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Appendix A

Deep Aquifers Definition, Final Extents Descriptions, and Delineations Using AEM and Other Data

INTRODUCTION

The Deep Aquifers' extent was developed through a 2-phase process. The first phase of the Deep Aquifers Study (Study) focused on developing a conceptual definition of the Deep Aquifers and conducting a preliminary investigation based on existing data. This provided the foundation for a Phase 1 extent, interim management recommendations, and Study-focused data collection.

The second phase included conducting and integrating field studies, including AEM surveys, aquifer tests, and isotope analysis. With the additional data, the Deep Aquifers' lateral extent was finalized, which provided the basis for the water budget, analysis of current conditions, management guidance, and monitoring recommendations. This appendix summarizes the conceptual definition and the data, methods, and results of the lateral extent delineation. It describes the process of developing the definition, the Phase 1 extent, and the Phase 2 final extent by applying the Study-generated AEM data.

DEEP AQUIFERS DEFINITION

Previous studies have addressed the Deep Aquifers presence; however, there has been no unifying definition of the Deep Aquifers. Previously applied definitions have included:

- **Thorup, 1976:** The Deep Zone along the coast lies above the Miocene Marine Shale and is Pliocene in age. The top of the Deep Aquifer is the top of the Paso Robles Formation. This aquifer is.

- **Harding ESE, 2001:** The Deep Aquifer refers to the aquifer(s) contained in the middle or lower portions of the Paso Robles Formation and include what have been called the 800-foot, 900-foot, 1,000-foot, and 1,500-foot Aquifers.

- **Feeney/Rosenberg, 2003:** The current use of the term "deep aquifer" essentially aggregates all sediments below the 400-foot aquifer without respect to geology. Data available strongly suggest a multiple aquifer system.

- **MCWRA, 2017:** "Deep Aquifers" will be used to refer to the water-bearing zones in the 180/400 Foot Aquifer Subbasin underlying the Pressure 400-Foot Aquifer.

Study Definition for Delineation of the Deep Aquifers

For this Study, Montgomery & Associates developed a draft definition of the Deep Aquifers and presented it to the GTAC on February 3, 2022. GTAC discussions and recommendations reflected the complexity of the Deep Aquifers and the complexity of putting a definition on an aquifer system with limited data. The GTAC provided considerations that helped guide the definition and focus the Study, ultimately leading to the final extent.

The agreed upon definition of the Deep Aquifers are that they are water-bearing sediments that*:*

- Are below a relatively continuous aquitard, or area of higher clay content, that is often encountered between approximately 500 feet and 900 feet below land surface within the Salinas Valley Basin and potentially shallower where uplifted. The relatively continuous high-clay aquitard, or 400/Deep Aquitard, must be below the identified 400-Foot Aquifer, or its stratigraphic equivalent.
- Are in the Paso Robles Formation, Purisima Formation, and/or Santa Margarita Sandstone.

The definition focuses primarily on the presence of an aquitard—or zone with higher incidence of clay—that separates the 400-Foot Aquifer from the Deep Aquifers and is in specific geologic formations. The emphasis on an aquitard, or area of higher aquitard clay contents, reflects the idea that mapping these distinct aquifers requires they be separated from an overlying aquifer by some physical, definable feature. Generally, aquifers are separated by aquitards. This definition is supported by existing data that suggest near the coast, the Deep Aquifers are below a significant amount of clay that occurs below the 400-Foot Aquifer or its stratigraphic equivalent even if not called the 400-Foot Aquifer. This clay has provided protection from vertical migration of seawater to date, and separates the Deep and 400-Foot Aquifers into distinct productive zones.

It is important to distinguish a single continuous clay body/area—called 400/Deep Aquitard—that separates the Deep Aquifers from the 400-Foot Aquifer. Other distinct clay bodies that may occur in the subsurface at similar depths as the 400/Deep Aquitard are not considered the 400/Deep Aquitard; rather they are considered discontinuous and potentially overlying adjacent aquifers materials. They are not overlying the Deep Aquifers. The continuous 400/Deep Aquitard is encountered in the Paso Robles Formation.

The zone in which to encounter the 400/Deep Aquitard has been defined as generally occurring between 500 feet and 900 feet below land surface. This is based on the dipping trough structure of the Salinas Valley Basin and to be more accommodating of the heterogenous sediments in the subsurface. Where structural features impact the depth of formations, the depth to the 400/Deep Aquitard may be impacted and occur at shallower depths. Therefore, maintaining integrity with the continuity of the 400/Deep Aquitard and the established hydrostratigraphy of the Basin focused the data analysis in structurally deformed areas.

Another way to distinguish the 400/Deep Aquitard is the presence of porcelaneous chert within drill cuttings, which is indictive of source material from older sedimentary, sources and of the Paso Robles Formation. Other depositional/alluvial features in the subsurface may not have this clast type, may be considered sourced from other materials, and are therefore considered a different depositional feature or sediment adjacent to the Deep Aquifers and 400/Deep Aquitard.

The geologic formations are important because the 400/Deep Aquitard is encountered in one of the most dominant formations in the Salinas Valley, the Paso Robles Formation, to which previous investigators have linked to the Deep Aquifers. The Purisima Formation is generally either adjacent to or beneath the Paso Robles Formation, does not crop out in the Salinas Valley, and is only encountered at depth. Therefore, any wells completed in the Purisima Formation are assumed to be exclusively in the Deep Aquifers. The Santa Margarita Sandstone is not a consistent geologic layer within the Salinas Valley Basin, however, is included in the Basin conceptual hydrostratigraphy. It is considered to lie below the Purisima Formation, and subsequently wells completed in the Santa Margarita Sandstone are also assumed to be in the Deep Aquifers where the continuous 400/Deep Aquitard is encountered.

This definition is also intended to be comparable to previous definitions of the Deep Aquifers, such as those listed at the beginning of this section, and also includes a set of optional secondary characteristics to account for uncertainty and subsurface complexity when evaluating whether a well is in the Deep Aquifers. The characteristics are electrical resistivity, screen interval depth and extent, similar lithology and/or borehole geophysics to established nearby Deep Aquifers wells, differences in water quality from overlying and adjacent aquifers, and differences in groundwater levels from the overlying 400-Foot (or equivalent) Aquifer.

The optional secondary characteristics are necessary because of the subsurface complexity. The sediments which comprise the subsurface materials and productive aquifers are a mix of sands, gravels, clays, and silts throughout most of the geologic formations where the Deep Aquifers are encountered. These geologic formations record the basin's historical relationship with advancing and retreating seas, the continual tectonic and erosive forces acting on the Gabilan and Sierra de Salians Ranges, and the continued evolution of the Salinas River resulting in subsurface complexity. The secondary criteria help address this complexity and uncertainty frequently encountered in the subsurface. Figure A-1 shows a flowchart developed for this definition and was used throughout the Study to reanalyze existing and Study-generated data.

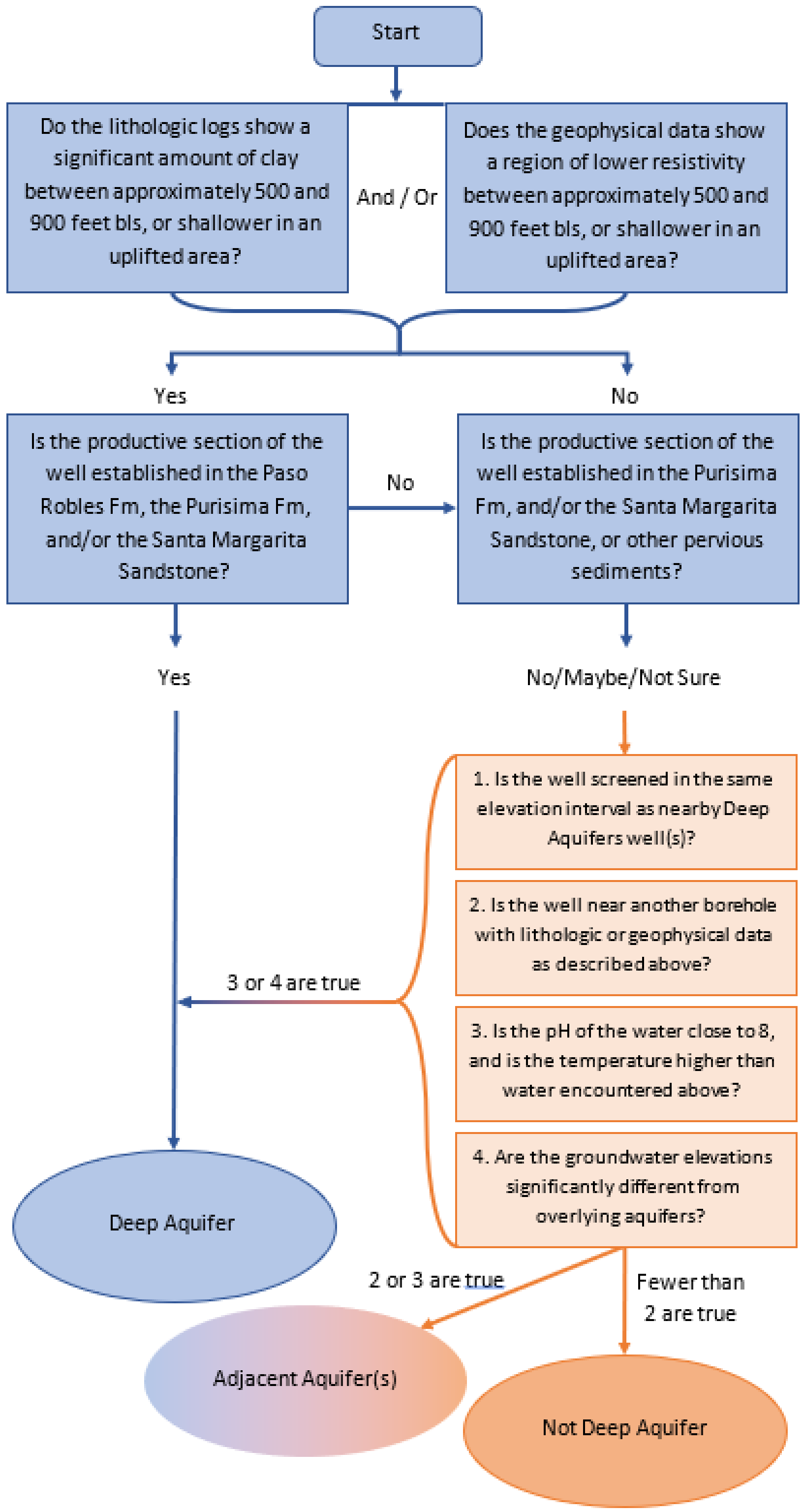

Figure A-1. Deep Aquifers Definition Flow Chart

DATA

This Study delineated the Deep Aquifers extent by integrating all available data, including well completion reports (WCRs) of 133 deep wells, basin structure from previous geologic reports, 91 e-logs, 2 previous AEM surveys, and an additional 300.3 line-km (186.6 line-miles) of AEM surveys collected specifically for this Study. In addition, 3 monitoring wells were drilled prior to the conclusion of the Study that confirmed the stratigraphy in their respective locations. All data—described in greater detail here—were integrated to produce the refined Phase 2 final extent presented.

Well Completion Reports

WCRs are records of boreholes that include key information such as driller-observed lithology, screen intervals, and date of well installation. Some WCRs were more detailed than others with more frequent lithologic descriptions, e-logs, and other construction or water level details. All California WCRs are publicly available, with redacted information, through the Online System for Well Completion Reports (OSCWR) database. The Monterey County Health Department, Monterey County Water Resource Agency, and private entities also have WCRs available if WCRs cannot be located through the State site due to varying naming conventions. This Study procured WCRs from all these sources.

Geophysical Data

The 2 types of geophysical data primarily available for use in this Study were AEM resistivity data and borehole resistivity data. Both types of data send electrical pulses into the subsurface and receive signals back. The received signal helps differentiate subsurface materials and high TDS water. For this Study, most of the resistivity data were interpreted to be indicative of varying sediment type, as most of the Study was conducted far from seawater-intruded areas. The lower resistivity values roughly correspond to finer sediments such as clays and silts, whereas the higher resistivity values roughly correspond to coarser sediments such as sands and gravels. The highest resistivity values were in places of known bedrock such as the Gabilan Range and Sierra de Salinas.

M&A partnered with Ramboll to conduct an additional AEM surveys for the Study, and synthesize these data with previous AEM surveys conducted by DWR. Borehole geophysical logs were collected from various well owners, organized, and included in the AEM analyses for improved AEM validation.

E-logs/Borehole geophysical logs

E-logs and borehole geophysical logs are important for refining the WCR analysis. The lithology reported in the WCRs is typically from drilling notes and may not be the most accurate representation of the subsurface materials because the cuttings have longer travel times to the surface as the borehole advances. Borehole geophysical tools, such as electrical resistivity loggers, can take *in-situ* measurements and record refined subsurface signals that are then interpreted for more accurate borehole logs. Although some WCRs have e-logs attached, the majority of e-logs for this study were requested from Monterey County Health Department and various stakeholders. Monterey County Health Department shared 254 PDF files of wells, which were organized, reviewed, and matched to wells in the database. M&A and Ramboll incorporated 92 e-logs into the database for Deep Aquifers analysis, and Ramboll used them to verify the AEM subsurface resistivity data.

AEM Data

AEM data is a measure of resistivity of materials in the subsurface, both solid and liquid. Lower resistivity materials—which have higher electrical conductance—are clays and/or higher total dissolved solids (TDS) water. Higher resistivity materials—which have lower electrical conductance—are sands and gravels and/or lower TDS water. AEM data are collected over broad areas and are therefore useful for filling in the gaps between known points such as wells. This study focused on reviewing and analyzing the lower resistivities at the target depth, as these were easily correlated to higher clay contents.

There have been 3 AEM surveys in the Salinas Basin prior to the Deep Aquifers AEM survey, but only 2 were used for the analysis here as the 2019 survey was a repeat and extension of the 2017 survey. The surveys also collected lithologic logs, geophysical logs, water level information, and water quality information to refine the relationship between resistivity and lithology.

DWR Surveys

The State of California has conducted AEM surveys across California's major groundwater basins in support of SGMA implementation. The first of these surveys, DWR Survey Area 1, was conducted in 2020 in the Salinas Valley and Paso Robles Basins using the SkyTEM 312 system. The average depth of investigation with this survey/these data is approximately 150 to 400 meters (492-1,312 feet). This survey is shown on Figure A-2 as pink lines.

The second of these surveys, DWR Survey Area 8, was conducted in 2022, focused on the coastal areas of the Salinas Valley Basin, and included some flightlines in Monterey Bay. Several of these flightlines repeat the same lines as the coastal lines described below. The average depth of investigation with this survey/these data is approximately 150-400 meters (492-1,312 feet). This survey is shown on Figure A-2 as purple lines.

Coastal Surveys

Marina Coast Water District conducted 2 coastal surveys, one in 2017 and one in 2019, to estimate the seawater intrusion extent. The AEM system used in the 2019 survey is the SkyTEM 312 system, which is the same as used in the DWR Statewide AEM Surveys. As the 2019 survey was a repeat and extension of the 2017 survey, only the 2019 data are incorporated into the analysis for this study. The average depth of investigation with these data is approximately 150 to 400 meters (492-1,312 feet) because it used the same tool as the DWR statewide surveys. The areas of seawater intrusion impacted the depth of investigation as high saline/high TDS water interfere with the signal, resulting in shallower depths of investigation. This survey is shown on Figure A-2 as black lines.

Deep Aquifers AEM Study

The AEM survey conducted for the Deep Aquifers Study employed a customized tool to extend the depth of investigation to identify and locate the 400/Deep Aquitard in the subsurface. Additionally, the survey flightlines for this study were selected to fill in the gaps from the DWR surveys, provide a more complete picture of the subsurface at the greater depth, and interrogate areas where questions on the extents were most pertinent. Depth of investigation ranges from 350 to 400 meters (1150-1310 feet) in coastal areas, to up to 600 meters (1970 feet) in inland areas. This survey is shown on Figure A-2 as blue lines.

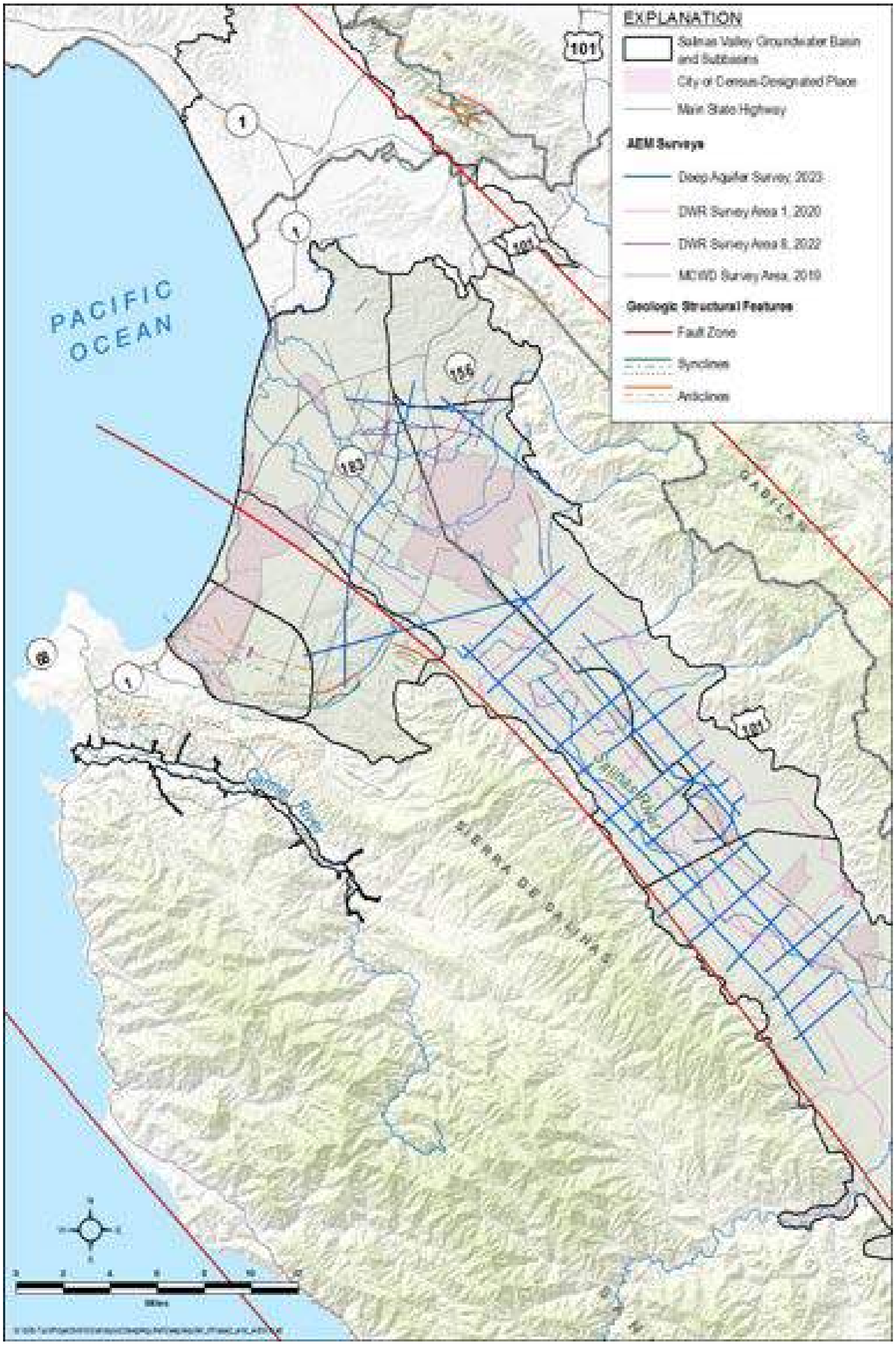

Figure A-2. AEM Survey Lines

Previously Prepared Reports

Previous reports on the Deep Aquifers or specific well investigations helped limit the extent of the Deep Aquifers. Several of these reports focused on the installation of a Deep Aquifers well, providing detailed information about the lithologic and water quality setting with which to compare it to other boreholes. Previous published investigations of the Deep Aquifers are listed in Table A-1.

Table A-1. Previous Investigations of the Deep Aquifers

Date	Author	Title
1970	Greene, USGS	Geology of Southern Monterey Bay and its Relationship to the Ground Water Basin and Salt Water Intrusion
1976	Thorup, R.R.	Report on Castroville Irrigation Project Deep Test Hole and Freshwater Bearing Strata Below the Pressure 400-Foot Aquifer, Salinas Valley, CA
1976-1983	Thorup, R.R.	Hydrogeological Report on the Deep Aquifer, Salinas Valley, Monterey County, CA (draft report)
2001	Harding ESE	Hydrogeologic Investigation of Salinas Valley Basin in the Vicinity of Fort Ord and Marina Salinas Valley, California - Final Report
2002	Hanson, R.T., *et al.*	Geohydrology of a Deep-aquifer System Monitoring-well Site at Marina, Monterey County, California
2003	Feeney, M.B., and L.I. Rosenberg,	Deep Aquifer Investigation - Hydrogeologic Data Inventory, Review, Interpretation, and Implications.
2005	MACTEC Engineering	Final report; Installation of Deep Aquifer Monitoring Wells – DMW-2; Marina Coast Water District; Marina, California
2009	HydroMetrics WRI	Seaside Groundwater Basin Modeling and Protective Groundwater Elevations
2015	Brown & Caldwell	State of the Salinas River Groundwater Basin - Hydrology Report
2017	MCWRA	Recommendations to Address the Expansion of Seawater Intrusion in the Salinas Valley Groundwater Basin; Special Reports Series 17-01
2018	MCWRA	Deep Aquifers Roundtable Meeting; March 9, 2018, slide presentation
2020	MCWRA	Recommendations to Address the Expansion of Seawater Intrusion in the Salinas Valley Groundwater Basin: 2020 Update; Special Reports Series 20-01

MCWRA Deep Wells Designations

Many of the wells within the basin have been designated as Deep Aquifers wells by Monterey County Water Resources Agency (MCWRA). These designations provided the basis for a preliminary initial extent, shown on Figure A-3. These well designations provide anchor points of known aquitard/Deep Aquifers locations and screened intervals of known Deep Aquifers water production. These wells were used as comparison points for nearby deep wells' subsurface lithology and screened intervals.

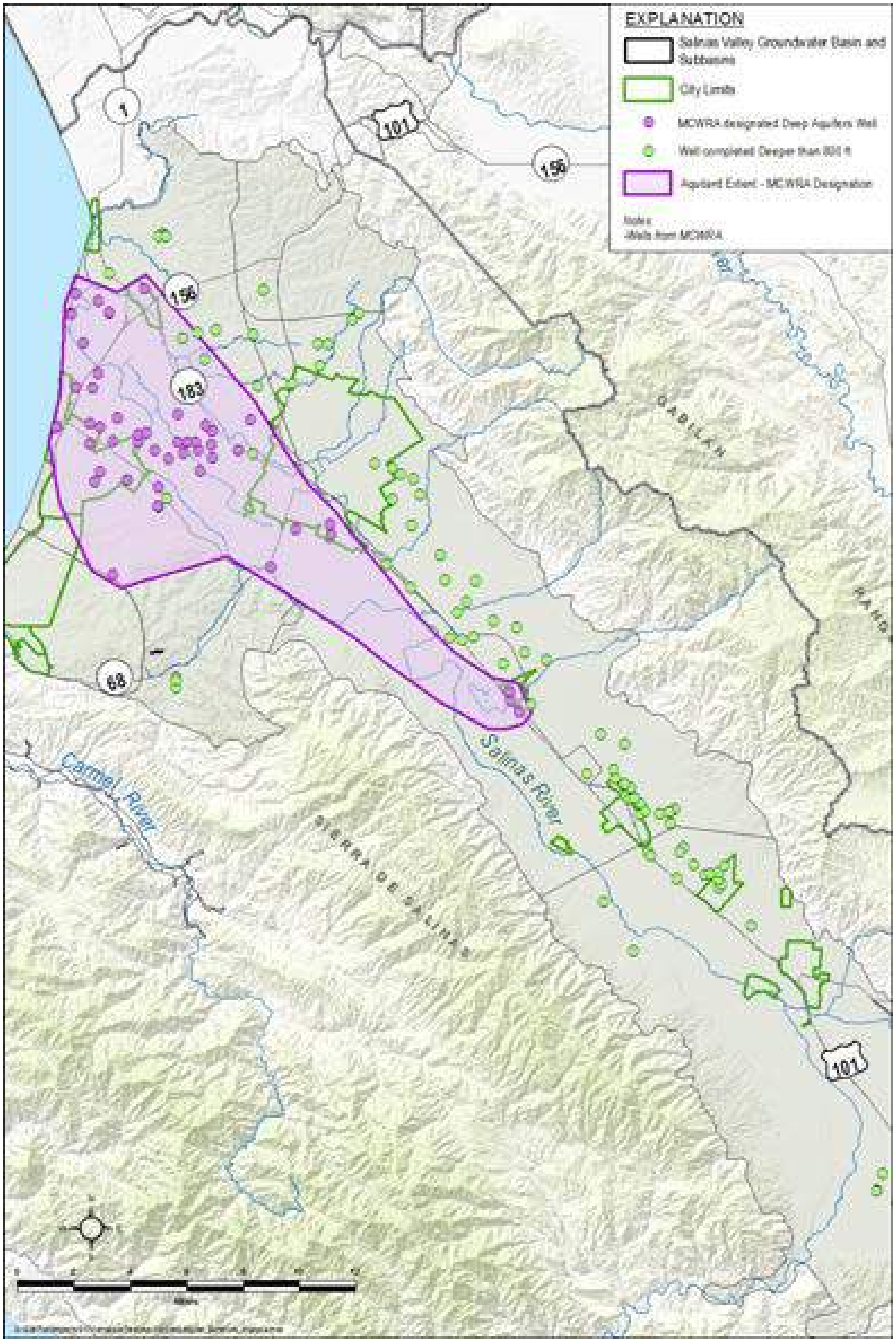

Figure A-3. MCWRA Designated Wells (purple) and Respective Preliminary Deep Aquifers Extent

Basin Structure

The basin structure used for this analysis was first developed by the USGS in the *Two-Dimensional and Three-Dimensional Digital Flow Models of the Salinas Valley Ground-Water Basin, California* report, and focuses on the bottom of the usable portion of the basin with respect to groundwater resources (Durbin, 1978). The USGS report discusses the fact that the depth to the basement rocks is likely deeper than the modeled basin bottom, however due to compaction and water quality, deeper sediments and sedimentary rocks may not be productive or useful for the basin without additional treatment. The basin structure delineated by the USGS is shown on Figure A-4. The model structure reflects the northwest dipping, asymmetrical trough shape of the Salinas Basin. The portions of the basin structure closer to the Gabilan range are more likely to be in contact with the crystalline rocks of the Gabilan Range, thereby representing the actual bottom of the basin. The portions of the basin closer to the Sierra de Salinas are less likely to be in contact with the crystalline basement, and subsequently represent the usable basin thickness.

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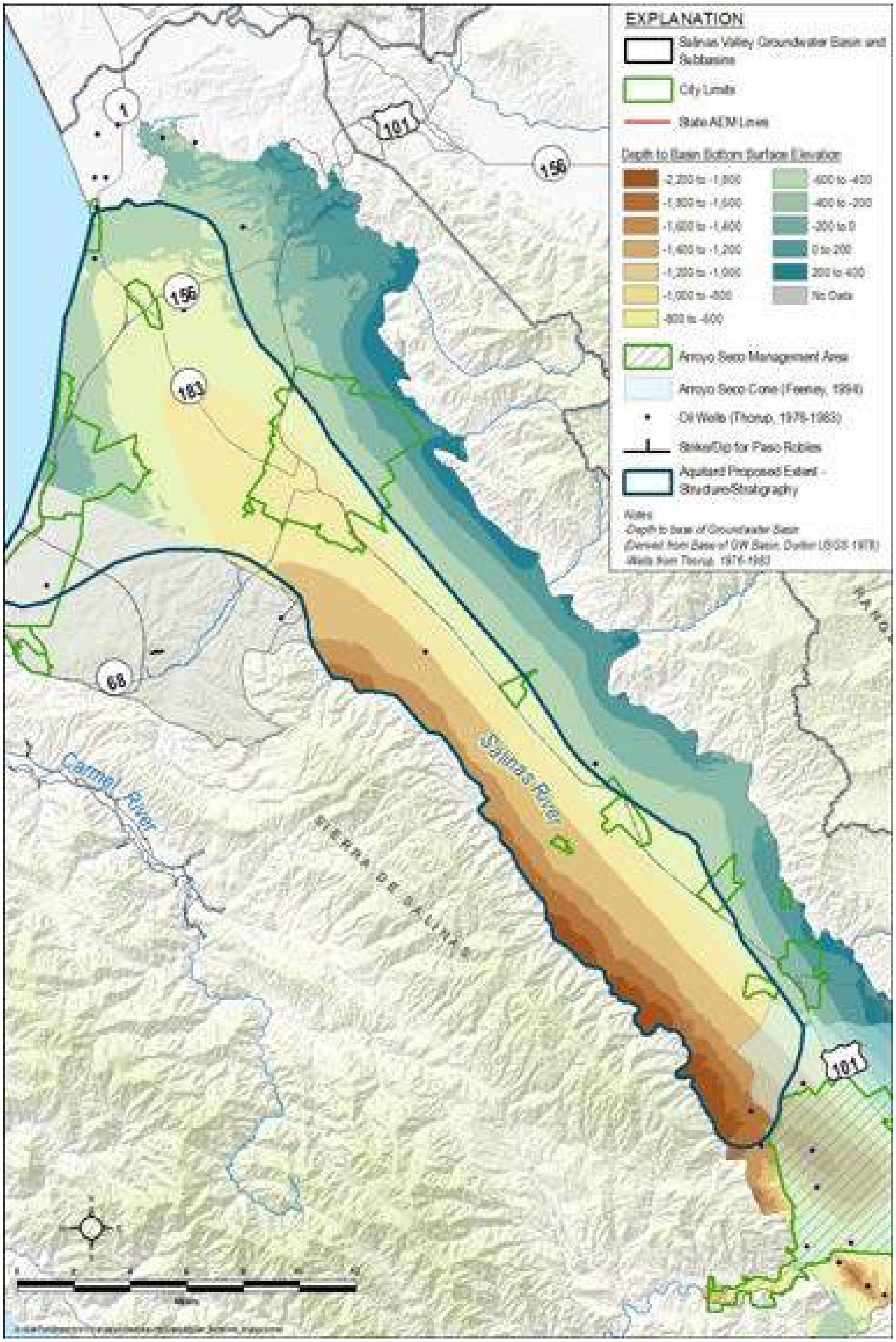

Figure A-4. Basin Structure Extent with USGS Model Contours

Paso Robles Formation Extent

The extent of the Paso Robles Formation in the subsurface was first described in the *Hydrogeological Report on the Deep Aquifer, Salinas Valley*, with additional supporting plates prepared in 1983 (Thorup, 1976; Thorup, 1983). This was one of the earliest investigations to characterize the Deep Aquifers in the Salinas Basin. The report assessed oil exploration wells, deep wells, geophysical data, and geological maps to determine the extent of the Paso Robles Formation; which was assumed to constitute the Basin's deeper productive zones. The extent of the Paso Robles Formation in the subsurface as described in this report is shown on Figure A-5.

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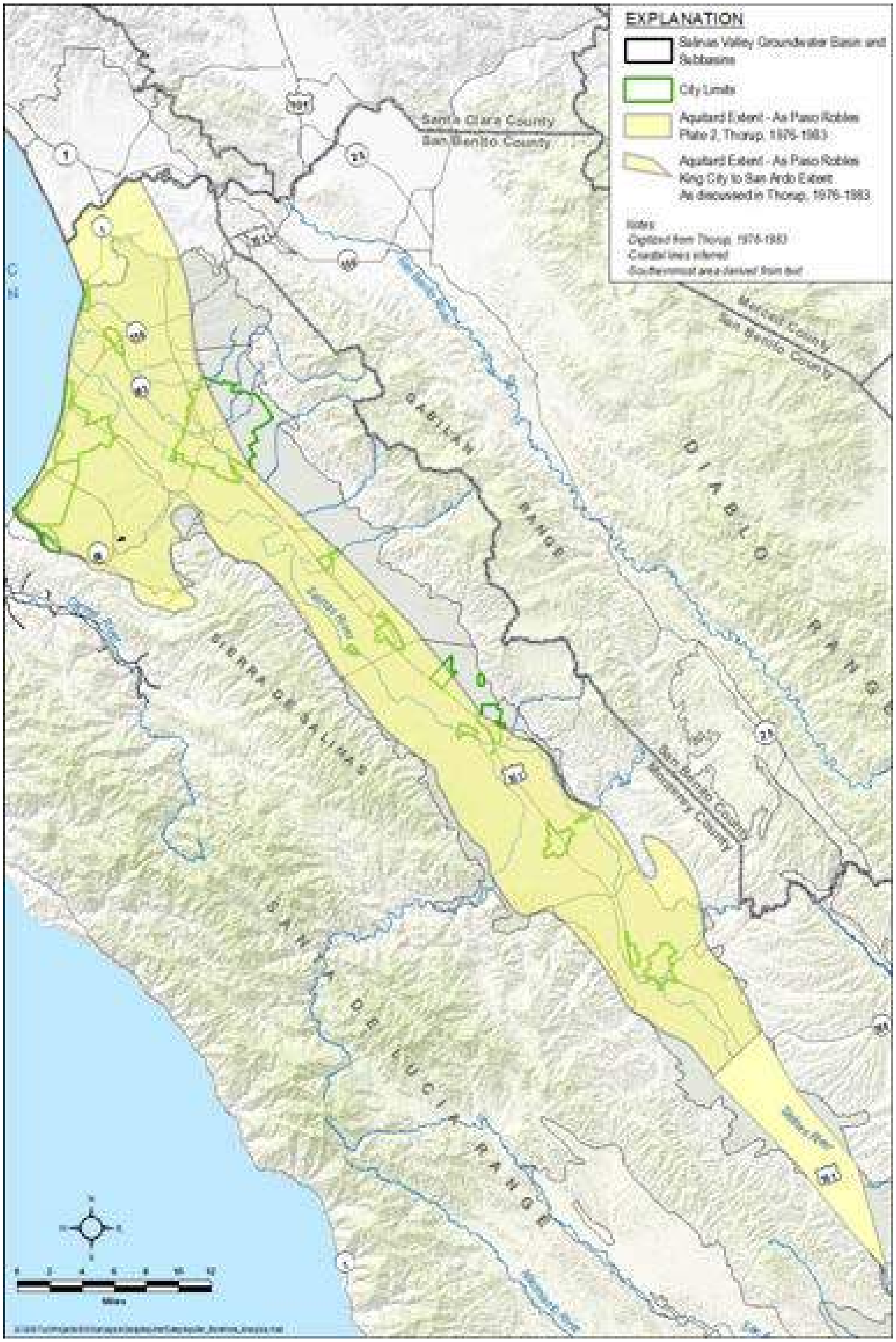

Figure A-5. Extent of Paso Robles Formation as Described by Thorup (1976), Appended at Coast

METHODS

The Deep Aquifers' extents are primarily delineated by identifying and locating the 400/Deep Aquitard, as guided by the Deep Aquifers definition. The methods for locating the Deep Aquifers extents were iterative as new data became available throughout the Study.

Delineating Lateral Extent – Phase 1

Phase 1 focused on analyzing and integrating all pre-existing data within the framework of the Deep Aquifers definition. Pre-existing data included WCRs, e-logs, previously published data, and previous AEM surveys.

Well Completion Reports

WCRs were the first set of data M&A reviewed to assess the extent of 400/Deep Aquitard and the Deep Aquifers. M&A evaluated the WCRs to identify where there was a higher incidence of clay or fine-grained material in the subsurface at the target depth of approximately 500 to 900 feet below land surface (ft bls). The higher incidence of clay through this target interval is referred to as the 400/Deep Aquitard throughout this memo.

M&A looked at all wells drilled to 800 feet or greater, based on historical practices and assumptions that the shallowest incidence of the Deep Aquifers was the 800-Foot Aquifer. All WCRs for these wells were compiled and reviewed for aquitard thickness using two methods. Method 1 summed the thicknesses of all clay units from 500 to 700 feet below ground surface (bgs). This is based on local expert recommendations, as well as the traditional definition of the 400-Foot Aquifer occurring primarily between 270 and 470 feet bgs. Method 2 expanded on Method 1 by summing the thicknesses of all clay units from 450 to 900 feet bgs. The aquitard thickness of MCWRA-designated Deep Wells were compared with the aquitard presence and thickness in other deep wells to establish a firm understanding of the aquitard thickness in MCWRA-designated Deep wells and apply it to the other deep wells. Upon comparison, the primary observation was that while the clay incidence separating the Deep Aquifers from overlying aquifers was present, the thickness was variable from well to well. These two initial analyses and review of MCWRA-designated Deep Aquifers wells necessitated a more thorough and standardized approach to evaluating WCRs for clay content and intervals, which is described below.

Standardized/Thorough WCR Review for 400/Deep Aquitard

Each WCR was analyzed using the following steps, and recorded in an excel table for future use:

1. Review WCR and note all intervals of clay, or clay/fines-dominant intervals, starting at 450 ft bgs, and continuing to the full drill depth of the borehole. Skip coarse intervals, or non clay-dominant intervals.
2. Review WCR and note screen interval(s).
3. Make note of other sediment characteristics such as color, presence of fossils and shells, or other notable characteristics encountered in the subsurface.
4. Note where the well is located.

This was completed for 131 WCRs, and Figure A-6 shows an example of this analysis.

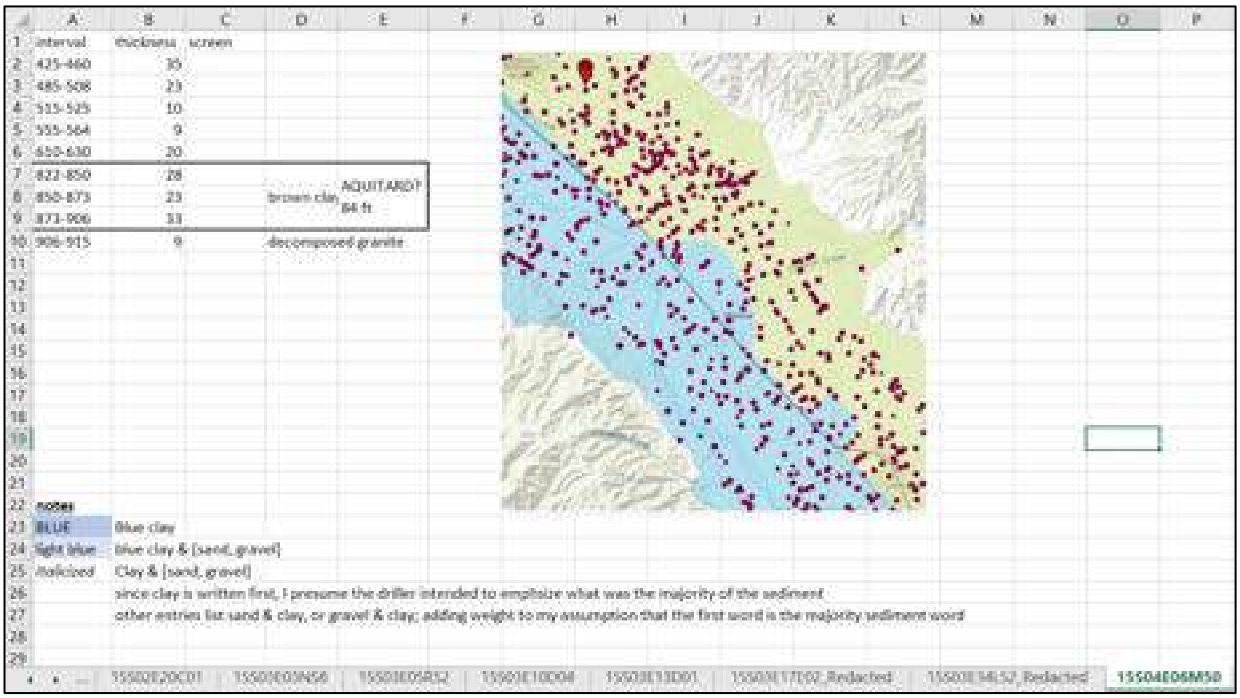

Figure A-6. Example of Standardized WCR Evaluation

This task highlighted certain challenges, including:

- Inconsistent nomenclature
- Poor quality of scanned WCR PDFs
- Difficulty interpreting and correlating inconsistent intervals (e.g., many 5-feet intervals versus a few 50-feet intervals)
- Difficulty interpreting handwritten logs
- Lengthy logs as a result of greater borehole depths

Linguistic Interpretation Over time, various drillers with various levels of expertise and knowledge have drilled and installed hundreds of wells in the Salinas Valley Basin. They each bring these varying levels of expertise and knowledge to their work, which is reflected in their logs. Language choice and interpretation is an important component of evaluating these logs.

The goal in evaluating a borehole for clay content was to identify where there was more clay or fine-grained material in the subsurface. This is a direct result of many local experts describing the aquitard that separates the 400-Foot Aquifer from the Deep Aquifers as less of a competent, continuous, notable single layer of clay, and more of an interval where there is a higher occurrence of clay that effectively acts as a confining unit over the productive zones of the Deep Aquifers. Cautious review of language in the drillers' logs was necessary to derive useful information about the subsurface, and the 400/Deep Aquitard. Table A-2 and Table A-3 provide a list of words and phrases used to identify clay-rich intervals, along with the rationale used to support the note. The phrases selected are non-exhaustive of every notation in every WCR. However, these selections are provided here to demonstrate the bulk of phrases found, as well as the over-arching line of reasoning to delineate sediment intervals from WCRs.

Table A-2. Phrases Used to Determine Clay-rich or Fines-dominant Intervals from Drillers' Logs

Phrase	Reasoning
Clay	"Clay" is a clear indication of sediments encountered.
Silt	"Silt" is a clear indication of low permeability sediments encountered.
Silty Clay	"Silty" is the modifier to "clay," and both sediments are in the "fines" category, which are low-permeability.
Sandy/Gravelly Clay	"Sandy"/ "Gravelly" is the modifier to "clay," whereby "clay" is the dominant sediment, and "Sand" / "Gravel" is the lesser sediment. These intervals were considered ~50% clay/fines.
Clay and … Clay/ Clay with …	Notes that started with "Clay" were considered to be predominantly clay, earning the primary spot in the notation.
Shale	Shale is sedimentary rock formed from consolidated clay/fines, and considered low-permeability.
Sandy Clay & Shale	A double mention of clay-based sediments is considered fines/clay-dominant.
Shale and …	Notes that started with "Shale" were considered to be predominantly shale/clay/fines, earning the primary spot in the notation.
Clay with sand streaks	Notes that started with "Clay" were considered to be predominantly clay, earning the primary spot in the notation.
Gravel Streaked Clay/ Sand Streaked Clay	"Gravel Streaked"/ "Sand Streaked" are modifiers to "clay." "Clay" is the dominant sediment, and "Gravel" / "Sand" is the lesser sediment, streaking the clay. These intervals were considered ~50% clay/fines.

Note: Much of this interpretation is based on relating the phrases to USCS soils-classification flowcharts. Logs that specifically called out clay percentages were strongly considered. Soils with clay percentages at 50% or greater were considered a clay, in the same line of reasoning as the USCS soil classification determination.

Table A-3. Phrases Used to Determine Non Clay-rich or Fines-dominant Intervals from Drillers' Logs

Phrase	Reasoning
Sandy Clay & Gravel	Clay is not the dominant sediment with the presence of a “Sandy” modifier and inclusion of “gravel”
Sand/Gravel & Clay	Notes that started with “Sand” or “Gravel” were considered to be predominantly sand, earning the primary spot in the notation.
Clayey Sand/Gravel	“Clayey” is the modifier to “Sand”/”Gravel,” whereby “Sand”/”Gravel” are the dominant sediment, and “Clay” is the lesser sediment. These intervals were considered <50% clay/fines.
… “with clay”/”with clay lenses”/”with clay streaks”	Clay is not the dominant sediment. Clay exists only as smaller pieces of the whole.
Clay Streaked Sand/Gravel	“Clay Streaked” is the modifier to “Sand” or “Gravel.” “Sand” or “Gravel” are the dominant sediments, and “Clay” is the lesser sediment, streaking the sand or gravel.

This analysis also allowed each well to be assigned a level of confidence that the aquitard as present. Due to the amount of clay in the subsurface, the main confidences were “Yes” and “Maybe” for a primary aquitard that separates the 400-Foot Aquifer from the Deep Aquifers. These categorizations were used for building proposed aquitard extents based on different constraining conditions, as shown on Figure A-7.

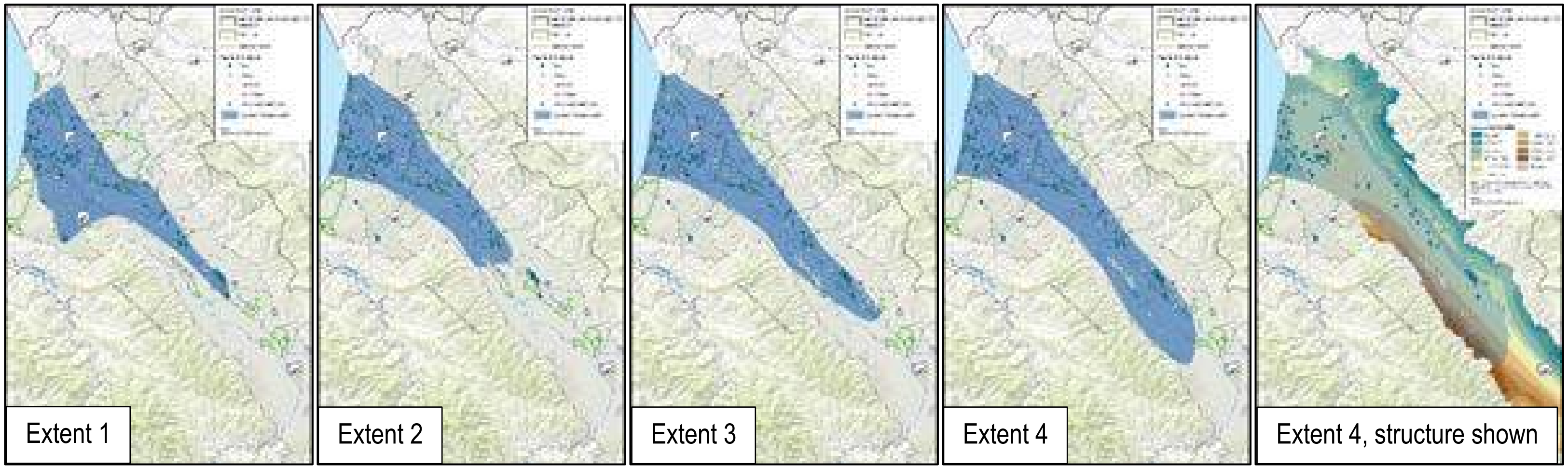

Figure A-7. Proposed 400/Deep Aquitard Extents Based on WCR Analysis and Visualization Analysis/Confidence Assessment

Extent 1 is the smallest extent, fitted as closely as possible to the wells that were categorized with "Yes" aquitard confidence.

Extent 2 is a relatively small extent that includes most of the "Yes" aquitard confidence wells (except near Gonzales), a closeness with the Sierra de Salinas, and excludes the SBWMFO-5/Hoffman well in the Monterey Subbasin. The SBWMFO-5/Hoffman well was excluded because the stratigraphic relationship between the Former Fort Ord highlands, where the well is located, and the lowlands of the main Salinas Basin where the 400-Foot/Deep Aquitard is unclear.

Extent 3 is similar to Extent 2, but includes the wells near Gonzales.

Extent 4 is the largest extent. It includes the wells with "Yes" aquitard confidence and incorporates more structural understanding of the basin. The basin structure used to estimate Extent 4 is from the Durbin basin model from 1978, which is shown on Figure A-7.

Of the proposed extents based on the WCR analysis, extents 2 & 3 from Figure A-7 seemed most probable to move forward with based on integrating existing data and historical reports, as well as conversations with local experts.

Lith Log Analysis Use – Simplified Lithology

After analyzing the WCRs for clay and fines-rich intervals, these intervals were tabulated to facilitate construction of a geologic model, using Leapfrog Geo software (Leapfrog Geo). The Leapfrog model was constructed with the borehole information and provides a better visualization of the clay/fines in the subsurface by borehole. The intervals were split into the following 3 simplified intervals for visualization:

- "Clay" (Dark Blue)
- "Clay and" (Light Blue)
- "Not Clay" (White)

These simplified designations for the intervals were selected to broaden the visual scope of the subsurface, and focus on the important components noted in the WCRs. Several boreholes had many intervals of each type. Additionally, boreholes very close to one another could look very different due to a combination of subsurface sediment variability over short distance and variable driller descriptions, resulting in lithologic variability over short distances, similar to the boreholes in the example on Figure A-8.

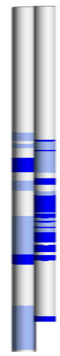

Figure A-8. Example Leapfrog Borehole Displays for Closely Spaced Wells 15S/02E-04A03 and 5S/02E-04A04

Each borehole was visually inspected in the Leapfrog model to determine the 400/Deep Aquitard presence and interval. This visual inspection was coupled with a comparison to other relevant data to establish the presence of the aquitard. In each borehole, the largest cluster of clay intervals were compared to the well's screened interval and the largest cluster of clay intervals in nearby known Deep Aquifer or other deep to establish the 400/Deep Aquitard depth.

Well screen intervals were an important component of aquitard analysis as a secondary check on site-specific conditions. Drillers, or other water resources professionals who helped design the well, presumably have a conceptual understanding of the subsurface conditions and adjust the well construction to maximize productivity from specific intervals. Due to the nature of the interbedded and complex sedimentation of the Salinas Valley Basin, the screen interval provided a secondary check on aquitard presence and location.

Development of the 400/Deep Aquitard using Lithology logs

Once the lithologic visualization was complete, the interval that was determined to be the aquitard was recorded, and the analysis simplified the boreholes into the following 3 categories, shown on Figure A-9:

- Not Aquitard (White)
- Aquitard (Dark Gray)
- Deep Aquifer (White)

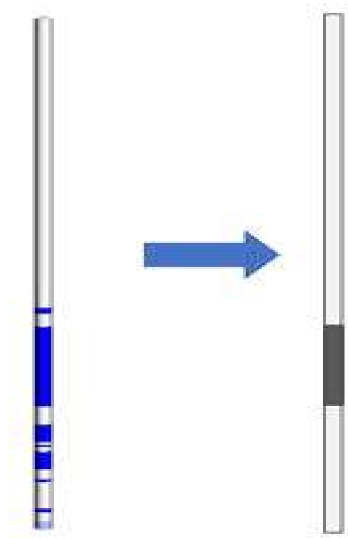

Figure A-9. Example of How Borehole Lithology at Well 15S/04E-21E52 is Converted to Aquitard Delineation

From this simplification and subsequent review in the Leapfrog platform, aquitard surfaces (top/bottom) were generated to create a volumetric representation of the aquitard. This volume was then compared to the reported screened intervals of wells for a more complete view of the aquitard and wells relationships, as shown on Figure A-10.

This visualization helped review the relationship between the 400/Deep Aquitard and well screens based on geography. The wells closest to the coast primarily had screened intervals below the aquitard. Inland wells had screened intervals that spanned the aquitard. This is shown on Figure A-10, with the aquitard represented by transparent purple and the well screens represented by yellow. On this figure, the coast is to the left, and the inland regions are to the right.

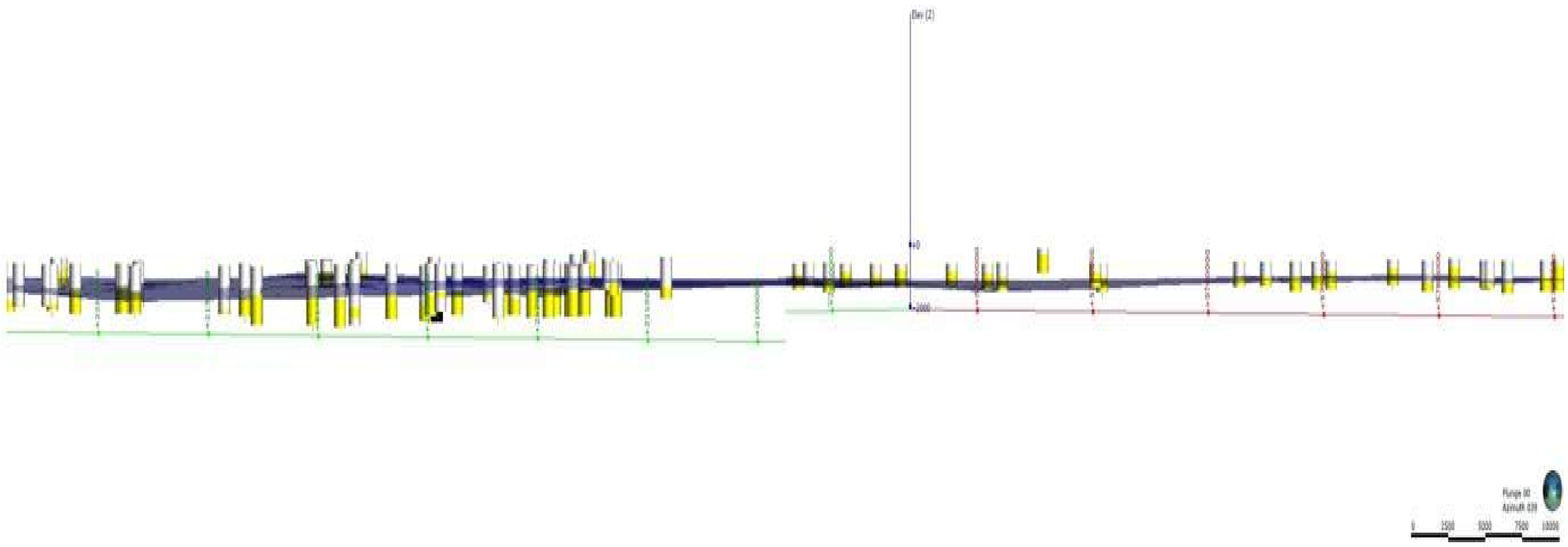

Figure A-10. Extent 2 400/Deep Aquitard and Screen Intervals Comparison

Final WCR Extent

The final WCR lithologic log analysis resulted in the Phase 1, or preliminary Deep Aquifers extent shown on Figure A-11. This extent was based on reviewing WCR Extents 2 and 3 against previously published reports and the DWR AEM flightlines to better refine the preliminary extent. The preliminary extent is primarily based on WCR Extent 3, but is refined further from looking more closely at key wells.

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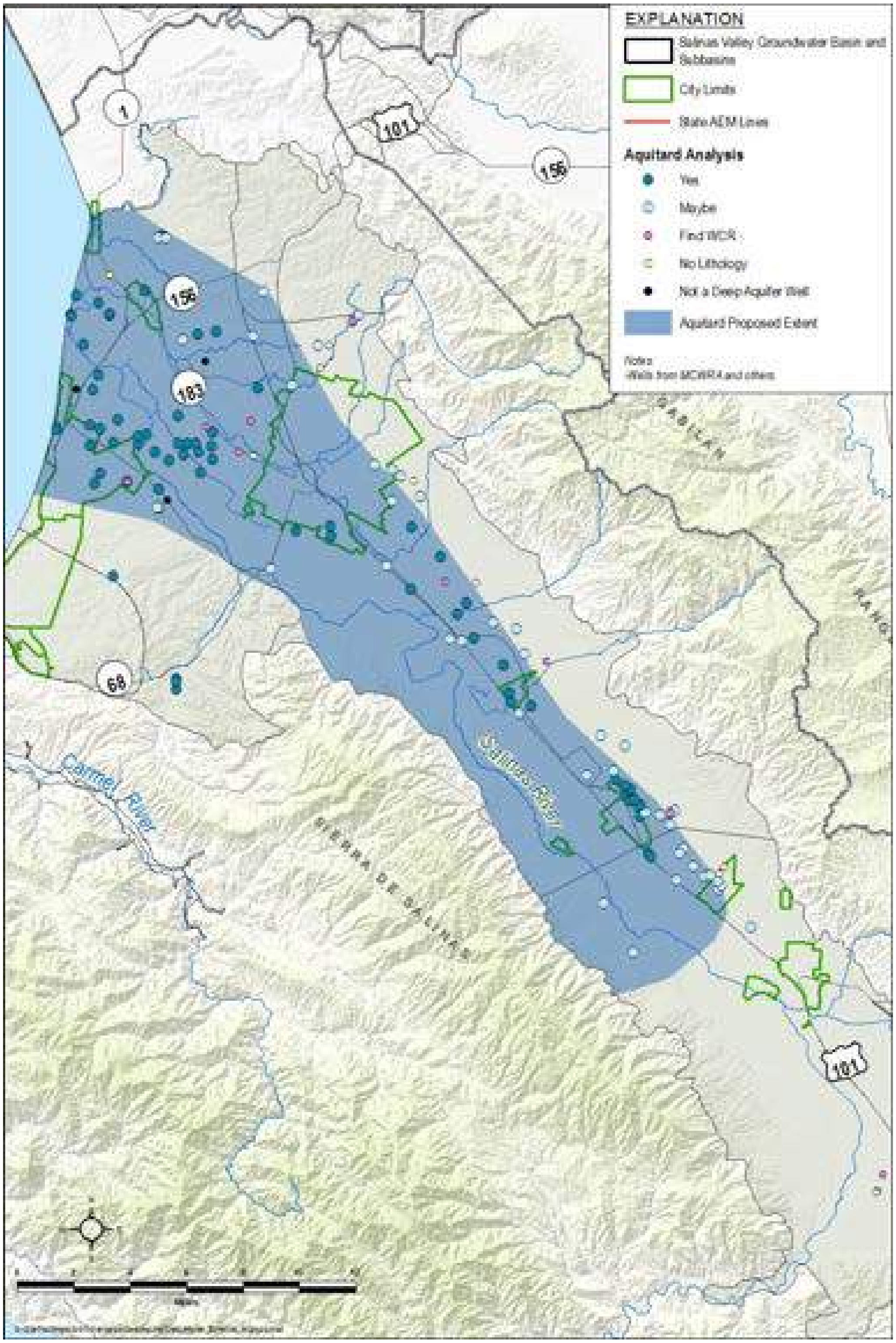

Figure A-11. WCR Based Deep Aquifers Extent from Lithologic Log Analysis

Geophysical Data

E-logs/Borehole geophysical Logs

The Phase 1 analyses reviewed e-logs to try and identify a signature resistivity pattern that indicates the 400/Deep Aquitard. Formations can sometimes be quickly and easily identified through unique borehole resistivity shapes when the electrical pulse encounters a sharp change, or specific facies change. Similar to the WCR analyses, the e-log analysis did not identify or locate a specific or unique resistivity signature to denote the 400/Deep Aquitard. Rather, the higher incidence of clay in the subsurface was reflected in segments of lower resistivity, often below 25 ohm-meters, in the profile of the borehole in the vicinity of the higher clays delineating the 400-Foot Aquifer from the Deep Aquifers.

The primary use of the e-logs during the Study was for ground truthing the AEM resistivity profiles. Ramboll incorporated the e-logs into the AEM inversion process for the Study's AEM survey, as explained in more detail in Appendix 2 of the Deep Aquifers Study Report.

AEM Data

Phase 1 analyses incorporated AEM data from 2020 DWR Survey Area 1 and 2019 MCWD surveys. Generally, electrically resistive zones may indicate aquifers, and electrically conductive zones may indicate aquitards and/or high TDS waters. The Phase 1 analysis focused on identifying and locating the continuous 400/Deep Aquitard using the lower resistivity data in the subsurface, and correlating as much additional data as possible to verify sediment types.

The MCWD survey was conducted in the coastal area, and largely focused on the presence saltwater intrusion with high density line placement and a different inversion process. The inversion process from this survey masked some lithologic differences between higher resistivity units and made formation identification challenging. However the flightline density was useful for reviewing continuity of resistivities through geologically challenging areas.

Several of the longitudinal flightlines from DWR Survey Area 1 showed the presence of a lower resistivity unit at the depth of investigation, which coincided with the base of the 400-Foot Aquifer. This supported the location of the 400/Deep Aquitard identified in the WCR analysis and feedback from other experts in the Basin. AEM results from an example flight line are shown on Figure A-12. The hotter colors correspond with the 180-Foot and 400-Foot aquifers. The cooler colors, particularly the green color adjacent to the depth of investigation, corresponds with the 400/Deep Aquitard.

A few of the cross-Basin flightlines from DWR Survey Area 1 showed the presence of a lower resistivity unit in a sloping, wedge coming off the Gabilan Range, seen on Figure A-14 and

Figure A-15. These sloping, lower resistivity units are alluvial fans, and are characteristic of the sedimentary deposits from the Gabilan Range on the east side of the Basin, exemplified on Figure A-13.

These alluvial fan deposits are distinct from the relatively continuous 400/Deep Aquitard encountered in the main body of the Salinas Valley Basin because they are derived from different source material and have different depositional features.

The edge of the alluvial fans are therefore indicative of the extent of the 400/Deep Aquitard.

Two DWR Survey Area 1 cross-Basin flightlines were used to delineate the extent of the alluvial fans originating from the Gabilan Range. These fans are shown in the blue hues (lowest resistivities) on Figure A-14 and Figure A-15.

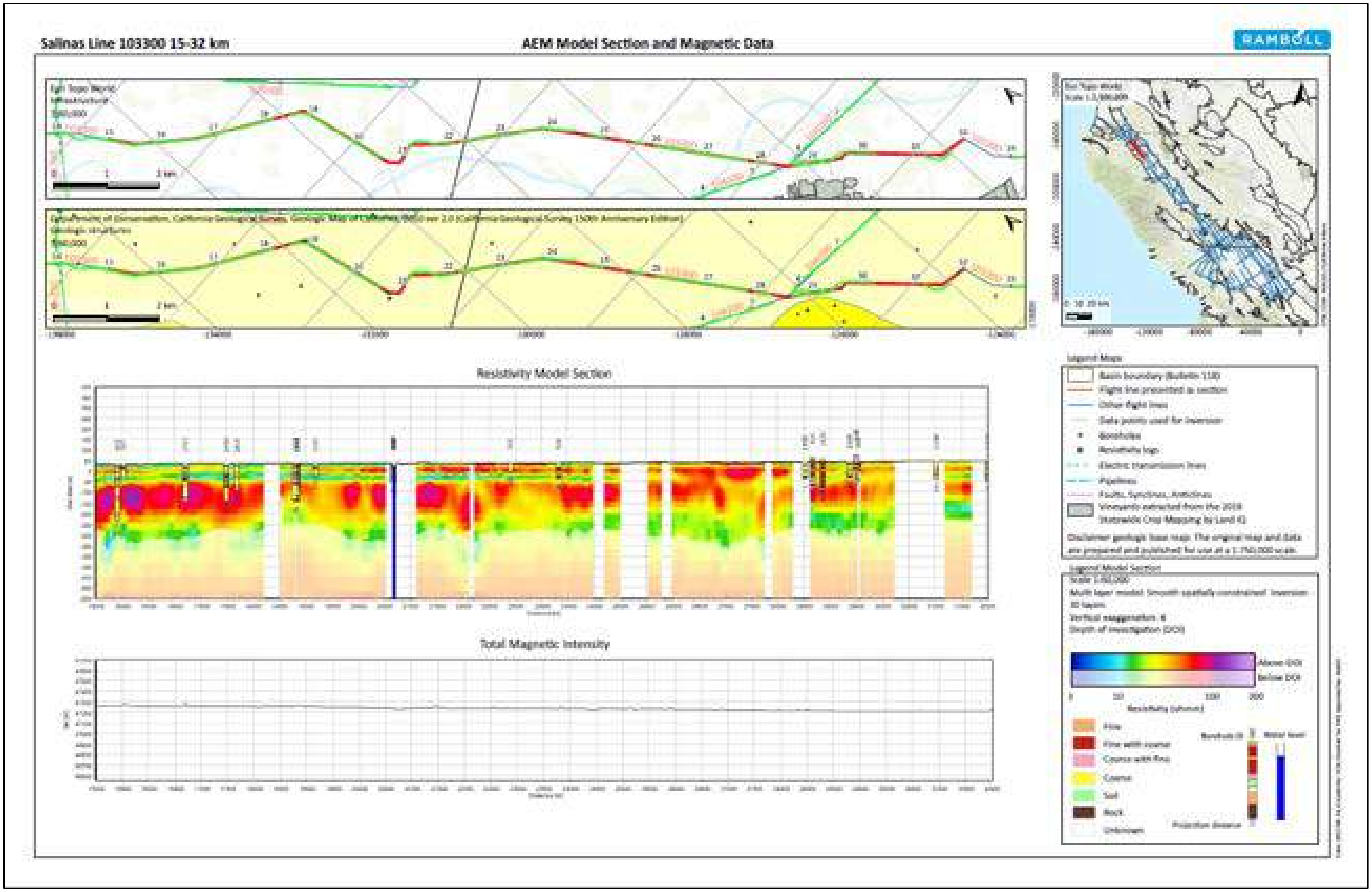

Figure A-12. DWR Survey Area 1, Line 103300, 15-32km Section Showing Lower Resistivities (interpreted as 400/Deep Aquitard) (DWR, 2022)

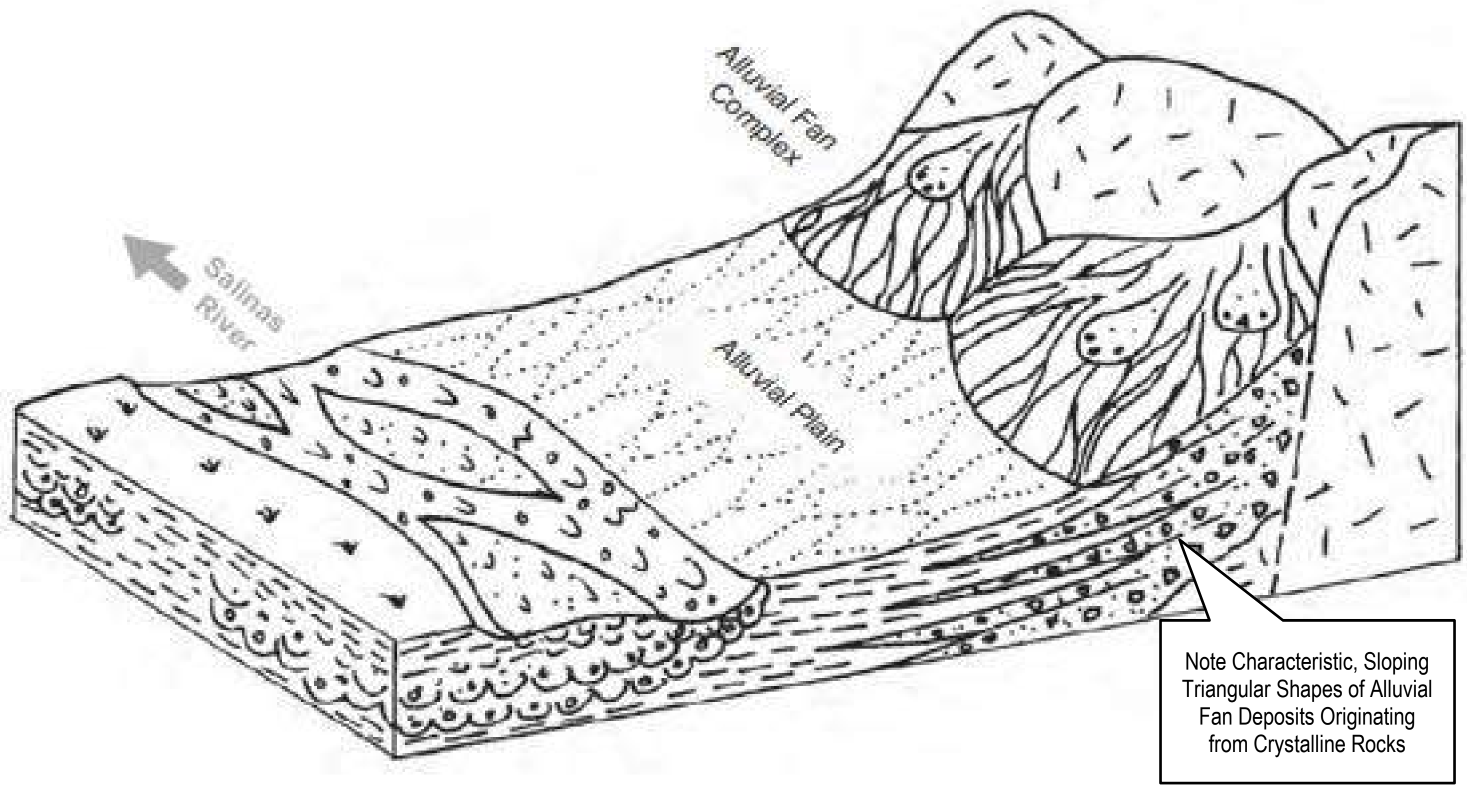

Figure A-13. Cartoon Diagram of Alluvial Fan Complex and Relationship with Salinas Valley Basin Sediments (Kennedy/Jenks, 2004)

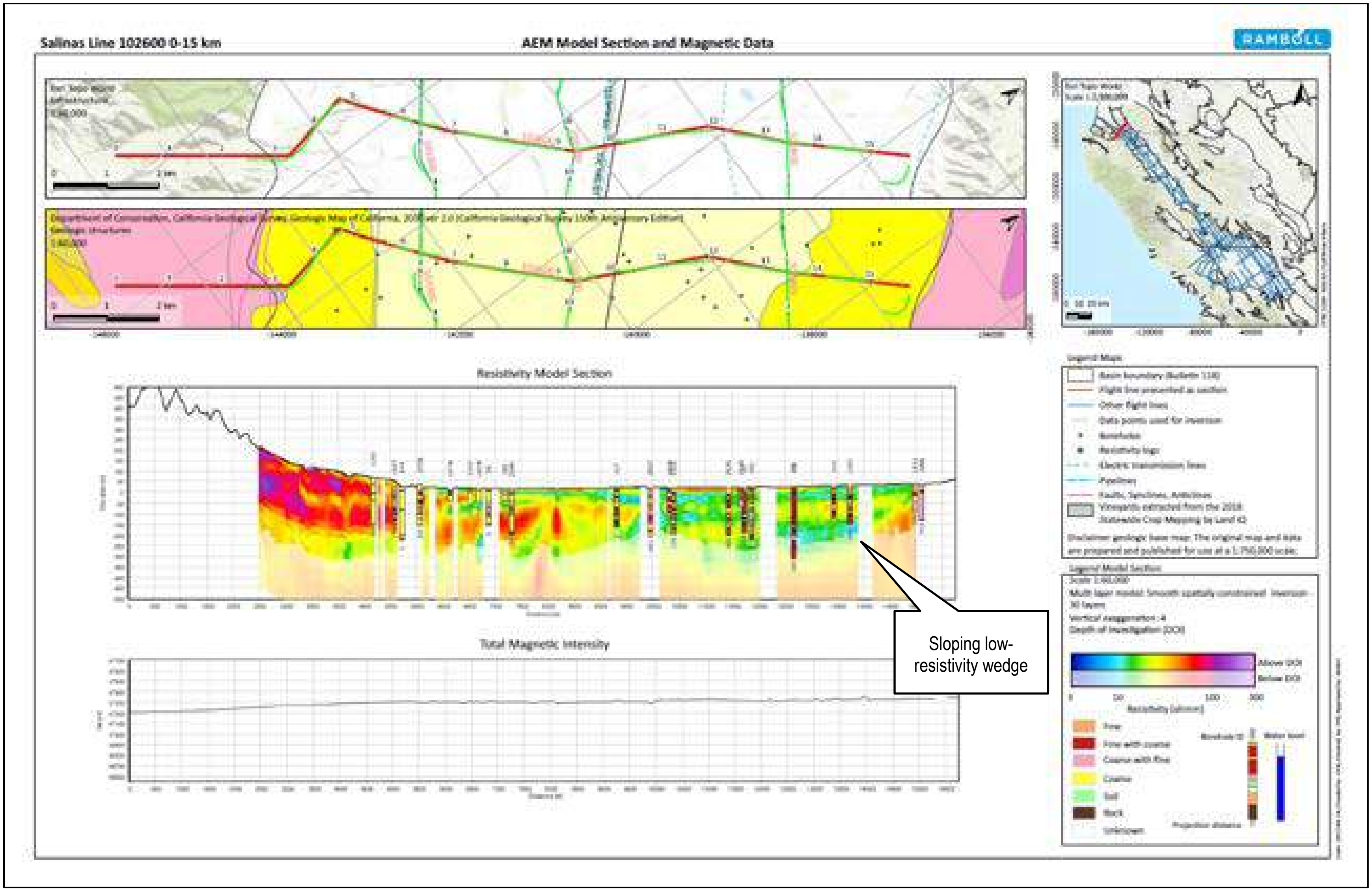

Figure A-14. DWR Survey Area 1, Line 102600, 0-15km Section Showing Lower Resistivities (Blue Hues Interpreted as Alluvial Fans) (DWR, 2022)

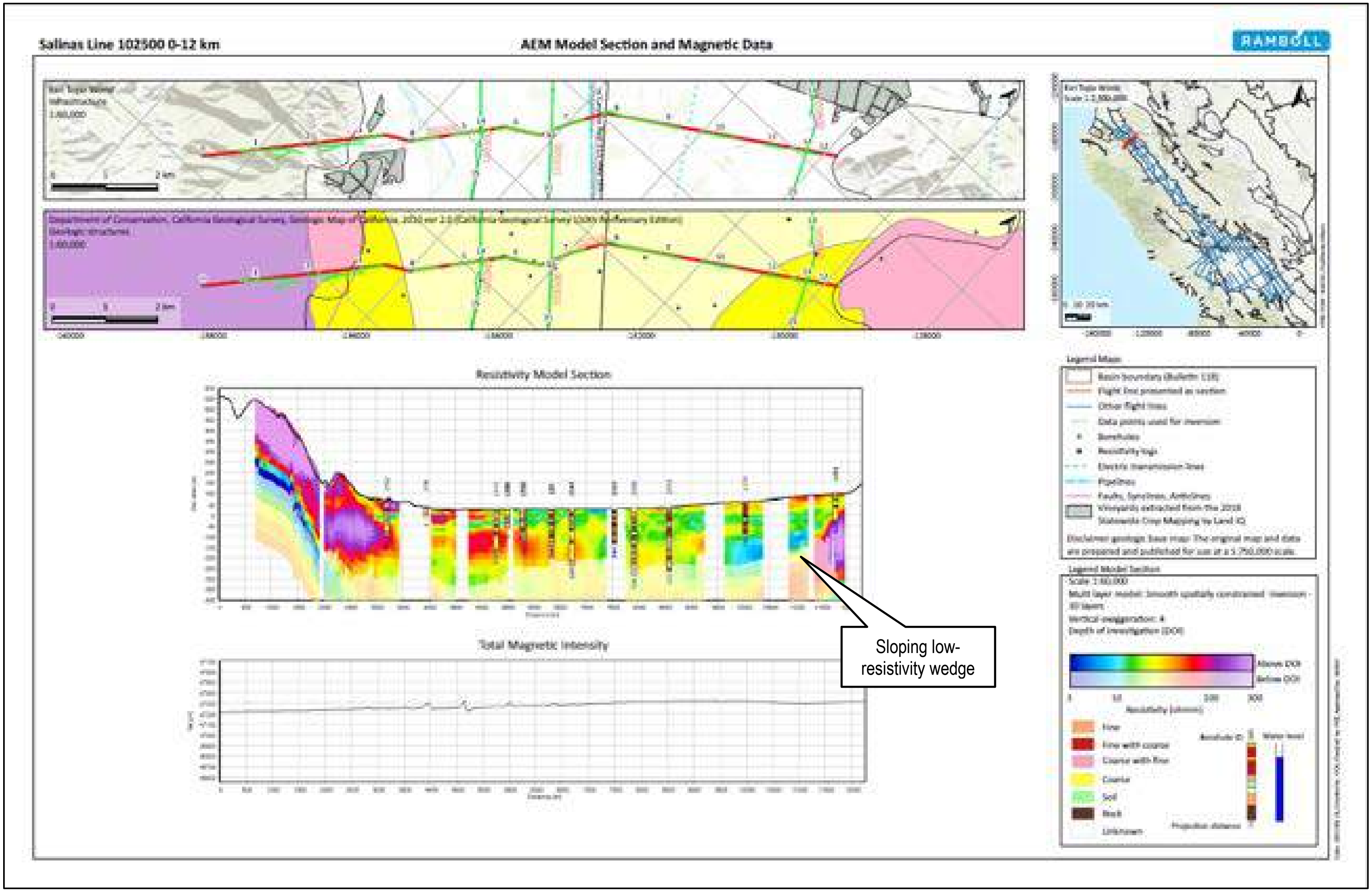

Figure A-15. DWR Survey Area 1, Line 102500, 0-12km Section Showing Lower Resistivities (Blue Hues Interpreted as Alluvial Fans) (DWR, 2022)

Previously Published Reports and Other Data

Basin Structure (USGS, 1978)

The USGS-developed Basin structure shown on Figure A-4 further limited the extent of the Deep Aquifers. Based on lithology reported in the WCRs, as well as Deep Wells designated by MCWRA where the 400/Deep Aquitard was easily discernable, 600 feet below land surface was selected as the upper threshold for the extent of the Deep Aquifers; any portion of the basin shallower than 600 feet below land surface was not considered to contain the Deep Aquifers, whereas any portion of the basin deeper than 600 feet below land surface was considered to contain the Deep Aquifers. All areas where the USGS-developed Basin structure was less than 600 feet deep were eliminated as potential Deep Aquifer locations.

Paso Robles Extent (Thorup, 1976-1983)

The 400/Deep Aquitard is found in the lower Paso Robles Formation. Plate 2 of the *Hydrogeological Report on the Deep Aquifer, Salinas Valley* report outlined the Paso Robles Formation, with notable exclusions near the coast (Thorup, 1976; Thorup, 1983). For this study, the coastal segments were interpolated by incorporating other known geological features such as the Ord Terrace Fault, Laguna Seca Anticline, and the Elkhorn Slough clay-filled paleochannel. The extent of the Paso Robles Formation reported by Thorup is shown on Figure A-5.

For the Phase 1 analysis, the Paso Robles Formation was generally honored throughout the preliminary extent delineation with the exception of the region near the City of Salinas based on a few key WCRs.

Other Data

Alluvial Fans Additional Discussion

The alluvial fans were excluded from the extent based on not only the resistivity profiles, but also because they are a different depositional environment than the sediments that constitute the Deep Aquifers and the overlying 400/Deep Aquitard.

The alluvial fans are primarily derived from the Gabilan Range and are composed of decomposed granite. Chemical weathering of decomposed granite can result in potassium-rich clays. Therefore, the abundance of clays in the subsurface in the alluvial fan-dominated regions is expected. The lowest resistivity areas (less than or equal to 10-ohm-m) were considered the extents of the alluvial fans.

The sediments of the main Salinas Basin are derived from a variety of rock sources, including older sedimentary rocks such as the Monterey Shale. The Salinas Valley Basin sediments, including the Paso Robles Formation, contain porcelaneous chert, which is not encountered in the alluvial fan deposits. Therefore, the alluvial fans are considered a separate and discontinuous deposit in the Basin.

Integration/Synthesis of existing data and Phase 1 extent

The synthesis of all publicly available AEM surveys, borehole geophysical data, previously published reports, well completion reports, numerical model reports, and first-hand experience resulted in a comprehensive initial view of the Deep Aquifers' extent. The specific data-supported extents were overlapped on a single map and compared to one another to look for concurrence of extents and places where some data were stronger than other data (Figure A-16).

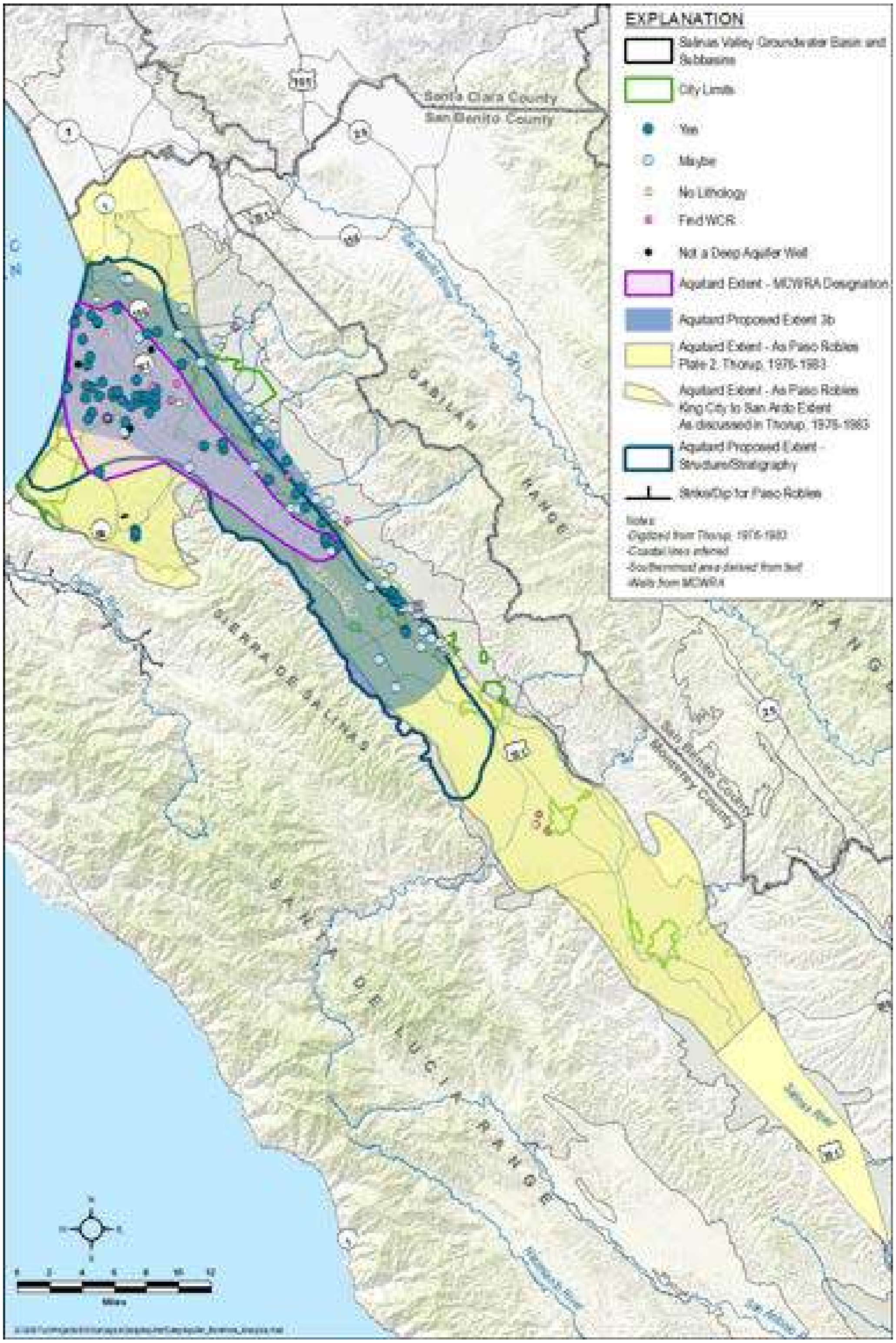

Figure A-16. Overlapping of Various Data-Based Deep Aquifers Extents

Results of this synthesis are summarized below:

- **Gabilan Range Bajada/East Boundary:** The structurally based boundary, the Paso Robles extents, WCRs, and the DWR Survey Area 1 AEM data all agreed well through the Gabilan Bajada.
- **Arroyo Seco Cone/Southern Boundary:** Two wells and 3 DWR Survey Area 1 AEM flightlines concurred to delineate the southern boundary near the City of Soledad. While some data suggested the Deep Aquifers' boundary could be farther south, the concurrence of AEM data and well logs defined this southern boundary near Soledad.
- **Sierra de Salinas/West Boundary:** The structurally based boundary, the Paso Robles extents, and the DWR Survey Area 1 AEM data all concurred to mark the boundary at the Basin boundary.
- **South Coastal Boundary/South Marina :** This boundary exists in the Seaside Basin near Highway 68. Previously published cross sections, mapped structural deformities, coastal AEM flightlines, and 1 MCWRA Deep Aquifers well all suggested the extent of the Deep Aquifers is in the Former Fort Ord area. Many of the available data focused on the geology rather than stratigraphy of this area, and the 400/Deep Aquitard was not as easily identified. This Study exercised caution in conflating geology with hydrostratigraphy and delineated the boundary based on the most overlapping data as possible.
- **Monterey Bay Shoreline/Coastal Boundary:** The Deep Aquifers definition is terminated at the coastline as all data are focused on land.
- **Elkhorn Slough and North Salinas Boundary/North Boundary:** The structurally based boundary, the Paso Robles extents, and WCRs data all suggested the Deep Aquifers extend up to Basin Boundary at Elkhorn Slough.

This synthesis resulted in a Phase 1, or Preliminary extent of the Deep Aquifers, shown on Figure A-17.

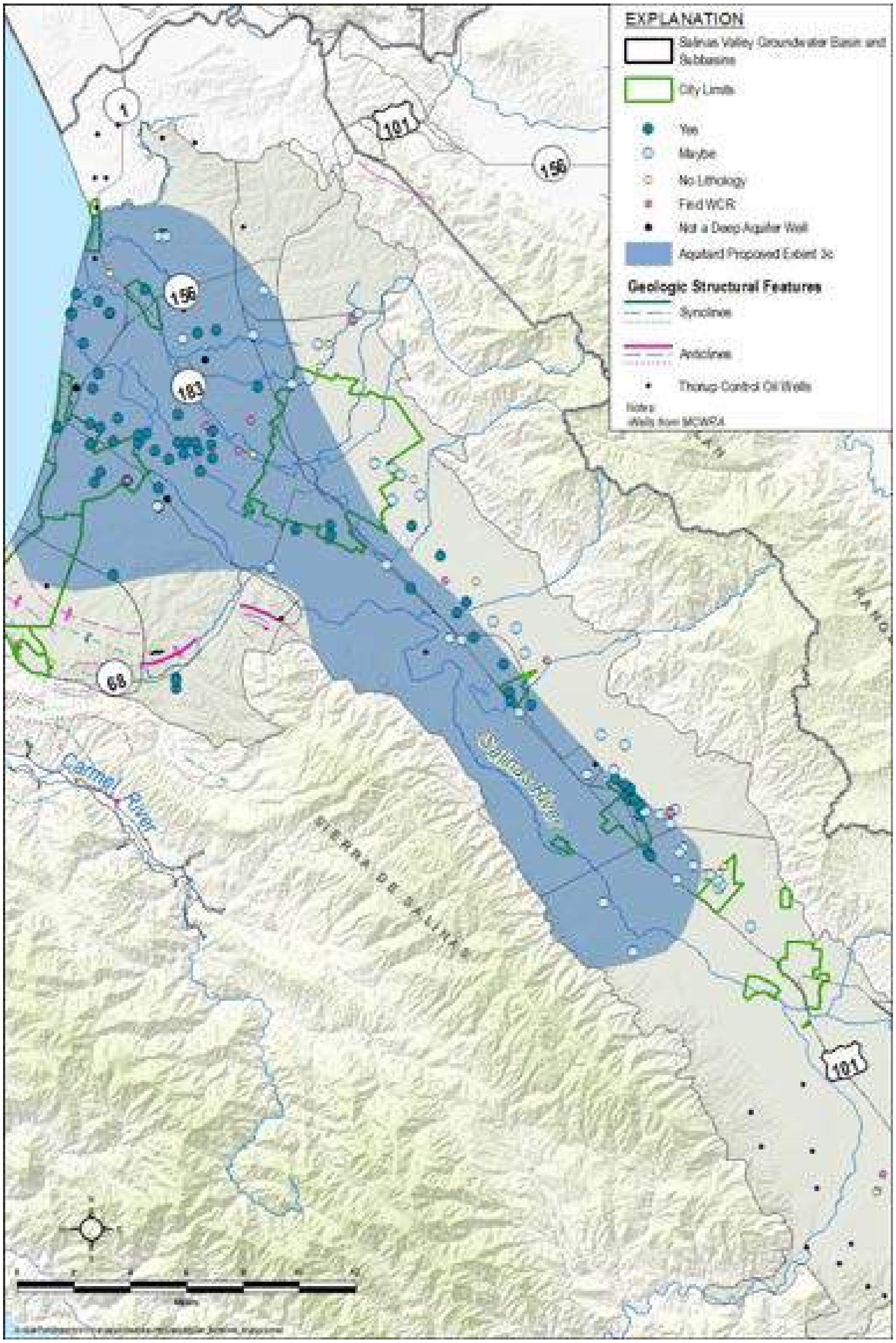

Figure A-17. Phase 1, Preliminary Deep Aquifers Extent

Delineating Lateral Extent – Phase 2

Phase 2 integrated AEM, aquifer tests, water chemistry, and isotopic data into the Phase 1 analysis and extent. These data were used to refine the existing extent. These data were not categorized into individual extents like the data-driven extents shown in Phase 1 analysis. They were instead compared to the boundaries of the Phase 1 extent and used to address specific points where the improved data showed the need to move the extent.

Deep Aquifers AEM Study

The most pivotal data gathered and applied/used during Phase 2 analysis was from the AEM survey conducted for the Deep Aquifers Study. This survey employed a customized tool to extend the depth of investigation to identify and locate the 400/Deep Aquitard in the subsurface. Additionally, the survey flightlines for this study were selected to fill in the gaps from the DWR surveys, provide a more complete picture of the subsurface at the greater depth, interrogate areas where questions on the extents were most pertinent. Depth of investigation ranges from 350 to 400m (1,150-1,310 feet) in coastal areas, to up to 600m (1970 feet) in inland areas.

The deeper depth of investigation of 350-400m (1,150-1,310 feet) in coastal areas, to up to 600m (1970 ft) in inland areas, compared to approximately 150-400 m (492-1,312 feet), revealed both the 400/Deep Aquitard as well as other key sediments in the subsurface.

Other Supporting Data

Aquifer tests, water chemistry, and isotopic data were used to support the AEM-refined boundaries through Phase 2. These data were primarily used to try to understand recharge and transmission of water to and within the Deep Aquifers, but also supported the delineated extents in key wells.

RESULTS - DEEP AQUIFERS EXTENT

The synthesis of all data from both phases of the Study resulted in the final extent shown on Figure A-18, described in the sections below, and available in the main body of the Deep Aquifers report. Importantly the Deep Aquifers extent is limited to the defined Salinas Valley Groundwater Basin for management purposes. This is similar to how the geologic formations of the Deep Aquifers are treated as they extend north of the Salinas Valley into the Pajaro Basin and Santa Cruz area.

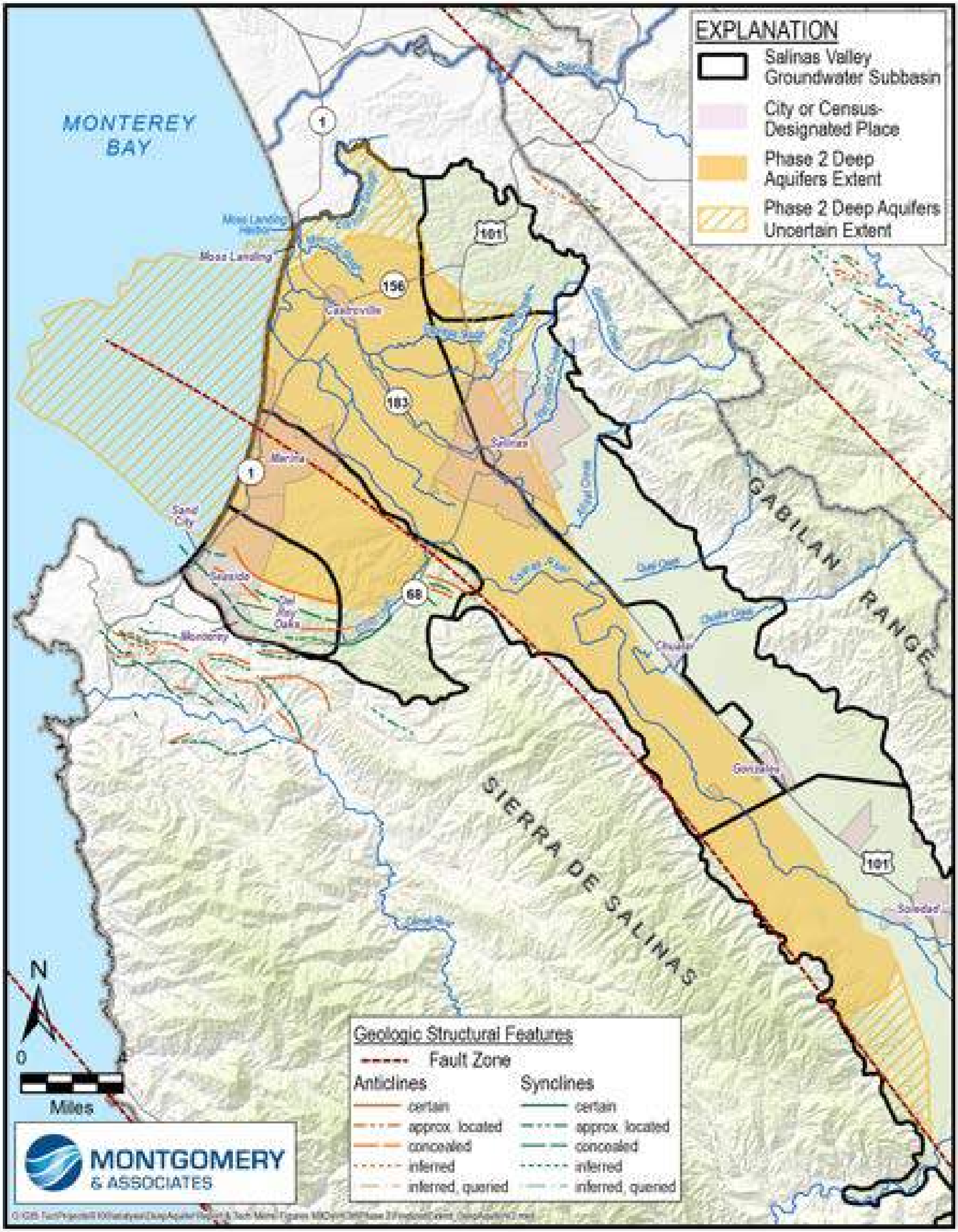

Figure A-18. Deep Aquifers Final Extent

Physical Lateral Boundaries

The Deep Aquifers are bounded by the following physical features:

The Monterey Bay shoreline

The Deep Aquifers' northern boundary is defined by the Monterey Bay shoreline. The controlling data that determined/focused this boundary are primarily a lack of data beneath the Monterey Bay and lack of offshore groundwater management authority. The geologic formations that form the Deep Aquifers outcrop in Monterey Canyon under the Monterey Bay, as shown on Figure A-19 (Wagner *et al*., 2002). The portion of these geologic formations that exist under the Monterey Bay and crop out in Monterey Canyon are considered an "uncertain" lateral extent.

The Deep Aquifers likely extend under Monterey Bay, and there are no hydrogeologic barriers limiting groundwater flow across the coastal boundary. However, there are no wells or subsurface data to provide lithologic insight into the sediments beneath the Bay, much less collect aquifer water samples. All Deep Aquifers' extraction occurs on land, and all known data are on land.

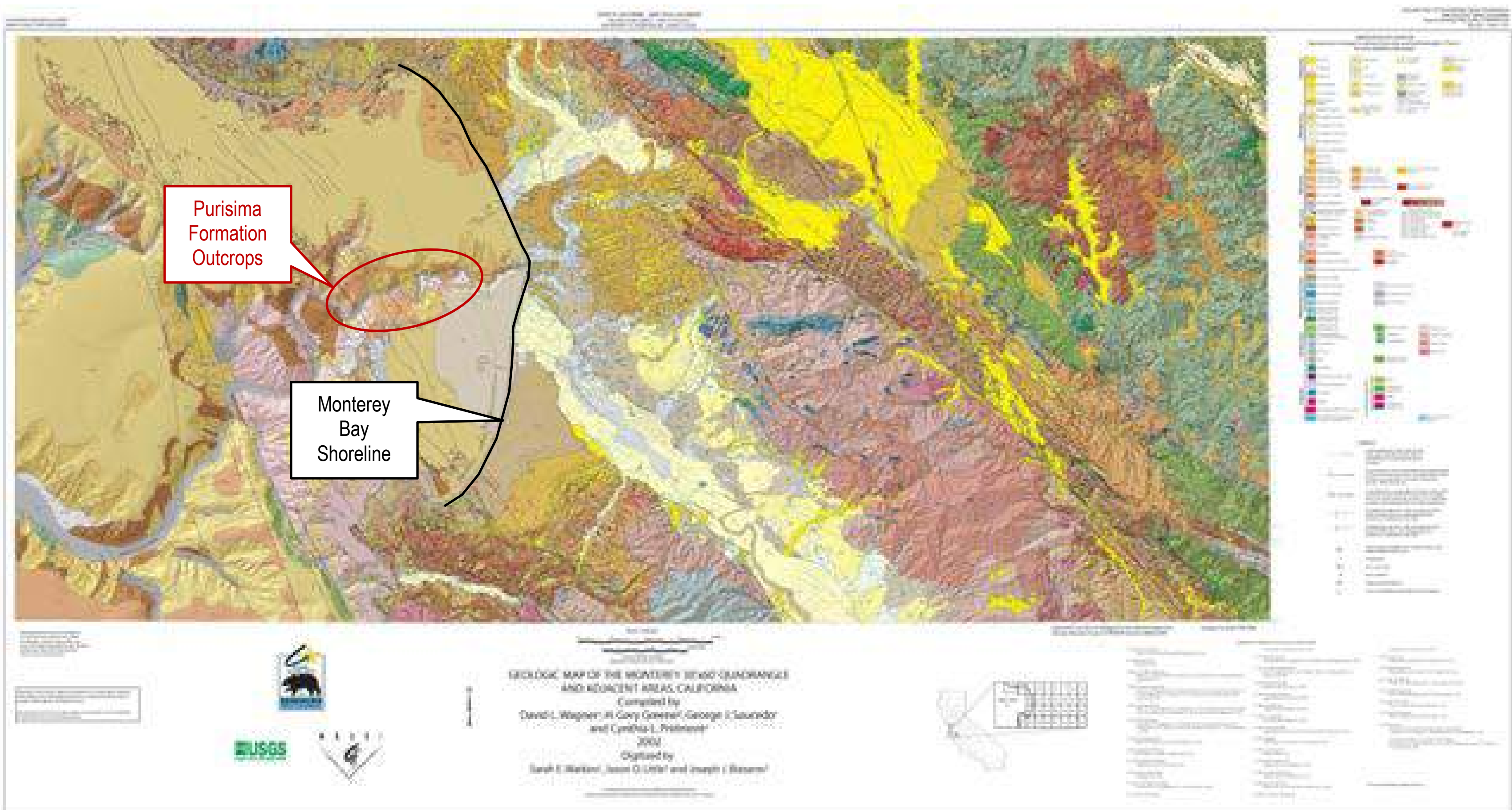

Figure A-19. Map of Monterey Bay Region Geology with Monterey Bay Shoreline Outlined in Black and Outcrops of Deep Aquifers Geologic Formations Circled in Red (Wagner *et al*., 2002)

Elkhorn Slough & North of City of Salinas

The northern boundary of the Deep Aquifers is generally south of the current course of Elkhorn Slough; corresponding to a paleo-drainage of the Salinas River (DWR, 2003). Elkhorn Slough is a buried and clay-filled paleo-drainage that is at least 400 feet deep, and represents a discontinuity in the 400/Deep Aquitard shown on Figure A-20. Figure A-20 shows the Paso Robles Formation terminating somewhere before Elkhorn Slough, on the left of the cross-section. This implies the 400/Deep Aquitard contained within the Paso Robles Formation also terminates. (Durbin *et al.*, 1978; Fugro West, 1995). The Purisima Formation does continue to the north, ultimately cropping out near Santa Cruz (Feeney and Rosenberg, 2003; Fugro West, 1995). However, the clays commonly found in the Paso Robles Formation that define the continuous 400/Deep Aquitard do not.

The controlling data that determined this boundary are published cross-sections (Feeney, Rosenberg, 2003; Greene, 1977; Garrison *et al.*, 1990; Fugro West, 1995), AEM surveys (DWR, 2023; MCWD, 2019), and local deep wells (13S/02E-19Q03, 13S/02E-15M03). Well 13S/02E-19Q03 is further highlighted on Figure A-20 with a blue rectangle positioned near the Purisima Formation contact where the geophysical log indicated a thick section of low-resistivity material, generally interpreted as clay-abundance as discussed above. The 400/Deep Aquitard can be assumed to be present here, however its continuity is uncertain moving northward (rightward on the figure).

The extent of the continuous 400/Deep Aquitard found within the Paso Robles Formation is unclear in this particular region due to the abundance of clay in the subsurface from several sources as seen on Figure A-21 through Figure A-23. These AEM profiles show an abundance of blue hues in the subsurface, which are low resistivity and indicate strong clay presence throughout all depths of the profile. The various clay sources makes it difficult to discern whether any clay horizon is part of the continuous aquitard. Therefore, it is difficult to demarcate where the extent of the Deep Aquifers may be through this area.

The best data available to draw this boundary were the previously published reports and maps through the area . The USGS claims the Paso Robles Formation pinches out near Moss Landing (Greene, 1977), and the *Deep Aquifer Investigation* shows the Paso Robles Formation beginning to thin northward from Moss Landing (Feeney and Rosenberg, 2003). Therefore, this boundary was set closer to wells that show a clear aquitard, and the remainder of the area in the Salinas Valley Basin is considered uncertain.

Inland from the coast, the Deep Aquifers boundary generally follows the previously mapped structural boundary, the mapped Paso Robles Formation boundary, and one well near Prunedale. The AEM data were intermittent in the area between Prunedale and the City of Salinas due to interference from infrastructure.

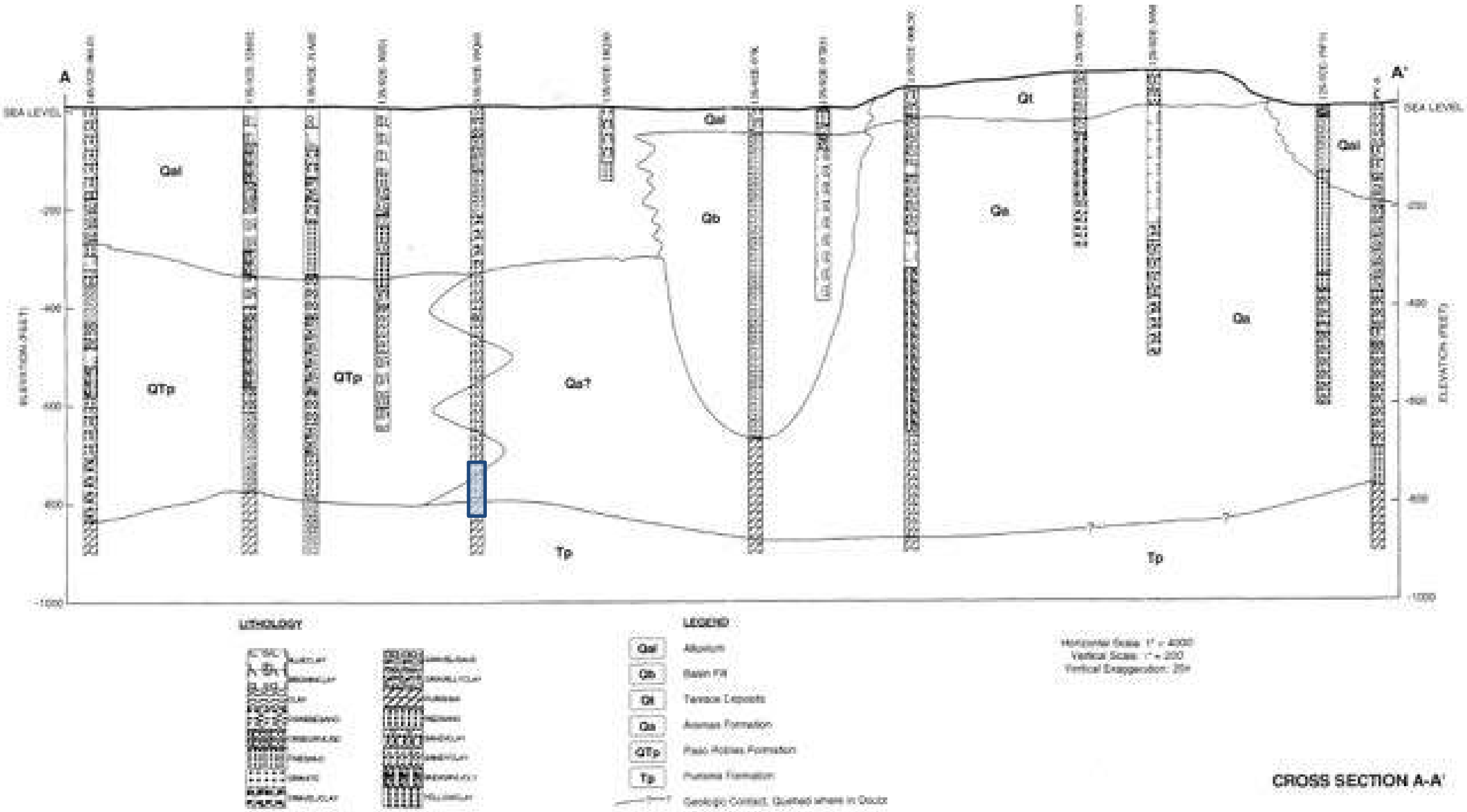

Figure A-20. Coastal Cross-section A-A' Showing Clay-filled Elkhorn Slough and Low-Resistivity Zone in Key Well (Fugro West, 1995)

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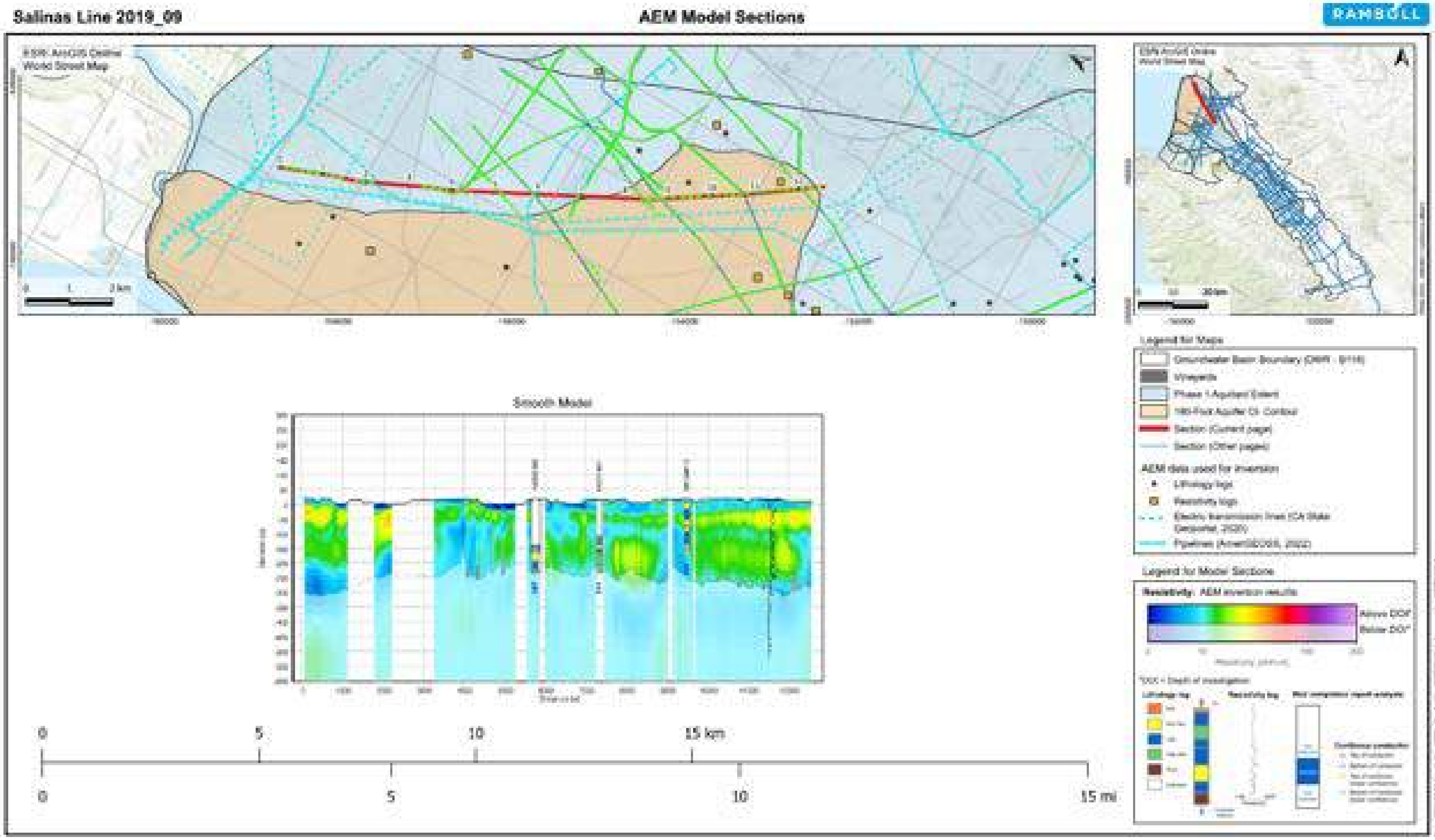

Figure A-21. MCWD AEM Survey, 2019, with Elkhorn Slough Toward Left of Section

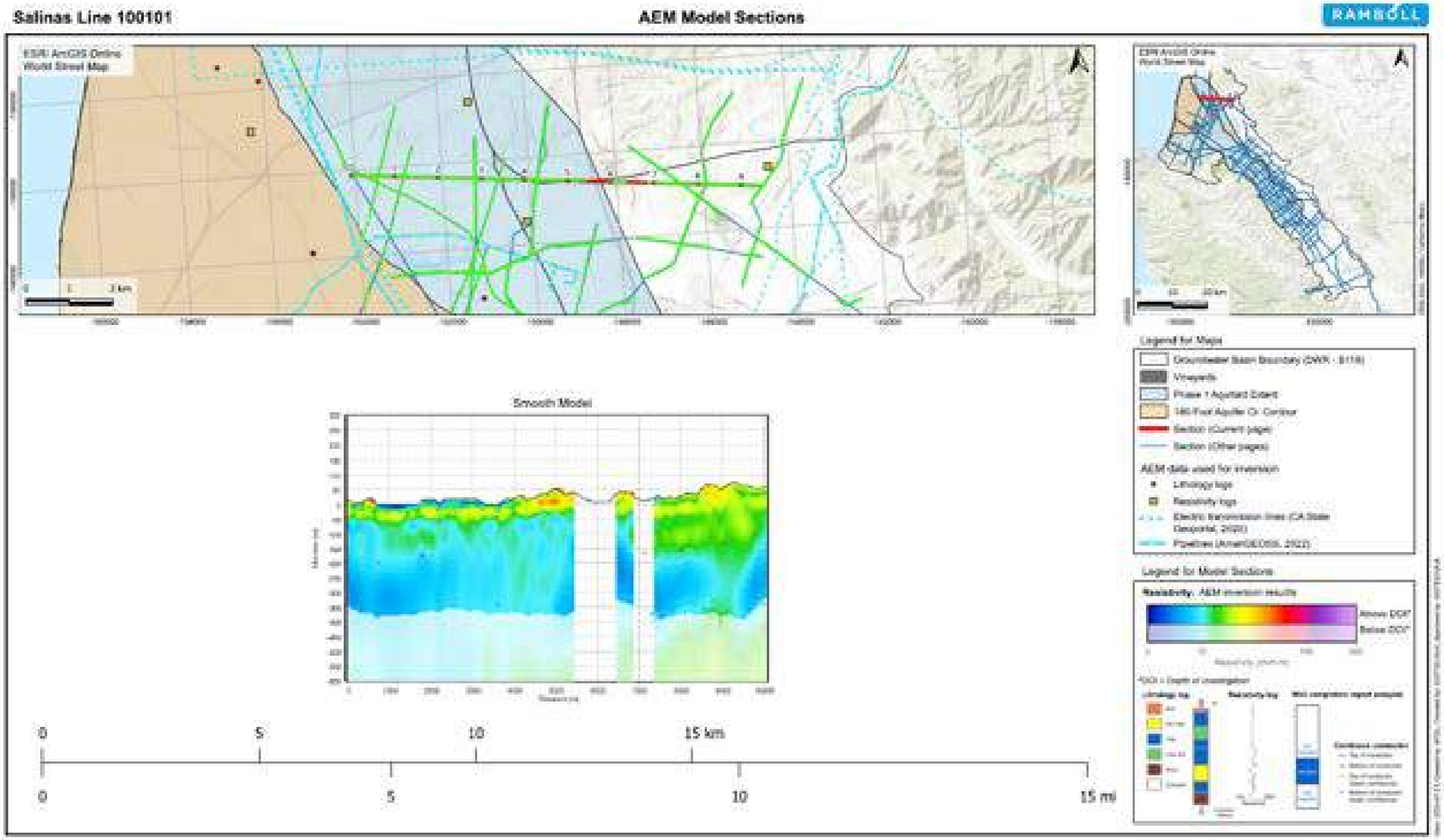

Figure A-22. Deep Aquifers Study Survey Line 100101, 2023

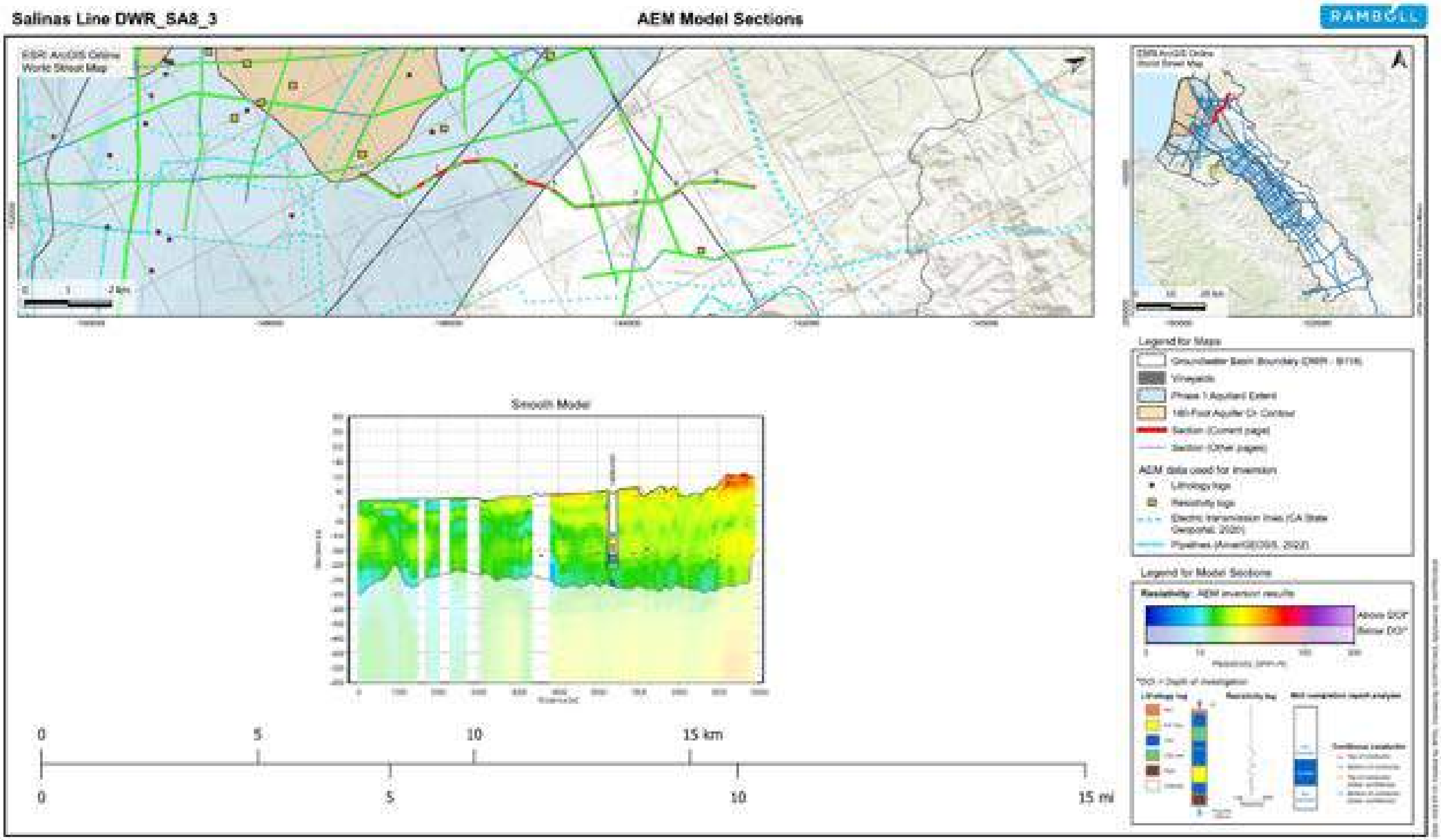

Figure A-23. DWR Survey Area 8, 2022

The Gabilan Range Bajada

The Deep Aquifers' northeast boundary is defined by the extent of the alluvial fan complex, or bajada, along the Gabilan Range. Multiple alluvial fans have developed along this mountain front, and they represent a discontinuity in the 400/Deep Aquitard that defines the presence of the Deep Aquifers. Although these fans are represented by an abundance of clay in the subsurface, they are not of the same source, and overlie different sediments from the Deep Aquifers. This bajada constitutes an adjacent aquifer system.

The controlling data that determined this boundary are primarily the AEM surveys (DWR, 2020; Deep Aquifer Study, 2023). Several wells were analyzed in the Phase 1 portion of the study, and combined with the USGS's Basin Bottom model (Durbin 1978) and the extent of the Paso Robles Formation mapped in the *Hydrogeological Report on the Deep Aquifer, Salinas Valley* (Thorup 1976) to estimate the Deep Aquifers' presence. Subsequent to the Phase 1 portion of this study, DWR's AEM Survey Area 1 and this study's AEM Survey revealed the fans were larger and extended further into the Salinas Valley than previously understood. An example of this is shown on Figure A-24. These fan sediments, shown as blue areas on the Figure A-24 cross-sections, comprise eroded Gabilan Range rocks, and do not contain clasts or sediments typical of the Deep Aquifers.

Therefore, the extent of the alluvial fans as determined by the AEM surveys is the eastward lateral limit of the 400/Deep Aquitard, and subsequently, the Deep Aquifers.

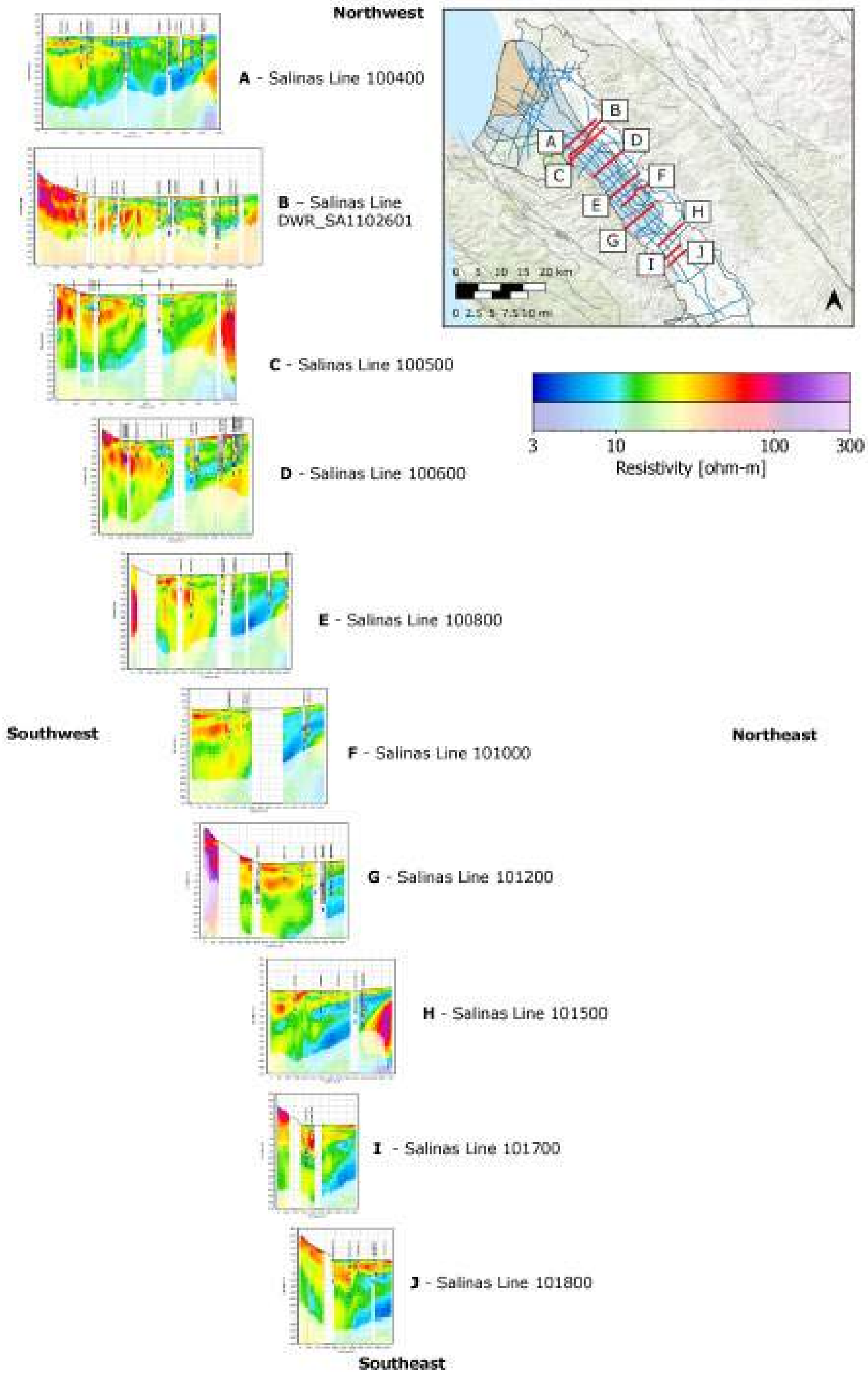

Figure 5-18 Series of cross-sections across the survey area oriented across the basin southwest to northeast. Cross-section B comes from the DWR Statewide AEM Surveys, while all other cross-sections come from the current survey. The name of each cross-section refers to the page name in Appendix 3. The dots shown in each cross-section are the interpretations of the top and bottom of the continuous conductor.

Figure A-24. Cross-Basin AEM Profiles from DWR Survey Area 1 and Deep Aquifers Study

The Arroyo Seco Cone and Forebay/Upper Valley Basement Rock Rise

The Deep Aquifers' southern boundary is defined by the Arroyo Seco Cone and the basement rock rise near the boundary of the Forebay and Upper Valley Subbasins. This is an area where the continuity of 400/Deep Aquitard is interrupted or impacted by the alluvial fans from both the Arroyo Seco River and Reliz Creek, as well as by fans from the Gabilan Range. Additionally, the basement rocks rise to form the Gabilan High, which contributes to a discontinuity in the 400/Deep Aquitard from increased erosion of the Paso Robles Formation.

The controlling data that determined this boundary are the AEM surveys (DWR, 2020; Deep Aquifer Study, 2023) and previously published reports and cross-sections (Feeney, 1994; Durham 1974; Brown & Caldwell, 2015). The AEM surveys revealed a unique relationship between the Salinas Valley sediments, which include the Paso Robles Formation, and both the Arroyo Seco Cone and alluvial fans from the Gabilan Range as discussed previously. Where resistivity data exist, they confirm the presence of deeply buried Paso Robles formation, overlain by different sediments and deposition from the Arroyo Seco Cone. The 400/Deep Aquitard is circled in a black dashed line on Figure A-25, and is shown to have these coarse, overlying, Arroyo Seco Cone sediments. Moving southward in the Basin, sediments from Reliz Creek and the Gabilan Range alluvial fans, shown circled with black dashed lines on Figure A-26, begin coalescing. Where these alluvial sediments are deposited coincides with structural changes in the basement rock. Structural changes begin occurring as the Basin progresses southward toward King City, shown on Figure A-27 through Figure A-29. Figure A-28 demonstrates a rise in the basement with the crystalline granite increasing in elevation and having less sedimentary rocks overlying them, benchmarked with the black line and arrow (Durham, 1974). Figure A-29 demonstrates the same with a decrease in deeper wells as the cross section moves south, or right (Brown & Caldwell, 2015). The lack of deeper wells is because the crystalline rocks generally do not produce water.

Published reports and cross sections map this structural shallowing southward, as well as minor outcrops of Paso Robles Formation in the foothills of the Sierra de Salinas, broken up by the presence of the Reliz Fault Zone. Combining the published reports and cross sections with the AEM data, the southernmost extent of the Deep Aquifers is delineated at the AEM cross sections with the clearest view and indication of continuous 400/Deep Aquitard in the subsurface. There are additional indications that the continuous 400/Deep Aquitard extends even further south, however these data are sparse and intermittent, and therefore classified into an uncertain region of the extent. The Deep Aquifers neither extend into the Upper Valley Subbasin, nor past the structural rise.

