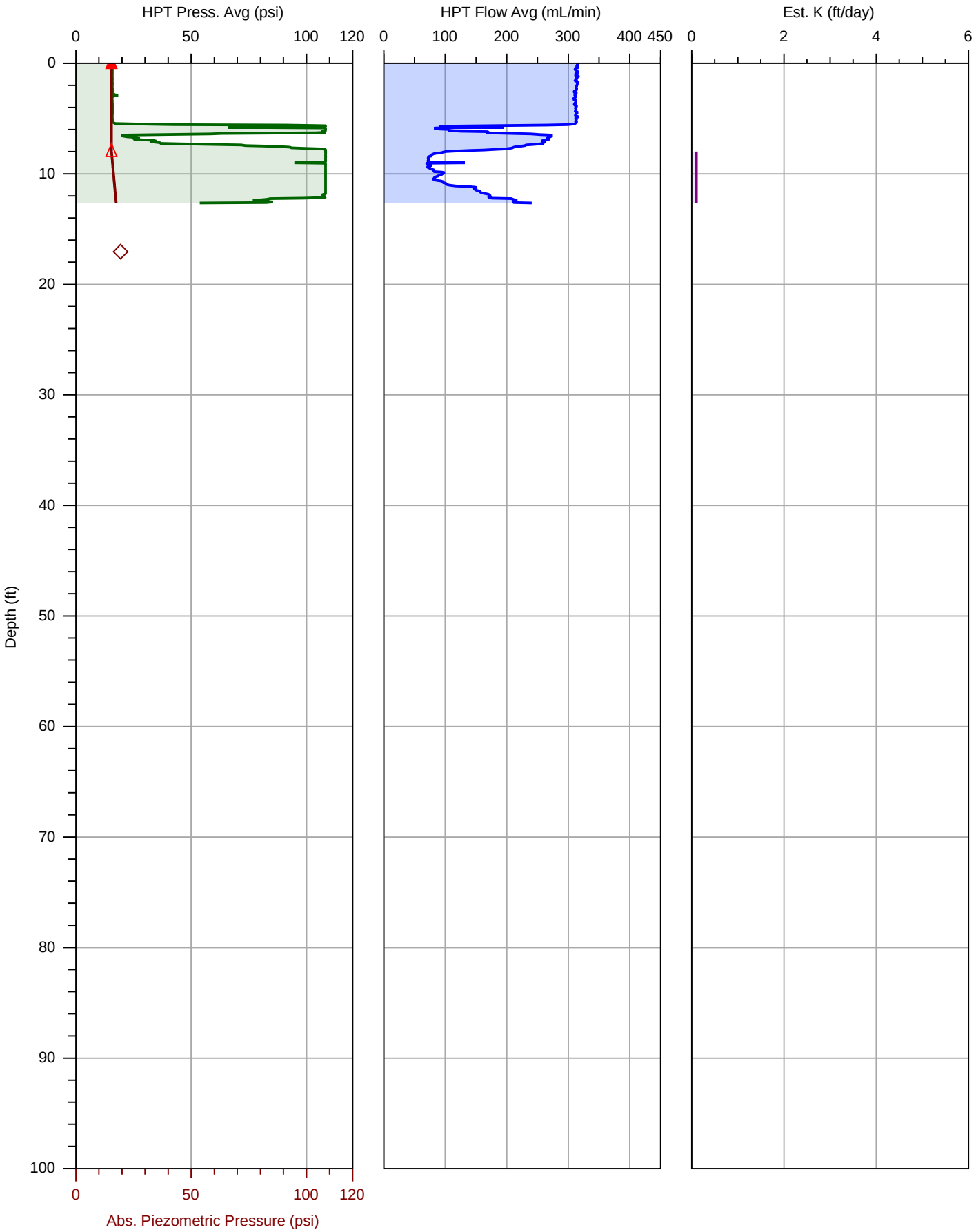
		File: 25-56-30135_HPT-06.HPT
Company: ConeTec	Sounding: HPT-06	Date: 9/4/2025
Project ID: Vina GSA Component 5	Client: Geosyntec Consultants, Inc	Location: N: 4394541m E: 598572m



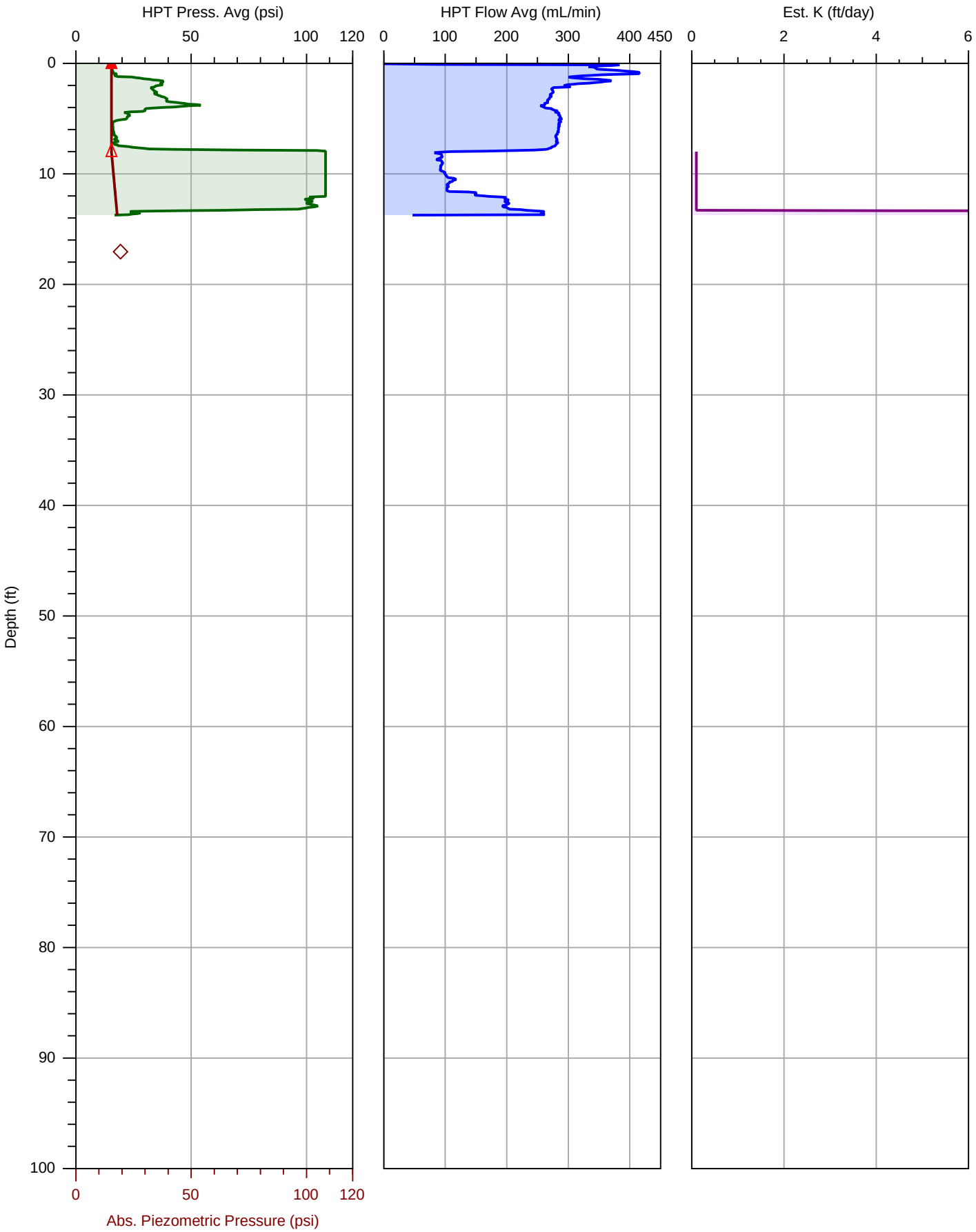
		File: 25-56-30135_HPT-07.HPT
Company: ConeTec	Sounding: HPT-07	Date: 9/3/2025
Project ID: Vina GSA Component 5	Client: Geosyntec Consultants, Inc	Location: N: 4395121m E: 598695m



			File: 25-56-30135_HPT-08.HPT
Company: ConeTec		Sounding: HPT-08	Date: 9/4/2025
Project ID: Vina GSA Component 5		Client: Geosyntec Consultants, Inc	Location: N: 4394566m E: 598864m

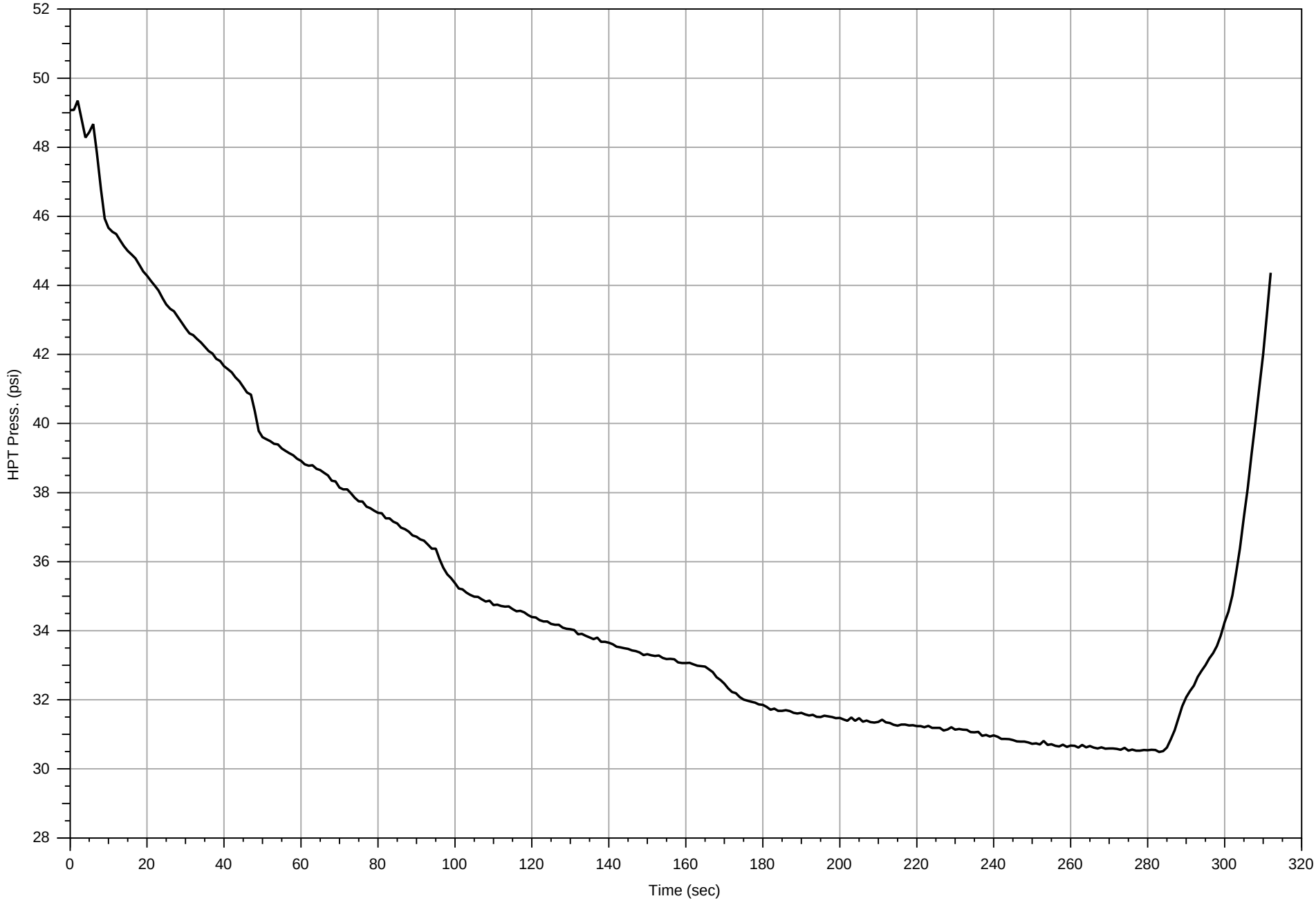


			File: 25-56-30135_HPT-B01.HPT
Company: ConeTec		Sounding: HPT-B-01	Date: 9/5/2025
Project ID: Vina GSA Component 5		Client: Geosyntec Consultants, Inc	Location: N: 4406782m E: 593403m



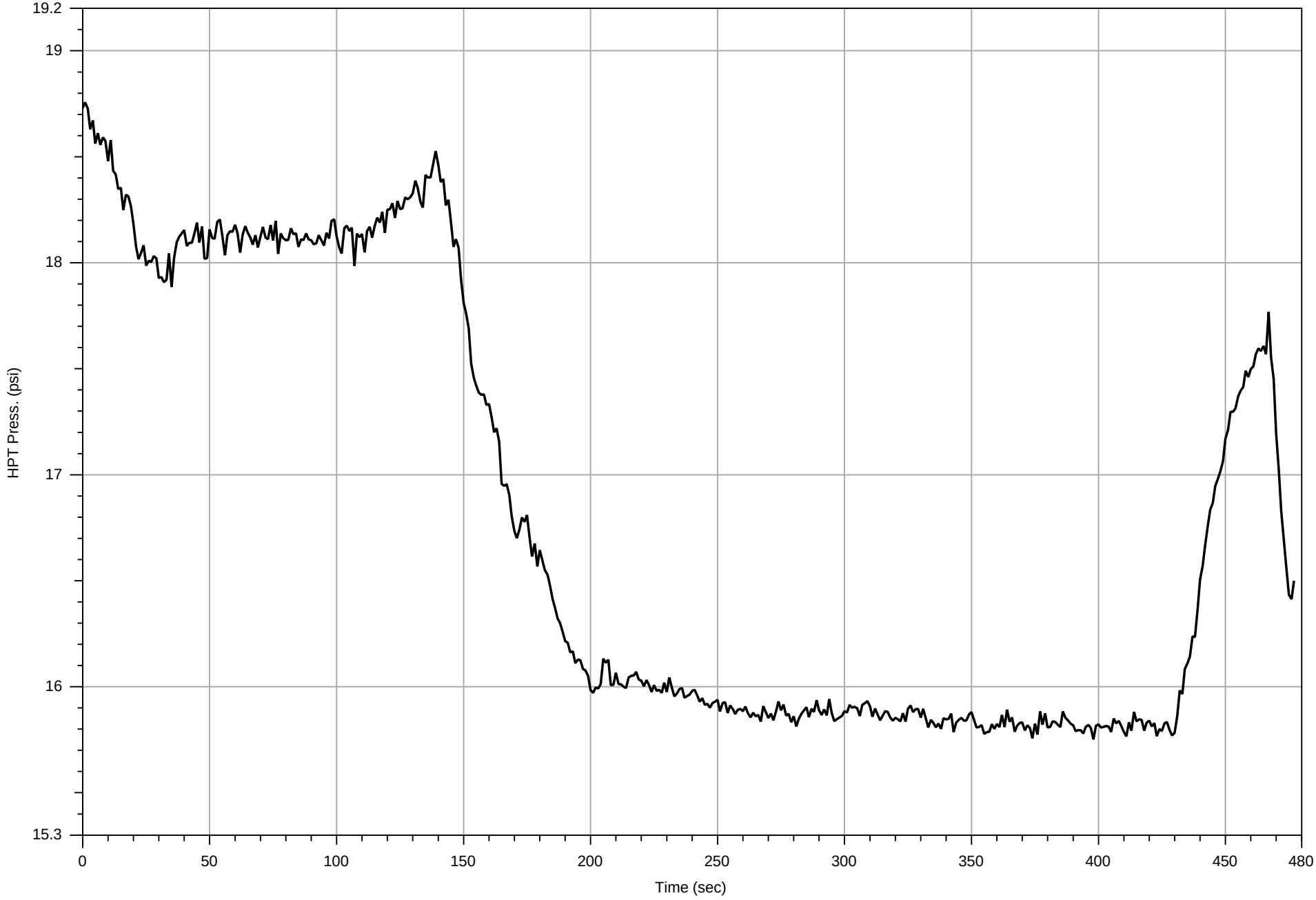
			File: 25-56-30135_HPT-B02.HPT
Company: ConeTec		Sounding: HPT-B-02	Date: 9/5/2025
Project ID: Vina GSA Component 5		Client: Geosyntec Consultants, Inc	Location: N: 4406782m E: 593403m

HPT Dissipation Plots



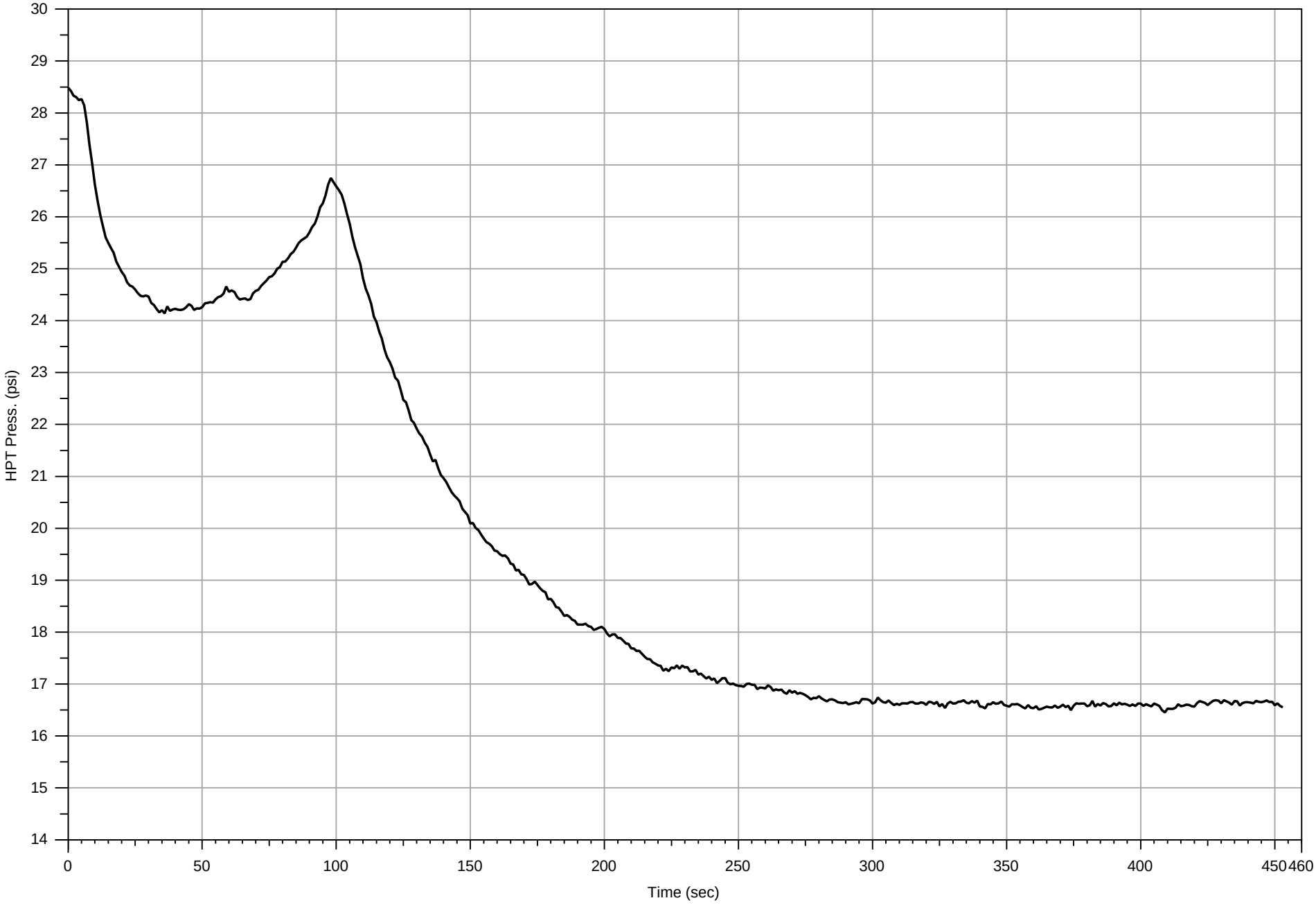
HPT DISSIPATION (SINGLE CASE)

Company: ConeTec	Sounding: HPT-02	File: 25-56-30135_HPT-02.TIM	Date: 9/3/2025
Project ID: Vina GSA Component 5	Client: Geosyntec Consultants, Inc	Location: N: 4395111m E: 599129m	Sensor: HPT Press.
		Depth: 38.60 ft	Test: 1



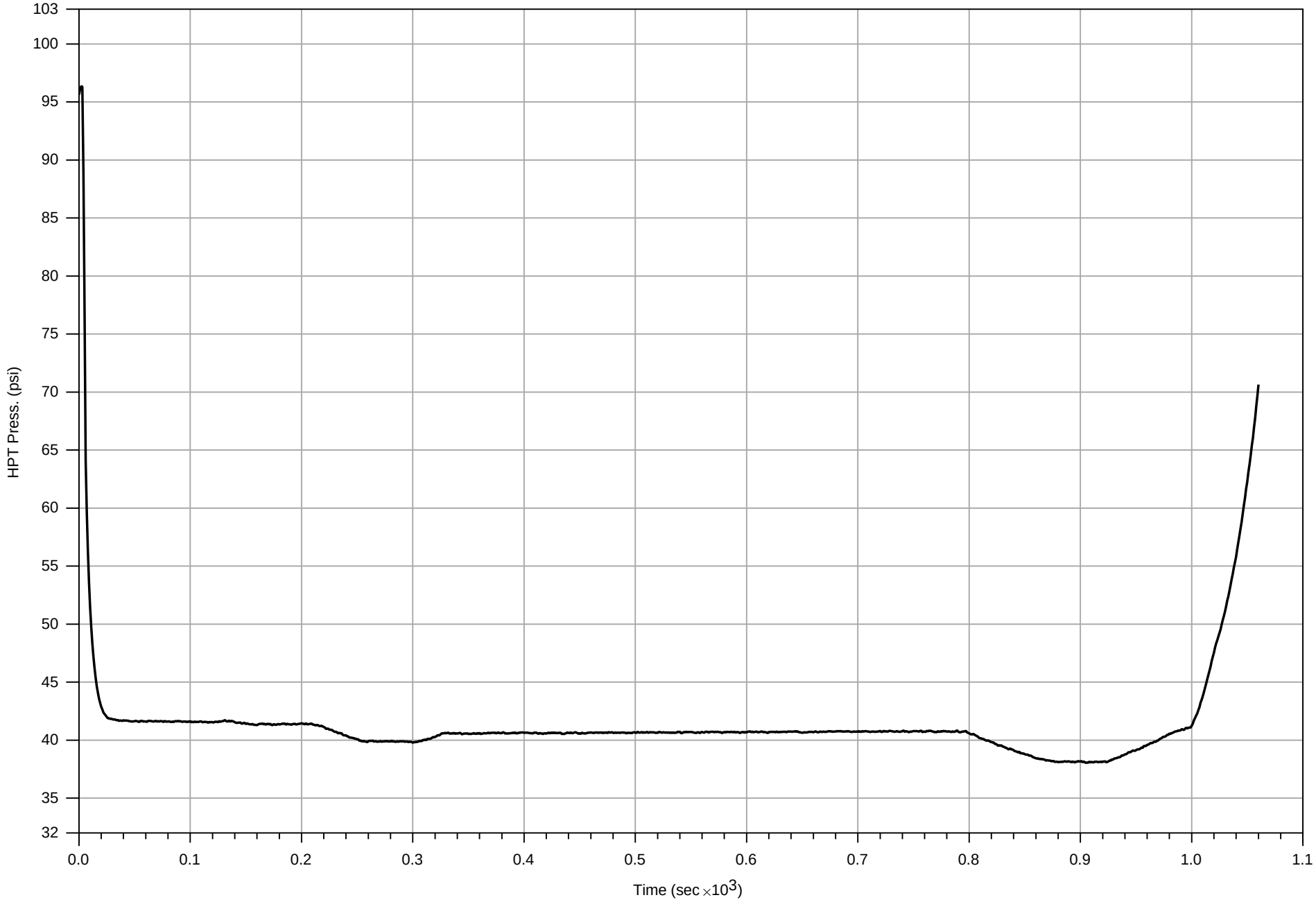
HPT DISSIPATION (SINGLE CASE)

		File: 25-56-30135_HPT-03.TIM	Date: 9/4/2025
Company: ConeTec	Sounding: HPT-03	Location: N: 4127506m E: 694088m	Sensor: HPT Press.
Project ID: Vina GSA Component 5	Client: Geosyntec Consultants, Inc	Depth: 20.60 ft	Test: 1



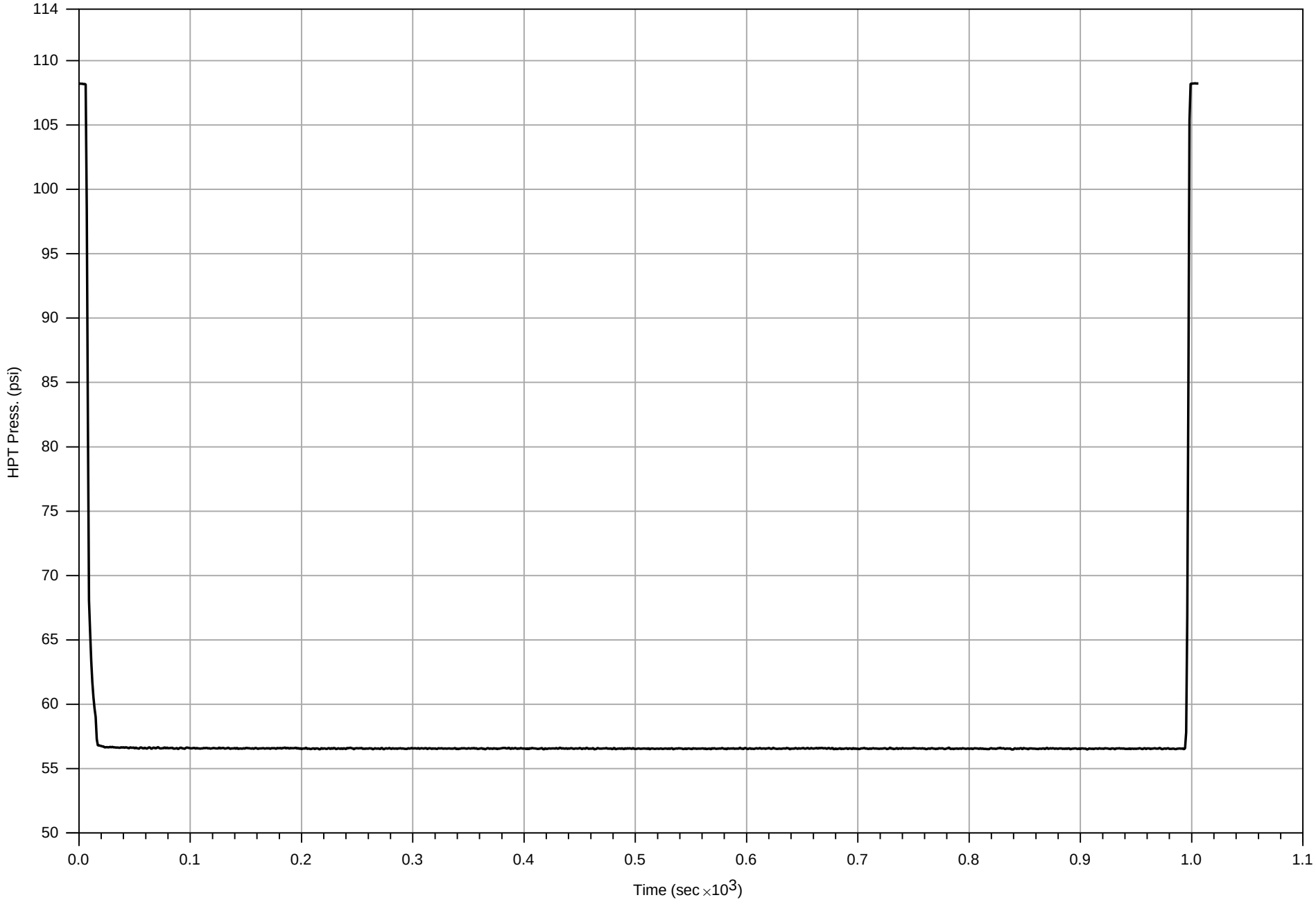
HPT DISSIPATION (SINGLE CASE)

Company: ConeTec	Sounding: HPT-03	File: 25-56-30135_HPT-03.TIM	Date: 9/4/2025
Project ID: Vina GSA Component 5	Client: Geosyntec Consultants, Inc	Location: N: 4127506m E: 694088m	Sensor: HPT Press.
		Depth: 38.75 ft	Test: 1



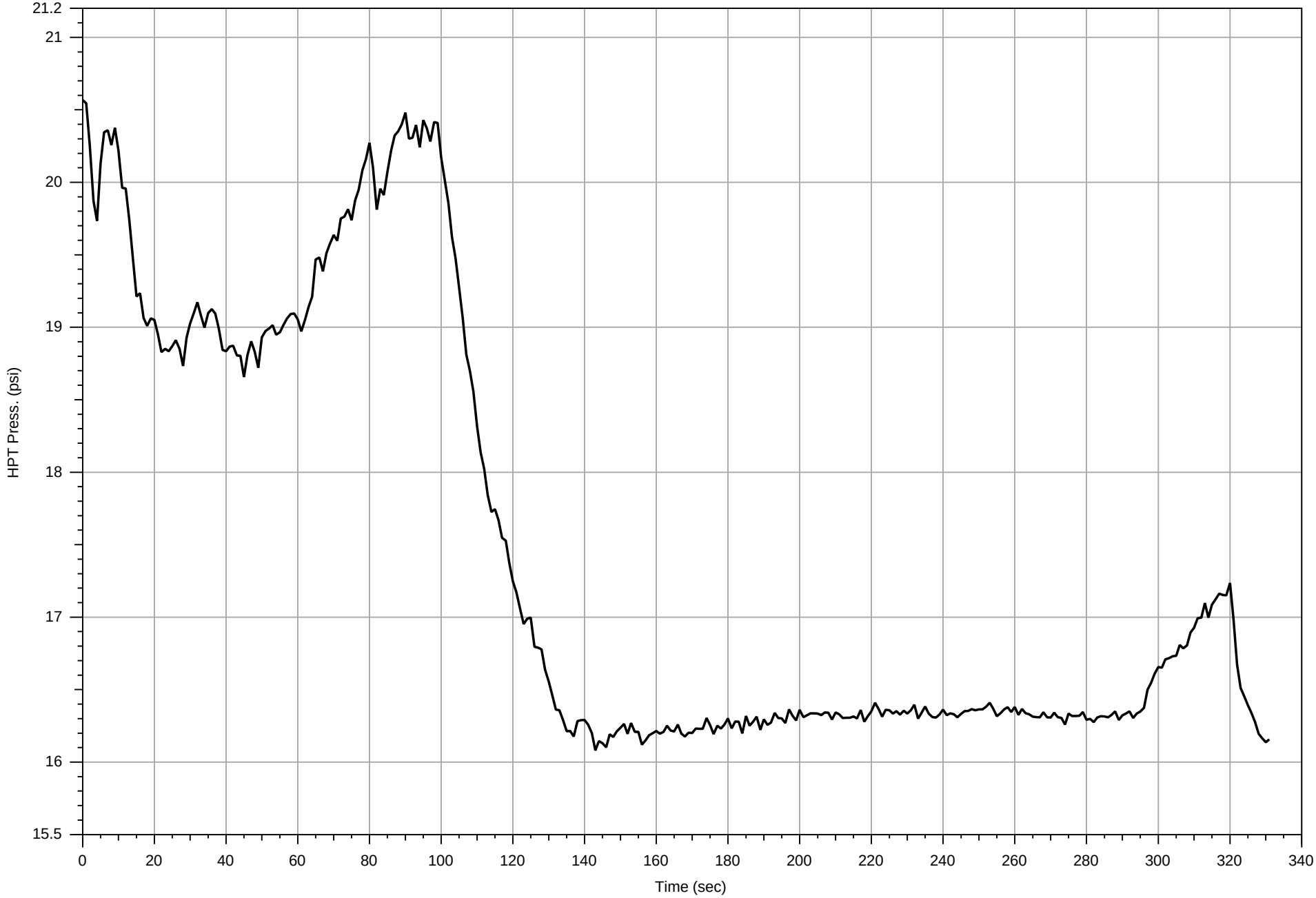
HPT DISSIPATION (SINGLE CASE)

Company: ConeTec	Sounding: HPT-04	File: 25-56-30135_HPT-04.TIM	Date: 9/4/2025
Project ID: Vina GSA Component 5	Client: Geosyntec Consultants, Inc	Location: N: 4394740m E: 598643m	Sensor: HPT Press.
		Depth: 54.95 ft	Test: 1



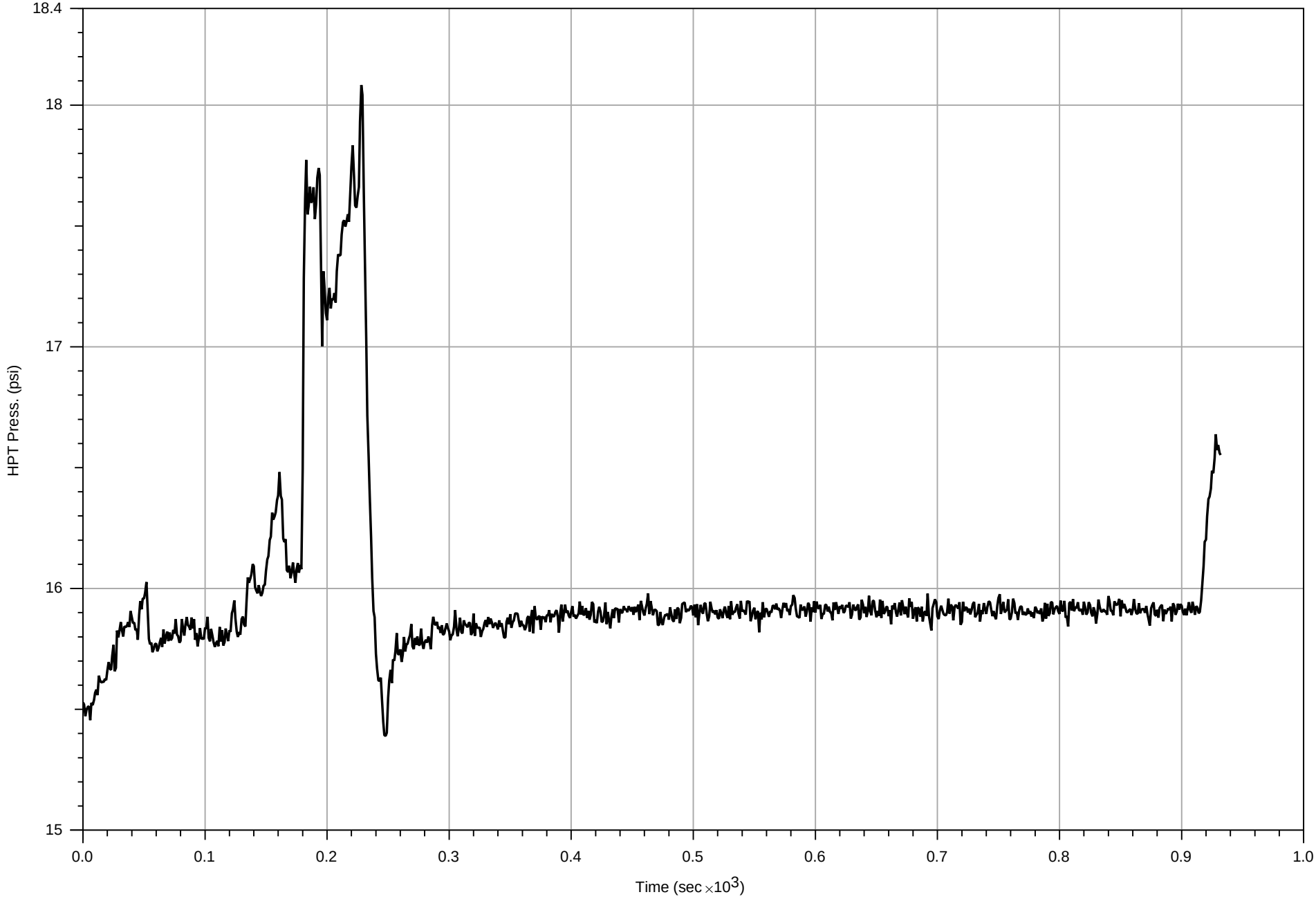
HPT DISSIPATION (SINGLE CASE)

Company: ConeTec	Sounding: HPT-04	File: 25-56-30135_HPT-04.TIM	Date: 9/4/2025
Project ID: Vina GSA Component 5	Client: Geosyntec Consultants, Inc	Location: N: 4394740m E: 598643m	Sensor: HPT Press.
		Depth: 88.10 ft	Test: 1



HPT DISSIPATION (SINGLE CASE)

Company: ConeTec	Sounding: HPT-08	File: 25-56-30135_HPT-08.TIM	Date: 9/4/2025
Project ID: Vina GSA Component 5	Client: Geosyntec Consultants, Inc	Location: N: 4394566m E: 598864m	Sensor: HPT Press.
		Depth: 30.40 ft	Test: 1



HPT DISSIPATION (SINGLE CASE)

Company: ConeTec	Sounding: HPT-B02	File: 25-56-30135_HPT-B02.TIM	Date: 9/5/2025
Project ID: Vina GSA Component 5	Client: Geosyntec Consultants, Inc	Location: N: 4127409m E: 694492m	Sensor: HPT Press.
		Depth: 13.75 ft	Test: 1

SUPPORTING DOCUMENTS AND MATERIALS

The documents and materials listed below are included in the report:

- **Methodology Statements**
- **Cone Penetration Digital File Formats**
- **Description of Methods for Calculated CPTu Geotechnical Parameters**
- **Calibration Records**

Methodology Statements

CONETEC

METHODOLOGY STATEMENTS

CONE PENETRATION TEST (CPTu) - eSeries

Cone penetration tests (CPTu) are conducted using an integrated electronic piezocone penetrometer and data acquisition system manufactured by Adara Systems Ltd., a subsidiary of ConeTec.

ConeTec's piezocone penetrometers are compression type designs in which the tip and friction sleeve load cells are independent and have separate load capacities. The piezocones use strain gauged load cells for tip and sleeve friction and a strain gauged diaphragm type transducer for recording pore pressure. The piezocones also have a platinum resistive temperature device (RTD) for monitoring the temperature of the sensors, an accelerometer type dual axis inclinometer and two geophone sensors for recording seismic signals. All signals are amplified and measured with minimum sixteen-bit resolution down hole within the cone body, and the signals are sent to the surface using a high bandwidth, error corrected digital interface through a shielded cable.

ConeTec penetrometers are manufactured with various tip, friction and pore pressure capacities in both 10 cm^2 and 15 cm^2 tip base area configurations in order to maximize signal resolution for various soil conditions. The specific piezocone used for each test is described in the CPT summary table. The 15 cm^2 penetrometers do not require friction reducers as they have a diameter larger than the deployment rods. The 10 cm^2 piezocones use a friction reducer consisting of a rod adapter extension behind the main cone body with an enlarged cross sectional area (typically 44 millimeters diameter over a length of 32 millimeters with tapered leading and trailing edges) located at a distance of 585 millimeters above the cone tip.

The penetrometers are designed with equal end area friction sleeves, a net end area ratio of 0.8 and cone tips with a 60 degree apex angle.

All ConeTec piezocones can record pore pressure at various locations. Unless otherwise noted, the pore pressure filter is located directly behind the cone tip in the "u_2" position (ASTM Type 2). The filter is six millimeters thick, made of porous plastic (polyethylene) having an average pore size of 125 microns (90-160 microns). The function of the filter is to allow rapid movements of extremely small volumes of water needed to activate the pressure transducer while preventing soil ingress or blockage.

The piezocone penetrometers are manufactured with dimensions, tolerances and sensor characteristics that are in general accordance with the current ASTM D5778 standard. ConeTec's calibration criteria also meets or exceeds those of the current ASTM D5778 standard. An illustration of the piezocone penetrometer is presented in Figure CPTu.

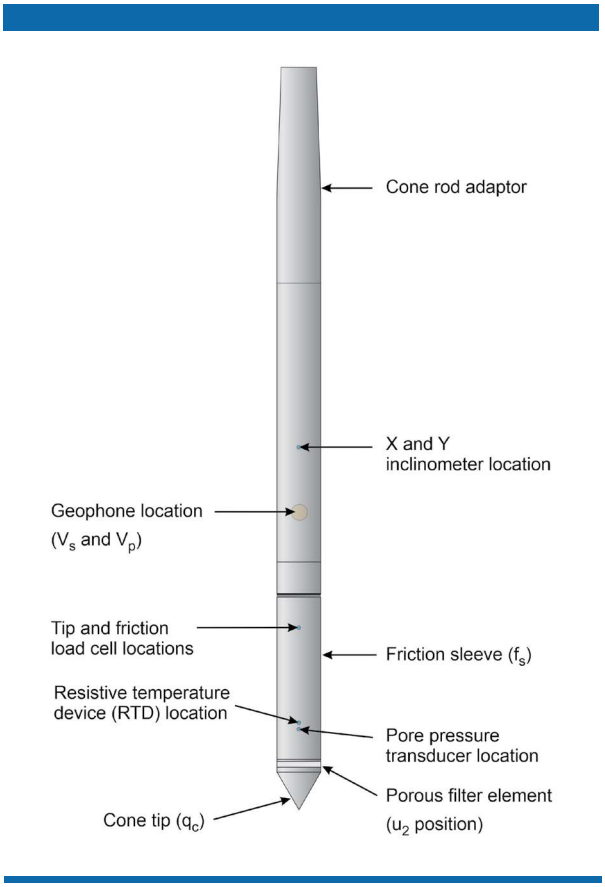


Figure CPTu. Piezocone Penetrometer (15 cm²)

The ConeTec data acquisition system consists of a Windows based computer, signal interface box, and power supply. The signal interface combines depth increment signals, seismic trigger signals and the downhole digital data. This combined data is then sent to the Windows based computer for collection and presentation. The data is recorded at fixed depth increments using a depth encoder that is either portable or integrated into the rig. The typical recording interval is 2.5 centimeters; custom recording intervals are possible.

The system displays the CPTu data in real time and records the following parameters to a storage media during penetration:

- Depth
- Uncorrected tip resistance (q_c)
- Sleeve friction (f_s)
- Dynamic pore pressure (u)
- Additional sensors such as resistivity, passive gamma, ultra violet induced fluorescence, if applicable

All testing is performed in accordance to ConeTec's CPTu operating procedures which are in general accordance with the current ASTM D5778 standard.

Prior to the start of a CPTu sounding a suitable cone is selected, the cone and data acquisition system are powered on, the pore pressure system is saturated with silicone oil and the baseline readings are recorded with the cone hanging freely in a vertical position.

The CPTu is conducted at a steady rate of two centimeters per second, within acceptable tolerances. Typically one meter length rods with an outer diameter of 1.5 inches are added to advance the cone to the sounding termination depth. After cone retraction final baselines are recorded.

Additional information pertaining to ConeTec's cone penetration testing procedures:

- Each filter is saturated in silicone oil under vacuum pressure prior to use
- Baseline readings are compared to previous readings
- Soundings are terminated at the client's target depth or at a depth where an obstruction is encountered, excessive rod flex occurs, excessive inclination occurs, equipment damage is likely to take place, or a dangerous working environment arises
- Differences between initial and final baselines are calculated to ensure zero load offsets have not occurred and to ensure compliance with ASTM standards

The interpretation of piezocone data for this report is based on the corrected tip resistance (q_t), sleeve friction (f_s) and pore water pressure (u). The interpretation of soil type is based on the correlations developed by Robertson, P.K., 2010. The Soil Behavior Type (SBT) classification chart developed by Robertson, P.K., 2010 is presented in Figure SBT. It should be noted that it is not always possible to accurately identify a soil behavior type based on these parameters. In these situations, experience, judgment and an assessment of other parameters may be used to infer soil behavior type.

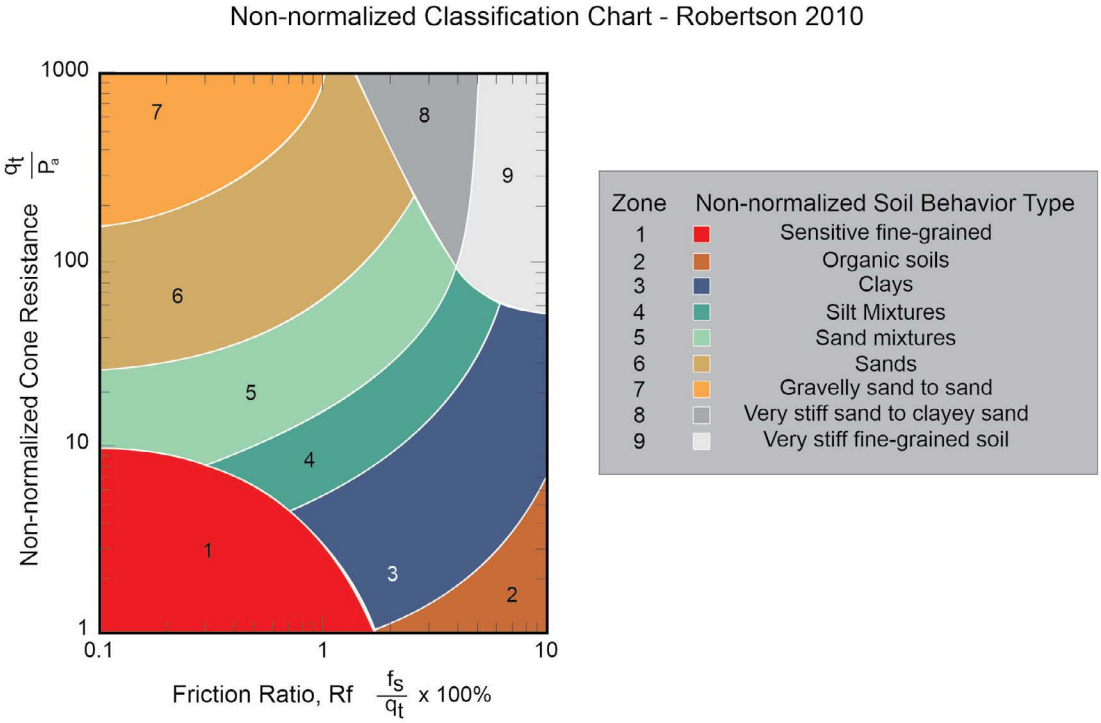


Figure SBT. Non-Normalized Soil Behavior Type Classification Chart (SBT)

The recorded tip resistance (q_c) is the total force acting on the piezocone tip divided by its base area. The tip resistance is corrected for pore pressure effects and termed corrected tip resistance (q_t) according to the following expression presented in Robertson et al. (1986):

$$q_t = q_c + (1-a) \bullet u_2$$

where: q_t is the corrected tip resistance
q_c is the recorded tip resistance
u_2 is the recorded dynamic pore pressure behind the tip (u_2 position)
a is the Net Area Ratio for the piezocone (0.8 for ConeTec probes)

The sleeve friction (f_s) is the frictional force on the sleeve divided by its surface area. As all ConeTec piezocones have equal end area friction sleeves, pore pressure corrections to the sleeve data are not required.

The dynamic pore pressure (u) is a measure of the pore pressures generated during cone penetration. To record equilibrium pore pressure, the penetration must be stopped to allow the dynamic pore pressures to stabilize. The rate at which this occurs is predominantly a function of the permeability of the soil and the diameter of the cone.

The friction ratio (Rf) is a calculated parameter. It is defined as the ratio of sleeve friction to the tip resistance expressed as a percentage. Generally, saturated cohesive soils have low tip resistance, high friction ratios and generate large excess pore water pressures. Cohesionless soils have higher tip resistances, lower friction ratios and do not generate significant excess pore water pressure.

For additional information on CPTu interpretations and calculated geotechnical parameters, refer to Robertson et al. (1986), Lunne et al. (1997), Robertson (2009), Mayne (2013, 2014) and Mayne and Peuchen (2012).

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Mayne, P.W., 2014, "Interpretation of geotechnical parameters from seismic piezocone tests", CPT'14 Keynote Address, Las Vegas, NV, May 2014.

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Robertson, P.K., 2009, "Interpretation of cone penetration tests – a unified approach", Canadian Geotechnical Journal, Volume 46: 1337-1355. DOI: 10.1139/T09-065.

Robertson, P.K., 2010. Soil behavior type from the CPT: an update. 2nd International Symposium on Cone Penetration Testing, CPT'10, Huntington Beach, CA, USA

PORE PRESSURE DISSIPATION TEST

The cone penetration test is halted at specific depths to carry out pore pressure dissipation (PPD) tests, shown in Figure PPD-1. For each dissipation test the cone and rods are decoupled from the rig and the data acquisition system measures and records the variation of the pore pressure (u) with time (t).

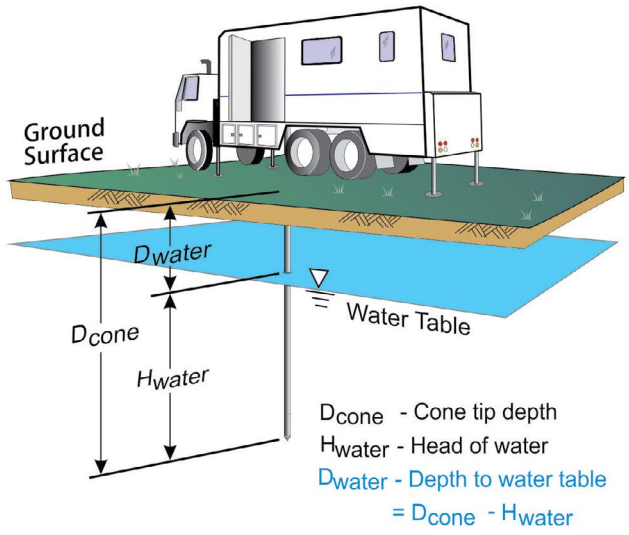

Figure PPD-1. Pore pressure dissipation test setup

Pore pressure dissipation data can be interpreted to provide estimates of ground water conditions, permeability, consolidation characteristics and soil behavior.

The typical shapes of dissipation curves shown in Figure PPD-2 are very useful in assessing soil type, drainage, in situ pore pressure and soil properties. A flat curve that stabilizes quickly is typical of a freely draining sand. Undrained soils such as clays will typically show positive excess pore pressure and have long dissipation times. Dilative soils will often exhibit dynamic pore pressures below equilibrium that then rise over time. Overconsolidated fine-grained soils will often exhibit an initial dilatory response where there is an initial rise in pore pressure before reaching a peak and dissipating.

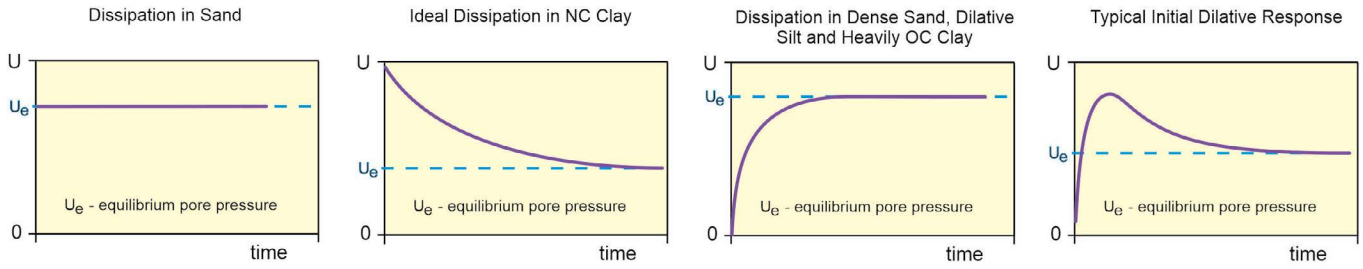

Figure PPD-2. Pore pressure dissipation curve examples

In order to interpret the equilibrium pore pressure (u_{eq}) and the apparent phreatic surface, the pore pressure should be monitored until such time as there is no variation in pore pressure with time as shown for each curve in Figure PPD-2.

To determine the electrical resistivity of the soil (the inverse of electrical conductivity), resistivity measurements are performed in conjunction with piezocone penetration testing (RCPTu) using a resistivity cone. An illustration of the resistivity piezocone penetrometer is presented in Figure RCPTu.

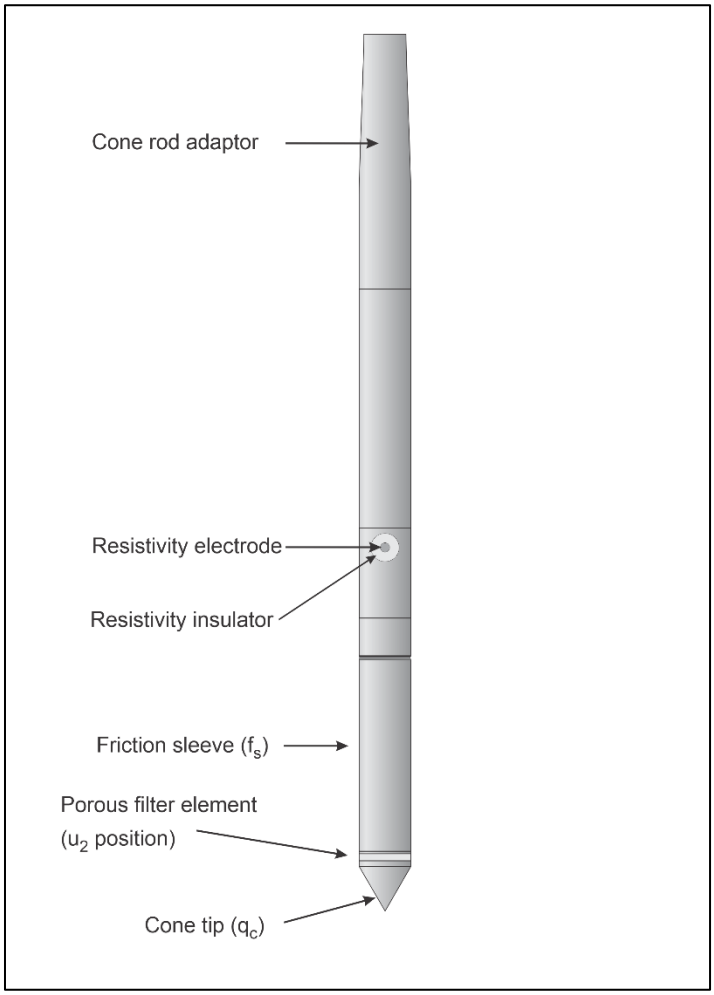

Figure RCPTu. Resistivity piezocone penetrometer (15 cm^2)

The resistivity cone has a single, wear resistant, 8 mm diameter stainless steel electrode set within a 25 mm diameter Delrin plastic insulator. The measurement of resistivity is confined to the region of soil in contact with the electrode and the cone body just beyond the boundary of the insulator. The configuration of the electrode provides vertical resolution of resistivity changes of approximately 25 mm.

The electrical resistance is determined by measuring the voltage drop and current applied across the soil in contact with the electrode and cone body. A 960 hertz alternating current source is used to avoid polarization of the electrode. Polarization is the process where ions accumulate at the electrode thus increasing the measured resistance.

Electrical resistance is not a material property, it is a function of the resistivity of the material being measured, and the electrode configuration. To convert from resistance (ohm) to resistivity (ohm-m) a lab calibration is necessary. Resistivity cones are calibrated in a water tank with solutions of known resistivity. The resistance across the electrode and ground is measured in the various solutions and a calibration

curve is generated. It is necessary to assume that the calibration factors determined in the homogeneous isotropic medium do not vary significantly as the cone is advanced into the ground through soil.

Prior to the start of a test, the procedures described in the cone penetration test section are followed and the resistivity output is verified using various resistors. The resistivity measurements are recorded on a continuous basis at the same time as the tip, friction, and pore pressure measurements. Due to the vertical offset between the cone tip and the electrode, resistivity data is not available for the last 0.275 meters of each profile.

The resistivity of soil is for the most part influenced by the resistivity of the pore fluid, which in turn is a measure of the groundwater chemical composition. Electrical conduction in saturated sandy soils is largely by electrolytic conduction in the pore fluid whereas for clayey soils, ion exchange contributes significantly within the soil skeleton. Resistivity measurements will increase as the saturation of the soil decreases. For additional information on resistivity cone penetration testing, refer to Campanella and Weemees (1990).

Resistivity CPTu plots are presented in the relevant appendix.

References

Campanella, R.G. and Weemees, I., 1990, “Development and Use of an Electrical Resistivity Cone for Groundwater Contamination Studies”, Canadian Geotechnical Journal, Vol. 27 No. 5: 557-567. DOI: 10.1139/T90-071.

The Hydraulic Profiling Tool (HPT) system developed by Geoprobe Systems®, is a logging tool designed to evaluate the hydraulic behavior of unconsolidated materials. The HPT probe has an electrical conductivity (EC) array built into it that records bulk formation EC data for lithologic interpretation. HPT testing is performed as a standalone test or in conjunction with Geoprobe®'s Membrane Interface Probe (MIP). The combined testing is referred to as MiHPT.

There are four main components of the HPT system: Field Instrument, HPT Flow Controller, trunk line and probe assembly. A schematic of the HPT system configuration is presented in Figure HPT-1 and an image of the HPT system components is presented in Figure HPT-2.

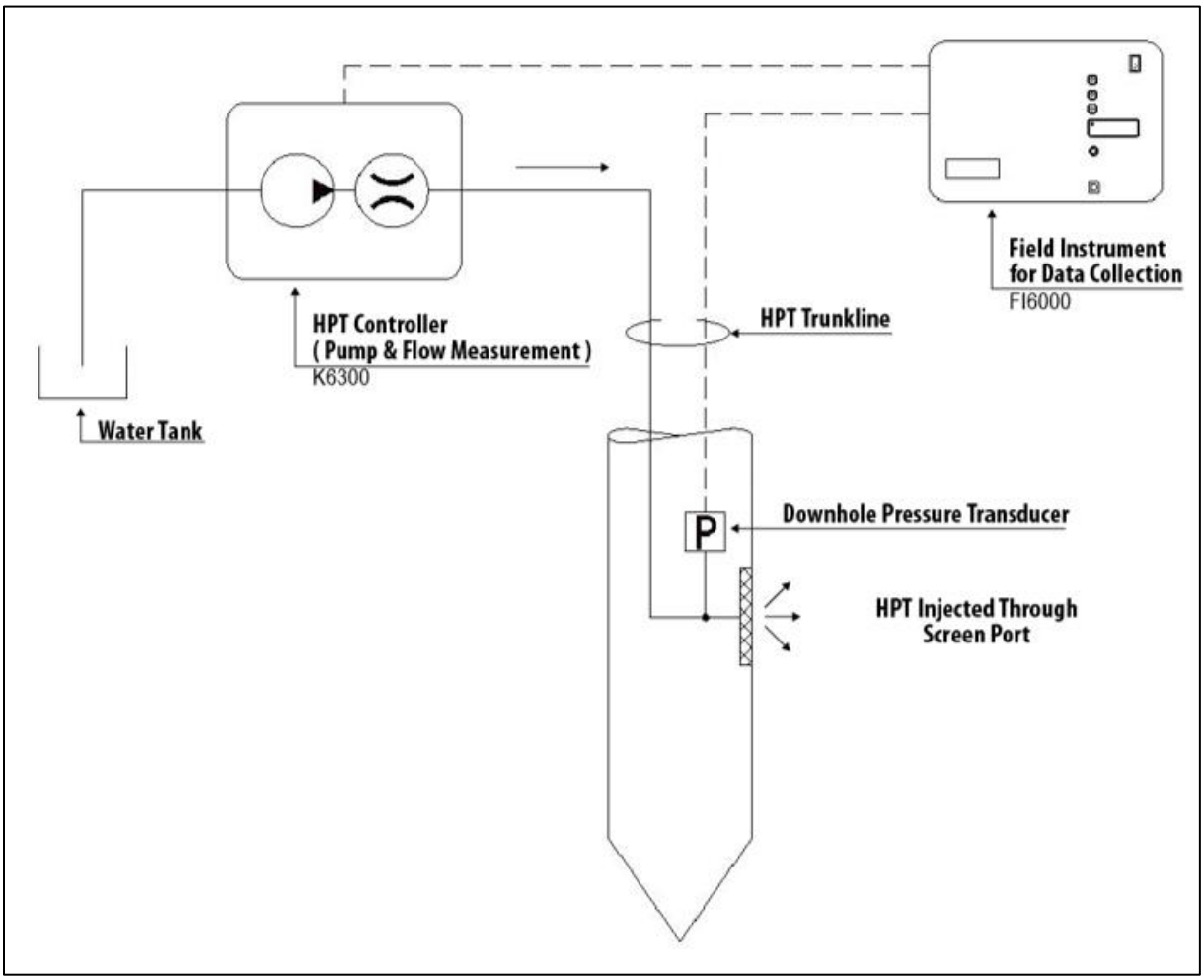

Figure HPT-1. HPT system configuration (courtesy of Geoprobe Systems®)

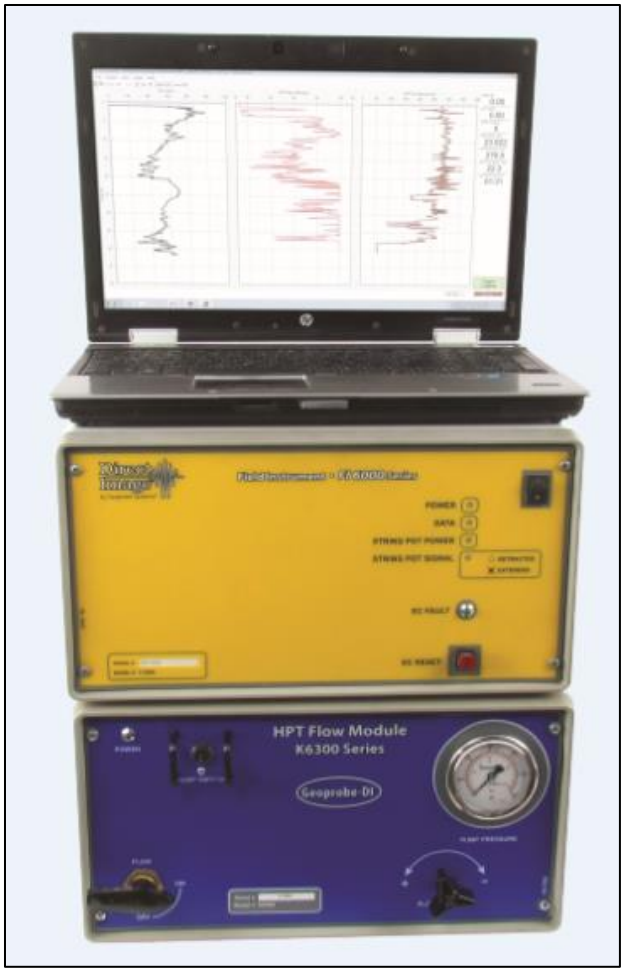

Figure HPT-2. HPT system components (courtesy of Geoprobe Systems®)

The probe assembly consists of the HPT probe and connection tube section. The downhole HPT absolute pressure transducer, water and electrical connections are housed inside the connection tube section and the injection screen and electrical conductivity array are located on the body of the probe. An image of the HPT probe is presented in Figure HPT-3.

Figure HPT-3. HPT Probe (courtesy of Geoprobe Systems®)

The HPT system generates fast, continuous real-time profiles of soil hydraulic properties in both fine-grained and coarse-grained soils. As the probe is pushed or hammered into the subsurface, water is injected into the formation through a screen on the side of the probe at a controlled flow rate. The probe's downhole pressure transducer measures the pressure response (injection pressure) of the soil which is plotted with depth in real time. Large coarse-grained material will typically have a relatively low-pressure response which is indicative of the ability to easily transmit water. Whereas a relatively high-pressure response would indicate a relatively small grain size and the lack of ability to transmit water. At discrete depths during the logging process, the probe can also collect static water pressure data under zero-flow conditions. The data can be used to generate a piezometric pressure profile for the log and to estimate the depth of the water table or phreatic surface.

Since the HPT pressure response is analogous to relative changes in the ability to transmit water (and therefore the relative change in dominant grain size), the HPT system can be used to identify potential contaminant migration pathways. Similarly, it can help identify zones for remedial material injection or provide qualitative guidance on how difficult injection may be in different zones of the formation.

The HPT system response is evaluated prior to and upon completion of each HPT push location. The purpose of quality assurance and quality control (QA/QC) testing is to ensure that the instrument is capable of generating high quality data, to prove that the instrumentation operates properly throughout the course of the log and that the logs are performed in accordance with established standards.

A reference test is performed on the HPT pressure sensor by submerging the HPT probe into a reference tube filled with water. A two-step test is performed to verify that the pressure sensor is providing the correct measurement (0.216 psi/1.49kPa) for a defined length (6 inches/15.2 cm) of water column. If the result is more than ± 10% out of range, the transducer will fail the test. Occasionally, the HPT screen becomes clogged or damaged after a test and must be removed and cleaned or replaced to obtain a successful QA test.

The QA/QC testing is conducted in accordance with Geoprobe Systems® standard operating procedures (SOP), Geoprobe® (2015), and in general accordance with the current ASTM D8037M standard.

HPT testing is conducted at a steady rate of approximately 2 cm/s. Typically, one meter length rods with an outer diameter of 1.75 inches are added to advance the HPT probe to the log termination depth. Geoprobe®'s data acquisition program Direct Image® (DI) Acquisition displays the data in real time and records the following parameters to a storage media during penetration:

- Depth
- Transducer pressure
- Flow rate
- Electrical conductivity (EC)

All testing is performed in accordance to Geoprobe Systems® standard operating procedures (SOP), Geoprobe® (2015).

An image of an HPT log with EC measurements and images from the probe is presented in Figure HPT-4.

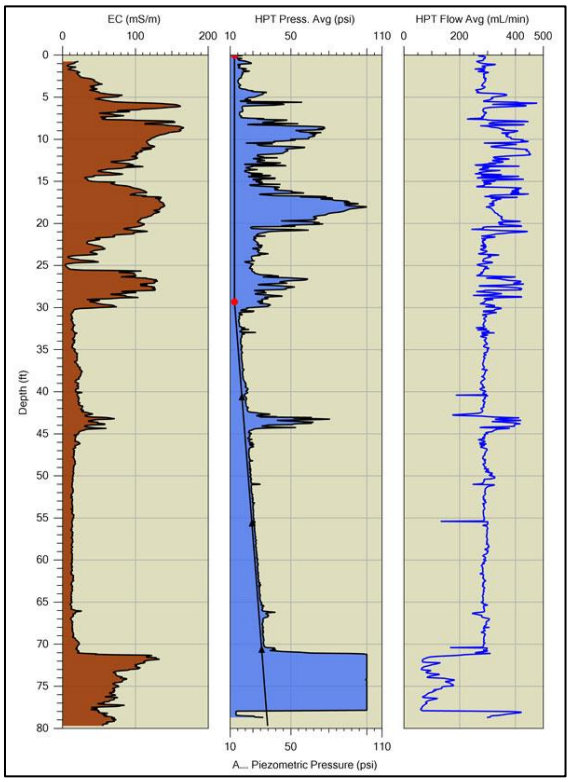

Figure HPT-4. HPT Log (courtesy of Geoprobe Systems®)

If static water pressure data is collected during a log, the static water level can be calculated using the static pressure and depth data from response testing, as well as the pre- and post-test response data measured at the top of the reference tube at zero flow. The pre- and post-test data must be corrected to reference atmospheric pressure as the HPT system uses an absolute pressure transducer to measure in-situ pressures. The piezometric profile can be used to calculate the corrected HPT pressure. This data along with the flow rate can then be used to calculate an estimate of hydraulic conductivity (K) in the saturated formation.

A summary of the HPT logs along with test details and individual plots are provided in the relevant appendix. Summaries of the HPT sensor data and HPT response data are provided in the relevant appendix and the data files are provided in the data release folder.

For additional information on the HPT system, refer to the Geoprobe Systems® website, https://geoprobe.com/hpt-hydraulic-profiling-tool or Geoprobe® (2010).

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Cone Penetration Digital File Formats

CONETEC

CONE PENETRATION DIGITAL FILE FORMATS - eSeries

CPT Data Files (COR Extension)

ConeTec CPT data files are stored in ASCII text files that are readable by almost any text editor. ConeTec file names start with the job number (which includes the two digit year number) an underscore as a separating character, followed by two letters based on the type of test and the sounding ID. The last character position is reserved for an identifier letter (such as b, c, d etc) used to uniquely distinguish multiple soundings at the same location. The CPT sounding file has the extension COR. As an example, for job number 21-02-00001 the first CPT sounding will have file name 21-02-00001_CP01.COR

The sounding (COR) file consists of the following components:

1. Two lines of header information
2. Data records
3. End of data marker
4. Units information

Header Lines

Line 1: Columns 1-6 may be blank or may indicate the version number of the recording software
Columns 7-21 contain the sounding Date and Time (Date is MM:DD:YY)
Columns 23-38 contain the sounding Operator
Columns 51-100 contain extended Job Location information

Line 2: Columns 1-16 contain the Job Location
Columns 17-32 contain the Cone ID
Columns 33-47 contain the sounding number
Columns 51-100 may contain extended sounding ID information

Data Records

The data records contain 4 or more columns of data in floating point format. A comma and spaces separate each data item:

Column 1: Sounding Depth (meters)
Column 2: Tip (q_c), recorded in units selected by the operator
Column 3: Sleeve (f_s), recorded in units selected by the operator
Column 4: Dynamic pore pressure (u), recorded in units selected by the operator
Column 5: Empty or may contain other requested data such as Gamma, Resistivity or UVIF data

End of Data Marker

After the last line of data there is a line containing an ASCII 26 (CTL-Z) character (small rectangular shaped character) followed by a newline (carriage return / line feed). This is used to mark the end of data.

Units Information

The last section of the file contains information about the units that were selected for the sounding. A separator bar makes up the first line. The second line contains the type of units used for depth, q_c, f_s and u. The third line contains the conversion values required for ConeTec's software to convert the recorded data to an internal set of base units (bar for q_c, bar for f_s and meters for u). Additional lines intended for internal ConeTec use may appear following the conversion values.

CPT Data Files (XLS Extension)

Excel format files of ConeTec CPT data are also generated from corresponding COR files. The XLS files have the same base file name as the COR file with a -BSC suffix. The information in the file is presented in table format and contains additional information about the sounding such as coordinate information, and tip net area ratio.

The BSCI suffix is given to XLS files which are enhanced versions of the BSC files and include the same data records in addition to inclination data collected for each sounding.

CPT Dissipation Files (XLS Extension)

Pore pressure dissipation files are provided in Excel format and contain each dissipation trace that exceeds a minimum duration (selected during post-processing) formatted column wise within the spreadsheet. The first column (Column A) contains the time in seconds and the second column (Column B) contains the time in minutes. Subsequent columns contain the dissipation trace data. The columns extend to the longest trace of the data set.

Detailed header information is provided at the top of the worksheet. The test depth in meters and feet, the number of points in the trace and the particular units are all presented at the top of each trace column.

CPT Dissipation files have the same naming convention as the CPT sounding files with a "–PPD" suffix.

Data Records

Each file will contain dissipation traces that exceed a minimum duration (selected during post-processing) in a particular column. The dissipation pore pressure values are typically recorded at varying time intervals throughout the trace; rapidly to start and increasing as the duration of the test lengthens. The test depth in meters and feet, the number of points in the trace and the trace number are identified at the top of each trace column.

Cone Type Designations

Cone ID	Cone Description	Tip Cross Sect. Area (cm^2)	Tip Capacity (bar)	Sleeve Area (cm^2)**	Sleeve Capacity (bar)	Pore Pressure Capacity (bar)
EC###	A15T1500F15U35	15	1500	225	15	35
EC###	A15T375F10U35	15	375	225	10	35
EC###	A10T1000F10U35	10	1000	150	10	35

refers to the Cone ID number
**Outer Cylindrical Area

Description of Methods for Calculated CPT Geotechnical Parameters

CONETEC

CALCULATED CPT GEOTECHNICAL PARAMETERS

A Detailed Description of the Methods Used in ConeTec's CPT Geotechnical Parameter Calculation and Plotting Software

Revision SZW-Rev 18

Revised February 10, 2023

Prepared by Jim Greig, M.A.Sc, P.Eng (BC, AB, ON)

Limitations

The geotechnical parameter output was prepared specifically for the site and project named in the accompanying report subject to objectives, site conditions and criteria provided to ConeTec by the client. The output may not be relied upon by any other party or for any other site without the express written permission of ConeTec Group (ConeTec) or any of its affiliates. For this project, ConeTec has provided site investigation services, prepared factual data reporting and produced geotechnical parameter calculations consistent with current best practices. No other warranty, expressed or implied, is made.

To understand the calculations that have been performed and to be able to reproduce the calculated parameters the user is directed to the basic descriptions for the methods in this document and the detailed descriptions and their associated limitations and appropriateness in the technical references cited for each parameter.

ConeTec's Calculated CPT Geotechnical Parameters as of February 10, 2023.

ConeTec's CPT parameter calculation and plotting routine provides a tabular output of geotechnical parameters based on current published CPT correlations and is subject to change to reflect the current state of practice. Due to drainage conditions and the basic assumptions and limitations of the correlations, not all geotechnical parameters provided are considered applicable for all soil types. The results are presented only as a guide for geotechnical use and should be carefully examined for consideration in any geotechnical design. Reference to current literature is strongly recommended. ConeTec does not warranty the correctness or the applicability of any of the geotechnical parameters calculated by the program and does not assume liability for any use of the results in any design or review. For verification purposes we recommend that representative hand calculations be done for any parameter that is critical for design purposes. The end user of the parameter output should also be fully aware of the techniques and the limitations of any method used by the program. The purpose of this document is to inform the user as to which methods were used and to direct the end user to the appropriate technical papers and/or publications for further reference.

The geotechnical parameter output was prepared specifically for the site and project named in the accompanying report subject to objectives, site conditions and criteria provided to ConeTec by the client. The output may not be relied upon by any other party or for any other site without the express written permission of ConeTec Group (ConeTec) or any of its affiliates.

The CPT calculations are based on values of tip resistance, sleeve friction and pore pressures considered at each data point or averaged over a user specified layer thickness (e.g., 0.20 m). Note that q_t is the tip resistance corrected for pore pressure effects and q_c is the recorded tip resistance. The corrected tip resistance (corrected using u_2 pore pressure values) is used for all calculations. Since all ConeTec cones have equal end area friction sleeves pore pressure corrections to sleeve friction, f_s, are not performed.

Corrected tip resistance: $q_t = q_c + (1-a) \cdot u_2$ (consistent units are required)

where: q_t is the corrected tip resistance
q_c is the recorded tip resistance
u_2 is the recorded dynamic pore pressure from behind the tip (u_2 position)
a is the Net Area Ratio for the cone (typically 0.80 for ConeTec cones)

The total stress calculations are based on soil unit weight values that have been assigned to the Soil Behavior Type (SBT) zones, from a user defined unit weight profile, by using a single uniform value throughout the profile, through unit weight estimation techniques described in various technical papers or from a combination of these methods. The parameter output files indicate the method(s) used.

Effective vertical overburden stresses are calculated using the total stress and equilibrium pore pressure (u_{eq} or u_o) values derived from an assumed hydrostatic distribution of pore pressures below the water table or from a user defined equilibrium pore pressure profile (typically obtained from CPT dissipation tests) or a combination of the two. For over water projects the stress effects of the column of water above the mudline are taken into account as is the appropriate unit weight of water. How this is done depends on where the instruments are zeroed (i.e. on deck or at the mudline). The parameter output files indicate the method(s) used.

A majority of parameter calculations are derived from or driven by results based on material types as determined by the various soil behavior type charts depicted in Figures 1 through 6. The parameter output files indicate the method(s) used.

The Soil Behavior Type classification chart shown in Figure 1 is the classic non-normalized SBT Chart developed at the University of British Columbia and reported in Robertson, Campanella, Gillespie and Greig (1986). Figure 2 shows the original normalized (linear method) SBTn chart developed by Robertson (1990). The Bq classification charts

shown in Figures 3a and 3b incorporate pore pressures into the SBT classification and are based on the methods described in Robertson (1990). Many of these charts have been summarized in Lunne, Robertson and Powell (1997). The Jefferies and Davies SBT chart shown in Figure 3c is based on the techniques discussed in Jefferies and Davies (1993) which introduced the concept of the Soil Behavior Type Index parameter, I_c. Take note that the I_c parameter developed by Robertson and Fear (1995) and Robertson and Wride (1998) is similar in concept but uses a slightly different calculation method than that defined by Jefferies and Davies (1993) as the latter incorporates pore pressure in their technique through the use of the Bq parameter. The normalized Qtn SBT chart shown in Figure 4 is based on the work by Robertson (2009) utilizing a variable stress ratio exponent, n, for normalization based on a slightly modified redefinition and iterative approach for I_c. The boundary curves drawn on the chart are based on the work described in Robertson (2010).

Figure 5 shows a revised 1986 SBT Chart presented to CPT'10 by Robertson (2010b). It is known as the Updated non-normalized Soil Behavior Chart (also referred to as the Rev SBT Chart (PKR2010) in our output files). This chart was produced to be more in line with all post-1986 Robertson charts having the same 9 soil type zones, a $\log_{10}$ axis for friction ratio, R_f in this case, and a unitless tip resistance axis.

Figure 6 shows a revised behavior based chart by Robertson (2016) depicting contractive-dilative zones. As the zones represent material behavior rather than soil gradation ConeTec has chosen a set of zone colors that are less likely to be confused with material type colors from previous SBT charts. These colors differ from those used by Dr. Robertson. A green palette was selected for the dilative (desirable) side of the chart and a red palette for the contractive side of the chart.

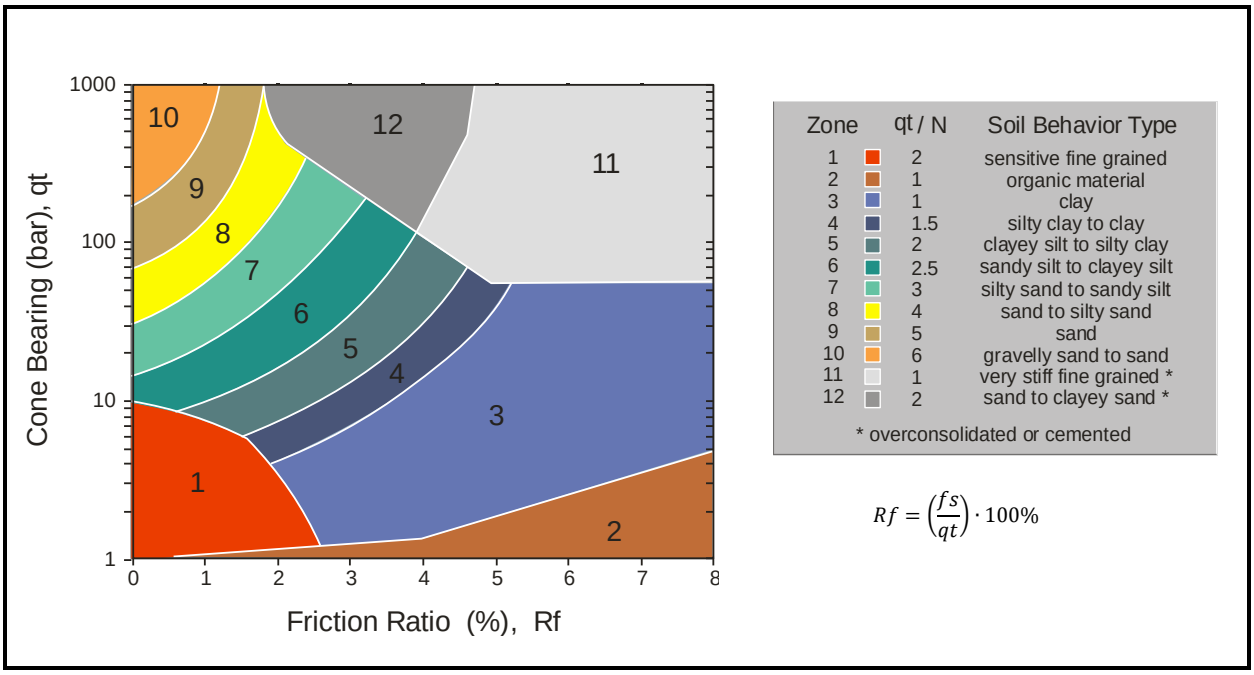


Figure 1. Non-normalized Soil Behavior Type Classification Chart (SBT)

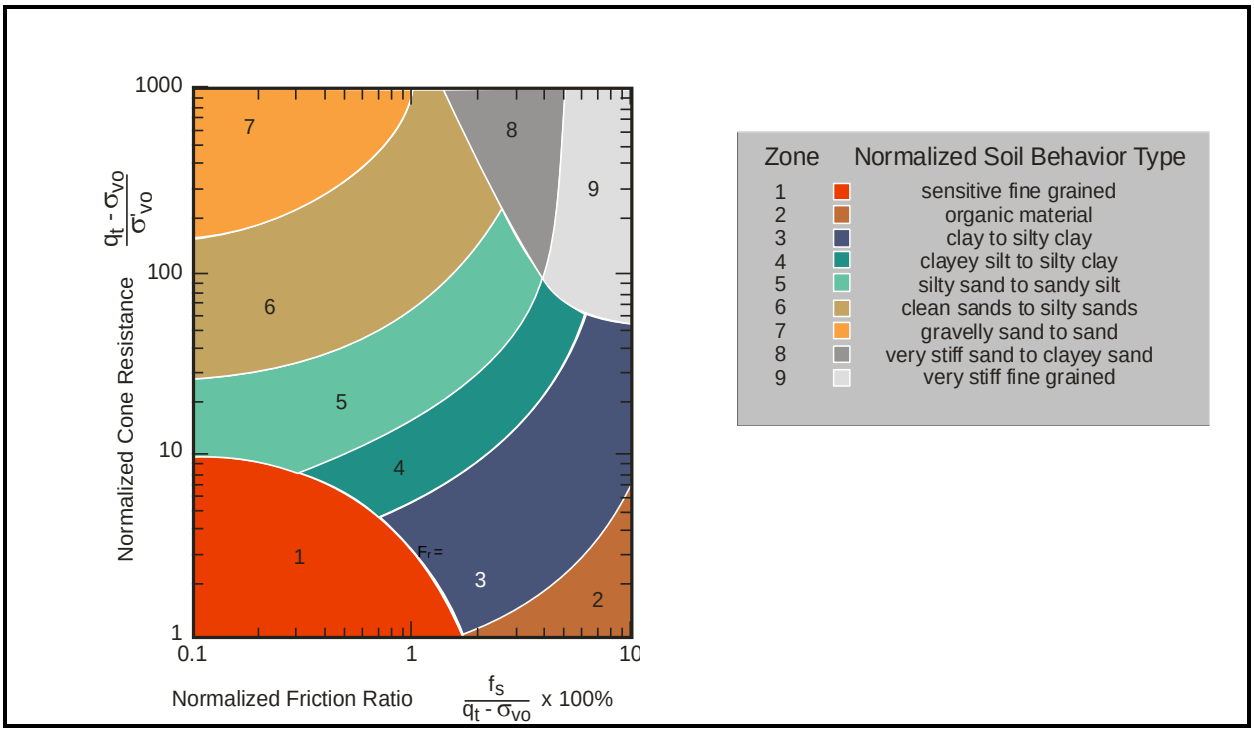


Figure 2. Normalized Soil Behavior Type Classification Chart (SBTn)

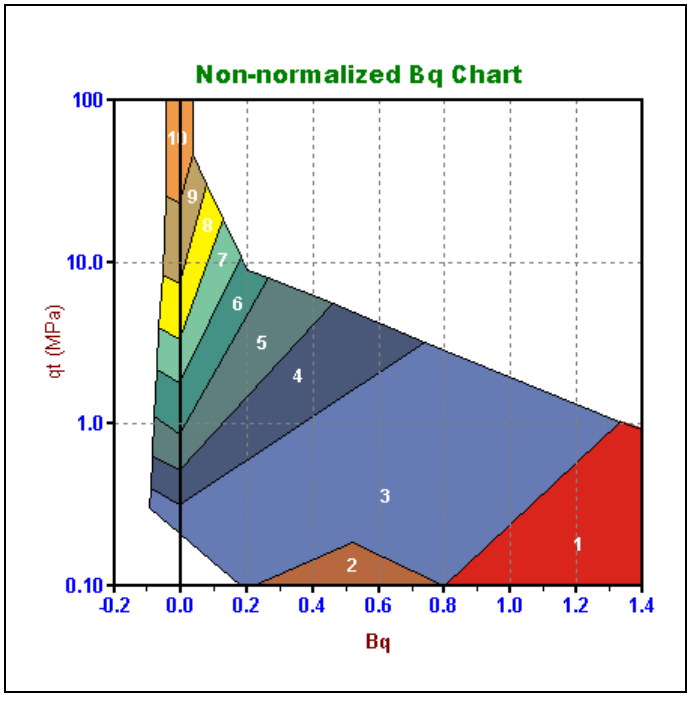


Figure 3a. Alternate Soil Behavior Type Chart (SBT Bq): q_t - B_q

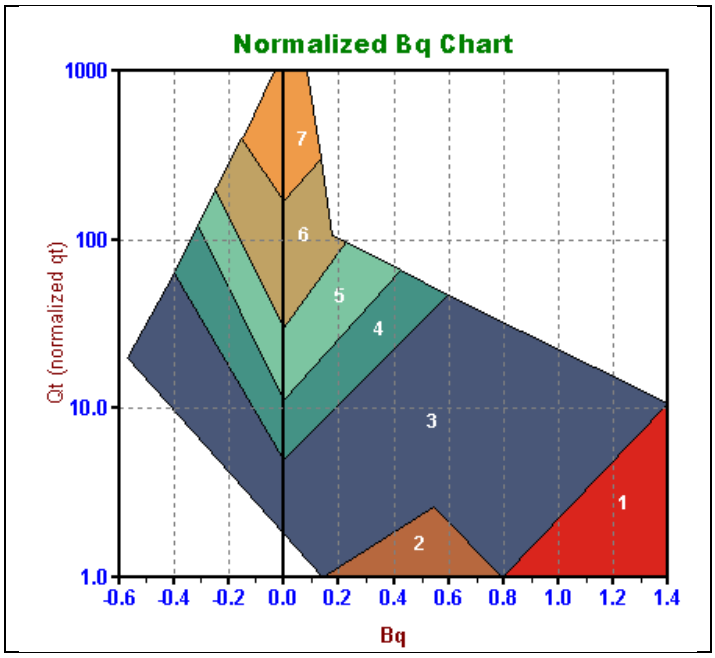


Figure 3b. Alternate Soil Behavior Type Charts (SBT Bqn): Q_t-B_q

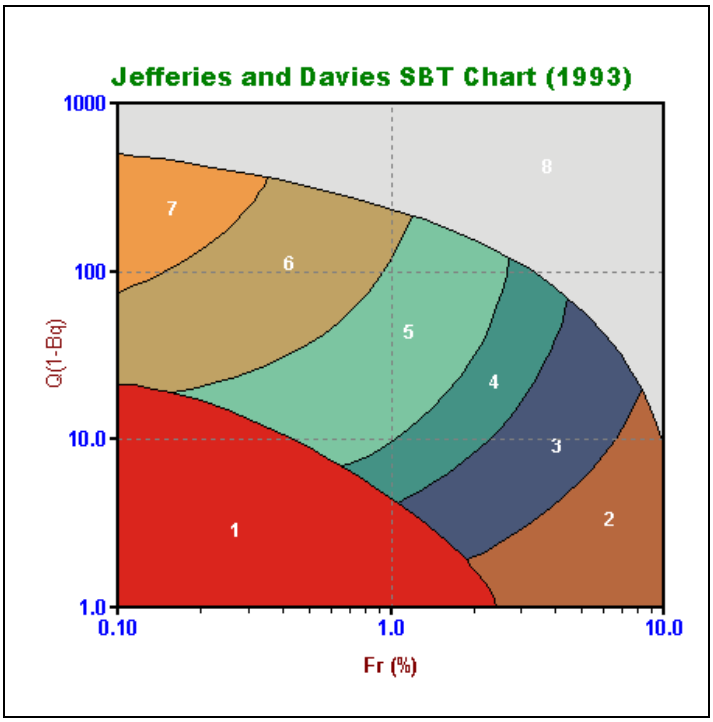


Figure 3c. Alternate Soil Behavior Type Charts: $Q(1-B_q)$ - F_r

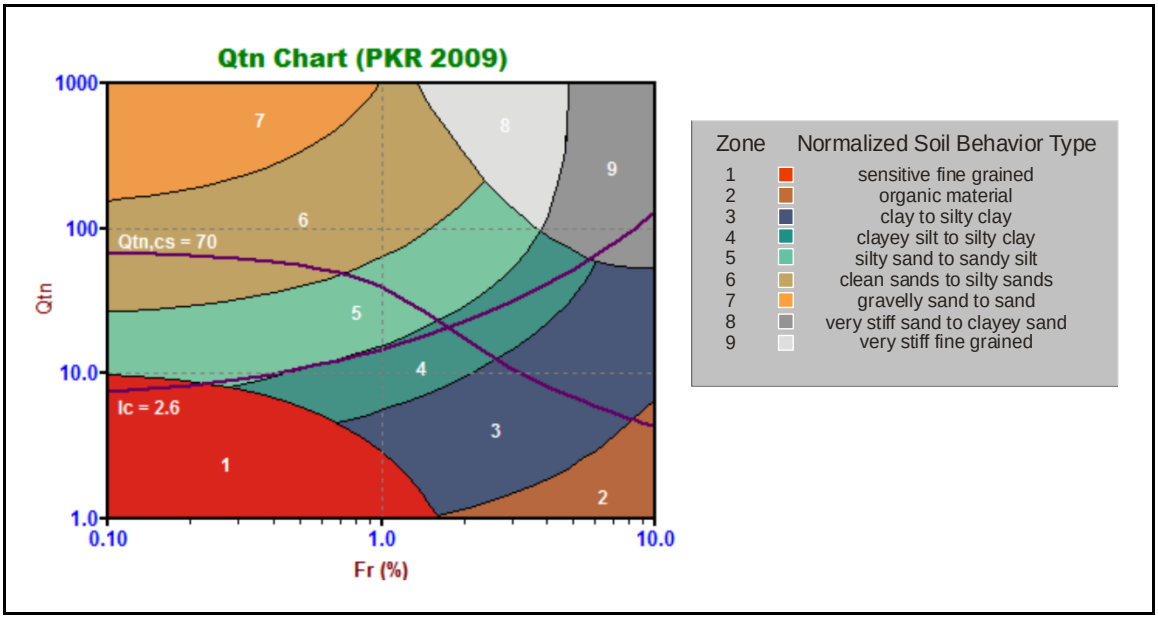


Figure 4. Normalized Soil Behavior Type Chart using Q_{tn} (SBT Qtn)

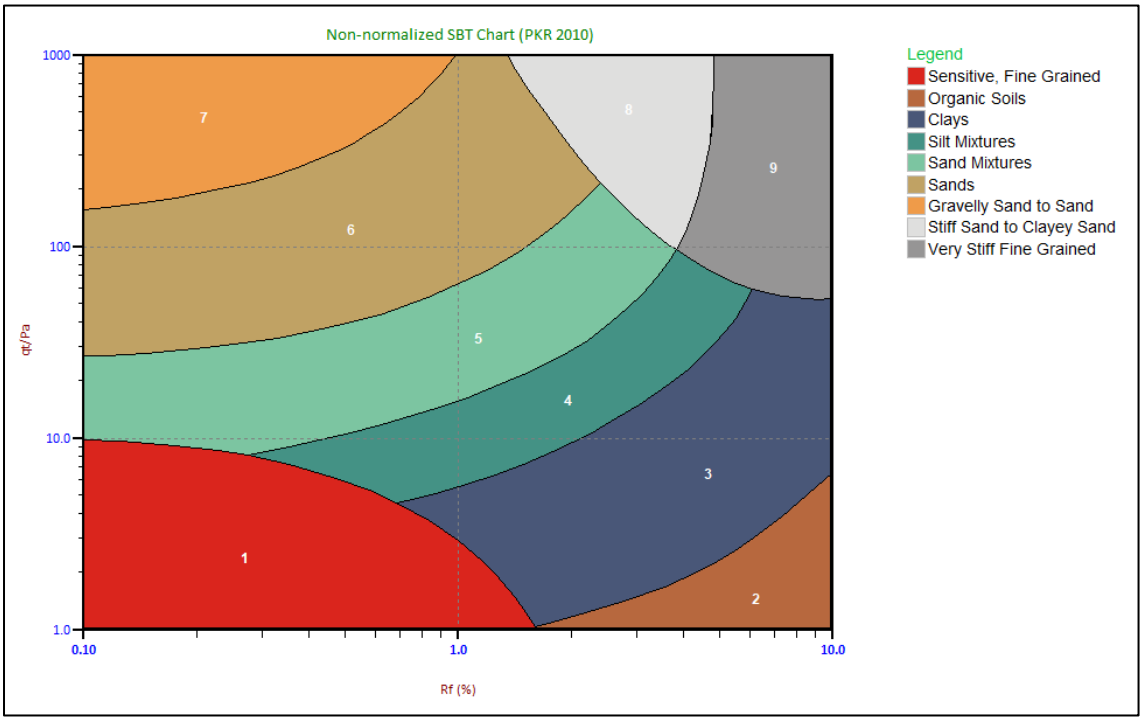


Figure 5. Non-normalized Soil Behavior Type Chart (2010)

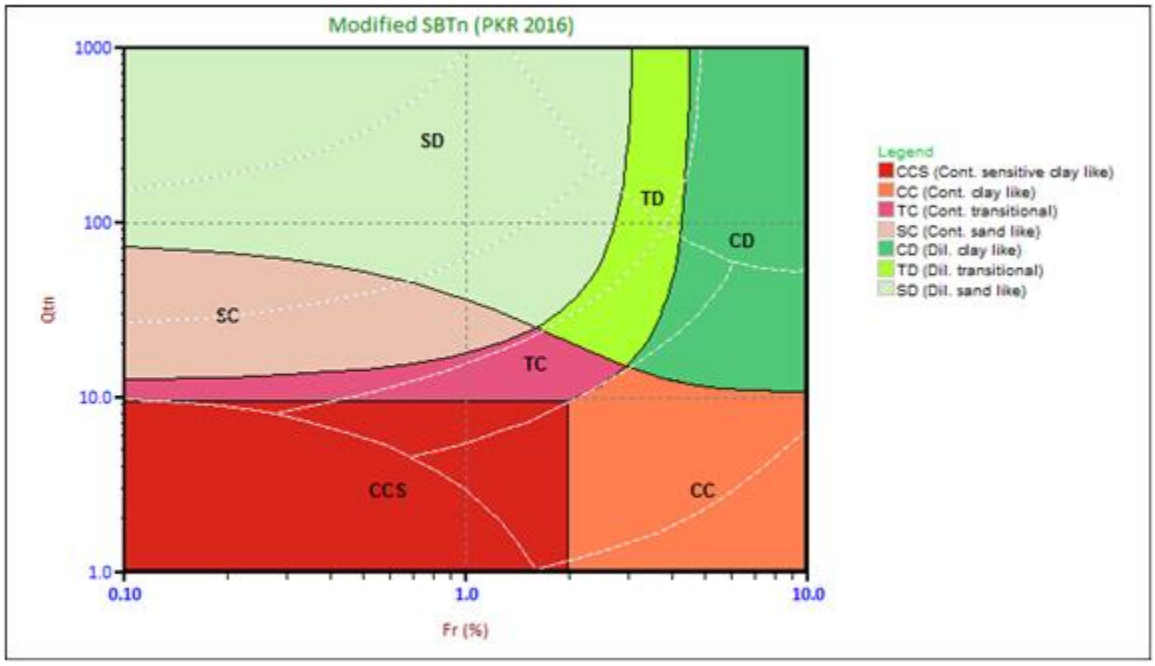


Figure 6. Modified SBTn Behavior Based Chart

Details regarding the geotechnical parameter calculations are provided in Tables 1a and 1b. The appropriate references cited are listed in Table 2. Non-liquefaction specific parameters are detailed in Table 1a and liquefaction specific parameters are detailed in Table 1b.

Where methods are based on charts or techniques that are too complex to describe in this summary, we recommend that the user refer to the cited material. Specific limitations for each method are described in the cited material.

Where the results of a calculation/correlation are deemed *'invalid'* the value will be represented by the text strings "-9999", "-9999.0", the value 0.0 (Zero) or an empty cell. Invalid results will occur because of (and not limited to) one or a combination of:

1. Invalid or undefined CPT data (e.g., drilled out section or data gap).

2. Where the calculation method is inappropriate, for example, drained parameters in a material behaving in an undrained manner (and vice versa).

3. Where input values are beyond the range of the referenced charts or specified limitations of the correlation method.

4. Where pre-requisite or intermediate parameter calculations are invalid.

The parameters selected for output from the program are often specific to a particular project. As such, not all of the calculated parameters listed in Tables 1and 1a may be included in the output files delivered with this report.

The output files are typically provided in Microsoft Excel XLS, XLSX or CSV format. The ConeTec software has several options for output depending on the number or types of calculated parameters desired or those specifically contracted for by the client. Each output file is named using the original file base name (from the .COR file) followed

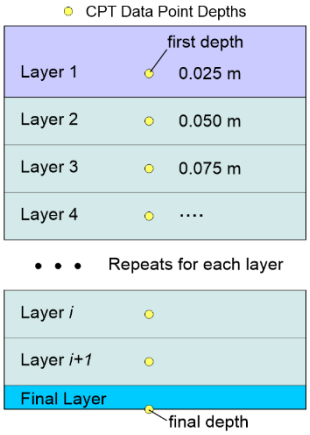
by a three or four character indicator of the output set selected (e.g. BSC, TBL, NLI, NL2, IFI, IFI2, IFI3) and possibly followed by an operator selected suffix identifying the characteristics of the particular calculation run.

Table 1a. CPT Parameter Calculation Methods – Non liquefaction Parameters

Reference Notes: CK* - Common Knowledge, U* - Unpublished

Calculated Parameter	Description	Equation	Ref
Depth	Mid Layer Depth *(where calculations are done at each point then Mid Layer Depth = Recorded Depth)*	*[Depth (Layer Top) + Depth (Layer Bottom)]/ 2.0*	CK*
Elevation	Elevation of Mid Layer is based on the sounding collar elevation supplied by the client or through a site survey In Sweden a variation of elevation is used where the elevation increases with depth. We refer to this as inverse elevation.	Elevation = Collar Elevation – Depth InverseElevation = Collar Elevation + Depth	CK* N/A
Avg qc	Averaged recorded tip value (q_c)	$Avgqc = \frac{1}{n}\sum_{i=1}^{n} q_c$ *n=1 when calculations are done at each point*	CK*
Avg qt	Averaged corrected tip (q_t) where: $q_t = q_c + (1-a)\cdot u_2$ Averaged q_t is not calculated using the average q_c and averaged u values. Averaged q_t is based on the average of the q_t values calculated at each data point.	$Avgqt = \frac{1}{n}\sum_{i=1}^{n} q_t$ *n=1 when calculations are done at each point*	1
Avg fs	Averaged sleeve friction (f_s) No pore pressure corrections are applied to f_s.	$Avgfs = \frac{1}{n}\sum_{i=1}^{n} fs$ *n=1 when calculations are done at each point*	CK*
Avg Rf	Averaged friction ratio (R_f) where friction ratio is defined as: $R_f = 100\% \cdot \frac{fs}{q_t}$	$AvgRf = 100\% \cdot \frac{Avgfs}{Avgqt}$ *not an average of individual R_f values*	CK*
Avg u	Averaged dynamic pore pressure *(u)*	$Avgu = \frac{1}{n}\sum_{i=1}^{n} u_i$ *n=1 when calculations are done at each point*	CK*
Avg Res	Averaged Resistivity (this data is not always available since it is a specialized test requiring an additional module)	$AvgRes = \frac{1}{n}\sum_{i=1}^{n} Resistivity_i$ *n=1 when calculations are done at each point*	CK*
Avg UVIF	Averaged UVIF ultra-violet induced fluorescence (this data is not always available since it is a specialized test requiring an additional module)	$AvgUVIF = \frac{1}{n}\sum_{i=1}^{n} UVIF_i$ *n=1 when calculations are done at each point*	CK*
Avg Temp	Averaged Temperature (this data is not always available)	$AvgTemp = \frac{1}{n}\sum_{i=1}^{n} Temperature_i$ *n=1 when calculations are done at each point*	CK*
Avg Gamma	Averaged Gamma Counts (this data is not always available since it is a specialized test requiring an additional module)	$AvgGamma = \frac{1}{n}\sum_{i=1}^{n} Gamma_i$ *n=1 when calculations are done at each point*	CK*
SBT	Soil Behavior Type as defined by Robertson et al 1986 (often referred to as Robertson and Campanella, 1986)	See Figure 1	1, 5
SBTn	Normalized Soil Behavior Type as defined by Robertson 1990 (linear normalization using Q_t, now referred to as Q_{t1})	See Figure 2	2, 5

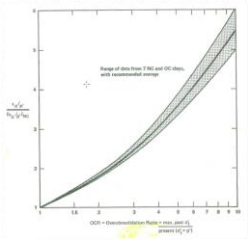
Calculated Parameter	Description	Equation	Ref
SBT-Bq	Non-normalized Soil Behavior type based on non-normalized tip resistance and the B_q parameter	See Figure 3a	1, 2, 5
SBT-Bqn	Normalized Soil Behavior type based on normalized tip resistance (Q_t, now called Q_{t1}) and the B_q parameter	See Figure 3b	2, 5
SBT-JandD	Soil Behavior Type as defined by Jeffries and Davies	See Figure 3c	7
SBT Qtn	Soil Behavior Type as defined by Robertson (2009) using a variable stress ratio exponent for normalization based on $I_{c\ (PKR\ 2009)}$	See Figure 4	15
Modified Non-normalized SBT Chart SBT (PKR2010)	This is a revised version of the simple 1986 non-normalized SBT chart (presented at CPT '10). The revised version has been reduced from 12 zones to 9 zones to be similar to the normalized Robertson charts. Other updates include a dimensionless tip resistance normalized to atmospheric pressure, q_t/P_a, on the vertical axis and a log scale for non-normalized friction ratio, R_f, along the horizontal axis.	See Figure 5	33
Modified SBTn (contractive /dilative)	Modified SBTn chart as defined by Robertson (2016) indicating zones of contractive/dilative behavior. Note that ConeTec displays the chart with colors different from Robertson. ConeTec's colors were chosen to avoid confusion with soil type descriptions.	See Figure 6	30
Unit Wt.	Unit Weight of soil determined from one of the following user selectable options: 1) uniform value 2) value assigned to each SBT zone 3) value assigned to each SBTn zone 4) value assigned to SBTn zone as determined from Robertson and Wride (1998) based on q_{c1n} 5) values assigned to SBT Qtn zones 6) values based on Robertson updated non-normalized Soil Behavior Type Chart (2010b) 6) Mayne f_s (sleeve friction) method 7) Robertson and Cabal 2010 method 8) user supplied unit weight profile The last option may co-exist with any of the other options.	See references	3, 5, 15, 21, 24, 29, 33

Calculated Parameter	Description	Equation	Ref
TStress σ_v	Total vertical overburden stress at Mid Layer Depth *A layer is defined as the averaging interval specified by the user where depths are reported at their respective mid-layer depth.* For data calculated at each point layers are defined using the recorded depth as the mid-point of the layer. Thus, a layer starts half-way between the previous depth and the current depth unless this is the first point in which case the layer start is at zero depth. The layer bottom is half-way from the current depth to the next depth unless it is the last data point. Defining layers affects how stresses are calculated since the unit weight attributed to a data point is used throughout the entire layer. This means that to calculate the stresses the total stress at the top and bottom of a layer are required. The stress at mid layer is determined by adding the incremental stress from the layer top to the mid-layer depth. The stress at the layer bottom becomes the stress at the top of the subsequent layer. Stresses are NOT calculated from mid-point to mid-point. For over-water work the total stress due to the column of water above the mid line is taken into account where appropriate.	$TStress = \sum_{i=1}^{n} \gamma_i h_i$ *where* γ_i is layer unit weight h_i is layer thickness 	CK*
EStress σ_v'	Effective vertical overburden stress at mid-layer depth.	$\sigma_v' = \sigma_v - u_{eq}$	CK*
Equil u u_{eq} or u_0	Equilibrium pore pressures are determined from one of the following user selectable options: 1) hydrostatic below the water table 2) user supplied profile 3) combination of those above When a user supplied profile is used/provided a linear interpolation is performed between equilibrium pore pressures defined at specific depths. If the profile values start below the water table then a linear transition from zero pressure at the water table to the first defined pointed is used. Equilibrium pore pressures may come from dissipation tests, adjacent piezometers or other sources. Occasionally, an extra equilibrium point ("assumed value") will be provided in the profile that does not come from a recorded value to smooth out any abrupt changes or to deal with material interfaces. These "assumed" values will be indicated on our plots and in tabular summaries.	For the hydrostatic option: $u_{eq} = \gamma_w \cdot (D - D_{wt})$ where u_{eq} is equilibrium pore pressure γ_w is the unit weight of water D is the current depth D_{wt} is the depth to the water table	CK*
K_0	Coefficient of earth pressure at rest, K_0.	$K_O = (1 - \sin\Phi') OCR^{\sin\Phi'}$	17
C_n	Overburden stress correction factor used for $(N_1)_{60}$ and older CPT parameters.	$C_n = (P_a/\sigma_v')^{0.5}$ where $0.0 < C_n < 2.0$ *(user adjustable, typically ranging from 1.7 to 2.0)* P_a *is atmospheric pressure (100 kPa)*	4, 12

Calculated Parameter	Description	Equation	Ref
C_q	Overburden stress normalizing factor.	$C_q = 1.8 / [0.8 + (\sigma_v'/P_a)]$ where *$0.0 < C_q < 2.0$ (user adjustable)* *P_a is atmospheric pressure (100 kPa)* *Robertson and Wride define C_q to be the same as C_n. The Olson definition above is used in the program.*	3, 12
N_{60}	SPT N value at 60% energy calculated from q_t/N ratios assigned to each SBT zone. This method has abrupt N value changes at zone boundaries.	*See Figure 1*	5
$(N_1)_{60}$	SPT N_{60} value corrected for overburden pressure.	$(N_1)_{60} = C_n \bullet N_{60}$	4
$N_{60}I_c$	SPT N_{60} values based on the I_c parameter, as defined by Robertson and Wride 1998 (3), or by Robertson 2009 (15).	$(q_t/P_a)/ N_{60} = 8.5 (1 – I_c/4.6)$ $(q_t/P_a)/ N_{60} = 10^{(1.1268 – 0.2817Ic)}$ P_a being atmospheric pressure	3, 5 15, 31
$(N_1)_{60}I_c$	SPT N_{60} value corrected for overburden pressure (using N_{60} I_c). User has 3 options.	*1) $(N_1)_{60}Ic = C_n \bullet (N_{60} I_c)$* 2) $q_{c1n}/ (N_1)_{60}I_c = 8.5 (1 – I_c/4.6)$ 3) $(Q_{tn})/ (N_1)_{60}I_c = 10^{(1.1268 – 0.2817Ic)}$	4 5 15, 31
S_u or S_u (N_{kt})	Undrained shear strength based on q_t S_u factor N_{kt} is user selectable.	$Su = \frac{qt - \sigma_v}{N_{kt}}$	1, 5
S_u or S_u (N_{du}) or S_u ($N_{\Delta u}$)	Undrained shear strength based on pore pressure S_u factor $N_{\Delta u}$ is user selectable.	$Su = \frac{u_2 - u_{eq}}{N_{\Delta u}}$	1, 5
D_r	Relative Density determined from one of the following user selectable options: 1) Ticino Sand 2) Hokksund Sand 3) Schmertmann (1978) 4) Jamiolkowski (1985) - All Sands 5) Jamiolkowski et al (2003) (various compressibilities, K_o)	See reference (methods 1 through 4) Jamiolkowski et al (2003) reference	5 14
PHI ϕ	Friction Angle determined from one of the following user selectable options (methods 1 through 4 are for sands and method 5 is for silts and clays): 1) Campanella and Robertson 2) Durgunoglu and Mitchel 3) Janbu 4) Kulhawy and Mayne 5) NTH method (clays and silts)	See appropriate reference	5 5 5 11 23
Delta U/q_t $\Delta u/q_t$ du/q_t	Differential pore pressure ratio (older parameter used before B_q was established)	$= \frac{\Delta u}{qt}$ *where:* $\Delta u = u - u_{eq}$ *and u = dynamic pore pressure* *u_{eq} = equilibrium pore pressure*	39

Calculated Parameter	Description	Equation	Ref
B_q	Pore pressure parameter	$Bq = \frac{\Delta u}{qt - \sigma_v}$ where: $\Delta u = u - u_{eq}$ *and* u *= dynamic pore pressure* u_{eq} *= equilibrium pore pressure*	1, 2, 5
Net q_t or qtNet	Net tip resistance (used in many subsequent correlations)	$qt - \sigma_v$	36
q_e or qE or q_E	Effective tip resistance (using the dynamic pore pressure u_2 and not equilibrium pore pressure)	$q_t - u_2$	36
qeNorm	Normalized effective tip resistance	$\frac{qt - u_2}{\sigma_v}$	36
Q_t or Norm: Qt or Q_{t1}	Normalized q_t for Soil Behavior Type classification as defined by Robertson (1990) using a linear stress normalization. Note this is different from Q_{tn}. This parameter was renamed to Q_{t1} in Robertson, 2009. Without normalization limits this parameter calculates to very high unrealistic values at low stresses.	$Qt = \frac{qt - \sigma_v}{\sigma_v}$	2, 5, 15
F_r or Norm: Fr	Normalized Friction Ratio for Soil Behavior Type classification as defined by Robertson (1990)	$Fr = 100 \cdot \frac{fs}{qt - \sigma_v}$	2, 5
Q(1-B_q) Q(1-B_q) + 1	Q(1-B_q) grouping as suggested by Jefferies and Davies for their classification chart and the establishment of their I_c parameter. Later papers added the +1 term to the equation.	$Q \cdot (1 - Bq)$ $Q \cdot (1 - Bq) + 1$ *where Bq is defined as above and Q is the same as the normalized tip resistance,* Q_{t1}*, defined above*	6, 7, 34
q_{c1}	Normalized tip resistance, q_{c1}, using a fixed stress ratio exponent, n (this method has stress units)	$q_{c1} = q_t \cdot (Pa/\sigma_v')^{0.5}$ where: P_a = atmospheric pressure	21
q_{c1} (0.5)	Normalized tip resistance, q_{c1}, using a fixed stress ratio exponent, n (this method is unit-less)	$q_{c1}(0.5) = (q_t/P_a) \cdot (Pa/\sigma_v')^{0.5}$ where: P_a = atmospheric pressure	5
q_{c1} (C_n)	Normalized tip resistance, q_{c1}, based on C_n (this method has stress units)	$q_{c1}(Cn) = C_n * q_t$	5, 12
q_{c1} (C_q)	Normalized tip resistance, q_{c1}, based on C_q (this method has stress units)	$q_{c1}(Cq) = C_q * q_t$ (some papers use q_c)	5, 12
q_{c1n}	normalized tip resistance, q_{c1n}, using a variable stress ratio exponent, n (where n=0.0, 0.70, or 1.0) (this method is unit-less)	$q_{c1n} = (q_t / P_a)(P_a/\sigma_v')^n$ where: P_a = atm. Pressure and n varies as described below	3

Calculated Parameter	Description	Equation	Ref
I_c or Ic (RW1998)	Soil Behavior Type Index as defined by Robertson and Wride (1997, 1998) for estimating grain size characteristics and providing smooth gradational changes across the SBTn chart. Ic(RW1998) is different from that of Jefferies and Davies (7) and is different from Ic(PKR2009).	$I_c = [(3.47 - \log_{10}Q)^2 + (\log_{10} Fr + 1.22)^2]^{0.5}$ *Where:* $Q = \left(\frac{qt - \sigma_v}{P_a}\right)\left(\frac{P_a}{\sigma_v'}\right)^n$ *Or* $Q = q_{c1n} = \left(\frac{qt}{P_a}\right)\left(\frac{P_a}{\sigma_v'}\right)^n$ *depending on the iteration in determining I_c* *And Fr is in percent* *P_a = atmospheric pressure* *n has the following distinct values:* *0.5, 0.75 and 1.0* *and is determined in an iterative manner based on the resulting I_c in each iteration* *Note that NCEER replaced 0.75 with 0.70*	3, 4, 5 10
I_c (PKR 2009)	Soil Behavior Type Index, I_c (PKR 2009) is based on a variable stress ratio exponent n, which itself is based on I_c (PKR 2009). An iterative calculation is required to determine I_c (PKR 2009) and its corresponding n (PKR 2009).	*I_c (PKR 2009) =* *$[(3.47 - \log_{10}Q_{tn})^2 + (1.22 + \log_{10}F_r)^2]^{0.5}$*	15
n (PKR 2009)	Stress ratio exponent n, based on I_c (PKR 2009). An iterative calculation is required to determine n (PKR 2009) and its corresponding I_c (PKR 2009).	*n (PKR 2009) = 0.381 (I_c) + 0.05 (σ_v'/P_a) – 0.15*	15
Q_{tn} (PKR 2009)	Normalized tip resistance using a variable stress ratio exponent based on I_c (PKR 2009) and n (PKR 2009). An iterative calculation is required to determine Q_{tn} (PKR 2009).	*$Q_{tn} = [(qt - \sigma_v)/P_a](P_a/\sigma_v')^n$* *where P_a = atmospheric pressure (100 kPa)* *n = stress ratio exponent described above*	15
FC	Apparent fines content (%)	*FC=1.75($Ic^{3.25}$) - 3.7* *FC=100 for $I_c > 3.5$* *FC=0 for $I_c < 1.26$* *FC = 5% if 1.64 < I_c < 2.6 AND F_r<0.5*	3
I_c Zone	This parameter is the Soil Behavior Type zone based on the I_c parameter (valid for zones 2 through 7 on SBTn or SBT Qtn charts)	I_c < 1.31 Zone = 7 1.31 < I_c < 2.05 Zone = 6 2.05 < I_c < 2.60 Zone = 5 2.60 < I_c < 2.95 Zone = 4 2.95 < I_c < 3.60 Zone = 3 I_c > 3.60 Zone = 2	3
CD	The contractive / dilative boundary on Robertson's Modified SBTn (contractive/dilative) Chart shown in Figure 6 above. The boundary is marked as CD = 70 on the chart in the relevant paper. Similar to the $Q_{tn,cs}$ = 70 line in Figure 4.	CD = 70 = $(Q_{tn} - 11)(1 + 0.06F_r)^{17}$ lower bound of CD = 60: CD = 60 = $(Q_{tn} - 9.5)(1 + 0.06F_r)^{17}$	30

Calculated Parameter	Description	Equation	Ref
I_B	Hyberbolic fit defining the boundary between SBT soil types proposed by Schneider as a better fit than the I_c circles. I_B = 32 represents the boundary for most sand like soils. I_B = 22 represents the upper boundary for most clay like soils. The region between I_B=22 and I_B=32 is the "transitional soil" zone.	$I_B = 100\ (Q_{tn} + 10) / (70 + Q_{tn}\ F_r)$	30
State Param or State Parameter or ψ	The state parameter index, ψ, is defined as the difference between the current void ratio, e, and the critical void ratio, e_c. Positive ψ - contractive soil Negative ψ - dilative soil This is based on the work by Been and Jefferies (1985) and Plewes, Davies and Jefferies (1992) This method uses mean normal stresses based on a uniform value of K_0 or a calculated K_0 using methods described elsewhere in this document	See reference	6, 8
Yield Stress σ_p'	Yield stress is calculated using the following methods 1) General method 2) 1st order approximation using q_tNet (clays) 3) 1st order approximation using Δu_2 (clays) 4) 1st order approximation using q_e (clays) 5) Based on Vs	All stresses in kPa 1) $\sigma_p' = 0.33 \cdot (q_t - \sigma_v)^{m'} (\sigma_{atm}/100)^{1-m'}$ where $m = 1 - \frac{0.28}{1 + (I_c / 2.65)^{25}}$ 2) $\sigma_p' = 0.33 \cdot (q_t - \sigma_v)$ 3) $\sigma_p' = 0.54 \cdot (\Delta u_2)$ $\Delta u_2 = u_2 - u_0$ 4) $\sigma_p' = 0.60 \cdot (q_t - u_2)$ 5) $\sigma_p' = (Vs/4.59)^{1.47}$	19 20 20 20 18
OCR OCR(JS1978) YSR(Mayne2014) YSR (qtNet) YSR (deltaU) YSR (qe) YSR (Vs) OCR (PKR2015)	Over Consolidation Ratio based on 1) Schmertmann (1978) method involving a plot plot of S_u/σ_v' /($S_u/\sigma_v')_{NC}$ and OCR  2) based on Yield stresses described above 3) approximate version based on qtNet 4) approximate version based on Δu 5) approximate version based on effective tip, q_e 6) approximate version based on shear wave velocity, V_s and σ_v' 7) based on Qt	1) requires a user defined value for NC Su/P_c' ratio 2 through 5) *based on yield stresses* 6) YSR (Vs) = $\sigma_p'(Vs) / \sigma_v'$ 7) OCR = $0.25 \cdot (Qt)^{1.25}$	9 19 20 20 20 18 32
Es/qt	Intermediate parameter for calculating Young's Modulus, E, in sands. It is the Y axis of the reference chart. Note that Figured 5.59 from reference 5, Lunne, Robertson and Powell, (LRP) has an error. The X axis values are too high by a factor of 10. The plot is based on Baldi's (not Bellotti as cited in	Based on Figure 5.59 in the reference	5, 37

Calculated Parameter	Description	Equation	Ref
	LRP) original Figure 3 where the X axis is: $\frac{q_c}{\sqrt{\sigma_v'}}$ (both in kPa) with a range of 200 to 3000. Figure 5.59 from LRP shows a dimensionless form of the equation, q_{c1}, displaying the same range of values. Figure 5.59's X axis uses $q_{c1} = \left(\frac{q_c}{P_a}\right)\left(\frac{P_a}{\sigma_v'}\right)^{0.5}$ The two expressions are not the same: they differ by a factor of $\frac{\sqrt{P_a}}{P_a}$. With P_a taken to be 100 kPa the factor is 1/10. Substituting typical values of 200 bar (20000 kPa) for q_c and 225 kPa for σ_v' one gets: 20000 / 15 = 1333.33 for Bellotti's axis and $(200/1)(100/225)^{0.5}$ = 200 * (10/15) = 133.3 for LRP's axis (noting that P_a = 1 bar) showing a factor of 10 difference.		
Es or E_s Young's Modulus E	Young's Modulus based on the work done in Italy. There are three types of sands considered in this technique. The user selects the appropriate type for the site from: a) OC Sands b) Aged NC Sands c) Recent NC Sands Each sand type has a family of curves that depend on mean normal stress. The program calculates mean normal stress and linearly interpolates between the two extremes provided in the E_s/q_t chart. E_s is evaluated for an axial strain of 0.1%.	Mean normal stress is evaluated from: $\sigma_m' = \frac{1}{3}(\sigma_v' + \sigma_h' + \sigma_h')$ where σ_v'= vertical effective stress σ_h'= horizontal effective stress *and* $\sigma_h = K_o \cdot \sigma_v'$ with K_o assumed to be 0.5	5
Delta U/TStress $\Delta u / \sigma_v$	Differential pore pressure ratio with respect to total stress	$= \frac{\Delta u}{\sigma_v}$ *where:* $\Delta u = u - u_{eq}$	39
Delta U/EStress, P Value, Excess Pore Pressure Ratio $\Delta u/\sigma_v'$	Differential pore pressure ratio with respect to effective stress. Key parameter (P, Normalized Pore Pressure Parameter, Excess Pore Pressure Ratio) in the Winckler et. al. static liquefaction method.	$= \frac{\Delta u}{\sigma_v'}$ *where:* $\Delta u = u - u_{eq}$	25, 25a
Su/EStress S_u/σ_v'	Undrained shear strength ratio with respect to vertical effective overburden stress using the S_u (N_{kt}) method	= *Su* (N_{kt}) / σ_v'	9, 23
Vs or V_s	Recorded shear wave velocities (not estimated). The shear wave velocities are typically collected over 1 m depth intervals. Each data point over the relevant depth range is assigned the same V_s value.	recorded data	27
Vp or V_p	Recorded compression wave (or P wave) velocities (not estimated). The P wave velocities are typically collected over 1 m depth intervals. Each data point over the relevant depth range is assigned the same V_p value.	recorded data	27

Calculated Parameter	Description	Equation	Ref
V_{s30} V_{s100}	The average shear wave velocity of the near surface materials to a depth of 30 m (100 ft). It is based on the sum of all travel times through all layers in the top 30m (100 ft). V_{s100} is the same calculation as V_{s30} except down to a depth of 100 feet.	$V_{s30} = \frac{total\ thickness\ of\ all\ layers\ to\ 30\ m}{\Sigma\left(\frac{layer\ thickness}{layer\ shear\ wave\ velocity}\right)}$ $V_{s30} = \frac{total\ thickness\ of\ all\ layers\ to\ 30\ m}{\Sigma\ (layer\ travel\ times)}$	38
G_{max}	G_{max} determined from SCPT shear wave velocities (not estimated values). Note that seismic data (V_s) is collected over set depth intervals (typically 1 meter). Each data point over the test segment is assigned the same V_s value. Since soil density changes with depth, slightly different G_{max} values may be calculated over the test depth interval.	$G_{max} = \rho V_s^2$ where ρ is the mass density of the soil determined from the estimated unit weights at each test depth	27
qtNet/G_{max}	Net tip resistance ratio with respect to the small strain modulus G_{max} determined from SCPT shear wave velocities (not estimated values)	$= (qt - \sigma_v) / G_{max}$ where $G_{max} = \rho V_s^2$ and ρ is the mass density of the soil determined from the estimated unit weights at each test depth	15, 28, 30
qUlt	A site specific and client specific parameter for estimating the limiting stress for "crane walk" accessibility	$q_{ult} = CraneWalkFactor \cdot S_u$ Where: *CraneWalkFactor* is client provided	U*
Estimated G_o	Estimated value for small strain shear modulus	$G_o = 0.0188[10^{(0.55Ic + 1,68)}](q_t - \sigma_v)$	15
Estimated E_{25}	Estimated value for Young's Modulus, E, at a 25% working load	$E_{25} = \alpha_E$ (qtNet) where $\alpha_E = 0.015[10^{(0.55Ic + 1,68)}]$	15
k_{SBT}	Estimated soil permeability derived from Soil Behavior Type (SBT) Chart I_c values.	For $1.0 < I_c \leq 3.27$: $k = 10^{(0.952 - 3.04Ic)}$ in m/s For $3.27 < Ic < 4.0$: $k = 10^{(-4.52 - 1.37Ic)}$ in m/s	35
M or D' Constrained Modulus	Constrained Modulus based on 1) Robertson, M 2) Mayne, D'	1) Robertson $M = \alpha_M (q_t - \sigma_v)$ $I_c > 2.2$ (fine grained) $\alpha_M = Qt$ when $Qt < 14$ $\alpha_M = 14$ when $Qt > 14$ $Ic < 2.2$ (coarse grained) $\alpha_M = 0.0188\ [10^{(0.55Ic + 1.68)}]$ $D' = \alpha_D (qt - \sigma_v)$ where $\alpha_D = 5$	32 23

Table 1b. CPT Parameter Calculation Methods – Liquefaction Parameters

Calculated Parameter	Description	Equation	Ref
K_{SPT} or K_s	Equivalent clean sand factor for $(N_1)60$	$K_{SPT} = 1 + ((0.75/30) \bullet (FC - 5))$	10
K_{CPT} or K_c (RW1998)	Equivalent clean sand correction for q_{c1N}	$K_{cpt} = 1.0$ for $I_c \leq 1.64$ $K_{cpt} = f(I_c)$ for $I_c > 1.64$ (see reference) $K_c = -0.403\ I_c^4 + 5.581\ I_c^3 - 21.63 I_c^2 + 33.75\ I_c - 17.88$	3, 10
K_c (PKR 2010)	Clean sand equivalent factor to be applied to Q_{tn}	$K_c = 1.0$ for $I_c \leq 1.64$ $K_c = -0.403\ I_c^4 + 5.581\ I_c^3 - 21.63 I_c^2 + 33.75\ I_c - 17.88$ for $I_c > 1.64$	16
$(N_1)_{60cs}I_C$	Clean sand equivalent SPT $(N_1)_{60}I_c$. User has 3 options.	1) $(N_1)_{60cs}Ic = \alpha + \beta((N_1)_{60}I_c)$ 2) $(N_1)_{60cs}Ic = K_{SPT} * ((N_1)_{60}I_c)$ 3) $(q_{c1ncs})/(N_1)_{60cs}I_c = 8.5\ (1 - I_c/4.6)$ FC ≤ 5%: $\alpha = 0,\ \beta = 1.0$ FC ≥ 35% $\alpha = 5.0,\ \beta = 1.2$ 5% < FC < 35% $\alpha = exp[1.76 - (190/FC^2)]$ $\beta = [0.99 + (FC^{1.5}/1000)]$	10 10 5
q_{c1ncs}	Clean sand equivalent q_{c1n}	$q_{c1ncs} = q_{c1n} \bullet K_{cpt}$	3
$Q_{tn,cs}$ (PKR 2010)	Clean sand equivalent for Q_{tn} described above - Q_{tn} being the normalized tip resistance based on a variable stress exponent as defined by Robertson (2009)	$Q_{tn,cs} = Q_{tn} \cdot K_c$ (PKR 2016)	16
Su(Liq)/ESv or $S_u(Liq)/\sigma_v'$	Liquefied shear strength ratio as defined by Olson and Stark	$\frac{S_u(Liq)}{\sigma_v'} = 0.03 + 0.0143(q_{c1})$ Note: σ_v' and s_v' are synonymous	13
Su(Liq)/ESv or $S_u(Liq)/\sigma_v'$ (PKR 2010)	Liquefied shear strength ratio as defined by Robertson (2010)	$\frac{S_u(Liq)}{\sigma_v'}$ Based on a function involving $Q_{tn,cs}$	16
S_u (Liq) (PKR 2010)	Liquefied shear strength derived from the liquefied shear strength ratio and effective overburden stress	$S_u(Liq) = \sigma_v' \cdot \left(\frac{S_u(Liq)}{\sigma_v'}\right)$	16
Cont/Dilat Tip	Contractive / Dilative q_{c1} Boundary based on $(N_1)_{60}$	$(\sigma_v')_{boundary} = 9.58 \times 10^{-4}\ [(N_1)_{60}]^{4.79}$ q_{c1} is calculated from specified q_t(MPa)/N ratio	13
CRR	Cyclic Resistance Ratio (for Magnitude 7.5)	$q_{c1ncs} < 50$: $CRR_{7.5} = 0.833\ [q_{c1ncs}/1000] + 0.05$ $50 \leq q_{c1ncs} < 160$: $CRR_{7.5} = 93\ [q_{c1ncs}/1000]^3 + 0.08$	10
Kg or K_g	Small strain Stiffness Ratio Factor, K_g	$[G_{max}/q_t]/[q_{c1n}{}^{-m}]$ m = empirical exponent, typically 0.75	26

Calculated Parameter	Description	Equation	Ref
K_g*	Revised K_g factor extended to fine grained soils (Robertson).	$K_g^* = (G_o / q_n)(Q_{tn})^{0.75}$ where q_n is the net tip resistance = $q_t - \sigma_v$	30
SP Distance	State Parameter Distance, Winckler static liquefaction method	Perpendicular distance on Q_{tn} chart from plotted point to state parameter Ψ = -0.05 curve	25
URS NP Fr	Normalized friction ratio point on Ψ = -0.05 curve used in SP distance calculation		25
URS NP Q_{tn}	Normalized tip resistance (Q_{tn}) point on Ψ = -0.05 curve used in SP Distance calculation		25

Table 2. References

No.	Reference
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No.	Reference
19	Mayne, P.W., 2014, "Generalized CPT Method for Evaluating Yield Stress in Soils", Geocharacterization for Modeling and Sustainability (GSP 235: Proc. GeoCongress 2014, Atlanta, GA), ASCE, Reston, Virginia: 1336-1346.
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Calibration Records

CONETEC

ADARA

Adara Systems Ltd.
201-8327 Eastlake Drive, Burnaby, BC, Canada V5A4W2
Tel: 1-604-273-6013

CERTIFICATE OF CALIBRATION

Calibration Information			
Cone Serial Number	EC968	Model	A15 T1500 F15 U35
Calibration Date (YYYY-MM-DD)	2025-05-28		
Calibration Due (YYYY-MM-DD)	2026-05-28		
Calibration Performed By	Richard Chen	Signature	Digitally signed by Richard Chen Date: 2025-06-02
Calibration Approved By	Diane Eden	Signature	Digitally signed by Diane Eden Date: 2025-06-02

Lab Condition	As Found	As Left		
Lab Temperature	23 ˚C	23˚C		
Lab Humidity	22%	22%	Reason for Calibration	Repair

Cone Information				
Tip Stress Limit	1500	bar	Tip End Area	15 cm²
Friction Stress Limit	15	bar	Friction Surface Area	225 cm²
Pressure Limit	35	bar	RTD Location	Pressure Carrier
X-Inclinometer Limit	30	degrees	Geophone	X and Z
Y-Inclinometer Limit	30	degrees	Temperature Range	-20°C to 60°C

Baseline Summary: (For Reference Only)

Channel	Units	As Found	As Left
Tip	bar	-2.664	-0.111
Sleeve	bar	0.080	-0.021
Pressure	bar	1.007	1.006
X-Inclinometer	degrees	-0.025	0.000
Y-Inclinometer	degrees	-0.400	0.000
Temperature	˚C	24.487	24.461

Classified in accordance with ISO 22476-1:2012 Class 1
Classified in accordance with ISO 22476-1:2012 Class 2

Calibrated in general accordance with the ASTM D5778-20 and D7400-19 standards

Calibrated with Adara calibration procedure EC_CPTCAL-2.3

Collective uncertainty of the measurement standards conforms to a test uncertainty ratio (TUR) of 3:1 for tip and sleeve measurement and 4:1 for pressure measurement with a confidence level k=2

ADARA

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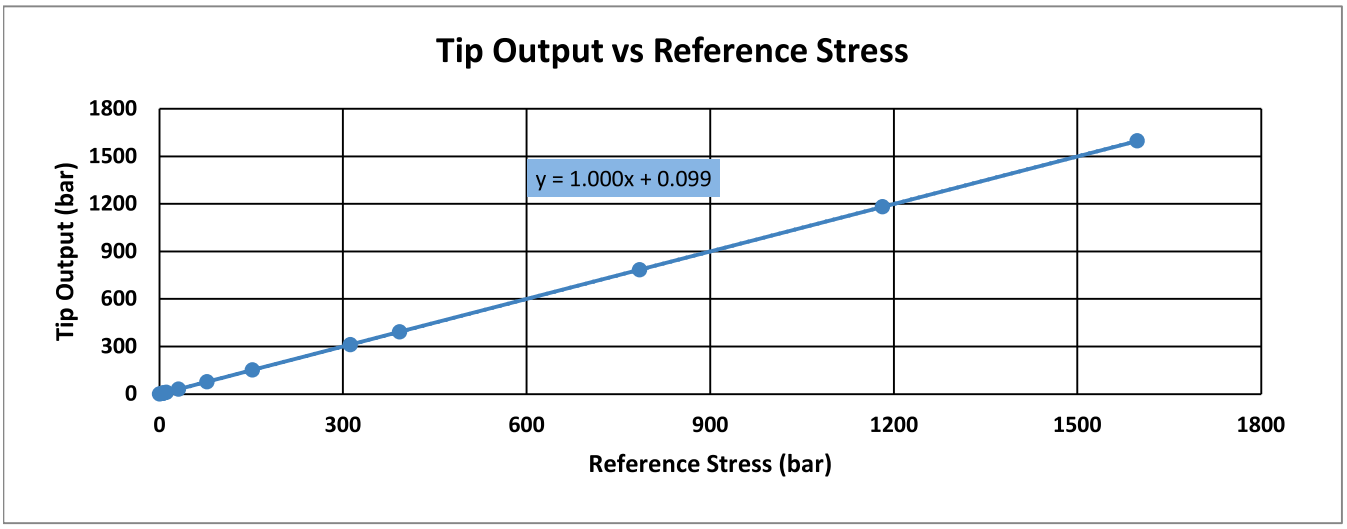
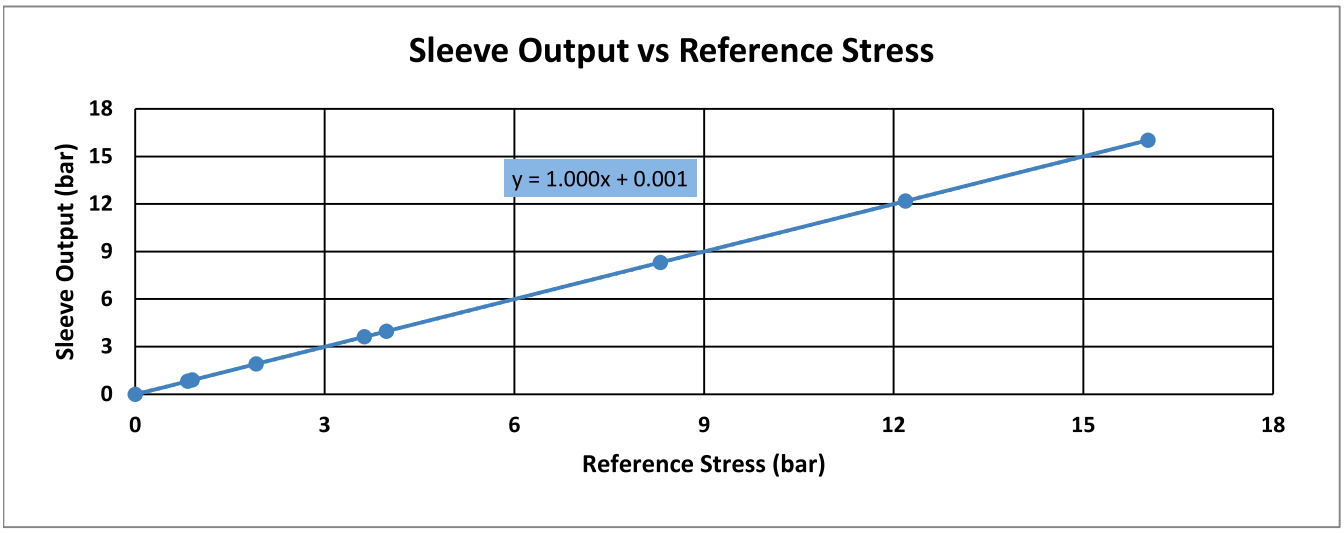
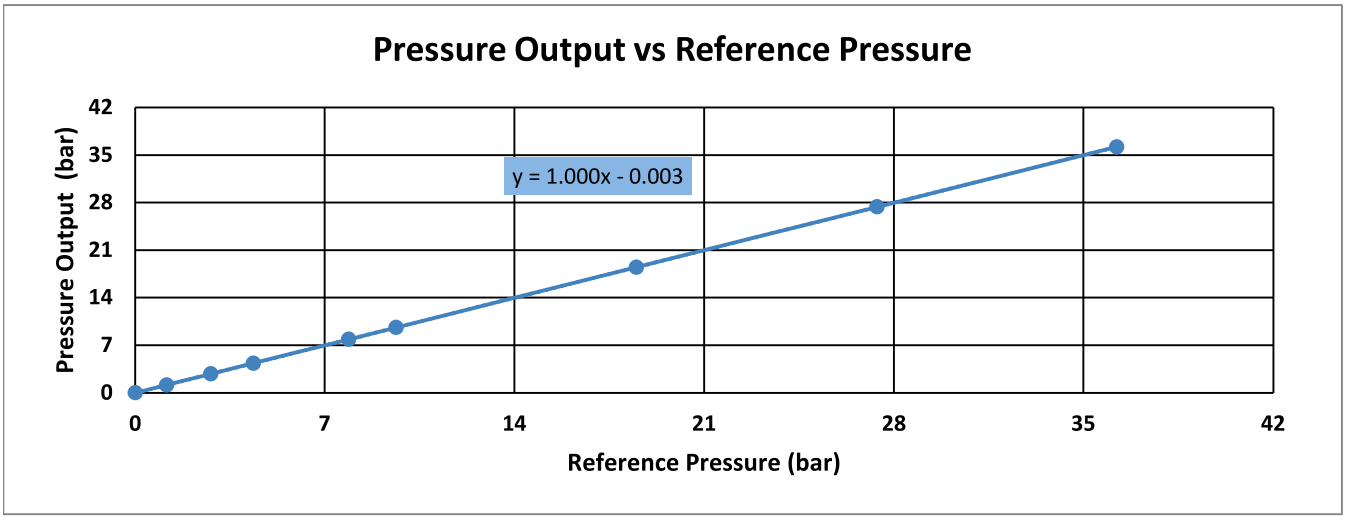
Cone Output vs Reference Stress/Pressure Plots







ADARA

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Calibration Results

Tip Calibration					
	As Found			As Left	
Max. Non Linearity	0.09%	PASS	Max. Non Linearity	0.05%	PASS
Calibration Error	0.16%	PASS	Calibration Error	0.12%	PASS

Sleeve Calibration					
	As Found			As Left	
Max. Non Linearity	0.05%	PASS	Max. Non Linearity	0.06%	PASS
Calibration Error	0.24%	PASS	Calibration Error	0.08%	PASS

Pressure Calibration					
	As Found			As Left	
Max. Non Linearity	0.04%	PASS	Max. Non Linearity	0.02%	PASS
Calibration Error	0.10%	PASS	Calibration Error	0.08%	PASS

X-Inclinometer Calibration					
	As Found			As Left	
Max. Non Linearity	N/A	N/A	Max. Non Linearity	-0.67%	PASS
Calibration Error	N/A	N/A	Calibration Error	1.33%	PASS

Y-Inclinometer Calibration					
	As Found			As Left	
Max. Non Linearity	N/A	N/A	Max. Non Linearity	-0.37%	PASS
Calibration Error	N/A	N/A	Calibration Error	0.75%	PASS

Seismic Calibration					
	As Found			As Left	
Trigger Delay Error	N/A	N/A	Trigger Delay Error	0.01%	PASS

Temperature Calibration			
Full Scale Error	0.06%	PASS	

Channel	Cold	Room	Hot	Units
Ref_Temp	2.1	24.1	42.8	˚C
Tip	-3.305	-0.259	2.395	bar
Sleeve	-0.035	-0.021	0.003	bar
Pressure	1.095	1.064	1.045	bar
Temperature	2.132	24.091	42.784	˚C

Tip Temperature Coefficient	0.140 bar/˚C	PASS
Sleeve Temperature Coefficient	0.001 bar/˚C	PASS
Pressure Temperature Coefficient	-0.001 bar/˚C	PASS

Adara Systems Ltd.
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Testing Equipment Details

Testing Machines	Model Number	Serial Number	Calibration Number	Due Date
Tip Load Cell	Precision	P-10289	101141	2025-07-03
Sleeve Load Cell	Precision	P-11313	101214	2025-10-21
Digital Loadcell Indicator	9840-200-1-T	88364	101098	2025-06-07
Fluke Reference Pressure Monitor	RPM4 A10Ms	3061	101258	2025-12-11
Tektronix Function Generator	AFG1022	1820013	101200	2025-09-30
Thermometer	THS-222-555	D23255834	101116	2025-06-27
Thermometer	THS-222-555	D23255829	101116	2025-06-27
Thermometer	THS-222-555	D20345575	101116	2025-06-27

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Adara Error Definitions

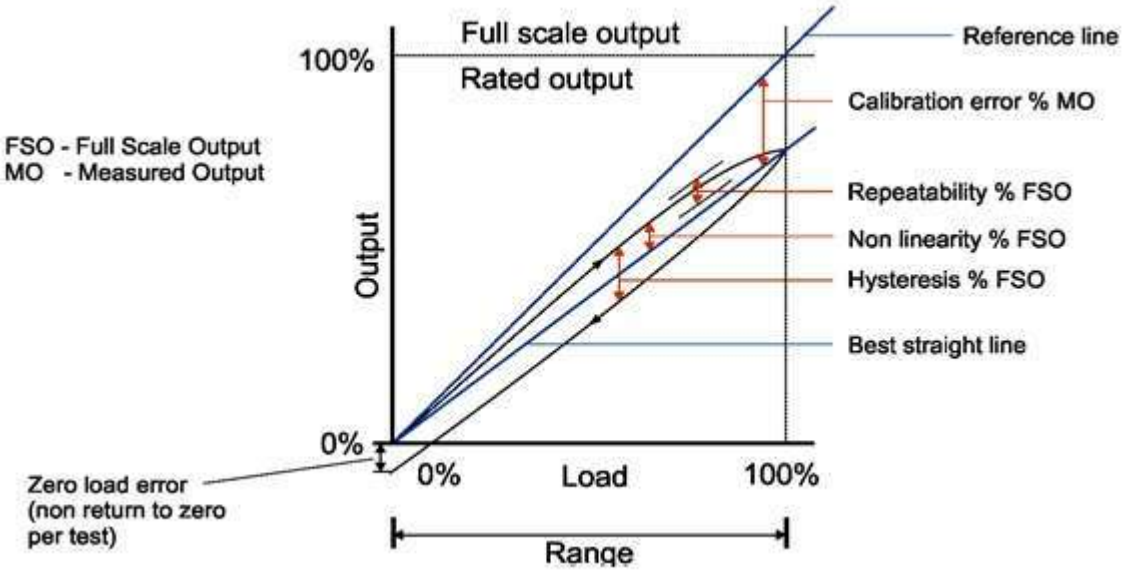

Figure 1: Definition of Calibration Terms for Load Cell and Transducers (Adapted from [1])

Actual Sensitivity	The slope of the best fit line through all data points starting at zero load.
Slope Error	The error in the best fit line compared to the ideal linear calibration in % . Slope Error = (Best Fit Slope - Ideal Slope) / Ideal Slope
Maximum Non Linearity	This value represents the maximum error (absolute value) relative to the best fit line considering each calibration point starting at loads greater than approximately 10% of FSO. The reported errors are a percent error of FSO. Adara's Pass/Fail criteria is 0.5% of FSO (ASTM is 0.5% of FSO at loads > 20% FSO).
Calibration Error	This value represents the maximum error (absolute value) in the recorded load value as compared to the actual load value for each calibration point for loads greater than approximately 10% of FSO. Adara's Pass/Fail criteria for the tip and sleeve is 0.5% of MO and 1.0% of MO for the pore pressure (ASTM for the tip and sleeve is 1.5% and 1.0% of MO respectively at loads greater than 20% of FSO)

Temperature Check Passing Criteria

Tip Temperature Coefficient	<0.200	bar/˚C
Sleeve Temperature Coefficient	<0.005	bar/˚C
Pressure Temperature Coefficient	<0.0196	bar/˚C

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ASTM D5778-20 Annex A Summary [1]

A1.4 Force Transducer Calibration Requirements

A1.4.1 states the following limits:

Non Linearity	Tip	≤ +0.5% of FSO
	Sleeve	≤ +1.0% of FSO
Calibration Error	Tip	≤ +1.5% of MO at loads > 20% FSO
	Sleeve	≤ +1.0% of MO at loads > 20% FSO

A1.5 Pressure Transducer Calibrations

A1.5.1 limits:

Non Linearity	Pore Pressure	≤ +1.0% of FSO
Calibration Error	Pore Pressure	not specified

ISO 22476 -1:2012 Summary [2]

Section 5.2 states the following allowable minimum accuracy

Class 1	Cone Resistance	35 kPa or 5%
	Sleeve Friction	5 kPa or 10%
	Pore Pressure	10 kPa or 2%
Class 2	Cone Resistance	100 kPa or 5%
	Sleeve Friction	15 kPa or 15%
	Pore Pressure	25 kPa or 3%

Note: ISO Compliance is based on low end calibration only.

References

[1] ASTM D5778-20. "Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils". ASTM, West Conshohocken, PA, USA.

[2] ISO 22476-1:2012. "Geotechnical investigation and testing - Field Testing - Part 1: Electrical cone and piezocone penetration test". ISO, Geneva, Switzerland.

ASTM D7400-19. "Standard Test Methods for Downhole Seismic Testing". ASTM, West Conshohocken, PA, USA.

Appendix F – Boring Logs and Well Completion Forms

Site S1

Geosyntec consultants
engineers | scientists | innovators
3043 Gold Canal Drive
Suite 100
Rancho Cordova, California 95670
Telephone: 916-637-8048
Fax: 916-550-9498

BORING NUMBER SB-2

CLIENT Butte County
PROJECT NAME Vina Basin
PROJECT NUMBER SFO154C
PROJECT LOCATION Violich Property - Chico, CA
DATE STARTED 11/4/25 **COMPLETED** 11/4/25
GROUND ELEVATION _____ **HOLE SIZE** 4x6 inches
DRILLING CONTRACTOR Cascade
GROUND WATER LEVELS:
DRILLING METHOD Sonic
AT TIME OF DRILLING ---
LOGGED BY Z. Laforet **CHECKED BY** J. Turner
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0		CL		(CL) 0'-8' **SANDY CLAY:** Dark Yellowish Brown (10YR 4/4); dry; no plasticity, firm clay; coarse sand. (0,30,70)
8.0				
10		ML		(ML) 8'-17' **SANDY SILT:** Brown (10YR 4/3); dry; no plasticity, soft silt; coarse to fine sand; trace clay. (0,30,70)
17.0				
20		CL		(CL) 17'-24' **SANDY CLAY:** Yellowish Brown (10YR 5/6); dry; low plasticity, firm clay; coarse to fine sand. (0,30,70) 17'-19' **No Recovery**
24.0		SW		(SW) 24'-27' **WELL GRADED SAND w/ GRAVEL:** Yellowish Brown (10YR 5/4); dry; well graded, round to subround, coarse to fine sand; coarse to fine sand; 1" gravel; clay. (20,70,10)
27.0		SW-SM		(SW-SM) 27'-47' **WELL GRADED GRAVEL w/ SAND & CLAY:** Dark Yellowish Brown (10YR 3/4); wet to saturated; well graded, round to subround, coarse to fine gravel/cobbles, half inch to 2-inch in size; coarse to fine sand; low plasticity clay; trace silt. (60,25,15) @27' **Saturated**
30				
40				
47.0		ML		(ML) 47'-50' **SILT:** Pale Brown (10YR 6/3); moist; low plasticity, firm to hard silt; clay; [60% Silt/ 40% Clay]. (0,0,100)
50				
50.0		CL		(CL) 50'-64' **CLAY:** Pale Brown (10YR 6/3); moist; low plasticity, firm to hard silt; clay; [40% Silt/60% Clay]. (0,0,100)
60				
64.0		CL		
65.0		SW		(CL) 64'-65' **SANDY CLAY:** Yellowish Brown (10YR 5/6); moist; low plasticity, firm to hard clay; coarse to fine sand. (0,25,75)
67.0				(SW) 65'-67' **WELL GRADED SAND:** Brown (10YR 4/3); moist; well graded, subangular to subround, coarse to fine sand; trace clay. (0,95,5)
70		ML		(ML) 67'-77' **SILT:** Pale Brown (10YR 6/3); moist; low plasticity, firm to hard silt; clay; [60% Silt/ 40% Clay]. (0,0,100)
77.0				Bottom of borehole at 77.0 feet.

GENERAL BH / TP / WELL - DATA TEMPLATE FOR GINT WELL.GDT - 4/15/26 09:48 - P:\GIS\GINT\PROJECTS\SFO154C_VIOLICH.GPJ

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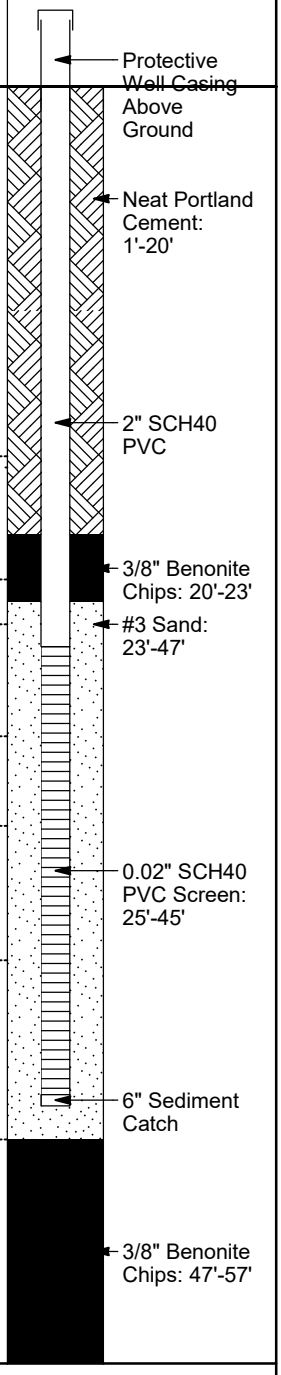
WELL NUMBER VP-MW01

CLIENT Butte County
PROJECT NAME Vina Basin
PROJECT NUMBER SFO154C
PROJECT LOCATION Violich Property - Chico, CA
DATE STARTED 11/3/25 **COMPLETED** 11/3/25
GROUND ELEVATION _____ **HOLE SIZE** 4x6 inches
DRILLING CONTRACTOR Cascade
GROUND WATER LEVELS:
DRILLING METHOD Sonic
AT TIME OF DRILLING ---
LOGGED BY Z. Laforet **CHECKED BY** J. Turner
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0		ML		(ML) 0'-16.5' **SILT w/ SAND:** Brown (10YR 4/3); dry; no plasticity, soft silt; coarse sand; trace clay. (0,15,85)
16.5		ML		(ML) 16.5'-17.5' **SANDY SILT:** Brown (10YR 4/3); dry; no plasticity, soft silt; coarse to medium sand; trace clay. (0,30,70)
17.0		SM		(SM) 17'-22' **SILTY SAND:** Brown (10YR 4/3); dry; well graded, subangular to subround, coarse to medium sand; non plasticity silt; trace clay. (0,60,40) 17'-19' **No Recovery**
22.0		SC		(SC) 22'-24' **CLAYEY SAND:** Yellowish Brown (10YR 5/4); dry; well graded, subangular to subround, medium to fine sand; low plasticity clay. (0,80,20)
24.0		GW-GM		(GW-GM) 24'-29' **WELL GRADED GRAVEL w/ SAND & SILT:** Dark Yellowish Brown (10YR 3/4); dry; well graded, round to subround, coarse to fine gravel/cobbles, half inch to 4-inch in size; coarse to fine sand; silt; trace clay. (75,15,10) @27' **Saturated**
29.0		SW-SM		(SW-SM) 29'-33' **WELL GRADED SAND w/ SILT:**Dark Yellowish Brown (10YR 3/4); saturated; well graded, subangular to subround, medium to fine sand; non plasticity silt; trace clay. (0,90,10)
33.0		GW-GM		(GW-GM) 33'-39' **WELL GRADED GRAVEL w/ SAND & SILT:** Dark Yellowish Brown (10YR 3/4); wet; well graded, round to subround, coarse to fine gravel/cobbles, half inch to 4-inch in size; coarse to fine sand; silt; trace clay. (75,15,10) @35' 2-inch wide round 1-inch Gravel lense
39.0		GW-GC		(GW-GC) 39'-47' **WELL GRADED GRAVEL w/ SAND & CLAY:** Dark Yellowish Brown (10YR 3/4); wet to saturated; well graded, round to subround, coarse to fine gravel/cobbles, half inch to 4-inch in size; coarse to fine sand; non to low plasticity clay; trace silt. (75,15,10)
47.0		ML		(ML) 47'-57' **SILT:** Pale Brown (10YR 6/3); moist; low plasticity, firm to hard silt; clay; [60% Silt/ 40% Clay]. (0, 0, 100)
57.0				Bottom of borehole at 57.0 feet.

WELL DIAGRAM



GENERAL BH / TP / WELL - DATA TEMPLATE FOR GINT WELL.GDT - 4/15/26 10:19 - P:\GIS\GINT\PROJECTS\SFO154C_VIOLICH.GPJ

Site S6

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BORING NUMBER SB-2

CLIENT Butte County
PROJECT NAME Vina Basin
PROJECT NUMBER SFO154C
PROJECT LOCATION Washington Property - Durham, CA
DATE STARTED 1/15/26 **COMPLETED** 1/15/26
GROUND ELEVATION _____ **HOLE SIZE** 4x6 inches
DRILLING CONTRACTOR Geocentric
GROUND WATER LEVELS:
DRILLING METHOD Sonic
AT TIME OF DRILLING ---
LOGGED BY J. Lewis **CHECKED BY** J. Turner
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0		SW		(SW) 0'-5' **WELL GRADED SAND w/ GRAVEL:** Dark Yellowish Brown (10YR 4/5); dry; well graded, angular to subangular, coarse to fine sand; round gravel. (15,80,5)
5.0		CL		(CL) 5'-10' **LEAN CLAY:** Dark Brown (10YR 3/3); moist; medium plasticity, soft clay. (0,5,95)
10		SW-SM		(SW-SM) 10'-15' **WELL GRADED SAND w/ GRAVEL & SILT:** Very Dark Gray (2.5Y 3/1); wet; well graded, angular to subangular, coarse to fine sand; round gravel & cobbles. (25,65,10)
15.0		GW-GC		(GW-GC) 15'-16.5' **WELL GRADED GRAVEL w/ SAND & CLAY:** Grayish Brown (2.5Y 5/2); wet; well graded, well rounded gravel & cobbles; coarse to fine sand; clay. (60,30,10)
16.5		ML		(ML) 16.5'-19.5' **SILT:** Brown (10YR 5/3); moist; medium plasticity, firm silt. (0,0,100)
19.5		SP		(SP) 19.5'-21.5' **POORLY GRADED SAND:** Gray (2.5Y 5/1); moist; poorly graded, subangular, coarse sand; trace gravel & fines. (10,85,5)
20		CL		(CL) 21.5'-22' **SANDY LEAN CLAY:** Brown (10YR 5/3); dry; low plasticity, soft clay. (0,40,60)
21.5		SP-SC		(SP-SC) 22'-25' **POORLY GRADED SAND w/ CLAY:** Light Olive Brown (2.5YR 5/3); moist; poorly graded, subangular, medium to fine sand. (0,90,10)
22.0		ML		(ML) 25'-30' **SILT:** Brown (10YR 5/3); moist; low plasticity, soft silt. (0,0,100)
25.0		CH		(CH) 30'-31.5' **FAT CLAY:** Dark Greyish Brown (10YR 4/2); dry; high plasticity, firm clay. (0,0,100)
30		ML		(ML) 31.5'-40' **SILT:** Brown (10YR 5/3); moist; low plasticity, soft silt. (0,0,100)
30.0		CH		(CH) 40'-48' **SANDY FAT CLAY:** Brown (10YR 5/3); dry; high plasticity, firm clay. (0,25,75)
31.5		SW		(SW) 48'-60' **WELL GRADED SAND w/ GRAVEL:** Gray (2.5Y 5/1); moist; well graded, subangular to subround, coarse to fine sand; rounded cobbles and gravel; trace silt. (25,70,5)
40				
40.0				
48.0				
50				
60				
60.0				Bottom of borehole at 60.0 feet.

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BORING NUMBER SB-3

CLIENT Butte County
PROJECT NAME Vina Basin
PROJECT NUMBER SFO154C
PROJECT LOCATION Washington Property - Durham, CA
DATE STARTED 1/13/26 **COMPLETED** 1/14/26
GROUND ELEVATION _____ **HOLE SIZE** 4x6 inches
DRILLING CONTRACTOR Geocentric
GROUND WATER LEVELS:
DRILLING METHOD Sonic
AT TIME OF DRILLING ---
LOGGED BY Z. Laforet **CHECKED BY** J. Turner
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		SC		(SC) 0'-5' **CLAYEY SAND:** Dark Yellowish Brown (10YR 4/4); moist; poorly graded, subangular to subround, medium to fine sand; medium plasticity clay. (0,60,40)
5.0				
		SW		(SW) 5'-9' **WELL GRADED SAND w/ GRAVEL:** Dark Yellowish Brown (10YR 4/4); wet; well graded, subangular to subround, coarse to fine sand; 1" to 2" round gravel. (40,60,0)
9.0				
10		SW-SC		(SW-SC) 9'-13' **WELL GRADED SAND w/ GRAVEL & CLAY:** Dark Yellowish Brown (10YR 4/4); moist; well graded, subangular to subround, coarse to fine sand; 1" to 2" round gravel; low plasticity clay. (30,60,30)
13.0				
		CL		(CL) 13'-15' **GRAVELLY LEAN CLAY:** Dark Brown (10YR 3/3); moist; medium plasticity, firm clay; 2" subround gravel. (25,0,75)
15.0				
		SM		(SM) 15'-30' **SILTY SAND:** Brown (10YR 4/3); dry; poorly graded, subangular to subround, medium to fine sand; silt; trace clay. (0,60,40)
20				
30				
30.0				
		SP		(SP) 30'-35' **POORLY GRADED SAND:** Very Dark Grayish Brown (10YR 3/2); dry; poorly graded, angular to angular, coarse sand; trace 1" to 2" round gravel; trace fines. (5,90,5)
35.0				
		SM		(SM) 35'-40' **SILTY SAND:** Brown (10YR 4/3); dry; poorly graded, subangular to subround, medium to fine sand; silt; trace clay. (0,60,40)
40				
40.0				
		SP		(SP) 40'-45' **POORLY GRADED SAND:** Very Dark Grayish Brown (10YR 3/2); dry; poorly graded, angular to angular, fine sand; trace fines. (0,95,5)
45.0				
		ML		(ML) 45'-50' **SILT:** Grayish Brown (10YR 5/2); dry; soft silt; hard cemented sections throughout. (0,0,100)
50				
50.0				
		SP		(SP) 50'-55' **POORLY GRADED SAND:** Grayish Brown (10YR 5/2); moist; poorly graded, subangular to subround, fine sand. (0,100,0)
55.0				
		CL		(CL) 55'-63' **LEAN CLAY:** Grayish Brown (10YR 5/2); moist; low pasticity, soft caly; cemented sections.
60				
63.0				

Bottom of borehole at 63.0 feet.

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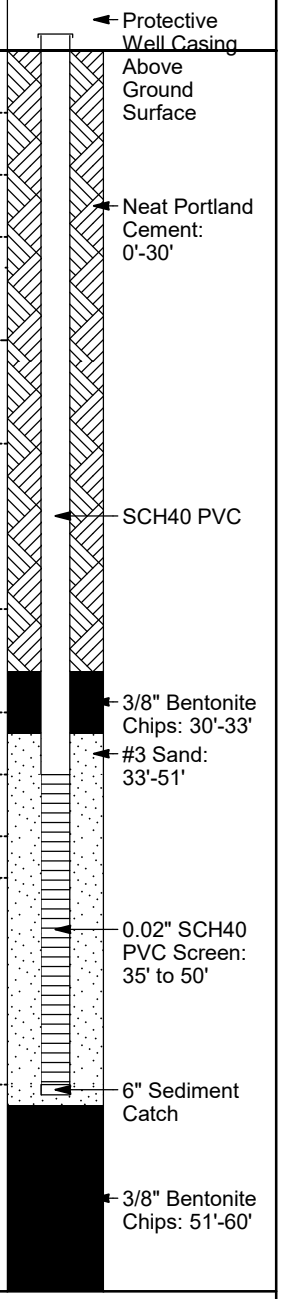
WELL NUMBER WP-MW01

CLIENT Butte County
PROJECT NAME Vina Basin
PROJECT NUMBER SFO154C
PROJECT LOCATION Washington Property - Durham, CA
DATE STARTED 1/14/26 **COMPLETED** 1/14/26
GROUND ELEVATION _____ **HOLE SIZE** 4x6 inches
DRILLING CONTRACTOR Geocentric
GROUND WATER LEVELS:
DRILLING METHOD Sonic
AT TIME OF DRILLING ---
LOGGED BY Z. Laforet **CHECKED BY** J. Turner
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		CL		(CL) 0'-3' **SANDY CLAY:** Yellowish Brown (10YR 5/4); moist; low plasticity, soft clay; well graded, subangular to subround, coarse to fine sand. (0,40,50)
3.0				
		CL		(CL) 3'-6' **LEAN CLAY:** Dark Brown (10YR 3/3); moist; medium plasticity, firm clay; trace gravel and coarse sand. (5,5,95)
6.0				
		ML		(ML) 6'-9' **SANDY SILT:** Dark Yellowish Brown (10YR 4/4); moist; low plasticity, firm clay; trace gravel and coarse sand. (5,5,95)
9.0				
10		SM		(SM) 9'-10.5' **SILTY SAND:** Dark Yellowish Brown (10YR 4/4); wet; well graded, subangular to subround, medum to fine sand; silt. (0,60,40)
10.5				
		GW		(GW) 10.5'-14' **WELL GRADED GRAVEL w/ SAND:** Dark Yellowish Brown (10YR 3/4); saturated; well graded, round, 1/2-inch to 2-inch gravel; coarse to fine sand. (70,30,0)
14.0				
		GW-GC		(GW-GC) 14'-19' **WELL GRADED GRAVEL w/ SAND & CLAY:** Dark Yellowish Brown (10YR 3/4); moist; well graded, round, 1/2-inch to 3-inch gravel; low plastic clay; coarse to fine sand; cobbles. (60,10,30)
19.0				
20		SW-SM		(SW-SM) 19'-27' **WELL GRADED SAND w/ SILT:** Yellowish Brown (10YR 5/4); moist to wet; well graded, angular to subangular, coarse to fine sand; silt. (0,90,10)
27.0				
30		CL		(CL) 27'-32' **LEAN CLAY w/ SAND:** Dark Yellowish Brown (10YR 4/4); moist grades to dry; medium plasticity, firm clay; trace gravel and coarse sand. (5,5,95)
32.0				
		CL		(CL) 32'-35' **LEAN CLAY:** Light Gray (10YR 7/2); dry; low plasticity, very hard clay. (0,0,100)
35.0				
		GW		(GW) 35'-38' **WELL GRADED GRAVEL w/ SAND:** Dark Yellowish Brown (10YR 4/4); saturated; well graded, round, 1/4-inch to 4-inch gravel; coarse to fine sand. (80,20,0)
38.0				
40		SP		(SP) 38'-40' **POORLY GRADED SAND:** Dark Yellowish Brown (10YR 4/4); dry; poorly graded, angular to subangular, medium sand; section with strong cementation. (0,100,0)
40.0				
		ML		(ML) 40'-50' **SILT:** Dark Gray (10YR 4/1); very hard, no plasticity silt; cementation section increasing with depth. (0,0,100)
50.0				
50		CL		(CL) 50'-60' **LEAN CLAY:** Dark Gray (10YR 4/1); dry; low plasticity, hard clay; silt. (0,0,100)
60				
60.0				

Bottom of borehole at 60.0 feet.



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Site N4

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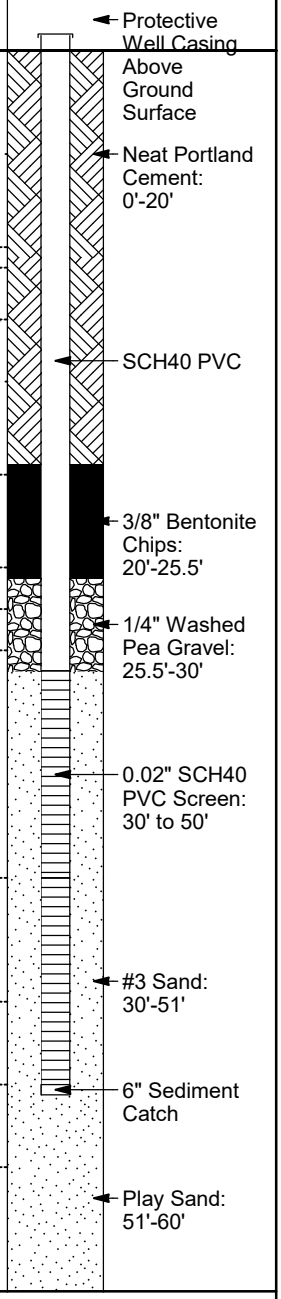
WELL NUMBER RP-MW01

CLIENT Butte County
PROJECT NAME Vina Basin
PROJECT NUMBER SFO154C
PROJECT LOCATION Rice Property - Chico, CA
DATE STARTED 1/16/26 **COMPLETED** 1/16/26
GROUND ELEVATION _____ **HOLE SIZE** 4x6 inches
DRILLING CONTRACTOR Geocentric
GROUND WATER LEVELS:
DRILLING METHOD Sonic
AT TIME OF DRILLING ---
LOGGED BY J. Lewis **CHECKED BY** J. Turner
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0		ML		(ML) 0'-5' **SILT:** Dark Brown (10YR 3/3); dry; low plasticity, soft silt; clay; trace sand. (0,5,95)
5.0				@4.5' **Lean Clay** lense
		ML		(ML) 5'-9.5' **SILT w/ SAND:** Dark Yellowish Brown (10YR 4/5); moist; no plasticity, soft silt; fine sand. (0,15,85)
9.5				
10		SP		(SP) 9.5'-10.5' **POORLY GRADED SAND:** Very Dark Gray (2.5YR 3/1); moist; poorly graded, subangular to subround, medium sand; well rounded cobbles. (5,90,5)
10.5		SP-SM		(SP-SM) 10.5'-13.5' **POORLY GRADED SAND w/ SILT & GRAVEL:** Dark Yellowish Brown (10YR 4/4); moist; poorly graded, round, fine sand; well rounded cobbles and gravel. (15,75,10)
13.0		SP		(SP) 13'-16' **POORLY GRADED SAND:** Very Dark Gray (2.5YR 3/1); moist; poorly graded, subangular to subround, medium sand; well rounded cobbles. (5,90,5)
16.0		ML		(ML) 16'-20.5' **SILT w/ SAND:** Dark Yellowish Brown (10YR 4/5); moist; no plasticity, soft silt; fine sand. (0,15,85)
20				
20.5		ML		(ML) 20.5'-25' **SILT:** Yellow (2.5Y 8/6); dry; medium plasticity, firm silt. (0,0,100)
25.0		SP		(SP) 25'-27' **POORLY GRADED SAND:** Yellow (2.5Y 8/6); saturated; poorly graded, subangular to subround, fine sand; trace silt. (0,95,5)
27.0		ML		(ML) 27'-29' **SILT:** Yellow (2.5Y 8/6); dry; medium plasticity, firm silt. (0,0,100)
29.0				
30		CL		(CL) 29'-40' **LEAN CLAY:** Yellow (2.5Y 8/6); dry; medium plasticity, firm clay.
40.0		ML		(ML) 40'-46' **SANDY SILT:** Yellow (2.5Y 8/6); moist; no plasticity, firm to soft silt; fine sand; clay. (0,15,85)
46.0		SW		(SW) 46'-50' **WELL GRADED SAND:** Dark Olive Brown (2.5Y 5/3); wet to saturated; well graded, subangular to subround, coarse to fine sand; trace silt. (0,95,5)
50				
50.0		SW		(SW) 50'-54' **WELL GRADED SAND w/ GRAVEL:** Dark Olive Brown (2.5Y 5/3); wet to saturated; well graded, subangular to subround, coarse to fine sand; subround gravel; trace silt. (15,80,5)
54.0		ML		(ML) 54'-60' **SILT w/ SAND:** Olive Yellow (2.5Y 6/6); moist; no plasticity, firm to soft silt; fine sand. (0,10,90)
60				
60.0				Bottom of borehole at 60.0 feet.



GENERAL BH / TP / WELL - DATA TEMPLATE FOR GINT WELL.GDT - 4/15/26 11:44 - P:\GIS\GINT\PROJECTS\SFO154C_RICE.GPJ

Site N5

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BORING NUMBER SB-1

CLIENT Butte County
PROJECT NAME Vina Basin
PROJECT NUMBER SFO154C
PROJECT LOCATION Nicolaus Property - Chico, CA
DATE STARTED 4/7/16 **COMPLETED** 4/7/26
GROUND ELEVATION _____ **HOLE SIZE** 4x6 inches
DRILLING CONTRACTOR Penecore Drilling
GROUND WATER LEVELS:
DRILLING METHOD Sonic
AT TIME OF DRILLING ---
LOGGED BY Z. Laforet **CHECKED BY** J. Turner
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0		ML		(ML) 0'-6' **SILT w/ SAND:** Dark Reddish Brown (5YR 3/4); moist; non plastic, soft silt; fine sand; clay. (0,10,90)
6.0		ML		(ML) 6'-11' **SANDY SILT:** Reddish Brown (5YR 5/4); moist; non plastic, soft silt; medium to fine sand. (0,30,70)
11.0		SW		(SW) 11'-15' **WELL GRADED SAND w/ GRAVEL:** Dark Reddish Brown (5YR 3/4); moist; wet to saturated; well graded, subangular to subround, coarse to fine sand; 1/4" to 3" round gravel; silt; cobbles. (30,60,10)
15.0				Bottom of borehole at 15.0 feet.

GENERAL BH / TP / WELL - DATA TEMPLATE FOR GINT WELL.GDT - 4/15/26 14:24 - P:\GIS\GINT\PROJECTS\SFO154C-NICOLAS.GPJ

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BORING NUMBER SB-4

CLIENT Butte County
PROJECT NAME Vina Basin
PROJECT NUMBER SFO154C
PROJECT LOCATION Nicolaus Property - Chico, CA
DATE STARTED 4/6/26 **COMPLETED** 4/6/26
GROUND ELEVATION _____ **HOLE SIZE** 4x6 inches
DRILLING CONTRACTOR Penecore Drilling
GROUND WATER LEVELS:
DRILLING METHOD Sonic
AT TIME OF DRILLING ---
LOGGED BY Z. Laforet **CHECKED BY** J. Turner
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0		ML		(ML) 0'-5' **SILT w/ SAND:** Dark Reddish Brown (5YR 3/4); moist; no plasticty, soft silt; fine sand. (0,10,90)
5.0		SP		(SP) 5'-11' **POORLY GRADED SAND w/ GRAVEL:** Dark Reddish Brown (5YR 3/4); moist; poorly graded, subangular to subround, medium to fine sand; 1/4"-1/2" round gravel; trace silt. (10,85,5)
11.0		SP-SM		(SP-SM) 11'-16' **SILTY SAND w/ GRAVEL:** Dark Reddish Brown (5YR 3/4); moist; poorly graded, subangular to subround, medium to fine sand; 1/4"-1/2" round gravel; trace silt. (15,70,15)
16.0		ML		(ML) 16'-20' **SILT:** Reddish Brown (5YR 4/4); dry; no plasticity, firm to hard silt. (0,0,100)
20.0				Bottom of borehole at 20.0 feet.

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BORING NUMBER SB-2

CLIENT Butte County
PROJECT NAME Vina Basin
PROJECT NUMBER SFO154C
PROJECT LOCATION Nicolaus Property - Chico, CA
DATE STARTED 4/7/16 **COMPLETED** 4/7/16
GROUND ELEVATION _____ **HOLE SIZE** 4x6 inches
DRILLING CONTRACTOR Penecore Drilling
GROUND WATER LEVELS:
DRILLING METHOD Sonic
AT TIME OF DRILLING ---
LOGGED BY Z. Laforet **CHECKED BY** J. Turner
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		CL		(CL) 0'-4' **CLAY w/ SAND:** Dark Reddish Brown (5YR 3/4); moist; low plasticity, soft clay; fine sand; silt. (0,10,90)
4.0				
5		SW		(SW) 4'-17.5'' **WELL GRADED SAND w/ GRAVEL & SILt:** Dark Reddish Brown (5YR 3/4); moist; well graded, subangular to subround, coarse to fine sand; 1/4"-2" subround to round gravel; silt. (40,50,10)
10				@10' **Saturated**
15				
17.5				
20		ML		(ML) 17.5'-20' **SILT w/ SAND:** Reddish Brown (5YR 5/4); moist to dry; no plasticity, hard silt; subangular to subround, medium sand. (0,10,90)
20.0				
25		CL		(CL) 20'-26' **GRAVELLY CLAY w/ SAND:** Dark Reddish Brown (5YR 3/4); moist; low plasticity; firm clay; 1/4"-1" round gravel; coarse to fine sand. (30,30,40)
26.0				
30		ML		(ML) 26'-30' **SANDY SILT:** Yellowish Red (5YR 4/6); dry; no plasticity, firm silt; poorly graded, subangular to subround, fine sand. (0,40,60)
30.0				
35		CL		(CL) 30'-40' **LEAN CLAY:** Light Gray (5YR 7/1); moist to dry; hard to firm, low plasticity clay; silt. (0,0,100)
40				
40.0				Bottom of borehole at 40.0 feet.

GENERAL BH / TP / WELL - DATA TEMPLATE FOR GINT WELL.GDT - 4/15/26 14:26 - P:\GIS\GINT\PROJECTS\SFO154C-NICOLAS.GPJ

Geosyntec consultants
engineers | scientists | innovators
3043 Gold Canal Drive
Suite 100
Rancho Cordova, California 95670
Telephone: 916-637-8048
Fax: 916-550-9498

BORING NUMBER SB-3

CLIENT Butte County
PROJECT NAME Vina Basin
PROJECT NUMBER SFO154C
PROJECT LOCATION Nicolaus Property - Chico, CA
DATE STARTED 4/7/16 **COMPLETED** 4/7/16
GROUND ELEVATION _____ **HOLE SIZE** 4x6 inches
DRILLING CONTRACTOR Penecore Drilling
GROUND WATER LEVELS:
DRILLING METHOD Sonic
AT TIME OF DRILLING ---
LOGGED BY Z. Laforet **CHECKED BY** J. Turner
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
5		CL		(CL) 0'-9' **LEAN CLAY w/ SAND:** Dark Reddish Brown (5YR 3/3); moist; low plasticity, firm to soft clay; fine sand; silt. (0,10,90)
9.0				
10		SM		(SM) 9'-14' **SILTY SAND:** Dark Reddish Brown (5YR 3/3); moist; poorly graded, subangular to subround, medium to fine sand; no plasticity silt. (0,70,30) @10.5' **Saturated**
14.0				
15		SW		(SW) 14'-16' **WELL GRADED SAND w/ GRAVEL & SILT:** Dark Reddish Brown (5YR 3/3); saturated; well graded, subangular to subround, coarse to fine sand; 1/4"-2" round gravel; silt. (30,50,20)
16.0				
20		GC		(GC) 16'-21' **CLAYEY GRAVEL w/ SAND:** Dark Reddish Brown (5YR 3/3); moist; 1/2"-3" round gravel; well graded, subangular to subround, coarse to fine sand; clay. (50,30,20)
21.0				
25		CL		(CL) 21'-29' **LEAN CLAY:** Reddish Brown (5YR 4/4); moist; medium to low plasticity, firm clay; silt; trace 1/4"-1/2" angular cemented pieces. (5,0,95)
29.0				
30		GW		(GW) 29'-30' **WELL GRADED GRAVEL w/ SAND:** Dark Reddish Brown (5YR 3/3); moist: well graded, subround to round 1"-2" gravel; subangular to subround, coarse to fine sand. (80,20,0)
30.0				(CL) 30'-40' **LEAN CLAY:** Light Gray (5YR 7/1); moist; hard to low plasticity clay. (0,0,100)
35		CL		
40				
40.0				Bottom of borehole at 40.0 feet.

GENERAL BH / TP / WELL - DATA TEMPLATE FOR GINT WELL.GDT - 4/15/26 14:26 - P:\GIS\GINT\PROJECTS\SFO154C-NICOLAS.GPJ

Site N6

Geosyntec consultants
engineers | scientists | innovators
3043 Gold Canal Drive
Suite 100
Rancho Cordova, California 95670
Telephone: 916-637-8048
Fax: 916-550-9498

BORING NUMBER SB-1

CLIENT Butte County
PROJECT NAME Vina Basin
PROJECT NUMBER SFO154C
PROJECT LOCATION Riolo Property - Chico, CA
DATE STARTED 4/9/26 **COMPLETED** 4/9/26
GROUND ELEVATION _____ **HOLE SIZE** 4x6 inches
DRILLING CONTRACTOR Penecore
GROUND WATER LEVELS:
DRILLING METHOD Sonic
AT TIME OF DRILLING ---
LOGGED BY Z. Laforet **CHECKED BY** J. Turner
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0		ML		(ML) 0'-1.5' **SILT:** Dark Reddish Brown (5YR 3/3); no plasticity, soft silt. (0,0,100)
1.5				
5		GW-GC		(GW-GC) 1.5'-10' **WELL GRADED GRAVEL w/ CLAY & SAND:** Dark Reddish Brown (5YR 3/3); well graded, 1"-4" round gravel; low plasticity clay; coarse to fine sand; cobbles. (60,20,20) @5' Wet
10				(ML) 10'-30' **SANDY SILT:** Reddish Brown (5YR 5/4); no plasticity, soft silf; moist to dry; well graded, subangular to subround, coarse to fine sand. (0,40,60)
10.0				
15		ML		
20				
25				
30				
30.0				Bottom of borehole at 30.0 feet.

GENERAL BH / TP / WELL - DATA TEMPLATE FOR GINT WELL.GDT - 4/15/26 17:15 - P:\GIS\GINT\PROJECTS\SFO154C_RIOLO.GPJ

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engineers | scientists | innovators
3043 Gold Canal Drive
Suite 100
Rancho Cordova, California 95670
Telephone: 916-637-8048
Fax: 916-550-9498

BORING NUMBER SB-2

CLIENT Butte County
PROJECT NAME Vina Basin
PROJECT NUMBER SFO154C
PROJECT LOCATION Riolo Property - Chico, CA
DATE STARTED 4/9/26 **COMPLETED** 4/9/26
GROUND ELEVATION _____ **HOLE SIZE** 4x6 inches
DRILLING CONTRACTOR Penecore
GROUND WATER LEVELS:
DRILLING METHOD Sonic
AT TIME OF DRILLING ---
LOGGED BY Z. Laforet **CHECKED BY** J. Turner
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0		MH		(MH) 0'-0.5' **ORGANIC SILT(MH):** Black (5YR 2.5/1); dry; no plasticity silt. (0,0,100)
0.5				(GW-GC) 0.5'-10' No Recovery
5		GW-GC		
10				(GW-GC) 10'-15' **CLAYEY GRAVEL:** Dark Reddish Brown (5YR 3/3); wet; well graded, 1/4"-2" round to subround gravel; subangular to subround, coarse to fine sand; low plasticity clay. (60,10,30)
10.0		GW-GC		
15				(CL) 15'-25' **SANDY CLAY:** Reddish Brown (5YR 5/4); wet; low plasticity, firm to soft clay; well graded, subangular to subround, coarse to fine sand. (0,40,60)
15.0		CL		
20				
25				(SW-SM) 25'-30' **WELL GRADED SAND w/ SILT:** Reddish Brown (5YR 5/4); wet; well graded, subangular to subround, coarse to fine sand; silt; partial cementation. (0,90,10)
25.0		SW-SM		
30				(SM) 30'-40' **SILTY SAND:** Reddish Brown (5YR 5/4); wet; poorly graded, subangular to subround, medium to fine sand; no plasticity silt. (0,60,40)
30.0		SM		
35				
40				
40.0				Bottom of borehole at 40.0 feet.