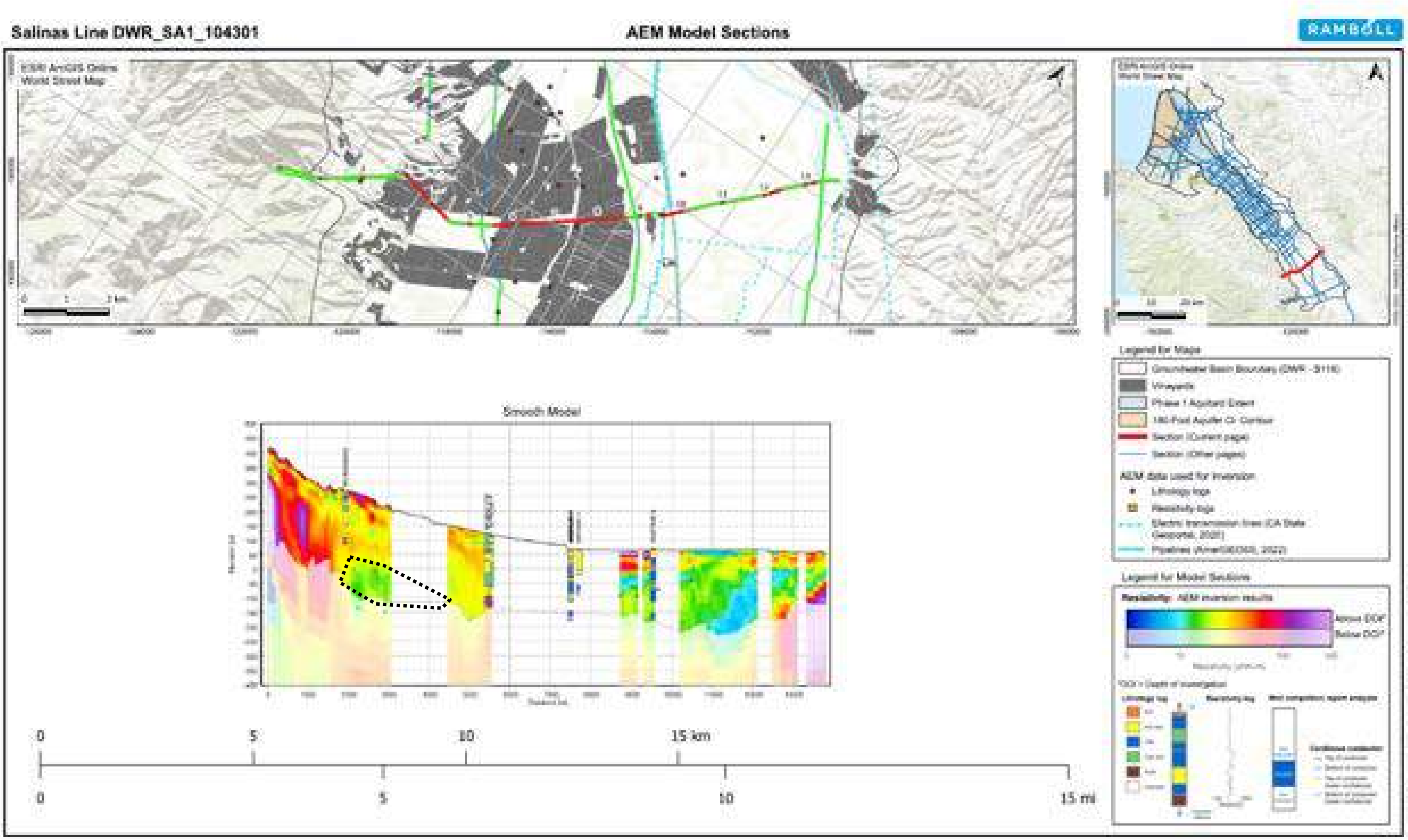

Figure A-25. Deep Aquifers Study AEM Profiles Showing the Continuous 400/Deep Aquitard under the Arroyo Seco Cone

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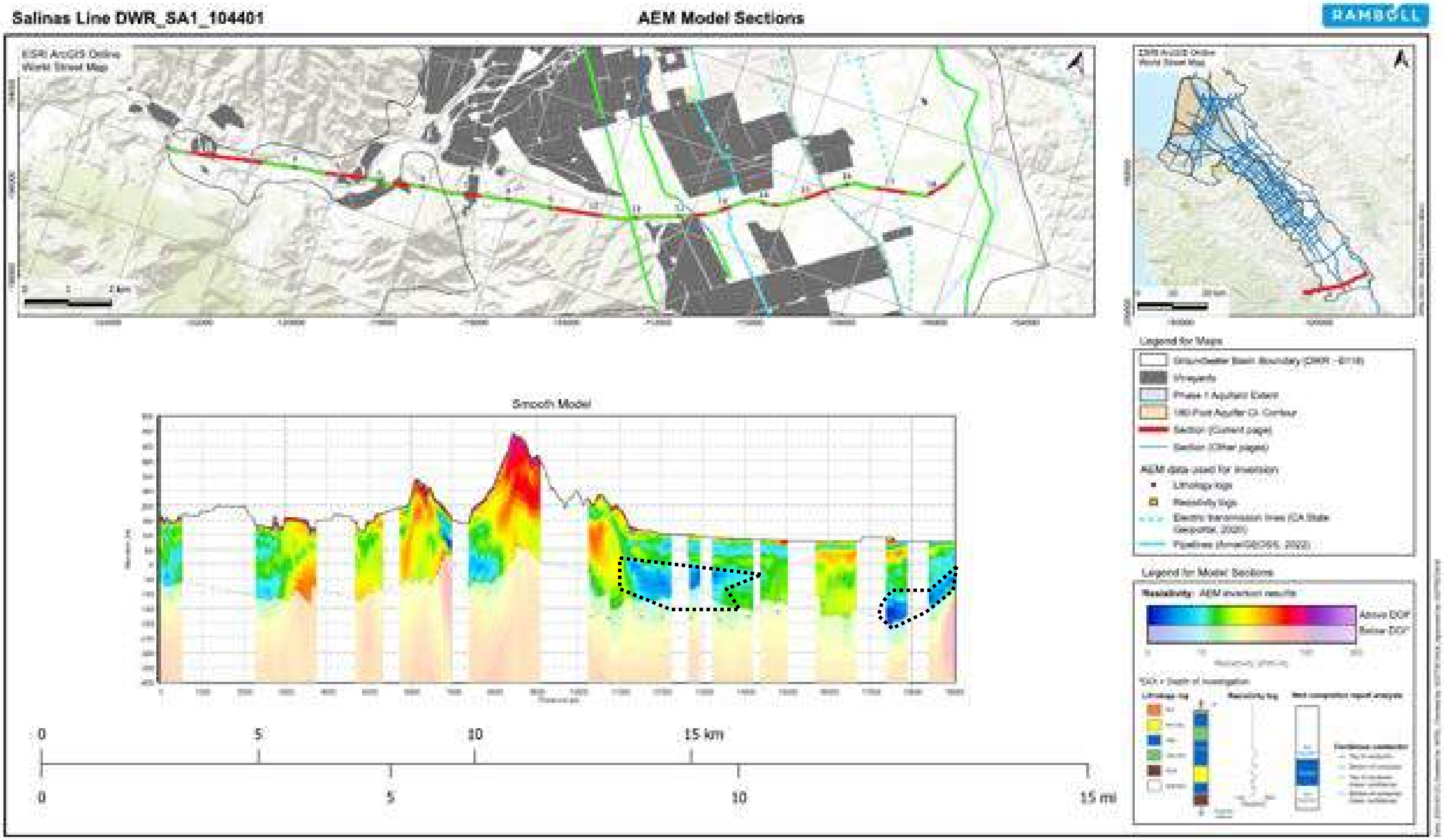

Figure A-26. Coalescing Alluvial Fans on the South Side of the Arooyo Seco Cone, Shown in DWR 2020 AEM Survey

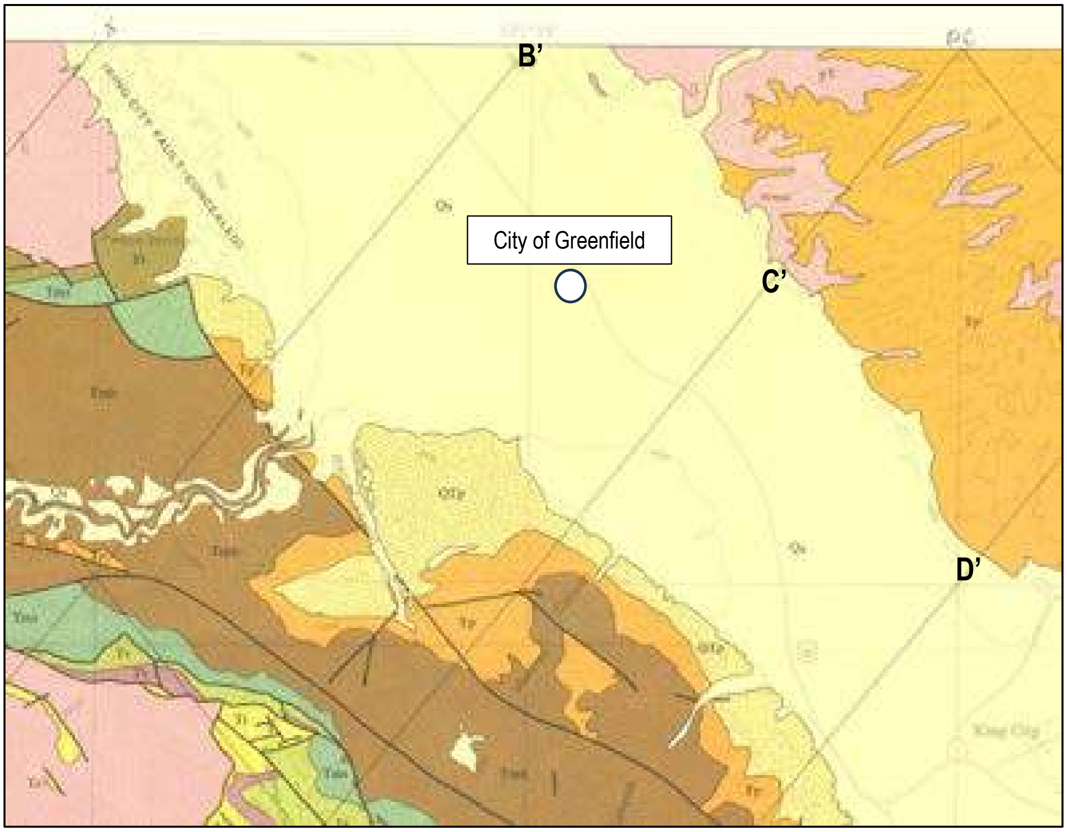

Figure A-27. Durham, 1974, Geologic Map with Selected Cross Sections to Demonstrate Gabilan High and Shallowing of Paso Robles Fm Moving South through the Valley

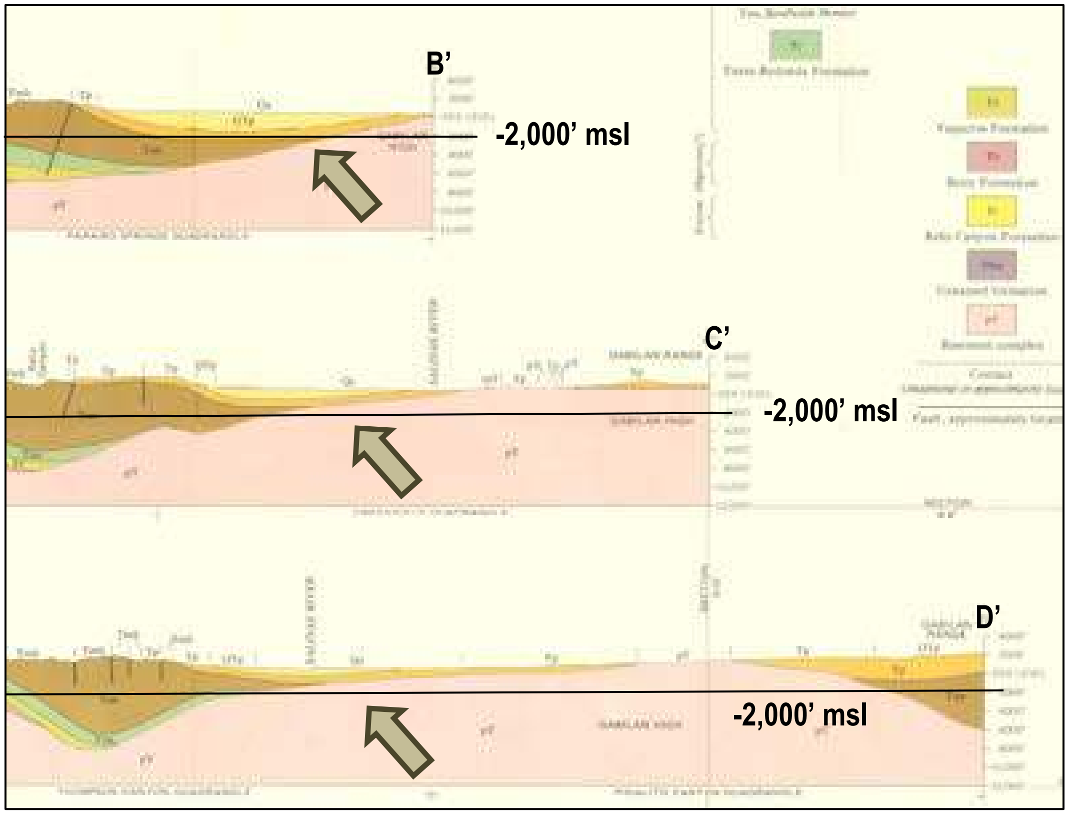

Figure A-28. Selected Cross Sections to Demonstrate Gabilan High and Shallowing of Paso Robles Formation (QTp) Moving South through the Valley (Durham, 1974)

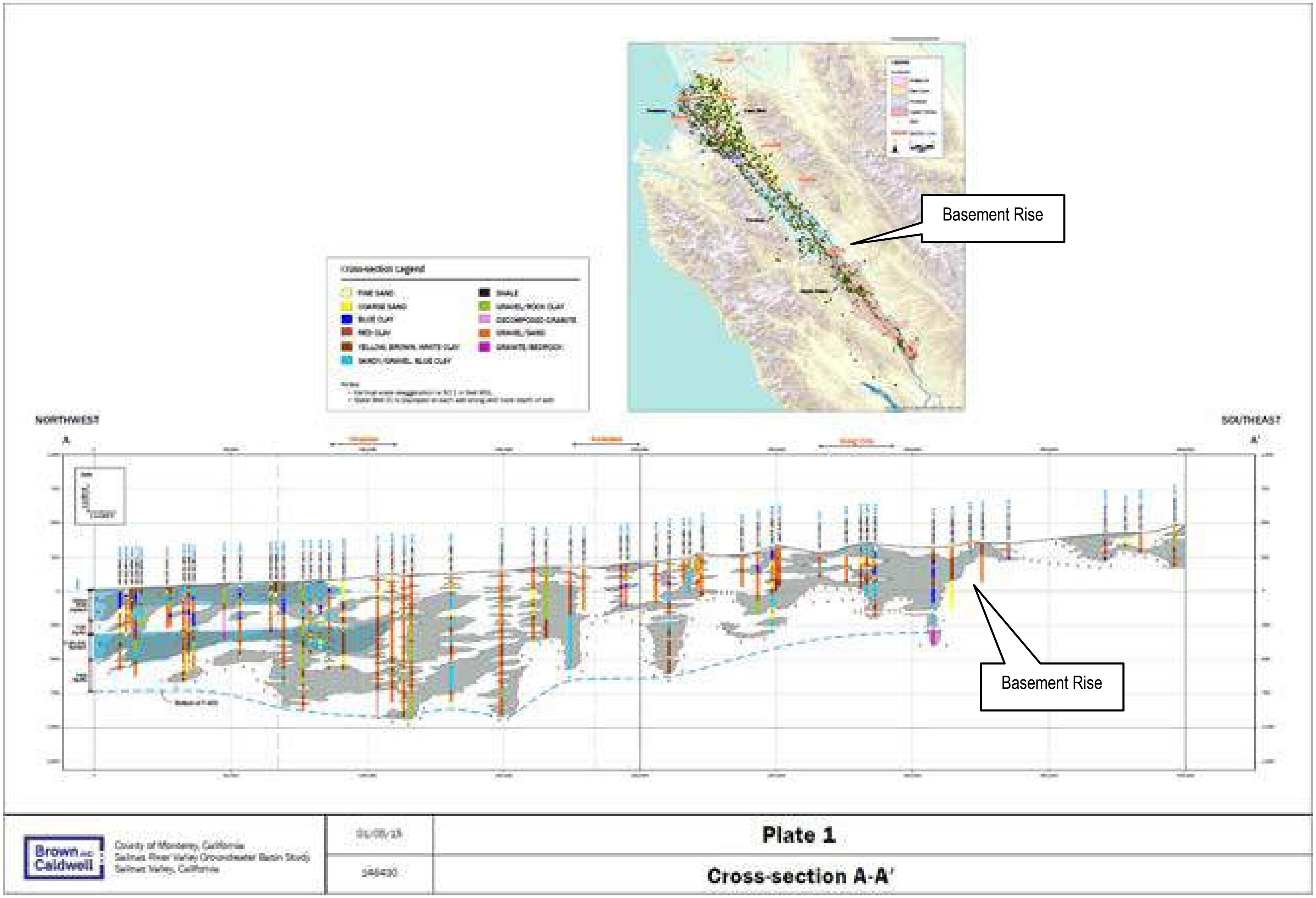

Figure A-29. Down Valley Cross Section by Brown and Caldwell Showing Structural Rise near King City

The Sierra de Salinas/Reliz Fault

The inland southwest boundary is defined by the presence of the Reliz Fault that displaces the Basin and corresponds to the contact between the Quaternary deposits and the low-permeability granitic and metamorphic basement rock of the Sierra de Salinas. This geologic contact creates a groundwater flow barrier and the southwestern hydrogeologic boundary of the Basin, as well as the Deep Aquifers. The controlling data that determined/focused this boundary are primarily the AEM surveys (DWR, 2020; Deep Aquifer Study, 2023).

An example AEM flight line showing the effect of the Reliz Fault is shown on Figure A-30. On this figure, the Reliz Fault zone lies between the 2 vertical dashed lines. A vertical displacement juxtaposing high resistivity features (shown as reds and purples) and lower resistivity features (shown as greens and blues) is evident in the fault zone. The red and purple features represent crystalline rocks of the Sierra de Salinas, and the adjacent green sediments between 250 and 400 meters bgs represent the 400/Deep Aquitard. The Salinas Valley Sediments, including the Paso Robles Formation, do not extend laterally across this displacement, and as such the displacement from the fault represents a discontinuity. Therefore, the Reliz Fault, as mapped by the California Geologic Survey, is the western lateral extent against the Sierra de Salinas.

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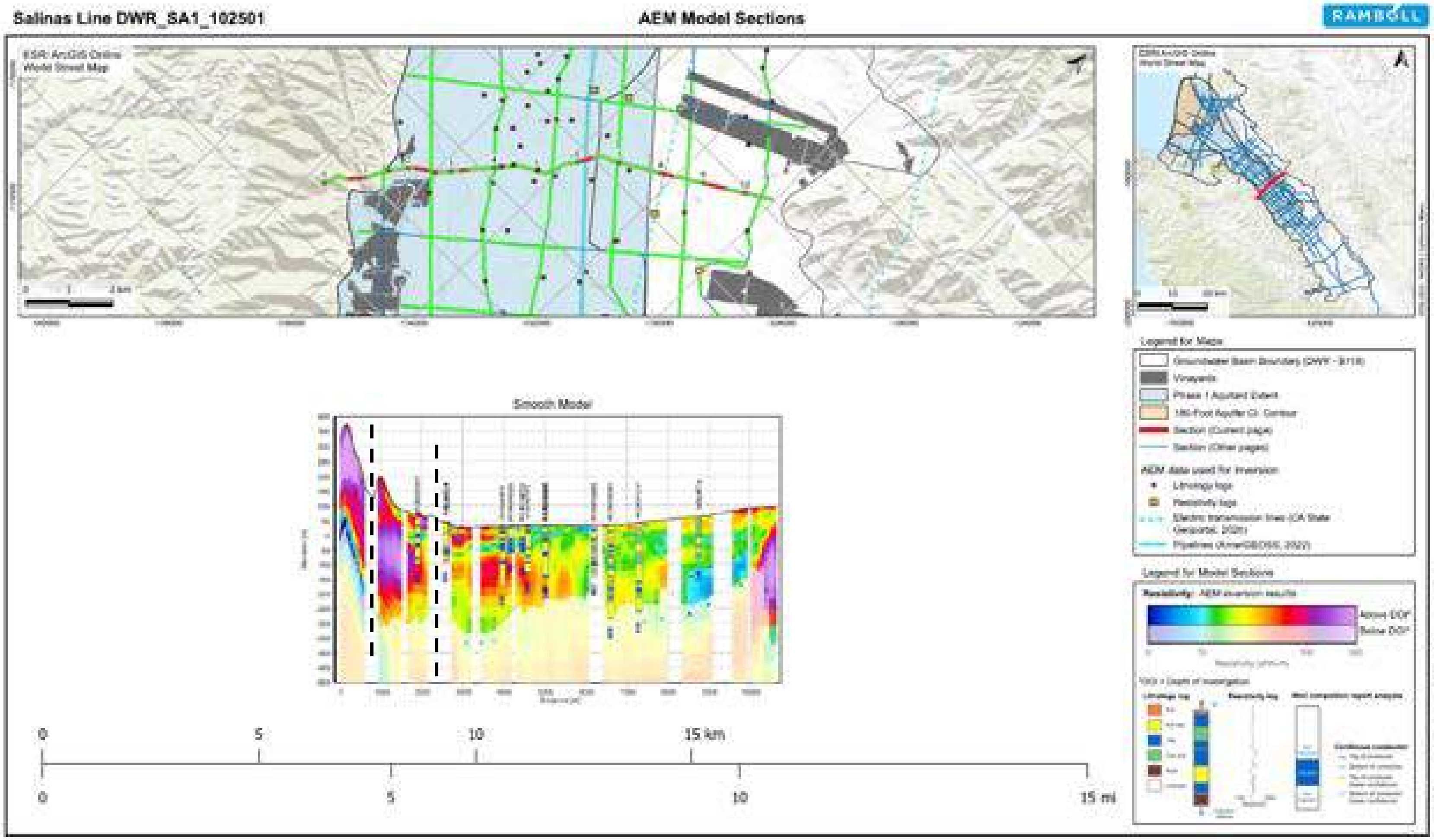

Figure A-30. AEM Profile Showing Reliz Fault Displacement on Left

South Coastal/Laguna Seca Anticline Axis

The coastal southwest boundary is defined by the Laguna Seca Anticline axis, which was formed during a period of structural uplift and deformation. The Anticline axis generally follows a semi-parallel orientation as Highway 68, traversing through the Seaside Basin and turning northward near the Toro Park region. The north-dipping arm is seen clearly in AEM data, and the 400/Deep Aquitard sediments are readily discernable from the Anticline into the main Salinas Basin. The Reliz Fault bisects the north-dipping arm, but does not act as a barrier to flow, as established by equipotential lines for the principal aquifers described in both the Monterey and 180/400-Foot Aquifer Subbasins' GSPs.

The controlling data that determined this boundary are the AEM surveys (MCWD, 2019, DWR, 2022, and Deep Aquifer Study, 2023), previously published reports and cross-sections (Feeney and Rosenberg, 2003; Hanson, 2002; Yates, 2005; HydroMetrics WRI, 2009; Feeney, 2007; Feeney, 2010; MacTec, 2005; Harding ESE, 2001), and wells with known screen intervals. The anticlinal structure is depicted in the modified A-A' cross section from the Deep Aquifer Investigation (Feeney and Rosenberg, 2003), modified in the *Seaside Groundwater Basin Watermaster Seawater Sentinel Wells Project, Summary of Operations* report (Feeny, 2007), and shown on Figure A-31. This figure shows how the Paso Robles Formation occurs continuously from the Reliz Fault over the anticline, terminating at the Ord-Terrace Fault. Geologic maps, cross-sections, and descriptions were helpful to begin the analysis; additional geophysical data refined the hydrogeological relationships with the regional geology.

The AEM surveys display a low-resistivity zone that follows the anticlinal structure (Figure A-32). This low resistivity zone is outlined with a black dashed line, and does not necessarily correspond with the geologic contacts shown on Figure A-31. The outlined low resistivity zone on Figure A-32 appears to be continuous with the low-resistivity 400/Deep aquitard in the Monterey and 180/400-Foot Aquifer subbasins. The low resistivity zone in these AEM surveys suggests a continuous aquitard from the Monterey subbasin up the north arm of the Laguna Seca anticline. Furthermore, the depth of this low-resistivity zone is supported by the locations of known wells' screened intervals.

The screened intervals for wells installed for the Seaside Basin are shown as grey horizontal bands on Figure A-32, and were helpful to correlate the subsurface geology with the subsurface hydrogeology. Overlaying these wells' screen intervals with the AEM data shows that many of these wells are screened below the continuous, low-resistivity aquitard within the Paso Robles Formation, and only a few screened above the aquitard. Notably, there are no wells screened within the aquitard, suggesting the aquitard is avoided when installing wells. Additionally, the Seaside model developed by HydroMetrics WRI in 2009 made note of historical observations of a thick, clay-rich zone within the Paso Robles Formation, and subsequently discretized it within the model.

The continuous low-resistivity zone shown on the AEM data and unscreened by most wells defines a continuation of the400/Deep Aquitard. This low resistivity zone does not necessarily terminate at the crest of the Laguna Seca Anticline, however it does change dip direction across the crest of the anticline. It is unclear from the AEM data if the deep aquifers sediments, shown in red on Figure A-32 extend south of the anticline crest. Therefore, to find a reasonable lateral extent with the structure, stratigraphy, and hydrostratigraphy all acting in concert, the axis of the Laguna Seca Anticline was selected as the southern coastal lateral extent of the Deep Aquifers.

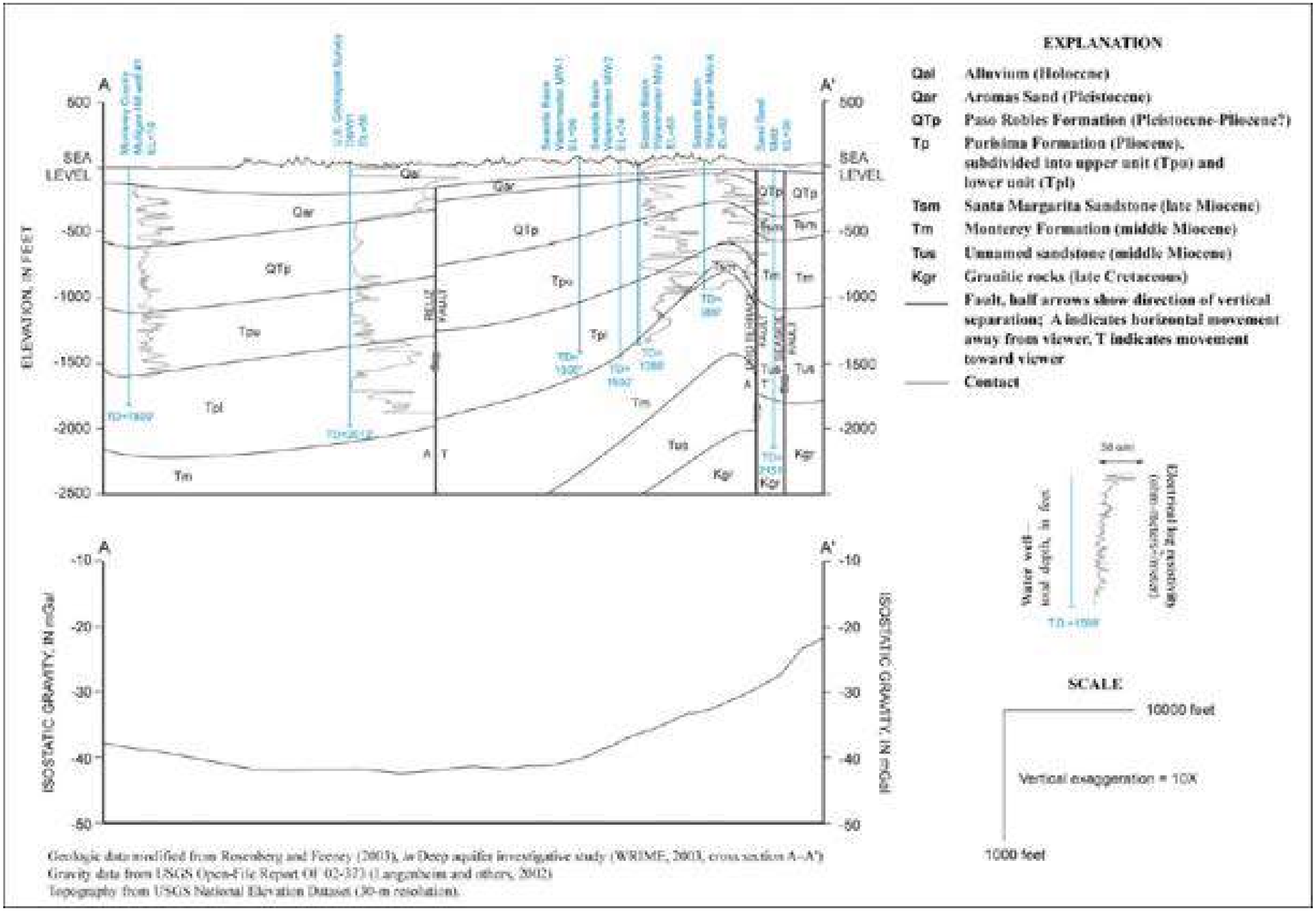

Figure A-31. Modified Feeney and Rosenberg, 2003 Cross Section A-A', Modified by Feeney, 2007

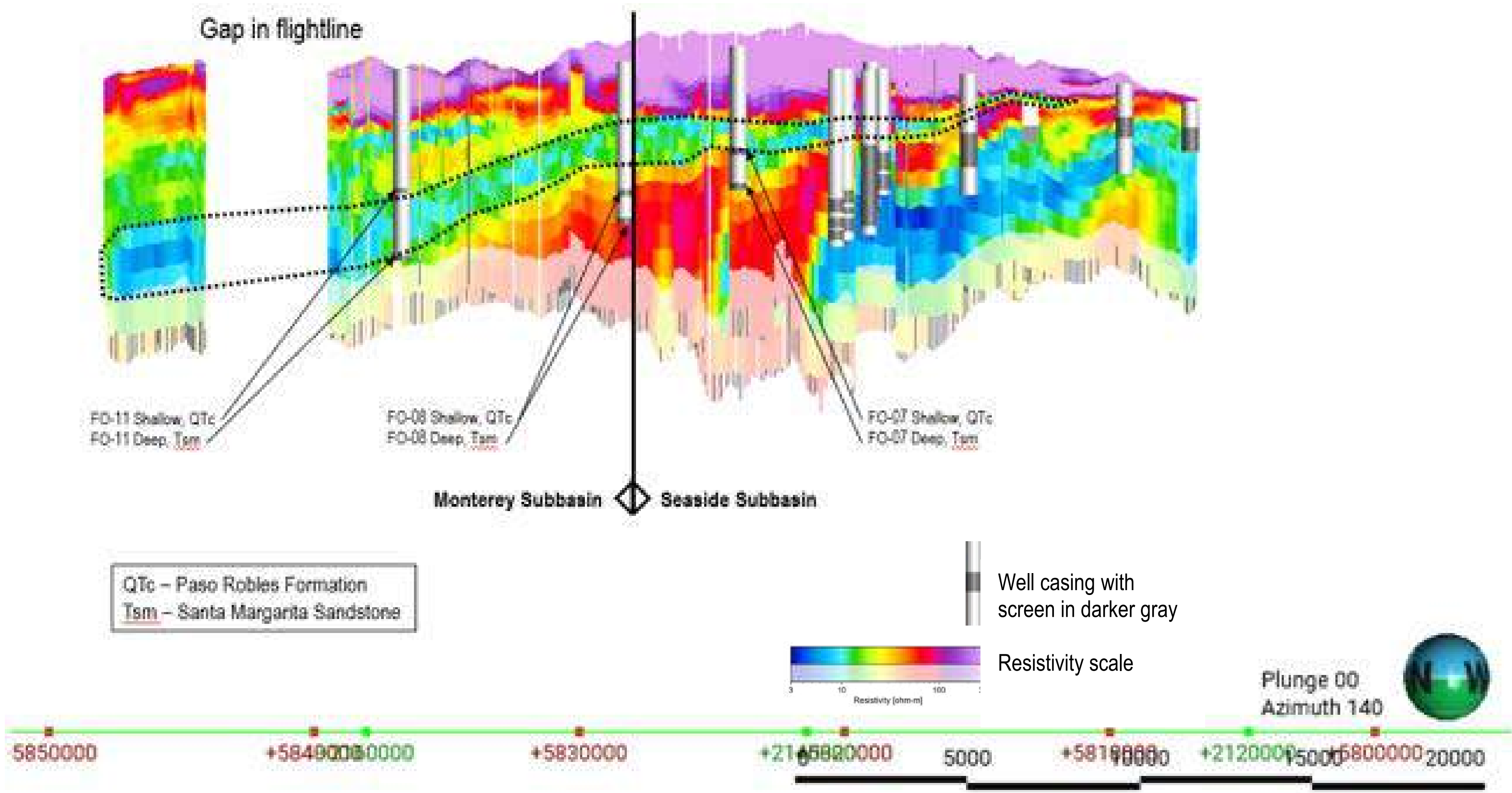

Figure A-32. 2022 DWR Coastal AEM survey Highighting the Hydrostratigraphy that Separates Sediment Types within the Paso Robles Formation

SUMMARY

The Deep Aquifers' extent is delineated by the extent of the continuous 400/Deep Aquitard as identified through a variety of data, including AEM surveys, WCRs, borehole e-logs, previously published reports and cross sections, and professional experience in the Basin. Through the synthesis of all data available for each area, the extent was determined based on multiple lines of evidence using overlapping or confirming data as much as possible. In certain areas, some data are weighed more heavily than others based on availability of data, overlapping/confirming data, completeness of data, and reliability of data. Much of the synthesis was built on existing knowledge. There are still areas of uncertainty, which are shown on Figure A-18. However, the areas of certainty delineated through this analysis have shifted the historical conceptual understanding of the Deep Aquifers' presence in the Basin. The data presented here are the best available data at the time of publication of this report.

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MONTGOMERY
& ASSOCIATES

Appendix B

Ramboll Geophysical Data Report: Salinas Valley Deep Aquifers AEM Survey Geophysical Report

Intended for
Montgomery and Associates

Document type
Data Report

Date
July 2023

Salinas Valley Deep Aquifers AEM Survey

Data Report

Bright ideas.
Sustainable change.

Salinas Valley Deep Aquifers AEM Survey

Data Report

Project name	**Salinas Deep Aquifers AEM Study**
Project no.	**1690025794**
Recipient	**Montgomery and Associates**
Document type	**Report**
Version	**3**
Date	**July 28, 2023**
Description	**This data report describes the acquisition, processing, inversion, and analysis of the AEM dataset acquired in the Salinas Valley to better understand the Deep Aquifers in the region. The report also provides a description of the existing well and AEM data compiled along the planned flight lines and its integration into the analysis.**

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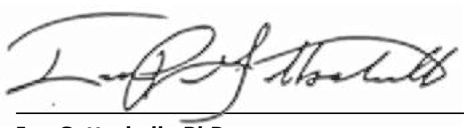
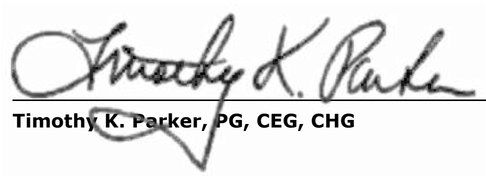


7/28/2023

Ian Gottschalk, PhD **Date**



7/28/2023

Timothy K. Parker, PG, CEG, CHG **Date**

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List of Abbreviations and Acronyms

400-FDA	400 Foot/Deep Aquitard
AEM	Airborne Electromagnetic
amsl	Above mean sea level
bgs	Below ground surface
DEM	Digital elevation model
DGPS	Differential global positioning system
DMS	Data management system
DOI	Depth of Investigation
DWR	Department of Water Resources
ft	Foot
GIS	Geographic Information System
km	Kilometer
L	Liter
LAS	Log-ASCII Standard
m	Meter
M&A	Montgomery and Associates
SCI	Spatially constrained inversion
SGMA	Sustainable Groundwater Management Act
TEM	Time-domain (or Transient) Electromagnetics
TEM	Time-domain electromagnetic

Project Team

The project team for the Salinas Deep Aquifers AEM Survey includes:

- **Ramboll** – responsible for coordination of the contractors and acquisition of AEM data, borehole data compilation, interpretation, and reporting and quality control of deliverables.
- **Geophysical Imaging Partners** – conducted daily quality control of the data during the flight operation, data processing and inversion, interpretation support, and assisted in report preparation.
- **SkyTEM –** responsible for the final planning and execution of the AEM survey.
- **Eclogite** – digitized a set of geophysical logs.

1. Introduction

In March 2023, Ramboll carried out a geophysical airborne electromagnetic (AEM) survey in Monterey County, California to support analysis by Montgomery and Associates (M&A) of the Deep Aquifers in the northern Salinas Valley. An important step in understanding the Deep Aquifers, expected to be encountered 750 ft or more below ground surface (bgs), is defining the overlying 400-Foot/Deep Aquitard (400-FDA). Data from AEM surveys contain information that can be used to identify clay-rich sediment, such as composes the 400-FDA. However, while multiple AEM surveys have been flown previously in the northern Salinas Valley, the depth of the 400-FDA is often below the depth at which these existing data provide useful information, and the paths along which AEM data were acquired southeast of Salinas have a wide lateral separation. The AEM survey conducted by Ramboll used a more powerful AEM system, which can image the subsurface to greater depths, and was designed to provide additional data coverage, especially south of Salinas. The central objective of the AEM survey was to determine the geometry of a continuous feature in the geophysical data with the depth and character expected of the 400-FDA.

The AEM method is a geophysical technique that measures the electrical resistivity of the subsurface from an airborne platform. The AEM system used in this survey includes a large hexagonal frame containing the geophysical equipment suspended by cable beneath a helicopter about 100 feet above the ground surface along a defined flight path. During the survey, the system sends a weak, pulsed electromagnetic signal that, in most alluvial subsurface environments, can penetrate hundreds of meters into the subsurface. The returning signal is measured by receivers in the frame as a voltage timeseries. The resulting data provide a measurement of the electrical resistivity of the subsurface with depth, which can be related to material properties of the subsurface such as groundwater salinity, sediment type, and degree of water saturation. The AEM system in this survey was customized to extend the depth of penetration beyond that of typical AEM surveys, with the goal of obtaining information relevant to the understanding of the Deep Aquifers.

The planned flight lines for the AEM survey are shown as black lines Figure 1-1. Most of the survey was conducted in the 180/400 Foot Aquifer, East Side Aquifer, and Forebay Aquifer Groundwater Subbasins, with some of the survey overlapping the Monterey, Langley Area, and Seaside Groundwater Subbasins. The survey flight lines have a high degree of overlap with the extent of the Phase 1 400-FDA (blue polygon), as determined by M&A in their Deep Aquifers Study (Montgomery & Associates, 2022). The survey flight lines largely avoid the coastal Salinas Valley where the depth to which the AEM method can obtain useful information is reduced due to elevated chloride concentrations, which have been recorded in the 180-Foot Aquifer (orange polygon) and the 400-Foot Aquifer (not pictured).

This report presents the methodology, results, and analysis related to the acquired AEM data and integration of the existing data from the survey area. The report describes the following topics:

- compilation of existing borehole and existing AEM data
- operation of the AEM survey
- processing and inversion of the AEM data
- analysis and results of the existing data and newly acquired AEM data
- contents of the deliverables attached to this report.

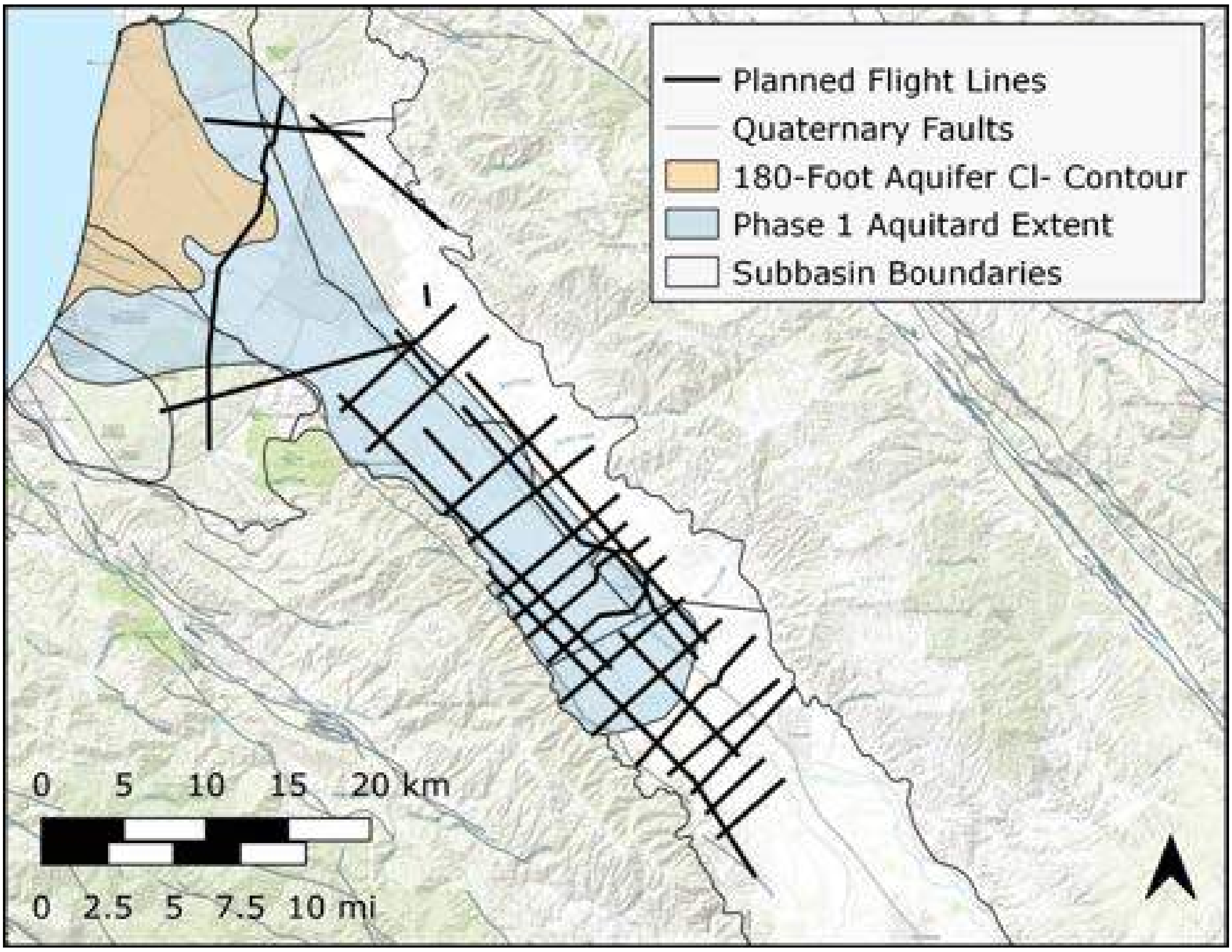


Figure 1-1 Survey area and planned flight lines for the Deep Aquifers survey.

2. Existing Data Compilation

Independent datasets, including borehole lithology, borehole resistivity, and pre-existing geophysical data, are of critical value to the interpretation and corroboration of AEM data. As part of this project, existing data were compiled to support the analysis of the newly acquired AEM data. The goal of the data compilation was to assemble data that could contribute independent information on the subsurface resistivity structure, especially at depth. The data types compiled were lithology and resistivity data from boreholes, and resistivity estimates from other AEM surveys.

This section provides a description of the existing data compilation process. The compiled data are provided as deliverables (see Section 7 for format). A graphical display of the borehole geophysical data is presented in Appendix 1.

Data from boreholes within 5 km of the planned AEM flight lines were integrated into the analysis and interpretation. The data were processed and integrated into a data management system (DMS) for this project. All coordinates were transformed into NAD 83 California Albers projection (EPSG 3310).

2.1 Datasets

The existing data in used in this project were compiled from four sources and are outlined in the following four sections.

2.1.1 Deep Aquifers Study Phase 1 Borehole Dataset and Resistivity Logs

A lithology dataset, compiled by M&A for the Deep Aquifers Study Phase 1, was made available for analysis in this project. The dataset includes lithology, screen interval information, and interpretations of the top and bottom of the 400-FDA from the deep boreholes in the survey area. Additionally, a set of borehole resistivity logs were made available, sourced from multiple datasets.

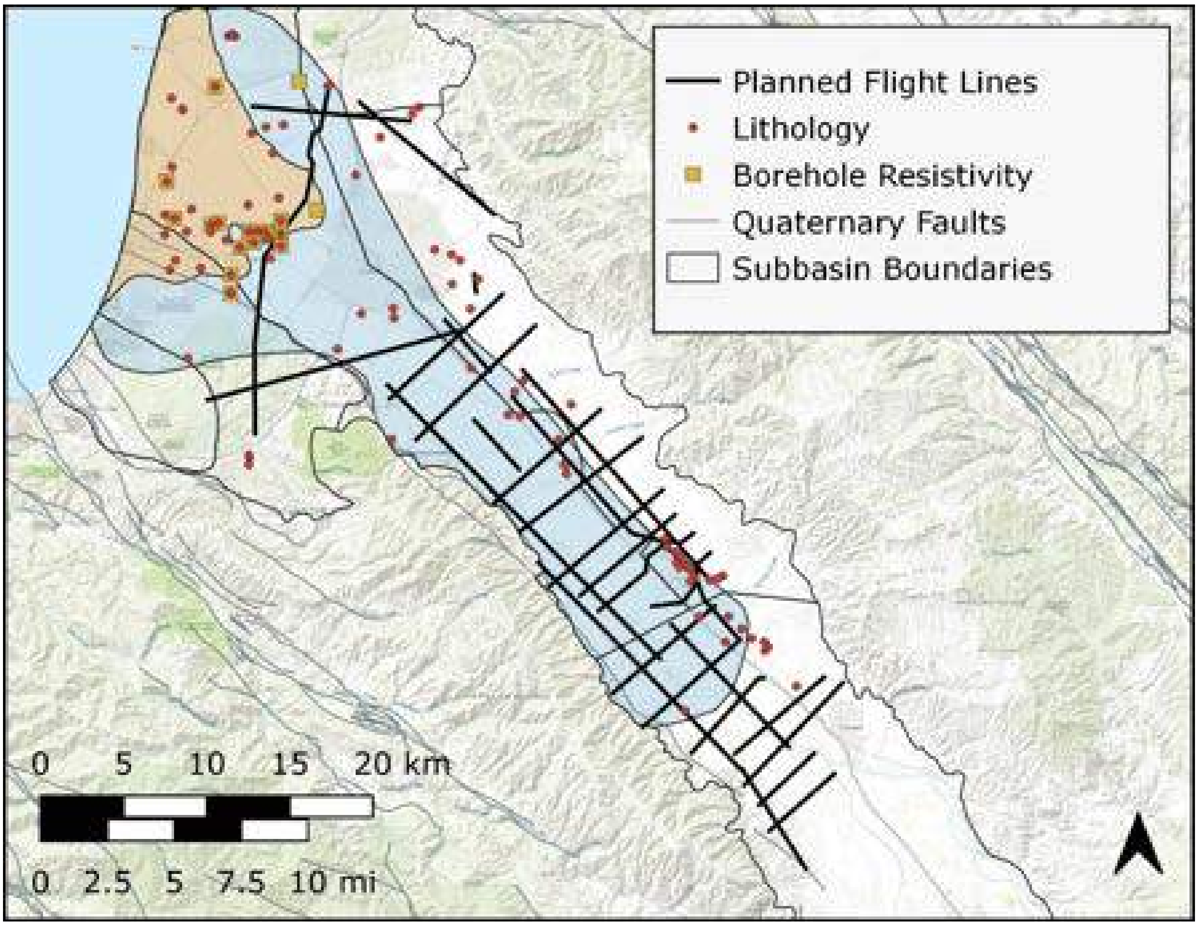


Figure 2-1 Existing data used from the Deep Aquifers Study Phase 1 Borehole Dataset and Resistivity Logs.

2.1.2 2021 and 2022 DWR Statewide AEM Surveys

The California Department of Water Resources (DWR) is conducting a series of AEM surveys in groundwater basins across California to improve the understanding of groundwater aquifer structure in support of the implementation of the Sustainable Groundwater Management Act. The AEM surveys include the compilation of existing borehole data, namely lithology, borehole resistivity, water quality, and water level data. The data were compiled from wells along the planned flight lines before they were flown.

The DWR Statewide AEM Surveys intersecting the survey area for the current project come from Survey Area 1, completed in August 2021, which mainly covers the Salinas Valley east of Salinas south to Paso Robles Area Groundwater Subbasin, and Survey Area 8, completed in November 2022 and covers the coastal Salinas Valley south, west, and north of Salinas. The flight lines corresponding to Survey Areas 1 and 8 are shown in Figure 2-2.

Borehole lithology and geophysical data from the DWR Statewide AEM Surveys were also complied for use in this project; the locations of these borehole data are shown in Figure 2-2. All borehole data compiled come only from Survey Area 1, since the borehole data compiled for Survey Area 8 have not been published yet.

All AEM and compiled borehole data from the DWR Statewide AEM Surveys are publicly accessible and are hosted, along with reports detailing existing data compilation, the AEM surveys, data processing, inversion, and further products, at the following website: https://data.cnra.ca.gov/dataset/aem.

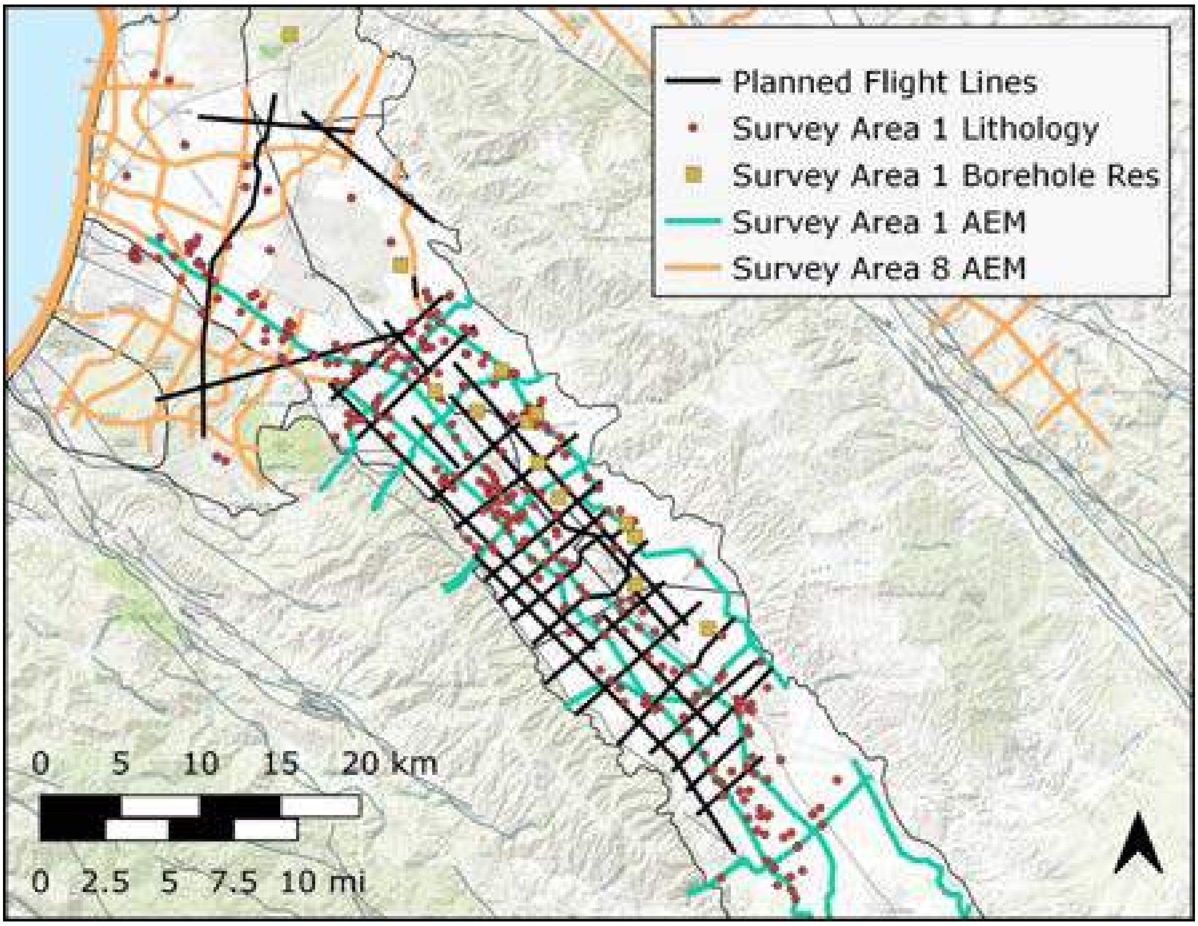


Figure 2-2 Existing data used from the DWR Statewide AEM Surveys. Survey Area 8 borehole data are not yet available.

2.1.3 2017 and 2019 Coastal Salinas Valley AEM Surveys

Two previous AEM surveys were flown in the coastal Salinas Valley, extending from the coast to the city of Salinas, shown in Figure 2-3. The two surveys, conducted in 2017 and 2019, contain nearly identical flight paths, although the 2019 survey lines (grey in Figure 2-3) extend farther south into the Seaside Groundwater Subbasin than do the survey lines from 2017 (blue lines in Figure 2-3). The AEM system used in the 2019 survey is the SkyTEM 312 system, which is the same as used in the DWR Statewide AEM Surveys. The 2017 survey used a SkyTEM 304 system, which, as compared to the SkyTEM 312 system, has a smaller magnetic moment and thus a shallower average depth of investigation. The acquisition and interpretation of the 2017 dataset is detailed in Gottschalk et al. (2020) and in the following report: http://svbgsa.org/wp-content/uploads/2020/09/Stanford-AGF_2017-AEM-Study-Report_Final.pdf, and the results of the 2019 dataset can be found in the following appendix: http://svbgsa.org/wp-content/uploads/2020/09/3.-Appendix-1-2D-Profiles-2019-Rho-CLconc-Lith-ELogs-Comparison.pdf

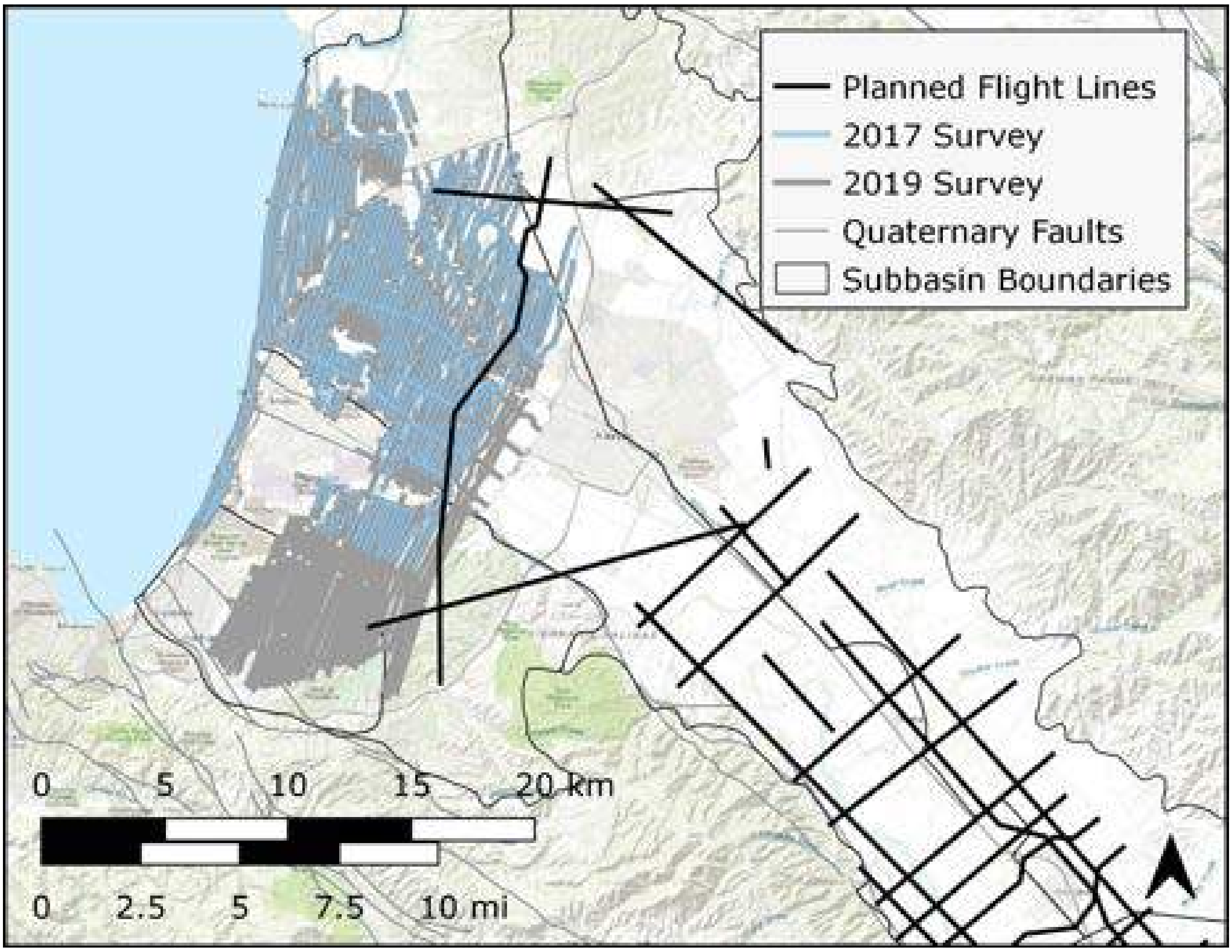


Figure 2-3 Flight lines from the coastal Salinas Valley AEM surveys.

2.1.4 Digitized Borehole Geophysical Logs

A set of 18 borehole resistivity logs were digitized to support this project. The locations of the selected resistivity logs were near planned flight lines and correspond to areas of higher uncertainty about the 400-FDA, and areas without nearby borehole resistivity data. The resistivity logs were selected from well completion reports in the form of scanned PDF documents. The scanned documents were converted to the tabulated, Log ASCII Standard (LAS) format. Figure 2-4 shows the locations of the digitized borehole resistivity logs.

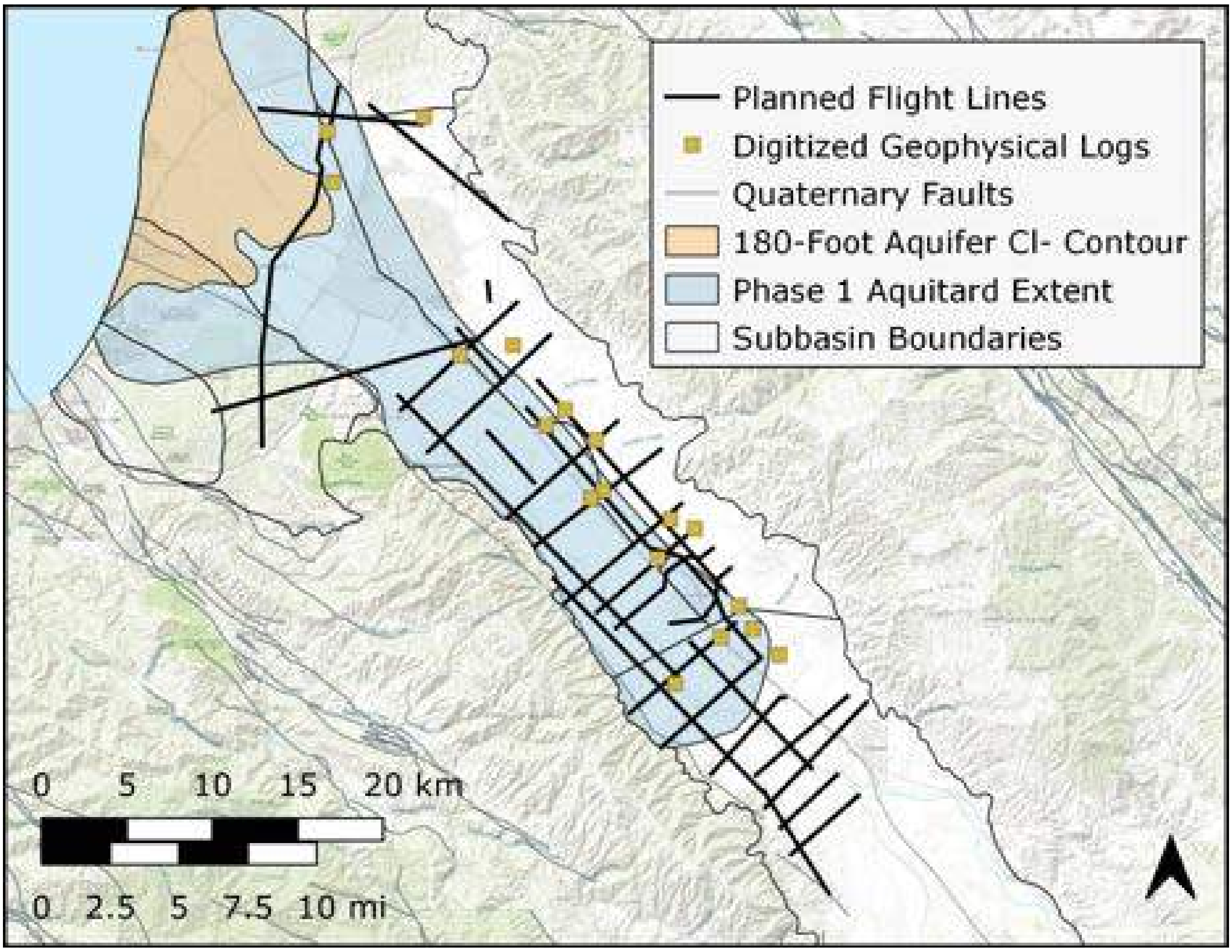


Figure 2-4 Borehole resistivity logs digitized as part of this project.

2.2 Lithology Data Processing

Lithology data were available from the Deep Aquifers Study Phase 1 Borehole Dataset and from Survey Area 1 of the DWR Statewide AEM Surveys. The lithology data from each dataset were processed to merge the two datasets for the current project. Figure 2-5 shows the distribution of borehole depths from the two datasets. Many more boreholes are available from the DWR AEM Surveys dataset; however, almost all boreholes are shallower than those in the Deep Aquifers Study Phase 1 Borehole Dataset.

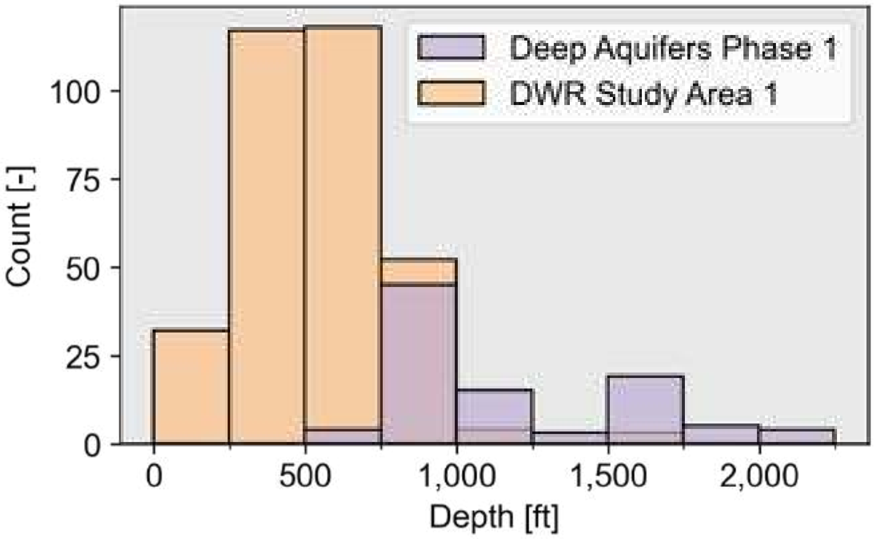


Figure 2-5 Histogram of borehole depth from analyzed well completion reports.

A final list of lithology descriptors was established for all lithology data analyzed in support of locating the 400-FDA. The final list contains the descriptors from the Deep Aquifers Study Phase 1 Borehole Dataset and two additional descriptors from the DWR Statewide AEM Surveys. The final list is shown below:

- clay
- clay and
- not clay
- soil
- rock
- unknown

The lithology descriptors in the Deep Aquifers Study Phase 1 Borehole Dataset begin at approximately 450 ft bgs and continue to the bottom of each borehole. Lithology data are grouped into five descriptors: "clay", "clay and", "not clay", and "rock"; the definition of each descriptor can be found in Montgomery & Associates (2022). For each borehole, the shallowest lithology interval, corresponding to shallow depths where the lithology descriptors were not logged, was set to "unknown".

Lithology data from boreholes in the DWR Statewide AEM Surveys, which span a much larger area than the current survey, were included for consideration if within 5 km of the planned flight lines for the current AEM survey. The lithology data include both a lithology description transcribed from the well completion report and multiple sets of categorized descriptors. The "texture refined" descriptor set focuses on the lithology texture and contains a similar degree of specificity as they were mapped onto the descriptors used in this project. Table 2-1 shows the mapping of each category.

Lithology intervals described as "rock" with an original transcription containing the word "shale" were reclassified if the interval was considered not to refer to consolidated rock (shale), but rather to compacted sediment (clay). Of the evaluated intervals, 11 were reclassified to "clay", 2 to "not clay", and 3 to "clay and". This change was made to accommodate various historical descriptions that may not be accurate when viewed in the light of updated data and improved geologic knowledge of the area.

Table 2-1 Mapping from the lithology descriptors used in the DWR AEM Surveys lithology data to the lithology descriptors used in this project. *Each descriptor containing the word "shale" and classified as "rock" was evaluated as to whether it corresponded to consolidated rock or clay.

DWR AEM Surveys descriptor	Reclassified descriptor
fine	clay
fine with coarse	clay and
coarse with fine	not clay
coarse	not clay
soil	soil
unknown	unknown
rock	rock*

The lithology data from multiple boreholes in the DWR Statewide AEM Surveys dataset appeared to be duplicated in the Deep Aquifers Study Phase 1 Borehole Dataset. Although the naming convention is not the same between the datasets, potential duplicates were identified by the proximity between recorded borehole positions (less than 5 m apart) and an identical or near-identical depth discretization and description of the lithology intervals. For each potential duplicate, the lithology intervals from the Deep Aquifers Study Phase 1 Borehole Dataset were given preference.

2.3 Borehole Resistivity Logs

Borehole resistivity logs were available from three datasets: the Deep Aquifers Phase 1 Borehole Dataset and Resistivity Logs, Survey Area 1 of the DWR AEM Statewide Surveys, and the Digitized Borehole Geophysical Logs. The logs from each dataset were available in a LAS or similar text format. In the case that the log did not conform to the LAS format, slight modifications were made to get the file into the standard format.

2.4 Existing AEM Data

AEM data from four previous surveys were available in the survey area, listed in Table 2-2. The surveys come from two datasets: the DWR Statewide AEM Surveys and the Coastal Salinas Valley AEM Surveys. The two AEM datasets from the DWR Statewide AEM Surveys were used for further analysis in the project because each dataset covers a complementary area and overlaps the survey area. Of the two datasets from the Coastal Salinas Valley AEM Surveys dataset, only the 2019 dataset was used for further analysis in this project. This decision was made because little additional value was expected from using the 2017 dataset in addition to the 2019 dataset: the flightline coverage of both datasets is very similar (see Figure 2-3), the 2017 dataset is older than the 2019 dataset, and the same equipment was used in the 2019 dataset and in the DWR Statewide AEM Survey Areas 1 and 8.

The resistivity values resulting from inversion were imported into the Aarhus Workbench software for analysis.

Table 2-2 Existing AEM datasets.

AEM Dataset	Survey	AEM System	Region	Used in analysis
DWR Statewide AEM Surveys	Survey Area 1	SkyTEM 312	Salinas Valley and Paso Robles Basins	Yes
	Survey Area 8	SkyTEM 312	Coastal Monterey Bay	Yes
Coastal Salinas Valley AEM Surveys	2017 Survey	SkyTEM 304	Coastal Salinas Valley	No
	2019 Survey	SkyTEM 312	Coastal Salinas Valley	Yes

3. Deep Aquifers AEM Survey

This section provides a description of the methodology used for the AEM data acquisition, survey objectives, and procedures taken for flight planning. A more detailed description of the survey and SkyTEM system specifications can be found in Appendix 2.

3.1 AEM Method

3.1.1 AEM Principles

The AEM method deploys the time-domain electromagnetic (TEM) method on an airborne platform. The TEM method is based on the principle of inducing electrical currents into the subsurface and receiving Earth’s response over a short period of time. During each transient measurement, direct current is conveyed through the transmitter loop, which, after a very short time, is abruptly turned off. This abrupt turn-off induces electrical currents (called eddy currents) in the subsurface that in return, generates secondary magnetic fields that decay with time. With depth, the area in which currents are induced expands, such that a larger region of the subsurface is sampled with depth. The decaying magnetic fields are measured using the receiver coils as a voltage timeseries, also referred to as a sounding. An optimization algorithm, called inversion, is then applied to the processed data to yield estimates of the subsurface resistivity structure, called resistivity models.

The TEM system can be deployed on the ground surface for stationary measurements or carried on moving platforms such as sleds, boats or, in the case of AEM, carried by a helicopter or airplane. Figure 3-1 provides an image of an AEM system operated by SkyTEM, similar to the one used in the current project.

An example of a single sounding of AEM data and a corresponding resistivity model of the subsurface is shown in Figure 3-2. During the inversion, the entire AEM dataset is inverted together and the resistivity model for each sounding is constrained. This is done by introducing a dependency in between models for neighboring soundings, as discussed in Section 4.2.

More information on the physical principles of the TEM method can be found in Ward and Hohmann (1988), Schamper et al. (2013), and in Appendix 2. A detailed description of the SkyTEM/AEM system used in this survey can be found in Section 3.2.1 and Appendix 2.

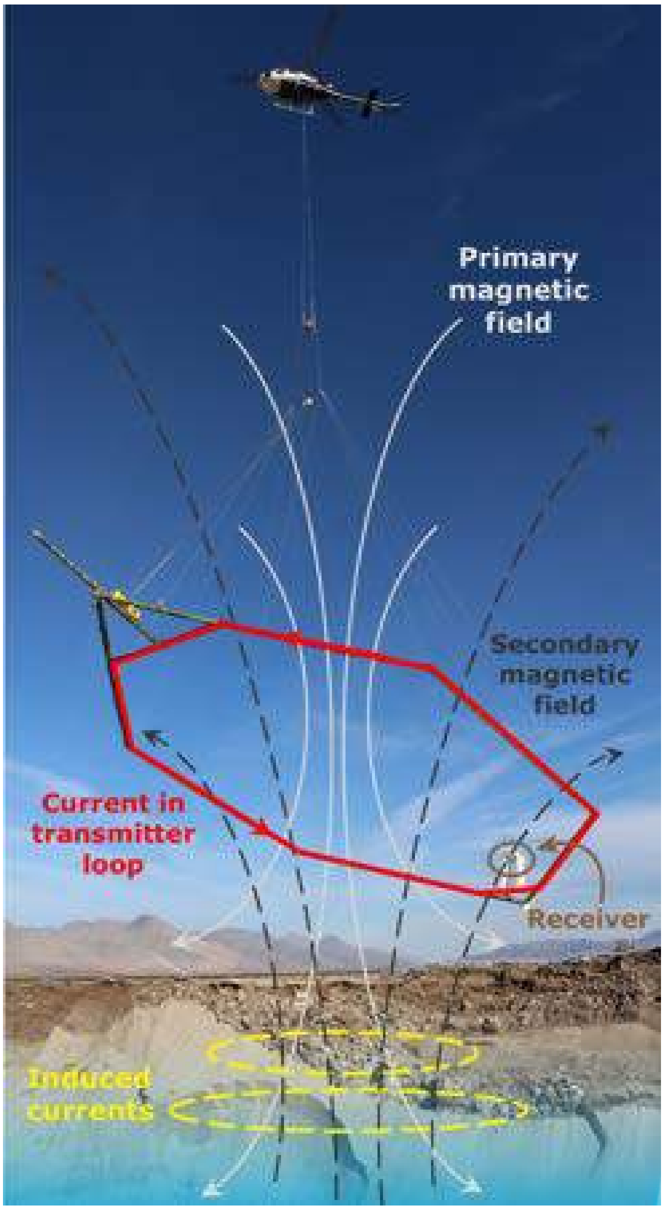


Figure 3-1 AEM Survey Schematic including the transmitter loop (current in red), the primary magnetic field (in grey), the induced subsurface currents (in yellow), and subsurface response (in dashed black lines) which is picked up by the system receiver (circled in brown).

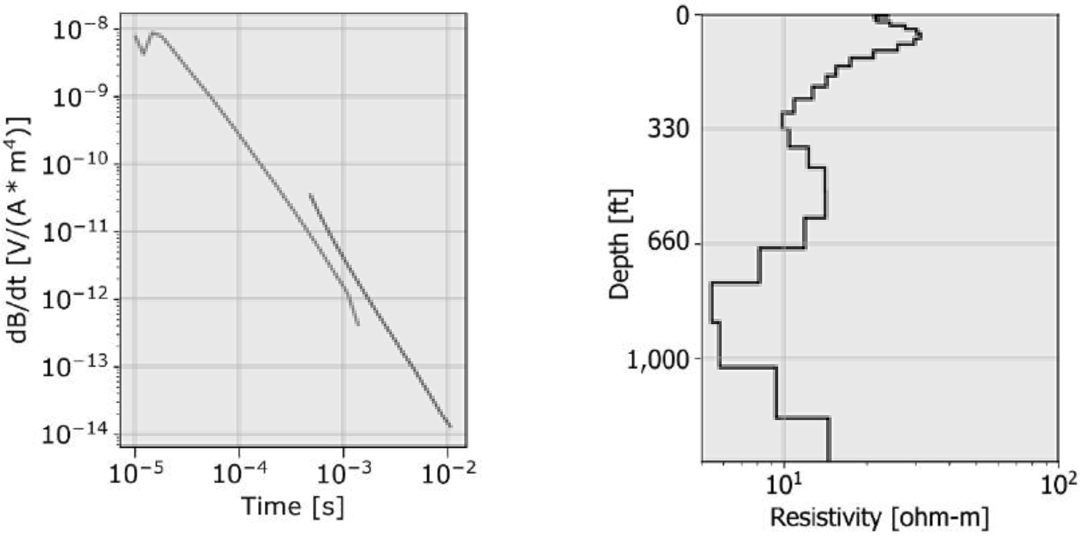


Figure 3-2 Example of a single sounding of acquired AEM data and the resulting resistivity model. Left: acquired AEM data (change in magnetic field as a function of time). Right: resulting resistivity model, showing the resistivity from the ground surface to a depth of 350 meters (1,150 feet).

3.1.2 Rock-Physics Relationship

The resistivity values estimated using the AEM method provide value for groundwater management because of the relationship between electrical resistivity and subsurface properties of interest. These include the degree of saturation, groundwater salinity, and lithology. This relationship is known as the rock-physics relationship. Generally, resistivity will decrease with an increase in fine sediment, salinity, and saturation. The relationship between resistivity values, lithology, and salinity can be seen in Figure 3-3, where the resistivity range corresponding to gravel and sand is higher than that of glacial tills and higher still than that of clays. Similarly, saltwater has a much lower resistivity than does freshwater. Consolidated rocks such as granite will typically have very high resistivities. Shales, on the other hand, can take on a wide range of resistivity values. In this project, variations in water saturation are not considered since the deep subsurface considered for analysis is assumed to be below the water table.

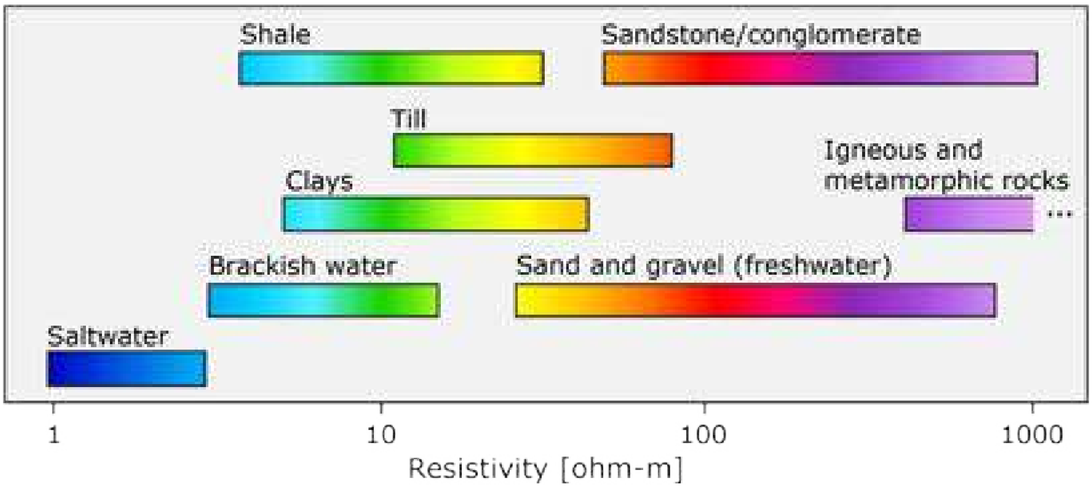


Figure 3-3 General relationship between resistivity and subsurface materials: type of rock, sediments, and water salinity. Modified from Palacky (1987).

3.1.3 Resistivity Color Scale

The wide range of resistivity values spanned by each bar in Figure 3-3 (most spanning over an order of magnitude) underscores the variable and site-specific nature of the relationship between resistivity and earth materials. Locally variable conditions can cause coarse sediments to have higher resistivity in some areas than in others, and mixtures of sediments (e.g., glacial till) result in resistivity values between those of coarse and fine. Thus, the choice of color scale for the presentation of all resistivity results should reflect the span of resistivity values found at the specific site.

For the resistivity values displayed in this report, a color scale was chosen with resistivity values ranging from 3-300 ohm-m to represent the resistivity variations seen in AEM data from the survey area. The color scale varies on a logarithmic scale, which is appropriate for visualizing the subsurface resistivity, which often varies over orders of magnitude (Figure 3-3).

The scale bar is shown in Figure 3-4.

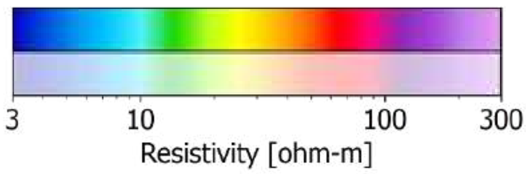


Figure 3-4 The resistivity color scale used in this study for presentation of all resistivity AEM results in this report.

3.2 AEM Survey Flight Line Planning

The flight lines for the AEM survey were preliminarily prepared by M&A working with Ramboll, considering the Phase 1 Extent of the 400-FDA and DWR Survey Area 1 flightlines. Ramboll, SkyTEM and Sinton Helicopters conducted a final review of the planned flight lines using aerial photos from Google Earth and aeronautical charts to identify possible safety considerations in relation to:

- Land use, including built up areas that would need to be avoided, and vineyards that contain metal in the trellises that interferes with the AEM signal

- Trees and forested areas that the pilot either would need to navigate around or climb in altitude while flying over
- Towers, power lines, and other infrastructure that the pilot either would need to navigate around or climb in altitude while flying over
- Major roads that the pilot would need to navigate around
- Restricted air space
- Restricted areas due to environmental sensitivities

Taking as input the preliminary flight lines, SkyTEM prepared a final flight line map (Figure 1-1), after conducting a safety review of the flight lines and landing zone bases (small airports) that were identified for survey logistics, equipment checks, data downloads, and fueling.

3.3 AEM Survey Equipment and Instrumentation

The helicopter-borne SkyTEM 312HPM time-domain electromagnetic system was used during this survey. The AEM instrumentation consists of a transmitter loop, two receiver coils, two inclinometers, two altimeters, and two differential global positioning system (DGPS) units (for more information, see Appendix 2).

The AEM system is carried as a sling load, suspended 40 m (120 ft) beneath the helicopter and flown 30-50 m (98-164 ft) above the land surface (Figure 3-5) while flying at a ground speed of 60-80 kph (37–50mph). The system is designed for hydrogeological, environmental, and mineral investigations. The SkyTEM 312HPM system has a transmitter loop area of 342 m^2 (3,681 ft^2) contained within a hexagonal frame suspended beneath the helicopter. The transmitter contains 12 turns making the effective area of loop 4,104 m^2 (44,172 ft^2).

In addition to acquiring electromagnetic data, which provide information about the resistivity structure of the subsurface, the system also collects magnetic data that are primarily used for mapping magnetic anomalies, fractures, and faults. Auxiliary data are also recorded and include GPS data for positional accuracy, inclinometer data for the pitch and roll of the system, laser altimeter data for elevation, and video for a record of the ground surface along the flight path.

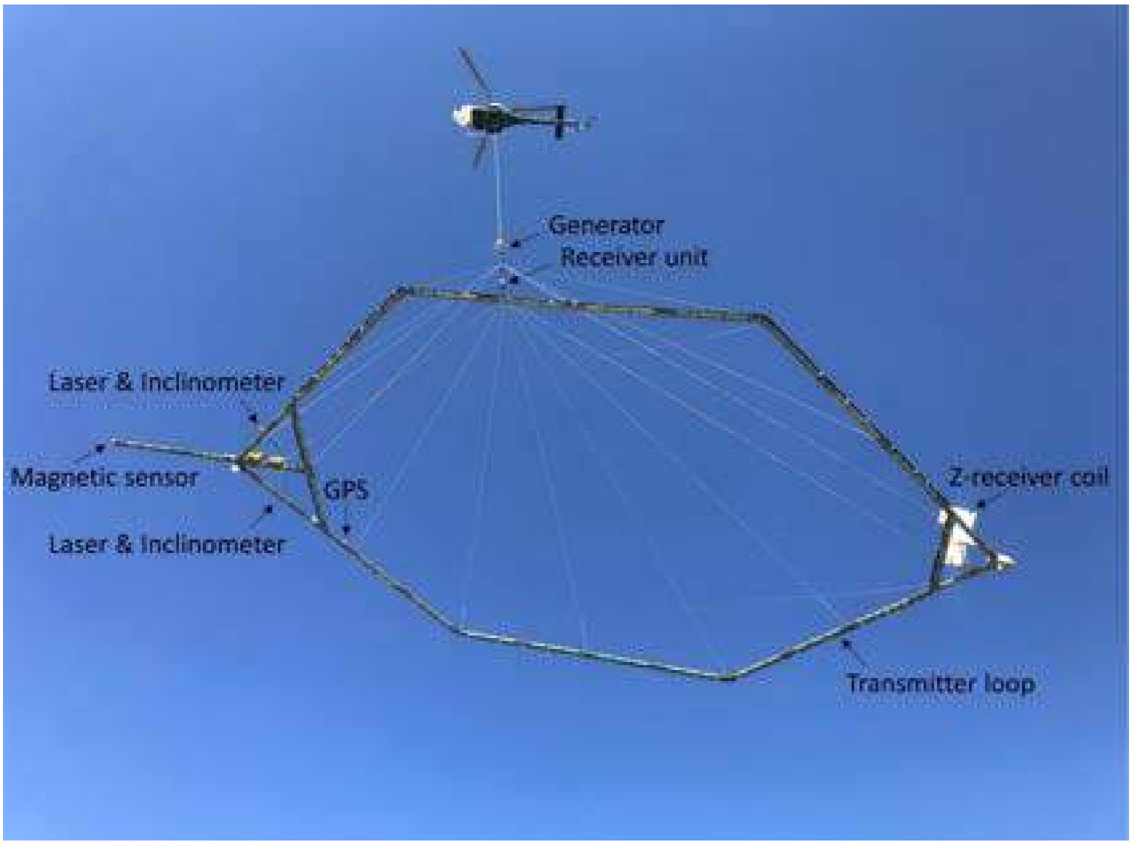


Figure 3-5 AEM Equipment and instrumentation configuration. The picture shows the helicopter towing the hexagonal transmitter loop. The front of the loop contains the GPS, laser, inclinometer, and magnetic sensor. At the back of the loop is the Z-receiver coil. Suspended between the transmitter loop and the helicopter are the generator and receiver unit.

3.4 AEM Survey Operation

3.4.1 Landing Zones

The Salinas Municipal Airport was used as a base for the operation.

3.4.2 AEM Data Acquisition

The AEM survey was carried out between March 1-2, 2023. Data were acquired along a total of 300.3 line-km (186.6 line-miles). Figures of the AEM system during the survey are shown in Figure 3-6.

Figure 3-6 Photos of the AEM system in operation in the Salinas Valley for the Deep Aquifers Study.

Before, during and after the acquisition of the AEM data, several measures were taken to ensure that the AEM system functioned properly, and that the quality of the acquired data was acceptable. During the initial on-site SkyTEM system set-up phase, very high-altitude tests, waveform, configuration settings and null positions were checked in collaboration with SkyTEM. This was to ensure that the configuration and specifications were performing as agreed upon in the contract.

During the survey, SkyTEM provided daily updates, including a map of daily production, high altitude test, raw electromagnetic, magnetic, and reference line data, which was quality control checked. The quality of the data evaluated daily during the AEM survey was found to be acceptable.

Figure 3-7 shows the actual flown flight lines compared with the planned flight lines. The flown flight lines were in good agreement with the planned lines.

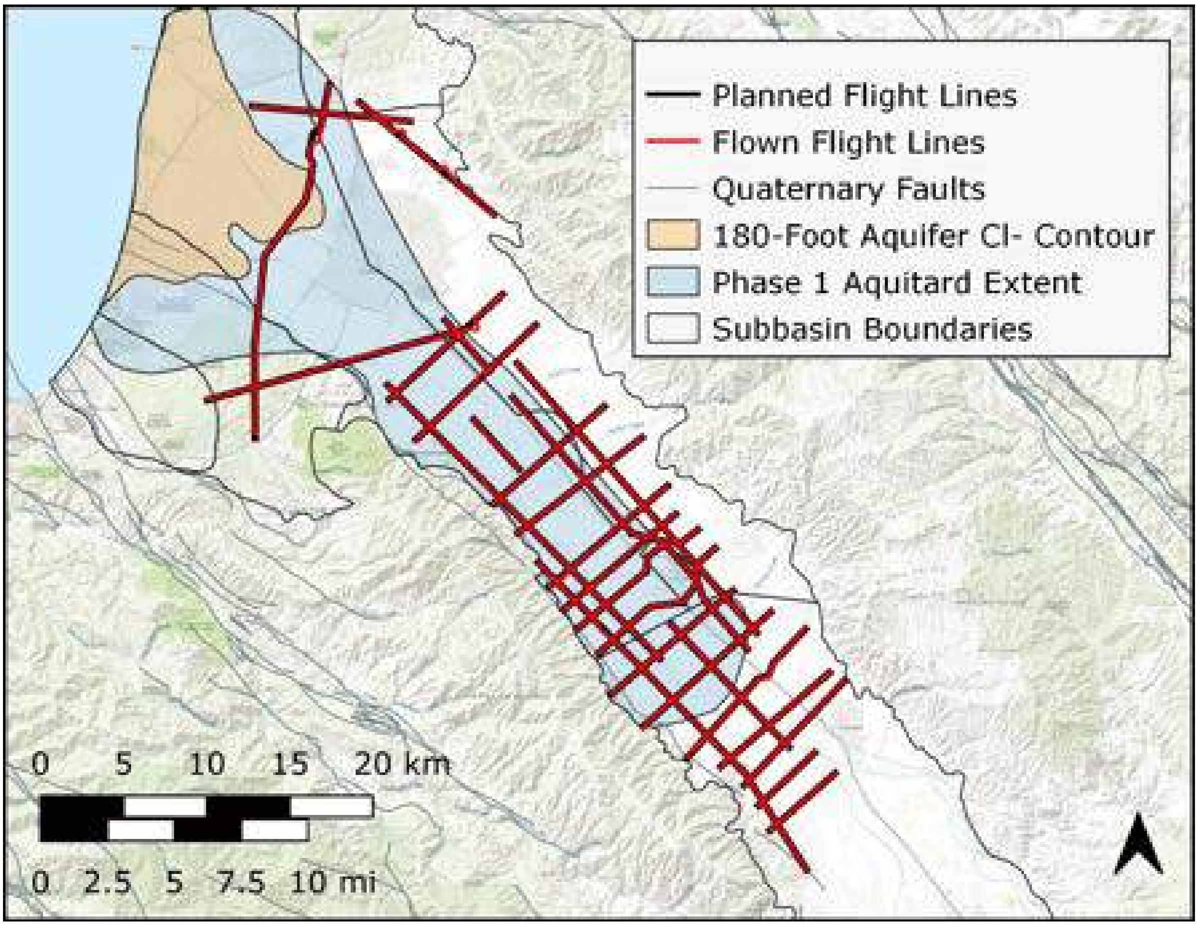


Figure 3-7 Map showing the planned and flown AEM flight lines.

3.4.3 Reference Lines

Reference lines are flight lines where AEM data are acquired multiple times throughout the survey. This is to ensure the reproducibility of the AEM system during the survey to validate instrument performance, to identify any potential drift and to document the stability of the data processing and inversion algorithms. The reference line was flown during each of the two production days, March 1-2, 2023, which resulted in a total of three repetitions of a flight line with a length of 1,000 m (3,300 ft) located east of the airport.

The AEM data acquired along the reference lines demonstrate that the AEM system was not affected by drift or instrumentation issues. It also showed that the processing and inversion schemes were consistent. Figure 3-8 offers a comparison between the AEM data from the current project and from a co-located flight line from Survey Area 8 in the DWR Statewide AEM Surveys.

The resistivity values result show excellent agreement, with the same resistivity structures present. The newly acquired AEM data offering information to a greater depth, indicated by the depth to which data are not greyed out. The results demonstrate that the data are highly repeatable. More information and the results of the reference lines can be found in Appendix 2.

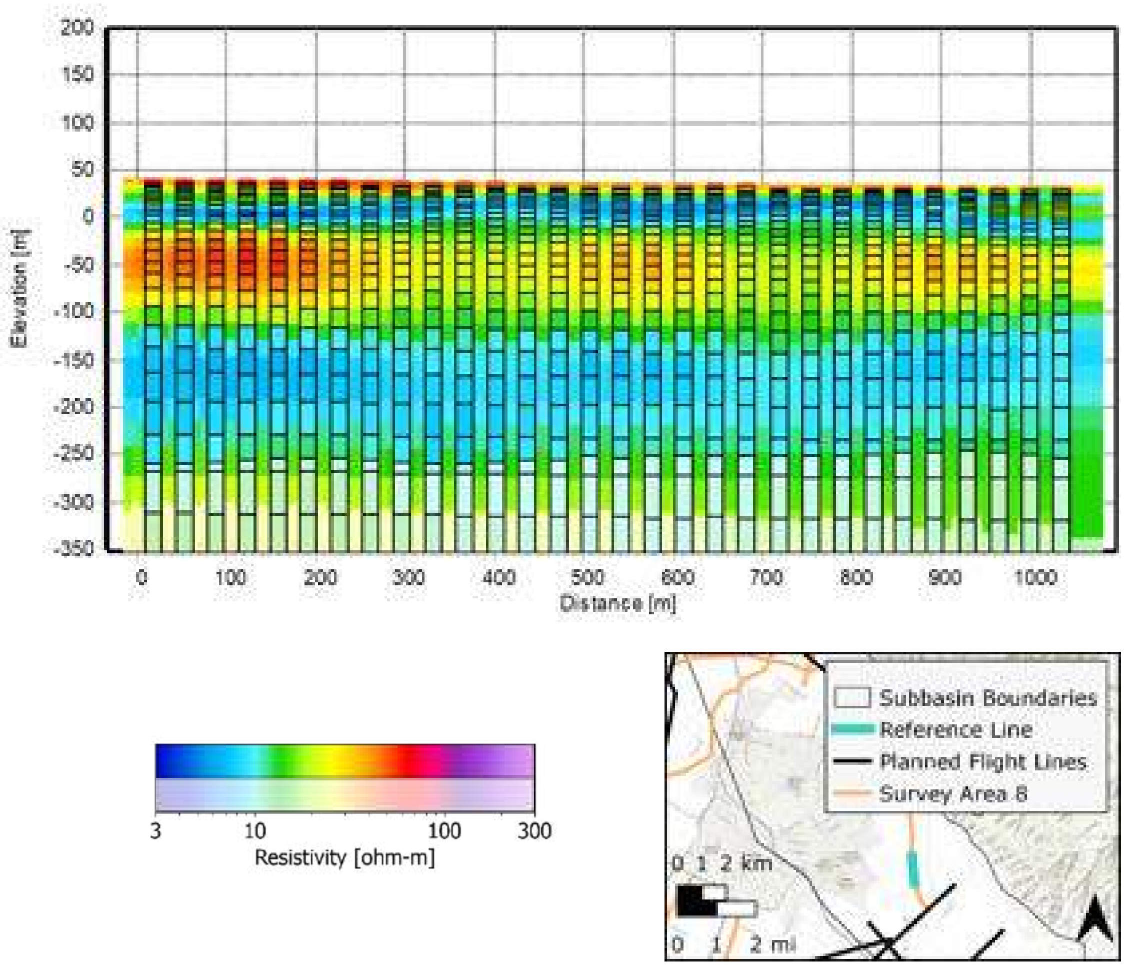


Figure 3-8 Reference flight line. Resistivity values shown in the background come from the current project. The resistivity values in the foreground, outlined in black, come from Survey Area 8 of the DWR Statewide AEM Surveys.

4. AEM Data Processing and Inversion

To obtain quantitative information on the subsurface resistivity from the raw AEM data, all the data acquired during the survey must go through the steps of processing and inversion. This includes the soundings and auxiliary data (location, flight height, angle of the transmitter tilt). Processing refers to actions that prepare the data for inversion, including the removal of noisy or coupled AEM data, and the application of averaging filters to the data. Filters are applied to obtain usable, noise-free data and optimize lateral resolution. Inversion refers to the numerical optimization algorithm that identifies the subsurface resistivity distribution that agrees with the AEM data.

All raw (electromagnetic & auxiliary) data are first checked for quality, then imported into the Aarhus Workbench software (https://www.aarhusgeosoftware.dk/aarhus-workbench) for data processing and inversion, which comprises the following steps:

1. Process auxiliary data (e.g., location, height)
2. Process AEM data automatically and manually
3. Run inversion on the AEM data

4. Calculate the depth of investigation from AEM data

This section provides an overview of the processing and inversion.

4.1 Data Processing

The first data to be processed are the auxiliary data: these include pitch and roll (tilt) data, transmitter height data, and GPS data. The tilt and transmitter height data affect the raw AEM measurement and must be accounted for during the inversion, while the GPS data are needed to relate each measurement to its correct geographic position. To relate the resistivity models to the topography of the landscape, a terrain elevation was assigned to each electromagnetic sounding using a digital elevation model (DEM).

Next, the raw AEM data (voltage timeseries) are processed to prepare for inversion. The AEM system continuously makes electromagnetic measurements, which are averaged together every 1.2 seconds. The average ground speed of the helicopter during the survey was 43.2 miles per hour, resulting in one measurement every 76 ft (23 m) on average, or 70 measurements per mile (43 measurements per km). The AEM data processing comprises an automatic and a manual component. The automatic processing requires selection of appropriate filters and other parameters.

After automatic processing, the data are manually reviewed for noise, as well as interference from infrastructure, such as powerlines, pipes or vineyards. The distance of AEM data locations to human-made structures was considered, and portions of the dataset were selectively removed. The AEM data processing is an iterative process, which requires revisiting the data after each step, and again after provisional inversion results are visualized. The AEM data retained for inversion, along with the locations of infrastructure, are shown in Figure 4-1.

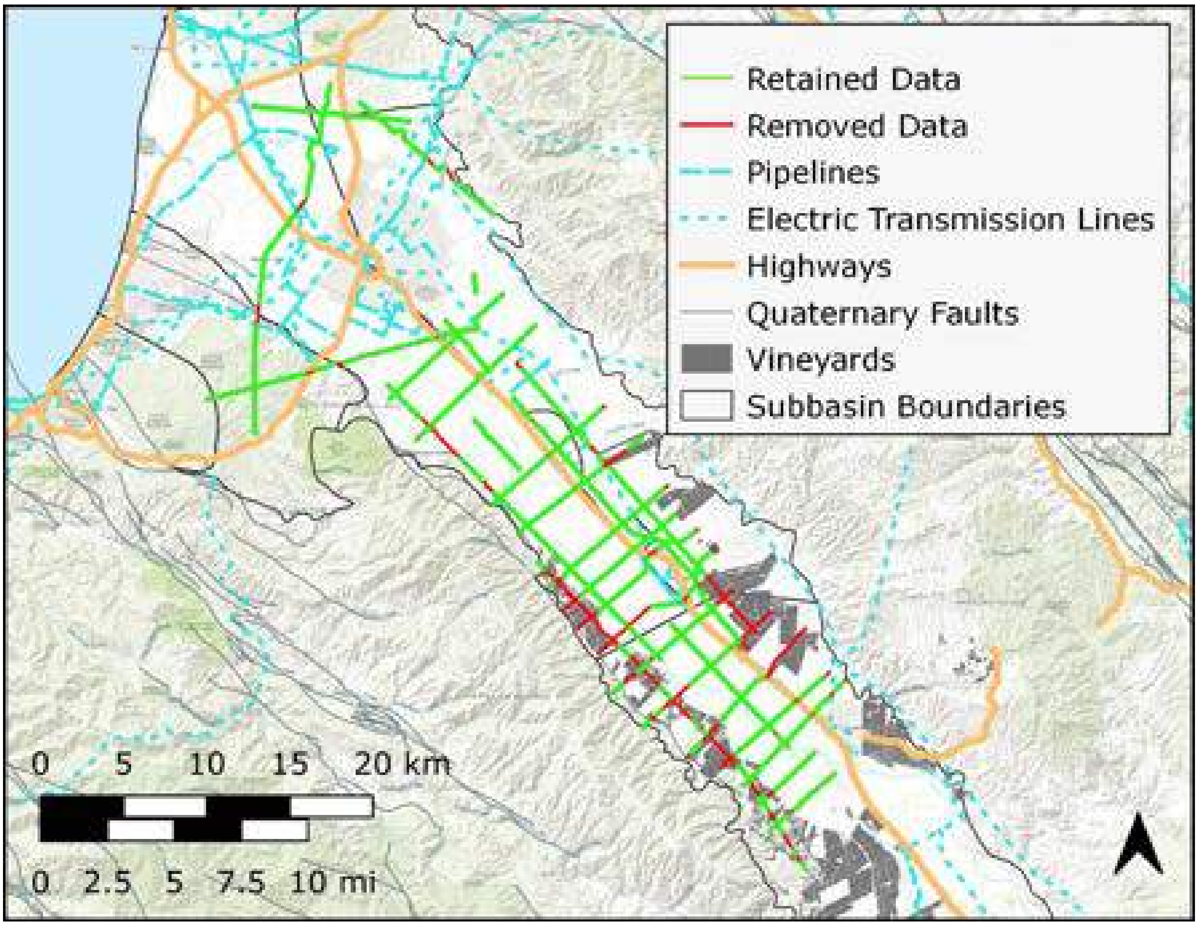


Figure 4-1 Map showing the retained and removed AEM data. Retained data are shown in green, while the removed data are shown in red.

4.2 Inversion

Once the auxiliary and AEM data were processed, the data were used to produce resistivity models through inversion. The inversion is an iterative optimization; the resistivity model at each location where AEM data were acquired (i.e., each sounding) along each flight line, is used to calculate synthetic AEM data. This synthetic AEM data are compared to the processed AEM data acquired during the survey. The misfit between the observed and synthetic data is used as a criterion to update the resistivity model, and the process is repeated. While minimizing the data misfit, the inversion allows nearby AEM data to be constrained vertically (i.e., between the resistivity values of adjacent layers) and horizontally (i.e., along and between flight lines) to allow the migration of information to nearby AEM data. Once the synthetic AEM data match the acquired AEM data within a specified tolerance, the resistivity model is considered final.

All AEM data are inverted simultaneously using the spatially constrained inversion (SCI) approach (Viezzoli et al., 2008), which accounts for all model parameters, AEM data and spatial constraints. The system setup information (AEM equipment metrics) is used during the inversion when calculating the synthetic AEM data. The inversion algorithm requires user input on specific values, including the depth discretization of the resistivity model (i.e., the estimate of the subsurface resistivity structure), the initial estimate of resistivity values, and horizontal and vertical constraints. Each value is selected based on the AEM system setup, depth interval of interest, and background geologic information of the study area. Multiple inversions may be run on the same dataset to find the optimal values for these input values. Typically, two to three inversions are run on the dataset to 1) finalize the processing of the data (e.g., by removing noisy or coupled data that appear in the inversion result) and 2) obtain final input values for the inversion. Detailed information of the inversion approach can be found in Auken et al. (2015).

4.2.1 Inversion Scheme

Using the SCI approach, the AEM data were inverted in a smooth inversion scheme. In this scheme, many layers (in this project, 35 layers) are used in the model, where each layer thickness is larger than the layer above it. Each layer thickness remains fixed during iterations of the inversion, but the resistivity value of each layer is allowed to vary. Using spatial constraints, resistivity values are constrained to stay within a factor of neighboring resistivity values, resulting in smoothly varying resistivity-depth models.

4.2.2 Depth of Investigation

The resistivity values resulting from inversion were used to calculate the depth of investigation (DOI). The DOI is an estimate of the depth, below which there is an elevated uncertainty of resistivity values. For the AEM method, as for all diffusive geophysical methods, it is not possible to define an exact depth, below which there is no information on the resistivity structure. Thus, resistivity information below the DOI may still be useful. But interpretation of resistivity values below the DOI is cautioned.

The DOI is dependent on 1) the AEM data quality and 2) the subsurface resistivity structure. The DOI in this survey was maximized in two ways: first, by using the modified setup of the SkyTEM 312HPM system, high data quality was maintained until later times (corresponding to deeper subsurface information) in the AEM measurement, as compared to previous AEM surveys in the area; this results in a deeper DOI. Second, areas known to contain shallow, low-resistivity layers, such as areas containing thick conductive clays and saline water, were avoided, since these layers reduce the DOI due to the physics of the AEM measurement.

In this survey, the DOI was calculated using sensitivity information output from the inversion, following the approach presented by Christiansen et al. (2012). The resulting DOI varies throughout the survey area; a histogram of all DOI values can be seen in Figure 4-2. In the westernmost part of the survey area, south and west of Salinas and the areas close to the coast, the DOI is typically below 350-400 m (1,150-1,310 ft), while for the central and eastern parts of the survey area, the DOI is typically 400-600 m (1,310-1,970 ft). In a few locations, the DOI extends beyond 600 m (1,970 ft) in a few places.

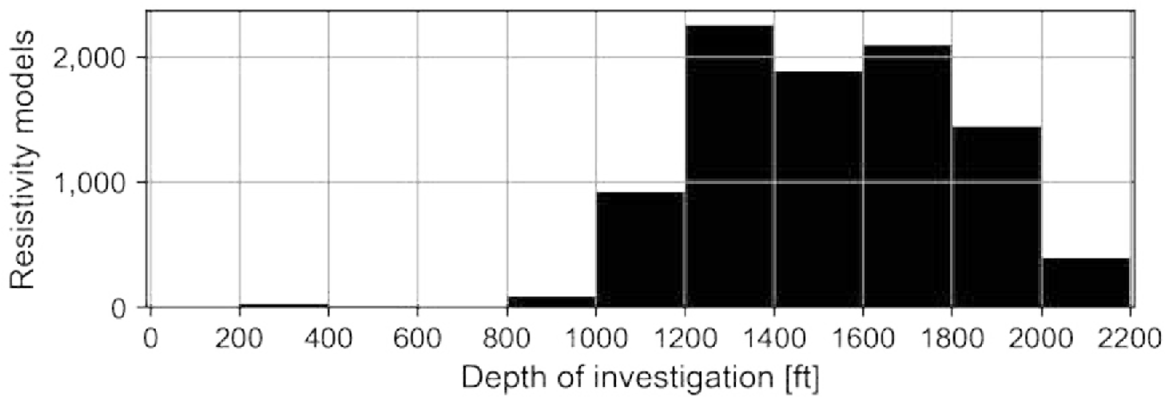


Figure 4-2 Depth of investigation histogram for all resistivity models in the inversion. In most locations where AEM data were acquired, the DOI is between 1,000 and 2,000 ft (300 and 600 m).

5. Survey and Interpretation Results

In this section, the results of the Deep Aquifers AEM survey and analysis of borehole data are presented. First, analysis of the borehole lithology and geophysical data is presented. Next, selected results of the AEM survey are shown, with additional results in Appendix 3 and 4.

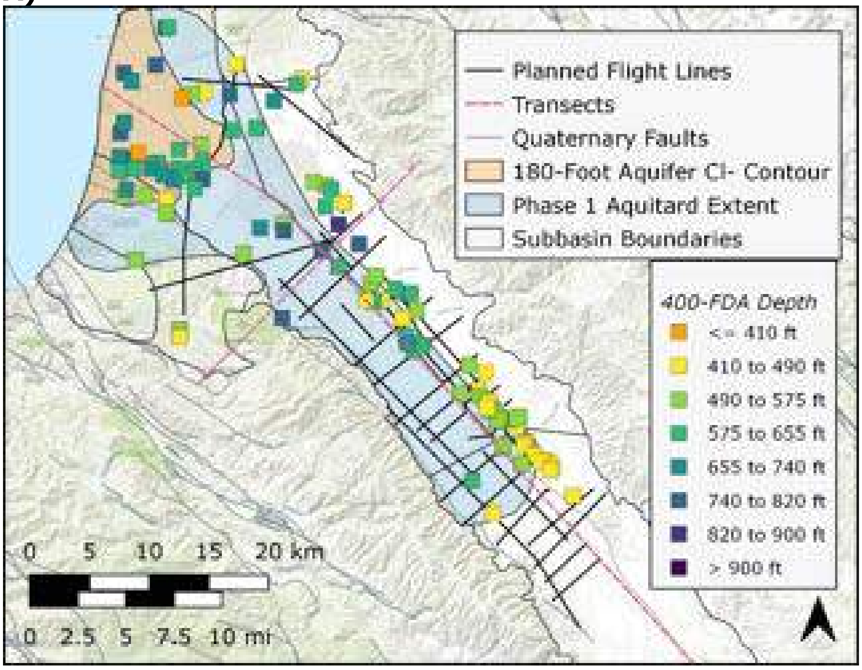
It is important to underscore that, while the goal of this study is to improve the understanding of the Deep Aquifers and the overlying 400-FDA, AEM data are sensitive to variations in the subsurface resistivity (see Section 3.1) and cannot directly identify hydrogeologic units. Thus, the focus of the interpretation of the AEM resistivity results in this project is to identify, within the resistivity results, a continuous unit that corresponds to expected character and depth of the 400-FDA.

Within the survey area, the 400-FDA is expected to be a continuous unit that is more conductive than the overlying and underlying units (400-Foot Aquifer and Deep Aquifers, respectively). A resistivity decrease is expected compared to adjacent units because the 400-FDA contains an elevated percentage of clays. Furthermore, high TDS concentrations are not expected in the 400-FDA or adjacent units to confound the resistivity signal attributed to clay content. In this report, the identified unit is referred to as the "continuous conductor".

5.1 Deep Aquifers Study Phase 1 Borehole Data

The borehole data compiled from the Deep Aquifers Study Phase 1 include valuable interpreted depth intervals of the 400-FDA. The top and bottom of these intervals, shown as two maps in Figure 5-1, provide a starting point from which to understand the geometry of the 400-FDA. Figure 5-1a and Figure 5-1b show the interpreted depth to the top and bottom of the 400-FDA, respectively. Visibly, the top and bottom of the 400-FDA appear to shallow with distance away from the coast. A notable data gap is the lack of data points on the southeast side of the basin south of Salinas.

A)



B)

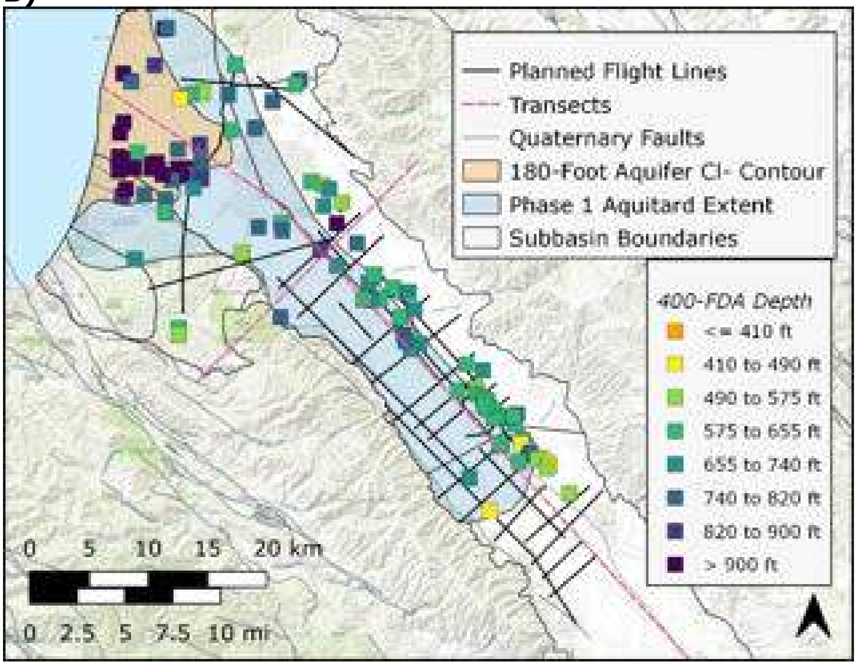
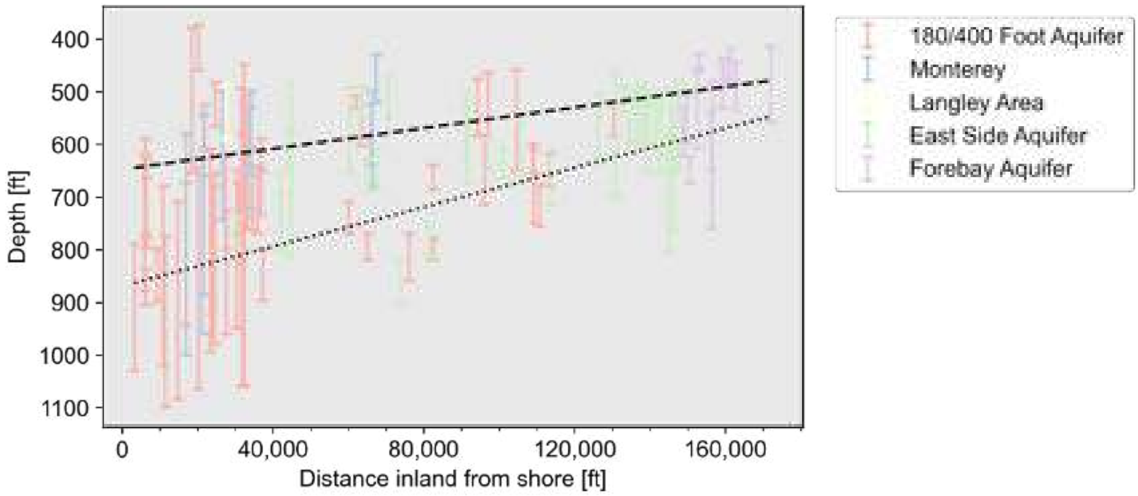


Figure 5-1 Interpreted depth of the top and bottom of the 400-FDA from the Deep Aquifers Study Phase 1 Borehole Dataset. A) Depth to the top of the 400-FDA, B) Depth to the bottom of the 400-FDA.

Figure 5-2 plots the interpreted depths as a function of distance from the coast (Figure 5-2a) and across the Salians Valley (Figure 5-2b), as defined by the pink transects shown in Figure 5-1. Each bar, showing the top and bottom of the 400-FDA, is colored by the subbasin corresponding to the measurement point. This view of the data shows a significant thinning of the 400-FDA with distance inland, indicated by the regression lines fitted to the top (dashed) and bottom (dotted) of the 400-FDA in Figure 5-2a. Moving across the Salinas Valley (Figure 5-2b), the interpretated thickness of the 400-FDA increases upon crossing from the Monterey Subbasin to the 180/400 Foot Aquifer Subbasin. Once in the East Side Aquifer Subbasin and Forebay Aquifer Subbasin, the interpreted 400-FDA begins to thin again.

In both plots of Figure 5-2, a significant degree of variance can be seen along the x-axis. This variance is reflected in the maps of Figure 5-1, where significantly different interpreted depths of the 400-FDA can be found in nearby boreholes. These results suggest that some regional trends are present in the 400-FDA, but a high degree of local variability is expected.

A)



B)

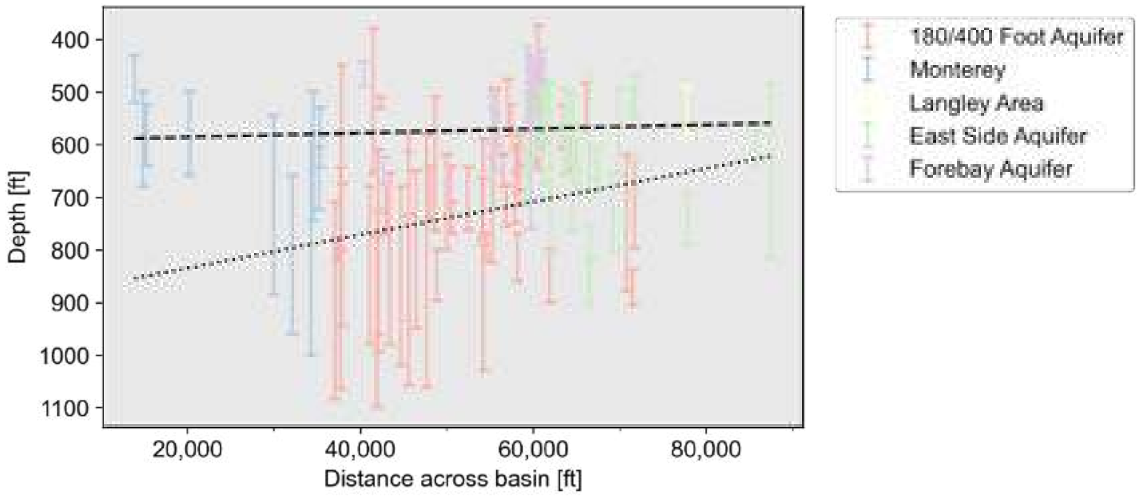


Figure 5-2 Depth of the 400-FDA interpreted from borehole data as a function of distance. A) Distance inland from shore, B) distance across the Salinas Valley from SW to NE, as shown by the pink transect lines in Figure 5-1. The top and bottom of each bar indicates the depth to the top and bottom of the 400-FDA, respectively. Each bar is colored by the subbasin corresponding to the measurement location. The black dashed and dotted line, respectively, show the least squares regression line fit to the interpreted top and bottom of the 400-FDA.

5.2 AEM Data

The inversion of the AEM data produces many 1D vertical estimates. The resistivity estimates can be stitched together to form 2D vertical sections or cut into depth or elevation slices to show the spatial distribution of mean resistivity across different depth or elevation intervals.

5.2.1 Resistivity Cross-sections

A total of 63 resistivity cross-sections were generated along the flight lines and show the resistivity distribution of the subsurface to depths of 1,000-2,000 ft (300-600 m) below ground surface. A selected set of cross-sections are shown in Figure 5-3 through Figure 5-5. All resistivity values are colored according to the color bar shown in Figure 3-4, showing low and high resistivity values in cool and warm colors, respectively. Resistivity values below the DOI are partially greyed out in each cross-section to reflect that the resistivity values are more uncertain. The sections are presented with the same horizontal and vertical scale. The x-axis shows distance along each flight line in meters, as constrained by the software used to render the cross-sections. Borehole lithology and resistivity data within 500 m of the transect defining each cross-section are also plotted on each section. Borehole lithology data from the Deep Aquifer Study Phase 1 contain lithology descriptors starting at 450 ft depth; above this depth, a white bar is show, indicating no data. Section 5.3 includes additional cross-sections plotted with interpretive annotations. The entire set of sections are presented, along with existing data and interpretive annotations, in Appendix 3.

In Figure 5-3 through Figure 5-5, three vertical model-sections across the surveyed area are provided to illustrate the spatial variations with a focus on how generated resistivity models compare to borehole lithology and resistivity data. All the resistivity data demonstrate good near surface resolution with the SkyTEM 312HPM system, which has deeper penetration capability than the AEM systems used to produce the existing AEM data in the survey area. The near-surface resolution of the SkyTEM 312HPM system allows for additional use of the AEM data for identifying near-surface units, and for validation with previous AEM surveys (e.g. Figure 3-8).

Figure 5-3 shows a section spanning 8.5 km (5.3 mi) in the central part of the area. Several borehole logs are included with lithologies that generally agree with the resistivities. The resistivity data on the section shows varying resistivity layers in the basin, with the lowest resistivity layer (blue color) overlain by a moderate resistivity layer (yellow and green colors), overlain by a high resistivity layer (orange and red colors). In the right (eastern) portion of the section, a very high resistivity layer (purple color) forms the base of the sediments and is likely bedrock (undifferentiated igneous and metamorphic). The lithology data in the cross-section show almost all “not clay” intervals, with “clay” intervals near the bottom of some boreholes.

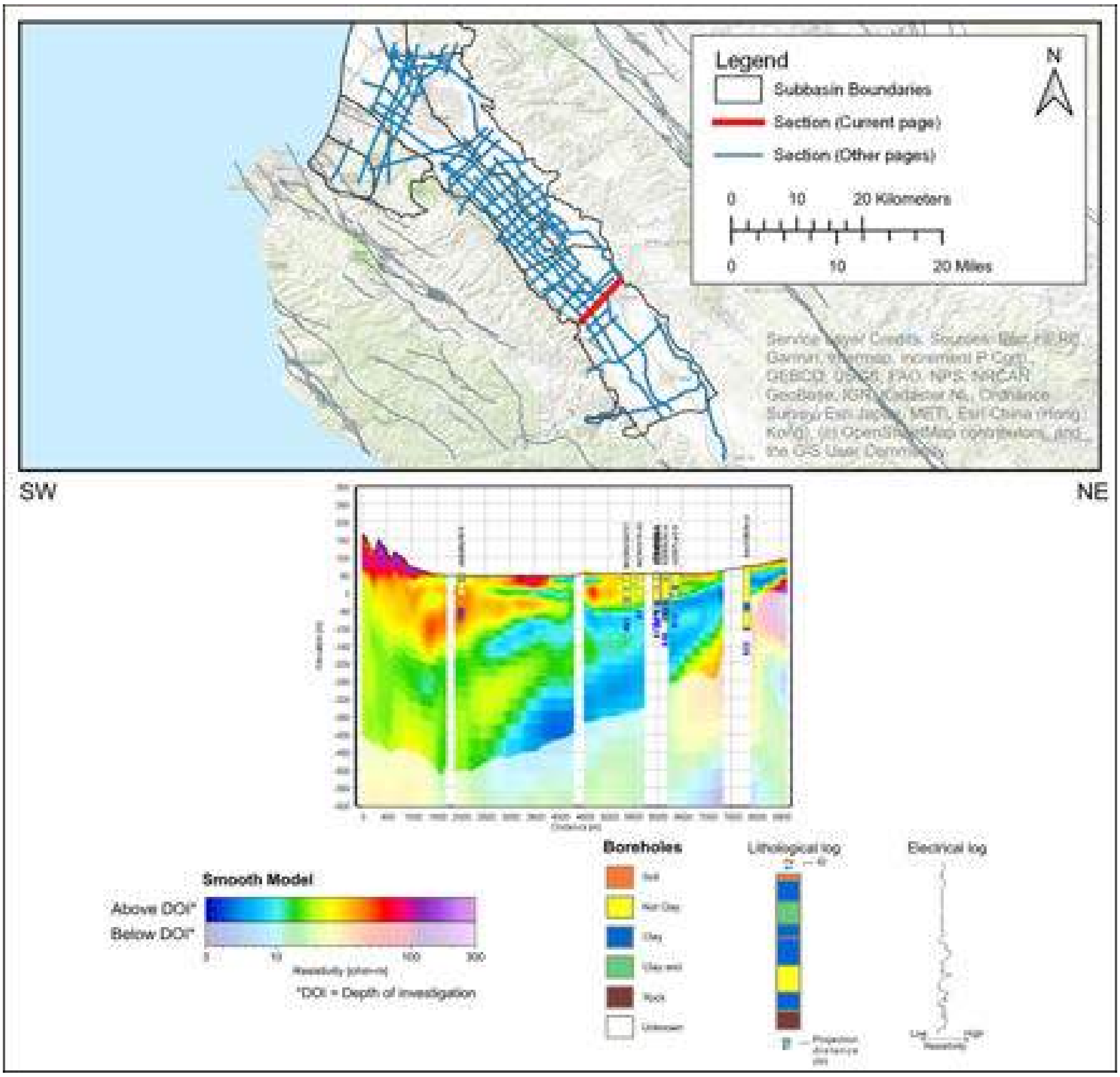


Figure 5-3 Resistivity along Section 101600. The section location is shown as the red line in the top panel, while the vertical resistivity section from northeast to southwest is provided in the bottom panel. Faded colors near the bottom of the cross-section represent resistivity values below the DOI. Borehole lithology data (colored columns) are projected onto the section.

Figure 5-4 shows a section spanning 16 km (9.9 mi) in the northern part of the survey area, including nearby borehole lithology logs projected onto the section. The resistivity values show various resistivity layers, with a low-resistivity layer (blue and green colors), overlain by a moderate resistivity layer (yellow and green colors), overlain by a low resistivity layer to the east. The lithology log from the well on the right (eastern) portion of the section shows alternating lithology and fits well with alternating resistivity layers seen on the section. In the western part of the section, a high resistivity region (red color) is present below the layers; this may be Salinian Block granitic rocks that have been reverse faulted against older sediments to the east. There also appears to be evidence of folding in the layers from the faulting. The Reliz Fault is mapped at 8 km along the section (https://www.usgs.gov/programs/earthquake-hazards/faults), corresponding to the area (6.7 to 9 km) where abrupt elevation shifts can be seen in the elevation of the top of the conductor between -100 to -200 m.

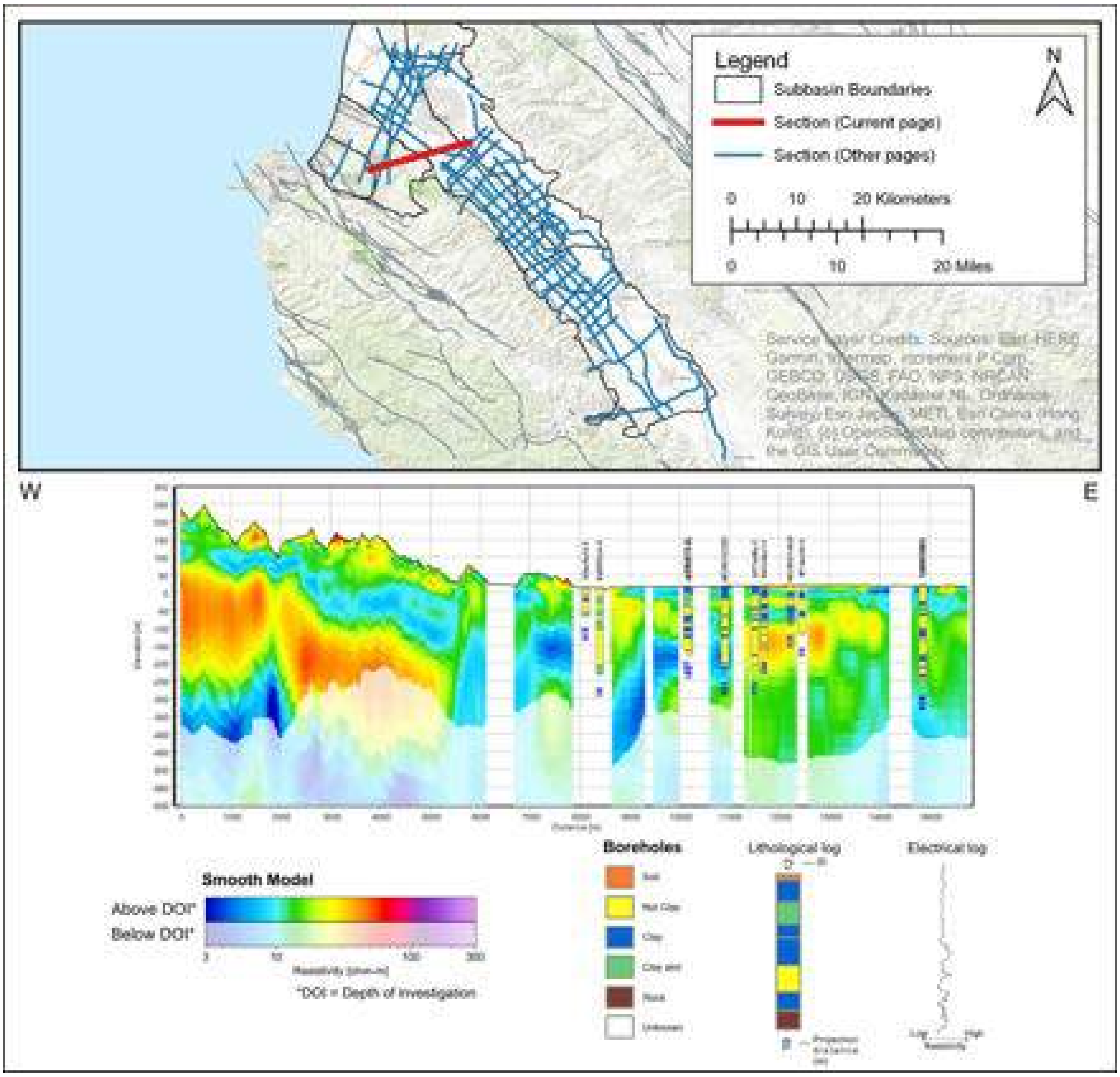


Figure 5-4 Resistivity along Section 100300. The section location is shown as the red line in the top panel, while the vertical resistivity section from northeast to southwest is provided in the bottom panel. Faded colors near the bottom of the cross-section represent resistivity values below the DOI. Borehole lithology data (colored columns) are projected onto the section. The Reliz Fault is mapped at 8 km along the section

Figure 5-5 shows a section spanning 22.5 km (14 mi) in the northern part of the survey area. Nearby borehole lithology logs are projected onto the section. A relatively uniform series of alternating high- and low-resistivity layers can be found on the left (south) side of the section, while the remaining portion of the section shows a complex distribution of resistivity, where resistivity values change over short lateral and vertical distances.