GENERAL BH / TP / WELL - DATA TEMPLATE FOR GINT WELL.GDT - 4/15/26 17:15 - P:\GIS\GINT\PROJECTS\SFO154C_RIOLO.GPJ

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Rancho Cordova, California 95670
Telephone: 916-637-8048
Fax: 916-550-9498

BORING NUMBER SB-3

CLIENT Butte County
PROJECT NAME Vina Basin
PROJECT NUMBER SFO154C
PROJECT LOCATION Riolo Property - Chico, CA
DATE STARTED 4/8/26 **COMPLETED** 4/8/26
GROUND ELEVATION _____ **HOLE SIZE** 4x6 inches
DRILLING CONTRACTOR Penecore
GROUND WATER LEVELS:
DRILLING METHOD Sonic
AT TIME OF DRILLING ---
LOGGED BY Z. Laforet **CHECKED BY** J. Turner
AT END OF DRILLING ---
NOTES _____
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0		ML		(ML) 0'-3' **GRAVELLY SILT:** Reddish Brown (5YR 4/4); dry; no plasticity, soft silt; 1/4"-2" round gravel. (30,20,50)
3.0		GW		(GW) 3'-5' **WELL GRADED GRAVEL w/ SAND:** Dark Reddish Brown (5YR 3/3); dry; well graded, round 1/4"-4" gravel; round cobbles; subangular to subround, coarse to fine sand; trace fines. (70,25,5)
5.0		GW-GC		(GW-GC) 5'-10' **WELL GRADED GRAVEL w/ SAND & CLAY:** Dark Reddish Brown (5YR 3/3); dry; well graded, round 1/4"-4" gravel; round cobbles; subangular to subround, coarse to fine sand; low plasticity clay. (80,10,10)
10				
10.0		ML		(ML) 10'-13.5' **SANDY SILT:** Reddish Brown (5YR 5/4); wet; no plasticity, soft silt; well graded, subangular to subround, coarse to fine sand. (0,30,70)
13.5		GC		(GC) 13.5'-18' **CLAYEY GRAVEL w/ SAND:** Dark Reddish Brown (5YR 3/3); wet; well graded, 1/4"-2" round to subround gravel; subangular to subround, coarse to fine sand; low plasticity clay. (60,10,30)
18.0				
20		ML		(ML) 18'-31' **SANDY SILT:** Reddish Brown (5YR 5/4); wet; no plasticity, soft silt; well graded, subangular to subround, coarse to fine sand. (0,30,70)
30				
31.0		SW-SM		(SW-SM) 31'-34.5' **WELL GRADED SAND w/ GRAVEL & SILT:** Reddish Brown (5YR 4/3); wet; well graded, subangular to subround, coarse to fine sand; 1/4"-1.5" round gravel; silt. (35,50,15)
34.5		CL		(CL) 34.5'-36' **LEAN CLAY:** Dark Reddish Brown (5YR 3/3); wet; low plasticity, firm clay; silt. (0,0,100)
36.0		GC		(GC) 36'-50' **CLAYEY GRAVEL w/ SAND:** Dark Reddish Brown (5YR 3/3); wet; well graded, 1/4"-3" round gravel; low plasticity, firm clay; silt; coarse sand. (60,10,30)
40				
50				
50.0		CH		(CH) 50'-60' **FAT CLAY w/ SAND:** Reddish Brown (5YR 5/4); wet (no visible water); high plasticity, soft clay; coarse sand; moisture content > plastic limit. (0,10,90)
60				
60.0		SC		(SC) 60'-70' **CLAYEY SAND:** Reddish Brown (5YR 5/4); wet; well graded, subangular to subround, coarse to fine sand; low plasticity clay; moisture content > plastic limit. (0,20,80)
70				
70.0				Bottom of borehole at 70.0 feet.

GENERAL BH / TP / WELL - DATA TEMPLATE FOR GINT WELL.GDT - 4/15/26 17:18 - P:\GIS\GINT\PROJECTS\SFO154C_RIOLO.GPJ

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engineers | scientists | innovators
3043 Gold Canal Drive
Suite 100
Rancho Cordova, California 95670
Telephone: 916-637-8048
Fax: 916-550-9498

BORING NUMBER SB-4

CLIENT Butte County
PROJECT NAME Vina Basin
PROJECT NUMBER SFO154C
PROJECT LOCATION Riolo Property - Chico, CA
DATE STARTED 4/9/26 **COMPLETED** 4/9/26
GROUND ELEVATION _____ **HOLE SIZE** 4x6 inches
DRILLING CONTRACTOR Penecore
GROUND WATER LEVELS:
DRILLING METHOD Sonic
AT TIME OF DRILLING ---
LOGGED BY Z. Laforet **CHECKED BY** J. Turner
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0		ML		(ML) 0'-4' **GRAVELLY SILT:** Reddish Brown (5YR 4/4); dry; no plasticity, soft silt; 1/4"-2" round gravel. (30,20,50)
4.0		GW		(GW) 4'-9' **WELL GRADED GRAVEL w/ SAND:** Dark Reddish Brown (5YR 3/3); wet; well graded, round 1/4"-4" gravel; round cobbles; subangular to subround, coarse to fine sand. (60,40,0)
9.0		GW-GC		(GW-GC) 9'-14' **CLAYEY GRAVEL:** Dark Reddish Brown (5YR 3/3); wet; well graded, 1/4"-2" round to subround gravel; subangular to subround, coarse to fine sand; low plasticity clay. (60,10,30)
14.0		SM		(SM) 14'-26' **SILTY SAND:** Reddish Brown (5YR 5/4); wet; well graded, subangular to subround, coarse to fine sand; no plasticity, soft silt; . (0,60,40)
26.0		GM		(GM) 26'-30' **SILTY GRAVEL w/ SAND:** Dark Reddish Brown (5YR 3/3); wet; well graded, 1/4"-3" round gravel; low plasticity, silt; coarse sand. (60,15,25)
30.0		GC		(GC) 30'-50' **CLAYEY GRAVEL:** Light Reddish Brown (5YR 6/4); wet; well graded, 1/4"-4" round gravel; medium plasticity clay. (75,0,25)
50.0		CH		(CH) 50'-60' **SANDY CLAY:** Reddish Brown (5YR 5/4); wet; high plasticity, firm clay; poorly graded, angular, coarse sand; moisture content > plastic limit. (0,30,70)
60.0				Bottom of borehole at 60.0 feet.

GENERAL BH / TP / WELL - DATA TEMPLATE FOR GINT WELL.GDT - 4/15/26 17:18 - P:\GIS\GINT\PROJECTS\SFO154C_RIOLO.GPJ

DWR Well Completion Forms

State of California

Well Completion Report

Form DWR 188 Auto-Completed

WCR2025-011984

Owner's Well Number: MW-1 **Date Work Began:** 11/03/2025 **Date Work Ended:** 11/04/2025

Local Permit Agency: Butte County Public Health **County:** Butte

Secondary Permit Agency: **Permit Number:** EH-MWSB-25-000855 **Permit Date:** 10/23/2025

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: Zack Laforet

Business Name: Geosyntec Consultants Inc

Address: 3043 Gold Canal Rd

City: Rancho Cordova **State:** California **Zip:** 95670

Planned Use and Activity

Activity: New Production or Monitoring Well

Planned Use: Monitoring

Well Location

Address: 2001 DAYTON RD

City: CHICO **Zip:** 95928

APN: 039-090-081-000

Township: 21N **Range:** 01E

Section: 03 **BM:** Mount Diablo

Latitude: 39 Deg. 42 Min. 3.402 Sec. N

Dec. Lat. : 39.700945

Location Accuracy: 20 Ft

Location Method:

Longitude: -121 Deg. 51 Min. 22.3308 Sec. W

Dec. Long. : -121.843797

Horizontal Datum:

Ground Surface Elevation:

Elevation Accuracy:

Elevation Method:

Vertical Datum:

Borehole Information

Orientation: Vertical **# of casings (Specify):** 1

Drilling Method: Sonic **Drilling Fluid:** None

Total Depth of Boring: 57 (feet)

Total Depth of Completed Well: 47 (feet)

Water Level and Yield of Completed Well

Depth to first water: 27 (feet below surface)

Depth to Static Water Level:

Date Measured:

Estimated Yield*: **Test Type:**

Test Length*: **Total Drawdown:**

***May not be representative of a well's long term yield.**

Geologic Log - UscsorAstmd2488s

Depth from Surface (Feet to Feet)		Soil Classification	Soil Color	Soil Description
0	17	(ML) Silt with sand	Brown (10YR 4/3)	Brown (10YR 4/3); dry; no plasticity, soft silt; coarse sand; trace clay. (0,15,85)

Depth from Surface (Feet to Feet)		Soil Classification	Soil Color	Soil Description
17	22	(SM) Silty sand	Brown (10YR 4/3);	(SM) SILTY SAND: Brown (10YR 4/3); dry; well graded, subangular to subround, coarse to medium sand; non plasticity silt; trace clay. (0,60,40)
22	24	(SC) Clayey sand	Yellowish Brown (10YR 5/4)	Yellowish Brown (10YR 5/4); dry; well graded, subangular to subround, medium to fine sand; low plasticity clay. (0,80,20)
24	29	(GW-GM) Well-graded gravel with silt	Dark Yellowish Brown (10YR 3/4);	(GW-GM) WELL GRADED GRAVEL w/ SAND & SILT: Dark Yellowish Brown (10YR 3/4); dry; well graded, round to subround, coarse to fine gravel/ cobbles, half inch to 4-inch in size; coarse to fine sand; silt; trace clay. (75,15,10) @27' Saturated
29	33	(SW-SM) Well-graded sand with silt and gravel		(SW-SM) WELL GRADED SAND w/ SILT:Dark Yellowish Brown (10YR 3/4); saturated; well graded, subangular to subround, medium to fine sand; non plasticity silt; trace clay. (0,90,10)
33	39	(GW-GM) Well-graded gravel with silt and sand		(GW-GM) WELL GRADED GRAVEL w/ SAND & SILT: Dark Yellowish Brown (10YR 3/4); wet; well graded, round to subround, coarse to fine gravel/ cobbles, half inch to 4-inch in size; coarse to fine sand; silt; trace clay. (75,15,10) @35' 2-inch wide round 1-inch Gravel lense
39	47	(GW-GC) Well-graded gravel with clay and sand		(GW-GC) WELL GRADED GRAVEL w/ SAND & CLAY: Dark Yellowish Brown (10YR 3/4); wet to saturated; well graded, round to subround, coarse to fine gravel/cobbles, half inch to 4-inch in size; coarse to fine sand; non to low plasticity clay; trace silt. (75,15,10)
47	57	(ML) Silt		(ML) SILT: Pale Brown (10YR 6/3); moist; low plasticity, firm to hard silt; clay; [60% Silt/ 40% Clay]. (0, 0, 100)

Casings										
Casing #	Depth from Surface (Feet to Feet)		Casing Type	Material	Casings Specifications	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	25	Blank	PVC	OD: 2.375 in. | SDR: SCH 40 | Thickness: 0.154 in.	0.154	2.375			
1	25	45	Screen	PVC	OD: 2.375 in. | SDR: SCH 40 | Thickness: 0.154 in.	0.154	2.375	Milled Slots	0.02	

Annular Material					
Depth from Surface (Feet to Feet)		Fill	Fill Type Details	Filter Pack Size	Description
1	20	Cement	Portland Cement/Neat Cement		
20	23	Bentonite	Low Solids		
23	47	Filter Pack	6 x 16		#3 Sand
47	57	Bentonite	Low Solids		Chips

Other Observations:

Borehole Specifications		
Depth from Surface (Feet to Feet)		Borehole Diameter (inches)
0	57	6

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

Name: CASCADE DRILLING LP
Person, Firm or Corporation

PO BOX 1184	Woodinville	Washington	90872
Address	City	State	Zip

Signed: electronic signature received — C-57 Licensed Water Well Contractor

12/17/2025 — Date Signed

1058336 — License Number

DWR Use Only

CSG #	State Well Number			Site Code	Local Well Number		

----	----	----	N

Latitude Deg/Min/Sec

----	----	----	W

Longitude Deg/Min/Sec

APN: ----

Township: ---- **Range:** ----

Section: ---- **Tract:** ----

SEQ: ---- **BM:** ----

Attachments

- **MW-1.pdf** - Geologic Log

State of California

Well Completion Report

Form DWR 188 Submitted

WCR2026-002384

Owner's Well Number: WP-MW01 **Date Work Began:** 01/14/2026 **Date Work Ended:** 01/15/2026

Local Permit Agency: Butte County Public Health **County:** Butte

Secondary Permit Agency: **Permit Number:** EH-MWSB-26-0029 **Permit Date:** 01/12/2026

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: Zack Laforet

Business Name: Geosyntec Consultants inc

Address: 11020 White Rock Rd

Suite 120

City: Rancho Cordova **State:** California **Zip:** 95670

Planned Use and Activity

Activity: New Production or Monitoring Well

Planned Use: Monitoring

Well Location

Address:

City: **Zip:**

Latitude: 39 Deg. 35 Min. 16.2492 Sec. N

Dec. Lat. : 39.587847

Location Accuracy:

Location Method:

Longitude: -121 Deg. 42 Min. 1.4724 Sec. W

Dec. Long. : -121.700409

Horizontal Datum:

APN: 039-210-021-000

Township: 20N **Range:** 02E

Section: 13 **BM:** Mount Diablo

Ground Surface Elevation:

Elevation Accuracy:

Elevation Method:

Vertical Datum:

Borehole Information

Orientation: Vertical **# of casings (Specify):** 1

Drilling Method: Sonic **Drilling Fluid:** None

Total Depth of Boring: 60 (feet)

Total Depth of Completed Well: 51 (feet)

Water Level and Yield of Completed Well

Depth to first water:

Depth to Static Water Level:

Date Measured:

Estimated Yield*: **Test Type:**

Test Length*: **Total Drawdown:**

***May not be representative of a well's long term yield.**

Geologic Log - Free Form

Depth from Surface (Feet to Feet)		Description
0	3	SANDY CLAY: Yellowish Brown (10YR 5/4); moist; low plasticity, soft clay; well graded, subangular to subround, coarse to fine sand. (0,40,50)
3	6	LEAN CLAY: Dark Brown (10YR 3/3); moist; medium plasticity, firm clay; trace gravel and coarse sand. (5,5,95)

Depth from Surface (Feet to Feet)		Description
6	9	SANDY SILT: Dark Yellowish Brown (10YR 4/4); moist; low plasticity, firm clay; trace gravel and coarse sand. (5,5,95)
9	10.5	SILTY SAND: Dark Yellowish Brown (10YR 4/4); wet; well graded, subangular to subround, medium to fine sand; silt. (0,60,40)
9	10.5	SILTY SAND: Dark Yellowish Brown (10YR 4/4); wet; well graded, subangular to subround, medium to fine sand; silt. (0,60,40)
10.5	14	WELL GRADED GRAVEL w/ SAND: Dark Yellowish Brown (10YR 3/4); saturated; well graded, round, 1/2-inch to 2-inch gravel; coarse to fine sand. (70,30,0)
14	19	WELL GRADED GRAVEL w/ SAND & CLAY: Dark Yellowish Brown (10YR 3/4); moist; well graded, round, 1/2-inch to 3-inch gravel; low plastic clay; coarse to fine sand; cobbles. (60,10,30)
19	27	WELL GRADED SAND w/ SILT: Yellowish Brown (10YR 5/4); moist to wet; well graded, angular to subangular, coarse to fine sand; silt. (0,90,10)
27	32	LEAN CLAY w/ SAND: Dark Yellowish Brown (10YR 4/4); moist grades to dry; medium plasticity, firm clay; trace gravel and coarse sand. (5,5,95)
32	35	LEAN CLAY: Light Gray (10YR 7/2); dry; low plasticity, very hard clay. (0,0,100)
35	38	WELL GRADED GRAVEL w/ SAND: Dark Yellowish Brown (10YR 4/4); saturated; well graded, round, 1/4-inch to 4-inch gravel; coarse to fine sand. (80,20,0)
38	40	POORLY GRADED SAND: Dark Yellowish Brown (10YR 4/4); dry; poorly graded, angular to subangular, medium sand; section with strong cementation. (0,100,0)
40	50	SILT: Dark Gray (10YR 4/1); very hard, no plasticity silt; cementation section increasing with depth. (0,0,100)
50	60	LEAN CLAY: Dark Gray (10YR 4/1); dry; low plasticity, hard clay; silt. (0,0,100)

Casings

Casing #	Depth from Surface (Feet to Feet)		Casing Type	Material	Casings Specifications	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	35	Blank	PVC	OD: 2.375 in. | SDR: SCH 40 | Thickness: 0.154 in.	0.154	2.375			
1	35	50	Screen	PVC	OD: 2.375 in. | SDR: SCH 40 | Thickness: 0.154 in.	0.154	2.375	Milled Slots	0.02	
1	50	50.5	Blank	PVC	OD: 2.375 in. | SDR: SCH 40 | Thickness: 0.154 in.	0.154	2.375			

Annular Material

Depth from Surface (Feet to Feet)		Fill	Fill Type Details	Filter Pack Size	Description
0	30	Cement	Portland Cement/Neat Cement		
30	33	Bentonite	Low Solids		
33	51	Filter Pack	Other Gravel Pack		#3 Sand

Depth from Surface (Feet to Feet)		Fill	Fill Type Details	Filter Pack Size	Description
51	60	Bentonite	Low Solids		

Other Observations:

Borehole Specifications

Depth from Surface (Feet to Feet)		Borehole Diameter (inches)
0	60	6

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

Name: GEOCENTRIC DRILLING INC
Person, Firm or Corporation

140 Astoria Ct	Vacaville	California	95687
Address	City	State	Zip

Signed: electronic signature received — C-57 Licensed Water Well Contractor
03/23/2026 — Date Signed
1073146 — License Number

DWR Use Only

CSG #	State Well Number			Site Code	Local Well Number		
----	----	----	N	----	----	----	W
	Latitude Deg/Min/Sec				Longitude Deg/Min/Sec		

APN: ----

Township: ---- **Range:** ----

Section: ---- **Tract:** ----

SEQ: ---- **BM:** ----

Attachments

- **WP-MW01.pdf** - Geologic Log

State of California

Well Completion Report

Form DWR 188 Submitted

WCR2026-004392

Owner's Well Number: RP-MW01 **Date Work Began:** 01/16/2026 **Date Work Ended:** 01/16/2026

Local Permit Agency: Butte County Public Health **County:** Butte

Secondary Permit Agency: **Permit Number:** EH-MWSB-25-000870 **Permit Date:** 10/16/2025

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: Zack Laforet

Business Name: Geosyntec Consultants inc

Address: 11020 White Rock Rd

Suite 120

City: Rancho Cordova **State:** California **Zip:** 95670

Planned Use and Activity

Activity: New Production or Monitoring Well

Planned Use: Monitoring

Well Location

Address:

City: undefined **Zip:** undefined

APN: 047-130-184-000

Township: 23N **Range:** 01W

Section: 36 **BM:** Mount Diablo

Latitude: 39 Deg. 48 Min. 31.824 Sec. N

Dec. Lat. : 39.80884

Location Accuracy:

Location Method:

Longitude: -121 Deg. 55 Min. 26.3352 Sec. W

Dec. Long. : -121.923982

Horizontal Datum:

Ground Surface Elevation:

Elevation Accuracy:

Elevation Method:

Vertical Datum:

Borehole Information

Orientation: Vertical **# of casings (Specify):** 1

Drilling Method: Sonic **Drilling Fluid:** None

Total Depth of Boring: 60 (feet)

Total Depth of Completed Well: 50 (feet)

Water Level and Yield of Completed Well

Depth to first water:

Depth to Static Water Level:

Date Measured:

Estimated Yield*: **Test Type:**

Test Length*: **Total Drawdown:**

***May not be representative of a well's long term yield.**

Geologic Log - Free Form

Depth from Surface (Feet to Feet)		Description
0	5	SILT: Dark Brown (10YR 3/3); dry; low plasticity, soft silt; clay; trace sand. (0,5,95)
5	9.5	SILT w/ SAND: Dark Yellowish Brown (10YR 4/5); moist; no plasticity, soft silt; fine sand. (0,15,85)
9.5	10.5	POORLY GRADED SAND: Very Dark Gray (2.5YR 3/1); moist; poorly graded, subangular to subround, medium sand; well rounded cobbles. (5,90,5)

Depth from Surface (Feet to Feet)		Description
10.5	13	POORLY GRADED SAND w/ SILT & GRAVEL: Dark Yellowish Brown (10YR 4/4); moist; poorly graded, round, fine sand; well rounded cobbles and gravel. (15,75,10)
13	16	POORLY GRADED SAND: Very Dark Gray (2.5YR 3/1); moist; poorly graded, subangular to subround, medium sand; well rounded cobbles. (5,90,5)
16	20.5	SILT w/ SAND: Dark Yellowish Brown (10YR 4/5); moist; no plasticity, soft silt; fine sand. (0,15,85)
20.5	25	SILT: Yellow (2.5Y 8/6); dry; medium plasticity, firm silt. (0,0,100)
25	27	POORLY GRADED SAND: Yellow (2.5Y 8/6); saturated; poorly graded, subangular to subround, fine sand; trace silt. (0,95,5)
27	29	SILT: Yellow (2.5Y 8/6); dry; medium plasticity, firm silt. (0,0,100)
29	40	LEAN CLAY: Yellow (2.5Y 8/6); dry; medium plasticity, firm clay.
40	46	SANDY SILT: Yellow (2.5Y 8/6); moist; no plasticity, firm to soft silt; fine sand; clay. (0,15,85)
46	50	WELL GRADED SAND: Dark Olive Brown (2.5Y 5/3); wet to saturated; well graded, subangular to subround, coarse to fine sand; trace silt. (0,95,5)
50	54	WELL GRADED SAND w/ GRAVEL: Dark Olive Brown (2.5Y 5/3); wet to saturated; well graded, subangular to subround, coarse to fine sand; subround gravel; trace silt. (15,80,5)
54	60	SILT w/ SAND: Olive Yellow (2.5Y 6/6); moist; no plasticity, firm to soft silt; fine sand. (0,10,90)

Casings

Casing #	Depth from Surface (Feet to Feet)		Casing Type	Material	Casings Specifications	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	30	Blank	PVC	OD: 2.375 in. | SDR: SCH 40 | Thickness: 0.154 in.	0.154	2.375			
1	30	50	Screen	PVC	Other	0.154	2.375	Milled Slots	0.02	
1	50	50.5	Blank	PVC	OD: 2.375 in. | SDR: SCH 40 | Thickness: 0.154 in.	0.154	2.375			

Annular Material

Depth from Surface (Feet to Feet)		Fill	Fill Type Details	Filter Pack Size	Description
0	20	Cement	Portland Cement/Neat Cement		
20	25.5	Bentonite	Low Solids		
25.5	30	Filter Pack	Other Gravel Pack		Washed Pea Gravel
25.5	60	Filter Pack	8 x 20		#3 Sand

Other Observations:

Borehole Specifications

Depth from Surface (Feet to Feet)		Borehole Diameter (inches)
0	60	6

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

Name: GEOCENTRIC DRILLING INC
Person, Firm or Corporation

140 Astoria Ct	Vacaville	California	95687
Address	City	State	Zip

Signed: electronic signature received | 05/12/2026 | 1073146
C-57 Licensed Water Well Contractor | Date Signed | License Number

DWR Use Only

CSG #	State Well Number			Site Code	Local Well Number		

----	----	----	N

Latitude Deg/Min/Sec

----	----	----	W

Longitude Deg/Min/Sec

APN: ----

Township: ---- **Range:** ----

Section: ---- **Tract:** ----

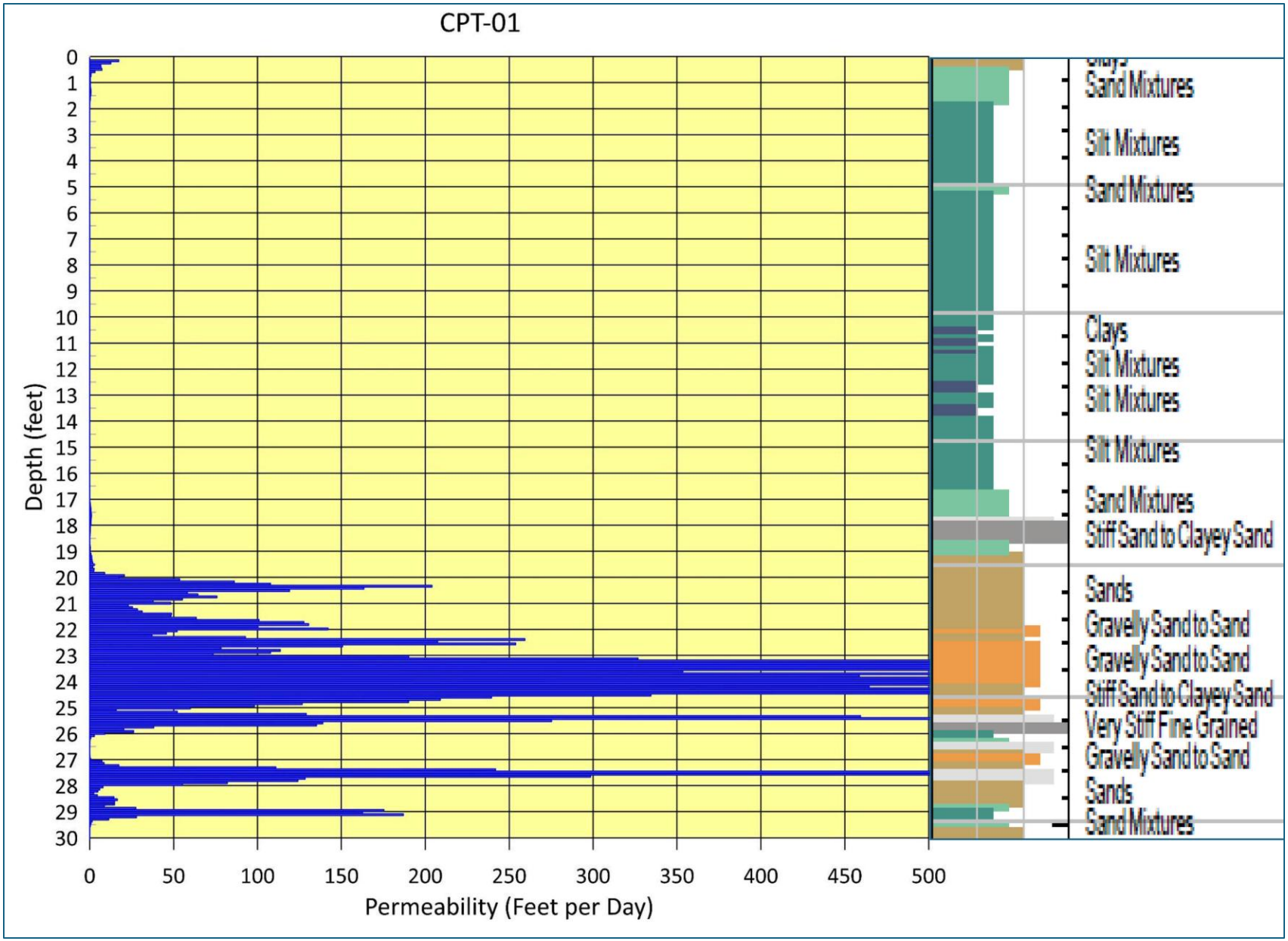
SEQ: ---- **BM:** ----

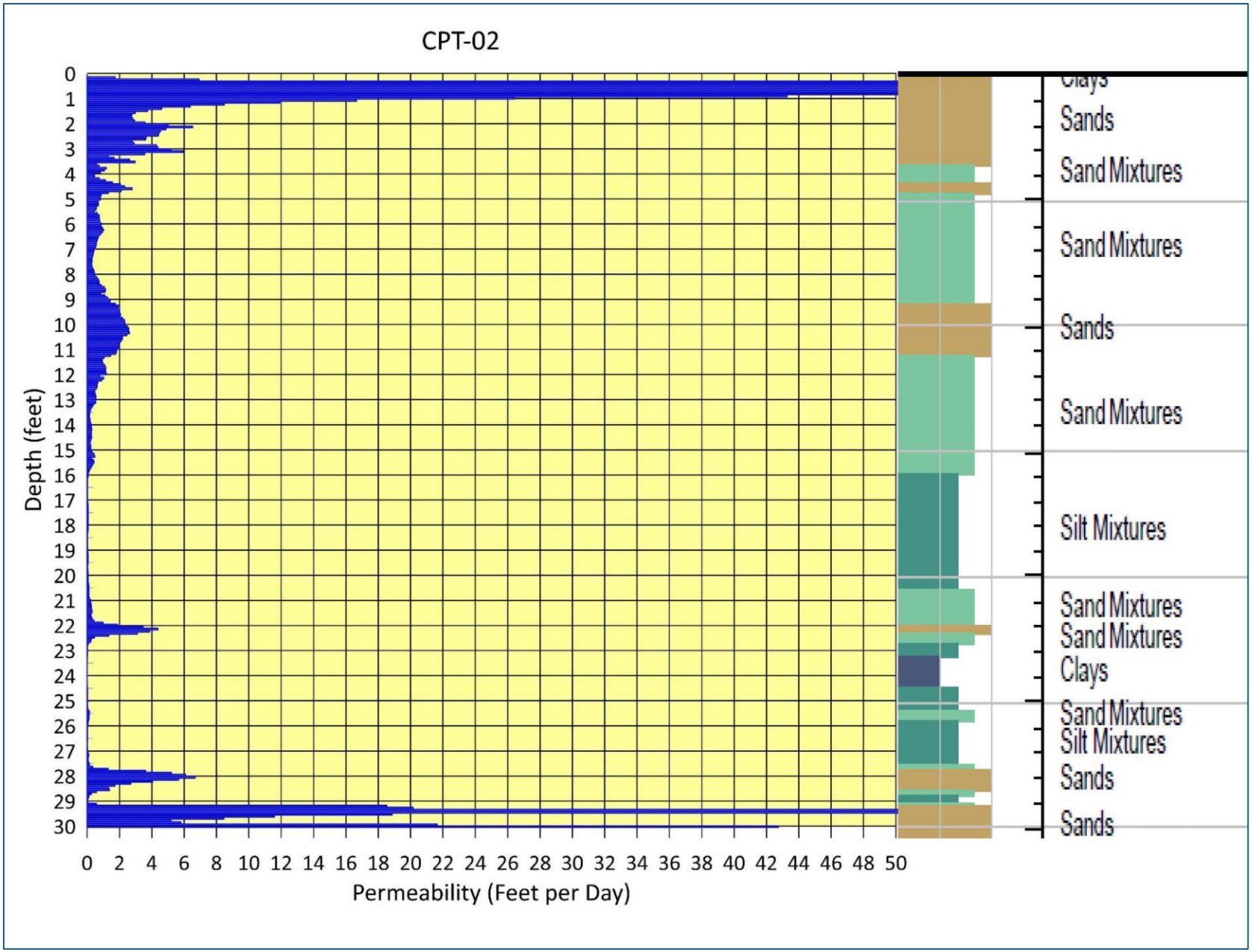
Attachments

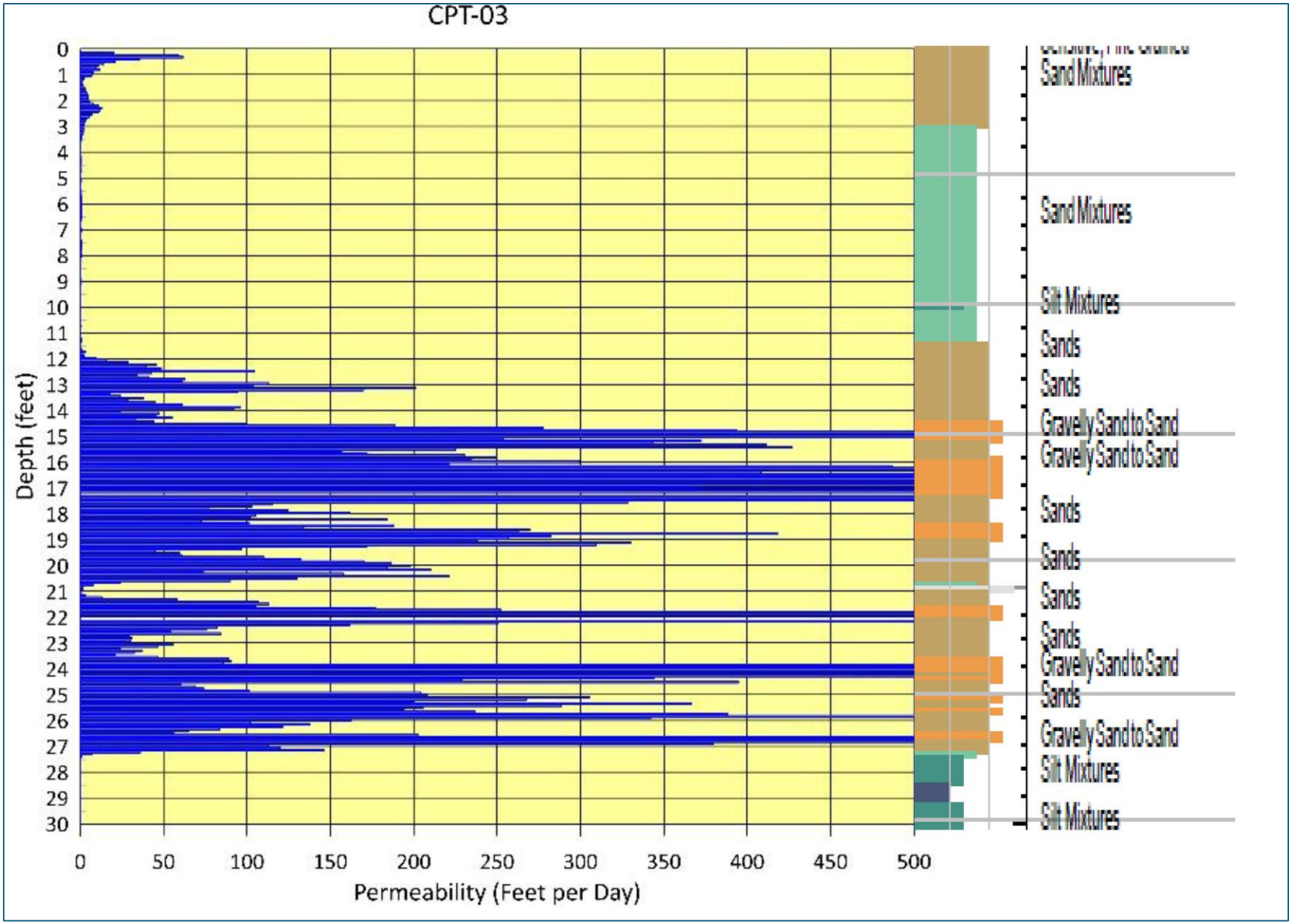
- **Rice Property - MW.pdf** - Geologic Log

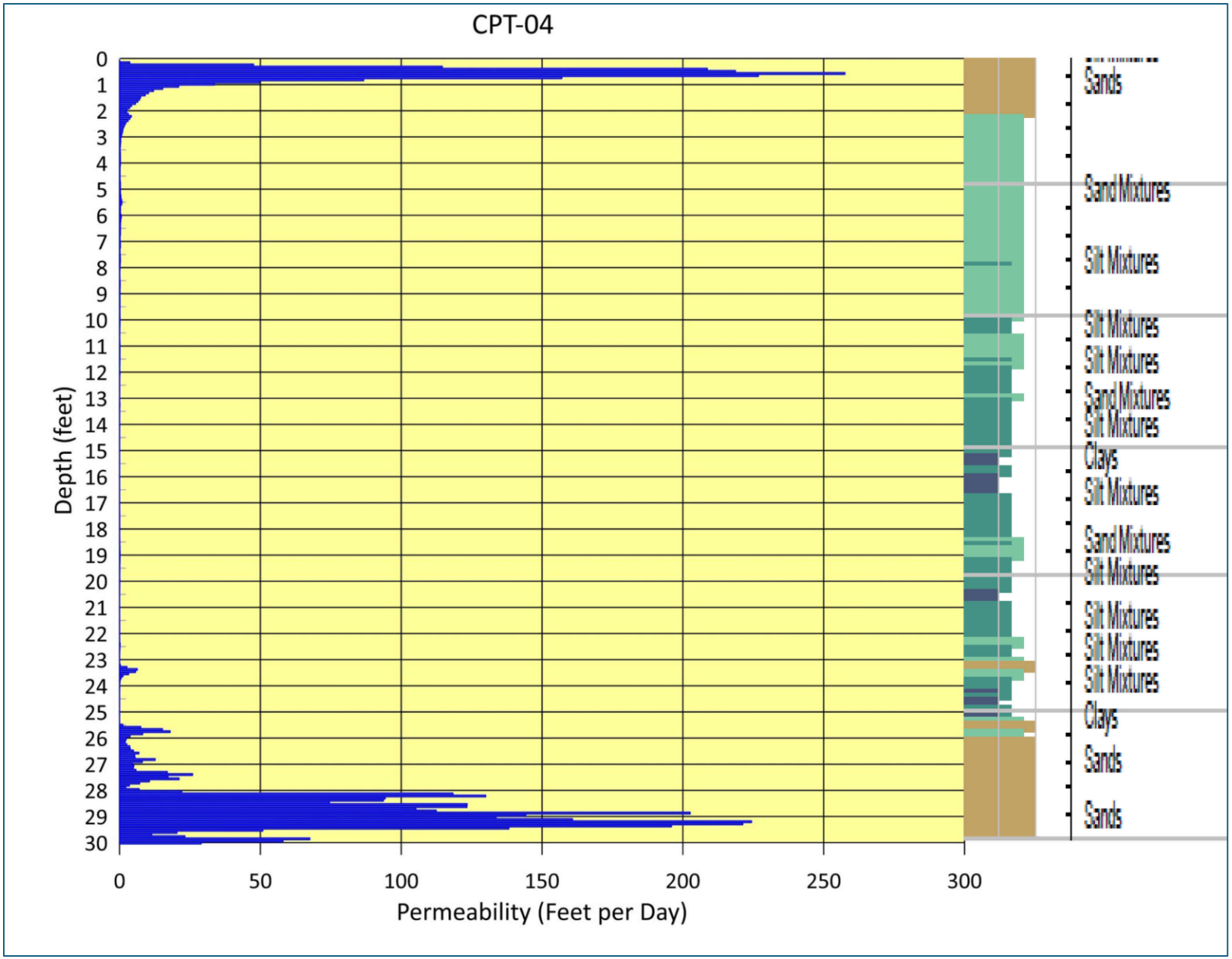
Appendix G - CPT-Hydraulic Conductivity (Kh) Plots

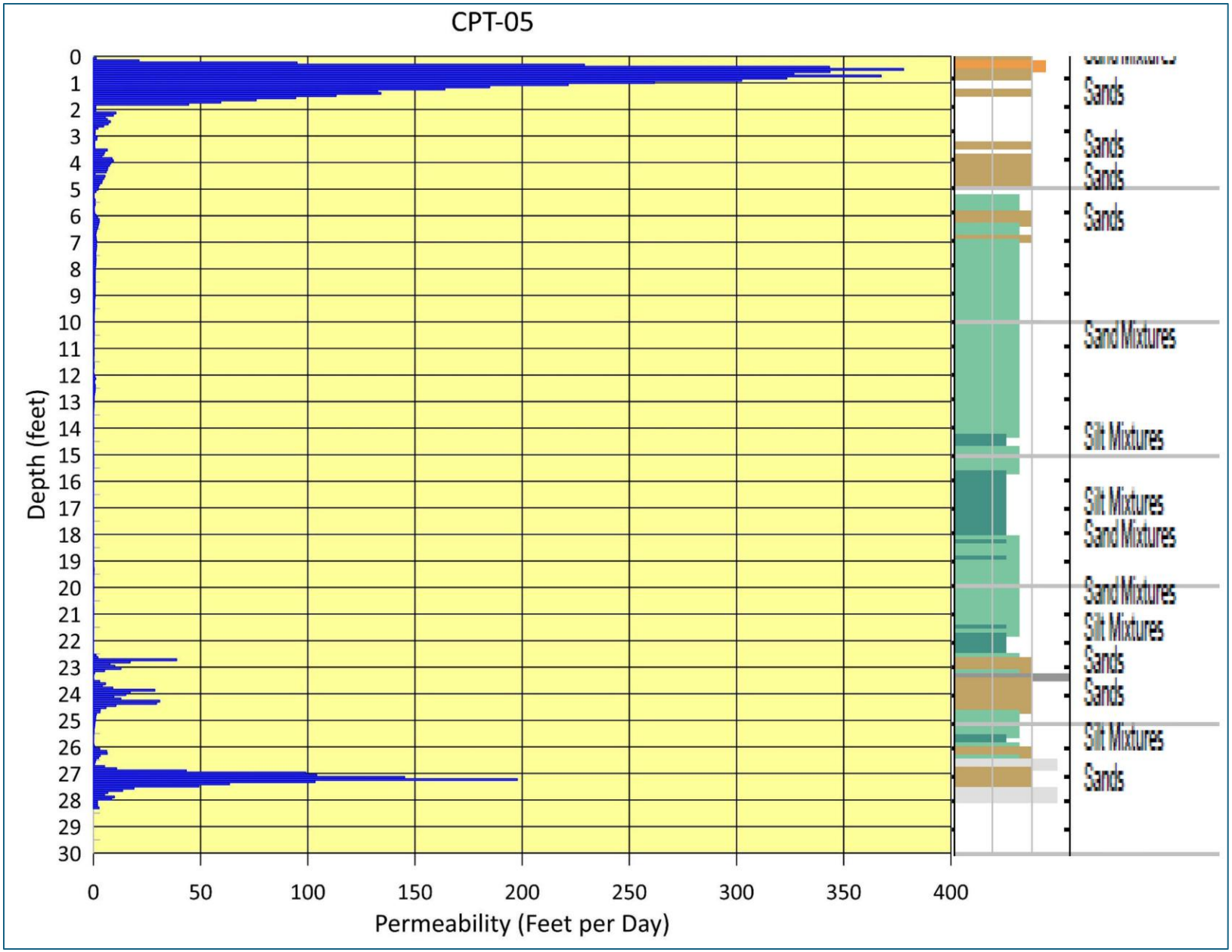
Site S1

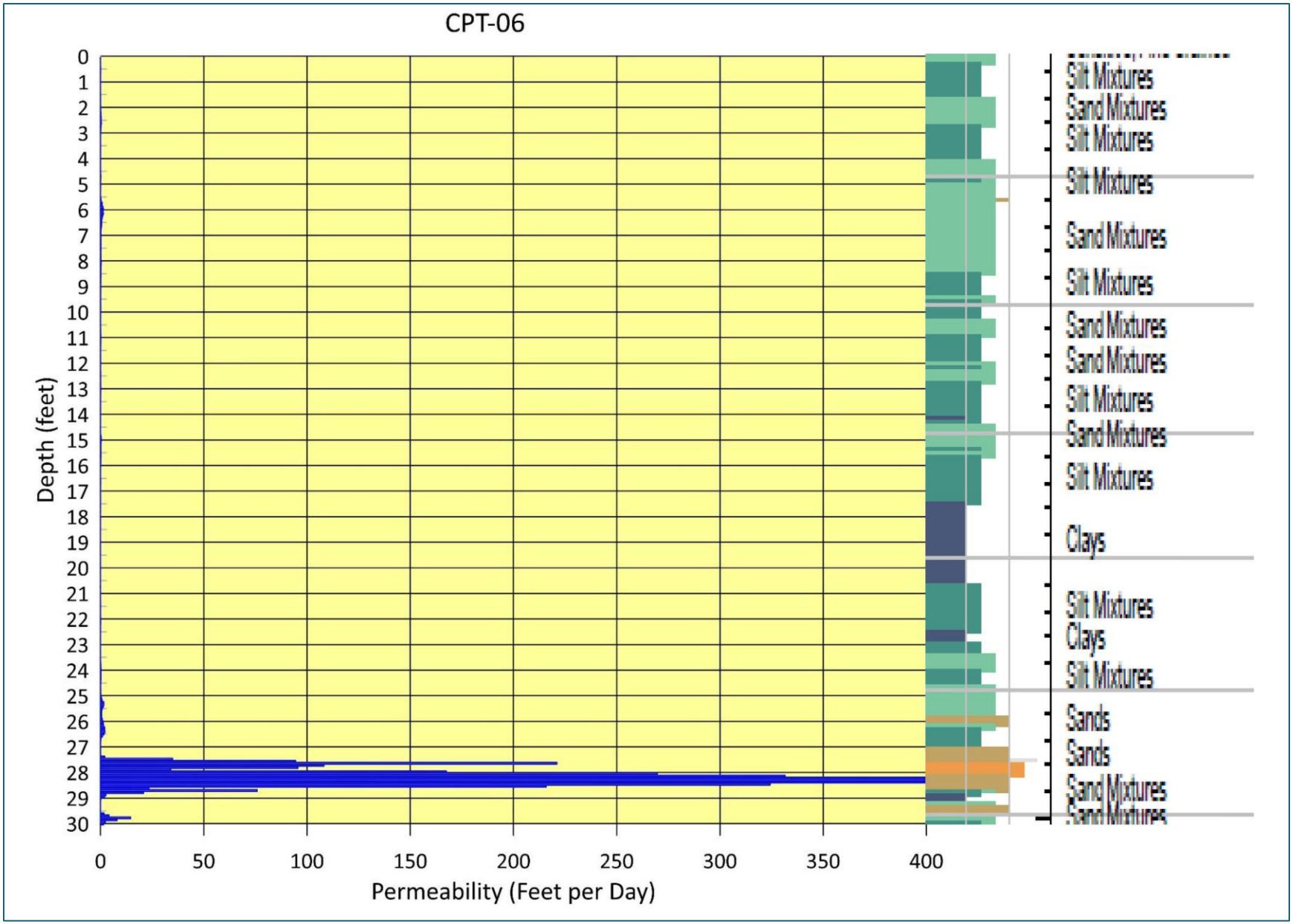

CPT-01
Depth (feet)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
0
50
100
150
200
250
300
350
400
450
500
Permeability (Feet per Day)
Sand Mixtures
Silt Mixtures
Sand Mixtures
Silt Mixtures
Clays
Silt Mixtures
Silt Mixtures
Silt Mixtures
Sand Mixtures
Stiff Sand to Clayey Sand
Sands
Gravelly Sand to Sand
Gravelly Sand to Sand
Stiff Sand to Clayey Sand
Very Stiff Fine Grained
Gravelly Sand to Sand
Sands
Sand Mixtures

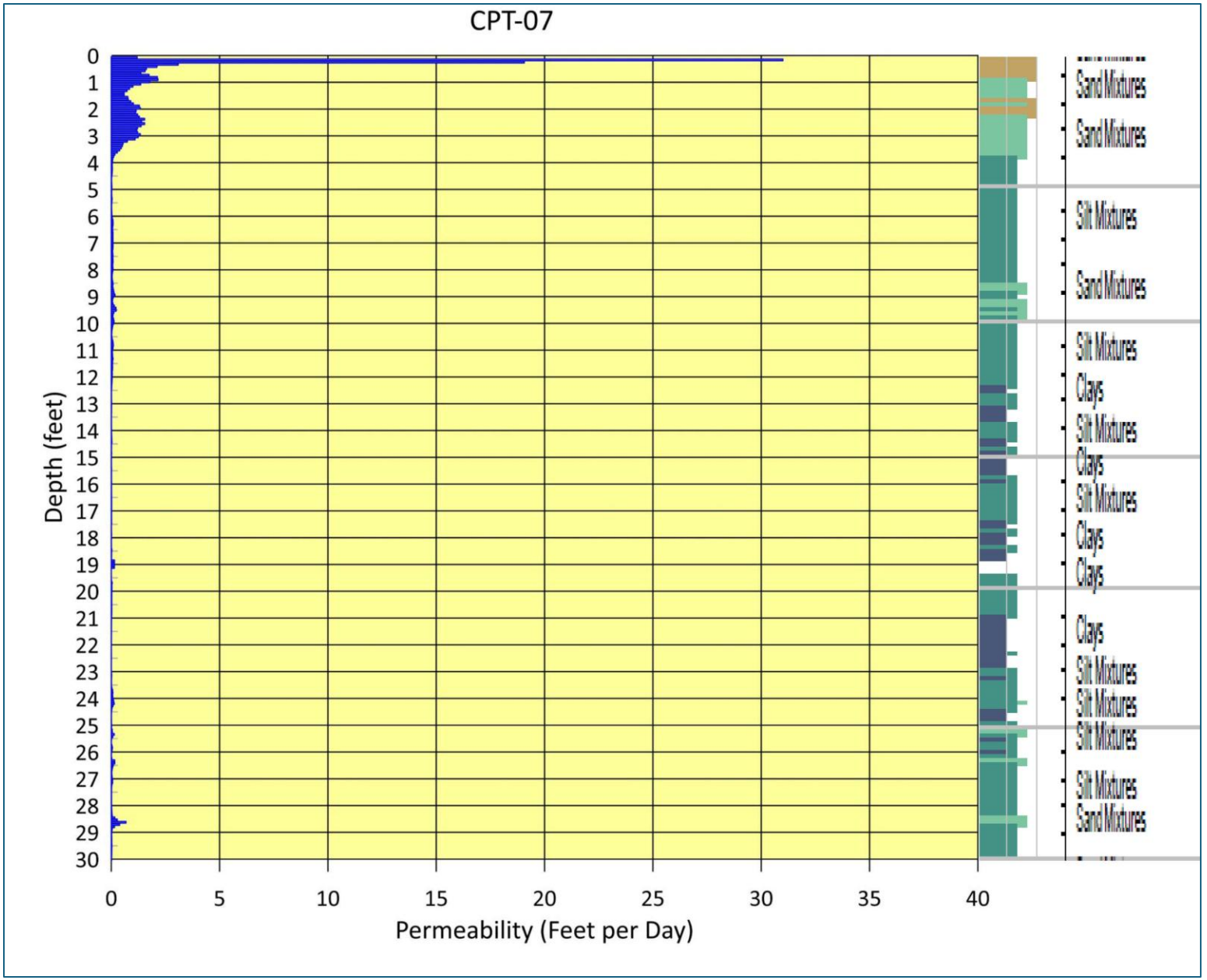

CPT-02
Depth (feet)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
Permeability (Feet per Day)
Clays
Sands
Sand Mixtures
Sand Mixtures
Sands
Sand Mixtures
Silt Mixtures
Sand Mixtures
Sand Mixtures
Clays
Sand Mixtures
Silt Mixtures
Sands
Sands

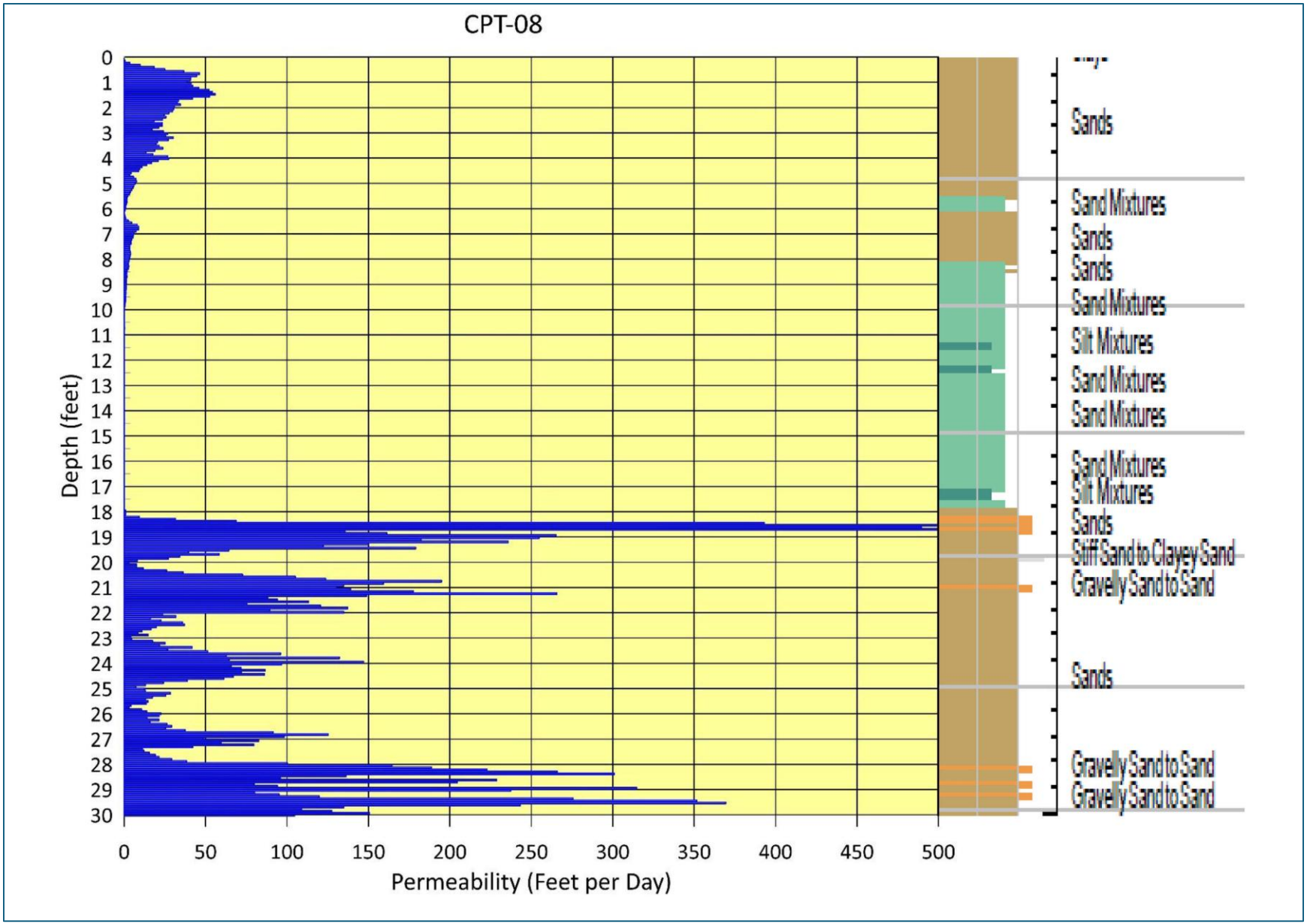

CPT-03
Depth (feet)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
0
50
100
150
200
250
300
350
400
450
500
Permeability (Feet per Day)
Sand Mixtures
Sand Mixtures
Silt Mixtures
Sands
Sands
Gravelly Sand to Sand
Gravelly Sand to Sand
Sands
Sands
Sands
Sands
Gravelly Sand to Sand
Sands
Gravelly Sand to Sand
Silt Mixtures
Silt Mixtures


CPT-04
Depth (feet)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
0
50
100
150
200
250
300
Permeability (Feet per Day)
Sands
Sand Mixtures
Silt Mixtures
Silt Mixtures
Silt Mixtures
Sand Mixtures
Silt Mixtures
Clays
Silt Mixtures
Sand Mixtures
Silt Mixtures
Silt Mixtures
Silt Mixtures
Silt Mixtures
Clays
Sands
Sands

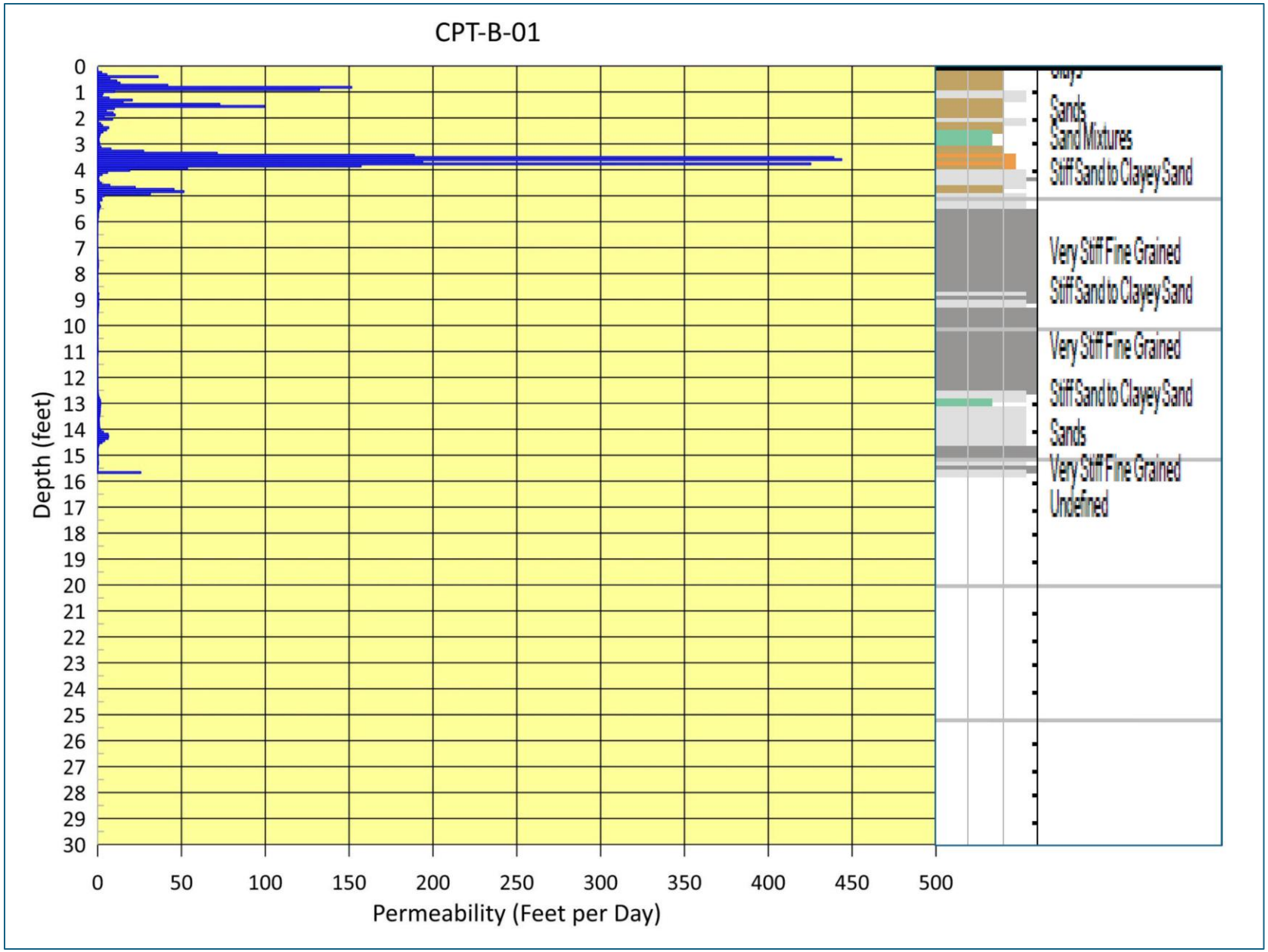

CPT-05
Depth (feet)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
0
50
100
150
200
250
300
350
400
Permeability (Feet per Day)
Sands
Sands
Sands
Sands
Sand Mixtures
Silt Mixtures
Silt Mixtures
Sand Mixtures
Sand Mixtures
Silt Mixtures
Sands
Sands
Silt Mixtures
Sands

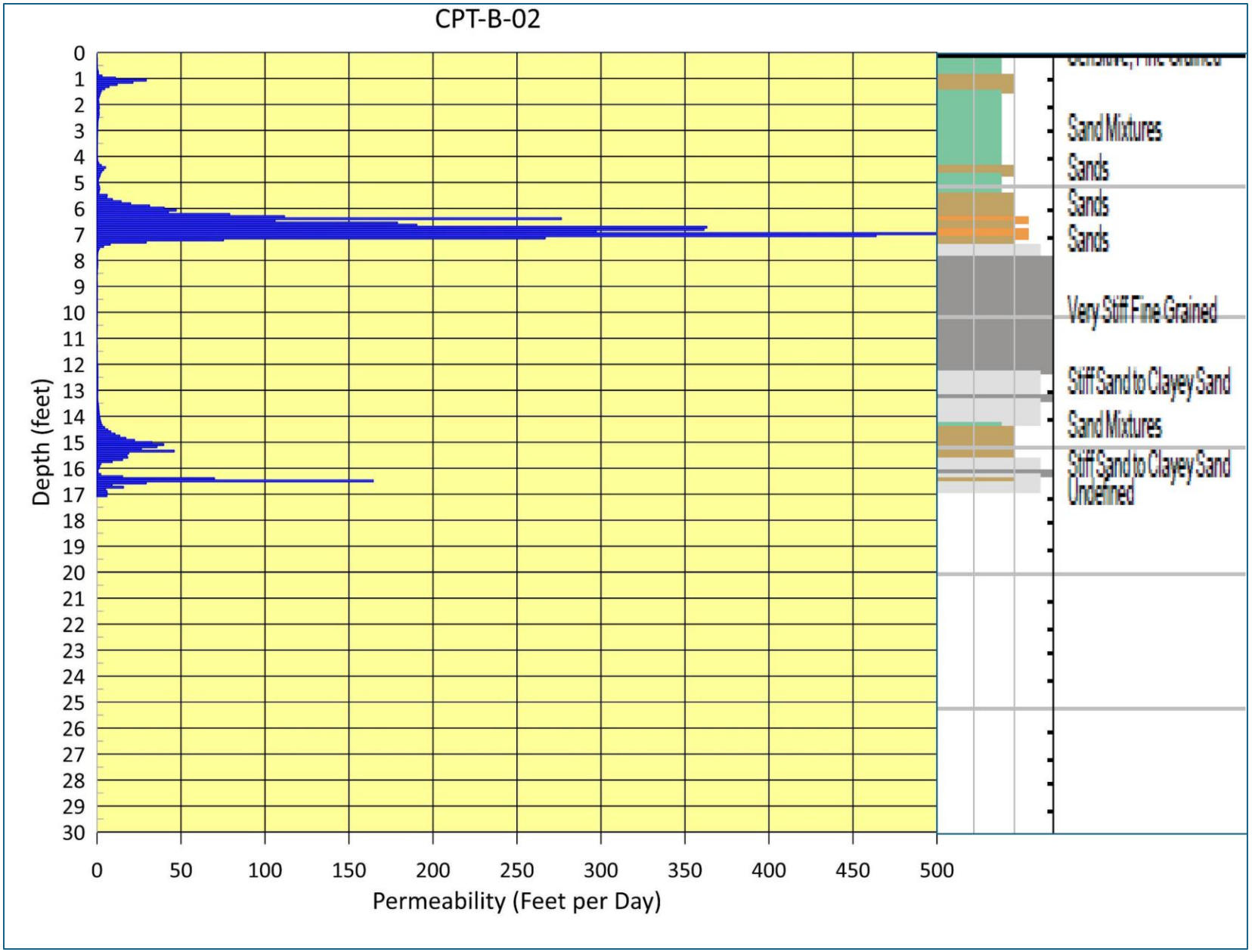

CPT-06
Depth (feet)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
0
50
100
150
200
250
300
350
400
Permeability (Feet per Day)
Silt Mixtures
Sand Mixtures
Silt Mixtures
Silt Mixtures
Sand Mixtures
Silt Mixtures
Sand Mixtures
Sand Mixtures
Silt Mixtures
Sand Mixtures
Silt Mixtures
Clays
Silt Mixtures
Clays
Silt Mixtures
Sands
Sands
Sand Mixtures


CPT-07
Depth (feet)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
0
5
10
15
20
25
30
35
40
Permeability (Feet per Day)
Sand Mixtures
Sand Mixtures
Silt Mixtures
Sand Mixtures
Silt Mixtures
Clays
Silt Mixtures
Clays
Silt Mixtures
Clays
Clays
Clays
Silt Mixtures
Silt Mixtures
Silt Mixtures
Silt Mixtures
Sand Mixtures


CPT-08
Depth (feet)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
0
50
100
150
200
250
300
350
400
450
500
Permeability (Feet per Day)
Sands
Sand Mixtures
Sands
Sands
Sand Mixtures
Silt Mixtures
Sand Mixtures
Sand Mixtures
Sand Mixtures
Silt Mixtures
Sands
Stiff Sand to Clayey Sand
Gravelly Sand to Sand
Sands
Gravelly Sand to Sand
Gravelly Sand to Sand

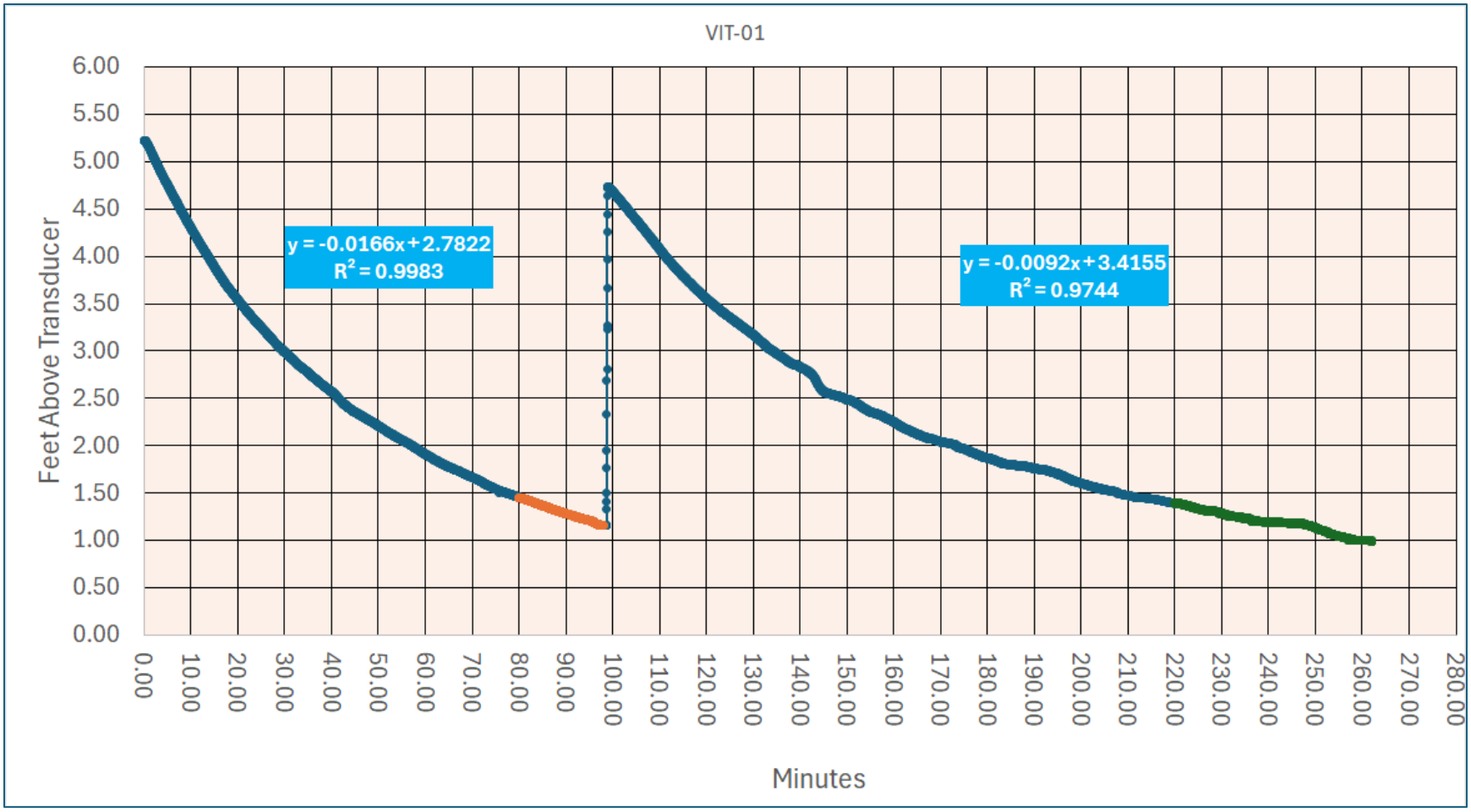
Site N5

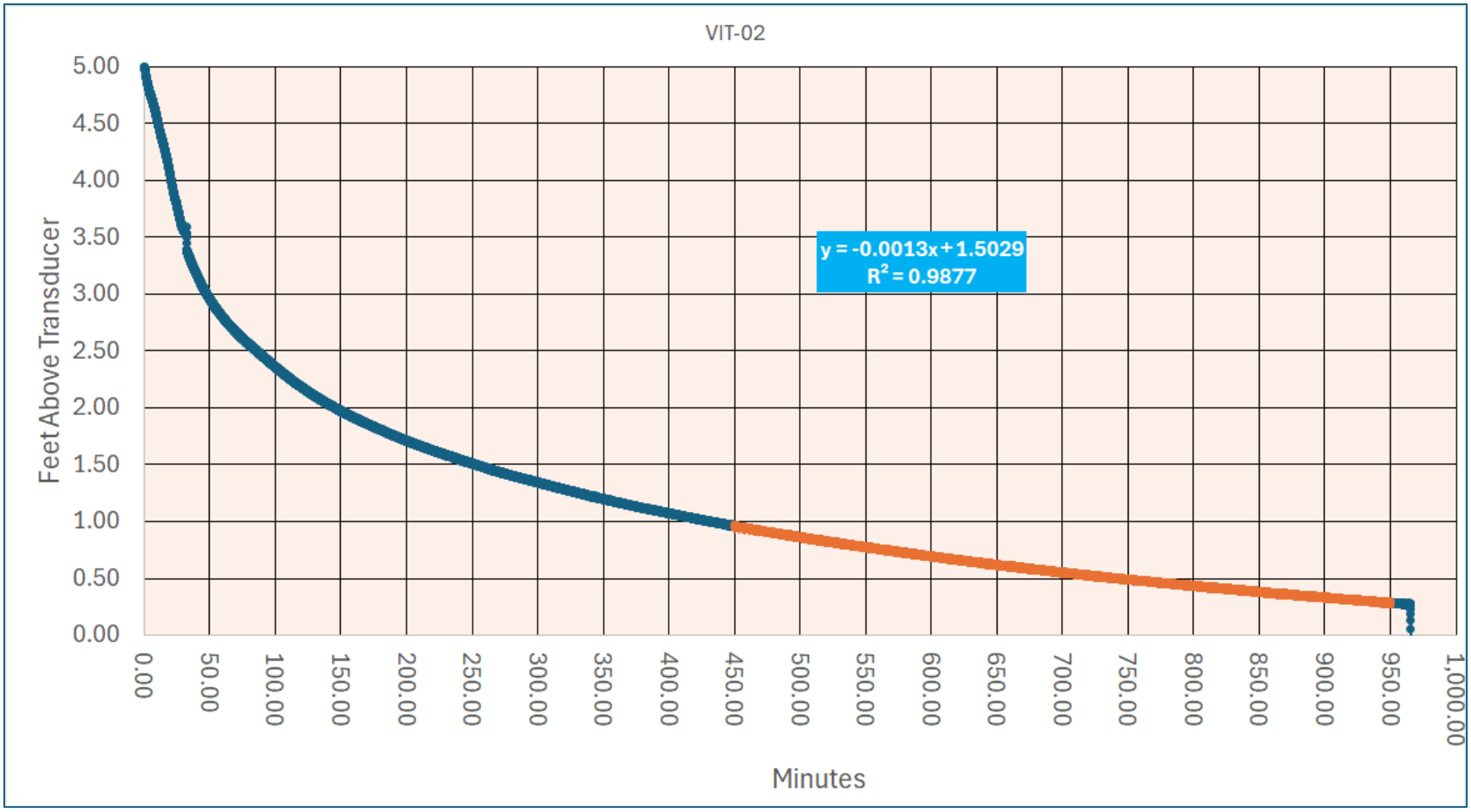

CPT-B-01
Depth (feet)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
0
50
100
150
200
250
300
350
400
450
500
Permeability (Feet per Day)
Sands
Sand Mixtures
Stiff Sand to Clayey Sand
Very Stiff Fine Grained
Stiff Sand to Clayey Sand
Very Stiff Fine Grained
Stiff Sand to Clayey Sand
Sands
Very Stiff Fine Grained
Undefined

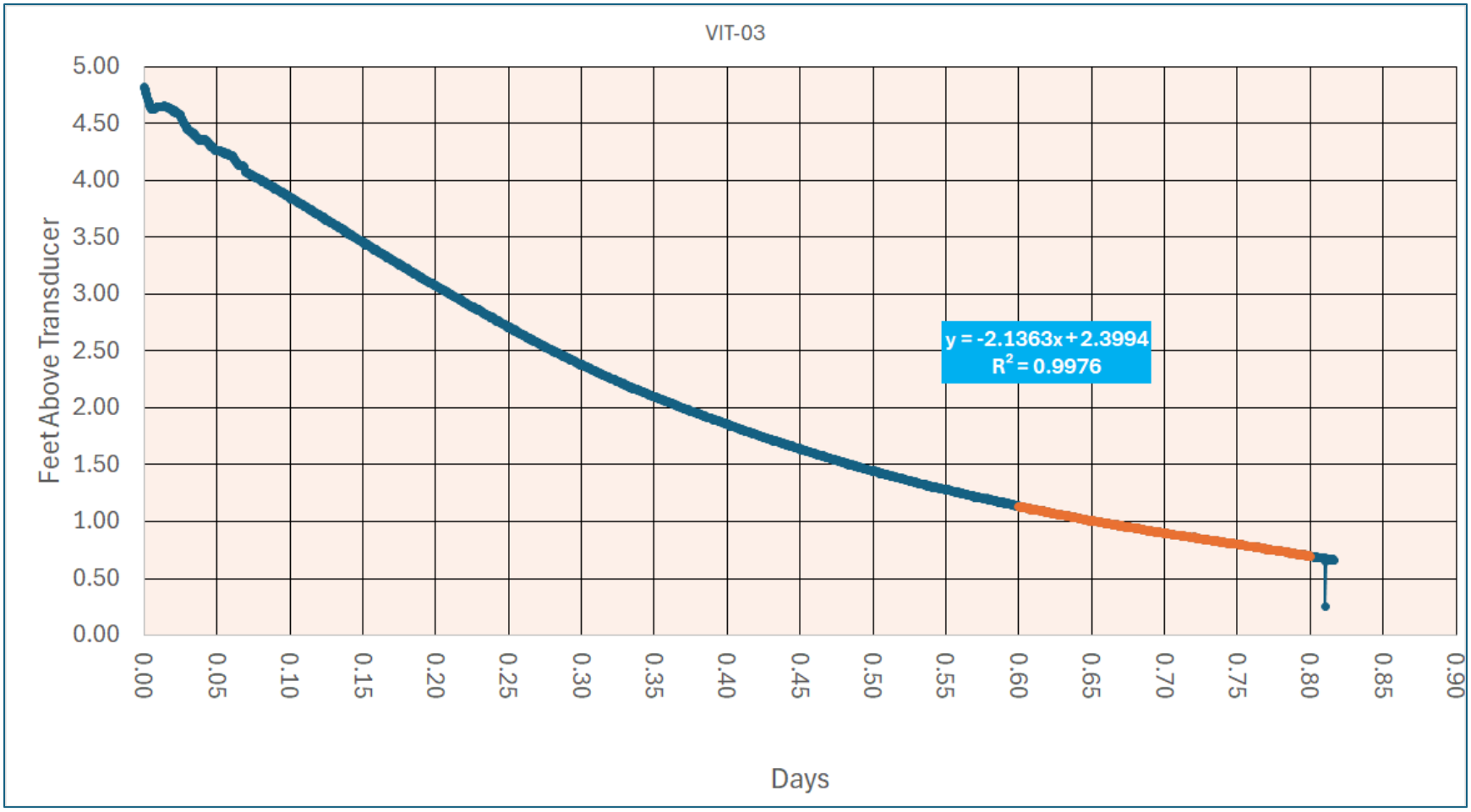

CPT-B-02
Depth (feet)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
0
50
100
150
200
250
300
350
400
450
500
Permeability (Feet per Day)
Sand Mixtures
Sands
Sands
Sands
Very Stiff Fine Grained
Stiff Sand to Clayey Sand
Sand Mixtures
Stiff Sand to Clayey Sand
Undefined

Appendix H - Infiltration Plots

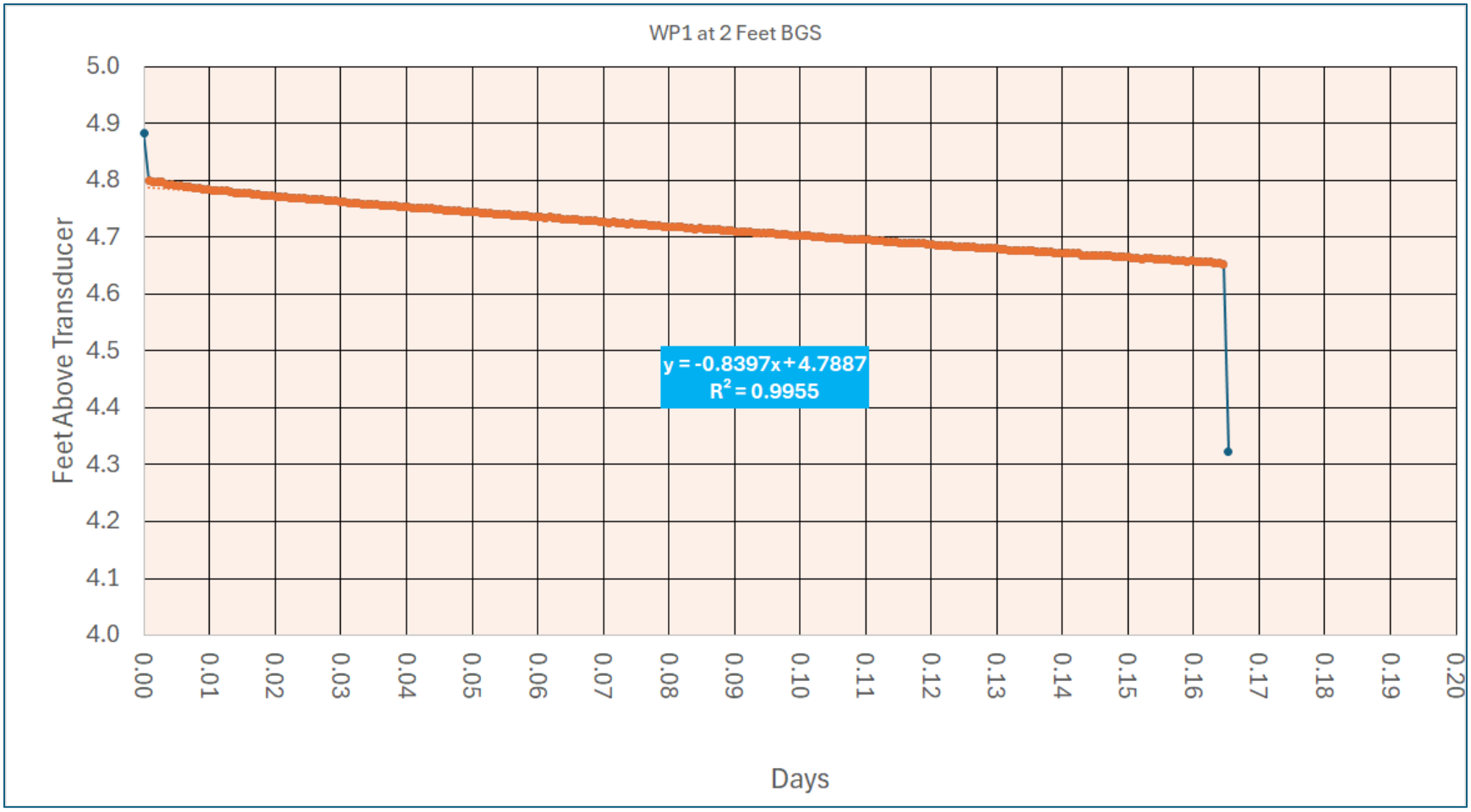
Site S1

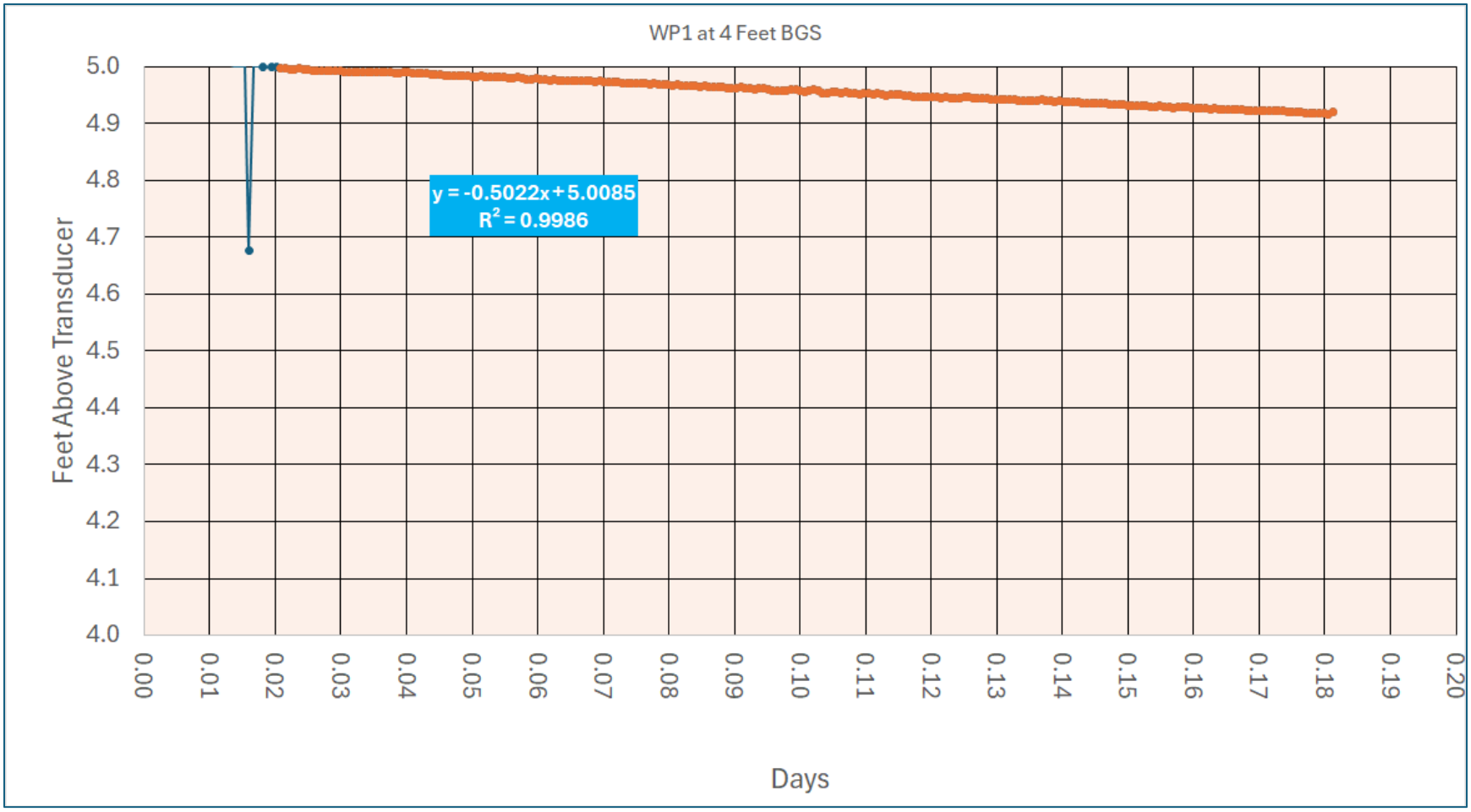

VIT-01
Feet Above Transducer
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
y = -0.0166x + 2.7822
R² = 0.9983
y = -0.0092x + 3.4155
R² = 0.9744
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
90.00
100.00
110.00
120.00
130.00
140.00
150.00
160.00
170.00
180.00
190.00
200.00
210.00
220.00
230.00
240.00
250.00
260.00
270.00
280.00
Minutes

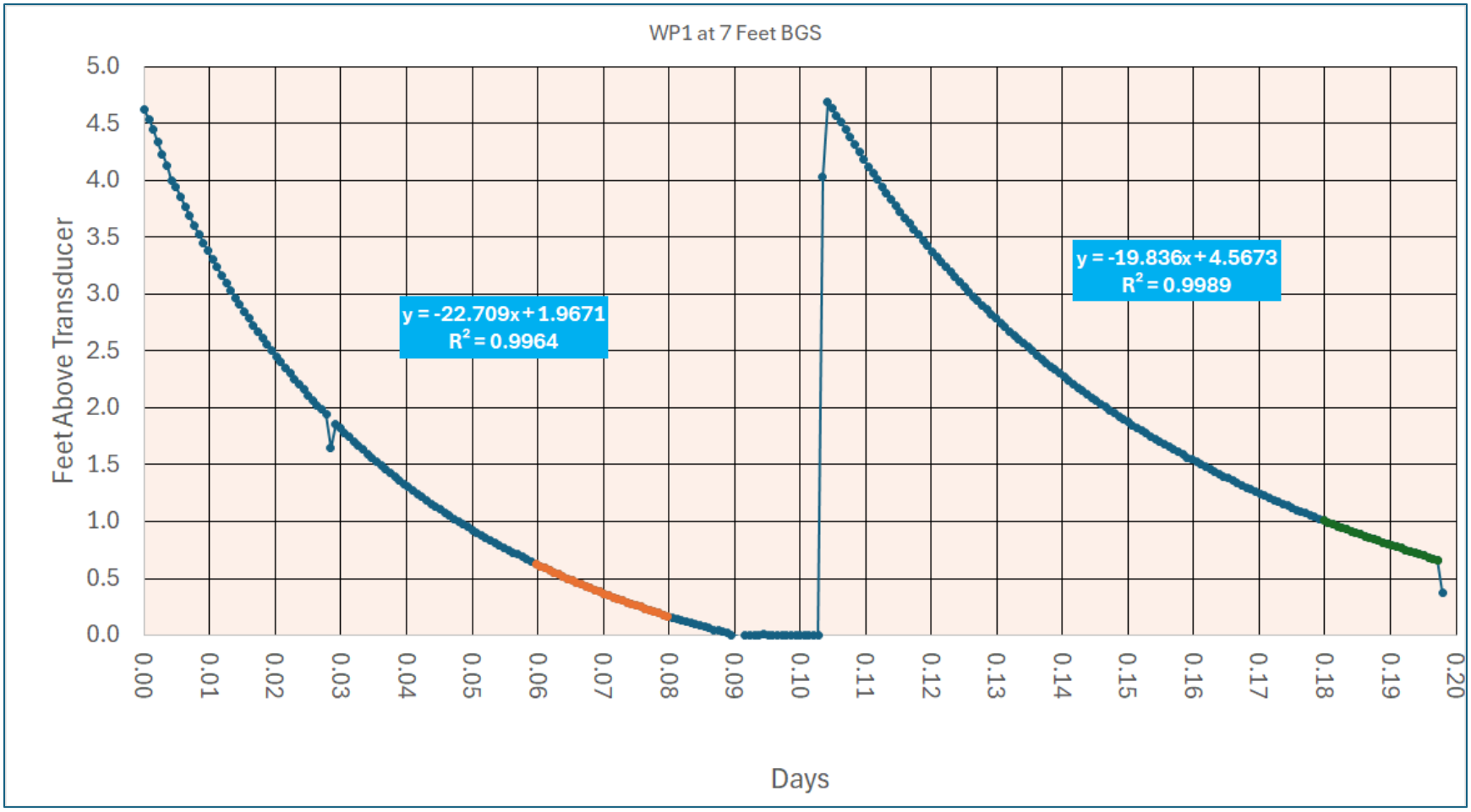

VIT-02
Feet Above Transducer
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
y = -0.0013x + 1.5029
R² = 0.9877
0.00
50.00
100.00
150.00
200.00
250.00
300.00
350.00
400.00
450.00
500.00
550.00
600.00
650.00
700.00
750.00
800.00
850.00
900.00
950.00
1,000.00
Minutes

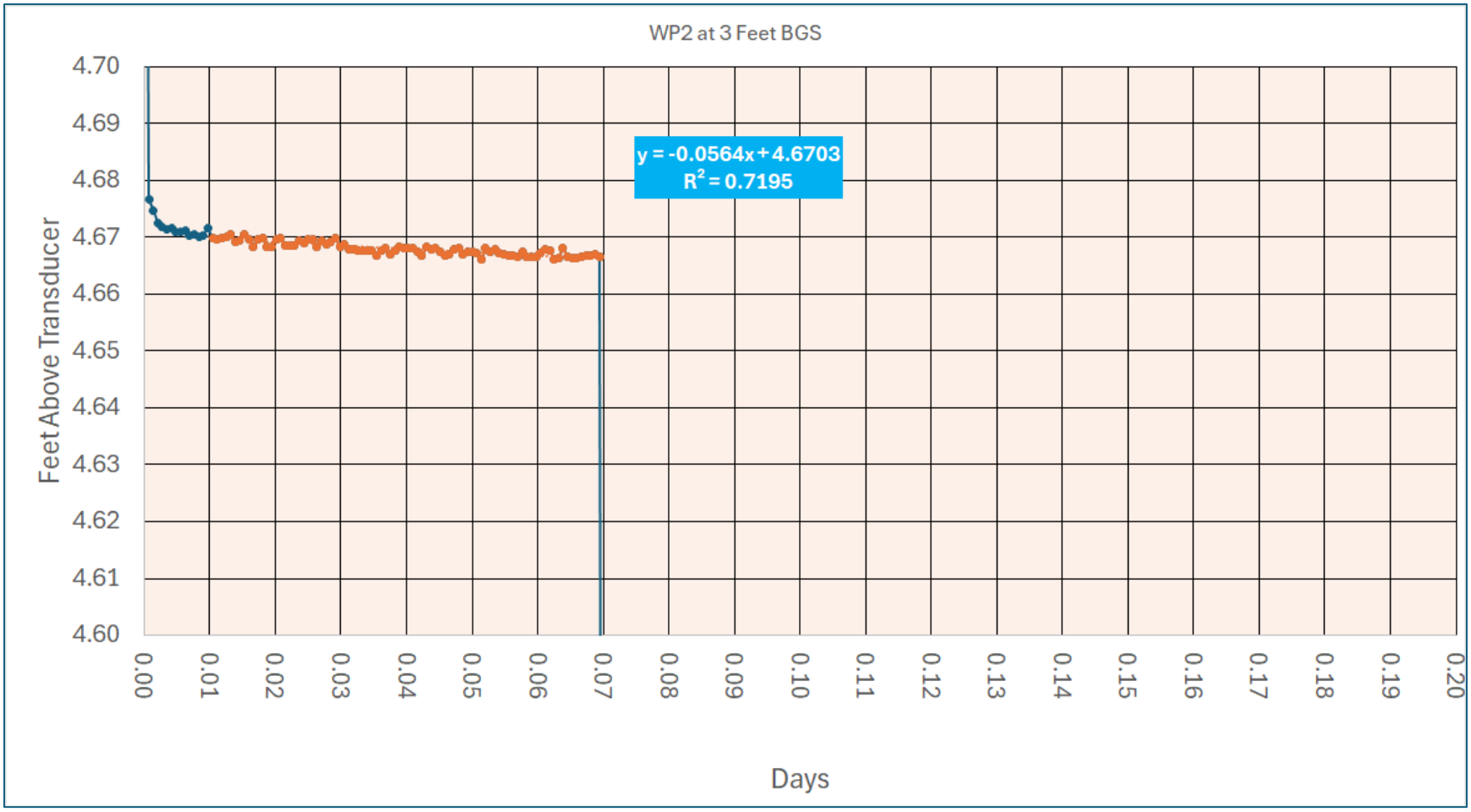

VIT-03
Feet Above Transducer
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
0.50
0.55
0.60
0.65
0.70
0.75
0.80
0.85
0.90
Days
y = -2.1363x + 2.3994
R² = 0.9976

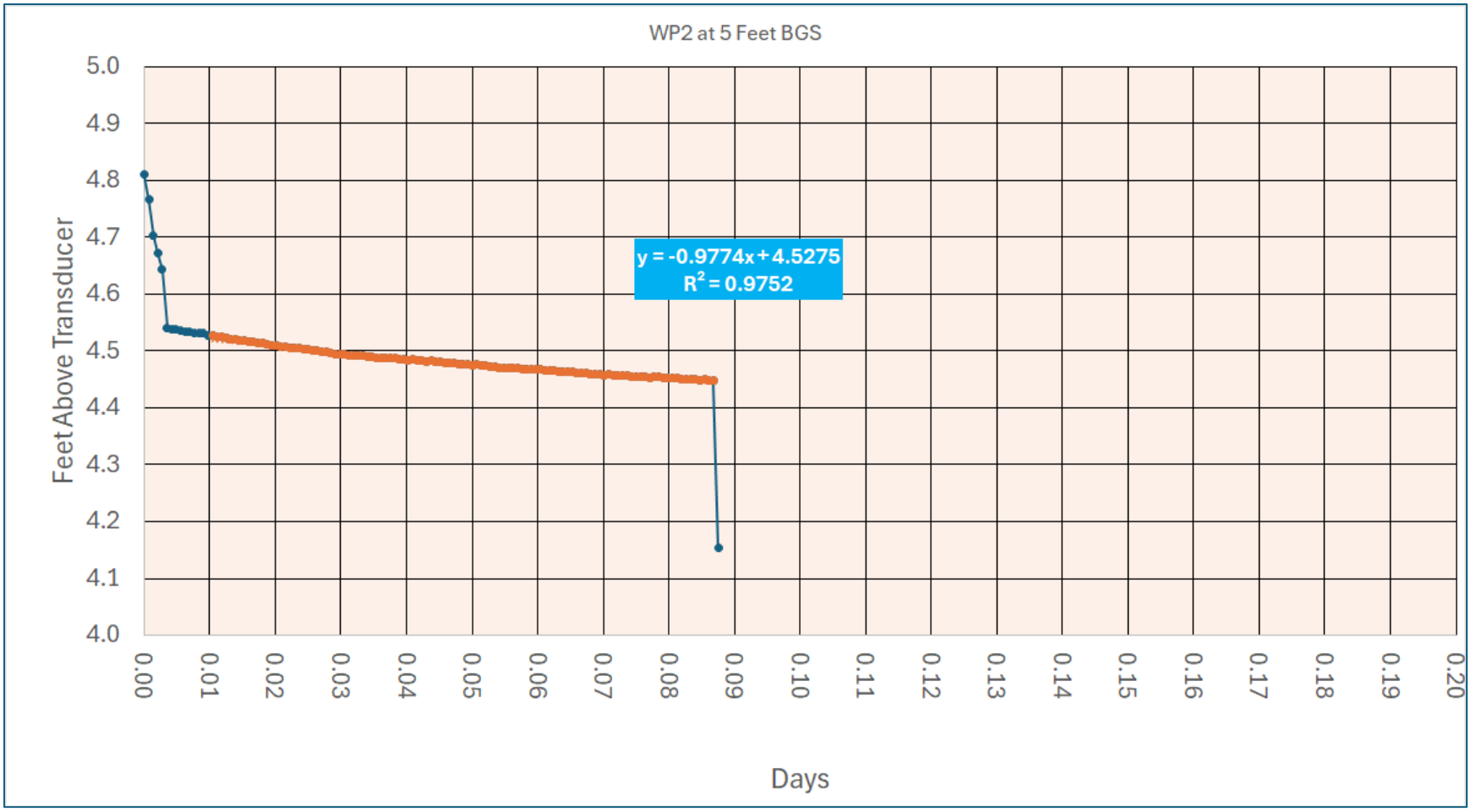
Site S6

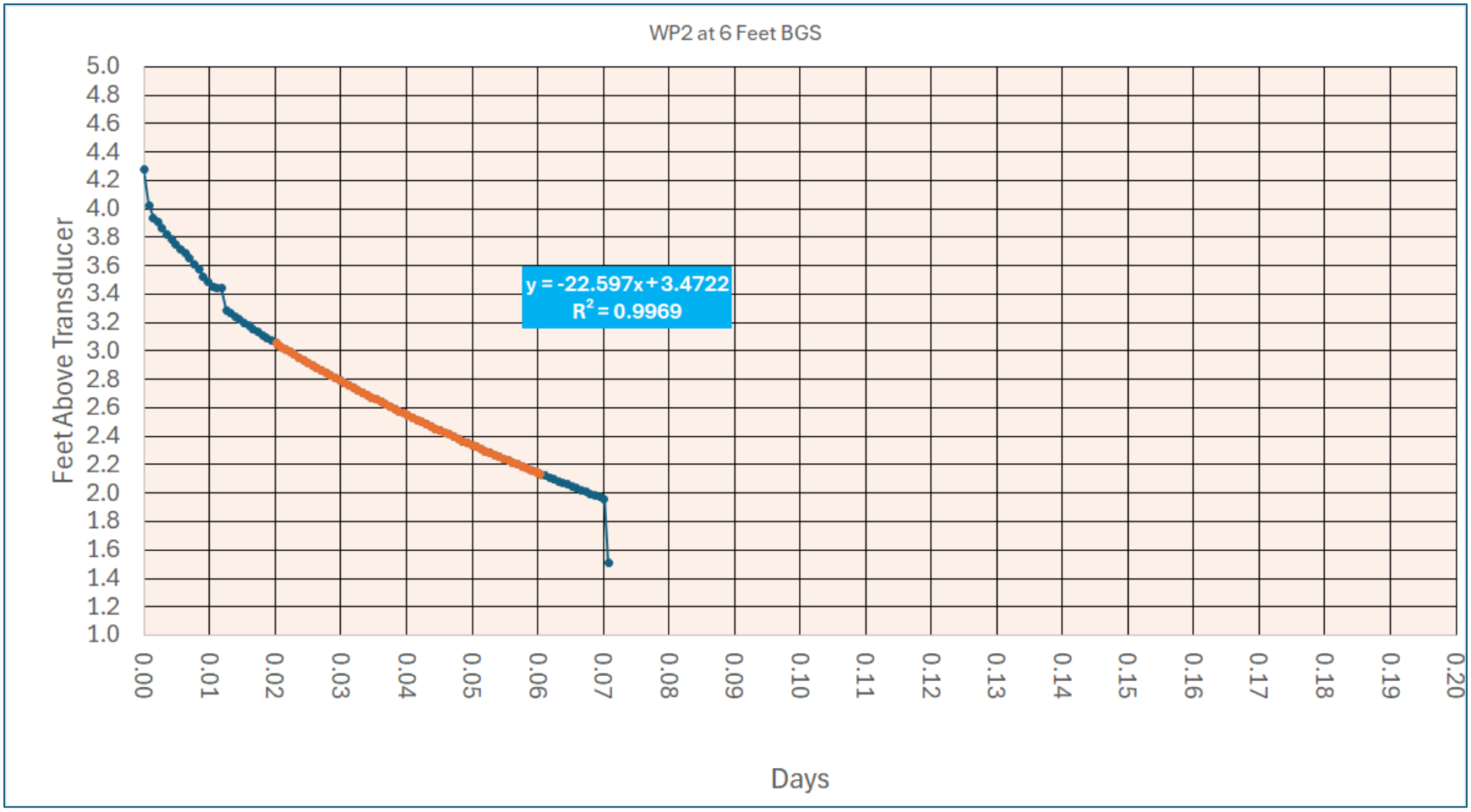

WP1 at 2 Feet BGS
Feet Above Transducer
5.0
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
4.1
4.0
y = -0.8397x + 4.7887
R² = 0.9955
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
0.12
0.13
0.14
0.15
0.16
0.17
0.18
0.19
0.20
Days

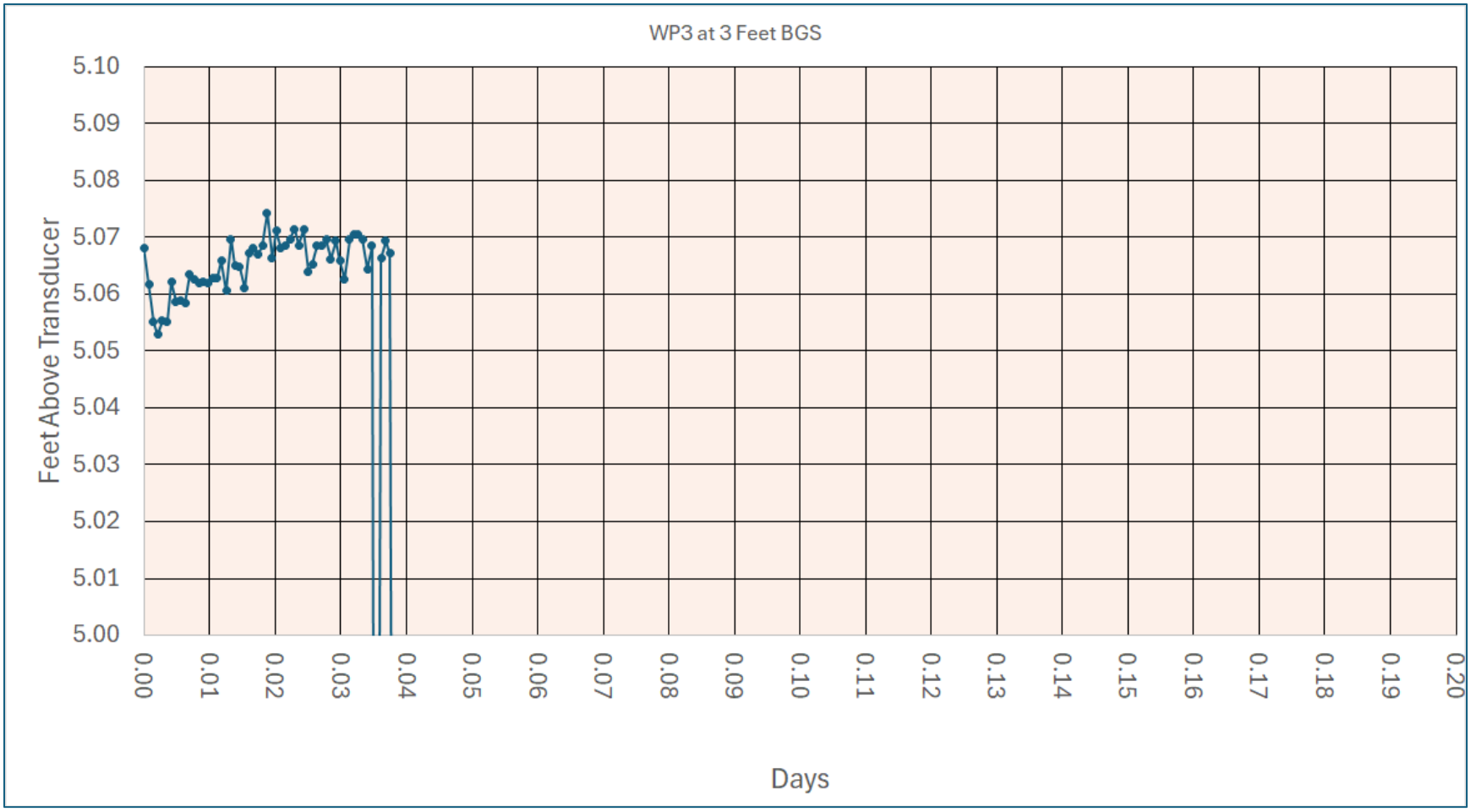

WP1 at 4 Feet BGS
Feet Above Transducer
5.0
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
4.1
4.0
y = -0.5022x + 5.0085
R² = 0.9986
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
0.12
0.13
0.14
0.15
0.16
0.17
0.18
0.19
0.20
Days

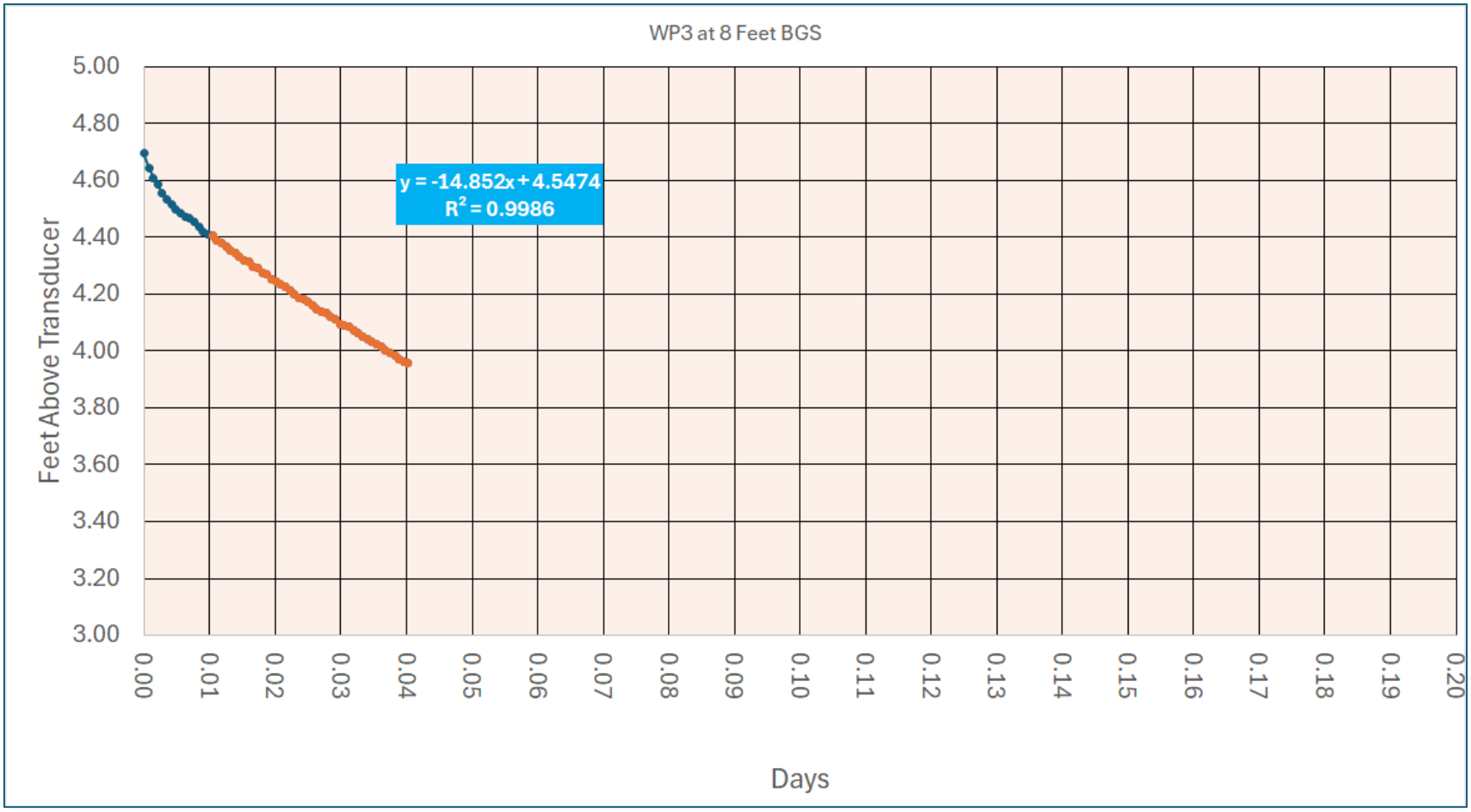

WP1 at 7 Feet BGS
Feet Above Transducer
Days
y = -22.709x + 1.9671
R² = 0.9964
y = -19.836x + 4.5673
R² = 0.9989
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
0.12
0.13
0.14
0.15
0.16
0.17
0.18
0.19
0.20


WP2 at 3 Feet BGS
y = -0.0564x + 4.6703
R² = 0.7195
Feet Above Transducer
4.70
4.69
4.68
4.67
4.66
4.65
4.64
4.63
4.62
4.61
4.60
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
0.12
0.13
0.14
0.15
0.16
0.17
0.18
0.19
0.20
Days

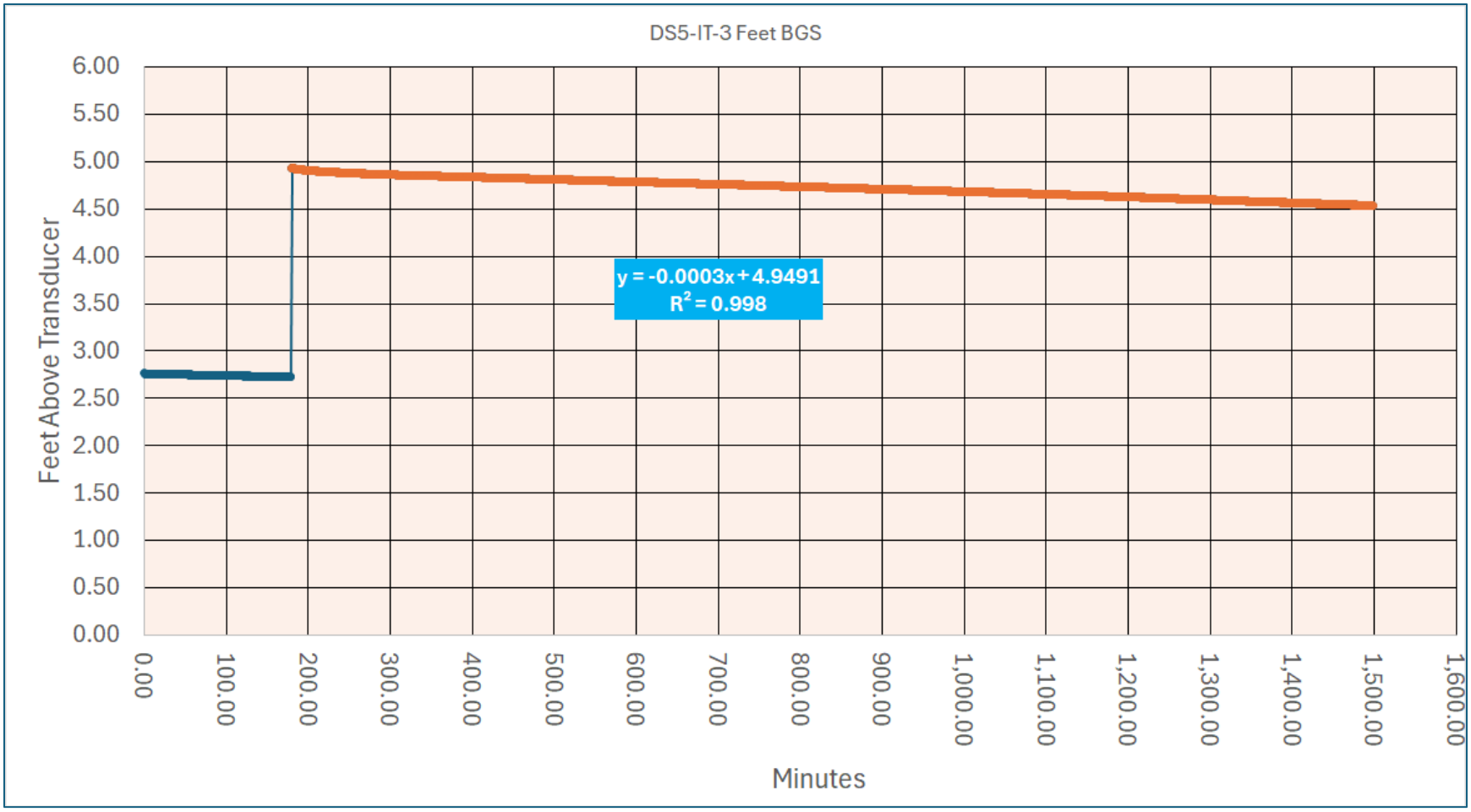

WP2 at 5 Feet BGS
Feet Above Transducer
5.0
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
4.1
4.0
y = -0.9774x + 4.5275
R² = 0.9752
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
0.12
0.13
0.14
0.15
0.16
0.17
0.18
0.19
0.20
Days

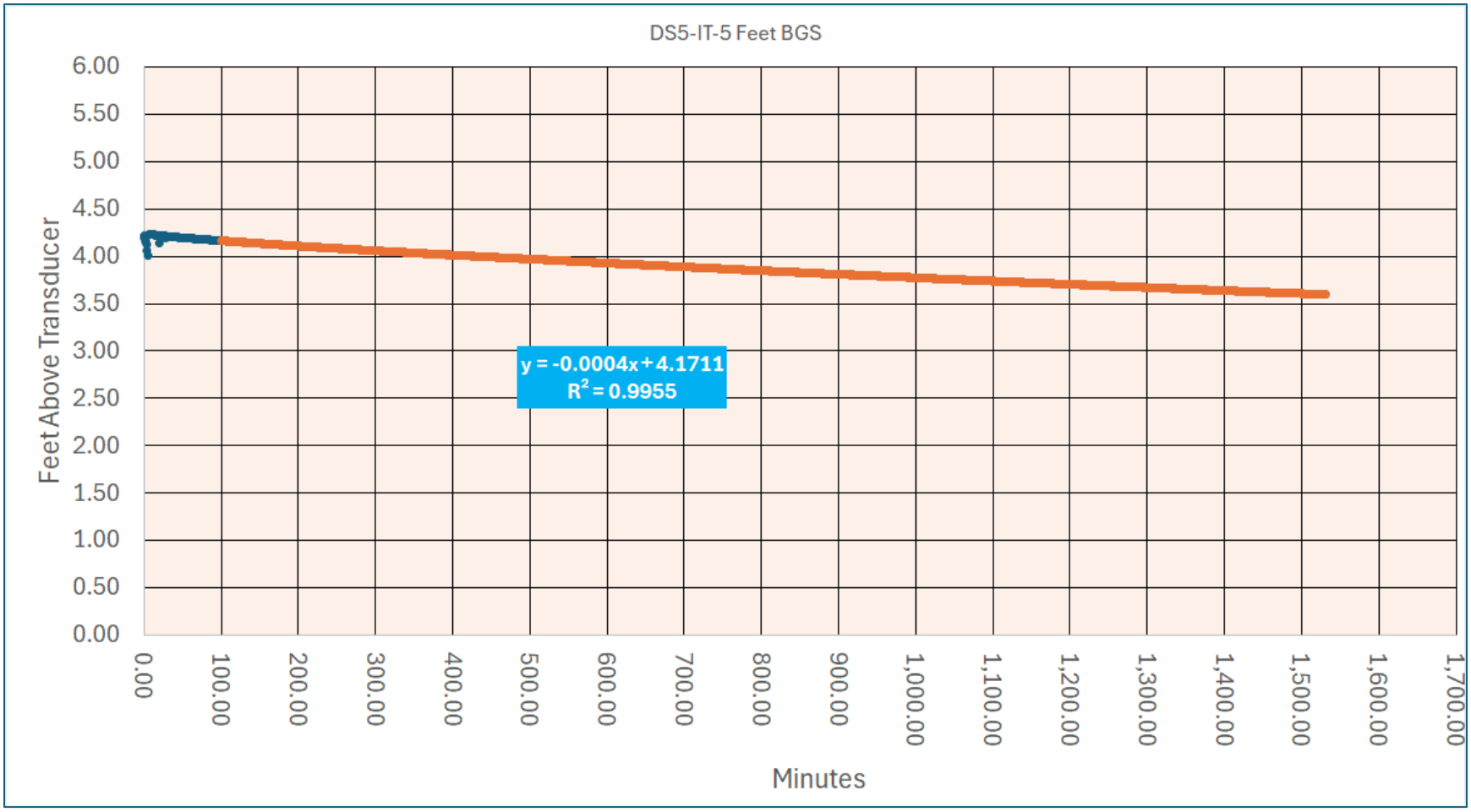

WP2 at 6 Feet BGS
Feet Above Transducer
5.0
4.8
4.6
4.4
4.2
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
y = -22.597x + 3.4722
R² = 0.9969
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
0.12
0.13
0.14
0.15
0.16
0.17
0.18
0.19
0.20
Days

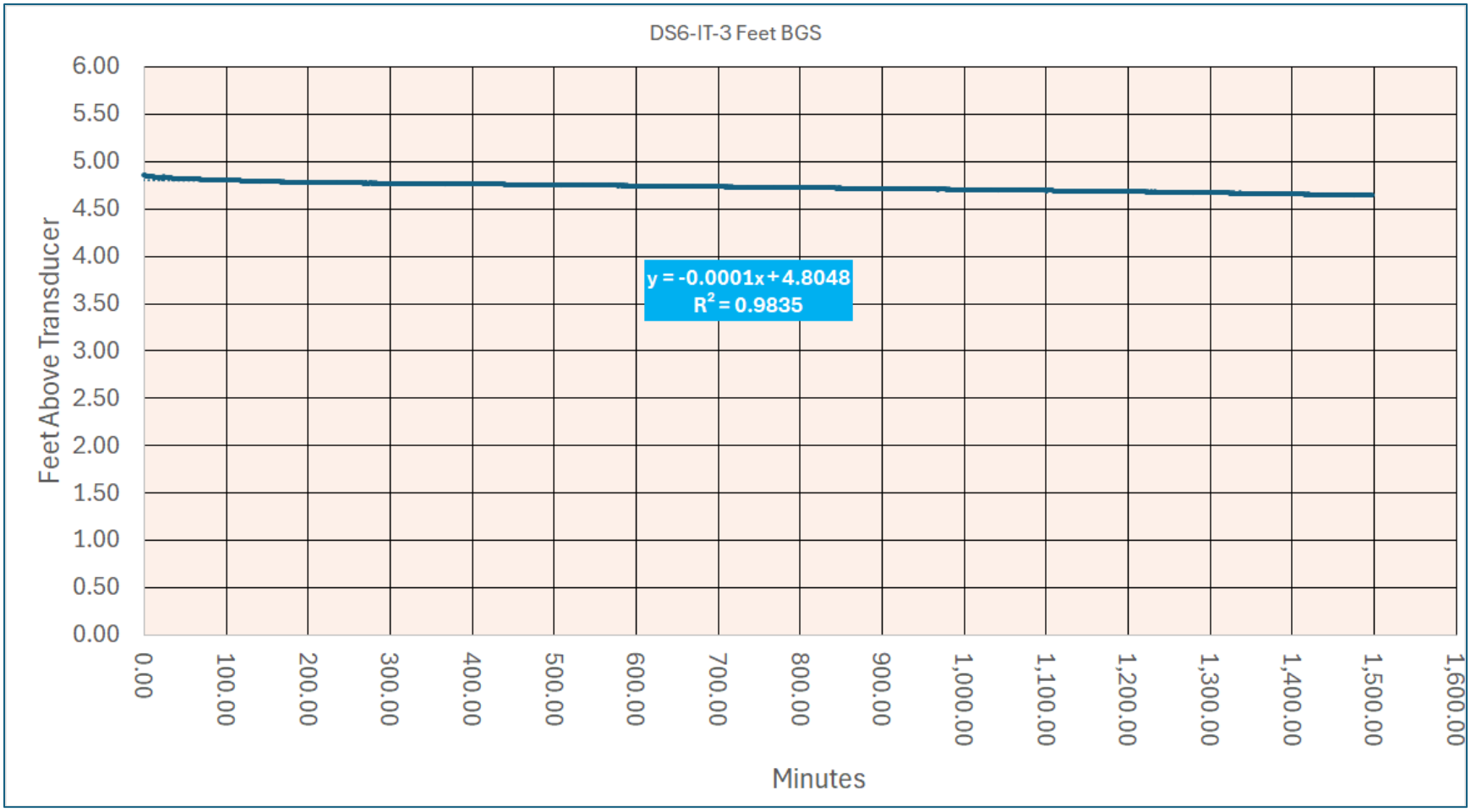

WP3 at 3 Feet BGS
Feet Above Transducer
5.10
5.09
5.08
5.07
5.06
5.05
5.04
5.03
5.02
5.01
5.00
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
0.12
0.13
0.14
0.15
0.16
0.17
0.18
0.19
0.20
Days

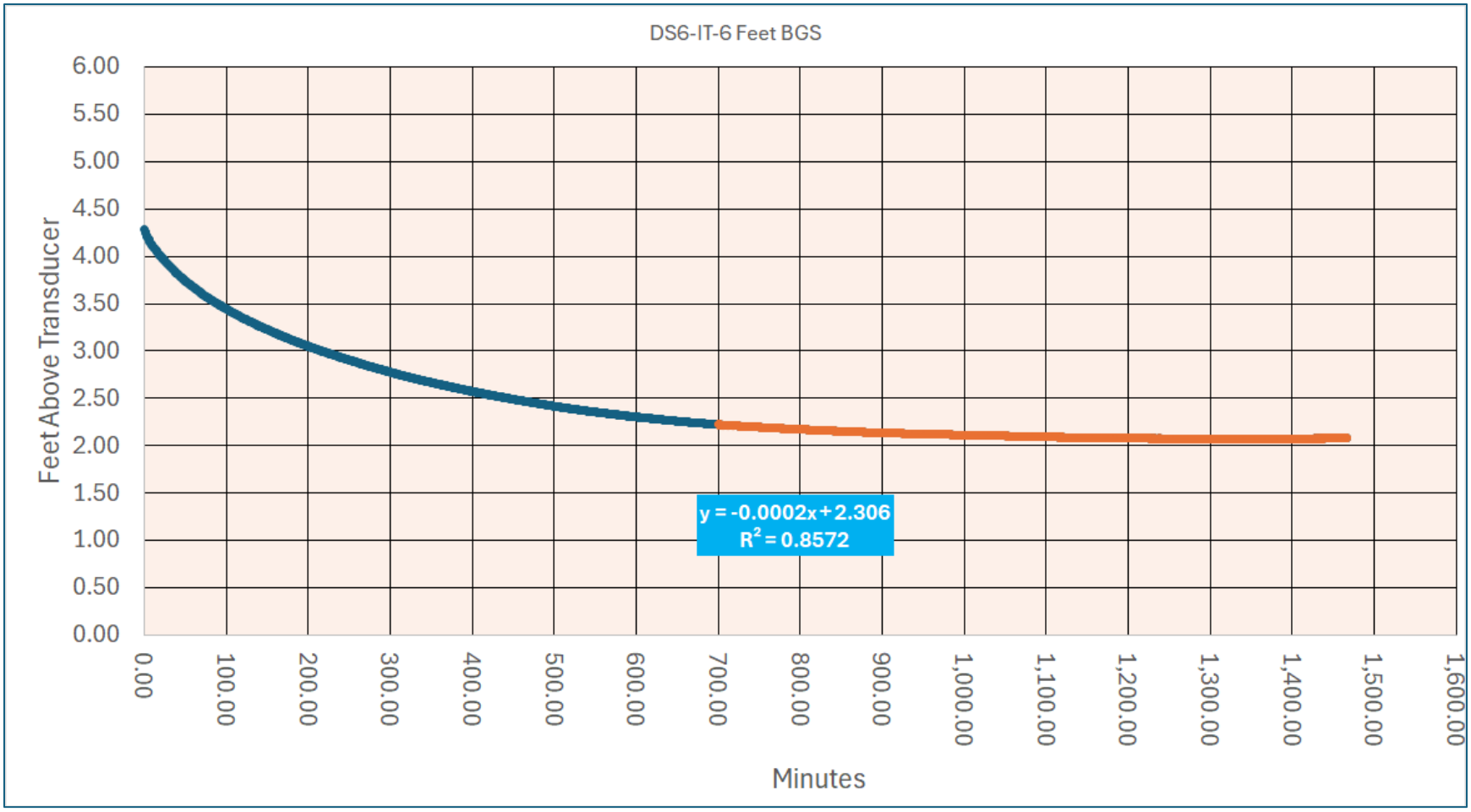

WP3 at 8 Feet BGS
y = -14.852x + 4.5474
R² = 0.9986
Feet Above Transducer
5.00
4.80
4.60
4.40
4.20
4.00
3.80
3.60
3.40
3.20
3.00
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
0.12
0.13
0.14
0.15
0.16
0.17
0.18
0.19
0.20
Days

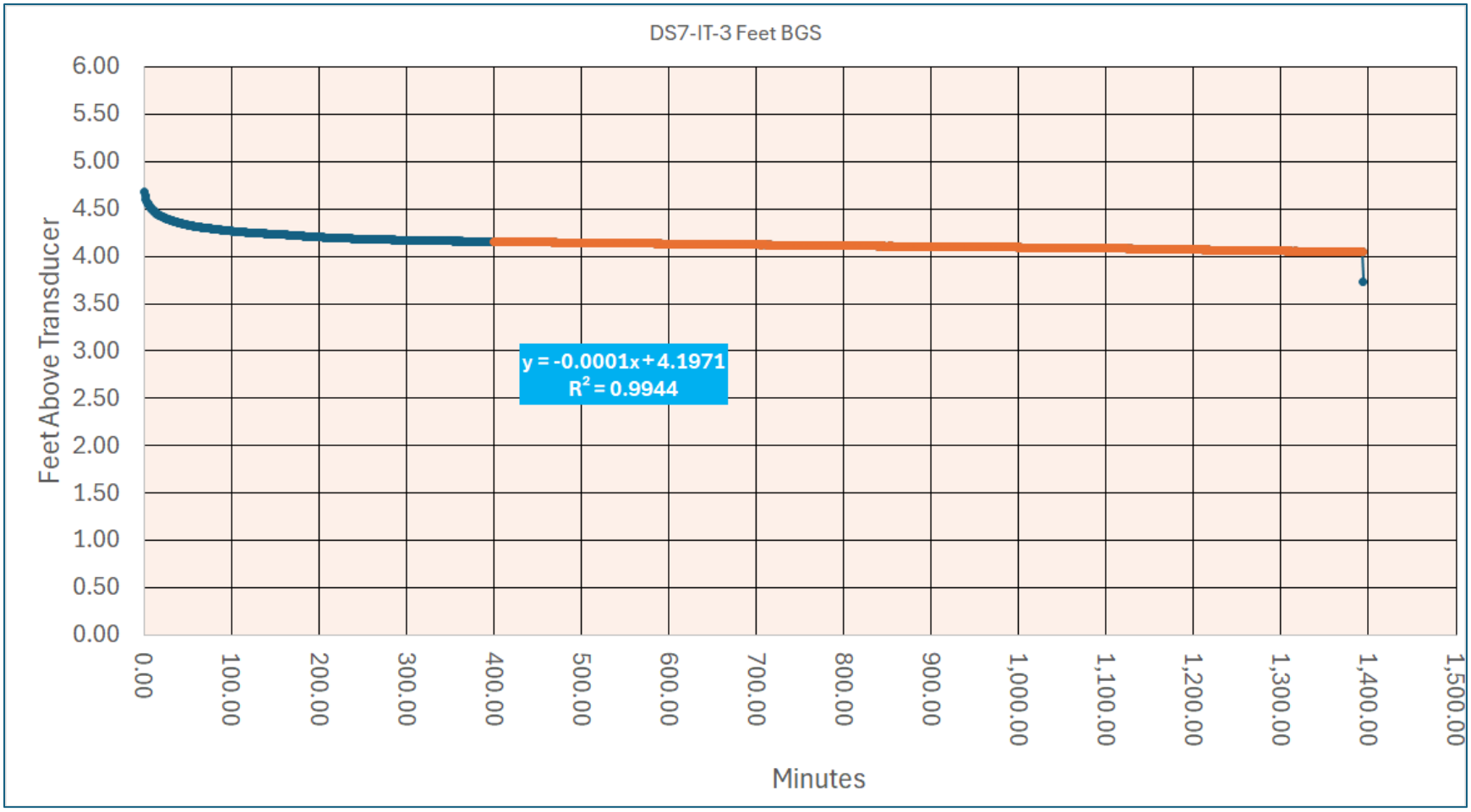
Site N3

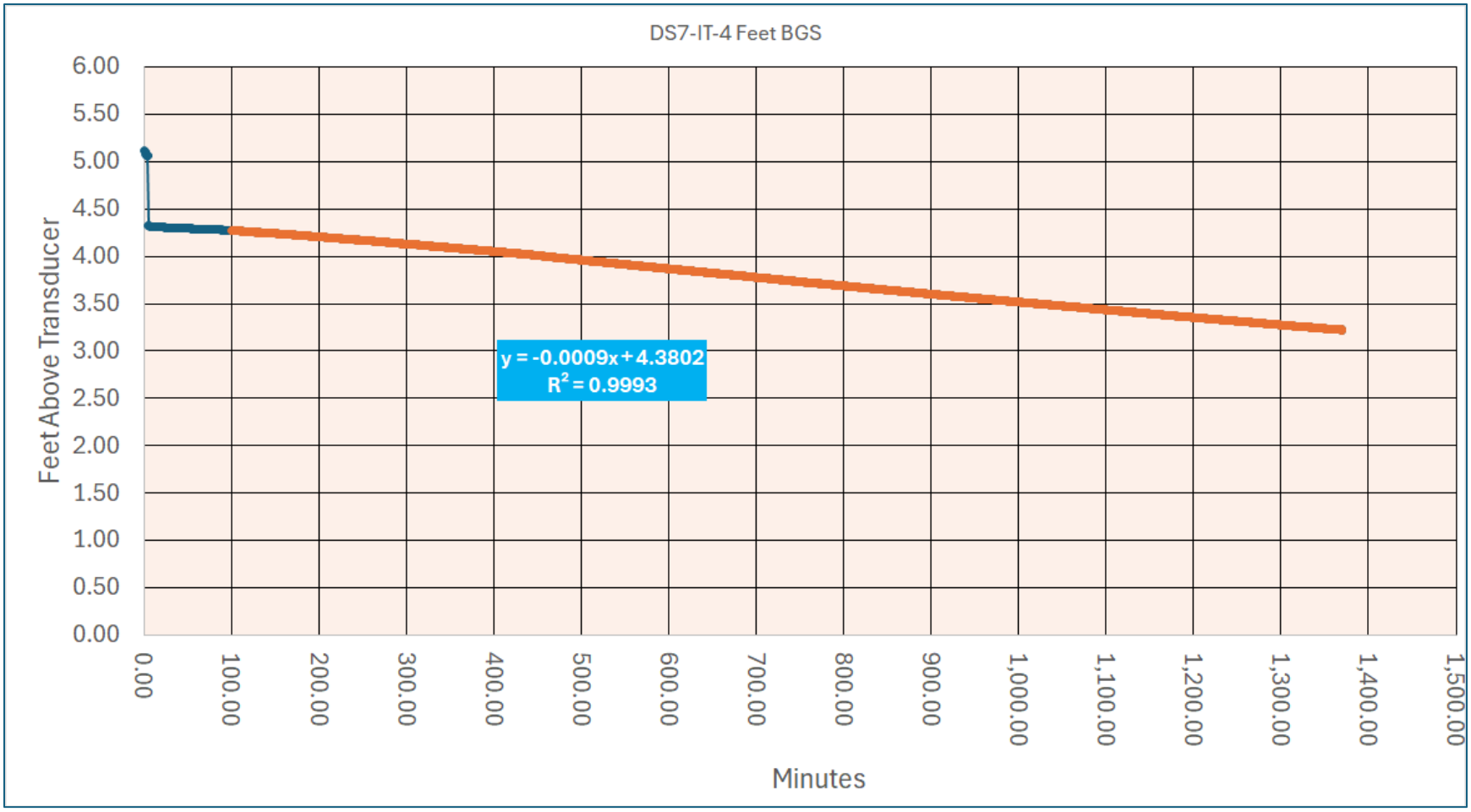

DS5-IT-3 Feet BGS
Feet Above Transducer
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
y = -0.0003x + 4.9491
R² = 0.998
0.00
100.00
200.00
300.00
400.00
500.00
600.00
700.00
800.00
900.00
1,000.00
1,100.00
1,200.00
1,300.00
1,400.00
1,500.00
1,600.00
Minutes

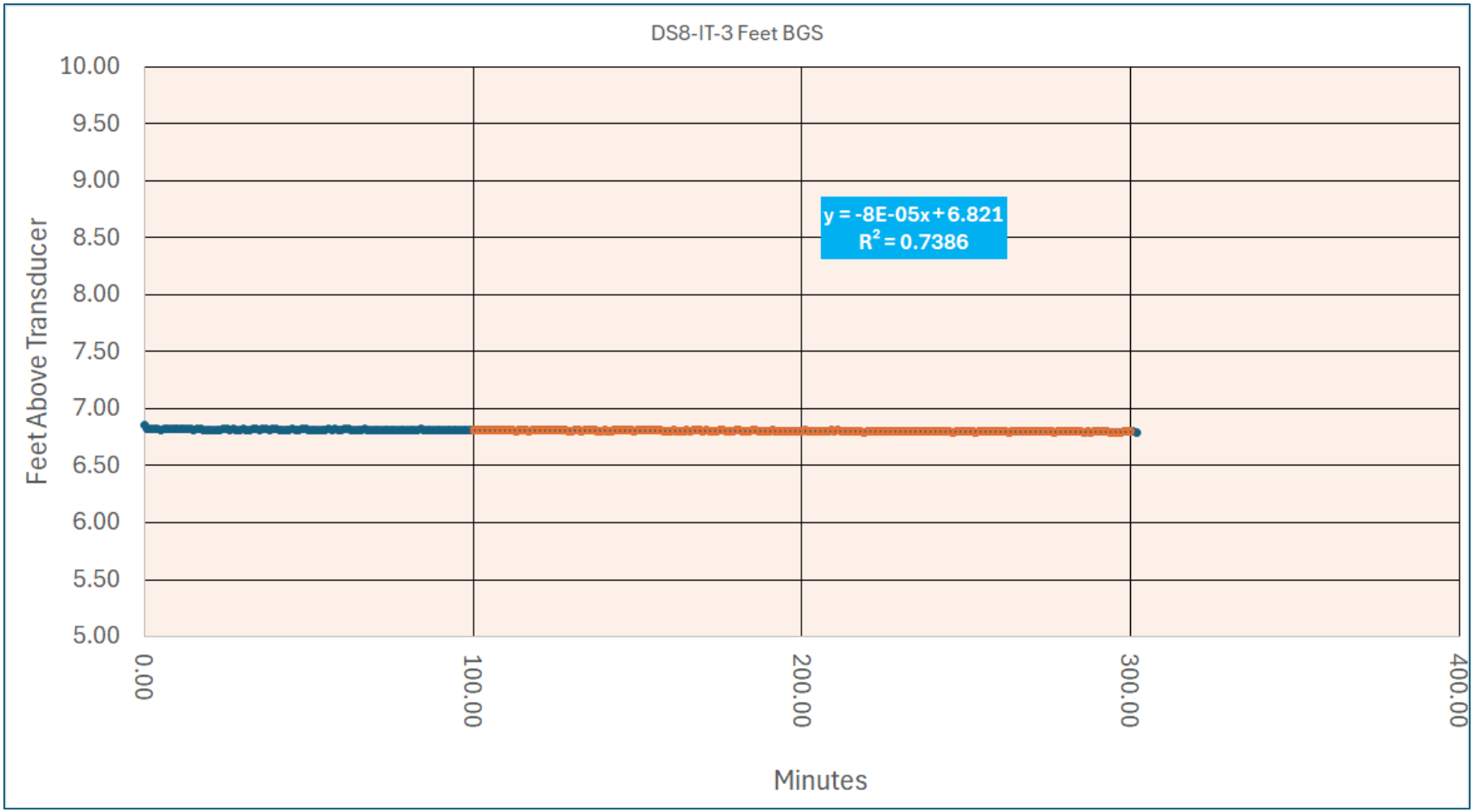

DS5-IT-5 Feet BGS
Feet Above Transducer
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
y = -0.0004x + 4.1711
R² = 0.9955
0.00
100.00
200.00
300.00
400.00
500.00
600.00
700.00
800.00
900.00
1,000.00
1,100.00
1,200.00
1,300.00
1,400.00
1,500.00
1,600.00
1,700.00
Minutes

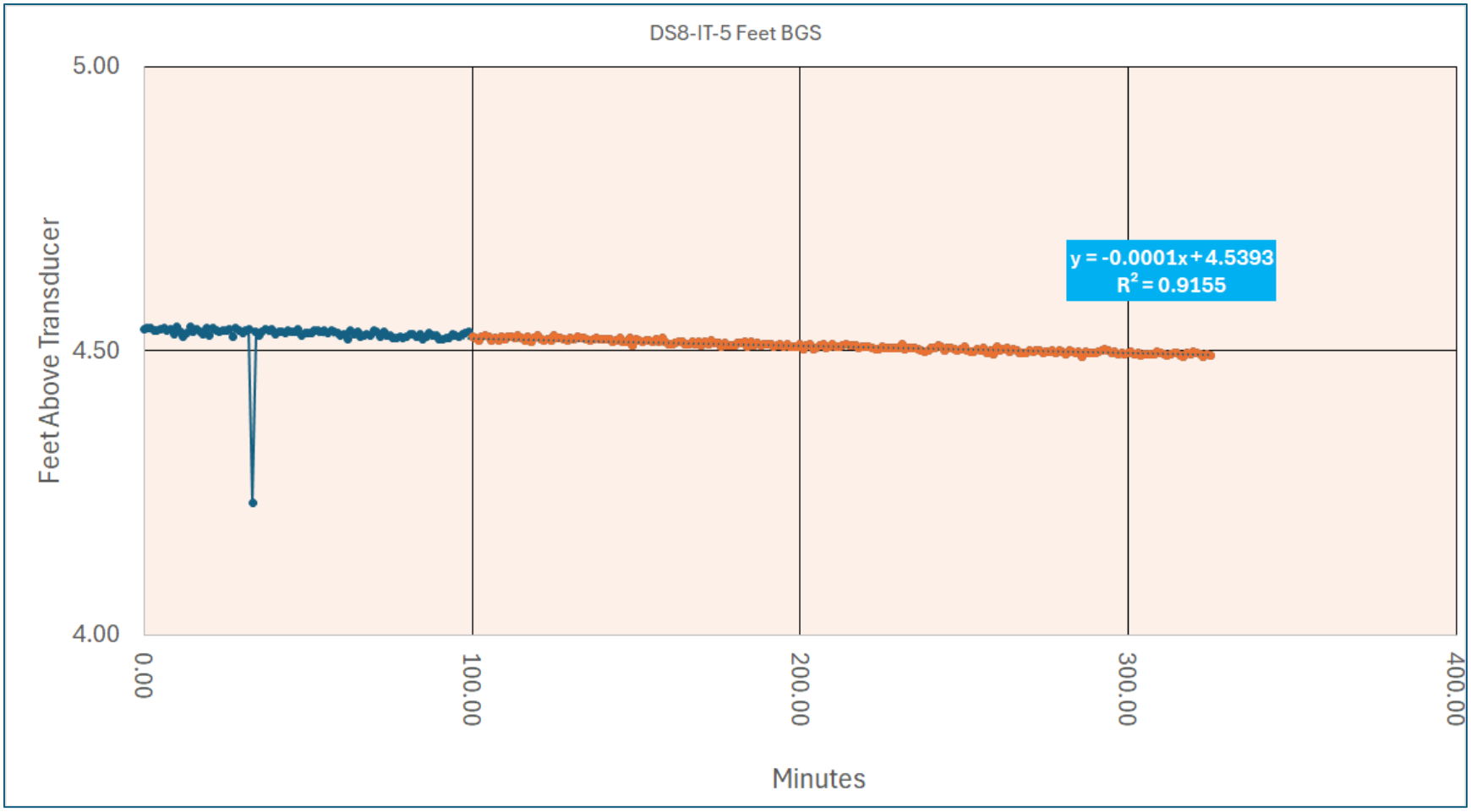

DS6-IT-3 Feet BGS
Feet Above Transducer
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
y = -0.0001x + 4.8048
R² = 0.9835
0.00
100.00
200.00
300.00
400.00
500.00
600.00
700.00
800.00
900.00
1,000.00
1,100.00
1,200.00
1,300.00
1,400.00
1,500.00
1,600.00
Minutes

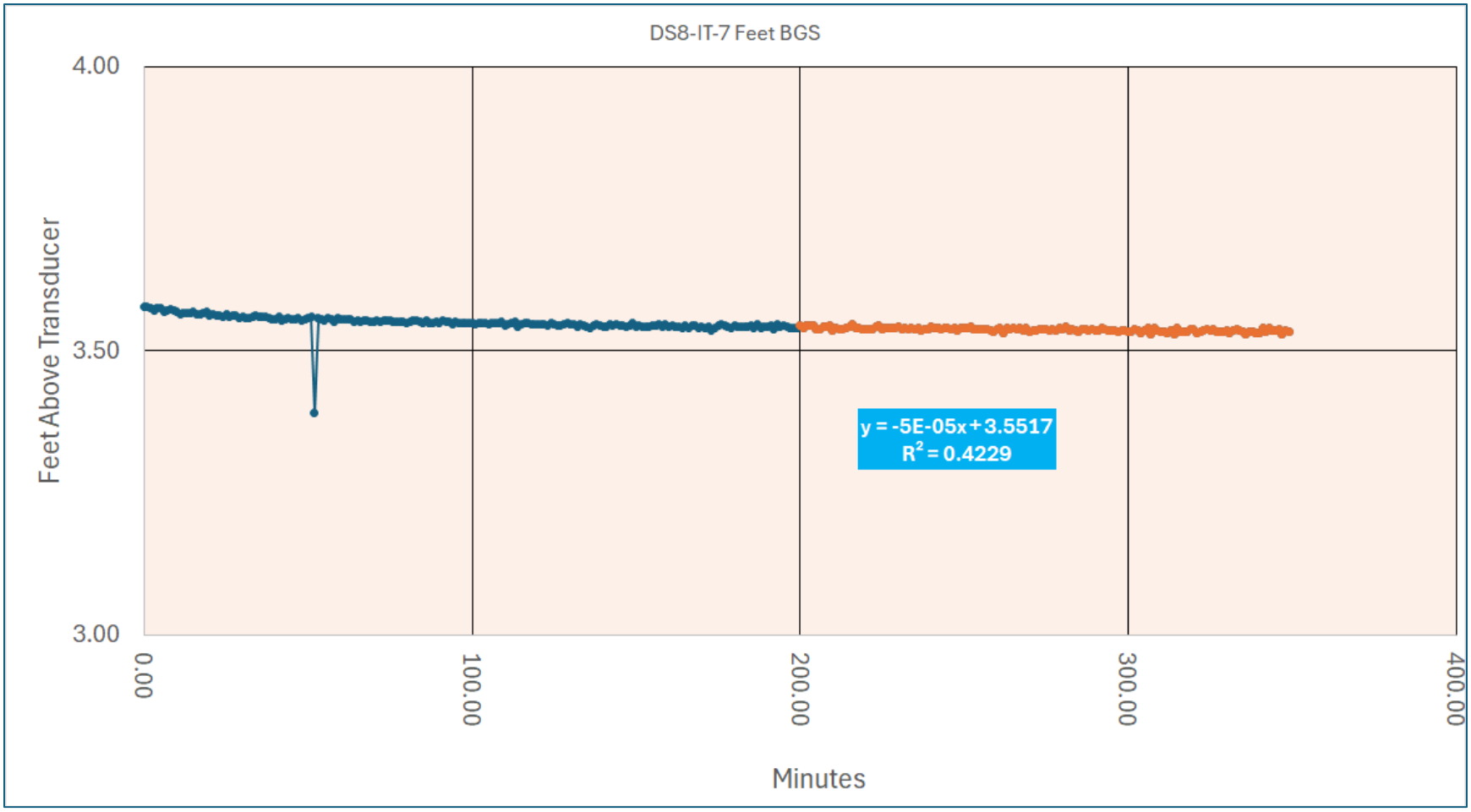

DS6-IT-6 Feet BGS
Feet Above Transducer
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.00
100.00
200.00
300.00
400.00
500.00
600.00
700.00
800.00
900.00
1,000.00
1,100.00
1,200.00
1,300.00
1,400.00
1,500.00
1,600.00
Minutes
y = -0.0002x + 2.306
R² = 0.8572

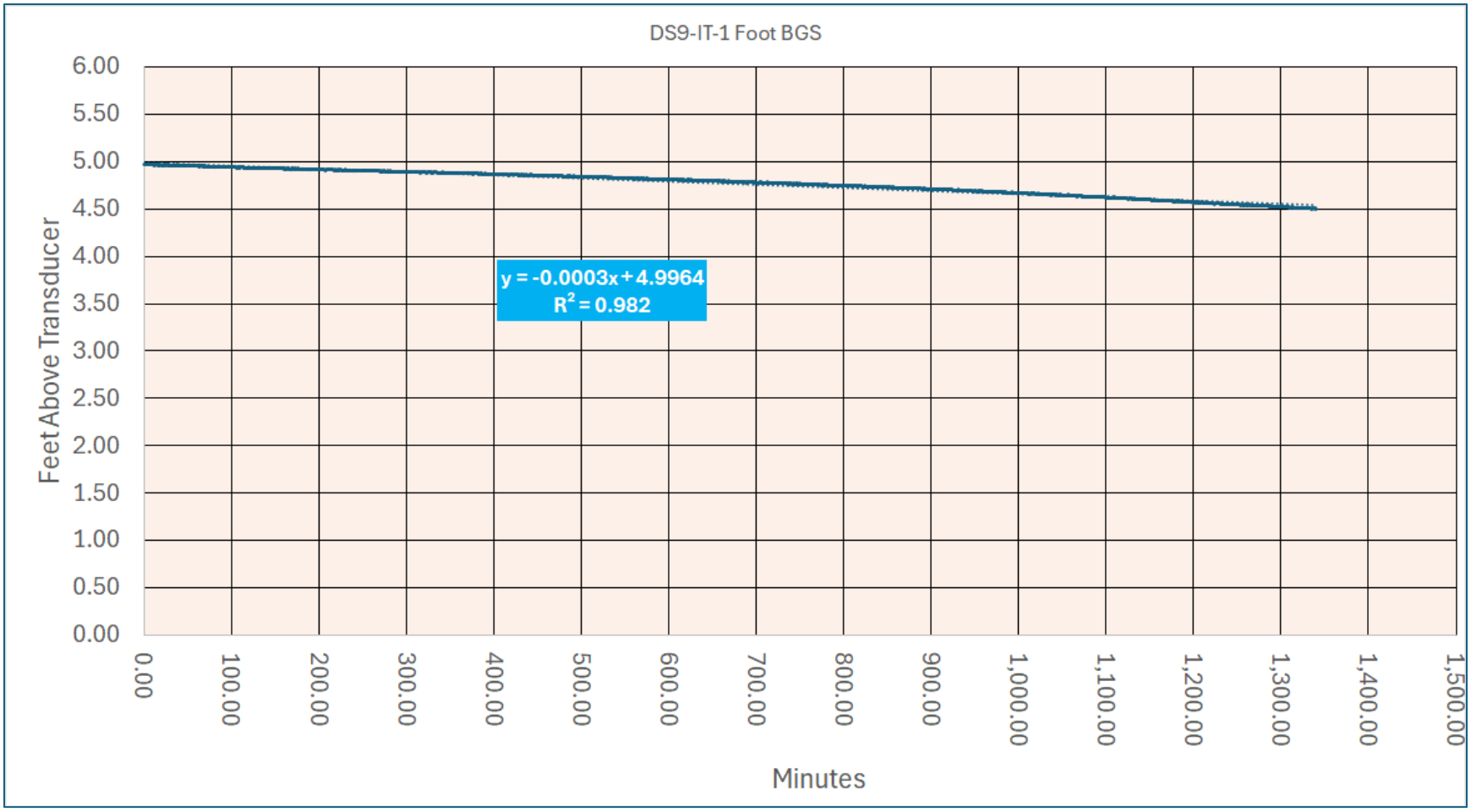

DS7-IT-3 Feet BGS
Feet Above Transducer
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.00
100.00
200.00
300.00
400.00
500.00
600.00
700.00
800.00
900.00
1,000.00
1,100.00
1,200.00
1,300.00
1,400.00
1,500.00
Minutes
y = -0.0001x + 4.1971
R² = 0.9944

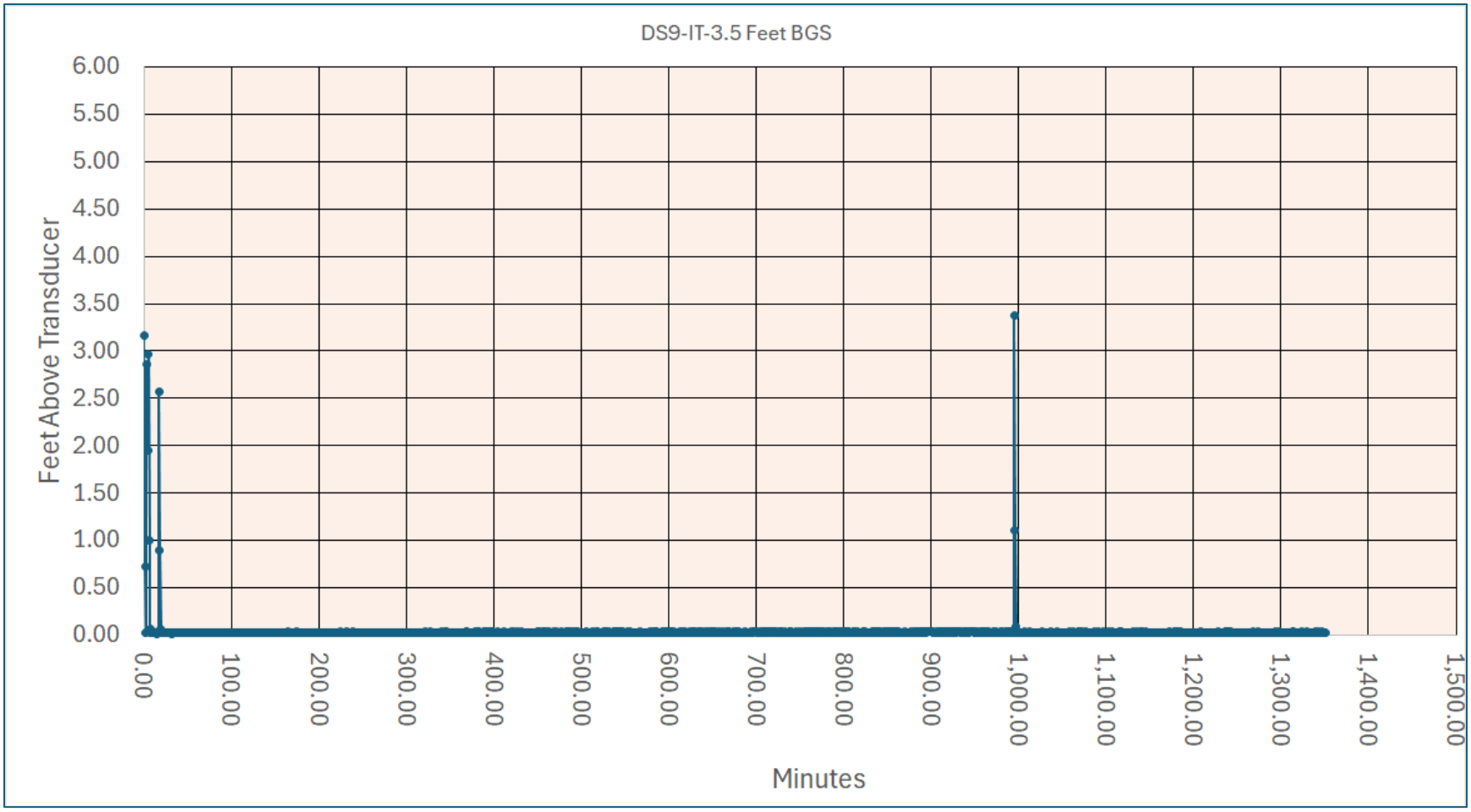

DS7-IT-4 Feet BGS
Feet Above Transducer
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.00
100.00
200.00
300.00
400.00
500.00
600.00
700.00
800.00
900.00
1,000.00
1,100.00
1,200.00
1,300.00
1,400.00
1,500.00
Minutes
y = -0.0009x + 4.3802
R² = 0.9993


DS8-IT-3 Feet BGS
10.00
9.50
9.00
8.50
8.00
7.50
7.00
6.50
6.00
5.50
5.00
Feet Above Transducer
y = -8E-05x + 6.821
R² = 0.7386
0.00
100.00
200.00
300.00
400.00
Minutes

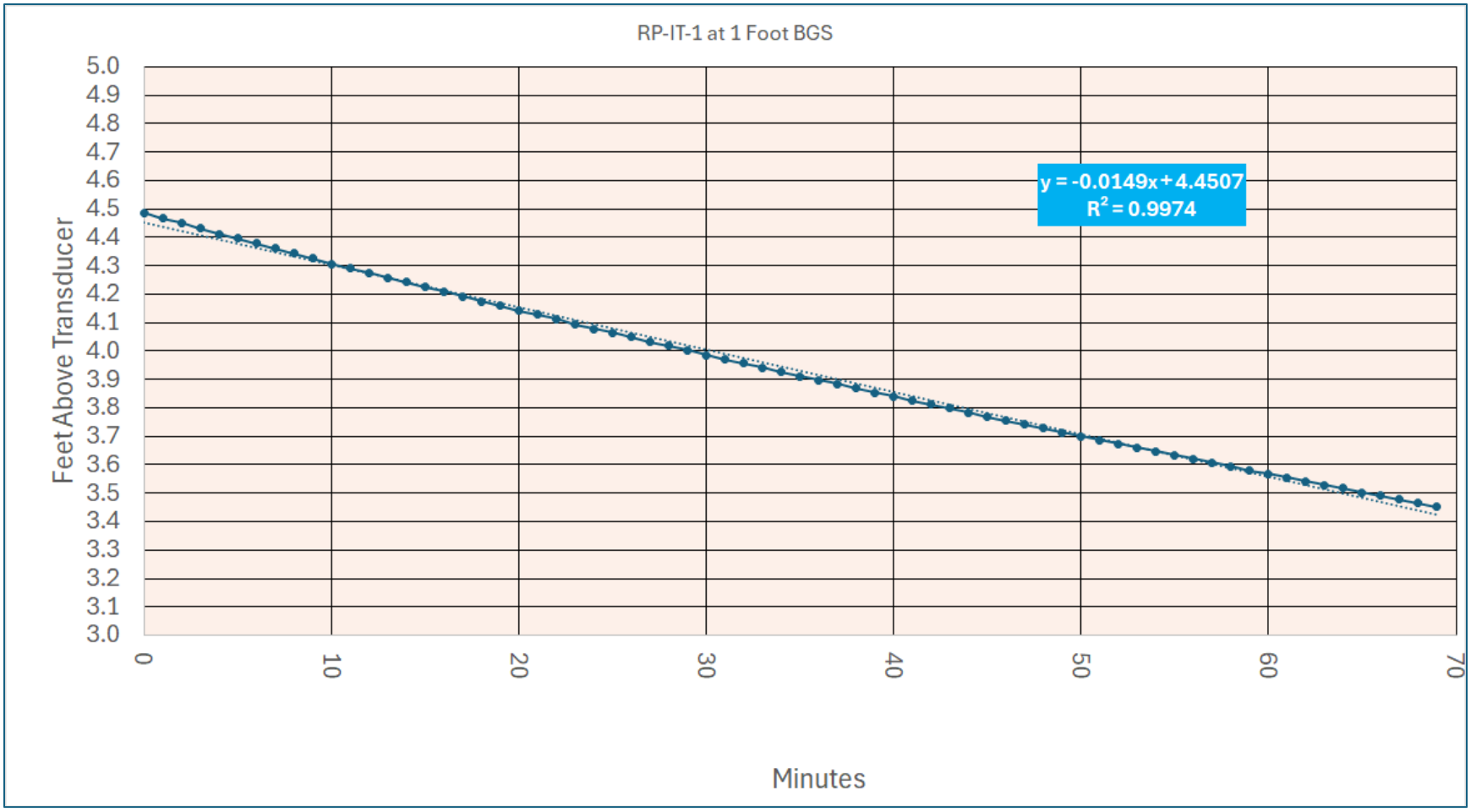

DS8-IT-5 Feet BGS
5.00
4.50
4.00
Feet Above Transducer
y = -0.0001x+4.5393
R² = 0.9155
0.00
100.00
200.00
300.00
400.00
Minutes

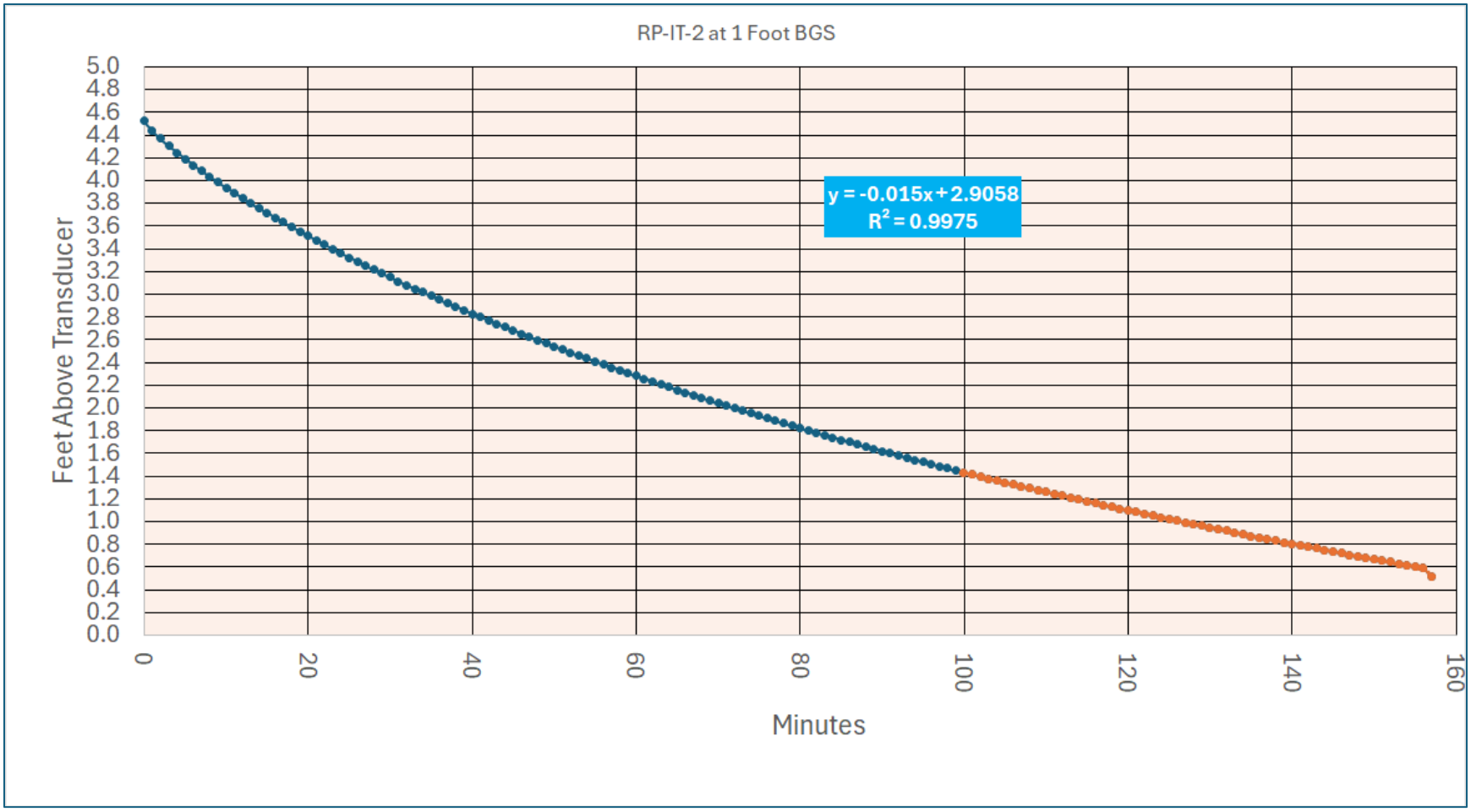

DS8-IT-7 Feet BGS
4.00
3.50
3.00
Feet Above Transducer
0.00
100.00
200.00
300.00
400.00
Minutes
y = -5E-05x + 3.5517
R² = 0.4229

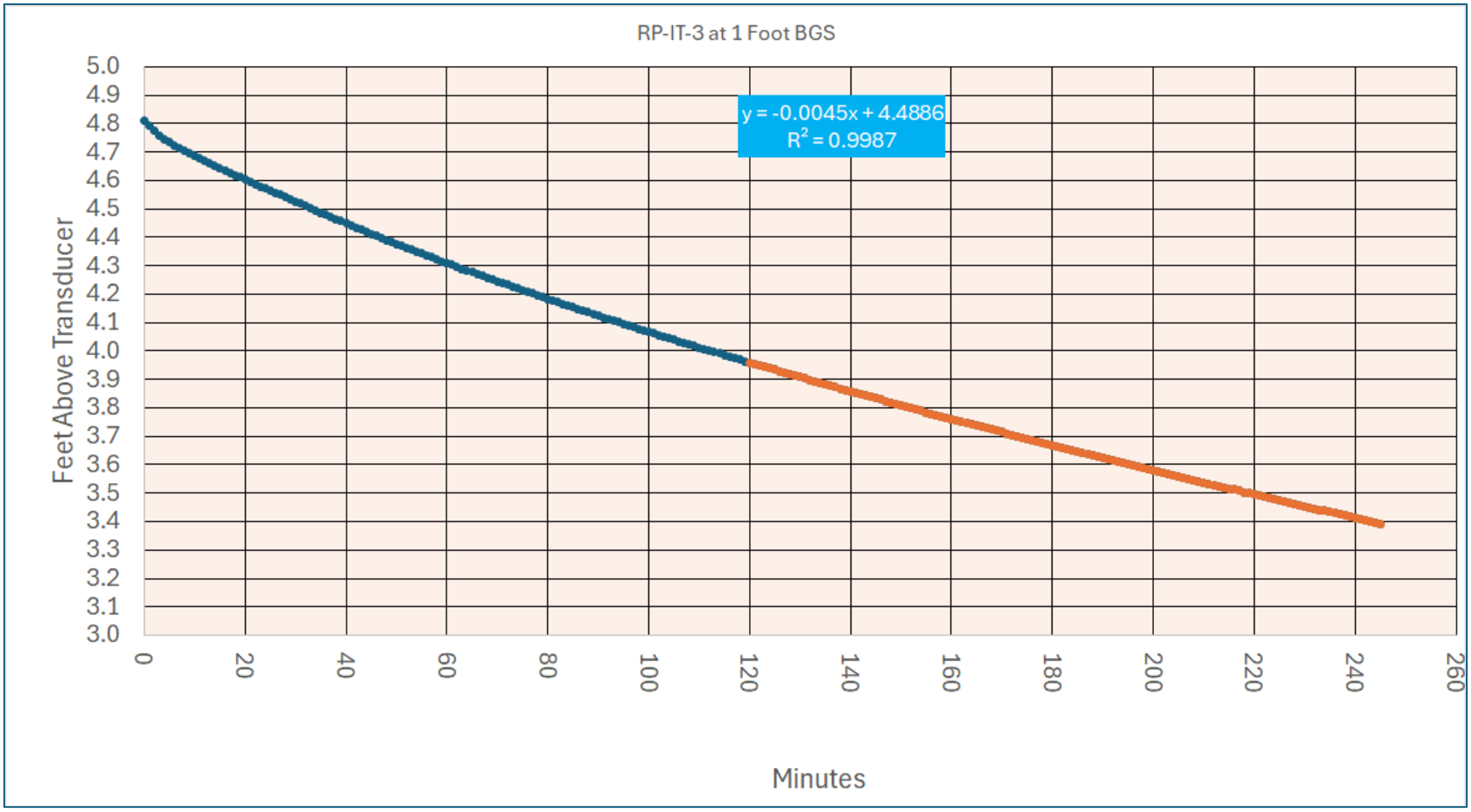

DS9-IT-1 Foot BGS
Feet Above Transducer
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
y = -0.0003x + 4.9964
R² = 0.982
0.00
100.00
200.00
300.00
400.00
500.00
600.00
700.00
800.00
900.00
1,000.00
1,100.00
1,200.00
1,300.00
1,400.00
1,500.00
Minutes

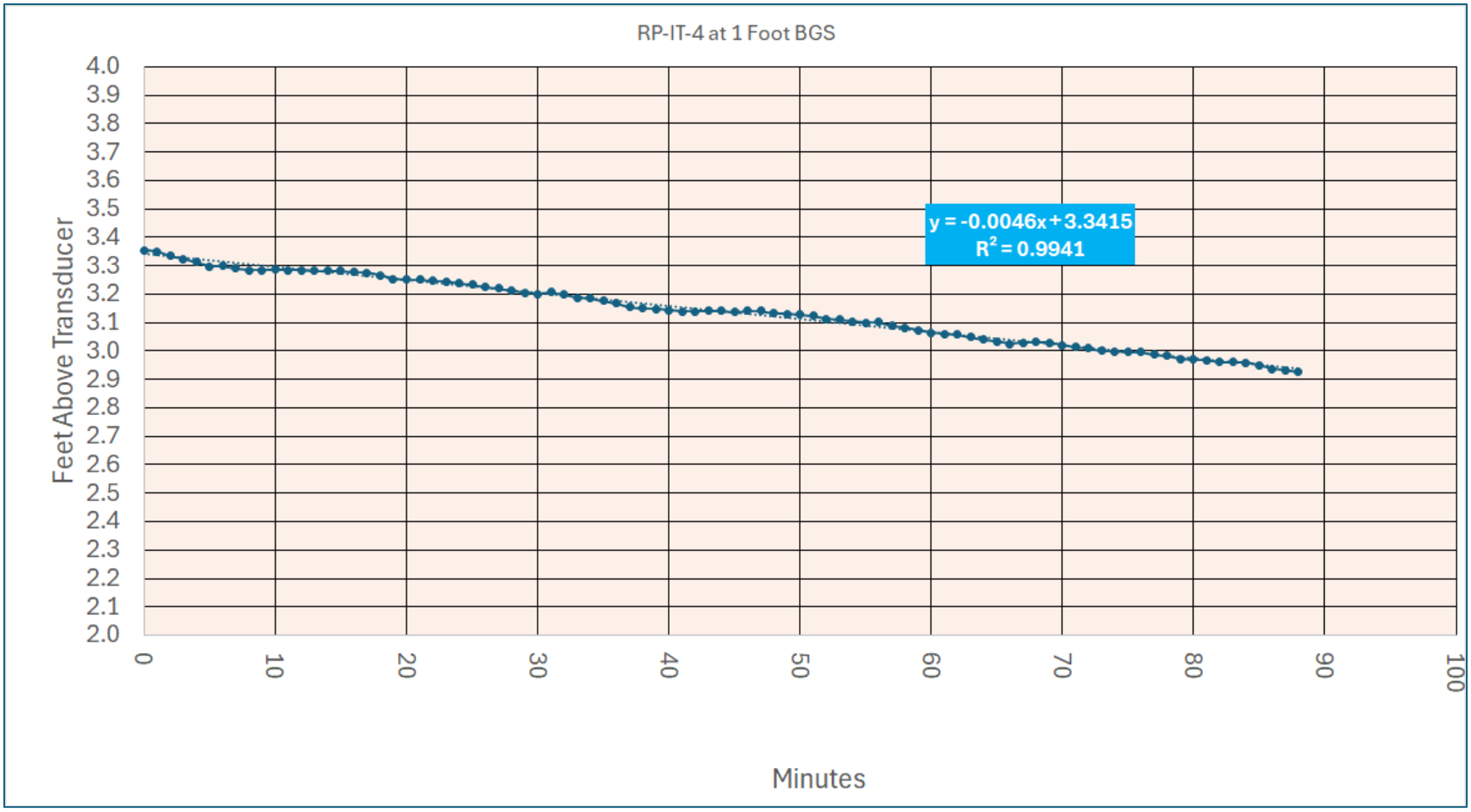

DS9-IT-3.5 Feet BGS
Feet Above Transducer
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.00
100.00
200.00
300.00
400.00
500.00
600.00
700.00
800.00
900.00
1,000.00
1,100.00
1,200.00
1,300.00
1,400.00
1,500.00
Minutes

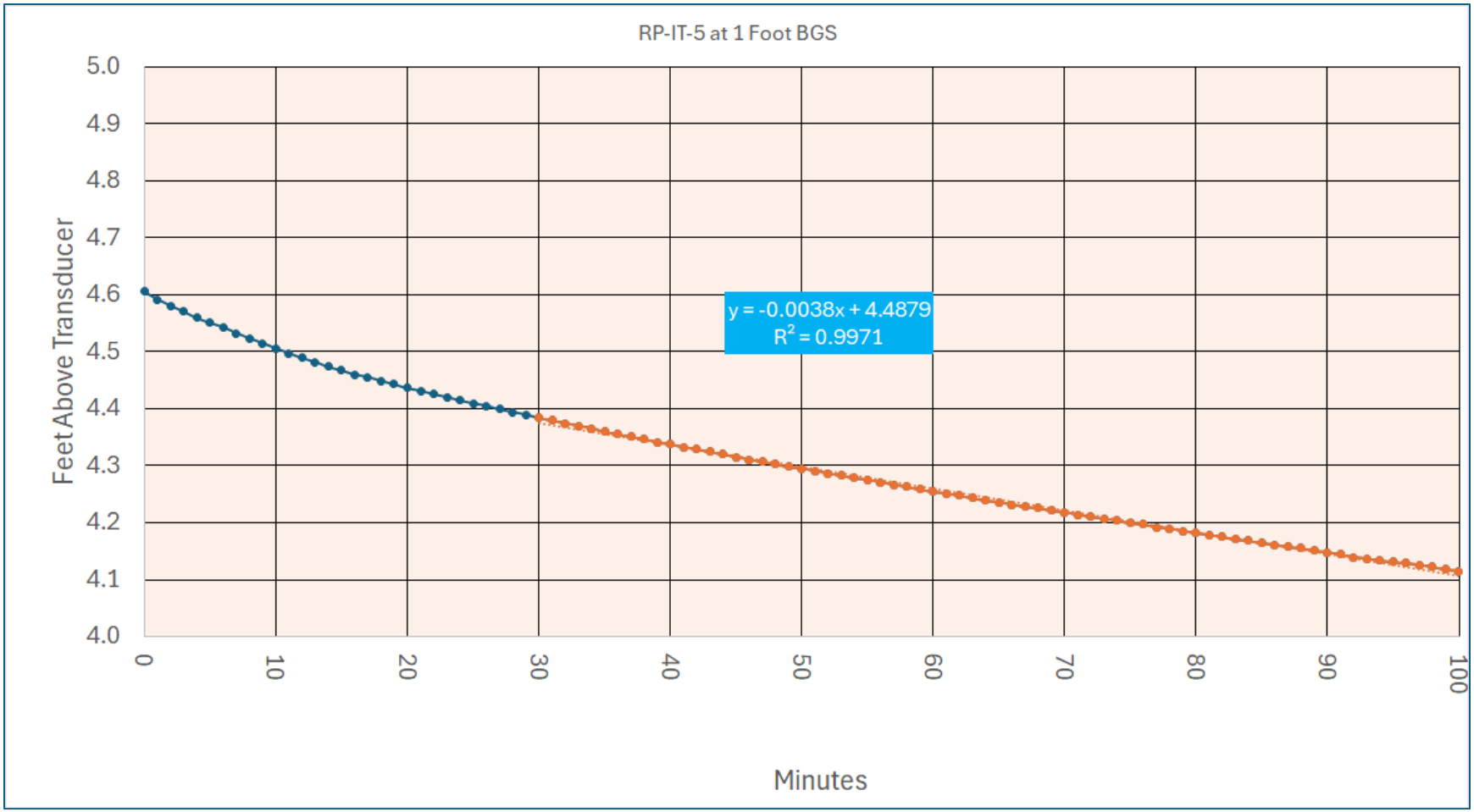
Site N4

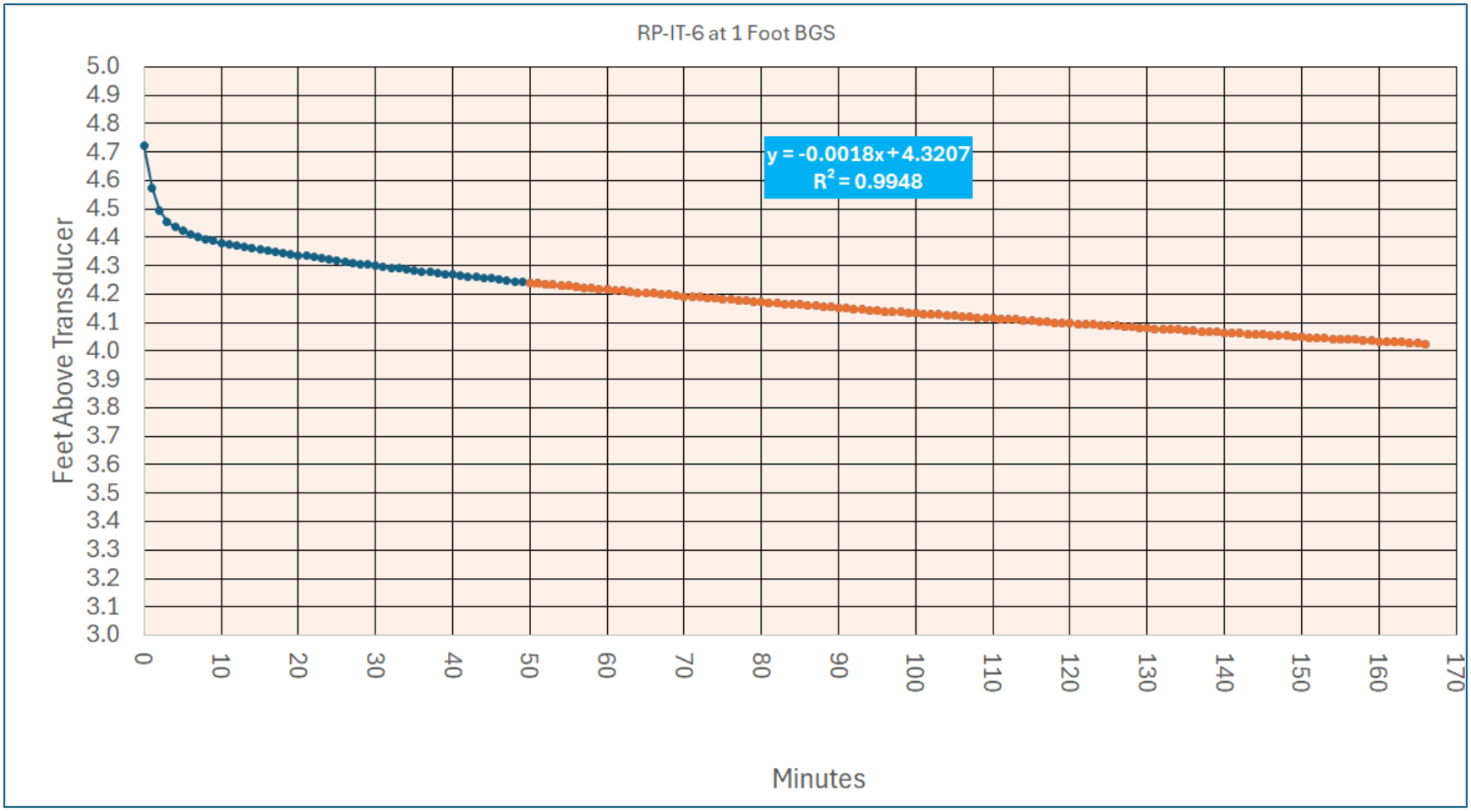

RP-IT-1 at 1 Foot BGS
Feet Above Transducer
5.0
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
4.1
4.0
3.9
3.8
3.7
3.6
3.5
3.4
3.3
3.2
3.1
3.0
0
10
20
30
40
50
60
70
Minutes
y = -0.0149x + 4.4507
R² = 0.9974

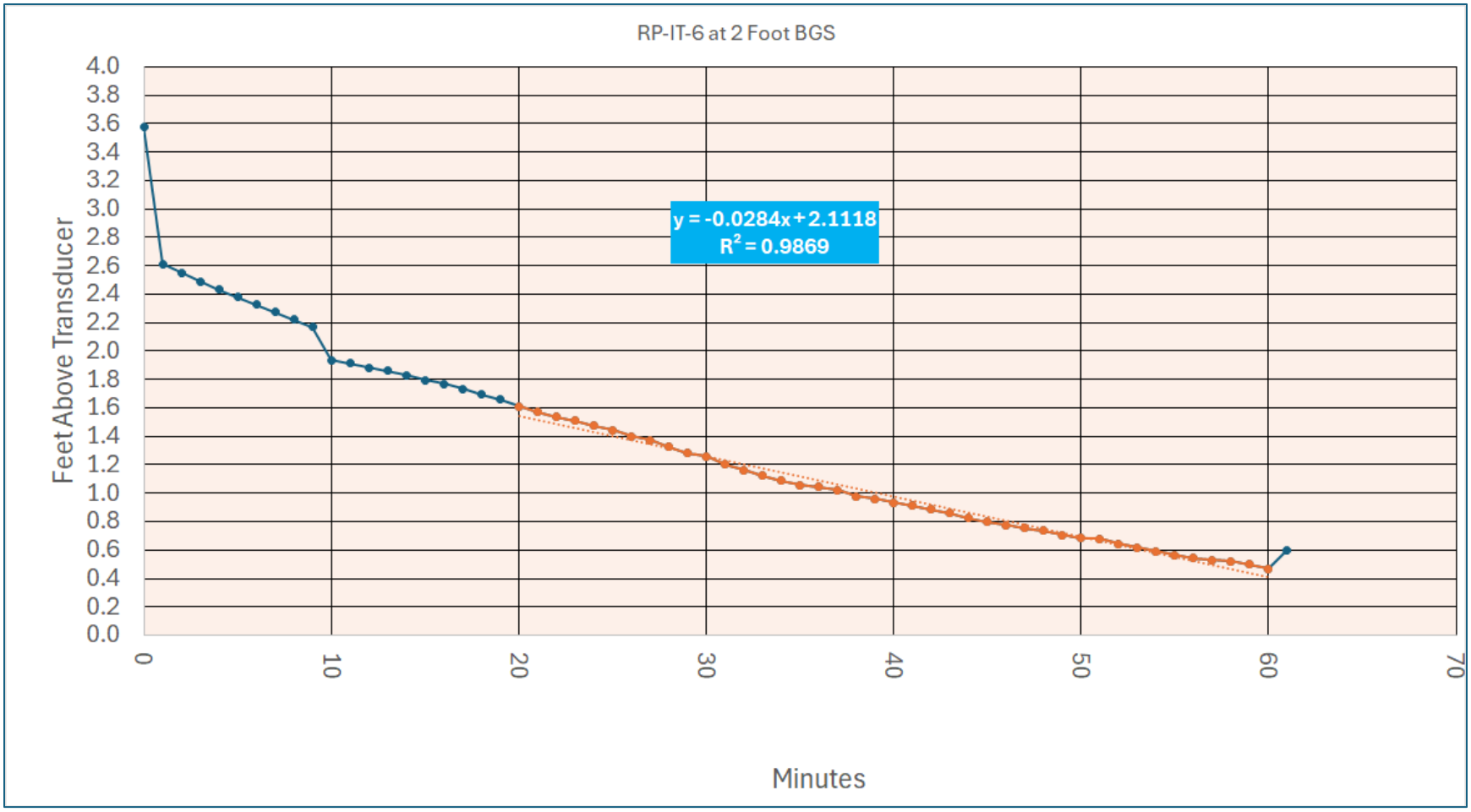

RP-IT-2 at 1 Foot BGS
Feet Above Transducer
5.0
4.8
4.6
4.4
4.2
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
20
40
60
80
100
120
140
160
Minutes
y = -0.015x + 2.9058
R² = 0.9975