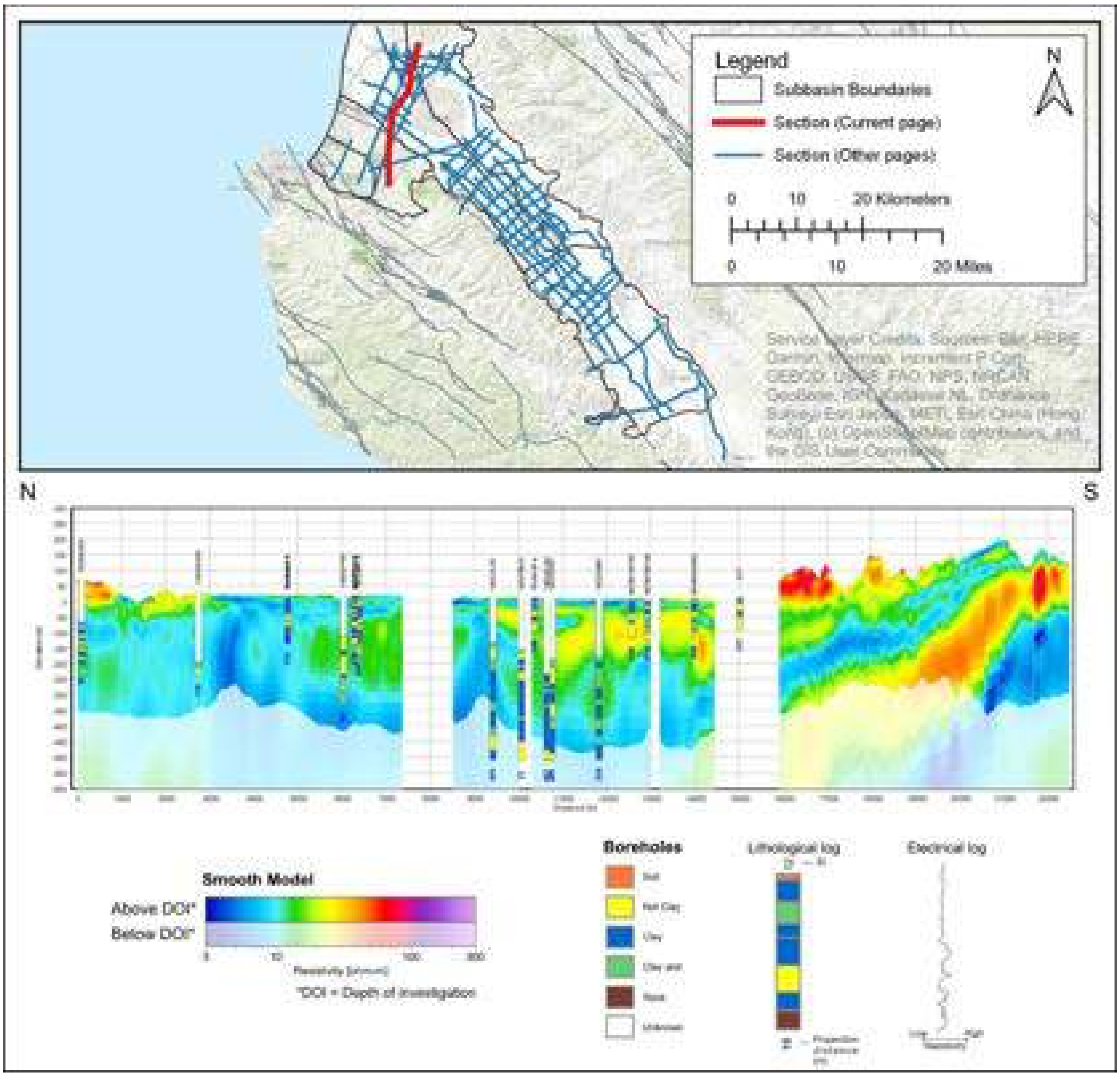


Figure 5-5 Resistivity along Section 100200. The section location is shown as the red line in the top panel, while the vertical resistivity section from northeast to southwest is provided in the bottom panel. Faded colors near the bottom of the cross-section represent resistivity values below the DOI. Borehole lithology data (colored columns) are projected onto the section.

5.2.2 Mean Resistivity Maps

Mean resistivity maps provide another visualization means to illustrate the variation in resistivity across the survey area. The maps can be shown as mean values over either depth or elevation intervals.

The mean resistivity values were calculated at each location where AEM data were retained for inversion, with the mean defined as the harmonic mean over the given vertical interval. Once calculated, each mean resistivity value was then estimated on a uniform grid using inverse distance interpolation with a node spacing of 40 m and search radius of 400 m.

Four representative plan-view maps of horizontal slices along the flight lines are displayed at different depth and elevation intervals in Figure 5-6 through Figure 5-9. These maps illustrate detailed structures and provide insight into variations across the surveyed area at each interval. A larger set of mean resistivity maps can be found in Appendix 4.

Figure 5-6 illustrates the mean resistivity over the depth interval 5-15 m (16-49 ft) bgs. Within this shallow depth interval, resistivity values vary over a short lateral distance; however, regional trends can be identified: extremely low resistivity values (dark blue colors) are found along the shore, corresponding to ocean water and saline groundwater. Low resistivity values are present in the northwestern part of the survey area (light blue colors) where the Salinas Valley Aquitard is expected. Moderate-to-high resistivity values (green, yellow, and orange colors) can be found throughout the rest of the survey area.

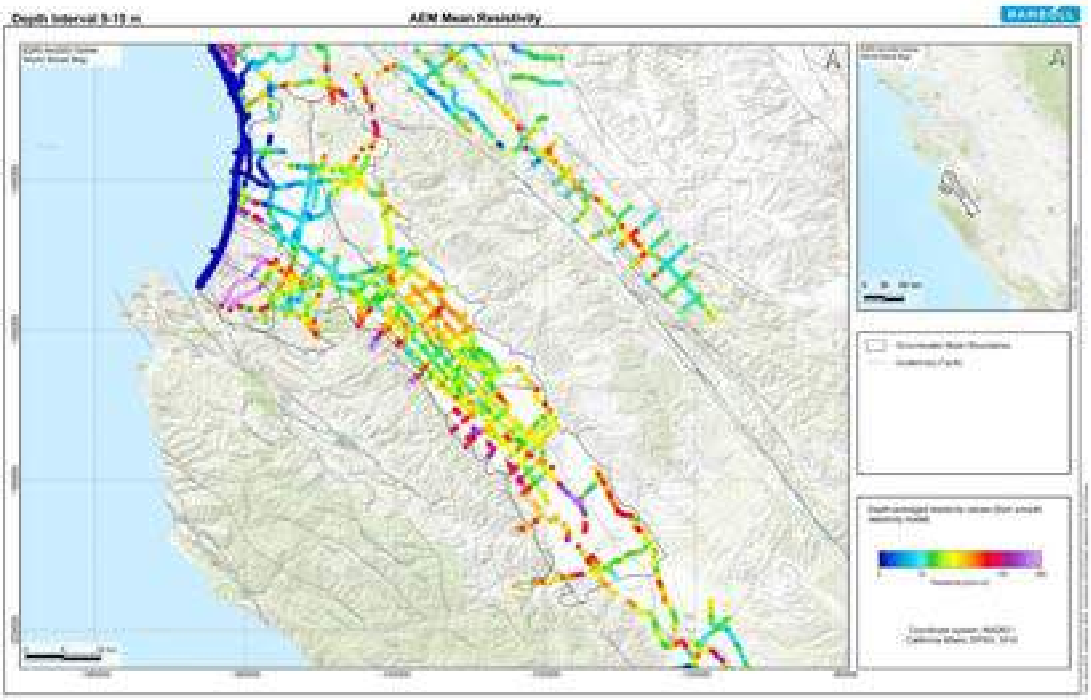


Figure 5-6 Mean resistivity plan-view map in the depth interval 5 to 15 m (16 to 49 ft) bgs.

Figure 5-7 shows the mean resistivity values in the elevation interval of –150 to -100 m (-492 to -328 ft) above mean sea level (amsl). At this elevation, south of Salinas, the southwest side of the basin has a high resistivity (red color), while the northeast side has a significantly lower resistivity (green and blue colors). The northern and southern side of the area have relatively low resistivity values. Very high resistivity values (purple color) emerge along the eastern edge of the survey area, corresponding to where bedrock is expected.

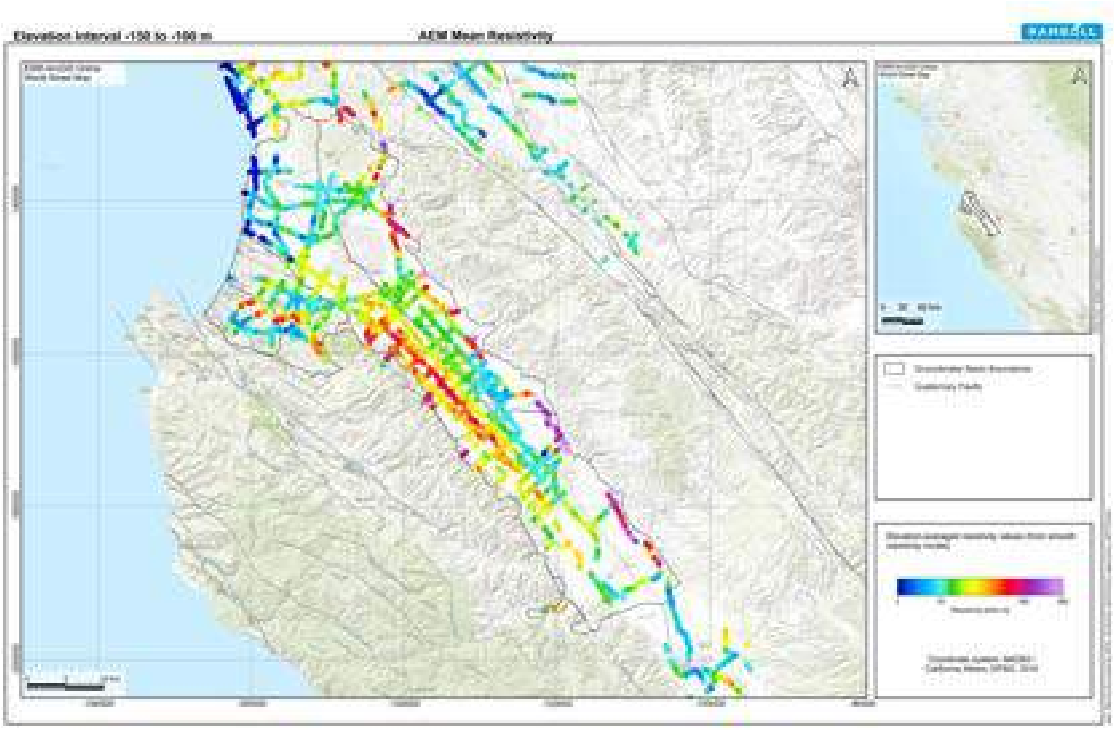


Figure 5-7 Mean resistivity plan-view map in the elevation interval of –150 to -100 m (-492 to -328 ft) amsl.

Figure 5-8 shows the mean resistivity values in the elevation interval –250 to -200 m (-820 to -656 ft) amsl. Low resistivity values are found in the areas north and west of Salinas, while south of Salinas, as in Figure 5-7, resistivity values are higher in the southwest than in the northeast. However, the resistivity values on both sides of the basin are lower than in Figure 5-7.

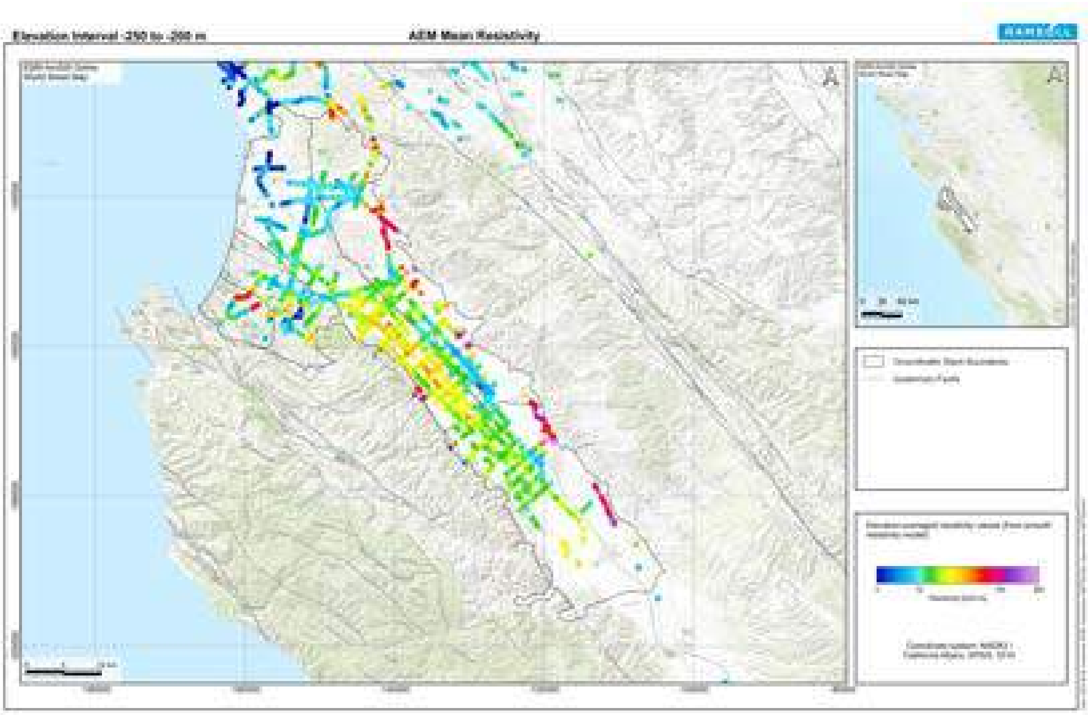


Figure 5-8 Mean resistivity plan-view map in the elevation interval of –250 to -200 m (-820 to -656 ft) amsl.

The data presented in Figure 5-9 illustrate the mean resistivity values within the elevation range of -350 to -300 m (-1,148 to -984 ft) amsl. Notably, a significant portion of the data in both the southern and northern regions fall below the DOI at this elevation and are therefore not displayed. South of Salinas, the trend of lower resistivity in the northeast side of the basin is still present at this elevation.

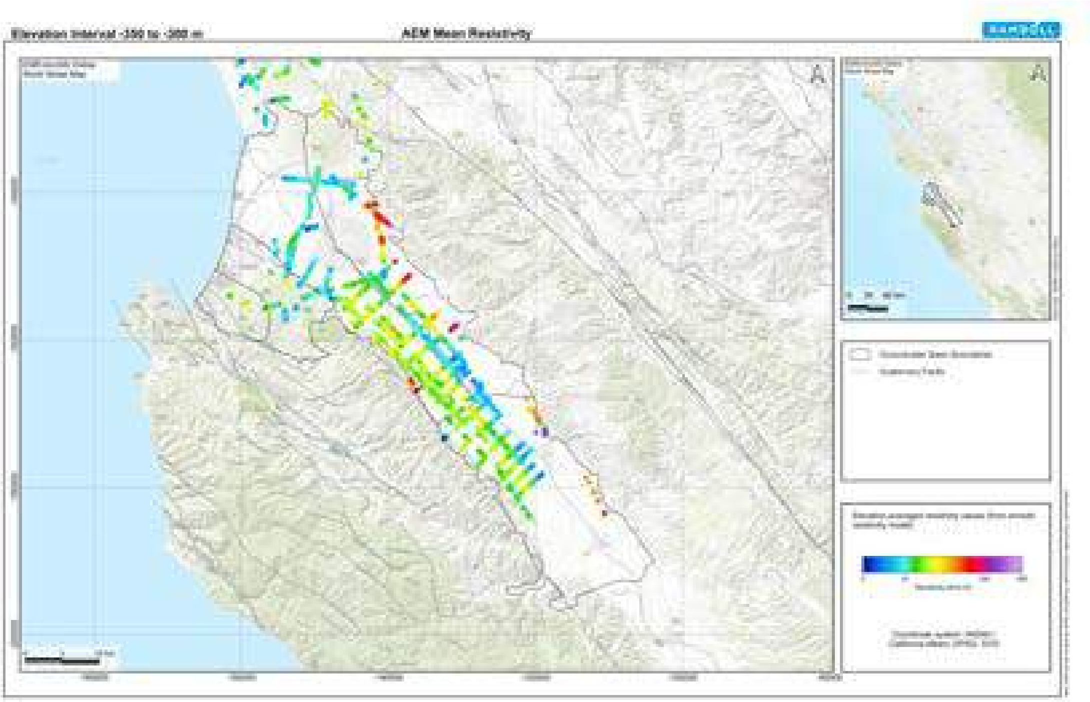


Figure 5-9 Mean resistivity plan-view map in the elevation interval of -350 to -300 m (-1148 to -984 ft) amsl.

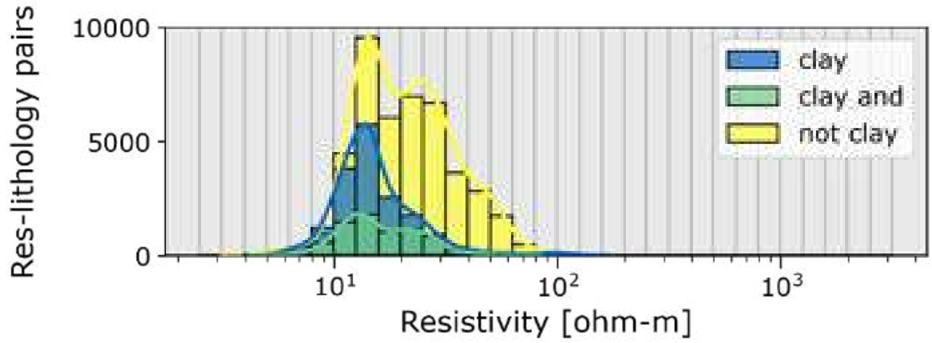
5.2.3 Comparison of Lithology and Resistivity from AEM Data

Nearby AEM and lithology data can provide a baseline understanding of the rock-physics relationship between resistivity and lithology. As can be seen in the cross-sections and mean resistivity maps above (Figure 5-3 through Figure 5-9), a significant degree of regional change is expected in the distribution of resistivity values and may be related to underlying changes in rock-physics relationship. In cases where this relationship varies within the study area, it can be challenging to produce quantitative metrics for the rock-physics relationship: statistical relationships built from data across the study area will tend to smear and obfuscate the underlying, local relationships.

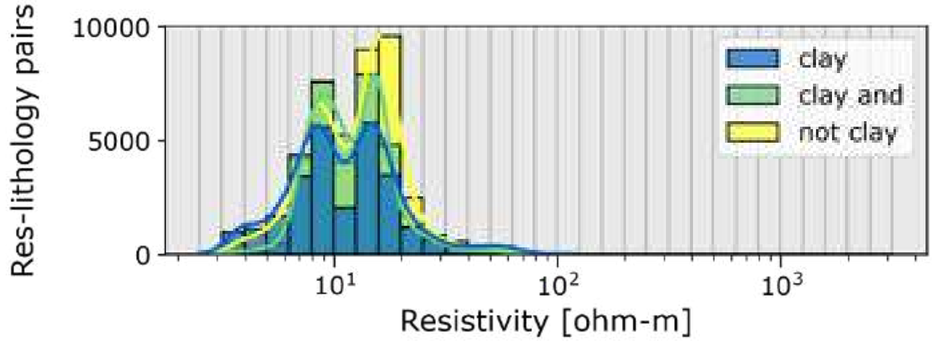
Figure 5-10 presents this relationship in the three subbasins where a significant amount of data are available: a) the 180/400 Foot Aquifer Subbasin, b) East Side Aquifer Subbasin, c) Forebay Aquifer Subbasin, and d) all available data. In each histogram, resistivity values from the newly acquired AEM data are paired with lithology descriptors from boreholes within 300 m. Every meter along the borehole, a sample is taken of the resistivity-lithology pair, generating tens of thousands of points. The histograms are shown colored by the lithology descriptor, and a line depicting the kernel density estimate is shown as a visual aid in case one histogram is partially hidden.

The results in Figure 5-10 show interesting differences in the relative amount of lithology descriptors and the shifting resistivity-lithology relationship between the different subbasins. In the 180/400-Foot Aquifer and Forebay Aquifer Subbasins, the "not clay" descriptor has an overlapping but distinguishable resistivity distribution from the "clay" and "clay and" descriptors. However, in the East Side Aquifer Subbasin, each distribution overlaps almost completely. Furthermore, the range of resistivity values in the Forebay Aquifer Subbasin compare more closely to the East Side Aquifer Subbasin (most data approximately 7 to 30 ohm-m) than to the 180-Foot Aquifer Subbasin, which has a higher average resistivity (most data approximately 10 to 70 ohm-m). Based on the data available, these figures suggest that a global relationship between resistivity and the defined sediment types ("clay", "clay and", and "not clay") will be more readily identified within the Forebay Subbasin and the 180/400-Foot Subbasin than in the East Side Aquifer Subbasin.

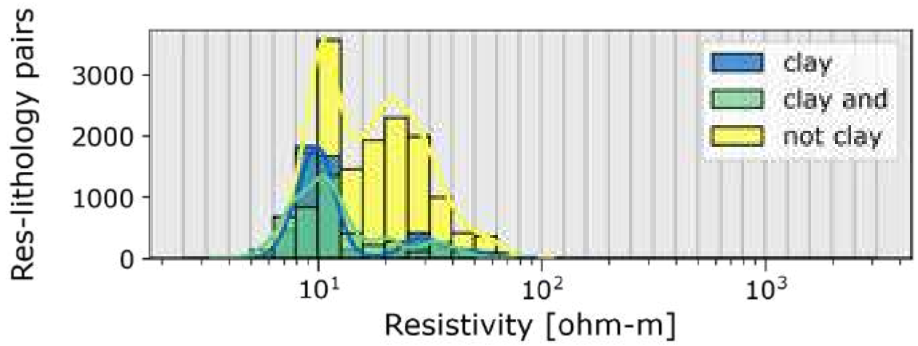
A) 180/400 Foot Aquifer Subbasin



B) East Side Aquifer Subbasin



C) Forebay Aquifer Subbasin



D) All Data

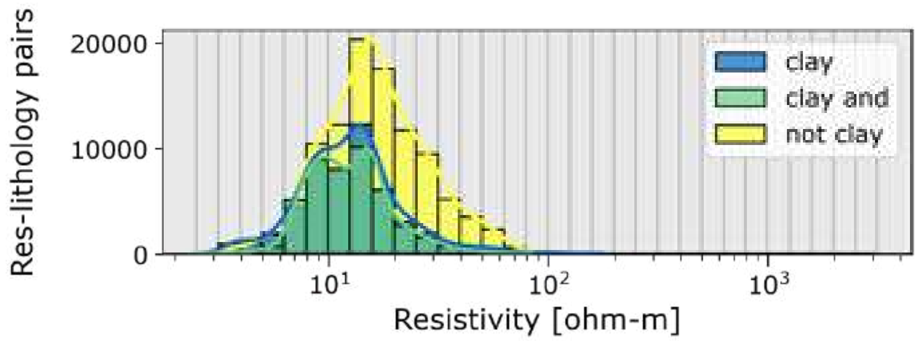


Figure 5-10 Distribution of AEM resistivity values compared to lithology from boreholes within 300 m. The distributions are shown for A) the 180/400 Foot Aquifer Subbasin, B) the East Side Aquifer Subbasin, C) the Forebay Aquifer Subbasin, and D) all data.

Another perspective on borehole and AEM data can be gained from the interpretations of the 400-FDA from the Deep Aquifers Study Phase 1 Borehole Dataset. The panels in Figure 5-11 contain a set of smoothed histograms, each of which show the distribution of resistivity values (x-axis) over a 50-foot elevation interval. Resistivity values are shown if they are within 1,000 ft (300 m) of a borehole with an interpretation of the 400-FDA. Values on the y-axis indicate the elevation interval as an offset from the interval interpreted as the 400-FDA from analysis of the Deep Aquifers Study Phase 1 Borehole Dataset: positive values indicate the offset above the top of the interval, and negative values indicate the offset below the bottom of the interval. At the zero value on the y-axis, the resistivity is averaged over the elevation interval corresponding to the interpretation of the 400-FDA (which may be more or less than 50 feet); this histogram is shown in blue to distinguish it from the rest in the series. The mean resistivity (taken on a logarithmic scale) is displayed as a line crossing each histogram. Only values above the DOI are used for calculation; thus, fewer data are generally available with increasing depth as more resistivity values fall below the DOI.

The distributions in the panels of Figure 5-11 share some general trends: the mean resistivity generally decreases with a decrease in offset, although at a modest rate. AEM data away from borehole data with interpretations of the 400-FDA show this trend of decreasing resistivity with depth as well (e.g., Figure 5-3). Furthermore, the resistivity values near the boreholes used in Figure 5-11 all fall within a relatively small range: approximately 3 to 30 ohm-m.

While some trends are shared across the subbasins represented in Figure 5-11, distinct differences can be seen as well. For the 180/400 Foot Aquifer Subbasin (Figure 5-11a), the resistivity distributions are generally monomodal, with not much of a shift in the distributions at zero offset (blue distribution), which corresponds to the elevation interval of the interpreted 400-FDA and has a mean resistivity of 11 ohm-m. These results suggests that, based on the borehole data available in the Deep Aquifers Study Phase 1 Borehole Dataset, correlating the interpreted 400-FDA to a shift in resistivity may prove challenging.

In the East Side Aquifer Subbasin (Figure 5-11b), the distributions are more complex, and are often bimodal and long tailed. A shift in character of the distributions can be seen around the zero offset, where distributions with a positive offset generally have a long, higher resistivity tail, and distributions with a negative offset have long, low-resistivity tails. Furthermore, the distributions shift from more bimodal to monomodal from positive to negative offset, respectively. The distribution with a zero offset has short tails and modes around 8 and 15 ohm-m, which are slightly more conductive than the modes of the distributions with positive offset. The shorter tails and well-defined modes suggest that borehole interpretations of the 400-FDA may be more easily correlated to the resistivity estimates from AEM data than in the 180/400 Foot Aquifer Subbasin.

Few borehole data with interpretations of the 400-FDA are present in the Forebay Aquifer Subbasin, which decreases confidence in the trends seen in Figure 5-11c. There appears to be a slight and gradual decrease in the resistivity value with a decreasing offset until the offset is zero. The mean resistivity of the interval associated with the 400-FDA is around 10 ohm-m.

The 400-FDA is expected to be a generally continuous unit that is more conductive than the overlying and underlying units; however, the distributions in Figure 5-11 show only a slight correlation between the AEM resistivity values and the interpretations of the 400-FDA. This ostensibly modest correlation may be explained by a few potential underlying causes, including that the resistivity corresponding to the 400-FDA varies throughout each subbasin due to variability in sediment deposition (i.e., that the relationship is non-stationary, suggested by the bimodal zero-offset distribution in Figure 5-11b), that the interpretations of the 400-FDA do not correspond closely to a continuous conductor in the region, or that not enough deep boreholes are available near AEM data to identify the underlying relationship.

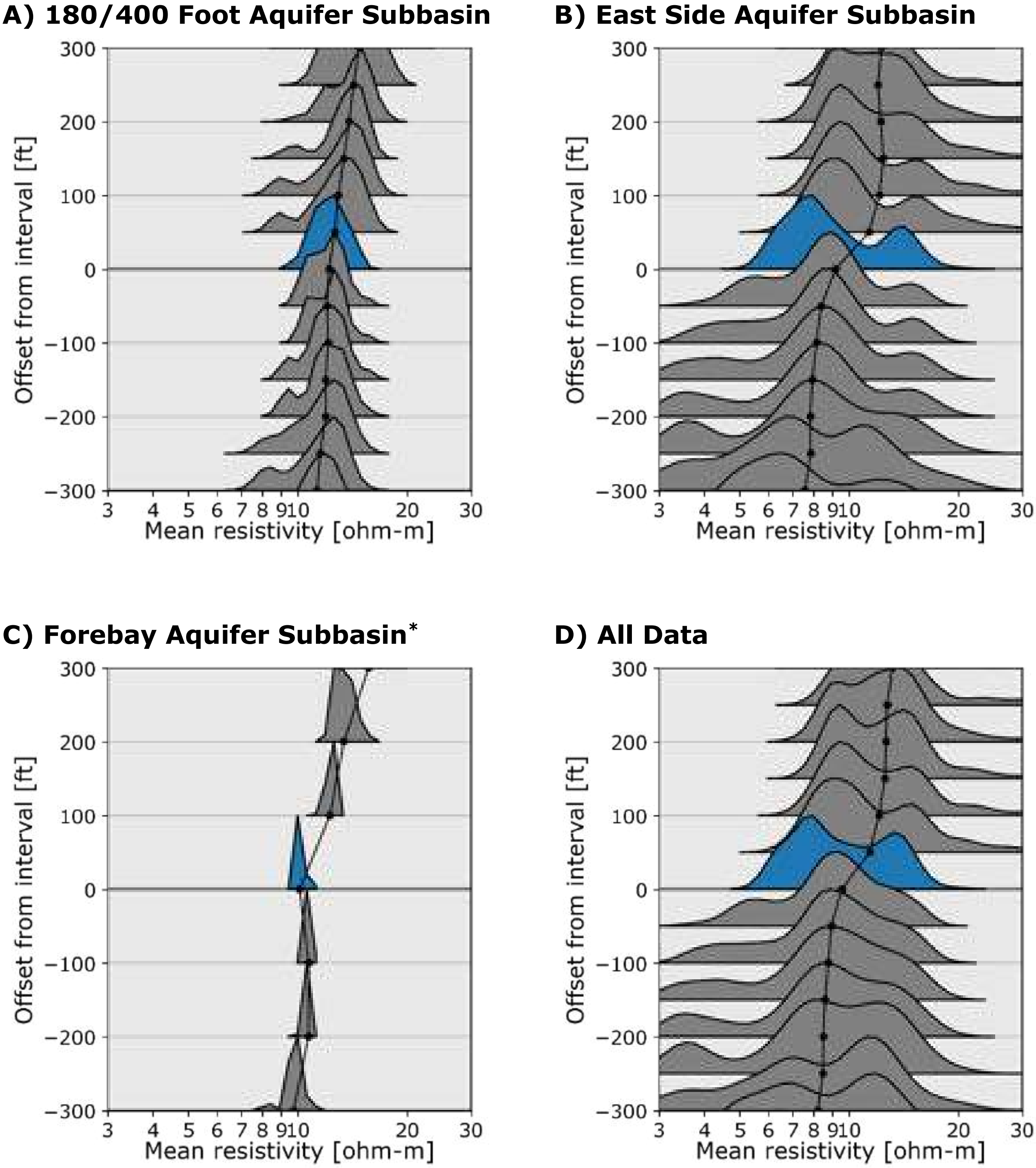


Figure 5-11 Distribution of AEM resistivity values within 300 m of boreholes with interpretations of the 400-FDA. Each panel contains a set of smoothed histograms displaying the distribution of resistivity values over a 50-foot sliding elevation interval. The black line indicates the mean value for each distribution. Positive and negative y-values, respectively, indicate the number of feet the sliding window is offset above and below the interval interpreted as "aquitard" in the Deep Aquifers Study Phase 1 Borehole Dataset. An offset of zero corresponds to the data within the interval interpreted as "aquitard", and the corresponding histogram is colored blue. The data are shown for A) the 180/400 Foot Aquifer Subbasin, B) the East Side Aquifer Subbasin, C) the Forebay Aquifer Subbasin, and D) all data. *The size of the sliding window was increased to 100 feet to increase the amount of data.

5.3 Delineation of Continuous Conductor

The goal of the Deep Aquifers AEM survey is to better understand the Deep Aquifers and the overlying 400-FDA using the resistivity values from AEM data. While the AEM data cannot directly confirm the presence of the 400-FDA, they can be used to identify continuous resistors and conductors in the survey area, which in turn, can be compared to auxiliary information to make a more informed interpretation of the 400-FDA. This section describes the interpretation of a continuous conductor that generally corresponds to the expected depth and location of the 400-FDA (referred to as the "continuous conductor"), as identified from the AEM resistivity values, in concert with borehole lithology data, borehole resistivity logs, and lithology interpretations from the Deep Aquifers Study Phase 1 Borehole Dataset. As discussed in Section 5.2.3, any continuous conductor identified from AEM data was not expected to correlate perfectly with existing interpretations of the 400-FDA; however, these interpretations offer a separate dataset to help guide the interpretations of AEM-derived resistivity cross-sections.

Points of interpretation were added to resistivity cross-sections from the AEM datasets considered for analysis (2019 coastal AEM dataset, DWR Survey Areas 1 and 8, Deep Aquifers AEM Survey) where the top or bottom of the continuous conductor was identified. In cases where the top or bottom of the continuous conductor was identified with lower confidence, the interpretive point was flagged as a lower confidence interpretation.

In this section, three cross-sections (Figure 5-12 through Figure 5-14) across the survey area are discussed. The entire set of annotated cross-sections are presented in Appendix 3. Each cross-section displays the following data:

- the resistivity data resulting from the inversion of AEM data (colored according to Figure 3-4);
- nearby lithology data, colored by lithology descriptor;
- nearby borehole resistivity data, displayed as a curve with depth;
- nearby interpreted intervals of the 400-FDA (shown in blue behind the lithology data) from the Deep Aquifers Study Phase 1 Borehole Dataset;
- points indicating the interpreted depth of the top and bottom (red and blue, respectively) of the continuous conductor corresponding to the depth of the 400-FDA.

Figure 5-12 shows a section spanning 20.5 km (13.7 mi) in the central part of the area. On the right side of the cross-section (southeast), the continuous conductor (blue color) can be seen from around–50 to –150 m (-160 to -490 ft) amsl, dipping slowly toward the left (northwest). Moving toward the left side of the cross-section, the conductor becomes more muted in resistivity contrast (1.5-10 km) but becomes slightly more prominent on the left side of the cross-section.

On the left and right sides of the cross-section (0-1.5 km and 13-20 km distance), the continuous conductor identified with high confidence (red and dark blue dots) agrees with most of the interpretations of the 400-FDA, except for the borehole at 19 km along the cross-section, which identifies the entire continuous conductor as "not clay". In the middle of the section, the continuous conductor is identified with lower confidence (yellow and light blue dots).

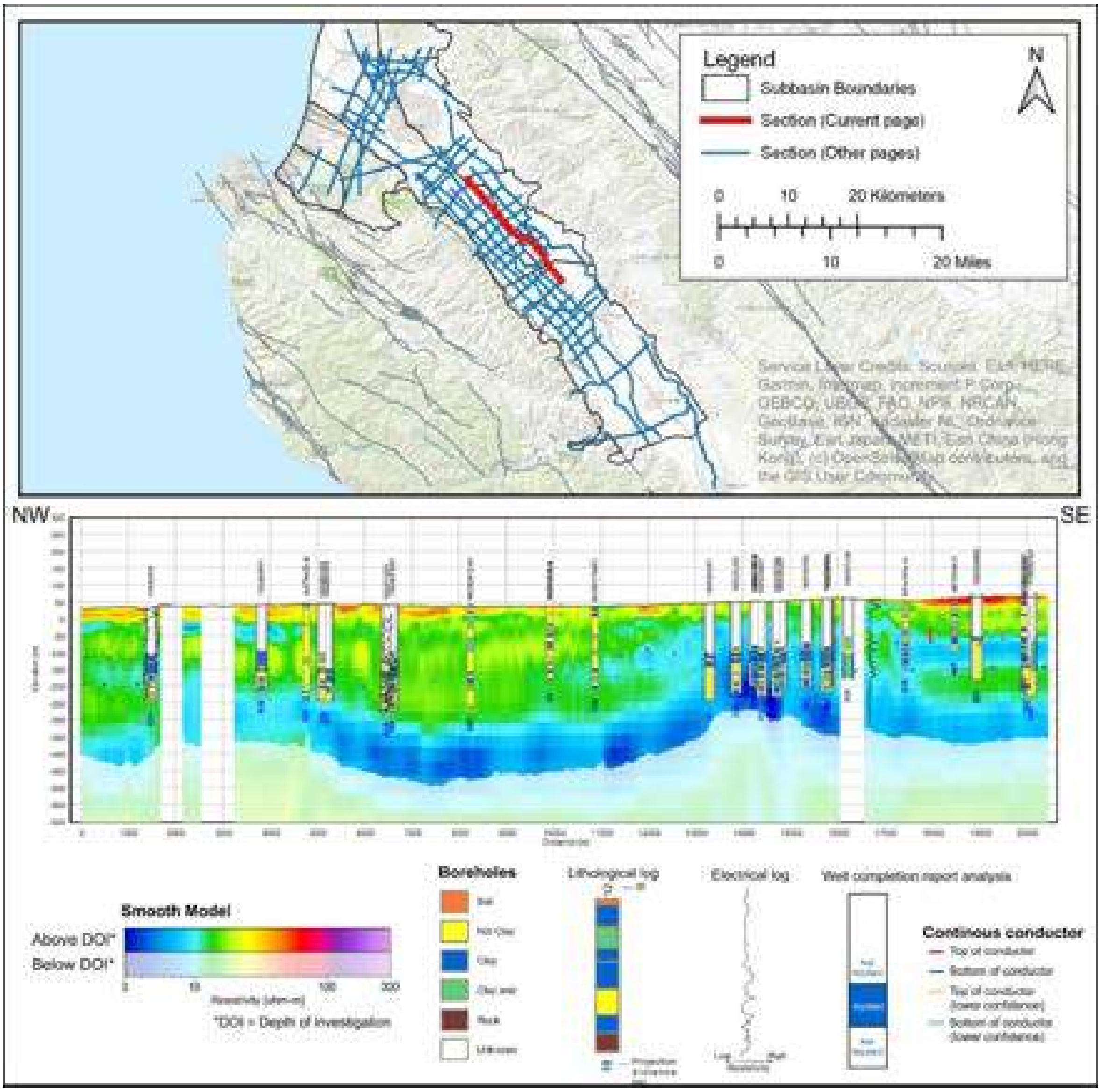


Figure 5-12 Annotated resistivity along Section 200400. The section location is shown as the red line in the top panel, while the vertical resistivity section from northwest to southeast is provided in the bottom panel. Faded colors near the bottom of the cross-section represent resistivity values below the DOI. Borehole lithology data (colored columns) are projected onto the section. Borehole intervals interpreted as the 400-FDA are shown behind the lithology data in blue. The top and bottom of the continuous conductor are shown as red and blue points, respectively.

Figure 5-13 shows a section spanning 8.5 km (5.3 mi) in the southern part of the area. A very distinct, continuous conductor can be seen overlying a region of high resistivity (likely bedrock) on the right side of the section and dipping toward the center of the basin. Left of 5.5 km along the cross-section, a deeper conductor appears to split off from the continuous conductor.

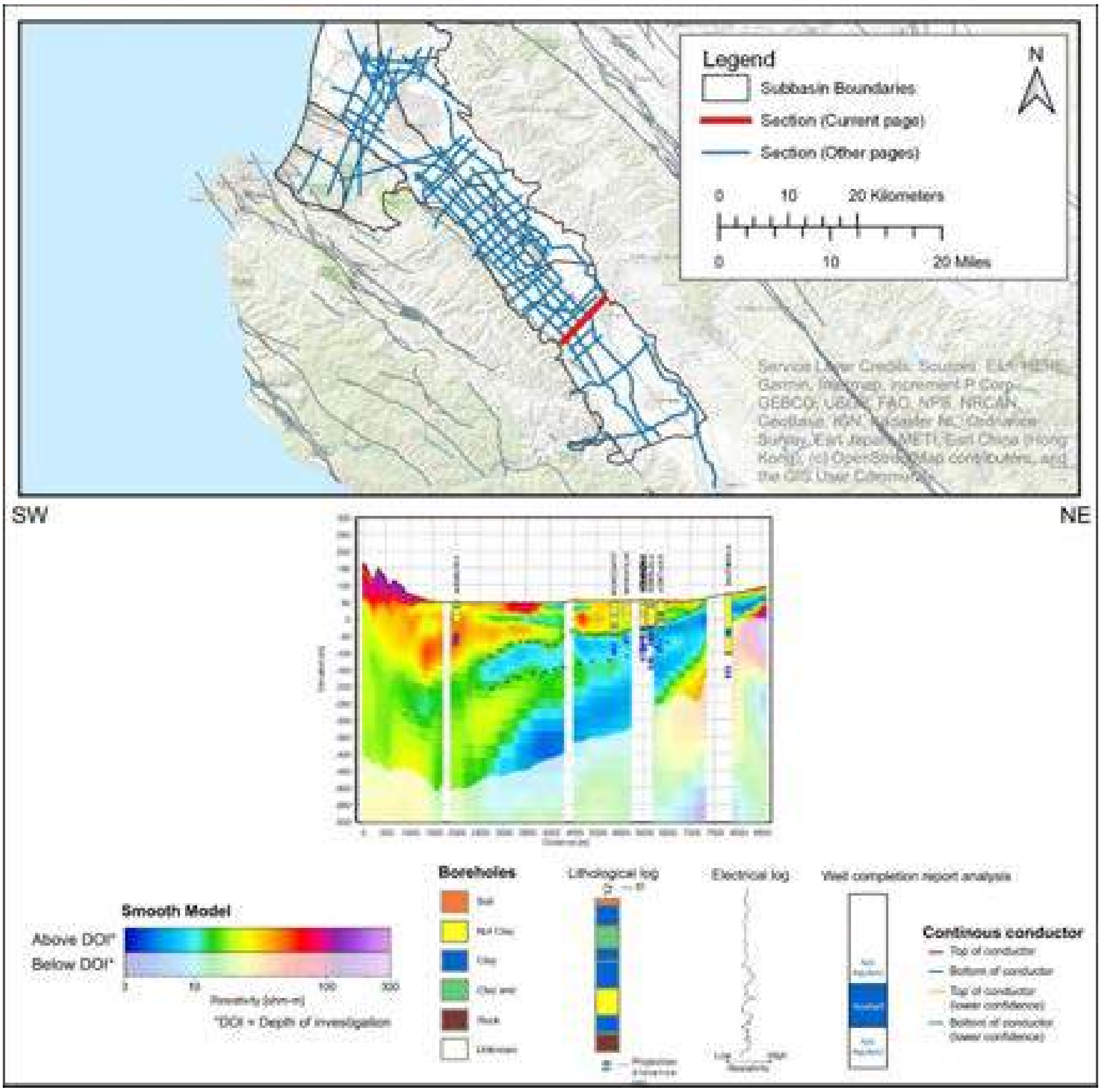


Figure 5-13 Annotated resistivity along Section 101600. The section location is shown as the red line in the top panel, while the vertical resistivity section from southwest to northeast is provided in the bottom panel. Faded colors near the bottom of the cross-section represent resistivity values below the DOI. Borehole lithology data (colored columns) are projected onto the section. Borehole intervals interpreted as the 400-FDA are shown behind the lithology data in blue. The top and bottom of the continuous conductor are shown as red and blue points, respectively.

Figure 5-14 shows a section spanning 8.5 km (5.3 mi) in the central part of the survey area. Here, similar patterns are seen as in Figure 5-13 but with resistivity variations of lower magnitude: the continuous conductor has a higher resistivity than in Figure 5-13. The resistivity structure and values on the left side of the cross-section (180/400 Foot Aquifer Subbasin) are distinctive from those on the right side of the cross-section (East Side Aquifer Subbasin), with resistivity values much higher in the 180/400 Foot Aquifer Subbasin, reflecting the distributions shown in Figure 5-10. The changing nature of the continuous conductor across the survey area underscores the need for closely spaced AEM flightlines (available in this area from the current survey and the DWR Survey Area 1 survey) to track spatially variable patterns with high confidence.

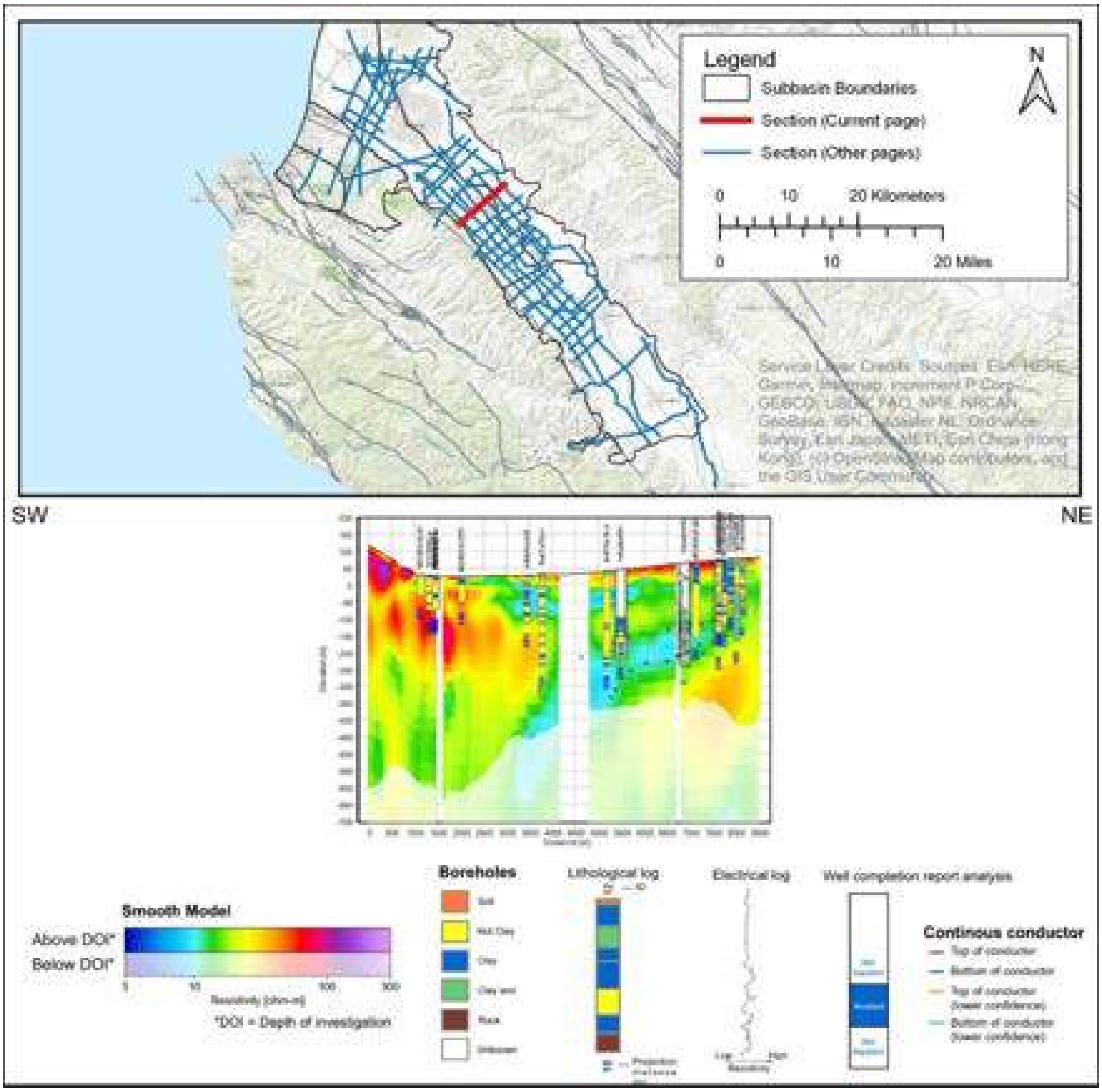


Figure 5-14 Annotated resistivity along Section 100600. The section location is shown as the red line in the top panel, while the vertical resistivity section from southwest to northeast is provided in the bottom panel. Faded colors near the bottom of the cross-section represent resistivity values below the DOI. Borehole lithology data (colored columns) are projected onto the section. Borehole intervals interpreted as the 400-FDA are shown behind the lithology data in blue. The top and bottom of the continuous conductor are shown as red and blue points, respectively.

Figure 5-15 through Figure 5-17 provide sequential views of selected resistivity cross-sections across the survey area that help to visualize the overall structure and trends in lithology across the basin. Figure 5-15 presents cross-sections oriented northwest-southeast from the northeast to southwest, while Figure 5-16 and Figure 5-17 display cross-sections oriented southwest-northeast from the northwest to the southeast. Several observations are clear from the sequential sections:

- Coarse-grained deposits tend to dominate the western portion of the basin, while the eastern portion of the basin tends to be finer-grained sediments overall, based on the higher resistivity values in the west (red-orange-yellow colors) as compared to the east (blue-green colors). The reds and purples along the basin boundary typically represent consolidated sediments and bedrock.
- Layering is evident in the resistivity profiles that generally dips downward to the basin center. The resistivity sections illustrating generally dipping alluvial layers and fluvial deposits and coarsening and fining lithology trends help provide more detail for the hydrogeologic conceptual model for the basin.
- The continuous conductor (light to dark blue) layers that may represent the 400-FDA are most obvious and thickest in the eastern part of the basin. These layers appear to coarsen toward the north, evidenced by higher resistivity, and then become finer once again.
- Salinas Lines DWR_SA1103800_1, DWR_SA1103800_2, and 200400 in the eastern portion of the basin display the deep blue continuous conductor as two distinct layers and join with the lower layer geometry, suggesting compressional folding as is common withing the Coast Ranges. The discontinuous and changing nature of the conductor is especially evident in Salinas Line 200400 starting in the center and moving to the left (north).
- In the northwest portion of the basin, Salinas Lines DWR_SA1103305_1, DWR_SA1103305_2, 200700, and DWR_SA1103304 illustrate the extent of the 180-Foot Aquifer, 180-Foot Aquitard, 400-Foot Aquifer, and some areas where the aquifers may be interconnected, and the 180-Foot Aquitard seems to be absent. A low-resistivity region can be seen in the far lefthand side (northwest) of the cross-section, reflecting influence of high-salinity groundwater.
- In the northernmost southwest-northeast cross-sections (Figure 5-17), seawater intrusion is evident where there is a strong conductor (blue) present in the upper half of the cross-section. On the southwest side of the cross-sections, folding and faulting appear to be present, most prominent in Salinas Line 100300.
- In the southernmost southwest-northeast lines, the continuous conductor (blue) appears evident on the west and east sides of the basin.

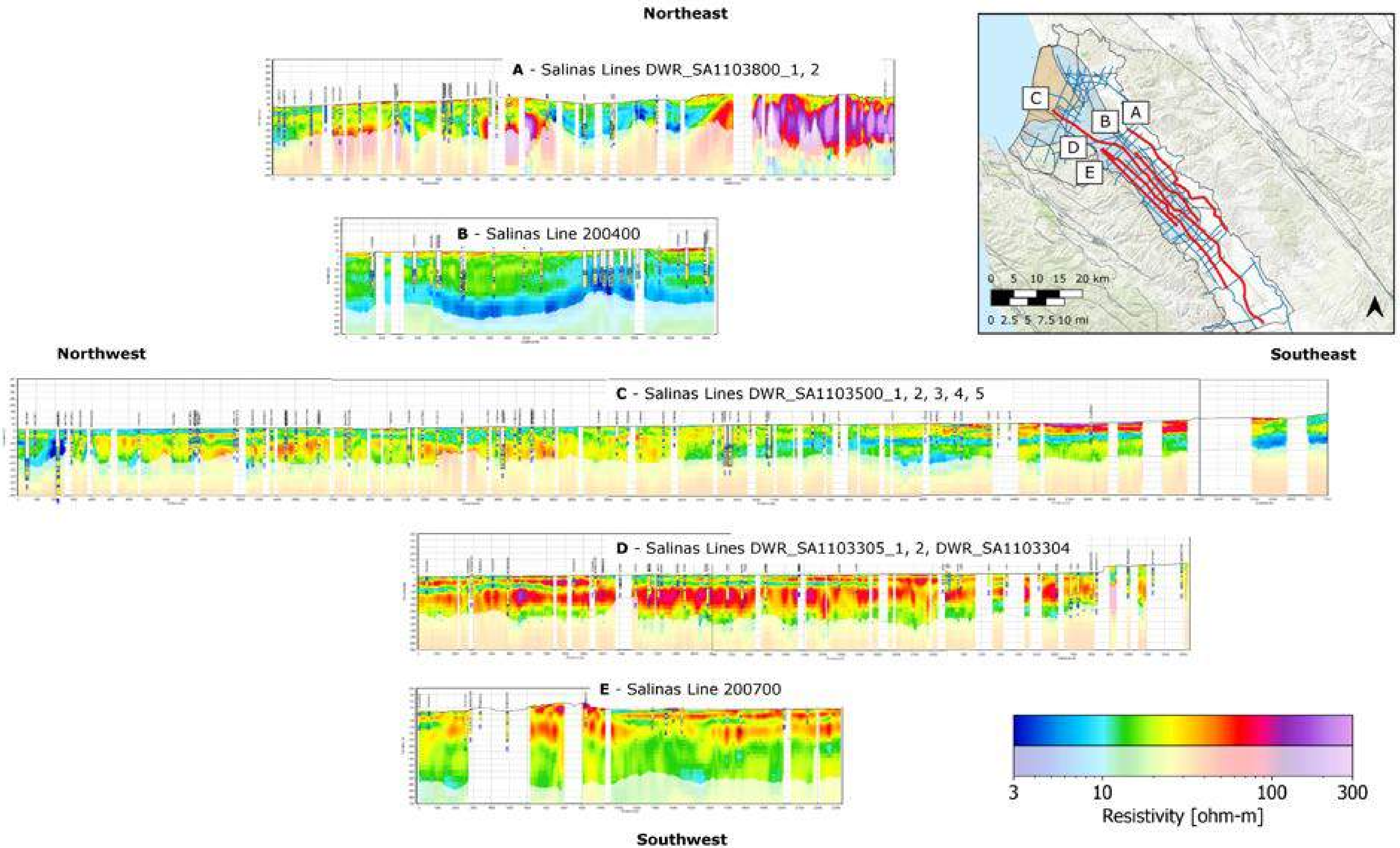


Figure 5-15 Series of cross-sections across the survey area oriented northeast to southwest. Cross-sections A, C, and D come from the DWR Statewide AEM Surveys, while cross-sections B and E come from the current survey. The name of each cross-section refers to the page name in Appendix 3. The dots shown in each cross-section are the interpretations of the top and bottom of the continuous conductor.

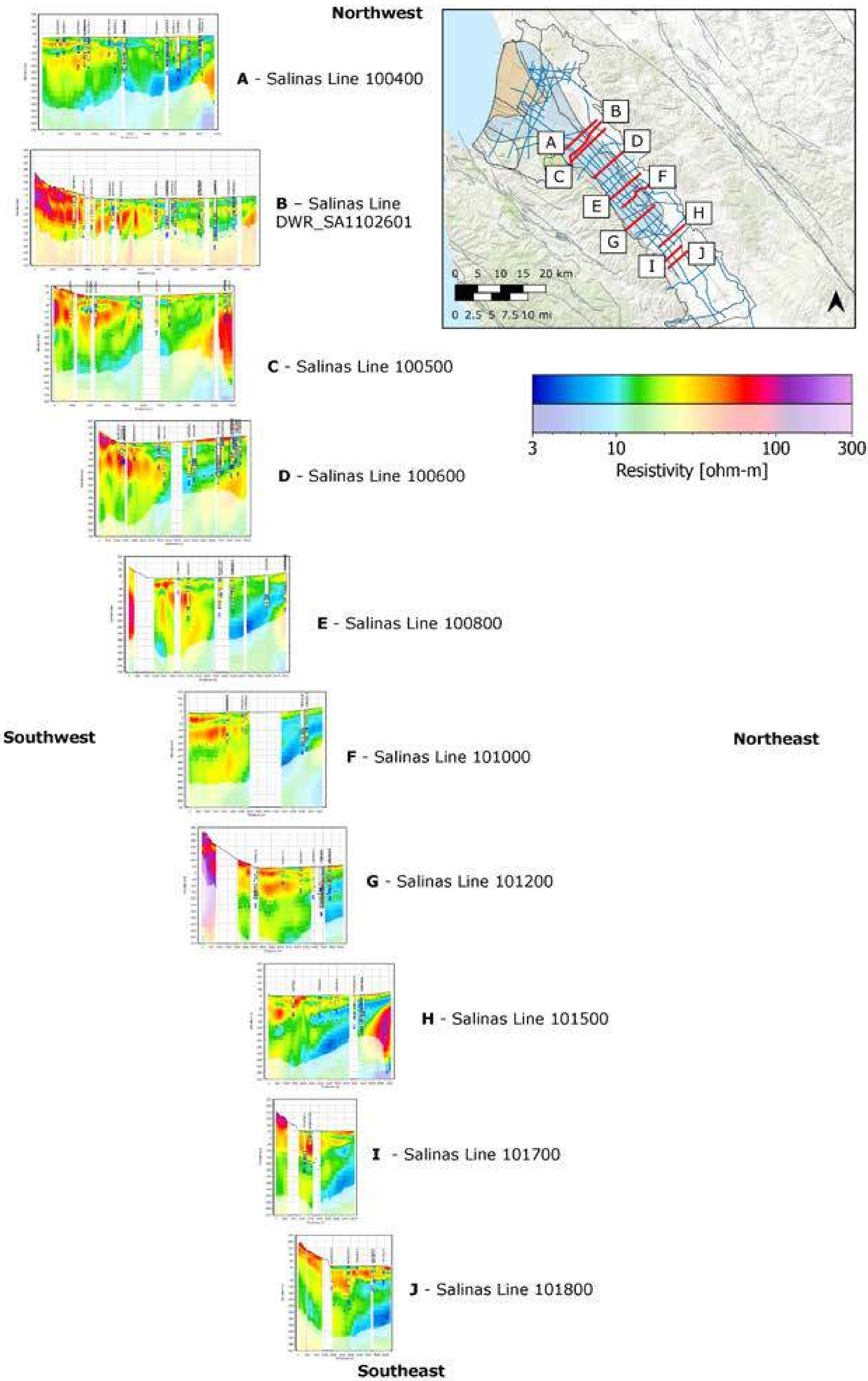


Figure 5-16 Series of cross-sections across the survey area oriented across the basin southwest to northeast. Cross-section B comes from the DWR Statewide AEM Surveys, while all other cross-sections come from the current survey. The name of each cross-section refers to the page name in Appendix 3. The dots shown in each cross-section are the interpretations of the top and bottom of the continuous conductor.

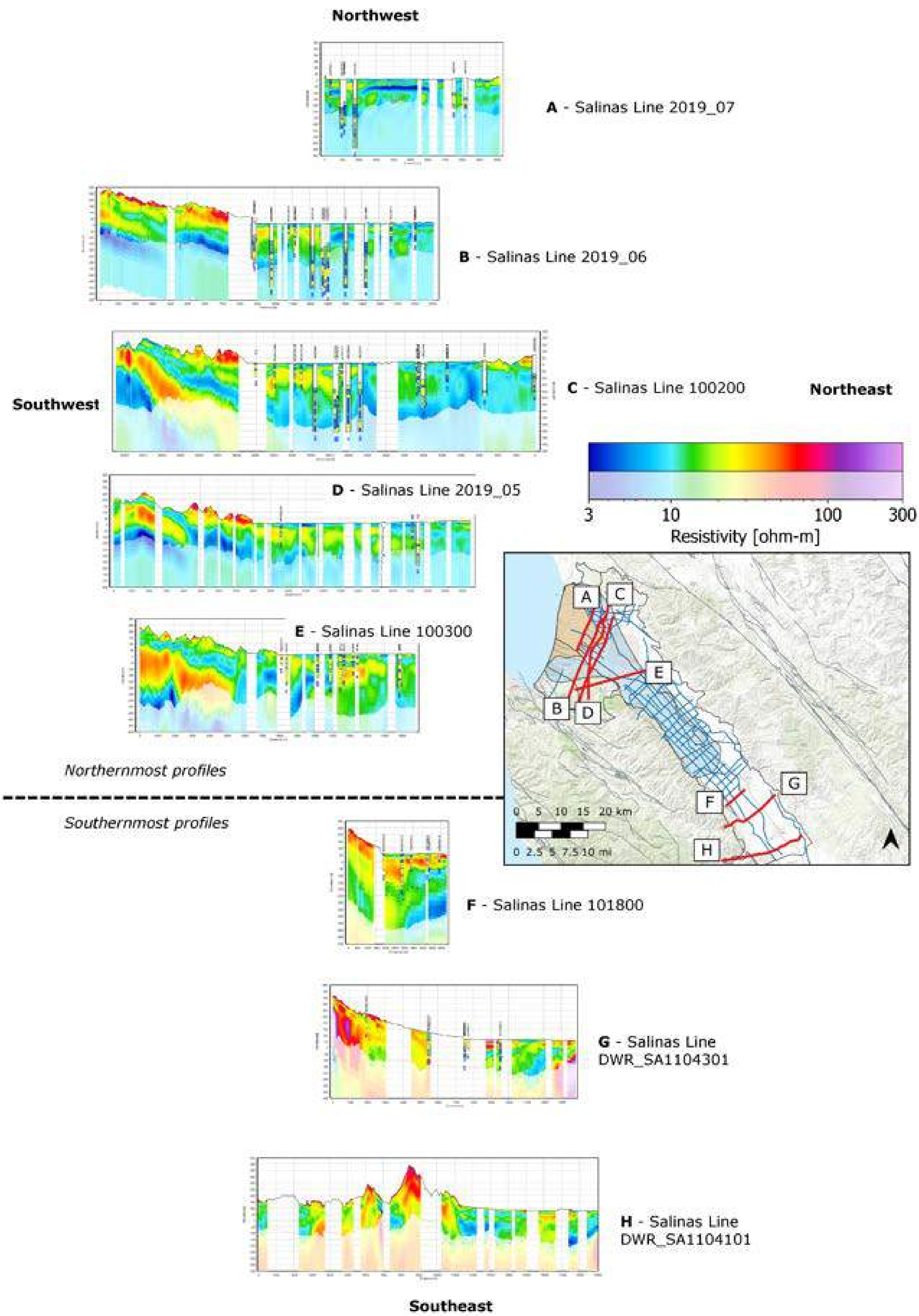
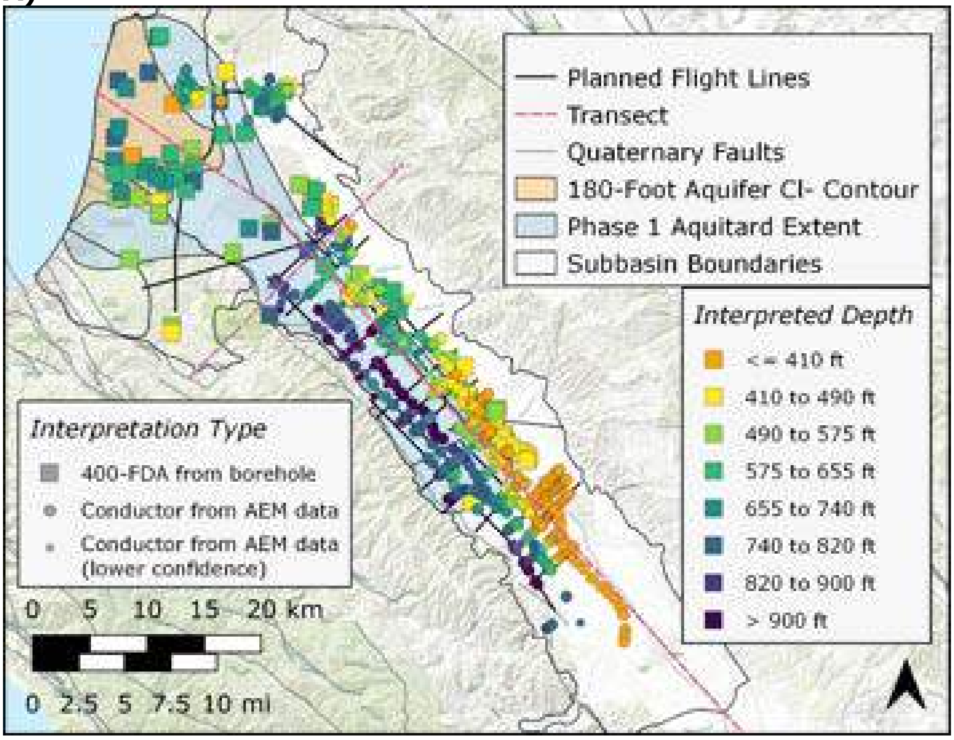


Figure 5-17 Series of cross-sections oriented across the basin southwest to northeast from the northernmost and southernmost parts of the survey area. Cross-sections A, B, and D come from the Coastal Salinas Valley AEM Surveys 2019 dataset, cross-sections G and H come from the DWR Statewide AEM Surveys, while all other cross-sections come from the current survey. The name of each cross-section refers to the page name in Appendix 3.

The interpreted depths of the continuous conductor are summarized as two maps in Figure 5-18. The interpreted depth to the top and bottom of the continuous conductor are shown as circles in Figure 5-18a and Figure 5-18b, respectively. Locations where the interpreted depth had lower confidence, shown as a smaller circle with a grey border, are more abundant for the bottom of the continuous conductor than for the top, largely because the depth of the bottom may be approaching the DOI. As in Figure 5-1, the interpreted depths to the 400-FDA from the Deep Aquifers Study Phase 1 Borehole Dataset are presented as large squares.

The maps in Figure 5-18 offer a wealth of information about the geometry of the continuous conductor, provided by the density and spatial continuity of data points. While borehole data are unevenly distributed across the survey area to identify the 400-FDA (see Figure 5-1), the AEM data could be used across the entire survey area to interpret the depth to the continuous conductor. Notably, the continuous conductor was mapped much farther south into the Salinas Valley than was suggested by the Phase 1 extent of the 400-FDA.

A)



B)

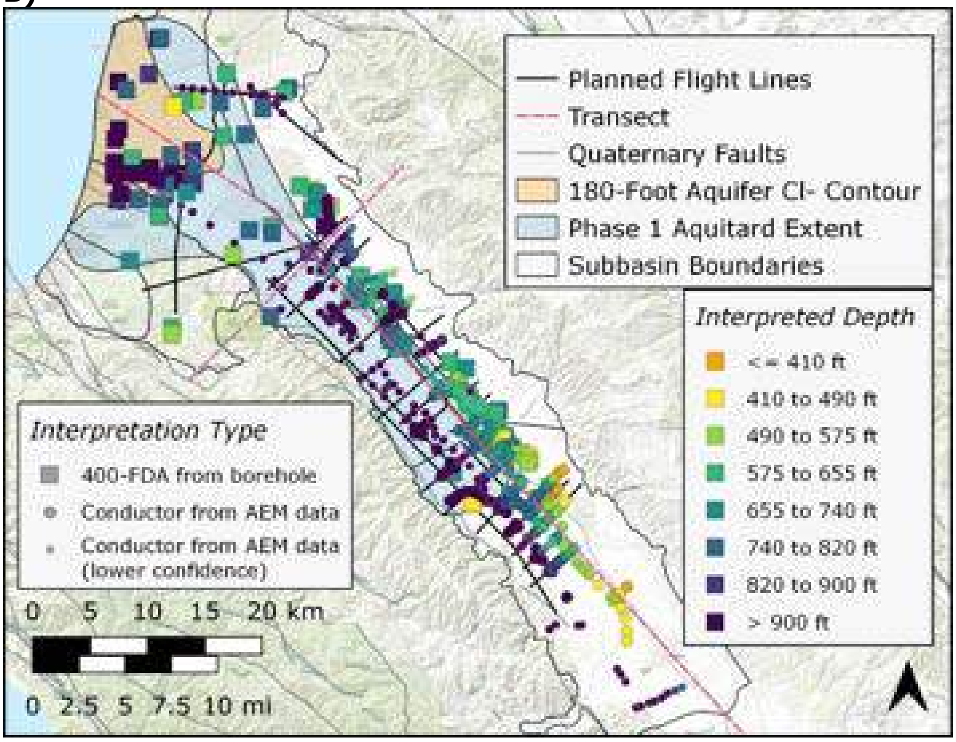


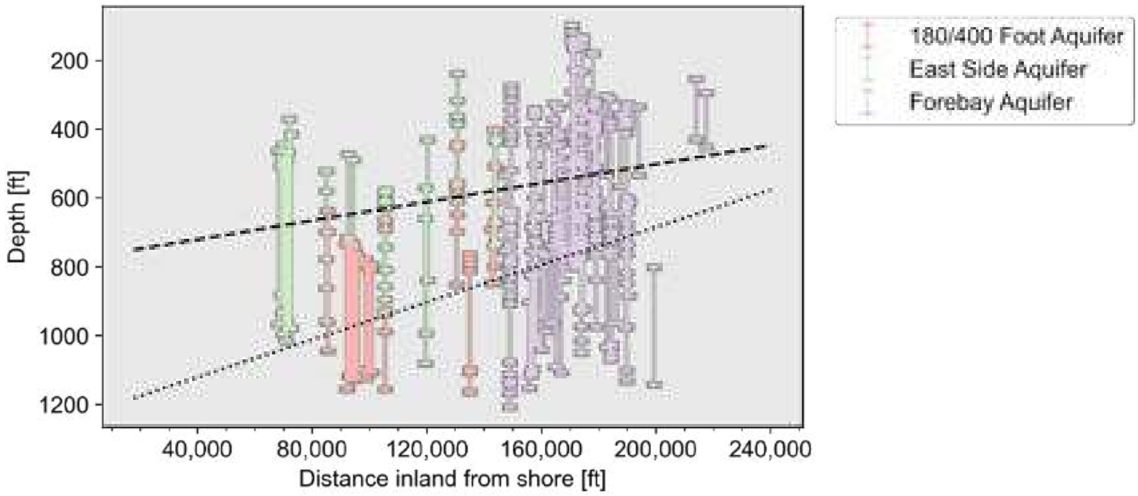
Figure 5-18 Interpreted depth of the top and bottom of the 400-FDA and the continuous conductor. Depth to the 400-FDA was interpreted from borehole data in the Deep Aquifers Study Phase 1 Borehole Dataset, while depth to the continuous conductor is interpreted from AEM data. A) Depth to the top of the 400-FDA and continuous conductor, B) Depth to the bottom of the 400-FDA and continuous conductor. Lower confidence interpretations from AEM data are shown as smaller dots with grey borders.

The interpreted depths of the conductor as a function of distance along the pink transect lines are provided in Figure 5-19. The tops and bottoms of the continuous conductor are shown connected by vertical bars. Although the tops and bottoms of the continuous conductor were interpreted independently, each interpreted top was linked to the closest interpreted bottom, within 500 ft. Depths interpreted with lower confidence are not shown.

As in the analysis of the Deep Aquifers Phase 1 Borehole Dataset (Figure 5-2), the regression line best fitting the depth to the top and bottom of the continuous conductor is shown as a dashed and dotted line, respectively. Figure 5-19a shows that the continuous conductor shallows and thins with distance inland, as shown similarly with the 400-FDA in the analysis of the Deep Aquifers Phase 1 Borehole Dataset, although the average depth of the continuous conductor is greater in Figure 5-19a than the average depth of the 400-FDA shown in Figure 5-2a.

Figure 5-19b shows the continuous conductor dipping toward the southwest. This dip is a strong and consistent trend across each of the subbasins displayed. In the analysis of the Deep Aquifers Phase 1 Borehole Dataset (Figure 5-2b), the depth of the 400-FDA was shown to thicken toward the southwest, and then shallow and thin in the Monterey Subbasin. In the case of Figure 5-19b, however, data come from farther inland, and no data are displayed from the Monterey Subbasin. In contrast, Figure 5-19b adds a wealth of information from the Forebay Aquifer Subbasin, and to a lesser degree the East Side Aquifer Subbasin. Because of the spatial continuity of the AEM data, there are rarely nearby interpretation points that vary significantly; however, because the AEM data extended much farther to the southwest side of the basin as well as higher into the foothills in the northeast, there is a much larger portion of the basin structure represented in the AEM data, leading to higher scatter within both Figure 5-19a and Figure 5-19b.

A)



B)

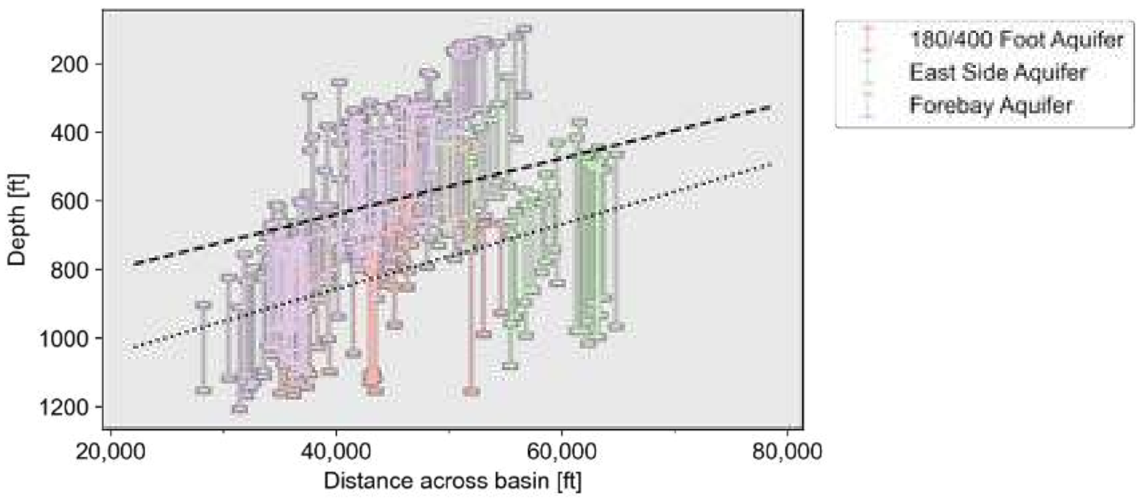


Figure 5-19 Depth of the continuous conductor, interpreted from AEM data, shown as a function of distance.

A) Distance inland from shore, B) distance across the Salinas Valley from SW to NE, as shown by the pink transect lines in Figure 5-18 where circles and squares indicate the depth to the top and bottom of the continuous conductor, respectively. Each point is colored by the Subbasin corresponding to the measurement location. The black dashed and dotted line, respectively, show the least squares regression line fit to the interpreted top and bottom of the continuous conductor. Only points with high confidence are shown.

5.4 Deep Conductor

Presence of a deep, continuous conductor was noted in the AEM data at multiple locations, below the continuous conductor outlined in Section 5.3. Within the groundwater basin, this deeper conductor appears 100 m below the bottom of the continuous conductor delineated above. While not the focus of this project, this deep conductor is a regionally consistent and potentially geologically relevant feature that can be seen in many cross-sections.

The trend of the deep conductor in the direction of the Salinas Valley can be seen in Figure 5-12, where the deep conductor appears to dip regionally toward the coast with significant undulation along the cross-section distance.

Cross-sections E through J in Figure 5-16 show the regional change in this deep conductor moving from the north to the south of the survey area. Farther north (E), the continuous conductor is indistinguishable from a deeper conductor on the right side (northeast) of the cross-section. Moving south (G), there are two visibly separate conductors, which both appear to dip toward the basin center, although the deep conductor has a larger dip than the continuous conductor.

6. Summary and Conclusions

The Salinas Valley has been the location of multiple AEM surveys, with the current survey conducted with the goal of better understanding the Deep Aquifers, the top of which is defined by the presence of the 400-FDA. The SkyTEM 312HPM time-domain electromagnetic system was used for this survey and provided the ability for deeper penetration into the subsurface than did previous AEM surveys, offering information from the ground surface to a depth of between 1,000 and 2,000 ft (300 and 600 m). As a result, the AEM data could be used to successfully locate the top—and in many cases the bottom—of a continuous conductor at depth intervals corresponding to the current understanding of the 400-FDA. While some differences exist when comparing the continuous conductor as interpreted from AEM resistivity values, to the depth interval of the 400-FDA as interpreted from the Deep Aquifers Phase 1 Borehole Dataset, regional trends show a close correlation.

The results of the geophysical surveys in general confirm the working hydrogeologic conceptual model of finer grained alluvial plain deposits filling the eastern portion of the survey area of the Salinas Valley, and generally coarser grained fluvial and alluvial deposits in the western portion. Several southwest-northeast resistivity cross-sections across the survey area demonstrate this with the coarser deposits designated by red, orange, and yellow colors, and the finer grained green to blue with the blue generally indicative of clay aquitards, although increased salinity near the coast can lower the resistivity as well. Northwest-southeast resistivity cross-sections also demonstrate this trend in lithology. The newly acquired AEM data, in concert with existing data, show a consistent indication of faulting along the Reliz Fault, accompanying possible folding and warping of adjacent and underlying sediments.

The results in this report suggest a conductor across much of the study area corresponding to the depth at which the 400-FDA is expected. However, the interpreted conductor does not necessarily reflect variation in sediment provenance, which may have implications for the definition of the 400-FDA: resistivity values from AEM data can only distinguish between sediments insofar as a resistivity contrast is present. Additional data should be analyzed in combination with the AEM data to understand the relationship of the continuous conductor to the 400-FDA.

6.1 Recommended Future Work

The work completed in this project provides a strong foundation for integrating AEM and existing borehole data into a unified interpretation of the Deep Aquifers. To continue building on this work, we foremost recommend integrating AEM resistivity and supporting data into a three-dimensional geologic modeling and visualization platform. Because the analysis completed in this project relied on two-dimensional maps and cross-sections, additional cross checks and interpretation for regional and localized geologic trends and structure mapping can be achieved through three-dimensional analysis.

Furthermore, addressing the following data gaps would add additional clarity to the AEM data results:

- Mineralogy data could be helpful in further understanding the source and differentiating provenance of the 400-FDA
- Geophysical logging of cased holes could help reduce uncertainties and help quantify aquifer properties
- Identification and prioritization of key areas for an additional data collection next step based on combined geophysics and log data

7. Deliverables

The project deliverables consist of the following files:

1. **Raw AEM Data**. Raw data as extracted from the instrument, including:
    1. " .xyz" files – ASCII files with information about the geographical coordinates, transmitted current and many other supporting data.
    2. " .gex" and ".sr2" files – ASCII files containing the system description (geometry, waveform, filters etc.).
    3. " .alc" files – ASCII files describing the mapping from the ".xyz" file to the datatype used in the Aarhus Workbench software.
2. **AEM Database.** A Firebird database containing all raw data, processed data, and inversion results. The database is structured according to the Danish Geologic Survey "GERDA" format (https://eng.geus.dk/products-services-facilities/data-and-maps/national-geophysical-database-gerda/). The database can be opened with the Aarhus Workbench Viewer software package (https://www.aarhusgeosoftware.dk/workbench-viewer).
3. **Geospatial data (shapefile, grid, GeoTIFF).** ArcGIS shapefiles, grid files and/or geo-referenced TIF files including:
    1. Layout: Shapefiles (".shp") containing geographical information about the surveyed area, surveyed flight lines, retained flight lines after data processing, etc.
    2. Boreholes: Shapefile containing locations of the boreholes used in the project.
    3. Mean Resistivity Maps: Geo-referenced TIF files (".tif") illustrating plan-view maps of average resistivities within different elevation intervals that are presented in this report. Each file name includes information about the top and bottom of the interval.
    4. Resistivity Cross-Sections: Shapefiles (".shp") containing geographical information for the vertical sections presented in this report.
    5. 3D Resistivity Cross-Sections: Google Earth KMZ (".kmz") containing a 3D gridded representation of the AEM resistivity results.
    6. Interpretations: Shapefiles containing locations of interpretations of the top and bottom of the continuous conductor in the survey area.
4. **CSV Results.** Text files containing 3D results. Included files are the direct export from the Aarhus Workbench software (extension of ".xyz") and set of files formatted for import into Leapfrog software (https://www.seequent.com/products-solutions/leapfrog-geo/, ".csv" extension).
    1. AEM: Resistivity values resulting from inversion.
    2. Interpretations: Locations of interpretations of the top and bottom of the continuous conductor in the survey area.
5. **Project Report.** The project report is delivered as a PDF document.
6. **Borehole Database.** Files containing the borehole data compiled for this project.
    1. Collar: CSV (".csv") containing high-level information for each borehole
    2. Interval: CSV (".csv") containing the depth interval information on lithology, screen intervals, and interpreted depths of the 400-FDA.
    3. LAS: Log-ASCII Standard (LAS) files containing borehole geophysical data.

The file structure of the deliverables is shown in Table 7-1. In each folder, a text file named "Readme.txt" describes detailed information of the files within the folder.

Table 7-1 Structure of the project digital delivery folder.

Parent Folder	Subfolder	Subfolder	Extension	Content
01_Raw_SkyTEM_Data	01_XYZ		.xyz	Raw data file
	02_GEX		.gex .sr2	System description
	03_ALC		.alc	Column mapping from xyz file
02_AEM_Database			.gdb	Firebird Database
03_GIS_Grid_GeoTIFF	01_Layout	01_Flightlines	.shp	General survey information
		02_Magnetics	.tif	Magnetics information
		03_Distance_Lines	.shp	Distance along and across basin
		04_DEM	.grd .tif	Elevation model
	02_Boreholes		.shp	Borehole locations
	03_Mean_Resistivity_Maps		.tif	Mean resistivity plan view maps
	04_CrossSections		.shp	Locations of the cross-sections
	05_CrossSections_3D		.kmz	3D representation of cross-sections
	06_Interpretations		.shp	Locations of interpretation points

Table 7-1 Structure of the project digital delivery folder.

Parent Folder	**Subfolder**	**Subfolder**	**Extension**	**Content**
04_CSV	01_AEM	Dataset	.xyz .csv	AEM resistivity values
	02_Interpretations		.xyz .csv	Interpretation locations
05_Report			.pdf	Project report
06_Borehole_Database	01_Collar		.xlsx	Borehole point information
	02_Interval		.xlsx	Lithology, interpreted aquitard, screen intervals
	02_LAS	Dataset	.las	Borehole geophysical data

8. References

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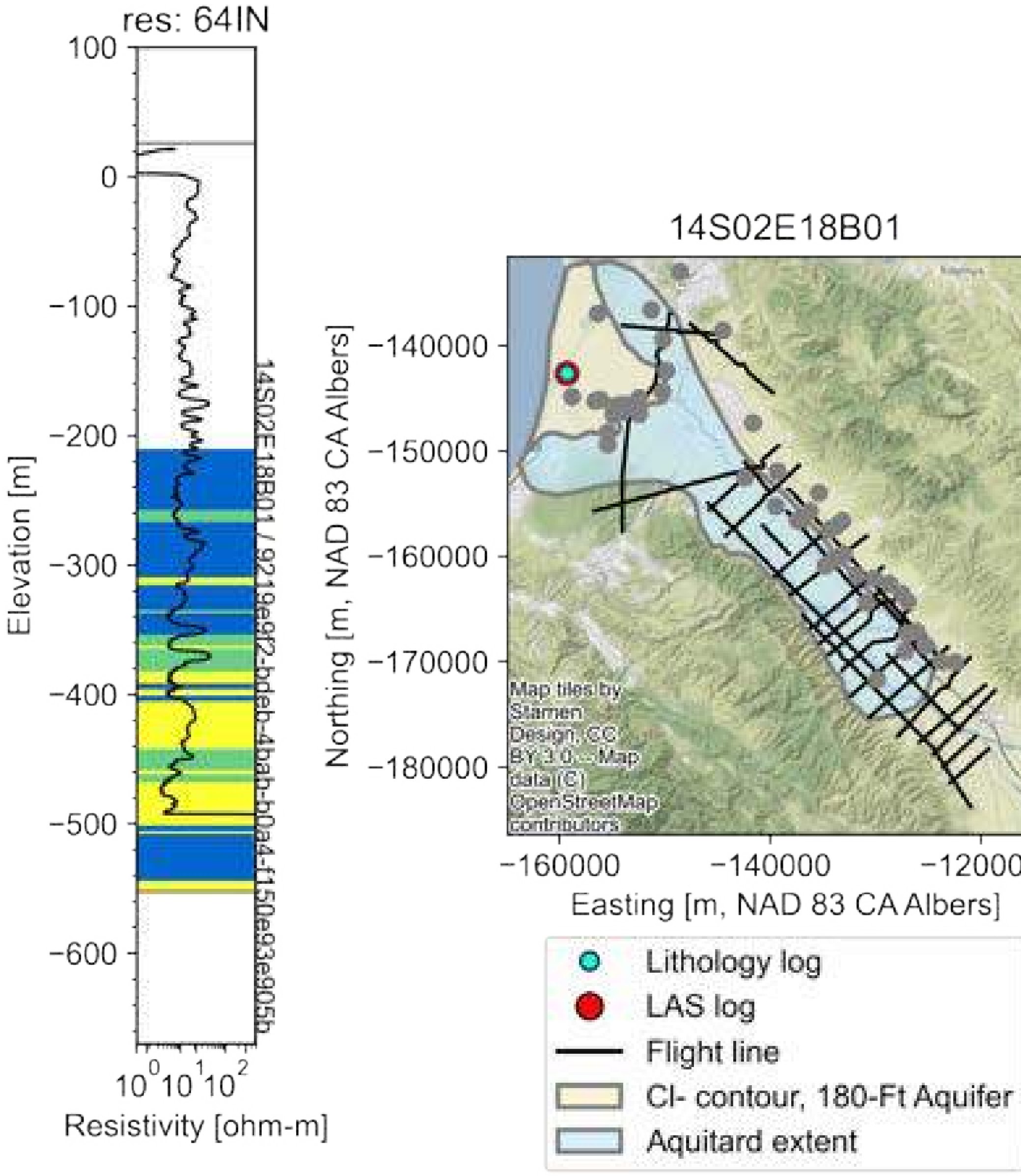
Appendices

Appendix 1
Borehole Geophysical Data



res: 64IN
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
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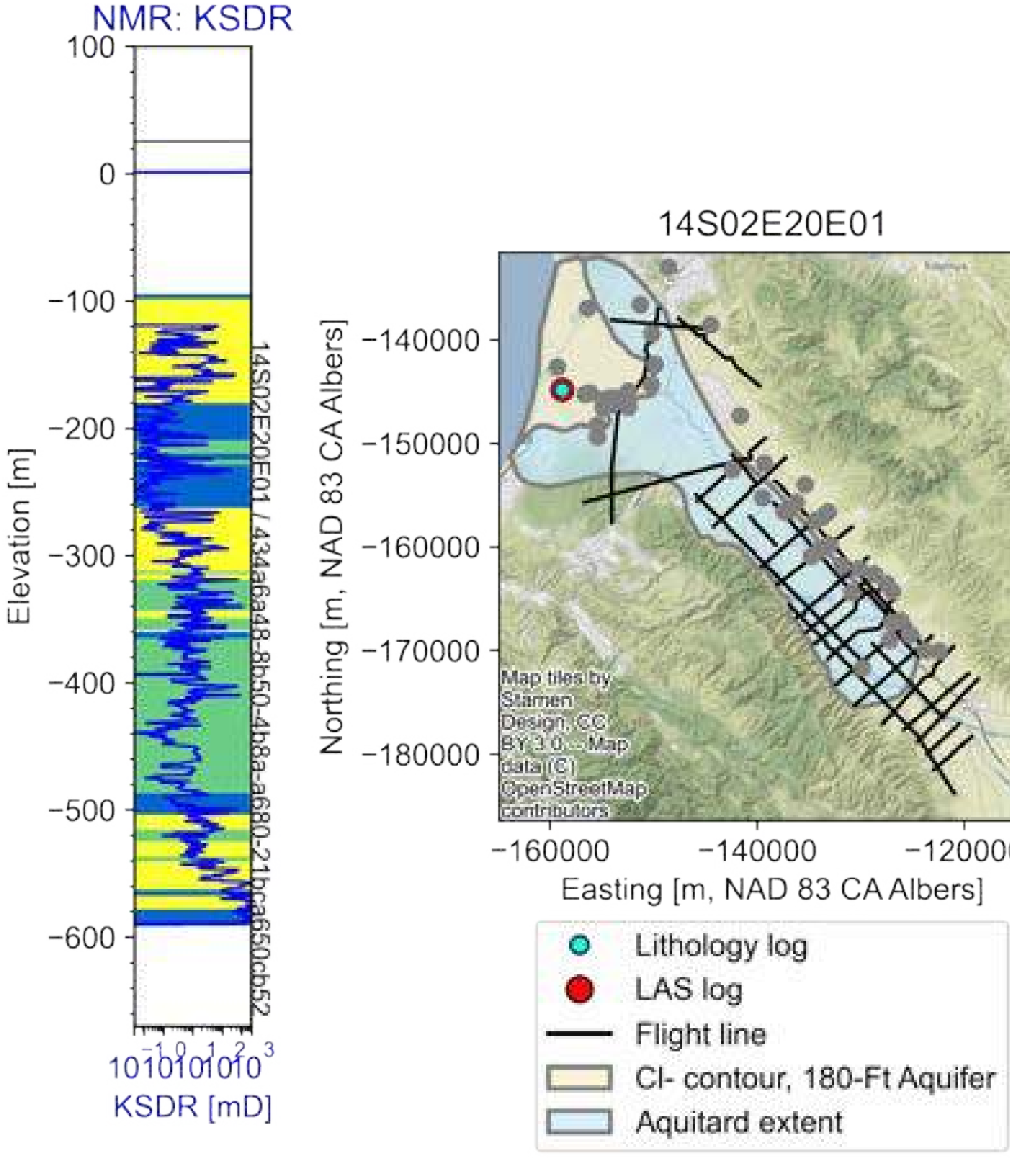
10^0 10^1 10^2
Resistivity [ohm-m]
14S02E18B01
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent


NMR: KSDR
Elevation [m]
KSDR [mD]
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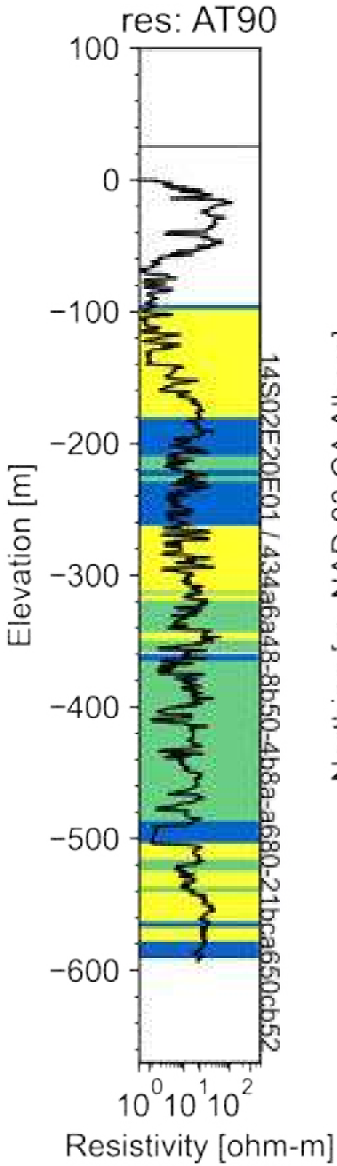
14S02E20E01
Northing [m, NAD 83 CA Albers]
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent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Elevation [m]
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0
−100
−200
−300
−400
−500
−600
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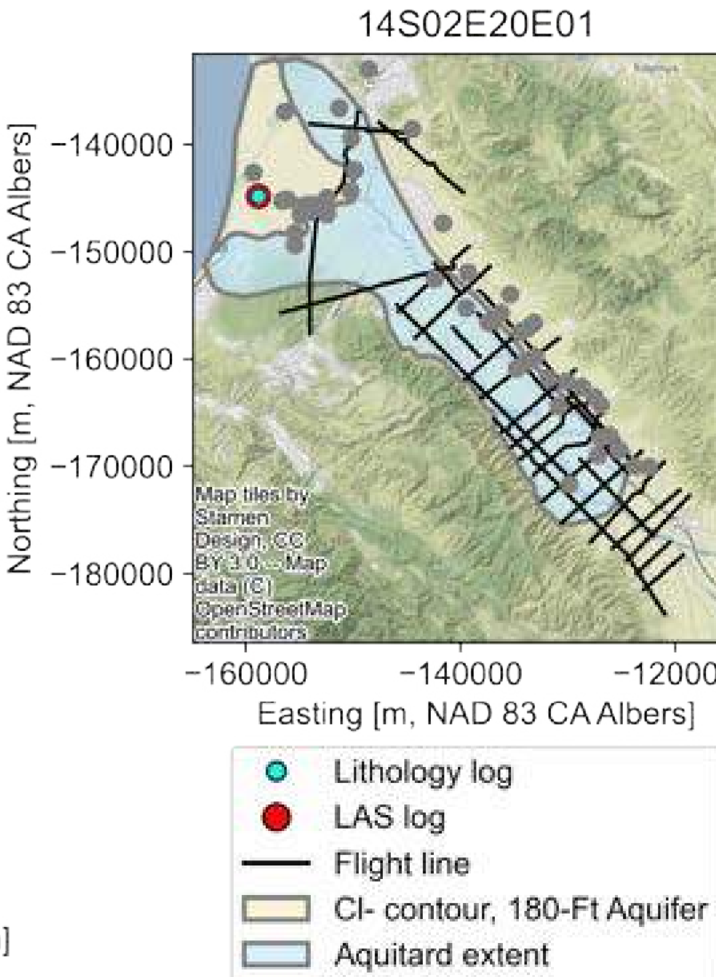
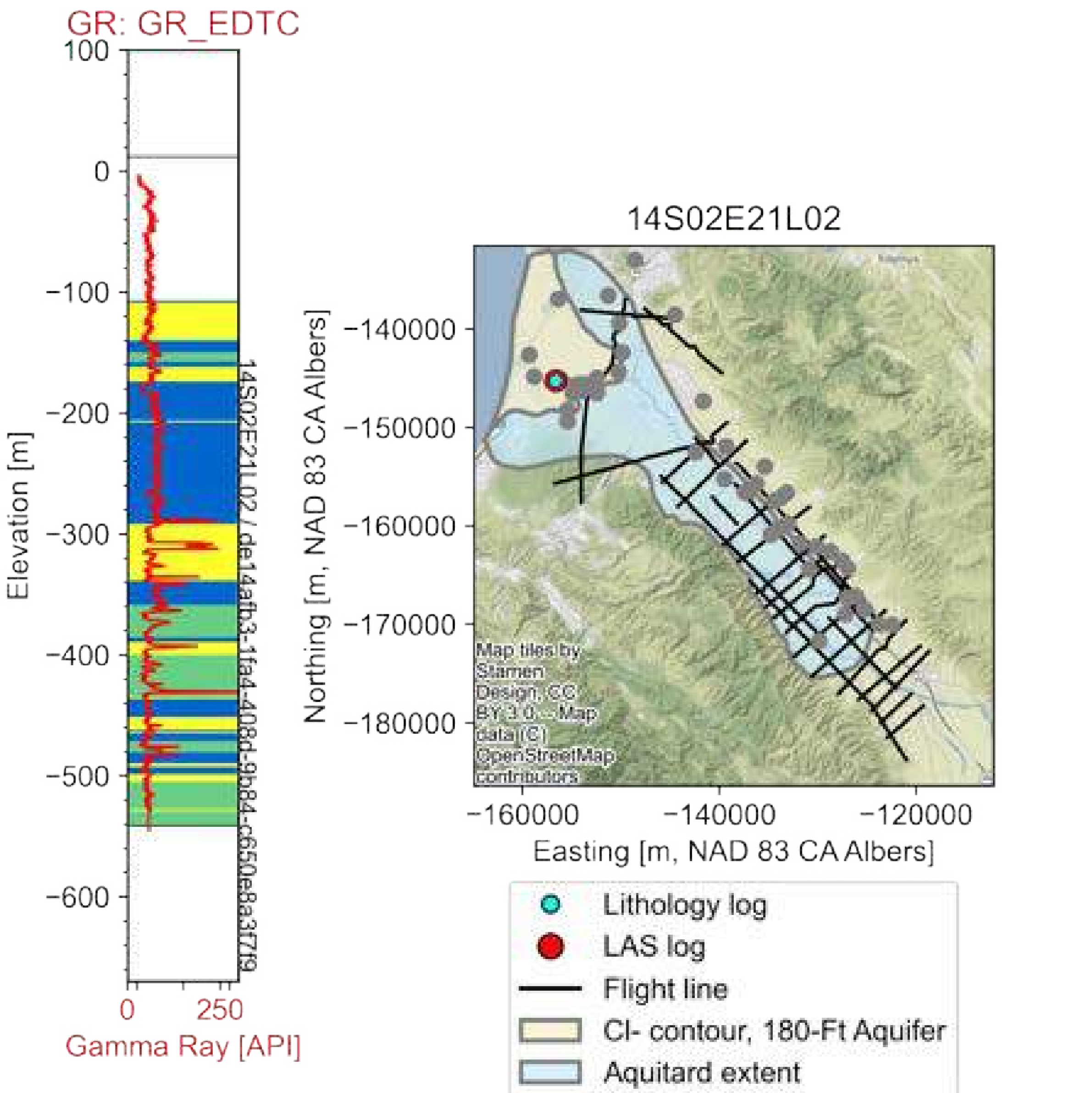
$10^0 10^1 10^2$
Resistivity [ohm-m]


14S02E20E01
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent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0
−100
−200
−300
−400
−500
−600
Elevation [m]
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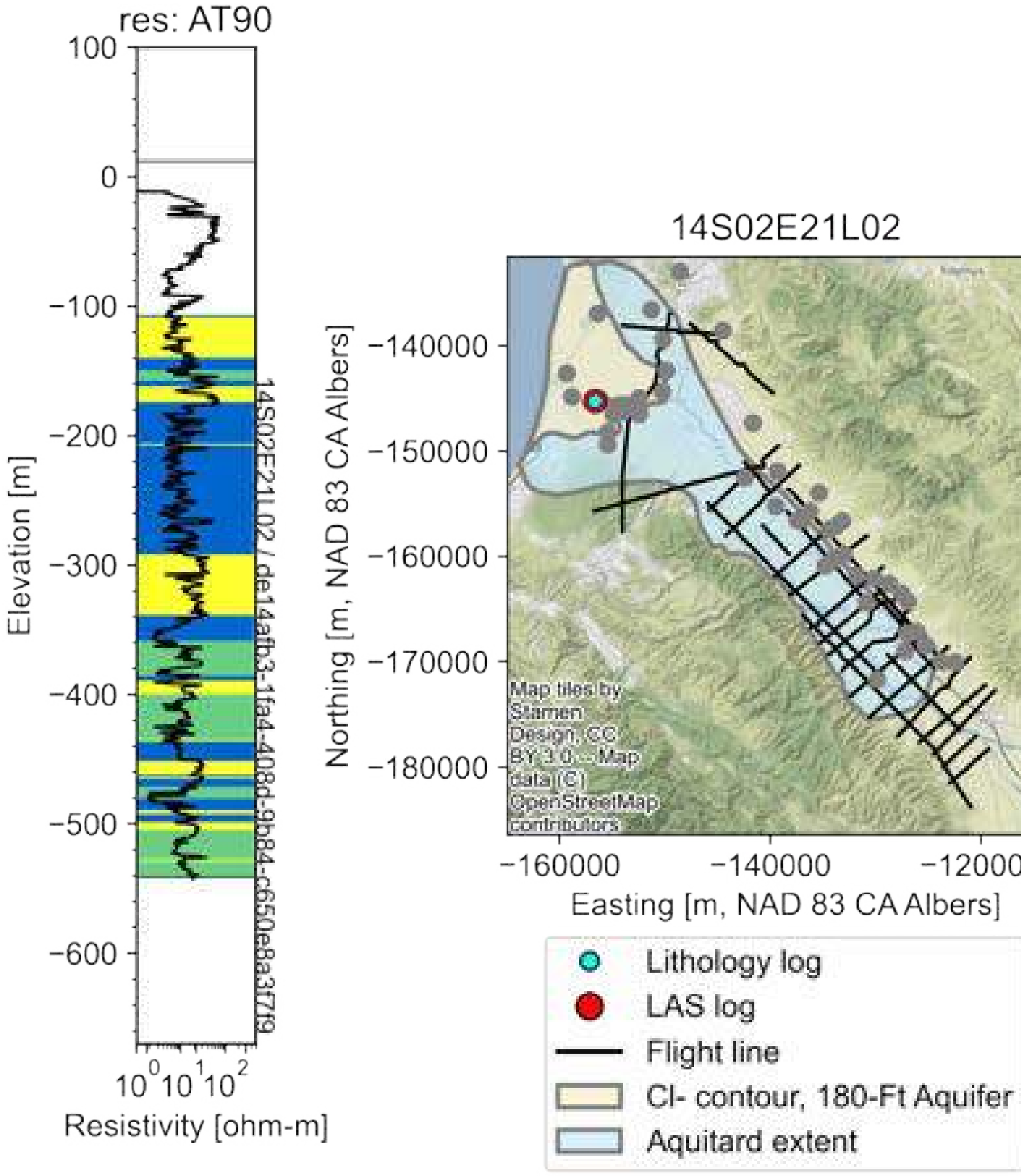
0
250
Gamma Ray [API]
14S02E21L02
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



res: AT90
Elevation [m]
Resistivity [ohm-m]
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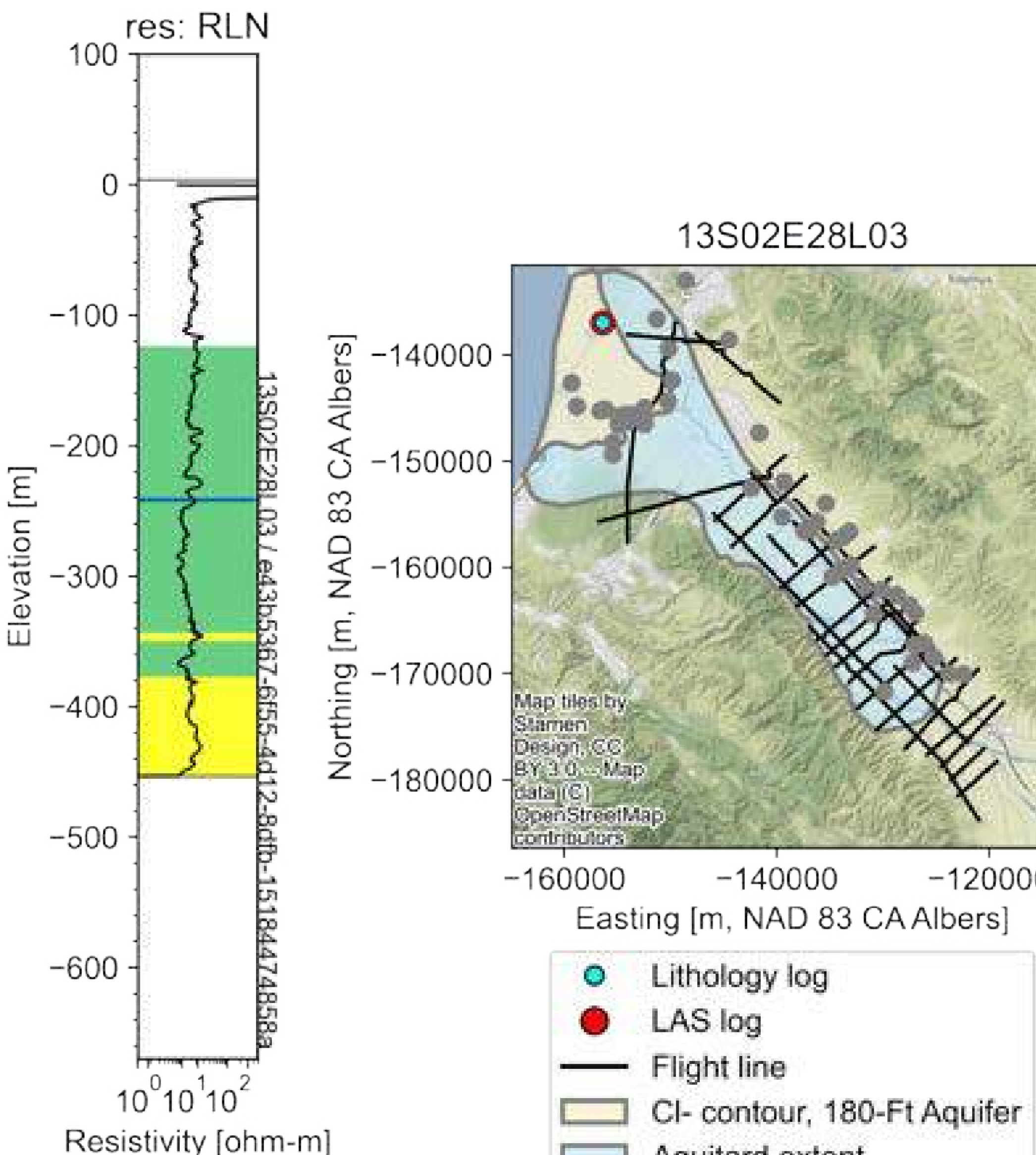
14S02E21L02
Northing [m, NAD 83 CA Albers]
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



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−100
−200
−300
−400
−500
−600
Elevation [m]
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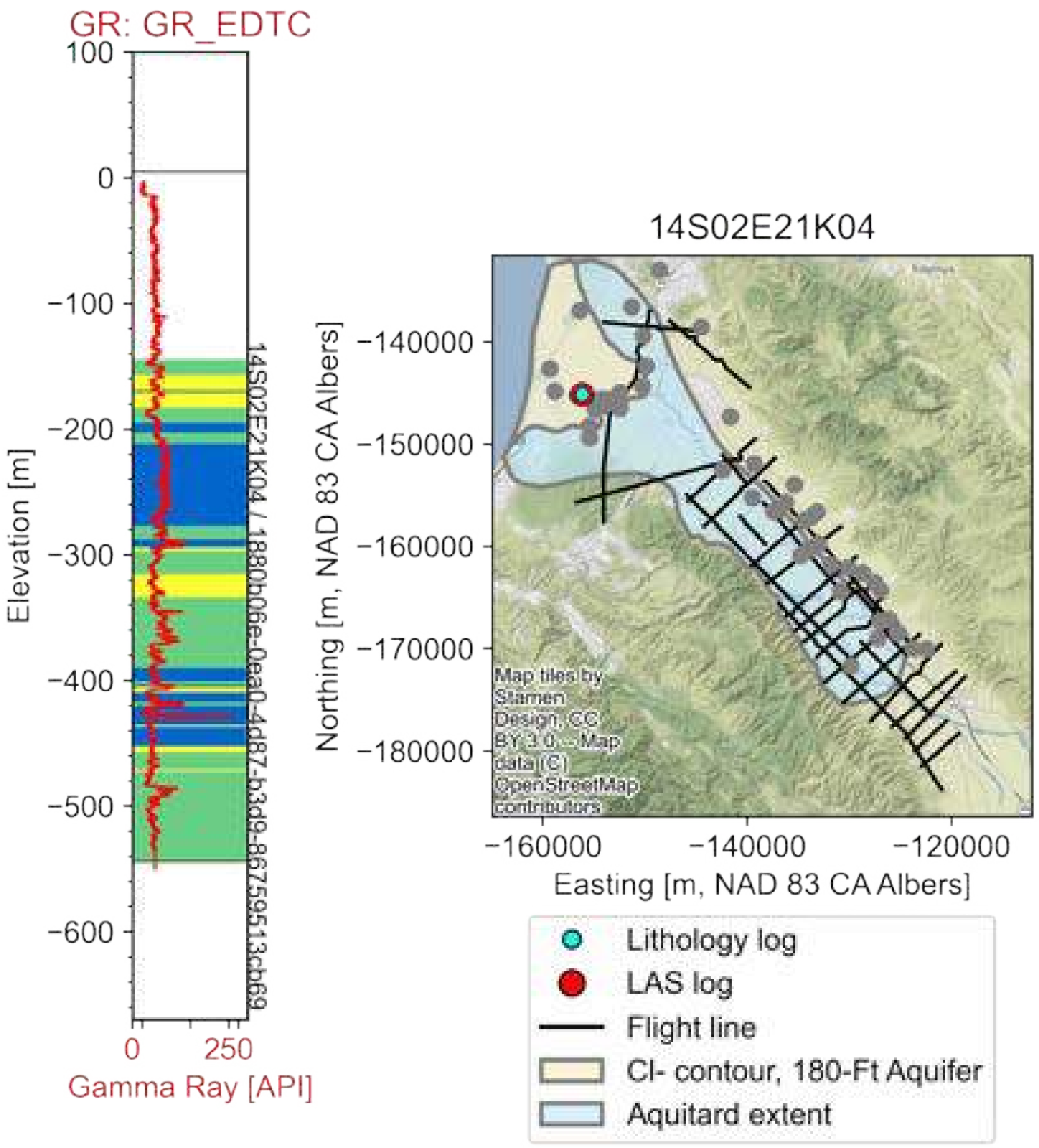
10^0 10^1 10^2
Resistivity [ohm-m]
13S02E28L03
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



GR: GR_EDTC
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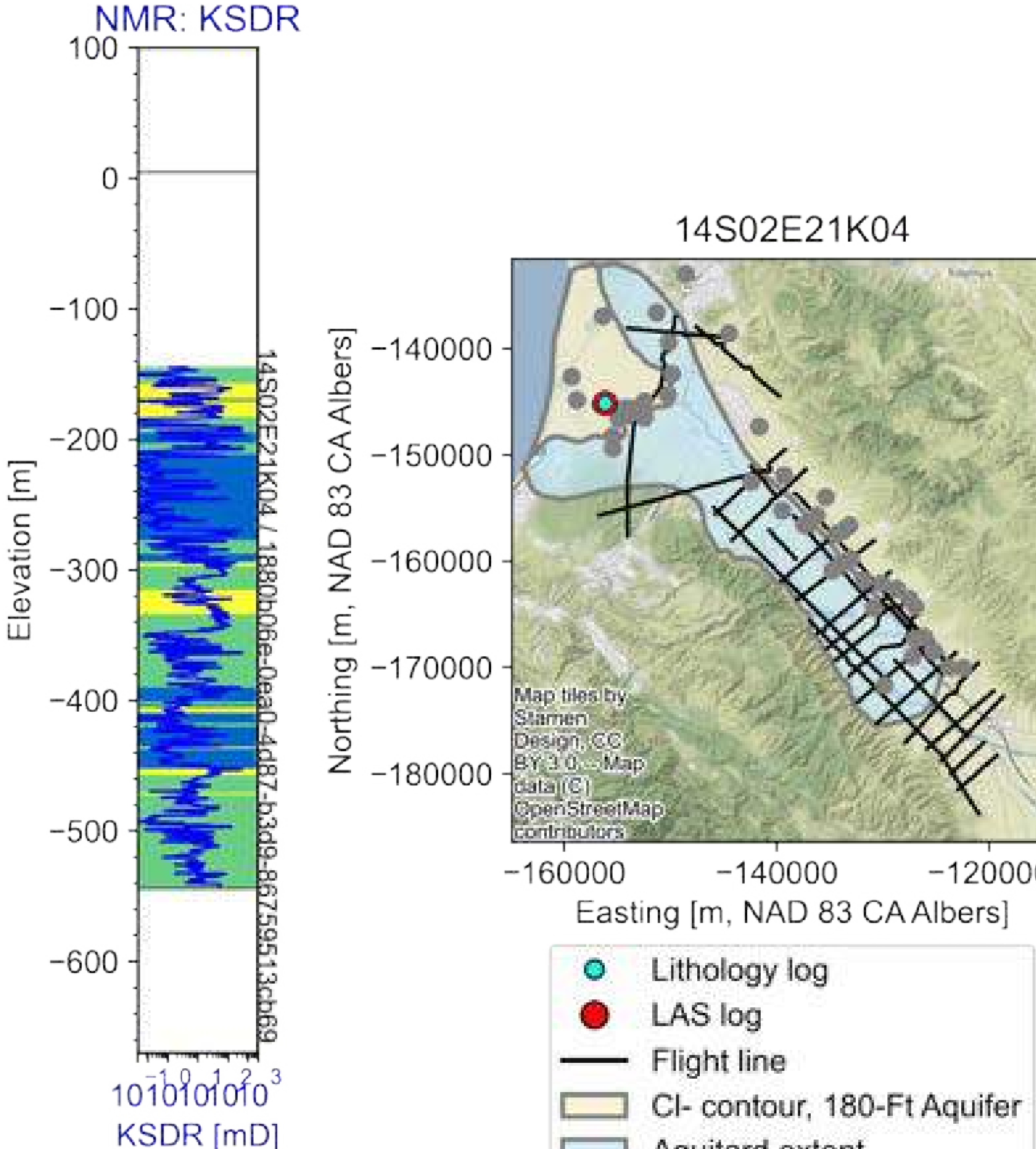
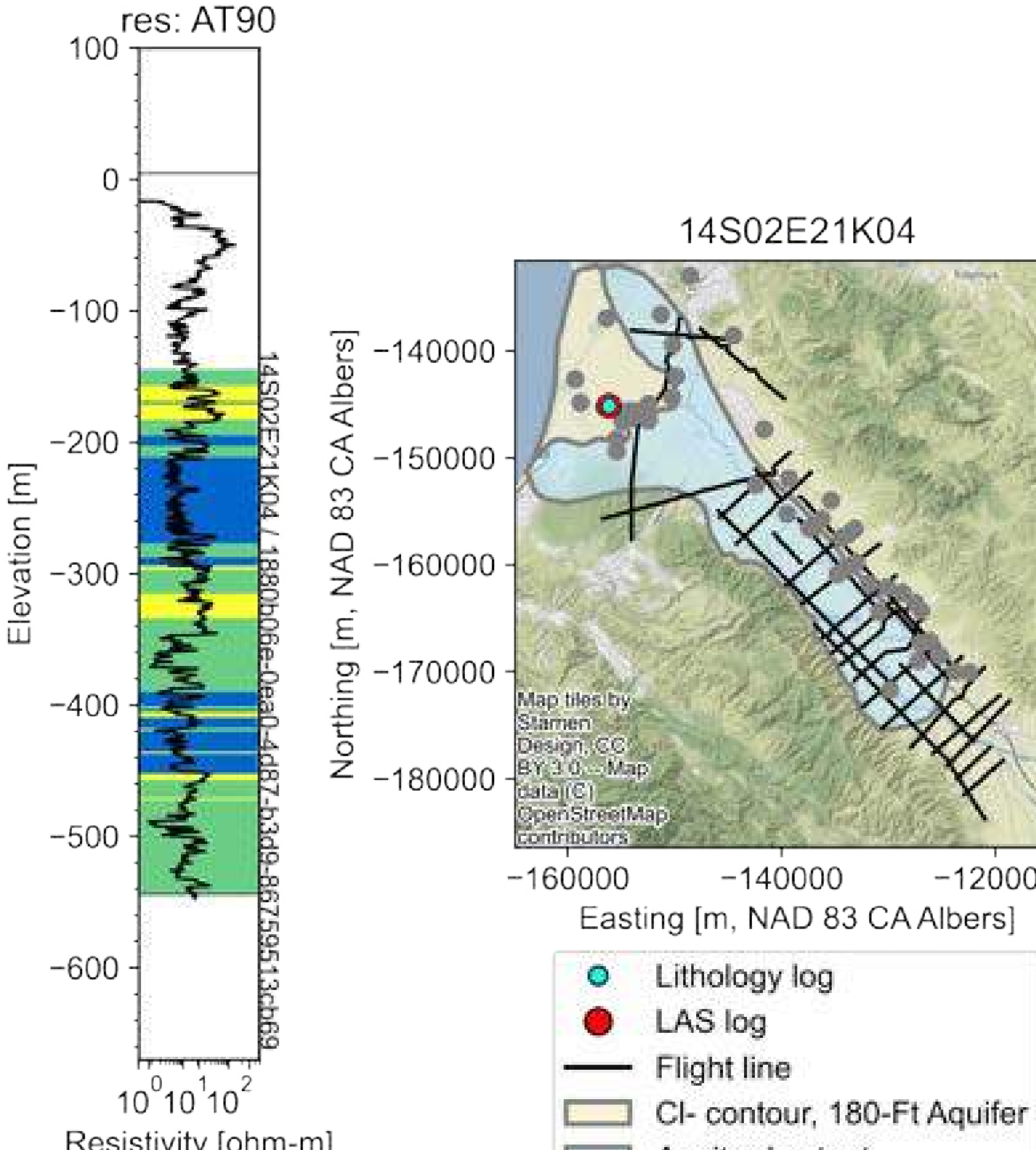
0
−100
−200
−300
−400
−500
−600
Elevation [m]
14S02E21K04 / 1880b06e-0ea0-4d87-b3d9-867595513cb69
0
250
Gamma Ray [API]
14S02E21K04
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent


NMR: KSDR
Elevation [m]
100
0
−100
−200
−300
−400
−500
−600
14S02E21K04 / 1880b06e-0ea0-4d87-b3d9-86759513cb69
KSDR [mD]
14S02E21K04
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
Easting [m, NAD 83 CA Albers]
−160000
−140000
−120000
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



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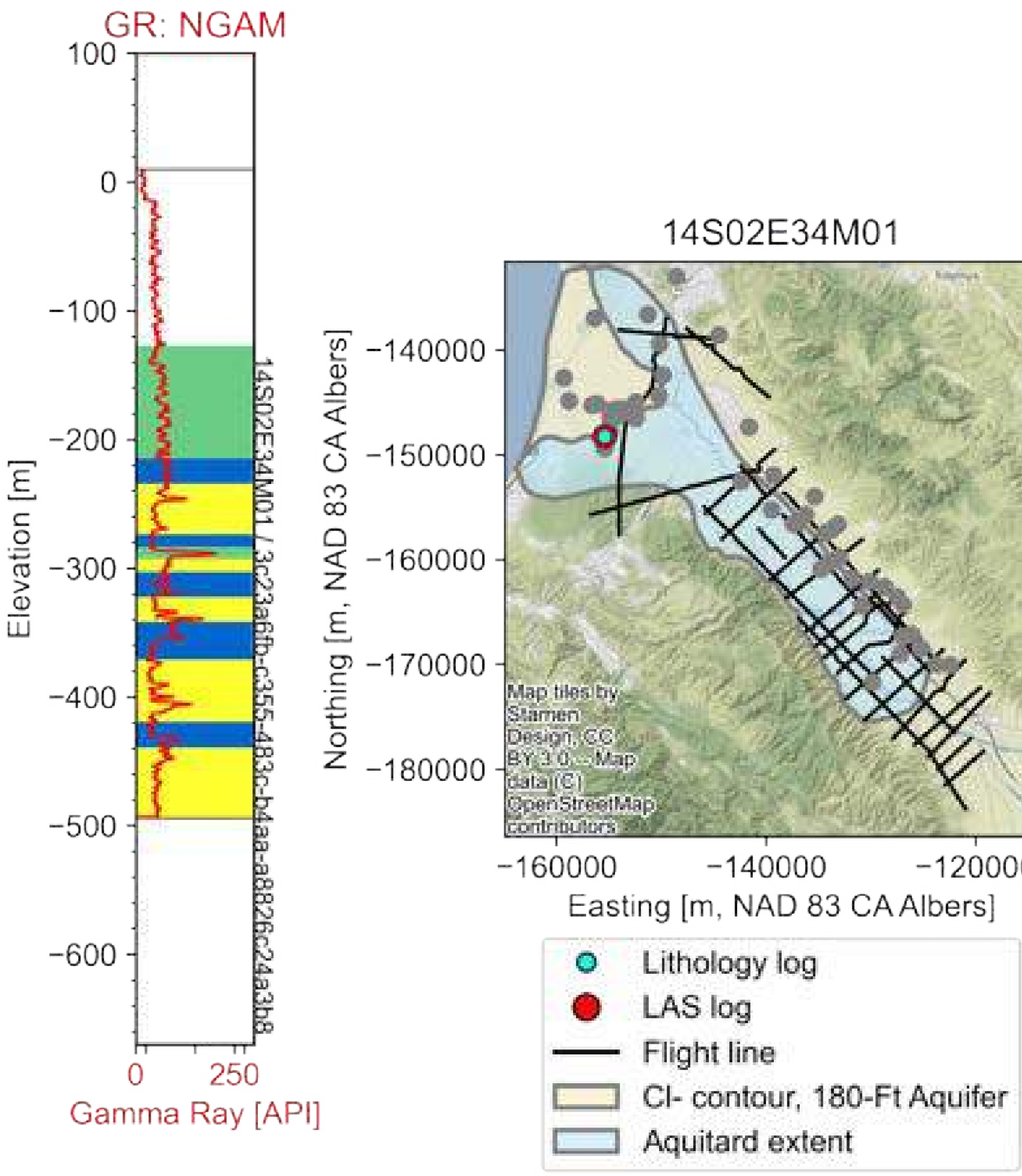
Elevation [m]
100
0
−100
−200
−300
−400
−500
−600
14S02E21K04 / 1880b06e-0ea0-4d87-b3d9-86759513cb69
10^0 10^1 10^2
Resistivity [ohm-m]
14S02E21K04
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



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0
−100
−200
−300
−400
−500
−600
Elevation [m]
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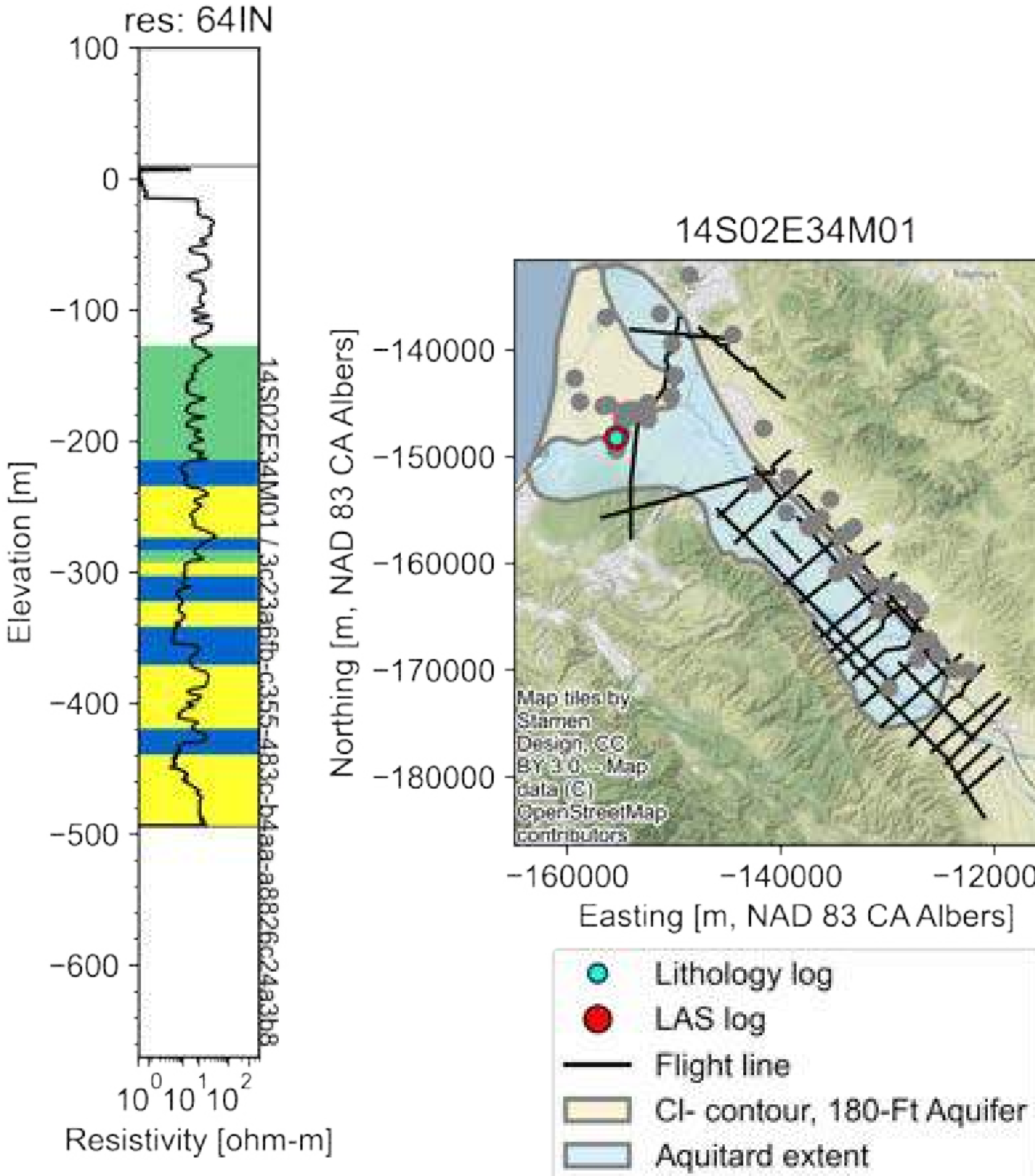
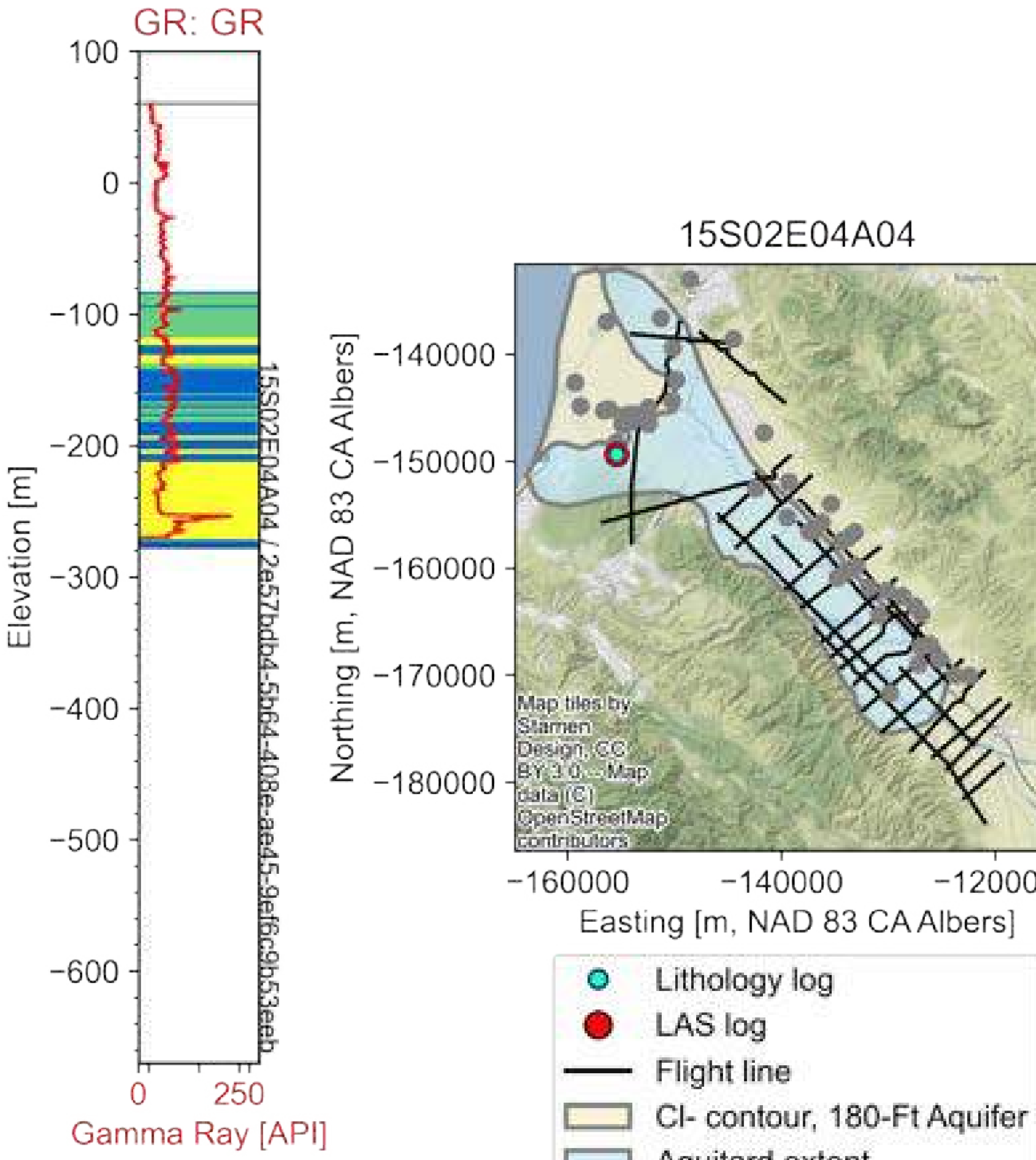
0
250
Gamma Ray [API]
14S02E34M01
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



res: 64IN
Elevation [m]
100
0
−100
−200
−300
−400
−500
−600
14S02E34M01 / 3c23af6b-c355-483c-b4aa-a8826c24a3b8
Resistivity [ohm-m]
14S02E34M01
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
Easting [m, NAD 83 CA Albers]
−160000
−140000
−120000
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