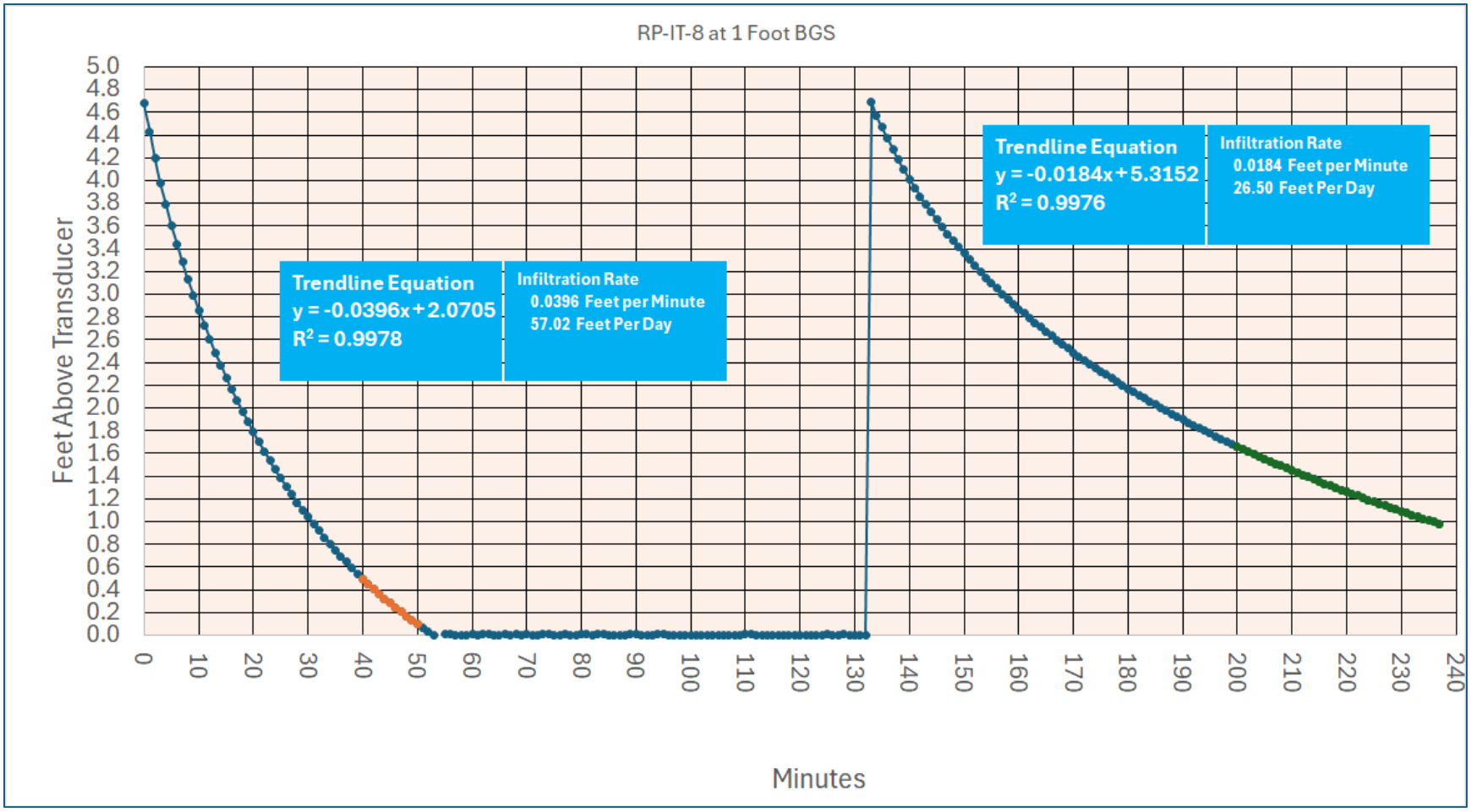

RP-IT-3 at 1 Foot BGS
y = -0.0045x + 4.4886
R² = 0.9987
Feet Above Transducer
5.0
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
4.1
4.0
3.9
3.8
3.7
3.6
3.5
3.4
3.3
3.2
3.1
3.0
0
20
40
60
80
100
120
140
160
180
200
220
240
260
Minutes

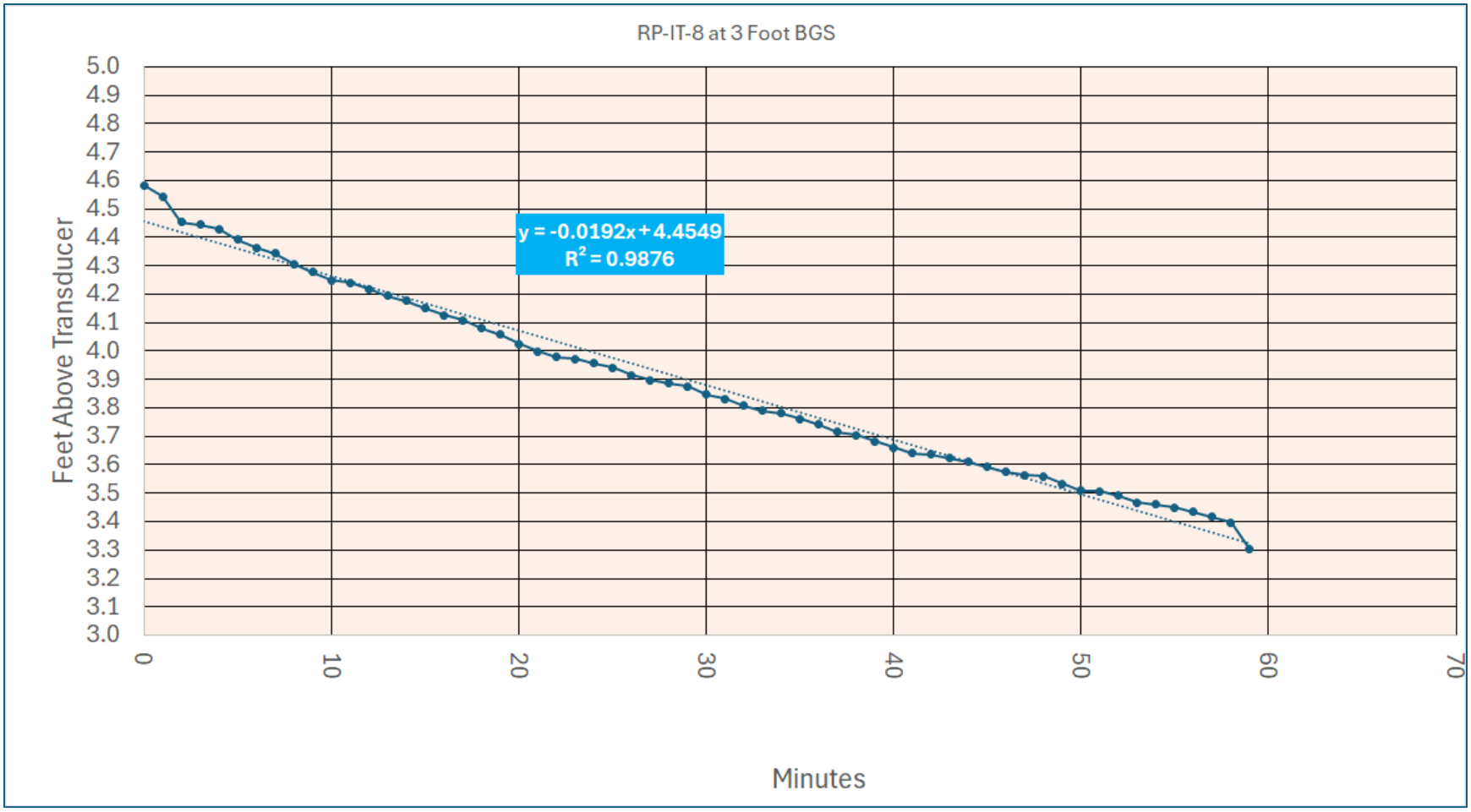

RP-IT-4 at 1 Foot BGS
Feet Above Transducer
4.0
3.9
3.8
3.7
3.6
3.5
3.4
3.3
3.2
3.1
3.0
2.9
2.8
2.7
2.6
2.5
2.4
2.3
2.2
2.1
2.0
0
10
20
30
40
50
60
70
80
90
100
Minutes
y = -0.0046x + 3.3415
R² = 0.9941


RP-IT-5 at 1 Foot BGS
Feet Above Transducer
5.0
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
4.1
4.0
0
10
20
30
40
50
60
70
80
90
100
Minutes
y = -0.0038x + 4.4879
R² = 0.9971

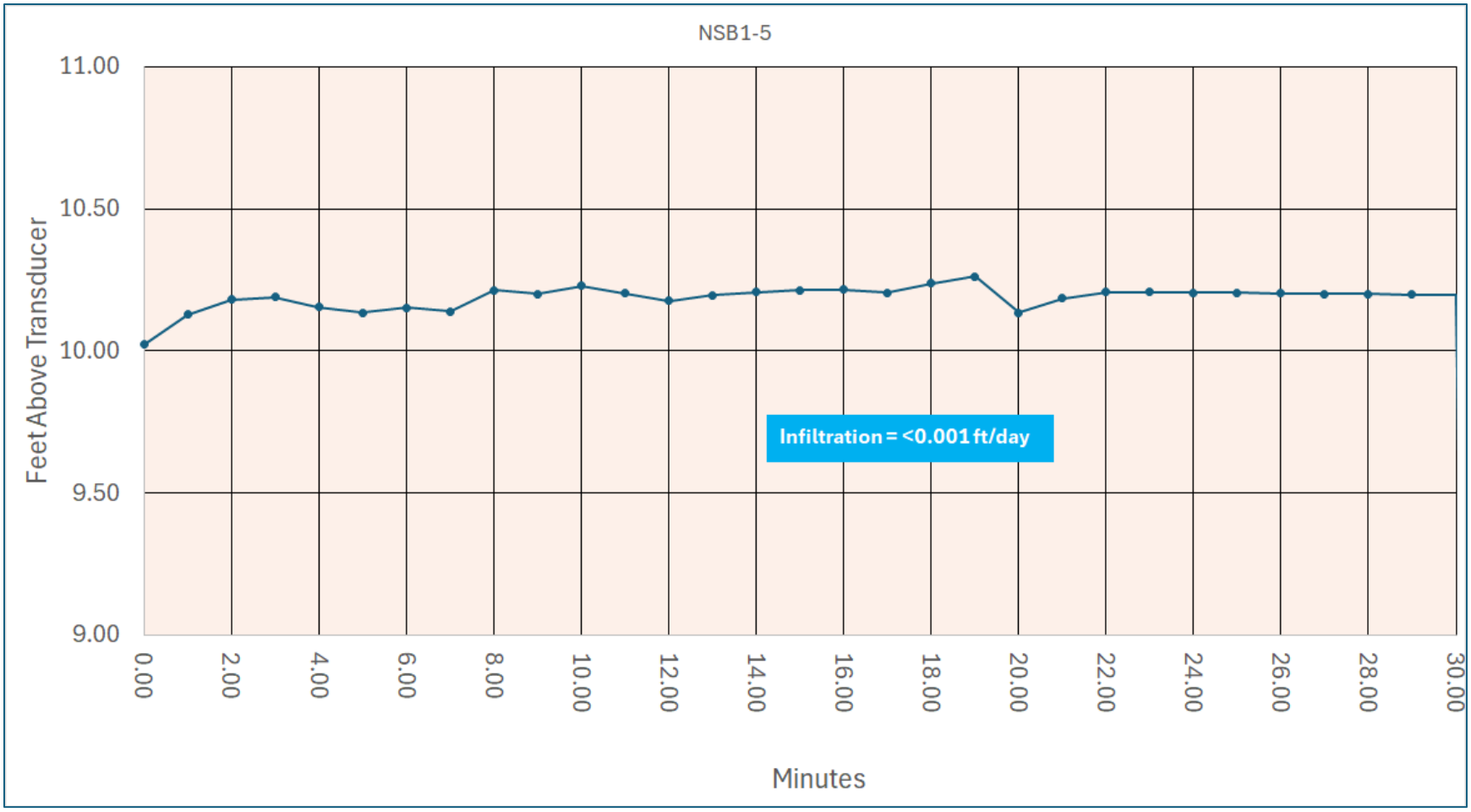

RP-IT-6 at 1 Foot BGS
y = -0.0018x + 4.3207
R² = 0.9948
Feet Above Transducer
5.0
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
4.1
4.0
3.9
3.8
3.7
3.6
3.5
3.4
3.3
3.2
3.1
3.0
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
Minutes

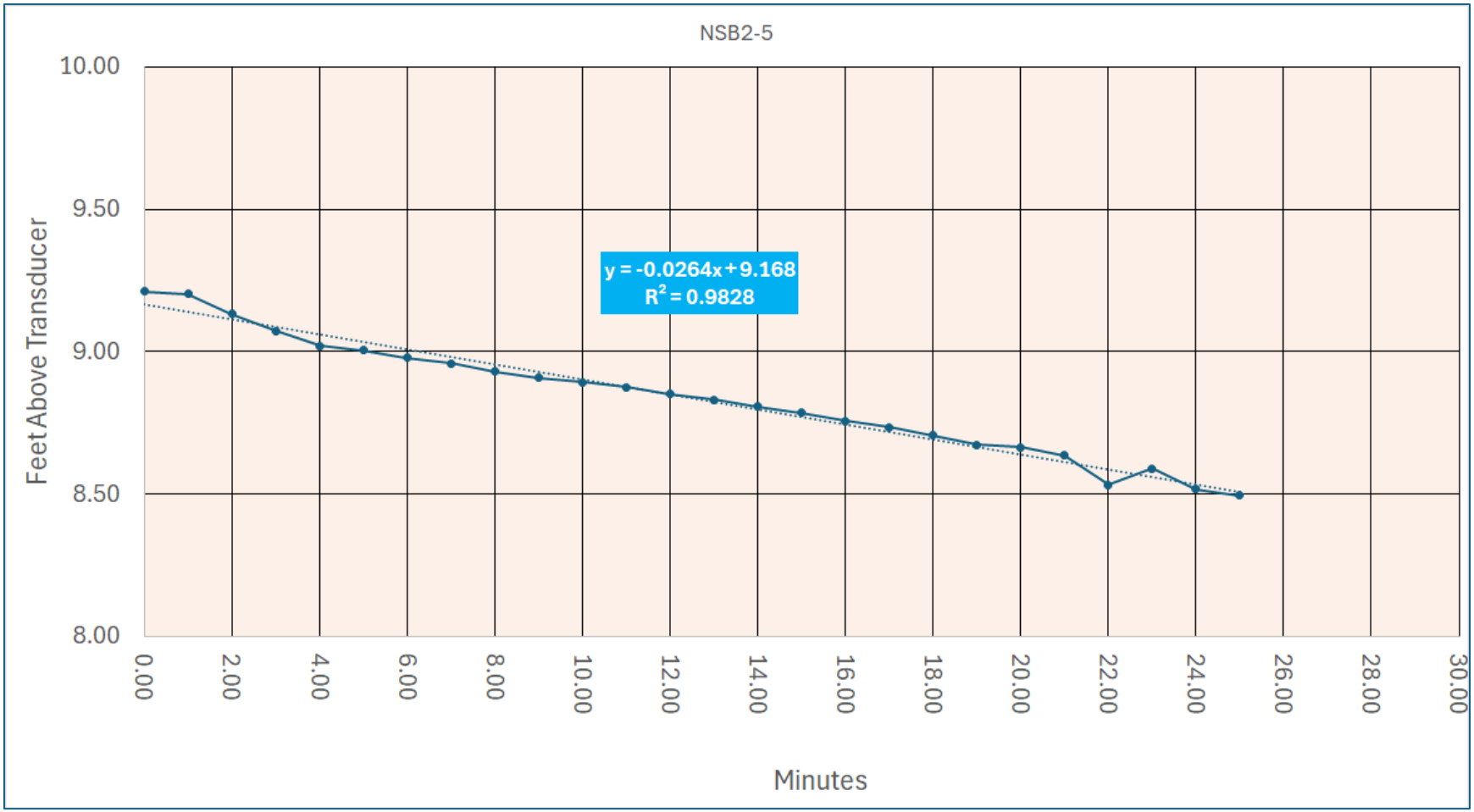

RP-IT-6 at 2 Foot BGS
Feet Above Transducer
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
10
20
30
40
50
60
70
Minutes
y = -0.0284x + 2.1118
R² = 0.9869

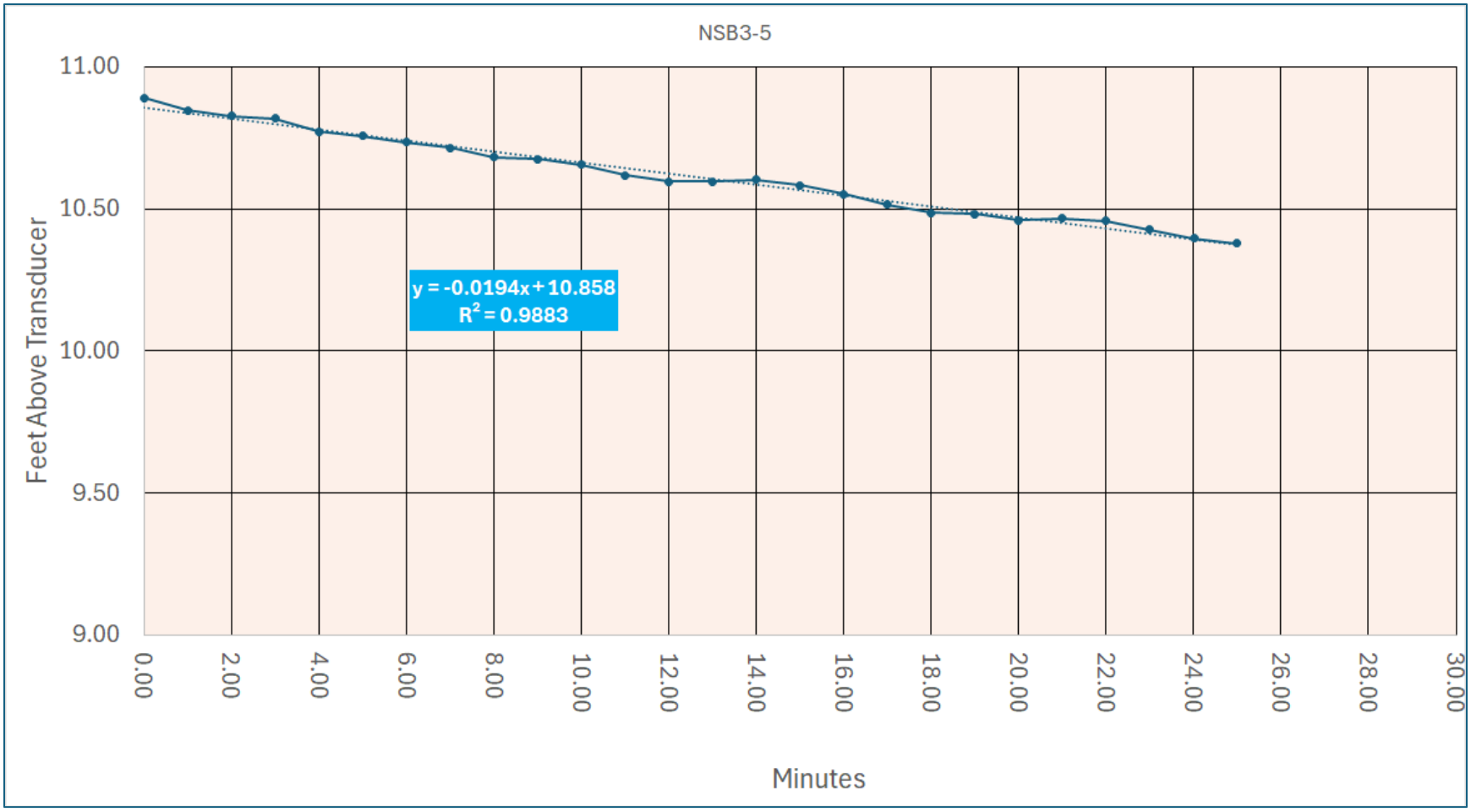

RP-IT-8 at 1 Foot BGS
Feet Above Transducer
Minutes
Trendline Equation
y = -0.0396x + 2.0705
R² = 0.9978
Infiltration Rate
0.0396 Feet per Minute
57.02 Feet Per Day
Trendline Equation
y = -0.0184x + 5.3152
R² = 0.9976
Infiltration Rate
0.0184 Feet per Minute
26.50 Feet Per Day

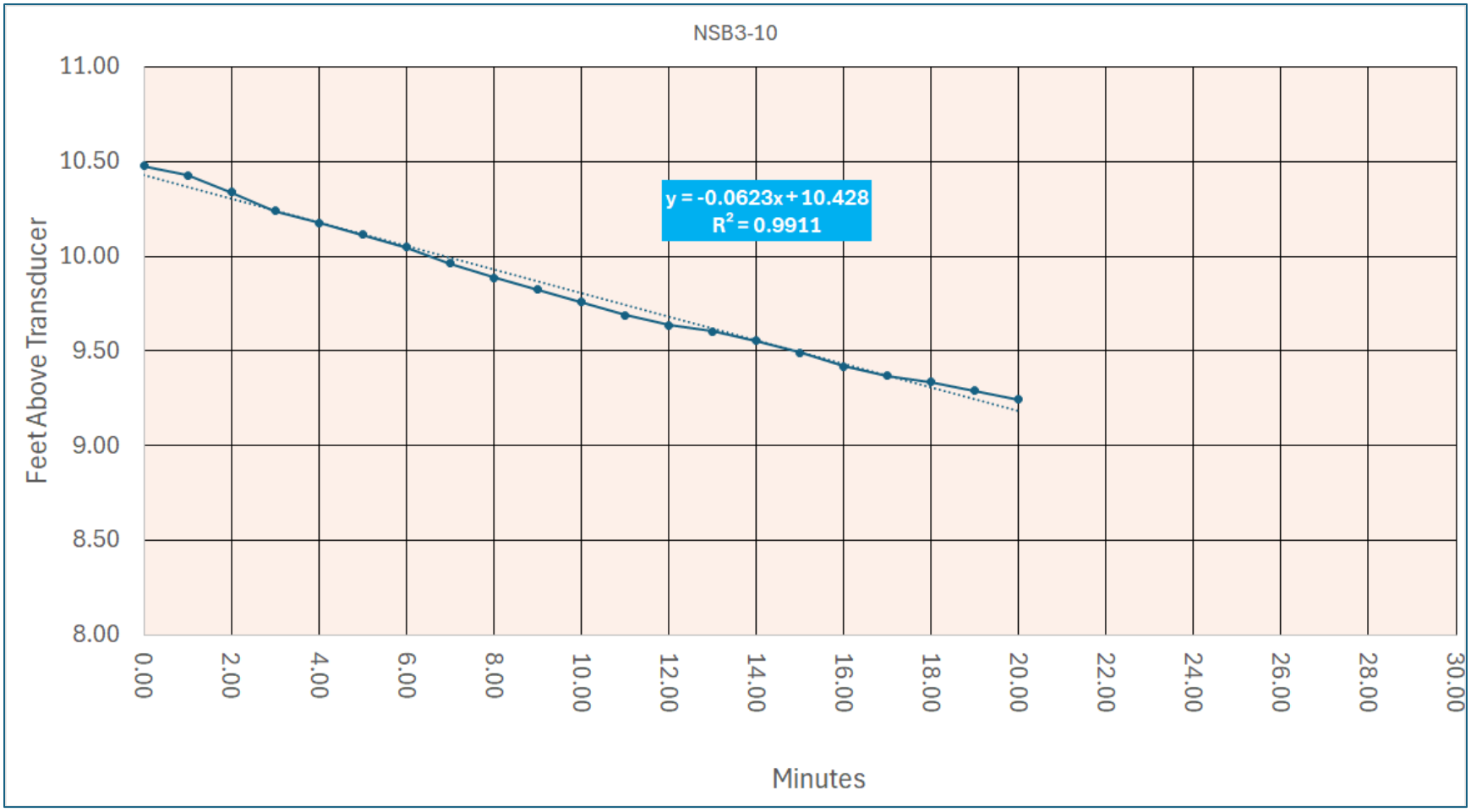

RP-IT-8 at 3 Foot BGS
Feet Above Transducer
5.0
4.9
4.8
4.7
4.6
4.5
4.4
4.3
4.2
4.1
4.0
3.9
3.8
3.7
3.6
3.5
3.4
3.3
3.2
3.1
3.0
y = -0.0192x + 4.4549
R² = 0.9876
0
10
20
30
40
50
60
70
Minutes

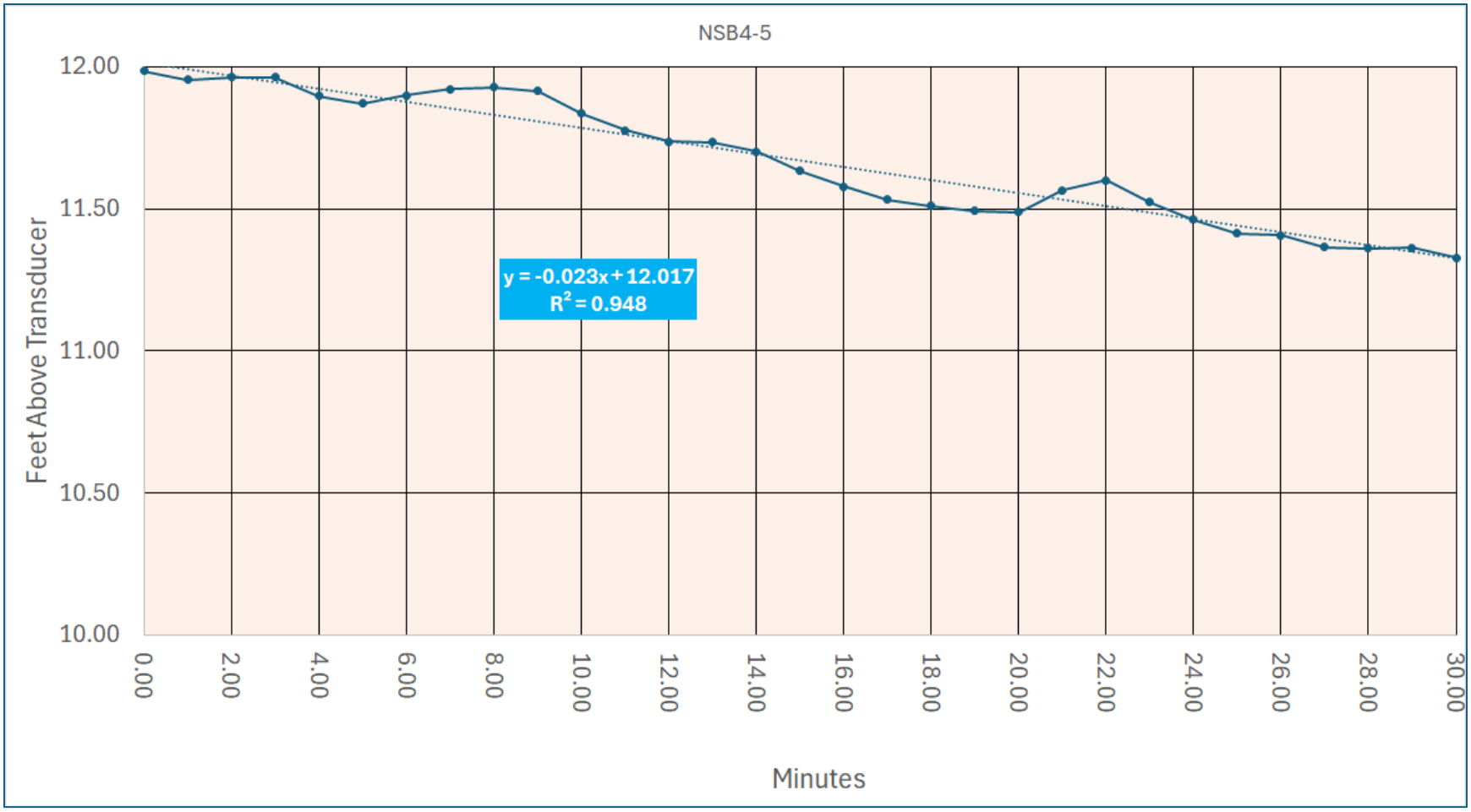
Site N5


NSB1-5
11.00
10.50
10.00
9.50
9.00
Feet Above Transducer
Infiltration = <0.001 ft/day
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00
22.00
24.00
26.00
28.00
30.00
Minutes

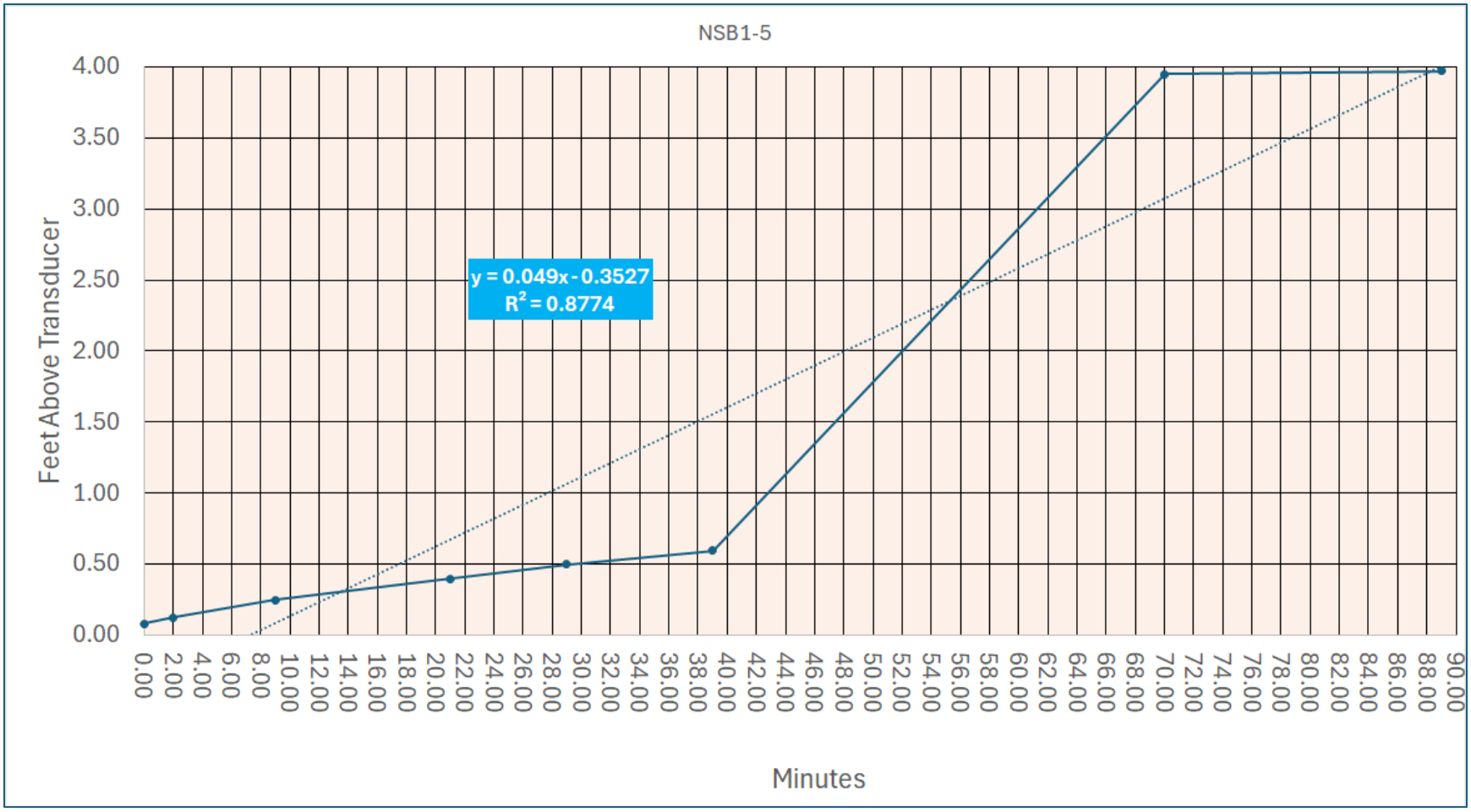

NSB2-5
10.00
9.50
9.00
8.50
8.00
Feet Above Transducer
y = -0.0264x + 9.168
R² = 0.9828
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00
22.00
24.00
26.00
28.00
30.00
Minutes

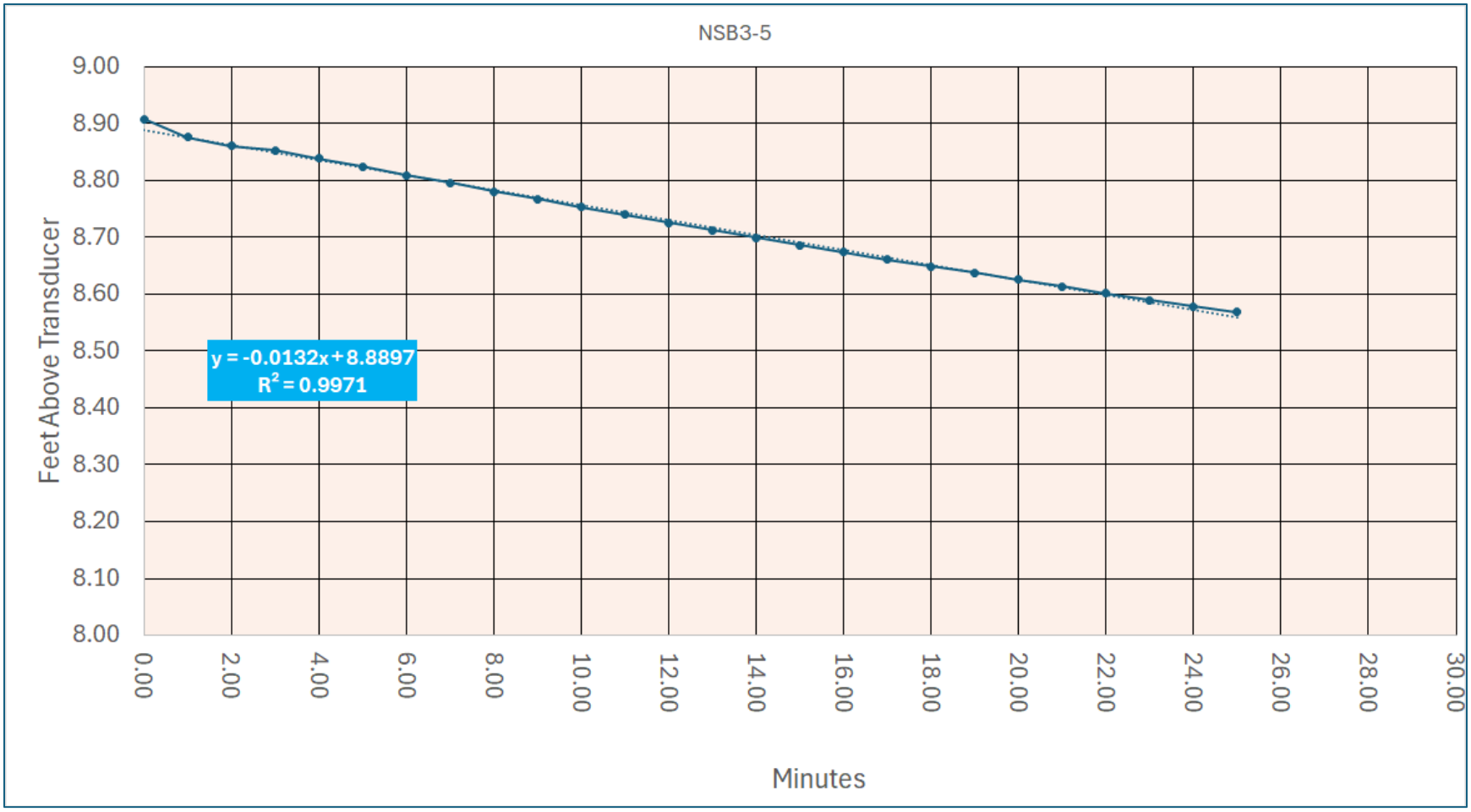

NSB3-5
11.00
10.50
10.00
9.50
9.00
Feet Above Transducer
y = -0.0194x + 10.858
R² = 0.9883
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00
22.00
24.00
26.00
28.00
30.00
Minutes


NSB3-10
11.00
10.50
10.00
9.50
9.00
8.50
8.00
Feet Above Transducer
y = -0.0623x + 10.428
R² = 0.9911
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00
22.00
24.00
26.00
28.00
30.00
Minutes


NSB4-5
12.00
11.50
11.00
10.50
10.00
Feet Above Transducer
y = -0.023x + 12.017
R² = 0.948
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00
22.00
24.00
26.00
28.00
30.00
Minutes

Site N6


NSB1-5
Feet Above Transducer
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
y = 0.049x - 0.3527
R² = 0.8774
0.00 2.00 4.00 6.00 8.00 10.00 12.00 14.00 16.00 18.00 20.00 22.00 24.00 26.00 28.00 30.00 32.00 34.00 36.00 38.00 40.00 42.00 44.00 46.00 48.00 50.00 52.00 54.00 56.00 58.00 60.00 62.00 64.00 66.00 68.00 70.00 72.00 74.00 76.00 78.00 80.00 82.00 84.00 86.00 88.00 90.00
Minutes


NSB3-5
9.00
8.90
8.80
8.70
8.60
8.50
8.40
8.30
8.20
8.10
8.00
Feet Above Transducer
y = -0.0132x + 8.8897
R² = 0.9971
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
18.00
20.00
22.00
24.00
26.00
28.00
30.00
Minutes

Appendix I – Field Record of Water Samples

Low Flow Sampling Form

Sheet 1 of 1

Job No. SFO 154C | Date: 1-7-26 | Initials

Site Velocity property | Start Time: 0930 | Weather

Well ID VP-MW 01 | Finish Time: | Key No.

1. Well Water Level/Pump Information:

a. Well Diameter (in)	2"	f. Initial depth to water from M.P. (ft)	27.20
b. M.P. Desc. (e.g., 2" PVC, notched)		g. Water column length [e-f (ft)]	19.84
c. M.P. Elevation (ft)		h. Depth to top of screen (ft)	
d. G.S. Elevation (ft)		i. Depth to pump intake (ft)	
e. Depth to bottom from M.P. (ft)	47.54	j. Saturated well volume (gal) (ex. 0.17 gal/ft for 2" well; 0.66 gal/ft for 4" well)	3.37 gal

2. Field Water Quality Measurements

a. EquipmentDescription (type, model number, serial number)

Pump:

Meters

Flow through cell

b. Purging Information

Time:	Cumulative Purge Vol. (L)	Pump Rate (ml/min)	Temp (deg C)	Conductivty (uS/cm)	Dis. Oxy. (mg/l)	Redox (mV)	pH	Turbidity (NTU)	Water Level (ft)
0950			15.97	0.197	7.34	116	583	454	27.75
1046			15.90	0.164	7.35	109	6.14	703	
1430			15.63	0.148	8.93	143	5.72	602	27.42

3. Sample Collection Information

Sample ID	Time Collected	Container Type/No./Vol.	Preservation	Analytical Method
1.				
2.				
3.				
4.				

notes: NA = not applicable NM = not measured/recorded

4. Comments:

Low Flow Sampling Form

Sheet 1 of 1

Job No. SF0154C
Site Violich property
Well ID Comanche Creek

Date: 1-7-26
Start Time: 1215
Finish Time:

Initials 2L
Weather Sunny
Key No.

1. Well Water Level/Pump Information:
   a. Well Diameter (in)
   b. M.P. Desc. (e.g., 2" PVC, notched)
   c. M.P. Elevation (ft)
   d. G.S. Elevation (ft)
   e. Depth to bottom from M.P. (ft)
   f. Initial depth to water from M.P. (ft)
   g. Water column length [e-f (ft)]
   h. Depth to top of screen (ft)
   i. Depth to pump intake (ft)
   j. Saturated well volume (gal) (ex. 0.17 gal/ft for 2" well; 0.66 gal/ft for 4" well)

2. Field Water Quality Measurements

a. EquipmentDescription (type, model number, serial number)

Pump: DiP CUP
Meters Horiba U52
Flow through cell

b. Purging Information

Time:	Cumulative Purge Vol. (L)	Pump Rate (ml/min)	Temp (deg C)	Conductivty (uS/cm)	Dis. Oxy. (mg/l)	Redox (mV)	pH	Turbidity (NTU)	Water Level (ft)
1220			13.56	0.111	9.47	112	6.04	1.1	2'

3. Sample Collection Information

Sample ID	Time Collected	Container Type/No./Vol.	Preservation	Analytical Method
1.				
2.				
3.				
4.				

notes: NA = not applicable NM = not measured/recorded

4. Comments:

Low Flow Sampling Form

Sheet 1 of 1

Job No. 6F0154C | Date: 1/7/26 | Initials ZL
Site Lindo Channel | Start Time: 1330 | Weather Sunny
Well ID Lindo Channel | Finish Time: | Key No.

1. Well Water Level/Pump Information:

a. Well Diameter (in)
b. M.P. Desc. (e.g., 2" PVC, notched)
c. M.P. Elevation (ft)
d. G.S. Elevation (ft)
e. Depth to bottom from M.P. (ft)
f. Initial depth to water from M.P. (ft)
g. Water column length [e-f (ft)]
h. Depth to top of screen (ft)
i. Depth to pump intake (ft)
j. Saturated well volume (gal) (ex. 0.17 gal/ft for 2" well; 0.66 gal/ft for 4" well)

2. Field Water Quality Measurements

a. EquipmentDescription (type, model number, serial number)

Pump:
Meters Horiba U52
Flow through cell

b. Purging Information

Time:	Cumulative Purge Vol. (L)	Pump Rate (ml/min)	Temp (deg C)	Conductivty (uS/cm)	Dis. Oxy. (mg/l)	Redox (mV)	pH	Turbidity (NTU)	Water Level (ft)
1340			13.69	0.046	89.5	142	5.76	60.8	

3. Sample Collection Information

Sample ID	Time Collected	Container Type/No./Vol.	Preservation	Analytical Method
1. LC-lindochannel				
2.				
3.				
4.				

notes: NA = not applicable NM = not measured/recorded

4. Comments:

Groundwater Monitoring Well Sampling Form

Sheet 1 of 1

Job No. Vina Basin | Date: 3/26/26 | Initials ZL
Site Vaglich property | Start Time: 1342 | Weather Sunny
Well ID VP-MW01 | Finish Time: 1530 | Key No.

1. Well Water Level/Pump Information:

a. Well Diameter (in): 2"
b. M.P. Desc. (e.g., 2" PVC, notched): N of TOC
c. M.P. Elevation (ft):
d. G.S. Elevation (ft):
e. Depth of well from G.S. (ft):
f. Initial depth to water from M.P. (ft): 26.49
g. Water column length [d-e+f](ft):
h. Depth to top of screen (ft):
i. Depth to pump intake (ft): 45.48
j. Saturated well volume (gal):

2. Field Water Quality Measurements

a. Equipment Description (type, model number, serial number)

Pump:
Meters
Flow through cell

b. Purging Information

Time:	Cumulative Purge Vol. (gal)	Pump Rate (mL/min) ~~(gal/min)~~	Temp (deg C)	Conductivty (m-ohm/cm)	Dis. Oxy. (mg/l)	Redox (mV)	pH	Turbidity (NTU)	Water Level (ft)
1400		200	17.19	0.457	9.86	181	6.51	>1000	26.49
1405		200	~~+6~~	Cleaned out		sediment			
1410		200	18.30	0.418	9.39	215	6.53	296	26.49
1415		200	18.50	0.417	8.90	216	6.49	255	26.49
1420		200	18.52	0.418	8.61	220	6.48	234	26.49
1425		200	18.44	0.417	8.46	223	6.67	166	26.49
1430		200	~~18.50~~	flush	horiba				
1435		200	18.52	0.419	8.34	214	6.56	130	26.49
1440		200	18.44	0.419	8.78	225	6.46	96.8	26.49
1445		200	18.50	0.421	8.49	224	6.51	79.0	26.49
1450		200	18.53	0.425	8.92	226	6.47	60.4	26.49
~~1500~~ 1455		200	18.52	0.431	8.24	228	6.46	33.2	26.49
1500		200	18.50	0.431	8.78	226	6.48	20.1	26.49

3. Sample Collection Information

	Sample ID	Time Collected	Container Type/No./Vol.	Preservation	Analytical Method
1.	VP-MW01-20260326	1505	Field	filtered	
2.	VP-MW02-20260326	1300	"	"	
3.					
4.					

notes: NA = not applicable NM = not measured/recorded

4. Comments:

Groundwater Monitoring Well Sampling Form

Sheet 1 of 1

Job No. Vina Basin
Site Rice property
Well ID RP-MW01

Date: 3/26/26
Start Time: 1550
Finish Time: ~~1750~~ 1750

Initials ZL
Weather
Key No.

1. Well Water Level/Pump Information:

a. Well Diameter (in) 2
b. M.P. Desc. (e.g., 2" PVC, notched) N of TOC
c. M.P. Elevation (ft)
d. G.S. Elevation (ft)
e. Depth of well from G.S. (ft)

f. Initial depth to water from M.P. (ft) 25.51
g. Water column length [d-e+f](ft)
h. Depth to top of screen (ft)
i. Depth to pump intake (ft) 48.58
j. Saturated well volume (gal)

2. Field Water Quality Measurements

a. Equipment Description (type, model number, serial number)

Pump:
Meters
Flow through cell

b. Purging Information

Time:	Cumulative Purge Vol. (gal)	Pump Rate (mL/min) ~~(gal/min)~~	Temp (deg C)	Conductivty (m-ohm/cm)	Dis. Oxy. (mg/l)	Redox (mV)	pH	Turbidity (NTU)	Water Level (ft)
									~~25.51~~
1610	Purge	Begin							25.50
1615		~~250~~ 200	20.45	0.497	9.25	195	6.96	1000	25.72
1620		250	19.58	0.493	9.03	202	6.97	—	25.64
1625		200	19.32	0.475	8.97	203	6.99	—	25.58
1630		200	19.72	0.464	9.62	186	~~7.07~~ 7.06	—	25.58
1635		200	19.65	0.455	9.34	201	~~7.05~~ 7.04	—	25.58
1640		200	19.89	0.450	9.40	202	7.04	—	25.58
1645		200	19.84	0.454	9.33	205	7.07	933	25.58
1650		200	19.75	0.455	9.05	207	7.06	762	25.58
1655		200	20.06	0.456	9.05	206	7.07	517	25.58
1700		200	19.96	0.456	9.02	206	7.07	366	25.58
1705		200	19.79	0.457	9.06	206	7.07	246	25.58
1710		200	19.84	0.458	9.07	207	7.09	195	25.58
1715		200	19.70	0.461	9.07	208	7.08	173	25.58
1725		200	19.45	0.456	9.24	213	7.09	129	25.58
1730	2.5	200	19.46	0.456	9.14	215	7.09	127	25.58

3. Sample Collection Information

	Sample ID	Time Collected	Container Type/No./Vol.	Preservation	Analytical Method
1.	RP-MW01-20260326	1735	Field	Filtered	
2.					
3.					
4.					

notes: NA = not applicable NM = not measured/recorded

4. Comments:

Groundwater Monitoring Well Sampling Form

Sheet 1 of 1

Job No. Vina Basin | Date: 3/27/26 | Initials ZL
Site Washington Property | Start Time: 1330 | Weather Sunny
Well ID WP-MW01 | Finish Time: 1450 | Key No.

1. Well Water Level/Pump Information:

a. Well Diameter (in): 2
b. M.P. Desc. (e.g., 2" PVC, notched): Not TOC
c. M.P. Elevation (ft):
d. G.S. Elevation (ft):
e. Depth of well from G.S. (ft):
f. Initial depth to water from M.P. (ft): 39.42
g. Water column length [d-e+f](ft):
h. Depth to top of screen (ft):
i. Depth to pump intake (ft): 49.72
j. Saturated well volume (gal)

2. Field Water Quality Measurements

a. Equipment Description (type, model number, serial number)
Pump: Geotech #8101 (Bladder)
Meters: Horiba U-52 ~~717~~ 30054
Flow through cell:

b. Purging Information

Time:	Cumulative Purge Vol. (gal)	Pump Rate ~~(gal/min)~~ mL/min	Temp (deg C)	Conductivty (m-ohm/cm)	Dis. Oxy. (mg/l)	Redox (mV)	pH	Turbidity (NTU)	Water Level (ft)
1405	0	225	22.04	0.692	4.15	258	7.16	298	39.42
1410		225	22.55	0.705	8.74	159	7.12	162	39.42
1415		250	20.72	0.716	8.87	225	7.05	242	39.41
1420		250	20.41	0.715	9.63	243	7.03	203	39.42
1425		250	20.36	0.713	8.41	174	7.05	251	39.42
1430		250	20.70	0.691	8.56	177	7.06	171	39.42
1435		250	20.65	0.687	8.61	180	7.07	106	39.42
1440		250	20.17	0.684	8.31	182	7.07	87.4	39.42
1445	2.5	250	20.54	0.691	8.42	184	7.07	64.5	39.42

3. Sample Collection Information

	Sample ID	Time Collected	Container Type/No./Vol.	Preservation	Analytical Method
1.	WP-MW01-20260327	1450	Field Filtered		
2.					
3.					
4.					

notes: NA = not applicable NM = not measured/recorded

4. Comments:

Low Flow Sampling Form

Sheet 1 of 1

Job No: SFO 1546 | Date: 1-7-26 | Initials:
Site: Victory Motors | Start Time: 0930 | Weather:
Well ID: VP-MW-01 | Finish Time: | Key No.

1. Well Water Level/Pump Information

a. Well Diameter (in): 2"
b. M.P. Desc. (e.g., 2" PVC, notched):
c. M.P. Elevation (ft):
d. G.S. Elevation (ft):
e. Depth to bottom from M.P. (ft): 47.54

f. Initial depth to water from M.P. (ft): 27.70
g. Water column length [e-f (ft)]: 19.84
h. Depth to top of screen (ft):
i. Depth to pump intake (ft):
j. Saturated well volume (gal) (ex. 0.17 gal/ft for 2" well; 0.66 gal/ft for 4" well): 3.37 gal

2. Field Water Quality Measurements

a. EquipmentDescription (type, model number, serial number)

Pump:
Meters:
Flow through cell:

b. Purging Information

Time	Cumulative Purge Vol. (L)	Pump Rate (ml/min)	Temp (deg C)	Conductivty (uS/cm)	Dis. Oxy. (mg/l)	Redox (mV)	pH	Turbidity (NTU)	Water Level (ft)
0950			15.47	0.197	7.34	116	5.83	454	27.75
1046			15.90	0.164	7.35	109	6.14	203	
1130			15.63	0.148	8.93	143	5.72	602	27.72

3. Sample Collection Information

	Sample ID	Time Collected	Container Type/No./Vol.	Preservation	Analytical Method
1.					
2.					
3.					
4.					

notes: NA = not applicable NM = not measured/recorded

4. Comments:

Low Flow Sampling Form

Sheet 1 of 1

Job No: SEQ15MC | Date: 1-7-26 | Initials: ZL

Site: Violich property | Start Time: 1215 | Weather: Sunny

Well ID: Comanche Creek | Finish Time: | Key No.:

1. Well Water Level/Pump Information

a. Well Diameter (in)

b. M.P. Desc. (e.g., 2" PVC, notched)

c. M.P. Elevation (ft)

d. G.S. Elevation (ft)

e. Depth to bottom from M.P. (ft)

f. Initial depth to water from M.P. (ft)

g. Water column length [e-f (ft)]

h. Depth to top of screen (ft)

i. Depth to pump intake (ft)

j. Saturated well volume (gal) (ex. 0.17 gal/ft for 2" well, 0.66 gal/ft for 4" well)

2. Field Water Quality Measurements

a. EquipmentDescription (type, model number, serial number)

Pump: DiP cup

Meters: Horiba U52

Flow through cell:

b. Purging Information

Time	Cumulative Purge Vol. (L)	Pump Rate (ml/min)	Temp (deg C)	Conductivty (uS/cm)	Dis. Oxy. (mg/l)	Redox (mV)	pH	Turbidity (NTU)	Water Level (ft)
1220			13.56	0.111	9.47	112	6.04	1.1	2'

3. Sample Collection Information

Sample ID	Time Collected	Container Type/No./Vol.	Preservation	Analytical Method
1.				
2.				
3.				
4.				

notes: NA = not applicable NM = not measured/recorded

4. Comments:

Low Flow Sampling Form

Sheet 1 of 1

Job No: 6F0154C
Site: Lindo Channel
Well ID: Lindo Channel

Date: 1/7/26
Start Time: 1330
Finish Time:

Initials: ZL
Weather: Sunny
Key No.:

1. Well Water Level/Pump Information

a. Well Diameter (in)
b. M.P. Desc. (e.g., 2" PVC, notched)
c. M.P. Elevation (ft)
d. G.S. Elevation (ft)
e. Depth to bottom from M.P. (ft)
f. Initial depth to water from M.P. (ft)
g. Water column length [e-f (ft)]
h. Depth to top of screen (ft)
i. Depth to pump intake (ft)
j. Saturated well volume (gal) (ex. 0.17 gal/ft for 2" well; 0.66 gal/ft for 4" well)

2. Field Water Quality Measurements

a. EquipmentDescription (type, model number, serial number)

Pump:
Meters: Horiba U52
Flow through cell:

b. Purging Information

Time:	Cumulative Purge Vol. (L)	Pump Rate (ml/min)	Temp (deg C)	Conductivty (uS/cm)	Dis. Oxy. (mg/l)	Redox (mV)	pH	Turbidity (NTU)	Water Level (ft)
1340			13.69	0.046	89.5	142	5.76	60.8	

3. Sample Collection Information

Sample ID	Time Collected	Container Type/No./Vol.	Preservation	Analytical Method
1. LC-LindoChannel				
2.				
3.				
4.				

notes: NA = not applicable NM = not measured/recorded

4. Comments:

Appendix J – Laboratory Reports

Enthalpy Analytical
931 West Barkley Ave
Orange, CA 92868
(714) 771-6900

enthalpy.com

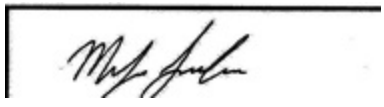
Lab Job Number : 550446
Report Level : II
Report Date : 02/04/2026

Analytical Report *prepared for:*

Joe Turner
Geosyntec Consultants
3043 Gold Canal Drive
Suite 100
Rancho Cordova, CA 95670

Project: BUTTE COUNTY

Authorized for release by:



Miguel Gamboa, Project Manager
miguel.gamboa@enthalpy.com

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the above signature which applies to this PDF file as well as any associated electronic data deliverable files. The results contained in this report meet all requirements of NELAP and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

CA ELAP# 1338, CA ELAP #1338-S1, NELAP# 4038, SCAQMD LAP# 18LA0518, LACSD ID# 10105, ORELAP# 4197

ENTHALPY ANALYTICAL

Sample Summary

Joe Turner
Geosyntec Consultants
3043 Gold Canal Drive
Suite 100
Rancho Cordova, CA
95670

Lab Job #: 550446
Project No: BUTTE COUNTY
Date Received: 01/08/26

Sample ID	Lab ID	Collected	Matrix
VP-MW-01	550446-001	01/07/26 11:30	Water
VP-COMANCHE CREEK	550446-002	01/07/26 12:15	Water
LC-LINDO CHANNEL	550446-003	01/07/26 13:40	Water
FD20260107	550446-004	01/07/26 12:00	Water

Case Narrative

Geosyntec Consultants
3043 Gold Canal Drive
Suite 100
Rancho Cordova, CA 95670
Joe Turner

Lab Job Number: 550446
Project No: BUTTE COUNTY
Date Received: 01/08/26

This data package contains sample and QC results for four water samples, requested for the above referenced project on 01/09/26. The samples were received in good condition.

Volatile Organics by GC/MS (EPA 8260B):
No analytical problems were encountered.

Metals (EPA 200.8):

- High recoveries were observed for calcium, magnesium, and sodium in the MS/MSD of LC-DW-01 (lab # 550445-002); the LCS was within limits, and the associated RPDs were within limits.
- No other analytical problems were encountered.

Ion Chromatography (EPA 300.0):

- Responses exceeding the instrument's linear range were observed for chloride in the MS/MSD for batch 392104; affected data was qualified with "E".
- No other analytical problems were encountered.

Alkalinity (SM2320B):
No analytical problems were encountered.

Total Dissolved Solids (TDS) (SM2540C):
No analytical problems were encountered.

Nitrate (EPA 300.0):
CLS in Rancho Cordova, CA performed the analysis (see sublab report section for certifications). Please see the CLS case narrative.

Isotopic Hydrogen & Oxygen ():
UC Davis SIF in Davis, CA performed the analysis (see sublab report section for certifications). Please see the UC Davis SIF case narrative.

Login 550446

Enthalpy Analytical - Orange

931 W. Barkley Avenue, Orange, CA 92868

Phone 714-771-6900

Chain of Custody Record

Lab No: 550446

Page: 1 of 1

Turn Around Time (rush by advanced notice only)

Standard: X | 5 Day: | 3 Day:

2 Day: | 1 Day: | Custom TAT:

Matrix:

W = Water | DW = Drinking Water | S = Soil / Solid

WP = Wipe | SEA = Sea Water | O = Other

Preservatives:

1 = $Na_2S_2O_3$ | 2 = HCl

3 = HNO_3 | 4 = H_2SO_4

5 = NaOH | 6 = Other

Sample Receipt Temp:

(lab use only)

CUSTOMER INFORMATION		PROJECT INFORMATION	
Company:	Geosyntec	Quote #:	540671
Report To:	Joe Turner	Proj. Name:	
Email:	JTurner@Geosyntec.com	Proj. #:	SF154C/B/4
Address:	1420 White Rock Road	P.O. #:	
	Suite 120 Rancho Cordova, CA	Address:	
~~Phone:~~	95620	Global ID:	
~~Fax:~~ Phone	916-637-8327	Sampled By:	Joe Lewis/Zac Lutfort

	Sample ID	Sampling Date	Sampling Time	Matrix	Number of Containers	Preservative	2H + 18O (succeeded)	Alkalinity, TDS	Ca, Fe, Mn, K, Mg, Na	Chloride, Nitrate, Sulfate	VOCs						Test Instructions / Comments
1	VP-MW-01	1/7/26	~~1130~~	GW	7		X	X	X	X	X						
2	VP-Comanche Creek	1/7/26	1215	GW	4		X	X	X	X							
3	LC-Lindo Channel	1/7/26	1340	GW	4		X	X	X	X							
4	FD 20260107	1/7/26	~~1130~~ 1200	GW	7		X	X	X	X	X						
5																	
6																	
7																	
8																	
9																	
10																	

	Signature	Print Name	Company / Title	Date / Time
[1] Relinquished By:	Joe Lewis	Joe Lewis	Geosyntec / Staff Prof.	1/8/2026 0905
[1] Received By:	Brenda Hamilton	Brenda Hamilton	EA / SCM	1/8/26 0905
[2] Relinquished By:				
[2] Received By:		JK2	EA	1/9/26 0630
[3] Relinquished By:				
[3] Received By:				

SAMPLE RECEIPT CHECKLIST

Section 1: General Info
Date Received: 1/8/26 WO# 550446 Client: Geosyntec

Section 2: Shipping / Custody — **Are custody seals present?** ☐ Yes ☐ No
Custody seals intact on arrival? ☑ N/A ☐ Yes ☐ No ☐ On cooler / box ☐ On samples
☐ Courier ☑ Walk-In ☐ Field Sampling ☐ Shipping Info: _____

Section 3a: Condition / Packaging — ☐ **Outside 0.0 - 6.0°C (0.0 - 10.0°C for microbiology) (PM notified)**
Date Opened 1/8/26 By (initials) JT Type of ice used: ☑ Wet ☐ Blue/Gel ☐ None
☐ Samples received on ice directly from the field; cooling process had begun. (if checked, skip temperatures)
☐ Sample matrix doesn't require cooling (e.g. air, bulk PCB). (if checked, skip temperatures)
If no cooler: Observed/Adjusted Temp (°C): _____ / _____ Thermometer/IR Gun: IR 16 CF: +0.1°C
Cooler Temp (°C) #1: 5.5 / 5.6 #2: ____/____ #3: ____/____ #4: ____/____ #5: ____/____ #6: ____/____

Section 3b: Microbiology Samples — ☐ **No microbiology samples submitted (skip 3b)**
☐ Within temp range 0.0 - 10.0°C or received on ice directly from field.
☐ Adequate headspace for microbiology analysis.

Section 3c: Air Samples — ☑ **No air samples submitted (skip 3c)**
☐ 1.4L Canisters ☐ 6L Canisters ☐ Tedlar Bags ☐ MCE Cassettes ☐ Sorbent Tubes ☐ Other_____

Section 4: Containers / Labels / Samples	YES	NO	N/A
1) Were custody papers present, filled properly, and legible?	✓		
2) Is the sampler's name present on the CoC?	✓		
3) Were containers received in good condition (unbroken / unopened / uncompromised)?	✓		
4) Were the samples bagged? (required for microbiology samples; recommended for soil samples)	✓		
5) Were all of, and only, the correct samples received?	✓		
6) Are sample labels present, legible, and in agreement with the CoC?		✓	
7) Does the container count match the CoC?	✓		
8) Was sufficient sample volume / mass received for the analyses requested?	✓		
9) Were samples received in proper containers for the analyses requested?	✓		
10) Were samples received with > 1/2 holding time remaining?		✓	
11) Are samples properly preserved as indicated by CoC / labels?	✓		
12) Unpreserved VOAs received - If necessary, was the hold time changed in LIMS?			✓
13) Are VOA vials free from headspace/bubbles > 6mm?	✓		

Section 5: Explanations / Comments
(If no comments are made, then no discrepancies noted.)
-001 All Sample ID on labels is 'VP-MW01', CoC is 'VP-MW-01'.
-002 All Sample Time on labels is 1220, CoC is 1218
-All - Split sample into 125mL for Sub.
All - < 1/2 Hold time for Nitrate.

☐ **No additional discrepancies**

Date Logged 1/8/26 **By (print)** Joel Tillman **(sign)** JT
Date Labeled 1/8/26 **By (print)** Joel Tillman **(sign)** JT

SAMPLE RECEIPT CHECKLIST

Section 1: General Info

Date Received: 01/09/26 WO# 550446 Client: Geosyntec

Section 2: Shipping / Custody **Are custody seals present?** ☐ Yes ☒ No

Custody seals intact on arrival? ■ N/A ☐ Yes ☐ No ☐ On cooler / box ☐ On samples

☐ Courier ☐ Walk-In ☐ Field Sampling ■ Shipping Info: Intrastate

Section 3a: Condition / Packaging ☐ **Outside 0.0 - 6.0°C (0.0 - 10.0°C for microbiology) (PM notified)**

Date Opened 01/09/26 By (initials) JXR Type of ice used: ■ Wet ☐ Blue/Gel ☐ None

☐ Samples received on ice directly from the field; cooling process had begun. (if checked, skip temperatures)

☐ Sample matrix doesn't require cooling (e.g. air, bulk PCB). (if checked, skip temperatures)

If no cooler: Observed/Adjusted Temp (°C): _____ / _____ Thermometer/IR Gun: IR10 CF: +0.2

Cooler Temp (°C) #1: 1.7 / 1.9 #2: ____/____ #3: ____/____ #4: ____/____ #5: ____/____ #6: ____/____

Section 3b: Microbiology Samples ■ **No microbiology samples submitted (skip 3b)**

☐ Within temp range 0.0 - 10.0°C or received on ice directly from field.

☐ Adequate headspace for microbiology analysis.

Section 3c: Air Samples ■ **No air samples submitted (skip 3c)**

☐ 1.4L Canisters ☐ 6L Canisters ☐ Tedlar Bags ☐ MCE Cassettes ☐ Sorbent Tubes ☐ Other _____

Section 4: Containers / Labels / Samples	YES	NO	N/A
1) Were custody papers present, filled properly, and legible?	X		
2) Is the sampler's name present on the CoC?	X		
3) Were containers received in good condition (unbroken / unopened / uncompromised)?	X		
4) Were the samples bagged? (required for microbiology samples; recommended for soil samples)	X		
5) Were all of, and only, the correct samples received?	X		
6) Are sample labels present, legible, and in agreement with the CoC?		X	
7) Does the container count match the CoC?	X		
8) Was sufficient sample volume / mass received for the analyses requested?	X		
9) Were samples received in proper containers for the analyses requested?	X		
10) Were samples received with > 1/2 holding time remaining?	X		
11) Are samples properly preserved as indicated by CoC / labels?	X		
12) Unpreserved VOAs received - If necessary, was the hold time changed in LIMS?			X
13) Are VOA vials free from headspace/bubbles > 6mm?	X		

Section 5: Explanations / Comments

(If no comments are made, then no discrepancies noted.)

See previous checklist

☐ **No additional discrepancies**

Date Logged 01/08/26 **By (print)** SAC **(sign)** _____

Date Labeled 01/08/26 **By (print)** SAC **(sign)** _____

ENTHALPY ANALYTICAL

Enthalpy Analytical Report

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID:	VP-MW-01	**Batch#:**	392445	**Prep:**	EPA 5030B
Lab ID:	550446-001	**Sampled:**	01/07/26	**Analysis:**	EPA 8260B
Matrix:	Water	**Received:**	01/08/26	**Analyst:**	HMN
DF:	1.000	**Analyzed:**	01/14/26		

550446-001 Analyte	Result	RL	Units
Freon 12	ND	0.5	ug/L
Chloromethane	ND	0.5	ug/L
Vinyl Chloride	ND	0.5	ug/L
Bromomethane	ND	1.0	ug/L
Chloroethane	ND	0.5	ug/L
Trichlorofluoromethane	ND	0.5	ug/L
Acetone	ND	20	ug/L
Freon 113	ND	0.5	ug/L
1,1-Dichloroethene	ND	0.5	ug/L
Methylene Chloride	ND	10	ug/L
MTBE	ND	0.5	ug/L
trans-1,2-Dichloroethene	ND	0.5	ug/L
1,1-Dichloroethane	ND	0.5	ug/L
2-Butanone	ND	5.0	ug/L
cis-1,2-Dichloroethene	ND	0.5	ug/L
2,2-Dichloropropane	ND	0.5	ug/L
Chloroform	ND	0.5	ug/L
Bromochloromethane	ND	0.5	ug/L
1,1,1-Trichloroethane	ND	0.5	ug/L
1,1-Dichloropropene	ND	0.5	ug/L
Carbon Tetrachloride	ND	0.5	ug/L
1,2-Dichloroethane	ND	0.5	ug/L
Benzene	ND	0.5	ug/L
Trichloroethene	ND	0.5	ug/L
1,2-Dichloropropane	ND	0.5	ug/L
Bromodichloromethane	ND	0.5	ug/L
Dibromomethane	ND	0.5	ug/L
4-Methyl-2-Pentanone	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	0.5	ug/L
Toluene	ND	0.5	ug/L
trans-1,3-Dichloropropene	ND	0.5	ug/L
1,1,2-Trichloroethane	ND	0.5	ug/L
1,3-Dichloropropane	ND	0.5	ug/L
Tetrachloroethene	ND	0.5	ug/L
Dibromochloromethane	ND	0.5	ug/L
1,2-Dibromoethane	ND	0.5	ug/L
Chlorobenzene	ND	0.5	ug/L
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L
Ethylbenzene	ND	0.5	ug/L
m,p-Xylenes	ND	1.0	ug/L
o-Xylene	ND	0.5	ug/L
Styrene	ND	0.5	ug/L
Bromoform	ND	1.0	ug/L
Propylbenzene	ND	0.5	ug/L
Isopropylbenzene	ND	0.5	ug/L
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L

ENTHALPY ANALYTICAL

Enthalpy Analytical Report

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

550446-001 Analyte	Result	RL	Units
1,2,3-Trichloropropane	ND	0.5	ug/L
Bromobenzene	ND	1.0	ug/L
1,3,5-Trimethylbenzene	ND	0.5	ug/L
2-Chlorotoluene	ND	0.5	ug/L
4-Chlorotoluene	ND	0.5	ug/L
tert-Butylbenzene	ND	0.5	ug/L
1,2,4-Trimethylbenzene	ND	0.5	ug/L
sec-Butylbenzene	ND	0.5	ug/L
para-Isopropyl Toluene	ND	0.5	ug/L
1,3-Dichlorobenzene	ND	0.5	ug/L
1,4-Dichlorobenzene	ND	0.5	ug/L
n-Butylbenzene	ND	0.5	ug/L
1,2-Dichlorobenzene	ND	0.5	ug/L
1,2-Dibromo-3-Chloropropane	ND	2.0	ug/L
1,2,4-Trichlorobenzene	ND	0.5	ug/L
Hexachlorobutadiene	ND	2.0	ug/L
Naphthalene	ND	2.0	ug/L
1,2,3-Trichlorobenzene	ND	0.5	ug/L
Isopropyl Ether (DIPE)	ND	0.5	ug/L
Ethyl tert-Butyl Ether (ETBE)	ND	0.5	ug/L
tert-Butyl Alcohol (TBA)	ND	10	ug/L
Methyl tert-Amyl Ether (TAME)	ND	0.5	ug/L
Xylene (total)	ND	0.5	ug/L

550446-001 Surrogate	%REC	Limits
Dibromofluoromethane	112	70-130
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	102	70-130
Bromofluorobenzene	98	70-130

Legend

ND: Not Detected

RL: Reporting Limit

ENTHALPY ANALYTICAL

Enthalpy Analytical Report

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID:	FD20260107	**Batch#:**	392445	**Prep:**	EPA 5030B
Lab ID:	550446-004	**Sampled:**	01/07/26	**Analysis:**	EPA 8260B
Matrix:	Water	**Received:**	01/08/26	**Analyst:**	HMN
DF:	1.000	**Analyzed:**	01/14/26		

550446-004 Analyte	Result	RL	Units
Freon 12	ND	0.5	ug/L
Chloromethane	ND	0.5	ug/L
Vinyl Chloride	ND	0.5	ug/L
Bromomethane	ND	1.0	ug/L
Chloroethane	ND	0.5	ug/L
Trichlorofluoromethane	ND	0.5	ug/L
Acetone	ND	20	ug/L
Freon 113	ND	0.5	ug/L
1,1-Dichloroethene	ND	0.5	ug/L
Methylene Chloride	ND	10	ug/L
MTBE	ND	0.5	ug/L
trans-1,2-Dichloroethene	ND	0.5	ug/L
1,1-Dichloroethane	ND	0.5	ug/L
2-Butanone	ND	5.0	ug/L
cis-1,2-Dichloroethene	ND	0.5	ug/L
2,2-Dichloropropane	ND	0.5	ug/L
Chloroform	ND	0.5	ug/L
Bromochloromethane	ND	0.5	ug/L
1,1,1-Trichloroethane	ND	0.5	ug/L
1,1-Dichloropropene	ND	0.5	ug/L
Carbon Tetrachloride	ND	0.5	ug/L
1,2-Dichloroethane	ND	0.5	ug/L
Benzene	ND	0.5	ug/L
Trichloroethene	ND	0.5	ug/L
1,2-Dichloropropane	ND	0.5	ug/L
Bromodichloromethane	ND	0.5	ug/L
Dibromomethane	ND	0.5	ug/L
4-Methyl-2-Pentanone	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	0.5	ug/L
Toluene	ND	0.5	ug/L
trans-1,3-Dichloropropene	ND	0.5	ug/L
1,1,2-Trichloroethane	ND	0.5	ug/L
1,3-Dichloropropane	ND	0.5	ug/L
Tetrachloroethene	ND	0.5	ug/L
Dibromochloromethane	ND	0.5	ug/L
1,2-Dibromoethane	ND	0.5	ug/L
Chlorobenzene	ND	0.5	ug/L
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L
Ethylbenzene	ND	0.5	ug/L
m,p-Xylenes	ND	1.0	ug/L
o-Xylene	ND	0.5	ug/L
Styrene	ND	0.5	ug/L
Bromoform	ND	1.0	ug/L
Propylbenzene	ND	0.5	ug/L
Isopropylbenzene	ND	0.5	ug/L
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L

ENTHALPY ANALYTICAL

Enthalpy Analytical Report

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

550446-004 Analyte	Result	RL	Units
1,2,3-Trichloropropane	ND	0.5	ug/L
Bromobenzene	ND	1.0	ug/L
1,3,5-Trimethylbenzene	ND	0.5	ug/L
2-Chlorotoluene	ND	0.5	ug/L
4-Chlorotoluene	ND	0.5	ug/L
tert-Butylbenzene	ND	0.5	ug/L
1,2,4-Trimethylbenzene	ND	0.5	ug/L
sec-Butylbenzene	ND	0.5	ug/L
para-Isopropyl Toluene	ND	0.5	ug/L
1,3-Dichlorobenzene	ND	0.5	ug/L
1,4-Dichlorobenzene	ND	0.5	ug/L
n-Butylbenzene	ND	0.5	ug/L
1,2-Dichlorobenzene	ND	0.5	ug/L
1,2-Dibromo-3-Chloropropane	ND	2.0	ug/L
1,2,4-Trichlorobenzene	ND	0.5	ug/L
Hexachlorobutadiene	ND	2.0	ug/L
Naphthalene	ND	2.0	ug/L
1,2,3-Trichlorobenzene	ND	0.5	ug/L
Isopropyl Ether (DIPE)	ND	0.5	ug/L
Ethyl tert-Butyl Ether (ETBE)	ND	0.5	ug/L
tert-Butyl Alcohol (TBA)	ND	10	ug/L
Methyl tert-Amyl Ether (TAME)	ND	0.5	ug/L
Xylene (total)	ND	0.5	ug/L

550446-004 Surrogate	%REC	Limits
Dibromofluoromethane	108	70-130
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	101	70-130
Bromofluorobenzene	99	70-130

Legend

ND: Not Detected

RL: Reporting Limit

Enthalpy Analytical Report: Batch QC

Lab #: 550446 **Project#:** BUTTE COUNTY
Client: Geosyntec Consultants **Location:**

Type: BS **DF:** 1.000 **Prep:** EPA 5030B
Lab ID: QC1330524 **Batch#:** 392445 **Analysis:** EPA 8260B
Matrix: Water **Analyzed:** 01/14/26 **Analyst:** HMN

QC1330524 Analyte	Spiked	Result	%REC	Limits	Units
1,1-Dichloroethene	50.00	59.56	119	69-128	ug/L
MTBE	50.00	54.93	110	66-125	ug/L
Benzene	50.00	50.47	101	76-121	ug/L
Trichloroethene	50.00	54.92	110	76-124	ug/L
Toluene	50.00	49.61	99	76-120	ug/L
Chlorobenzene	50.00	54.36	109	78-120	ug/L

QC1330524 Surrogate	%REC	Limits
Dibromofluoromethane	109	70-130
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	102	70-130
Bromofluorobenzene	102	70-130

Type: BSD **DF:** 1.000 **Prep:** EPA 5030B
Lab ID: QC1330525 **Batch#:** 392445 **Analysis:** EPA 8260B
Matrix: Water **Analyzed:** 01/14/26 **Analyst:** HMN

QC1330525 Analyte	Spiked	Result	%REC	Limits	Units	RPD	Lim
1,1-Dichloroethene	50.00	60.63	121	69-128	ug/L	2	23
MTBE	50.00	56.24	112	66-125	ug/L	2	22
Benzene	50.00	51.32	103	76-121	ug/L	2	21
Trichloroethene	50.00	59.95	120	76-124	ug/L	9	22
Toluene	50.00	52.44	105	76-120	ug/L	6	21
Chlorobenzene	50.00	57.29	115	78-120	ug/L	5	20

QC1330525 Surrogate	%REC	Limits
Dibromofluoromethane	108	70-130
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	103	70-130
Bromofluorobenzene	94	70-130

Legend

RPD: Relative Percent Difference

Enthalpy Analytical Report: Batch QC

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type: BLANK **DF:** 1.000 **Prep:** EPA 5030B

Lab ID: QC1330529 **Batch#:** 392445 **Analysis:** EPA 8260B

Matrix: Water **Analyzed:** 01/14/26 **Analyst:** HMN

QC1330529 Analyte	Result	RL	Units
Freon 12	ND	0.5	ug/L
Chloromethane	ND	0.5	ug/L
Vinyl Chloride	ND	0.5	ug/L
Bromomethane	ND	1.0	ug/L
Chloroethane	ND	0.5	ug/L
Trichlorofluoromethane	ND	0.5	ug/L
Acetone	ND	20	ug/L
Freon 113	ND	0.5	ug/L
1,1-Dichloroethene	ND	0.5	ug/L
Methylene Chloride	ND	10	ug/L
MTBE	ND	0.5	ug/L
trans-1,2-Dichloroethene	ND	0.5	ug/L
1,1-Dichloroethane	ND	0.5	ug/L
2-Butanone	ND	5.0	ug/L
cis-1,2-Dichloroethene	ND	0.5	ug/L
2,2-Dichloropropane	ND	0.5	ug/L
Chloroform	ND	0.5	ug/L
Bromochloromethane	ND	0.5	ug/L
1,1,1-Trichloroethane	ND	0.5	ug/L
1,1-Dichloropropene	ND	0.5	ug/L
Carbon Tetrachloride	ND	0.5	ug/L
1,2-Dichloroethane	ND	0.5	ug/L
Benzene	ND	0.5	ug/L
Trichloroethene	ND	0.5	ug/L
1,2-Dichloropropane	ND	0.5	ug/L
Bromodichloromethane	ND	0.5	ug/L
Dibromomethane	ND	0.5	ug/L
4-Methyl-2-Pentanone	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	0.5	ug/L
Toluene	ND	0.5	ug/L
trans-1,3-Dichloropropene	ND	0.5	ug/L
1,1,2-Trichloroethane	ND	0.5	ug/L
1,3-Dichloropropane	ND	0.5	ug/L
Tetrachloroethene	ND	0.5	ug/L
Dibromochloromethane	ND	0.5	ug/L
1,2-Dibromoethane	ND	0.5	ug/L
Chlorobenzene	ND	0.5	ug/L
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L
Ethylbenzene	ND	0.5	ug/L
m,p-Xylenes	ND	1.0	ug/L
o-Xylene	ND	0.5	ug/L
Styrene	ND	0.5	ug/L
Bromoform	ND	1.0	ug/L
Propylbenzene	ND	0.5	ug/L
Isopropylbenzene	ND	0.5	ug/L
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L
1,2,3-Trichloropropane	ND	0.5	ug/L
Bromobenzene	ND	1.0	ug/L

ENTHALPY ANALYTICAL

Enthalpy Analytical Report: Batch QC

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

QC1330529 Analyte	Result	RL	Units
1,3,5-Trimethylbenzene	ND	0.5	ug/L
2-Chlorotoluene	ND	0.5	ug/L
4-Chlorotoluene	ND	0.5	ug/L
tert-Butylbenzene	ND	0.5	ug/L
1,2,4-Trimethylbenzene	ND	0.5	ug/L
sec-Butylbenzene	ND	0.5	ug/L
para-Isopropyl Toluene	ND	0.5	ug/L
1,3-Dichlorobenzene	ND	0.5	ug/L
1,4-Dichlorobenzene	ND	0.5	ug/L
n-Butylbenzene	ND	0.5	ug/L
1,2-Dichlorobenzene	ND	0.5	ug/L
1,2-Dibromo-3-Chloropropane	ND	2.0	ug/L
1,2,4-Trichlorobenzene	ND	0.5	ug/L
Hexachlorobutadiene	ND	2.0	ug/L
Naphthalene	ND	2.0	ug/L
1,2,3-Trichlorobenzene	ND	0.5	ug/L
Isopropyl Ether (DIPE)	ND	0.5	ug/L
Ethyl tert-Butyl Ether (ETBE)	ND	0.5	ug/L
tert-Butyl Alcohol (TBA)	ND	10	ug/L
Methyl tert-Amyl Ether (TAME)	ND	0.5	ug/L
Xylene (total)	ND	0.5	ug/L

QC1330529 Surrogate	%REC	Limits
Dibromofluoromethane	108	70-130
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	101	70-130
Bromofluorobenzene	100	70-130

Legend

ND: Not Detected

RL: Reporting Limit

ENTHALPY ANALYTICAL

Enthalpy Analytical Report: Batch QC

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID: ZZZZZZZZZZ **DF:** 1.000 **Prep:** EPA 5030B
Type: MS **Batch#:** 392445 **Analysis:** EPA 8260B
MSS Lab ID: 550542-002 **Sampled:** 01/08/26 **Analyst:** HMN
Lab ID: QC1330611 **Received:** 01/08/26
Matrix: Water **Analyzed:** 01/14/26

QC1330611 Analyte	MSS Result	Spiked	Result	%REC	Limits	Units
1,1-Dichloroethene	<0.1050	20.00	25.16	126	62-131	ug/L
MTBE	0.3932	20.00	22.24	109	61-124	ug/L
Benzene	<0.1327	20.00	20.32	102	70-123	ug/L
Trichloroethene	<0.1462	20.00	23.71	119	65-131	ug/L
Toluene	<0.1192	20.00	20.68	103	69-120	ug/L
Chlorobenzene	<0.1235	20.00	22.34	112	72-121	ug/L

QC1330611 Surrogate	%REC	Limits
Dibromofluoromethane	109	70-130
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	103	70-130
Bromofluorobenzene	100	70-130

Field ID: ZZZZZZZZZZ **DF:** 1.000 **Prep:** EPA 5030B
Type: MSD **Batch#:** 392445 **Analysis:** EPA 8260B
MSS Lab ID: 550542-002 **Sampled:** 01/08/26 **Analyst:** HMN
Lab ID: QC1330612 **Received:** 01/08/26
Matrix: Water **Analyzed:** 01/14/26

QC1330612 Analyte	Spiked	Result	%REC	Limits	Units	RPD	Lim
1,1-Dichloroethene	20.00	21.44	107	62-131	ug/L	16	31
MTBE	20.00	20.58	101	61-124	ug/L	8	30
Benzene	20.00	18.21	91	70-123	ug/L	11	31
Trichloroethene	20.00	21.07	105	65-131	ug/L	12	31
Toluene	20.00	17.82	89	69-120	ug/L	15	29
Chlorobenzene	20.00	20.22	101	72-121	ug/L	10	29

QC1330612 Surrogate	%REC	Limits
Dibromofluoromethane	108	70-130
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	101	70-130
Bromofluorobenzene	96	70-130

Legend

RPD: Relative Percent Difference

ENTHALPY ANALYTICAL

Metals Analytical Report

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID: VP-MW-01 **Batch#:** 392154 **Prep:** EPA 3015A
Type: SAMPLE **Sampled:** 01/07/26 **Analysis:** EPA 200.8
Lab ID: 550446-001 **Received:** 01/08/26 **Analyst:** DXC
Matrix: Water **Prepared:** 01/09/26
DF: 1.000 **Analyzed:** 01/10/26

550446-001 Analyte	Result	RL	Units
Calcium	**15,000**	500	ug/L
Iron	**290**	50	ug/L
Magnesium	**13,000**	250	ug/L
Manganese	**35**	10	ug/L
Potassium	ND	500	ug/L
Sodium	**5,000**	500	ug/L

Field ID: VP-COMANCHE CREEK **Batch#:** 392154 **Prep:** EPA 3015A
Type: SAMPLE **Sampled:** 01/07/26 **Analysis:** EPA 200.8
Lab ID: 550446-002 **Received:** 01/08/26 **Analyst:** DXC
Matrix: Water **Prepared:** 01/09/26
DF: 1.000 **Analyzed:** 01/10/26

550446-002 Analyte	Result	RL	Units
Calcium	**17,000**	500	ug/L
Iron	**120**	50	ug/L
Magnesium	**7,300**	250	ug/L
Manganese	ND	10	ug/L
Potassium	**1,600**	500	ug/L
Sodium	**6,200**	500	ug/L

Field ID: LC-LINDO CHANNEL **Batch#:** 392154 **Prep:** EPA 3015A
Type: SAMPLE **Sampled:** 01/07/26 **Analysis:** EPA 200.8
Lab ID: 550446-003 **Received:** 01/08/26 **Analyst:** DXC
Matrix: Water **Prepared:** 01/09/26
DF: 1.000 **Analyzed:** 01/10/26

550446-003 Analyte	Result	RL	Units
Calcium	**8,000**	500	ug/L
Iron	ND	50	ug/L
Magnesium	**3,800**	250	ug/L
Manganese	ND	10	ug/L
Potassium	**660**	500	ug/L
Sodium	**3,100**	500	ug/L

ENTHALPY ANALYTICAL

Metals Analytical Report

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID: FD20260107 **Batch#:** 392154 **Prep:** EPA 3015A

Type: SAMPLE **Sampled:** 01/07/26 **Analysis:** EPA 200.8

Lab ID: 550446-004 **Received:** 01/08/26 **Analyst:** DXC

Matrix: Water **Prepared:** 01/09/26

DF: 1.000 **Analyzed:** 01/10/26

550446-004 Analyte	Result	RL	Units
Calcium	**16,000**	500	ug/L
Iron	**310**	50	ug/L
Magnesium	**13,000**	250	ug/L
Manganese	**32**	10	ug/L
Potassium	ND	500	ug/L
Sodium	**5,400**	500	ug/L

Type: BLANK **DF:** 1.000 **Prep:** EPA 3015A

Lab ID: QC1329411 **Batch#:** 392154 **Analysis:** EPA 200.8

Matrix: Water **Prepared:** 01/09/26 **Analyst:** DXC

QC1329411 Analyte	Result	RL	Units	Analyzed
Calcium	ND	500	ug/L	01/10/26
Iron	ND	50	ug/L	01/10/26
Magnesium	ND	250	ug/L	01/10/26
Manganese	ND	10	ug/L	01/10/26
Potassium	ND	500	ug/L	01/13/26
Sodium	ND	500	ug/L	01/10/26

Legend

ND: Not Detected

RL: Reporting Limit

ENTHALPY ANALYTICAL

Metals Analytical Report: Batch QC

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type: LCS **DF:** 1.000 **Prep:** EPA 3015A

Lab ID: QC1329412 **Batch#:** 392154 **Analysis:** EPA 200.8

Matrix: Water **Prepared:** 01/09/26 **Analyst:** DXC

QC1329412 Analyte	Spiked	Result	%REC	Limits	Units	Analyzed
Calcium	5,100	5,321	104	85-115	ug/L	01/10/26
Iron	500.0	497.8	100	85-115	ug/L	01/10/26
Magnesium	5,100	4,907	96	85-115	ug/L	01/10/26
Manganese	100.0	107.9	108	85-115	ug/L	01/10/26
Potassium	6,000	6,473	108	85-115	ug/L	01/13/26
Sodium	5,100	5,001	98	85-115	ug/L	01/10/26

ENTHALPY ANALYTICAL

Metals Analytical Report: Batch QC

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID: LC-DW-02 **DF:** 1.000 **Prep:** EPA 3015A

Type: MS **Batch#:** 392154 **Analysis:** EPA 200.8

MSS Lab ID: 550445-001 **Sampled:** 01/07/26 **Analyst:** DXC

Lab ID: QC1329413 **Received:** 01/08/26

Matrix: Water **Prepared:** 01/09/26

QC1329413 Analyte	MSS Result	Spiked	Result	%REC	Limits	Units	Analyzed	Qual
Calcium	29,750	5,100	34,850	100	70-130	ug/L	01/10/26	NM
Iron	<29.13	500.0	486.4	97	70-130	ug/L	01/10/26	
Magnesium	22,770	5,100	27,260	88	70-130	ug/L	01/10/26	NM
Manganese	<4.470	100.0	105.1	105	70-130	ug/L	01/10/26	
Potassium	983.1	6,000	7,093	102	70-130	ug/L	01/13/26	
Sodium	17,140	5,100	22,060	97	70-130	ug/L	01/10/26	

Field ID: LC-DW-02 **DF:** 1.000 **Prep:** EPA 3015A

Type: MSD **Batch#:** 392154 **Analysis:** EPA 200.8

MSS Lab ID: 550445-001 **Sampled:** 01/07/26 **Analyst:** DXC

Lab ID: QC1329414 **Received:** 01/08/26

Matrix: Water **Prepared:** 01/09/26

QC1329414 Analyte	Spiked	Result	%REC	Limits	Units	RPD	Lim	Analyzed	Qual
Calcium	5,100	34,640	96	70-130	ug/L	1	20	01/10/26	NM
Iron	500.0	481.7	96	70-130	ug/L	1	20	01/10/26	
Magnesium	5,100	27,620	95	70-130	ug/L	1	20	01/10/26	NM
Manganese	100.0	103.9	104	70-130	ug/L	1	20	01/10/26	
Potassium	6,000	7,286	105	70-130	ug/L	3	20	01/13/26	
Sodium	5,100	21,130	78	70-130	ug/L	4	20	01/10/26	

Legend

NM: Not Meaningful

RPD: Relative Percent Difference

ENTHALPY ANALYTICAL

Metals Analytical Report: Batch QC

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID:	LC-DW-01	**DF:**	1.000	**Analyzed:**	01/13/26
Type:	MS	**Batch#:**	392154	**Prep:**	EPA 3015A
MSS Lab ID:	550445-002	**Sampled:**	01/07/26	**Analysis:**	EPA 200.8
Lab ID:	QC1329415	**Received:**	01/08/26	**Analyst:**	DXC
Matrix:	Water	**Prepared:**	01/09/26		

QC1329415 Analyte	MSS Result	Spiked	Result	%REC	Limits	Units
Calcium	16,580	5,100	24,500	155 *	70-130	ug/L
Iron	<29.13	500.0	555.3	111	70-130	ug/L
Magnesium	13,610	5,100	21,830	161 *	70-130	ug/L
Manganese	<4.470	100.0	110.6	111	70-130	ug/L
Potassium	646.0	6,000	6,982	106	70-130	ug/L
Sodium	12,010	5,100	19,060	138 *	70-130	ug/L

Field ID:	LC-DW-01	**DF:**	1.000	**Analyzed:**	01/13/26
Type:	MSD	**Batch#:**	392154	**Prep:**	EPA 3015A
MSS Lab ID:	550445-002	**Sampled:**	01/07/26	**Analysis:**	EPA 200.8
Lab ID:	QC1329416	**Received:**	01/08/26	**Analyst:**	DXC
Matrix:	Water	**Prepared:**	01/09/26		

QC1329416 Analyte	Spiked	Result	%REC	Limits	Units	RPD	Lim
Calcium	5,100	24,780	161 *	70-130	ug/L	1	20
Iron	500.0	571.6	114	70-130	ug/L	3	20
Magnesium	5,100	22,650	177 *	70-130	ug/L	4	20
Manganese	100.0	113.2	113	70-130	ug/L	2	20
Potassium	6,000	7,041	107	70-130	ug/L	1	20
Sodium	5,100	19,640	149 *	70-130	ug/L	3	20

Legend

***:** Value is outside QC limits

RPD: Relative Percent Difference

ENTHALPY ANALYTICAL

Enthalpy Analytical Report

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID: VP-MW-01 **Batch#:** 392104 **Prep:** METHOD
Type: SAMPLE **Sampled:** 01/07/26 11:30 **Analysis:** EPA 300.0
Lab ID: 550446-001 **Received:** 01/08/26 **Analyst:** KUM
Matrix: Water **Prepared:** 01/09/26 10:45
DF: 1.000 **Analyzed:** 01/09/26 20:56

550446-001 Analyte	Result	RL	Units
Chloride	**2.0**	1.0	mg/L
Sulfate	**9.8**	1.0	mg/L

Field ID: VP-COMANCHE CREEK **Batch#:** 392104 **Prep:** METHOD
Type: SAMPLE **Sampled:** 01/07/26 12:15 **Analysis:** EPA 300.0
Lab ID: 550446-002 **Received:** 01/08/26 **Analyst:** KUM
Matrix: Water **Prepared:** 01/09/26 10:45
DF: 1.000 **Analyzed:** 01/09/26 21:16

550446-002 Analyte	Result	RL	Units
Chloride	**2.4**	1.0	mg/L
Sulfate	**4.7**	1.0	mg/L

Field ID: LC-LINDO CHANNEL **Batch#:** 392104 **Prep:** METHOD
Type: SAMPLE **Sampled:** 01/07/26 13:40 **Analysis:** EPA 300.0
Lab ID: 550446-003 **Received:** 01/08/26 **Analyst:** KUM
Matrix: Water **Prepared:** 01/09/26 10:45
DF: 1.000 **Analyzed:** 01/09/26 21:36

550446-003 Analyte	Result	RL	Units
Chloride	**1.0**	1.0	mg/L
Sulfate	**2.1**	1.0	mg/L

Field ID: FD20260107 **Batch#:** 392104 **Prep:** METHOD
Type: SAMPLE **Sampled:** 01/07/26 12:00 **Analysis:** EPA 300.0
Lab ID: 550446-004 **Received:** 01/08/26 **Analyst:** KUM
Matrix: Water **Prepared:** 01/09/26 10:45
DF: 1.000 **Analyzed:** 01/09/26 21:56

550446-004 Analyte	Result	RL	Units
Chloride	**2.1**	1.0	mg/L
Sulfate	**11**	1.0	mg/L

Type: BLANK **Batch#:** 392104 **Analysis:** EPA 300.0
Lab ID: QC1329250 **Prepared:** 01/09/26 10:45 **Analyst:** KUM
Matrix: Water **Analyzed:** 01/09/26 12:00
DF: 1.000 **Prep:** METHOD

QC1329250 Analyte	Result	RL	Units
Chloride	ND	1.0	mg/L
Sulfate	ND	1.0	mg/L

ENTHALPY ANALYTICAL

Enthalpy Analytical Report

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Legend

ND: Not Detected

RL: Reporting Limit

ENTHALPY ANALYTICAL

Enthalpy Analytical Report: Batch QC

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type: LCS **Batch#:** 392104 **Analysis:** EPA 300.0

Lab ID: QC1329251 **Prepared:** 01/09/26 10:45 **Analyst:** KUM

Matrix: Water **Analyzed:** 01/09/26 12:19

DF: 1.000 **Prep:** METHOD

QC1329251 Analyte	Spiked	Result	%REC	Limits	Units
Chloride	50.00	47.91	96	90-110	mg/L
Sulfate	25.00	26.03	104	90-110	mg/L

ENTHALPY ANALYTICAL

Enthalpy Analytical Report: Batch QC

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID:	ZZZZZZZZZZ	**DF:**	1.000	**Analyzed:**	01/09/26 13:38
Type:	MS	**Batch#:**	392104	**Prep:**	METHOD
MSS Lab ID:	550486-001	**Sampled:**	01/08/26 08:29	**Analysis:**	EPA 300.0
Lab ID:	QC1329252	**Received:**	01/08/26	**Analyst:**	KUM
Matrix:	Water	**Prepared:**	01/09/26 10:45		

QC1329252 Analyte	MSS Result	Spiked	Result	%REC	Limits	Units
Chloride	1.715	100.0	101.1	99	80-123	mg/L
Sulfate	<0.2470	50.00	50.61	101	79-124	mg/L

Field ID:	ZZZZZZZZZZ	**DF:**	1.000	**Analyzed:**	01/09/26 13:58
Type:	MSD	**Batch#:**	392104	**Prep:**	METHOD
MSS Lab ID:	550486-001	**Sampled:**	01/08/26 08:29	**Analysis:**	EPA 300.0
Lab ID:	QC1329253	**Received:**	01/08/26	**Analyst:**	KUM
Matrix:	Water	**Prepared:**	01/09/26 10:45		

QC1329253 Analyte	Spiked	Result	%REC	Limits	Units	RPD	Lim
Chloride	100.0	104.5	103	80-123	mg/L	3	20
Sulfate	50.00	52.33	105	79-124	mg/L	3	20

Legend

RPD: Relative Percent Difference

Enthalpy Analytical Report: Batch QC

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID:	ZZZZZZZZZZ	**DF:**	1.000	**Analyzed:**	01/09/26 15:58
Type:	MS	**Batch#:**	392104	**Prep:**	METHOD
MSS Lab ID:	550514-001	**Sampled:**	01/08/26 09:50	**Analysis:**	EPA 300.0
Lab ID:	QC1329254	**Received:**	01/08/26	**Analyst:**	KUM
Matrix:	Water	**Prepared:**	01/09/26 10:45		

QC1329254 Analyte	MSS Result	Spiked	Result	%REC	Limits	Units	Qual
Chloride	205.7	100.0	304.0 E	98	80-123	mg/L	
Sulfate	330.1	50.00	327.0 E	-6	79-124	mg/L	NM

Field ID:	ZZZZZZZZZZ	**DF:**	1.000	**Analyzed:**	01/09/26 16:18
Type:	MSD	**Batch#:**	392104	**Prep:**	METHOD
MSS Lab ID:	550514-001	**Sampled:**	01/08/26 09:50	**Analysis:**	EPA 300.0
Lab ID:	QC1329255	**Received:**	01/08/26	**Analyst:**	KUM
Matrix:	Water	**Prepared:**	01/09/26 10:45		

QC1329255 Analyte	Spiked	Result	%REC	Limits	Units	RPD	Lim	Qual
Chloride	100.0	302.5 E	97	80-123	mg/L	NC	20	
Sulfate	50.00	326.5 E	-7	79-124	mg/L	NC	20	NM

Legend

E: Response exceeds instrument's linear range

NC: Not Calculated

NM: Not Meaningful

RPD: Relative Percent Difference

ENTHALPY ANALYTICAL

Alkalinity

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID: VP-MW-01 **DF:** 2.500 **Analyzed:** 01/16/26
Type: SAMPLE **Batch#:** 392710 **Prep:** METHOD
Lab ID: 550446-001 **Sampled:** 01/07/26 **Analysis:** SM2320B
Matrix: Water **Received:** 01/08/26 **Analyst:** WWC

550446-001 Analyte	Result	RL	Units
Alkalinity, Bicarbonate, as CaCO3	**84**	13	mg/L
Alkalinity, Carbonate, as CaCO3	ND	13	mg/L
Alkalinity, Hydroxide, as CaCO3	ND	13	mg/L
Alkalinity, Total as CaCO3	**84**	13	mg/L

Field ID: VP-COMANCHE CREEK **DF:** 2.500 **Analyzed:** 01/16/26
Type: SAMPLE **Batch#:** 392710 **Prep:** METHOD
Lab ID: 550446-002 **Sampled:** 01/07/26 **Analysis:** SM2320B
Matrix: Water **Received:** 01/08/26 **Analyst:** WWC

550446-002 Analyte	Result	RL	Units
Alkalinity, Bicarbonate, as CaCO3	**68**	13	mg/L
Alkalinity, Carbonate, as CaCO3	ND	13	mg/L
Alkalinity, Hydroxide, as CaCO3	ND	13	mg/L
Alkalinity, Total as CaCO3	**68**	13	mg/L

Field ID: LC-LINDO CHANNEL **DF:** 1.000 **Analyzed:** 01/16/26
Type: SAMPLE **Batch#:** 392710 **Prep:** METHOD
Lab ID: 550446-003 **Sampled:** 01/07/26 **Analysis:** SM2320B
Matrix: Water **Received:** 01/08/26 **Analyst:** WWC

550446-003 Analyte	Result	RL	Units
Alkalinity, Bicarbonate, as CaCO3	**36**	5.0	mg/L
Alkalinity, Carbonate, as CaCO3	ND	5.0	mg/L
Alkalinity, Hydroxide, as CaCO3	ND	5.0	mg/L
Alkalinity, Total as CaCO3	**36**	5.0	mg/L

Field ID: FD20260107 **DF:** 2.500 **Analyzed:** 01/16/26
Type: SAMPLE **Batch#:** 392710 **Prep:** METHOD
Lab ID: 550446-004 **Sampled:** 01/07/26 **Analysis:** SM2320B
Matrix: Water **Received:** 01/08/26 **Analyst:** WWC

550446-004 Analyte	Result	RL	Units
Alkalinity, Bicarbonate, as CaCO3	**79**	13	mg/L
Alkalinity, Carbonate, as CaCO3	ND	13	mg/L
Alkalinity, Hydroxide, as CaCO3	ND	13	mg/L
Alkalinity, Total as CaCO3	**79**	13	mg/L

ENTHALPY ANALYTICAL

Alkalinity

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type:	BLANK	**DF:**	1.000	**Prep:**	METHOD
Lab ID:	QC1331370	**Batch#:**	392710	**Analysis:**	SM2320B
Matrix:	Water	**Analyzed:**	01/16/26	**Analyst:**	WWC

QC1331370 Analyte	Result	RL	Units
Alkalinity, Bicarbonate, as CaCO3	ND	2.0	mg/L
Alkalinity, Carbonate, as CaCO3	ND	2.0	mg/L
Alkalinity, Hydroxide, as CaCO3	ND	2.0	mg/L
Alkalinity, Total as CaCO3	ND	2.0	mg/L

Legend

ND: Not Detected

RL: Reporting Limit

ENTHALPY ANALYTICAL

Alkalinity: Batch QC

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type: LCS **DF:** 1.000 **Prep:** METHOD

Lab ID: QC1331371 **Batch#:** 392710 **Analysis:** SM2320B

Matrix: Water **Analyzed:** 01/16/26 **Analyst:** WWC

QC1331371 Analyte	Spiked	Result	%REC	Limits	Units
Alkalinity, Total as CaCO3	100.0	94.16	94	90-110	mg/L

ENTHALPY ANALYTICAL

Alkalinity: Batch QC

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID:	ZZZZZZZZZZ	**DF:**	2.500	**Prep:**	METHOD
Type:	SDUP	**Batch#:**	392710	**Analysis:**	SM2320B
MSS Lab ID:	550285-001	**Sampled:**	01/06/26	**Analyst:**	WWC
Lab ID:	QC1331372	**Received:**	01/06/26		
Matrix:	Water	**Analyzed:**	01/16/26		

QC1331372 Analyte	MSS Result	Result	RL	Units	RPD	Lim
Alkalinity, Bicarbonate, as CaCO3	140.6	**147.4**	5.000	mg/L	5	20
Alkalinity, Carbonate, as CaCO3	<5.000	<5.000	5.000	mg/L	NC	20
Alkalinity, Hydroxide, as CaCO3	<5.000	<5.000	5.000	mg/L	NC	20
Alkalinity, Total as CaCO3	140.6	**147.4**	5.000	mg/L	5	20

Legend

NC: Not Calculated

RL: Reporting Limit

RPD: Relative Percent Difference

ENTHALPY ANALYTICAL

Total Dissolved Solids (TDS)

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID: VP-MW-01 **Batch#:** 392262 **Prep:** METHOD
Type: SAMPLE **Sampled:** 01/07/26 **Analysis:** SM2540C
Lab ID: 550446-001 **Received:** 01/08/26 **Analyst:** JAG
Matrix: Water **Prepared:** 01/12/26
DF: 1.000 **Analyzed:** 01/14/26

550446-001 Analyte	Result	RL	Units
Total Dissolved Solids	**160**	10	mg/L

Field ID: VP-COMANCHE CREEK **Batch#:** 392262 **Prep:** METHOD
Type: SAMPLE **Sampled:** 01/07/26 **Analysis:** SM2540C
Lab ID: 550446-002 **Received:** 01/08/26 **Analyst:** JAG
Matrix: Water **Prepared:** 01/12/26
DF: 1.000 **Analyzed:** 01/14/26

550446-002 Analyte	Result	RL	Units
Total Dissolved Solids	**100**	10	mg/L

Field ID: LC-LINDO CHANNEL **Batch#:** 392262 **Prep:** METHOD
Type: SAMPLE **Sampled:** 01/07/26 **Analysis:** SM2540C
Lab ID: 550446-003 **Received:** 01/08/26 **Analyst:** JAG
Matrix: Water **Prepared:** 01/12/26
DF: 1.000 **Analyzed:** 01/14/26

550446-003 Analyte	Result	RL	Units
Total Dissolved Solids	**72**	10	mg/L

Field ID: FD20260107 **Batch#:** 392262 **Prep:** METHOD
Type: SAMPLE **Sampled:** 01/07/26 **Analysis:** SM2540C
Lab ID: 550446-004 **Received:** 01/08/26 **Analyst:** JAG
Matrix: Water **Prepared:** 01/12/26
DF: 1.000 **Analyzed:** 01/14/26

550446-004 Analyte	Result	RL	Units
Total Dissolved Solids	**310**	10	mg/L

Type: BLANK **Batch#:** 392262 **Analysis:** SM2540C
Lab ID: QC1329858 **Prepared:** 01/12/26 **Analyst:** JAG
Matrix: Water **Analyzed:** 01/14/26
DF: 1.000 **Prep:** METHOD

QC1329858 Analyte	Result	RL	Units
Total Dissolved Solids	ND	10	mg/L

Legend
ND: Not Detected
RL: Reporting Limit

ENTHALPY ANALYTICAL

Total Dissolved Solids (TDS): Batch QC

Lab #: 550446 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type: LCS **Batch#:** 392262 **Analysis:** SM2540C

Lab ID: QC1329859 **Prepared:** 01/12/26 **Analyst:** JAG

Matrix: Water **Analyzed:** 01/14/26

DF: 1.000 **Prep:** METHOD

QC1329859 Analyte	Spiked	Result	%REC	Limits	Units
Total Dissolved Solids	1,000	1,009	101	90-110	mg/L

Field ID: ZZZZZZZZZZ **DF:** 2.000 **Analyzed:** 01/14/26

Type: SDUP **Batch#:** 392262 **Prep:** METHOD

MSS Lab ID: 550351-001 **Sampled:** 01/07/26 **Analysis:** SM2540C

Lab ID: QC1329897 **Received:** 01/07/26 **Analyst:** JAG

Matrix: Water **Prepared:** 01/12/26

QC1329897 Analyte	MSS Result	Result	RL	Units	RPD	Lim
Total Dissolved Solids	2,018	**1,998**	20.00	mg/L	1	5

Field ID: ZZZZZZZZZZ **DF:** 20.00 **Analyzed:** 01/14/26

Type: SDUP **Batch#:** 392262 **Prep:** METHOD

MSS Lab ID: 550475-001 **Sampled:** 01/08/26 **Analysis:** SM2540C

Lab ID: QC1329898 **Received:** 01/08/26 **Analyst:** JAG

Matrix: Water **Prepared:** 01/12/26

QC1329898 Analyte	MSS Result	Result	RL	Units	RPD	Lim
Total Dissolved Solids	61,460	**62,020**	200.0	mg/L	1	5

Legend

RL: Reporting Limit

RPD: Relative Percent Difference

Laboratory Job Number 550446

Subcontracted Products

CLS

CALIFORNIA LABORATORY SERVICES
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January 19, 2026

CLS Work Order #: 26A0382
COC #:

Miguel Gamboa
Enthalpy Analytical - Orange
931 W. Barkley Avenue
Orange, CA 92868

Project Name: EO-550446

Enclosed are the results of analyses for samples received by the laboratory on 01/08/26 14:42. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

Daniel Johnson
Technical Director

CA SWRCB ELAP Accreditation/Registration number 1233

26A0382

ENTHALPY ANALYTICAL
931 West Barkley Ave
Orange, CA 92868
(714) 771-6900

Subcontract Laboratory:
CLS
3249 Fitzgerald Rd
Rancho Cordova, CA 95742
ATTN:
PO #: Required, to be sent via email

Enthalpy Order: EO-550446
PM: Miguel Gamboa
Email: miguel.gamboa@enthalpy.com
CC: incomingreports@enthalpy.com
Phone: (714) 771-6900

Results Due: Standard TAT
Report Level: II
Report To: RL
EDDs: CLS Lab Standard Excel Transfer EDD (3 tabs)

Notes:

Sample ID	Collected	Lab ID	# Cont.	Matrix	Analysis Requested	Comment
VP-MW-01	07-JAN-2026 11:30	550446-001	1	Water	EPA 300.0 Nitrate	
VP-COMANCHE CREEK	07-JAN-2026 12:15	550446-002	1	Water	EPA 300.0 Nitrate	
LC-LINDO CHANNEL	07-JAN-2026 13:40	550446-003	1	Water	EPA 300.0 Nitrate	
FD20260107	07-JAN-2026 12:00	550446-004	1	Water	EPA 300.0 Nitrate	

Notes:	Relinquished By:	Received By:
	Anthony Chaves	
	Date: 1-8-26 14:42	Date: 1/8/26 1442
	Date:	Date:
	Date:	Date:

4.8/4.6

Enthalpy Analytical - Orange	Project:	EO-550446	
931 W. Barkley Avenue	Project Number:	[none]	**CLS Work Order #: 26A0382**
Orange, CA 92868	Project Manager:	Miguel Gamboa	COC #:

Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VP-MW-01 (26A0382-01) Water Sampled: 01/07/26 11:30 Received: 01/08/26 14:42									
Nitrate as N	**1.6**	0.40	mg/L	1	2600138	01/08/26	01/09/26	EPA 300.0	
VP-COMANCHE CREEK (26A0382-02) Water Sampled: 01/07/26 12:15 Received: 01/08/26 14:42									
Nitrate as N	**0.81**	0.40	mg/L	1	2600138	01/08/26	01/09/26	EPA 300.0	
LC-LINDO CHANNEL (26A0382-03) Water Sampled: 01/07/26 13:40 Received: 01/08/26 14:42									
Nitrate as N	**0.71**	0.40	mg/L	1	2600138	01/08/26	01/09/26	EPA 300.0	
FD20260107 (26A0382-04) Water Sampled: 01/07/26 12:00 Received: 01/08/26 14:42									
Nitrate as N	**1.8**	0.40	mg/L	1	2600138	01/08/26	01/09/26	EPA 300.0	

Enthalpy Analytical - Orange	Project:	EO-550446	
931 W. Barkley Avenue	Project Number:	[none]	**CLS Work Order #: 26A0382**
Orange, CA 92868	Project Manager:	Miguel Gamboa	COC #:

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2600138 - General Prep										
Blank (2600138-BLK1)				Prepared & Analyzed: 01/08/26						
Nitrate as N	ND	0.40	mg/L							
LCS (2600138-BS1)				Prepared & Analyzed: 01/08/26						
Nitrate as N	5.08	0.40	mg/L	5.00		102	80-120			
LCS Dup (2600138-BSD1)				Prepared & Analyzed: 01/08/26						
Nitrate as N	5.08	0.40	mg/L	5.00		102	80-120	0.07	20	
Matrix Spike (2600138-MS1)		**Source: 26A0263-04**		Prepared & Analyzed: 01/08/26						
Nitrate as N	7.60	0.40	mg/L	5.00	2.81	96	80-120			
Matrix Spike (2600138-MS2)		**Source: 26A0381-01**		Prepared: 01/08/26 Analyzed: 01/09/26						
Nitrate as N	7.02	0.40	mg/L	5.00	2.50	90	80-120			

Enthalpy Analytical - Orange	Project:	EO-550446	
931 W. Barkley Avenue	Project Number:	[none]	**CLS Work Order #: 26A0382**
Orange, CA 92868	Project Manager:	Miguel Gamboa	COC #:

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Laboratory Job Number 550446

Subcontracted Products

UC Davis SIF

STABLE ISOTOPE FACILITY
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UNIVERSITY OF CALIFORNIA
COLLEGE OF AGRICULTURAL AND
ENVIRONMENTAL SCIENCES

^{18}O and ^{2}H of Water by Headspace Equilibration using GasBench-IRMS

Methodology

Equilibration methods use CO_2 or H_2 in the headspace to isotopically equilibrate with water in the sample vial [1,2]. If necessary, the same sample vial can be utilized for both ^{18}O and ^{2}H measurements, provided a new cap is fitted prior to the second equilibration.

For ^{18}O, water samples are pipetted (200 µL) into 12 mL Labco Exetainer vials and flushed with 0.3 % CO_2 in helium for 5 minutes at 100 mL/min. Vials are held at 30 ºC in a thermostated tray for 24 hours prior to isotopic measurement.

Analysis of headspace CO_2 for ^{18}O is then performed on a Thermo Scientific GasBench II coupled to a Thermo Scientific Delta V Advantage isotope-ratio mass spectrometer. An autosampler utilizing a 2-hole sampling needle pushes CO_2 out of the vial and into a 100 µL sample loop. Once the loop is adequately flushed, pulses of sample gas are injected into the IRMS for isotopic measurement. Water is removed from the gas stream using a Nafion dryer, and sample CO_2 is chromatographically separated from other gases using an Agilent PoraPLOT Q GC column (25 m x 0.32 mm ID x 10 µm film thickness, 50 ºC, 2 mL/min).

For ^{2}H, water samples are pipetted (200 µL) into 12 mL Labco Exetainer vials containing platinum catalytic rods and flushed with 2.0 % H_2 in helium for 5 minutes at 100 mL/min. Vials are held at 30 ºC in a thermostated tray for 40 minutes prior to isotopic measurement.

Analysis of headspace H_2 for ^{2}H is performed on a Thermo Scientific GasBench II coupled to a Thermo Scientific Delta V Advantage isotope-ratio mass spectrometer. An autosampler utilizing a 2-hole sampling needle pushes H_2 out of the vial and into a 100 µL sample loop. Once the loop is adequately flushed, pulses of sample gas are injected into the IRMS for isotopic measurement. Water is removed from the gas stream using a Nafion dryer, and sample H_2 is chromatographically separated from other gases using an Agilent PoraPLOT Q GC column (25 m x 0.32 mm ID x 10 µm film thickness, 50 ºC, 2 mL/min).

One of every ten samples is analyzed in duplicate; further replicates may be analyzed if initial measurements fall outside expected measurement error. Replicates of the quality control and assurance reference materials are measured every ten samples.

Calibration and Reporting of Stable Isotope Ratios

Calibration procedures for water stable isotope ratios are applied identically across reference and sample materials and are directly traceable to the primary isotopic reference material, Vienna Standard Mean Ocean Water (VSMOW).

First, a pure CO_2 or H_2 reference gas is used to calculate provisional isotopic values of the sample peaks. Next, isotopic values are adjusted for changes in instrumental drift using an in-house reference material (e.g., SIF-3). Finally, measurements are scale-normalized to the primary reference material using three certified standard reference materials (i.e., SMOW2, GISP2, and SLAP2) available from USGS, NIST, and the IAEA.

Final quality assessment is based on the accuracy and precision of the unbiased quality control materials, which include a certified standard reference material (i.e., USGS47) and $\delta^{18}O$- and $\delta^{2}H$-calibrated waters (i.e., SIF1-8). Enriched waters are further calibrated against a suite of enriched standards including ER-1C1, ER-3A, ER-4A, ER-5A, High en, IAEA-608, and IAEA-609.

Quality assurance reference materials: SMOW2, GISP2, SLAP2
Quality control reference materials: USGS47, SIF 1-8

Measurement Uncertainty

Sample materials are inherently variable in composition, and measurement error may vary between different sample types due to differences in composition. Mean measurement error (σ) and accuracy, as determined by replicate measurements of the quality control and assurance materials, must fall below expected measurement error (± 0.20 ‰ for $\delta^{18}O$ and ± 2.0 ‰ for $\delta^{2}H$). Accuracy and precision of the co-measured calibrated quality control and assurance materials are provided with data reports.

Revision Date

September 6, 2019

Approved By

Richard Doucett

References

[1] Hilkert AW, Avak H. GasBench II: Isotope analysis of water, fruit juice, and wine using the Thermo Scientific GasBench II IRMS. *ThermoFinnigan Flash Report No. G30*. Bremen (DE): 1999.

[2] Duhr A, Hilkert AW. GasBench II: Automated H_2/H_2O equilibration for δD determination on aqueous samples using Thermo Scientific GasBench II. *ThermoFinnigan Flash Report No. G32*. Bremen (DE): 2001.

Glossary

ºC	degree Celsius
%	percent
‰	per mil; 1 ‰ is equivalent to 0.001 or 1 mUr
^{2}H	stable isotope of hydrogen; mass number of 2
^{18}O	stable isotope of oxygen; mass number of 18
δ	delta notation for isotopic composition; in per mil (“‰”) or mUr; 1 ‰ equals 1 mUr
µL	microliter
µm	micron or micrometer
σ	standard deviation
CO_2	carbon dioxide
GC	gas chromatograph
GISP2	Greenland Ice Sheet Precipitation 2 water prepared by the IAEA; formal name is GRESP (Greenland Summit Precipitation)
H_2	dihydrogen
IAEA	International Atomic Energy Agency
ID	inner diameter
IRMS	isotope-ratio mass spectrometry
m	meter

min	minute
mL	milliliter
mm	millimeter
mUr	milliurey; 1 mUr is equivalent to 0.001 or 1 ‰
NIST	National Institute of Standards and Technology
QA	quality assurance; overall laboratory measures to ensure measurement quality
QC	quality control; activities and procedures used to evaluate quality requirements
RSIL	USGS Reston Stable Isotope Laboratory, Reston, Virginia
SIF	Stable Isotope Facility
SIF-3	water reference material
SIF-4	water reference material
SLAP2	Standard Light Antarctic Precipitation 2 water prepared by the IAEA Isotope Hydrology Lab, 2006
SMOW2	Standard Mean Ocean Water 2 water prepared by the IAEA Isotope Hydrology Lab, 2006; formal name is VSMOW2 (Vienna Standard Mean Ocean Water 2)
USGS	United States Geological Survey
USGS47	Lake Louise Drinking Water prepared by H. Qi et al., RSIL
VSMOW	Vienna Standard Mean Ocean Water; primary reference for measurements of oxygen and hydrogen isotopes

General Resources

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Coplen TB. 2011. Guidelines and recommended terms for expression of stable-isotope-ratio and gas-ratio measurement results. *Rapid Commun Mass Spectrom*. 25(17):2538–2560. doi: 10.1002/rcm.5129.

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Reference Products for Environment and Trade. c2009. Vienna (AT): International Atomic Energy Agency (IAEA). https://nucleus.iaea.org/rpst/index.htm.

Sharp Z. 2017. *Principles of Stable Isotope Geochemistry*. 2nd ed. Available from: https://digitalrepository.unm.edu/unm_oer/1/.

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UNIVERSITY OF CALIFORNIA
COLLEGE OF AGRICULTURAL AND
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Stable Isotope Facility Data Report

Principal Investigator:	John Goyette	Email:	john.goyette@enthalpy.com
Researcher	Miguel Gamboa	Email:	miguel.gamboa@enthalpy.com
Institution:	Enthalpy Analytical		
Project:	Lindo Channel Butte County		
Submission Date:	December 18, 2025		
Completion Date:	January 16, 2026		
Report Date (pending payment):	January 23, 2026		
Analysis:	^{18}O and ^{2}H of Water by Headspace Equilibration using GasBench-IRMS		

	$\delta^{2}H$	$\delta^{18}O$
Mean SD for sample material replicates in this project:	±0.6 ‰	±0.05 ‰
Mean SD for reference material replicates in this project:	±1.7 ‰	±0.05 ‰
Mean absolute accuracy for calibrated reference materials within:	±0.6 ‰	±0.03 ‰

Notes:

Sample count to be charged: 7
Additional charges:

Reported by: Richard R. Doucett
rrdoucett@ucdavis.edu

Please review your data in a timely fashion, so that we may fully address any questions or concerns.

Samples

Sample ID	$\delta^{2}H_{VSMOW}$ (‰)	$\delta^{18}O_{VSMOW}$ (‰)	Comments	^{2}H Analysis #	^{18}O Analysis #
VP-MW-01	-76.3	-11.10		ICECUBE-69519	ICECUBE-69695
VP-MW-01	-75.8	-11.07	replicate	ICECUBE-69520	ICECUBE-69696
VP-COMANCHE CREEK	-60.5	-9.59		ICECUBE-69521	ICECUBE-69697
LC-LINDO CHANNEL	-61.1	-9.93		ICECUBE-69522	ICECUBE-69698
FD20260107	-72.8	-11.09		ICECUBE-69523	ICECUBE-69699
LC-DW-02	-63.3	-9.77		ICECUBE-69524	ICECUBE-69700
LC-DW-01	-65.4	-9.93		ICECUBE-69525	ICECUBE-69701
LC-DW-03	-67.3	-10.22		ICECUBE-69526	ICECUBE-69702

Reference Materials

Summary	δ^2H_{VSMOW} (‰) Expected	δ^2H_{VSMOW} (‰) Mean	δ^2H_{VSMOW} (‰) Standard deviation	$\delta^{18}O_{VSMOW}$ (‰) Expected	$\delta^{18}O_{VSMOW}$ (‰) Mean	$\delta^{18}O_{VSMOW}$ (‰) Standard deviation	Use
SIF-2	-312.0	-311.6	2.8	-39.24	-39.20	0.04	Quality control
SIF-3	-200.8	-201.2	1.1	-25.89	-25.90	0.02	Quality control
SIF-4	-150.1	-150.4	1.3	-19.90	-19.91	0.04	Quality control
SIF-5	-76.8	-75.9	1.5	-10.59	-10.60	0.07	Quality control
SIF-6	-45.9	-46.2	3.0	-6.91	-6.84	0.04	Scale correction
SIF-7	-26.1	-25.4	2.8	-4.81	-4.82	0.06	Drift correction
SIF-8	20.9	20.3	0.3	2.45	2.45	0.07	Scale correction
GRESP	-258.0	-259.2	0.7	-33.40	-33.45	0.03	Scale correction

Reference	δ^2H_{VSMOW} (‰)	$\delta^{18}O_{VSMOW}$ (‰)	Comments	^2H Analysis #	^{18}O Analysis #
SIF-7	-23.0	-4.74		ICECUBE-69466	ICECUBE-69642
SIF-7	-28.6	-4.78		ICECUBE-69478	ICECUBE-69654
SIF-7	-22.0	-4.86		ICECUBE-69489	ICECUBE-69665
SIF-7	-28.4	-4.79		ICECUBE-69504	ICECUBE-69680
SIF-7	-26.4	-4.88		ICECUBE-69516	ICECUBE-69692
SIF-7	-24.3	-4.89		ICECUBE-69531	ICECUBE-69707
SIF-7 Average	-25.4	-4.82			
SIF-7 StdDev	2.8	0.06			
SIF-8	19.9	2.38		ICECUBE-69469	ICECUBE-69645
SIF-8	20.4	2.48		ICECUBE-69470	ICECUBE-69646
SIF-8	20.4	2.50		ICECUBE-69471	ICECUBE-69647
SIF-8 Average	20.3	2.45			
SIF-8 StdDev	0.3	0.07			
SIF-6	-49.2	-6.81		ICECUBE-69472	ICECUBE-69648
SIF-6	-43.3	-6.82		ICECUBE-69473	ICECUBE-69649
SIF-6	-45.9	-6.89		ICECUBE-69474	ICECUBE-69650
SIF-6 Average	-46.2	-6.84			
SIF-6 StdDev	3.0	0.04			
GRESP	-258.8	-33.43		ICECUBE-69475	ICECUBE-69651
GRESP	-258.7	-33.48		ICECUBE-69476	ICECUBE-69652
GRESP	-260.0	-33.44		ICECUBE-69477	ICECUBE-69653
GRESP Average	-259.2	-33.45			
GRESP StdDev	0.7	0.03			
SIF-2	-308.3	-39.16		ICECUBE-69467	ICECUBE-69643
SIF-2	-310.4	-39.19		ICECUBE-69490	ICECUBE-69666
SIF-2	-314.1	-39.19		ICECUBE-69517	ICECUBE-69693
SIF-2	-313.8	-39.27		ICECUBE-69532	ICECUBE-69708
SIF-2 Average	-311.6	-39.20			
SIF-2 StdDev	2.8	0.04			
SIF-4	-149.2	-19.86		ICECUBE-69468	ICECUBE-69644
SIF-4	-151.3	-19.93		ICECUBE-69491	ICECUBE-69667
SIF-4	-151.8	-19.91		ICECUBE-69518	ICECUBE-69694
SIF-4	-149.3	-19.94		ICECUBE-69533	ICECUBE-69709
SIF-4 Average	-150.4	-19.91			
SIF-4 StdDev	1.3	0.04			
SIF-5	-77.6	-10.52		ICECUBE-69479	ICECUBE-69655
SIF-5	-75.0	-10.64		ICECUBE-69505	ICECUBE-69681
SIF-5	-75.0	-10.65		ICECUBE-69534	ICECUBE-69710

SIF-5 Average	-75.9	-10.60		
SIF-5 StdDev	1.5	0.07		
SIF-3	-202.2	-25.87	ICECUBE-69480	ICECUBE-69656
SIF-3	-201.4	-25.90	ICECUBE-69506	ICECUBE-69682
SIF-3	-200.0	-25.92	ICECUBE-69535	ICECUBE-69711
SIF-3 Average	-201.2	-25.90		
SIF-3 StdDev	1.1	0.02		

Onterris
931 West Barkley Ave
Orange, CA 92868
(714) 771-6900

onterris.com

Lab Job Number	:	556372
Report Level	:	II
Report Date	:	04/30/2026

Analytical Report *prepared for:*

Michael van den Enden
Geosyntec Consultants
11020 White Rock Road
Suite 120
Rancho Cordova, CA 95670

Project: BUTTE COUNTY - WO-26006451-19009 | 19009

Authorized for release by:

Miguel Gamboa, Project Manager
+1 510.204.2236
miguel.gamboa@onterris.com

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the above signature which applies to this PDF file as well as any associated electronic data deliverable files. The results contained in this report meet all requirements of NELAP and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

CA ELAP# 1338, CA ELAP #1338-S1, NELAP# 4038, SCAQMD LAP# 18LA0518, LACSD ID# 10105, ORELAP# 4197

Sample Summary

Michael van den Enden
Geosyntec Consultants
11020 White Rock Road
Suite 120
Rancho Cordova, CA
95670

Lab Job #:	556372
Project No:	BUTTE COUNTY
Location:	WO-26006451-19009 | 19009
Date Received:	03/27/26

Sample ID	Lab ID	Collected	Matrix
VP-MW01-20260326	556372-001	03/26/26 15:05	Water
VP-MW02-20260326	556372-002	03/26/26 13:00	Water
RP-MW01-20260326	556372-003	03/26/26 17:35	Water
WP-MW01-20260327	556372-004	03/27/26 14:50	Water

Case Narrative

Geosyntec Consultants 11020 White Rock Road Suite 120 Rancho Cordova, CA 95670 Michael van den Enden	Lab Job Number: 556372 Project No: BUTTE COUNTY Location: WO-26006451-19009 | 19009 Date Received: 03/27/26

- This data package contains sample and QC results for four water samples, requested for the above referenced project on 03/30/26. The samples were received in good condition.
- EPA 200.8, EPA 300.0, SM2320B, and SM2540C analyses were performed at 931 West Barkley Ave, Orange, CA, 92868.
- EPA 8260B analysis was performed at 2532 E Cerritos Ave., Anaheim, CA, 92806.

Volatile Organics by GC/MS (EPA 8260B):
No analytical problems were encountered.

Metals (EPA 200.8):
No analytical problems were encountered.

Ion Chromatography (EPA 300.0):

- High recovery was observed for chloride in the MS of VP-MW01-20260326 (lab # 556372-001); the LCS was within limits, and the associated RPD was within limits.
- Responses exceeding the instrument's linear range were observed for chloride, nitrogen, nitrate, and sulfate in the MS/MSD for batch 399470 and the MS/MSD of VP-MW01-20260326 (lab # 556372-001); affected data was qualified with "E".
- No other analytical problems were encountered.

Alkalinity (SM2320B):
No analytical problems were encountered.

Total Dissolved Solids (TDS) (SM2540C):
No analytical problems were encountered.

Isotopic Hydrogen & Oxygen ():
UC Davis SIF in Davis, CA performed the analysis (see sublab report section for certifications). Please see the UC Davis SIF case narrative.

ENTHALPY ANALYTICAL

Chain of Custody Record

Lab No: 336372

Page: 1 of 1

Login 556372

5834

Turn Around Time (rush by advanced notice only)

Standard:	X	5 Day:		3 Day:	
2 Day:		1 Day:		Custom TAT:	

Matrix: W = Water; DW = Drinking Water; S = Soil / Solid; WP = Wipe; SEA = Sea Water; O = Other

Preservatives: 1 = $Na_2S_2O_3$; 2 = HCl; 3 = HNO_3; 4 = H_2SO_4; 5 = NaOH; 6 = Other

Sample Receipt Temp: IR/0 0.9/1.1 (lab use only)

CUSTOMER INFORMATION

Company:	Geosyntec
Report To:	Mike vanden enden
Email:	Mvanden Eden@geosyntec.com
Address:	10220 Whiterock Suite 120, Rancho cordova
Phone:	916637 2048
Fax:	

PROJECT INFORMATION

Quote #:	
Proj. Name:	~~Lathrop~~ Butte county
Proj. #:	
P.O. #:	
Address:	
Global ID:	
Sampled By:	Z. Laforet

	Sample ID	Sampling Date	Sampling Time	Matrix	Number of Containers	Preservative	2H + 18O (subcontract)	Alkalinity, TDS	DF (Ca, Fe, Mn, K, Mg, Na)	Chloride, nitrate, sulfate	VOCs	Test Instructions / Comments
1	VP-MW01-~~20260~~326	3-26-26	1505	GW	~~4~~	HNO_3/HCl	X	X	X	X	X	FF
2	VP-MW02-20260326	"	1300	"	4	"	X	X	X	X		Field Filtered
3	RP-MW01-20260326	"	1735	"	4	"	X	X	X	X		
4	WP-MW01-20260327	~~3-26-26~~ 3-27-26	1450	"	4	"	X	X	X	X		
5												
6												
7												
8												
9												
10												

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:		Zach Laforet	Geosyntec	3-27-26
1 Received By:		MT LeBouef, Brenda Hagen	GEOTECH / EA	3-27-26 1650
2 Relinquished By:		Brenda Hamilton Hagen	EA	3-27-26 1800
2 Received By:		JKR	EA	3/28/26 0730
3 Relinquished By:				
3 Received By:				

* Came in just after Mike Signed. bh 3/27/26

SAMPLE RECEIPT CHECKLIST

Section 1: General Info
Date Received: 3/27/26 WO# 556372 Client: Geosyntec

Section 2: Shipping / Custody
Are custody seals present? ☐ Yes ☐ No
Custody seals intact on arrival? ☑ N/A ☐ Yes ☐ No ☐ On cooler / box ☐ On samples
☐ Courier ☑ Walk-In ☐ Field Sampling ☐ Shipping Info: _____

Section 3a: Condition / Packaging
☐ **Outside 0.0 - 6.0°C (0.0 - 10.0°C for microbiology) (PM notified)**
Date Opened 3/27/26 By (initials) TV Type of ice used: ☑ Wet ☐ Blue/Gel ☐ None
☑ Samples received on ice directly from the field; cooling process had begun. (if checked, skip temperatures)
☐ Sample matrix doesn't require cooling (e.g. air, bulk PCB). (if checked, skip temperatures)
If no cooler: Observed/Adjusted Temp (°C): _____ / _____ Thermometer/IR Gun: _____ CF: _____
Cooler Temp (°C) #1: ____/____ #2: ____/____ #3: ____/____ #4: ____/____ #5: ____/____ #6: ____/____

Section 3b: Microbiology Samples
☑ **No microbiology samples submitted (skip 3b)**
☐ Within temp range 0.0 - 10.0°C or received on ice directly from field.
☐ Adequate headspace for microbiology analysis.

Section 3c: Air Samples
☑ **No air samples submitted (skip 3c)**
☐ 1.4L Canisters ☐ 6L Canisters ☐ Tedlar Bags ☐ MCE Cassettes ☐ Sorbent Tubes ☐ Other _____

Section 4: Containers / Labels / Samples	YES	NO	N/A
1) Were custody papers present, filled properly, and legible?	X		
2) Is the sampler's name present on the CoC?	X		
3) Were containers received in good condition (unbroken / unopened / uncompromised)?	X		
4) Were the samples bagged? (required for microbiology samples; recommended for soil samples)	X		
5) Were all of, and only, the correct samples received?	X		
6) Are sample labels present, legible, and in agreement with the CoC?	X		
7) Does the container count match the CoC?	X		
8) Was sufficient sample volume / mass received for the analyses requested?	X		
9) Were samples received in proper containers for the analyses requested?	X		
10) Were samples received with > 1/2 holding time remaining?	X		
11) Are samples properly preserved as indicated by CoC / labels?	X		
12) Unpreserved VOAs received - If necessary, was the hold time changed in LIMS?			X
13) Are VOA vials free from headspace/bubbles > 6mm?	X		

Section 5: Explanations / Comments
(If no comments are made, then no discrepancies noted.)

☐ **No additional discrepancies**

Date Logged 3/27/26 **By (print)** Brenda Hamilton **(sign)** Brenda Hamilton
Date Labeled 3/27/26 **By (print)** Tyler Wenrich **(sign)**

SAMPLE RECEIPT CHECKLIST

ENTHALPY

Section 1: General Info

Date Received: 03/28/26 WO# 556372 Client: Geosyntec

Section 2: Shipping / Custody **Are custody seals present?** ☐ Yes ☒ No

Custody seals intact on arrival? ■ N/A ☐ Yes ☐ No ☐ On cooler / box ☐ On samples

☐ Courier ☐ Walk-In ☐ Field Sampling ■ Shipping Info: INTRASTATE

Section 3a: Condition / Packaging ☐ **Outside 0.0 - 6.0°C (0.0 - 10.0°C for microbiology) (PM notified)**

Date Opened 03/28/26 By (initials) JXR Type of ice used: ■ Wet ☐ Blue/Gel ☐ None

☐ Samples received on ice directly from the field; cooling process had begun. (if checked, skip temperatures)

☐ Sample matrix doesn't require cooling (e.g. air, bulk PCB). (if checked, skip temperatures)

If no cooler: Observed/Adjusted Temp (°C): _____ / _____ Thermometer/IR Gun: IR10 CF: +0.2

Cooler Temp (°C) #1: 0.9 / 1.1 #2: ____ / ____ #3: ____ / ____ #4: ____ / ____ #5: ____ / ____ #6: ____ / ____

Section 3b: Microbiology Samples ■ **No microbiology samples submitted (skip 3b)**

☐ Within temp range 0.0 - 10.0°C or received on ice directly from field.

☐ Adequate headspace for microbiology analysis.

Section 3c: Air Samples ■ **No air samples submitted (skip 3c)**

☐ 1.4L Canisters ☐ 6L Canisters ☐ Tedlar Bags ☐ MCE Cassettes ☐ Sorbent Tubes ☐ Other_____

Section 4: Containers / Labels / Samples	YES	NO	N/A
1) Were custody papers present, filled properly, and legible?	X		
2) Is the sampler's name present on the CoC?	X		
3) Were containers received in good condition (unbroken / unopened / uncompromised)?	X		
4) Were the samples bagged? (required for microbiology samples; recommended for soil samples)	X		
5) Were all of, and only, the correct samples received?	X		
6) Are sample labels present, legible, and in agreement with the CoC?	X		
7) Does the container count match the CoC?	X		
8) Was sufficient sample volume / mass received for the analyses requested?	X		
9) Were samples received in proper containers for the analyses requested?	X		
10) Were samples received with > 1/2 holding time remaining?	X		
11) Are samples properly preserved as indicated by CoC / labels?	X		
12) Unpreserved VOAs received - If necessary, was the hold time changed in LIMS?			X
13) Are VOA vials free from headspace/bubbles > 6mm?	X		

Section 5: Explanations / Comments

(If no comments are made, then no discrepancies noted.)

☐ **No additional discrepancies**

Date Logged 03/27/26 **By (print)** SAC **(sign)** _____

Date Labeled 03/27/26 **By (print)** SAC **(sign)** _____

ENTHALPY ANALYTICAL

Enthalpy Analytical Report

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID:	VP-MW01-20260326	**Batch#:**	399599	**Prep:**	EPA 5030B
Lab ID:	556372-001	**Sampled:**	03/26/26	**Analysis:**	EPA 8260B
Matrix:	Water	**Received:**	03/27/26	**Analyst:**	HMN
DF:	1.000	**Analyzed:**	04/01/26		

556372-001 Analyte	Result	RL	Units
Freon 12	ND	0.5	ug/L
Chloromethane	ND	0.5	ug/L
Vinyl Chloride	ND	0.5	ug/L
Bromomethane	ND	1.0	ug/L
Chloroethane	ND	0.5	ug/L
Trichlorofluoromethane	ND	0.5	ug/L
Acetone	ND	20	ug/L
Freon 113	ND	0.5	ug/L
1,1-Dichloroethene	ND	0.5	ug/L
Methylene Chloride	ND	10	ug/L
MTBE	ND	0.5	ug/L
trans-1,2-Dichloroethene	ND	0.5	ug/L
1,1-Dichloroethane	ND	0.5	ug/L
2-Butanone	ND	5.0	ug/L
cis-1,2-Dichloroethene	ND	0.5	ug/L
2,2-Dichloropropane	ND	0.5	ug/L
Chloroform	ND	0.5	ug/L
Bromochloromethane	ND	0.5	ug/L
1,1,1-Trichloroethane	ND	0.5	ug/L
1,1-Dichloropropene	ND	0.5	ug/L
Carbon Tetrachloride	ND	0.5	ug/L
1,2-Dichloroethane	ND	0.5	ug/L
Benzene	ND	0.5	ug/L
Trichloroethene	ND	0.5	ug/L
1,2-Dichloropropane	ND	0.5	ug/L
Bromodichloromethane	ND	0.5	ug/L
Dibromomethane	ND	0.5	ug/L
4-Methyl-2-Pentanone	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	0.5	ug/L
Toluene	ND	0.5	ug/L
trans-1,3-Dichloropropene	ND	0.5	ug/L
1,1,2-Trichloroethane	ND	0.5	ug/L
1,3-Dichloropropane	ND	0.5	ug/L
Tetrachloroethene	ND	0.5	ug/L
Dibromochloromethane	ND	0.5	ug/L
1,2-Dibromoethane	ND	0.5	ug/L
Chlorobenzene	ND	0.5	ug/L
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L
Ethylbenzene	ND	0.5	ug/L
m,p-Xylenes	ND	1.0	ug/L
o-Xylene	ND	0.5	ug/L
Styrene	ND	0.5	ug/L
Bromoform	ND	1.0	ug/L
Propylbenzene	ND	0.5	ug/L
Isopropylbenzene	ND	0.5	ug/L
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L

ENTHALPY ANALYTICAL

Enthalpy Analytical Report

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

556372-001 Analyte	Result	RL	Units
1,2,3-Trichloropropane	ND	0.5	ug/L
Bromobenzene	ND	1.0	ug/L
1,3,5-Trimethylbenzene	ND	0.5	ug/L
2-Chlorotoluene	ND	0.5	ug/L
4-Chlorotoluene	ND	0.5	ug/L
tert-Butylbenzene	ND	0.5	ug/L
1,2,4-Trimethylbenzene	ND	0.5	ug/L
sec-Butylbenzene	ND	0.5	ug/L
para-Isopropyl Toluene	ND	0.5	ug/L
1,3-Dichlorobenzene	ND	0.5	ug/L
1,4-Dichlorobenzene	ND	0.5	ug/L
n-Butylbenzene	ND	0.5	ug/L
1,2-Dichlorobenzene	ND	0.5	ug/L
1,2-Dibromo-3-Chloropropane	ND	2.0	ug/L
1,2,4-Trichlorobenzene	ND	0.5	ug/L
Hexachlorobutadiene	ND	2.0	ug/L
Naphthalene	ND	2.0	ug/L
1,2,3-Trichlorobenzene	ND	0.5	ug/L
Isopropyl Ether (DIPE)	ND	0.5	ug/L
Ethyl tert-Butyl Ether (ETBE)	ND	0.5	ug/L
tert-Butyl Alcohol (TBA)	ND	10	ug/L
Methyl tert-Amyl Ether (TAME)	ND	0.5	ug/L
Xylene (total)	ND	0.5	ug/L

556372-001 Surrogate	%REC	Limits
Dibromofluoromethane	97	70-130
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	98	70-130
Bromofluorobenzene	107	70-130

Legend

ND: Not Detected

RL: Reporting Limit

ENTHALPY ANALYTICAL

Enthalpy Analytical Report: Batch QC

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type: BLANK **DF:** 1.000 **Prep:** EPA 5030B

Lab ID: QC1355561 **Batch#:** 399599 **Analysis:** EPA 8260B

Matrix: Water **Analyzed:** 04/01/26 **Analyst:** HMN

QC1355561 Analyte	Result	RL	Units
Freon 12	ND	0.5	ug/L
Chloromethane	ND	0.5	ug/L
Vinyl Chloride	ND	0.5	ug/L
Bromomethane	ND	1.0	ug/L
Chloroethane	ND	0.5	ug/L
Trichlorofluoromethane	ND	0.5	ug/L
Acetone	ND	20	ug/L
Freon 113	ND	0.5	ug/L
1,1-Dichloroethene	ND	0.5	ug/L
Methylene Chloride	ND	10	ug/L
MTBE	ND	0.5	ug/L
trans-1,2-Dichloroethene	ND	0.5	ug/L
1,1-Dichloroethane	ND	0.5	ug/L
2-Butanone	ND	5.0	ug/L
cis-1,2-Dichloroethene	ND	0.5	ug/L
2,2-Dichloropropane	ND	0.5	ug/L
Chloroform	ND	0.5	ug/L
Bromochloromethane	ND	0.5	ug/L
1,1,1-Trichloroethane	ND	0.5	ug/L
1,1-Dichloropropene	ND	0.5	ug/L
Carbon Tetrachloride	ND	0.5	ug/L
1,2-Dichloroethane	ND	0.5	ug/L
Benzene	ND	0.5	ug/L
Trichloroethene	ND	0.5	ug/L
1,2-Dichloropropane	ND	0.5	ug/L
Bromodichloromethane	ND	0.5	ug/L
Dibromomethane	ND	0.5	ug/L
4-Methyl-2-Pentanone	ND	5.0	ug/L
cis-1,3-Dichloropropene	ND	0.5	ug/L
Toluene	ND	0.5	ug/L
trans-1,3-Dichloropropene	ND	0.5	ug/L
1,1,2-Trichloroethane	ND	0.5	ug/L
1,3-Dichloropropane	ND	0.5	ug/L
Tetrachloroethene	ND	0.5	ug/L
Dibromochloromethane	ND	0.5	ug/L
1,2-Dibromoethane	ND	0.5	ug/L
Chlorobenzene	ND	0.5	ug/L
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L
Ethylbenzene	ND	0.5	ug/L
m,p-Xylenes	ND	1.0	ug/L
o-Xylene	ND	0.5	ug/L
Styrene	ND	0.5	ug/L
Bromoform	ND	1.0	ug/L
Propylbenzene	ND	0.5	ug/L
Isopropylbenzene	ND	0.5	ug/L
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L
1,2,3-Trichloropropane	ND	0.5	ug/L
Bromobenzene	ND	1.0	ug/L

ENTHALPY ANALYTICAL

Enthalpy Analytical Report: Batch QC

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

QC1355561 Analyte	Result	RL	Units
1,3,5-Trimethylbenzene	ND	0.5	ug/L
2-Chlorotoluene	ND	0.5	ug/L
4-Chlorotoluene	ND	0.5	ug/L
tert-Butylbenzene	ND	0.5	ug/L
1,2,4-Trimethylbenzene	ND	0.5	ug/L
sec-Butylbenzene	ND	0.5	ug/L
para-Isopropyl Toluene	ND	0.5	ug/L
1,3-Dichlorobenzene	ND	0.5	ug/L
1,4-Dichlorobenzene	ND	0.5	ug/L
n-Butylbenzene	ND	0.5	ug/L
1,2-Dichlorobenzene	ND	0.5	ug/L
1,2-Dibromo-3-Chloropropane	ND	2.0	ug/L
1,2,4-Trichlorobenzene	ND	0.5	ug/L
Hexachlorobutadiene	ND	2.0	ug/L
Naphthalene	ND	2.0	ug/L
1,2,3-Trichlorobenzene	ND	0.5	ug/L
Isopropyl Ether (DIPE)	ND	0.5	ug/L
Ethyl tert-Butyl Ether (ETBE)	ND	0.5	ug/L
tert-Butyl Alcohol (TBA)	ND	10	ug/L
Methyl tert-Amyl Ether (TAME)	ND	0.5	ug/L
Xylene (total)	ND	0.5	ug/L

QC1355561 Surrogate	%REC	Limits
Dibromofluoromethane	94	70-130
1,2-Dichloroethane-d4	87	70-130
Toluene-d8	99	70-130
Bromofluorobenzene	108	70-130

Legend

ND: Not Detected

RL: Reporting Limit

ENTHALPY ANALYTICAL

Enthalpy Analytical Report: Batch QC

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type: BS **DF:** 1.000 **Prep:** EPA 5030B

Lab ID: QC1355564 **Batch#:** 399599 **Analysis:** EPA 8260B

Matrix: Water **Analyzed:** 04/01/26 **Analyst:** HMN

QC1355564 Analyte	Spiked	Result	%REC	Limits	Units
1,1-Dichloroethene	50.00	47.50	95	69-128	ug/L
MTBE	50.00	47.38	95	66-125	ug/L
Benzene	50.00	47.32	95	76-121	ug/L
Trichloroethene	50.00	45.45	91	76-124	ug/L
Toluene	50.00	46.38	93	76-120	ug/L
Chlorobenzene	50.00	46.27	93	78-120	ug/L

QC1355564 Surrogate	%REC	Limits
Dibromofluoromethane	99	70-130
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	101	70-130
Bromofluorobenzene	111	70-130

Type: BSD **DF:** 1.000 **Prep:** EPA 5030B

Lab ID: QC1355565 **Batch#:** 399599 **Analysis:** EPA 8260B

Matrix: Water **Analyzed:** 04/01/26 **Analyst:** HMN

QC1355565 Analyte	Spiked	Result	%REC	Limits	Units	RPD	Lim
1,1-Dichloroethene	50.00	48.23	96	69-128	ug/L	2	23
MTBE	50.00	46.30	93	66-125	ug/L	2	22
Benzene	50.00	48.07	96	76-121	ug/L	2	21
Trichloroethene	50.00	46.77	94	76-124	ug/L	3	22
Toluene	50.00	47.75	95	76-120	ug/L	3	21
Chlorobenzene	50.00	48.18	96	78-120	ug/L	4	20

QC1355565 Surrogate	%REC	Limits
Dibromofluoromethane	100	70-130
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	100	70-130
Bromofluorobenzene	109	70-130

Legend

RPD: Relative Percent Difference

Enthalpy Analytical Report: Batch QC

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID: VP-MW01-20260326 **DF:** 1.000 **Prep:** EPA 5030B

Type: MS **Batch#:** 399599 **Analysis:** EPA 8260B

MSS Lab ID: 556372-001 **Sampled:** 03/26/26 **Analyst:** HMN

Lab ID: QC1355626 **Received:** 03/27/26

Matrix: Water **Analyzed:** 04/01/26

QC1355626 Analyte	MSS Result	Spiked	Result	%REC	Limits	Units
1,1-Dichloroethene	<0.1163	20.00	20.31	102	62-131	ug/L
MTBE	<0.1531	20.00	20.43	102	61-124	ug/L
Benzene	<0.1003	20.00	19.93	100	70-123	ug/L
Trichloroethene	<0.1855	20.00	19.55	98	65-131	ug/L
Toluene	<0.1612	20.00	19.71	99	69-120	ug/L
Chlorobenzene	<0.1449	20.00	19.68	98	72-121	ug/L

QC1355626 Surrogate	%REC	Limits
Dibromofluoromethane	98	70-130
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	101	70-130
Bromofluorobenzene	109	70-130

Field ID: VP-MW01-20260326 **DF:** 1.000 **Prep:** EPA 5030B

Type: MSD **Batch#:** 399599 **Analysis:** EPA 8260B

MSS Lab ID: 556372-001 **Sampled:** 03/26/26 **Analyst:** HMN

Lab ID: QC1355627 **Received:** 03/27/26

Matrix: Water **Analyzed:** 04/01/26

QC1355627 Analyte	Spiked	Result	%REC	Limits	Units	RPD	Lim
1,1-Dichloroethene	20.00	19.25	96	62-131	ug/L	5	31
MTBE	20.00	20.16	101	61-124	ug/L	1	30
Benzene	20.00	19.82	99	70-123	ug/L	1	31
Trichloroethene	20.00	18.13	91	65-131	ug/L	7	31
Toluene	20.00	18.14	91	69-120	ug/L	8	29
Chlorobenzene	20.00	18.57	93	72-121	ug/L	6	29

QC1355627 Surrogate	%REC	Limits
Dibromofluoromethane	98	70-130
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	95	70-130
Bromofluorobenzene	108	70-130

Legend

RPD: Relative Percent Difference

ENTHALPY ANALYTICAL

Dissolved Metals Analytical Report

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID: VP-MW01-20260326 **DF:** 1.000 **Prepared:** 03/31/26
Type: SAMPLE **Batch#:** 399452 **Prep:** EPA 3015A
Lab ID: 556372-001 **Sampled:** 03/26/26 **Analysis:** EPA 200.8
Matrix: Filtrate **Received:** 03/27/26 **Analyst:** EPL

556372-001 Analyte	Result	RL	Units	Analyzed
Calcium	**34,000**	250	ug/L	03/31/26
Iron	**360**	50	ug/L	03/31/26
Magnesium	**30,000**	250	ug/L	03/31/26
Manganese	**20**	10	ug/L	03/31/26
Potassium	ND	250	ug/L	03/31/26
Sodium	**7,600**	250	ug/L	03/31/26

Field ID: VP-MW02-20260326 **DF:** 1.000 **Prepared:** 03/30/26
Type: SAMPLE **Batch#:** 399376 **Prep:** 200.8 DirectAnalysis
Lab ID: 556372-002 **Sampled:** 03/26/26 **Analysis:** EPA 200.8
Matrix: Filtrate **Received:** 03/27/26 **Analyst:** KAM

556372-002 Analyte	Result	RL	Units	Analyzed
Calcium	**34,000**	250	ug/L	03/30/26
Iron	**180**	50	ug/L	03/30/26
Magnesium	**30,000**	250	ug/L	03/30/26
Manganese	**23**	10	ug/L	03/30/26
Potassium	ND	250	ug/L	03/31/26
Sodium	**7,300**	250	ug/L	03/30/26

Field ID: RP-MW01-20260326 **DF:** 1.000 **Prepared:** 03/30/26
Type: SAMPLE **Batch#:** 399376 **Prep:** 200.8 DirectAnalysis
Lab ID: 556372-003 **Sampled:** 03/26/26 **Analysis:** EPA 200.8
Matrix: Filtrate **Received:** 03/27/26 **Analyst:** KAM

556372-003 Analyte	Result	RL	Units	Analyzed
Calcium	**37,000**	250	ug/L	03/30/26
Iron	**300**	50	ug/L	03/30/26
Magnesium	**26,000**	250	ug/L	03/30/26
Manganese	**13**	10	ug/L	03/30/26
Potassium	**860**	250	ug/L	03/31/26
Sodium	**13,000**	250	ug/L	03/30/26

Field ID: WP-MW01-20260327 **DF:** 1.000 **Prepared:** 03/30/26
Type: SAMPLE **Batch#:** 399376 **Prep:** 200.8 DirectAnalysis
Lab ID: 556372-004 **Sampled:** 03/27/26 **Analysis:** EPA 200.8
Matrix: Filtrate **Received:** 03/27/26 **Analyst:** KAM

556372-004 Analyte	Result	RL	Units	Analyzed
Calcium	**65,000**	250	ug/L	03/30/26
Iron	**320**	50	ug/L	03/30/26
Magnesium	**46,000**	250	ug/L	03/30/26
Manganese	**23**	10	ug/L	03/30/26
Potassium	**1,400**	250	ug/L	03/31/26
Sodium	**15,000**	250	ug/L	03/30/26

ENTHALPY ANALYTICAL

Dissolved Metals Analytical Report

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type: BLANK **DF:** 1.000 **Prep:** 200.8 DirectAnalysis

Lab ID: QC1354727 **Batch#:** 399376 **Analysis:** EPA 200.8

Matrix: Filtrate **Prepared:** 03/30/26 **Analyst:** KAM

QC1354727 Analyte	Result	RL	Units	Analyzed
Calcium	ND	250	ug/L	03/30/26
Iron	ND	50	ug/L	03/30/26
Magnesium	ND	250	ug/L	03/30/26
Manganese	ND	10	ug/L	03/30/26
Potassium	ND	250	ug/L	03/31/26
Sodium	ND	250	ug/L	03/30/26

Type: BLANK **DF:** 1.000 **Prep:** EPA 3015A

Lab ID: QC1355006 **Batch#:** 399452 **Analysis:** EPA 200.8

Matrix: Filtrate **Prepared:** 03/31/26 **Analyst:** EPL

QC1355006 Analyte	Result	RL	Units	Analyzed
Calcium	ND	250	ug/L	03/31/26
Iron	ND	50	ug/L	03/31/26
Magnesium	ND	250	ug/L	03/31/26
Manganese	ND	10	ug/L	03/31/26
Potassium	ND	250	ug/L	03/31/26
Sodium	ND	250	ug/L	03/31/26

Legend

ND: Not Detected

RL: Reporting Limit

ENTHALPY ANALYTICAL

Dissolved Metals Analytical Report: Batch QC

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type: LCS **DF:** 1.000 **Prep:** 200.8 DirectAnalysis

Lab ID: QC1354730 **Batch#:** 399376 **Analysis:** EPA 200.8

Matrix: Filtrate **Prepared:** 03/30/26 **Analyst:** KAM

QC1354730 Analyte	Spiked	Result	%REC	Limits	Units	Analyzed
Calcium	5,100	4,898	96	85-115	ug/L	03/30/26
Iron	500.0	503.4	101	85-115	ug/L	03/30/26
Magnesium	5,100	4,991	98	85-115	ug/L	03/30/26
Manganese	100.0	104.4	104	85-115	ug/L	03/30/26
Potassium	6,000	5,916	99	85-115	ug/L	03/31/26
Sodium	5,100	4,881	96	85-115	ug/L	03/30/26

ENTHALPY ANALYTICAL

Dissolved Metals Analytical Report: Batch QC

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID: VP-MW02-20260326 **DF:** 1.000 **Prep:** 200.8 DirectAnalysis

Type: MS **Batch#:** 399376 **Analysis:** EPA 200.8

MSS Lab ID: 556372-002 **Sampled:** 03/26/26 **Analyst:** KAM

Lab ID: QC1354731 **Received:** 03/27/26

Matrix: Filtrate **Prepared:** 03/30/26

QC1354731 Analyte	MSS Result	Spiked	Result	%REC	Limits	Units	Analyzed	Qual
Calcium	33,720	5,100	38,730	98	70-130	ug/L	03/30/26	NM
Iron	177.8	500.0	705.0	105	70-130	ug/L	03/30/26	
Magnesium	29,590	5,100	34,150	89	70-130	ug/L	03/30/26	NM
Manganese	23.45	100.0	127.4	104	70-130	ug/L	03/30/26	
Potassium	203.5	6,000	6,423	104	70-130	ug/L	03/31/26	
Sodium	7,272	5,100	12,310	99	70-130	ug/L	03/30/26	

Field ID: VP-MW02-20260326 **DF:** 1.000 **Prep:** 200.8 DirectAnalysis

Type: MSD **Batch#:** 399376 **Analysis:** EPA 200.8

MSS Lab ID: 556372-002 **Sampled:** 03/26/26 **Analyst:** KAM

Lab ID: QC1354732 **Received:** 03/27/26

Matrix: Filtrate **Prepared:** 03/30/26

QC1354732 Analyte	Spiked	Result	%REC	Limits	Units	RPD	Lim	Analyzed	Qual
Calcium	5,100	38,490	94	70-130	ug/L	1	20	03/30/26	NM
Iron	500.0	683.6	101	70-130	ug/L	3	20	03/30/26	
Magnesium	5,100	34,110	89	70-130	ug/L	0	20	03/30/26	NM
Manganese	100.0	123.1	100	70-130	ug/L	3	20	03/30/26	
Potassium	6,000	6,145	99	70-130	ug/L	4	20	03/31/26	
Sodium	5,100	11,990	93	70-130	ug/L	3	20	03/30/26	

Legend

NM: Not Meaningful

RPD: Relative Percent Difference

ENTHALPY ANALYTICAL

Dissolved Metals Analytical Report: Batch QC

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type: LCS **Batch#:** 399452 **Analysis:** EPA 200.8

Lab ID: QC1355007 **Prepared:** 03/31/26 **Analyst:** EPL

Matrix: Filtrate **Analyzed:** 03/31/26

DF: 1.000 **Prep:** EPA 3015A

QC1355007 Analyte	Spiked	Result	%REC	Limits	Units
Calcium	5,100	4,828	95	85-115	ug/L
Iron	500.0	498.5	100	85-115	ug/L
Magnesium	5,100	5,021	98	85-115	ug/L
Manganese	100.0	101.1	101	85-115	ug/L
Potassium	6,000	5,601	93	85-115	ug/L
Sodium	5,100	4,796	94	85-115	ug/L

ENTHALPY ANALYTICAL

Dissolved Metals Analytical Report: Batch QC

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID:	VP-MW01-20260326	**DF:**	1.000	**Analyzed:**	03/31/26
Type:	MS	**Batch#:**	399452	**Prep:**	EPA 3015A
MSS Lab ID:	556372-001	**Sampled:**	03/26/26	**Analysis:**	EPA 200.8
Lab ID:	QC1355008	**Received:**	03/27/26	**Analyst:**	EPL
Matrix:	Filtrate	**Prepared:**	03/31/26		

QC1355008 Analyte	MSS Result	Spiked	Result	%REC	Limits	Units	Qual
Calcium	33,680	5,100	38,490	94	70-130	ug/L	NM
Iron	357.2	500.0	846.7	98	70-130	ug/L	
Magnesium	30,310	5,100	34,210	77	70-130	ug/L	NM
Manganese	19.85	100.0	118.6	99	70-130	ug/L	
Potassium	223.5	6,000	5,615	90	70-130	ug/L	
Sodium	7,607	5,100	12,160	89	70-130	ug/L	

Field ID:	VP-MW01-20260326	**DF:**	1.000	**Analyzed:**	03/31/26
Type:	MSD	**Batch#:**	399452	**Prep:**	EPA 3015A
MSS Lab ID:	556372-001	**Sampled:**	03/26/26	**Analysis:**	EPA 200.8
Lab ID:	QC1355009	**Received:**	03/27/26	**Analyst:**	EPL
Matrix:	Filtrate	**Prepared:**	03/31/26		

QC1355009 Analyte	Spiked	Result	%REC	Limits	Units	RPD	Lim	Qual
Calcium	5,100	38,190	88	70-130	ug/L	1	20	NM
Iron	500.0	813.5	91	70-130	ug/L	4	20	
Magnesium	5,100	34,190	76	70-130	ug/L	0	20	NM
Manganese	100.0	117.9	98	70-130	ug/L	1	20	
Potassium	6,000	5,801	93	70-130	ug/L	3	20	
Sodium	5,100	12,010	86	70-130	ug/L	1	20	

Legend

NM: Not Meaningful

RPD: Relative Percent Difference

ENTHALPY ANALYTICAL

Enthalpy Analytical Report

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID: VP-MW01-20260326 **Lab ID:** 556372-001 **Sampled:** 03/26/26 15:05 **Prep:** METHOD

Type: SAMPLE **Matrix:** Water **Received:** 03/27/26 **Analysis:** EPA 300.0

556372-001 Analyte	Result	RL	Units	DF	Batch#	Prepared	Analyzed	Analyst
Chloride	**13**	1.0	mg/L	1.000	399227	03/28/26 09:45	03/28/26 10:21	AJL
Nitrogen, Nitrate	**13**	0.10	mg/L	1.000	399227	03/28/26 09:45	03/28/26 10:21	AJL
Sulfate	**68**	1.0	mg/L	1.000	399227	03/28/26 09:45	03/28/26 10:21	AJL

Field ID: VP-MW02-20260326 **Lab ID:** 556372-002 **Sampled:** 03/26/26 13:00 **Prep:** METHOD

Type: SAMPLE **Matrix:** Water **Received:** 03/27/26 **Analysis:** EPA 300.0

556372-002 Analyte	Result	RL	Units	DF	Batch#	Prepared	Analyzed	Analyst
Chloride	**13**	1.0	mg/L	1.000	399227	03/28/26 09:45	03/28/26 09:59	AJL
Nitrogen, Nitrate	**13**	0.10	mg/L	1.000	399227	03/28/26 09:45	03/28/26 09:59	AJL
Sulfate	**68**	1.0	mg/L	1.000	399227	03/28/26 09:45	03/28/26 09:59	AJL

Field ID: RP-MW01-20260326 **Lab ID:** 556372-003 **Sampled:** 03/26/26 17:35 **Prep:** METHOD

Type: SAMPLE **Matrix:** Water **Received:** 03/27/26 **Analysis:** EPA 300.0

556372-003 Analyte	Result	RL	Units	DF	Batch#	Prepared	Analyzed	Analyst
Chloride	**22**	1.0	mg/L	1.000	399227	03/28/26 09:45	03/28/26 10:43	AJL
Nitrogen, Nitrate	**21**	1.0	mg/L	10.00	399227	03/28/26 09:45	03/28/26 12:55	AJL
Sulfate	**35**	1.0	mg/L	1.000	399227	03/28/26 09:45	03/28/26 10:43	AJL

Field ID: WP-MW01-20260327 **Lab ID:** 556372-004 **Sampled:** 03/27/26 14:50 **Prep:** METHOD

Type: SAMPLE **Matrix:** Water **Received:** 03/27/26 **Analysis:** EPA 300.0

556372-004 Analyte	Result	RL	Units	DF	Batch#	Prepared	Analyzed	Analyst
Chloride	**21**	1.0	mg/L	1.000	399227	03/28/26 09:45	03/28/26 11:05	AJL
Nitrogen, Nitrate	**10**	0.10	mg/L	1.000	399227	03/28/26 09:45	03/28/26 11:05	AJL
Sulfate	**100**	5.0	mg/L	5.000	399470	03/31/26 15:51	04/01/26 03:35	KUM

Type: BLANK **Batch#:** 399227 **Analysis:** EPA 300.0

Lab ID: QC1354180 **Prepared:** 03/28/26 09:45 **Analyst:** AJL

Matrix: Water **Analyzed:** 03/28/26 11:27

DF: 1.000 **Prep:** METHOD

QC1354180 Analyte	Result	RL	Units
Chloride	ND	1.0	mg/L
Nitrogen, Nitrate	ND	0.10	mg/L
Sulfate	ND	1.0	mg/L

Type: BLANK **Batch#:** 399470 **Analysis:** EPA 300.0

Lab ID: QC1355083 **Prepared:** 03/31/26 15:51 **Analyst:** KUM

Matrix: Water **Analyzed:** 03/31/26 16:18

DF: 1.000 **Prep:** METHOD

QC1355083 Analyte	Result	RL	Units
Sulfate	ND	1.0	mg/L

Legend

ND: Not Detected

RL: Reporting Limit

ENTHALPY ANALYTICAL

Enthalpy Analytical Report: Batch QC

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type: LCS **Batch#:** 399227 **Analysis:** EPA 300.0

Lab ID: QC1354181 **Prepared:** 03/28/26 09:45 **Analyst:** AJL

Matrix: Water **Analyzed:** 03/28/26 11:49

DF: 1.000 **Prep:** METHOD

QC1354181 Analyte	Spiked	Result	%REC	Limits	Units
Chloride	50.00	47.03	94	90-110	mg/L
Nitrogen, Nitrate	4.518	4.497	100	90-110	mg/L
Sulfate	25.00	24.84	99	90-110	mg/L

Enthalpy Analytical Report: Batch QC

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID:	VP-MW01-20260326	**DF:**	1.000	**Analyzed:**	03/28/26 12:11
Type:	MS	**Batch#:**	399227	**Prep:**	METHOD
MSS Lab ID:	556372-001	**Sampled:**	03/26/26 15:05	**Analysis:**	EPA 300.0
Lab ID:	QC1354182	**Received:**	03/27/26	**Analyst:**	AJL
Matrix:	Water	**Prepared:**	03/28/26 09:45		

QC1354182 Analyte	MSS Result	Spiked	Result	%REC	Limits	Units
Chloride	12.75	100.0	138.9	126 *	80-123	mg/L
Nitrogen, Nitrate	13.27	9.036	23.80 E	117	80-123	mg/L
Sulfate	67.83	50.00	127.4 E	119	79-124	mg/L

Field ID:	VP-MW01-20260326	**DF:**	1.000	**Analyzed:**	03/28/26 12:33
Type:	MSD	**Batch#:**	399227	**Prep:**	METHOD
MSS Lab ID:	556372-001	**Sampled:**	03/26/26 15:05	**Analysis:**	EPA 300.0
Lab ID:	QC1354183	**Received:**	03/27/26	**Analyst:**	AJL
Matrix:	Water	**Prepared:**	03/28/26 09:45		

QC1354183 Analyte	Spiked	Result	%REC	Limits	Units	RPD	Lim
Chloride	100.0	125.1	112	80-123	mg/L	10	20
Nitrogen, Nitrate	9.036	22.63 E	104	80-123	mg/L	NC	20
Sulfate	50.00	120.6 E	106	79-124	mg/L	NC	20

Legend

***:** Value is outside QC limits

E: Response exceeds instrument's linear range

NC: Not Calculated

RPD: Relative Percent Difference

ENTHALPY ANALYTICAL

Enthalpy Analytical Report: Batch QC

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type:	LCS	**Batch#:**	399470	**Analysis:**	EPA 300.0
Lab ID:	QC1355084	**Prepared:**	03/31/26 15:51	**Analyst:**	KUM
Matrix:	Water	**Analyzed:**	03/31/26 16:39		
DF:	1.000	**Prep:**	METHOD		

QC1355084 Analyte	Spiked	Result	%REC	Limits	Units
Sulfate	25.00	25.24	101	90-110	mg/L

ENTHALPY ANALYTICAL

Enthalpy Analytical Report: Batch QC

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID:	ZZZZZZZZZZ	**DF:**	1.000	**Analyzed:**	03/31/26 18:51
Type:	MS	**Batch#:**	399470	**Prep:**	METHOD
MSS Lab ID:	556492-001	**Sampled:**	03/30/26 08:30	**Analysis:**	EPA 300.0
Lab ID:	QC1355094	**Received:**	03/31/26	**Analyst:**	KUM
Matrix:	Water	**Prepared:**	03/31/26 15:51		

QC1355094 Analyte	MSS Result	Spiked	Result	%REC	Limits	Units	Qual
Sulfate	205.1	50.00	235.4 E	61	79-124	mg/L	NM

Field ID:	ZZZZZZZZZZ	**DF:**	1.000	**Analyzed:**	03/31/26 19:13
Type:	MSD	**Batch#:**	399470	**Prep:**	METHOD
MSS Lab ID:	556492-001	**Sampled:**	03/30/26 08:30	**Analysis:**	EPA 300.0
Lab ID:	QC1355095	**Received:**	03/31/26	**Analyst:**	KUM
Matrix:	Water	**Prepared:**	03/31/26 15:51		

QC1355095 Analyte	Spiked	Result	%REC	Limits	Units	RPD	Lim	Qual
Sulfate	50.00	235.3 E	60	79-124	mg/L	NC	20	NM

Legend

E:	Response exceeds instrument's linear range
NC:	Not Calculated
NM:	Not Meaningful
RPD:	Relative Percent Difference

ENTHALPY ANALYTICAL

Alkalinity

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID: VP-MW01-20260326 **DF:** 2.500 **Analyzed:** 03/31/26
Type: SAMPLE **Batch#:** 399371 **Prep:** METHOD
Lab ID: 556372-001 **Sampled:** 03/26/26 **Analysis:** SM2320B
Matrix: Water **Received:** 03/27/26 **Analyst:** WWC

556372-001 Analyte	Result	RL	Units
Alkalinity, Bicarbonate, as CaCO3	**100**	13	mg/L
Alkalinity, Carbonate, as CaCO3	ND	13	mg/L
Alkalinity, Hydroxide, as CaCO3	ND	13	mg/L
Alkalinity, Total as CaCO3	**100**	13	mg/L

Field ID: VP-MW02-20260326 **DF:** 2.500 **Analyzed:** 03/31/26
Type: SAMPLE **Batch#:** 399371 **Prep:** METHOD
Lab ID: 556372-002 **Sampled:** 03/26/26 **Analysis:** SM2320B
Matrix: Water **Received:** 03/27/26 **Analyst:** WWC

556372-002 Analyte	Result	RL	Units
Alkalinity, Bicarbonate, as CaCO3	**100**	13	mg/L
Alkalinity, Carbonate, as CaCO3	ND	13	mg/L
Alkalinity, Hydroxide, as CaCO3	ND	13	mg/L
Alkalinity, Total as CaCO3	**100**	13	mg/L

Field ID: RP-MW01-20260326 **DF:** 2.500 **Analyzed:** 03/31/26
Type: SAMPLE **Batch#:** 399371 **Prep:** METHOD
Lab ID: 556372-003 **Sampled:** 03/26/26 **Analysis:** SM2320B
Matrix: Water **Received:** 03/27/26 **Analyst:** WWC

556372-003 Analyte	Result	RL	Units
Alkalinity, Bicarbonate, as CaCO3	**100**	13	mg/L
Alkalinity, Carbonate, as CaCO3	ND	13	mg/L
Alkalinity, Hydroxide, as CaCO3	ND	13	mg/L
Alkalinity, Total as CaCO3	**100**	13	mg/L

Field ID: WP-MW01-20260327 **DF:** 2.500 **Analyzed:** 03/31/26
Type: SAMPLE **Batch#:** 399371 **Prep:** METHOD
Lab ID: 556372-004 **Sampled:** 03/27/26 **Analysis:** SM2320B
Matrix: Water **Received:** 03/27/26 **Analyst:** WWC

556372-004 Analyte	Result	RL	Units
Alkalinity, Bicarbonate, as CaCO3	**220**	13	mg/L
Alkalinity, Carbonate, as CaCO3	ND	13	mg/L
Alkalinity, Hydroxide, as CaCO3	ND	13	mg/L
Alkalinity, Total as CaCO3	**220**	13	mg/L

ENTHALPY ANALYTICAL

Alkalinity

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type:	BLANK	**DF:**	1.000	**Prep:**	METHOD
Lab ID:	QC1354709	**Batch#:**	399371	**Analysis:**	SM2320B
Matrix:	Water	**Analyzed:**	03/31/26	**Analyst:**	WWC

QC1354709 Analyte	Result	RL	Units
Alkalinity, Bicarbonate, as CaCO3	ND	2.0	mg/L
Alkalinity, Carbonate, as CaCO3	ND	5.0	mg/L
Alkalinity, Hydroxide, as CaCO3	ND	5.0	mg/L
Alkalinity, Total as CaCO3	ND	2.0	mg/L

Legend

ND: Not Detected

RL: Reporting Limit

ENTHALPY ANALYTICAL

Alkalinity: Batch QC

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type: LCS **DF:** 1.000 **Prep:** METHOD

Lab ID: QC1354710 **Batch#:** 399371 **Analysis:** SM2320B

Matrix: Water **Analyzed:** 03/31/26 **Analyst:** WWC

QC1354710 Analyte	Spiked	Result	%REC	Limits	Units
Alkalinity, Total as CaCO3	100.0	94.15	94	90-110	mg/L

ENTHALPY ANALYTICAL

Alkalinity: Batch QC

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID:	ZZZZZZZZZZ	**DF:**	1.250	**Prep:**	METHOD
Type:	SDUP	**Batch#:**	399371	**Analysis:**	SM2320B
MSS Lab ID:	556132-002	**Sampled:**	03/24/26	**Analyst:**	WWC
Lab ID:	QC1354711	**Received:**	03/25/26		
Matrix:	Water	**Analyzed:**	03/31/26		

QC1354711 Analyte	MSS Result	Result	RL	Units	RPD	Lim
Alkalinity, Bicarbonate, as CaCO3	30.67	**30.43**	2.500	mg/L	1	20
Alkalinity, Carbonate, as CaCO3	38.04	**40.42**	6.250	mg/L	6	20
Alkalinity, Hydroxide, as CaCO3	<6.250	<6.250	6.250	mg/L	NC	20
Alkalinity, Total as CaCO3	68.71	**70.85**	2.500	mg/L	3	20

Legend

NC: Not Calculated

RL: Reporting Limit

RPD: Relative Percent Difference

ENTHALPY ANALYTICAL

Total Dissolved Solids (TDS)

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Field ID: VP-MW01-20260326	**Batch#:** 399477	**Prep:** METHOD
Type: SAMPLE	**Sampled:** 03/26/26	**Analysis:** SM2540C
Lab ID: 556372-001	**Received:** 03/27/26	**Analyst:** AAB
Matrix: Water	**Prepared:** 03/31/26	
DF: 2.000	**Analyzed:** 04/02/26	

556372-001 Analyte	Result	RL	Units
Total Dissolved Solids	**300**	20	mg/L

Field ID: VP-MW02-20260326	**Batch#:** 399477	**Prep:** METHOD
Type: SAMPLE	**Sampled:** 03/26/26	**Analysis:** SM2540C
Lab ID: 556372-002	**Received:** 03/27/26	**Analyst:** AAB
Matrix: Water	**Prepared:** 03/31/26	
DF: 2.000	**Analyzed:** 04/02/26	

556372-002 Analyte	Result	RL	Units
Total Dissolved Solids	**310**	20	mg/L

Field ID: RP-MW01-20260326	**Batch#:** 399477	**Prep:** METHOD
Type: SAMPLE	**Sampled:** 03/26/26	**Analysis:** SM2540C
Lab ID: 556372-003	**Received:** 03/27/26	**Analyst:** AAB
Matrix: Water	**Prepared:** 03/31/26	
DF: 2.000	**Analyzed:** 04/02/26	

556372-003 Analyte	Result	RL	Units
Total Dissolved Solids	**360**	20	mg/L

Field ID: WP-MW01-20260327	**Batch#:** 399477	**Prep:** METHOD
Type: SAMPLE	**Sampled:** 03/27/26	**Analysis:** SM2540C
Lab ID: 556372-004	**Received:** 03/27/26	**Analyst:** AAB
Matrix: Water	**Prepared:** 03/31/26	
DF: 2.000	**Analyzed:** 04/02/26	

556372-004 Analyte	Result	RL	Units
Total Dissolved Solids	**510**	20	mg/L

Type: BLANK	**Batch#:** 399477	**Analysis:** SM2540C
Lab ID: QC1355122	**Prepared:** 03/31/26	**Analyst:** AAB
Matrix: Water	**Analyzed:** 04/02/26	
DF: 1.000	**Prep:** METHOD	

QC1355122 Analyte	Result	RL	Units
Total Dissolved Solids	ND	10	mg/L

Legend

ND: Not Detected

RL: Reporting Limit

ENTHALPY ANALYTICAL

Total Dissolved Solids (TDS): Batch QC

Lab #: 556372 **Project#:** BUTTE COUNTY

Client: Geosyntec Consultants **Location:**

Type: LCS **Batch#:** 399477 **Analysis:** SM2540C

Lab ID: QC1355123 **Prepared:** 03/31/26 **Analyst:** AAB

Matrix: Water **Analyzed:** 04/02/26

DF: 1.000 **Prep:** METHOD

QC1355123 Analyte	Spiked	Result	%REC	Limits	Units
Total Dissolved Solids	1,000	1,011	101	90-110	mg/L

Field ID: ZZZZZZZZZZ **DF:** 4.000 **Analyzed:** 04/02/26

Type: SDUP **Batch#:** 399477 **Prep:** METHOD

MSS Lab ID: 556213-001 **Sampled:** 03/26/26 **Analysis:** SM2540C

Lab ID: QC1355120 **Received:** 03/26/26 **Analyst:** AAB

Matrix: Water **Prepared:** 03/31/26

QC1355120 Analyte	MSS Result	Result	RL	Units	RPD	Lim
Total Dissolved Solids	6,192	**6,124**	40.00	mg/L	1	5

Field ID: ZZZZZZZZZZ **DF:** 2.000 **Analyzed:** 04/02/26

Type: SDUP **Batch#:** 399477 **Prep:** METHOD

MSS Lab ID: 556243-001 **Sampled:** 03/26/26 **Analysis:** SM2540C

Lab ID: QC1355121 **Received:** 03/26/26 **Analyst:** AAB

Matrix: Water **Prepared:** 03/31/26

QC1355121 Analyte	MSS Result	Result	RL	Units	RPD	Lim
Total Dissolved Solids	406.0	**404.0**	20.00	mg/L	0	5

Legend

RL: Reporting Limit

RPD: Relative Percent Difference

Laboratory Job Number 556372

Subcontracted Products

UC Davis SIF

STABLE ISOTOPE FACILITY
DEPARTMENT OF PLANT SCIENCES
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UNIVERSITY OF CALIFORNIA
COLLEGE OF AGRICULTURAL AND
ENVIRONMENTAL SCIENCES

^{18}O and ^{2}H of Water by Headspace Equilibration using GasBench-IRMS

Methodology

Equilibration methods use CO_2 or H_2 in the headspace to isotopically equilibrate with water in the sample vial [1,2]. If necessary, the same sample vial can be utilized for both ^{18}O and ^{2}H measurements, provided a new cap is fitted prior to the second equilibration.

For ^{18}O, water samples are pipetted (200 µL) into 12 mL Labco Exetainer vials and flushed with 0.3 % CO_2 in helium for 5 minutes at 100 mL/min. Vials are held at 30 ºC in a thermostated tray for 24 hours prior to isotopic measurement.

Analysis of headspace CO_2 for ^{18}O is then performed on a Thermo Scientific GasBench II coupled to a Thermo Scientific Delta V Advantage isotope-ratio mass spectrometer. An autosampler utilizing a 2-hole sampling needle pushes CO_2 out of the vial and into a 100 µL sample loop. Once the loop is adequately flushed, pulses of sample gas are injected into the IRMS for isotopic measurement. Water is removed from the gas stream using a Nafion dryer, and sample CO_2 is chromatographically separated from other gases using an Agilent PoraPLOT Q GC column (25 m x 0.32 mm ID x 10 µm film thickness, 50 ºC, 2 mL/min).

For ^{2}H, water samples are pipetted (200 µL) into 12 mL Labco Exetainer vials containing platinum catalytic rods and flushed with 2.0 % H_2 in helium for 5 minutes at 100 mL/min. Vials are held at 30 ºC in a thermostated tray for 40 minutes prior to isotopic measurement.

Analysis of headspace H_2 for ^{2}H is performed on a Thermo Scientific GasBench II coupled to a Thermo Scientific Delta V Advantage isotope-ratio mass spectrometer. An autosampler utilizing a 2-hole sampling needle pushes H_2 out of the vial and into a 100 µL sample loop. Once the loop is adequately flushed, pulses of sample gas are injected into the IRMS for isotopic measurement. Water is removed from the gas stream using a Nafion dryer, and sample H_2 is chromatographically separated from other gases using an Agilent PoraPLOT Q GC column (25 m x 0.32 mm ID x 10 µm film thickness, 50 ºC, 2 mL/min).

One of every ten samples is analyzed in duplicate; further replicates may be analyzed if initial measurements fall outside expected measurement error. Replicates of the quality control and assurance reference materials are measured every ten samples.

Calibration and Reporting of Stable Isotope Ratios

Calibration procedures for water stable isotope ratios are applied identically across reference and sample materials and are directly traceable to the primary isotopic reference material, Vienna Standard Mean Ocean Water (VSMOW).

First, a pure CO_2 or H_2 reference gas is used to calculate provisional isotopic values of the sample peaks. Next, isotopic values are adjusted for changes in instrumental drift using an in-house reference material (e.g., SIF-3). Finally, measurements are scale-normalized to the primary reference material using three certified standard reference materials (i.e., SMOW2, GISP2, and SLAP2) available from USGS, NIST, and the IAEA.

Final quality assessment is based on the accuracy and precision of the unbiased quality control materials, which include a certified standard reference material (i.e., USGS47) and $\delta^{18}O$- and $\delta^{2}H$-calibrated waters (i.e., SIF1-8). Enriched waters are further calibrated against a suite of enriched standards including ER-1C1, ER-3A, ER-4A, ER-5A, High en, IAEA-608, and IAEA-609.

Quality assurance reference materials: SMOW2, GISP2, SLAP2
Quality control reference materials: USGS47, SIF 1-8

Measurement Uncertainty

Sample materials are inherently variable in composition, and measurement error may vary between different sample types due to differences in composition. Mean measurement error (σ) and accuracy, as determined by replicate measurements of the quality control and assurance materials, must fall below expected measurement error (± 0.20 ‰ for $\delta^{18}O$ and ± 2.0 ‰ for $\delta^{2}H$). Accuracy and precision of the co-measured calibrated quality control and assurance materials are provided with data reports.