GR: GR
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
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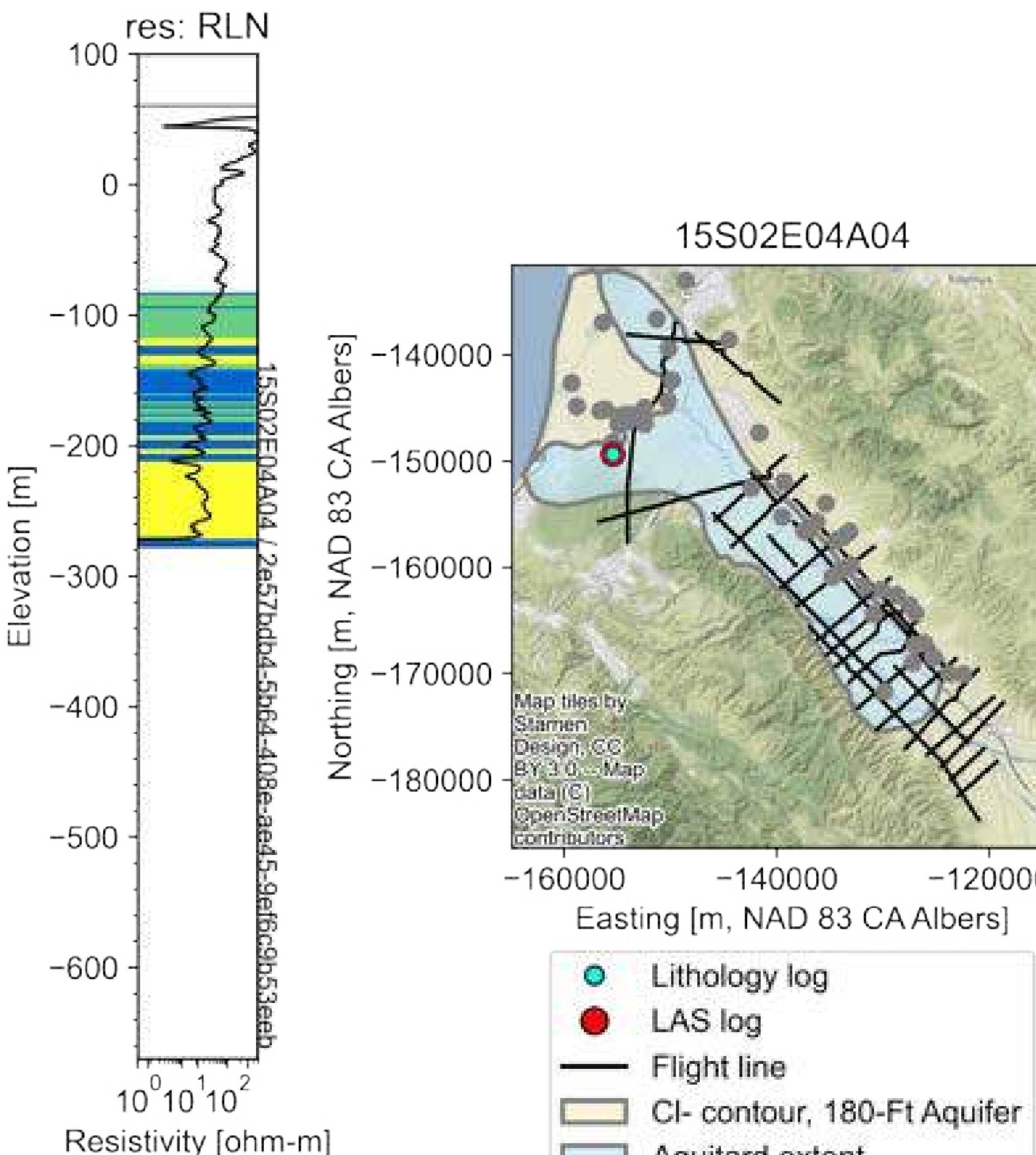
0
250
Gamma Ray [API]
15S02E04A04
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



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Elevation [m]
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0
−100
−200
−300
−400
−500
−600
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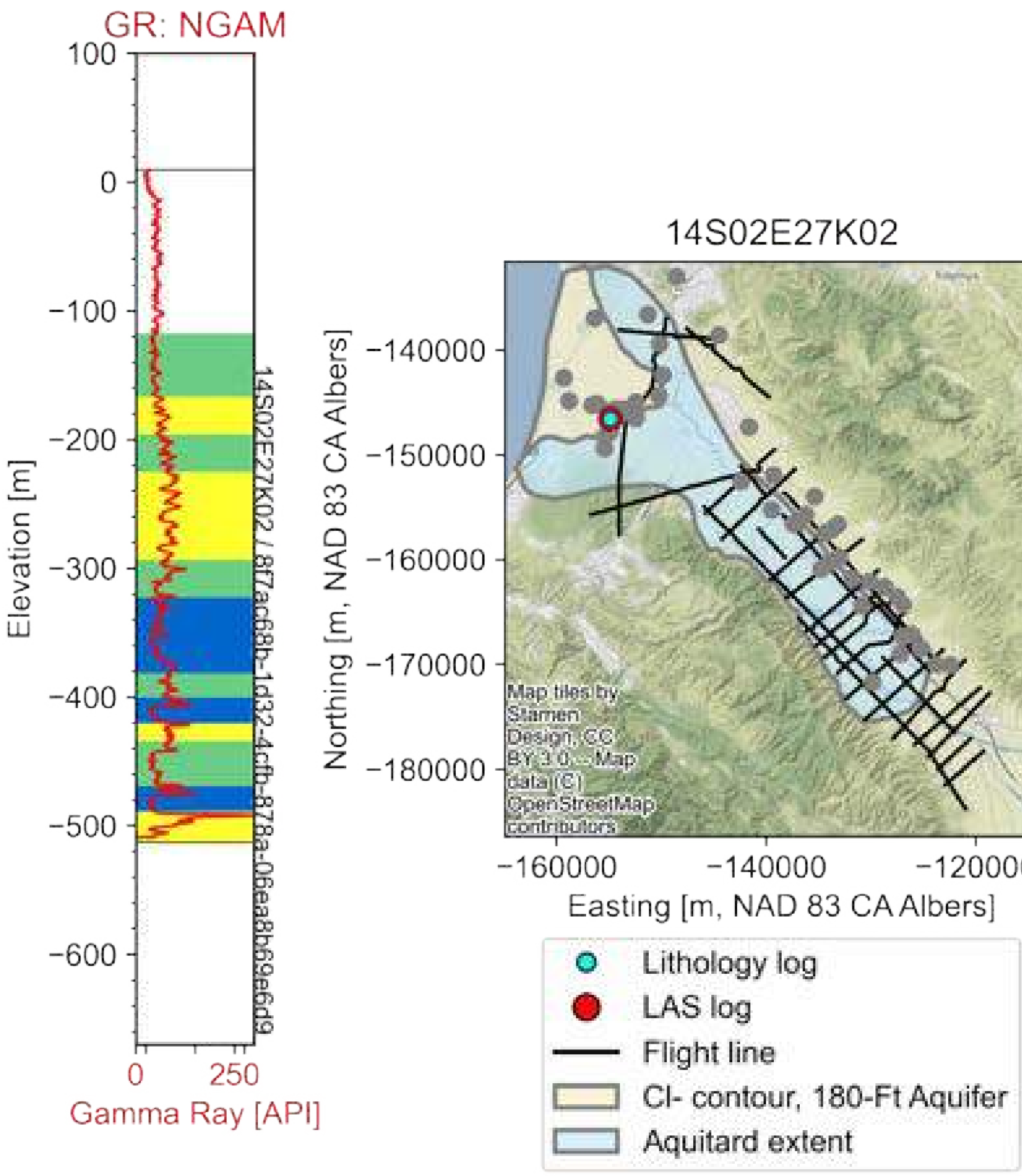
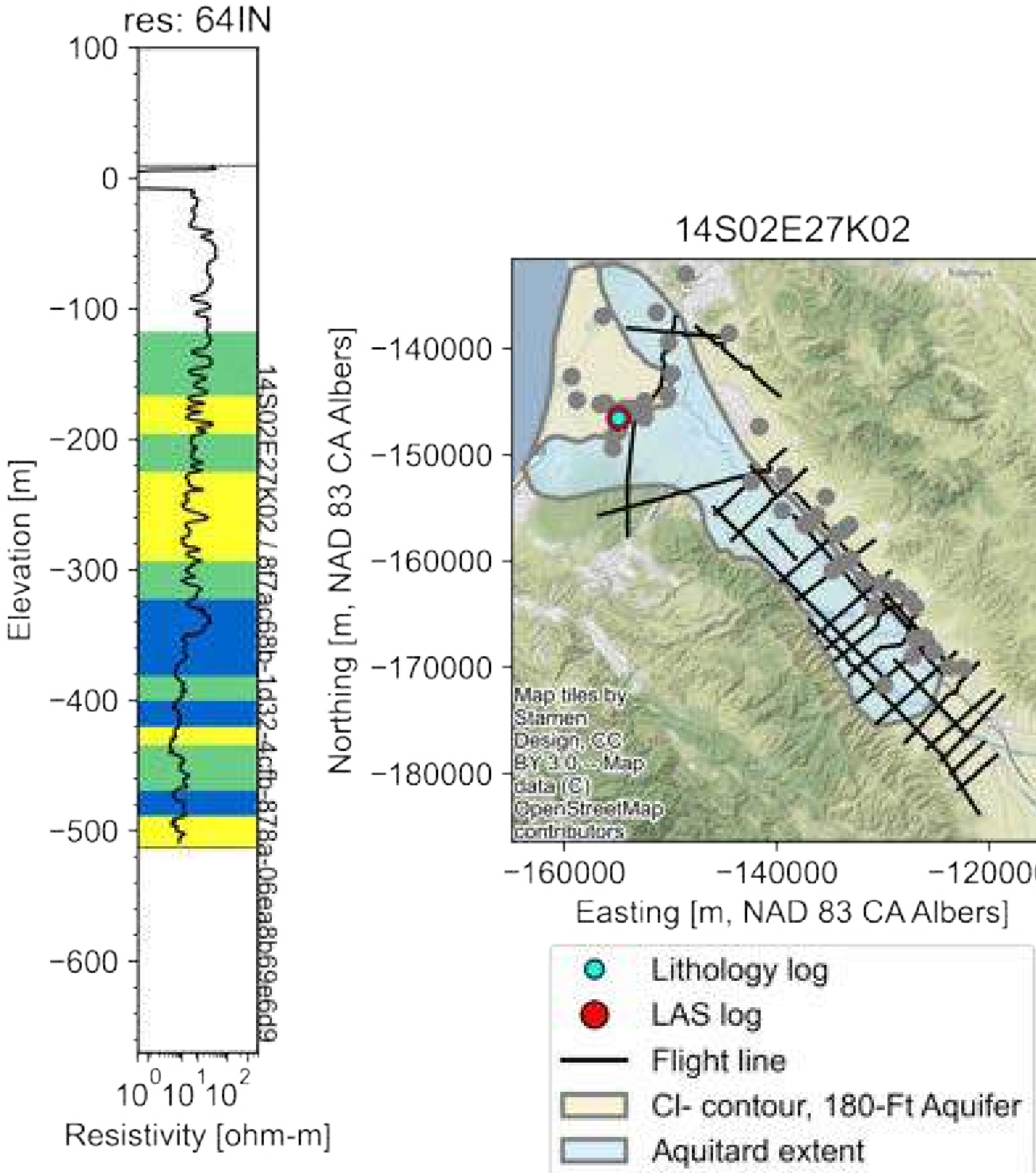
Resistivity [ohm-m]
15S02E04A04
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
Easting [m, NAD 83 CA Albers]
−160000
−140000
−120000
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



GR: NGAM
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
0
250
Gamma Ray [API]
14S02E27K02 / 8f7ac68b-1d32-4cfb-878a-06ea8b69e6d9
14S02E27K02
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



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100
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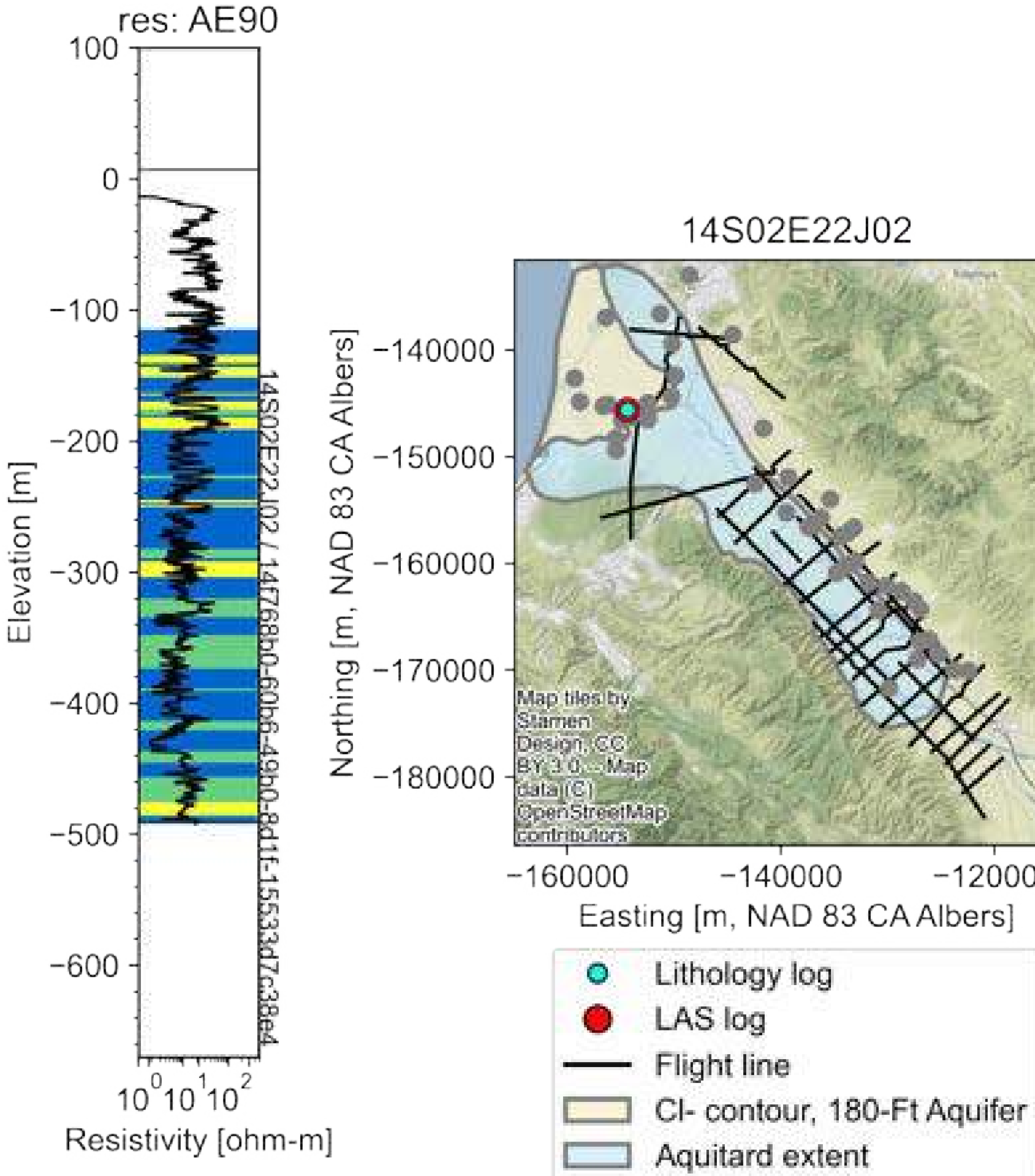
−100
−200
−300
−400
−500
−600
Elevation [m]
14S02E27K02 / 8f7ac68b-1d32-4cfb-878a-06ea8b69e6d9
10^0 10^1 10^2
Resistivity [ohm-m]
14S02E27K02
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



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Elevation [m]
Resistivity [ohm-m]
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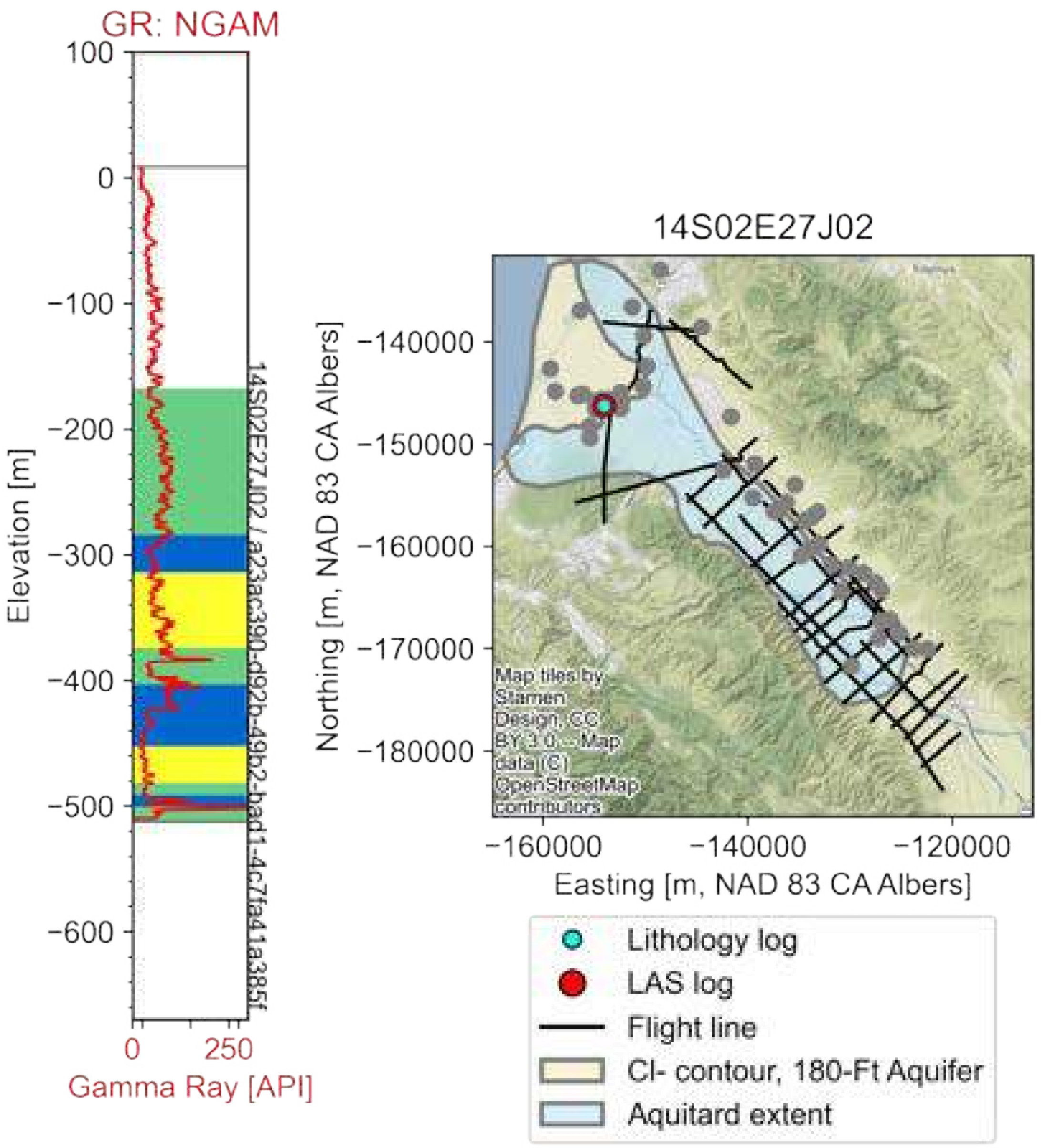
14S02E22J02
Northing [m, NAD 83 CA Albers]
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



GR: NGAM
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
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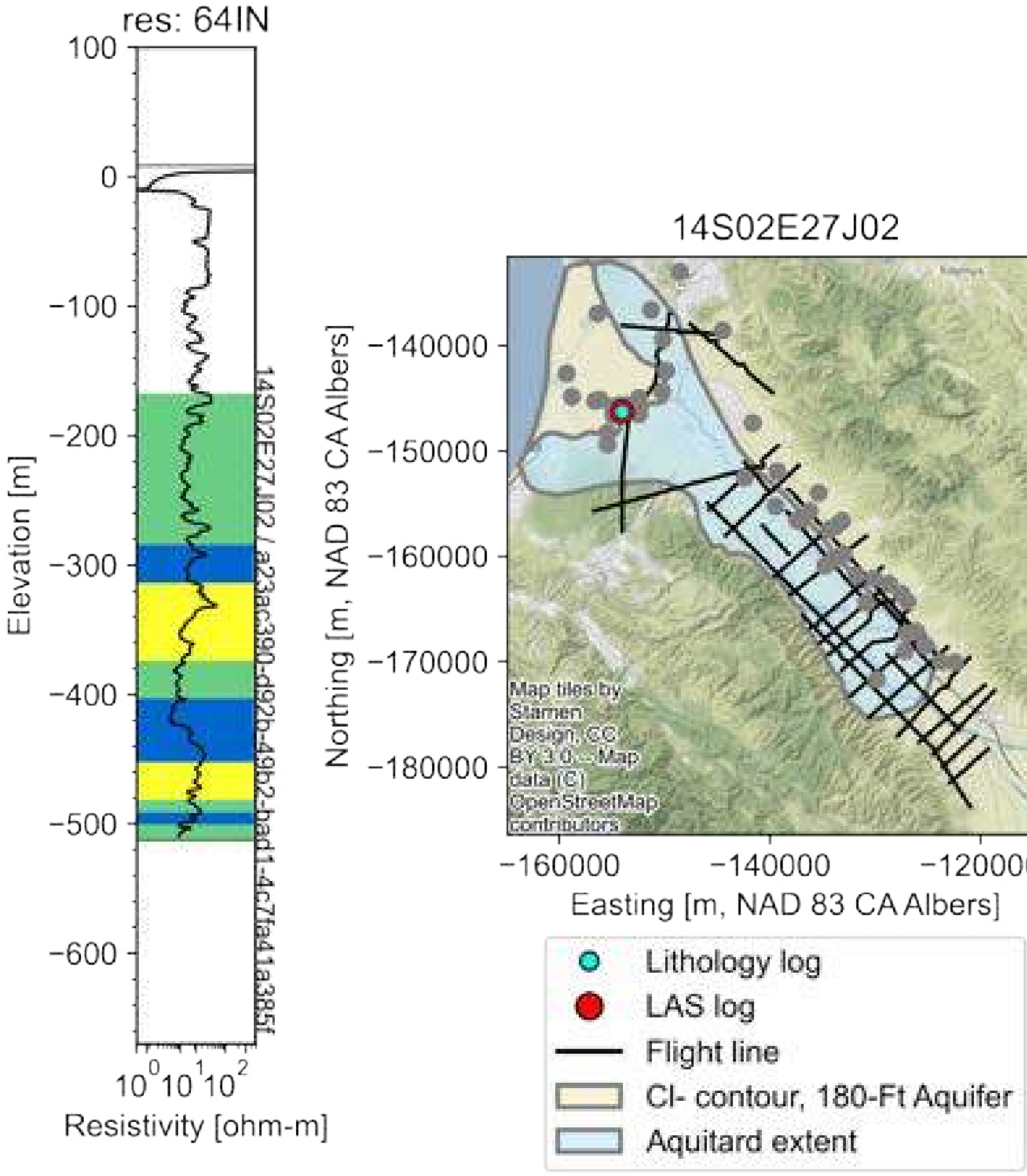
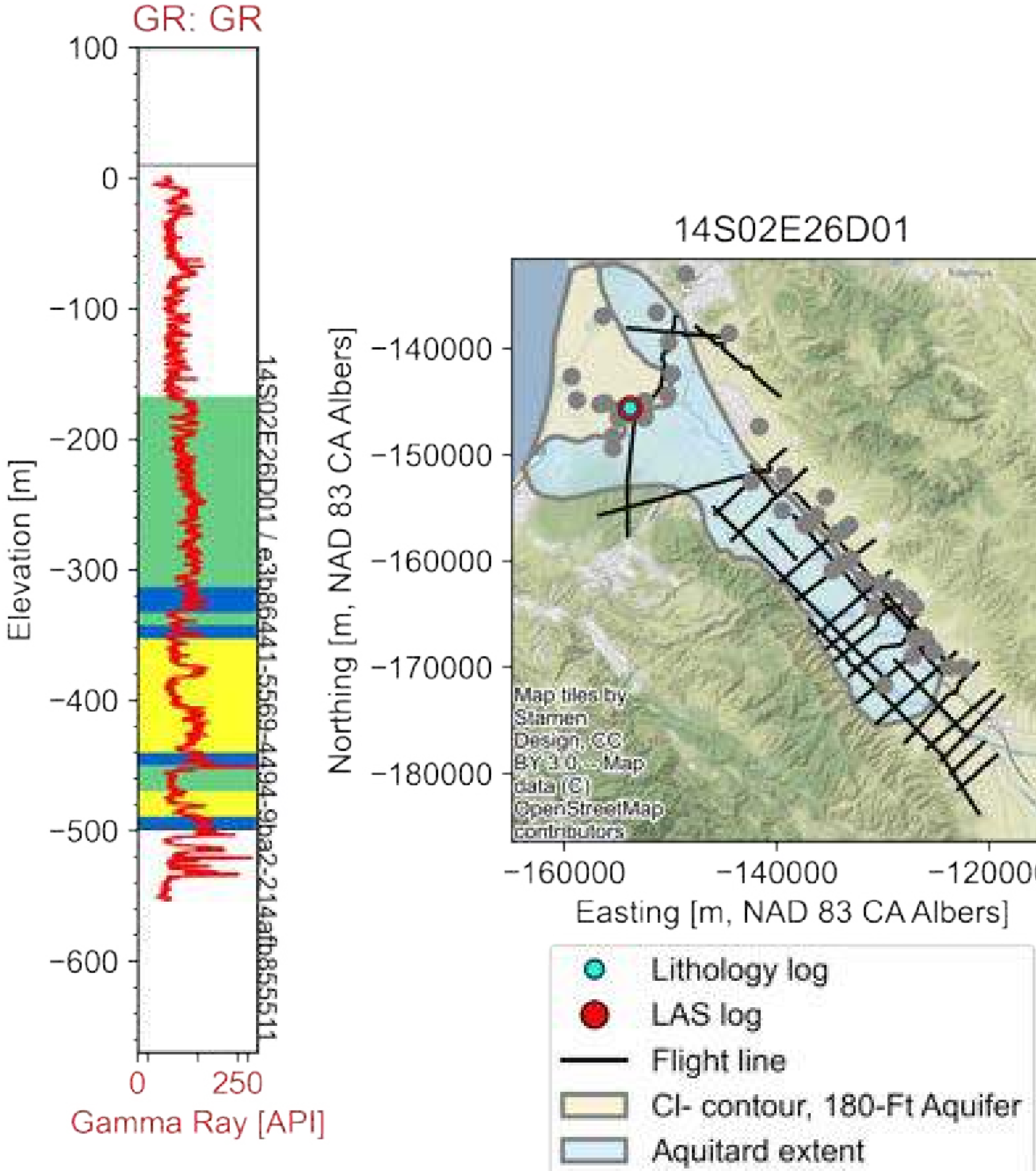
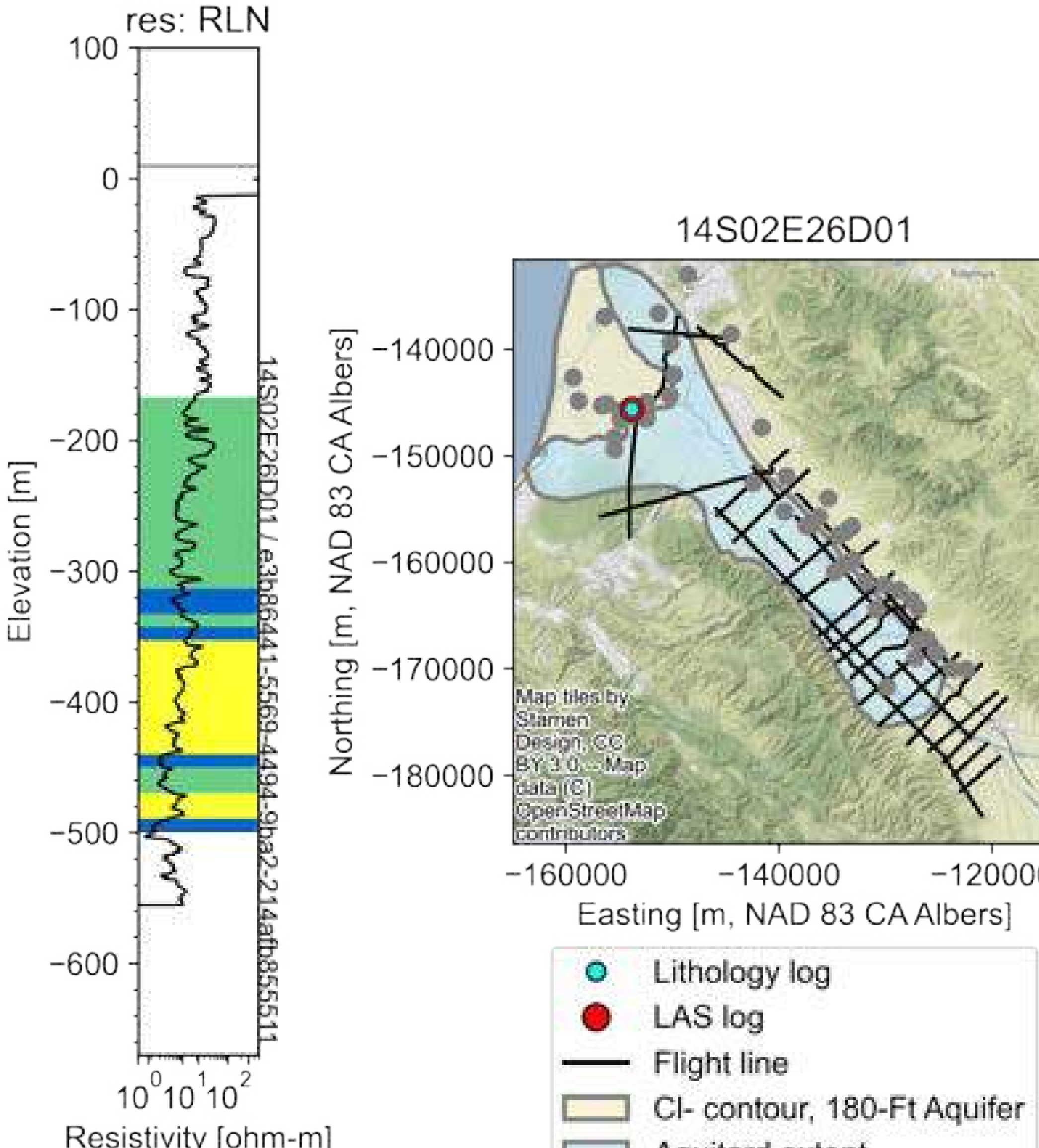
0
250
Gamma Ray [API]
14S02E27J02
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



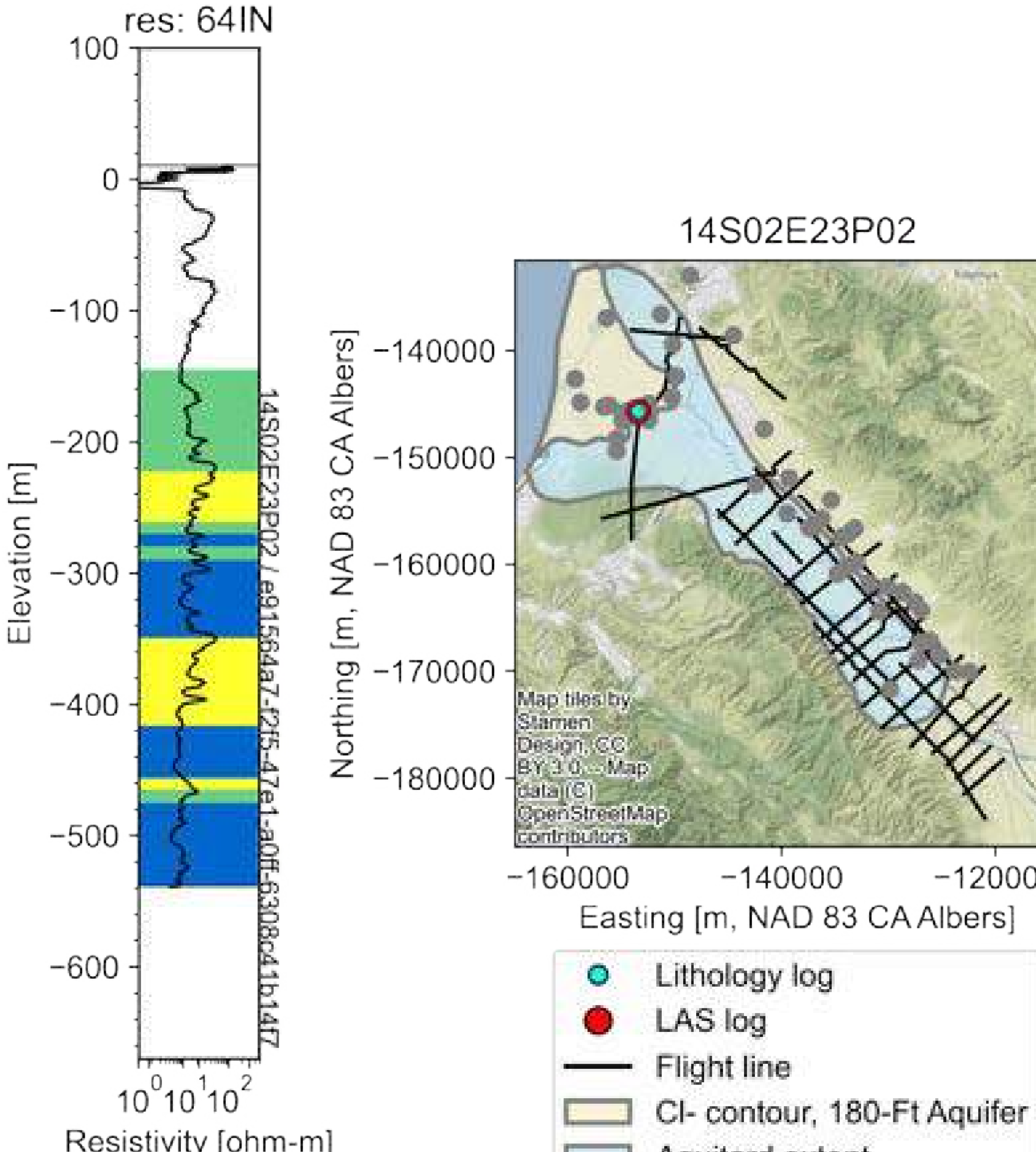
res: 64IN
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
14S02E27J02 / a23ac390-d92b-49b2-bad1-4c7fa41a385f
10^0 10^1 10^2
Resistivity [ohm-m]
14S02E27J02
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 — Map data (C) OpenStreetMap contributors
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



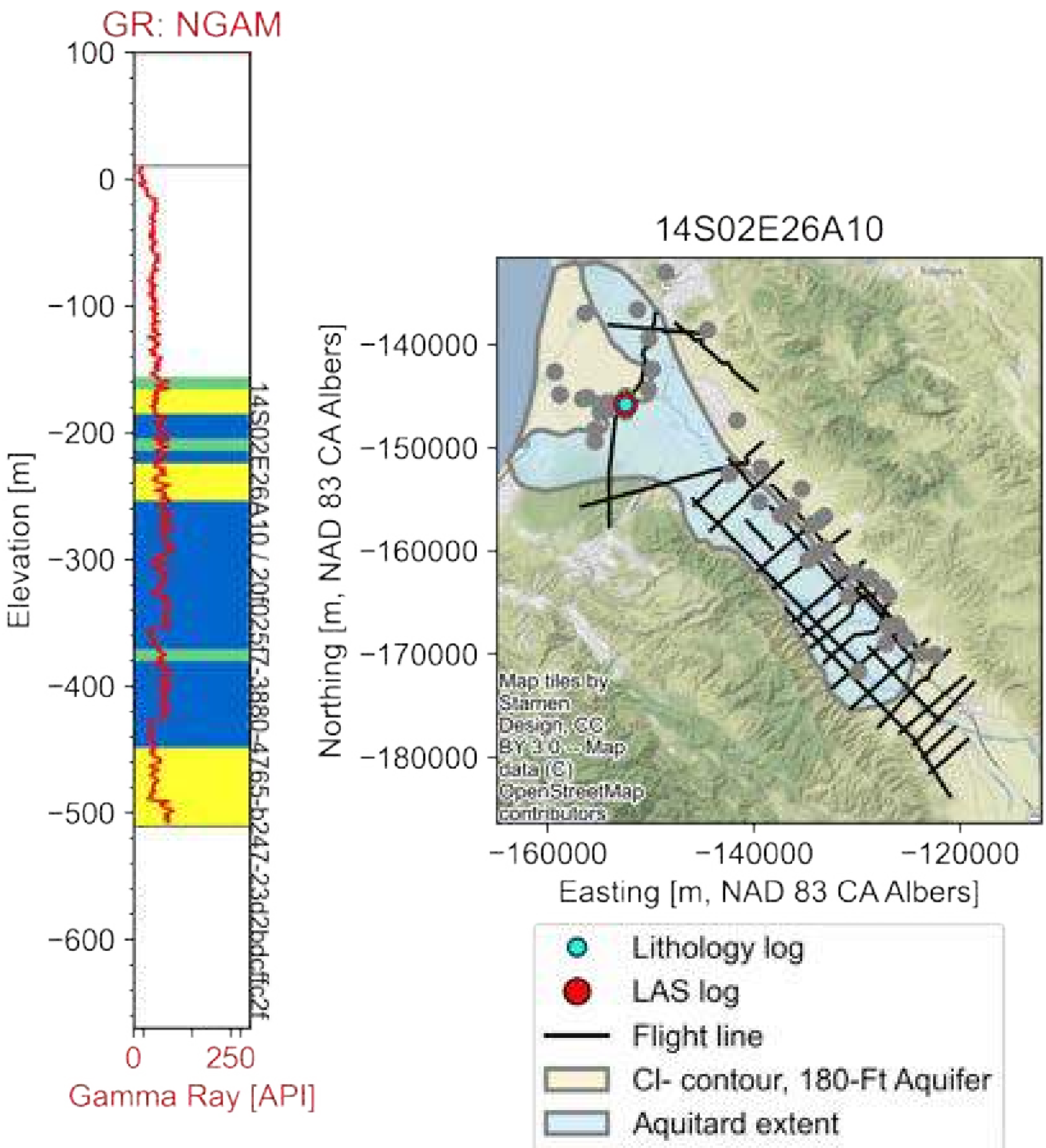
GR: GR
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
14S02E26D01 / e3b86441-5569-4494-9ba2-214afb855511
0
250
Gamma Ray [API]
14S02E26D01
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

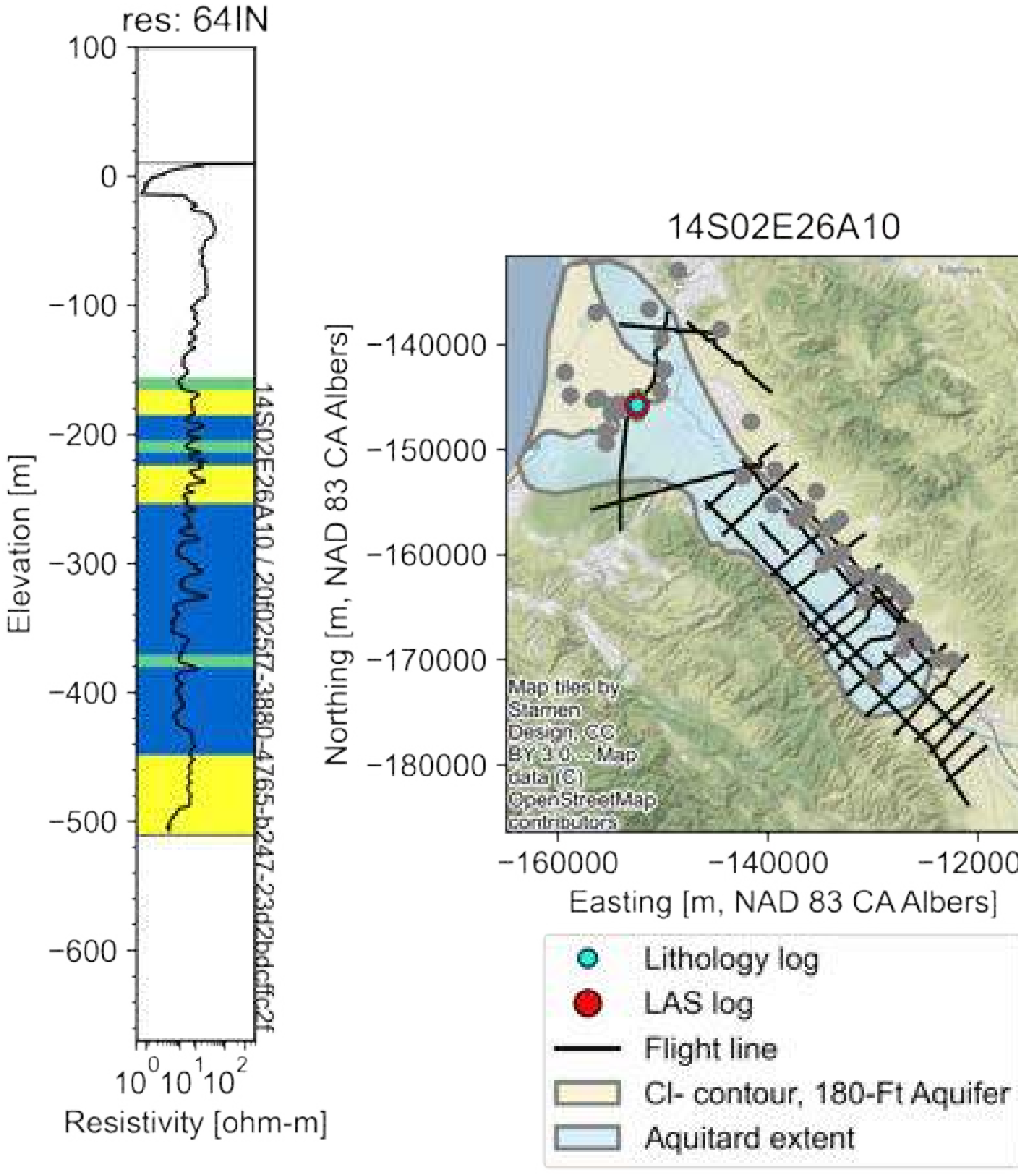


res: RLN
Elevation [m]
14S02E26D01 / e3b86441-5569-4494-9ba2-214afb855511
Resistivity [ohm-m]
14S02E26D01
Northing [m, NAD 83 CA Albers]
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

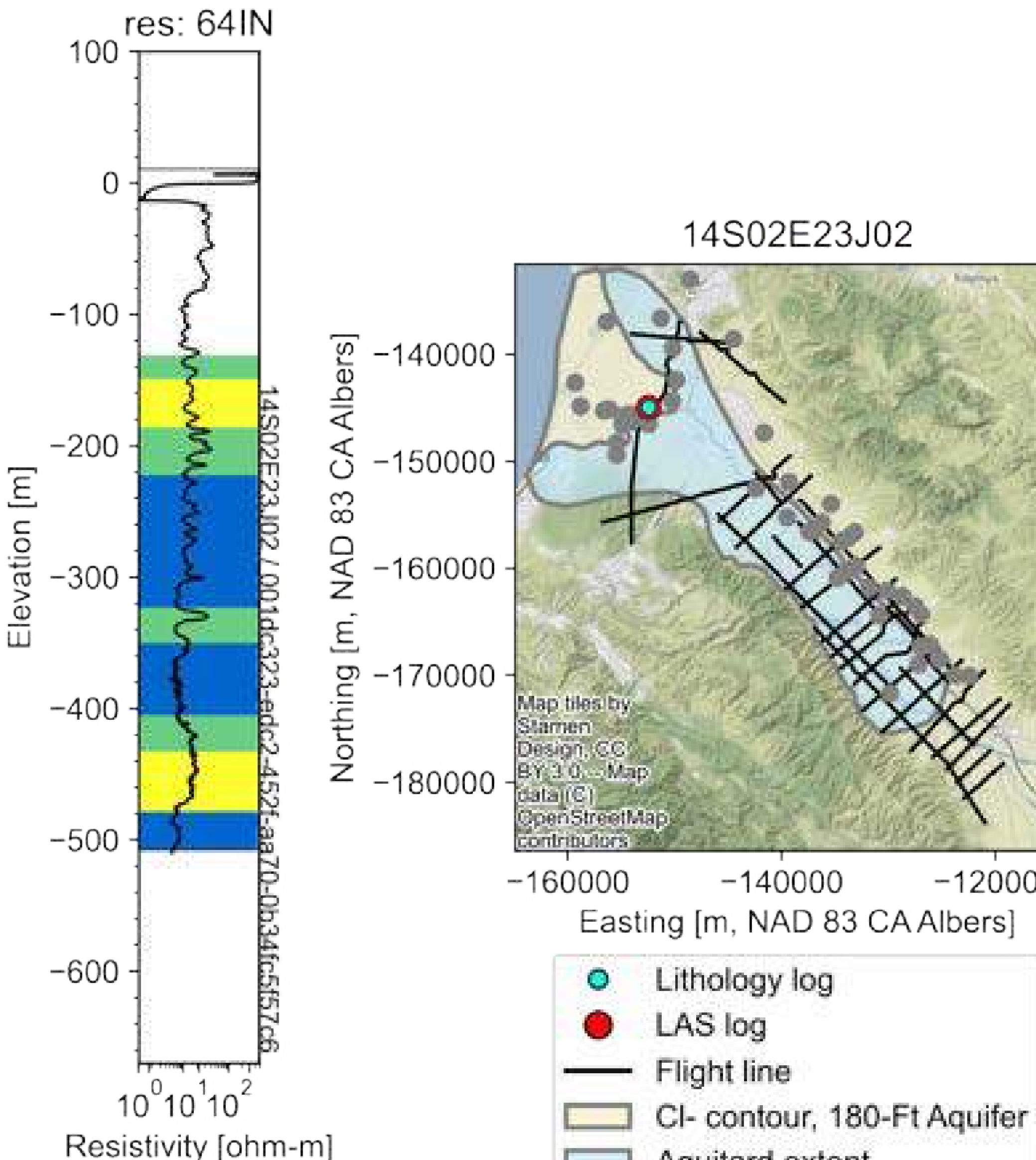


res: 64IN
Elevation [m]
Resistivity [ohm-m]
14S02E23P02 / e91564a7-f2f5-47e1-a0ff-6308c41b14f7
14S02E23P02
Northing [m, NAD 83 CA Albers]
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

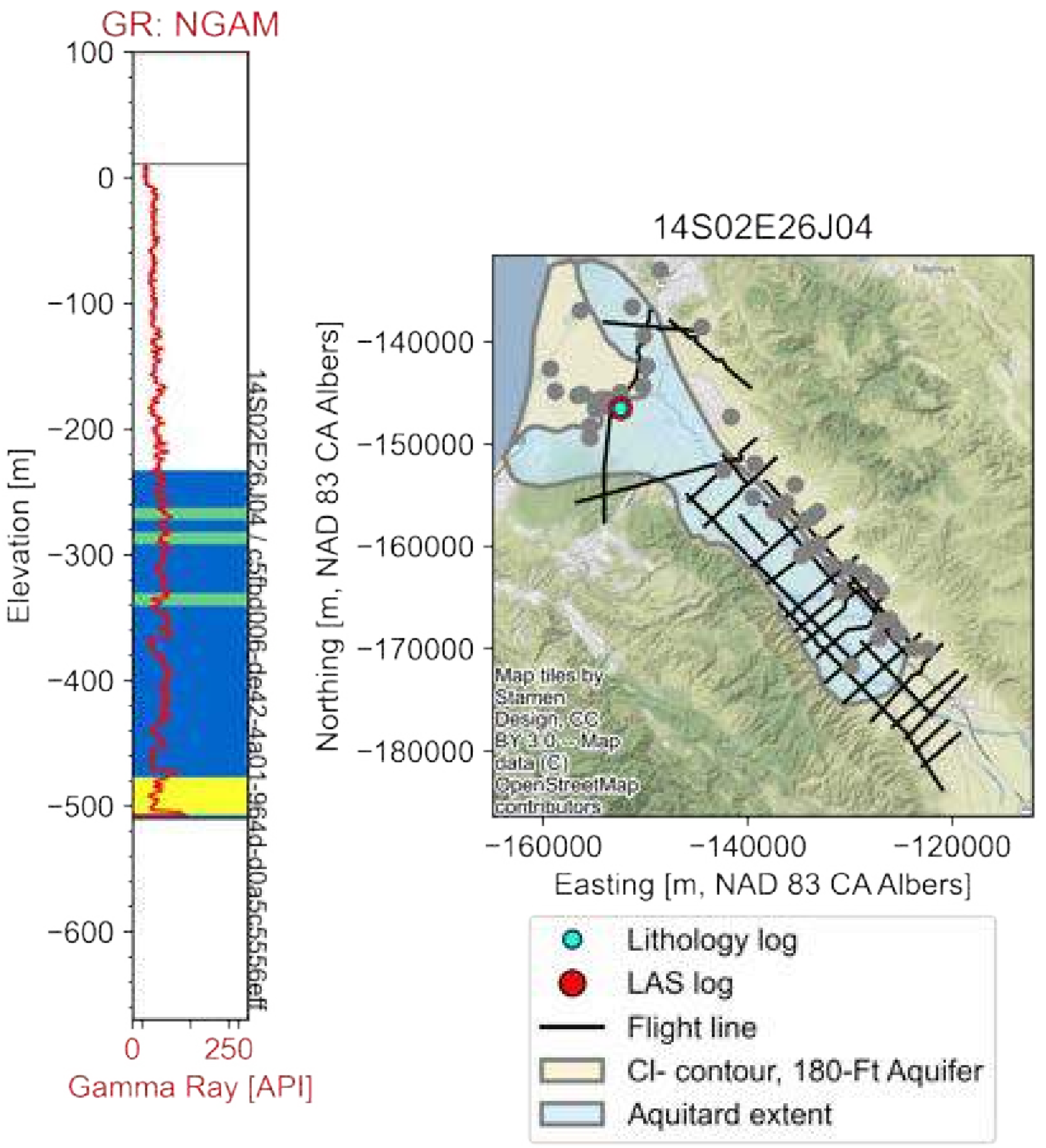

GR: NGAM
Elevation [m]
100
0
−100
−200
−300
−400
−500
−600
0
250
Gamma Ray [API]
14S02E26A10 / 20f025f7-3880-4765-b247-23d2bdcffc2f
14S02E26A10
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

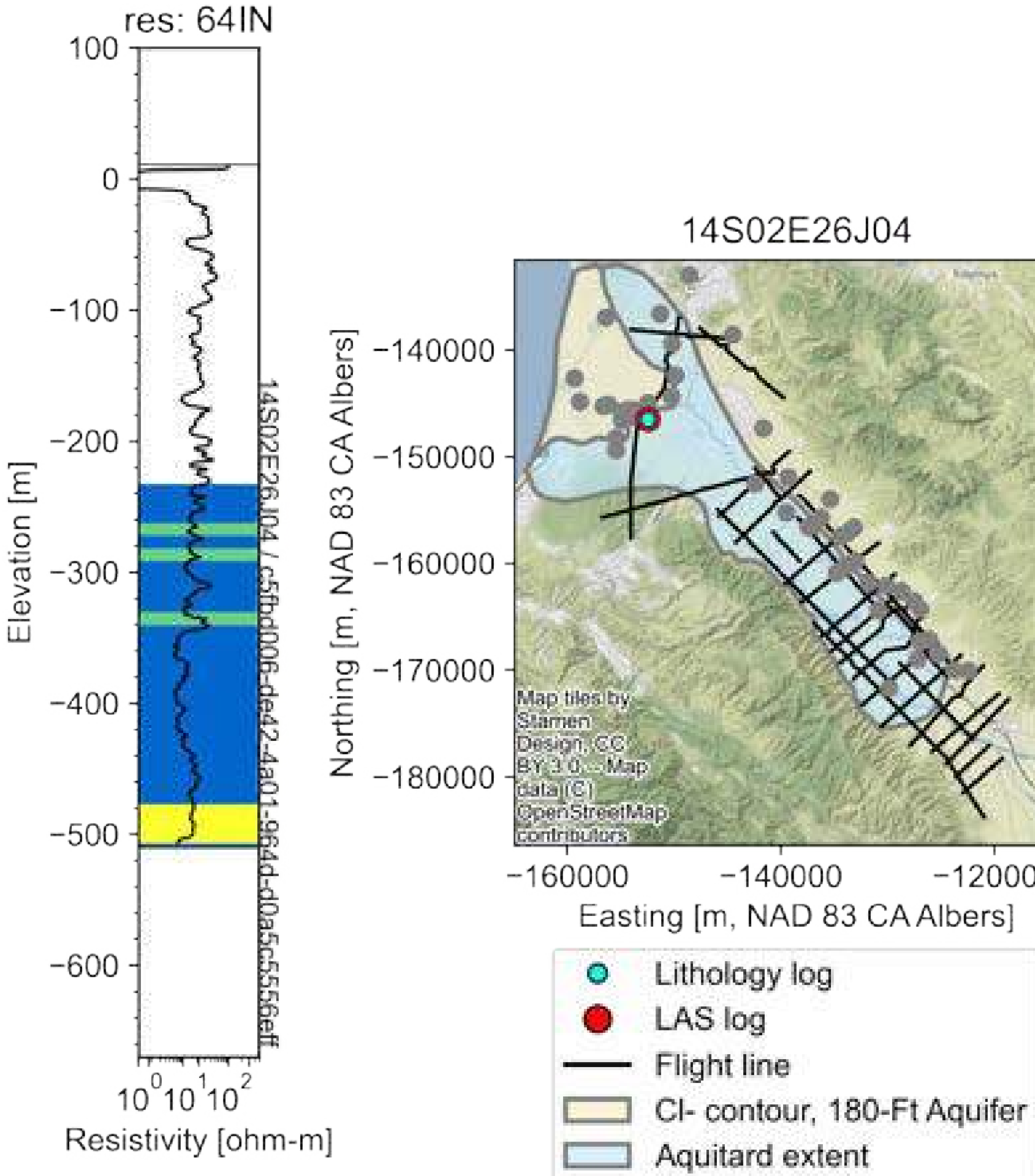


res: 64IN
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
14S02E26A10 / 20f025f7-3880-4765-b247-23d2bdcffc2f
$10^0 10^1 10^2$
Resistivity [ohm-m]
14S02E26A10
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

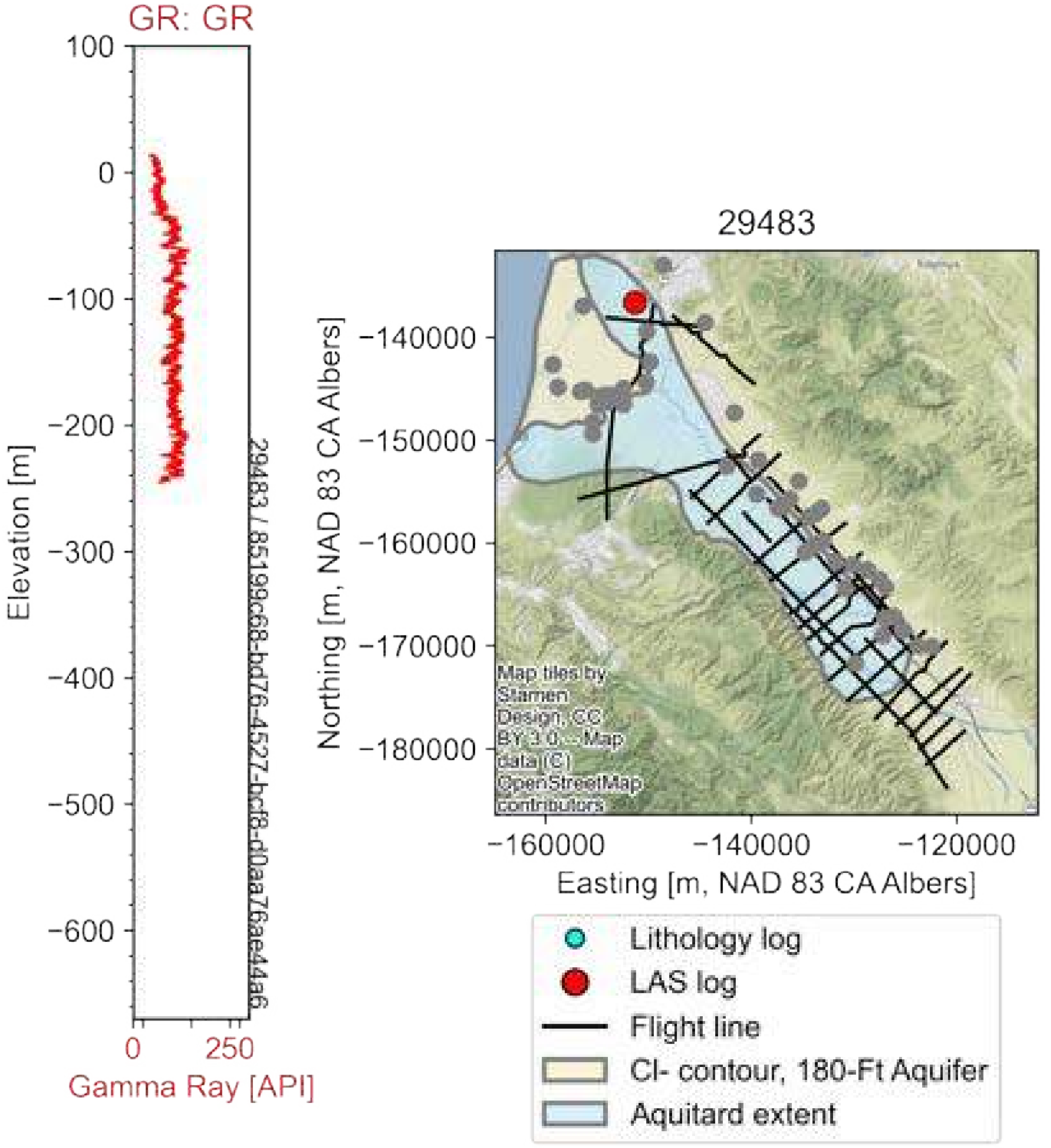


res: 64IN
Elevation [m]
100
0
−100
−200
−300
−400
−500
−600
10⁰10¹10²
Resistivity [ohm-m]
14S02E23J02 / 001dc323-edc2-452f-aa70-0b34fc5f57c6
14S02E23J02
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

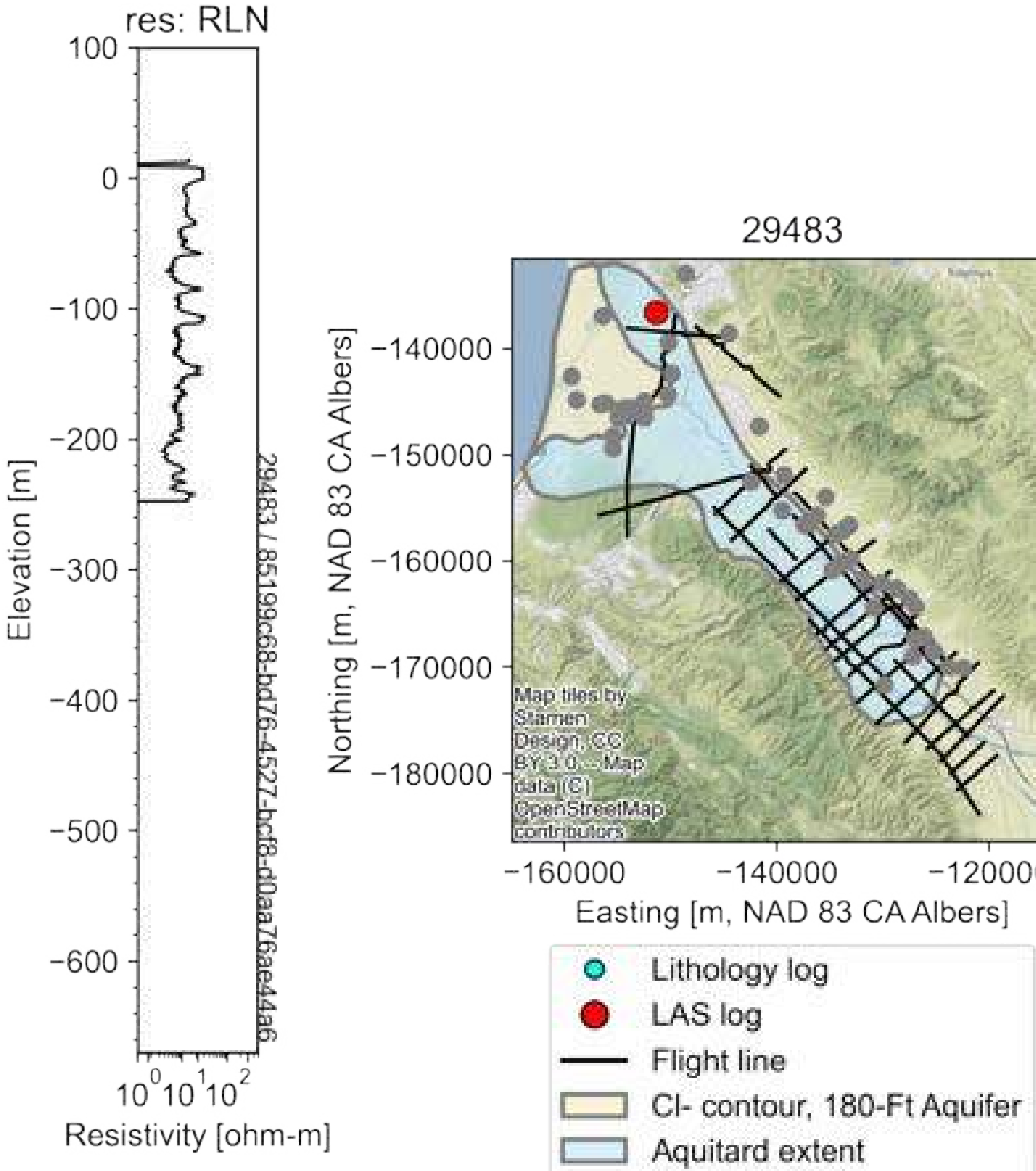

GR: NGAM
Elevation [m]
100
0
−100
−200
−300
−400
−500
−600
0
250
Gamma Ray [API]
14S02E26J04 / c5fbd006-de42-4a01-964d-d0a5c556eff
14S02E26J04
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



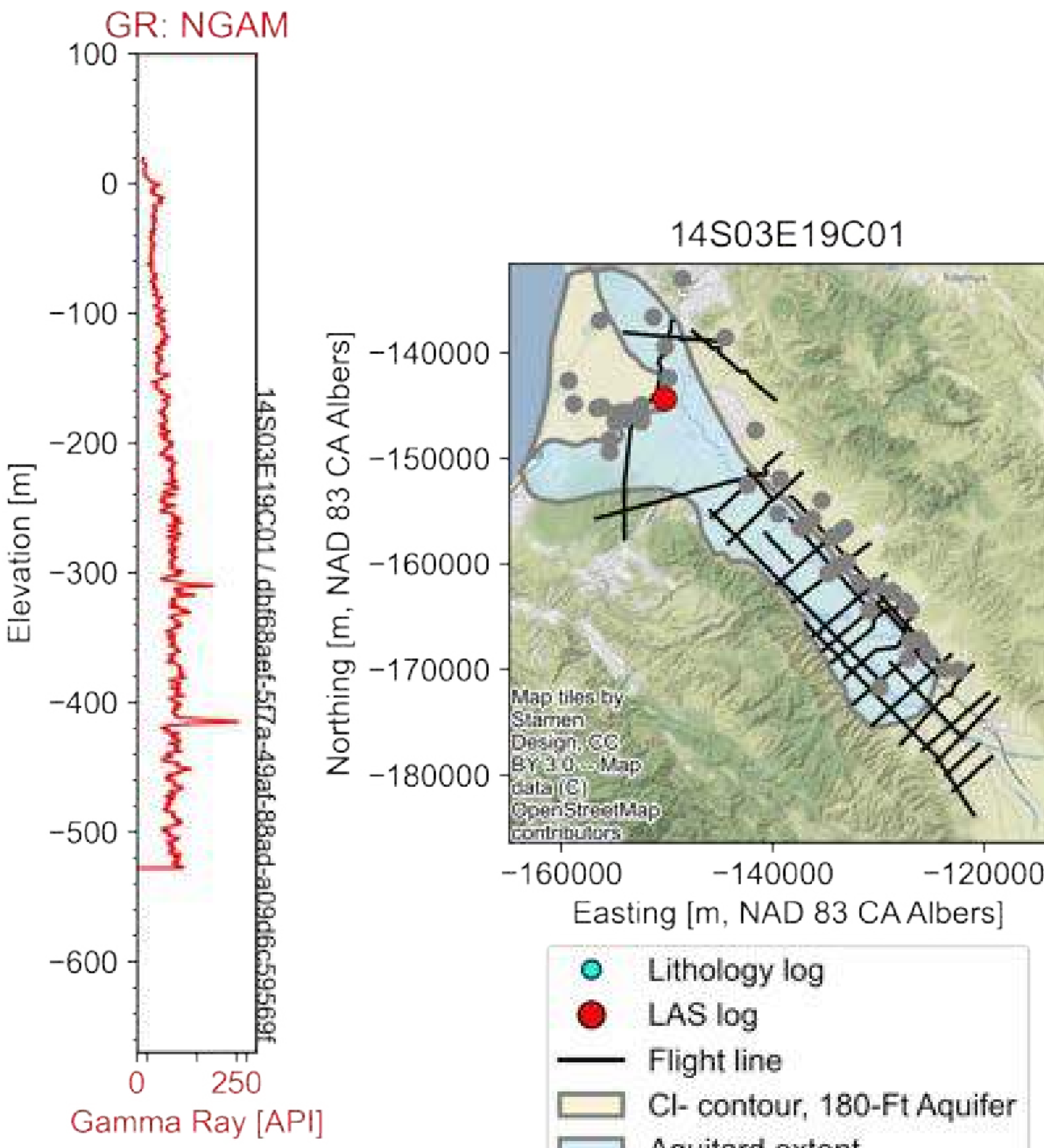
res: 64IN
Elevation [m]
Resistivity [ohm-m]
14S02E26J04 / c5fbd006-de42-4a01-964d-d0a5c556eff
14S02E26J04
Northing [m, NAD 83 CA Albers]
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



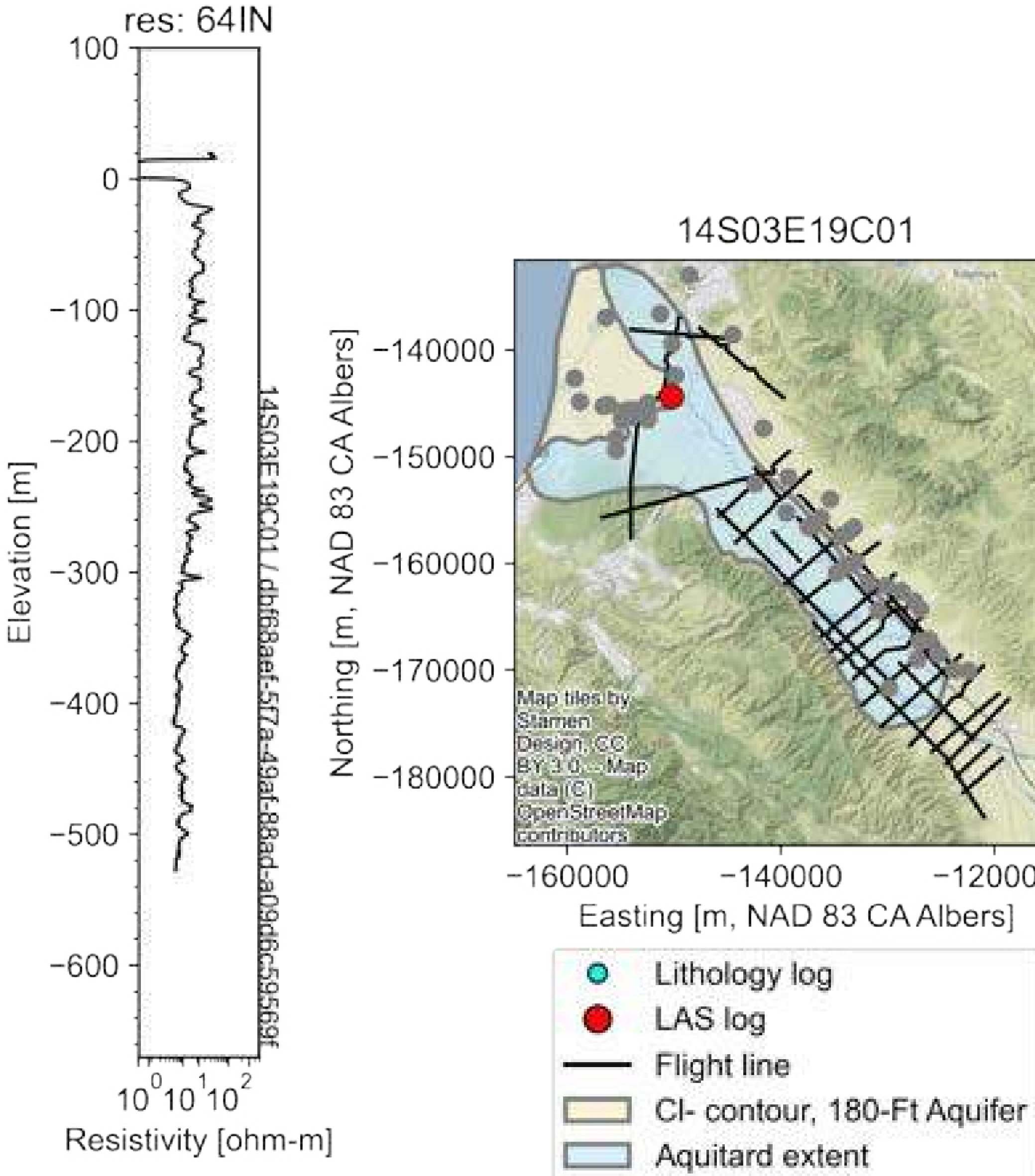
GR: GR
Elevation [m]
Gamma Ray [API]
29483 / 85199c68-bd76-4527-bcf8-d0aa76ae44a6
29483
Northing [m, NAD 83 CA Albers]
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

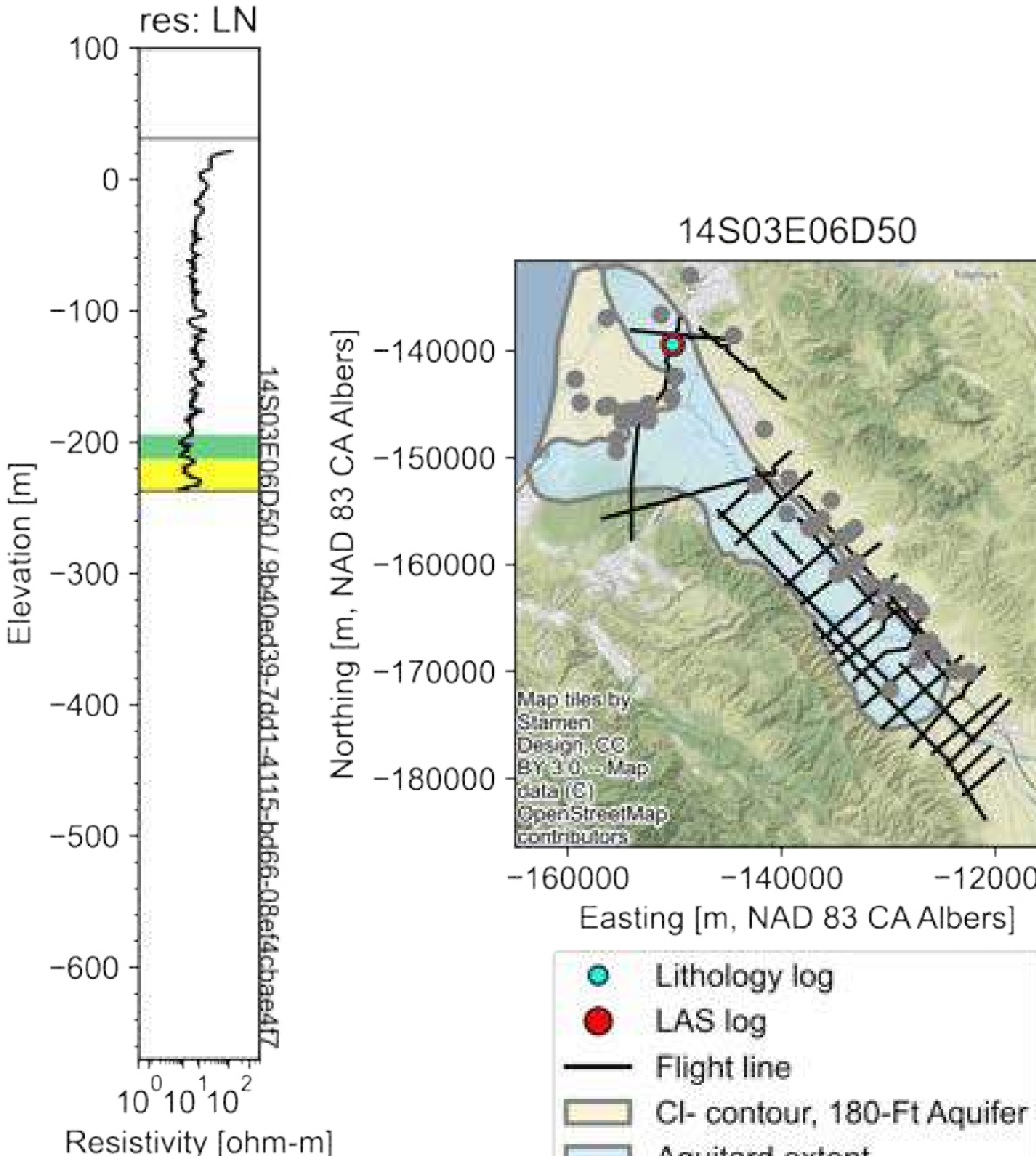


res: RLN
Elevation [m]
Resistivity [ohm-m]
29483 / 85199c68-bd76-4527-bcf8-d0aa76ae44a6
29483
Northing [m, NAD 83 CA Albers]
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

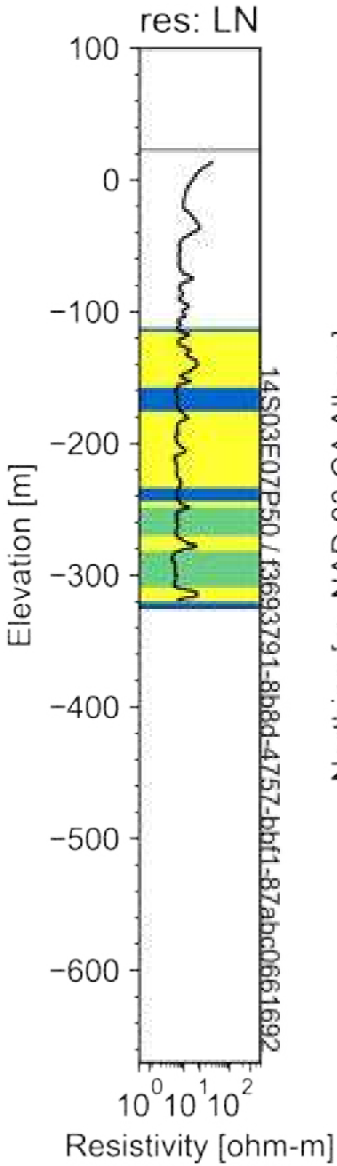


GR: NGAM
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
0
250
Gamma Ray [API]
14S03E19C01 / dbf68aef-5f7a-49af-88ad-a09d6c59569f
14S03E19C01
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

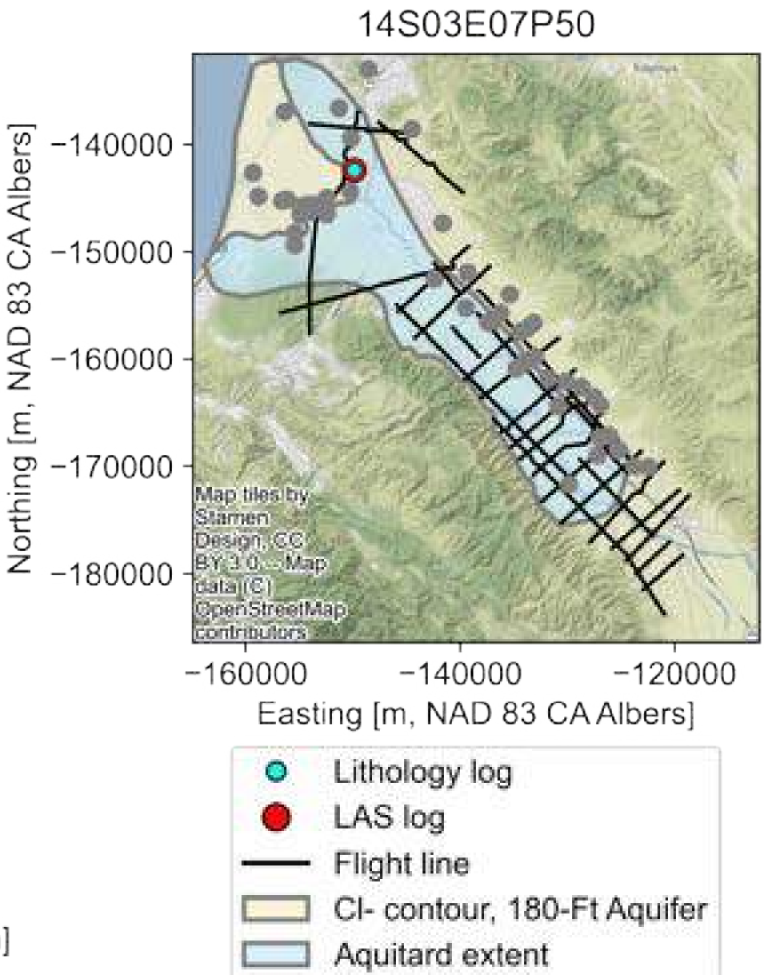

res: 64IN
Elevation [m]
Resistivity [ohm-m]
14S03E19C01 / dbf68aef-5f7a-49af-88ad-a09d6c59569f
14S03E19C01
Northing [m, NAD 83 CA Albers]
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



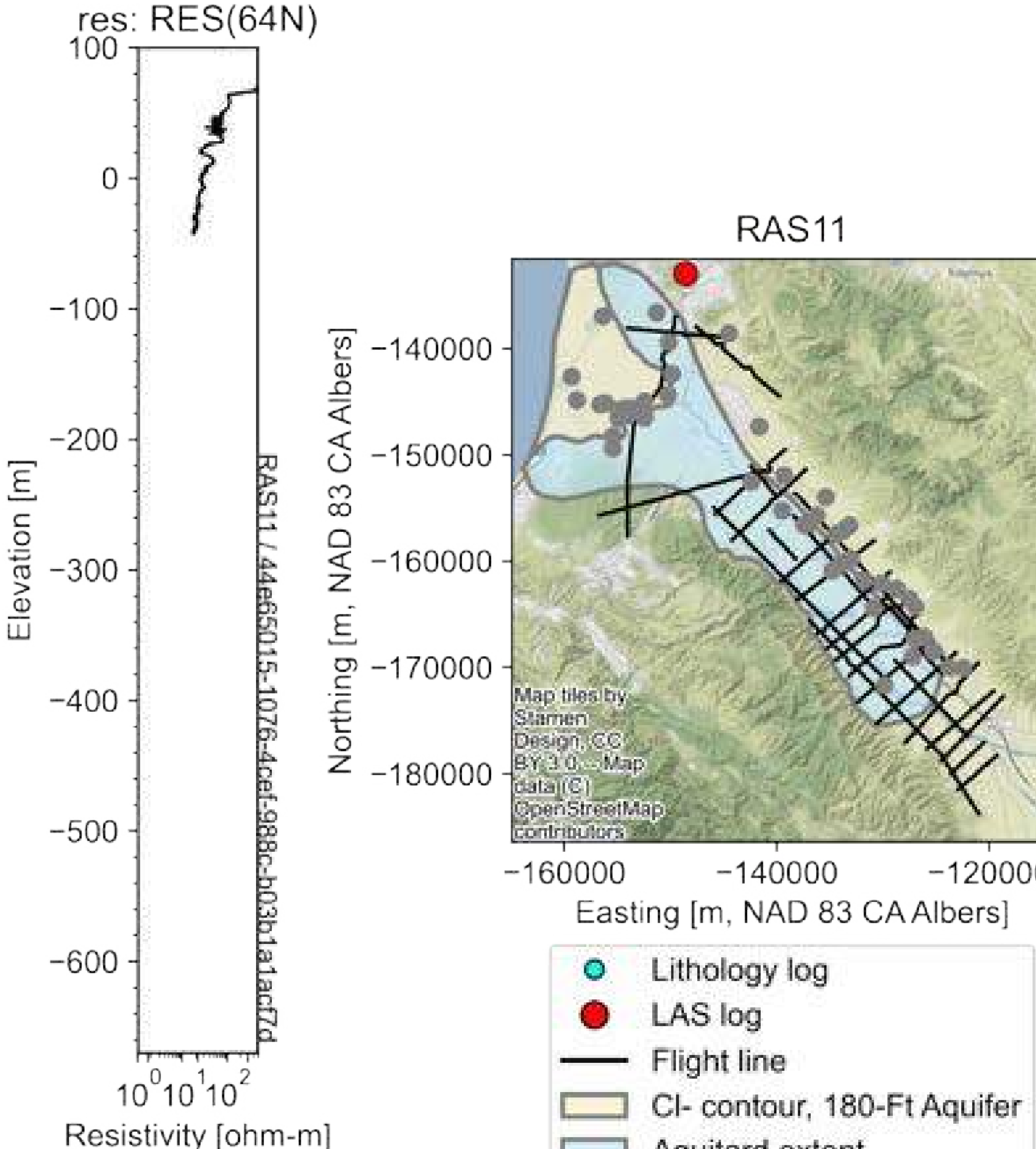
res: LN
Elevation [m]
100
0
−100
−200
−300
−400
−500
−600
14S03E06D50 / 9b40ed39-7dd1-4115-bd66-08ef4cbae4f7
Resistivity [ohm-m]
14S03E06D50
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

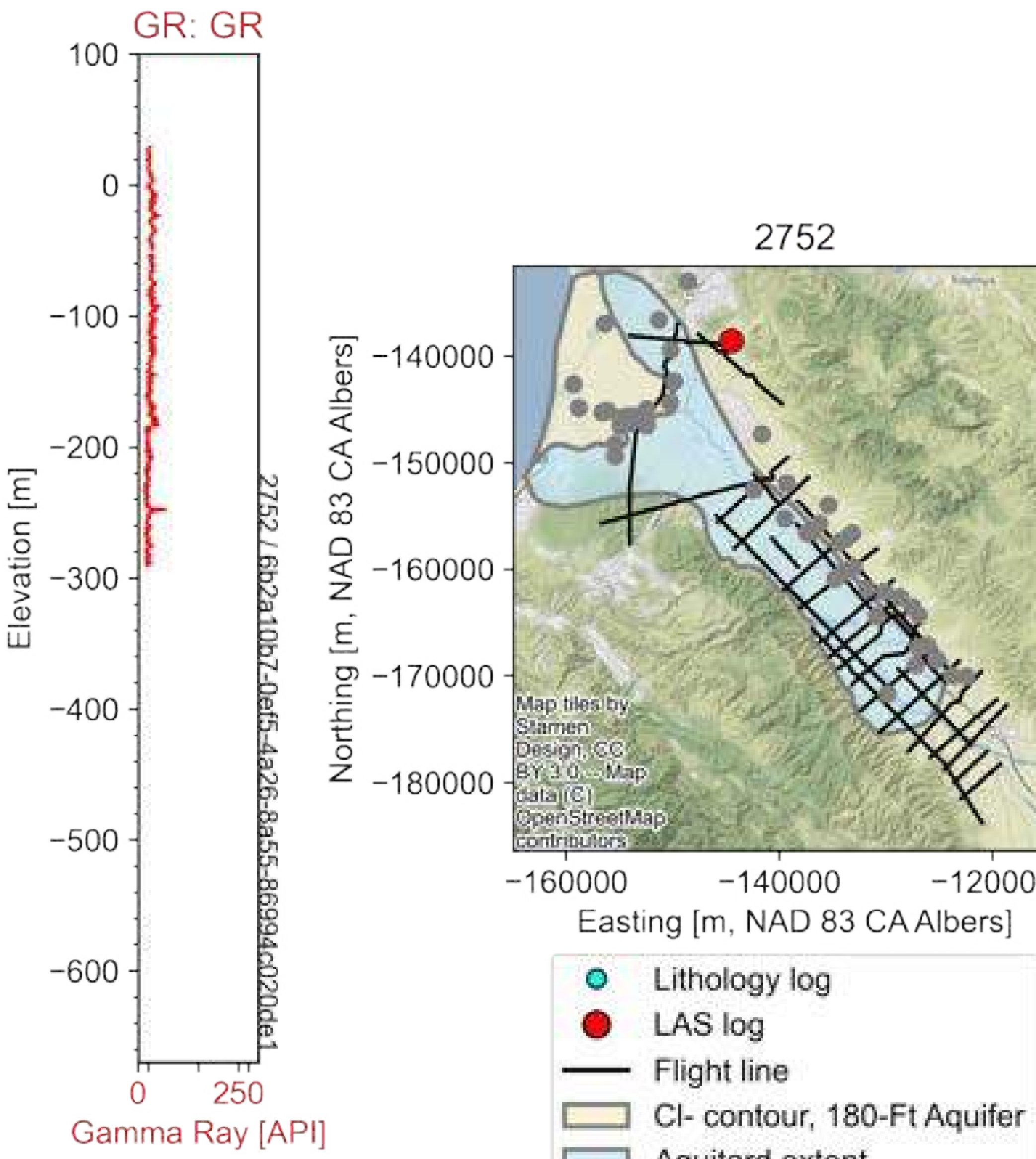


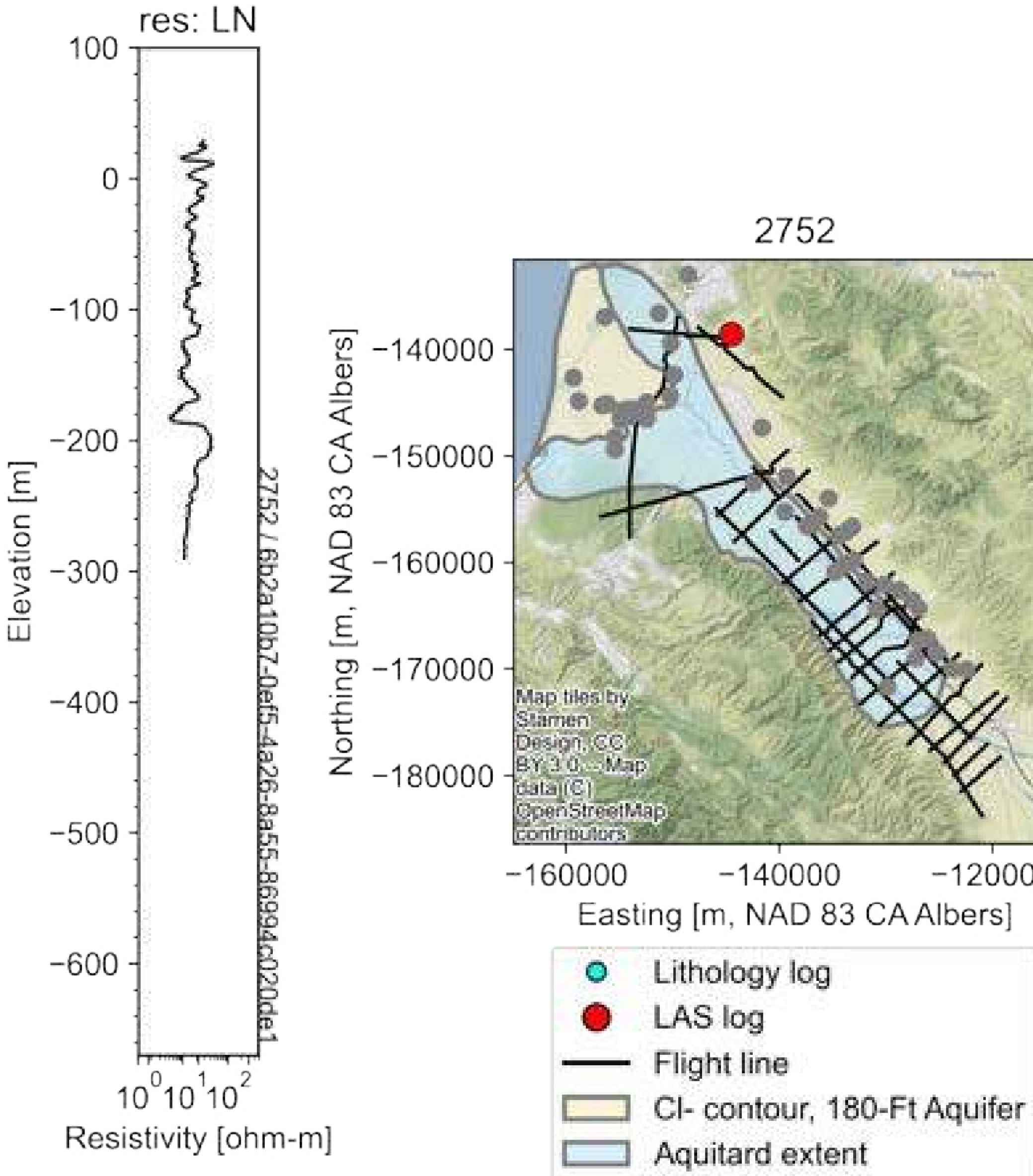
res: LN
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
14S03E07P50 / f3693791-8b8d-4757-bbf1-87abc0661692
$10^0 10^1 10^2$
Resistivity [ohm-m]



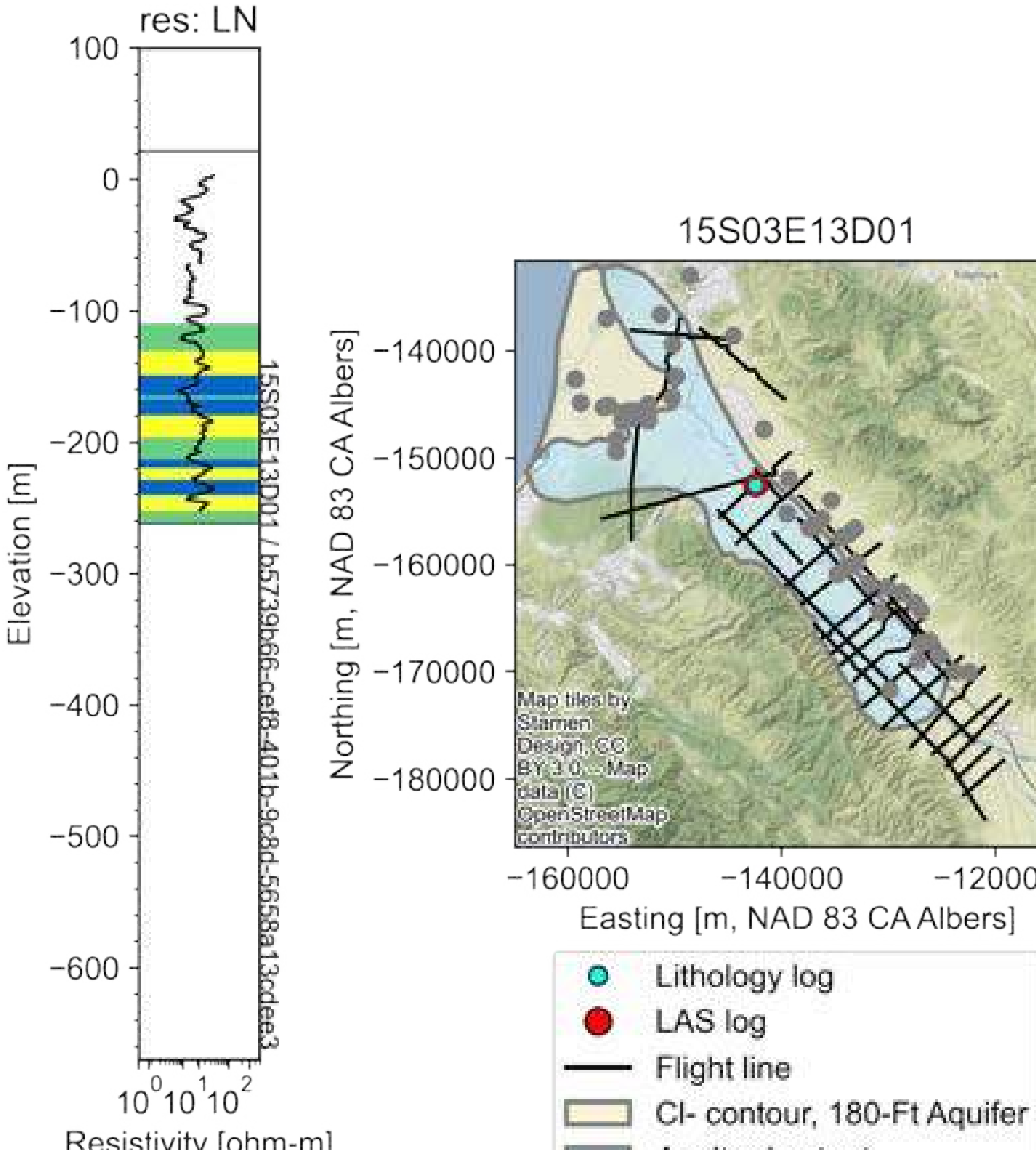
14S03E07P50
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

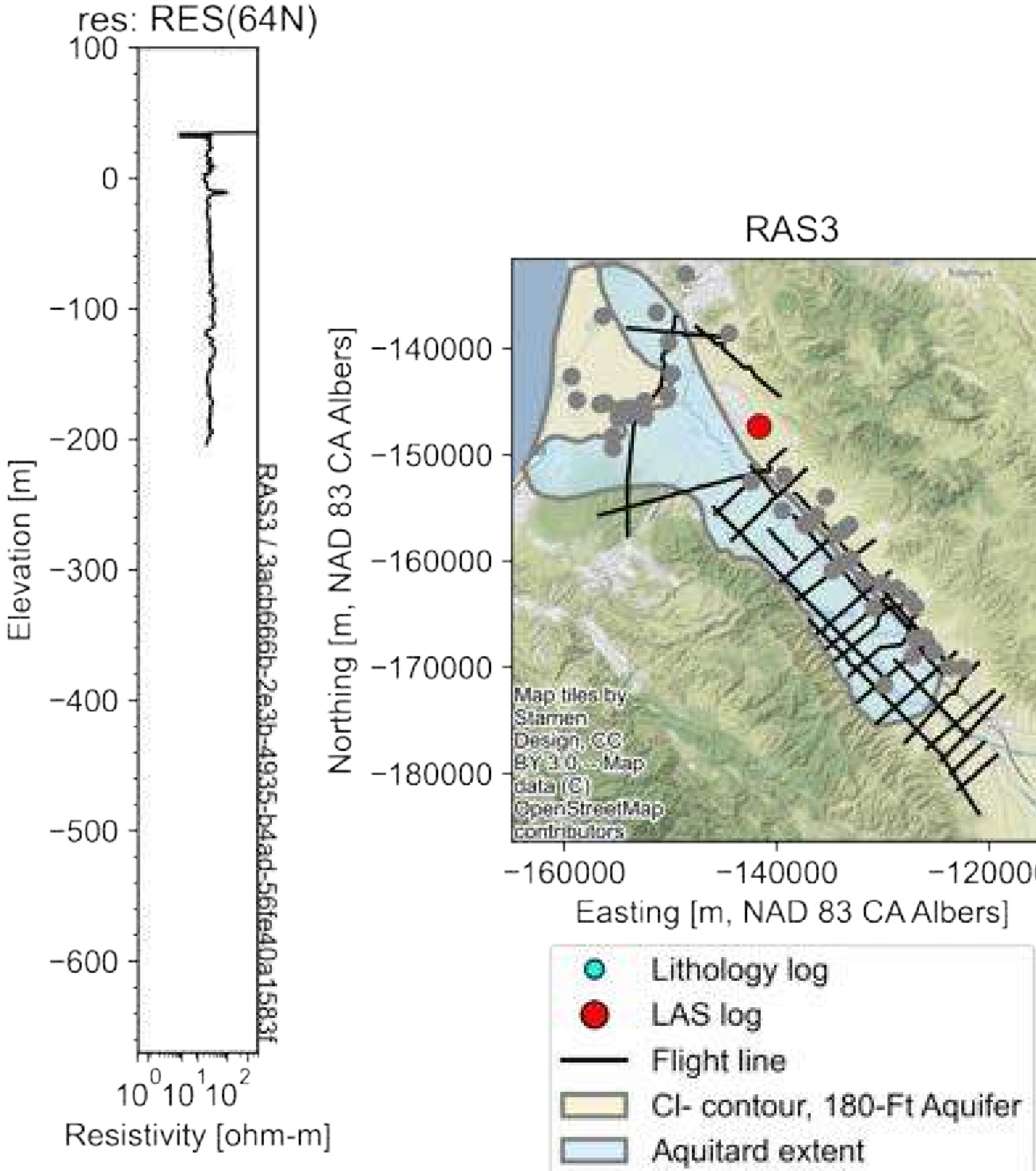

res: RES(64N)
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
RAS11 / 44e65015-1076-4cef-988c-b03b1a1acf7d
$10^0 10^1 10^2$
Resistivity [ohm-m]
RAS11
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent


GR: GR
Elevation [m]
100
0
−100
−200
−300
−400
−500
−600
0
250
Gamma Ray [API]
2752 / 6b2a10b7-0ef5-4a26-8a55-86994c020de1
2752
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
Easting [m, NAD 83 CA Albers]
−160000
−140000
−120000
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

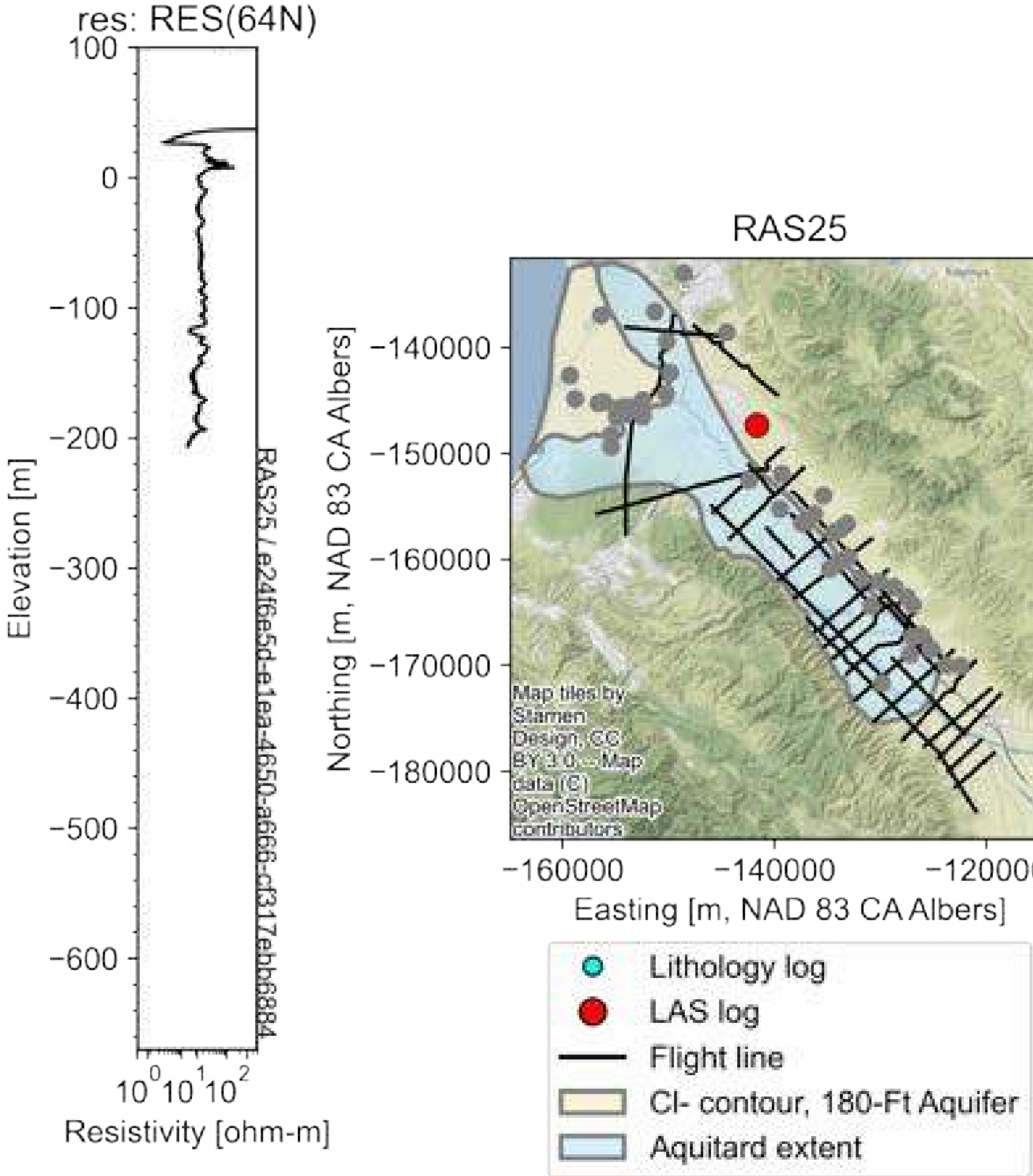


res: LN
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
2752 / 6b2a10b7-0ef5-4a26-8a55-86994c020de1
10^0 10^1 10^2
Resistivity [ohm-m]
2752
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

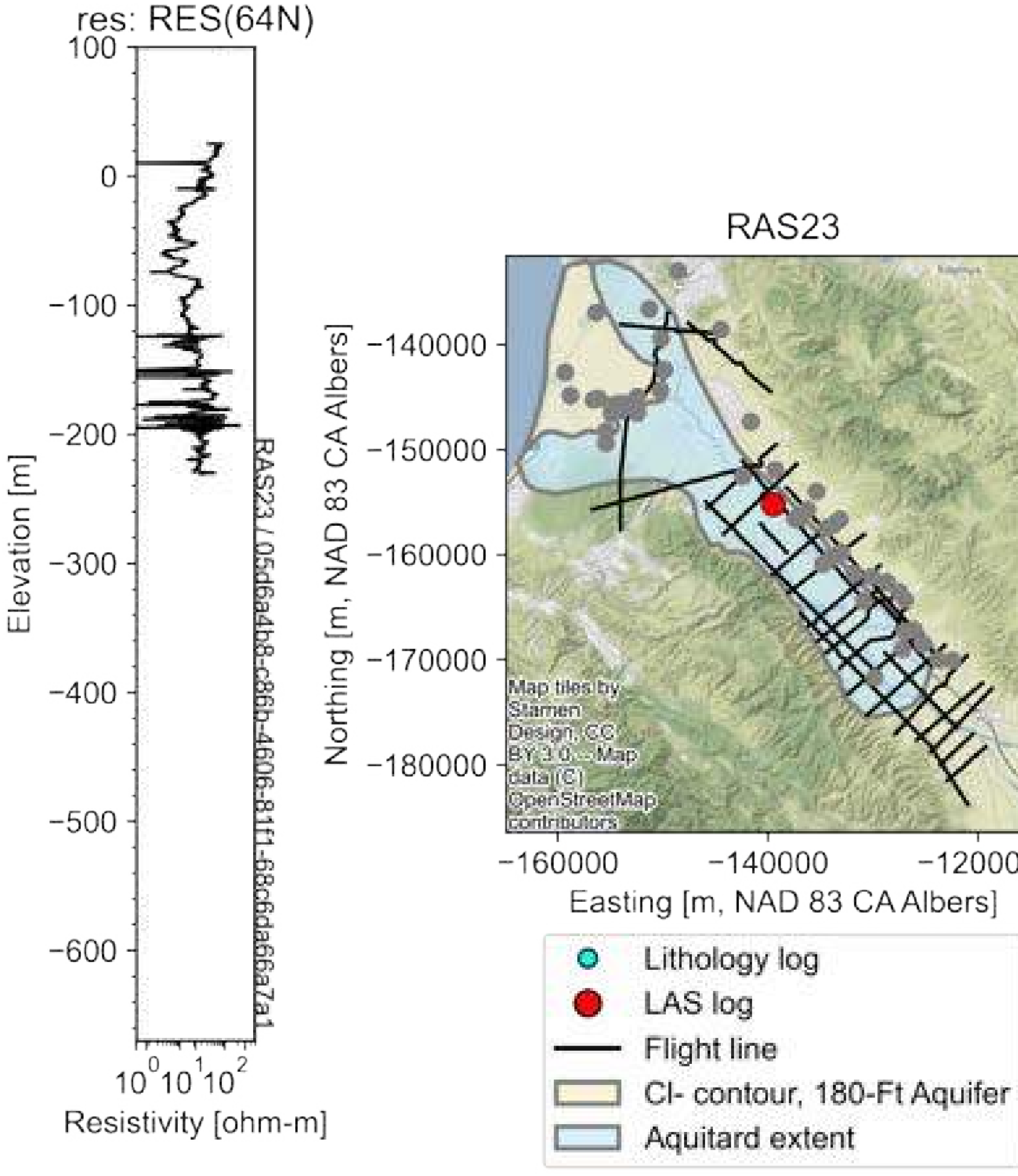

res: LN
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
10^0 10^1 10^2
Resistivity [ohm-m]
15S03E13D01 / b5739b66-cef8-401b-9c8d-5658a13cdee3
15S03E13D01
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



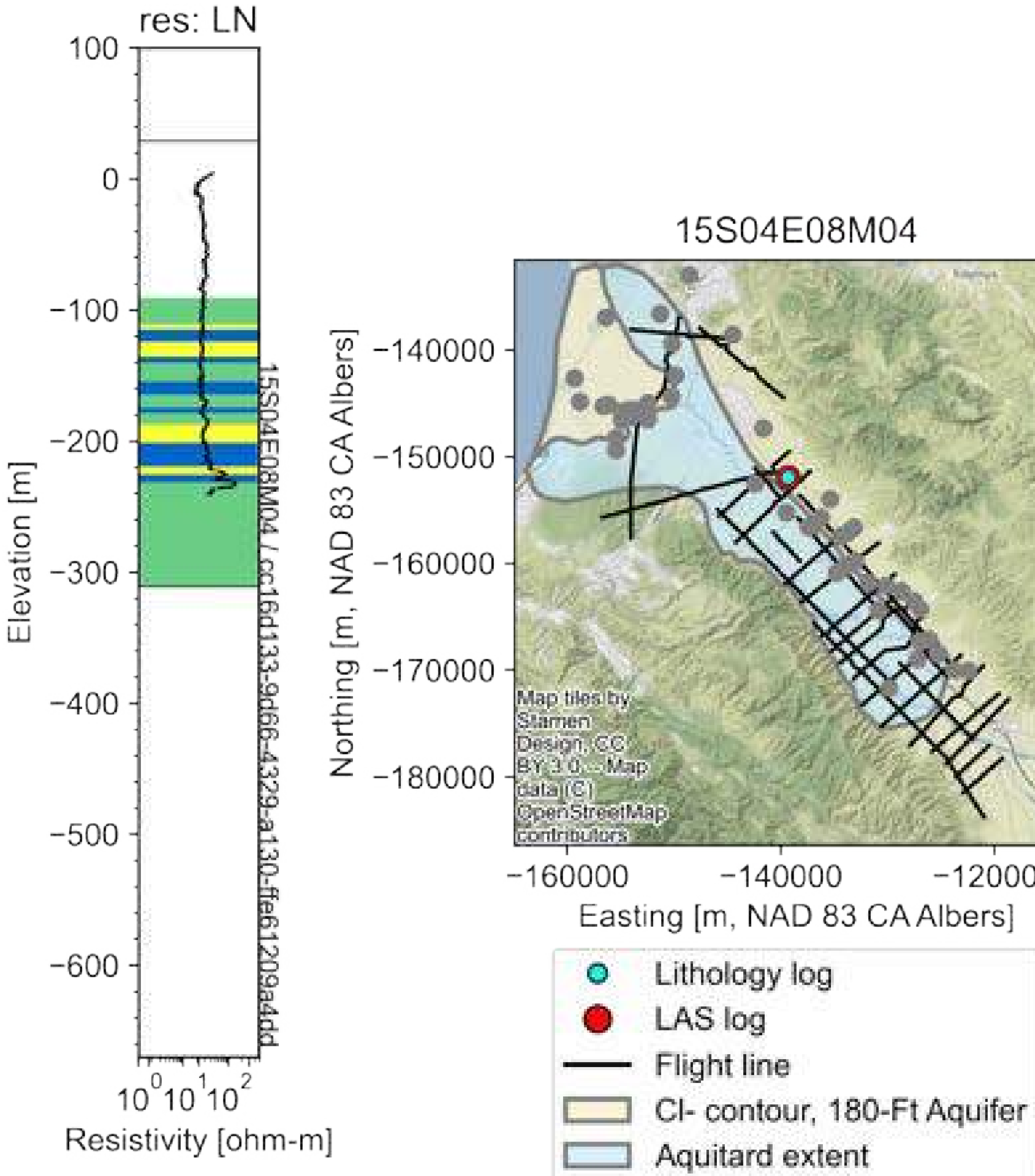
res: RES(64N)
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
$10^0 10^1 10^2$
Resistivity [ohm-m]
RAS3 / 3acb666b-2e3b-4935-b4ad-56fe40a1583f
RAS3
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



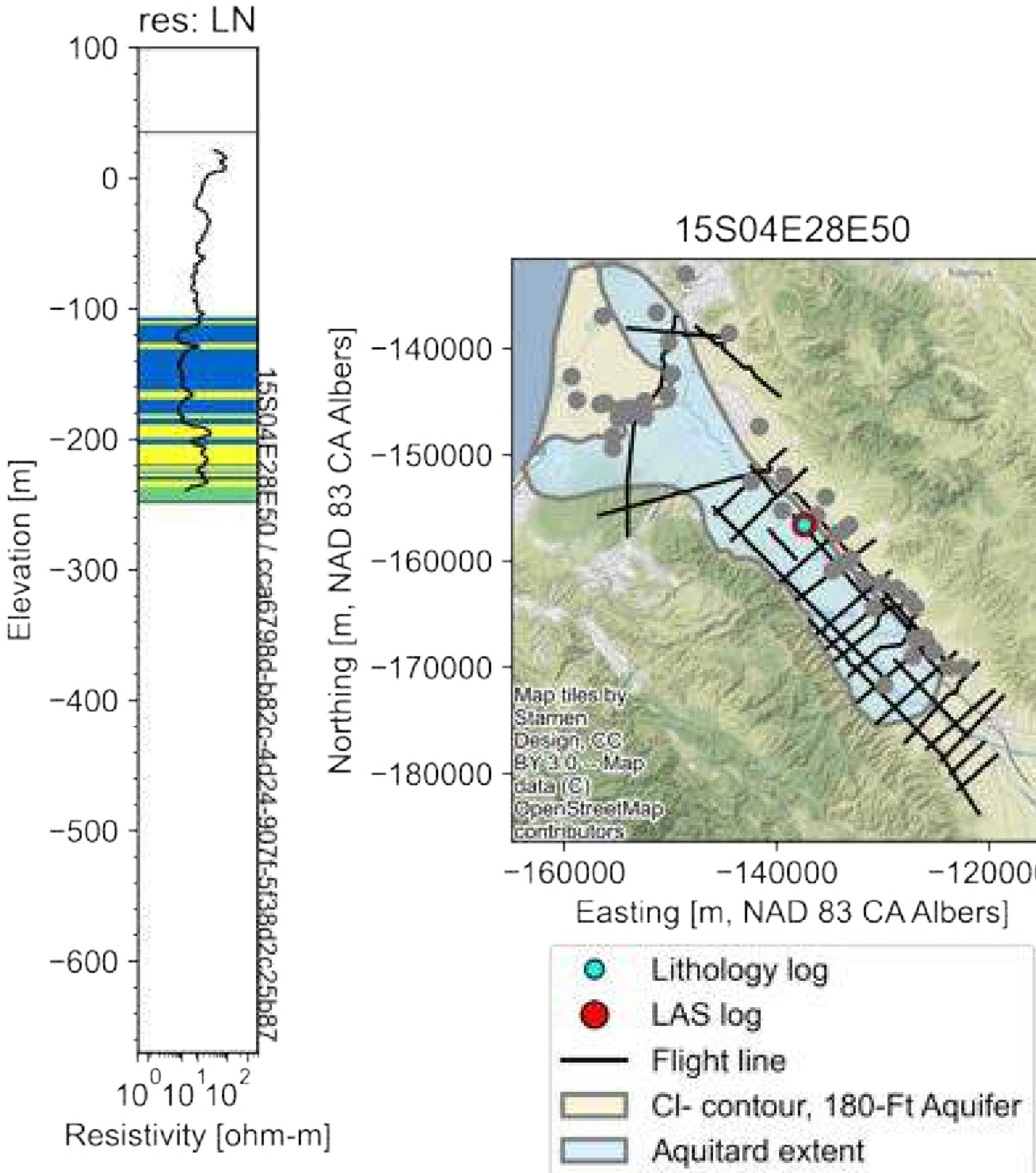
res: RES(64N)
Elevation [m]
Resistivity [ohm-m]
RAS25 / e24f6e5d-e1ea-4650-a666-cf317ebb6884
RAS25
Northing [m, NAD 83 CA Albers]
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

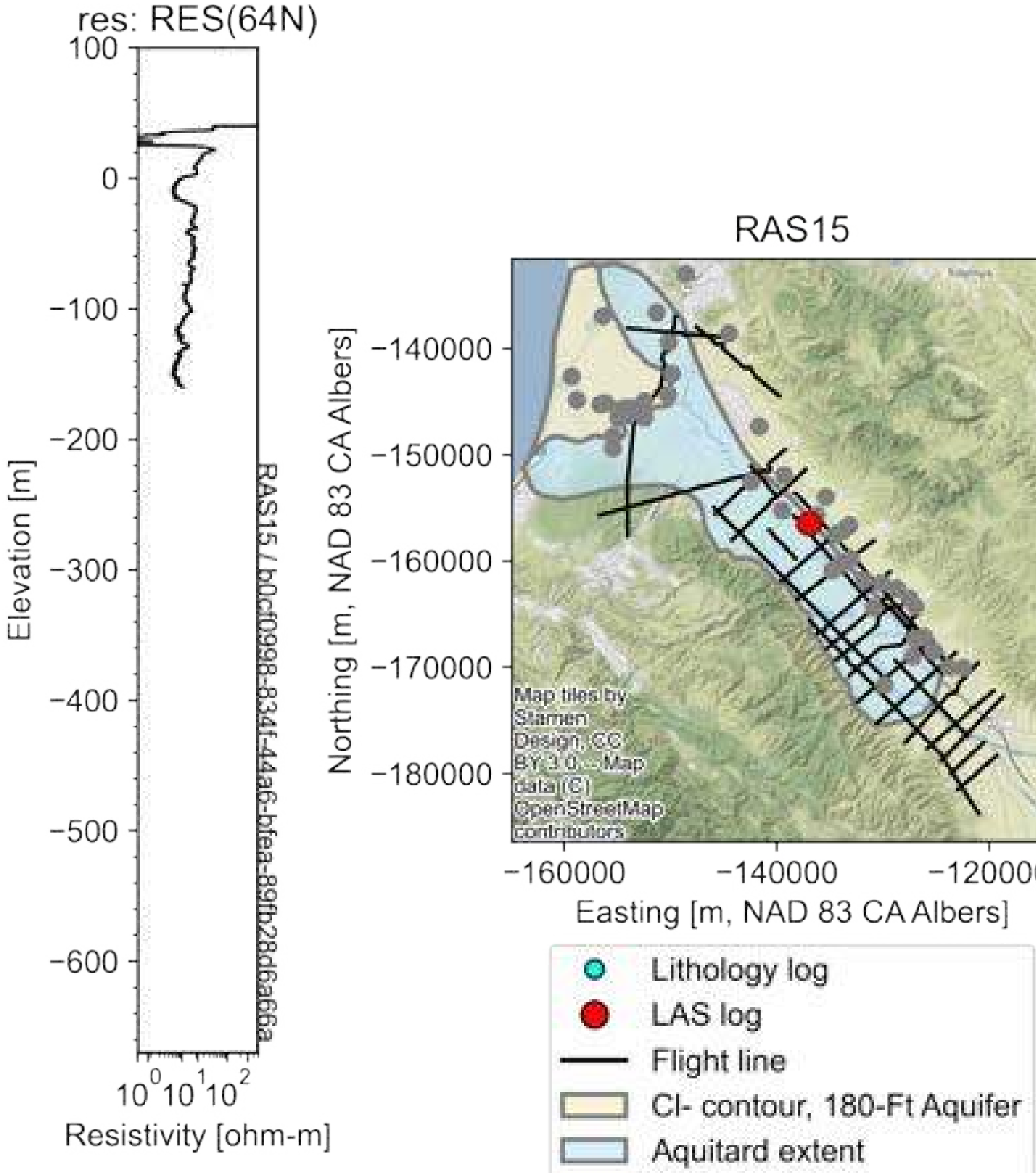


res: RES(64N)
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
RAS23 / 05d6a4b8-c86b-4606-81f1-68c6da66a7a1
$10^0 10^1 10^2$
Resistivity [ohm-m]
RAS23
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

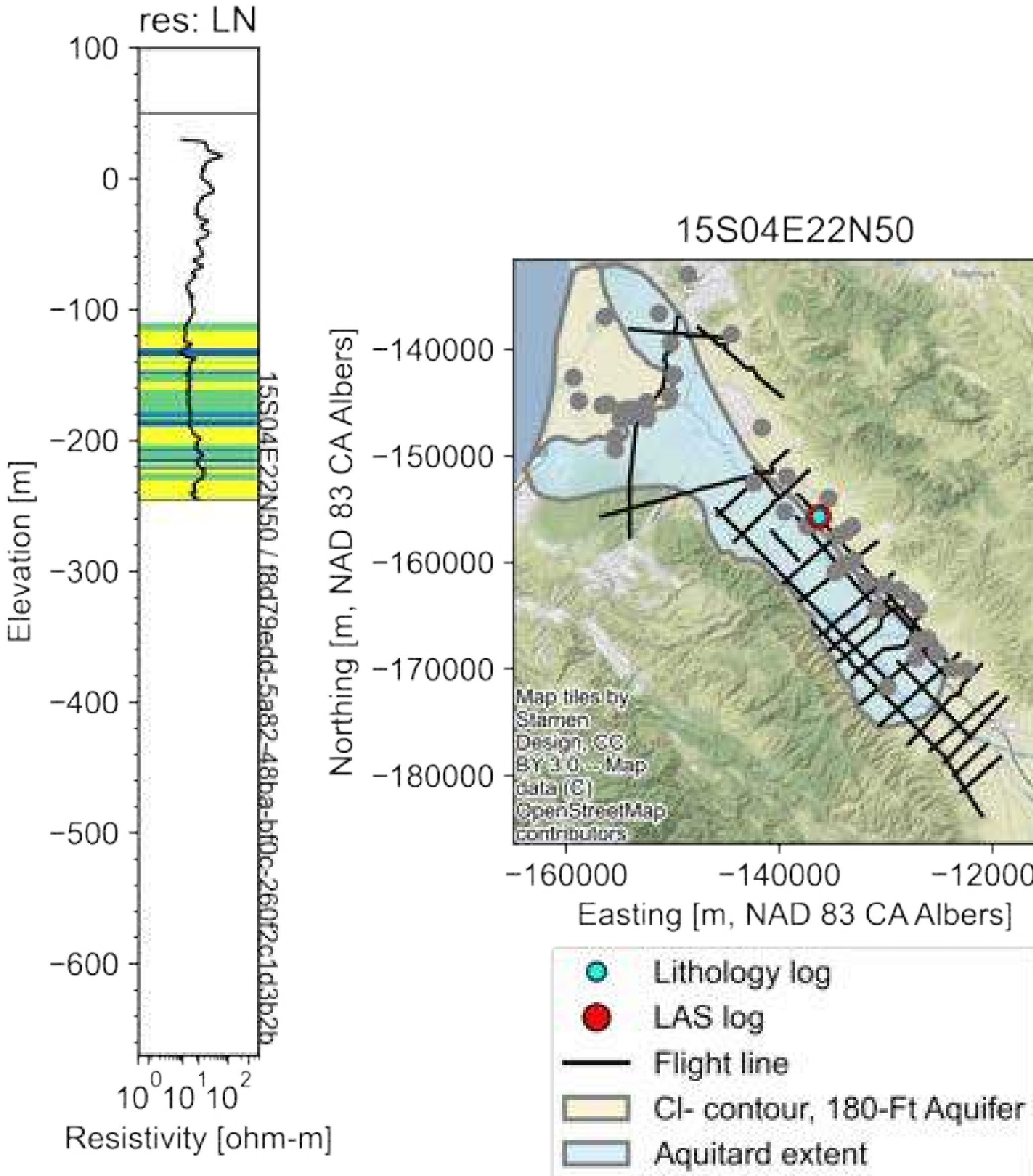


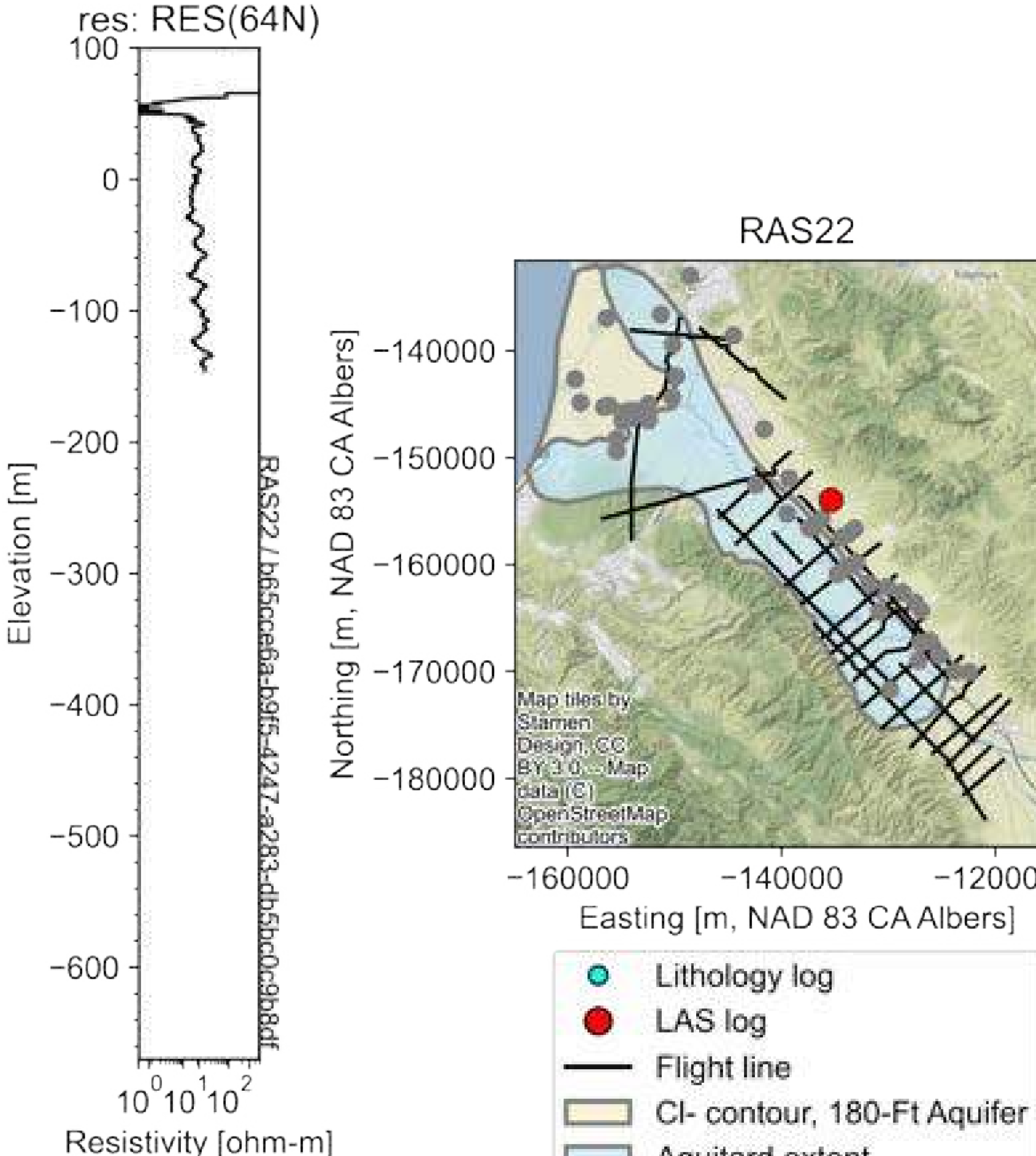
res: LN
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
15S04E08M04 / cc16d133-9d66-4329-a130-ffe61209a4dd
$10^0 10^1 10^2$
Resistivity [ohm-m]
15S04E08M04
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent


res: LN
Elevation [m]
Resistivity [ohm-m]
15S04E28E50 / cca6798d-b82c-4d24-907f-5f38d2c25b87
15S04E28E50
Northing [m, NAD 83 CA Albers]
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