Revision Date

September 6, 2019

Approved By

Richard Doucett

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Glossary

ºC	degree Celsius
%	percent
‰	per mil; 1 ‰ is equivalent to 0.001 or 1 mUr
^{2}H	stable isotope of hydrogen; mass number of 2
^{18}O	stable isotope of oxygen; mass number of 18
δ	delta notation for isotopic composition; in per mil (“‰”) or mUr; 1 ‰ equals 1 mUr
µL	microliter
µm	micron or micrometer
σ	standard deviation
CO_2	carbon dioxide
GC	gas chromatograph
GISP2	Greenland Ice Sheet Precipitation 2 water prepared by the IAEA; formal name is GRESP (Greenland Summit Precipitation)
H_2	dihydrogen
IAEA	International Atomic Energy Agency
ID	inner diameter
IRMS	isotope-ratio mass spectrometry
m	meter

min	minute
mL	milliliter
mm	millimeter
mUr	milliurey; 1 mUr is equivalent to 0.001 or 1 ‰
NIST	National Institute of Standards and Technology
QA	quality assurance; overall laboratory measures to ensure measurement quality
QC	quality control; activities and procedures used to evaluate quality requirements
RSIL	USGS Reston Stable Isotope Laboratory, Reston, Virginia
SIF	Stable Isotope Facility
SIF-3	water reference material
SIF-4	water reference material
SLAP2	Standard Light Antarctic Precipitation 2 water prepared by the IAEA Isotope Hydrology Lab, 2006
SMOW2	Standard Mean Ocean Water 2 water prepared by the IAEA Isotope Hydrology Lab, 2006; formal name is VSMOW2 (Vienna Standard Mean Ocean Water 2)
USGS	United States Geological Survey
USGS47	Lake Louise Drinking Water prepared by H. Qi et al., RSIL
VSMOW	Vienna Standard Mean Ocean Water; primary reference for measurements of oxygen and hydrogen isotopes

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UNIVERSITY OF CALIFORNIA
COLLEGE OF AGRICULTURAL AND
ENVIRONMENTAL SCIENCES

Stable Isotope Facility Data Report

Principal Investigator:	John Goyette	Email:	john.goyette@enthalpy.com
Researcher	Miguel Gamboa	Email:	miguel.gamboa@enthalpy.com

Institution: Enthalpy Analytical

Project: Lindo Channel Butte County

Submission Date: April 1, 2026
Completion Date: April 17, 2026
Report Date (pending payment): April 29, 2026

Analysis: ^{18}O and ^{2}H of Water by Headspace Equilibration using GasBench-IRMS

	$\delta^{2}H$	$\delta^{18}O$
Mean SD for sample material replicates in this project:	±0.9 ‰	±0.05 ‰
Mean SD for reference material replicates in this project:	±0.6 ‰	±0.06 ‰
Mean absolute accuracy for calibrated reference materials within:	±0.5 ‰	±0.03 ‰

Notes:

Sample count to be charged: 4
Additional charges:

Reported by: Richard R. Doucett
rrdoucett@ucdavis.edu

Please review your data in a timely fashion, so that we may fully address any questions or concerns.

Samples

Sample ID	$\delta^{2}H_{VSMOW}$ (‰)	$\delta^{18}O_{VSMOW}$ (‰)	Comments	^{2}H Analysis #	^{18}O Analysis #
VP-MW01-20260326	-66.2	-10.20		ICECUBE-74012	ICECUBE-74209
VP-MW01-20260326	-68.1	-10.08	replicate	ICECUBE-74013	ICECUBE-74210
VP-MW02-20260326	-65.5	-10.15		ICECUBE-74014	ICECUBE-74211
RP-MW01-20260326	-58.8	-8.81		ICECUBE-74015	ICECUBE-74212
WP-MW01-20260327	-50.6	-7.76		ICECUBE-74016	ICECUBE-74213

Reference Materials

Summary	δ^2H_{VSMOW} (‰) Expected	δ^2H_{VSMOW} (‰) Mean	δ^2H_{VSMOW} (‰) Standard deviation	$\delta^{18}O_{VSMOW}$ (‰) Expected	$\delta^{18}O_{VSMOW}$ (‰) Mean	$\delta^{18}O_{VSMOW}$ (‰) Standard deviation	Use
SIF-2	-312.0	-312.4	0.6	-39.24	-39.19	0.07	Quality control
SIF-3	-200.8	-201.4	0.8	-25.89	-25.87	0.07	Quality control
SIF-4	-150.1	-150.1	0.2	-19.90	-19.93	0.11	Quality control
SIF-5	-76.8	-76.8	0.4	-10.59	-10.59	0.05	Quality control
SIF-6	-45.9	-45.4	1.3	-6.91	-6.90	0.04	Scale correction
SIF-7	-26.1	-26.0	0.8	-4.81	-4.82	0.04	Drift correction
SIF-8	20.9	20.1	0.5	2.45	2.48	0.02	Scale correction
GRESP	-258.0	-256.9	0.5	-33.40	-33.47	0.05	Scale correction

Reference	δ^2H_{VSMOW} (‰)	$\delta^{18}O_{VSMOW}$ (‰)	Comments	^2H Analysis #	^{18}O Analysis #
SIF-7	-26.3	-4.82		ICECUBE-73997	ICECUBE-74194
SIF-7	-26.5	-4.75		ICECUBE-74009	ICECUBE-74206
SIF-7	-24.6	-4.81		ICECUBE-74023	ICECUBE-74220
SIF-7	-26.9	-4.83		ICECUBE-74035	ICECUBE-74234
SIF-7	-25.4	-4.86		ICECUBE-74051	ICECUBE-74248
SIF-7	-25.9	-4.81		ICECUBE-74065	ICECUBE-74262
SIF-7	-26.2	-4.87		ICECUBE-74075	ICECUBE-74272
SIF-7 Average	-26.0	-4.82			
SIF-7 StdDev	0.8	0.04			
SIF-8	19.7	2.46		ICECUBE-74000	ICECUBE-74197
SIF-8	20.6	2.49		ICECUBE-74001	ICECUBE-74198
SIF-8	20.1	2.50		ICECUBE-74002	ICECUBE-74199
SIF-8 Average	20.1	2.48			
SIF-8 StdDev	0.5	0.02			
SIF-6	-46.9	-6.87		ICECUBE-74003	ICECUBE-74200
SIF-6	-44.5	-6.87		ICECUBE-74004	ICECUBE-74201
SIF-6	-44.7	-6.94		ICECUBE-74005	ICECUBE-74202
SIF-6 Average	-45.4	-6.90			
SIF-6 StdDev	1.3	0.04			
GRESP	-256.4	-33.47		ICECUBE-74006	ICECUBE-74203
GRESP	-257.4	-33.52		ICECUBE-74007	ICECUBE-74204
GRESP	-256.8	-33.42		ICECUBE-74008	ICECUBE-74205
GRESP Average	-256.9	-33.47			
GRESP StdDev	0.5	0.05			
SIF-2	-311.8	-39.09		ICECUBE-73998	ICECUBE-74195
SIF-2	-313.0	-39.19		ICECUBE-74024	ICECUBE-74221
SIF-2	-311.9	-39.23		ICECUBE-74052	ICECUBE-74249
SIF-2	-312.9	-39.26		ICECUBE-74076	ICECUBE-74273
SIF-2 Average	-312.4	-39.19			
SIF-2 StdDev	0.6	0.07			
SIF-4	-150.4	-19.81		ICECUBE-73999	ICECUBE-74196
SIF-4	-150.0	-19.87		ICECUBE-74025	ICECUBE-74222
SIF-4	-150.3	-20.02		ICECUBE-74053	ICECUBE-74250
SIF-4	-149.9	-20.04		ICECUBE-74077	ICECUBE-74274
SIF-4 Average	-150.1	-19.93			
SIF-4 StdDev	0.2	0.11			
SIF-5	-77.1	-10.55		ICECUBE-74010	ICECUBE-74207
SIF-5	-76.9	-10.59		ICECUBE-74038	ICECUBE-74235
SIF-5	-77.0	-10.57		ICECUBE-74066	ICECUBE-74263
SIF-5	-76.2	-10.66		ICECUBE-74078	ICECUBE-74275
SIF-5 Average	-76.8	-10.59			
SIF-5 StdDev	0.4	0.05			
SIF-3	-202.5	-25.78		ICECUBE-74011	ICECUBE-74208
SIF-3	-201.4	-25.84		ICECUBE-74039	ICECUBE-74236
SIF-3	-200.6	-25.93		ICECUBE-74067	ICECUBE-74264
SIF-3	-201.2	-25.92		ICECUBE-74079	ICECUBE-74276
SIF-3 Average	-201.4	-25.87			
SIF-3 StdDev	0.8	0.07			

COOPER TESTING LABORATORY

Particle Size Distribution, TSS & TDS of Water Samples (ASTM D3977C m)

CTL Job No: 461-395 **Project No.:** SF0154C/05
Client: Geosyntec **Date:** 3/13/2026
Project Name: Vina Basin **By:** PJ

Source/ Boring No.:					
Sample No.:	Violich 1	Violich 2	Rice 1		
Depth, ft					
Sample Date:					
Total Vol. H20, ml	16400	14600	18900		

Sieve Analysis - Incremental Weight of Pan & Sediment Retained (g)

		SAMPLE A			SAMPLE B			SAMPLE C			SAMPLE D			SAMPLE E		
Sieve	Dia.,mm	Volume Filtered, ml	Pan Wt., g	Pan & Sediment, g	Volume Filtered, ml	Pan Wt., g	Pan & Sediment, g	Volume Filtered, ml	Pan Wt., g	Pan & Sediment, g	Volume Filtered, ml	Pan Wt., g	Pan & Sediment, g	Volume Filtered, ml	Pan Wt., g	Pan & Sediment, g
#10	2.0	16400	2.4848	2.5463	14600	2.4685	2.4917	18900	2.4501	2.4591	0			0		
#30	0.6	16400	2.4316	2.4580	14600	2.4893	2.5170	18900	2.4793	2.4865	0			0		
#50	0.3	16400	2.4401	2.4595	14600	2.4802	2.5436	18900	2.4802	2.4870	0			0		
#100	0.15	16400	2.4631	2.4835	14600	2.4836	2.5489	18900	2.5063	2.8440	0			0		
#200	0.075	16400	2.4621	2.5028	14600	2.4877	2.5301	18900	2.4488	2.5148	0			0		
#230	0.063	16400	2.4935	2.4990	14600	2.4657	2.4755	18900	2.4978	2.5501	0			0		
#270	0.053	16400	2.4326	2.4522	14600	2.4646	2.4729	18900	2.5020	2.5237	0			0		
#500	0.025	16400	2.4755	2.5023	14600	2.4868	2.5122	18900	2.4334	2.4454	0			0		
#850	0.010	500	2.4834	2.4839	350	2.4811	2.4821	450	2.4438	2.4451	0			0		

Filter Analysis

	Pan No.	Pan & F.Paper, g	Pan, FP & Sediment, g	Pan No.	Pan & F.Paper, g	Pan, FP & Sediment, g	Pan No.	Pan & F.Paper, g	Pan, FP & Sediment, g	Pan No.	Pan & F.Paper, g	Pan, FP & Sediment, g	Pan No.	Pan & F.Paper, g	Pan, FP & Sediment, g
6 Microns		17.2535	17.2734		15.8546	15.8549		15.8588	15.8672						
1.5 Microns		15.7369	15.7444		15.7333	15.7339		15.6672	15.6683						

Dissolved Solids Determination

	Pan No.	Pan & F.Paper, g	Pan, FP & Sediment, g	Pan No.	Pan & F.Paper, g	Pan, FP & Sediment, g	Pan No.	Pan & F.Paper, g	Pan, FP & Sediment, g	Pan No.	Pan & F.Paper, g	Pan, FP & Sediment, g	Pan No.	Pan & F.Paper, g	Pan, FP & Sediment, g
<1.5 Microns															
Comments:															

Particle Size Distribution & Solids Analysis of Water Samples (ASTM D 422M & SM2540 C,D)

CTL Job No.:	461-395	**Project Name:**	Vina Basin	**Date:**	3/13/2026
Client:	Geosyntec	**Project No.:**	SF0154C/05	**By:**	PJ
				Checked:	PJ

Data Summary

Source/ Boring No.:	-	-	-	-	-
Sample No.:	Violich 1	Violich 2	Rice 1	-	-
Depth, ft	-	-	-	-	-
Sample Date:	-	-	-	-	-
Total Volume, ml	16400	14600	18900	0	0
Split Volume, ml	500	350	450	0	0
Particle Diam. (mm)	Adjusted Cumulative Weight Retained*, g				
2.00	0.062	0.023	0.009	0.000	0.000
0.60	0.088	0.051	0.016	0.000	0.000
0.30	0.107	0.114	0.023	0.000	0.000
0.15	0.128	0.180	0.361	0.000	0.000
0.075	0.168	0.222	0.427	0.000	0.000
0.063	0.174	0.232	0.479	0.000	0.000
0.053	0.194	0.240	0.501	0.000	0.000
0.025	0.220	0.266	0.513	0.000	0.000
0.010	0.237	0.307	0.567	0.000	0.000
0.006	0.889	0.320	0.920	0.000	0.000
0.0015	1.135	0.345	0.966	0.000	0.000
Particle Diam. (mm)	Percent Passing (Relative to the Suspended Solids Only)				
2.00	94.6	93.3	99.1	-	-
0.60	92.3	85.2	98.3	-	-
0.30	90.5	66.8	97.6	-	-
0.15	88.8	47.9	62.7	-	-
0.08	85.2	35.6	55.8	-	-
0.063	84.7	32.8	50.4	-	-
0.053	83.0	30.4	48.2	-	-
0.025	80.6	23.0	46.9	-	-
0.010	79.2	10.9	41.3	-	-
0.006	21.7	7.3	4.8	-	-
0.0015	0.0	0.0	0.0	-	-
Particle Diam. (mm)	Cumulative Weight Retained, mg/L				
2.0	4	2	0	-	-
0.6	5	3	1	-	-
0.3	7	8	1	-	-
0.15	8	12	19	-	-
0.075	10	15	23	-	-
0.063	11	16	25	-	-
0.053	12	16	26	-	-
0.025	13	18	27	-	-
0.010	14	21	30	-	-
0.006	54	22	49	-	-
0.0015	69	24	51	-	-
	Total Suspended Solids, mg/L				
	69	24	51	-	-
	Total Dissolved Solids, mg/L				
	-	-	-	-	-
	Total Solids, mg/L				
	-	-	-	-	-

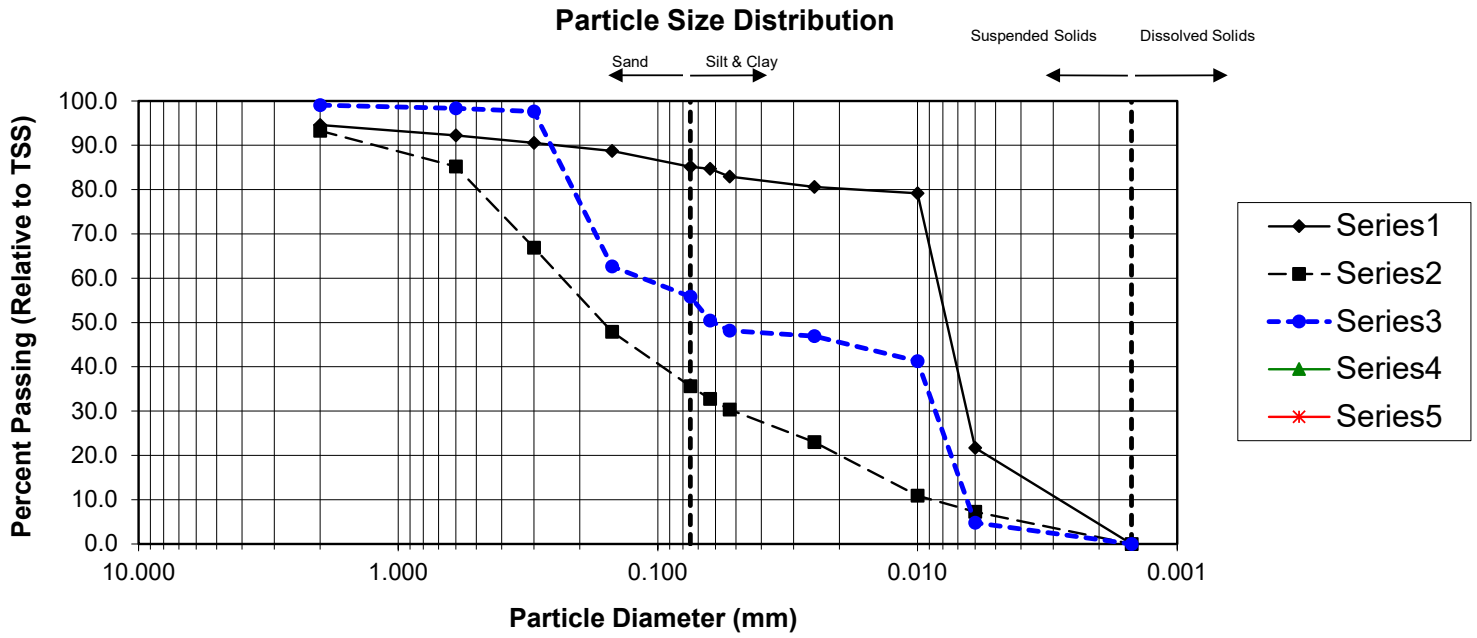
* In order to accurately measure the coarser sediment in the water, the sample may be split over a particular sieve. The entire sample is tested on that sieve and those above it. A smaller sample is tested for the sieves below it. The cumulative weight retained is adjusted to reflect the weight retained as though the sample had not been split in order to properly calculate the results.

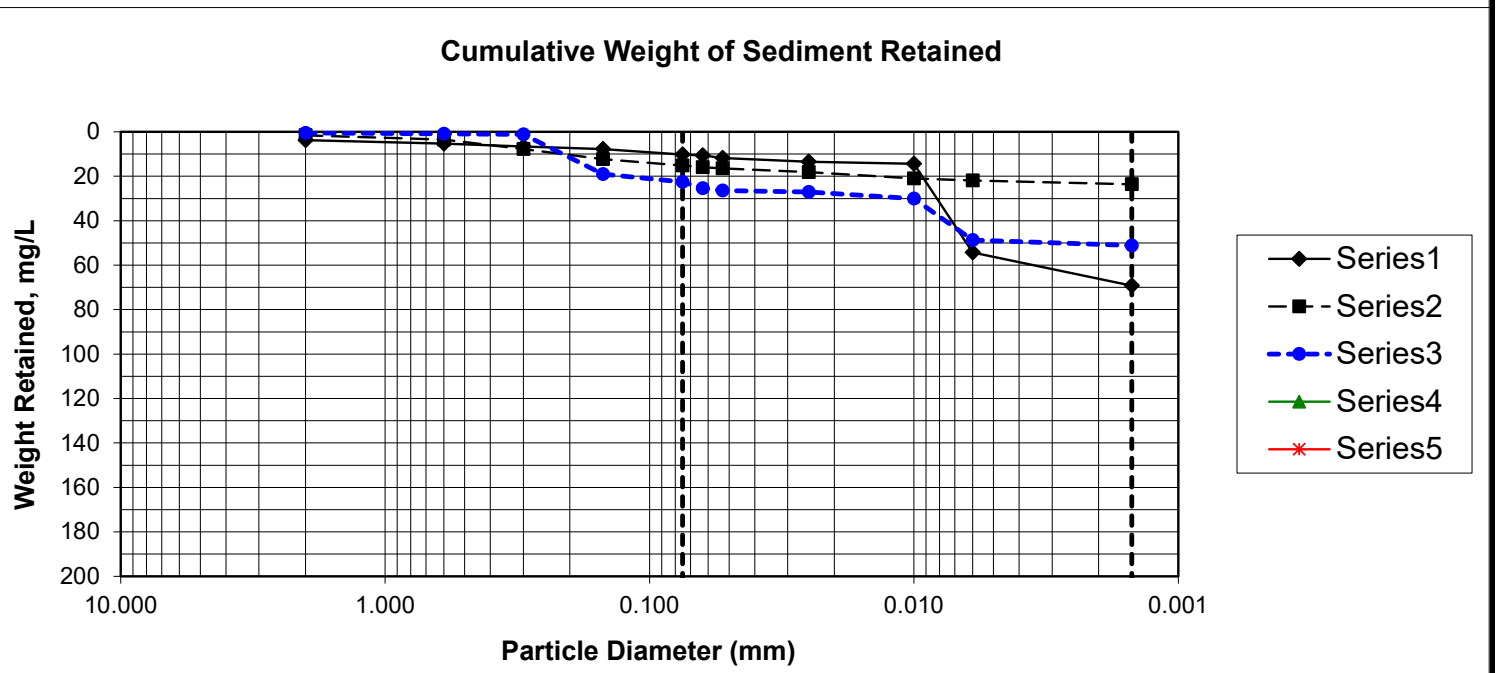
Particle Size Distribution & Solids Analysis of Water Samples (ASTM D 3977C m)

CTL Job No.:	461-395	**Project Name:**	Vina Basin	**Date:**	3/13/2026
Client:	Geosyntec	**Project No.:**	SF0154C/05	**By:**	PJ
				Checked:	PJ

Series No.:	**Series 1**	**Series 2**	**Series 3**	**Series 4**	**Series 5**
Source/ Boring No.:	-	-	-	-	-
Sample No.:	Violich 1	Violich 2	Rice 1	-	-
Sample Date:	-	-	-	-	-
Total Suspended Solids, mg/L:	69	24	51	-	-
Total Dissolved Solids, mg/L:	-	-	-	-	-
Total Solids, mg/L:	-	-	-	-	-
Comments:					

Note:The standard test method has been modified slightly by splitting on the #500 (25µm) sieve instead of the #230 (63µm) sieve. Also, enough data points were collected to generate a gradation curve instead of collecting only two.





Appendix K – FloodMAR (Water Code 1242.1) Documentation

Plan Documentation

Floodwater Recharge Pilot Program Implementation Plan

Background

Butte County's Department of Water and Resource Conservation (Department) is a subrecipient of a Sustainable Groundwater Management Grant awarded to the Vina Groundwater Sustainability Agency (GSA) in the Vina Subbasin, a high priority subbasin subject to the Sustainable Groundwater Management Act of 2014 (SGMA). In order to improve groundwater levels in the Vina Subbasin, the County retained Geosyntec Consultants, Inc. (project team) to establish a pilot groundwater recharge program working with willing landowners adjacent to flashy creeks and streams in the Vina Subbasin that are prone to flooding during high precipitation events. This effort is implemented in coordination with the Vina GSA and advances implementation steps outlined under Action 1 *Spread out and slow down flood flows* from the Butte County Recharge Action Plan, adopted by the Board of Supervisors in February 2024. The following outlines the roles and responsibilities for operation of the Floodwater Recharge Pilot Program (pilot program) and provides detailed descriptions of the conditions under which the program will become operational.

Program Authority

The pilot program will obtain access to water for recharge, utilizing the State Water Resources Control Board's Water Code section 1242.1 program. On July 10, 2023, Senate Bill 122 added section 1242.1 to the California Water Code with the dual purpose of managing floods and expediting the restoration of the State's groundwater levels. Section 1242.1 creates a pathway that can be used during flood events that allows for diversion of floodwater without a water right. More specifically, the flood determination is based on consideration of flood risk in a local agency's most recently adopted local plan of flood control or general plan. These diversions can have dual benefits: reducing flood risks and impacts, while at the same time recharging groundwater aquifers. Section 1242.1 currently has a sunset date of January 1, 2029.

On January 31, 2025, Governor Gavin Newsom issued Executive Order N-16-25 to facilitate the use of floodwaters to recharge California's aquifers by suspending certain requirements of Water Code 1242.1, for certain counties including Butte County. The Executive Order suspends the need for a local or regional agency to determine the imminent risk of flooding based off of a recently adopted local plan of flood control or general plan. The Executive Order allows local and regional agencies to use readily available information and expertise to determine imminent risk. As a subdivision of the

State, the Vina GSA will provide notice that flooding is imminent and diversions may occur, in accordance with the requirements and provisions of Section 1242.1.

It is uncertain when the Executive Order will be suspended and all codified requirements of Section 1242.1 will go back into effect. As Butte County currently lacks integration of flood risk triggers in an adopted local plan of flood control or general plan, the longer-term implementation of this pilot program is contingent on Executive Order N-16-25 remaining in place. The implementation of the pilot program beyond the timeframe of the Vina SGM grant is further contingent on adequate funding.

Program Roles and Responsibilities

The Department and project team will serve as the administrators of the pilot program including coordination with individual diverters/landowners and the Vina GSA. Butte County Department of Public Works (Public Works) previously provided information to the project team regarding locations of road closures and localized flooding historically. This was used to inform development of the triggers. The Department will communicate with Public Works and Butte County Emergency Management as needed during storm events to understand local conditions and potential road closure events.

Specific landowner(s) have been identified to participate in this recharge program. Individual diverters/landowners in concert with the project team will be responsible for operating the pumps and diversion equipment, and applying the water to the recharge area. The County or the project team will establish landowner access agreements for implementation of the pilot program on private lands.

Operational Procedures

The pilot program will be implemented utilizing the operation procedure outlined below.

Step		Responsible Party
1	Identify properties suitable for recharge, in accordance with CWC 1242.1, and coordinate with willing landowners.	Done - Project Team
2	Establish and document diversion triggers based on historical flooding and precipitation forecasting.	Done - Project Team
3	Prepare diversion sites and coordinate needed equipment.	Project Team
4	Monitor precipitation forecasts, diversion triggers, and flood notices from Butte County (such as road closures). Confirm Delta is in excess conditions.	Project Team
5	Alert landowners of potential to divert. Provide draft notice to GSA for posting on website per requirements.	Project Team/Department
6	Confirm that triggers have been met and publicly notice that program diversions may commence under CWC 1242.1, up to 48 hours in advance but no later than 48 hours after diversions commence.	Project Team/GSA, with Department support
7	Coordinate with landowners to begin diversions.	Project Team
8	Begin diversions and apply water to recharge area.	Project Team/Landowner
9	Prepare and submit preliminary reporting to SWRCB in coordination with GSA/County, no later than 14 days after diversions begin.	Project Team/GSA, with Department support
10	Publicly notice that diversions should cease based on established criteria or alleviated flood impacts.	GSA, with Project Team support
11	Coordinate with landowners to cease diversions.	Project Team
12	Prepare and submit post-diversion reporting to SWRCB, no later than 15 days after diversions cease.	Project Team/GSA, with Department support

Program Triggers

This document serves to describe the conditions that should be met for the Vina GSA and Department to implement this program, and the underlying information that will be relied upon to inform the implementation of flood diversions for groundwater recharge.

The flow threshold and timing of when these flood flows will be diverted were determined by reviewing historical records of flooding of roadways in Butte County and associated precipitation forecast for the 5 days preceding those flood events, as projected by the California Nevada River Forecast Center (CNRFC). When available, stream gage data was also utilized to identify dates when a particular stream reached established flood levels.

In addition, water may only be diverted when water rights holders from tributaries to the Sacramento-San Joaquin Delta are not making releases of stored water or reoperating facilities to provide flow for the purposes of meeting water quality control plan or endangered species requirements in the Delta at the time of the diversion. The Delta must be in an excess condition, or the Delta is with restrictions but Delta operations are controlled only by requirements for Old and Middle River flows (OMR) or San Joaquin River Inflow-to-Export ratio (SJR I/E). This information can be obtained from the following website:

https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Operations-And-Maintenance/Files/Operations-Control-Office/Delta-Status-And-Operations/Delta-Operations-Daily-Summary.pdf

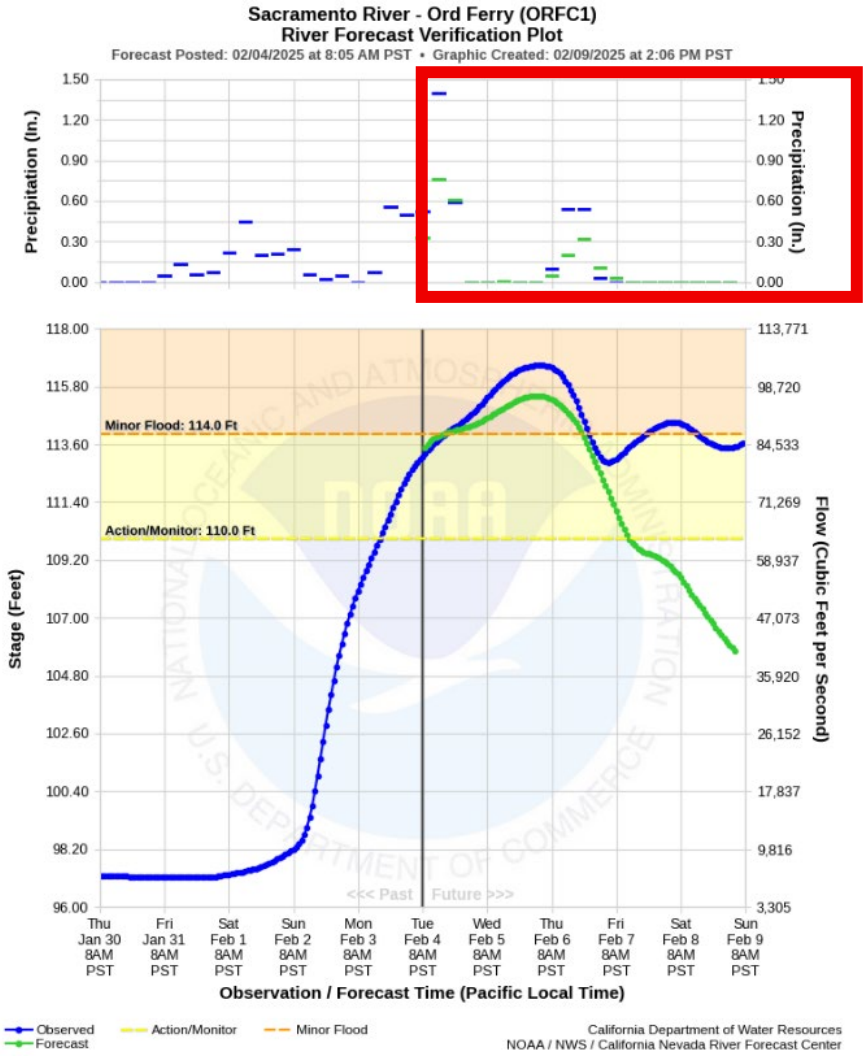
All diversions will be suspended after 24 hours, or when observed flooding has subsided as communicated by Department staff and the project team.

Mud Creek

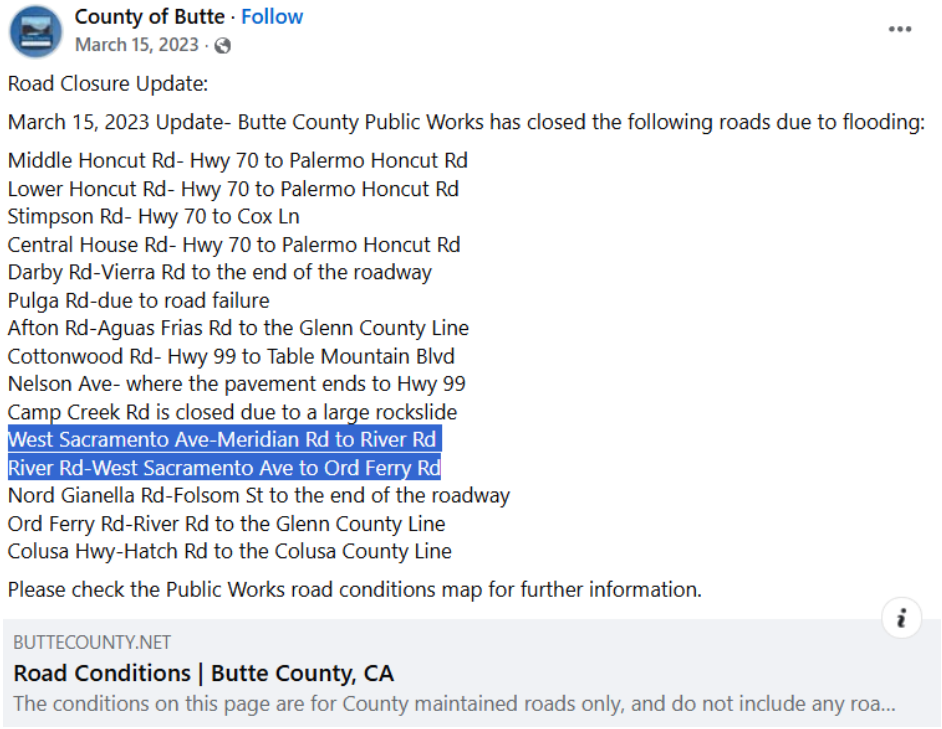
Trigger: Diversions may begin when there is at least 2 inches of rain in the 5-day forecasts at the CNRFC ORFC1 gage, and will cease after 24-hours, or when observed flood subsides.

Figure 2 below shows a sample Forecast Verification Plot, with 5-day Forecast Precipitation, from CNRF's ORFC1 gage. ORFC1 was used for precipitation forecasting for all creeks in this memo, including Mud Creek, as it is the nearest CNRF forecast gage location. The lower graph in Figure 1 showing river stage and flow is for the Sacramento River and does not provide observed flow data for Mud Creek. The table below provides river stage data from CDEC's MUC gage on Mud Creek.

Figure 1: Example of Ord Ferry CNRFC Forecast Verification w/ 5-day Forecast Precipitation.



Supporting record:

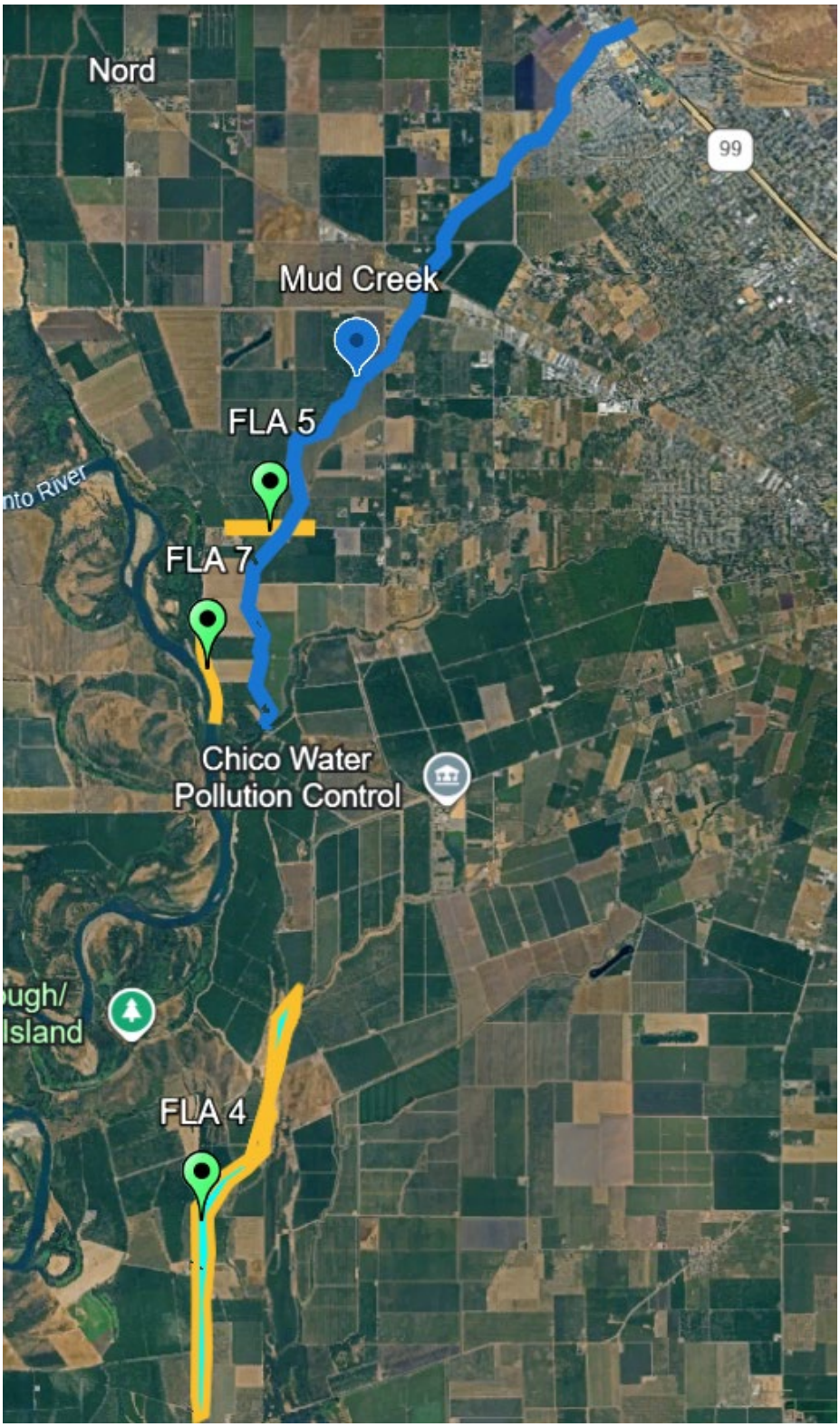
Date of flood event	River Stage (MUC)	Reported Flooding	Prior 5-day forecast (ORFC1)
02-04-2025 6:30pm	15.01’	West Sac Ave/Meridian Rd - River Rd[1]	3.75"
12-14-2024 9:45am	8.13’	West Sac Ave/Meridian Rd - River Rd[2] River Rd. from Chico River to W. Sacramento Ave.	2.05"
02-04-2024 10:45pm	7.55’	Butte County Emergency Proclamation[3]	2.55"
03-14-2023 11:15pm	8.33’		3.75"

[1] Action News Now. (2024, November 23). *Flood water rescue on Ord Ferry Rd and River Rd in Butte County*. https://www.actionnewsnow.com/news/flood-water-rescue-on-ord-ferry-rd-and-river-rd-in-butte-county/article_1224c758-a9d7-11ef-8909-d7d055812e3b.html

[2] Action News Now. (2024, December 15) *Butte County area road closures from the California Highway Patrol*. https://www.actionnewsnow.com/news/butte-county-area-road-closures-from-the-california-highway-patrol/article_68f15e2c-bb14-11ef-8649-4b6c4facace6.html

[3] Butte County. (2024, February 5). *Butte County issues local emergency proclamation in response to recent storm activity* [PDF]. https://www.buttecounty.net/DocumentCenter/View/12807/20240205-Butte-County-Issues-Local-Emergency-Proclamation-in-Response-to-Recent-Storm-Activity-PDF

Figure 2: Historic flooding on Mud Creek, as observed by DPW staff.



Keefer Slough

Trigger: Diversions may begin when there is at least 2 inches of rain in the 5-day forecasts at the CNRFC ORFC1 gage, and will cease after 24-hours, or when observed flood subsides.

As shown above in Figure 1, CNRF Forecast Verification Plots, with 5-day Forecast Precipitation, from CNRF's ORFC1 gage were used. ORFC1 was used for precipitation forecasting for all creeks in this memo, including Keefer Slough, as it is the nearest CNRF forecast gage location. Keefer Slough does not currently have a stream gage providing historical record of river stages. Instead reports of flood events were relied upon.

Supporting record:

Date of flood event	Reported Flooding	Prior 5-day forecast (ORFC1)
02-05-2025	Hwy 99/Keefer Rd closed[4]	3.75"
02-04-2024	Butte County Emergency Proclamation[5]	2.55"
12-15-2024	Wilson Landing from Meridian to Carmen[6]	2.05"

[4] Action News Now. (2025, February 5). *Road closures in Northern California due to flooding and weather conditions*. https://www.actionnewsnow.com/news/road-closures-in-northern-california-due-to-flooding-and-weather-conditions/article_265c6bc6-e3f3-11ef-86c9-cbcfee11d99a.html

[5] Butte County. (2024, February 5). *Butte County issues local emergency proclamation in response to recent storm activity* [PDF]. https://www.buttecounty.net/DocumentCenter/View/12807/20240205-Butte-County-Issues-Local-Emergency-Proclamation-in-Response-to-Recent-Storm-Activity-PDF

[6] Action News Now. (2024, December 15). *Butte County area road closures from the California Highway Patrol*. https://www.actionnewsnow.com/news/butte-county-area-road-closures-from-the-california-highway-patrol/article_68f15e2c-bb14-11ef-8649-4b6c4facace6.html

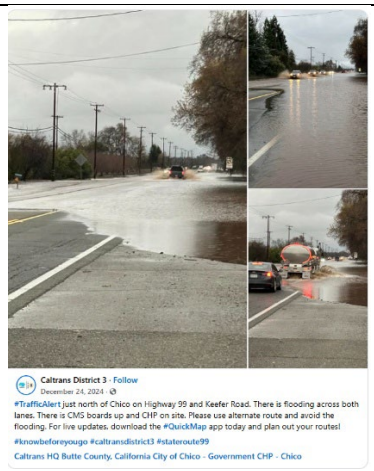
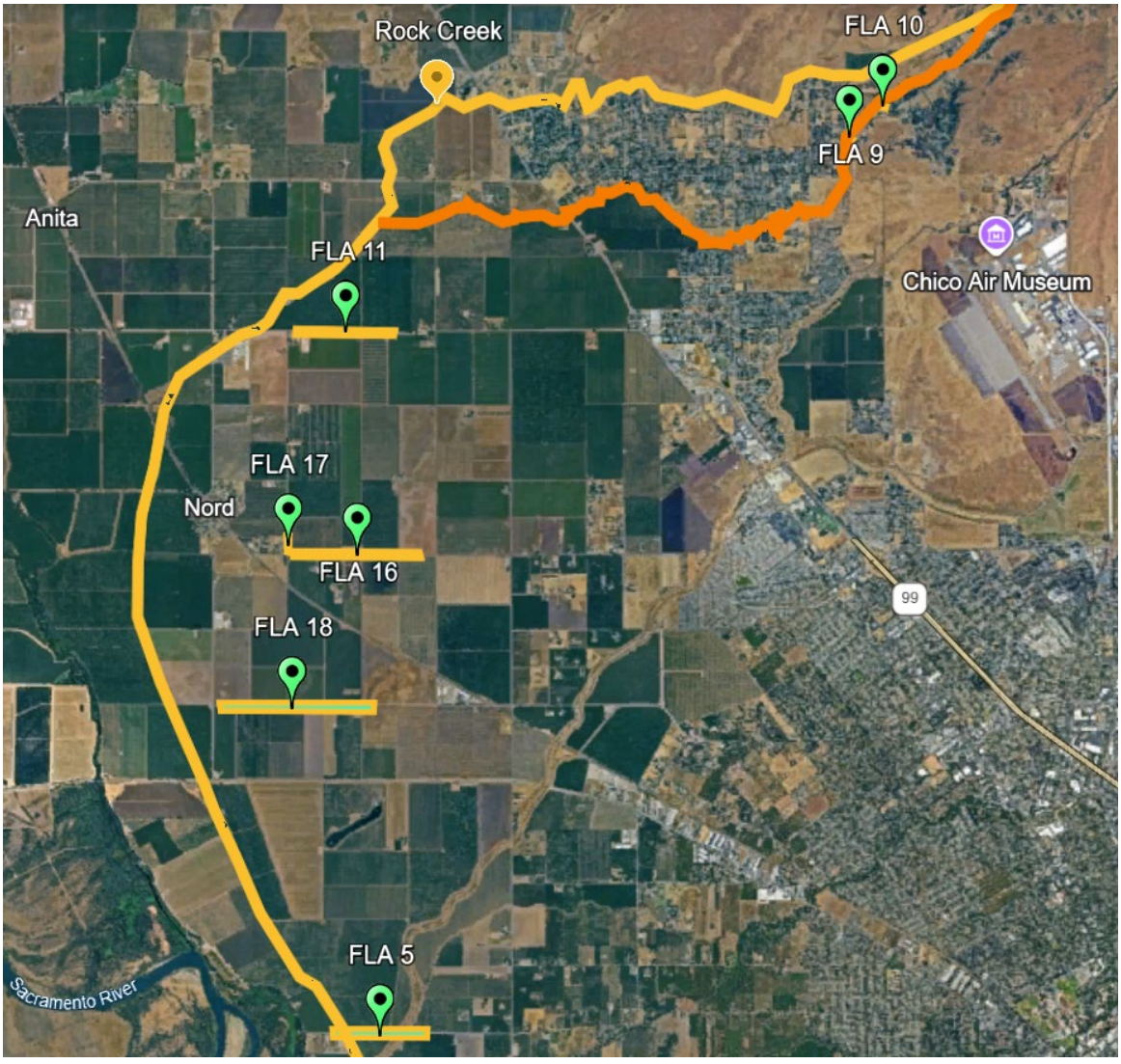
12-24-2024		2"

Figure 3: Historic flooding on Rock Creek and Keefer Slough, as observed by DPW staff.



Comanche Creek

Trigger: Diversions may begin when there is at least 2 inches of rain in the 5-day forecasts at the CNRFC ORFC1 gage, and will cease after 24-hours, or when observed flood subsides.

As shown above in Figure 1, CNRF Forecast Verification Plots, with 5-day Forecast Precipitation, from CNRF's ORFC1 gage were used. ORFC1 was used for precipitation forecasting for all creeks in this memo, including Comanche Creek, as it is the nearest CNRF forecast gage location. Comanche Creek does not currently have a stream gage providing historical record of river stages. Instead reports of flood events were relied upon.

Supporting record:

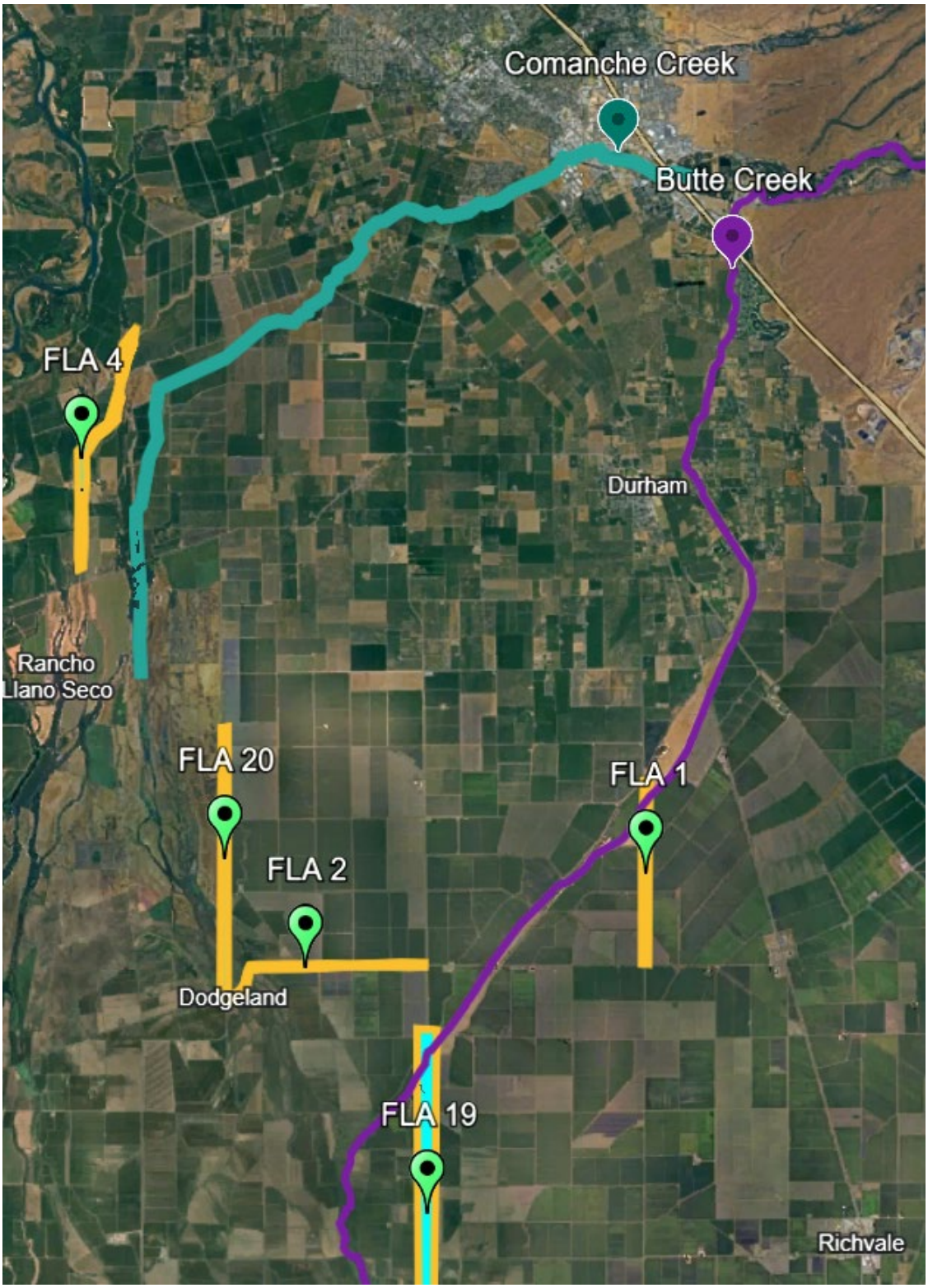
Date of flood event	Reported Flooding	Prior 5-day forecast (ORFC1)
11-23-2024	Ord Ferry Rd/River Rd[7]	7.35"
2-5-2025	Ord Ferry Rd/River Rd[8]	3.75"
12-15-2024	Ord Ferry/River Rd[9]	2.05"

[7] Action News Now. (2024, November 23). *Flood water rescue on Ord Ferry Rd and River Rd in Butte County*. https://www.actionnewsnow.com/news/flood-water-rescue-on-ord-ferry-rd-and-river-rd-in-butte-county/article_1224c758-a9d7-11ef-8909-d7d055812e3b.html

[8] Action News Now. (2025, February 5). *Road closures in Northern California due to flooding and weather conditions*. https://www.actionnewsnow.com/news/road-closures-in-northern-california-due-to-flooding-and-weather-conditions/article_265c6bc6-e3f3-11ef-86c9-cbcfee11d99a.html

[9] Action News Now. (2024, December 15). *Butte County area road closures from the California Highway Patrol*. https://www.actionnewsnow.com/news/butte-county-area-road-closures-from-the-california-highway-patrol/article_68f15e2c-bb14-11ef-8649-4b6c4facace6.html

Figure 4: Historic flooding on Comanche Creek and Butte Creek, as observed by DPW staff.



Pine Creek

Trigger: Diversions may begin when there is at least 2 inches of rain in the 5-day forecasts at the CNRFC ORFC1 gage, and will cease after 24-hours, or when observed flood subsides.

As shown above in Figure 1, CNRF Forecast Verification Plots, with 5-day Forecast Precipitation, from CNRF's ORFC1 gage were used. ORFC1 was used for precipitation forecasting for all creeks in this document, including Pine Creek, as it is the nearest CNRF forecast gage location. Pine Creek does not currently have a stream gage providing historical record of river stages. Instead reports of flood events were relied upon.

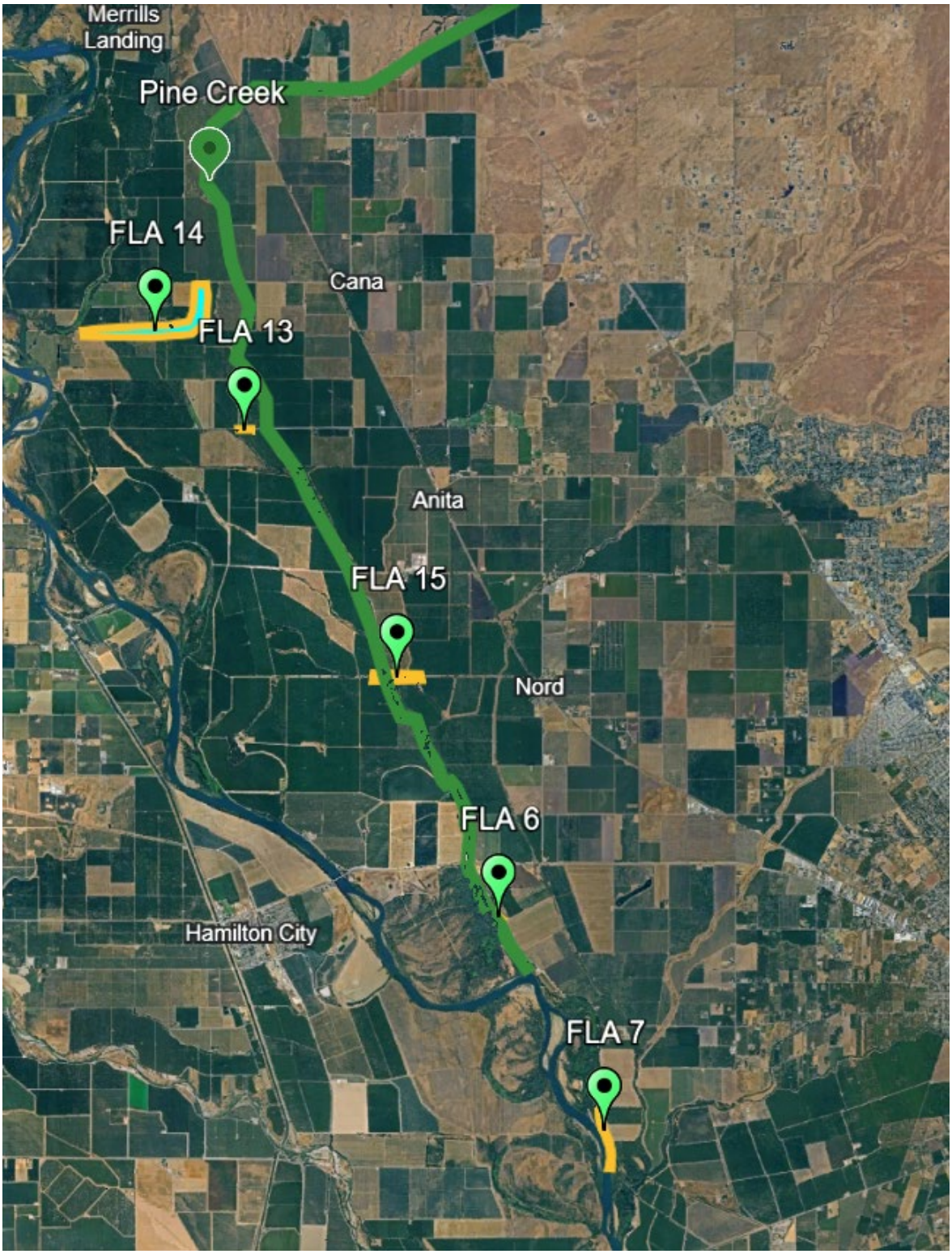
Supporting record:

Date of flood event	Reported Flooding	Prior 5-day forecast (ORFC1)
01-08-2023	Nord Gianella Rd[10]	4.8"
11-24-2024	Nord Gianella Rd[11]	7.35"

[10] Action News Now. (2023, January 8). *Butte County road closures*. https://www.actionnewsnow.com/news/local/butte-county-road-closures/article_e220127c-8fae-11ed-8a7a-477fb3604833.html

[11] Action News Now. (2024, November 25). *List of flooded roads with closures in Butte County*. Retrieved https://www.actionnewsnow.com/news/list-of-flooded-roads-with-closures-in-butte-county/article_e1d0416c-aa8b-11ef-b505-d34ca2963c1f.html

Figure 5: Historic flooding on Pine Creek, as observed by DPW staff.



Hamlin Slough

Trigger: Diversions may begin when there is at least 2 inches of rain in the 5-day forecasts at the CNRFC ORFC1 gage, and will cease after 24-hours, or when observed flood subsides.

As shown above in Figure 1, CNRF Forecast Verification Plots, with 5-day Forecast Precipitation, from CNRF's ORFC1 gage were used. ORFC1 was used for precipitation forecasting for all creeks in this memo, including Hamlin Slough, as it is the nearest CNRF forecast gage location. Hamin Slough does not currently have a stream gage providing historical record of river stages. Instead reports of flood events were relied upon.

Supporting record:

Date of flood event	Reported Flooding	Prior 5-day forecast (ORFC1)
2-5-2025	Durnel Drive[12]	3.75"
11-22-2024	Durnel Drive[13]	4.1"
1-10-2015	Durnel Drive[14]	1.325"
1-12-2017	Durnel Drive[15]	4.95"

[12] Action News Now. (2025, February 5). *Road closures in Northern California due to flooding and weather conditions*. https://www.actionnewsnow.com/news/road-closures-in-northern-california-due-to-flooding-and-weather-conditions/article_265c6bc6-e3f3-11ef-86c9-cbcfee11d99a.html

[13] Chico Enterprise-Record. (2024, November 22). *Flooding prompts Butte County sheriff to issue evacuation warnings | Midday Report*. https://www.chicoer.com/2024/11/22/flooding-prompts-butte-county-sheriff-to-issue-evacuation-warnings-midday-report/

[14] Oroville Mercury-Register. (2018, January 10). *Updated: Butte County roads closed by flooding.* https://www.orovillemr.com/2018/01/10/updated-butte-county-roads-closed-by-flooding/

[15] Chico Enterprise-Record. (2017, January 12). Butte County roads closed Thursday by flooding https://www.chicoer.com/2017/01/12/butte-county-roads-closed-thursday-by-flooding/

Figure 6: Historic flooding on Hamlin Slough, as observed by DPW staff.

Sacramento River at Ord Ferry-Main Channel

Trigger: Diversions may begin, including from tributaries within Butte County that are upstream of the Sacramento River at Ord Ferry that may be contributing to flooding, such as Mud Creek, Rock Creek, and Pine Creek, when there is at least 2.5 inches of rain in the 5-day forecasts at the CNRFC ORFC1 gage, and will cease after 24-hours, or when observed flood subsides.

As shown above in Figure 1, CNRF Forecast Verification Plots, with 5-day Forecast Precipitation, from CNRF's ORFC1 gage were used.

Supporting record:

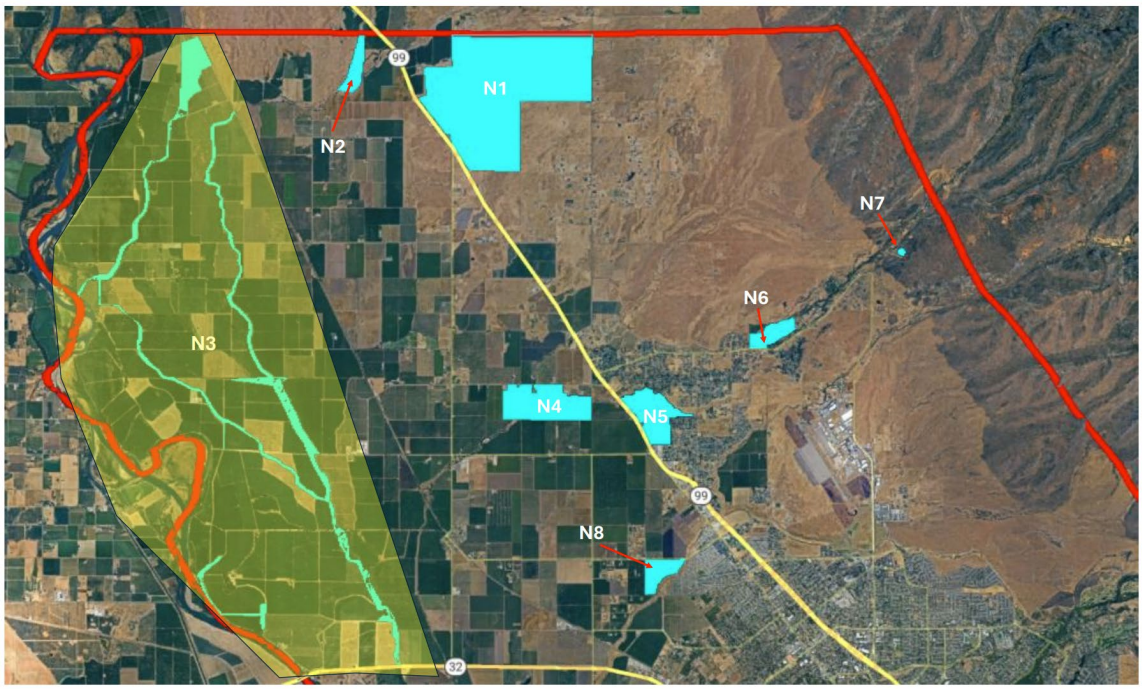
Date of flood event	Crest (ORFC1 gage)	Flood Stage	Prior 5-day forecast	Other
02-03-2025	110	Action	4"	
02-06-2025	116.61	Minor Flooding	5.95"	
02-19-2024	114.37	Minor Flooding	2.6"	
02-05-2024	112	Monitor	2.55"	Butte County Emergency Proclamation
03-14-2023	115.09	Minor Flooding	4.0"	
01-08-2023	114.30	Minor Flooding	4.8"	

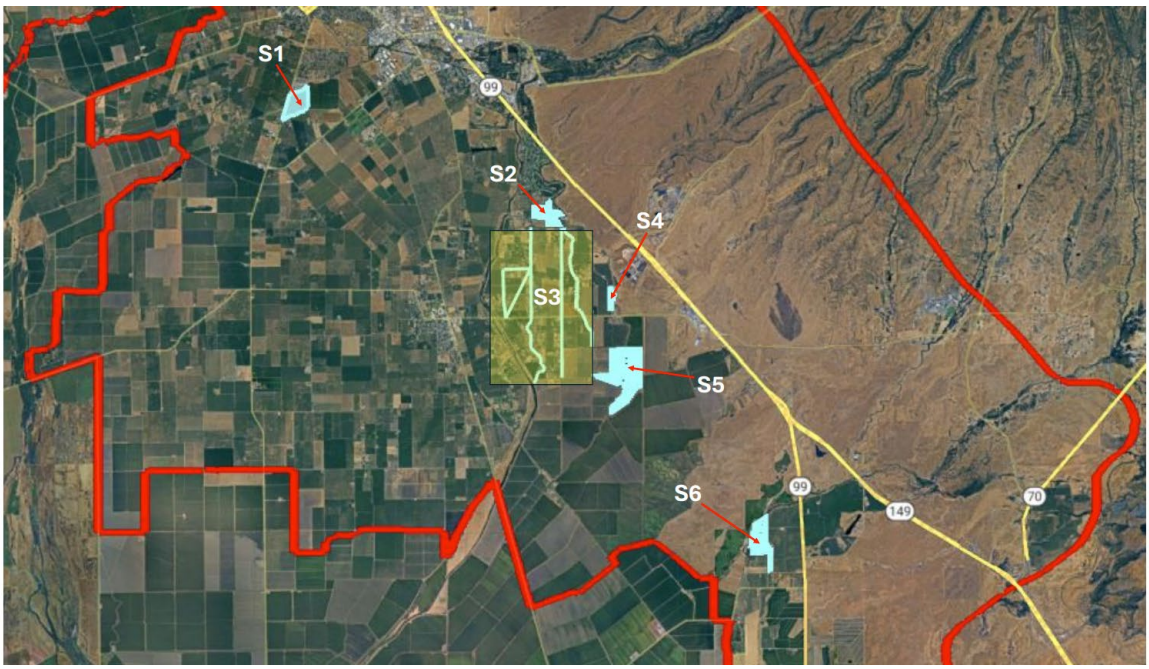
Flood Impacts

- 114 - Designated flood stage left bank.
- 113.8 - Design overflow level for M&T, 3Bs and Goose Lake flood control facilities to divert flood flows into Butte Basin. M&T overflows close River Road from Ord Ferry Road to Chico Road. Ord Ferry Road is already closed.
- 110.3 - Head cuts in 3Bs silt weir start overflow into Butte Basin, flooding dips on Ord Ferry Road west of River Road. Persistent flows at or above this level increase flooding in Butte Basin. Ord Ferry Road and additional roads in Glenn and Colusa counties are closed due to flooding.

Potential Pilot Program Recharge Locations

Potential locations of diversions and application of floodwater for groundwater recharge are marked on the maps below. Additional locations may be added, or locations may be discontinued, based on results of the initial pilot year and the Recharge Feasibility Analysis grant funded project.





Recharge Infiltration Testing and Groundwater Quality Impact Considerations

As part of the initial assessment of properties for potential recharge projects, California's GeoTracker webpage, https://geotracker.waterboards.ca.gov/, was reviewed for potential groundwater plumes within the area. For the specific recharge site adjacent to Comanche Creek, two nearby plume sites were identified: the Victor Industries 20th Street Site and the Chico Southwest Plume. Both of these sites are overseen by the California Department of Toxic Substances (DTSC) and more detailed information is provided on their webpage ENVIROSTAR, https://www.envirostor.dtsc.ca.gov/public/. The most recent report for both sites providing information regarding groundwater impacts was reviewed.

For the Victor Industries site, the most recent report was the March 2024 Semi-Annual Groundwater Monitoring Report dated June 2024 and prepared by AECOM. For the Chico Southwest Plume, the most recent report is the Second Half 2024 Groundwater Monitoring Report dated February 2025 also prepared by AECOM. Recharge water for the pilot test will enter the first encountered groundwater zone. Review of the above reports indicate that water quality impacts to the first groundwater zone at the plume sites are north of Comanche Creek and do not go beneath our project site.

To further assess potential impacts, a temporary shallow monitoring well, designated MW-1, was installed in the pilot test area and equipped with a pressure transducer to record water levels at 15-minute intervals. A stilling well was also placed in Comanche Creek adjacent to the site to record water levels within the creek at the same time interval. Figure 1 shows the hydrographs for these wells recorded between December 5, 2025, and January 7, 2026. As seen on this figure, stage records within Comanche Creek tracks in step with MW-01 over the overlapping period; the time series are effectively 1:1 correlated (hourly correlation ≈ 1.0), indicating direct hydraulic connectivity between MW-01 and the creek (i.e., the well responds to creek stage rather than to distant groundwater conditions). As such, these data strongly suggest that Comanche Creek functions as a hydraulic boundary, and that recharge water applied on the south side of the creek during the pilot test is unlikely to migrate to the north side where the identified plume impacts are located. This preliminary finding will be further evaluated as part of the pilot project's final report.

A groundwater sample was also collected from the monitoring well in January 2026 and submitted for analysis of volatile organic compounds (VOCs) that includes the constituents reported for the Victor Industries and Chico Southwest Plume. No VOCs were reported for this water sample.

This pilot diversion is experimental in nature, designed to establish infiltration rates, evaluate the effectiveness of reverse tile drain infrastructure for recharge, and assess challenges associated with sediment-laden flood water. The estimated volume of water to be diverted during this event is approximately 2.2 acre-feet over a 24-hour period, which is small relative to the natural recharge

occurring across the area from the forecasted precipitation event. Project feasibility analysis will more thoroughly evaluate the proximity of the identified plumes and determine whether their presence presents a constraint on future larger scale recharge operations at this site, and if so, what additional investigation would be required.

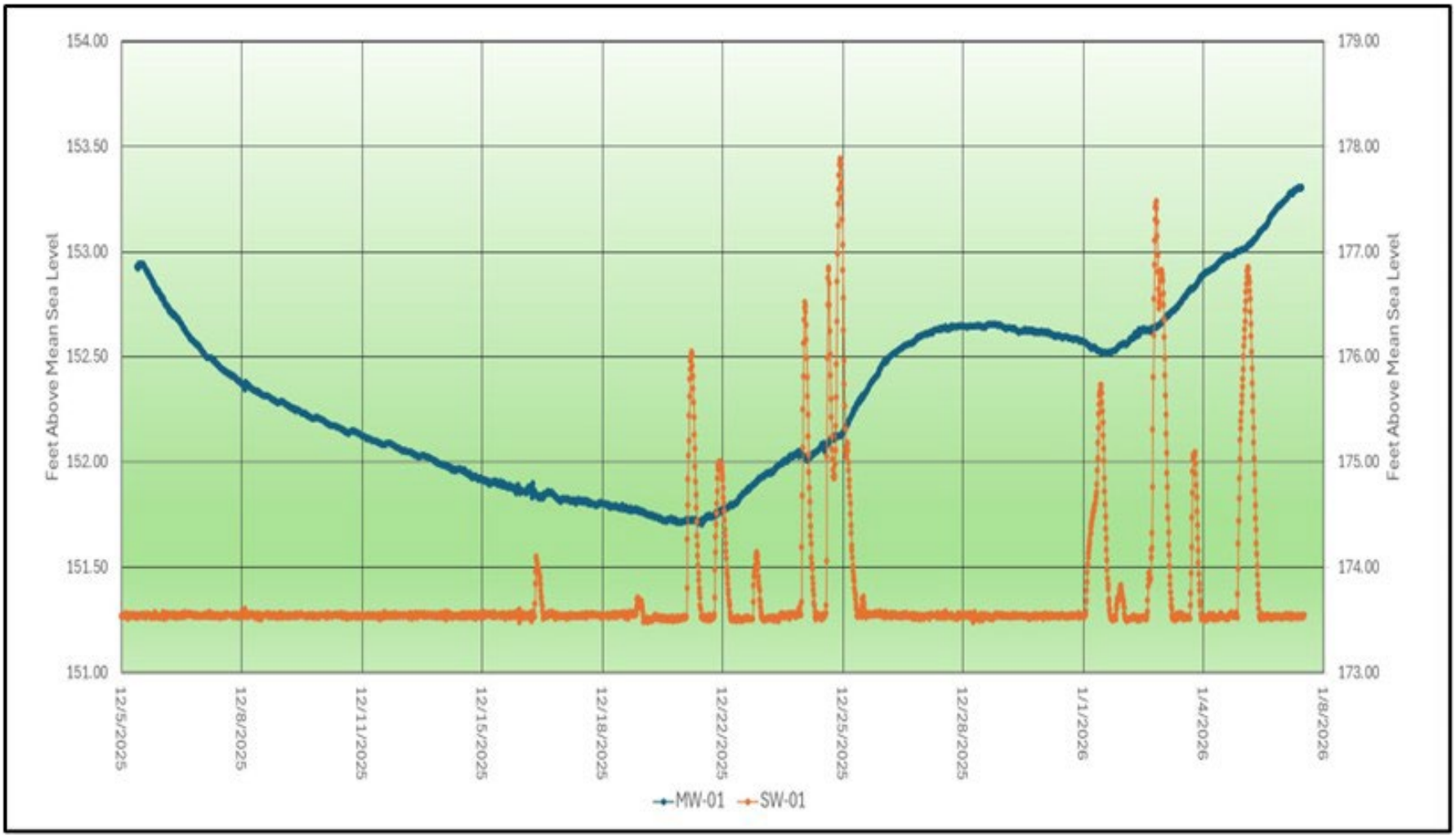


Figure 1. Hydrograph for monitoring well MW-1 and stilling well SW-01. Reported mean sea level elevations are approximate.

February 20, 2026

CALIFORNIA Water Boards

GAVIN NEWSOM
GOVERNOR

YANA GARCIA
SECRETARY FOR ENVIRONMENTAL PROTECTION

Flood Recharge Diversions (Water Code §1242.1)

Reporting Forms

CHOOSE REPORT TYPE FROM DROP-DOWN:
(Notice, Initial or Final)

Final report

- Attach verification of reported information, as necessary: click here → attach
- Reports received will be posted on website: **Water Code 1242.1 Flood Diversion**
- Direct questions and notice/report submittals to: FloodDiversion@waterboards.ca.gov

Flood Diversion Reporting is Not a Water Right

NOTICE:

- The required Notice shall be filed with the State Water Board **48 hours before** (if feasible, but in no case later than **48 hours after**) diversions begin - §1242.1(g)(1)(A)
- If a website is not provided as proof of notice, attach documentation of noticing (PDF, JPG, etc.)
- Calendar date & time (Pacific Standard) the Board receives the submittal serves as the official "filing". The submittal filing date will be posted on the **Water Code §1242.1 Flood Diversion Website**

1 Diverter information:

Owner Name: Vina Groundwater Sustainability Agency

Facility Name: N/A

Waterbody Source: Comanche Creek

County: Butte

2 CHOOSE DATE & TIME DIVERSION BEGAN :

MONTH/DAY/YEAR	HOUR	MINUTES	AM/PM
2/20/26	12	00	PM

3 Local or Regional agency identifying risk of flooding downstream: Vina GSA

Flood threshold/indicator: 2" of rain in the 5-day forecast at ORFC1 gage, which historic

Method & location of noticing: Vina GSA website

Website URL if applicable: https://www.vinagsa.org/cwc-1242-1-floodwater-recharge-pro

4 Provide an estimate, as of the report's date, of the amount of flood flows to be diverted: 3.1 (acre-feet)

Provide locations of all points of diversion (latitude/longitude), and associated assessor parcel numbers (APNs).

The Department of Water Resources maintains a Groundwater Recharge website with tutorials, webinars and a page for general questions. There is also an online application that can be used to help identify coordinates, APNs, acres, GSA information, and develop a map. **Visit this link :** https://data.cnra.ca.gov/dataset/california-groundwater-recharge-information

5 **Attach map showing associated inundation areas.** click here → attach Attach **PDF** or **JPG** file

6 **GPS Coordinates (Decimal Degrees # # # . # #):**

To list additional Points of Diversion (PODs), please see Addendum

	Latitude	Longitude
POD #1	39.701	121.84
POD #2		
POD #3		

7 **List APNs that could be or were inundated by the diversion activity:**
(# # # - # # # # - # # # - # # # # separated by commas)

039-090-081-000

INITIAL & FINAL REPORTS:

- **Preliminary report** to be filed with the Board and any applicable GSA, no later than **14 days after** diversions begin - §1242.1(g)(1)(B)
- **Final report** to be filed with the Board and any applicable GSA, no later than **15 days after** diversions end - §1242.1(g)(1)(C)

8 **Diverter information:**

Owner Name: Vina Groundwater Sustainability Agency

Facility Name: N/A

Waterbody Source: Comanche Creek

County: Butte

9 **CHOOSE DATE DIVERSIONS BEGAN/END FROM DROP-DOWN OPTIONS:**

	MONTH DAY YEAR
Date diversions began:	2/20/26
Date diversions end: (for initial report, leave blank)	2/21/26

10 **Provide an estimate, as of the report's date, of the amount of flood flows diverted:** (acre-feet) 3.1

11 **Provide an estimate of the maximum area of inundation:** (acres) 0.22

12 **Local entity (flood control agency, city or county) identifying risk of flooding downstream:**

Vina Groundwater Sustainability Agency

13 **You must also provide this report to the Groundwater Sustainablity Agency(s) (GSAs) for basin(s) receiving recharge.**

Identify GSAs you will notify: RCRD GSA
(You may choose to provide GSA notification as cc's on your submittal email)

Date of notification: 3/6/26

Self Certification For INITIAL/FINAL Reports:

Please check all boxes that apply

Please verify that you HAVE NOT diverted at:

☑ Any barns, ponds, or lands where manure or waste from an animal facility that generates waste from the feeding and housing of animals for more than 45 days per year in a confined area that is not vegetated are applied.

☑ Any agricultural field that has been identified as an outlier with respect to nitrogen application by any of the following: The board, appropriate regional board, agricultural coalition charged with implementation of the Irrigated Lands Regulatory Program.

☑ Any area that could cause damage to critical levees, infrastructure, wastewater and drinking water systems, drinking water wells or drinking water supplies, or exacerbate the threat of flood and other health and safety concerns.

☑ Any area that has not been in active irrigated agricultural cultivation within the past three years, including grazing lands, annual grasslands, and natural habitats. This limitation does not apply to facilities already constructed for the purpose of groundwater recharge or managed wetlands.

Please verify which of these apply:

☐ Diversions utilize existing infrastructure.

☑ Diversions do not require new permanent construction.

☑ Diversions utilize temporary pumps.

☑ Diversions from tributaries to the Sacramento-San Joaquin Delta would occur under excess conditions as described in Water Board's Technical Guidance document.

☑ Screens constructed of any rigid material, perforated, woven, or slotted, that provides water passage while physically excluding fish.

☑ Screen face is parallel to the flow and adjacent to the water's edge.

☑ Upstream and downstream transitions to the screen structure are designed and constructed to minimize eddies upstream of, in front of, and downstream of the screen, while minimizing entrainment to the degree feasible.

☑ Diverter has reviewed fish screen recommendations and design parameters as described in Water Board's Technical Guidance document.

Please check if apply to either the LOCAL or REGIONAL AGENCY:

☐ Has adopted a local plan of flood control.

☐ Has considered flood risk as part of its most recently adopted general plan.

☑ Diversion trigger identified by local or regional agency in a Proclaimed Drought County, per Executive Order N-16-25.

☑ Has given notice via its internet website/electronic distribution list/emergency notification service/another means of public notice, that flows downstream of the point of diversion are at imminent risk of flooding and inundation of land, roads, or structures. Request provide notice as attachment.

Check if the following APPLY to your diversions:

☑ Ceased when the flood conditions described in the public notice have abated to the point there is no longer a risk of flooding.

☑ PERSON OR ENTITY MAKING THE DIVERSION FOR GROUNDWATER RECHARGE DOES NOT CLAIM ANY WATER RIGHT BASED ON THAT DIVERSION AND RECHARGE.

By signing below, I certify that all information is true and correct to the best of my knowledge

PRINT NAME (First & Last):
Kamie Loeser

TITLE:
Member Agency Representative

EMAIL ADDRESS:
kloeser@buttecounty.net

COMPANY:
GSA Member Agency/Butte County

SIGNATURE:
Kamie Loeser

SIGN DATE:
3/5/2026

CALIFORNIA Water Boards

GAVIN NEWSOM
GOVERNOR

YANA GARCIA
SECRETARY FOR ENVIRONMENTAL PROTECTION

Flood Recharge Diversions (Water Code §1242.1)

Reporting Forms

CHOOSE REPORT TYPE FROM DROP-DOWN:
(Notice, Initial or Final)

Final report

- Attach verification of reported information, as necessary: click here → attach
- Reports received will be posted on website: **Water Code 1242.1 Flood Diversion**
- Direct questions and notice/report submittals to: FloodDiversion@waterboards.ca.gov

Flood Diversion Reporting is Not a Water Right

NOTICE:

- The required Notice shall be filed with the State Water Board **48 hours before** (if feasible, but in no case later than **48 hours after**) diversions begin - §1242.1(g)(1)(A)
- If a website is not provided as proof of notice, attach documentation of noticing (PDF, JPG, etc.)
- Calendar date & time (Pacific Standard) the Board receives the submittal serves as the official "filing". The submittal filing date will be posted on the **Water Code §1242.1 Flood Diversion Website**

1 Diverter information:

Owner Name: Vina Groundwater Sustainability Agency

Facility Name: N/A

Waterbody Source: Comanche Creek

County: Butte

2 CHOOSE DATE & TIME DIVERSION BEGAN :

MONTH/DAY/YEAR	HOUR	MINUTES	AM/PM
2/20/26	12	00	PM

3 Local or Regional agency identifying risk of flooding downstream: Vina GSA

Flood threshold/indicator: 2" of rain in the 5-day forecast at ORFC1 gage, which historic

Method & location of noticing: Vina GSA website

Website URL if applicable: https://www.vinagsa.org/cwc-1242-1-floodwater-recharge-pro

4 Provide an estimate, as of the report's date, of the amount of flood flows to be diverted: 3.1 (acre-feet)

Provide locations of all points of diversion (latitude/longitude), and associated assessor parcel numbers (APNs).

The Department of Water Resources maintains a Groundwater Recharge website with tutorials, webinars and a page for general questions. There is also an online application that can be used to help identify coordinates, APNs, acres, GSA information, and develop a map. **Visit this link :** https://data.cnra.ca.gov/dataset/california-groundwater-recharge-information

5 **Attach map showing associated inundation areas.** click here → attach Attach **PDF** or **JPG** file

6 **GPS Coordinates (Decimal Degrees # # # . # #):**

To list additional Points of Diversion (PODs), please see Addendum

	Latitude	Longitude
POD #1	39.701	121.84
POD #2		
POD #3		

7 **List APNs that could be or were inundated by the diversion activity:**
(# # # - # # # # - # # # - # # # # separated by commas)

039-090-081-000

INITIAL & FINAL REPORTS:

- **Preliminary report** to be filed with the Board and any applicable GSA, no later than **14 days after** diversions begin - §1242.1(g)(1)(B)
- **Final report** to be filed with the Board and any applicable GSA, no later than **15 days after** diversions end - §1242.1(g)(1)(C)

8 **Diverter information:**

Owner Name: Vina Groundwater Sustainability Agency

Facility Name: N/A

Waterbody Source: Comanche Creek

County: Butte

9 **CHOOSE DATE DIVERSIONS BEGAN/END FROM DROP-DOWN OPTIONS:**

	MONTH	DAY	YEAR
Date diversions began:	2/20/26		
Date diversions end: (for initial report, leave blank)	2/21/26		

10 **Provide an estimate, as of the report's date, of the amount of flood flows diverted:** 3.1 (acre-feet)

11 **Provide an estimate of the maximum area of inundation:** 0.22 (acres)

12 **Local entity (flood control agency, city or county) identifying risk of flooding downstream:**

Vina Groundwater Sustainability Agency

13 **You must also provide this report to the Groundwater Sustainablity Agency(s) (GSAs) for basin(s) receiving recharge.**

Identify GSAs you will notify: RCRD GSA
(You may choose to provide GSA notification as cc's on your submittal email)

Date of notification: 3/6/26

Self Certification For INITIAL/FINAL Reports:

Please check all boxes that apply

Please verify that you HAVE NOT diverted at:

☑ Any barns, ponds, or lands where manure or waste from an animal facility that generates waste from the feeding and housing of animals for more than 45 days per year in a confined area that is not vegetated are applied.

☑ Any agricultural field that has been identified as an outlier with respect to nitrogen application by any of the following: The board, appropriate regional board, agricultural coalition charged with implementation of the Irrigated Lands Regulatory Program.

☑ Any area that could cause damage to critical levees, infrastructure, wastewater and drinking water systems, drinking water wells or drinking water supplies, or exacerbate the threat of flood and other health and safety concerns.

☑ Any area that has not been in active irrigated agricultural cultivation within the past three years, including grazing lands, annual grasslands, and natural habitats. This limitation does not apply to facilities already constructed for the purpose of groundwater recharge or managed wetlands.

Please verify which of these apply:

☐ Diversions utilize existing infrastructure.

☑ Diversions do not require new permanent construction.

☑ Diversions utilize temporary pumps.

☑ Diversions from tributaries to the Sacramento-San Joaquin Delta would occur under excess conditions as described in Water Board's Technical Guidance document.

☑ Screens constructed of any rigid material, perforated, woven, or slotted, that provides water passage while physically excluding fish.

☑ Screen face is parallel to the flow and adjacent to the water's edge.

☑ Upstream and downstream transitions to the screen structure are designed and constructed to minimize eddies upstream of, in front of, and downstream of the screen, while minimizing entrainment to the degree feasible.

☑ Diverter has reviewed fish screen recommendations and design parameters as described in Water Board's Technical Guidance document.

Please check if apply to either the LOCAL or REGIONAL AGENCY:

☐ Has adopted a local plan of flood control.

☐ Has considered flood risk as part of its most recently adopted general plan.

☑ Diversion trigger identified by local or regional agency in a Proclaimed Drought County, per Executive Order N-16-25.

☑ Has given notice via its internet website/electronic distribution list/emergency notification service/another means of public notice, that flows downstream of the point of diversion are at imminent risk of flooding and inundation of land, roads, or structures. Request provide notice as attachment.

Check if the following APPLY to your diversions:

☑ Ceased when the flood conditions described in the public notice have abated to the point there is no longer a risk of flooding.

☑ PERSON OR ENTITY MAKING THE DIVERSION FOR GROUNDWATER RECHARGE DOES NOT CLAIM ANY WATER RIGHT BASED ON THAT DIVERSION AND RECHARGE.

By signing below, I certify that all information is true and correct to the best of my knowledge

PRINT NAME (First & Last):
Kamie Loeser

TITLE:
Member Agency Representative

EMAIL ADDRESS:
kloeser@buttecounty.net

COMPANY:
GSA Member Agency/Butte County

SIGNATURE:
Kamie Loeser

SIGN DATE:
3/5/2026

CALIFORNIA Water Boards

GAVIN NEWSOM
GOVERNOR

YANA GARCIA
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Flood Recharge Diversions (Water Code §1242.1)

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1 Diverter information:

Owner Name: Vina Groundwater Sustainability Agency

Facility Name: N/A

Waterbody Source: Comanche Creek

County: Butte

2 CHOOSE DATE & TIME DIVERSION BEGAN FROM DROP-DOWN OPTIONS:

MONTH	DAY	YEAR	HOUR	MINUTES	AM/PM
2-February	20	~~2025~~ 2026	12	00	PM

3 Local or Regional agency identifying risk of flooding downstream: Vina GSA

Flood threshold/indicator: 2" of rain in the 5-day forecast at ORFC1 gage, which historic

Method & location of noticing: Vina GSA website

Website URL if applicable: https://www.vinagsa.org/cwc-1242-1-floodwater-recharge-pro

4 Provide an estimate, as of the report's date, of the amount of flood flows to be diverted: 10 (acre-feet)

Provide locations of all points of diversion (latitude/longitude), and associated assessor parcel numbers (APNs).

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To list additional Points of Diversion (PODs), please see

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039-090-081-000

INITIAL & FINAL REPORTS:

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- **Final report** to be filed with the Board and any applicable GSA, no later than **15 days after** diversions end - §1242.1(g)(1)(C)

8 Diverter information:

Owner Name:

Facility Name:

Waterbody Source:

County: -SELECT-

9 CHOOSE DATE DIVERSIONS BEGAN/END FROM DROP-DOWN OPTIONS:

	MONTH	DAY	YEAR
Date diversions began:	2-February	20	2026
Date diversions end: (for initial report, leave blank)	2-February	20	2026

10 Provide an estimate, as of the report's date, of the amount of flood flows diverted: (acre-feet) 0

11 Provide an estimate of the maximum area of inundation: (acres) —

12 Local entity (flood control agency, city or county) identifying risk of flooding downstream:

13 You must also provide this report to the Groundwater Sustainablity Agency(s) (GSAs) for basin(s) receiving recharge.

Identify GSAs you will notify:
(You may choose to provide GSA notification as cc's on your submittal email)

Date of notification: 2-February 20 2026

14

Self Certification For INITIAL/FINAL Reports:

Please check all boxes that apply

Please verify that you HAVE NOT diverted at:

☑ Any barns, ponds, or lands where manure or waste from an animal facility that generates waste from the feeding and housing of animals for more than 45 days per year in a confined area that is not vegetated are applied.

☑ Any agricultural field that has been identified as an outlier with respect to nitrogen application by any of the following: The board, appropriate regional board, agricultural coalition charged with implementation of the Irrigated Lands Regulatory Program.

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Please verify which of these apply:

☐ Diversions utilize existing infrastructure.

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☑ Diversions utilize temporary pumps.

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☐ Has adopted a local plan of flood control.

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☑ Has given notice via its internet website/electronic distribution list/emergency notification service/another means of public notice, that flows downstream of the point of diversion are at imminent risk of flooding and inundation of land, roads, or structures. Request provide notice as attachment.

Check if the following APPLY to your diversions:

☐ Ceased when the flood conditions described in the public notice have abated to the point there is no longer a risk of flooding.

☑ PERSON OR ENTITY MAKING THE DIVERSION FOR GROUNDWATER RECHARGE DOES NOT CLAIM ANY WATER RIGHT BASED ON THAT DIVERSION AND RECHARGE.

By signing below, I certify that all information is true and correct to the best of my knowledge

PRINT NAME (First & Last):

Kamie Loeser

Kamie Loeser

TITLE:

Member Agency Representative

EMAIL ADDRESS:

kloeser@buttecounty.net

COMPANY:

GSA Member Agency/Butte County

SIGNATURE:

Kamie Loeser

SIGN DATE:

2/20/26

Vina Groundwater Sustainability Agency

308 Nelson Avenue, Oroville, California 95965
(530) 786-3303 • VinaGSA@gmail.com

February 19, 2026

NOTICE

DIVERSIONS FOR GROUNDWATER RECHARGE AND FLOOD MANAGEMENT

On or before February 20, 2026, the Vina Groundwater Sustainability Agency (GSA) may begin diversions from Comanche Creek at the location depicted in Figure 1, for a groundwater recharge pilot project in accordance with California Water Code section 1242.1 (CWC 1242.1).

CWC 1242.1 allows for the diversion of flood water for groundwater recharge while also reducing flood risks and impacts. Furthermore, California Governor's Executive Order N-16-25 encourages local agencies to provide these dual benefits of improved groundwater levels and flood management in specified counties, including Butte County. The Vina GSA is issuing this notice in its capacity as a local public agency, under authority of the State of California, in coordination and communication with Butte County Department of Water and Resource Conservation and other County departments, such as Public Works and Butte County Emergency Management. Implementation of this pilot recharge project using floodflows is consistent with Action 1.1 described in the Butte County Recharge Action Plan, adopted by the Butte County Board of Supervisors in 2024.

Ord Ferry Road and River Road are downstream of the identified diversion location and are prone to road closures and flood conditions when there is at least 2 inches of rain in the 5-day forecast at the California Nevada River Forecast Center (CNRFC) ORFC1 gage. An analysis of historic records of flooding downstream of the diversion point on Commanche Creek at Ord Ferry and River Road correlated with precipitation forecasts from CNRFC, determined that when at least 2-inches of precipitation falls over a 5-day period flooding is likely imminent. The current 5-day forecast shows 2.4 inches of rain at the CNRFC ORFC1 gage between February 18, 2026 and February 23, 2026. Because this threshold has been met, the Vina GSA has determined that flooding is likely imminent.

This floodflow diversion is expected to start shortly after 12:00 pm on February 20, 2026 and end after 24 hours or when observed flooding of roadways subsides. The Vina GSA will communicate the cessation of diversions via a notice posted to its website. The Vina GSA will divert floodflows utilizing temporary pumps, equipped with screens as required by CWC 1242.1(d), to adjacent farmland in the identified pilot area, where it will be applied for the purpose of groundwater recharge. Diverted water will be applied only to land that complies with the restrictions of CWC 1242.1(b), including actively cultivated agricultural fields.

Consistent with CWC 1242.1(f), no water right is claimed based on this diversion and recharge. Diverted water benefits the net groundwater balance of the Vina Subbasin.

In accordance with CWC 1242.1(g), the Vina GSA will file a Notice, Preliminary Report, and Final Report with the State Water Resources Control Board at FloodDiversion@waterboards.ca.gov, documenting the diversion including GPS coordinates, dates, maps, and estimated acre-feet diverted.