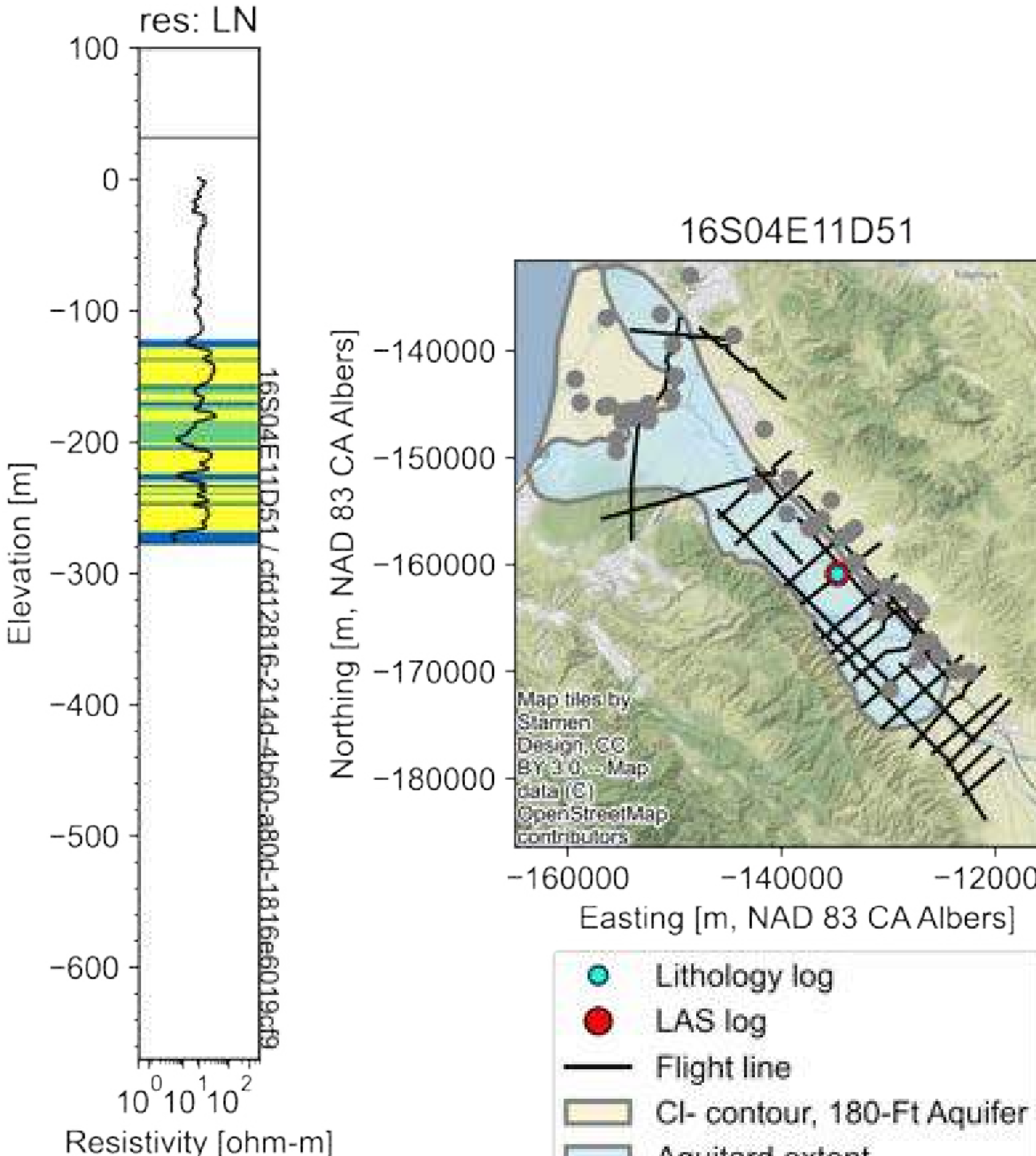


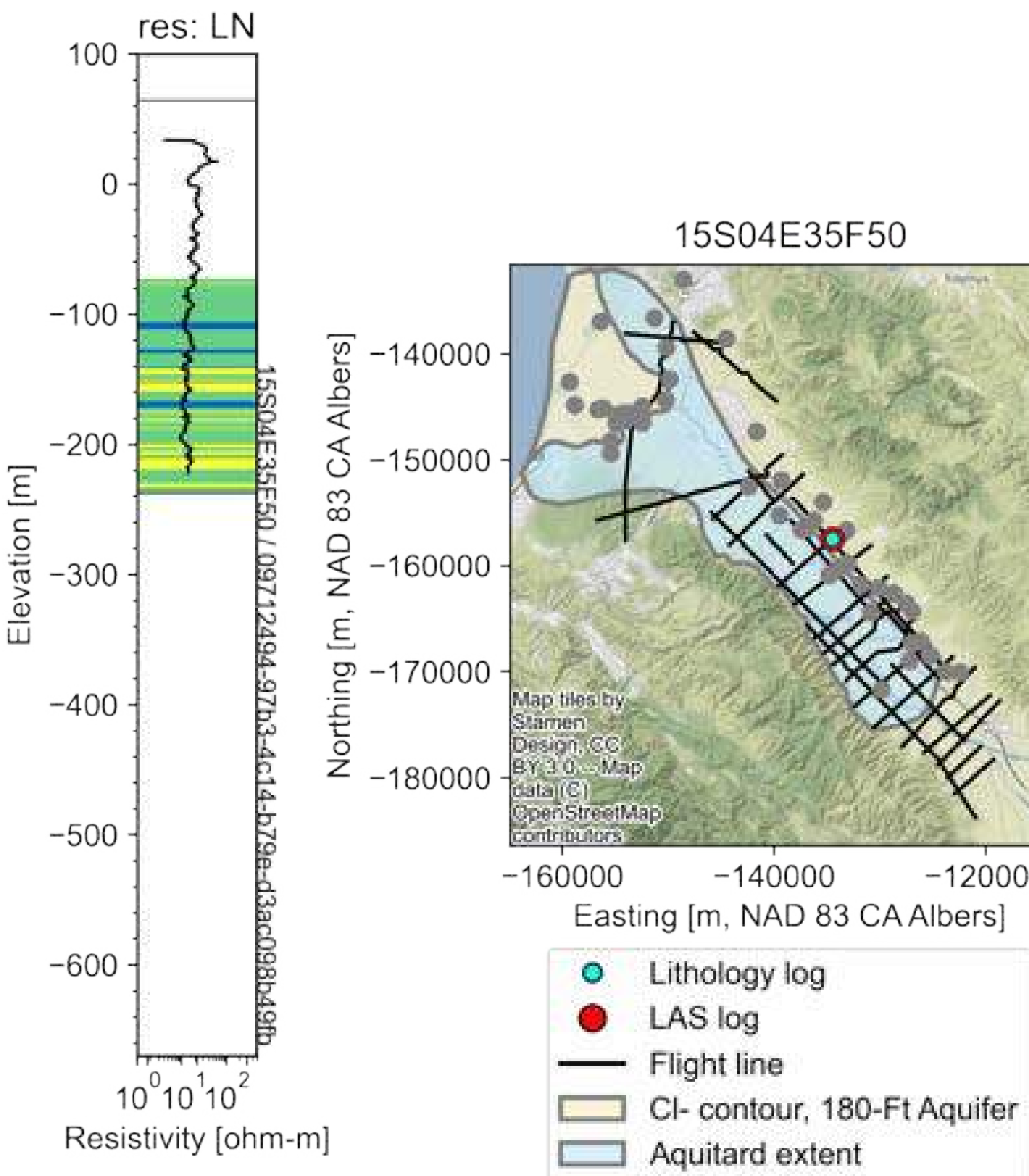
res: RES(64N)
Elevation [m]
100
0
−100
−200
−300
−400
−500
−600
10^0 10^1 10^2
Resistivity [ohm-m]
RAS15 / b0cf0998-834f-44a6-bfea-89fb28d6a66a
RAS15
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent


res: LN
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
15S04E22N50 / f8d79edd-5a82-48ba-bf0c-260f2c1d3b2b
10^0 10^1 10^2
Resistivity [ohm-m]
15S04E22N50
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

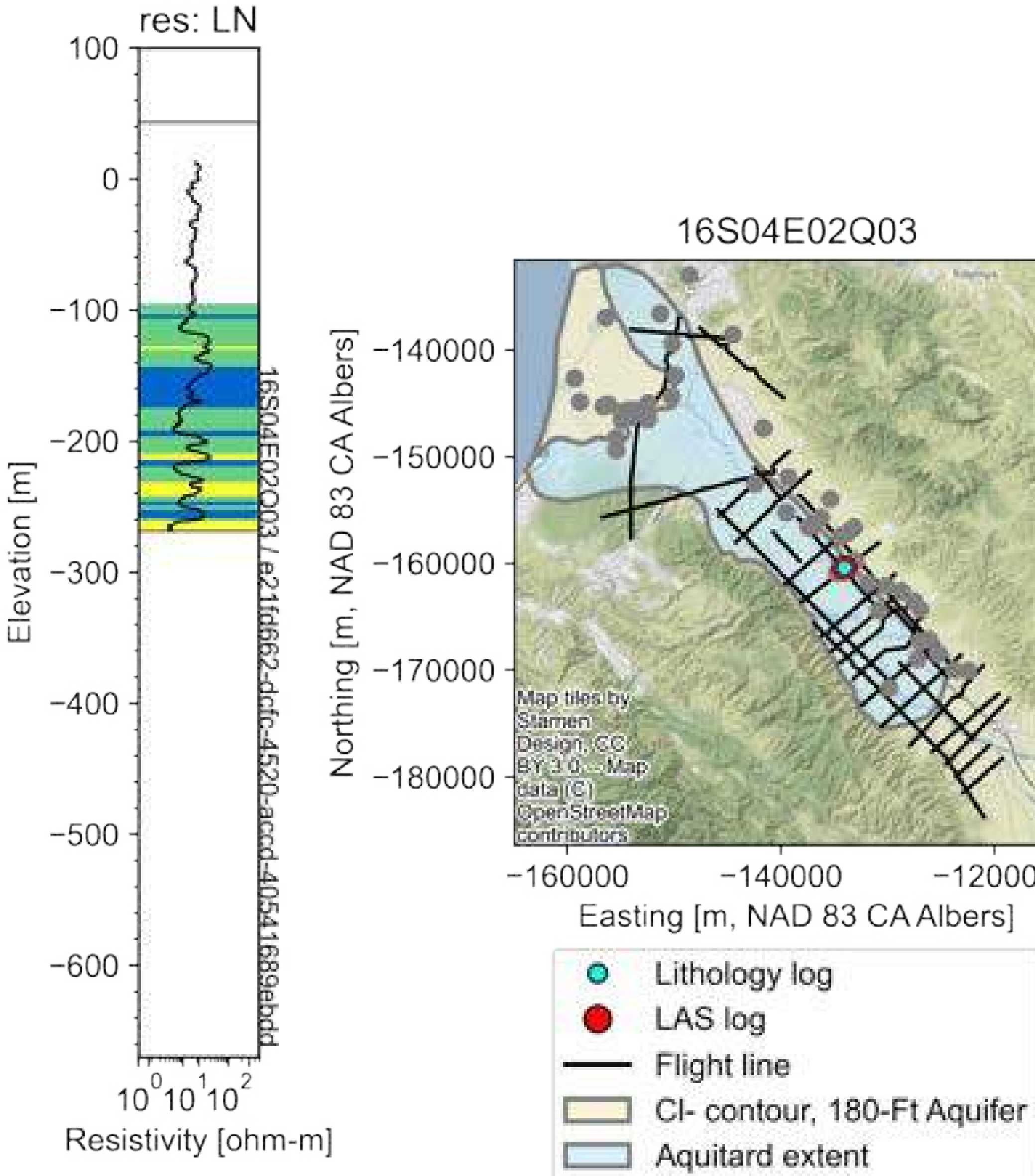


res: RES(64N)
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
RAS22 / b65cce6a-b9f5-4247-a283-db5bc0c9b8df
$10^0 10^1 10^2$
Resistivity [ohm-m]
RAS22
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

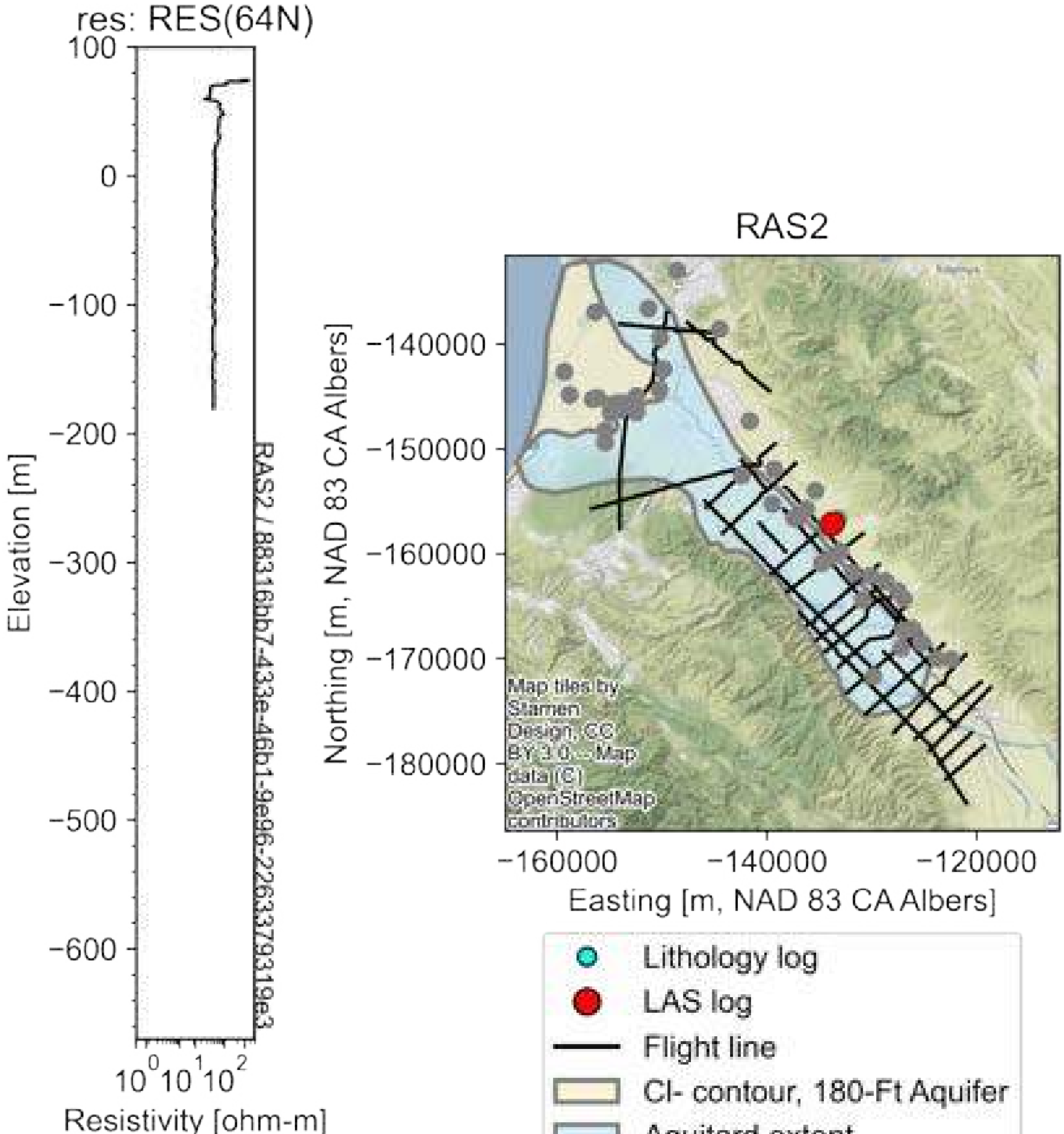

res: LN
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
16S04E11D51 / cfd12816-214d-4b60-a80d-1816e6019cf9
$10^0 10^1 10^2$
Resistivity [ohm-m]
16S04E11D51
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

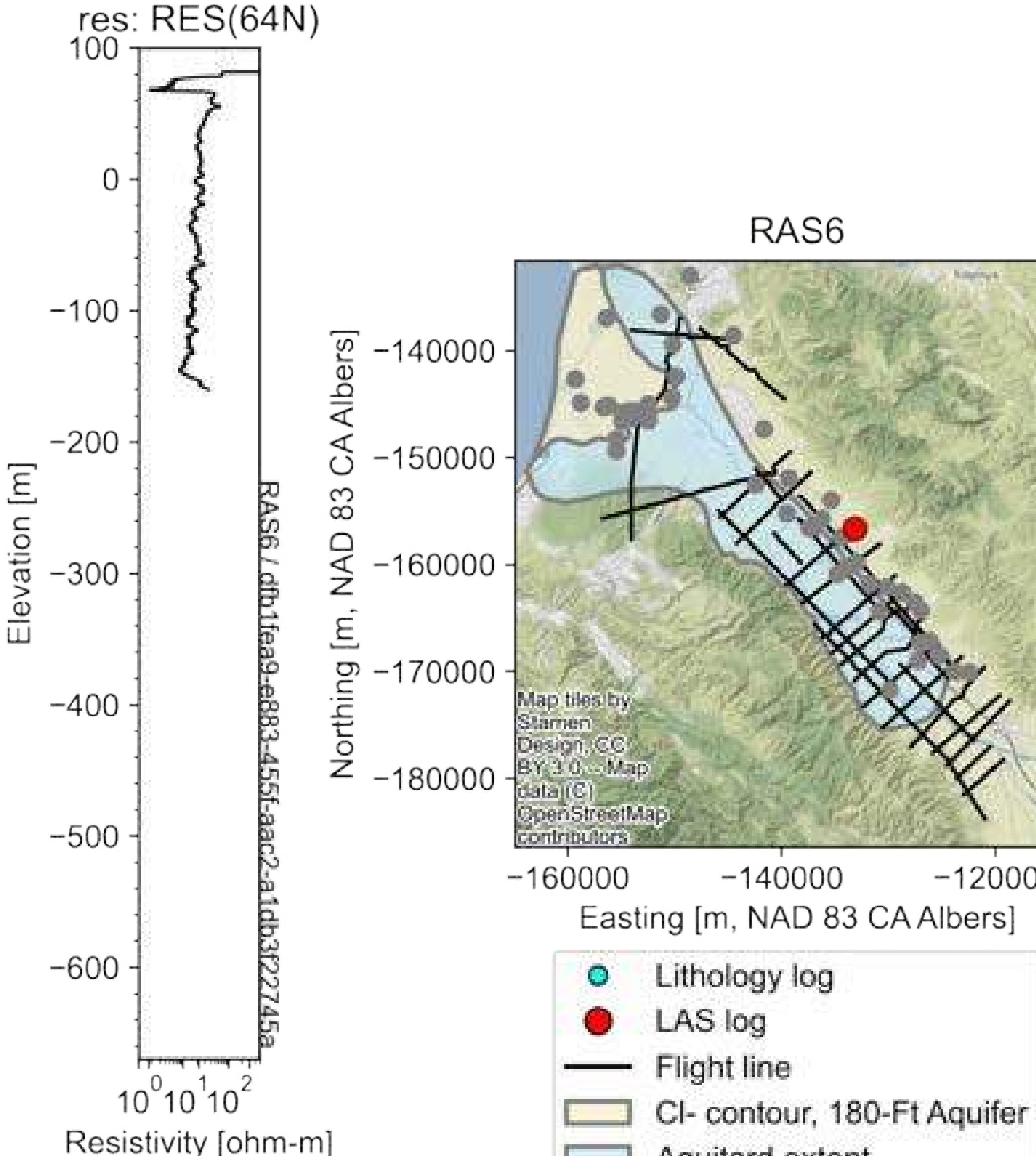


res: LN
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
10^0 10^1 10^2
Resistivity [ohm-m]
15S04E35F50 / 09712494-97b3-4c14-b79e-d3ac098b49fb
15S04E35F50
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

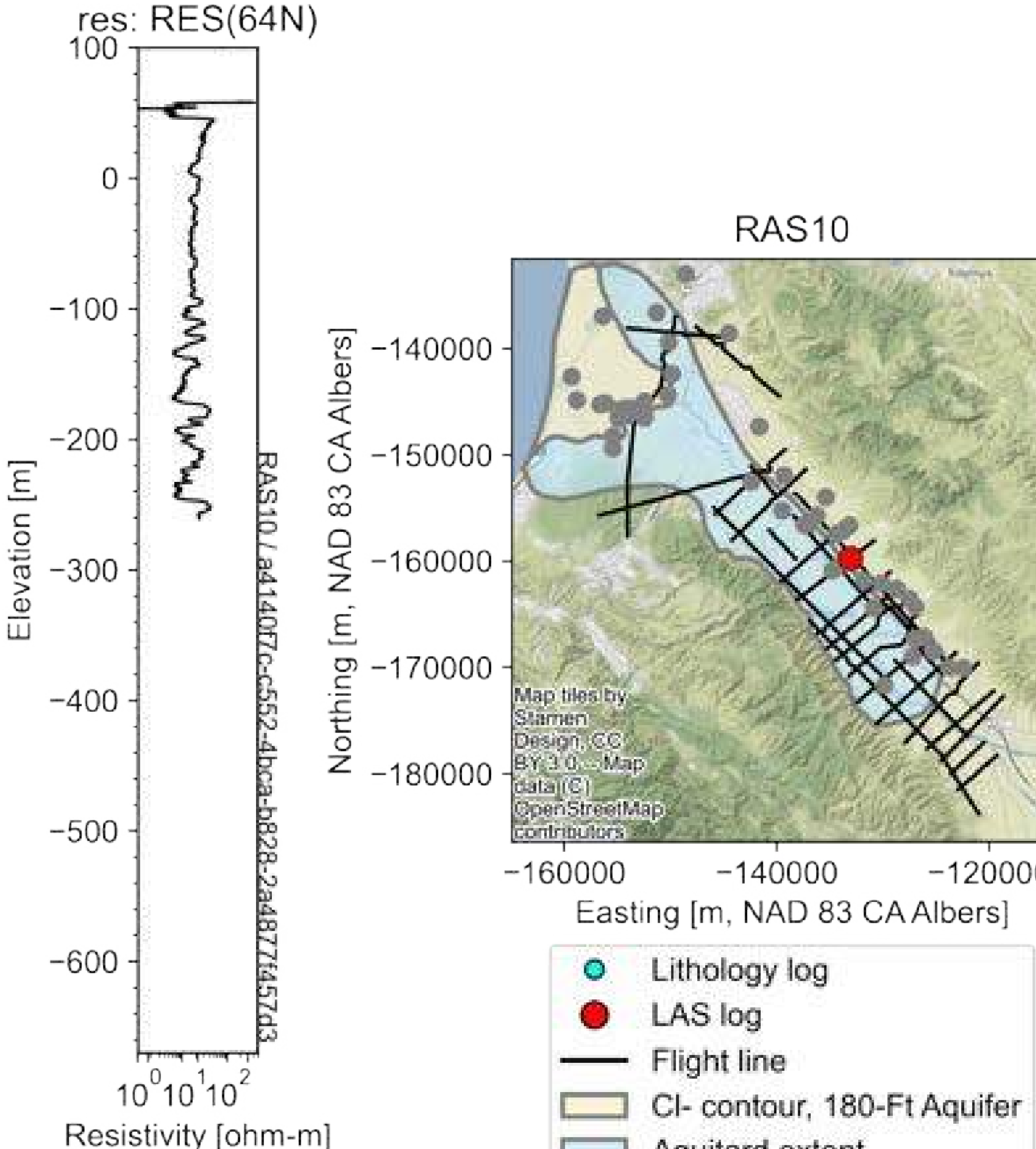


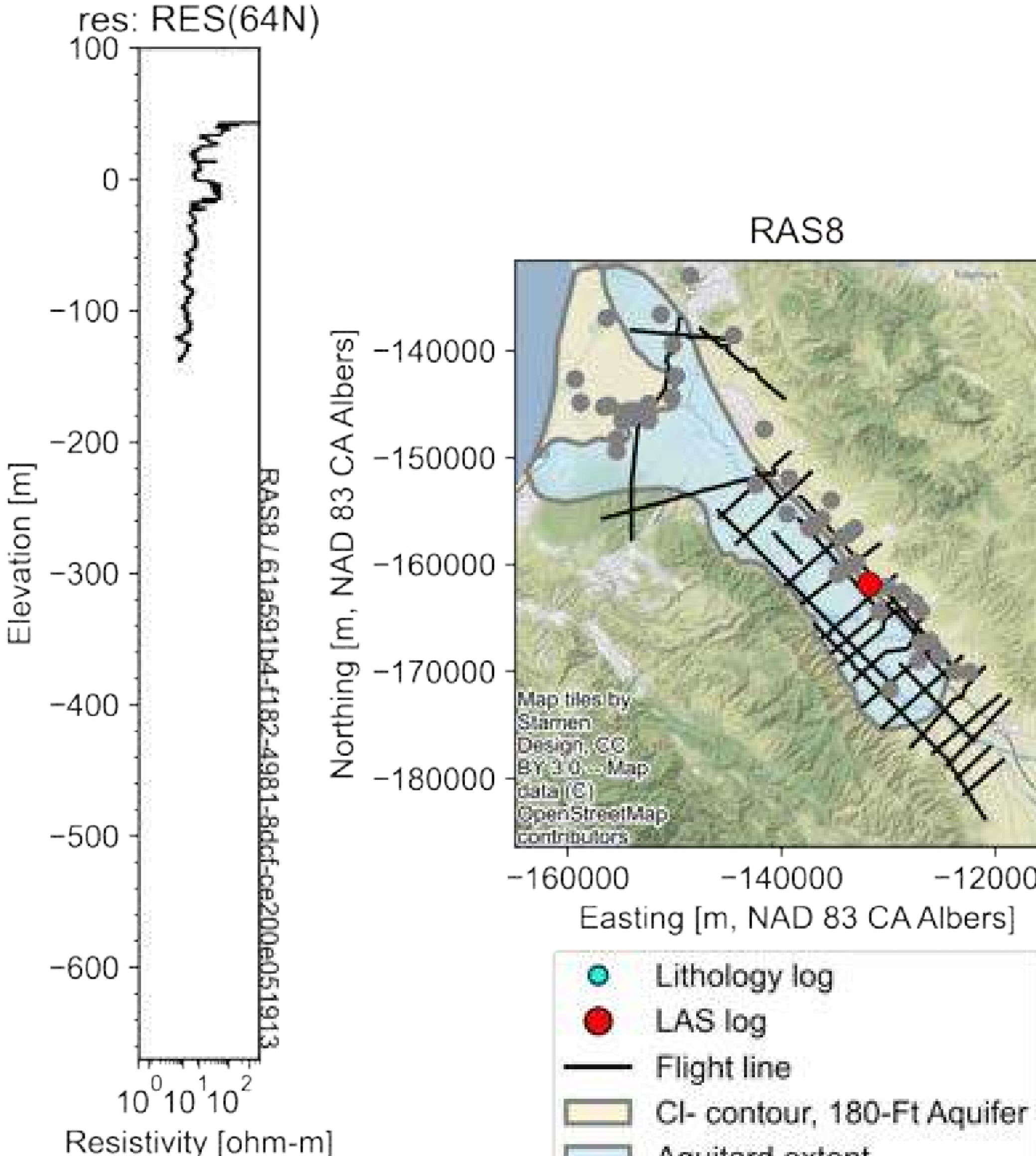
res: LN
Elevation [m]
100
0
−100
−200
−300
−400
−500
−600
16S04E02Q03 / e21fd662-dcfc-4520-accd-40541689ebdd
$10^0 10^1 10^2$
Resistivity [ohm-m]
16S04E02Q03
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
Easting [m, NAD 83 CA Albers]
−160000
−140000
−120000
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent


res: RES(64N)
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
RAS2 / 88316bb7-433e-46b1-9e96-22633793 19e3
$10^0 10^1 10^2$
Resistivity [ohm-m]
RAS2
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



res: RES(64N)
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
$10^0 10^1 10^2$
Resistivity [ohm-m]
RAS6 / dfb1fea9-e883-455f-aac2-a1db3f22745a
RAS6
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent


res: RES(64N)
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
RAS10 / a4140f7c-c552-4bca-b828-2a4877f457d3
10⁰10¹10²
Resistivity [ohm-m]
RAS10
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



res: RES(64N)
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
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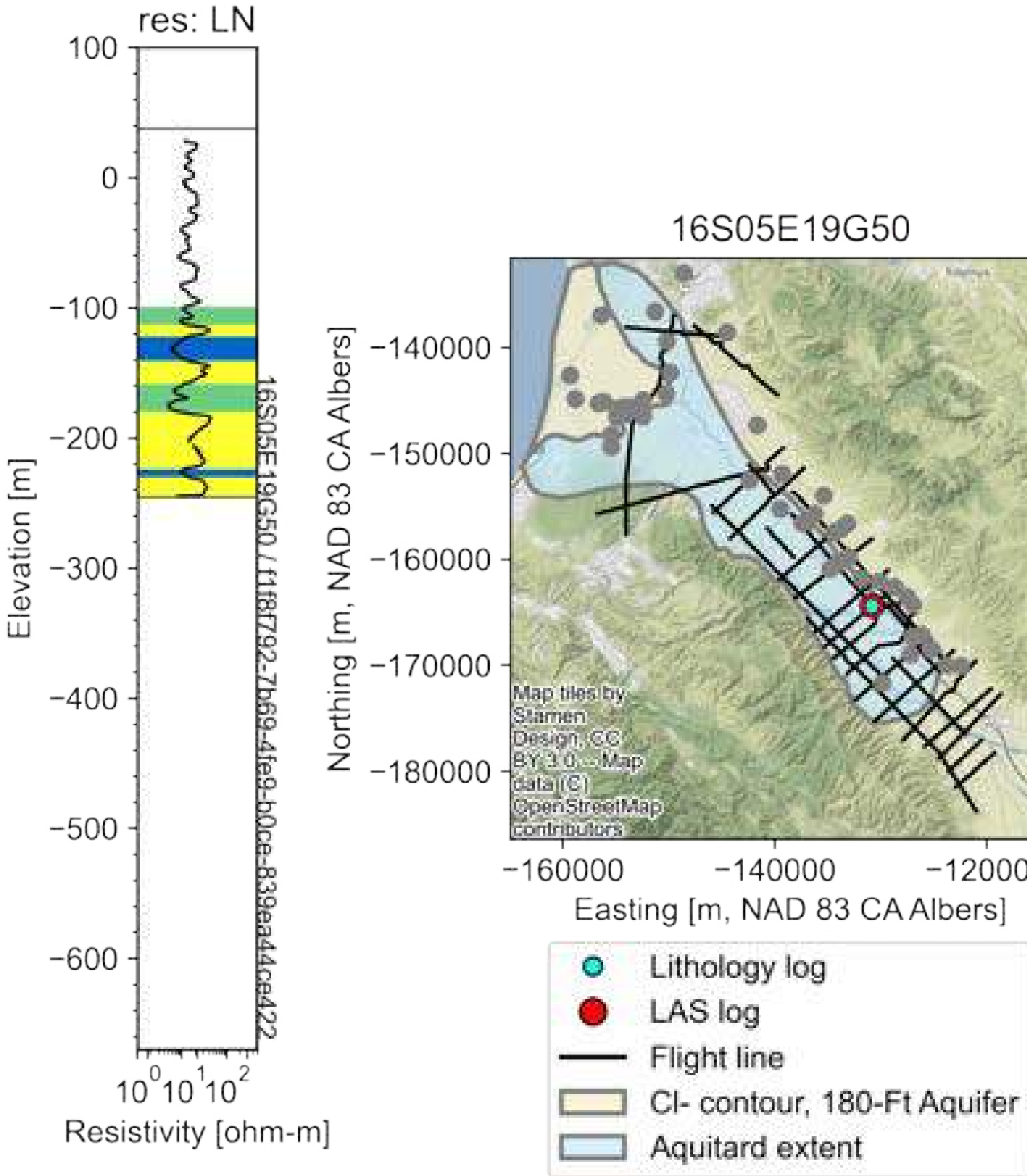
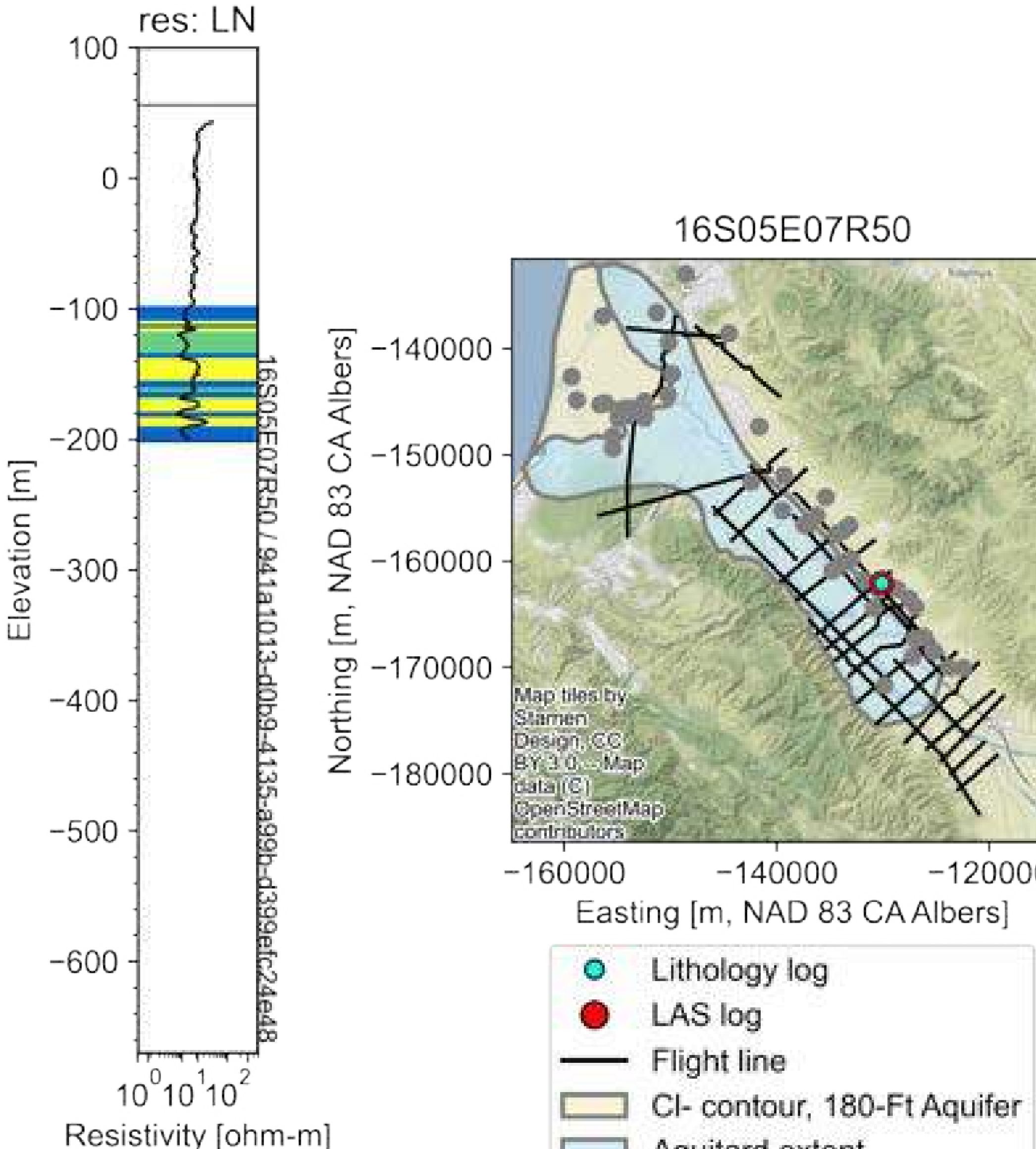
$10^0 10^1 10^2$
Resistivity [ohm-m]
RAS8
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



res: LN
Elevation [m]
100
0
−100
−200
−300
−400
−500
−600
10^0 10^1 10^2
Resistivity [ohm-m]
16S05E19G50 / f1f8f792-7b69-4fe9-b0ce-839ea44ce422
16S05E19G50
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



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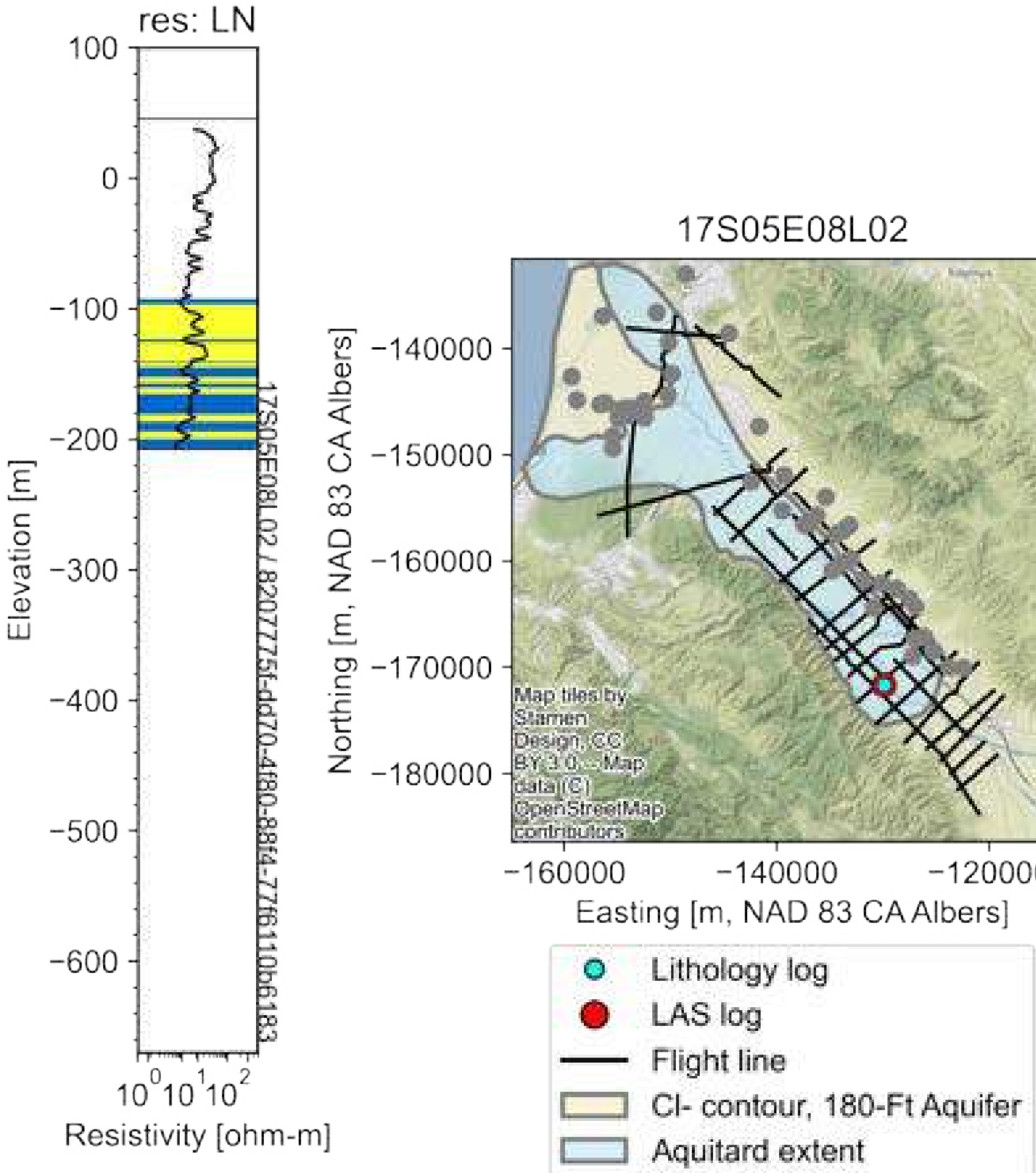
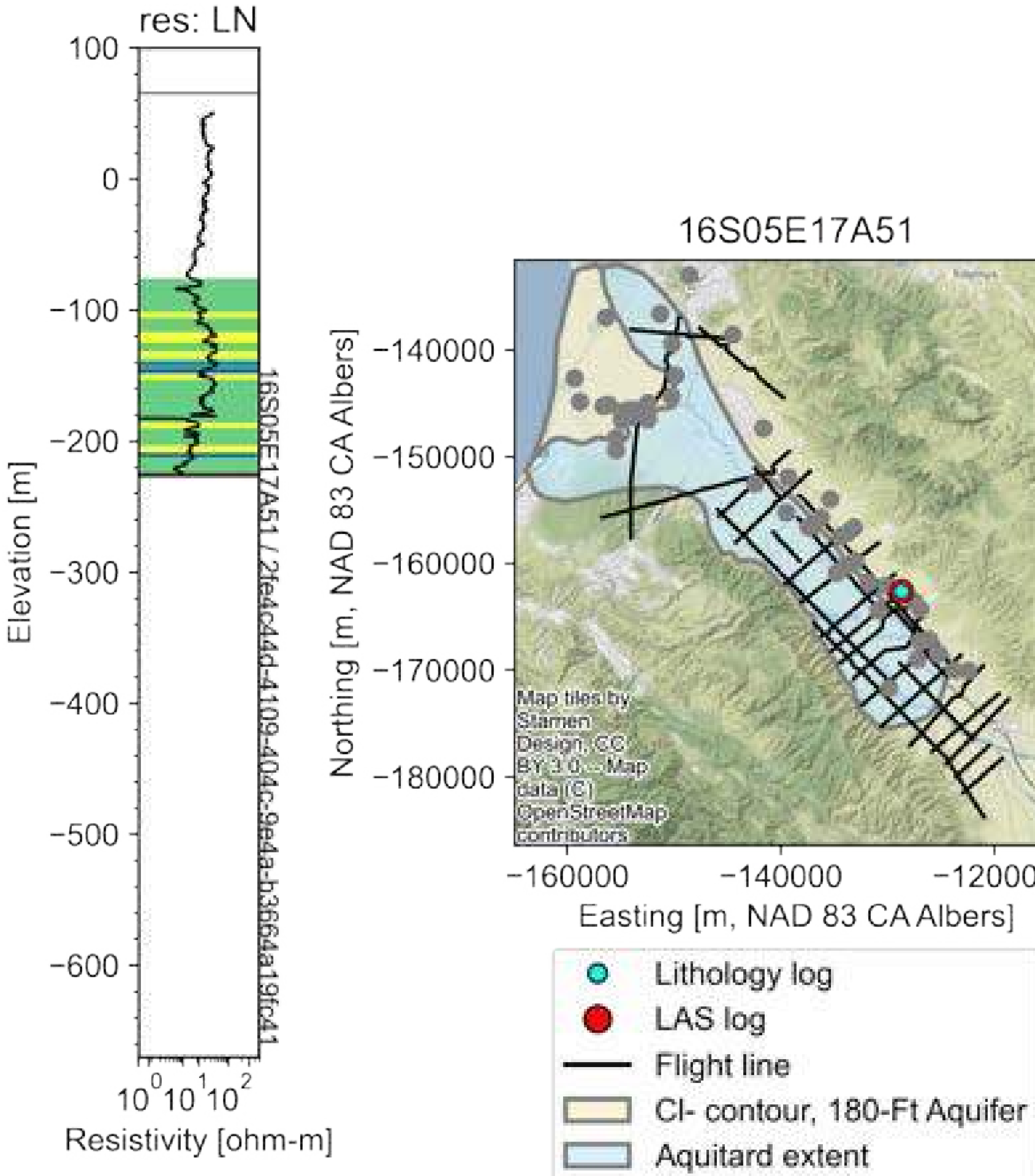
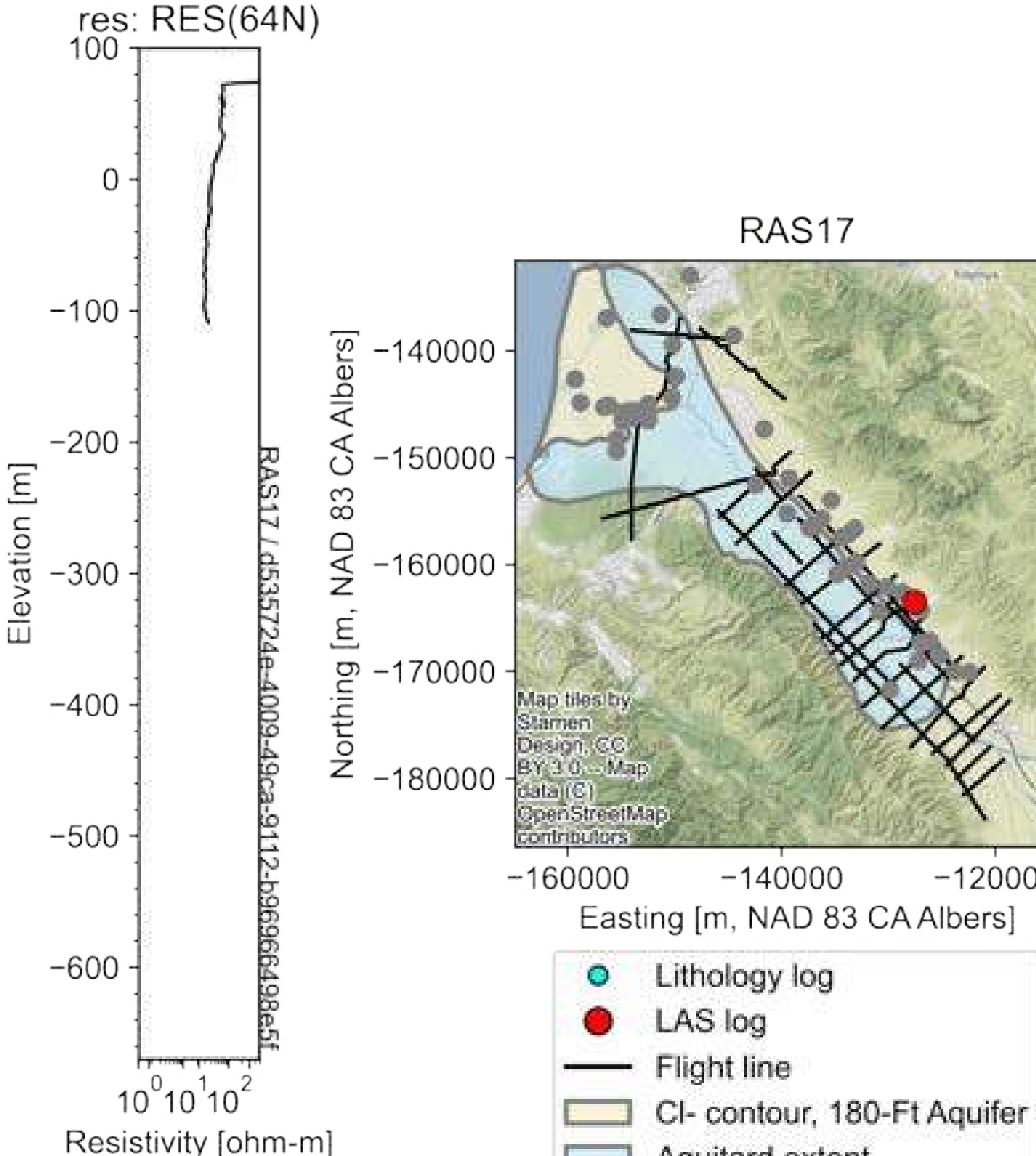
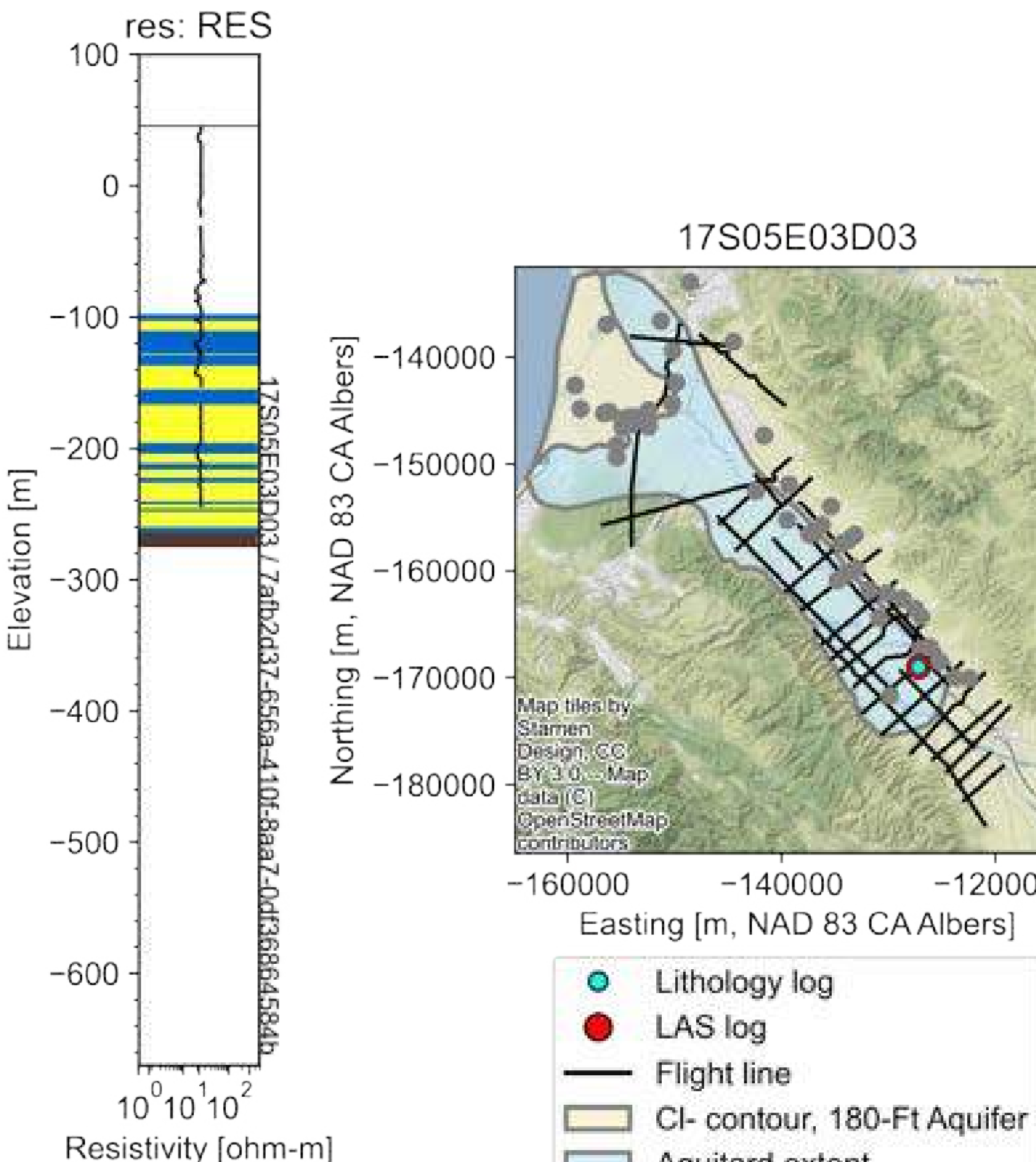
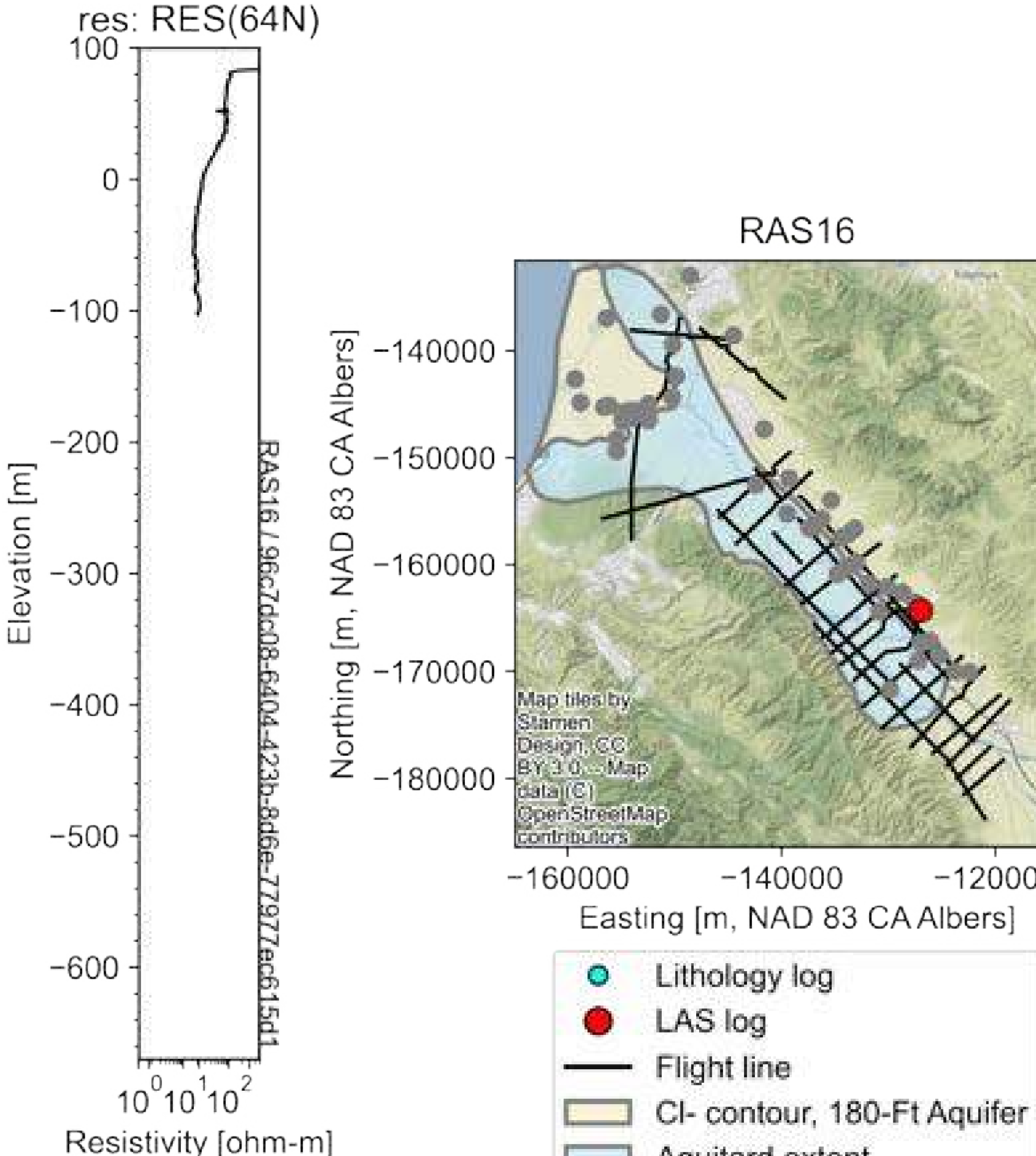
−100
−200
−300
−400
−500
−600
Elevation [m]
16S05E07R50 / 941a1013-d0b9-4135-a99b-d399efc24e48
10^0 10^1 10^2
Resistivity [ohm-m]
16S05E07R50
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

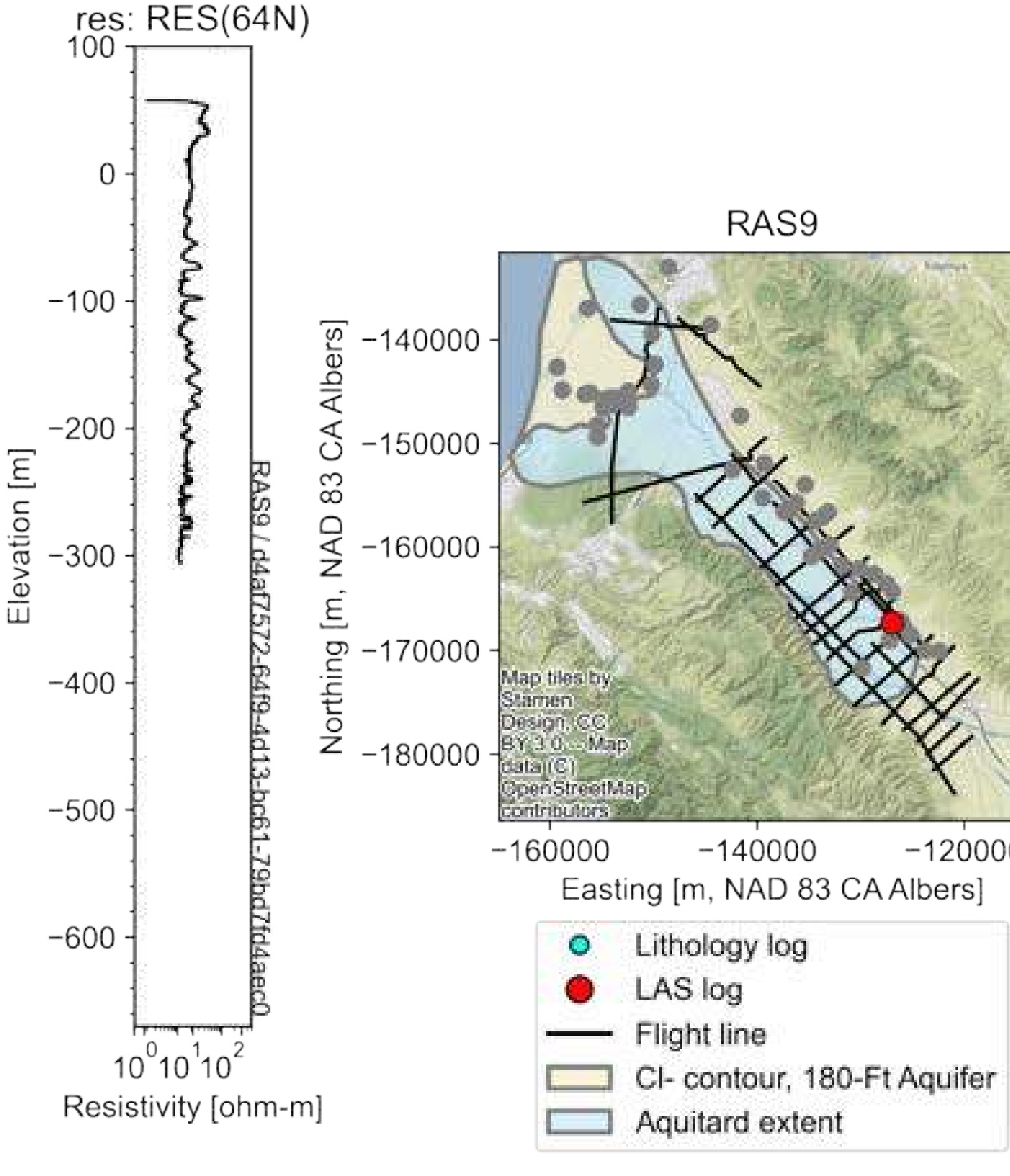

res: LN
Elevation [m]
Resistivity [ohm-m]
17S05E08L02 / 8207775f-dd70-4f80-88f4-77f6110b6183
17S05E08L02
Northing [m, NAD 83 CA Albers]
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

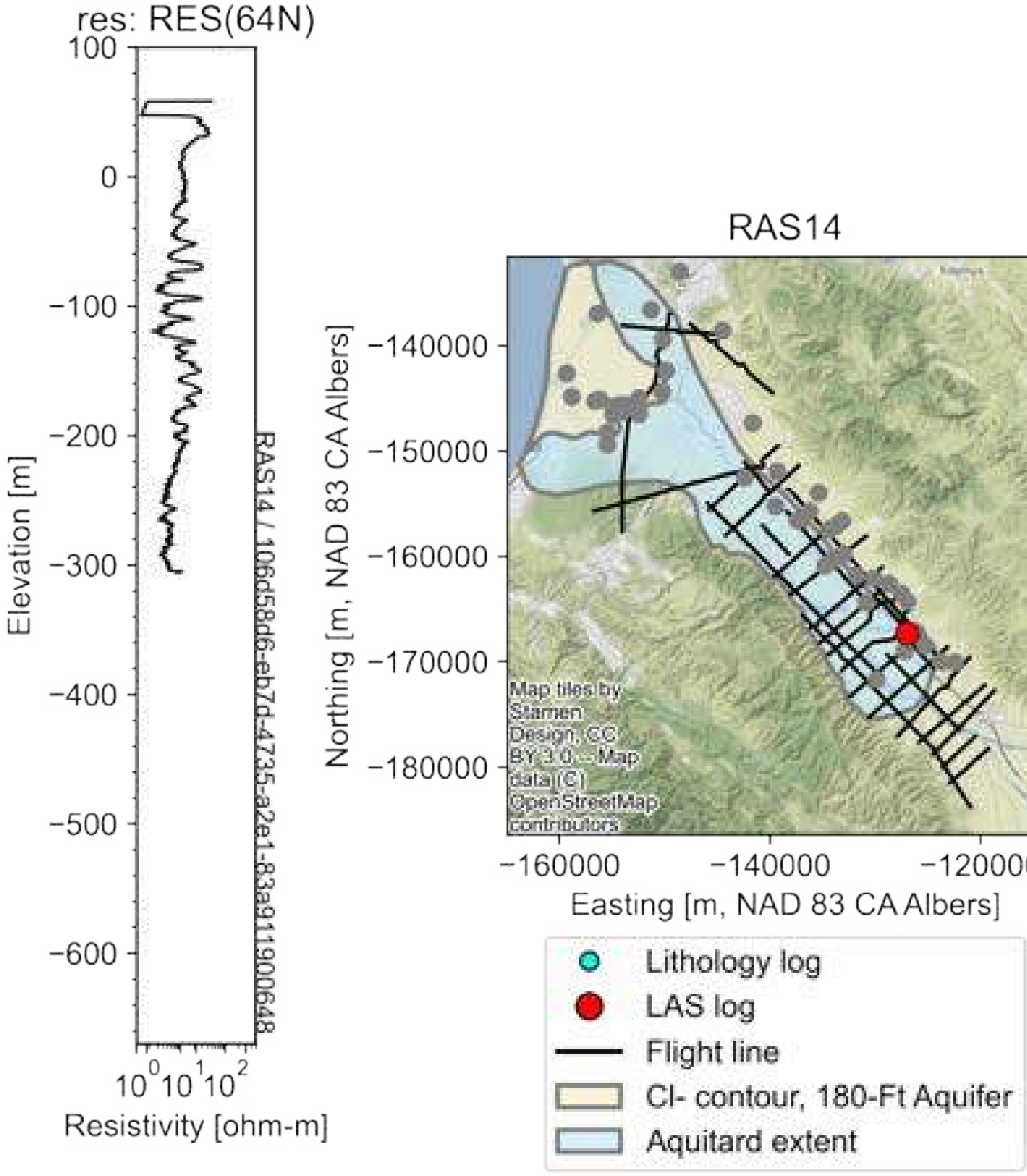

res: LN
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
16S05E17A51 / 2fe4c44d-4109-404c-9e4a-b3664a19fc41
10^0 10^1 10^2
Resistivity [ohm-m]
16S05E17A51
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent


res: RES(64N)
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
RAS17 / d535724e-4009-49ca-9112-b9696498e5f
Resistivity [ohm-m]
RAS17
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

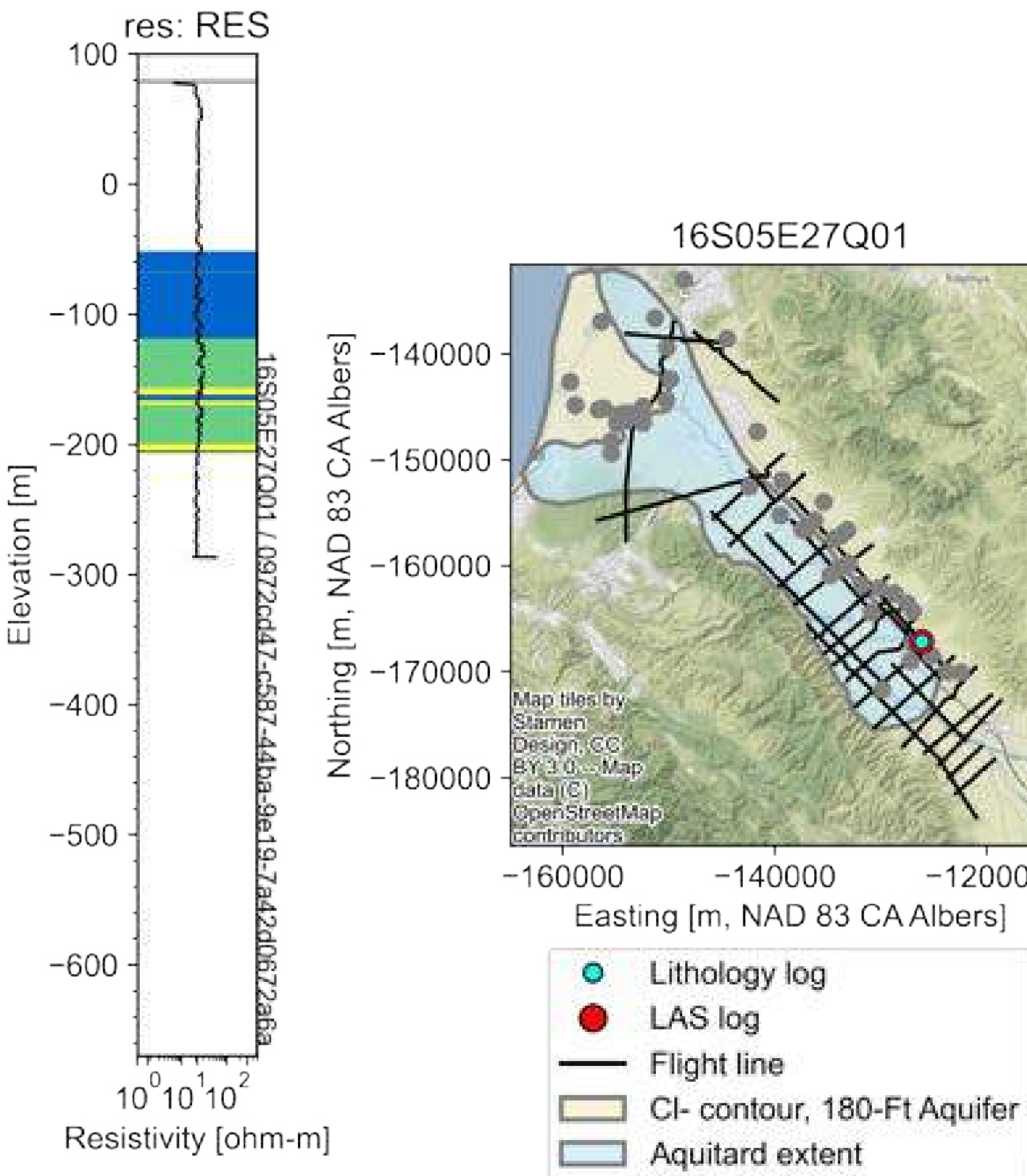

res: RES
Elevation [m]
Resistivity [ohm-m]
17S05E03D03 / 7afb2d37-656a-410f-8aa7-0df368645846
17S05E03D03
Northing [m, NAD 83 CA Albers]
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

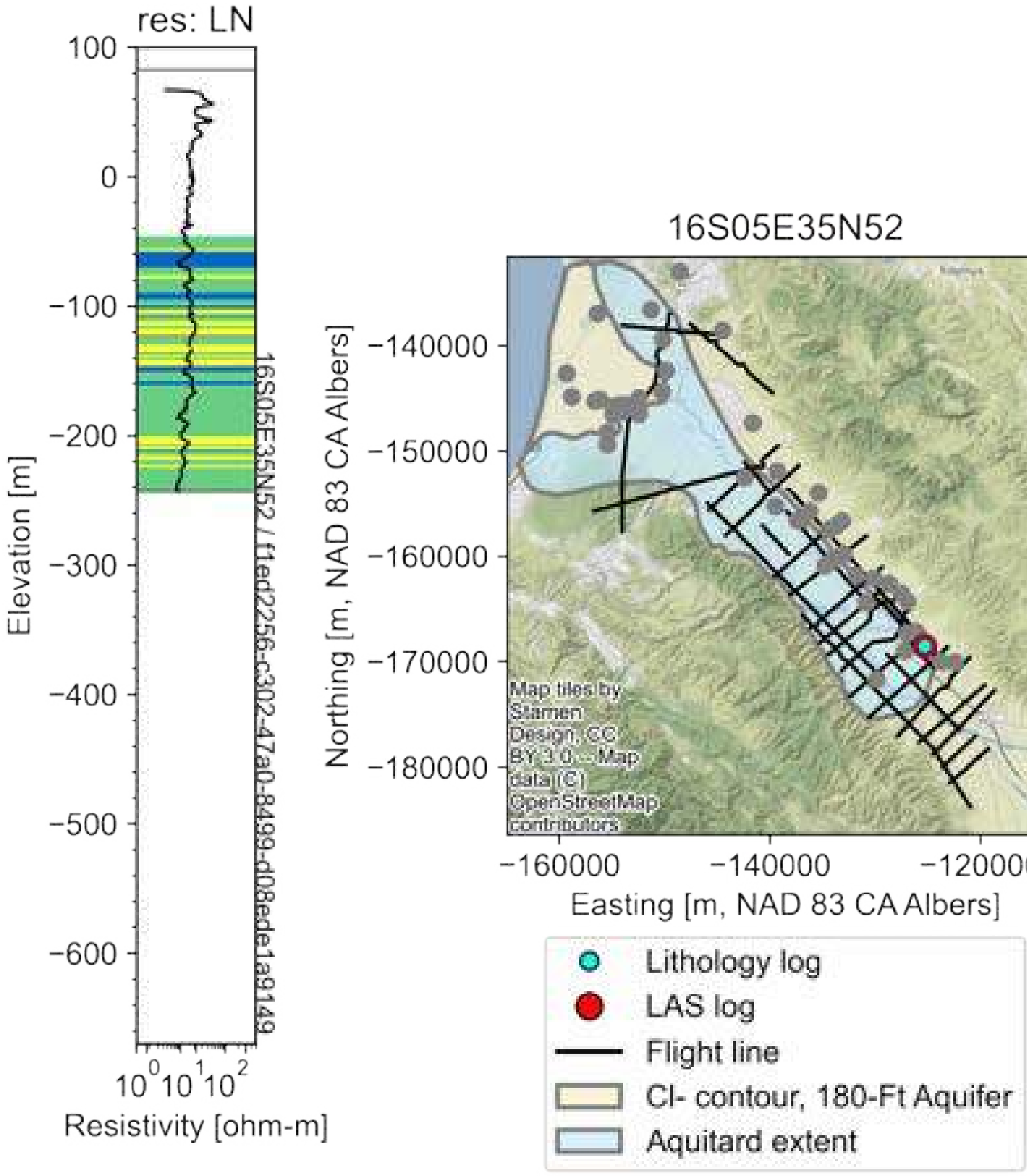

res: RES(64N)
Elevation [m]
100
0
−100
−200
−300
−400
−500
−600
RAS16 / 96c7dc08-6404-423b-8d6e-77977ec615d1
Resistivity [ohm-m]
RAS16
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent


res: RES(64N)
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
RAS9 / d4af7572-64f9-4d13-bc61-79bd7fd4aec0
10^0 10^1 10^2
Resistivity [ohm-m]
RAS9
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



res: RES(64N)
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
10^0 10^1 10^2
Resistivity [ohm-m]
RAS14 / 106d58d6-eb7d-4735-a2e1-83a911900648
RAS14
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent


res: RES
Elevation [m]
100
0
−100
−200
−300
−400
−500
−600
$10^0 10^1 10^2$
Resistivity [ohm-m]
16S05E27Q01 / 0972cd47-c587-44ba-9e19-7a42d0672a6a
16S05E27Q01
Northing [m, NAD 83 CA Albers]
−140000
−150000
−160000
−170000
−180000
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



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Elevation [m]
Resistivity [ohm-m]
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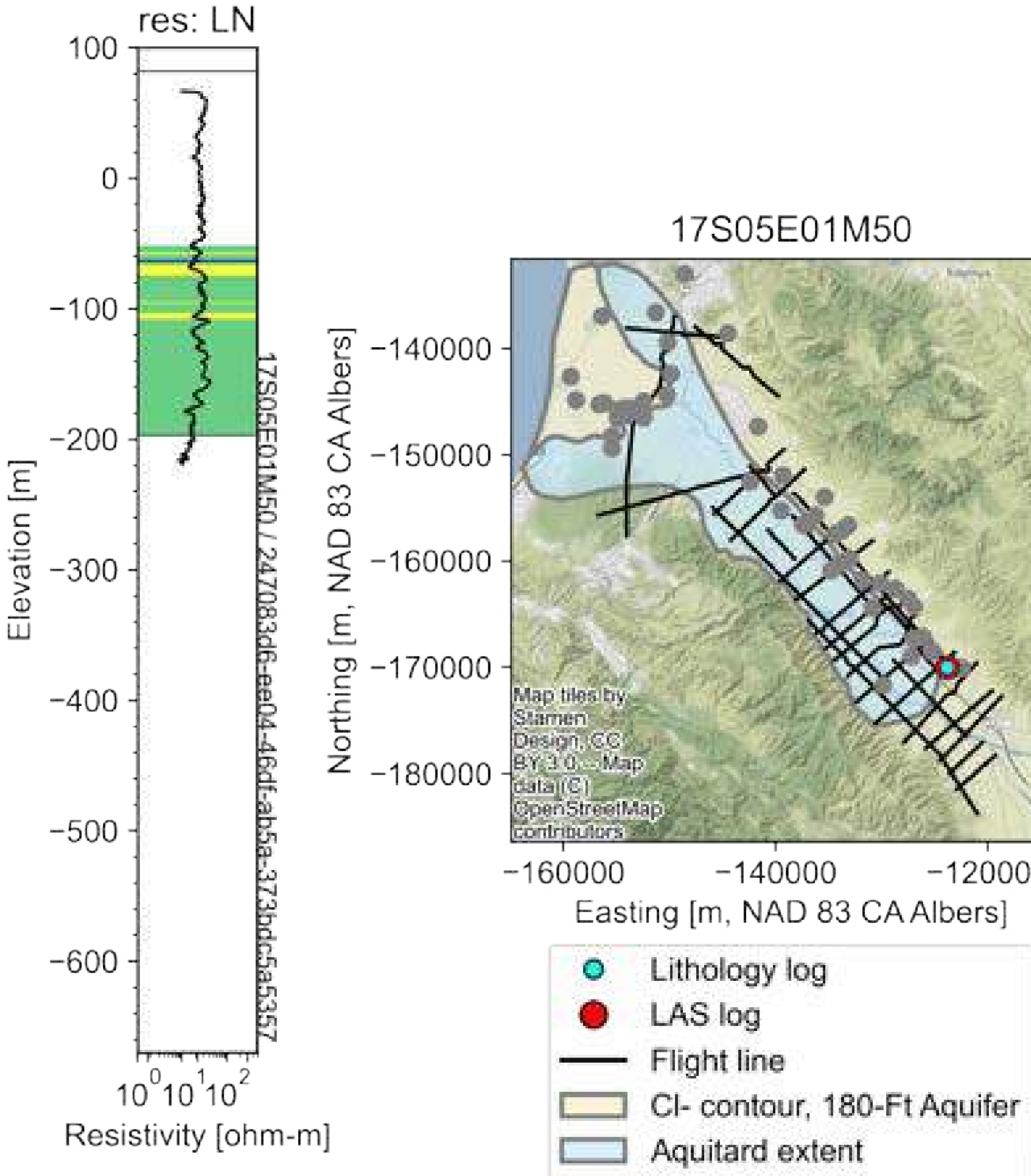
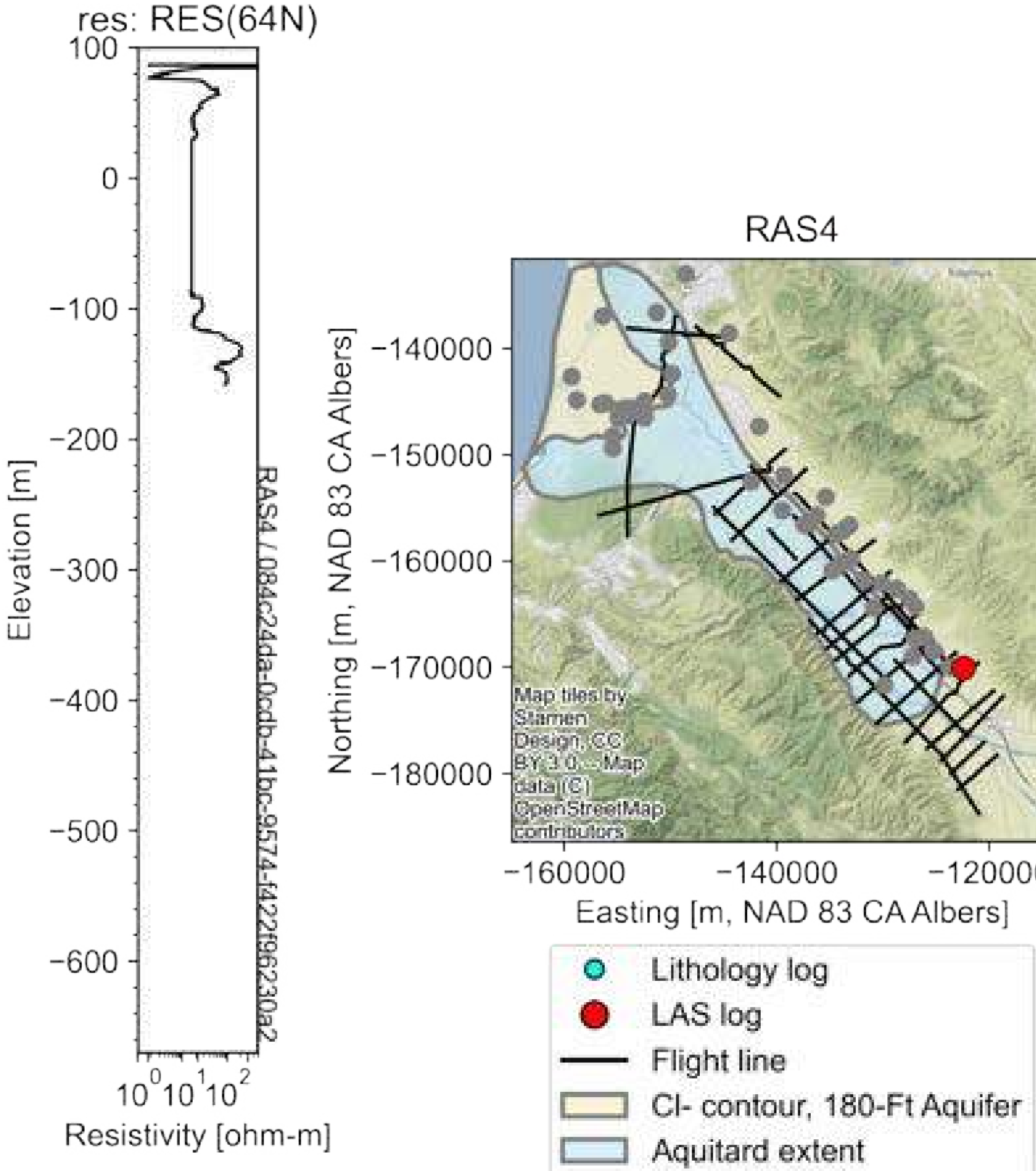
16S05E35N52
Northing [m, NAD 83 CA Albers]
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent



res: LN
Elevation [m]
Resistivity [ohm-m]
17S05E01M50 / 247083d6-ee04-46df-ab5a-373bdc5a5357
17S05E01M50
Northing [m, NAD 83 CA Albers]
Easting [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent


res: RES(64N)
100
0
−100
−200
−300
−400
−500
−600
Elevation [m]
RAS4 / 084c24da-0cdb-41bc-9574-f422f96230a2
10^0 10^1 10^2
Resistivity [ohm-m]
RAS4
−140000
−150000
−160000
−170000
−180000
Northing [m, NAD 83 CA Albers]
Map tiles by Stamen Design, CC BY 3.0 -- Map data (C) OpenStreetMap contributors
−160000
−140000
−120000
Easting [m, NAD 83 CA Albers]
Lithology log
LAS log
Flight line
Cl- contour, 180-Ft Aquifer
Aquitard extent

Appendix 2
SkyTEM Data Report

DATA REPORT

SkyTEM Survey: Salinas, California

Client: Ramboll US Consulting, Inc

Date: March 2023

AIRBORNE SURVEYS WORLDWIDE

SKYTEM Canada Inc
151 Yonge Street, 11th Floor
Toronto, Ontario M5C 2W7

TEL: +1 647 256-6716

WWW.SKYTEM.COM
INFO@SKYTEM.COM

Structure of the Digital Data Delivery catalogue

Folder	Sub folder	Sub folder	File format	Content
01_Data	01_GDB		.gdb (Geosoft database)	Data
	02_Workbench	01_XYZ 02_GEX 03_ALC	*.XYZ *.gex, *.SR2 *.ALC	EM and Auxiliary data files for Workbench processing
02_MapsGridsGIS	01_FlightPath 02_Grids 03_VD1_CSV		.shp .grd (Geosoft grids) .csv .Tiff (GeoTiff)	Flown and planned lines. PLNI and Magnetic data (TMI, RMF, 1st vertical derivative)
03_Report			.docx, .pdf	Data report

Contents

Abbreviations Table

µs:	microsecond
A/Amp:	Ampere
Base Station:	ground monitoring station used to correct or verify data.
dB/dt:	change in amplitude of magnetic field over the time it takes to make that change.
C:	degrees Celsius
DGPS:	Differential Global Positioning System
EM:	Electromagnetic
Gate Time:	A small amount of time over which the amplitude of the decaying magnetic field is measured and output as a data channel.
GDB:	Geosoft database
GMT:	Greenwich Mean Time
GNSS:	Global Navigation Satellite System
HA:	High Altitude, a flying height such that the return ground EM signal is greatly reduced or eliminated.
HM:	High Moment EM dB/dt data
Hz:	Hertz
IGRF:	International Geomagnetic Reference Field
l-km:	Line kilometre
LM:	Low moment EM dB/dt data
Km	Kilometres
Kph:	Kilometres per hour
masl:	metres above sea level
m:	metre
NIA:	Strength of generated EM field, i.e. dipole moment. Where *I* is the current in the transmitter, *A* is the area of the transmitter and *N* is the number of turns of wire
nT:	nano Tesla
PFC:	Primary Field Compensation
PLNI:	Power Line Noise Intensity
PPP:	Precise Point Positioning (GPS)
pV:	pico Volts
RX:	EM Receiver
TEM:	Time-domain (transient) Electromagnetic
TX:	EM Transmitter
UTC:	Coordinated Universal Time
UTM:	Universal Transverse Mercator coordinate system
V:	Volts
X data:	Measurement of the horizontal component of the secondary magnetic field
Z data:	Measurement of the vertical component of the secondary magnetic field
ρ:	Resistivity
Ω:	Ohm

Executive Summary

This report covers data acquisition, technical specifications, data processing and presentation of data results for the SkyTEM312HPM survey flown on March 1st to March 2nd, 2023 in the Salinas, California. The survey is comprised of 1 block with a total of 300.3 km planned flight lines.

All planned lines were covered during the survey, giving a total number of flown km for the entire work order as 300.3 km.

The SkyTEM312HPM collects time domain electromagnetic and magnetic data along with supporting navigation measurements.

All material is delivered digitally. The final product includes:

- Data report
- Data files (GDB and XYZ)
- Workbench input files
- Processed data in a Geosoft database
- Grids in Geosoft format

An overview of the digital data delivery can be seen on the inside of the front cover of this report.

Introduction

The SkyTEM electromagnetic (EM) and magnetic survey described in this report was requested by Ramboll US Consulting, Inc and performed by SkyTEM Canada Inc using the SkyTEM312HPM system. Basic survey information and key personnel are listed in Table 1.

The report covers survey specifications, data acquisition, instrument specifications, data processing and various images of the system. The data delivery includes raw and processed electromagnetic data, magnetic data, positional data, and input files for Workbench software. The digital data delivery folder is described on the inside of the front cover of this report.

This report does not include any geological interpretations of the geophysical dataset.

Ramboll US Consulting, Inc (Client) Client Contact person	 Mr Ian Gottschalk Email: IGOTTSCHALK@ramboll.com
SkyTEM Canada Inc. (Contractor) Contact person Project Manager Field Crew	 Ms Mandy Long Email: mlo@skytem.com Steve Startor Email: ssa@skytem.com Mr Poul Mousten Sørensen Mr Dominic Leblanc Mr Louis-Philippe Chénard
Helicopter operator Helicopter type Pilot	Sinton Helicopter Eurocopter Astar 350 B3 Mr Haydn Gaw Mr Scot Sinton
Data acquisition period	March 1st to March 2nd, 2023
Data processing and report	Mr Rasmus Teilmann

Table 1 Key personnel and survey information.

Survey outline

The survey areas are positioned near Salinas, California, USA. The planned survey lines have an irregular layout of varying line spacing and direction. Flight line details for the survey are listed in Table 2 and Table 3. The survey was flown from March 1st to March 2nd, 2023.

The coordinate system NAD83 / California Albers (EPSG 3310) was used throughout this report, and in the data delivery.

Area name	Line spacing (m)	Line direction (deg)	Tie line spacing (m)	Flight lines (km)	Tie lines (km)	Total line kilometers (km)
Salinas	Varying	Varying	Varying	**300.3 km**	0	**300.3 km**
Flown in total						**300.3 km**

Table 2 Survey line details.

The survey area is comprised by 1 block with lines of different spacings and directions as shown in Figure 1.

The actual surveyed lines are shown in as red lines in Figure 2

Line Numbering

The line numbering system uses the following six-digit convention:

- The first 6 digits represent the unique line number.
- Test lines begin with a 92 for reference lines and 93 for high altitude bias lines.

Area	Line numbering	Tie line numbering
Salinas SW-NE	100101 – 101801	N/A
Salinas NW-SE	200101 – 200901	N/A
Ref lines	920001 – 920003	N/A
High Altitude line	930002	N/A

Table 3 Line numbering.

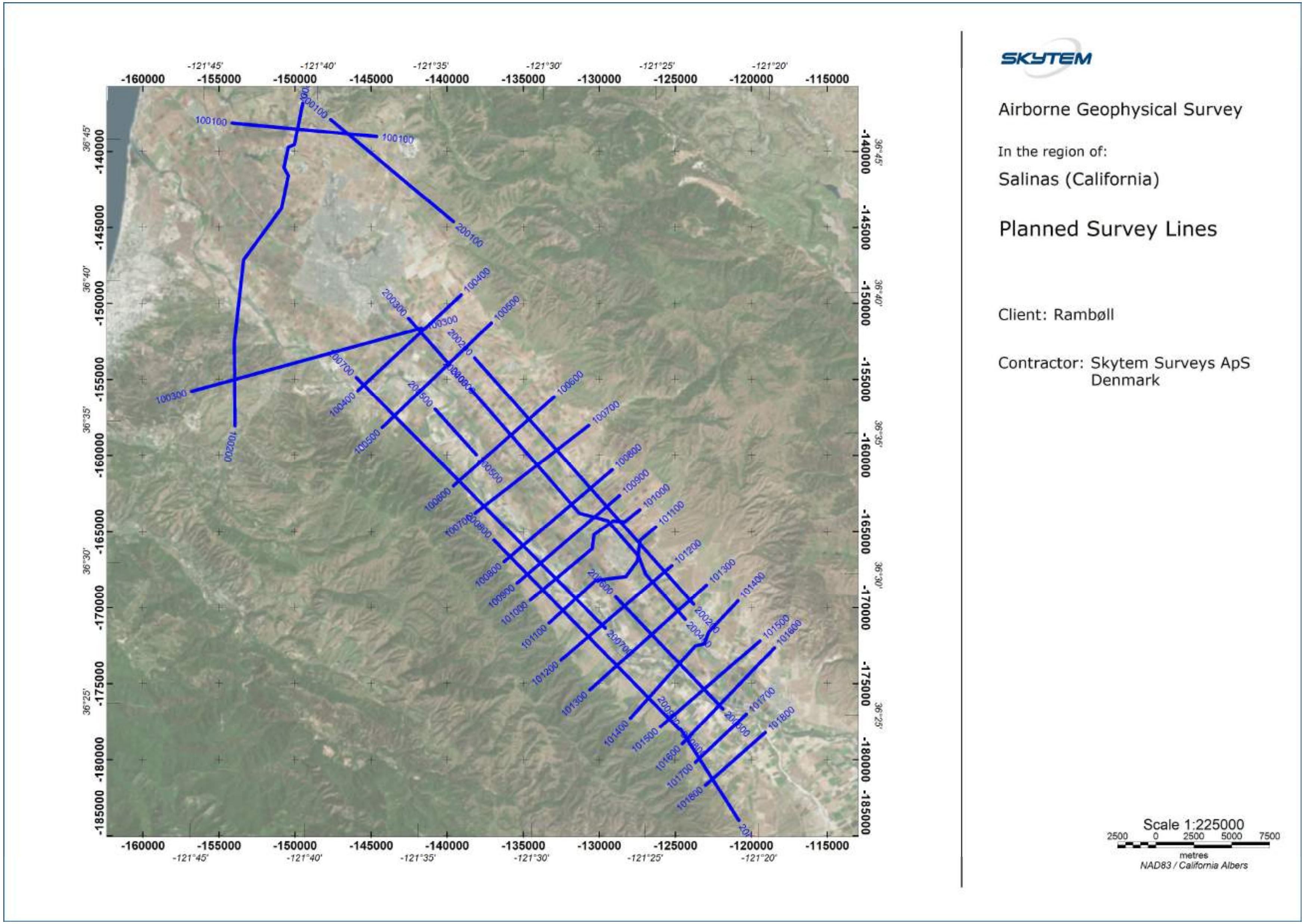


Figure 1. Planned lines (Blue).

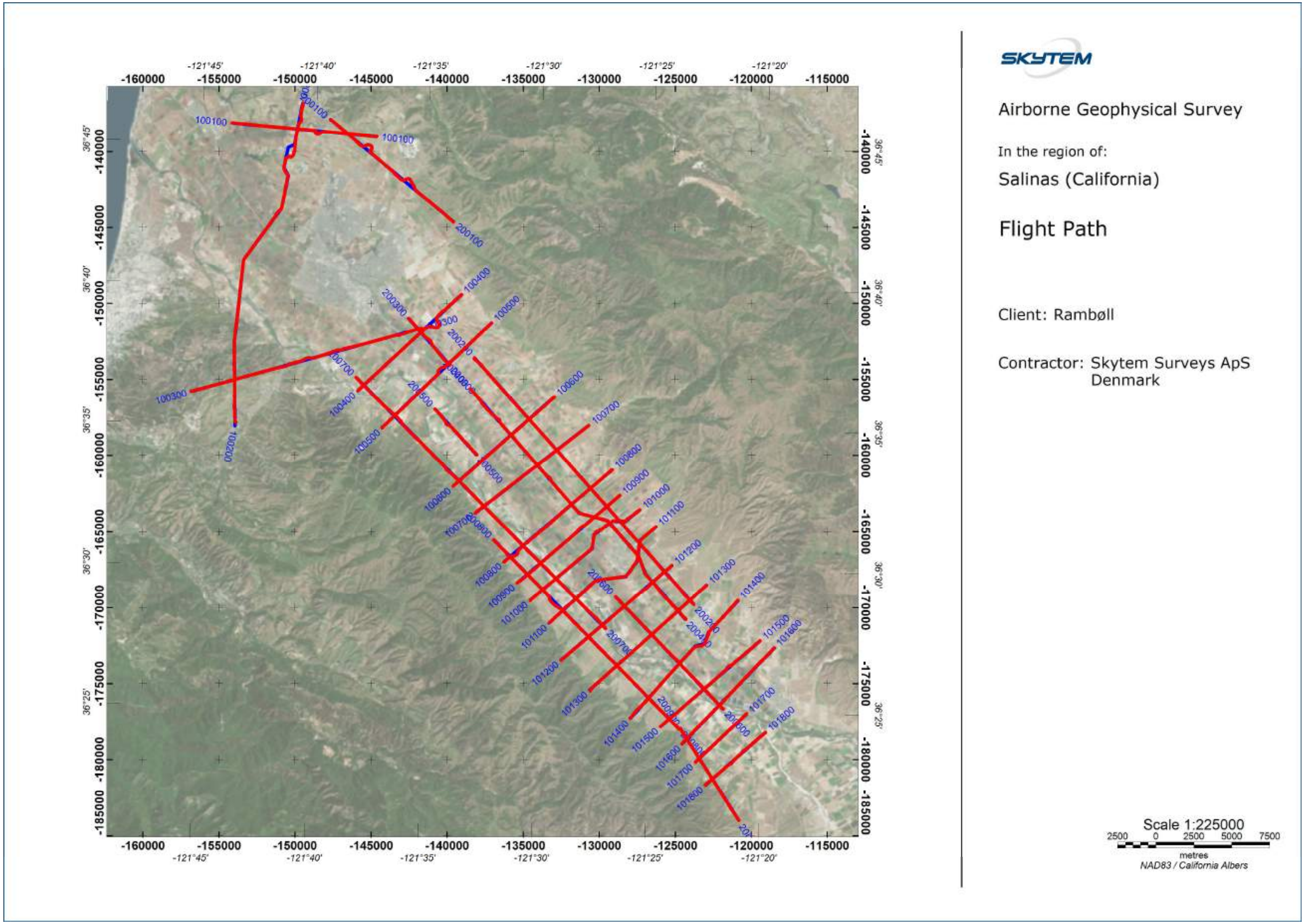


Figure 2. Flown lines (Red) on top of planned lines (Blue)

Flight Parameters

The nominal terrain clearance is 30 - 40 m, with a potential increase due to steep terrain, forests, power lines and any other obstacles or hazards on the ground. The safe flying height during the survey is always based on the pilot's assessment of risk and deviations from nominal values are at the discretion of the pilot.

The nominal production airspeed is 60 - 80 kph for a flat topography with no wind. This may vary in areas of rugged terrain and/or windy conditions.

Average values and standard deviations of survey flight parameters are found in Table 4.

Control parameter		Average Value	Standard Deviation
Ground speed*)		67.7 kph	14.7 kph
Processed height		38.1 m	13.5 m
Tilt angle	X	0.8 degrees	2.4 degrees
	Y	-0.3 degrees	1.1 degrees
Low Moment Current		6.0 A	0.03 A
High Moment Current		223.5 A	6.2 A

**) Actual speed varies as a function of day and flight direction due to different wind directions and magnitude.*

Table 4 Flight parameters for Salinas.

Flight Reports

For each flight, a report with key information regarding the data acquisition is made in the field. Listed in the reports are details on the weather, special data parameters and other events which may influence data. Details of the reports are shown in Table 5 and Table 6.

Flight	Temperature (C)	Wind (m/s)	Visibility
20230221.01	-	-	-
20230222.01	-	-	-
20230222.02	8	5W	Excellent
20230225.01	8	5W	Excellent
20230227.01	-	-	-
20230301.01	5	2S	Excellent
20230302.01	5	2NW	Excellent
20230302.02	3	1E	Excellent

Table 5 Weather report.

Flight	Comments
20230221.01	400 m - Calibration flight
20230222.01	1000 m - Calibration flight
20230222.02	400 m - Calibration flight
20230225.01	Ferry to Salinas
20230227.01	1000 m and ref line
20230301.01	Production
20230302.01	Production
20230302.02	Production

Table 6 Flight report.

High Altitude Flights

High altitude tests were flown at approximately 1000 m above terrain or high enough to negate the ground signal prior to production.

Reference Lines

In conjunction with every production flight a reference line was flown of a minimum 1 km length. This was established to ensure repeatability of the SkyTEM system during the survey period.

Instruments

This section provides an overview of airborne as well as ground base instruments.

Airborne unit

The airborne instrumentation comprising a SkyTEM312HPM system includes a time domain electromagnetic system, a magnetic data acquisition system and an auxiliary data acquisition system containing two inclinometers, two altimeters and two DGPS'. All instruments are mounted on the frame which is suspended ~40 m below the helicopter. The generator used to power the transmitter is suspended between the frame and the helicopter approximately 20 m below the helicopter. A picture of the airborne SkyTEM312HPM unit is seen in Figure 3, and a sketch of the instrumentation is seen in Figure 4.

Figure 3 SkyTEM312HPM Airborne unit.

Instrument positions

The instrumentation involves a time domain electromagnetic system, two inclinometers, two altimeters and two DGPS'.

The measurements were carried out, using a setup as described below.

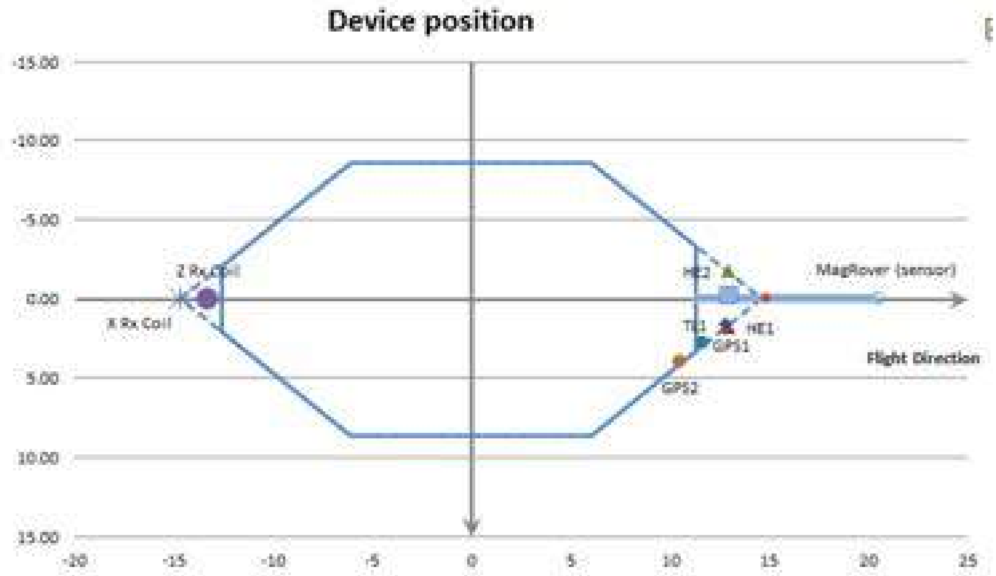


Figure 4 Sketch showing the frame and the position of the basic instruments. The blue line defines the transmitter loop. The horizontal plane is defined by (x, y).

The location of instruments in respect to the frame shown in Figure 4 is given in (x, y, z) coordinates in Table 7 below.

X and y define the horizontal plane. Z is perpendicular to (x, y). X is positive in the flight direction, y is positive to the right of the flight direction, and z is positive downwards.

The generator used for powering of the transmitter is ~20 m below the helicopter.

Device	X	Y	Z
DGPS1 (EM)	11.68	2.79	-0.16
DGPS2 (EM)	10.51	3.95	-0.16
HE1 (altim.)	12.94	1.79	-0.12
HE2 (altim.)	12.94	-1.79	-0.12
Inclinometer 1	12.79	1.64	-0.12
Inclinometer 2	12.79	1.64	-0.12
RX (Z Coil)	-13.65	0.00	-2.00
RX (X Coil)	-14.65	0.00	0.00
Mag sensor	20.50	0.00	-0.56

Table 7 Position of instrumentation on the system frame.

Magnetometer airborne unit

Instrument type: Geometrics G822A sensor and Kroum KMAG4 counter.

The Geometrics G822A sensor and Kroum KMAG4 counter is a high sensitivity Cesium magnetometer. The basic of the sensor is a self-oscillating split-beam Cesium vapor (non-radioactive) Principe, which operates on principles similar to other alkali vapor magnetometers.

The sensitivity of the Geometrics G822A sensor and Kroum KMAG4 counter is stated as <0.0005 nT/√Hz rms. Typically 0.002 nT P-P at a 0.1 second sample rate, combined with absolute accuracy of 3 nT over its full operating range.

The magnetometer is synchronized with the TEM system. When the TEM signal is on, the counter is closed. In the TEM off-time the magnetometer data is measured from 100 microseconds until the next TEM pulse is transmitted. The data are averaged and sampled as 30 Hz.

Parameter	**Value**
Sample frequency	30 Hz (in between each HM EM pulse)
Magnetometer on	HM Cycles
Magnetometer off	LM Cycles

Table 8 Airborne Magnetometer sampling

Inclination

Instrument type: Bjerre Technology

The inclination of the frame is measured with 2 independent inclinometers. The x and y angles are measured 2 times per second in both directions. The inclinometers are placed on the frame as close to the z coil as possible, see Figure 4.

The angle data are stored as x, y readings. X is parallel to the flight direction and positive when the front of the frame is above horizontal. Y is perpendicular to the flight direction and negative when the right side of the frame is above horizontal.

The angle is checked and calibrated manually within 1.0 degree by use of a level meter.

Altimeter

Instrument type: MDL ILM300R

Two independent laser units mounted on the frame measuring the distance from the frame to the ground, see Figure 4.

Each laser delivers 30 measurements per second and covers the interval from 0.2 m to approximately 200 m.

Dark surfaces including water surfaces will reduce the reflected signal. Consequently, it may occur that some measurements do not result in useful values.

The altimeter measurements are given in meters with two decimals. The uncertainty is 10 - 30 cm. The lasers are checked on a regular basis against well-defined targets.

Laser parameters	
Sample rate	30 Hz
Uncertainty	10 - 30 cm
Min/ max range	0.2 m / 200 m

Table 9 Laser Altimeter Sample Rate

Ground base stations

The DGPS and magnetic base stations were positioned within the survey area.

DGPS base station

DGPS base stations were placed at locations of maximum possible view to satellites and away from metallic objects that could influence the GPS antenna. The DGPS base stations were used as a back-up to the Precise Point Positioning (PPP) utilized on this project.
In the final PPP processing all data was processed without the use of GPS base stations.

Magnetometer base station

Instrument type: GEM Proton.

The GEM Proton is a portable high-sensitivity precession magnetometer.

The GEM Proton is a secondary standard for measurement of the Earth's magnetic field with 0.01 nT resolutions, and 1 nT absolute accuracy over its full temperature range. The base station data are sampled with 1 Hz frequency.

The base station magnetometer was placed in a location of low magnetic gradient.

Table 10 below shows the locations of the magnetic base station:

Magnetometer Base station	Period	Longitude	Latitude	Elevation
Salinas	20230301 – 20230302	-121.603432°	36.664833°	25 m

Table 10 Location of the magnetic base station.

Transmitter

The time domain transmitter loop can be described as an octagon with the corners listed below:

X	Y
-12.64	-2.10
-6.14	-8.58
6.14	-8.58
11.41	-3.31
11.41	3.31
6.14	8.58
-6.14	8.58
-12.64	2.10

Table 11 Transmitter loop corner points

The total area of the transmitter coil defined by the corner points is 342 m² and 68.3 m in circumference.

The key parameters defining the transmitter set up listed in Table 12 and Table 13.

Parameter	Value
Number of transmitter turns	2
Transmitter area	342 m²
Peak current	6 amp
Peak moment	~4,000 NIA
Repetition frequency	15 Hz
On-time	1000 μs
Off-time	492 μs
Duty cycle	67 %
Wave form	Sinusoidal

Table 12 Low Moment

Parameter	Value
Number of transmitter turns	12
Transmitter area	342 m²
Peak current	225 Amp
Peak moment	~930,000 NIA
Repetition frequency	15 Hz
On-time	8000 μs
Off-time	25333.4 μs
Duty cycle	24 %
Wave form	Square

Table 13 High Moment

Receiver system

The decay of the secondary magnetic field is measured using two independent active induction coils. The Z coil is the vertical component, and the X coil is the horizontal in-line component. Each coil has an effective receiver area of 100 m² (Z), 40 m² (x).

The receiver coils are placed in a null-position:

Z coil (x, y, z) = (-13.65 m, 0.0 m, -2.0 m)
X coil (x, y, z) = (-14.65 m, 0.0 m, 0.0 m)

In the null-position, the primary field is damped with a factor of 0.01 on HM and due to PFC correction it can be neglected on LM.

Figure 5 Rudder containing the Z coil located in the top part of the tower.

The key parameters defining the receiver set up listed in Table 14.

Receiver parameters		
Sample rate		All decays are measured
Number of output gates		40 (HM) and 22 (LM)
Receiver coil low pass filter		48.7 kHz (Z-coil) and 46.1 kHz (X-coil)
Receiver instrument low pass filter		1 MHz
Repetition frequency	LM HM	15 Hz 15 Hz
Front gate	LM HM	0.0 µs 40 µs

Table 14 Receiver set-up

A complete list describing gate open, close and centre times are listed in Table 19 and Table 20.

Waveform

The waveforms for LM and HM are measured using a Rogowski coil on the SkyTEM312HPM system. An approximation to the measured waveform is applied in modelling of the EM data.

SkyTEM312HPM:

Figure 6 and Figure 7 show the approximated up- and down ramp of the waveform.
Details are presented in Table 15 and Table 16.
Waveform tables are found in Table 17 and Table 18.

Parameter	Value
Base frequency (Multi moment)	15 Hz
Current range	6 amp

Table 15: Waveform parameters for LM

Parameter	Value
Base frequency (Multi moment)	15 Hz
Current range	225 Amp

Table 16: Waveform parameters for HM

The calibration parameters for the system are defined as:

SkyTEM312HPM:

Low Moment
Shift factor: 1.0 (on the raw dB/dt data)
Time shift: 0.0 s

High Moment
Shift factor: 1.0 (on the raw dB/dt data)
Time shift: 0.0 s

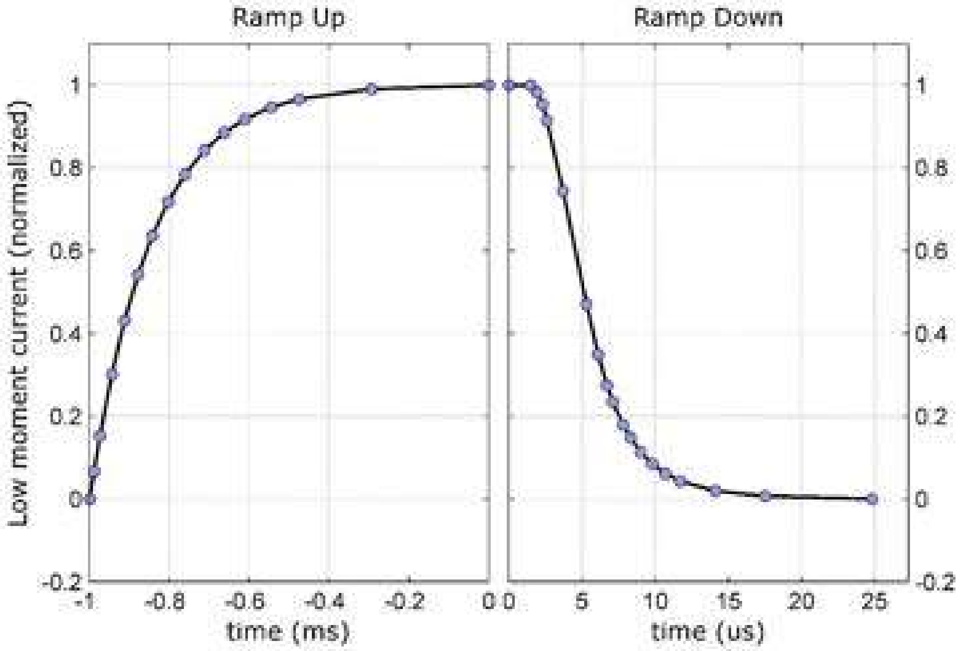


Figure 6. Ramp up and down for the LM waveform. The current is normalised.

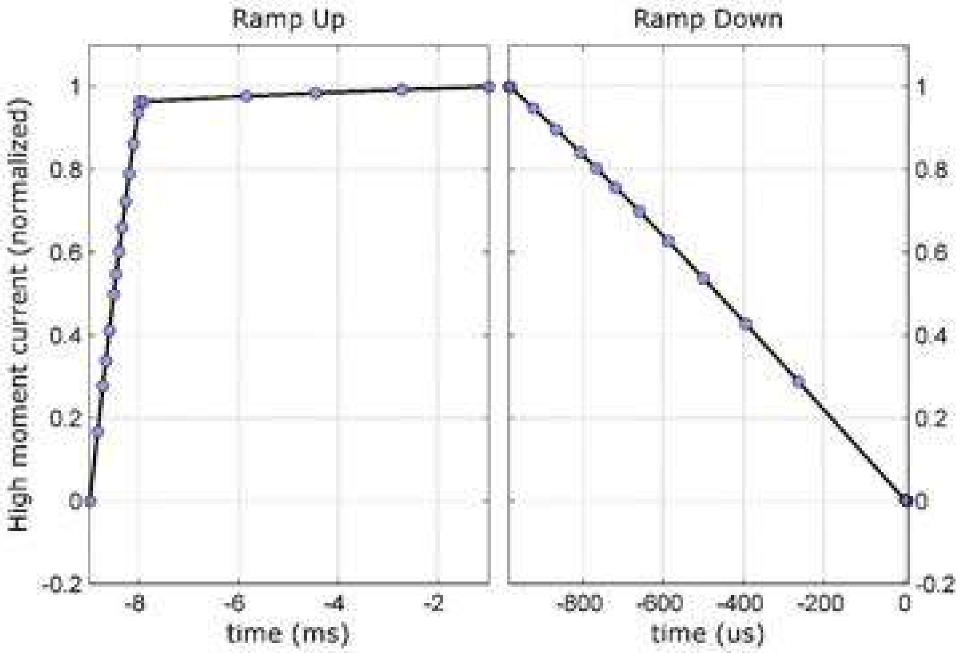


Figure 7. Ramp up and down for the HM waveform. The current is normalised.

Time [s]	Normalized current
-2.49000E-03	-0.00000E+00
-2.47920E-03	-3.32455E-02
-2.46440E-03	-7.63144E-02
-2.43460E-03	-1.50826E-01
-2.40290E-03	-2.15445E-01
-2.36910E-03	-2.71083E-01
-2.33360E-03	-3.17786E-01
-2.29360E-03	-3.59044E-01
-2.25160E-03	-3.92373E-01
-2.20280E-03	-4.21375E-01
-2.15330E-03	-4.42825E-01
-2.10090E-03	-4.59284E-01
-2.03610E-03	-4.73275E-01
-1.96590E-03	-4.83203E-01
-1.78510E-03	-4.95245E-01
-1.49200E-03	-5.00000E-01
-1.49050E-03	-4.99524E-01
-1.49010E-03	-4.91506E-01
-1.48970E-03	-4.76825E-01
-1.48940E-03	-4.57179E-01
-1.48830E-03	-3.72235E-01
-1.48670E-03	-2.35769E-01
-1.48590E-03	-1.74637E-01
-1.48530E-03	-1.37536E-01
-1.48490E-03	-1.17515E-01
-1.48420E-03	-8.94979E-02
-1.48370E-03	-7.41392E-02
-1.48300E-03	-5.68731E-02
-1.48220E-03	-4.24776E-02
-1.48130E-03	-3.07410E-02
-1.48030E-03	-2.16804E-02
-1.47790E-03	-9.82808E-03
-1.47450E-03	-3.52297E-03
-1.46720E-03	0.00000E+00
-9.98000E-04	0.00000E+00
-9.87200E-04	6.64910E-02
-9.72400E-04	1.52629E-01
-9.42600E-04	3.01653E-01
-9.10900E-04	4.30890E-01
-8.77100E-04	5.42165E-01
-8.41600E-04	6.35573E-01
-8.01600E-04	7.18088E-01
-7.59600E-04	7.84745E-01
-7.10800E-04	8.42750E-01
-6.61300E-04	8.85651E-01
-6.08900E-04	9.18568E-01
-5.44100E-04	9.46550E-01
-4.73900E-04	9.66407E-01
-2.93100E-04	9.90489E-01
0.00000E+00	1.00000E+00
1.50000E-06	9.99049E-01
1.90000E-06	9.83012E-01
2.30000E-06	9.53651E-01
2.60000E-06	9.14359E-01
3.70000E-06	7.44470E-01
5.30000E-06	4.71538E-01
6.10000E-06	3.49274E-01
6.70000E-06	2.75073E-01
7.10000E-06	2.35029E-01
7.80000E-06	1.78996E-01
8.30000E-06	1.48278E-01
9.00000E-06	1.13746E-01
9.80000E-06	8.49552E-02
1.07000E-05	6.14820E-02
1.17000E-05	4.33608E-02
1.41000E-05	1.96562E-02
1.75000E-05	7.04595E-03
2.48000E-05	0.00000E+00

Table 17: Normalized current waveform for LM

Time [s]	Normalized current
-4.23146E-02	-0.00000E+00
-4.21594E-02	-1.67413E-01
-4.20542E-02	-2.77595E-01
-4.19954E-02	-3.38342E-01
-4.19238E-02	-4.11322E-01
-4.18364E-02	-4.98688E-01
-4.17858E-02	-5.48290E-01
-4.17298E-02	-6.02257E-01
-4.16682E-02	-6.60403E-01
-4.16000E-02	-7.23165E-01
-4.15246E-02	-7.90421E-01
-4.14416E-02	-8.61658E-01
-4.13496E-02	-9.36920E-01
-4.13146E-02	-9.64139E-01
-4.12340E-02	-9.64146E-01
-3.91702E-02	-9.77312E-01
-3.77850E-02	-9.84994E-01
-3.60574E-02	-9.93202E-01
-3.43184E-02	-1.00000E+00
-3.43154E-02	-9.99783E-01
-3.42570E-02	-9.47956E-01
-3.42004E-02	-8.96622E-01
-3.41406E-02	-8.40997E-01
-3.41008E-02	-8.03225E-01
-3.40526E-02	-7.56728E-01
-3.39938E-02	-6.98961E-01
-3.39222E-02	-6.27208E-01
-3.38348E-02	-5.37775E-01
-3.37282E-02	-4.26420E-01
-3.35984E-02	-2.88324E-01
-3.33334E-02	-2.66916E-03
-3.33304E-02	-8.31366E-04
-3.33254E-02	-0.00000E+00
-8.98120E-03	0.00000E+00
-8.82600E-03	1.67413E-01
-8.72080E-03	2.77595E-01
-8.66200E-03	3.38342E-01
-8.59040E-03	4.11322E-01
-8.50300E-03	4.98688E-01
-8.45240E-03	5.48290E-01
-8.39640E-03	6.02257E-01
-8.33480E-03	6.60403E-01
-8.26660E-03	7.23165E-01
-8.19120E-03	7.90421E-01
-8.10820E-03	8.61658E-01
-8.01620E-03	9.36920E-01
-7.98120E-03	9.64139E-01
-7.90060E-03	9.64146E-01
-5.83680E-03	9.77312E-01
-4.45160E-03	9.84994E-01
-2.72400E-03	9.93202E-01
-9.85000E-04	1.00000E+00
-9.82000E-04	9.99783E-01
-9.23600E-04	9.47956E-01
-8.67000E-04	8.96622E-01
-8.07200E-04	8.40997E-01
-7.67400E-04	8.03225E-01
-7.19200E-04	7.56728E-01
-6.60400E-04	6.98961E-01
-5.88800E-04	6.27208E-01
-5.01400E-04	5.37775E-01
-3.94800E-04	4.26420E-01
-2.65000E-04	2.88324E-01
0.00000E+00	2.66916E-03
3.00000E-06	8.31366E-04
8.00000E-06	0.00000E+00

Table 18: Normalized current waveform for HM

Data Acquisition

The SkyTEM312HPM system setup uses dual moment configuration containing a Low Moment (LM) with a peak moment of ~4,000 NIA and a High Moment (HM) with a peak moment of ~930,000 NIA.

A dual moment system provides a major advantage over single moment systems as it is possible to measure a wider range of time gates. In LM mode earlier time gates can be measured allowing for a more accurate near surface resolution while in the HM mode, measuring at later times, a deeper penetration into the ground can be achieved.

Data from two GPS receivers are recorded by the EM data acquisition system while a third GPS is recorded by the magnetic data acquisition system. The DGPS system is used for time stamping, positioning, and correlation of the EM and magnetic datasets. All recorded data are marked with a time stamp which is used to link the different data types. The GPS receivers on the frame are activated for Precise Point Positioning (PPP) processing, which allows for a precise processing of the GPS position without the need of a base station.

The time stamp is in UTC/GMT and the formats are either,

- Date and Time defined as; yyyy/mm/dd hh:mm:ss.sss
  or
- Datetime values defined as decimal days since 1900-01-01 and seconds of the day; ddddd.ssssssss

Gate times

The gate times for the SkyTEM312HPM system are found in the following tables.

Gate times for the Low moment gates are presented in Table 19. Gate 1 – 10 of the LM gates were corrected for the primary field allowing the use of earlier gates than otherwise possible and are represented by boxcar gates. Gate 11 to 22 are provided as tapered gate values, where the gate tapering results in improved suppression of high frequency noise in the data. The times refer to beginning of ramp down. The 2 latest LM gates are not as wide as the previous gates and can as a result appear noisier. They can be omitted in the workbench processing.

The High moment data are provided as tapered gate values, where the gate tapering results in improved suppression of high frequency noise in the data. The equivalent gate times of the tapered gates are presented in Table 9 for the SkyTEM312HPM. The times refer to the end of ramp.

The tapered gates constitute smooth weighing functions which are applied to the recorded dB/dt signals with overlap between neighbouring gates. The weighing functions used are B-splines of order 3, which means that they are piecewise polynomial functions of order 2. The B-spline has been chosen specifically for the purpose of weighing function due to its property of:

- being maximally smooth while being compact (resulting in superior low pass filtering qualities),
- in combination the set of gates ensure equal weighing of the entire sounding curve,
- being uniquely defined simply by the chosen set of gate transition times (also called knot points),
- associated expressions exist for its function moments and frequency transform

The tapered gates are generated with gate transition times/knot points located at the gate transitions of the box gates. This means that every tapered gate contains signal contributions from three neighbouring box gate intervals.

The B field channels represent the actual B field level at the given channel time. Channel times for system SkyTEM312HPM can be found in Table 21.

The earliest gates for HM are not used as these are in the transition zone and affected by the primary field of the transmitter.
The earliest gates for LM can be used carefully when linked with the system response (SR2)

Gate #	Gate Center (s)	Gate Open (s)	Gate Close (s)	Comment
1	1.50000E-06	0.00000E+00	3.00000E-06	LM (PFC - Box)
2	4.50000E-06	3.00000E-06	6.00000E-06	LM (PFC - Box)
3	7.70000E-06	6.00000E-06	9.40000E-06	LM (PFC - Box)
4	1.13000E-05	9.40000E-06	1.32000E-05	LM (PFC - Box)
5	1.53000E-05	1.32000E-05	1.74000E-05	LM (PFC - Box)
6	1.99000E-05	1.74000E-05	2.24000E-05	LM (PFC - Box)
7	2.53000E-05	2.24000E-05	2.82000E-05	LM (PFC - Box)
8	3.17000E-05	2.82000E-05	3.52000E-05	LM (PFC - Box)
9	3.94000E-05	3.52000E-05	4.36000E-05	LM (PFC - Box)
10	4.87000E-05	4.36000E-05	5.38000E-05	LM (PFC - Box)
11	6.11000E-05	5.48667E-05	6.73333E-05	LM
12	7.49500E-05	6.74167E-05	8.24833E-05	LM
13	9.17500E-05	8.25833E-05	1.00917E-04	LM
14	1.12250E-04	1.01083E-04	1.23417E-04	LM
15	1.37200E-04	1.23567E-04	1.50833E-04	LM
16	1.67600E-04	1.51000E-04	1.84200E-04	LM
17	2.04700E-04	1.84467E-04	2.24933E-04	LM
18	2.49900E-04	2.25233E-04	2.74567E-04	LM
19	3.05000E-04	2.74900E-04	3.35100E-04	LM
20	3.72250E-04	3.35550E-04	4.08950E-04	LM
21	4.27650E-04	4.00617E-04	4.54683E-04	LM (reduced width)
22	4.68450E-04	4.53317E-04	4.83583E-04	LM (reduced width)

Table 19. SkyTEM312HPM. LM merged gate times with respect to the beginning of ramp down.

Gate #	Gate Center (s)	Gate Open (s)	Gate Close (s)	Comment
1	1.50000E-06	0.00000E-00	3.00000E-06	Not used
2	4.60000E-06	3.03333E-06	6.16667E-06	Not used
3	7.90000E-06	6.20000E-06	9.60000E-06	Not used
4	1.15000E-05	9.60000E-06	1.34000E-05	Not used
5	1.56000E-05	1.34333E-05	1.77667E-05	Not used
6	2.03000E-05	1.78000E-05	2.28000E-05	Not used
7	2.58000E-05	2.28333E-05	2.87667E-05	Not used
8	3.23500E-05	2.88167E-05	3.58833E-05	Not used
9	4.02000E-05	3.59333E-05	4.44667E-05	Not used
10	4.96500E-05	4.45167E-05	5.47833E-05	Not used
11	6.11000E-05	5.48667E-05	6.73333E-05	Not used
12	7.49500E-05	6.74167E-05	8.24833E-05	HM
13	9.17500E-05	8.25833E-05	1.00917E-04	HM
14	1.12250E-04	1.01083E-04	1.23417E-04	HM
15	1.37200E-04	1.23567E-04	1.50833E-04	HM
16	1.67600E-04	1.51000E-04	1.84200E-04	HM
17	2.04700E-04	1.84467E-04	2.24933E-04	HM
18	2.49900E-04	2.25233E-04	2.74567E-04	HM
19	3.05000E-04	2.74900E-04	3.35100E-04	HM
20	3.72250E-04	3.35550E-04	4.08950E-04	HM
21	4.54300E-04	4.09500E-04	4.99100E-04	HM
22	5.54400E-04	4.99733E-04	6.09067E-04	HM
23	6.76550E-04	6.09850E-04	7.43250E-04	HM
24	8.25600E-04	7.44233E-04	9.06967E-04	HM
25	1.00745E-03	9.08150E-04	1.10675E-03	HM
26	1.22935E-03	1.10818E-03	1.35052E-03	HM
27	1.50010E-03	1.35227E-03	1.64793E-03	HM
28	1.83045E-03	1.65008E-03	2.01082E-03	HM
29	2.23355E-03	2.01345E-03	2.45365E-03	HM
30	2.72540E-03	2.45683E-03	2.99397E-03	HM
31	3.32555E-03	2.99785E-03	3.65325E-03	HM
32	4.05785E-03	3.65802E-03	4.45768E-03	HM
33	4.95140E-03	4.46350E-03	5.43930E-03	HM
34	6.04170E-03	5.44637E-03	6.63703E-03	HM
35	7.37210E-03	6.64567E-03	8.09853E-03	HM
36	8.99550E-03	8.10910E-03	9.88190E-03	HM
37	1.09764E-02	9.89475E-03	1.20580E-02	HM
38	1.33934E-02	1.20736E-02	1.47131E-02	HM
39	1.63105E-02	1.47216E-02	1.78994E-02	HM
40	1.86941E-02	1.75392E-02	1.98490E-02	HM (reduced width)

Table 20 SkyTEM312HPM: HM gate times referenced to the end of ramp down.

Channel number #	Channel time (s)	Comment
1	3.00000E-06	Not used
2	6.00000E-06	Not used
3	9.40000E-06	Not used
4	1.32000E-05	Not used
5	1.74000E-05	Not used
6	2.24000E-05	Not used
7	2.82000E-05	Not used
8	3.52000E-05	Not used
9	4.36000E-05	Not used
10	5.38000E-05	Not used
11	6.60000E-05	Not used
12	8.10000E-05	HM B-field
13	9.90000E-05	HM B-field
14	1.21000E-04	HM B-field
15	1.48000E-04	HM B-field
16	1.80800E-04	HM B-field
17	2.20600E-04	HM B-field
18	2.69400E-04	HM B-field
19	3.28800E-04	HM B-field
20	4.01200E-04	HM B-field
21	4.89600E-04	HM B-field
22	5.97600E-04	HM B-field
23	7.29200E-04	HM B-field
24	8.89800E-04	HM B-field
25	1.08580E-03	HM B-field
26	1.32500E-03	HM B-field
27	1.61680E-03	HM B-field
28	1.97280E-03	HM B-field
29	2.40720E-03	HM B-field
30	2.93740E-03	HM B-field
31	3.58420E-03	HM B-field
32	4.37340E-03	HM B-field
33	5.33640E-03	HM B-field
34	6.51160E-03	HM B-field
35	7.94540E-03	HM B-field
36	9.69500E-03	HM B-field
37	1.18300E-02	HM B-field
38	1.44350E-02	HM B-field
39	1.76134E-02	HM B-field
40	2.13634E-02	HM B-field

Table 21 SkyTEM312HPM HM B-field channel times are referenced to end of ramp down.

Digital Data

The complete dataset of the SkyTEM survey is delivered as a Geosoft database (GDB) which can be used as input for further processing, gridding and as input to inversion and interpretation software. The channels of the GDB and xyz are described in Table 22.

Channel description, Survey Data

Parameter	Explanation	Unit
Fid	Unique Fiducial number	seconds
Line	Line number	LLLLLL
Flight	Name of flight	yyyymmdd.ff
DateTime	DateTime format	Decimal days
Date	Date	Yyyy/mm/dd
Time	Time	HH:MM:SS.ss
AngleX	Angle in flight direction	Degrees
AngleY	Angle perpendicular to flight direction	Degrees
Height	Filtered transmitter terrain clearance	Meters
Height_Raw	Measured transmitter terrain clearance	Meters
Lon*	Latitude/Longitude, WGS84	Decimal degrees
Lat*	Latitude/Longitude, WGS84	Decimal degrees
E_NAD83*	NAD83 / California Albers	Meter
N_NAD83*	NAD83 / California Albers	Meter
DEM	Digital Elevation Model	Meters above sea level
Alt	DGPS Altitude	Meters above sea level
GdSpeed	Ground Speed	kph
LMcurrent	Current, low moment	Amps
HMcurrent	Current, high moment	Amps
LM_Z_dBdt[xx]**	Geosoft array channels normalized LM dB/dt Z-coil value. Voltage/(Tx moment*RX area), normalization incudes the number of transmitter turns	pV/(m4*A)
HM_Z_dBdt[xx]**	Geosoft array channels normalized HM dB/dt Z-coil value. Voltage/(Tx moment*RX area), normalization incudes the number of transmitter turns	pV/(m4*A)

Parameter	Explanation	Unit
HM_X_dBdt[xx]**	Geosoft array channels normalized dB/dt HM X-coil value. Voltage/(Tx moment*RX area), normalization incudes the number of transmitter turns	pV/(m4*A)
HM_Z_B[xx]**	Geosoft array channels normalized HM Z B-field value. Voltage/(Tx moment*RX area), normalization incudes the number of transmitter turns	fT/(m2*A)
HM_X_B[xx]**	Geosoft array channels normalized HM X B-field value. Voltage/(Tx moment*RX area), normalization incudes the number of transmitter turns	fT/(m2*A)
PLNI	Powerline Noise intensity (60Hz)	PLNI
Bmag_Raw	Total Magnetic Intensity (1 Hz) Magnetic base station data	nT
Diurnal	Diurnal variation Magnetic base station data	nT
Mag_Raw	Total Magnetic Intensity Raw magnetic data	nT
Mag_Cor	Magnetic Intensity Filtered and diurnal corrected	nT
RMF	Residual magnetic Field Final Level and IGRF corrected data	nT
TMI	Total Magnetic Intensity IGRF recalculated	nT
RMF_1VD_calc	Calculated 1st Vertical derivative of the RMF Channel	nT/m
RelUnc_LM_Z_dBdt_Merge[**]	Relative uncertainty of LM_Z	-
RelUnc_HM_Z_dBdt_Spline[**]	Relative uncertainty of HM_Z	-
RelUnc_HM_Z_dBdt_Spline[**]	Relative uncertainty of HM_X	-

Table 22 Channel description, survey data

**) Data positions refer to the center of the frame.*

***) The first valid gates are:* 2 (LM Z), 11 (HM Z), 11 (HM X).

Workbench Input File Description

ASCII XYZ

The GDB data is stored in 10 HZ and has been exported into XYZ files.

- One XYZ file maintain the 10 Hz sample rate.
- A decimated XYZ file in 1 Hz has been exported as well. It is suggested to import the 1 Hz XYZ file to Workbench for inverting the data.

Geometry file (GEX)

The geometry file (GEX) contains information on the configuration of the SkyTEM system. This information is used during data processing and inversion in the Aarhus Workbench package. Two geometry files have been provided, one for use with the system response file, description below, and one for use without the system response file.

System Response file (GEX + SR2)

The System Response file (SR2) contains information regarding the system response of the SkyTEM system and is derived from the high-altitude data. This information is used during data processing and inversion and allows for the use of very early time gate information during the inversion process. Should be used cautiously by advanced users.

ALC file

An ALC file contains header information of the XYZ file. It is used to import XYZ files into Workbench.

Data processing

This section covers processing of auxiliary, magnetic and EM data that were applied to the data to create the Geosoft databases.

In the processing procedure all devices (DGPS, Laser altimeters, inclinometers) are moved to the centre of the frame and corrected for the tilt of the frame hence all data positions refer to the center of the frame. Data is split at the beginning and end of each planned flight line, to create individual lines of data.

After initial filtering, all data are resampled to 10Hz.

Gridding method and parameters

Grids generated with using the parameters in Table 23.

Area	Gridding algorithm	Gridding filter	Cell size	Blanking distance
Salinas	Minimum curvature	-	333 m	2000 m

Table 23 Geosoft gridding details.

Auxiliary data

Tilt processing

The X and Y angle processing involves manual and automated routines using a combination of the SkyTEM in-house software SkyLab and Geosoft.

The processing involves the following steps:

1. 3 sec box filter (SkyLab)
2. Low pass filtering of 3.0 sec. (Geosoft)

Height processing

The height processing involves automated routines using a combination of the SkyTEM in-house software (HEfiltering and SkyLab) and Geosoft.

The processing involves the following steps:

1. Iterative weighted splines to remove low values to correct for the canopy effect (treetop filter) (HEfilter)
2. Final spline of remaining data (HEfilter)
3. Tilt correction (SkyLab)
4. Averaging of the two laser values (SkyLab)
5. Additional filters:
    a. Low pass filter of 3.0 sec (Geosoft)

DGPS processing

The DGPS has been PPP processed (Precise Point Positioning) using the Waypoint GrafNav Differential GPS processing tool. PPP processing involves utilizing corrections derived from GNSS satellite clock and orbit corrections. These corrections are provided by a 3rd party, NovAtel, and are employed in correcting the raw airborne GPS data to improve the accuracy of the positional data. The PPP solution should provide a better solution when the distance between the airborne GPS antennae and the base station GPS location becomes quite long.

The standard airborne settings have been used.

- Import of airborne files (Rover)
- Download precise ephemeris and almanac
- Precise Point Positioning processing
- Export solution as .txt file
- Convert .txt file to .sps

The DGPS.txt files are used as input to the SkyLab software assuring DGPS corrected data in the processed files.

The ground speed, altitude, latitude and longitude from the processed DGPS' are imported into Geosoft and merged into the final database, where the coordinates are converted into NAD83 / California Albers and a low pass filter of 3.0 sec is applied.

Digital elevation model

A digital elevation model (DEM) has been calculated by subtracting the filtered laser altimeter data from the DGPS elevation. The vertical datum has been calculated to the EGM96 Datum. All steps related to the DEM are carried out Geosoft.
The processing of the final DEM involves the following steps:

- Filtering and processing of the laser altimeter height as described above
- DEM data received by subtraction of final filtered laser data from final processed DGPS altitude data

Figure 8 shows the DEM.

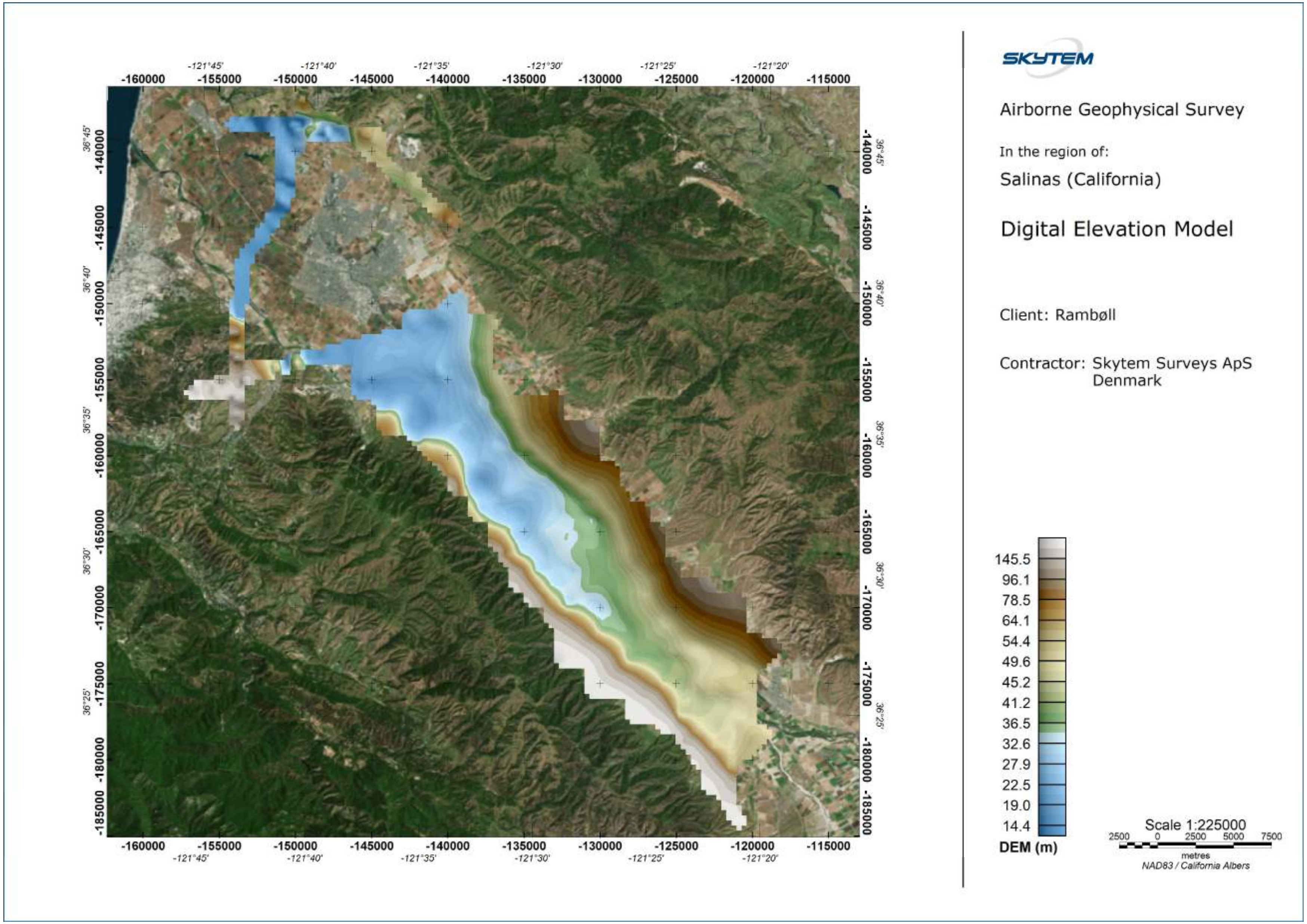

SKYTEM
Airborne Geophysical Survey
In the region of:
Salinas (California)
Digital Elevation Model
Client: Rambøll
Contractor: Skytem Surveys ApS
Denmark
-160000 -155000 -150000 -145000 -140000 -135000 -130000 -125000 -120000 -115000
-121°45' -121°40' -121°35' -121°30' -121°25' -121°20'
-140000 -145000 -150000 -155000 -160000 -165000 -170000 -175000 -180000 -185000
36°45' 36°40' 36°35' 36°30' 36°25'
145.5
96.1
78.5
64.1
54.4
49.6
45.2
41.2
36.5
32.6
27.9
22.5
19.0
14.4
DEM (m)
Scale 1:225000
2500 0 2500 5000 7500
metres
NAD83 / California Albers

Figure 8. DEM.

Magnetic data

Final processing of the magnetic data involves the application of traditional corrections to compensate for diurnal variation and heading effects prior to gridding. Geosoft magnetic data processing tools are applied as follows:

- Processing of static magnetic data acquired on magnetic base station
- Pre-processing of airborne magnetic data
  - Stacking of data to 10 Hz in SkyLab.
  - Moving positions to the center of the system in SkyLab.
  - Matlab Despiking
- Processing and filtering of airborne magnetic data
- Standard corrections to compensate the diurnal variation
- IGRF correction
- No levelling was applied due to the nature of the line layout
- Gridding

Processing of base station magnetic data

The base station magnetometer data was merged into the base station Geosoft database daily for further processing.

The following filtering was applied:

- Fraser Low-pass filter (width 60 sec)
- Diurnal variations calculated by subtracting mean value according to the table below.
- Processed residual magnetic data from the magnetic base station representing short term variations was merged with the airborne magnetic data.
- Base stations were levelled each time location was changed.

Magnetometer Base station	Period	Mean diurnal
Salinas	20230301 – 20230302	47183.1 nT

Processing and Filtering of airborne magnetic data

Airborne magnetic data is filtered and interpolated as follows:

- Matlab Despiking
    - The powerful EM system caused the mag sensor to be more sensitive to sensor orientation and variations in flight orientation.
      As a consequence more spikes than usual were introduced.
      A despiking routine in matlab was developed to preprocess the data before standard tools were applied.
    - Analysis showed that the positive EM pulses affected the data more and generated more spikes. It was decided to remove all data from the potentially affected pulses, so instead of 30 mag readings/second, we have 15 mag readings/sec and we are still able to process the mag data with acceptable result.
    - After this step traditional processing has been applied
- Adjustment of the data for the time lag between the GPS position and the position of the magnetic sensor
- Data resampling to 10 Hz (stacking)
- Nonlinear filtering (despiking in Geosoft)
- Manual despiking to remove spikes and spurious data
- Geosoft processing:
    - B-spline, smoothness 0.60, tension 0.0

Corrections to the magnetic data

The following corrections are applied to the airborne magnetic data:

- Correction for diurnal variation using the digitally recorded ground base station magnetic values as described above
- Lag is negligible for the SkyTEM312HPM and no lag correction was applied
- Heading is negligible for the SkyTEM312HPM and no correction was applied
- IGRF correction

IGRF correction

The International Geomagnetic Reference Field (IGRF) is a long-wavelength regional magnetic field calculated from permanent observatory data collected around the world. The IGRF is updated and determined by an international committee of geophysicists every 5 years. Secular variations in the Earth's magnetic field are incorporated into the determination of the IGRF.

The IGRF model is calculated before levelling using the following parameters:

IGRF model year: IGRF 13th generation
Date: variable according to date channel in database
Position: variable according to GPS WGS84 longitude and latitude

Elevation: variable according to magnetic sensor altitude derived from DGPS data

Residual Magnetic Field

The outcome of processed magnetic data after all corrections and levelling is the Residual magnetic field (RMF). See Figure 9.

The magnetic data maps the distribution of magnetic minerals within the ground from surface to great depths. Under favorable geologic conditions, it can help map geological formations, faults and fractures within the earth. The data can also be used to identify metallic man-made objects either on surface or buried.

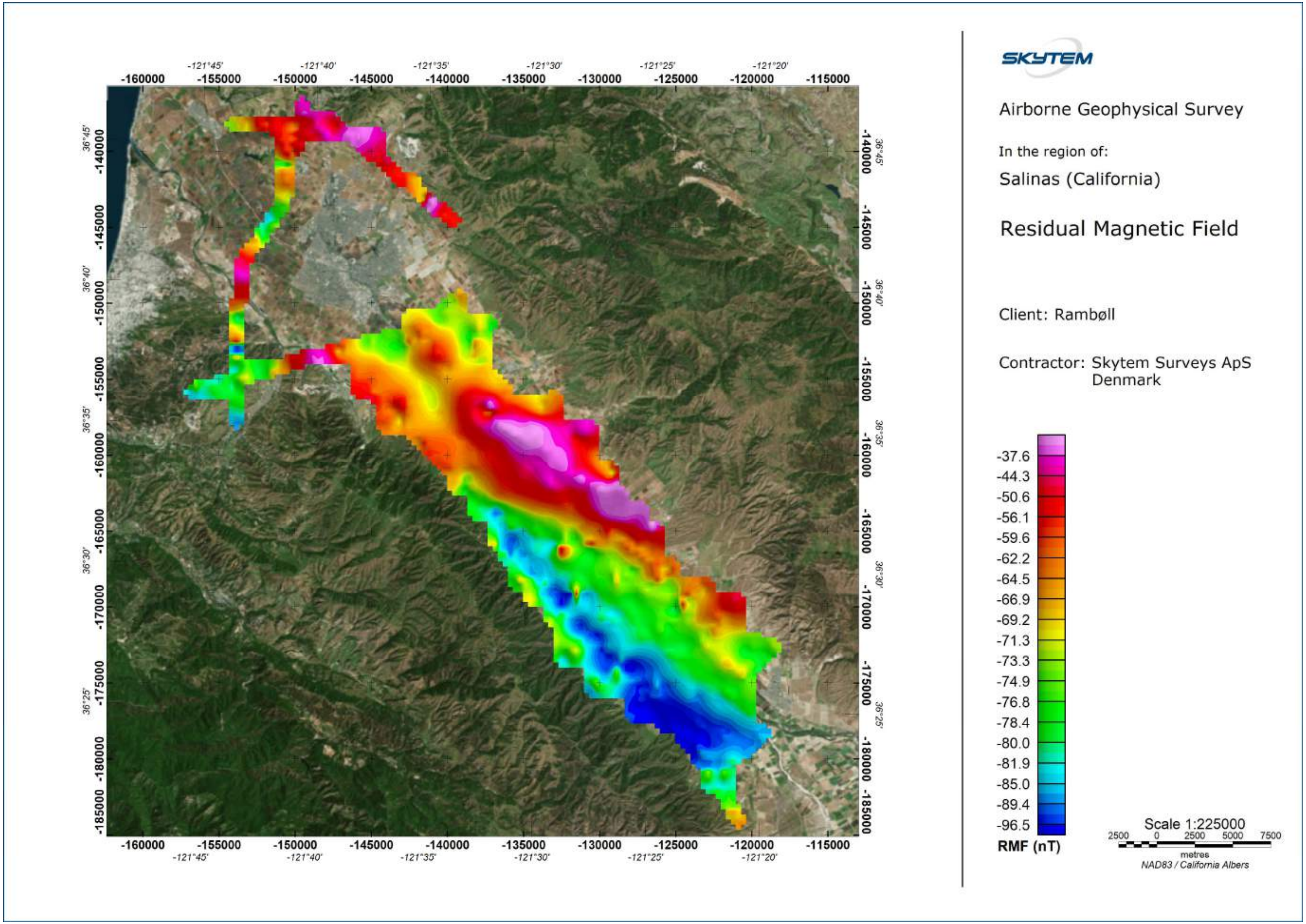


Figure 9. RMF of the entire survey area.

TMI recalculation

The outcome of processed magnetic data after all corrections and levelling is the Residual magnetic field (RMF).

The RMF data is used to generate the Total Magnetic Intensity (TMI) grid by adding the IGRF data from a fixed date and altitude.

Date: 2023/03/01
Position: variable according to GPS WGS84 longitude and latitude
Elevation: 0 m

First Vertical Magnetic Derivative

The first vertical derivative is a high pass filter which when applied to the gridded magnetic data enhances near surface magnetic responses while downplaying the longer wavelength response from deep seated sources. The first vertical magnetic derivative can be used to highlight the presence of faults, lineaments and near surface magnetic features. It can also be used to map metallic infrastructures either on surface or buried, if the source is large enough.

EM data

This section covers processing of EM data and filtering of EM data.

Primary Field Compensation (PFC)

The magnetic field coupling between the receiver coils and the transmitter loop is continuously hardware-monitored, providing a separate value for the magnetic field coupling during each transient sounding. These data are used for raw data correction in a separate post-processing step. The primary field compensation technique has proven stable and has routinely yielded a reduction of the primary field influence in very early time gates by a factor exceeding 50.

EM Filtering

The data are normalized in respect to effective Rx coil area, Tx coil area, number of turns and current giving the unit [pV/(m^4*A)].

Pre-averaging steps

Prior to applying standard averaging to the recorded data, the raw data are subjected to a few data processing steps:

- PFC correction of LM Z dBdt
- Outlier rejection filtering of the raw data, which reduces the influence from spherics and transient cultural noise. Outlier rejection has been performed on a gate-by-gate basis as a non-linear STD-estimate-scaled thresholding and interpolation process on minimally averaged EM data. The thresholding is a variant of the Median Absolute Deviation outlier detection method.
- Removal of constant system self-response (bias) on SkyTEM312HPM HM dBdt and B-field data
- Estimation of noise standard-deviation throughout the survey area on a gate-by-gate basis

The level of the constant system self-response (bias) is found in high altitude, where the recorded signal is free of signal from the ground. The self-response is approximated by fitting a sum of exponential functions to the sounding curves and subsequently the self-response is removed from data by subtracting the approximation.

Averaging approach

The averaging approach comprises applying a tapered convolution filter to all gates, where the filter has a fixed duration independent of the gate number. The full width at half maximum of the applied filter is 2.0 s.

B-field

The B-field data are recorded using the same induction coil receivers as are used for the dB/dt data. The receivers continuously monitor all B-field changes in their respective field component over the entire waveform (i.e. both during ON- and OFF time).

The continuous monitoring and the ability to integrate these changes allows for exact measured B-field response outputs.

Notice that the periodic and sign-alternating properties of the transmitted waveform permits the unique and accurate determination of the constant of integration.

Power Line Noise Intensity (PLNI)

The PLNI is a powerful tool for identifying power line noise effect on EM and magnetic data. The PLNI monitor values are derived from a frequency analysis of the raw Z-component EM data. The Fourier transformation is evaluated at the local power transmission frequency yielding the amplitude spectral density of the power line noise.

CAUTION - When evaluating the PLNI values one should be aware of the following factors that may give rise to anomalous PLNI patterns unrelated to the actual power line noise level:

- Other noise sources than power line noise may contribute to the total noise spectral density in the data at the power transmission frequency. When power line noise is present it tends to dominate all such other noise sources.
- The presented PLNI values are not corrected for fly height or frame angles, which means that adjacent lines crossing the same power line may not exhibit the same values of PLNI.

Figure 10 shows the PLNI.

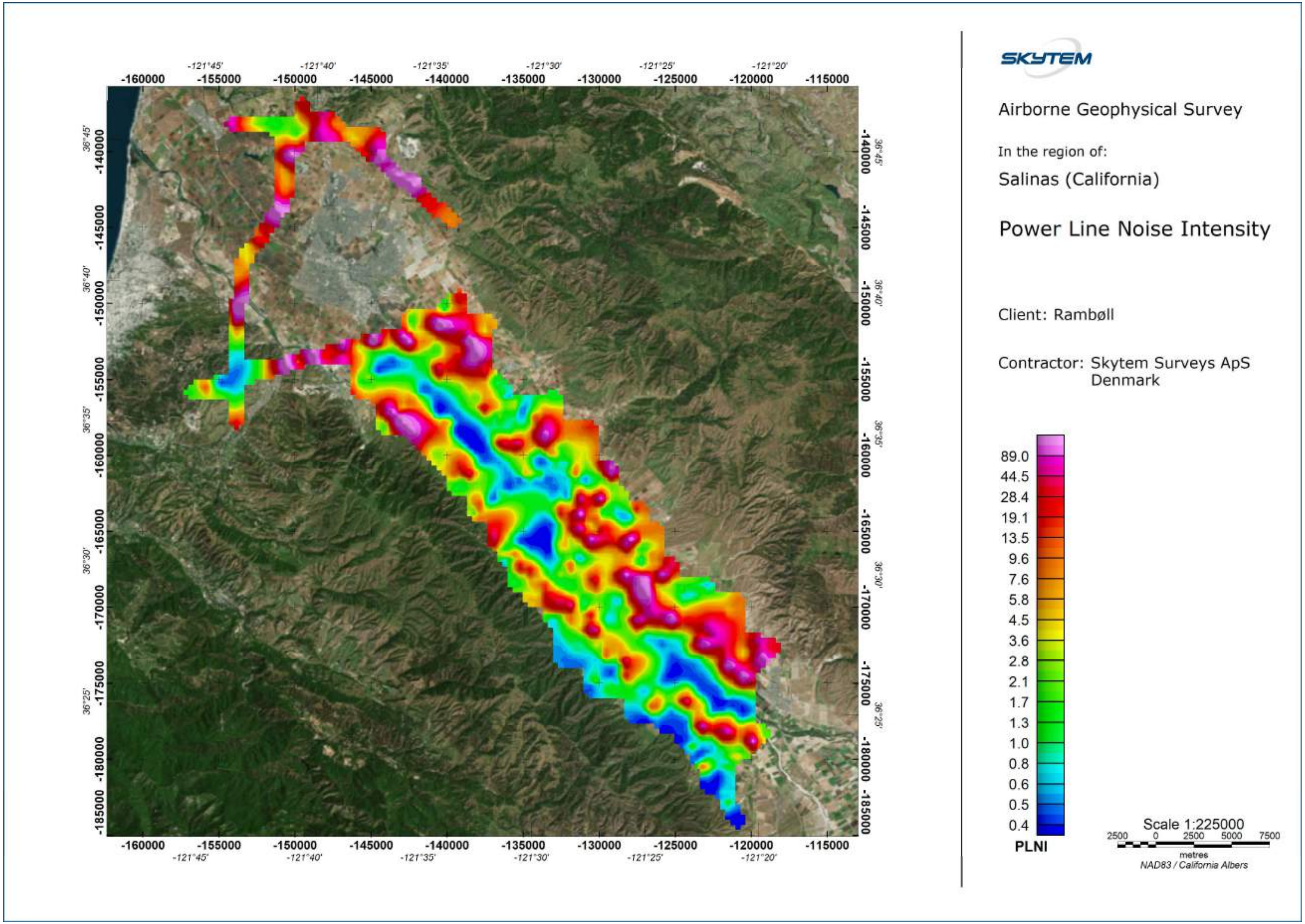
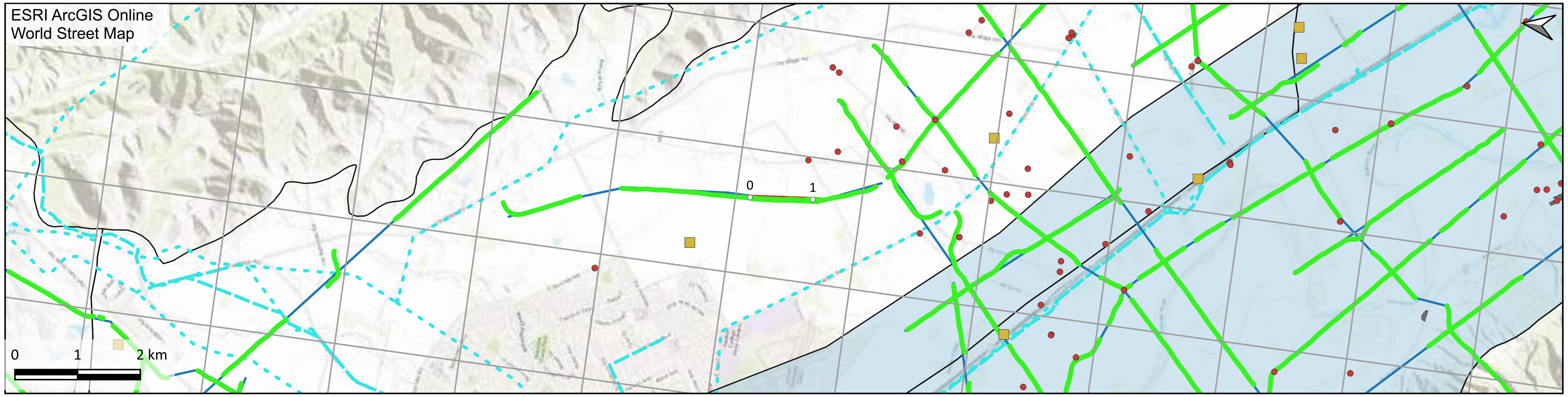


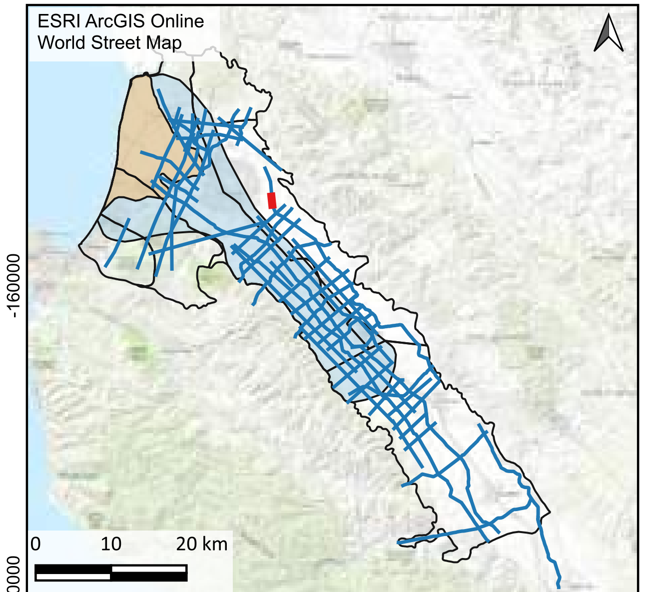
Figure 10. Power line noise intensity.

Appendix 3
AEM Inversion Cross-sectional Results

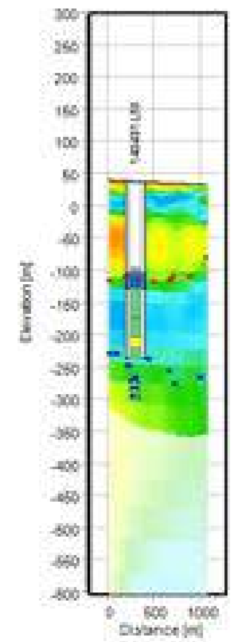
Salinas Line 920003

AEM Model Sections





Smooth Model



0 5 10 15 km

0 5 10 15 mi

Legend for Maps

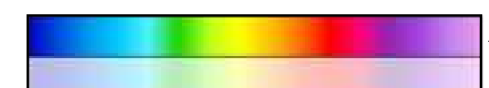
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

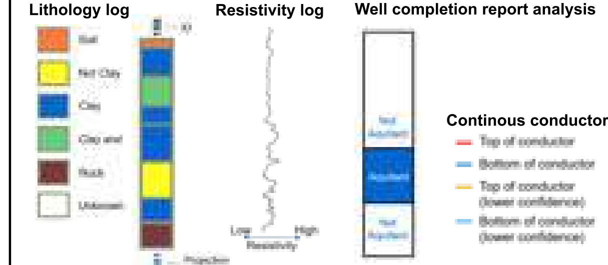
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Legend for Model Sections

Resistivity: AEM inversion resullts



*DOI = Depth of investigation

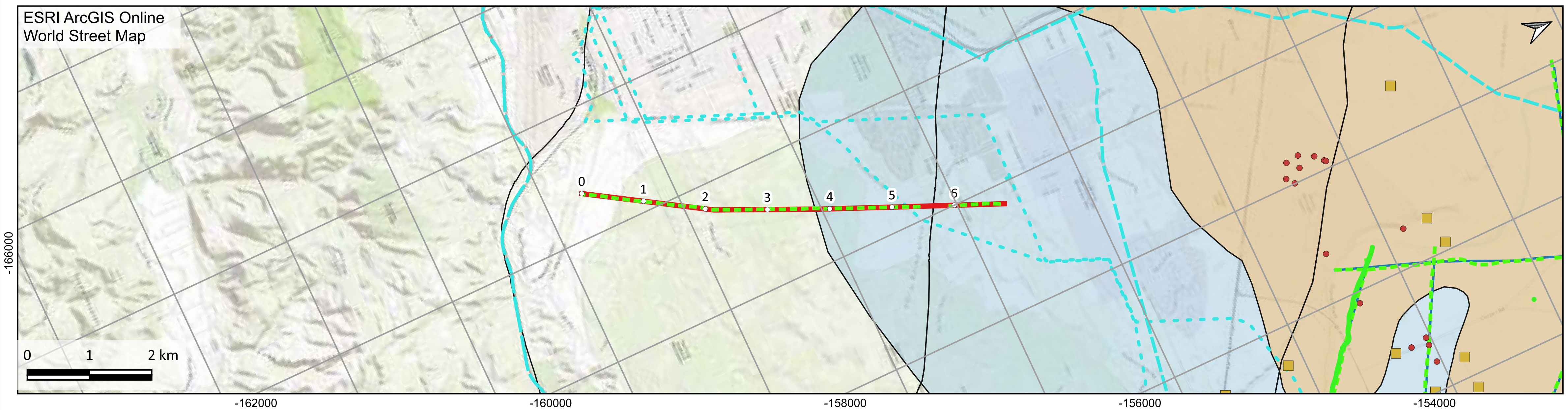


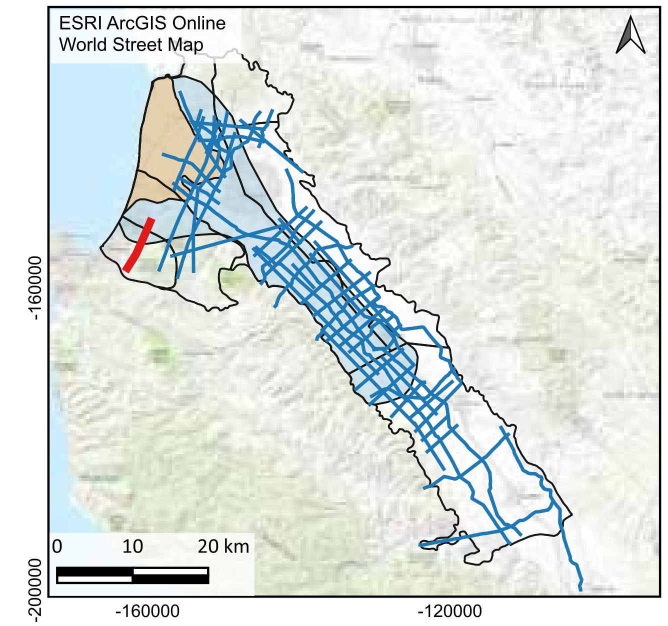
Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 2019_11

AEM Model Sections

RAMBOLL



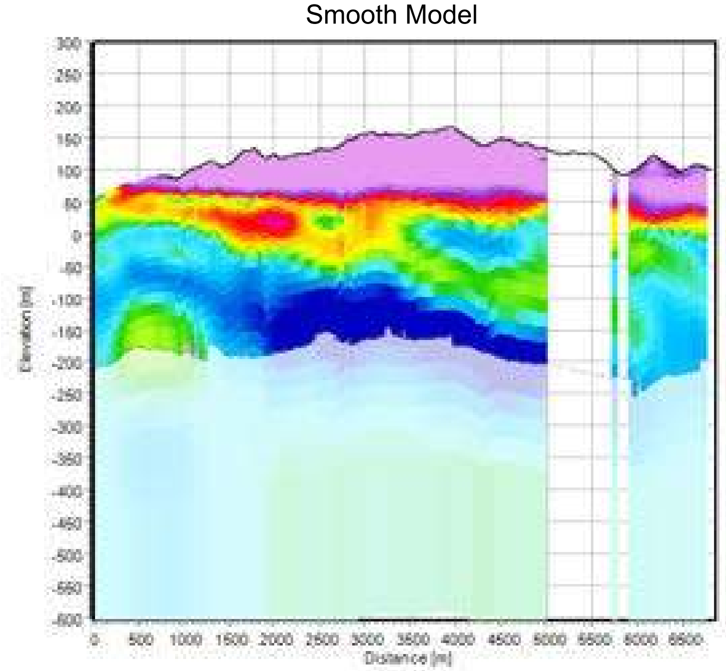


Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

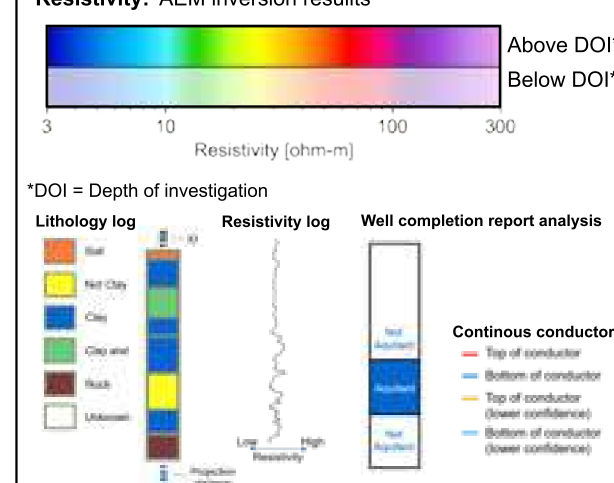
AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

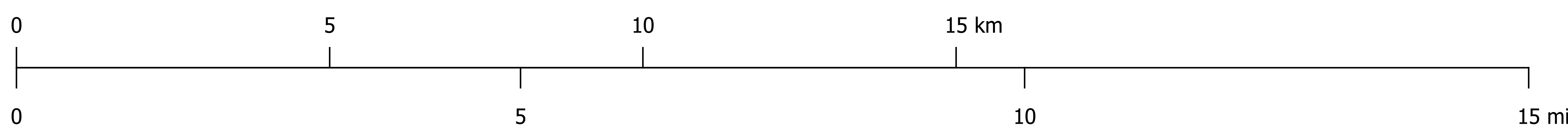


Legend for Model Sections

Resistivity: AEM inversion resullts



*DOI = Depth of investigation

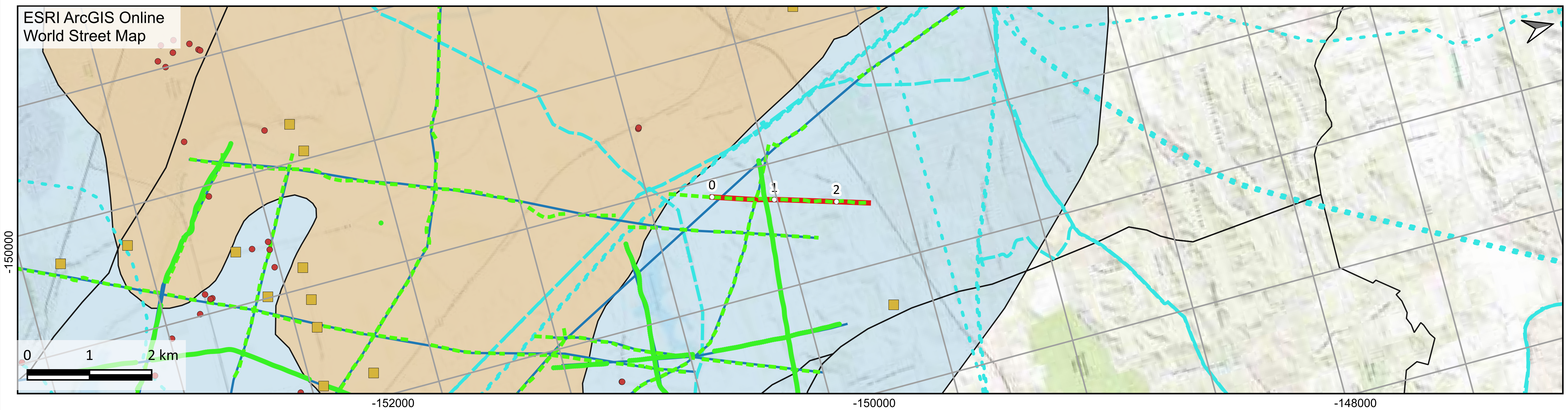


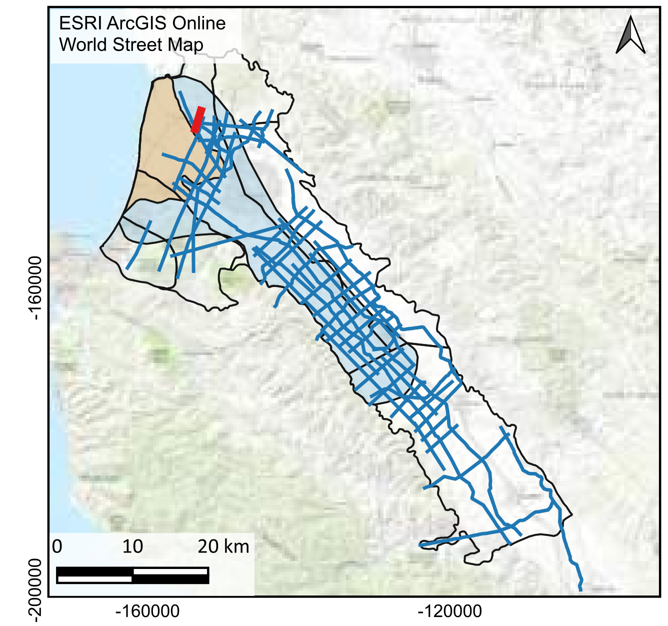
Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 2019_03

AEM Model Sections

RAMBOLL





Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
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- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

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- Resistivity logs
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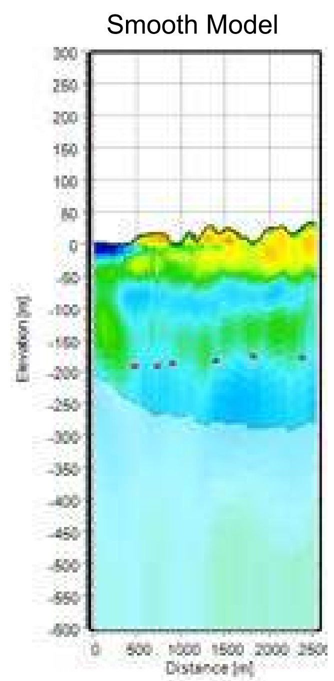
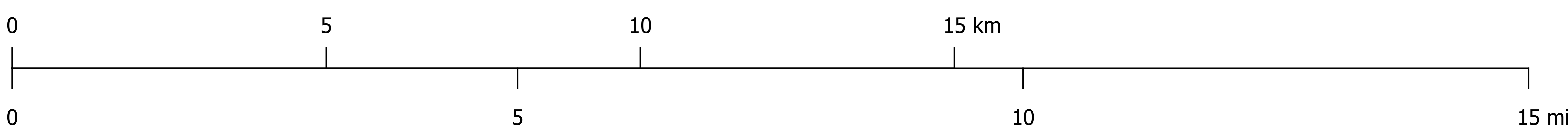
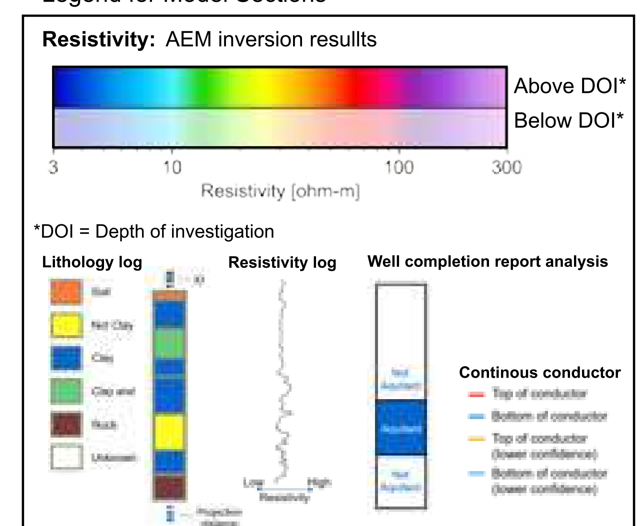
- Pipelines (AmeriGEOSS, 2022)





Legend for Model Sections



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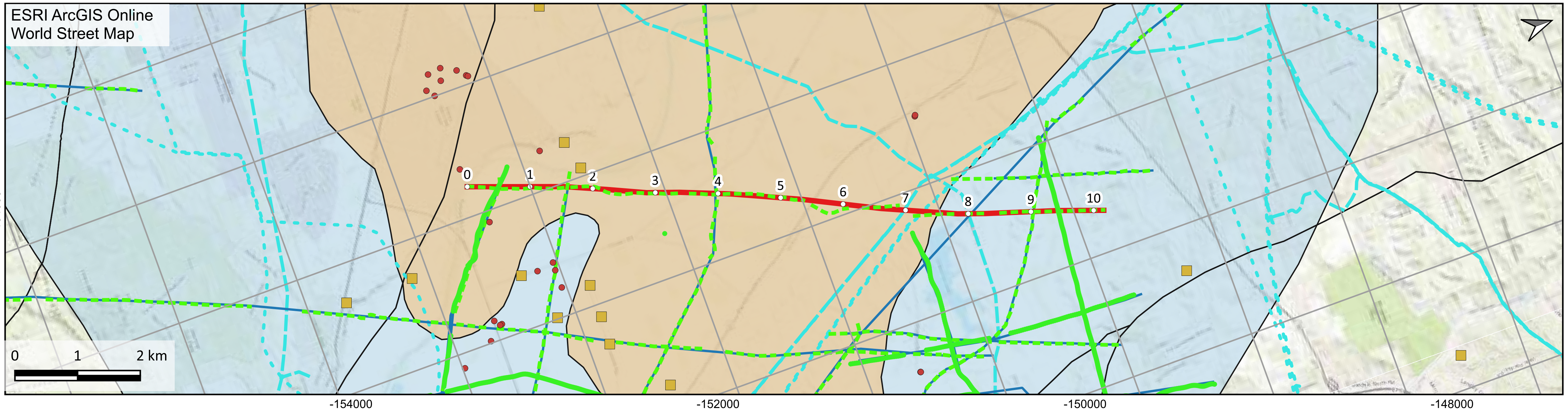
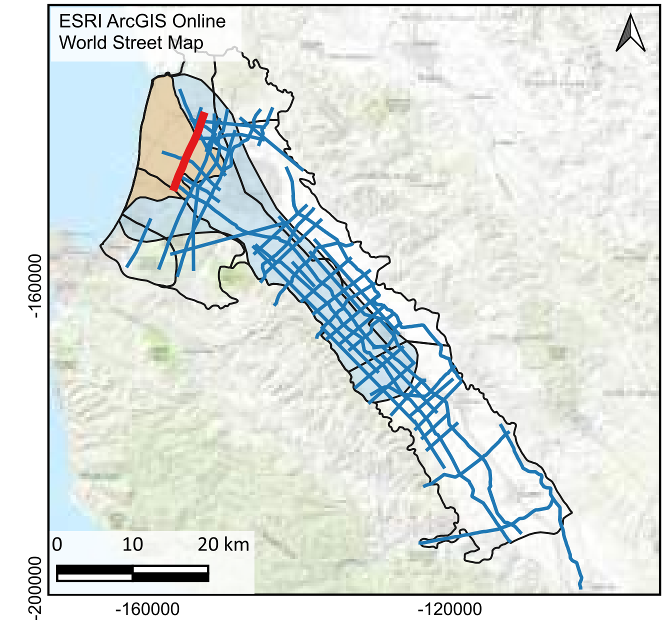
Salinas Line 2019_07

AEM Model Sections

RAMBOLL





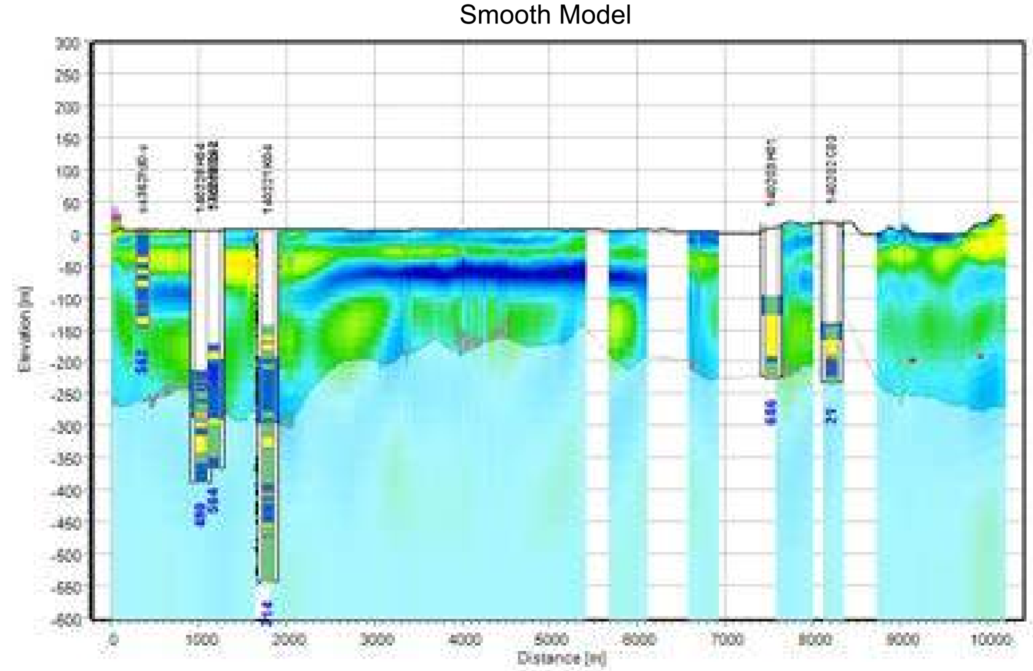
Legend for Maps

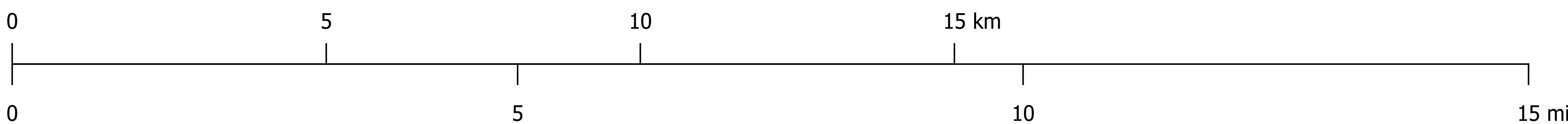
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

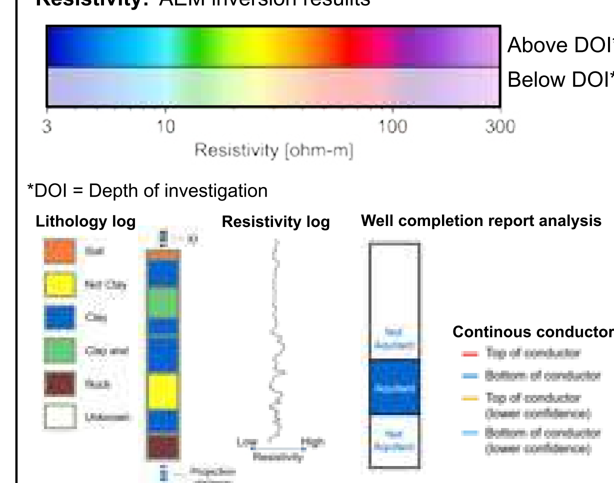
Smooth Model





Legend for Model Sections

Resistivity: AEM inversion resullts

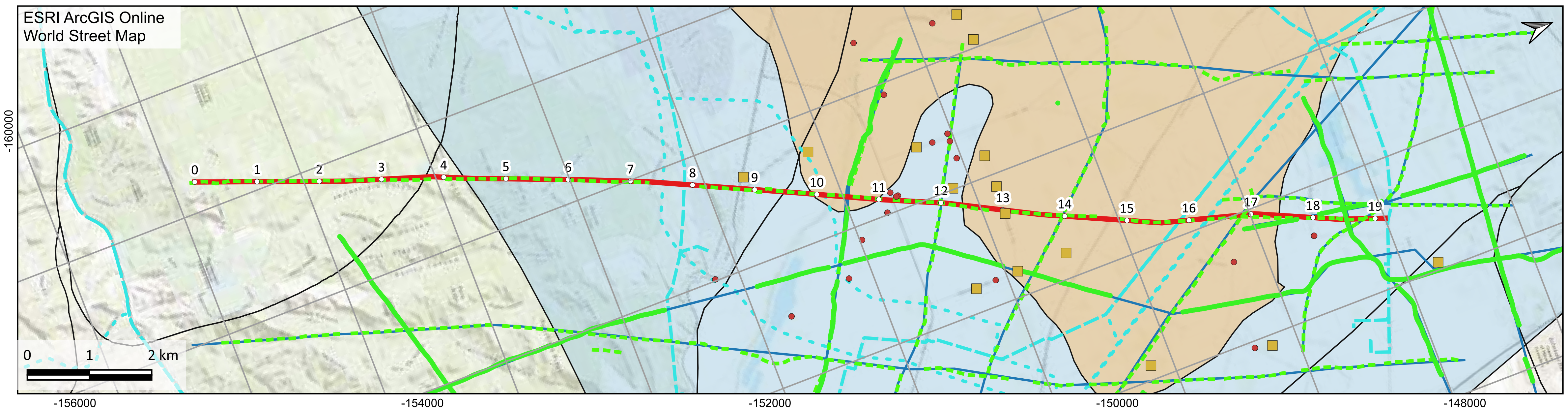


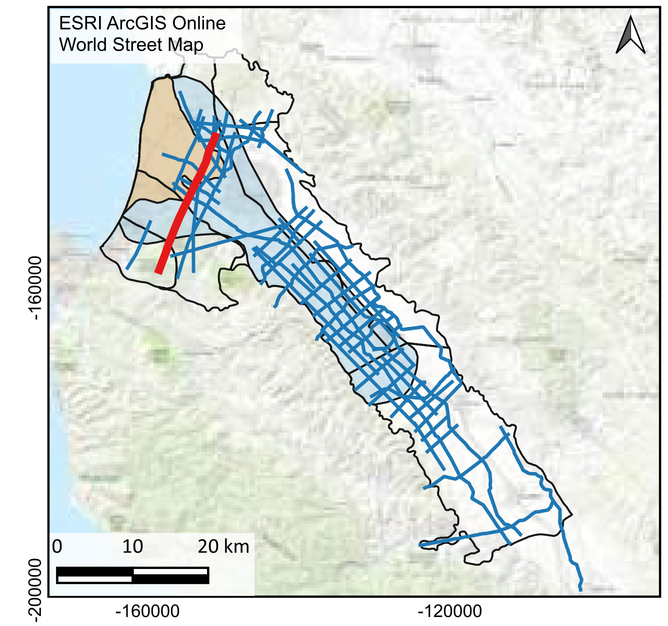
*DOI = Depth of investigation

Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 2019_06

AEM Model Sections





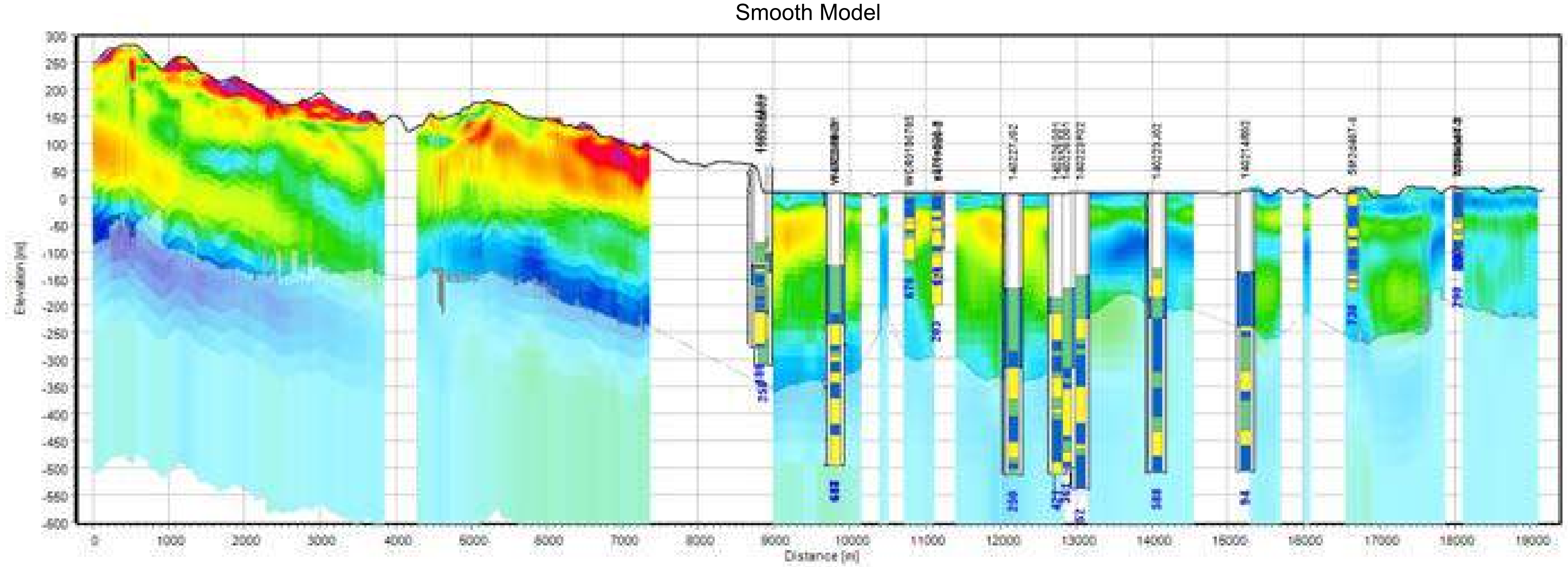
Legend for Maps

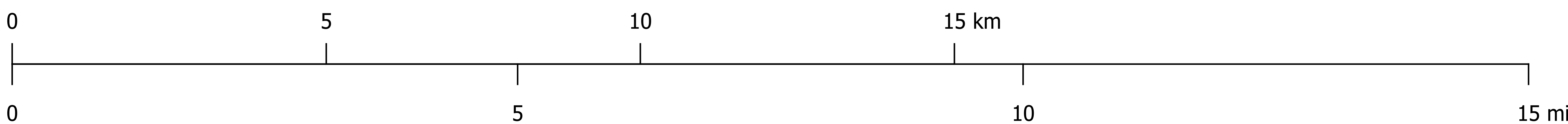
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

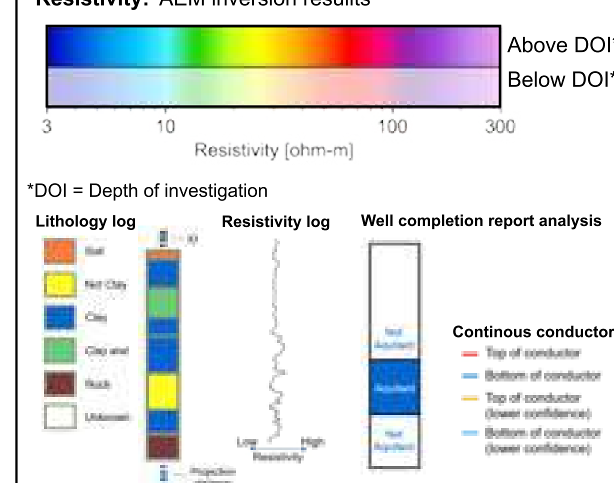
Smooth Model





Legend for Model Sections

Resistivity: AEM inversion resullts

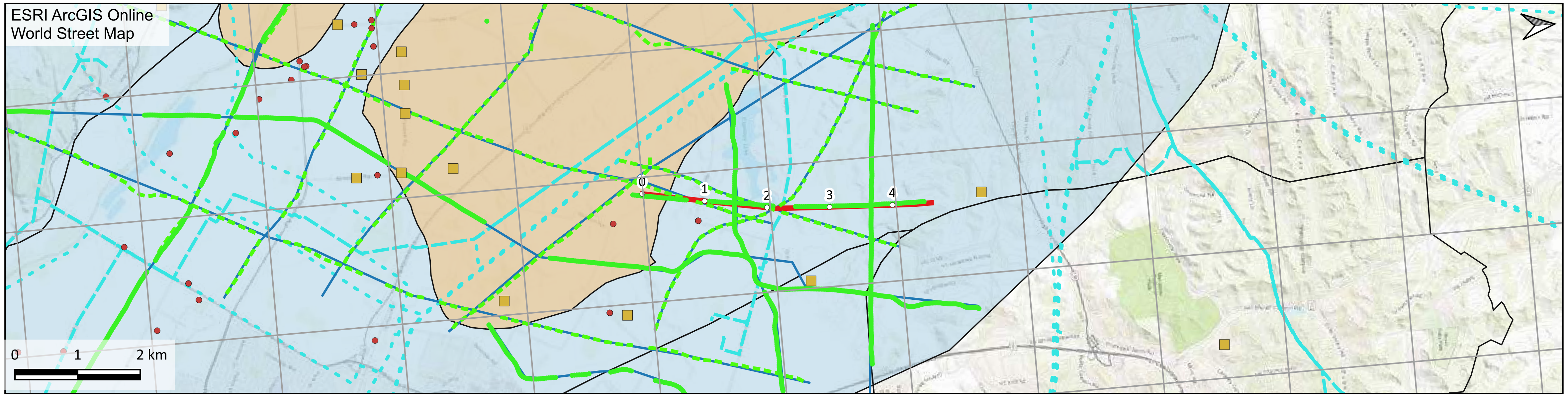


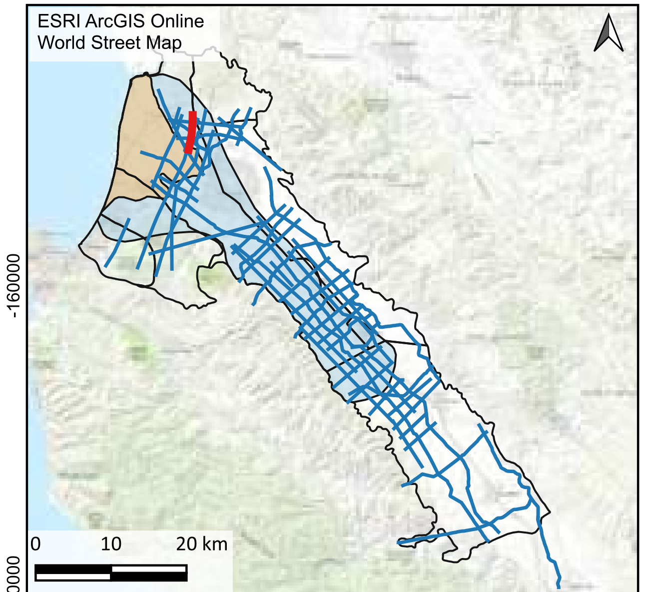
*DOI = Depth of investigation

Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA8_5

AEM Model Sections





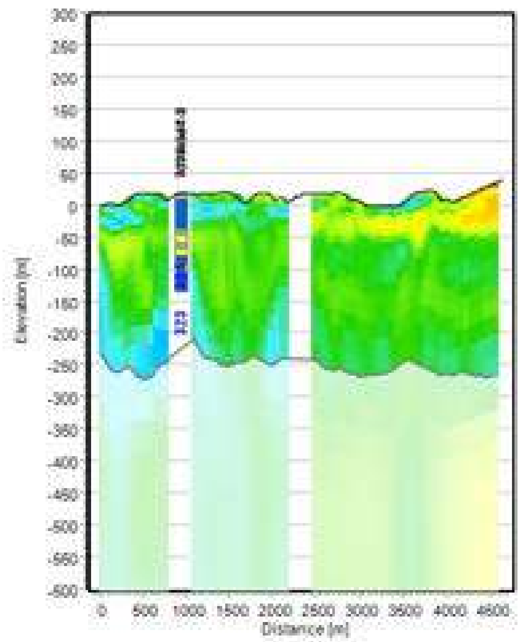
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model

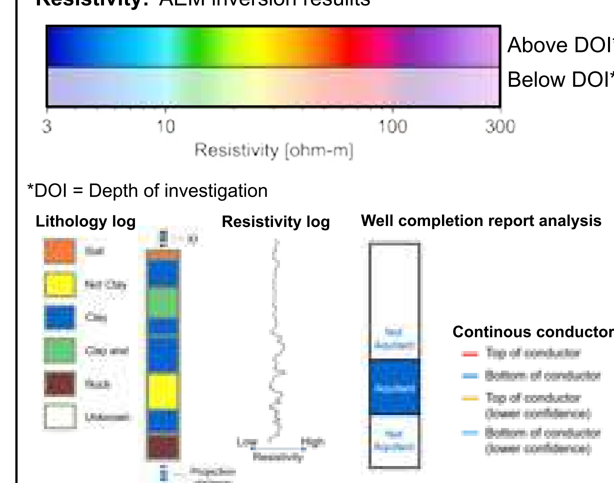


0 5 10 15 km

0 5 10 15 mi

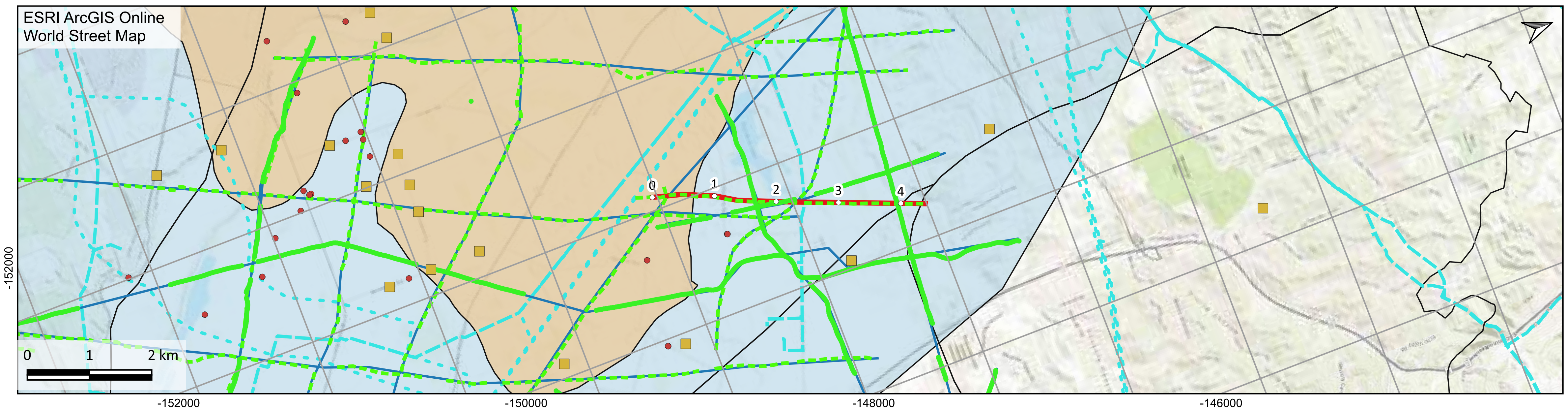
Legend for Model Sections

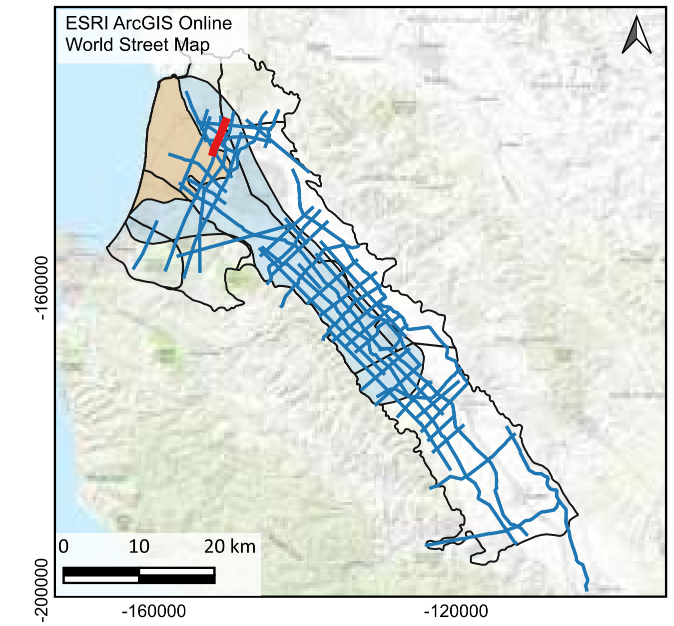
Resistivity: AEM inversion resullts



Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

AEM Model Sections



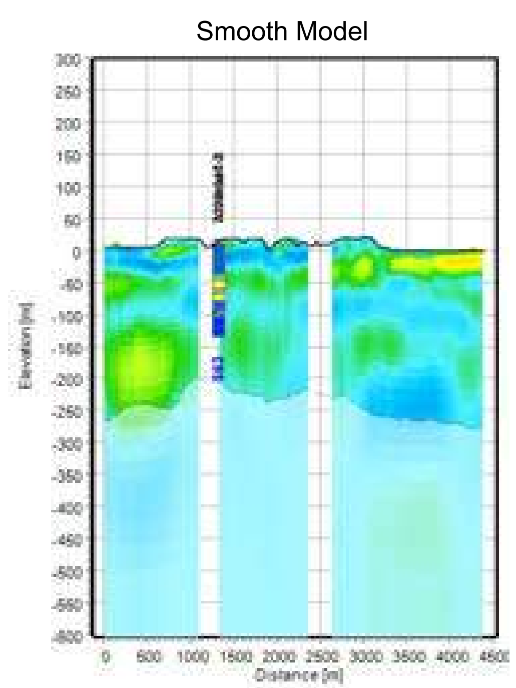


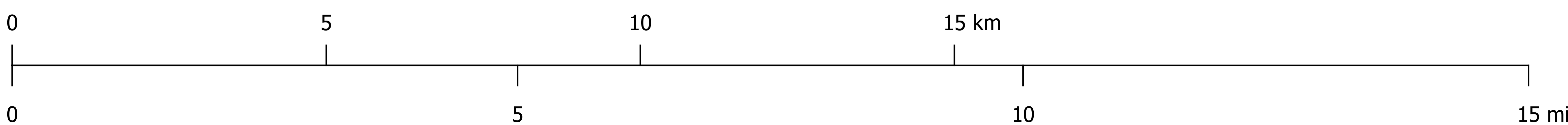
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)





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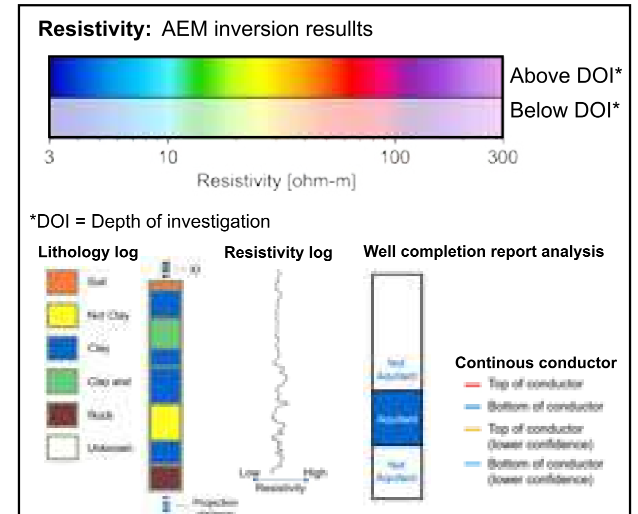
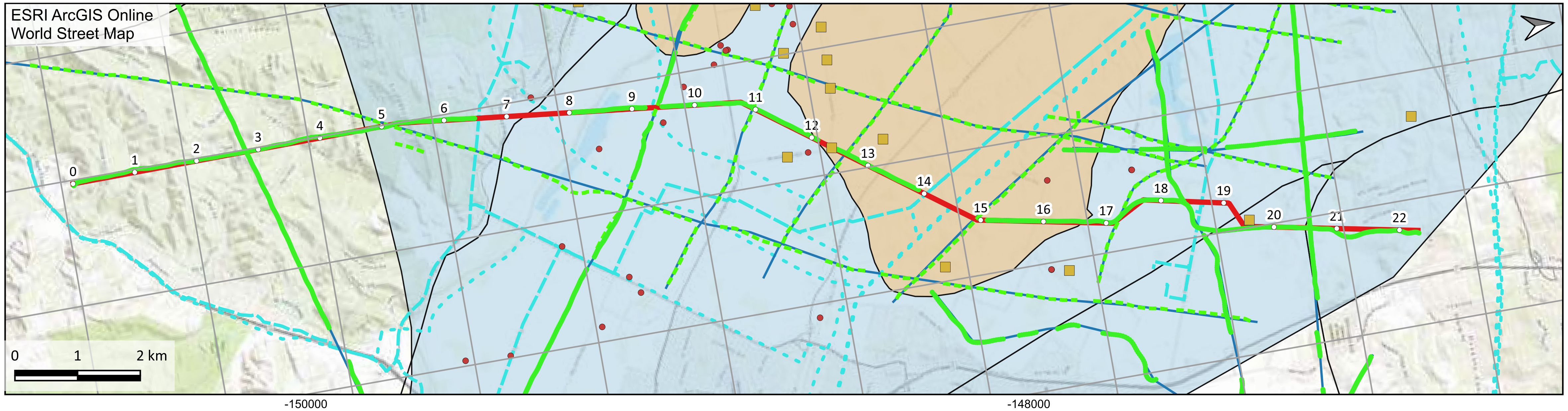
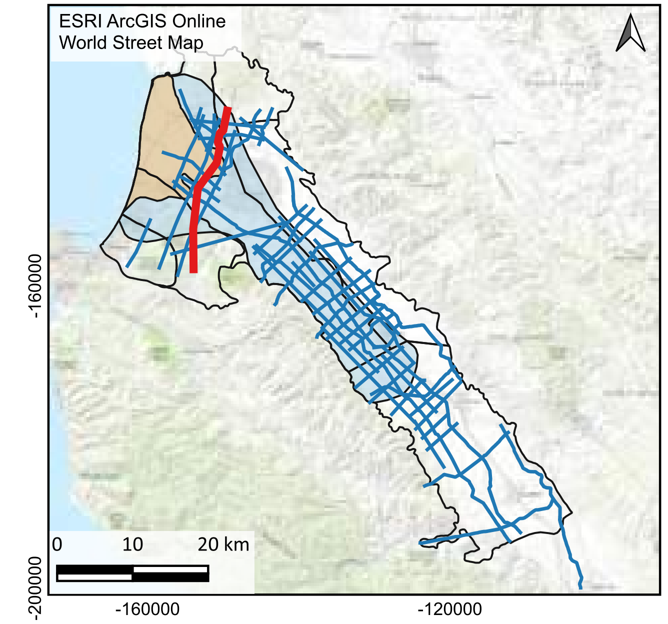


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 100200

AEM Model Sections



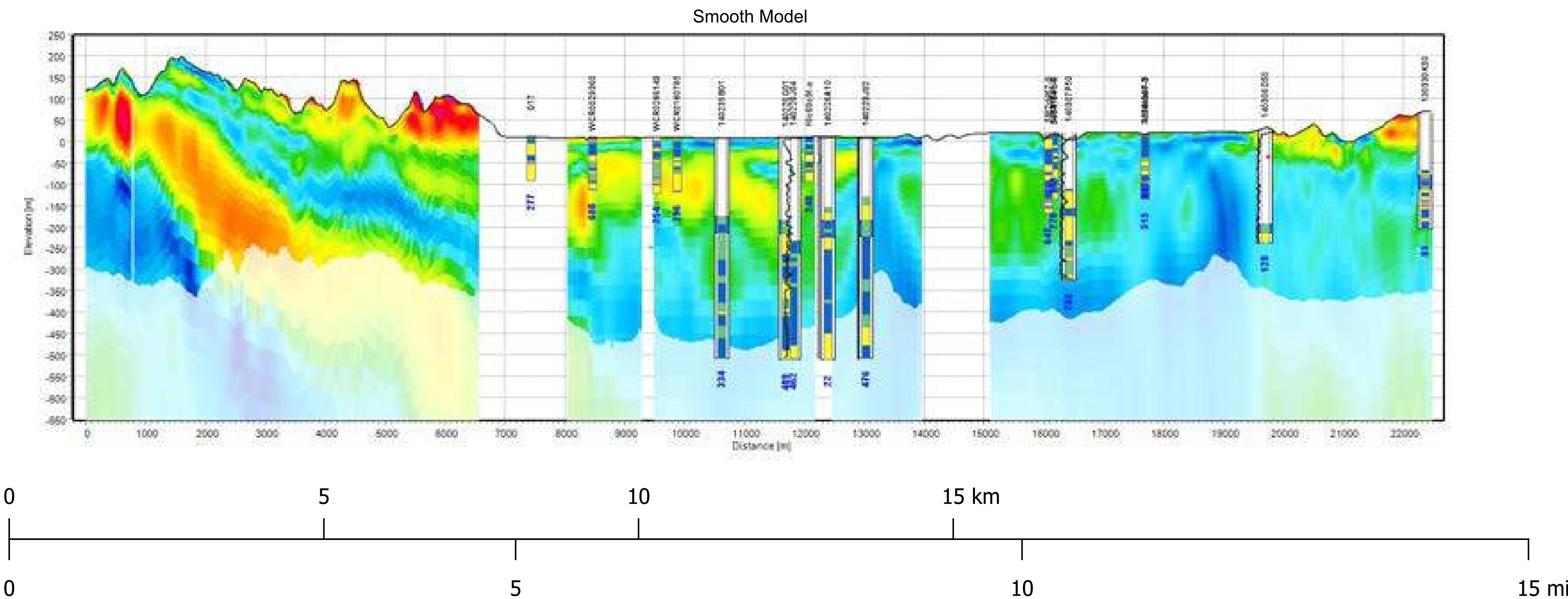


Legend for Maps

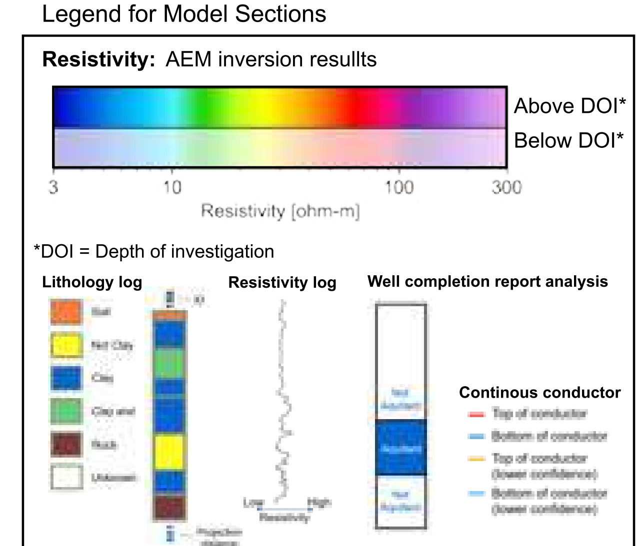
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)



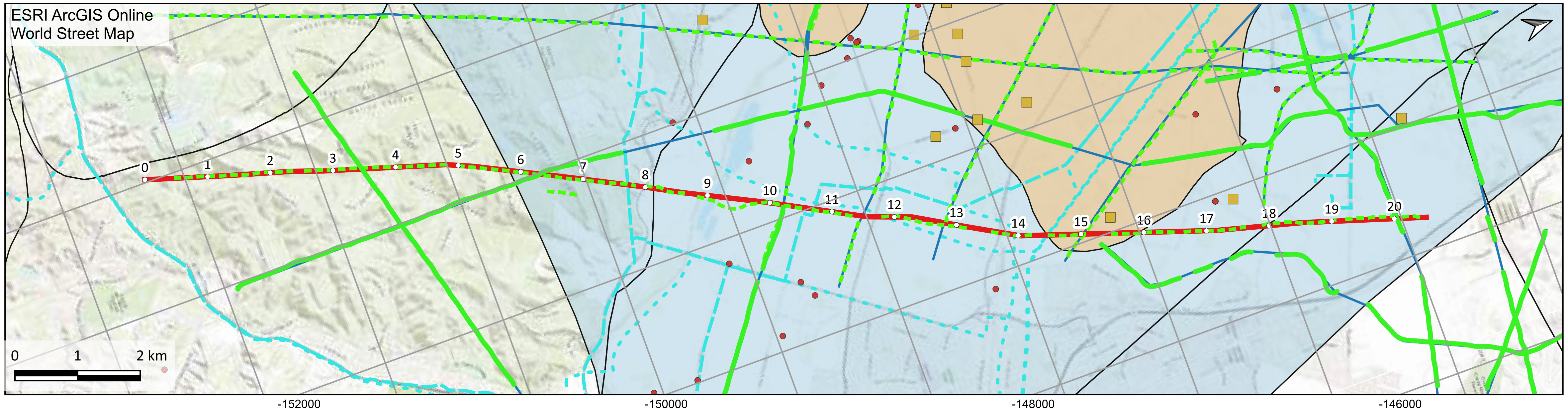
Legend for Model Sections

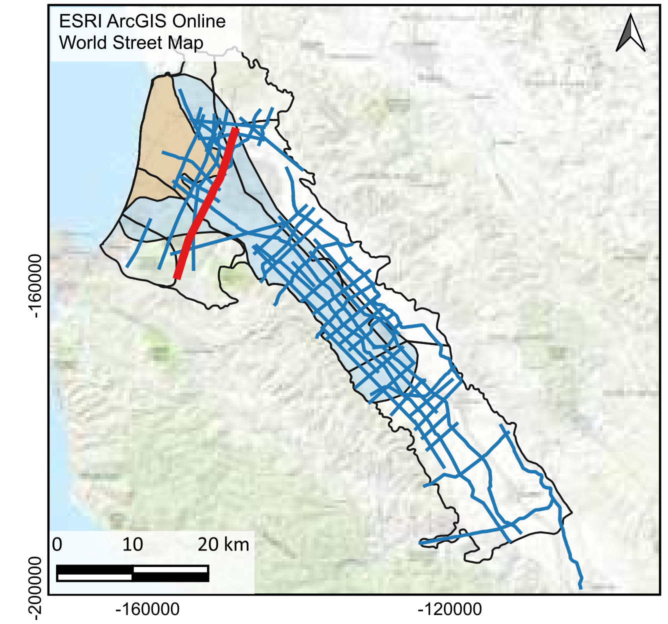


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 2019_05

AEM Model Sections





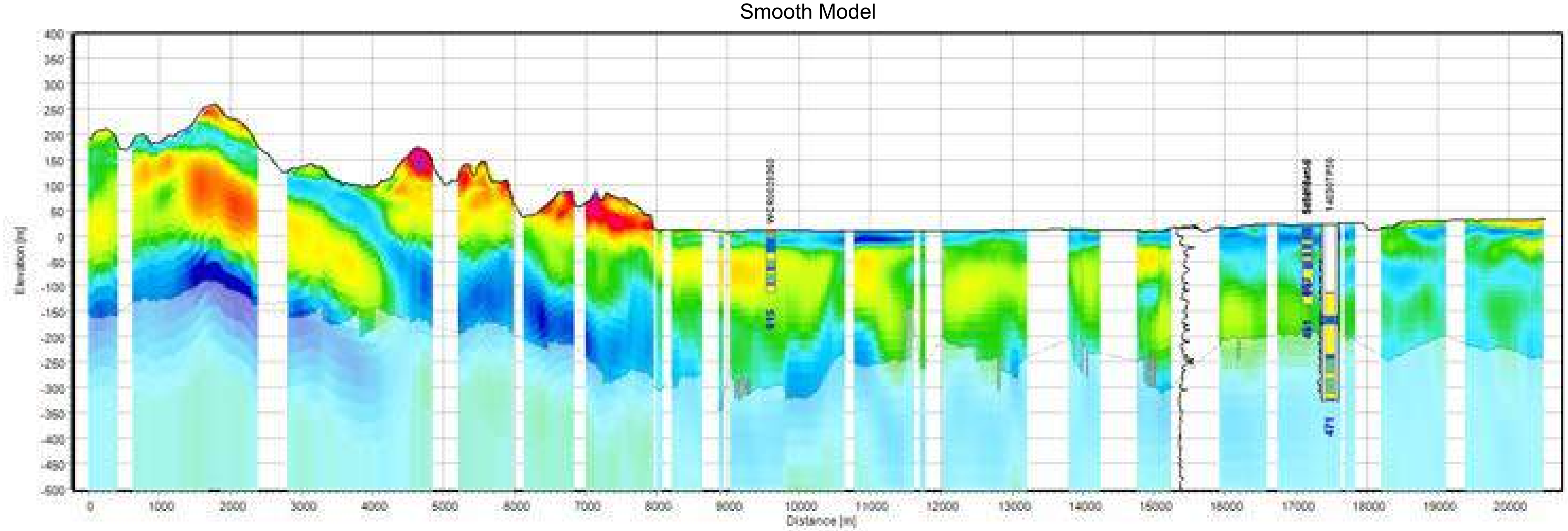
Legend for Maps

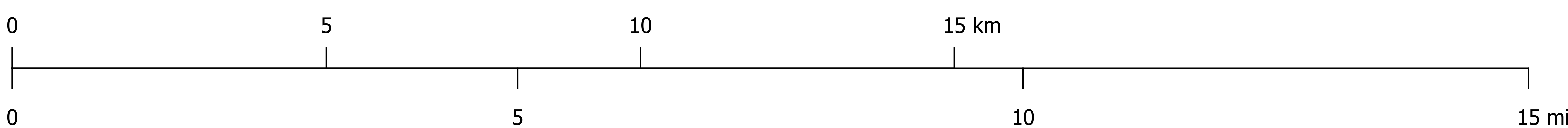
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model





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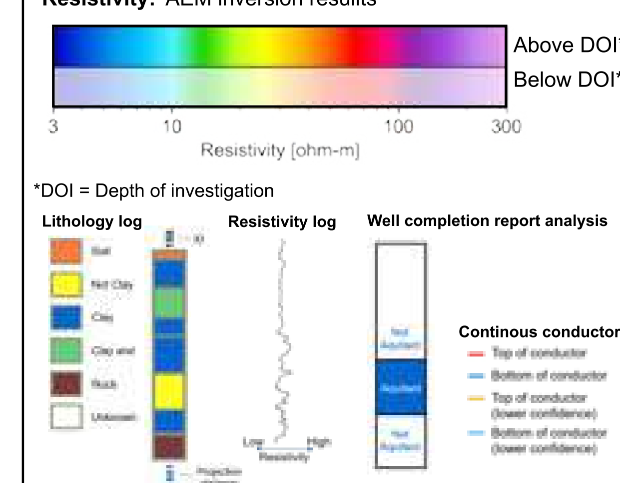
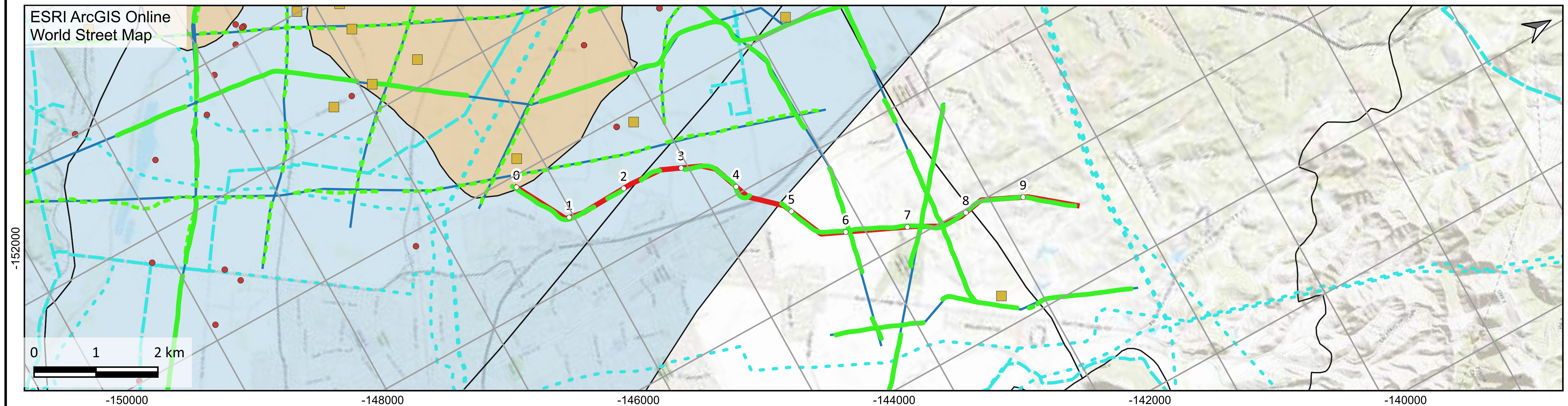
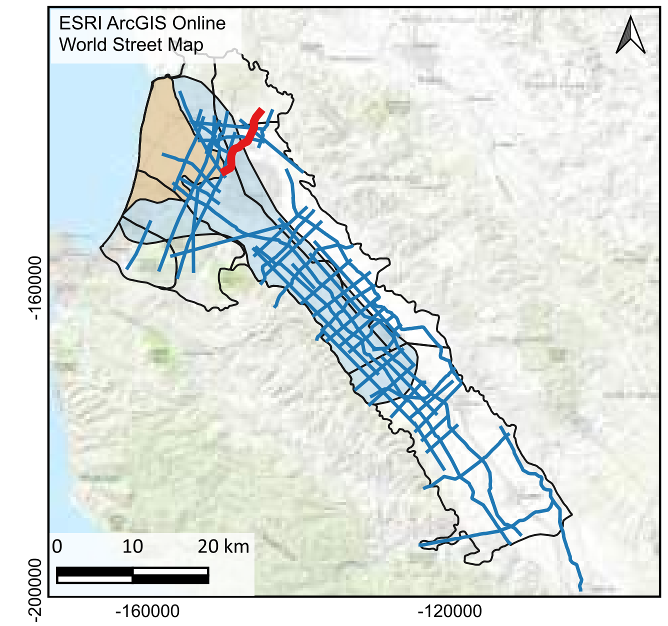


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA8_3

AEM Model Sections





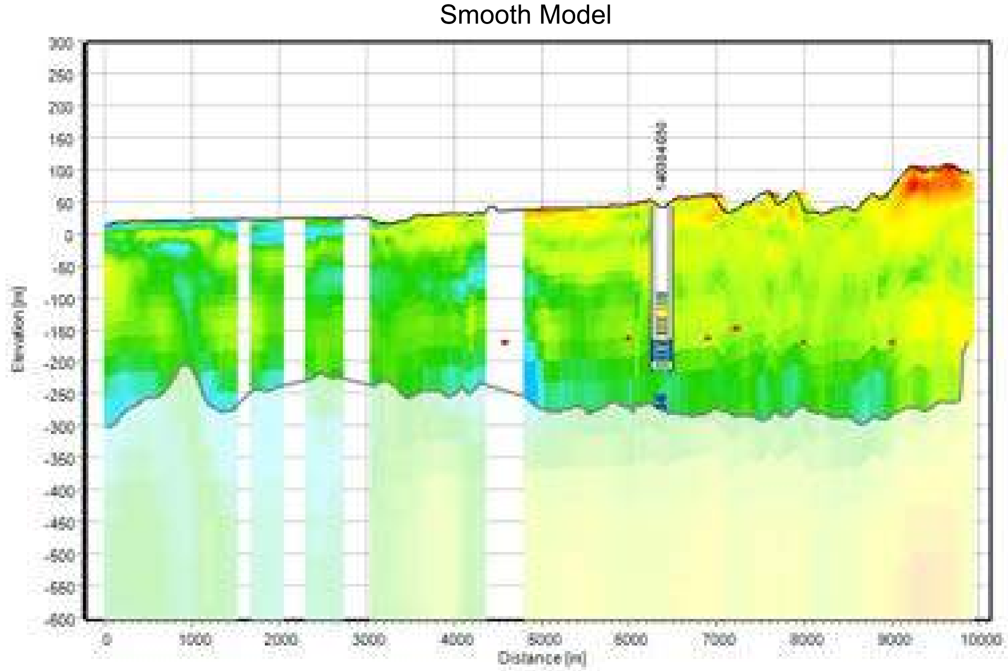
Legend for Maps

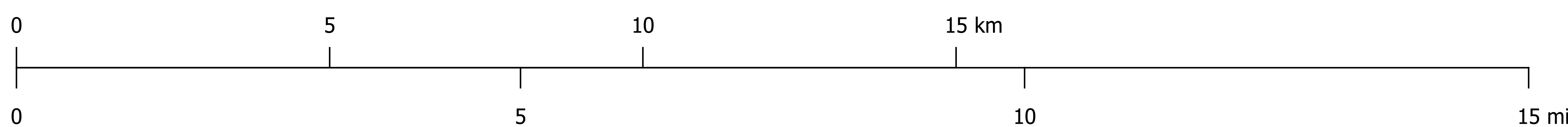
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model





Legend for Model Sections

Resistivity: AEM inversion resullts

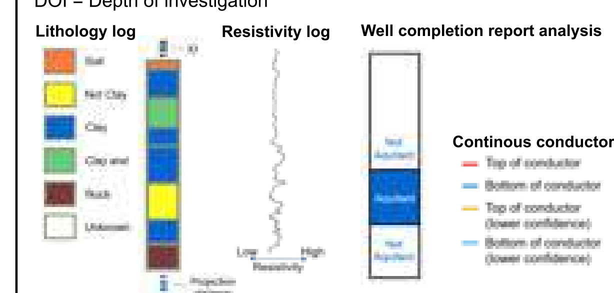
Above DOI*

Below DOI*

3 10 100 300

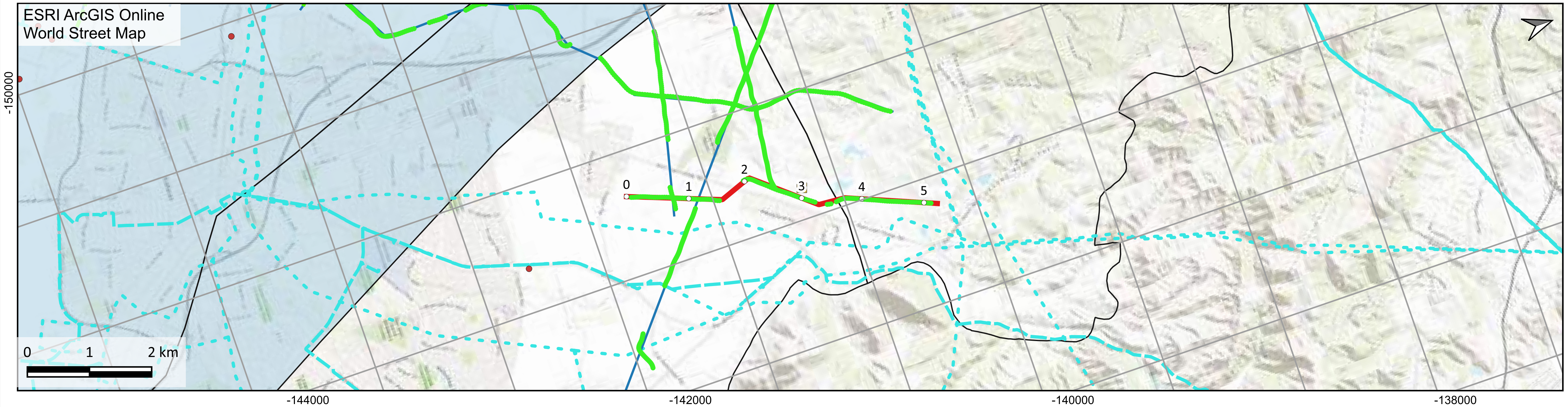
Resistivity [ohm-m]

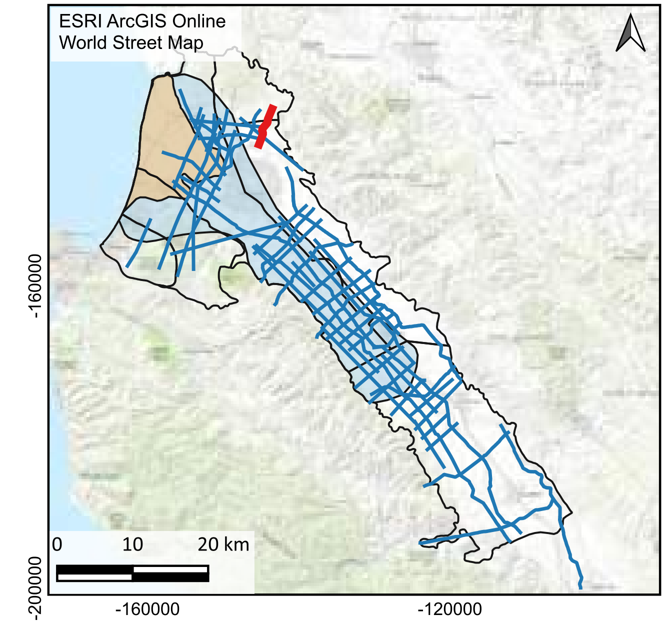
*DOI = Depth of investigation



Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

AEM Model Sections





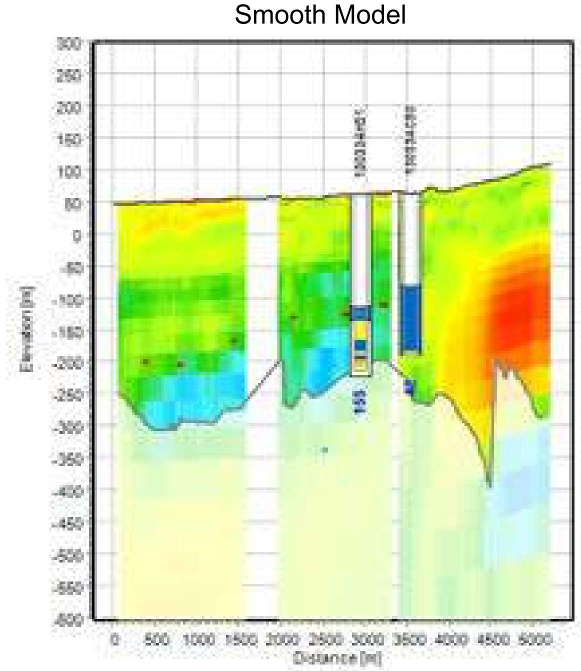
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

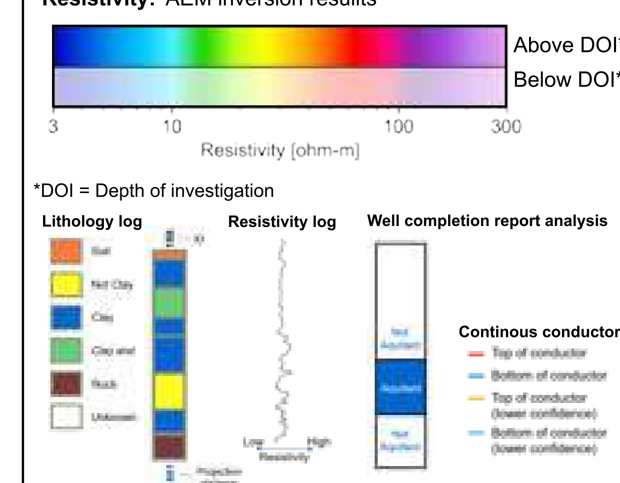
AEM data used for inversion

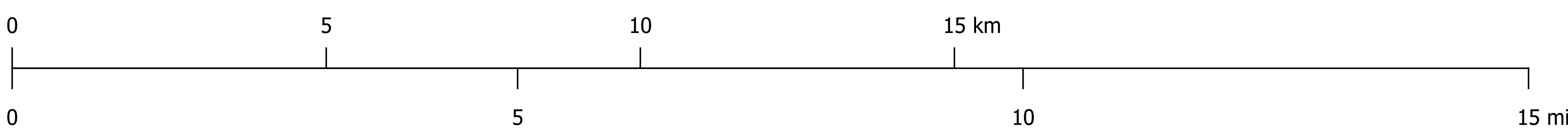
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model



Legend for Model Sections

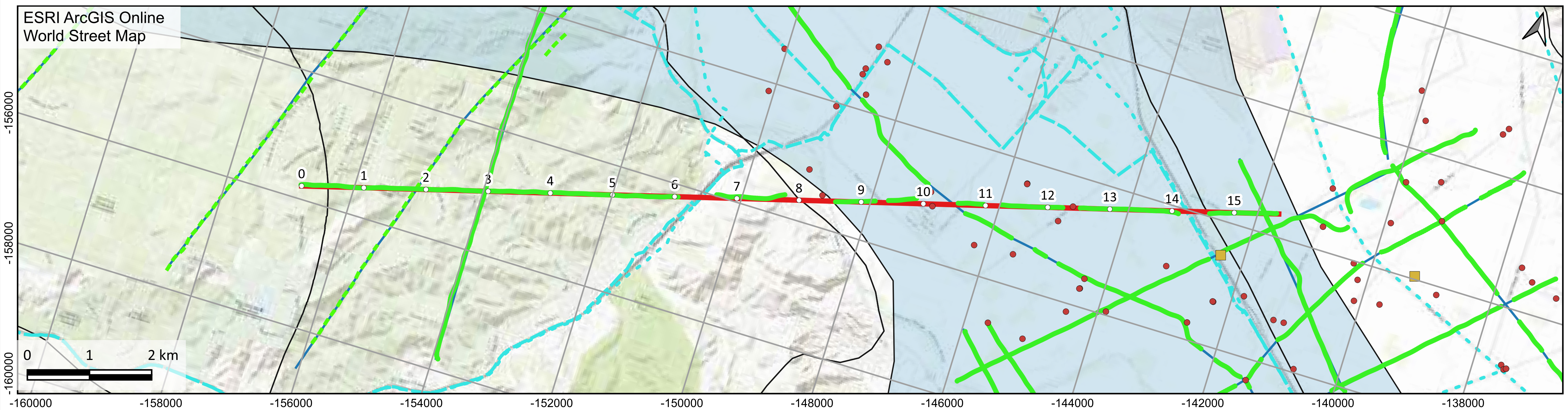


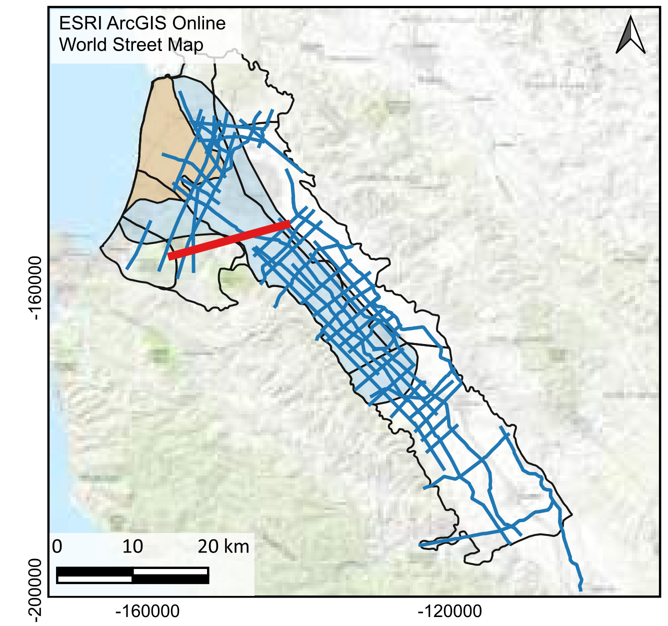


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 100300

AEM Model Sections





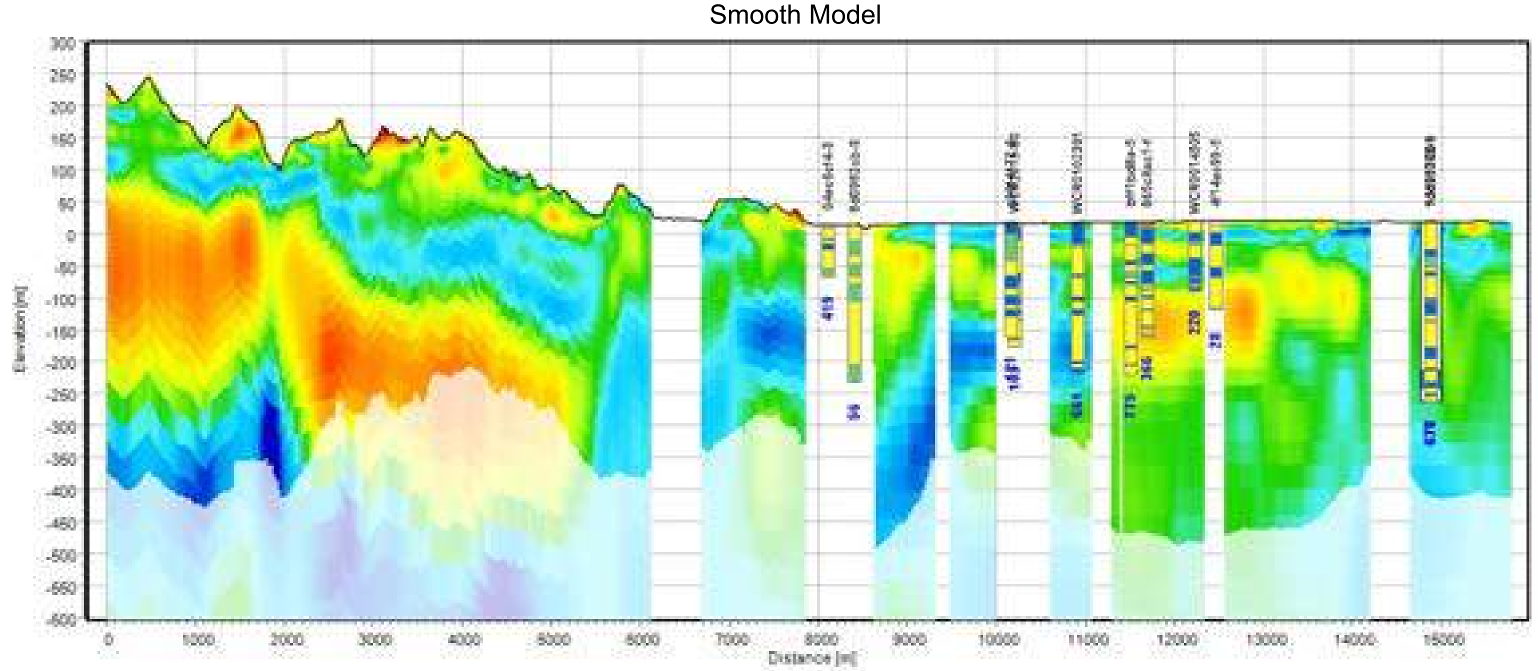
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model

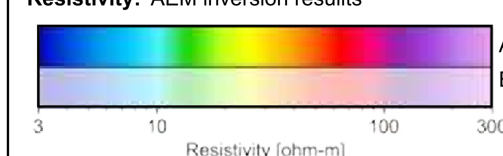


0 5 10 15 km

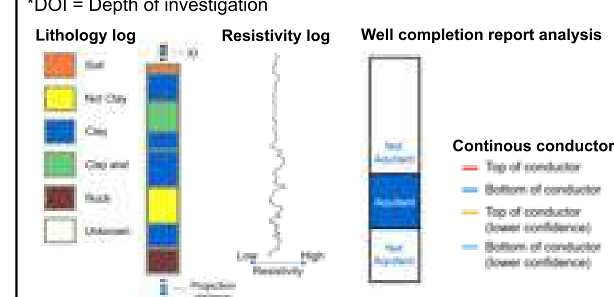
0 5 10 15 mi

Legend for Model Sections

Resistivity: AEM inversion resullts



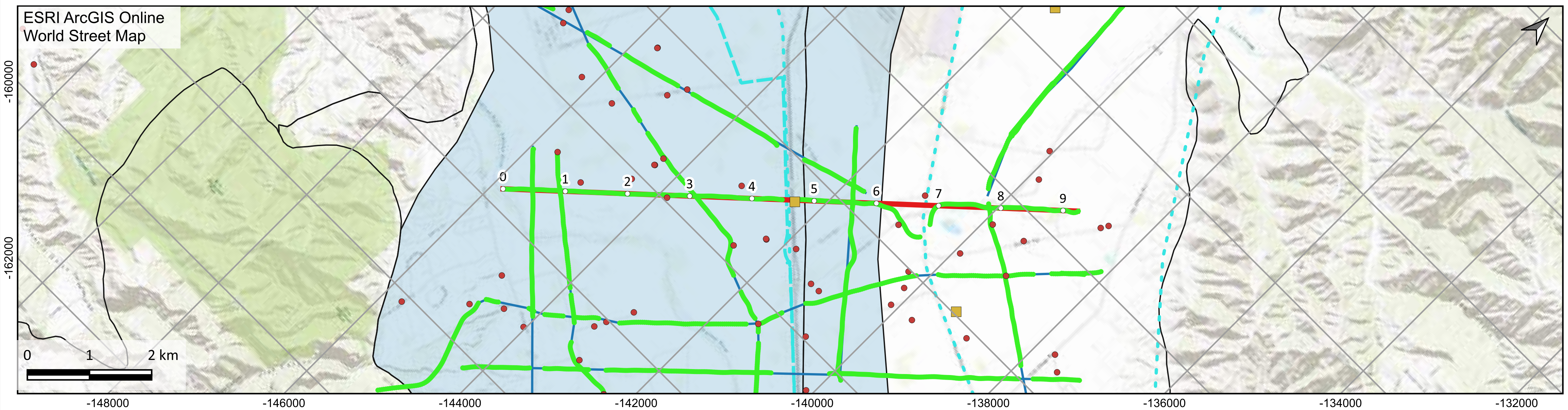
*DOI = Depth of investigation

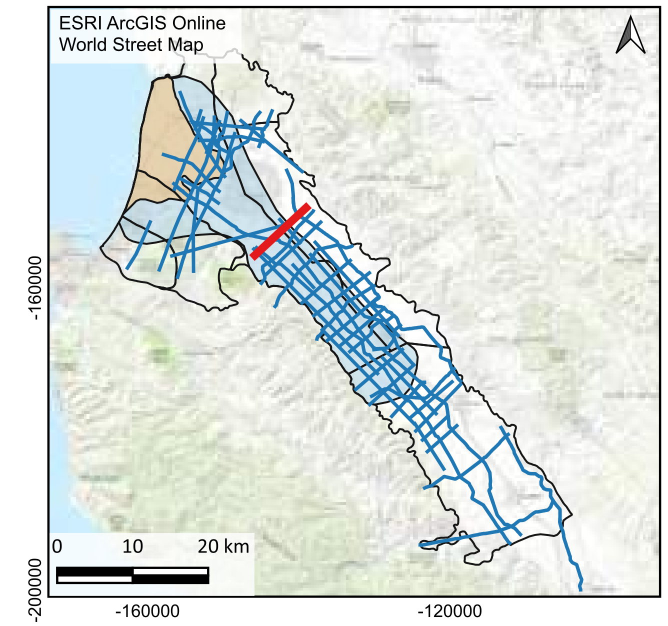


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 100400

AEM Model Sections



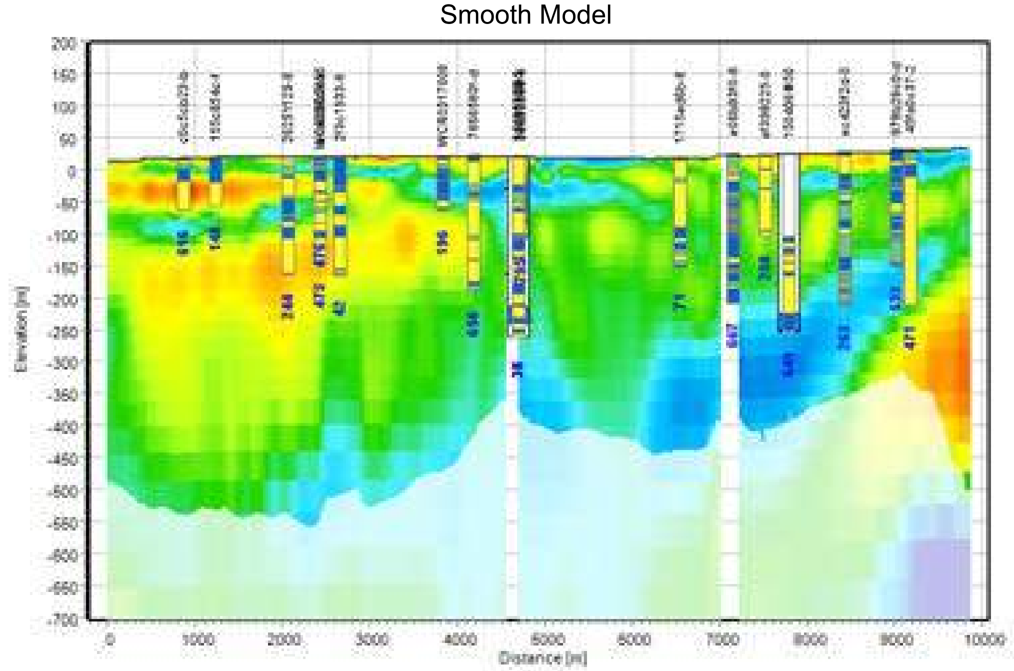


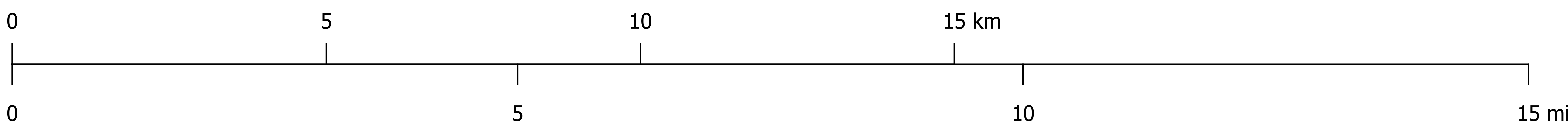
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

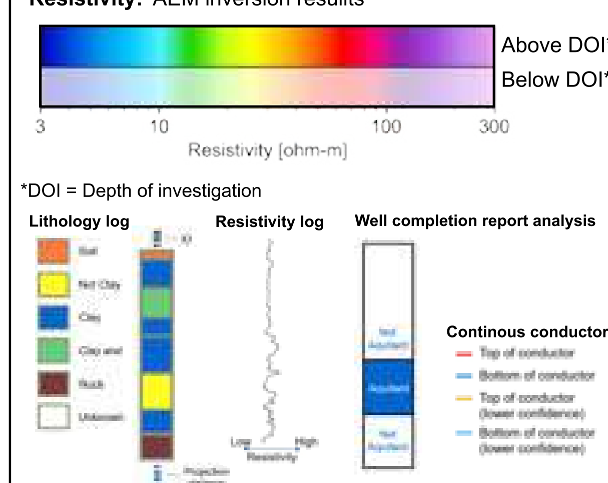
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)





Legend for Model Sections

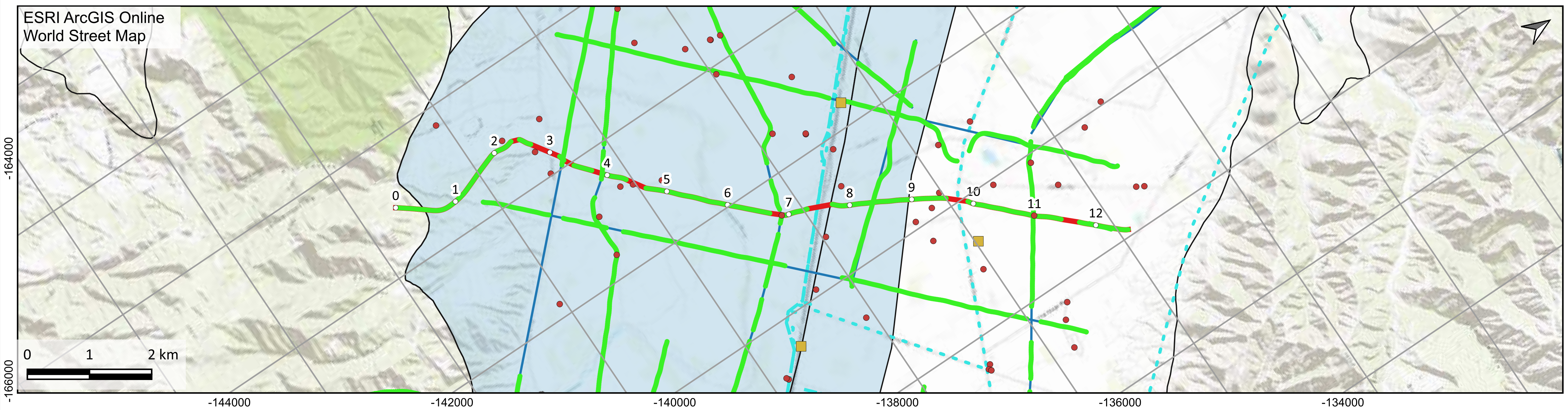
Resistivity: AEM inversion resullts

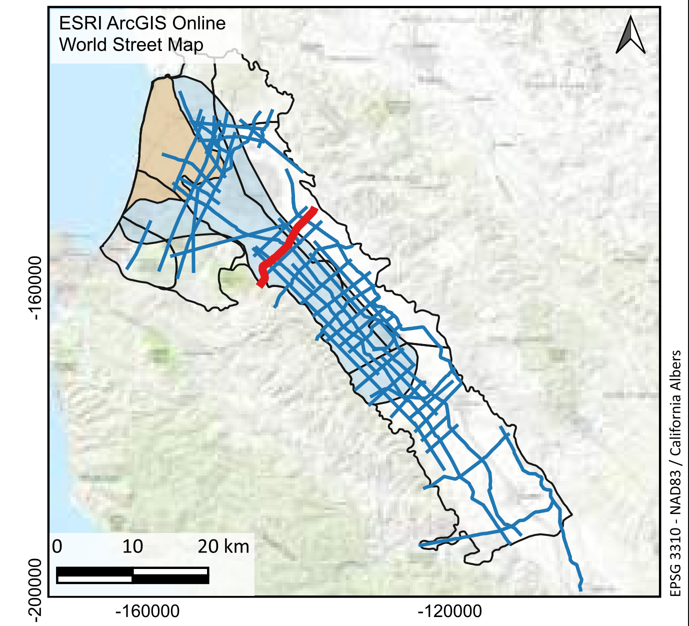


*DOI = Depth of investigation

Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

AEM Model Sections





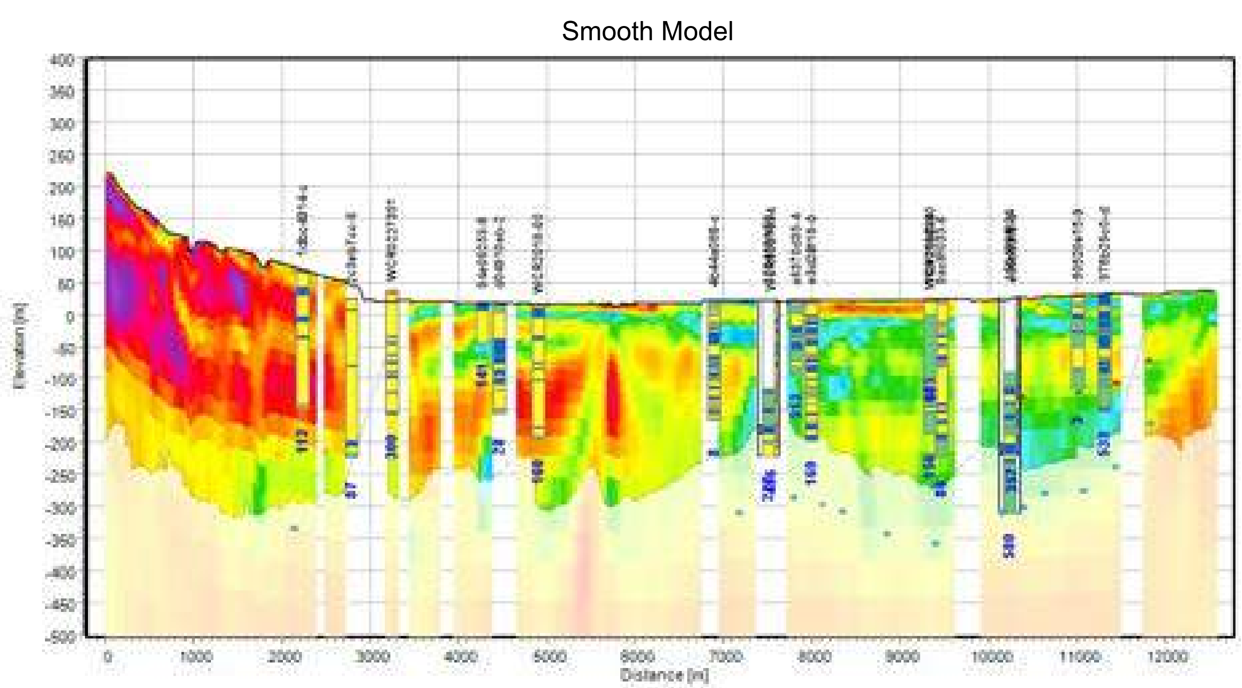
Legend for Maps

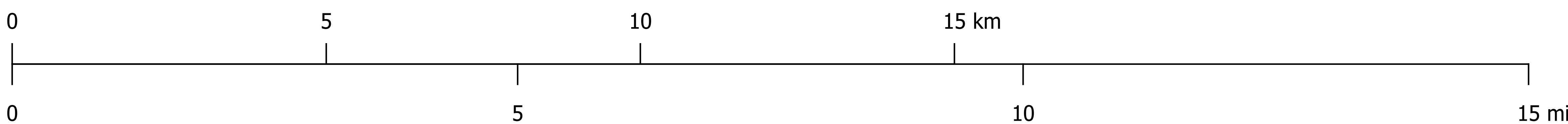
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model





Legend for Model Sections

Resistivity: AEM inversion resullts

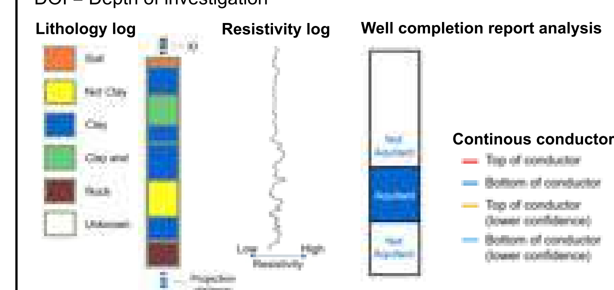
Above DOI*

Below DOI*

3 10 100 300

Resistivity [ohm-m]

*DOI = Depth of investigation



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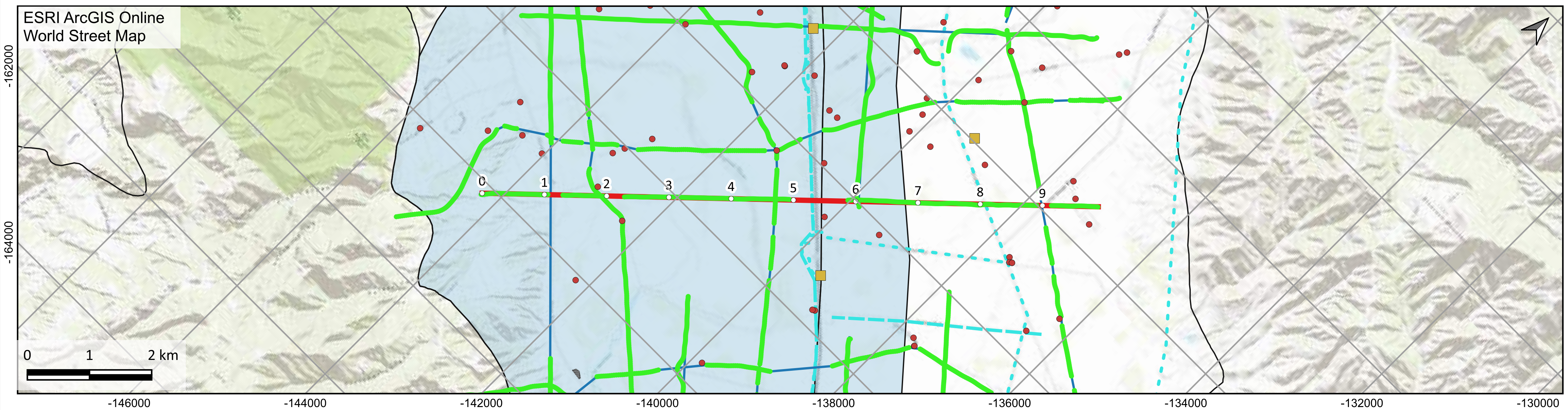
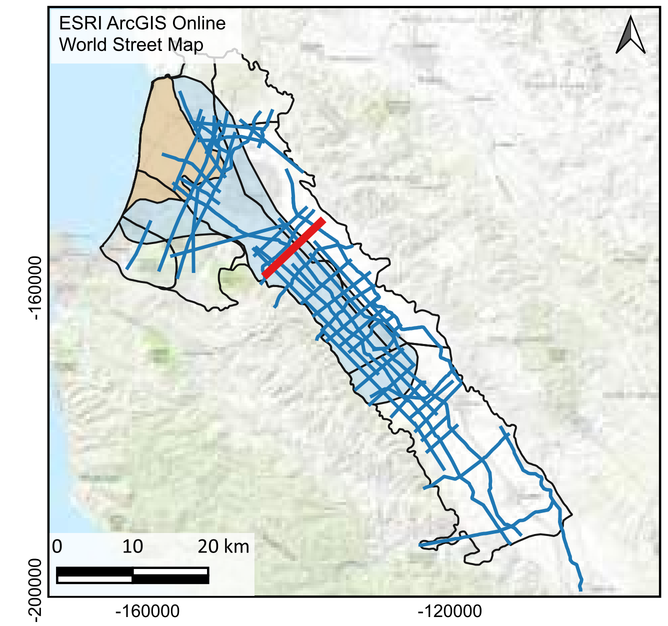
Salinas Line 100500

AEM Model Sections

RAMBOLL





EPSG 3310 - NAD83 / California Albers

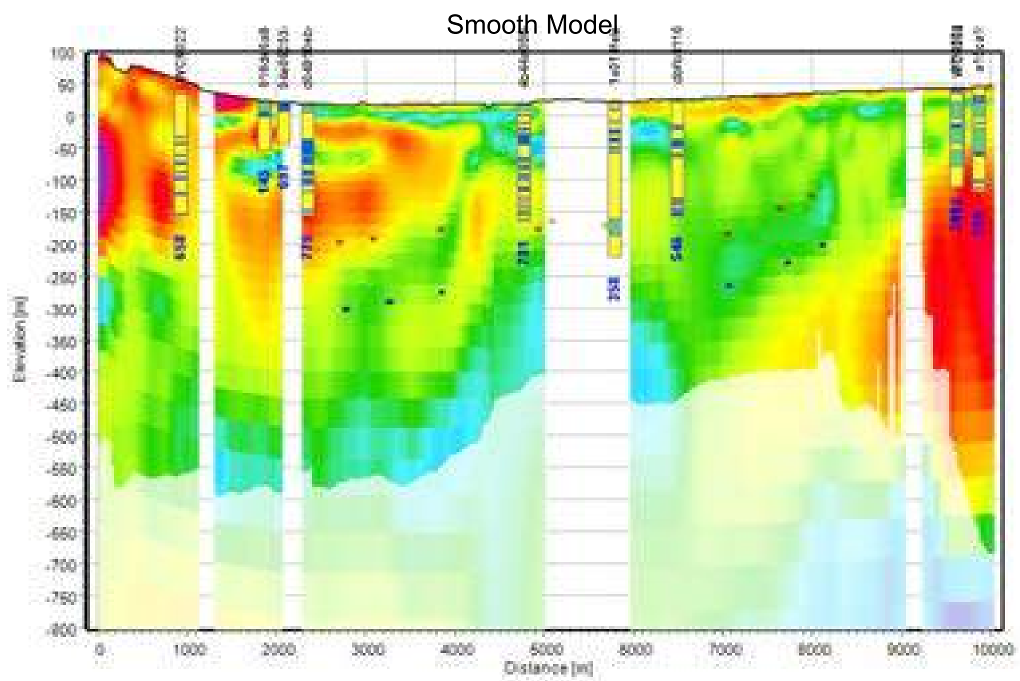
Legend for Maps

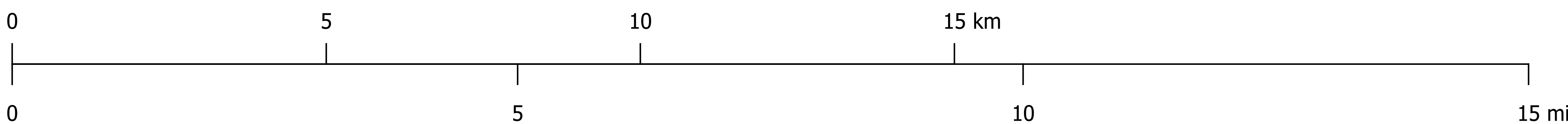
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