Questions regarding this notice may be directed to the Vina GSA at VinaGSA@gmail.com or (530) 552-3593.

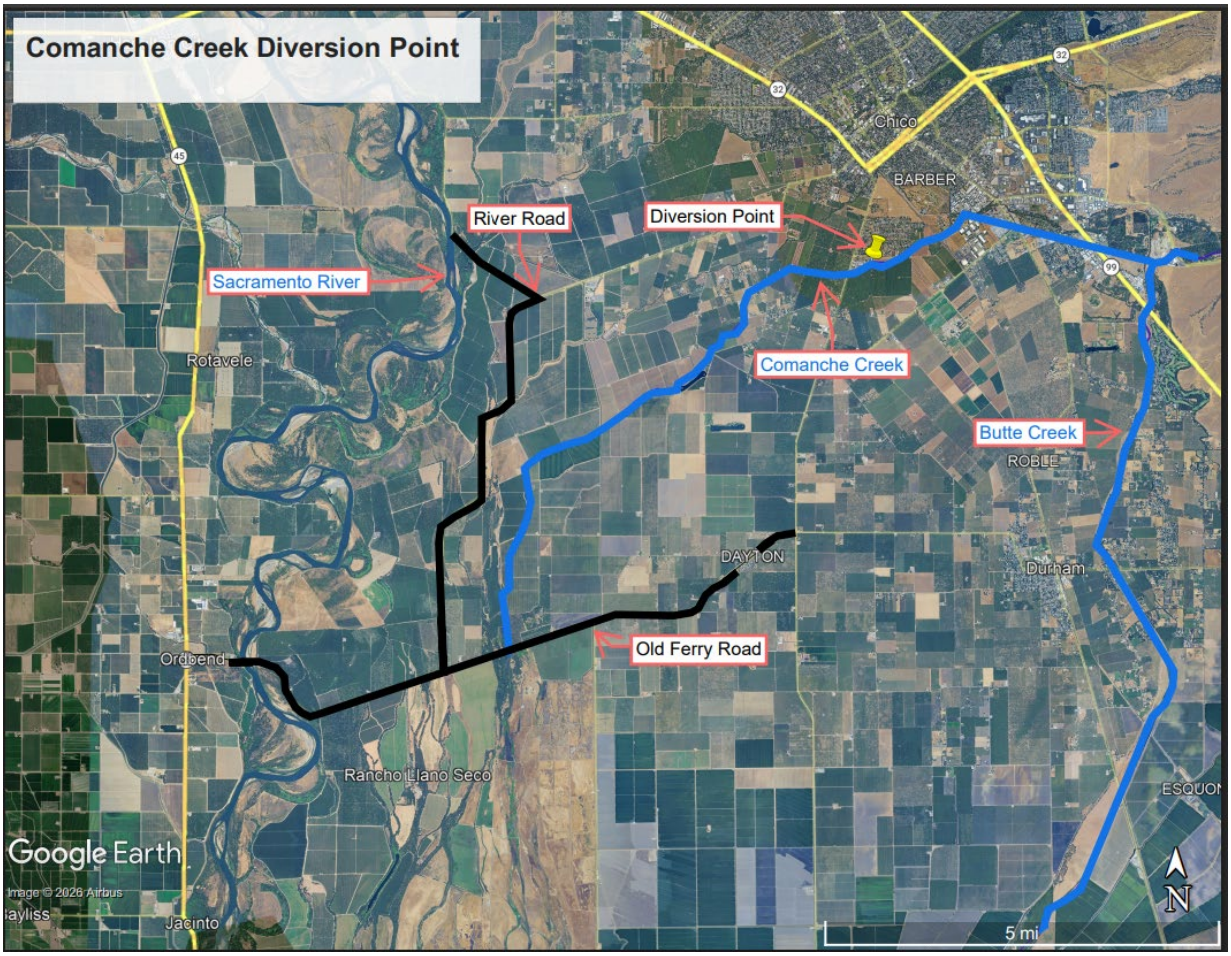
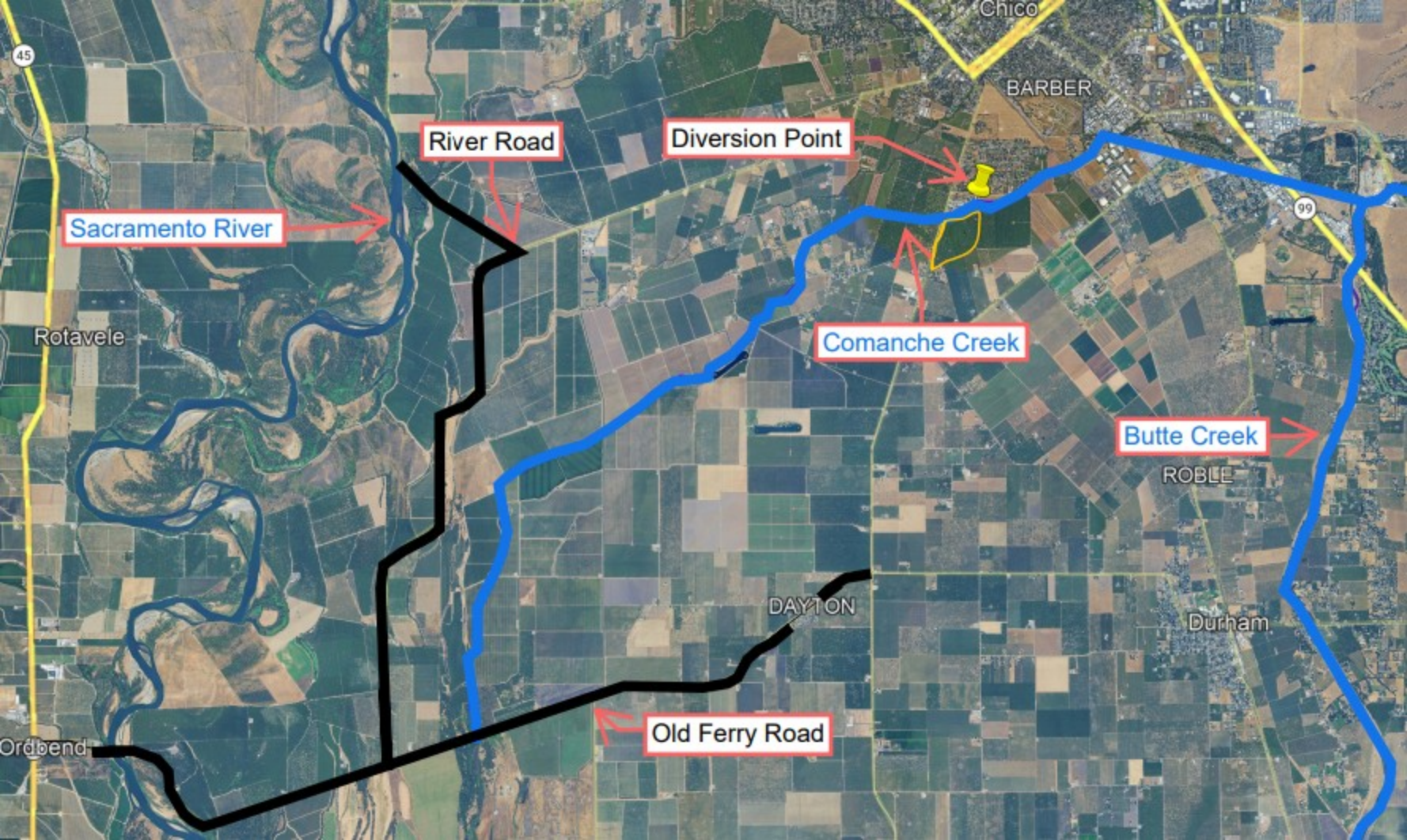
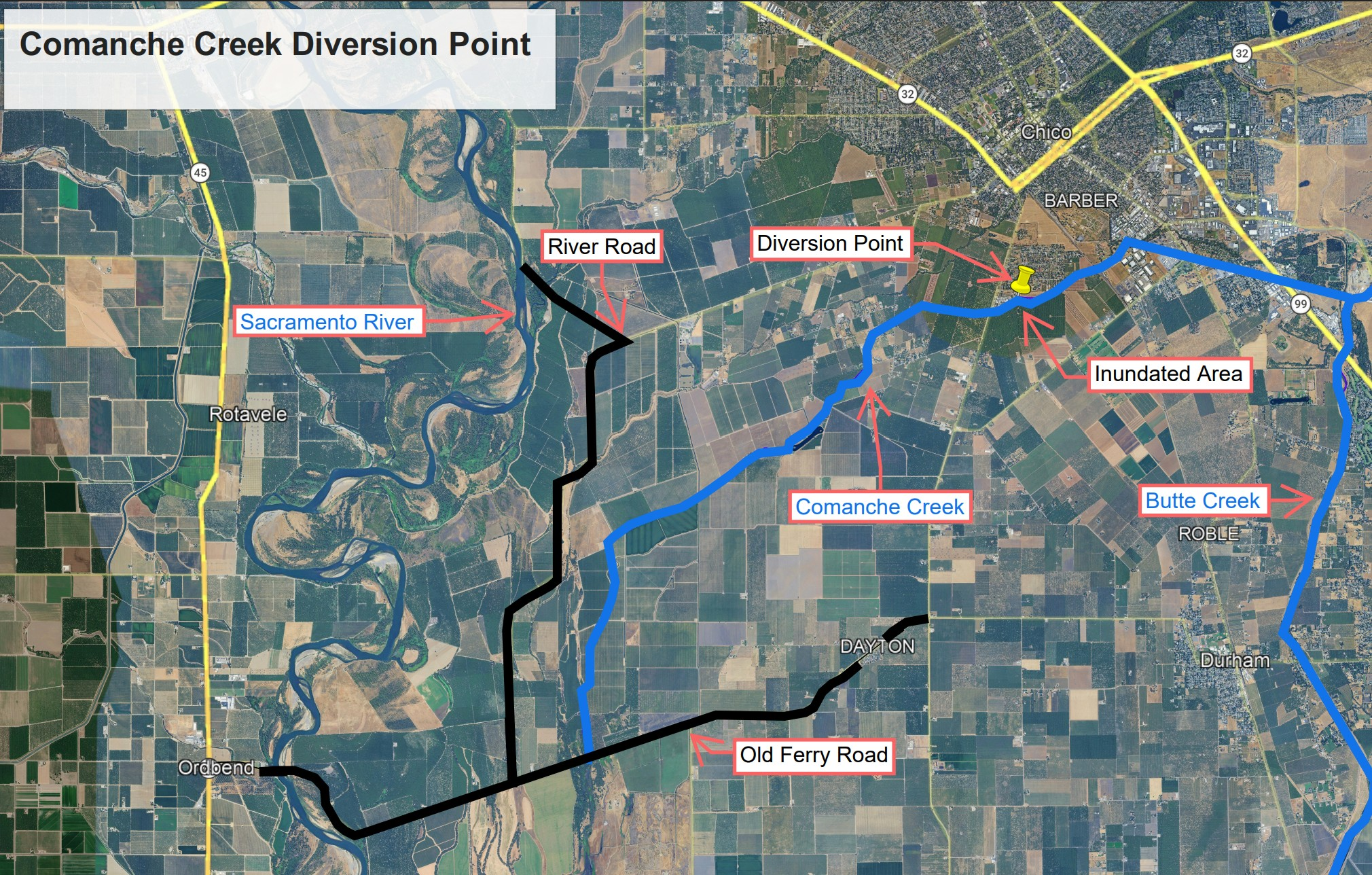


Figure 1: Map of Comanche Creek Pilot Project Area — showing point of diversion, Ord Ferry Road, River Road, and Comanche Creek


Chico
BARBER
River Road
Diversion Point
Sacramento River
Rotavele
Comanche Creek
Butte Creek
ROBLE
DAYTON
Durham
Old Ferry Road
Ordbend
45
99


Comanche Creek Diversion Point
River Road
Diversion Point
Sacramento River
Inundated Area
Comanche Creek
Butte Creek
Old Ferry Road
Chico
BARBER
Rotavele
DAYTON
ROBLE
Durham
Ordbend
32
45
99

February 25, 2026

CALIFORNIA Water Boards

GAVIN NEWSOM
GOVERNOR

YANA GARCIA
SECRETARY FOR ENVIRONMENTAL PROTECTION

Flood Recharge Diversions (Water Code §1242.1)

Reporting Forms

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Facility Name: N/A

Waterbody Source: Comanche Creek

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MONTH/DAY/YEAR	HOUR	MINUTES	AM/PM
2/20/26	12	00	PM

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039-090-081-000

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Date of notification: 3/6/26

Addendum

Additional Points of Diversion (PODs)

POD #4

POD #5

POD #6

POD #7

POD #8

POD #9

POD #10

POD #11

POD #12

POD #13

POD #14

POD #15

POD #16

POD #17

POD #18

POD #19

POD #20

POD #21

POD #22

POD #23

POD #24

POD #25

POD #26

POD #27

POD #28

POD #29

POD #30

POD #31

POD #32

POD #33

POD #34

POD #35

POD #36

POD #37

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POD #45

POD #46

POD #47

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PRINT NAME (First & Last):
Kamie Loeser

TITLE:
Member Agency Representative

EMAIL ADDRESS:
kloeser@buttecounty.net

COMPANY:
GSA Member Agency/Butte County

SIGNATURE:

SIGN DATE:
2/26/2026

ATTACHMENTS

SUBMIT TO EMAIL

CALIFORNIA Water Boards

GAVIN NEWSOM
GOVERNOR

YANA GARCIA
SECRETARY FOR ENVIRONMENTAL PROTECTION

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3 Local or Regional agency identifying risk of flooding downstream: Vina GSA

Flood threshold/indicator: Road closure of River Road and unpredictable road condition

Method & location of noticing: Vina GSA website

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POD #3		

7 **List APNs that could be or were inundated by the diversion activity:**
(# # # - # # # # - # # # - # # # # separated by commas)

039-090-081-000

INITIAL & FINAL REPORTS:

- **Preliminary report** to be filed with the Board and any applicable GSA, no later than **14 days after** diversions begin - §1242.1(g)(1)(B)
- **Final report** to be filed with the Board and any applicable GSA, no later than **15 days after** diversions end - §1242.1(g)(1)(C)

8 **Diverter information:**

Owner Name:

Facility Name:

Waterbody Source:

County: -SELECT-

9 **CHOOSE DATE DIVERSIONS BEGAN/END FROM DROP-DOWN OPTIONS:**

	MONTH DAY YEAR
Date diversions began:	2/17/26
Date diversions end: (for initial report, leave blank)	2/24/26

10 **Provide an estimate, as of the report's date, of the amount of flood flows diverted:** (acre-feet)

11 **Provide an estimate of the maximum area of inundation:** (acres)

12 **Local entity (flood control agency, city or county) identifying risk of flooding downstream:**

13 **You must also provide this report to the Groundwater Sustainablity Agency(s) (GSAs) for basin(s) receiving recharge.**

Identify GSAs you will notify:
(You may choose to provide GSA notification as cc's on your submittal email)

Date of notification: 3/3/26

Addendum

Additional Points of Diversion (PODs)

POD #4

POD #5

POD #6

POD #7

POD #8

POD #9

POD #10

POD #11

POD #12

POD #13

POD #14

POD #15

POD #16

POD #17

POD #18

POD #19

POD #20

POD #21

POD #22

POD #23

POD #24

POD #25

POD #26

POD #27

POD #28

POD #29

POD #30

POD #31

POD #32

POD #33

POD #34

POD #35

POD #36

POD #37

POD #38

POD #39

POD #40

POD #41

POD #42

POD #43

POD #44

POD #45

POD #46

POD #47

14

Self Certification For INITIAL/FINAL Reports:

Please check all boxes that apply

Please verify that you HAVE NOT diverted at:

- ☑ Any barns, ponds, or lands where manure or waste from an animal facility that generates waste from the feeding and housing of animals for more than 45 days per year in a confined area that is not vegetated are applied.
- ☑ Any agricultural field that has been identified as an outlier with respect to nitrogen application by any of the following: The board, appropriate regional board, agricultural coalition charged with implementation of the Irrigated Lands Regulatory Program.
- ☑ Any area that could cause damage to critical levees, infrastructure, wastewater and drinking water systems, drinking water wells or drinking water supplies, or exacerbate the threat of flood and other health and safety concerns.
- ☑ Any area that has not been in active irrigated agricultural cultivation within the past three years, including grazing lands, annual grasslands, and natural habitats. This limitation does not apply to facilities already constructed for the purpose of groundwater recharge or managed wetlands.

Please verify which of these apply:

- ☐ Diversions utilize existing infrastructure.
- ☑ Diversions do not require new permanent construction.
- ☑ Diversions utilize temporary pumps.
- ☑ Diversions from tributaries to the Sacramento-San Joaquin Delta would occur under excess conditions as described in Water Board's Technical Guidance document.
- ☑ Screens constructed of any rigid material, perforated, woven, or slotted, that provides water passage while physically excluding fish.
- ☑ Screen face is parallel to the flow and adjacent to the water's edge.
- ☑ Upstream and downstream transitions to the screen structure are designed and constructed to minimize eddies upstream of, in front of, and downstream of the screen, while minimizing entrainment to the degree feasible.
- ☑ Diverter has reviewed fish screen recommendations and design parameters as described in Water Board's Technical Guidance document.

Please check if apply to either the LOCAL or REGIONAL AGENCY:

- ☐ Has adopted a local plan of flood control.
- ☐ Has considered flood risk as part of its most recently adopted general plan.
- ☑ Diversion trigger identified by local or regional agency in a Proclaimed Drought County, per Executive Order N-16-25.
- ☑ Has given notice via its internet website/electronic distribution list/emergency notification service/another means of public notice, that flows downstream of the point of diversion are at imminent risk of flooding and inundation of land, roads, or structures. Request provide notice as attachment.

Check if the following APPLY to your diversions:

- ☐ Ceased when the flood conditions described in the public notice have abated to the point there is no longer a risk of flooding.
- ☑ PERSON OR ENTITY MAKING THE DIVERSION FOR GROUNDWATER RECHARGE DOES NOT CLAIM ANY WATER RIGHT BASED ON THAT DIVERSION AND RECHARGE.

By signing below, I certify that all information is true and correct to the best of my knowledge

PRINT NAME (First & Last):
Kamie Loeser

TITLE:
Member Agency Representative

EMAIL ADDRESS:
kloeser@buttecounty.net

COMPANY:
GSA Member Agency/Butte County

SIGNATURE:
Kamie Loeser

SIGN DATE:
2/26/2026

CALIFORNIA Water Boards

GAVIN NEWSOM
GOVERNOR

YANA GARCIA
SECRETARY FOR ENVIRONMENTAL PROTECTION

Flood Recharge Diversions (Water Code §1242.1)

Reporting Forms

CHOOSE REPORT TYPE FROM DROP-DOWN:
(Notice, Initial or Final)

Final report

- Attach verification of reported information, as necessary: click here → attach
- Reports received will be posted on website: **Water Code 1242.1 Flood Diversion**
- Direct questions and notice/report submittals to: FloodDiversion@waterboards.ca.gov

Flood Diversion Reporting is Not a Water Right

NOTICE:

- The required Notice shall be filed with the State Water Board **48 hours before** (if feasible, but in no case later than **48 hours after**) diversions begin - §1242.1(g)(1)(A)
- If a website is not provided as proof of notice, attach documentation of noticing (PDF, JPG, etc.)
- Calendar date & time (Pacific Standard) the Board receives the submittal serves as the official "filing". The submittal filing date will be posted on the **Water Code §1242.1 Flood Diversion Website**

1 Diverter information:

Owner Name: Vina Groundwater Sustainability Agency

Facility Name: N/A

Waterbody Source: Comanche Creek

County: Butte

2 CHOOSE DATE & TIME DIVERSION BEGAN :

MONTH/DAY/YEAR	HOUR	MINUTES	AM/PM
2/20/26	12	00	PM

3 Local or Regional agency identifying risk of flooding downstream: Vina GSA

Flood threshold/indicator: 2" of rain in the 5-day forecast at ORFC1 gage, which historic

Method & location of noticing: Vina GSA website

Website URL if applicable: https://www.vinagsa.org/cwc-1242-1-floodwater-recharge-pro

4 Provide an estimate, as of the report's date, of the amount of flood flows to be diverted: 3.1 (acre-feet)

Provide locations of all points of diversion (latitude/longitude), and associated assessor parcel numbers (APNs).

The Department of Water Resources maintains a Groundwater Recharge website with tutorials, webinars and a page for general questions. There is also an online application that can be used to help identify coordinates, APNs, acres, GSA information, and develop a map. **Visit this link :** https://data.cnra.ca.gov/dataset/california-groundwater-recharge-information

5 **Attach map showing associated inundation areas.** click here → attach Attach **PDF** or **JPG** file

6 **GPS Coordinates (Decimal Degrees # # # . # #):**

To list additional Points of Diversion (PODs), please see Addendum

	Latitude	Longitude
POD #1	39.701	121.84
POD #2		
POD #3		

7 **List APNs that could be or were inundated by the diversion activity:**
(# # # - # # # # - # # # - # # # # separated by commas)

039-090-081-000

INITIAL & FINAL REPORTS:

- **Preliminary report** to be filed with the Board and any applicable GSA, no later than **14 days after** diversions begin - §1242.1(g)(1)(B)
- **Final report** to be filed with the Board and any applicable GSA, no later than **15 days after** diversions end - §1242.1(g)(1)(C)

8 **Diverter information:**

Owner Name: Vina Groundwater Sustainability Agency

Facility Name: N/A

Waterbody Source: Comanche Creek

County: Butte

9 **CHOOSE DATE DIVERSIONS BEGAN/END FROM DROP-DOWN OPTIONS:**

	MONTH	DAY	YEAR
Date diversions began:	2/20/26		
Date diversions end: (for initial report, leave blank)	2/21/26		

10 **Provide an estimate, as of the report's date, of the amount of flood flows diverted:** 3.1 (acre-feet)

11 **Provide an estimate of the maximum area of inundation:** 0.22 (acres)

12 **Local entity (flood control agency, city or county) identifying risk of flooding downstream:**

Vina Groundwater Sustainability Agency

13 **You must also provide this report to the Groundwater Sustainablity Agency(s) (GSAs) for basin(s) receiving recharge.**

Identify GSAs you will notify: RCRD GSA
(You may choose to provide GSA notification as cc's on your submittal email)

Date of notification: 3/6/26

Self Certification For INITIAL/FINAL Reports:

Please check all boxes that apply

Please verify that you HAVE NOT diverted at:

☑ Any barns, ponds, or lands where manure or waste from an animal facility that generates waste from the feeding and housing of animals for more than 45 days per year in a confined area that is not vegetated are applied.

☑ Any agricultural field that has been identified as an outlier with respect to nitrogen application by any of the following: The board, appropriate regional board, agricultural coalition charged with implementation of the Irrigated Lands Regulatory Program.

☑ Any area that could cause damage to critical levees, infrastructure, wastewater and drinking water systems, drinking water wells or drinking water supplies, or exacerbate the threat of flood and other health and safety concerns.

☑ Any area that has not been in active irrigated agricultural cultivation within the past three years, including grazing lands, annual grasslands, and natural habitats. This limitation does not apply to facilities already constructed for the purpose of groundwater recharge or managed wetlands.

Please verify which of these apply:

☐ Diversions utilize existing infrastructure.

☑ Diversions do not require new permanent construction.

☑ Diversions utilize temporary pumps.

☑ Diversions from tributaries to the Sacramento-San Joaquin Delta would occur under excess conditions as described in Water Board's Technical Guidance document.

☑ Screens constructed of any rigid material, perforated, woven, or slotted, that provides water passage while physically excluding fish.

☑ Screen face is parallel to the flow and adjacent to the water's edge.

☑ Upstream and downstream transitions to the screen structure are designed and constructed to minimize eddies upstream of, in front of, and downstream of the screen, while minimizing entrainment to the degree feasible.

☑ Diverter has reviewed fish screen recommendations and design parameters as described in Water Board's Technical Guidance document.

Please check if apply to either the LOCAL or REGIONAL AGENCY:

☐ Has adopted a local plan of flood control.

☐ Has considered flood risk as part of its most recently adopted general plan.

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By signing below, I certify that all information is true and correct to the best of my knowledge

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Member Agency Representative

EMAIL ADDRESS:
kloeser@buttecounty.net

COMPANY:
GSA Member Agency/Butte County

SIGNATURE:
Kamie Loeser

SIGN DATE:
3/5/2026

CALIFORNIA Water Boards

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MONTH/DAY/YEAR	HOUR	MINUTES	AM/PM
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EMAIL ADDRESS:
kloeser@buttecounty.net

COMPANY:
GSA Member Agency/Butte County

SIGNATURE:
Kamie Loeser

SIGN DATE:
3/5/2026

Vina Groundwater Sustainability Agency

308 Nelson Avenue, Oroville, California 95965
(530) 786-3303 • VinaGSA@gmail.com

February 25, 2026

NOTICE

DIVERSIONS FOR GROUNDWATER RECHARGE AND FLOOD MANAGEMENT

On February 25, 2026, the Vina Groundwater Sustainability Agency (GSA) began diversions from Comanche Creek at the location depicted in Figure 1, for a groundwater recharge pilot project in accordance with California Water Code section 1242.1 (CWC 1242.1).

CWC 1242.1 allows for the diversion of flood water for groundwater recharge while also reducing flood risks and impacts. Furthermore, California Governor's Executive Order N-16-25 encourages local agencies to provide these dual benefits of improved groundwater levels and flood management in specified counties, including Butte County. The Vina GSA is issuing this notice in its capacity as a local public agency, under authority of the State of California, in coordination and communication with Butte County Department of Water and Resource Conservation and other County departments, such as Public Works and Butte County Emergency Management. Implementation of this pilot recharge project using floodflows is consistent with Action 1.1 described in the Butte County Recharge Action Plan, adopted by the Butte County Board of Supervisors in 2024.

River Road and Seven Mile Lane are downstream of the identified diversion location. On February 25, 2026 at 9:45 AM, River Road was closed due to flooding and Butte County Public Works issued a warning for unpredictable conditions on Seven Mile Lane, following several days of precipitation and high Sacramento River flows. Additionally, the California Nevada River Forecast Center (CNRFC) ORFC1 gage on the Sacramento River, downstream of Comanche Creek, is forecasted to reach 110 feet on February 25, 2026 and 114 feet on February 26, 2026. This location on the Sacramento River has an established "Action/Monitor" stage at 110 feet and "Minor Flooding" at 114 feet. At these levels the Sacramento River is known to flood Ord Ferry Road, River Road, and neighboring properties.

This floodflow diversion began at approximately 10:00 am on February 25, 2026 and will end after 24 hours or when observed flooding of roadways subsides. The Vina GSA will communicate the cessation of diversions via a notice posted to its website. The Vina GSA will divert floodflows utilizing temporary pumps, equipped with screens as required by CWC 1242.1(d), to adjacent farmland in the identified pilot area, where it will be applied for the purpose of groundwater recharge. Diverted water will be applied only to land that complies with the restrictions of CWC 1242.1(b), including actively cultivated agricultural fields.

Consistent with CWC 1242.1(f), no water right is claimed based on this diversion and recharge. Diverted water benefits the net groundwater balance of the Vina Subbasin.

In accordance with CWC 1242.1(g), the Vina GSA will file a Notice, Preliminary Report, and Final Report with the State Water Resources Control Board at FloodDiversion@waterboards.ca.gov, documenting the diversion including GPS coordinates, dates, maps, and estimated acre-feet diverted.

Questions regarding this notice may be directed to the Vina GSA at VinaGSA@gmail.com or (530) 552-3593.

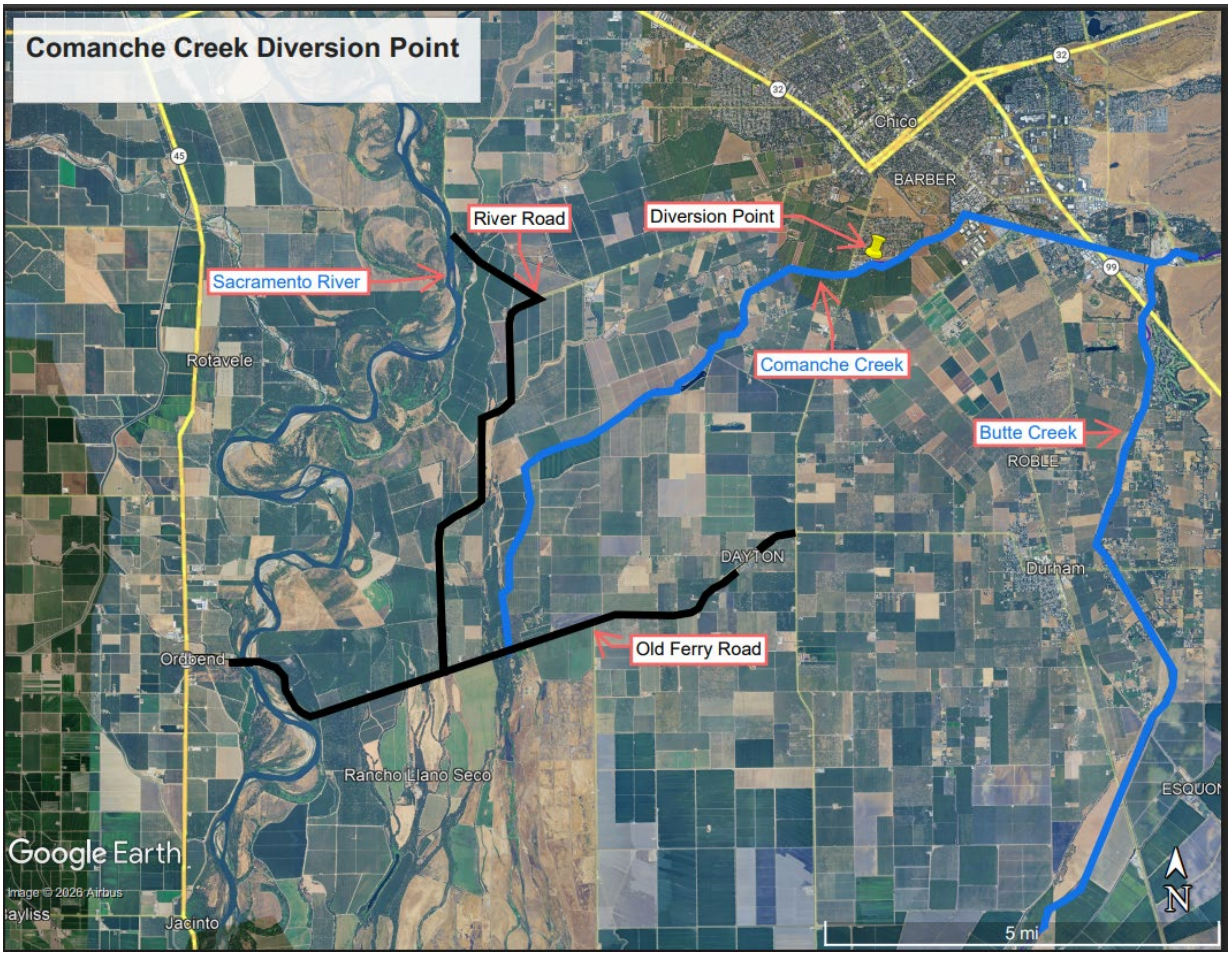
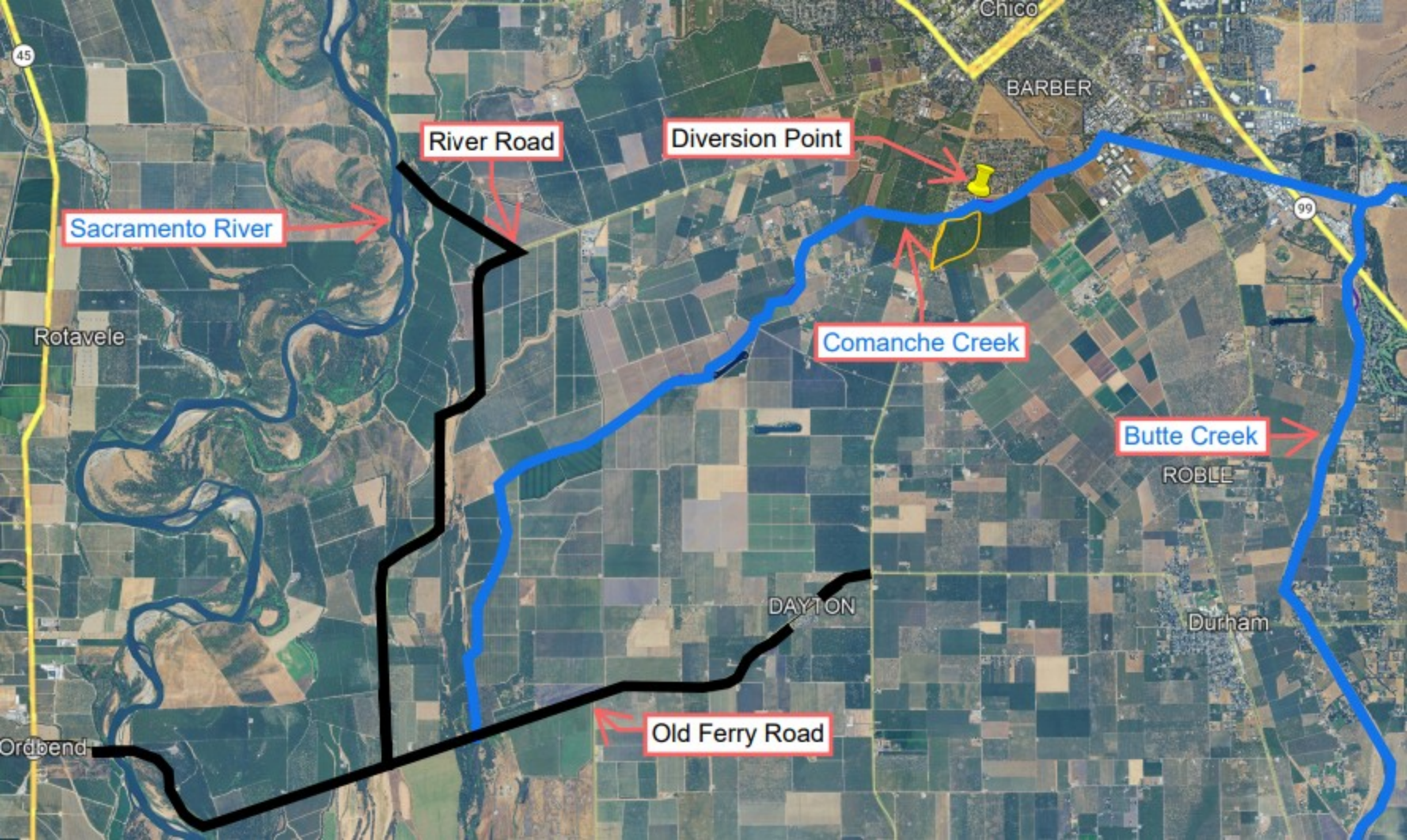
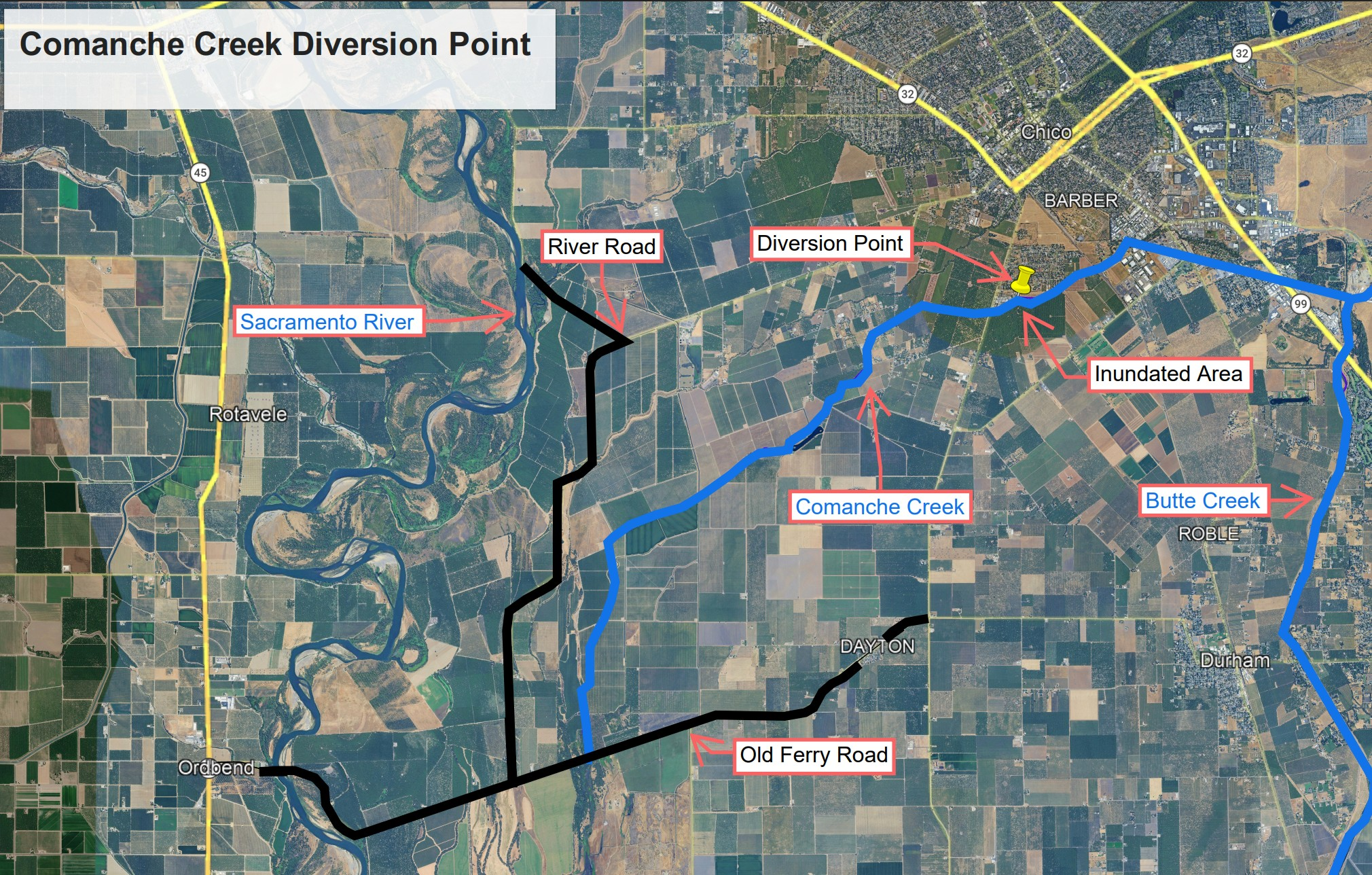


Figure 1: Map of Comanche Creek Pilot Project Area — showing point of diversion, Ord Ferry Road, River Road, and Comanche Creek


Chico
BARBER
River Road
Diversion Point
Sacramento River
Rotavele
Comanche Creek
Butte Creek
ROBLE
DAYTON
Durham
Old Ferry Road
Ordbend
45
99


Comanche Creek Diversion Point
River Road
Diversion Point
Sacramento River
Inundated Area
Comanche Creek
Butte Creek
Old Ferry Road
Chico
BARBER
Rotavele
DAYTON
ROBLE
Durham
Ordbend
32
45
99

Appendix L – Infiltration Calculation Tables

Site S1

Total Area - Basin 1	1,637,856.00	square feet						
	37.6	Acres						
	Infiltration Rates (Feet/Day)			0 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	6.8%	111,047	0.271	0.814	0.542
30 to 40 ohm/m	1	3	2.00	20.5%	335,269	0.205	0.614	0.409
20 to 30 ohm/m	0.5	2	1.25	65.7%	1,075,580	0.328	1.313	0.821
12 to 20 ohm/m	0.5	1	0.75	7.1%	115,960	0.035	0.071	0.053
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.84	2.81	1.83
	Infiltration Rates (Feet/Day)			1 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	6.4%	104,495	0.255	0.766	0.510
30 to 40 ohm/m	1	3	2.00	20.5%	335,760	0.205	0.615	0.410
20 to 30 ohm/m	0.5	2	1.25	67.1%	1,099,165	0.336	1.342	0.839
12 to 20 ohm/m	0.5	1	0.75	6.0%	98,271	0.030	0.060	0.045
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.83	2.78	1.80
	Infiltration Rates (Feet/Day)			3 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	5.8%	95,651	0.234	0.701	0.467
30 to 40 ohm/m	1	3	2.00	20.5%	70	0.205	0.616	0.411
20 to 30 ohm/m	0.5	2	1.25	69.5%	1,138,637	0.348	1.390	0.869
12 to 20 ohm/m	0.5	1	0.75	4.1%	66,988	0.020	0.041	0.031
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.81	2.75	1.78
	Infiltration Rates (Feet/Day)			5 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	5.0%	82,220	0.201	0.602	0.402
30 to 40 ohm/m	1	3	2.00	20.7%	339,691	0.207	0.622	0.415
20 to 30 ohm/m	0.5	2	1.25	72.4%	1,186,299	0.362	1.449	0.905
12 to 20 ohm/m	0.5	1	0.75	1.8%	29,645	0.009	0.018	0.014
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.78	2.69	1.74
	Infiltration Rates (Feet/Day)			10 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	4.1%	66,661	0.163	0.488	0.326
30 to 40 ohm/m	1	3	2.00	19.9%	325,278	0.199	0.596	0.397
20 to 30 ohm/m	0.5	2	1.25	75.0%	1,228,228	0.375	1.500	0.937
12 to 20 ohm/m	0.5	1	0.75	1.1%	17,689	0.005	0.011	0.008
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.74	2.59	1.67
	Infiltration Rates (Feet/Day)			15 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	2.7%	44,713	0.109	0.328	0.218
30 to 40 ohm/m	1	3	2.00	22.0%	360,492	0.220	0.660	0.440
20 to 30 ohm/m	0.5	2	1.25	73.6%	1,205,134	0.368	1.472	0.920
12 to 20 ohm/m	0.5	1	0.75	1.7%	27,516	0.008	0.017	0.013
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.71	2.48	1.59
	Infiltration Rates (Feet/Day)			20 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	1.6%	26,369	0.064	0.193	0.129
30 to 40 ohm/m	1	3	2.00	22.5%	368,681	0.225	0.675	0.450
20 to 30 ohm/m	0.5	2	1.25	72.6%	1,189,739	0.363	1.453	0.908
12 to 20 ohm/m	0.5	1	0.75	3.2%	52,903	0.016	0.032	0.024
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.67	2.35	1.51
	Infiltration Rates (Feet/Day)			25 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	1.9%	31,283	0.076	0.229	0.153
30 to 40 ohm/m	1	3	2.00	19.8%	324,459	0.198	0.594	0.396
20 to 30 ohm/m	0.5	2	1.25	73.6%	1,204,807	0.368	1.471	0.920
12 to 20 ohm/m	0.5	1	0.75	4.7%	77,307	0.024	0.047	0.035
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.67	2.34	1.50
	Infiltration Rates (Feet/Day)			30 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	2.2%	36,197	0.088	0.265	0.177
30 to 40 ohm/m	1	3	2.00	17.7%	290,556	0.177	0.532	0.355
20 to 30 ohm/m	0.5	2	1.25	74.1%	1,213,160	0.370	1.481	0.926
12 to 20 ohm/m	0.5	1	0.75	6.0%	97,780	0.030	0.060	0.045
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.67	2.34	1.50
					Harmonic Mean to 20 Feet	0.76	2.63	1.69
					Harmonic Mean to 30 Feet	0.72	2.50	1.61

Total Area - Basin 2	1,411,344.00	square feet						
	32.4	Acres						
	Infiltration Rates (Feet/Day)			0 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	3.6%	50,950	0.144	0.433	0.289
30 to 40 ohm/m	1	3	2.00	17.2%	242,610	0.172	0.516	0.344
20 to 30 ohm/m	0.5	2	1.25	67.4%	950,681	0.337	1.347	0.842
12 to 20 ohm/m	0.5	1	0.75	11.6%	164,280	0.058	0.116	0.087
5 to 12 ohm/m	0.01	0.05	0.03	0.2%	2,823	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.71	2.41	1.56
	Infiltration Rates (Feet/Day)			1 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	3.4%	47,703	0.135	0.406	0.270
30 to 40 ohm/m	1	3	2.00	17.2%	242,892	0.172	0.516	0.344
20 to 30 ohm/m	0.5	2	1.25	68.2%	962,537	0.341	1.364	0.853
12 to 20 ohm/m	0.5	1	0.75	11.1%	156,941	0.056	0.111	0.083
5 to 12 ohm/m	0.01	0.05	0.03	0.1%	1,270	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.70	2.40	1.55
	Infiltration Rates (Feet/Day)			3 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	3.2%	44,598	0.126	0.379	0.253
30 to 40 ohm/m	1	3	2.00	17.0%	239,928	0.170	0.510	0.340
20 to 30 ohm/m	0.5	2	1.25	69.6%	982,578	0.348	1.392	0.870
12 to 20 ohm/m	0.5	1	0.75	10.2%	143,957	0.051	0.102	0.077
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	141	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.70	2.38	1.54
	Infiltration Rates (Feet/Day)			5 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	2.5%	35,566	0.101	0.302	0.202
30 to 40 ohm/m	1	3	2.00	16.8%	237,529	0.168	0.505	0.337
20 to 30 ohm/m	0.5	2	1.25	73.0%	1,030,140	0.365	1.460	0.912
12 to 20 ohm/m	0.5	1	0.75	7.7%	108,109	0.038	0.077	0.057
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.67	2.34	1.51
	Infiltration Rates (Feet/Day)			10 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	1.7%	24,557	0.070	0.209	0.139
30 to 40 ohm/m	1	3	2.00	17.6%	247,832	0.176	0.527	0.351
20 to 30 ohm/m	0.5	2	1.25	76.3%	1,076,150	0.381	1.525	0.953
12 to 20 ohm/m	0.5	1	0.75	4.5%	62,805	0.022	0.045	0.033
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.65	2.31	1.48
	Infiltration Rates (Feet/Day)			15 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	1.1%	15,807	0.045	0.134	0.090
30 to 40 ohm/m	1	3	2.00	21.7%	306,685	0.217	0.652	0.435
20 to 30 ohm/m	0.5	2	1.25	73.7%	1,040,161	0.369	1.474	0.921
12 to 20 ohm/m	0.5	1	0.75	3.5%	48,833	0.017	0.035	0.026
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.65	2.29	1.47
	Infiltration Rates (Feet/Day)			20 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	2.1%	29,779	0.084	0.253	0.169
30 to 40 ohm/m	1	3	2.00	23.3%	328,137	0.233	0.698	0.465
20 to 30 ohm/m	0.5	2	1.25	71.2%	1,004,171	0.356	1.423	0.889
12 to 20 ohm/m	0.5	1	0.75	3.5%	49,397	0.018	0.035	0.026
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.69	2.41	1.55
	Infiltration Rates (Feet/Day)			25 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	3.0%	42,481	0.120	0.361	0.241
30 to 40 ohm/m	1	3	2.00	21.7%	305,697	0.217	0.650	0.433
20 to 30 ohm/m	0.5	2	1.25	71.1%	1,003,466	0.356	1.422	0.889
12 to 20 ohm/m	0.5	1	0.75	4.0%	57,018	0.020	0.040	0.030
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.71	2.47	1.59
	Infiltration Rates (Feet/Day)			30 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	3.3%	47,139	0.134	0.401	0.267
30 to 40 ohm/m	1	3	2.00	20.5%	289,749	0.205	0.616	0.411
20 to 30 ohm/m	0.5	2	1.25	71.6%	1,010,099	0.358	1.431	0.895
12 to 20 ohm/m	0.5	1	0.75	4.6%	64,498	0.023	0.046	0.034
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.72	2.49	1.61
					Harmonic Mean to 20 Feet	0.68	2.36	1.52
					Harmonic Mean to 30 Feet	0.68	2.38	1.53

Total Area - Forebay	906,048.00	square feet						
	20.8	Acres						
	Infiltration Rates (Feet/Day)			0 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	1.5%	13,228	0.058	0.175	0.117
30 to 40 ohm/m	1	3	2.00	19.4%	175,592	0.194	0.581	0.388
20 to 30 ohm/m	0.5	2	1.25	75.0%	679,174	0.375	1.499	0.937
12 to 20 ohm/m	0.5	1	0.75	4.2%	38,054	0.021	0.042	0.032
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.65	2.30	1.47
	Infiltration Rates (Feet/Day)			1 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	1.1%	10,057	0.044	0.133	0.089
30 to 40 ohm/m	1	3	2.00	18.9%	170,881	0.189	0.566	0.377
20 to 30 ohm/m	0.5	2	1.25	76.0%	688,143	0.380	1.519	0.949
12 to 20 ohm/m	0.5	1	0.75	4.1%	37,057	0.020	0.041	0.031
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.63	2.26	1.45
	Infiltration Rates (Feet/Day)			3 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.7%	6,342	0.028	0.084	0.056
30 to 40 ohm/m	1	3	2.00	17.9%	162,545	0.179	0.538	0.359
20 to 30 ohm/m	0.5	2	1.25	77.4%	701,100	0.387	1.548	0.967
12 to 20 ohm/m	0.5	1	0.75	4.0%	36,151	0.020	0.040	0.030
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.61	2.21	1.41
	Infiltration Rates (Feet/Day)			5 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.3%	2,899	0.013	0.038	0.026
30 to 40 ohm/m	1	3	2.00	15.7%	142,431	0.157	0.472	0.314
20 to 30 ohm/m	0.5	2	1.25	81.2%	735,349	0.406	1.623	1.015
12 to 20 ohm/m	0.5	1	0.75	2.8%	25,279	0.014	0.028	0.021
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.59	2.16	1.38
	Infiltration Rates (Feet/Day)			10 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.1%	1,087	0.005	0.014	0.010
30 to 40 ohm/m	1	3	2.00	12.3%	111,535	0.123	0.369	0.246
20 to 30 ohm/m	0.5	2	1.25	86.5%	783,913	0.433	1.730	1.082
12 to 20 ohm/m	0.5	1	0.75	1.1%	9,514	0.005	0.011	0.008
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.57	2.12	1.35
	Infiltration Rates (Feet/Day)			15 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.1%	815	0.004	0.011	0.007
30 to 40 ohm/m	1	3	2.00	9.7%	88,249	0.097	0.292	0.195
20 to 30 ohm/m	0.5	2	1.25	89.4%	810,369	0.447	1.789	1.118
12 to 20 ohm/m	0.5	1	0.75	0.7%	6,705	0.004	0.007	0.006
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.55	2.10	1.33
	Infiltration Rates (Feet/Day)			20 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	362	0.002	0.005	0.003
30 to 40 ohm/m	1	3	2.00	7.9%	71,940	0.079	0.238	0.159
20 to 30 ohm/m	0.5	2	1.25	90.9%	823,869	0.455	1.819	1.137
12 to 20 ohm/m	0.5	1	0.75	1.1%	9,876	0.005	0.011	0.008
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.54	2.07	1.31
	Infiltration Rates (Feet/Day)			25 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.1%	725	0.003	0.010	0.006
30 to 40 ohm/m	1	3	2.00	6.2%	56,084	0.062	0.186	0.124
20 to 30 ohm/m	0.5	2	1.25	91.7%	831,027	0.459	1.834	1.147
12 to 20 ohm/m	0.5	1	0.75	2.0%	18,212	0.010	0.020	0.015
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.53	2.05	1.29
	Infiltration Rates (Feet/Day)			30 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.2%	1,450	0.006	0.019	0.013
30 to 40 ohm/m	1	3	2.00	5.2%	47,205	0.052	0.156	0.104
20 to 30 ohm/m	0.5	2	1.25	92.0%	833,292	0.460	1.839	1.150
12 to 20 ohm/m	0.5	1	0.75	2.7%	24,010	0.013	0.027	0.020
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.53	2.04	1.29
					Harmonic Mean to 20 Feet	0.59	2.17	1.38
					Harmonic Mean to 30 Feet	0.56	2.11	1.33

Site N4

Total Area - Basin N1	1,289,376.00	square feet						
	29.6	Acres						
	Infiltration Rates (Feet/Day)			0 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.1%	1,289	0.001	0.003	0.002
20 to 30 ohm/m	0.5	2	1.25	34.2%	441,224	0.171	0.684	0.428
12 to 20 ohm/m	0.5	1	0.75	63.0%	811,662	0.315	0.630	0.472
5 to 12 ohm/m	0.01	0.05	0.03	2.7%	35,200	0.000	0.001	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.49	1.32	0.90
	Infiltration Rates (Feet/Day)			1 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	129	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	27.8%	358,833	0.139	0.557	0.348
12 to 20 ohm/m	0.5	1	0.75	68.8%	886,704	0.344	0.688	0.516
5 to 12 ohm/m	0.01	0.05	0.03	3.4%	43,710	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.48	1.25	0.86
	Infiltration Rates (Feet/Day)			3 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	21.2%	272,703	0.106	0.423	0.264
12 to 20 ohm/m	0.5	1	0.75	74.7%	962,648	0.373	0.747	0.560
5 to 12 ohm/m	0.01	0.05	0.03	4.2%	53,896	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.48	1.17	0.83
	Infiltration Rates (Feet/Day)			5 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	13.6%	175,226	0.068	0.272	0.170
12 to 20 ohm/m	0.5	1	0.75	80.9%	1,043,621	0.405	0.809	0.607
5 to 12 ohm/m	0.01	0.05	0.03	5.5%	70,529	0.001	0.003	0.002
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.47	1.08	0.78
	Infiltration Rates (Feet/Day)			10 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	8.1%	104,053	0.040	0.161	0.101
12 to 20 ohm/m	0.5	1	0.75	85.2%	1,098,419	0.426	0.852	0.639
5 to 12 ohm/m	0.01	0.05	0.03	6.8%	87,033	0.001	0.003	0.002
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.47	1.02	0.74
	Infiltration Rates (Feet/Day)			15 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	4.4%	56,861	0.022	0.088	0.055
12 to 20 ohm/m	0.5	1	0.75	86.9%	1,120,210	0.434	0.869	0.652
5 to 12 ohm/m	0.01	0.05	0.03	8.7%	112,176	0.001	0.004	0.003
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.46	0.96	0.71
	Infiltration Rates (Feet/Day)			20 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	0.3%	4,384	0.002	0.007	0.004
12 to 20 ohm/m	0.5	1	0.75	83.4%	1,075,469	0.417	0.834	0.626
5 to 12 ohm/m	0.01	0.05	0.03	16.3%	209,524	0.002	0.008	0.005
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.42	0.85	0.63
	Infiltration Rates (Feet/Day)			25 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	0.3%	4,384	0.002	0.007	0.004
12 to 20 ohm/m	0.5	1	0.75	83.4%	1,075,469	0.417	0.834	0.626
5 to 12 ohm/m	0.01	0.05	0.03	16.3%	209,524	0.002	0.008	0.005
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.42	0.85	0.63
	Infiltration Rates (Feet/Day)			30 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	0.0%	387	0.000	0.001	0.000
12 to 20 ohm/m	0.5	1	0.75	77.0%	993,206	0.385	0.770	0.578
5 to 12 ohm/m	0.01	0.05	0.03	22.9%	295,783	0.002	0.011	0.007
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.39	0.78	0.58
					Harmonic Mean to 20 Feet	0.47	1.07	0.77
					Harmonic Mean to 30 Feet	0.44	0.94	0.69

Total Area - Basin N2	980,100.00	square feet						
	22.5	Acres						
	Infiltration Rates (Feet/Day)			0 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	3.9%	37,734	0.039	0.116	0.077
20 to 30 ohm/m	0.5	2	1.25	59.1%	579,337	0.296	1.182	0.739
12 to 20 ohm/m	0.5	1	0.75	37.0%	363,029	0.185	0.370	0.278
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.52	1.67	1.09
	Infiltration Rates (Feet/Day)			1 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	3.7%	35,774	0.037	0.110	0.073
20 to 30 ohm/m	0.5	2	1.25	54.7%	536,409	0.274	1.095	0.684
12 to 20 ohm/m	0.5	1	0.75	41.6%	407,918	0.208	0.416	0.312
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.52	1.62	1.07
	Infiltration Rates (Feet/Day)			3 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	3.3%	32,245	0.033	0.099	0.066
20 to 30 ohm/m	0.5	2	1.25	48.6%	476,329	0.243	0.972	0.608
12 to 20 ohm/m	0.5	1	0.75	48.1%	471,526	0.241	0.481	0.361
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.52	1.55	1.03
	Infiltration Rates (Feet/Day)			5 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	2.1%	20,582	0.021	0.063	0.042
20 to 30 ohm/m	0.5	2	1.25	41.3%	404,683	0.206	0.826	0.516
12 to 20 ohm/m	0.5	1	0.75	56.6%	554,835	0.283	0.566	0.425
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.51	1.45	0.98
	Infiltration Rates (Feet/Day)			10 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.7%	6,469	0.007	0.020	0.013
20 to 30 ohm/m	0.5	2	1.25	32.4%	317,160	0.162	0.647	0.405
12 to 20 ohm/m	0.5	1	0.75	67.0%	656,471	0.335	0.670	0.502
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.34	0.92
	Infiltration Rates (Feet/Day)			15 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	28.5%	279,721	0.143	0.571	0.357
12 to 20 ohm/m	0.5	1	0.75	71.4%	700,183	0.357	0.714	0.536
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	98	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.29	0.89
	Infiltration Rates (Feet/Day)			20 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	26.5%	259,236	0.132	0.529	0.331
12 to 20 ohm/m	0.5	1	0.75	73.2%	717,727	0.366	0.732	0.549
5 to 12 ohm/m	0.01	0.05	0.03	0.3%	3,234	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.26	0.88
	Infiltration Rates (Feet/Day)			25 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	25.3%	247,475	0.126	0.505	0.316
12 to 20 ohm/m	0.5	1	0.75	73.1%	716,355	0.365	0.731	0.548
5 to 12 ohm/m	0.01	0.05	0.03	1.7%	16,270	0.000	0.001	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.49	1.24	0.86
	Infiltration Rates (Feet/Day)			30 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	25.1%	245,711	0.125	0.501	0.313
12 to 20 ohm/m	0.5	1	0.75	71.7%	703,026	0.359	0.717	0.538
5 to 12 ohm/m	0.01	0.05	0.03	3.2%	31,363	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.48	1.22	0.85
					Harmonic Mean to 20 Feet	0.51	1.44	0.98
					Harmonic Mean to 30 Feet	0.50	1.33	0.91

Total Area - Basin S1	1,655,280.00	square feet						
	38	Acres						
	Infiltration Rates (Feet/Day)			0 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	15.4%	255,575	0.154	0.463	0.309
20 to 30 ohm/m	0.5	2	1.25	38.1%	630,993	0.191	0.762	0.477
12 to 20 ohm/m	0.5	1	0.75	45.2%	748,518	0.226	0.452	0.339
5 to 12 ohm/m	0.01	0.05	0.03	1.2%	20,194	0.000	0.001	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.57	1.68	1.12
	Infiltration Rates (Feet/Day)			1 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	15.2%	251,603	0.152	0.456	0.304
20 to 30 ohm/m	0.5	2	1.25	36.2%	598,715	0.181	0.723	0.452
12 to 20 ohm/m	0.5	1	0.75	46.8%	774,009	0.234	0.468	0.351
5 to 12 ohm/m	0.01	0.05	0.03	1.9%	31,119	0.000	0.001	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.57	1.65	1.11
	Infiltration Rates (Feet/Day)			3 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	15.0%	247,464	0.150	0.449	0.299
20 to 30 ohm/m	0.5	2	1.25	33.7%	557,333	0.168	0.673	0.421
12 to 20 ohm/m	0.5	1	0.75	48.5%	803,142	0.243	0.485	0.364
5 to 12 ohm/m	0.01	0.05	0.03	2.9%	47,341	0.000	0.001	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.56	1.61	1.08
	Infiltration Rates (Feet/Day)			5 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	14.5%	240,016	0.145	0.435	0.290
20 to 30 ohm/m	0.5	2	1.25	29.8%	493,273	0.149	0.596	0.373
12 to 20 ohm/m	0.5	1	0.75	50.3%	831,778	0.251	0.503	0.377
5 to 12 ohm/m	0.01	0.05	0.03	5.5%	90,213	0.001	0.003	0.002
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.55	1.54	1.04
	Infiltration Rates (Feet/Day)			10 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	13.9%	230,249	0.139	0.417	0.278
20 to 30 ohm/m	0.5	2	1.25	26.2%	433,021	0.131	0.523	0.327
12 to 20 ohm/m	0.5	1	0.75	52.2%	864,222	0.261	0.522	0.392
5 to 12 ohm/m	0.01	0.05	0.03	7.7%	127,788	0.001	0.004	0.002
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.53	1.47	1.00
	Infiltration Rates (Feet/Day)			15 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	13.4%	221,476	0.134	0.401	0.268
20 to 30 ohm/m	0.5	2	1.25	25.0%	414,482	0.125	0.501	0.313
12 to 20 ohm/m	0.5	1	0.75	52.0%	860,911	0.260	0.520	0.390
5 to 12 ohm/m	0.01	0.05	0.03	9.6%	158,245	0.001	0.005	0.003
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.52	1.43	0.97
	Infiltration Rates (Feet/Day)			20 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	12.9%	213,366	0.129	0.387	0.258
20 to 30 ohm/m	0.5	2	1.25	24.9%	412,165	0.125	0.498	0.311
12 to 20 ohm/m	0.5	1	0.75	49.6%	821,515	0.248	0.496	0.372
5 to 12 ohm/m	0.01	0.05	0.03	12.6%	208,234	0.001	0.006	0.004
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.39	0.95
	Infiltration Rates (Feet/Day)			25 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	12.5%	206,082	0.125	0.374	0.249
20 to 30 ohm/m	0.5	2	1.25	24.9%	411,999	0.124	0.498	0.311
12 to 20 ohm/m	0.5	1	0.75	47.3%	782,285	0.236	0.473	0.354
5 to 12 ohm/m	0.01	0.05	0.03	15.4%	254,913	0.002	0.008	0.005
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.49	1.35	0.92
	Infiltration Rates (Feet/Day)			30 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	12.2%	201,117	0.122	0.365	0.243
20 to 30 ohm/m	0.5	2	1.25	25.2%	416,800	0.126	0.504	0.315
12 to 20 ohm/m	0.5	1	0.75	46.3%	765,567	0.231	0.463	0.347
5 to 12 ohm/m	0.01	0.05	0.03	16.4%	271,797	0.002	0.008	0.005
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.48	1.34	0.91
					Harmonic Mean to 20 Feet	0.54	1.53	1.04
					Harmonic Mean to 30 Feet	0.52	1.44	0.98

Total Area - Basin S2	1,720,620.00	square feet						
	39.5	Acres						
	Infiltration Rates (Feet/Day)			0 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.7%	12,216	0.007	0.021	0.014
20 to 30 ohm/m	0.5	2	1.25	40.4%	695,647	0.202	0.809	0.505
12 to 20 ohm/m	0.5	1	0.75	57.4%	987,120	0.287	0.574	0.430
5 to 12 ohm/m	0.01	0.05	0.03	1.5%	25,465	0.000	0.001	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.40	0.95
	Infiltration Rates (Feet/Day)			1 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.7%	11,356	0.007	0.020	0.013
20 to 30 ohm/m	0.5	2	1.25	35.8%	615,466	0.179	0.715	0.447
12 to 20 ohm/m	0.5	1	0.75	60.3%	1,036,674	0.301	0.603	0.452
5 to 12 ohm/m	0.01	0.05	0.03	3.3%	57,125	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.49	1.34	0.91
	Infiltration Rates (Feet/Day)			3 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.6%	10,496	0.006	0.018	0.012
20 to 30 ohm/m	0.5	2	1.25	29.6%	508,615	0.148	0.591	0.370
12 to 20 ohm/m	0.5	1	0.75	63.3%	1,088,292	0.316	0.633	0.474
5 to 12 ohm/m	0.01	0.05	0.03	6.6%	113,217	0.001	0.003	0.002
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.47	1.25	0.86
	Infiltration Rates (Feet/Day)			5 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.5%	8,947	0.005	0.016	0.010
20 to 30 ohm/m	0.5	2	1.25	22.8%	392,818	0.114	0.457	0.285
12 to 20 ohm/m	0.5	1	0.75	64.4%	1,107,563	0.322	0.644	0.483
5 to 12 ohm/m	0.01	0.05	0.03	12.3%	211,292	0.001	0.006	0.004
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.44	1.12	0.78
	Infiltration Rates (Feet/Day)			10 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.4%	7,227	0.004	0.013	0.008
20 to 30 ohm/m	0.5	2	1.25	16.0%	275,127	0.080	0.320	0.200
12 to 20 ohm/m	0.5	1	0.75	65.0%	1,118,231	0.325	0.650	0.487
5 to 12 ohm/m	0.01	0.05	0.03	18.6%	320,035	0.002	0.009	0.006
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.41	0.99	0.70
	Infiltration Rates (Feet/Day)			15 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.3%	5,850	0.003	0.010	0.007
20 to 30 ohm/m	0.5	2	1.25	11.7%	200,968	0.058	0.234	0.146
12 to 20 ohm/m	0.5	1	0.75	63.8%	1,097,928	0.319	0.638	0.479
5 to 12 ohm/m	0.01	0.05	0.03	24.2%	415,702	0.002	0.012	0.007
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.38	0.89	0.64
	Infiltration Rates (Feet/Day)			20 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.3%	4,818	0.003	0.008	0.006
20 to 30 ohm/m	0.5	2	1.25	7.6%	129,907	0.038	0.151	0.094
12 to 20 ohm/m	0.5	1	0.75	62.2%	1,069,882	0.311	0.622	0.466
5 to 12 ohm/m	0.01	0.05	0.03	30.0%	516,014	0.003	0.015	0.009
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.35	0.80	0.58
	Infiltration Rates (Feet/Day)			25 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.2%	3,957	0.002	0.007	0.005
20 to 30 ohm/m	0.5	2	1.25	5.8%	100,140	0.029	0.116	0.073
12 to 20 ohm/m	0.5	1	0.75	56.7%	976,280	0.284	0.567	0.426
5 to 12 ohm/m	0.01	0.05	0.03	37.2%	640,243	0.004	0.019	0.011
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.32	0.71	0.51
	Infiltration Rates (Feet/Day)			30 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.2%	3,613	0.002	0.006	0.004
20 to 30 ohm/m	0.5	2	1.25	5.5%	93,946	0.027	0.109	0.068
12 to 20 ohm/m	0.5	1	0.75	51.6%	887,324	0.258	0.516	0.387
5 to 12 ohm/m	0.01	0.05	0.03	42.8%	735,737	0.004	0.021	0.013
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.29	0.65	0.47
					Harmonic Mean to 20 Feet	0.43	1.07	0.75
					Harmonic Mean to 30 Feet	0.37	0.87	0.62

Total Area - Basin S3	1,154,340.00	square feet						
	26.5	Acres						
	Infiltration Rates (Feet/Day)			0 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.2%	2,770	0.002	0.007	0.005
20 to 30 ohm/m	0.5	2	1.25	41.6%	480,321	0.208	0.832	0.520
12 to 20 ohm/m	0.5	1	0.75	57.9%	668,247	0.289	0.579	0.434
5 to 12 ohm/m	0.01	0.05	0.03	0.3%	2,886	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.42	0.96
	Infiltration Rates (Feet/Day)			1 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.2%	1,962	0.002	0.005	0.003
20 to 30 ohm/m	0.5	2	1.25	37.4%	431,723	0.187	0.748	0.468
12 to 20 ohm/m	0.5	1	0.75	61.3%	707,380	0.306	0.613	0.460
5 to 12 ohm/m	0.01	0.05	0.03	1.2%	13,275	0.000	0.001	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.37	0.93
	Infiltration Rates (Feet/Day)			3 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.1%	808	0.001	0.002	0.001
20 to 30 ohm/m	0.5	2	1.25	33.2%	383,472	0.166	0.664	0.415
12 to 20 ohm/m	0.5	1	0.75	64.8%	747,666	0.324	0.648	0.486
5 to 12 ohm/m	0.01	0.05	0.03	1.9%	22,394	0.000	0.001	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.49	1.32	0.90
	Infiltration Rates (Feet/Day)			5 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	26.4%	304,630	0.132	0.528	0.330
12 to 20 ohm/m	0.5	1	0.75	69.9%	806,653	0.349	0.699	0.524
5 to 12 ohm/m	0.01	0.05	0.03	3.7%	43,057	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.48	1.23	0.86
	Infiltration Rates (Feet/Day)			10 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	20.1%	231,561	0.100	0.401	0.251
12 to 20 ohm/m	0.5	1	0.75	72.8%	840,013	0.364	0.728	0.546
5 to 12 ohm/m	0.01	0.05	0.03	7.2%	82,766	0.001	0.004	0.002
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.46	1.13	0.80
	Infiltration Rates (Feet/Day)			15 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	15.9%	183,425	0.079	0.318	0.199
12 to 20 ohm/m	0.5	1	0.75	71.0%	819,351	0.355	0.710	0.532
5 to 12 ohm/m	0.01	0.05	0.03	13.1%	151,565	0.001	0.007	0.004
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.44	1.03	0.73
	Infiltration Rates (Feet/Day)			20 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	12.2%	141,060	0.061	0.244	0.153
12 to 20 ohm/m	0.5	1	0.75	69.4%	800,650	0.347	0.694	0.520
5 to 12 ohm/m	0.01	0.05	0.03	18.4%	212,629	0.002	0.009	0.006
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.41	0.95	0.68
	Infiltration Rates (Feet/Day)			25 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	9.7%	111,509	0.048	0.193	0.121
12 to 20 ohm/m	0.5	1	0.75	66.8%	770,753	0.334	0.668	0.501
5 to 12 ohm/m	0.01	0.05	0.03	23.6%	271,963	0.002	0.012	0.007
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.38	0.87	0.63
	Infiltration Rates (Feet/Day)			30 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	8.9%	103,083	0.045	0.179	0.112
12 to 20 ohm/m	0.5	1	0.75	65.5%	755,746	0.327	0.655	0.491
5 to 12 ohm/m	0.01	0.05	0.03	25.6%	295,626	0.003	0.013	0.008
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.37	0.85	0.61
					Harmonic Mean to 20 Feet	0.47	1.18	0.83
					Harmonic Mean to 30 Feet	0.43	1.03	0.73

Total Area - Basin S4	1,032,372.00	square feet						
	23.7	Acres						
	Infiltration Rates (Feet/Day)			0 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	4.1%	42,637	0.041	0.124	0.083
20 to 30 ohm/m	0.5	2	1.25	50.1%	517,322	0.251	1.002	0.626
12 to 20 ohm/m	0.5	1	0.75	45.7%	471,381	0.228	0.457	0.342
5 to 12 ohm/m	0.01	0.05	0.03	0.1%	1,032	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.52	1.58	1.05
	Infiltration Rates (Feet/Day)			1 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	3.9%	40,572	0.039	0.118	0.079
20 to 30 ohm/m	0.5	2	1.25	45.1%	465,187	0.225	0.901	0.563
12 to 20 ohm/m	0.5	1	0.75	50.6%	522,587	0.253	0.506	0.380
5 to 12 ohm/m	0.01	0.05	0.03	0.4%	4,026	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.52	1.53	1.02
	Infiltration Rates (Feet/Day)			3 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	3.6%	36,649	0.036	0.107	0.071
20 to 30 ohm/m	0.5	2	1.25	40.2%	415,426	0.201	0.805	0.503
12 to 20 ohm/m	0.5	1	0.75	55.3%	571,005	0.277	0.553	0.415
5 to 12 ohm/m	0.01	0.05	0.03	0.9%	9,188	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.51	1.46	0.99
	Infiltration Rates (Feet/Day)			5 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	2.3%	23,848	0.023	0.069	0.046
20 to 30 ohm/m	0.5	2	1.25	35.4%	365,563	0.177	0.708	0.443
12 to 20 ohm/m	0.5	1	0.75	59.8%	617,049	0.299	0.598	0.448
5 to 12 ohm/m	0.01	0.05	0.03	2.5%	26,016	0.000	0.001	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.38	0.94
	Infiltration Rates (Feet/Day)			10 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.8%	7,949	0.008	0.023	0.015
20 to 30 ohm/m	0.5	2	1.25	31.4%	323,649	0.157	0.627	0.392
12 to 20 ohm/m	0.5	1	0.75	63.4%	654,730	0.317	0.634	0.476
5 to 12 ohm/m	0.01	0.05	0.03	4.5%	46,147	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.48	1.29	0.88
	Infiltration Rates (Feet/Day)			15 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.1%	723	0.001	0.002	0.001
20 to 30 ohm/m	0.5	2	1.25	27.5%	283,902	0.138	0.550	0.344
12 to 20 ohm/m	0.5	1	0.75	67.6%	697,883	0.338	0.676	0.507
5 to 12 ohm/m	0.01	0.05	0.03	4.8%	49,864	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.48	1.23	0.85
	Infiltration Rates (Feet/Day)			20 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	24.2%	250,040	0.121	0.484	0.303
12 to 20 ohm/m	0.5	1	0.75	71.8%	741,553	0.359	0.718	0.539
5 to 12 ohm/m	0.01	0.05	0.03	4.0%	40,779	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.48	1.20	0.84
	Infiltration Rates (Feet/Day)			25 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	20.9%	215,972	0.105	0.418	0.262
12 to 20 ohm/m	0.5	1	0.75	75.4%	778,512	0.377	0.754	0.566
5 to 12 ohm/m	0.01	0.05	0.03	3.7%	37,888	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.48	1.17	0.83
	Infiltration Rates (Feet/Day)			30 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	18.2%	187,479	0.091	0.363	0.227
12 to 20 ohm/m	0.5	1	0.75	77.8%	803,392	0.389	0.778	0.584
5 to 12 ohm/m	0.01	0.05	0.03	4.0%	41,398	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.48	1.14	0.81
					Harmonic Mean to 20 Feet	0.50	1.37	0.93
					Harmonic Mean to 30 Feet	0.49	1.26	0.87

Total Area - Basin W1	1,955,844.00	square feet						
	44.9	Acres						
	Infiltration Rates (Feet/Day)			0 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	17.4%	341,099	0.087	0.349	0.218
12 to 20 ohm/m	0.5	1	0.75	78.7%	1,539,249	0.394	0.787	0.590
5 to 12 ohm/m	0.01	0.05	0.03	3.9%	75,496	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.48	1.14	0.81
	Infiltration Rates (Feet/Day)			1 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	15.2%	297,679	0.076	0.304	0.190
12 to 20 ohm/m	0.5	1	0.75	80.4%	1,572,499	0.402	0.804	0.603
5 to 12 ohm/m	0.01	0.05	0.03	4.4%	85,666	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.48	1.11	0.79
	Infiltration Rates (Feet/Day)			3 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	12.8%	249,761	0.064	0.255	0.160
12 to 20 ohm/m	0.5	1	0.75	82.3%	1,609,660	0.412	0.823	0.617
5 to 12 ohm/m	0.01	0.05	0.03	4.9%	96,423	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.48	1.08	0.78
	Infiltration Rates (Feet/Day)			5 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	10.8%	210,449	0.054	0.215	0.135
12 to 20 ohm/m	0.5	1	0.75	83.9%	1,640,953	0.420	0.839	0.629
5 to 12 ohm/m	0.01	0.05	0.03	5.3%	104,442	0.001	0.003	0.002
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.47	1.06	0.77
	Infiltration Rates (Feet/Day)			10 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	9.1%	177,591	0.045	0.182	0.114
12 to 20 ohm/m	0.5	1	0.75	86.2%	1,685,351	0.431	0.862	0.646
5 to 12 ohm/m	0.01	0.05	0.03	4.8%	92,903	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.48	1.05	0.76
	Infiltration Rates (Feet/Day)			15 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	7.9%	154,707	0.040	0.158	0.099
12 to 20 ohm/m	0.5	1	0.75	91.4%	1,788,228	0.457	0.914	0.686
5 to 12 ohm/m	0.01	0.05	0.03	0.7%	12,909	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.07	0.78
	Infiltration Rates (Feet/Day)			20 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	7.9%	154,707	0.040	0.158	0.099
12 to 20 ohm/m	0.5	1	0.75	91.4%	1,788,228	0.457	0.914	0.686
5 to 12 ohm/m	0.01	0.05	0.03	0.7%	12,909	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.07	0.78
	Infiltration Rates (Feet/Day)			25 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	10.1%	197,345	0.050	0.202	0.126
12 to 20 ohm/m	0.5	1	0.75	89.9%	1,757,913	0.449	0.899	0.674
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	587	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.10	0.80
	Infiltration Rates (Feet/Day)			30 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	13.5%	264,430	0.068	0.270	0.169
12 to 20 ohm/m	0.5	1	0.75	86.5%	1,691,414	0.432	0.865	0.649
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.14	0.82
					Harmonic Mean to 20 Feet	0.48	1.08	0.78
					Harmonic Mean to 30 Feet	0.49	1.08	0.78

Total Area - Basin W2	1,276,308.00	square feet						
	29.3	Acres						
	Infiltration Rates (Feet/Day)			0 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	9.9%	125,844	0.049	0.197	0.123
12 to 20 ohm/m	0.5	1	0.75	88.6%	1,131,064	0.443	0.886	0.665
5 to 12 ohm/m	0.01	0.05	0.03	1.5%	19,400	0.000	0.001	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.49	1.08	0.79
	Infiltration Rates (Feet/Day)			1 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	7.8%	99,807	0.039	0.156	0.098
12 to 20 ohm/m	0.5	1	0.75	90.6%	1,156,335	0.453	0.906	0.680
5 to 12 ohm/m	0.01	0.05	0.03	1.6%	20,166	0.000	0.001	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.49	1.06	0.78
	Infiltration Rates (Feet/Day)			3 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	5.9%	74,664	0.029	0.117	0.073
12 to 20 ohm/m	0.5	1	0.75	92.5%	1,179,947	0.462	0.925	0.693
5 to 12 ohm/m	0.01	0.05	0.03	1.7%	21,697	0.000	0.001	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.49	1.04	0.77
	Infiltration Rates (Feet/Day)			5 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	3.7%	47,734	0.019	0.075	0.047
12 to 20 ohm/m	0.5	1	0.75	94.2%	1,202,537	0.471	0.942	0.707
5 to 12 ohm/m	0.01	0.05	0.03	2.0%	26,037	0.000	0.001	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.49	1.02	0.75
	Infiltration Rates (Feet/Day)			10 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	2.3%	29,483	0.012	0.046	0.029
12 to 20 ohm/m	0.5	1	0.75	96.6%	1,232,658	0.483	0.966	0.724
5 to 12 ohm/m	0.01	0.05	0.03	1.1%	14,167	0.000	0.001	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.49	1.01	0.75
	Infiltration Rates (Feet/Day)			15 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	1.2%	14,805	0.006	0.023	0.015
12 to 20 ohm/m	0.5	1	0.75	98.8%	1,261,248	0.494	0.988	0.741
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	255	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.01	0.76
	Infiltration Rates (Feet/Day)			20 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	0.3%	4,339	0.002	0.007	0.004
12 to 20 ohm/m	0.5	1	0.75	99.7%	1,271,969	0.498	0.997	0.747
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.00	0.75
	Infiltration Rates (Feet/Day)			25 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	0.0%	383	0.000	0.001	0.000
12 to 20 ohm/m	0.5	1	0.75	100.0%	1,275,925	0.500	1.000	0.750
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.00	0.75
	Infiltration Rates (Feet/Day)			30 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	0.1%	1,404	0.001	0.002	0.001
12 to 20 ohm/m	0.5	1	0.75	99.9%	1,274,904	0.499	0.999	0.749
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.00	0.75
					Harmonic Mean to 20 Feet	0.49	1.03	0.76
					Harmonic Mean to 30 Feet	0.50	1.01	0.75

Total Area - Forebay N	418,176.00	square feet						
	9.6	Acres						
	Infiltration Rates (Feet/Day)			0 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	0.0%	0	0.000	0.000	0.000
12 to 20 ohm/m	0.5	1	0.75	95.4%	398,773	0.477	0.954	0.715
5 to 12 ohm/m	0.01	0.05	0.03	4.6%	19,403	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.48	0.96	0.72
	Infiltration Rates (Feet/Day)			1 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	0.0%	0	0.000	0.000	0.000
12 to 20 ohm/m	0.5	1	0.75	94.4%	394,675	0.472	0.944	0.708
5 to 12 ohm/m	0.01	0.05	0.03	5.6%	23,501	0.001	0.003	0.002
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.47	0.95	0.71
	Infiltration Rates (Feet/Day)			3 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	0.0%	0	0.000	0.000	0.000
12 to 20 ohm/m	0.5	1	0.75	92.9%	388,318	0.464	0.929	0.696
5 to 12 ohm/m	0.01	0.05	0.03	7.1%	29,858	0.001	0.004	0.002
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.47	0.93	0.70
	Infiltration Rates (Feet/Day)			5 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	0.0%	0	0.000	0.000	0.000
12 to 20 ohm/m	0.5	1	0.75	86.8%	362,768	0.434	0.868	0.651
5 to 12 ohm/m	0.01	0.05	0.03	13.3%	55,408	0.001	0.007	0.004
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.44	0.87	0.65
	Infiltration Rates (Feet/Day)			10 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	0.0%	0	0.000	0.000	0.000
12 to 20 ohm/m	0.5	1	0.75	65.7%	274,909	0.329	0.657	0.493
5 to 12 ohm/m	0.01	0.05	0.03	34.3%	143,267	0.003	0.017	0.010
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.33	0.67	0.50
	Infiltration Rates (Feet/Day)			15 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	0.0%	0	0.000	0.000	0.000
12 to 20 ohm/m	0.5	1	0.75	38.1%	159,283	0.190	0.381	0.286
5 to 12 ohm/m	0.01	0.05	0.03	61.9%	258,893	0.006	0.031	0.019
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.20	0.41	0.30
	Infiltration Rates (Feet/Day)			20 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	0.0%	0	0.000	0.000	0.000
12 to 20 ohm/m	0.5	1	0.75	18.4%	76,986	0.092	0.184	0.138
5 to 12 ohm/m	0.01	0.05	0.03	81.6%	341,190	0.008	0.041	0.024
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.10	0.22	0.16
	Infiltration Rates (Feet/Day)			25 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	0.0%	0	0.000	0.000	0.000
12 to 20 ohm/m	0.5	1	0.75	15.0%	62,894	0.075	0.150	0.113
5 to 12 ohm/m	0.01	0.05	0.03	85.0%	355,282	0.008	0.042	0.025
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.08	0.19	0.14
	Infiltration Rates (Feet/Day)			30 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	0.0%	0	0.000	0.000	0.000
12 to 20 ohm/m	0.5	1	0.75	14.1%	59,088	0.071	0.141	0.106
5 to 12 ohm/m	0.01	0.05	0.03	85.9%	359,088	0.009	0.043	0.026
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.08	0.18	0.13
					Harmonic Mean to 20 Feet	0.26	0.55	0.41
					Harmonic Mean to 30 Feet	0.15	0.33	0.24

Total Area - Forebay S	574,992.00	square feet						
	13.2	Acres						
	Infiltration Rates (Feet/Day)			0 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	8.5%	48,989	0.085	0.256	0.170
20 to 30 ohm/m	0.5	2	1.25	58.4%	335,910	0.292	1.168	0.730
12 to 20 ohm/m	0.5	1	0.75	24.6%	141,161	0.123	0.246	0.184
5 to 12 ohm/m	0.01	0.05	0.03	8.4%	48,127	0.001	0.004	0.003
<5 ohm/m	0.001	0.09	0.05	0.2%	862	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.67	1.09
	Infiltration Rates (Feet/Day)			1 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	8.3%	47,724	0.083	0.249	0.166
20 to 30 ohm/m	0.5	2	1.25	57.5%	330,793	0.288	1.151	0.719
12 to 20 ohm/m	0.5	1	0.75	27.5%	158,008	0.137	0.275	0.206
5 to 12 ohm/m	0.01	0.05	0.03	6.7%	38,467	0.001	0.003	0.002
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.51	1.68	1.09
	Infiltration Rates (Feet/Day)			3 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	8.0%	45,769	0.080	0.239	0.159
20 to 30 ohm/m	0.5	2	1.25	56.1%	322,686	0.281	1.122	0.702
12 to 20 ohm/m	0.5	1	0.75	31.7%	182,157	0.158	0.317	0.238
5 to 12 ohm/m	0.01	0.05	0.03	4.2%	24,380	0.000	0.002	0.001
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.52	1.68	1.10
	Infiltration Rates (Feet/Day)			5 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	7.5%	42,952	0.075	0.224	0.149
20 to 30 ohm/m	0.5	2	1.25	53.7%	308,943	0.269	1.075	0.672
12 to 20 ohm/m	0.5	1	0.75	38.3%	219,934	0.191	0.383	0.287
5 to 12 ohm/m	0.01	0.05	0.03	0.6%	3,220	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.53	1.68	1.11
	Infiltration Rates (Feet/Day)			10 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	6.8%	39,272	0.068	0.205	0.137
20 to 30 ohm/m	0.5	2	1.25	53.7%	308,713	0.268	1.074	0.671
12 to 20 ohm/m	0.5	1	0.75	39.5%	227,007	0.197	0.395	0.296
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.53	1.67	1.10
	Infiltration Rates (Feet/Day)			15 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	7.0%	40,077	0.070	0.209	0.139
20 to 30 ohm/m	0.5	2	1.25	55.5%	319,293	0.278	1.111	0.694
12 to 20 ohm/m	0.5	1	0.75	37.5%	215,622	0.188	0.375	0.281
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.53	1.69	1.11
	Infiltration Rates (Feet/Day)			20 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	172	0.001	0.004	0.002
30 to 40 ohm/m	1	3	2.00	7.2%	41,457	0.072	0.216	0.144
20 to 30 ohm/m	0.5	2	1.25	58.2%	334,645	0.291	1.164	0.728
12 to 20 ohm/m	0.5	1	0.75	34.6%	198,660	0.173	0.346	0.259
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.54	1.73	1.13
	Infiltration Rates (Feet/Day)			25 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.3%	1,552	0.011	0.032	0.022
30 to 40 ohm/m	1	3	2.00	7.0%	40,192	0.070	0.210	0.140
20 to 30 ohm/m	0.5	2	1.25	60.4%	347,008	0.302	1.207	0.754
12 to 20 ohm/m	0.5	1	0.75	32.3%	185,780	0.162	0.323	0.242
5 to 12 ohm/m	0.01	0.05	0.03	0.1%	460	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.54	1.77	1.16
	Infiltration Rates (Feet/Day)			30 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.5%	2,587	0.018	0.054	0.036
30 to 40 ohm/m	1	3	2.00	6.7%	38,352	0.067	0.200	0.133
20 to 30 ohm/m	0.5	2	1.25	61.3%	352,528	0.307	1.226	0.766
12 to 20 ohm/m	0.5	1	0.75	31.2%	179,110	0.156	0.312	0.234
5 to 12 ohm/m	0.01	0.05	0.03	0.4%	2,357	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.55	1.79	1.17
					Harmonic Mean to 20 Feet	0.52	1.69	1.11
					Harmonic Mean to 30 Feet	0.54	1.72	1.13

Total Area - Forebay W	304,920.00	square feet						
	7	Acres						
	Infiltration Rates (Feet/Day)			0 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	37.6%	114,619	0.188	0.752	0.470
12 to 20 ohm/m	0.5	1	0.75	62.4%	190,301	0.312	0.624	0.468
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.38	0.94
	Infiltration Rates (Feet/Day)			1 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	34.0%	103,551	0.170	0.679	0.425
12 to 20 ohm/m	0.5	1	0.75	66.0%	201,369	0.330	0.660	0.495
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.34	0.92
	Infiltration Rates (Feet/Day)			3 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	29.5%	89,829	0.147	0.589	0.368
12 to 20 ohm/m	0.5	1	0.75	70.5%	215,091	0.353	0.705	0.529
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.29	0.90
	Infiltration Rates (Feet/Day)			5 Foot BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	21.3%	64,826	0.106	0.425	0.266
12 to 20 ohm/m	0.5	1	0.75	78.7%	240,094	0.394	0.787	0.591
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					0	0.50	1.21	0.86
	Infiltration Rates (Feet/Day)			10 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	11.6%	35,462	0.058	0.233	0.145
12 to 20 ohm/m	0.5	1	0.75	88.4%	269,458	0.442	0.884	0.663
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.12	0.81
	Infiltration Rates (Feet/Day)			15 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	5.9%	17,929	0.029	0.118	0.074
12 to 20 ohm/m	0.5	1	0.75	94.1%	286,991	0.471	0.941	0.706
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.06	0.78
	Infiltration Rates (Feet/Day)			20 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	4.0%	12,075	0.020	0.079	0.050
12 to 20 ohm/m	0.5	1	0.75	96.0%	292,845	0.480	0.960	0.720
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.04	0.77
	Infiltration Rates (Feet/Day)			25 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	3.4%	10,459	0.017	0.069	0.043
12 to 20 ohm/m	0.5	1	0.75	96.6%	294,461	0.483	0.966	0.724
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.03	0.77
	Infiltration Rates (Feet/Day)			30 Feet BGS		Calculation of Infiltration Rate		
Layer	Low	High	Average	Portion of Area (%)	Square Feet	Low	High	Average
>40 ohm/m	4	12	8.00	0.0%	0	0.000	0.000	0.000
30 to 40 ohm/m	1	3	2.00	0.0%	0	0.000	0.000	0.000
20 to 30 ohm/m	0.5	2	1.25	3.0%	9,209	0.015	0.060	0.038
12 to 20 ohm/m	0.5	1	0.75	97.0%	295,711	0.485	0.970	0.727
5 to 12 ohm/m	0.01	0.05	0.03	0.0%	0	0.000	0.000	0.000
<5 ohm/m	0.001	0.09	0.05	0.0%	0	0.000	0.000	0.000
					Assumed Infiltration	0.50	1.03	0.77
					Harmonic Mean to 20 Feet	0.50	1.19	0.85
					Harmonic Mean to 30 Feet	0.50	1.10	0.80