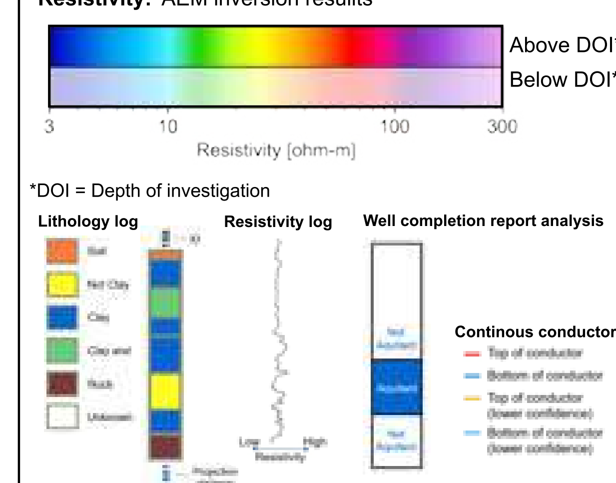
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model





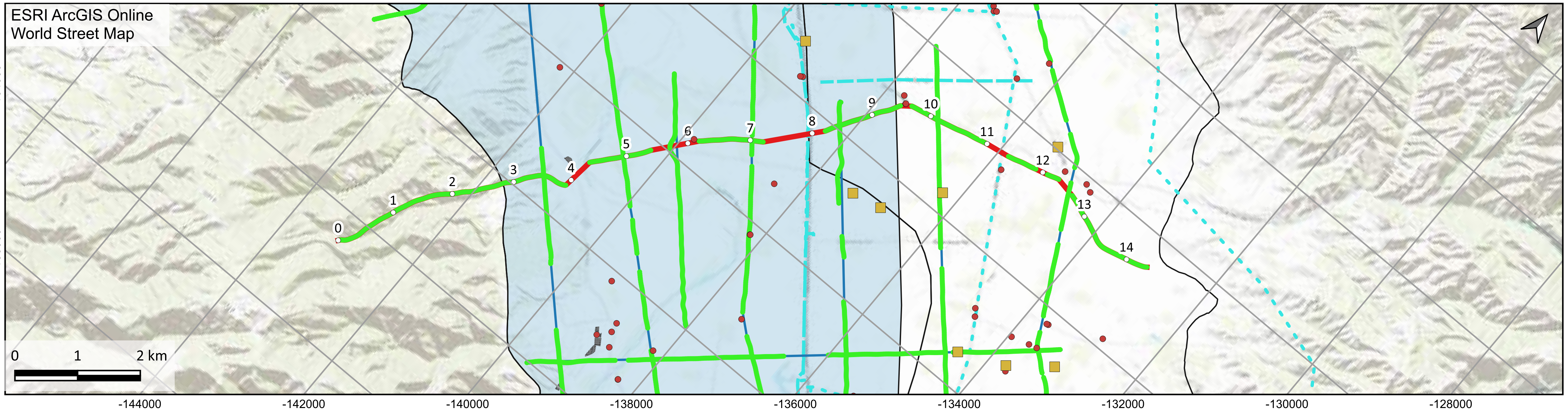
Legend for Model Sections

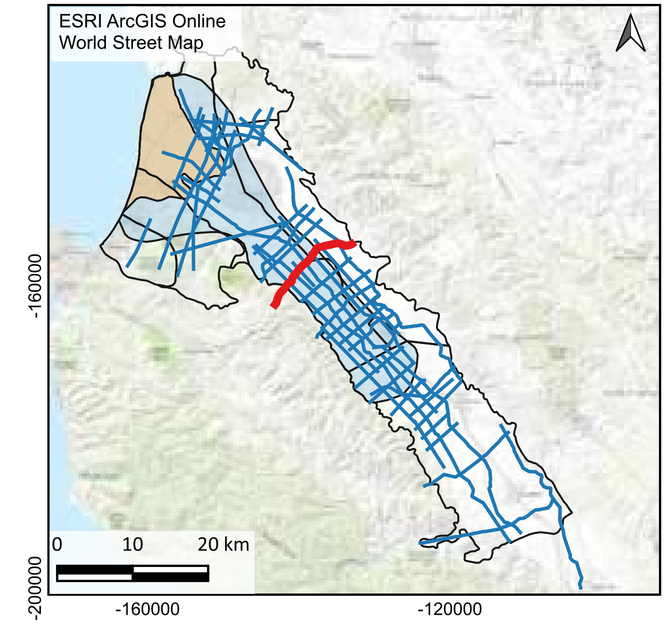


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA1_102401 **AEM Model Sections**

RAMBOLL





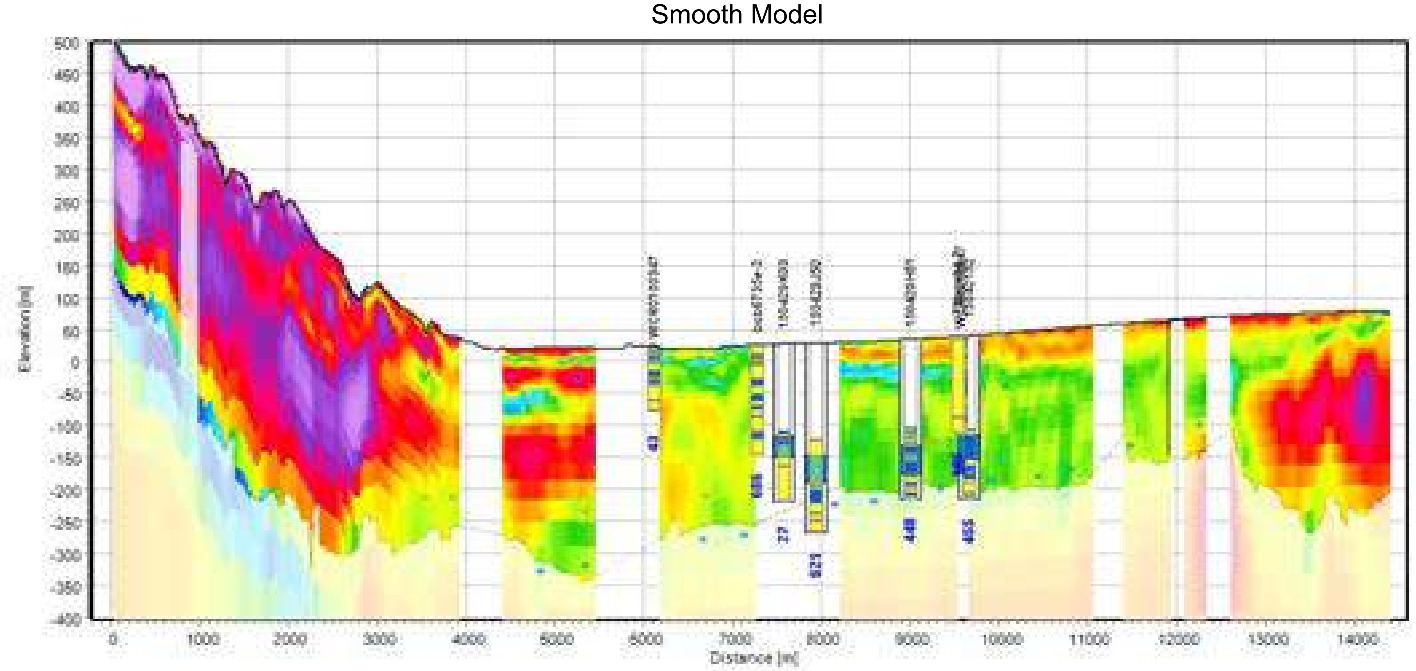
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

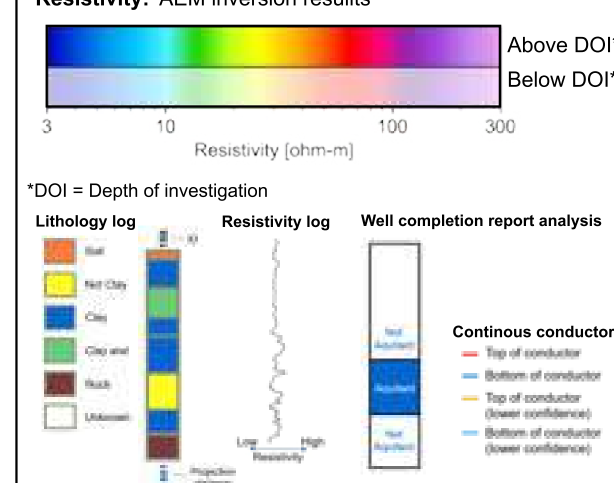
Smooth Model



0 5 10 15 km

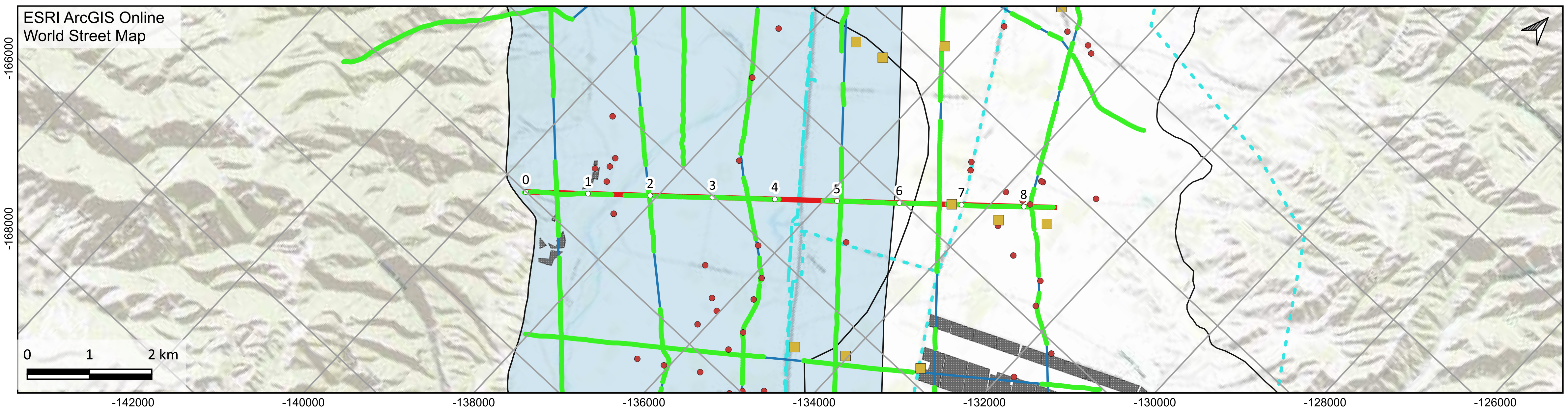
0 5 10 15 mi

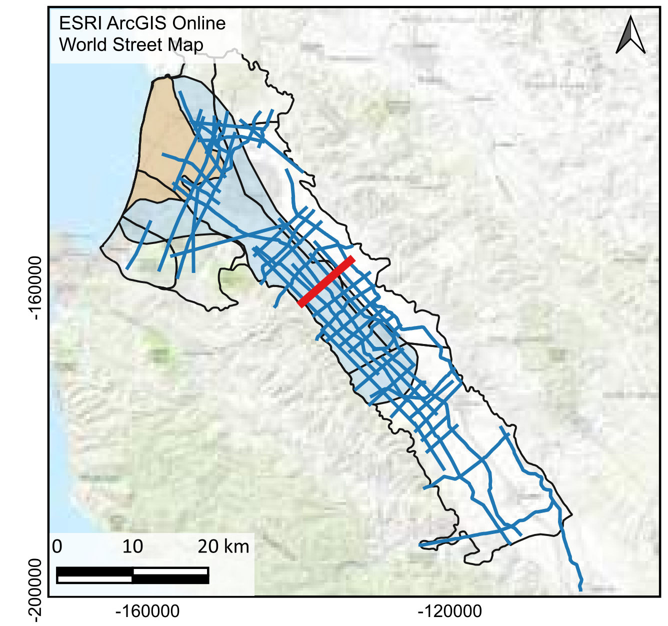
Legend for Model Sections



Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

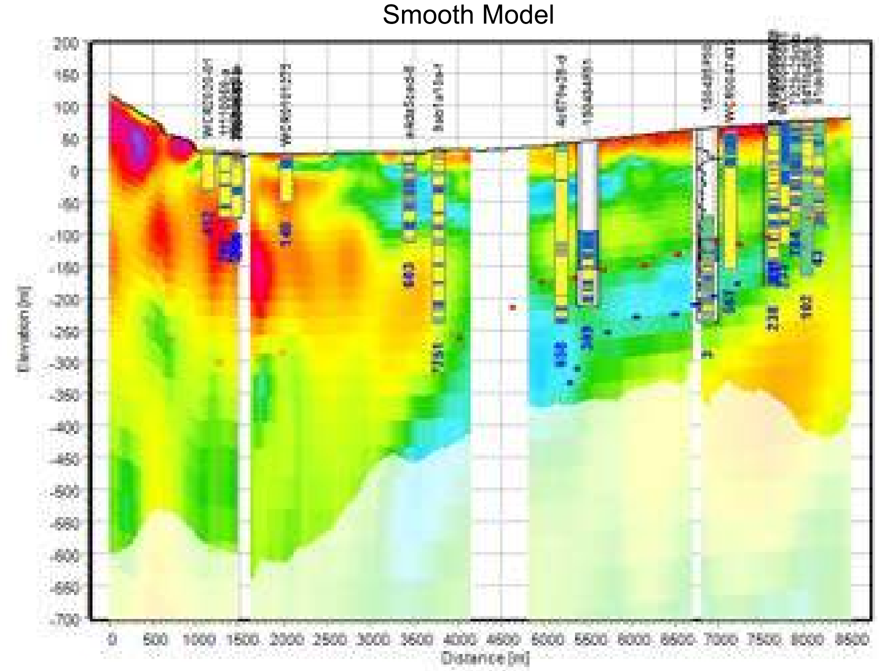
AEM Model Sections

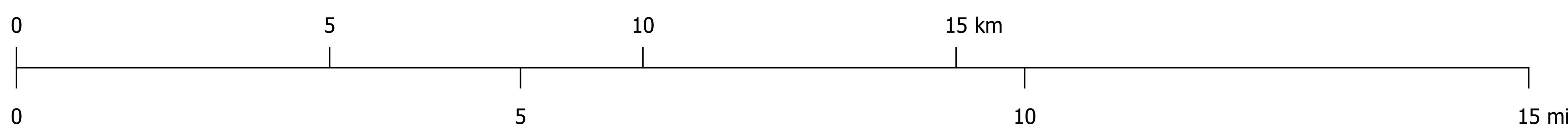




EPSG 3310 - NAD83 / California Albers

Smooth Model





Legend for Maps

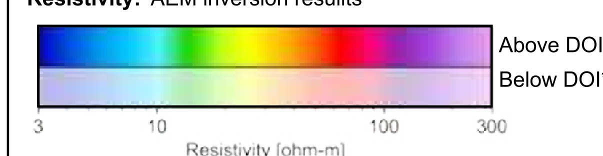
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

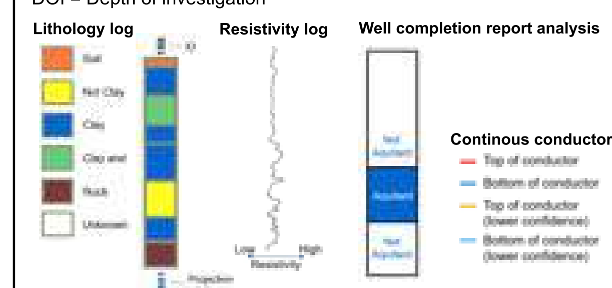
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Legend for Model Sections

Resistivity: AEM inversion resullts



*DOI = Depth of investigation



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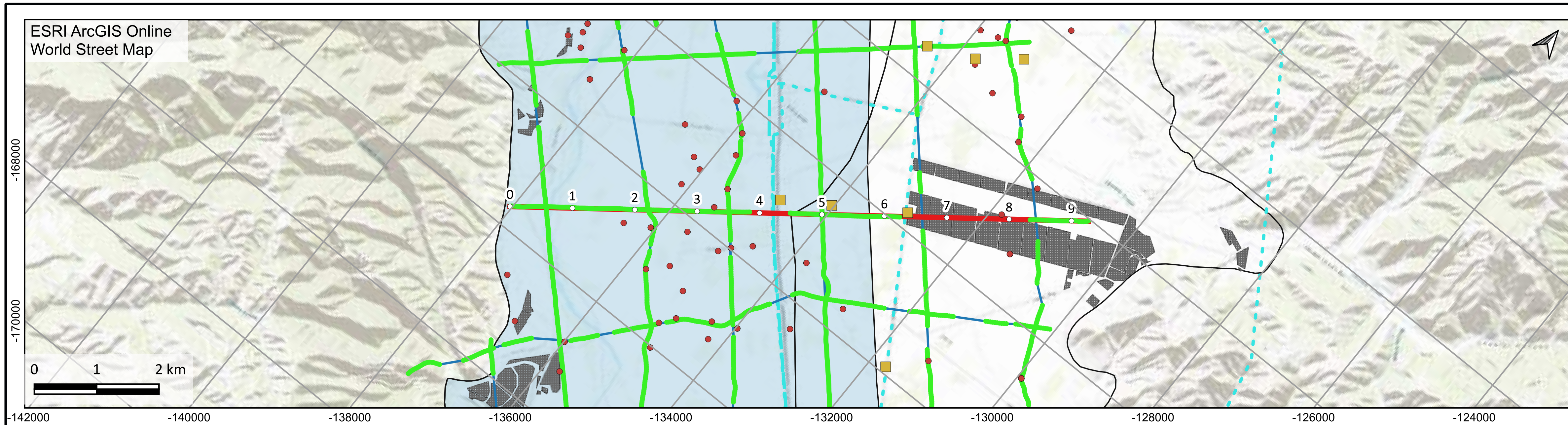
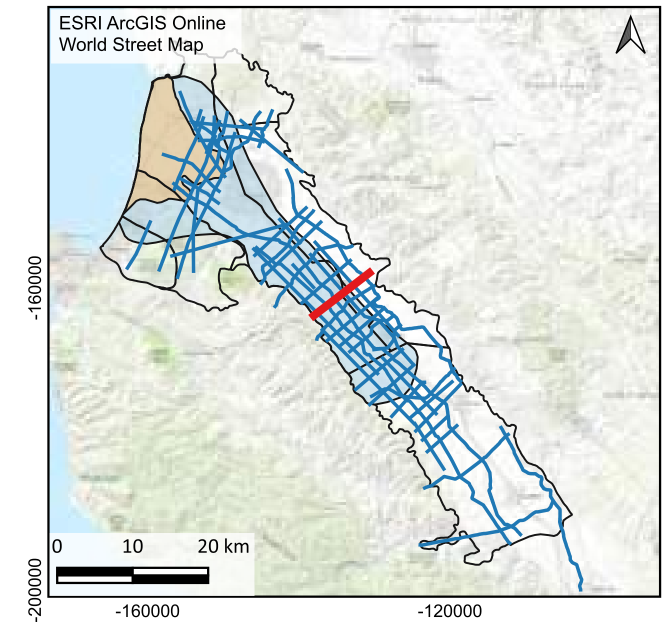
Salinas Line 100700

AEM Model Sections





EPSG 3310 - NAD83 / California Albers

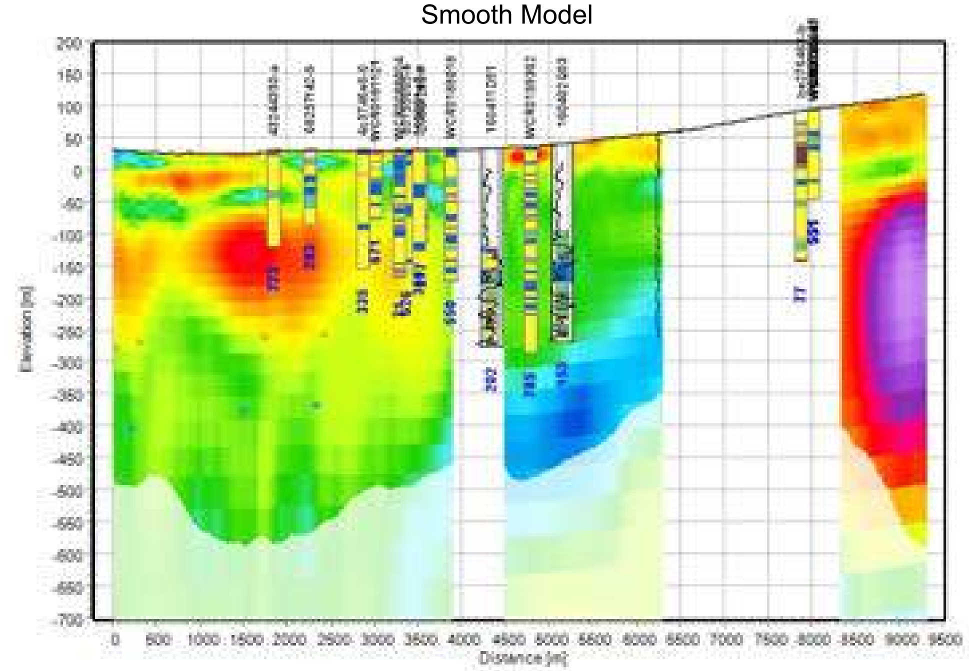
Legend for Maps

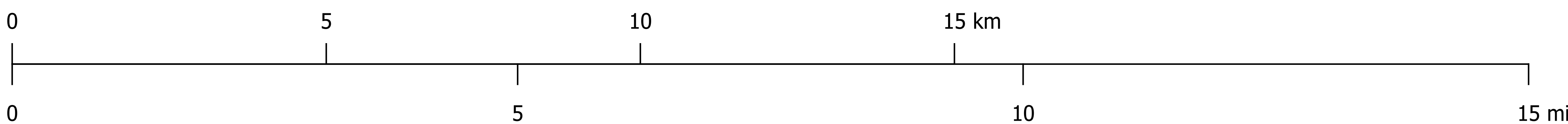
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

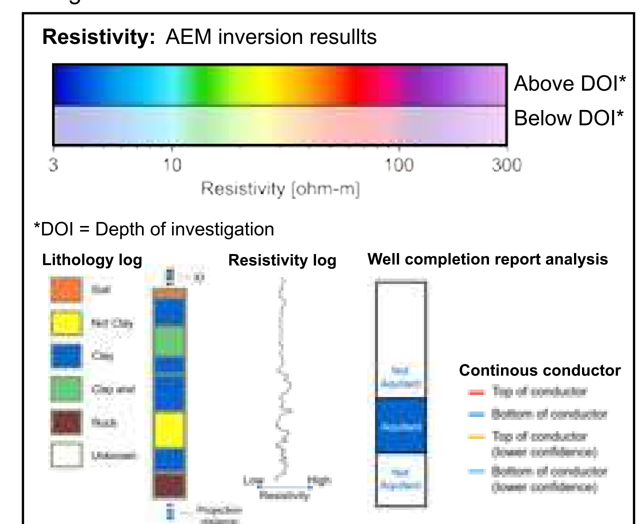
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model





Legend for Model Sections



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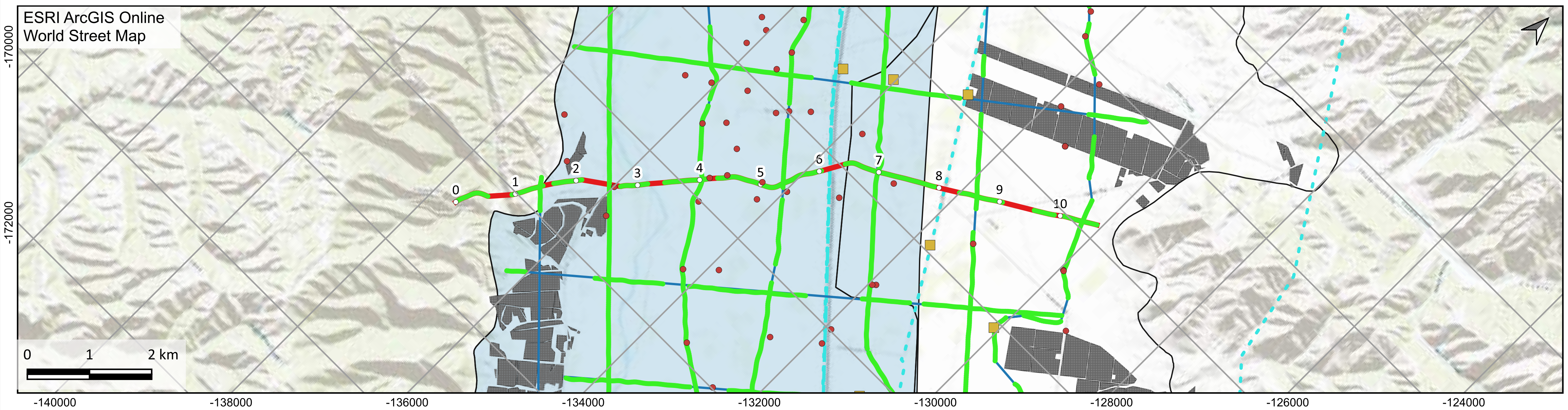
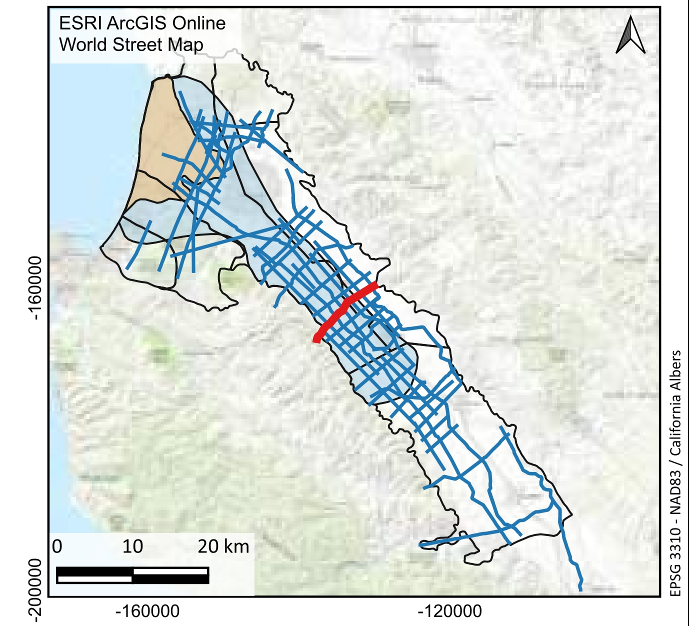
Salinas Line DWR_SA1_102501

AEM Model Sections





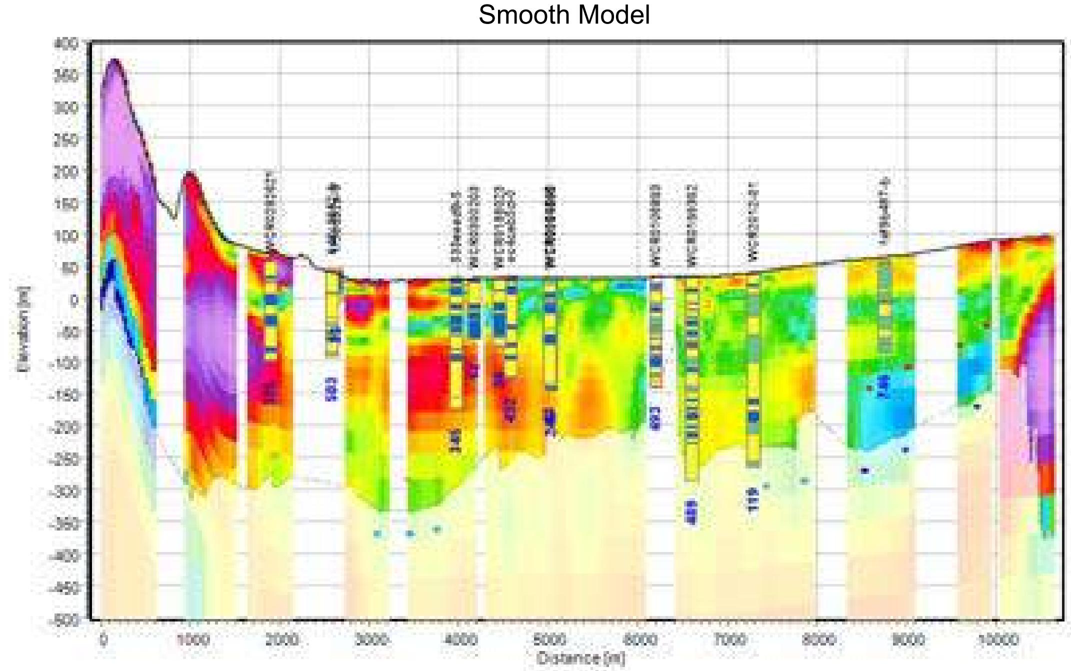
Legend for Maps

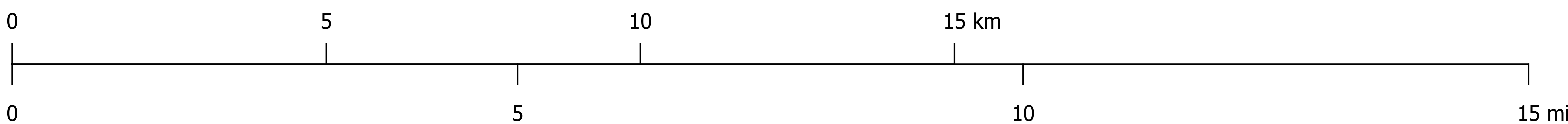
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

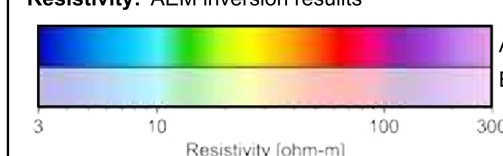
Smooth Model



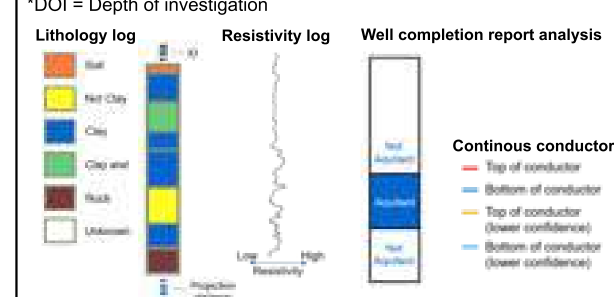


Legend for Model Sections

Resistivity: AEM inversion resullts



*DOI = Depth of investigation



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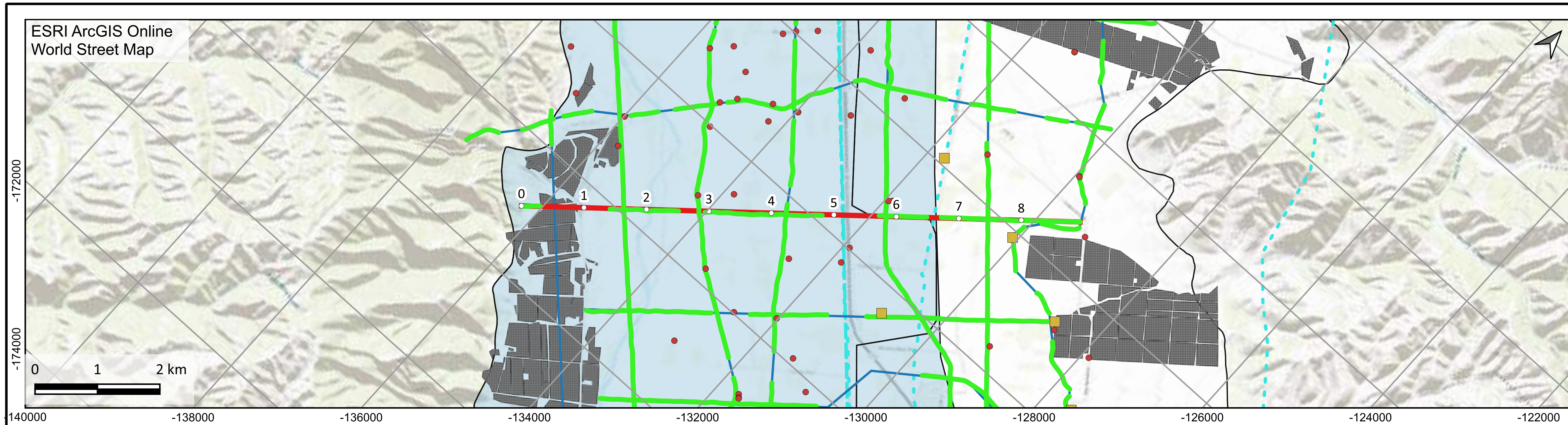
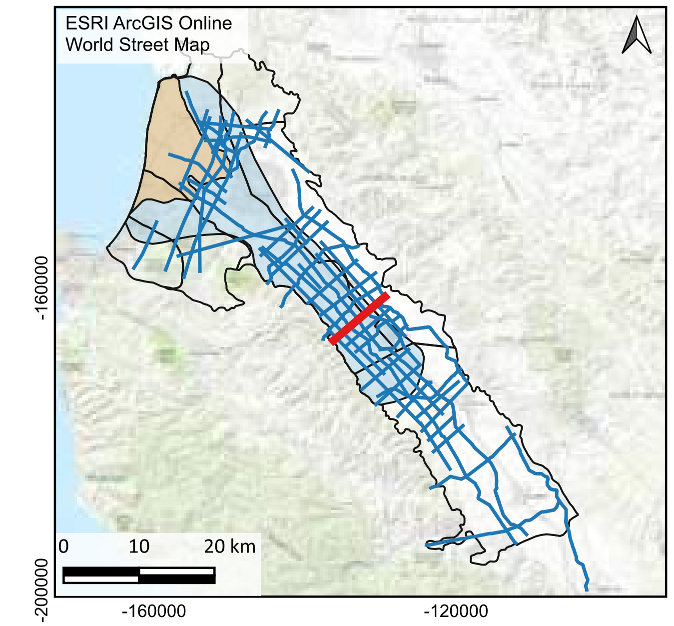
Salinas Line 100800

AEM Model Sections





EPSG 3310 - NAD83 / California Albers

Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
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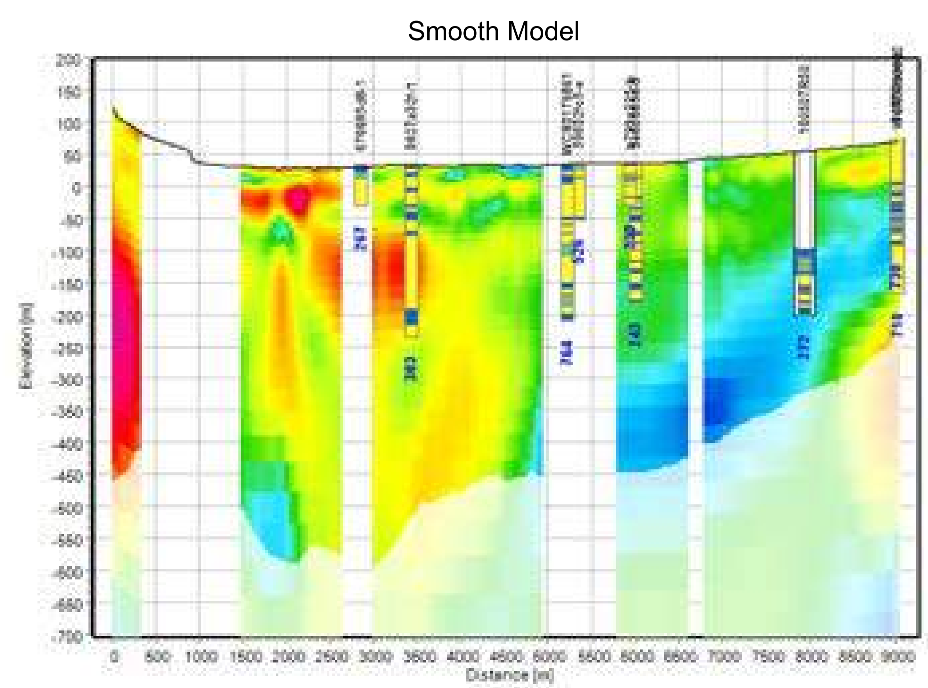
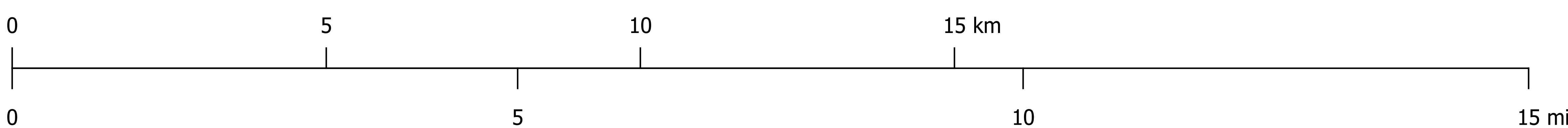
AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

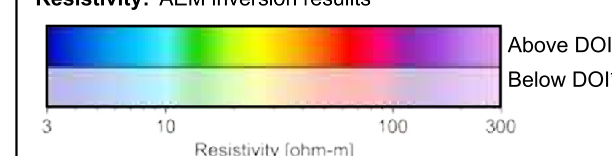
Smooth Model





Legend for Model Sections

Resistivity: AEM inversion resullts



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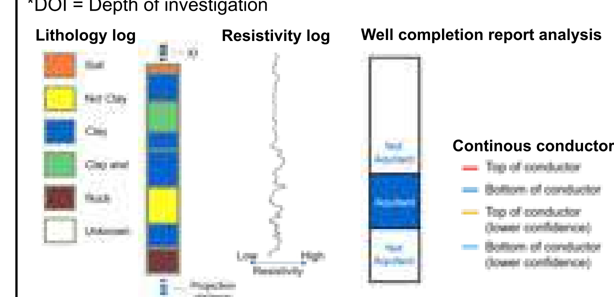
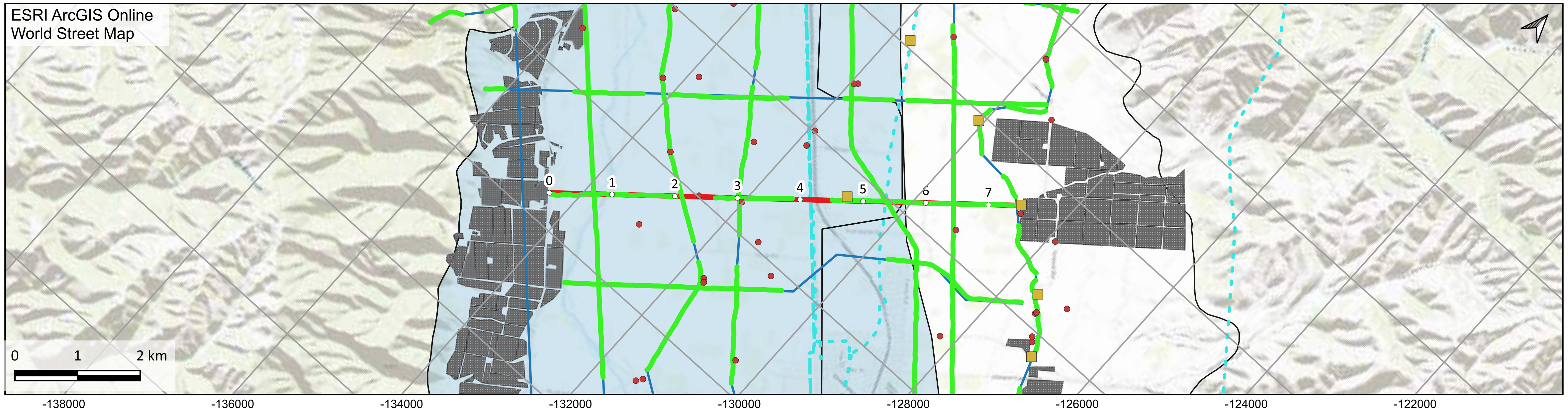


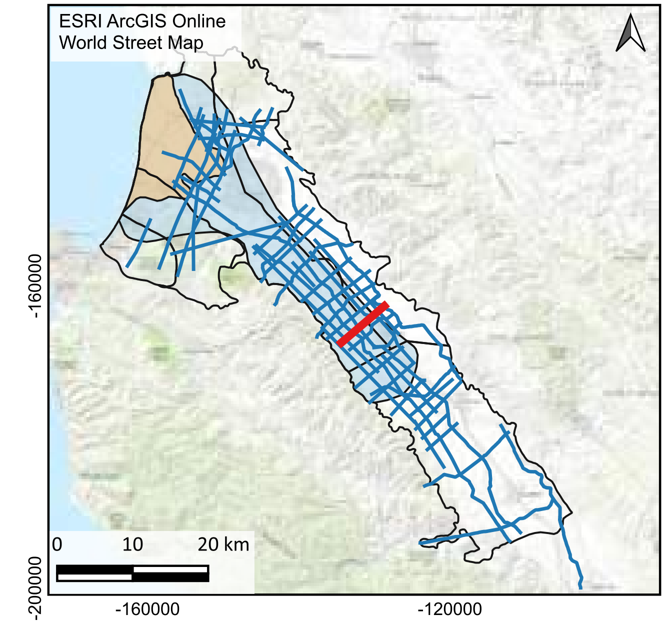
Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 100900

AEM Model Sections

RAMBOLL





EPSG 3310 - NAD83 / California Albers

Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
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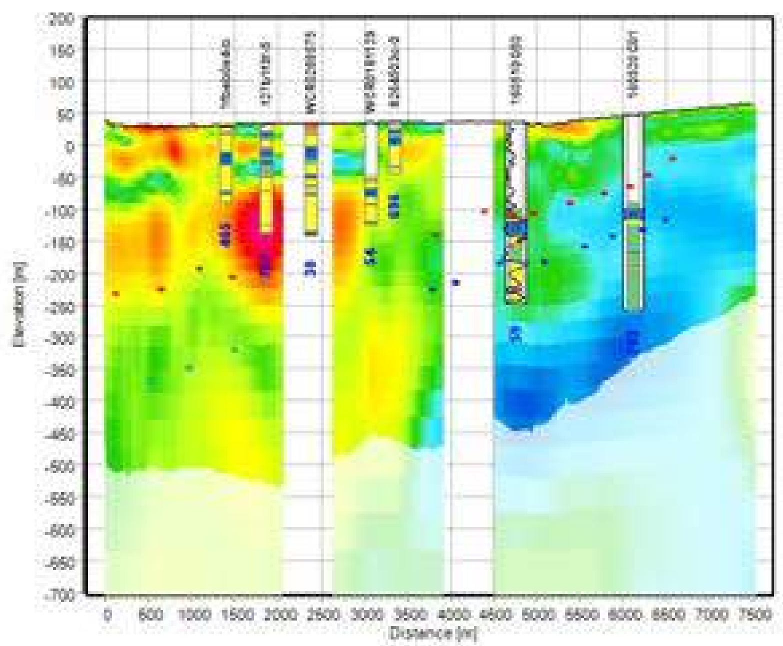
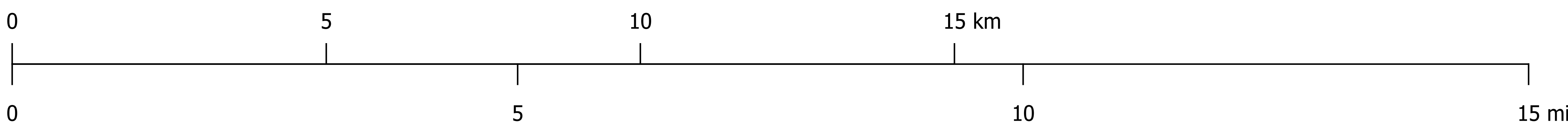
AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model





Legend for Model Sections

Resistivity: AEM inversion resullts

Above DOI*

Below DOI*

3 10 100 300

Resistivity [ohm-m]

*DOI = Depth of investigation

Lithology log

Resistivity log

Well completion report analysis

Continous conductor

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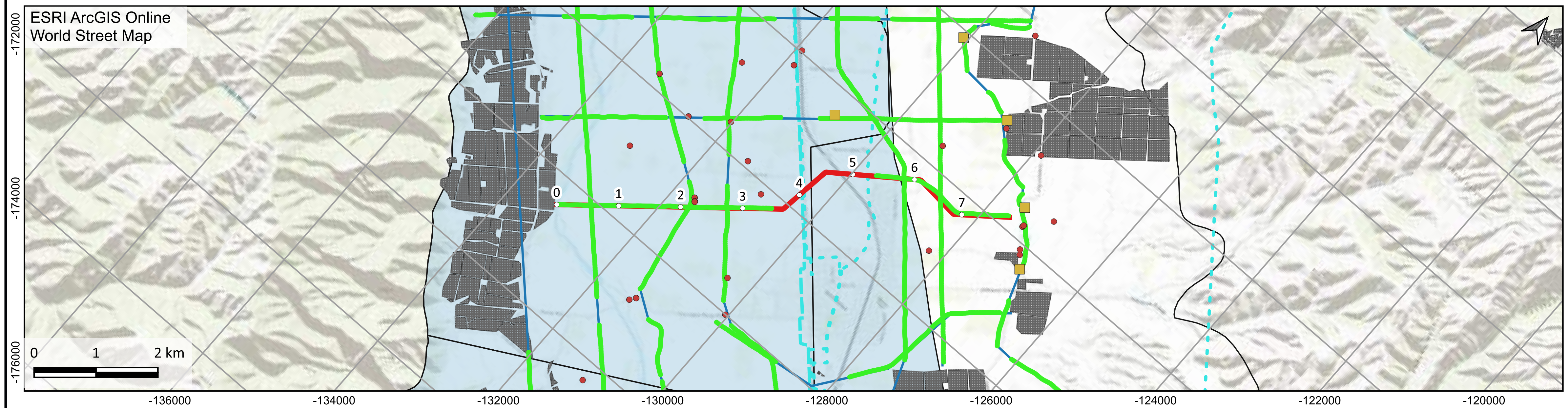
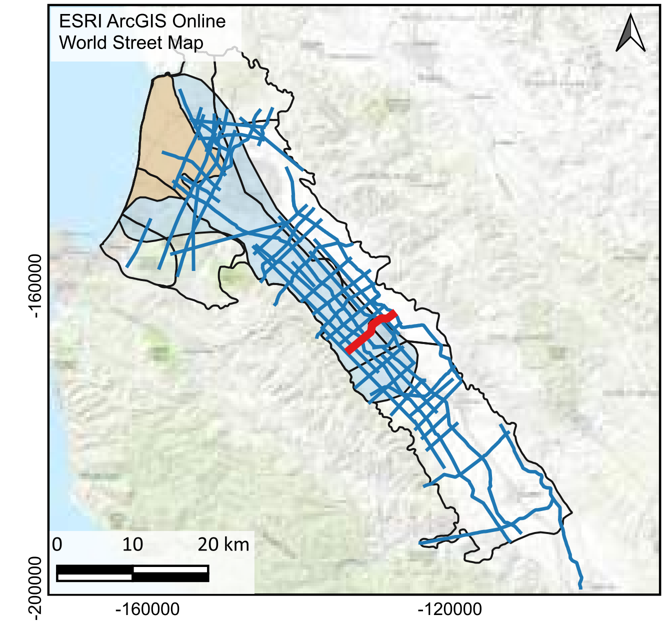
Salinas Line 101000

AEM Model Sections





Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
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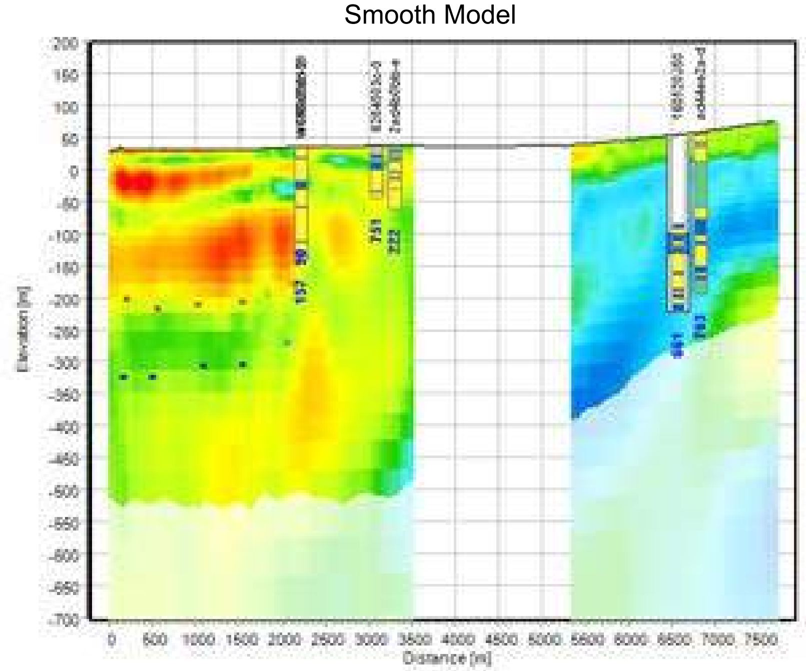
AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model

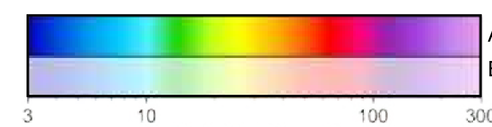


0 5 10 15 km

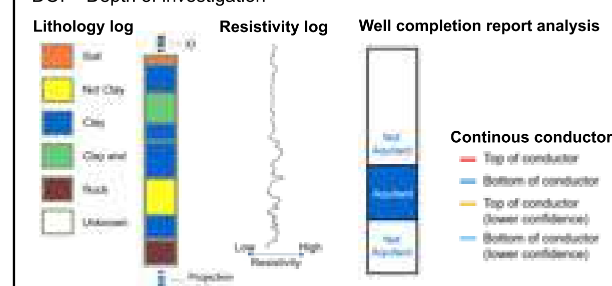
0 5 10 15 mi

Legend for Model Sections

Resistivity: AEM inversion resullts



*DOI = Depth of investigation



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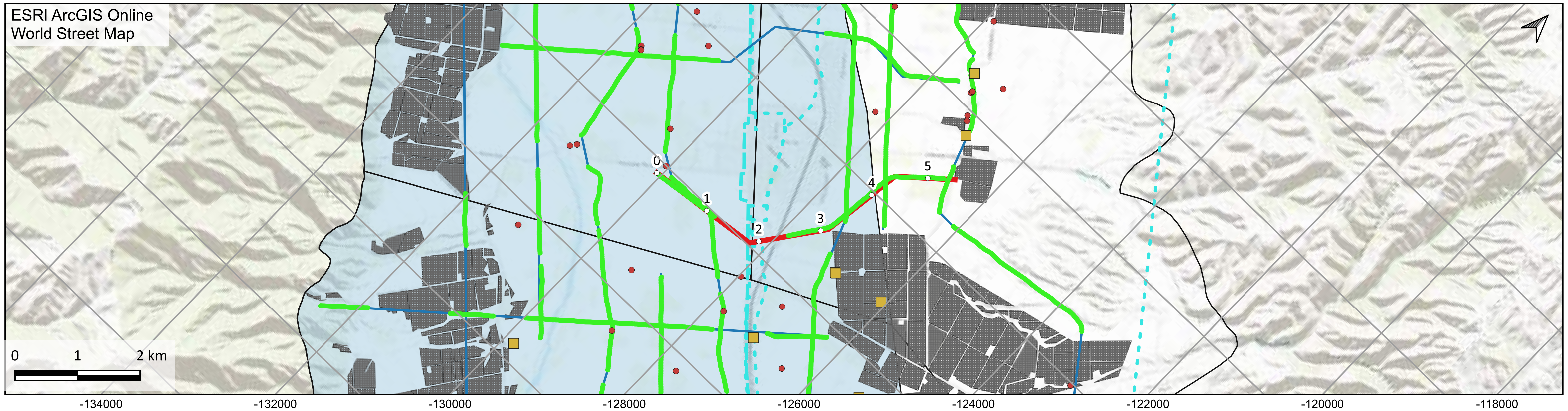
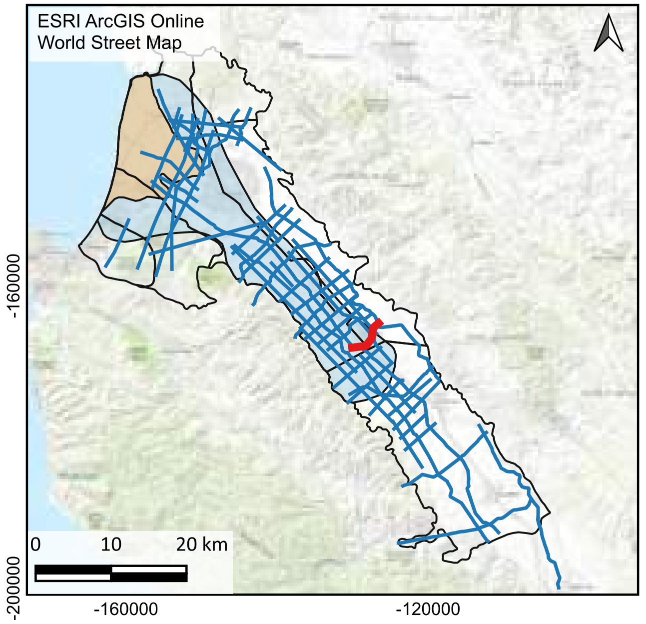
Salinas Line 101100

AEM Model Sections





Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
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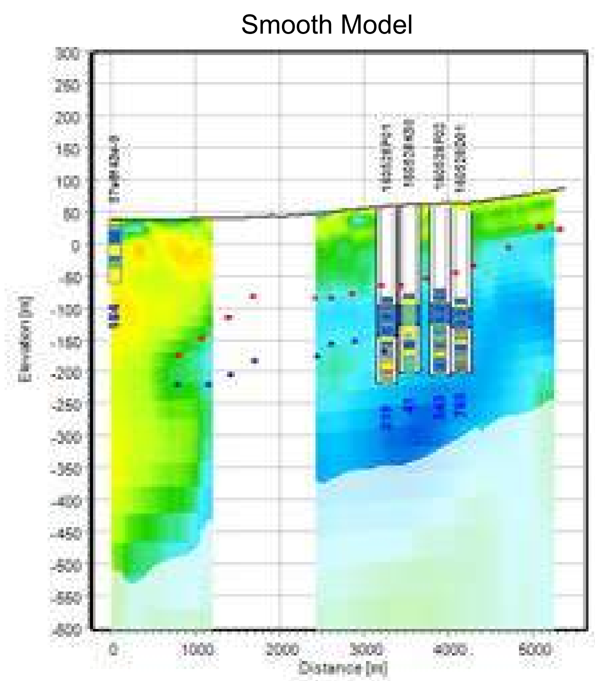
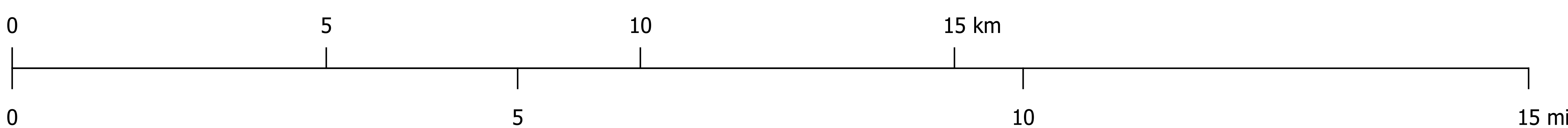
AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)





Legend for Model Sections

Resistivity: AEM inversion resullts

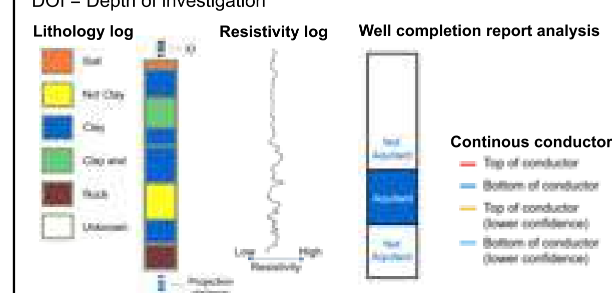
Above DOI*

Below DOI*

3 10 100 300

Resistivity [ohm-m]

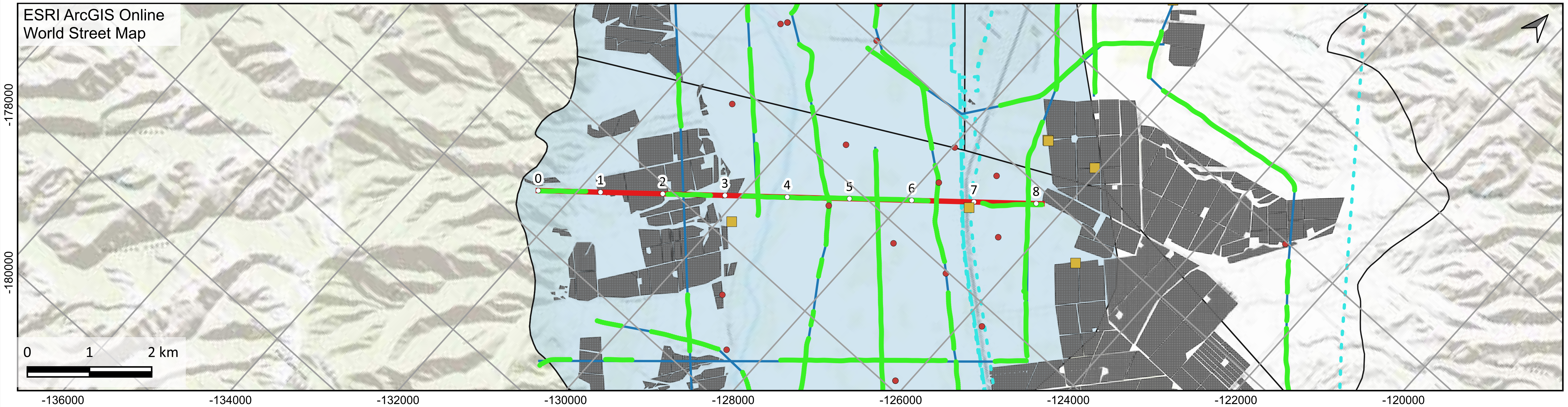
*DOI = Depth of investigation

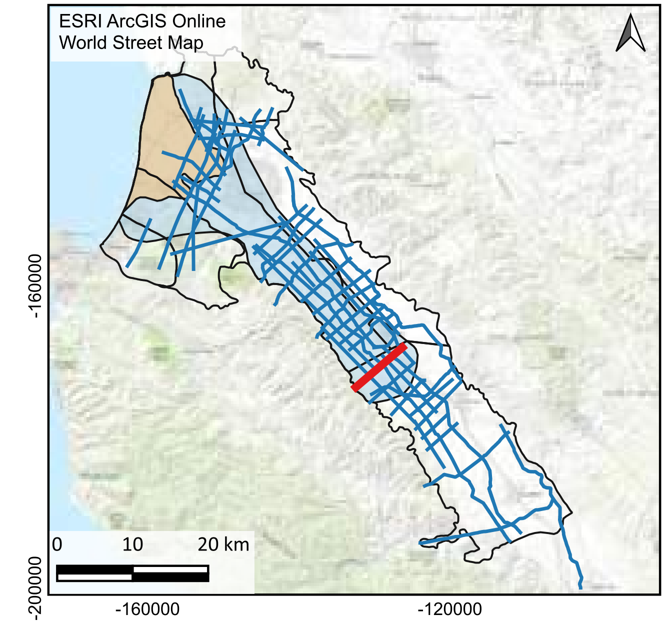


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 101200

AEM Model Sections





Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
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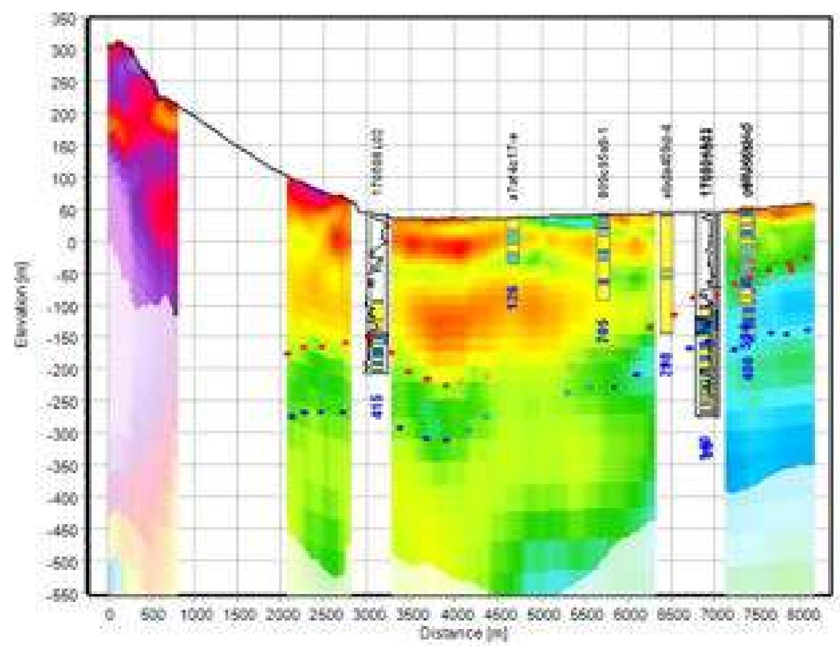
AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

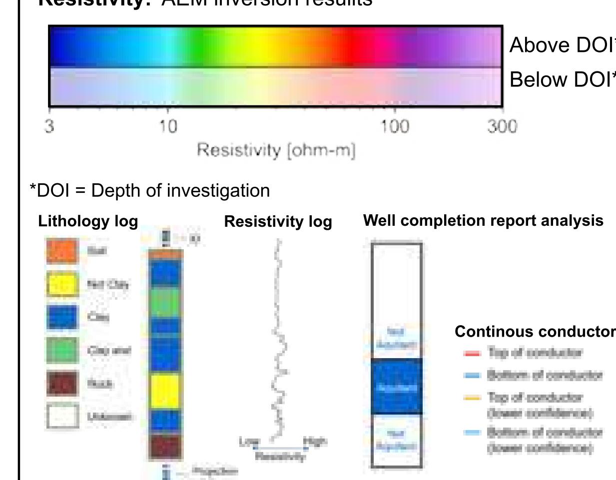
Smooth Model



0 5 10 15 km

0 5 10 15 mi

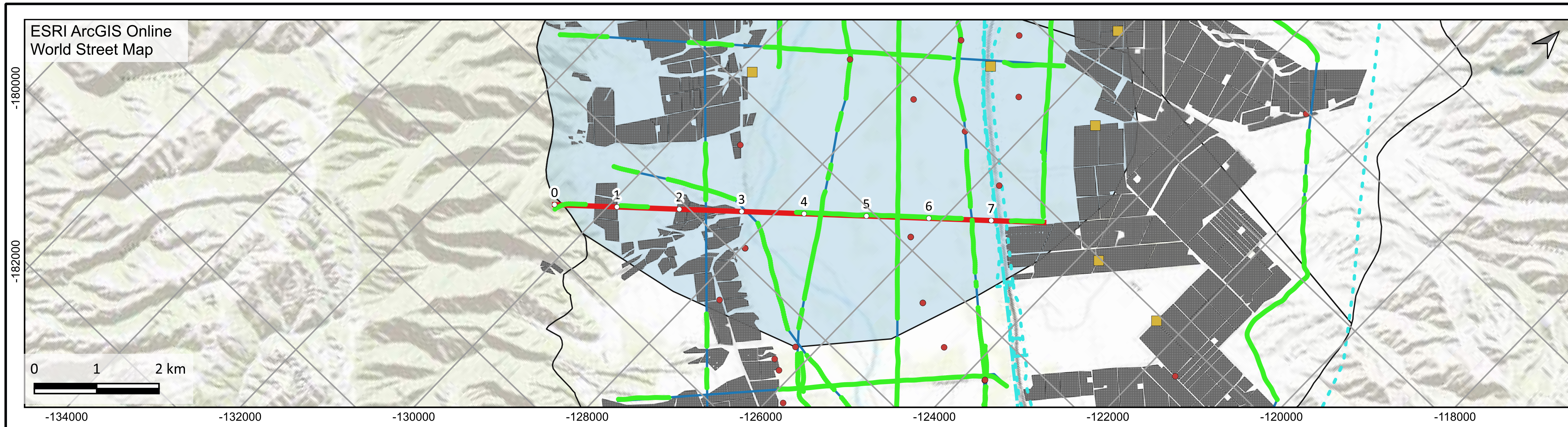
Legend for Model Sections

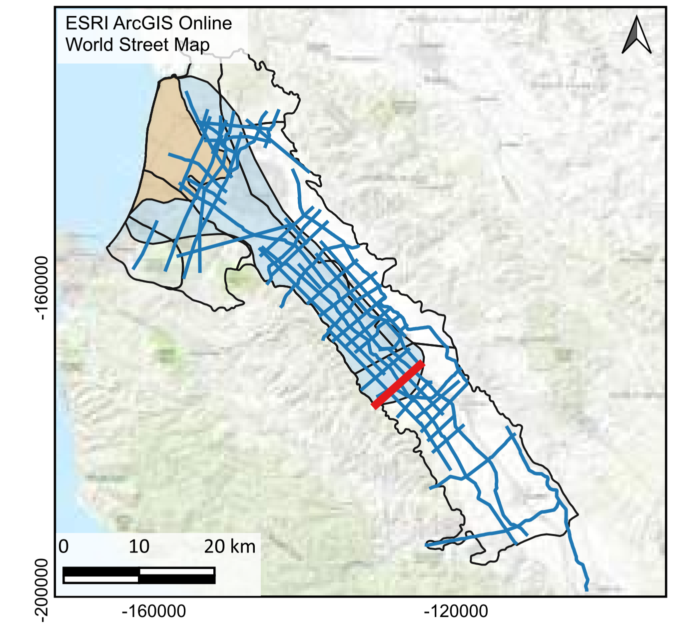


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 101300

AEM Model Sections





Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
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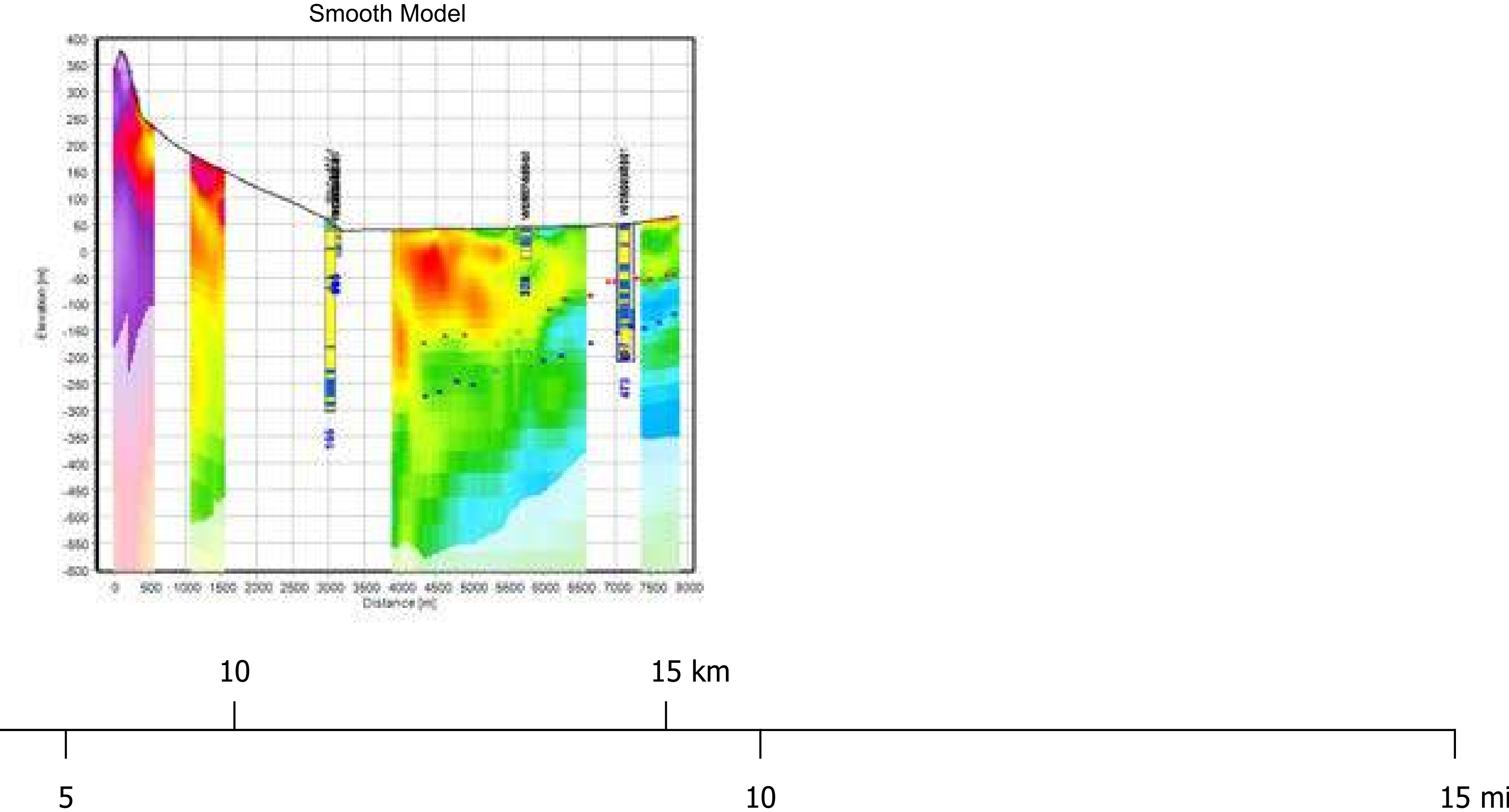
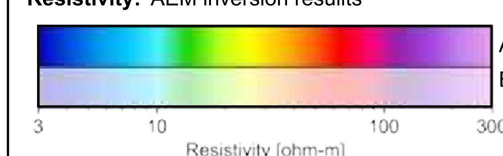
AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)



Legend for Model Sections

Resistivity: AEM inversion resullts



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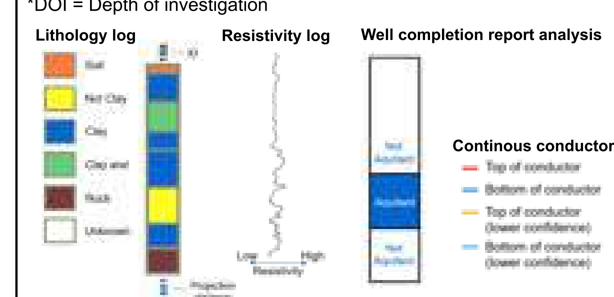

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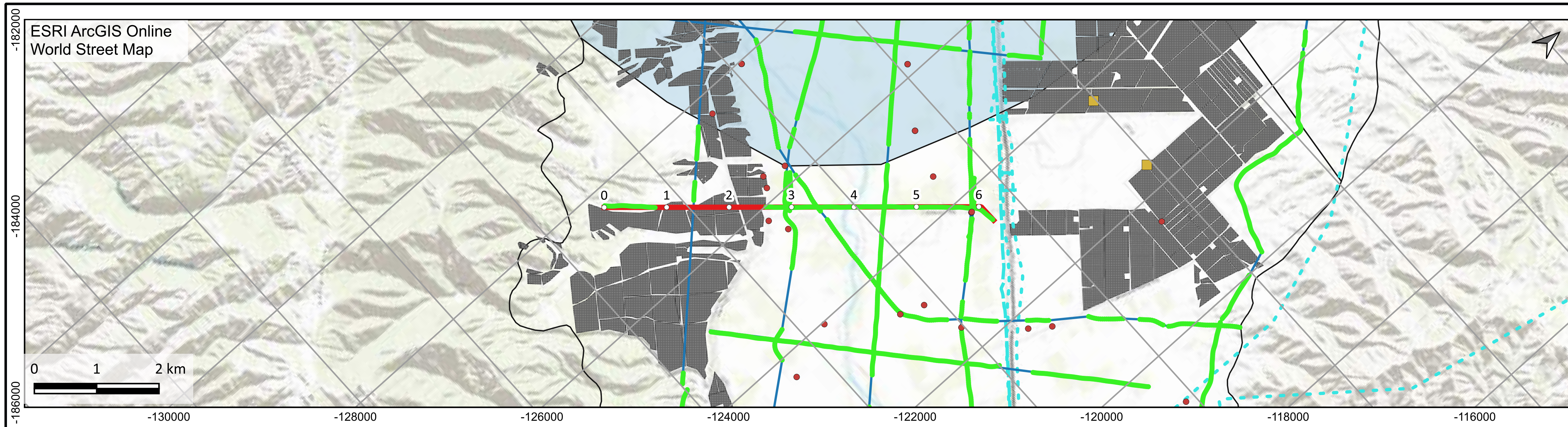
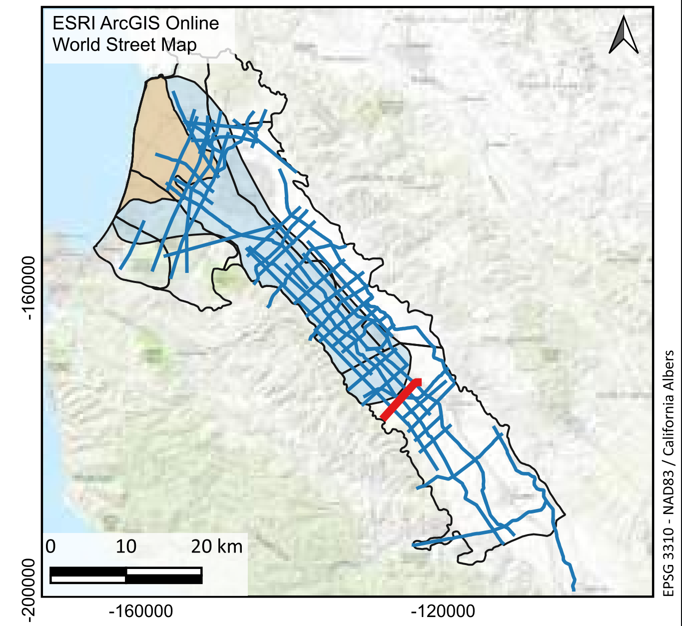
Salinas Line 101400

AEM Model Sections

RAMBOLL





Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
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- 180-Foot Aquifer Cl- Contour
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AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
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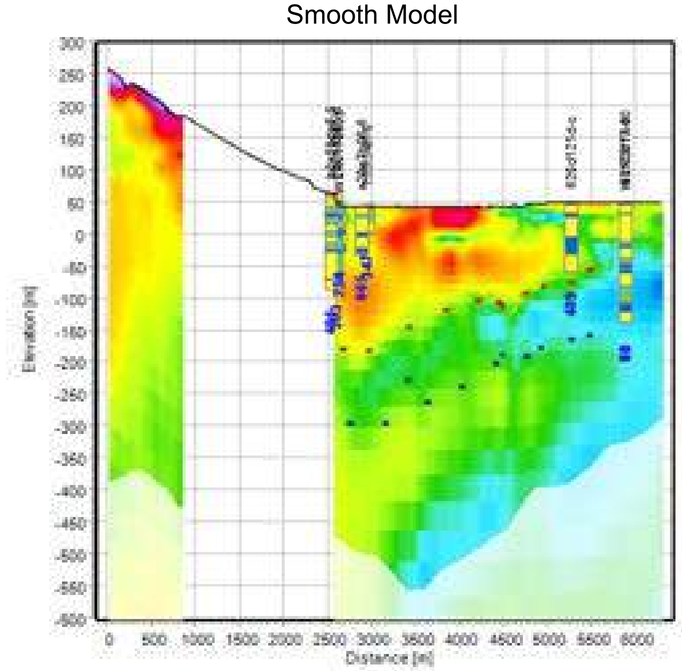
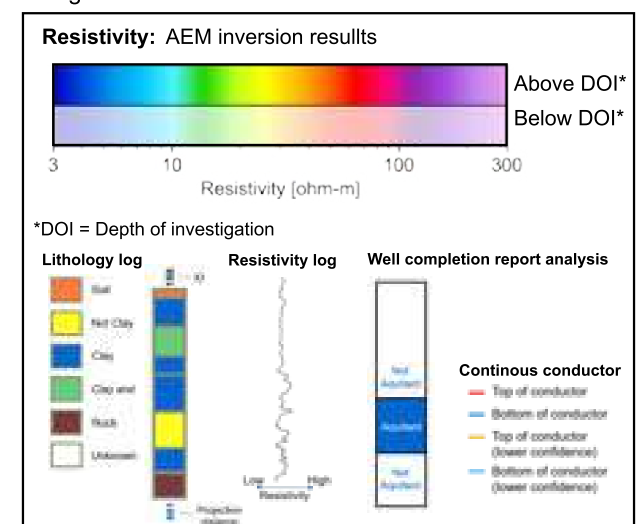
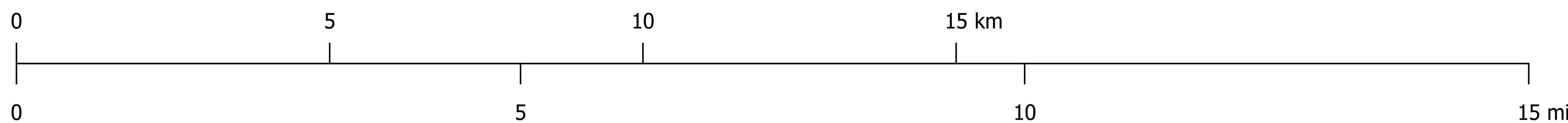
Smooth Model



Legend for Model Sections





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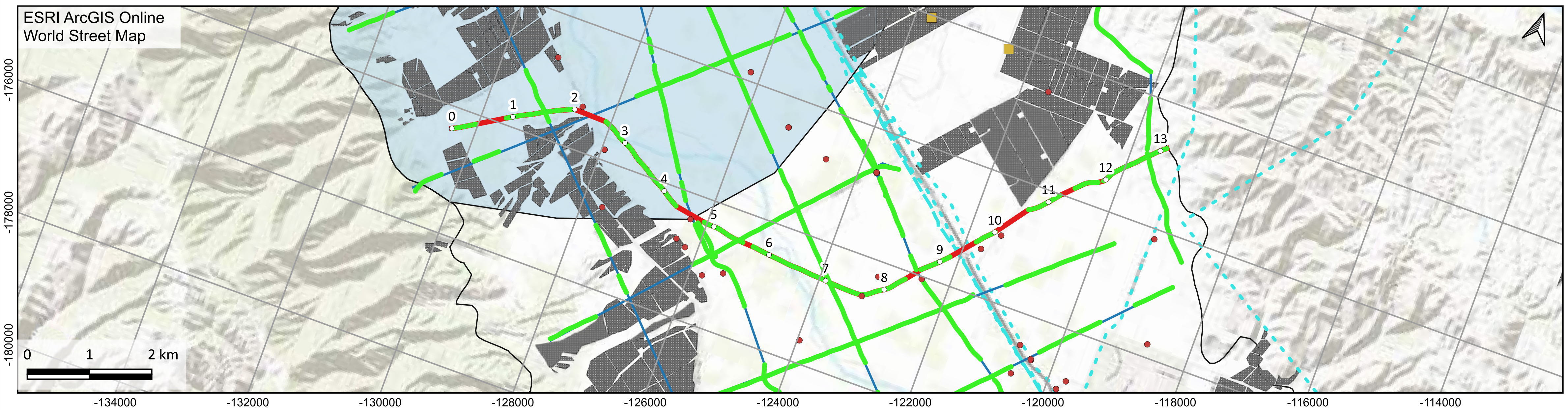
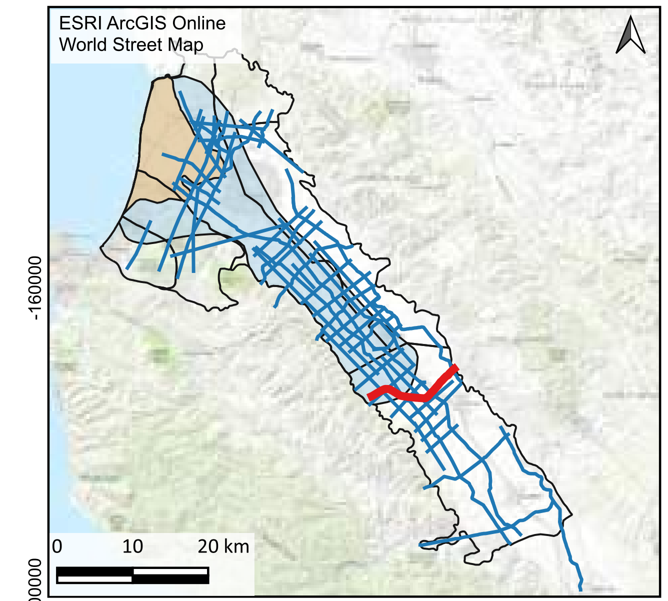
AEM Model Sections





Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
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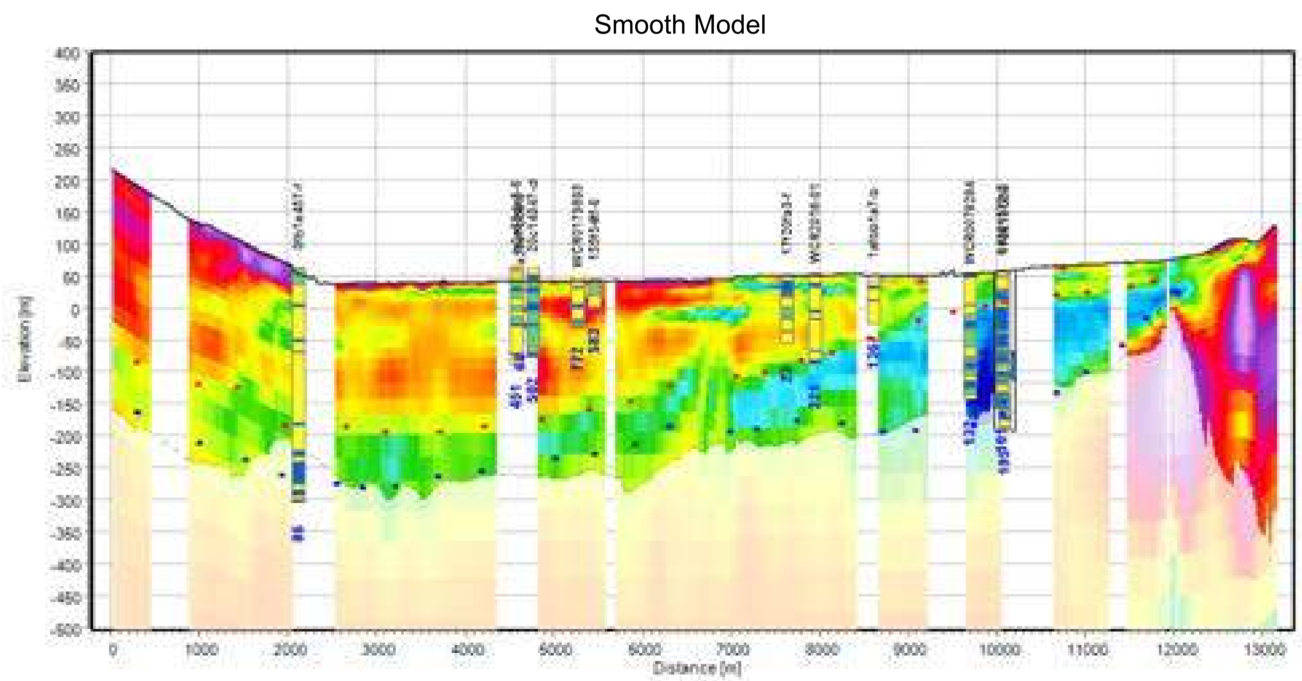
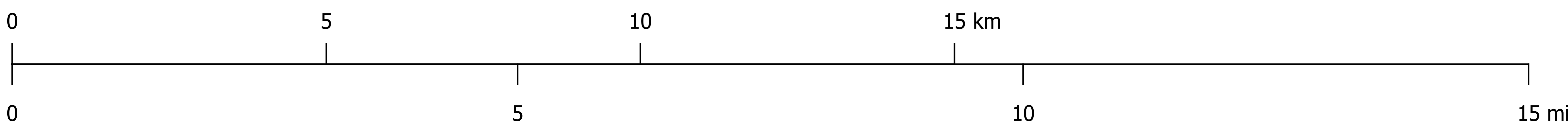
AEM data used for inversion

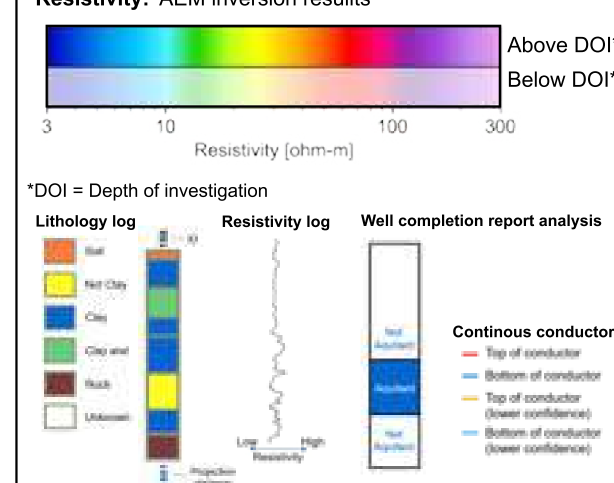
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)





Legend for Model Sections

Resistivity: AEM inversion resullts



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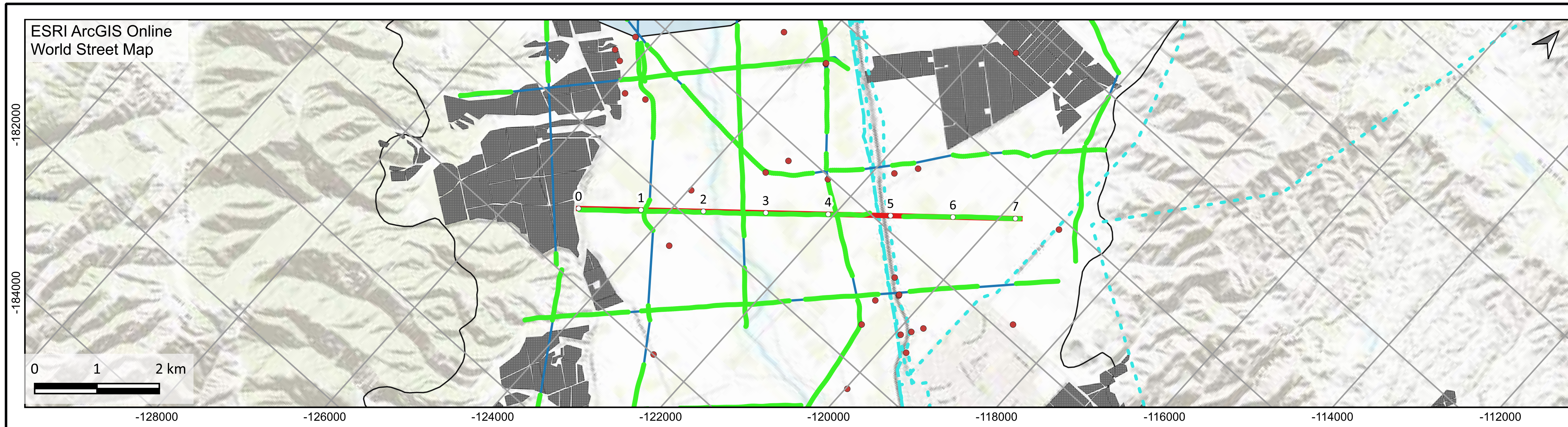
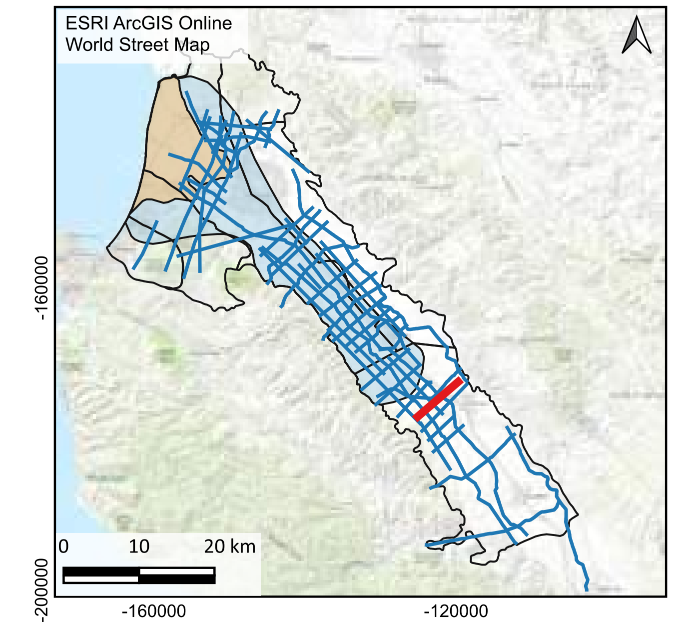
Salinas Line 101500

AEM Model Sections





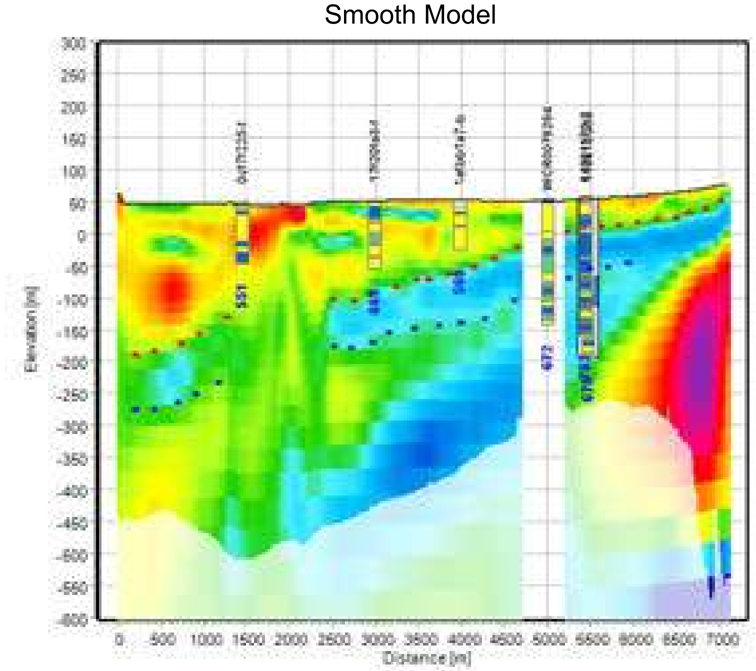
Legend for Maps

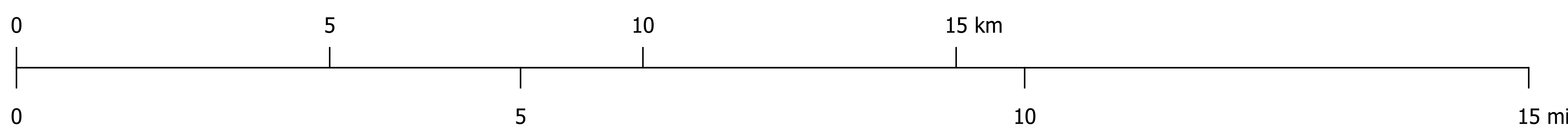
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

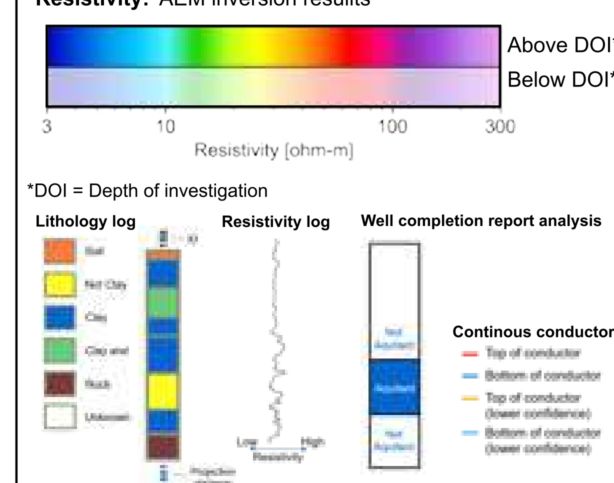
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model



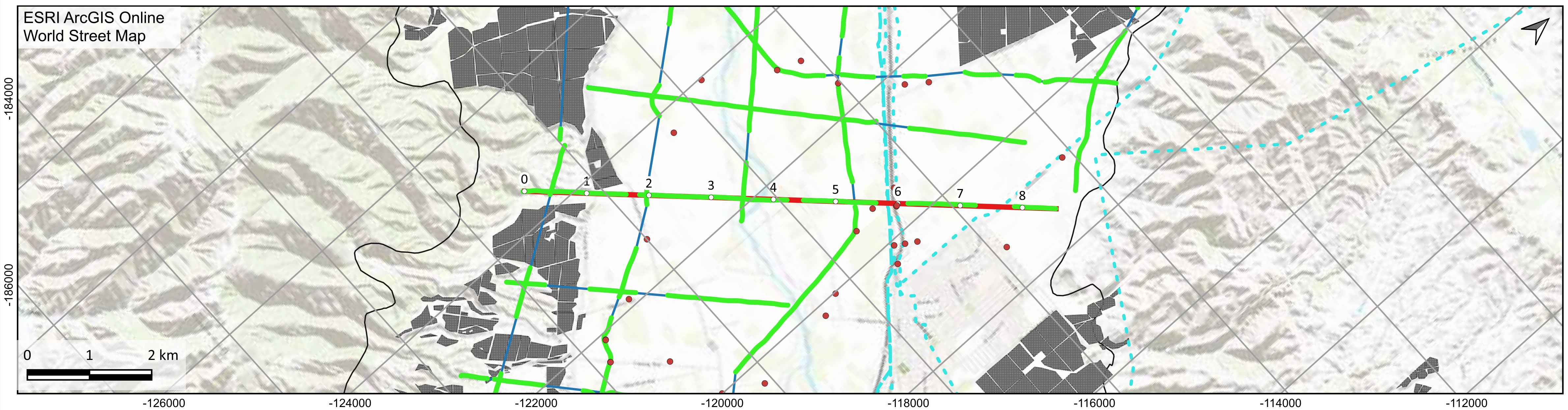


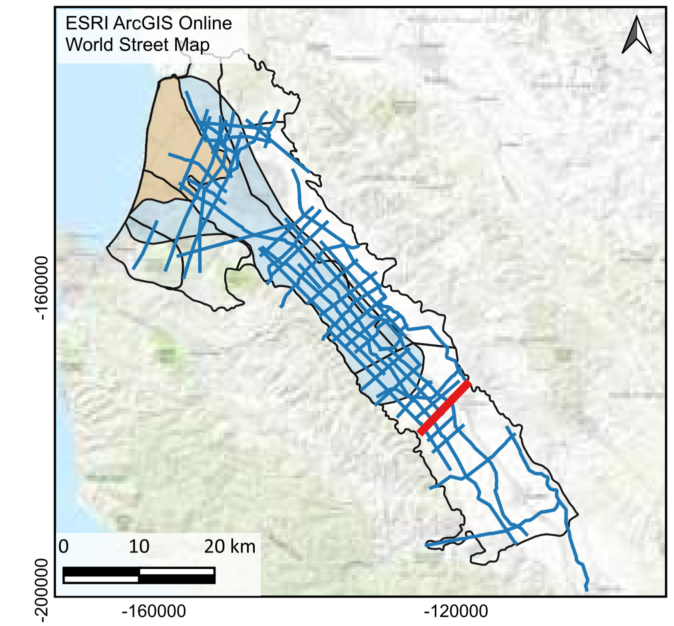
Legend for Model Sections



Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

AEM Model Sections





EPSG 3310 - NAD83 / California Albers

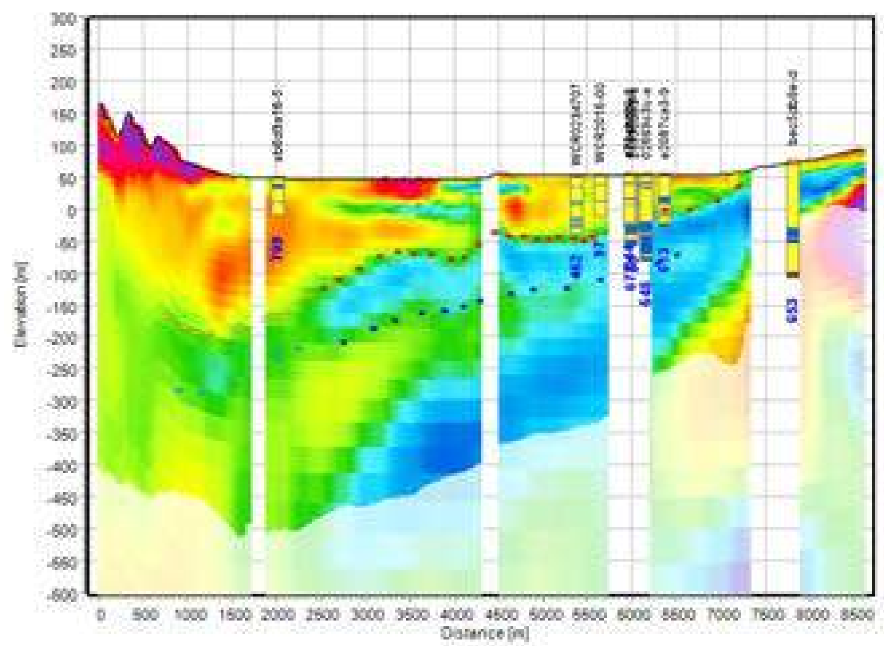
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model

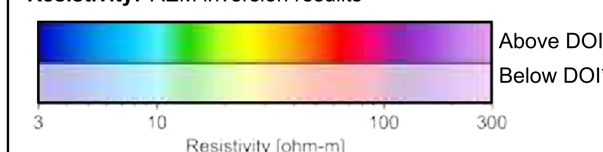


0 5 10 15 km

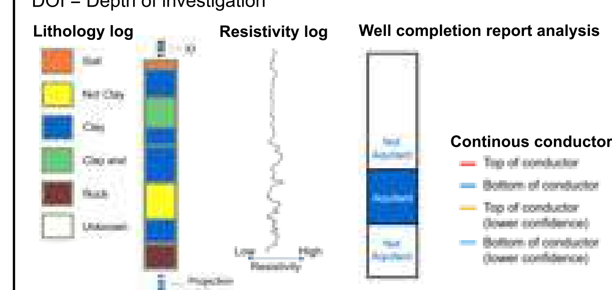
0 5 10 15 mi

Legend for Model Sections

Resistivity: AEM inversion resullts



*DOI = Depth of investigation

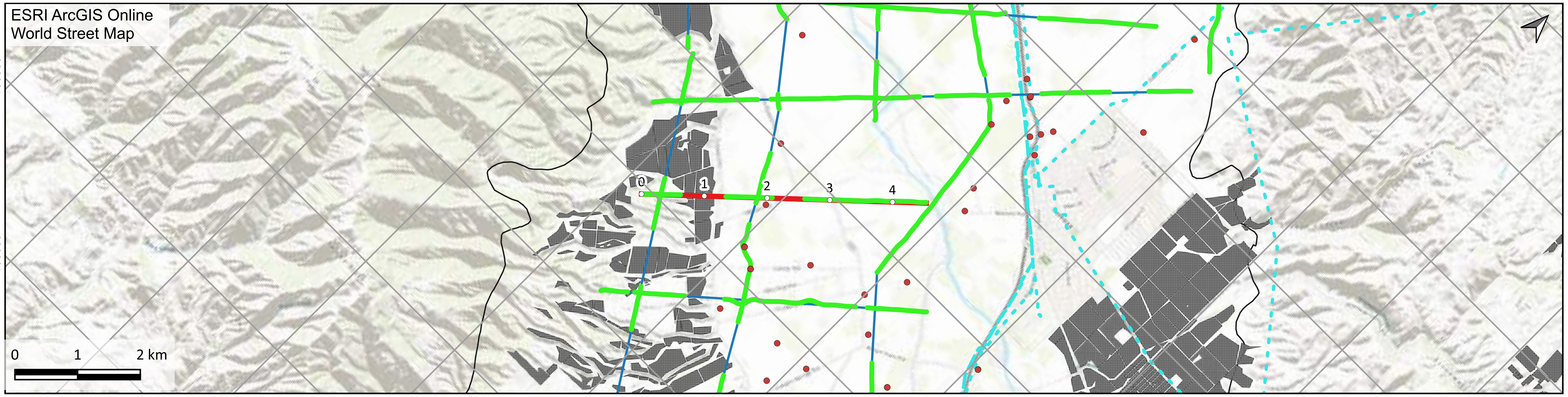


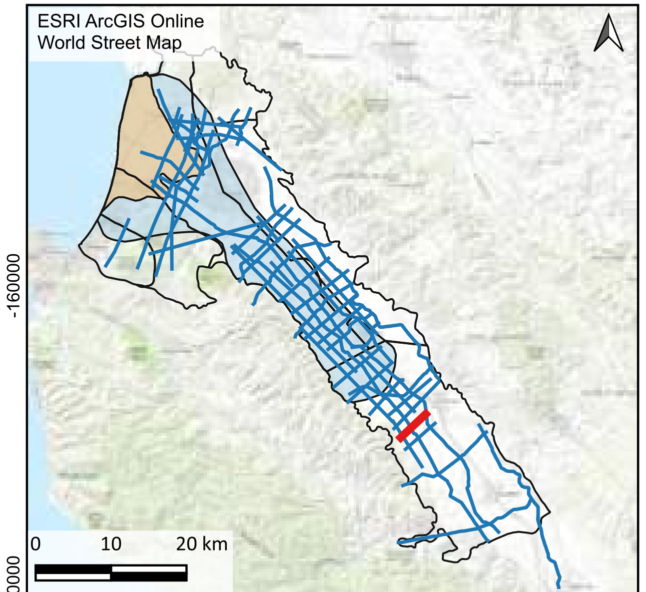
Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 101700

AEM Model Sections

RAMBOLL





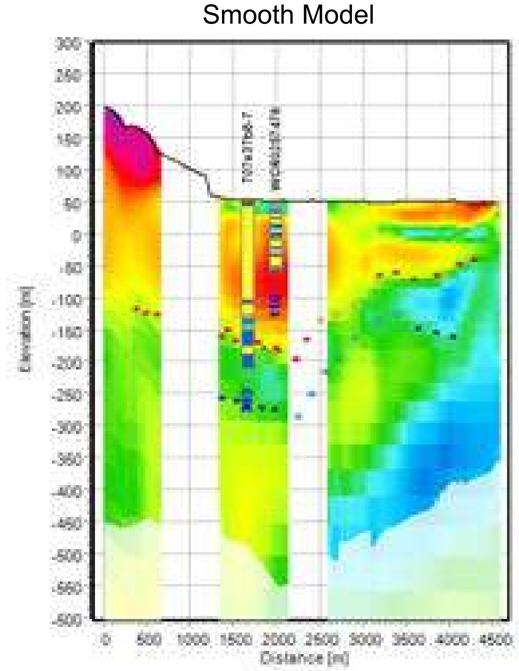
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

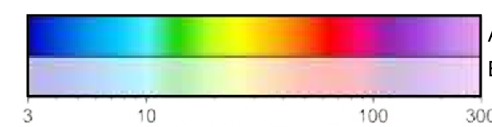
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model



Legend for Model Sections

Resistivity: AEM inversion resullts



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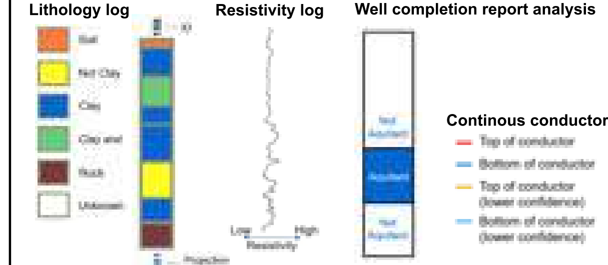

0 5 10 15 km

0 5 10 15 mi

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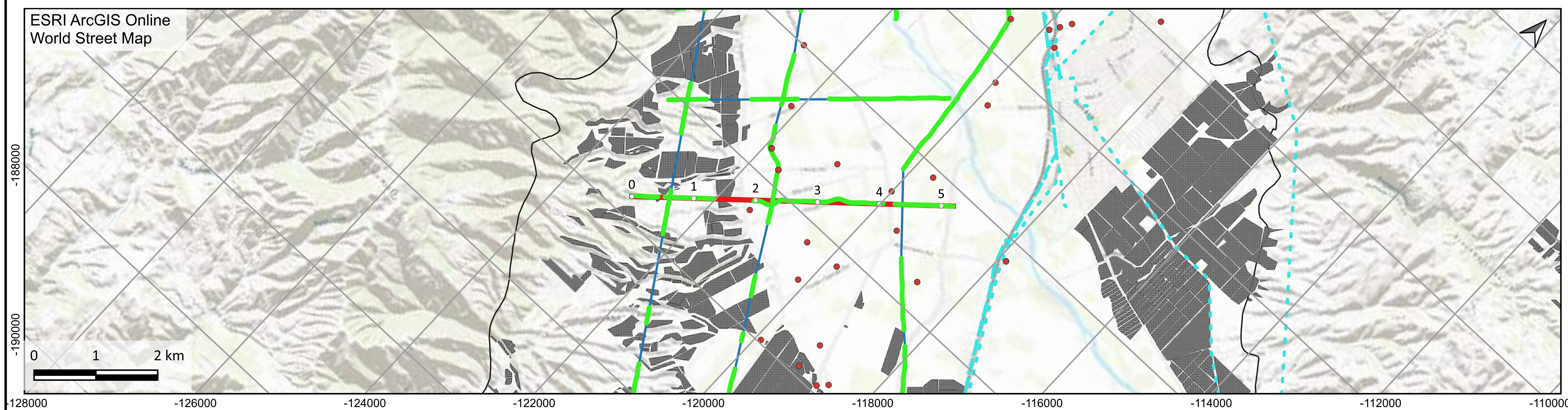
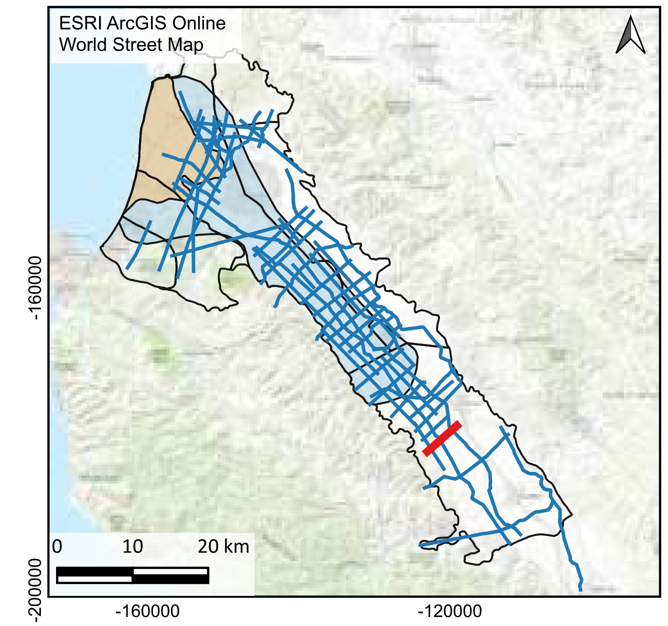
Salinas Line 101800

AEM Model Sections





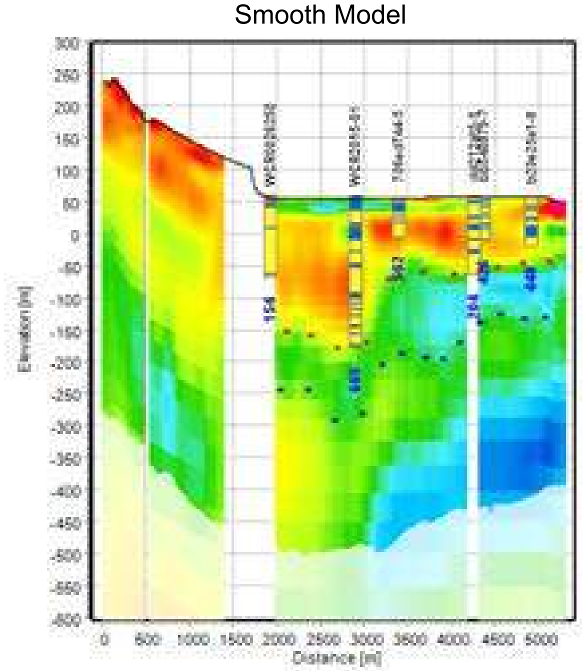
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model



0 5 10 15 km

0 5 10 15 mi

Legend for Model Sections

Resistivity: AEM inversion resullts

Above DOI*

Below DOI*

3 10 100 300

Resistivity [ohm-m]

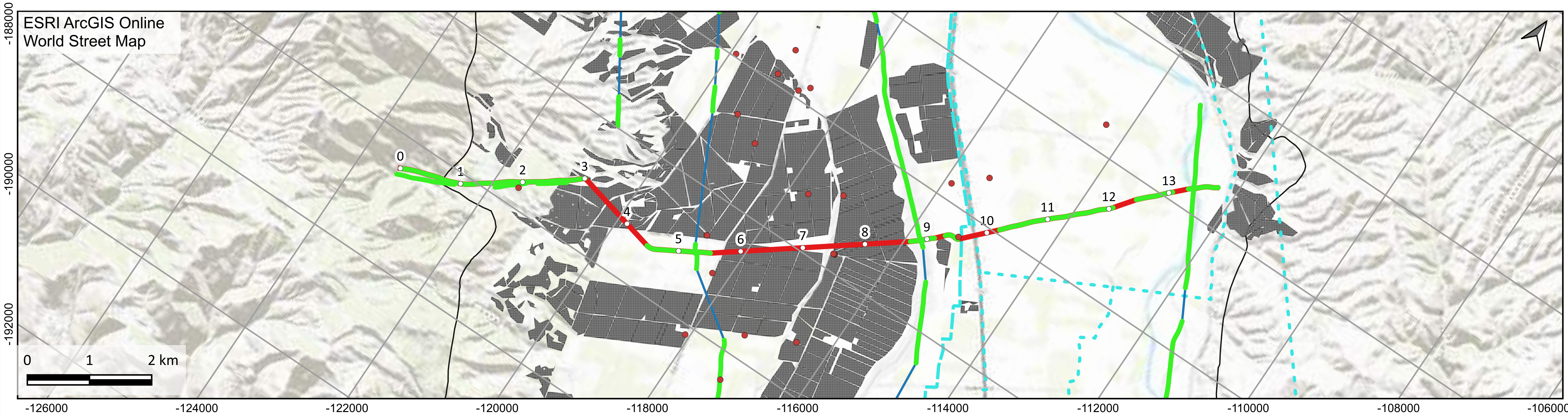
*DOI = Depth of investigation

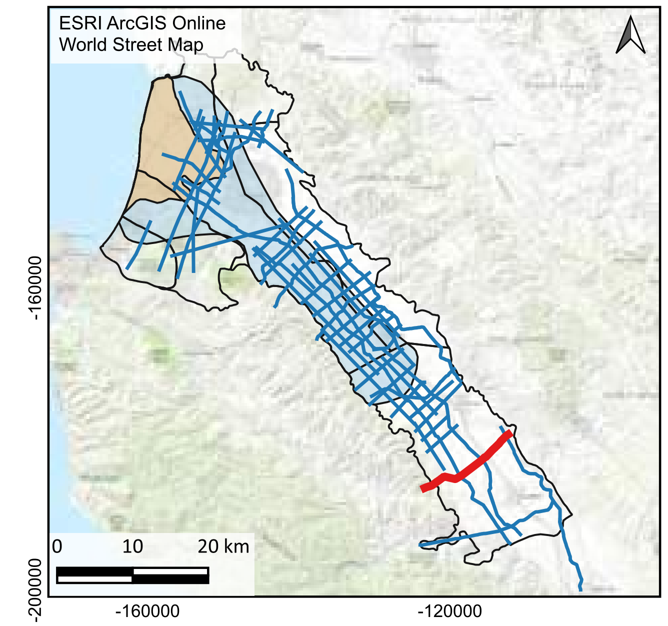
Lithology log **Resistivity log** **Well completion report analysis**

Continous conductor

Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

AEM Model Sections





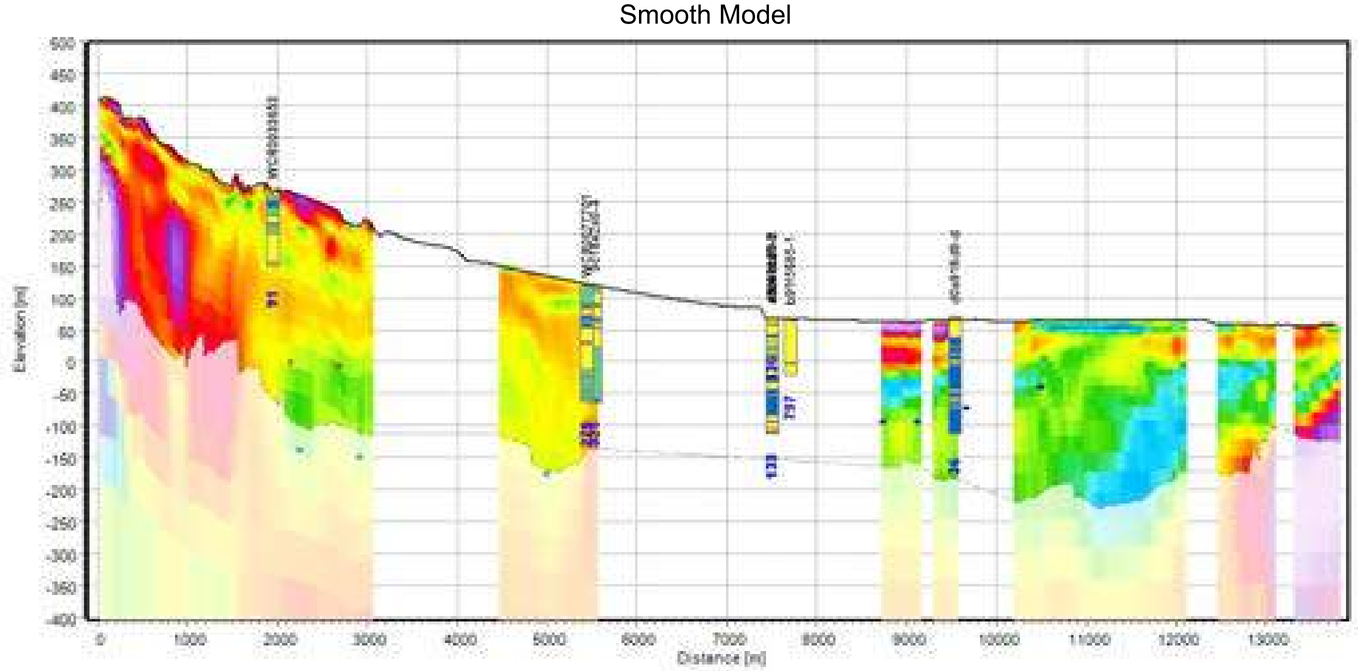
Legend for Maps

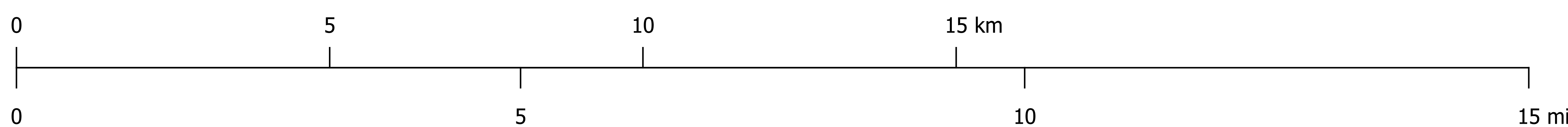
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

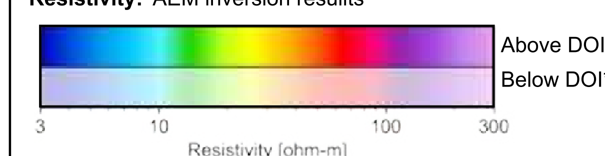
Smooth Model



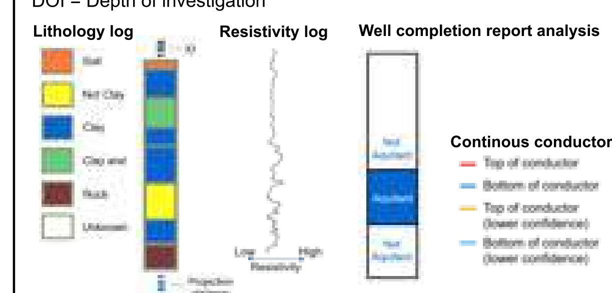


Legend for Model Sections

Resistivity: AEM inversion resullts



*DOI = Depth of investigation



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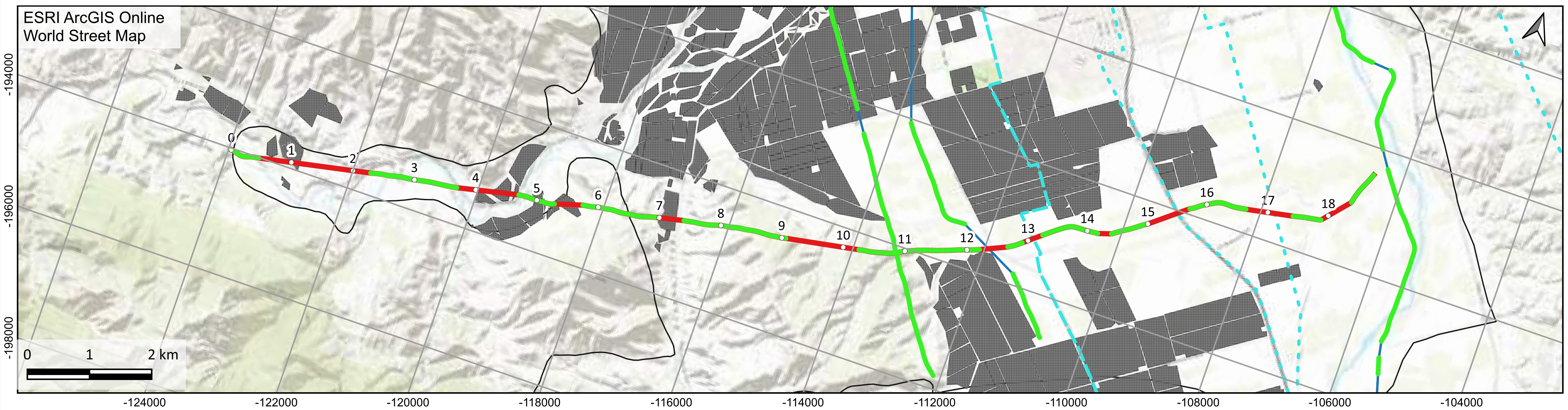
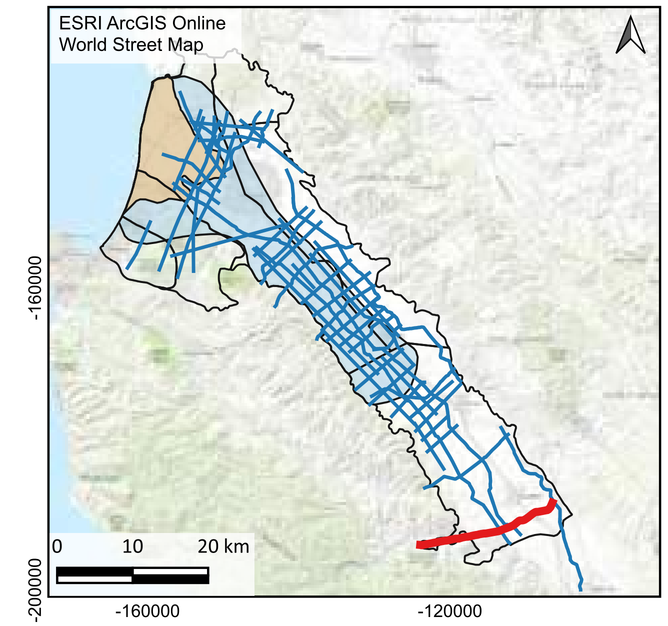
Salinas Line DWR_SA1_104401

AEM Model Sections





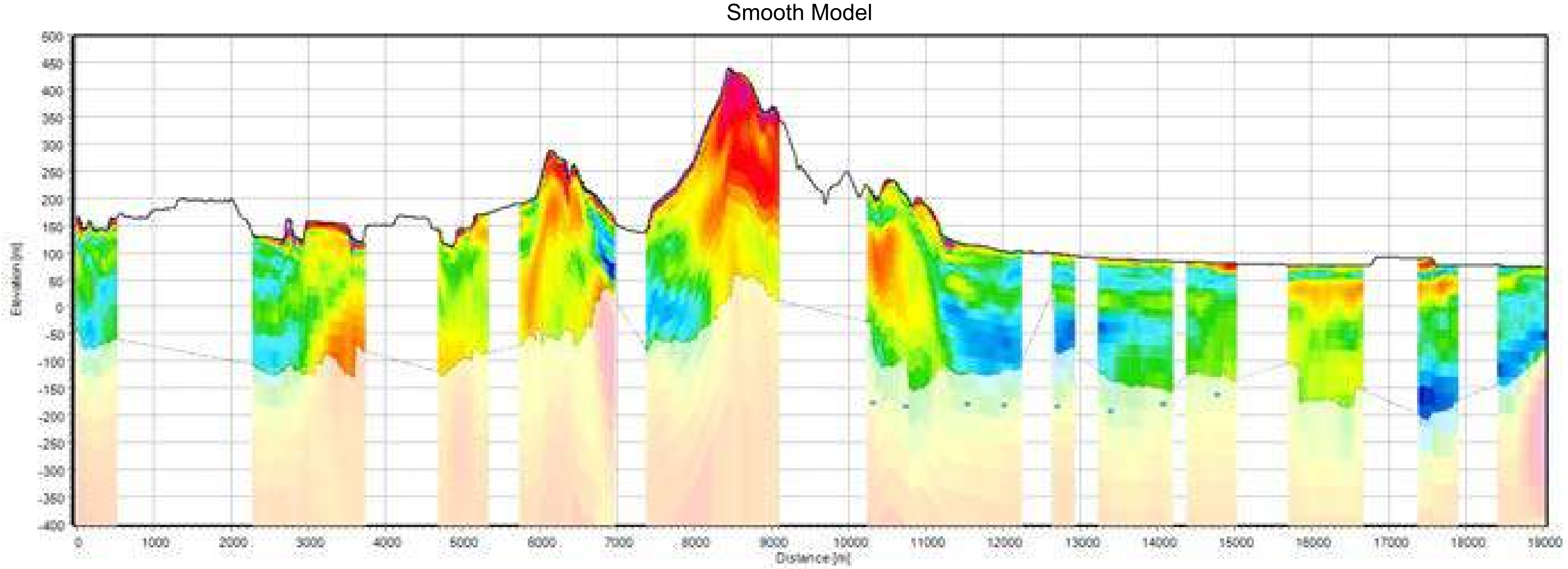
Legend for Maps

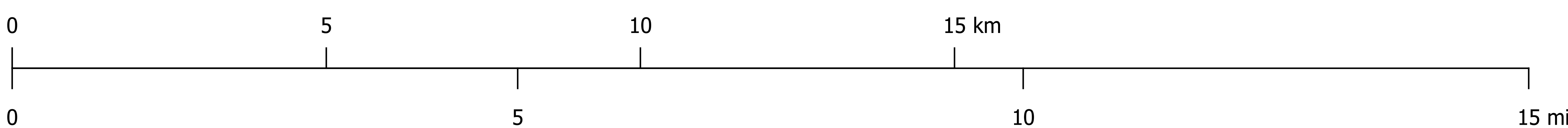
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model





Legend for Model Sections

Resistivity: AEM inversion resullts

Above DOI*
Below DOI*
3 10 100 300
Resistivity [ohm-m]

*DOI = Depth of investigation

Lithology log | Resistivity log | Well completion report analysis

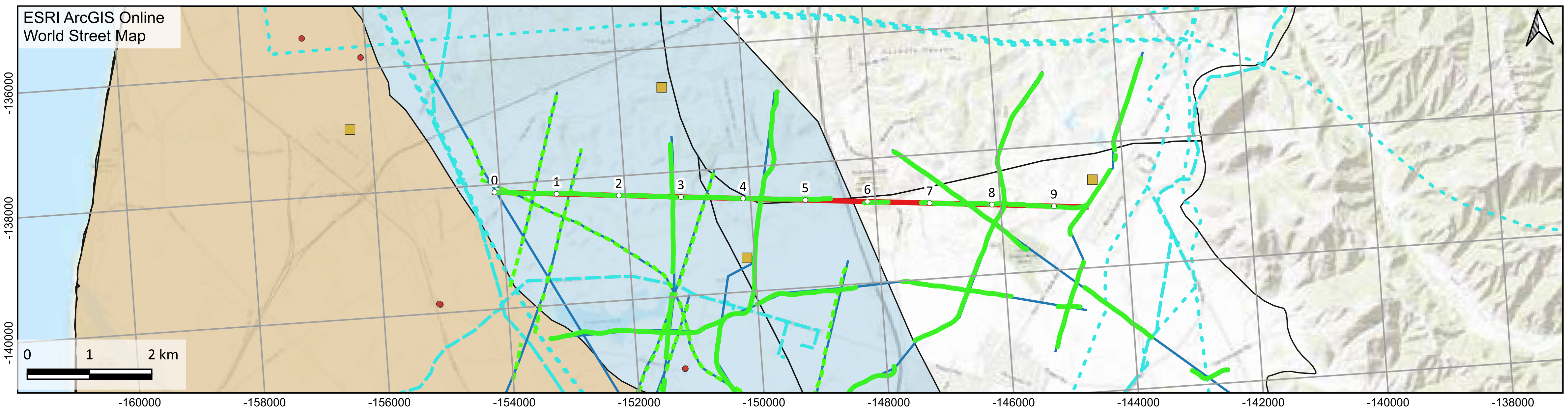
Continous conductor

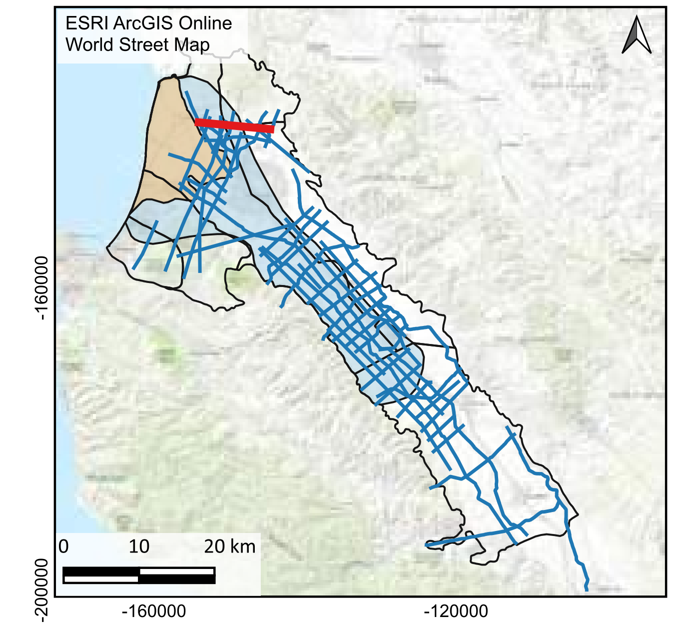
Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 100101

AEM Model Sections

RAMBOLL





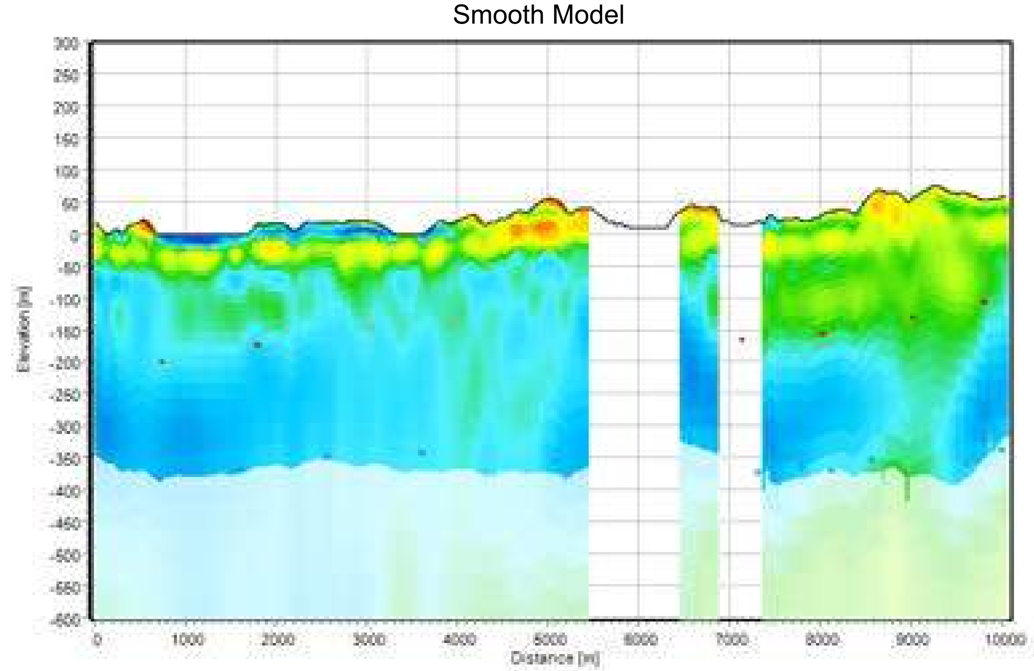
Legend for Maps

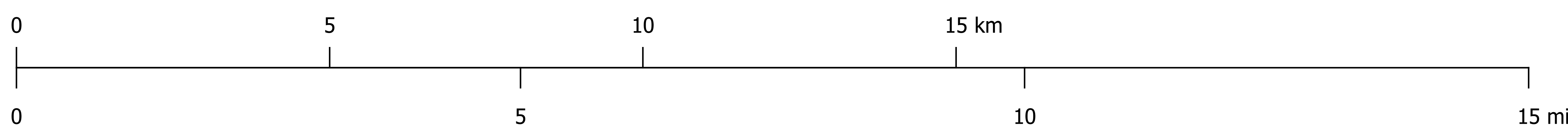
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

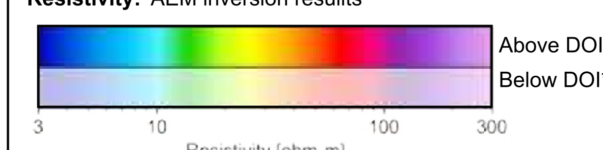
Smooth Model





Legend for Model Sections

Resistivity: AEM inversion resullts



*DOI = Depth of investigation

Lithology log

Resistivity log

Well completion report analysis

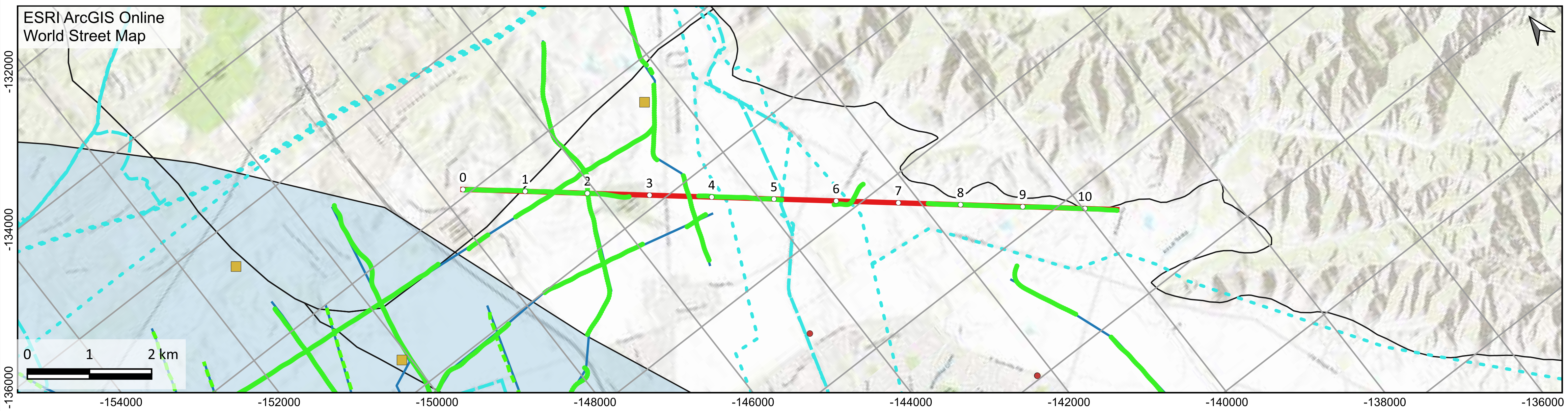
Continous conductor

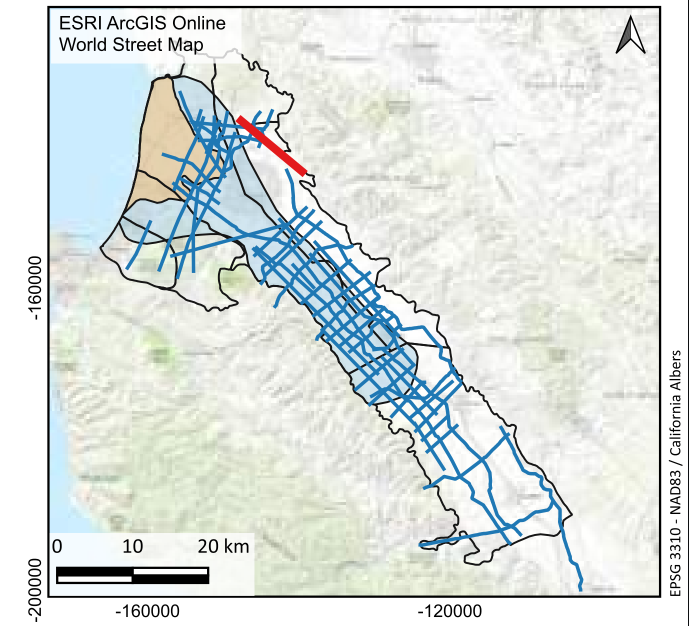
Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 200100

AEM Model Sections

RAMBOLL



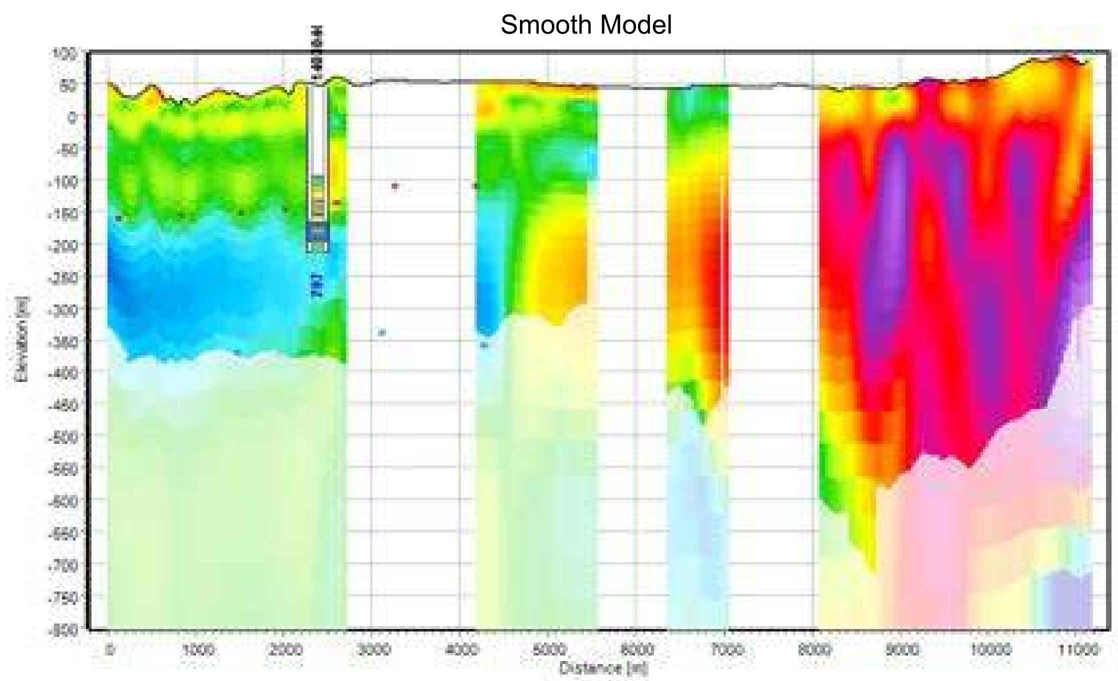


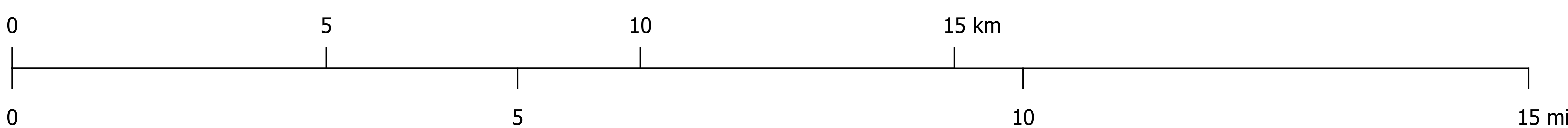
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

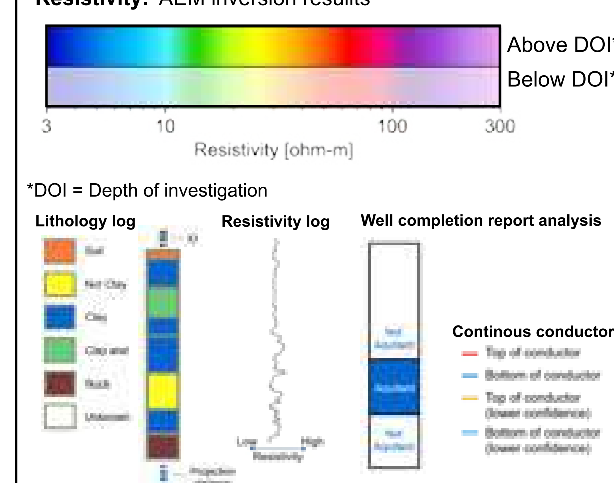
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)





Legend for Model Sections

Resistivity: AEM inversion resullts



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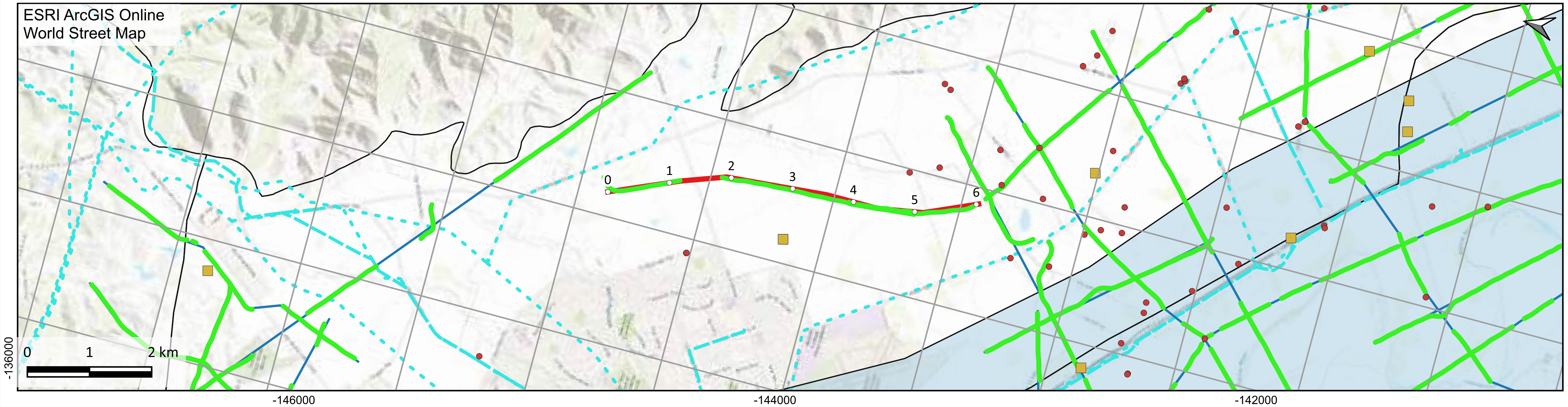
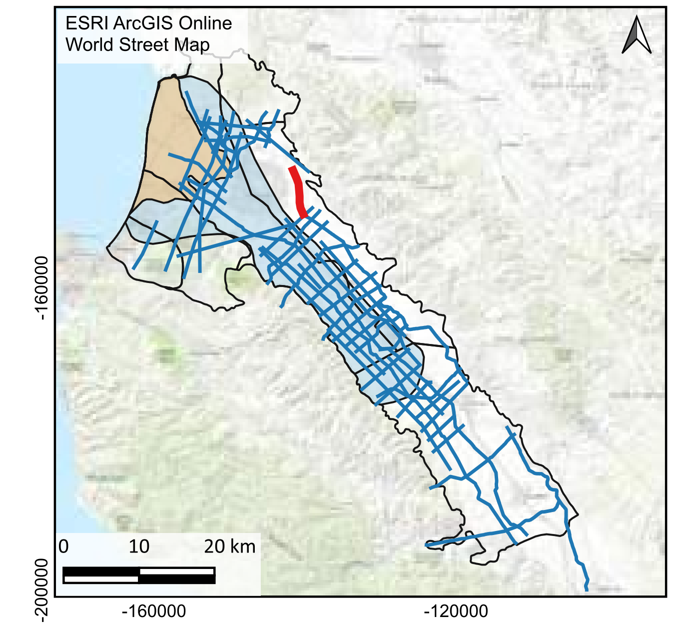
Salinas Line DWR_SA8_1

AEM Model Sections





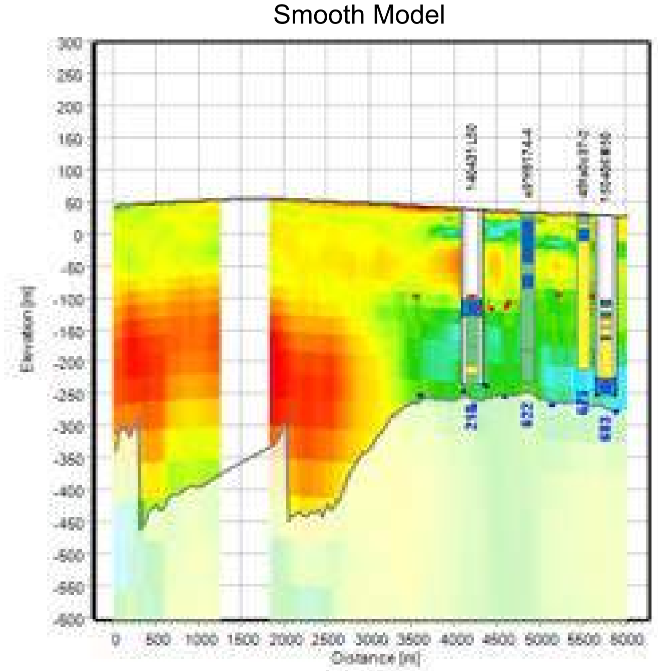
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

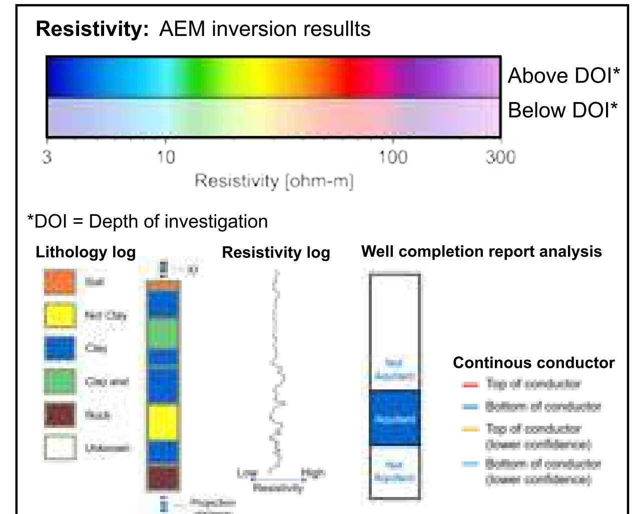
Smooth Model



0 5 10 15 km

0 5 10 15 mi

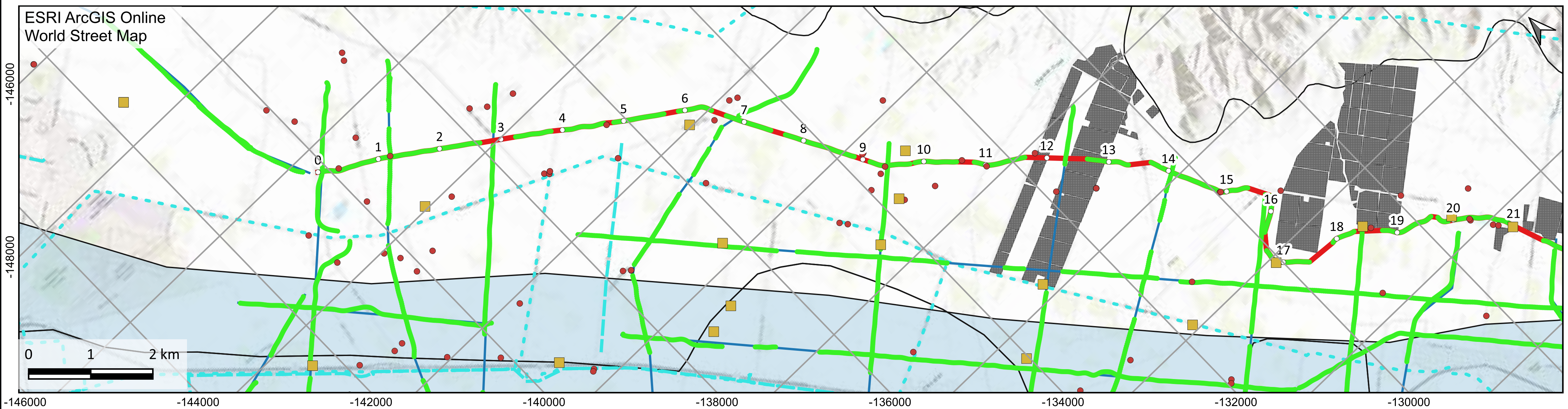
Legend for Model Sections

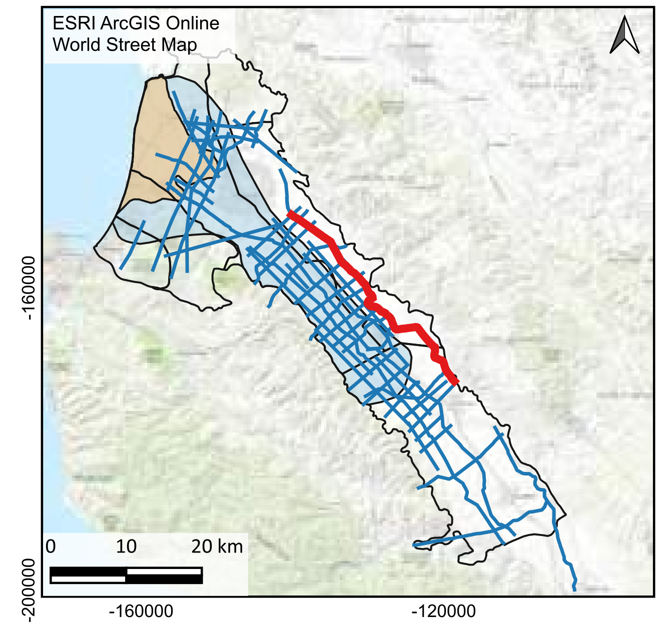


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA1_103800_1

AEM Model Sections





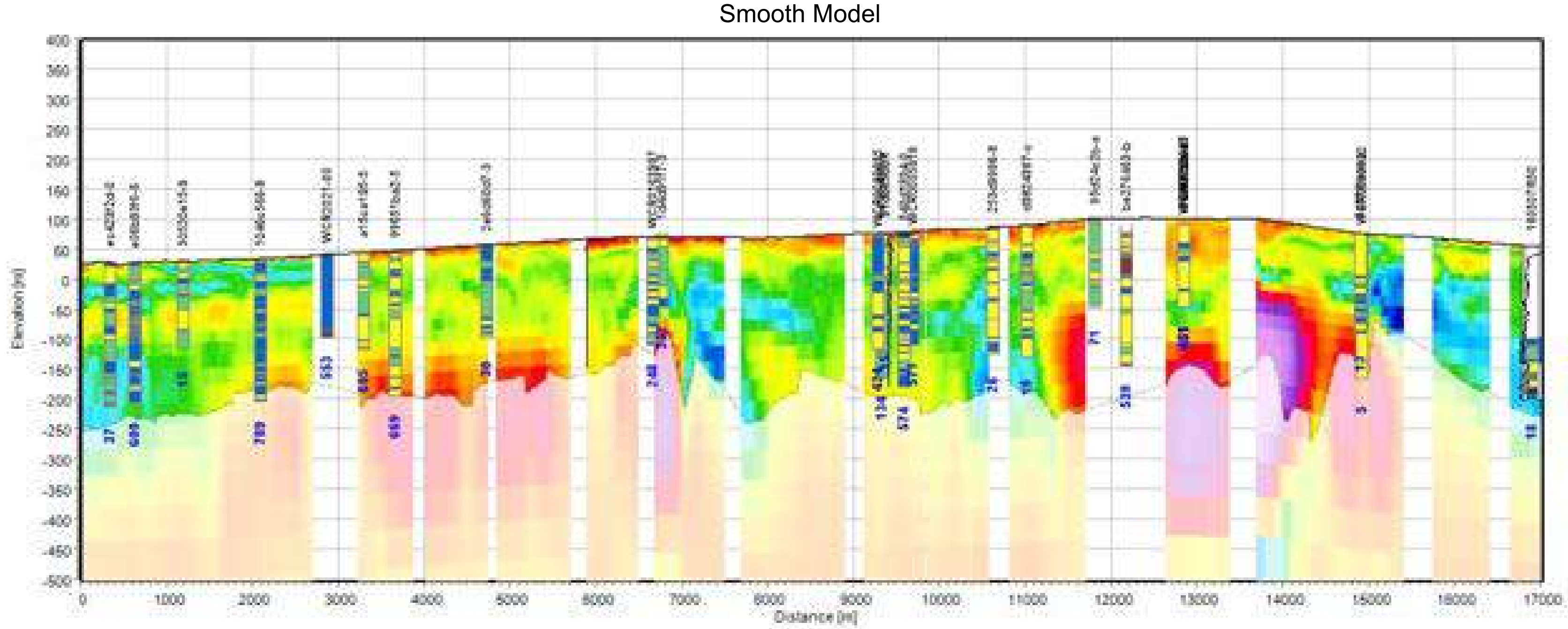
Legend for Maps

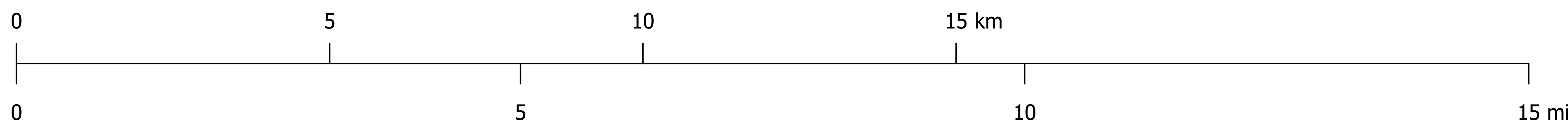
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

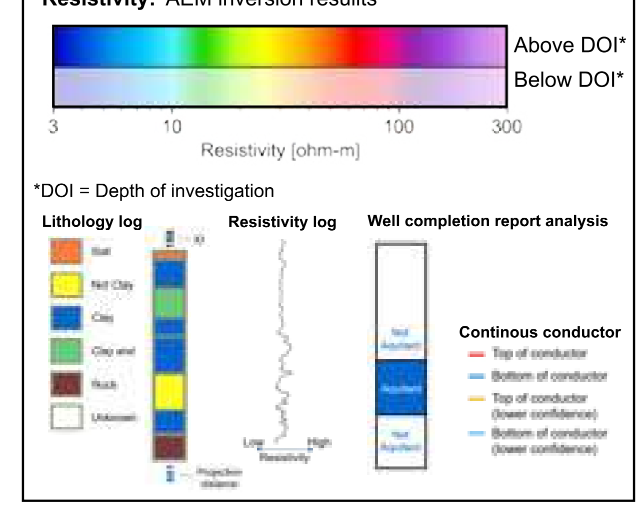
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model





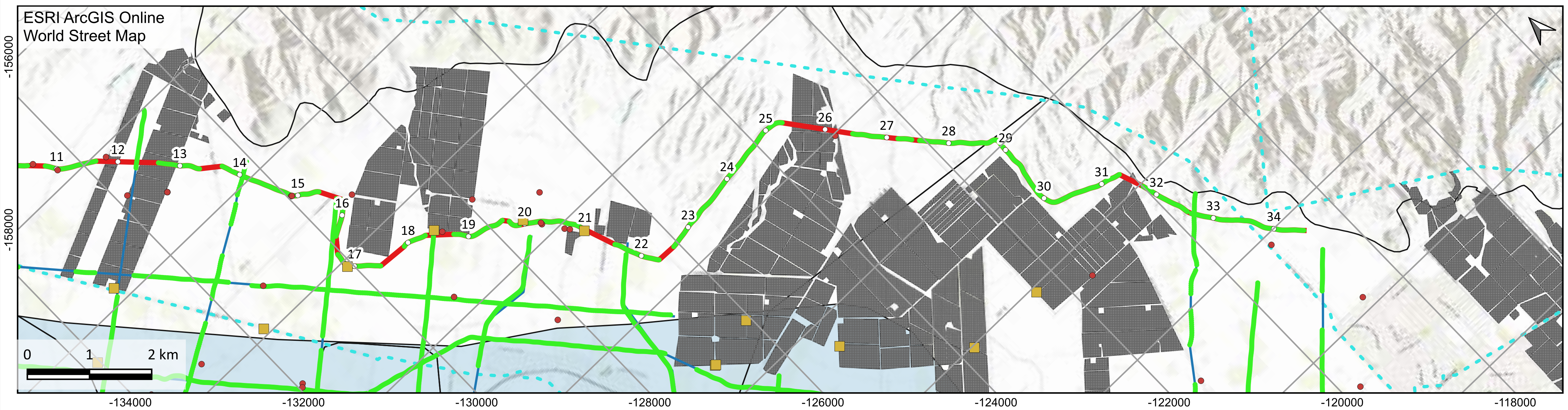
Legend for Model Sections

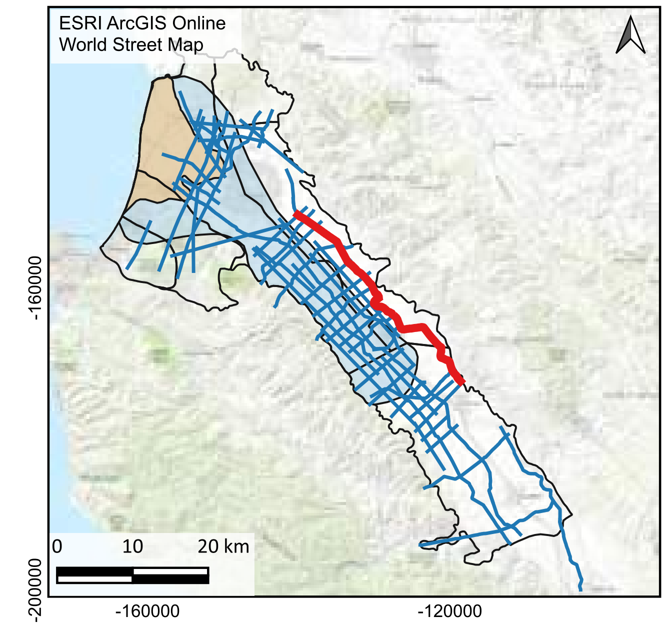


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA1_103800_2

AEM Model Sections





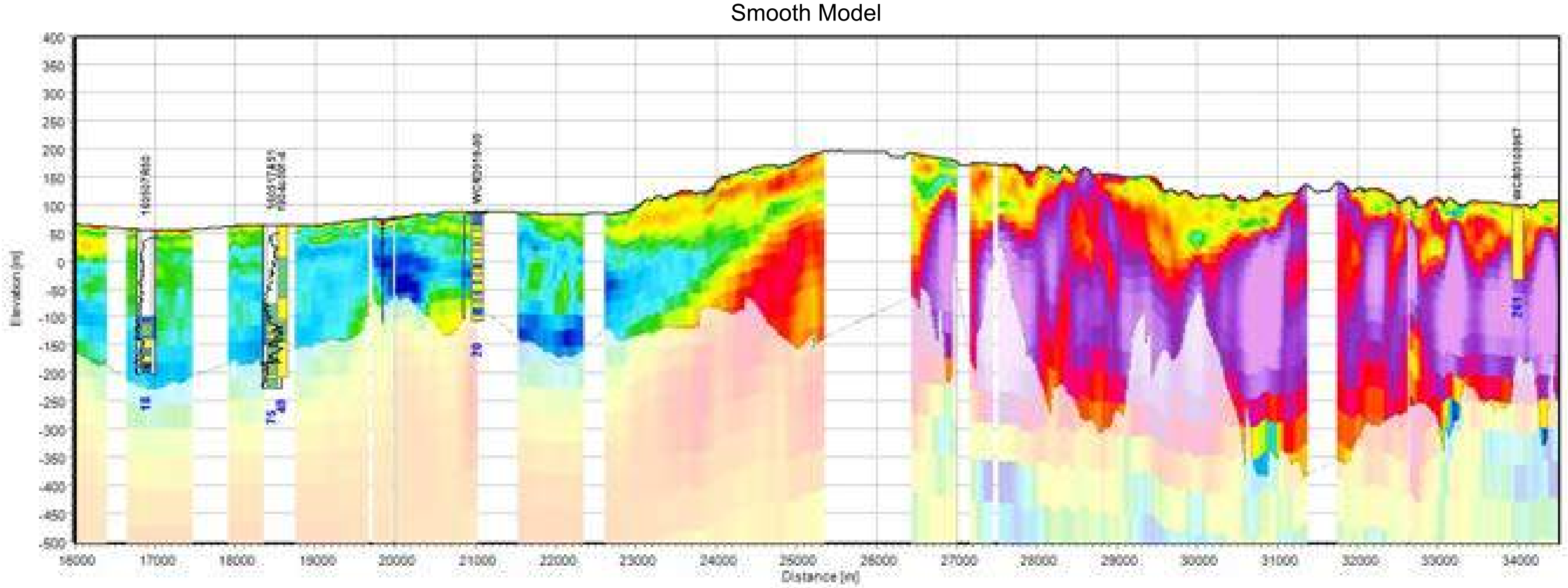
Legend for Maps

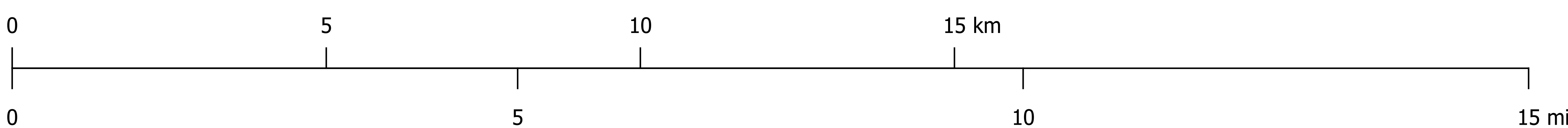
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

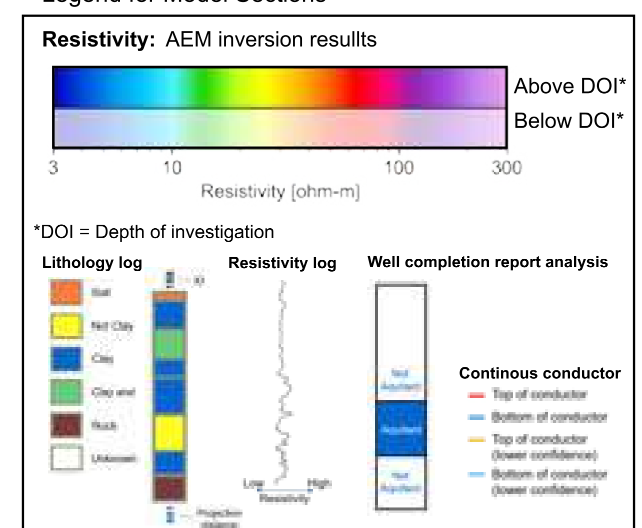
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model





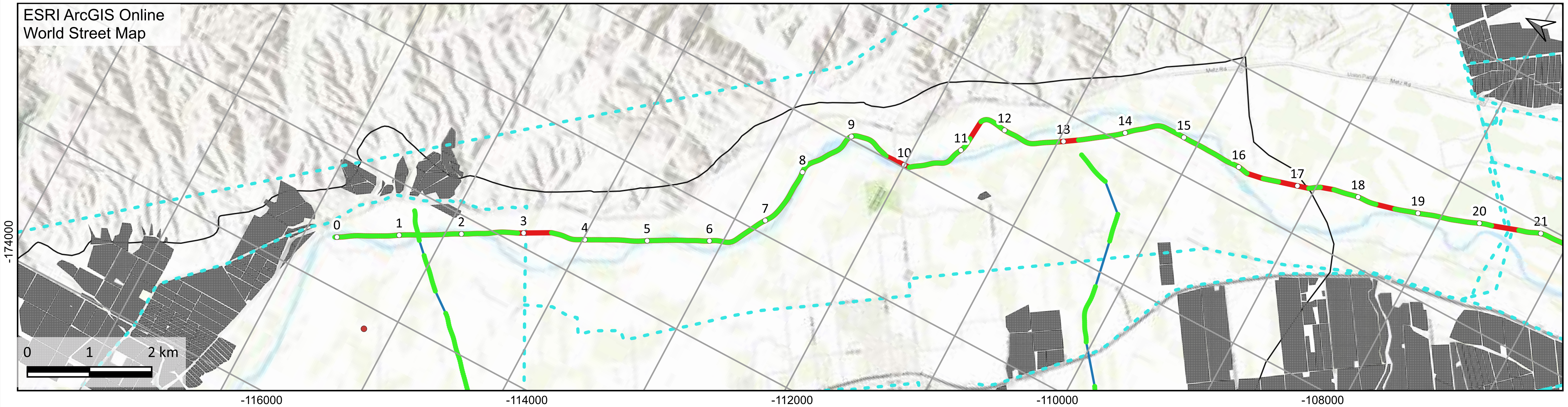
Legend for Model Sections

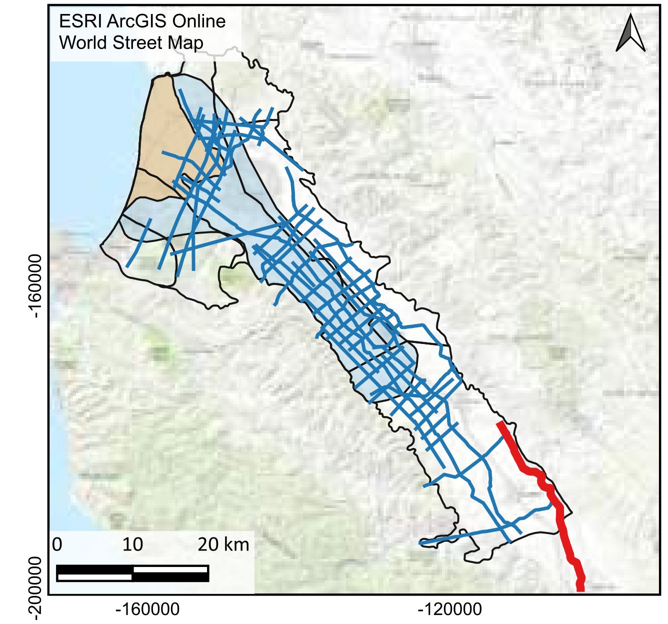


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA1_103400_1

AEM Model Sections





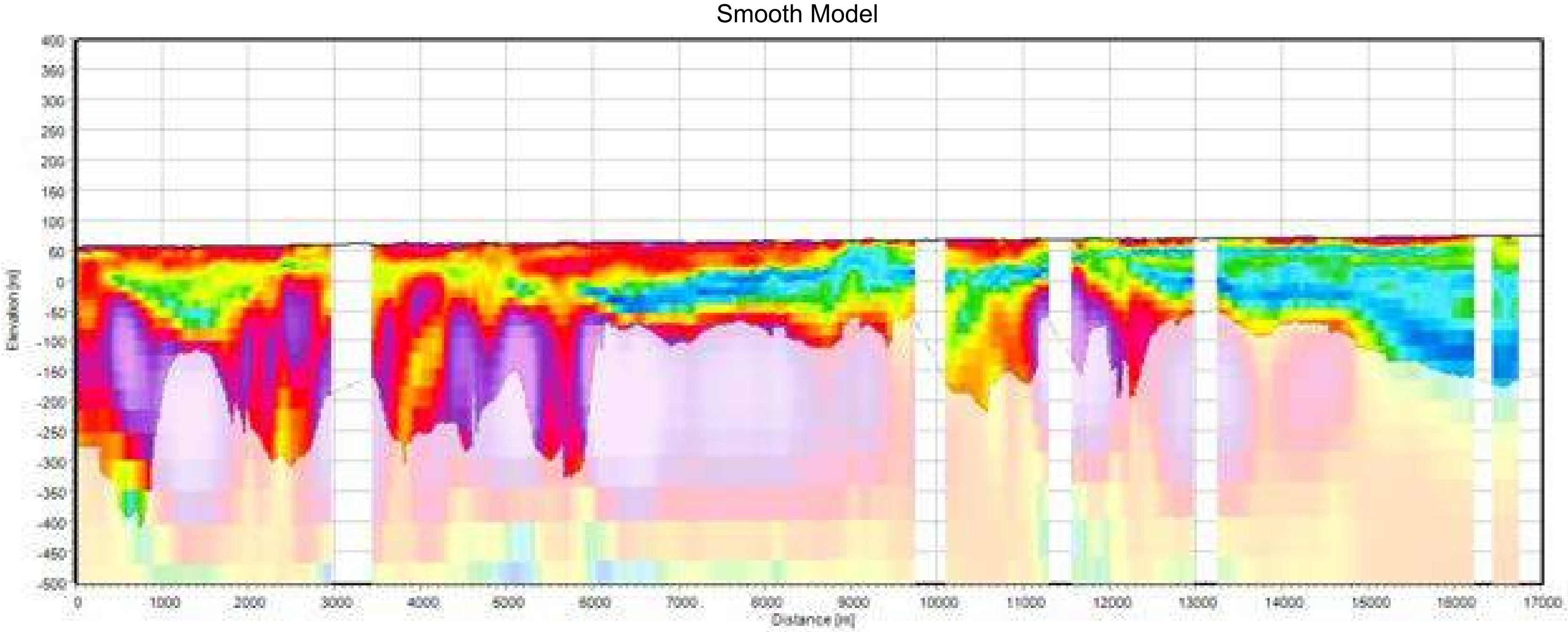
Legend for Maps

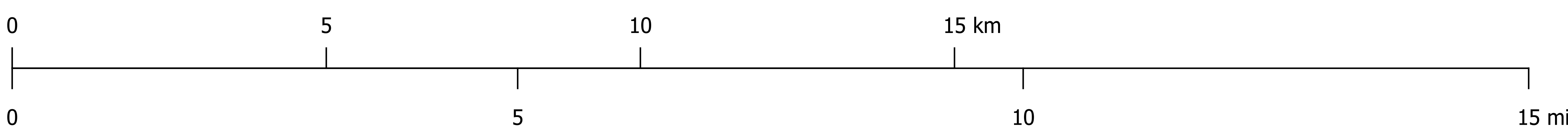
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

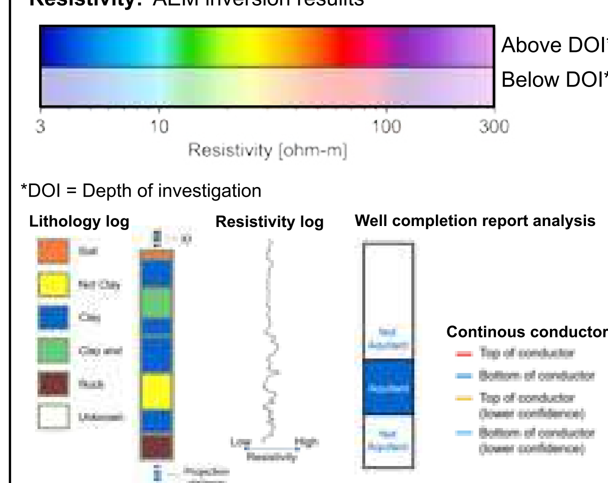
Smooth Model





Legend for Model Sections

Resistivity: AEM inversion resullts



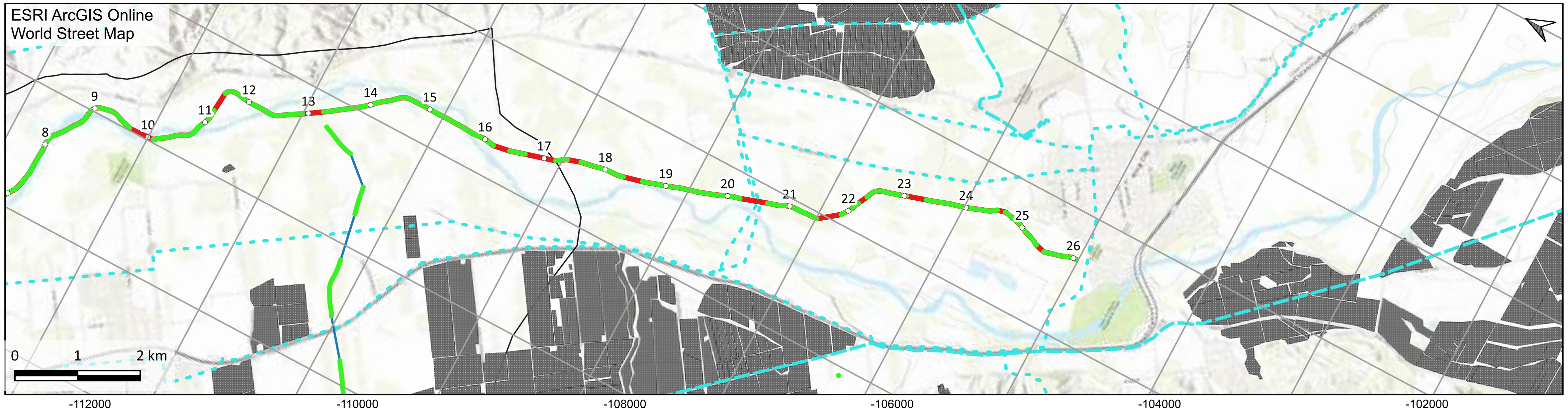
*DOI = Depth of investigation

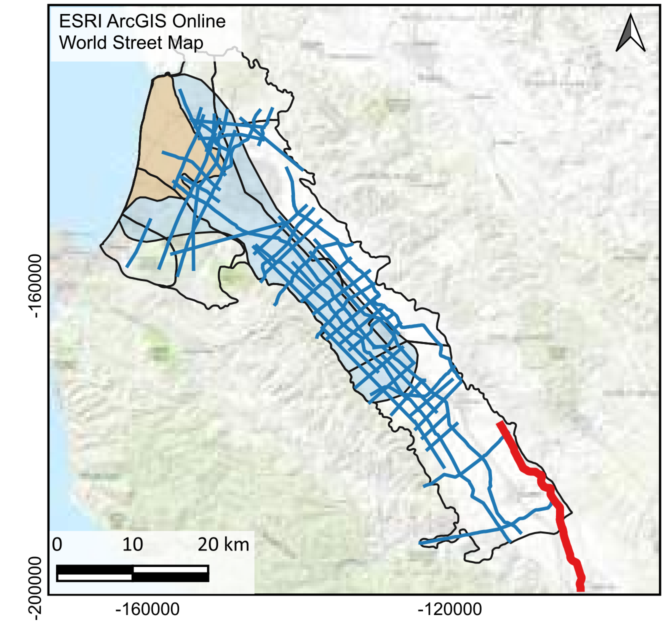
Lithology log **Resistivity log** **Well completion report analysis**

Continous conductor

Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA1_103400_2 | **AEM Model Sections**





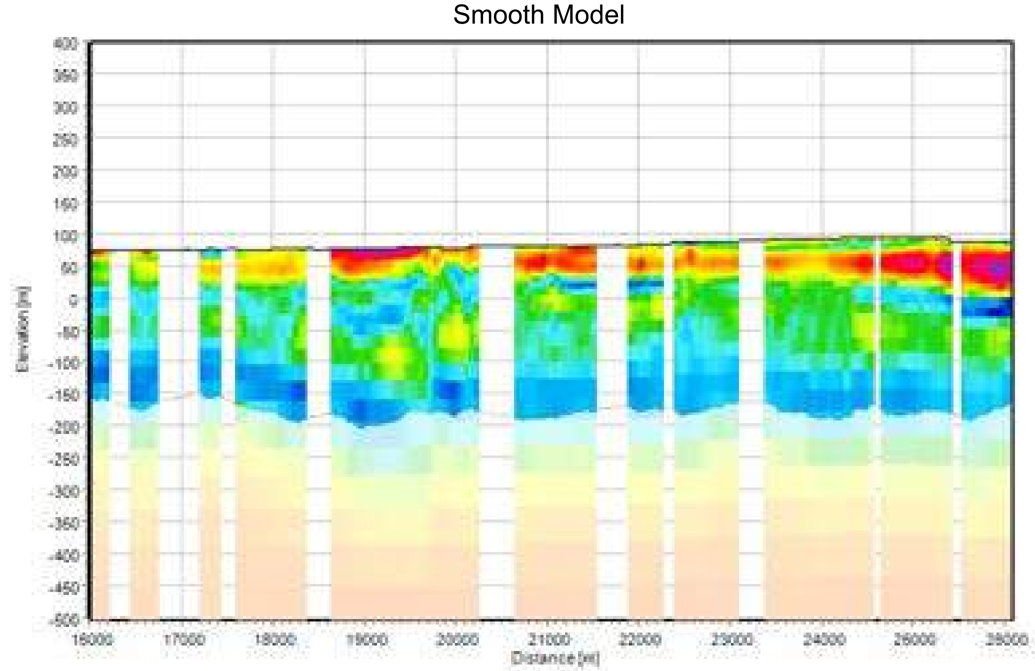
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model

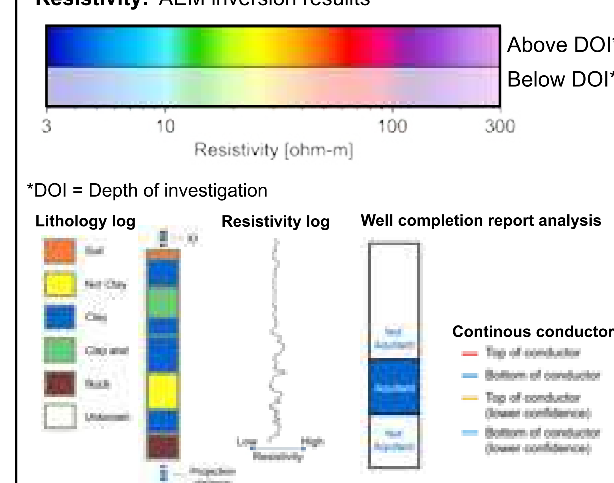


0 5 10 15 km

0 5 10 15 mi

Legend for Model Sections

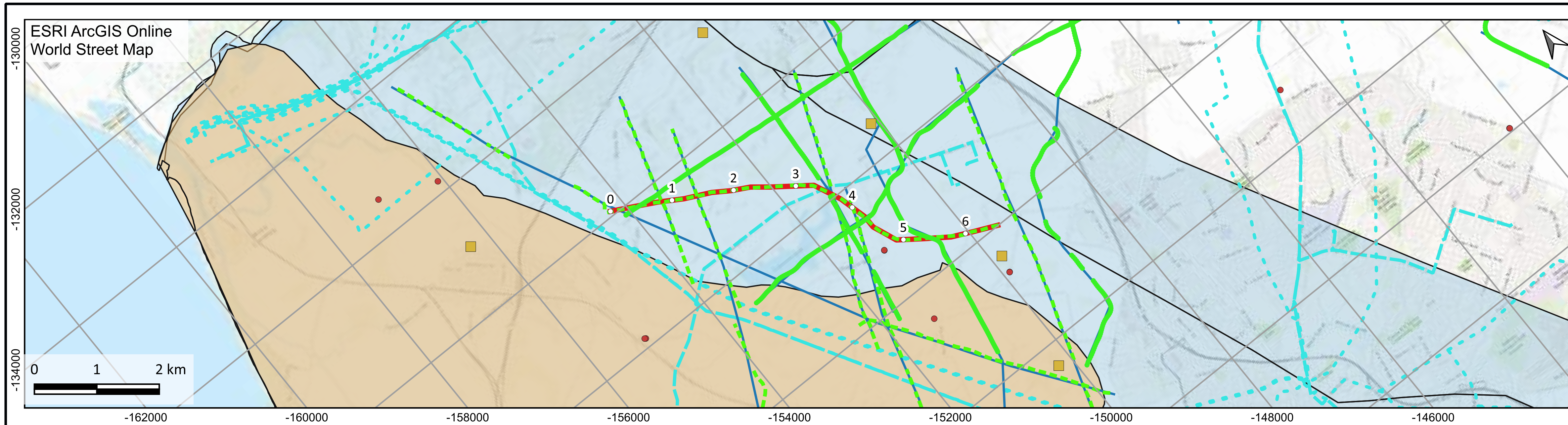
Resistivity: AEM inversion resullts

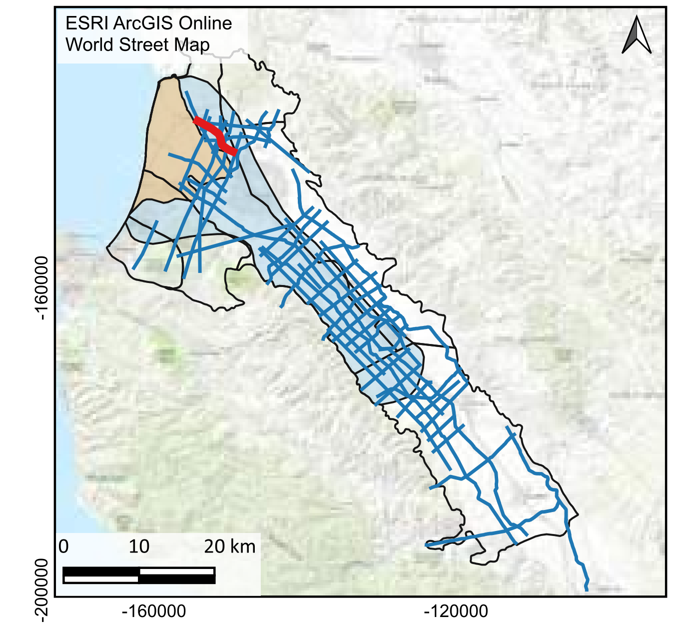


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 2019_02

AEM Model Sections





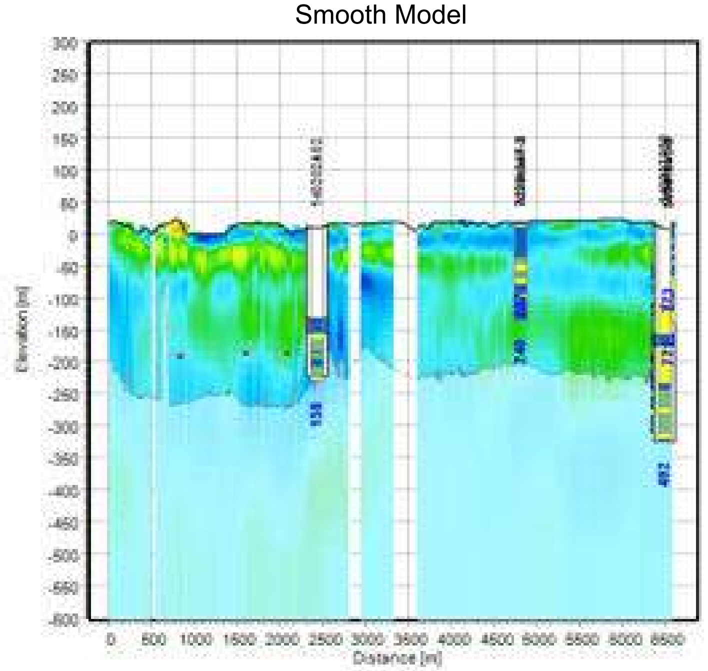
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

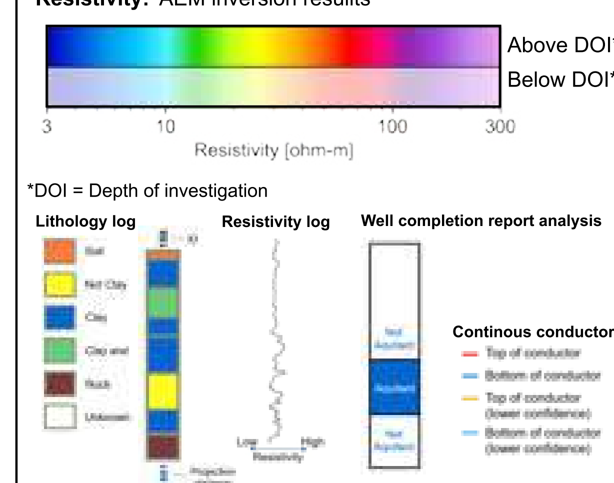
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

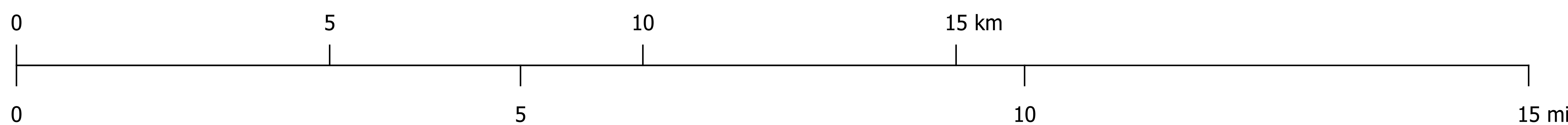
Smooth Model



Legend for Model Sections

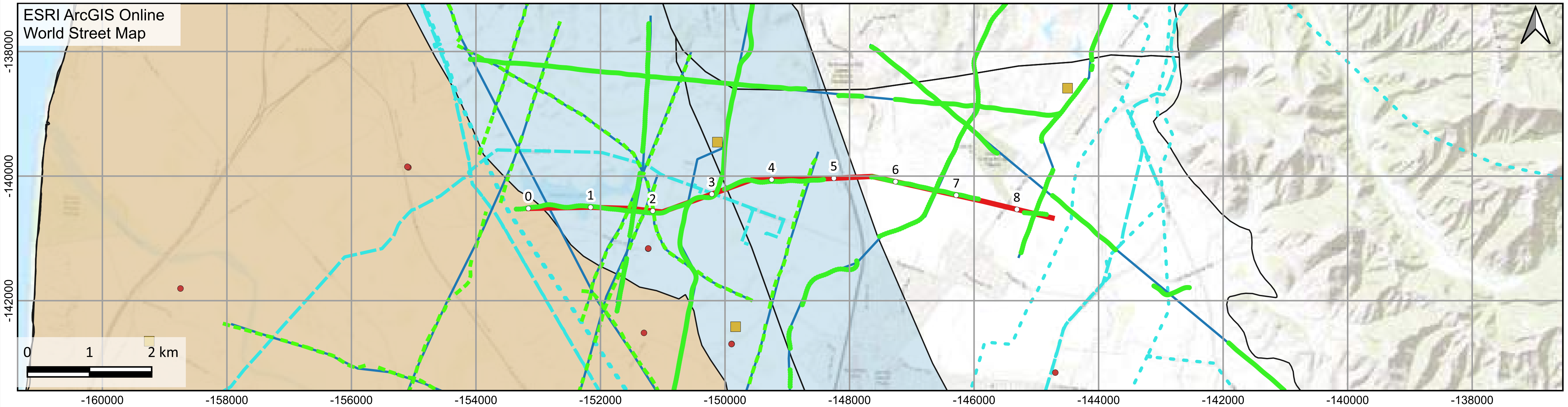
Resistivity: AEM inversion resullts

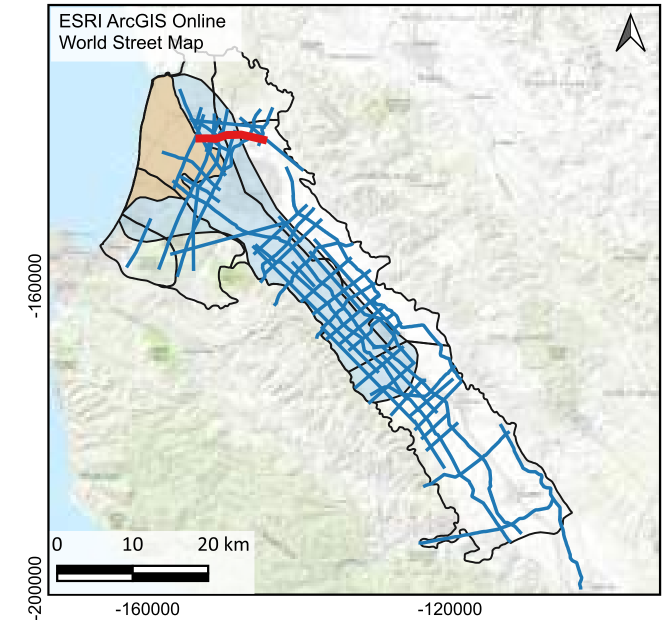




Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

AEM Model Sections





EPSG 3310 - NAD83 / California Albers

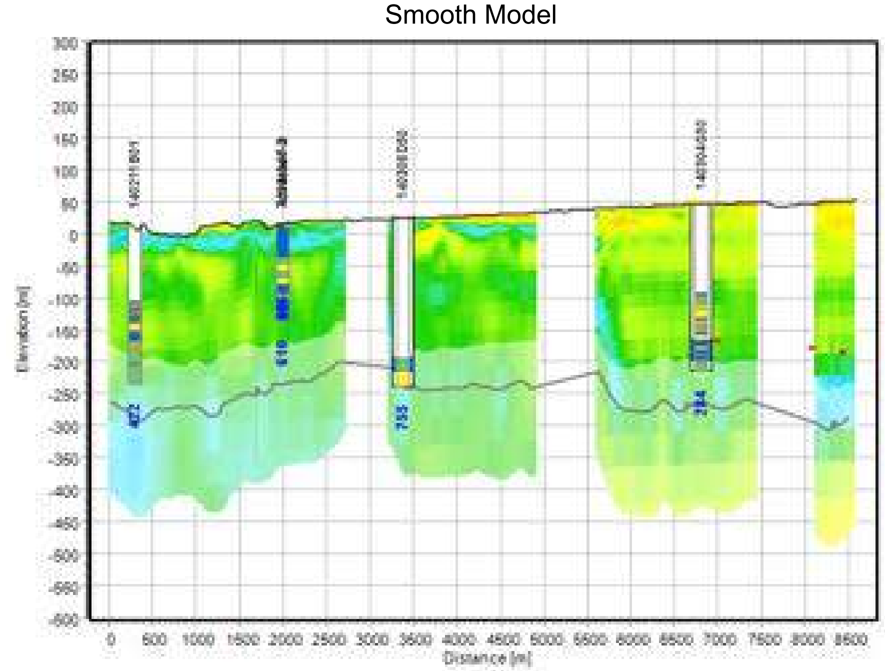
Legend for Maps

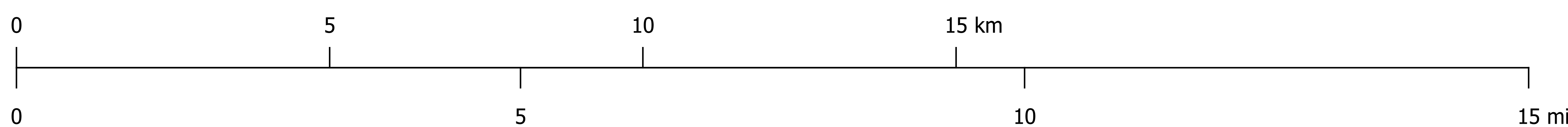
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model

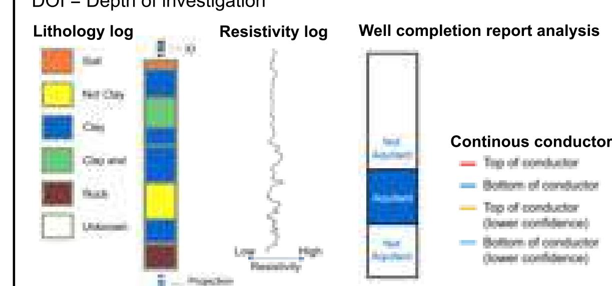




Legend for Model Sections

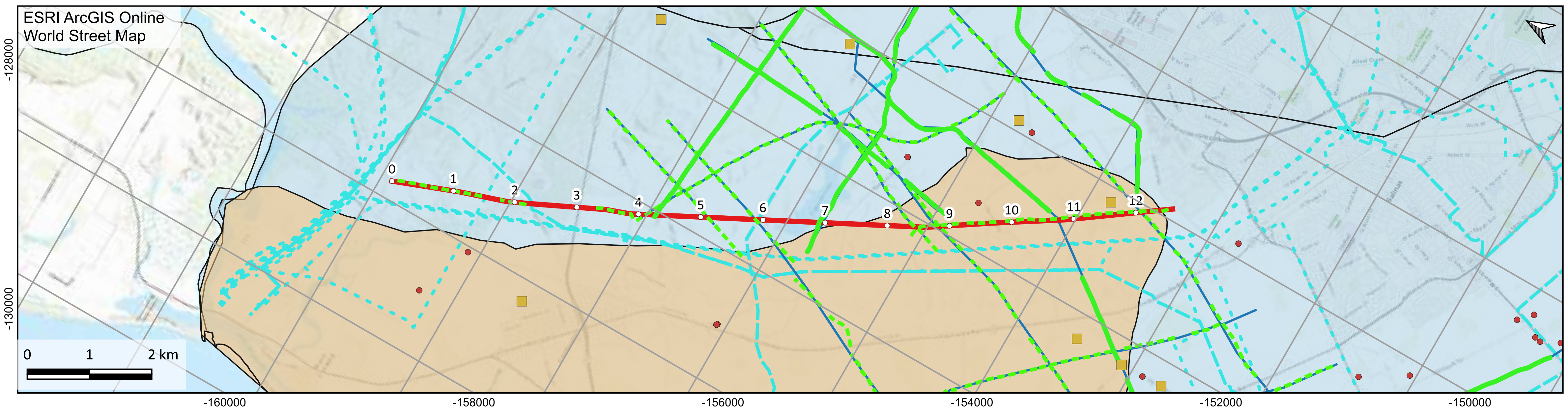
Resistivity: AEM inversion resullts

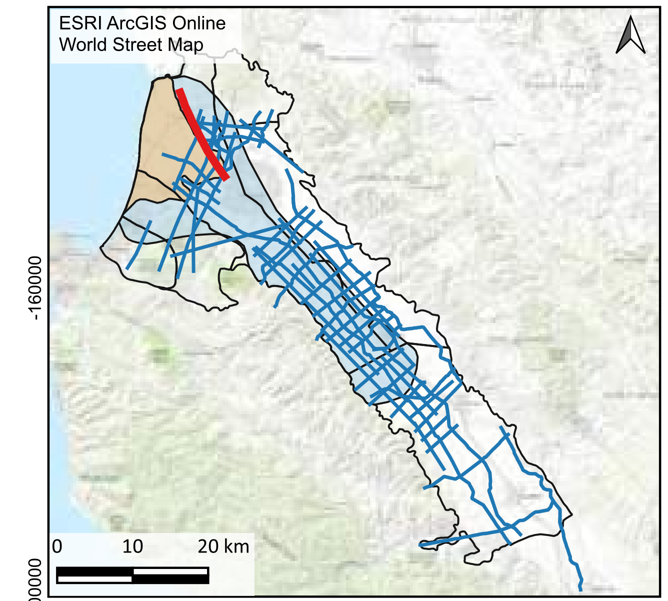
*DOI = Depth of investigation



Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

AEM Model Sections





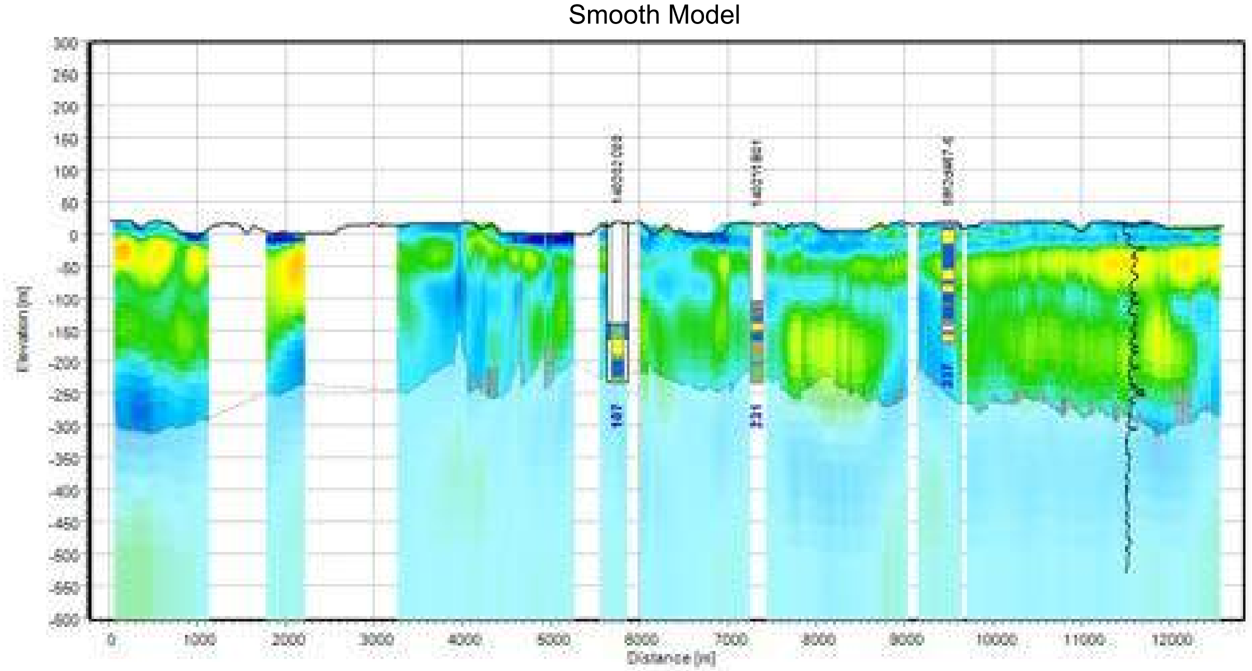
Legend for Maps

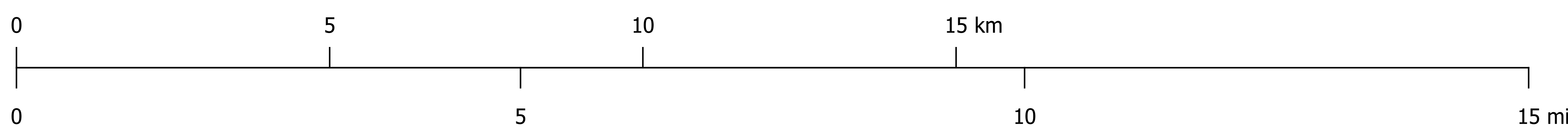
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

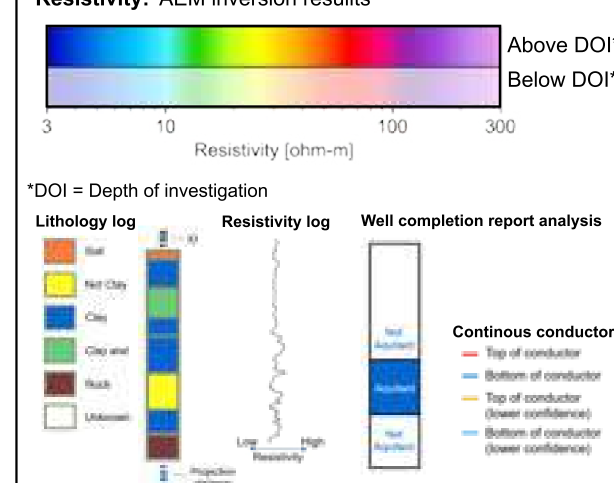
Smooth Model





Legend for Model Sections

Resistivity: AEM inversion resullts



*DOI = Depth of investigation

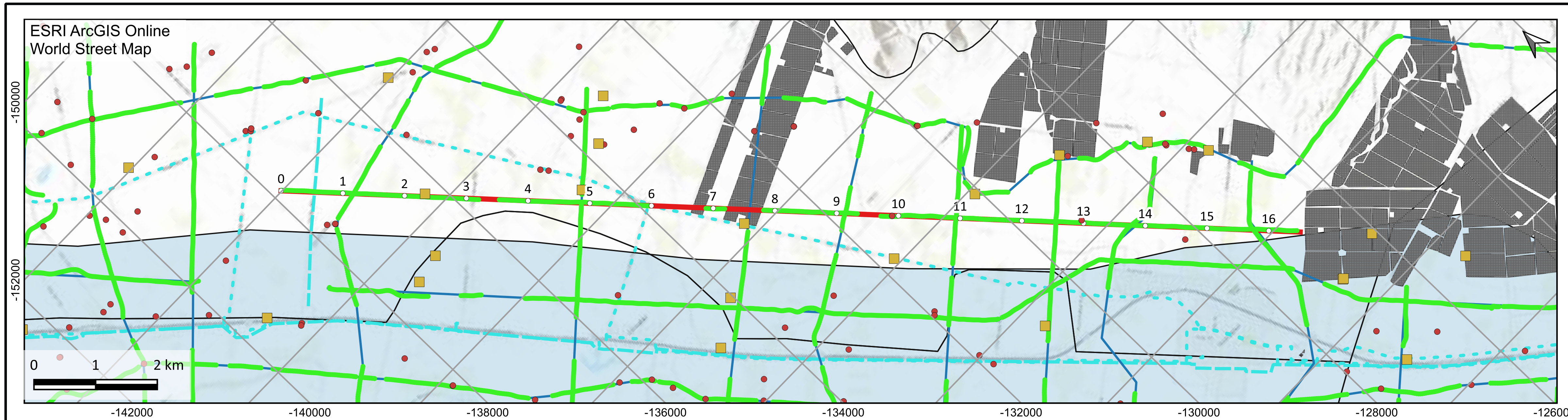
Lithology log | Resistivity log | Well completion report analysis

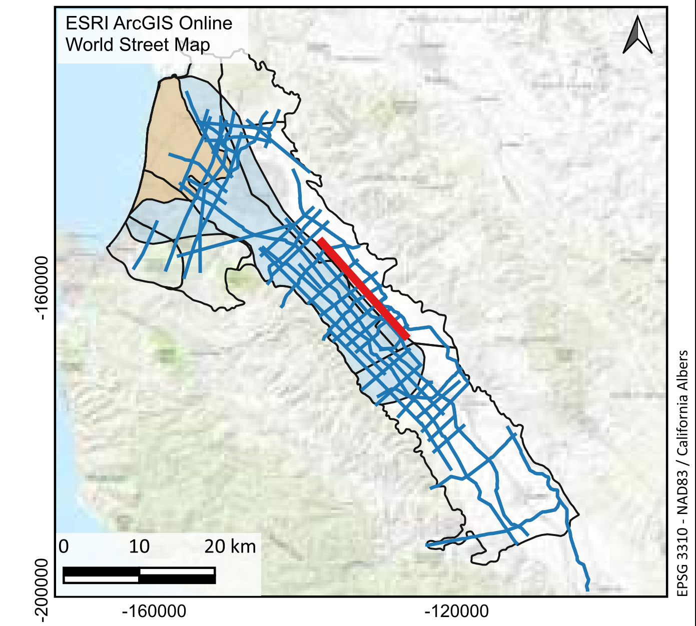
Continous conductor

Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 200200

AEM Model Sections





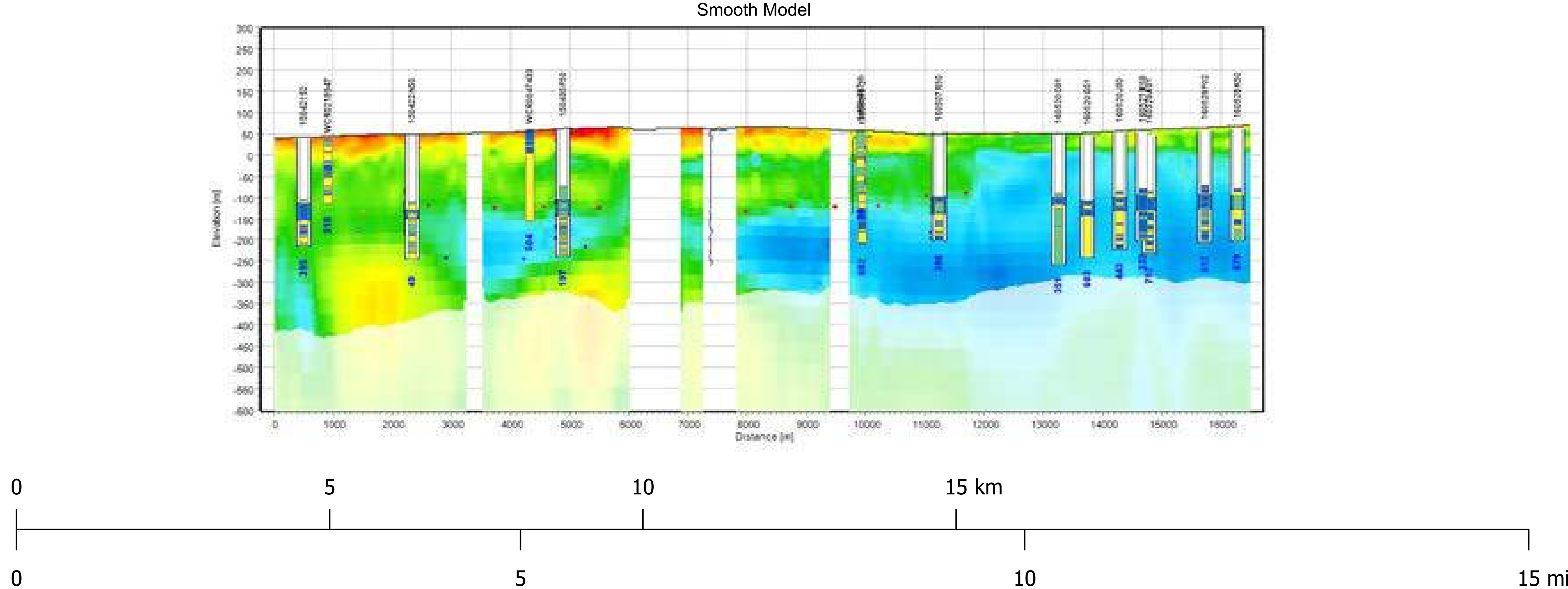
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

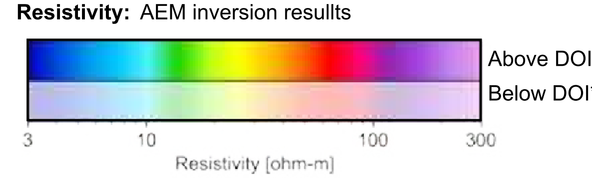
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model

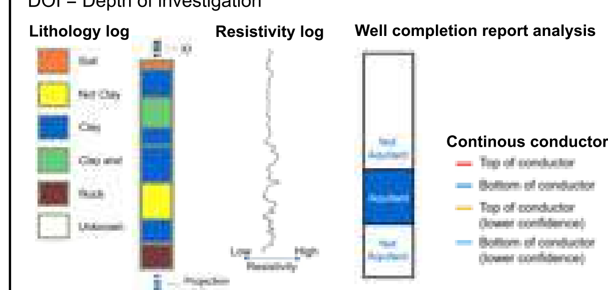


Legend for Model Sections

Resistivity: AEM inversion resullts



*DOI = Depth of investigation

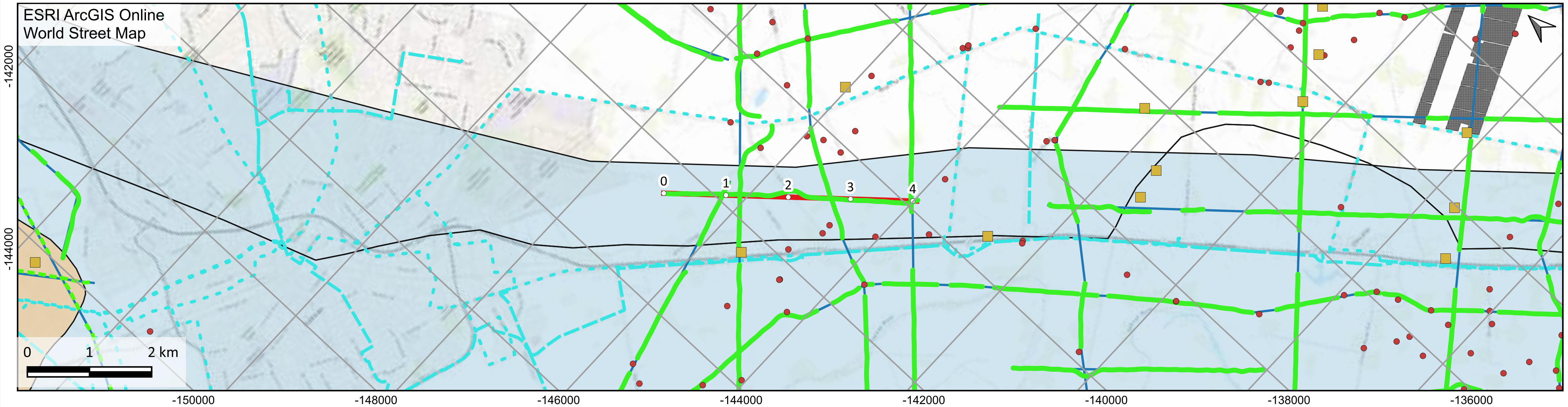


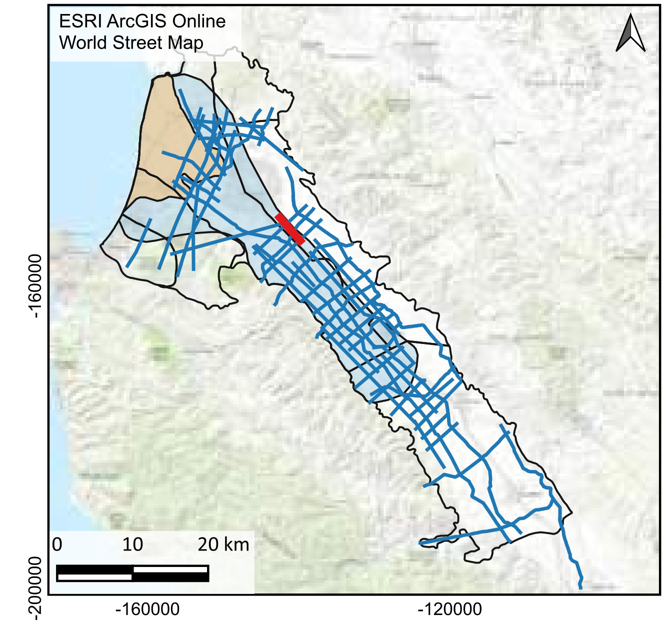
Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 200300

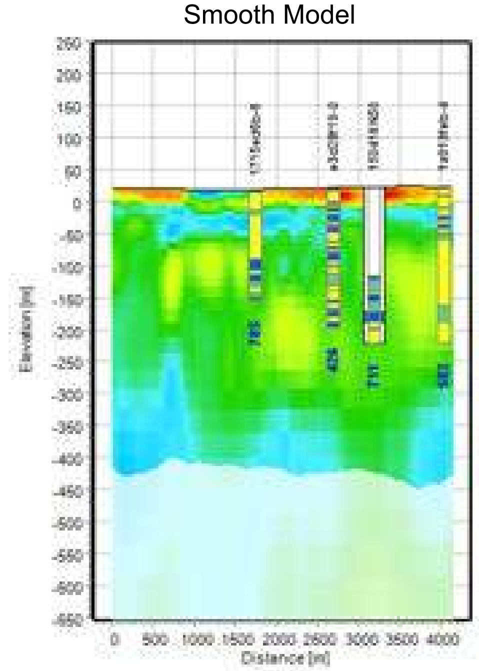
AEM Model Sections

RAMBOLL





Smooth Model



0 5 10 15 km

0 5 10 15 mi

Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
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- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Legend for Model Sections

Resistivity: AEM inversion resullts

Above DOI*

Below DOI*

3 10 100 300

Resistivity [ohm-m]

*DOI = Depth of investigation

Lithology log **Resistivity log** **Well completion report analysis**

Soil

Not Clay

Clay

Clay and

Rock

Unknown

Projection distance

Low High Resistivity

Not Aquifer

Aquifer

Not Aquifer

Continous conductor

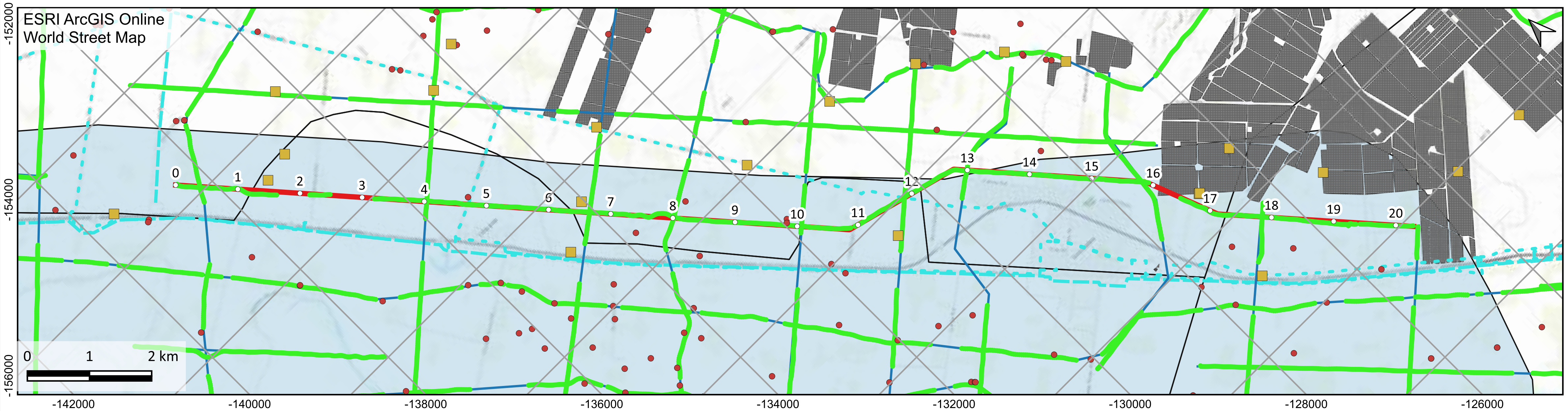
- Top of conductor
- Bottom of conductor
- Top of conductor (lower confidence)
- Bottom of conductor (lower confidence)

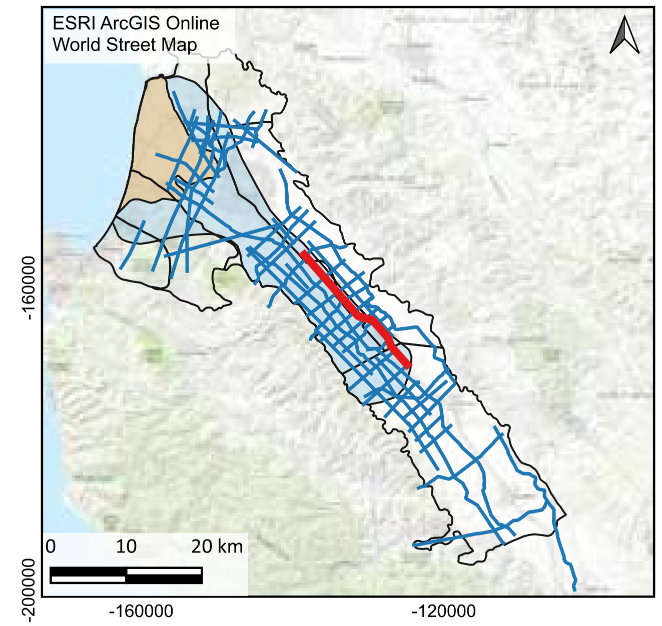
Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 200400

AEM Model Sections

RAMBØLL





EPSG 3310 - NAD83 / California Albers

Legend for Maps

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AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
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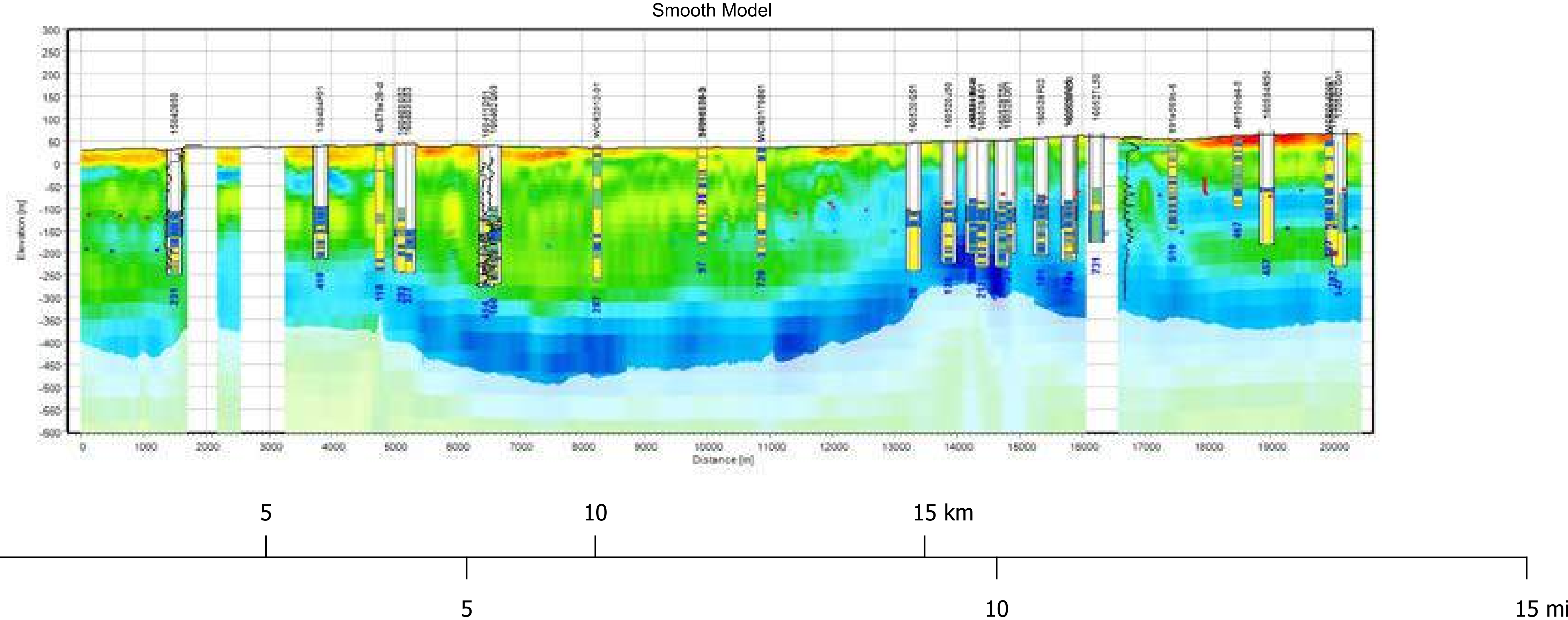
Smooth Model



Legend for Model Sections

Resistivity: AEM inversion resullts

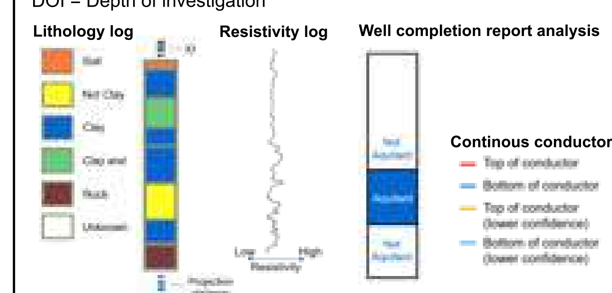
Above DOI*

Below DOI*

3 10 100 300

Resistivity [ohm-m]

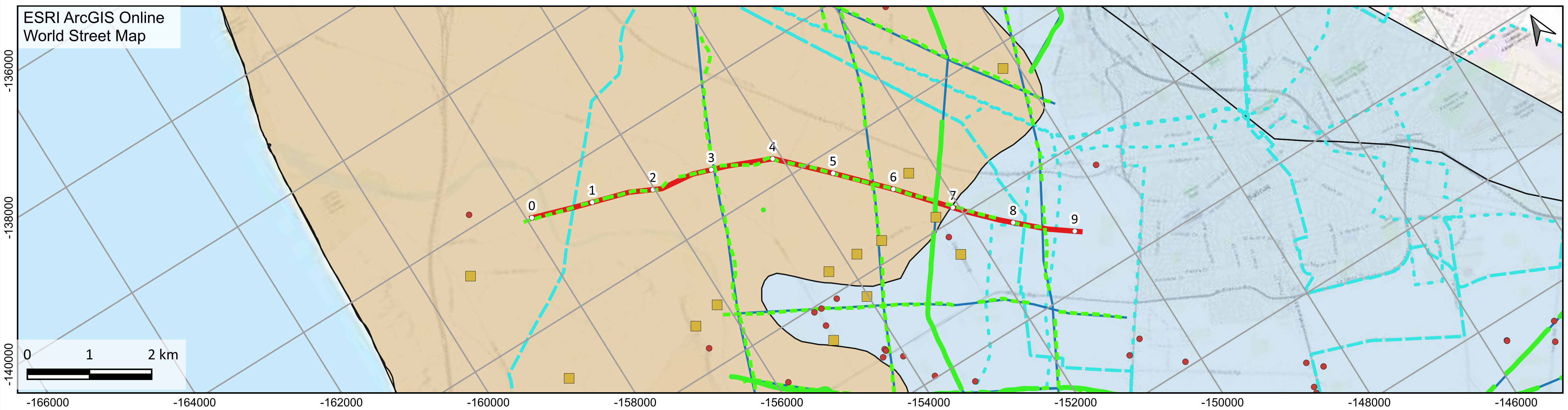
*DOI = Depth of investigation

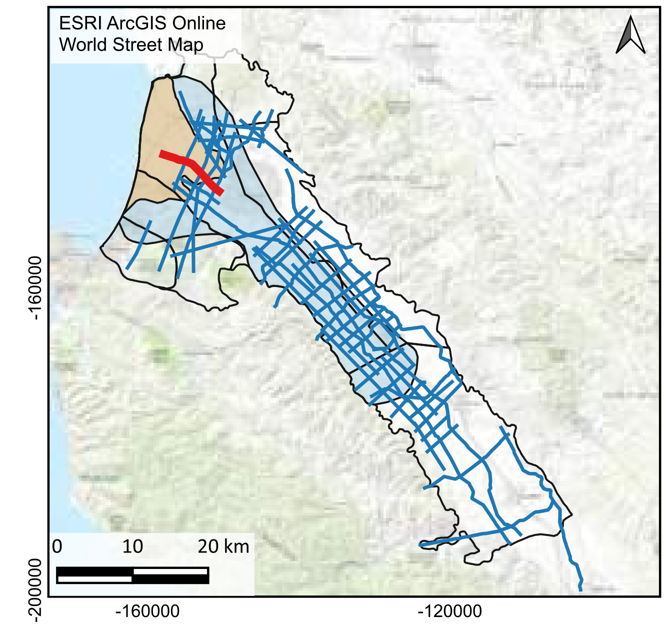


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 2019_08

AEM Model Sections





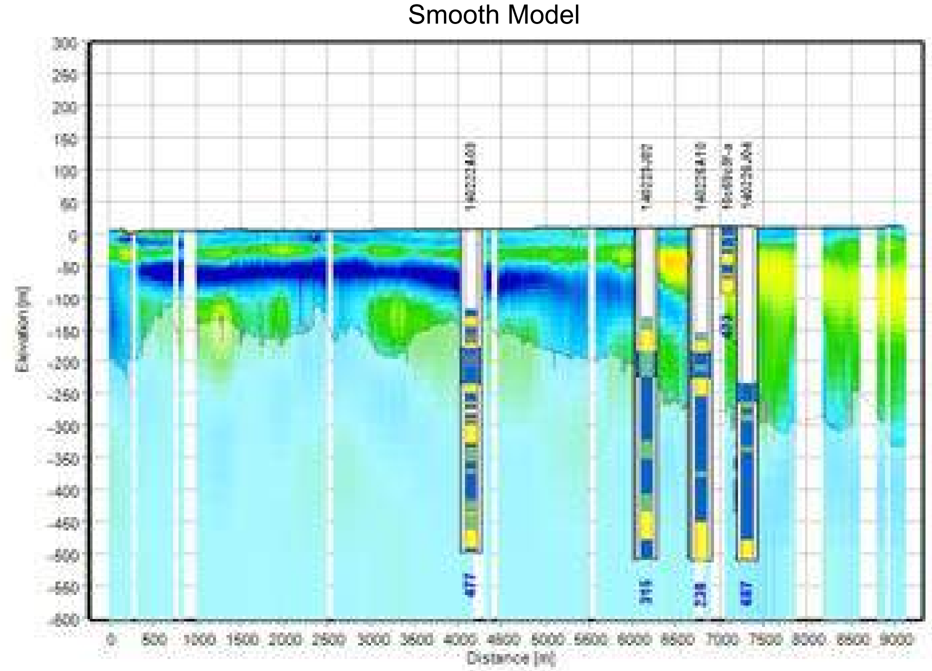
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

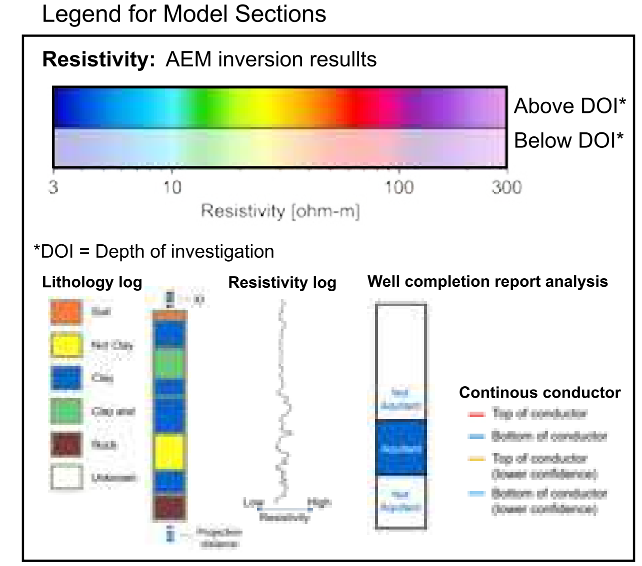
Smooth Model



0 5 10 15 km

0 5 10 15 mi

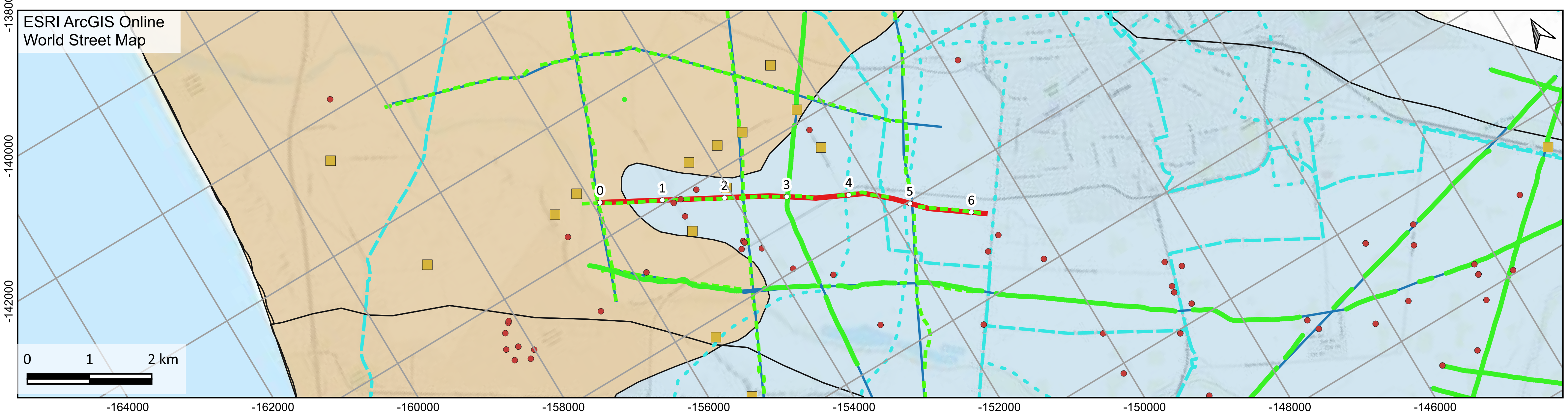
Legend for Model Sections

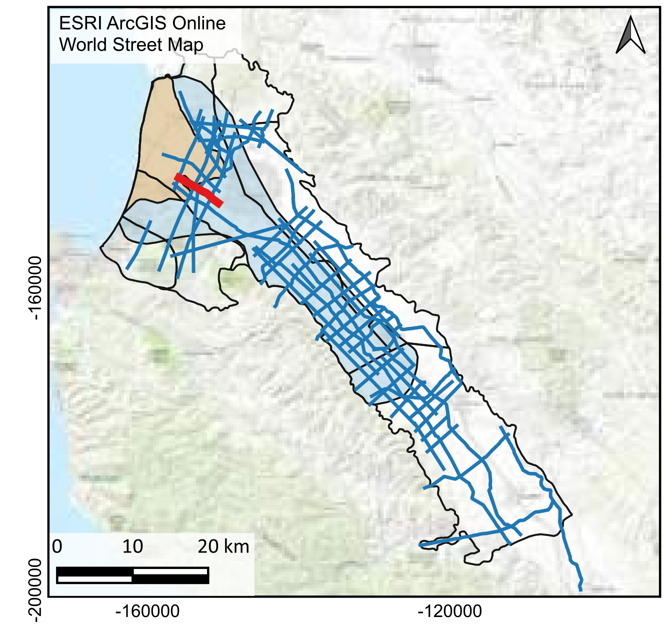


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 2019_10

AEM Model Sections





Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
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AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
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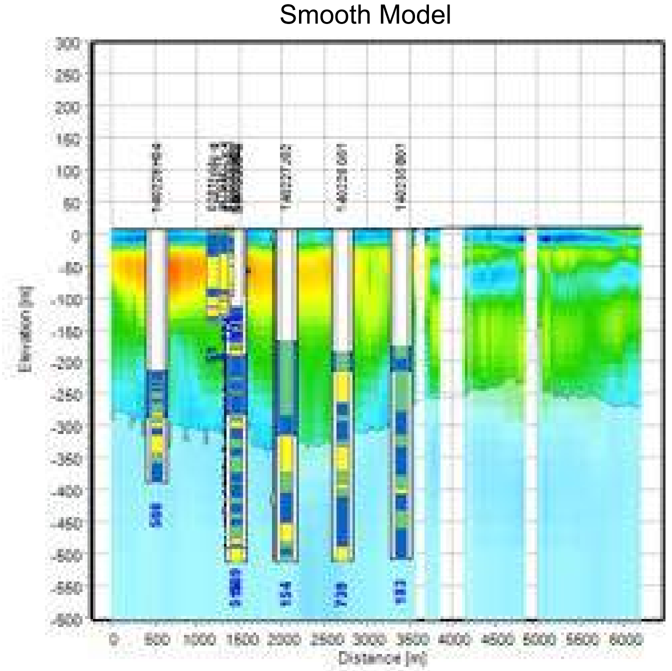
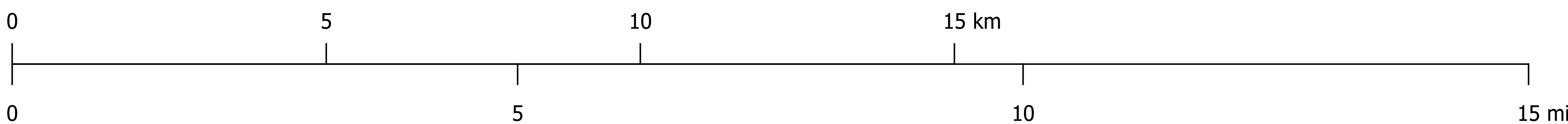
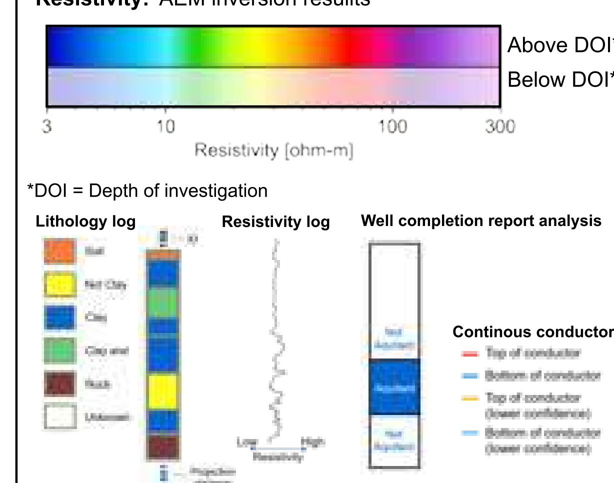
Smooth Model





Legend for Model Sections

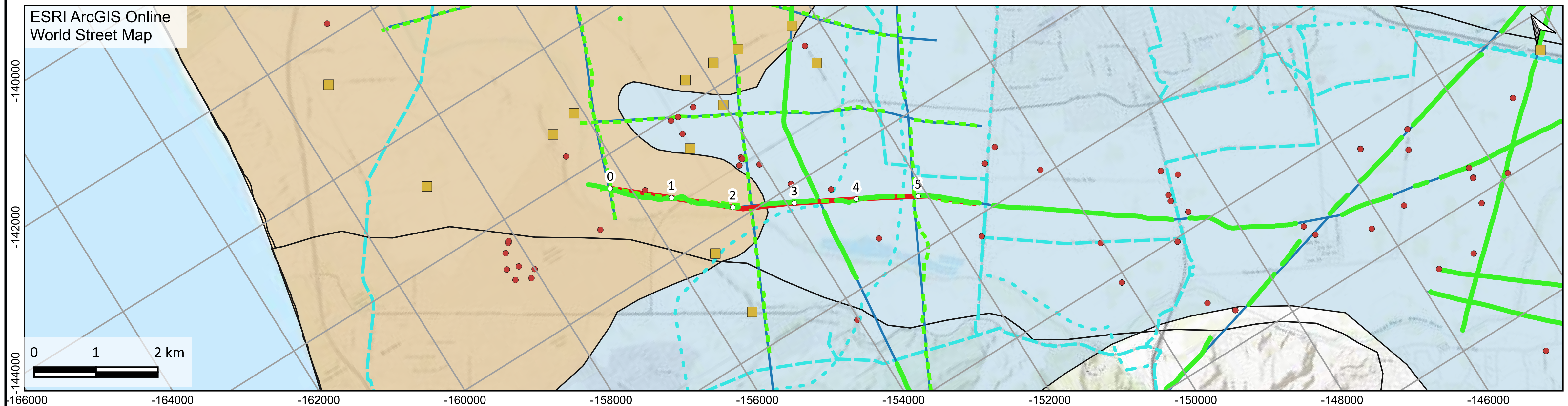
Resistivity: AEM inversion resullts

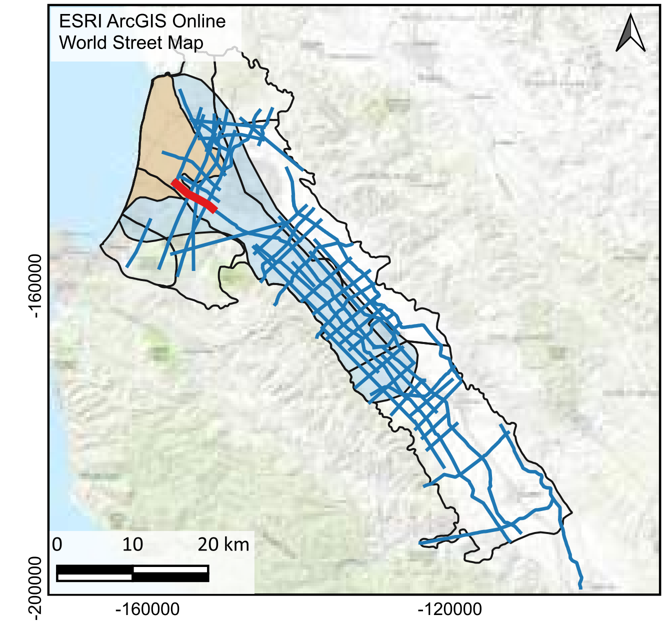


*DOI = Depth of investigation

Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

AEM Model Sections





Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
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- Section (Other pages)

AEM data used for inversion

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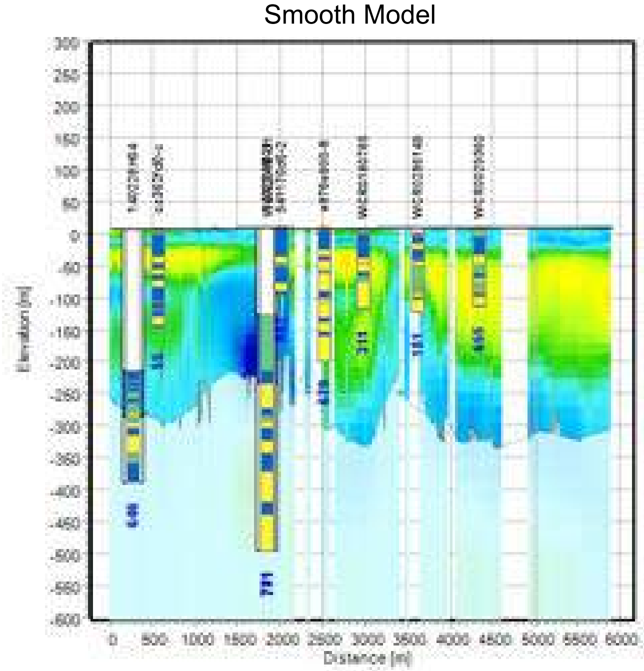
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model



0 5 10 15 km

0 5 10 15 mi

Legend for Model Sections

Resistivity: AEM inversion resullts

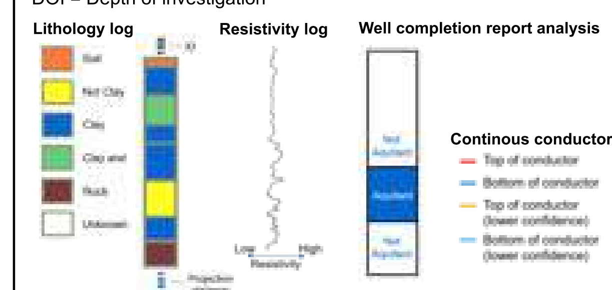
Above DOI*

Below DOI*

3 10 100 300

Resistivity [ohm-m]

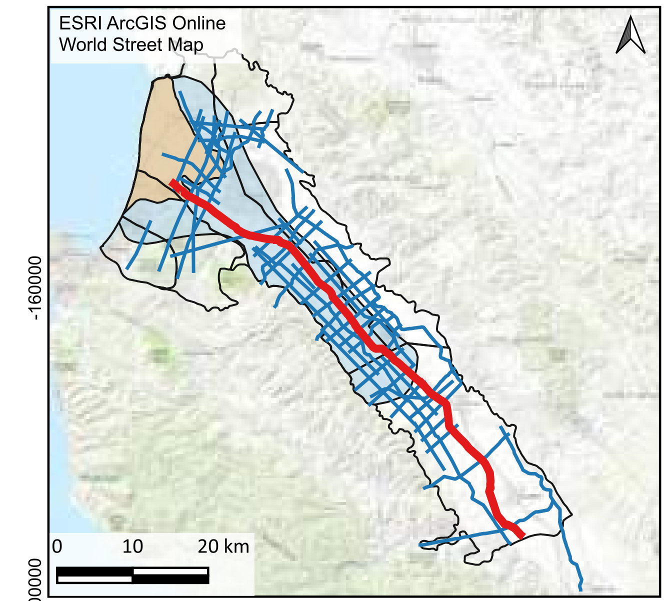
*DOI = Depth of investigation



Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA1_103500_1

AEM Model Sections



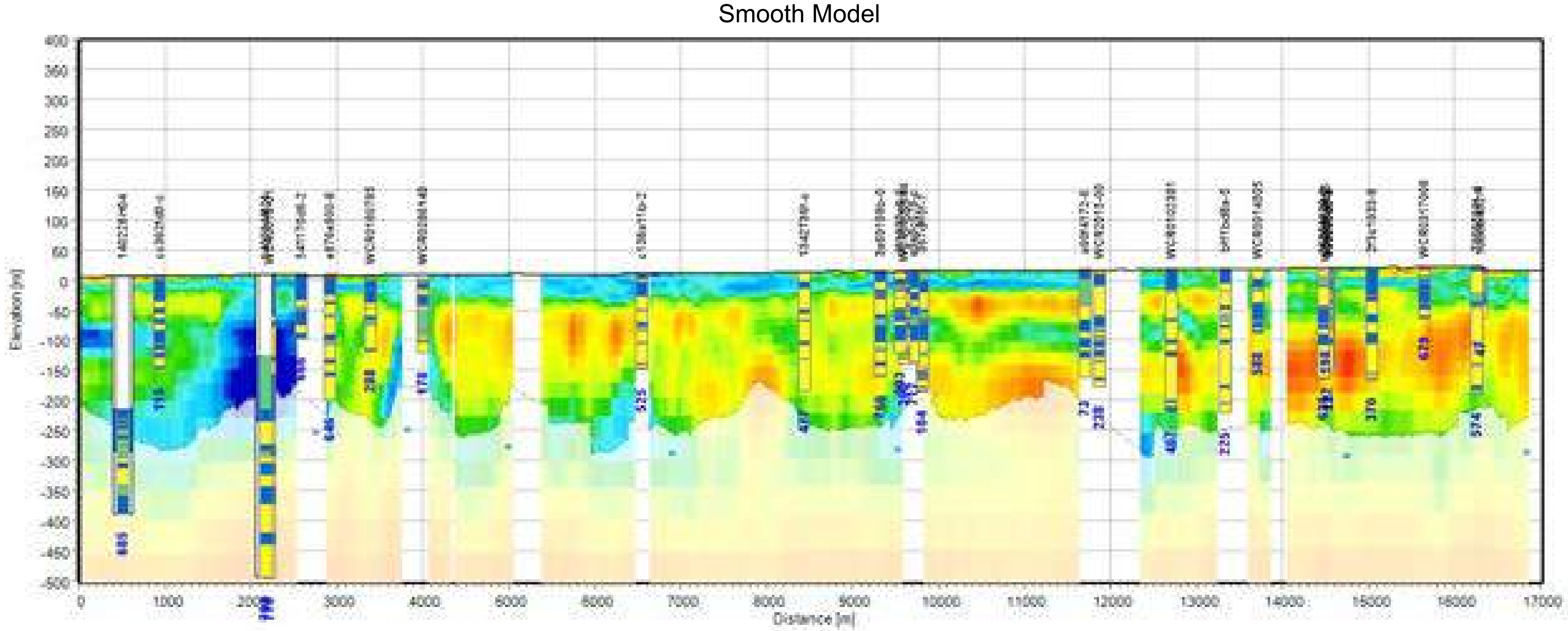
Legend for Maps

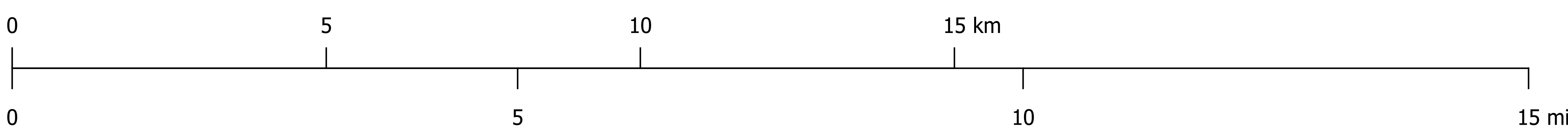
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

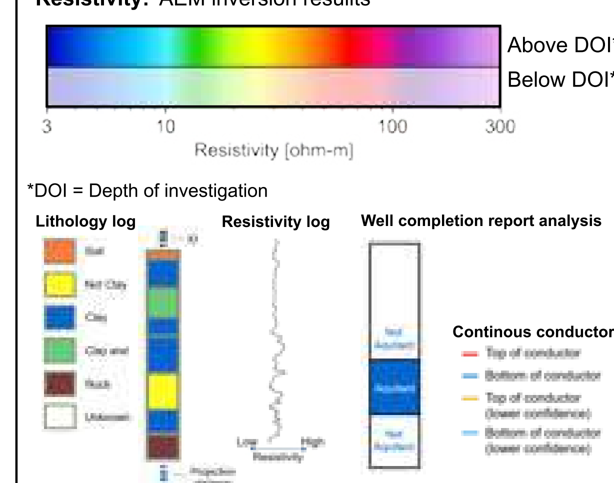
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model



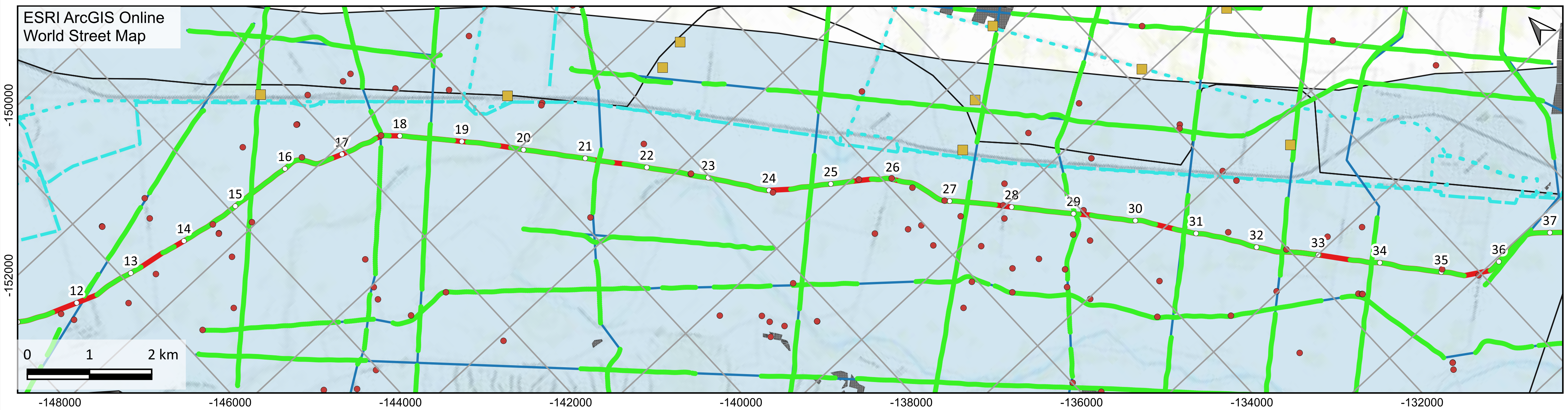


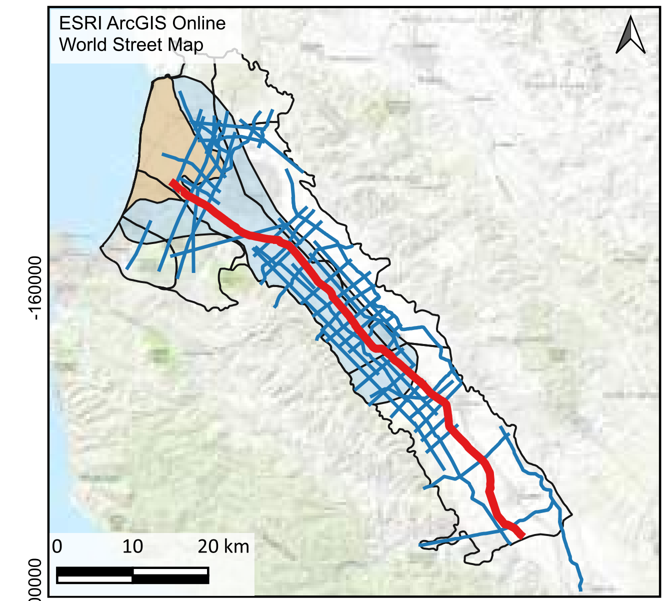
Legend for Model Sections



Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA1_103500_2 **AEM Model Sections**





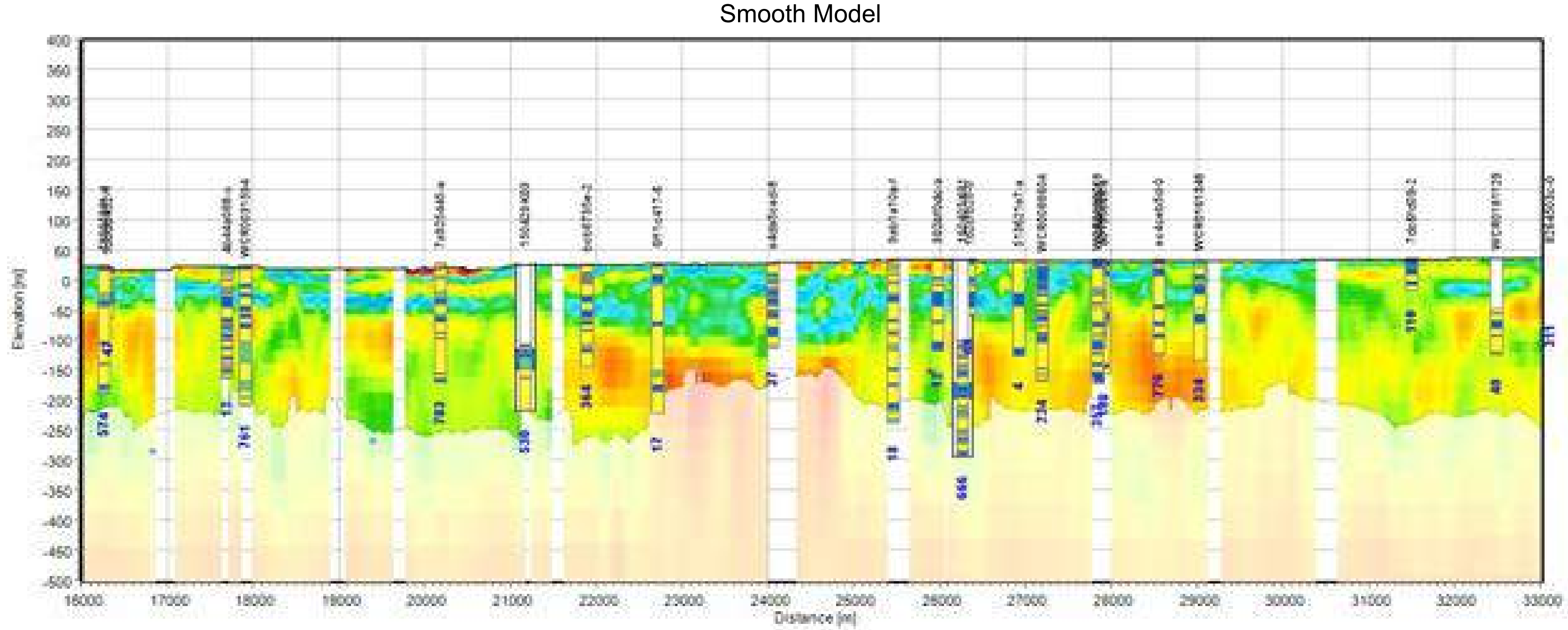
Legend for Maps

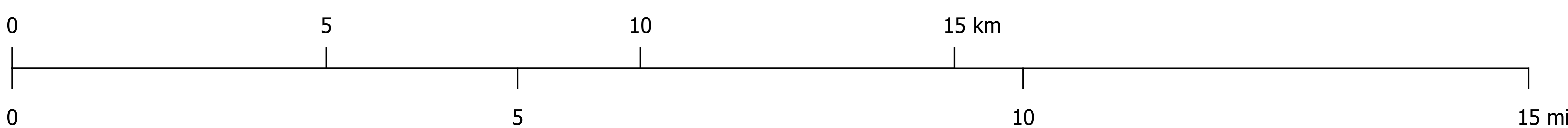
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model





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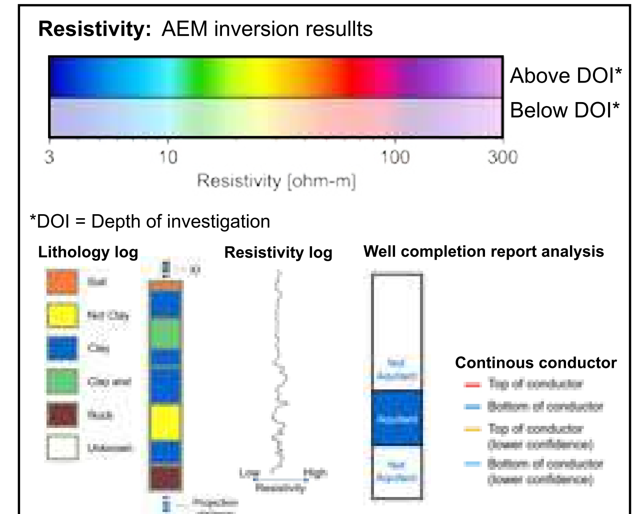
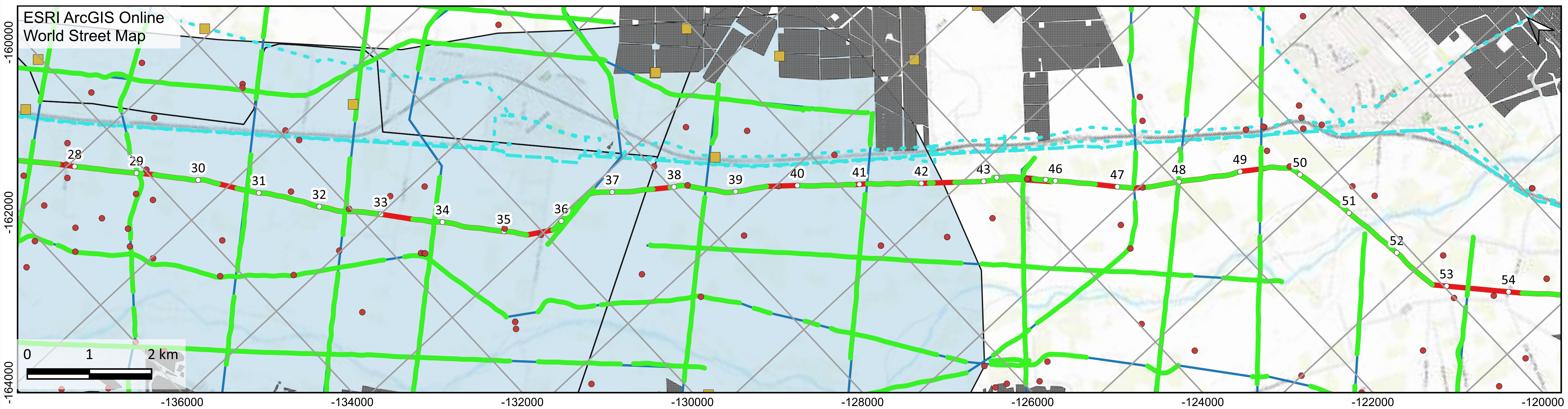
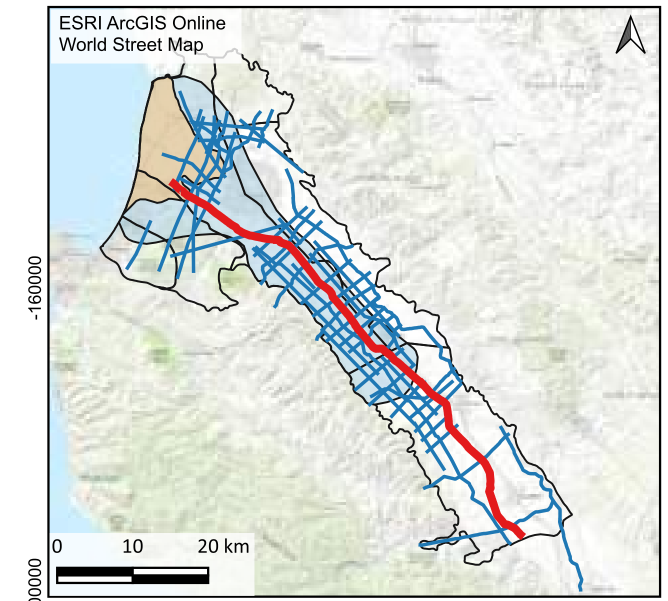


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA1_103500_3

AEM Model Sections





EPSG 3310 - NAD83 / California Albers

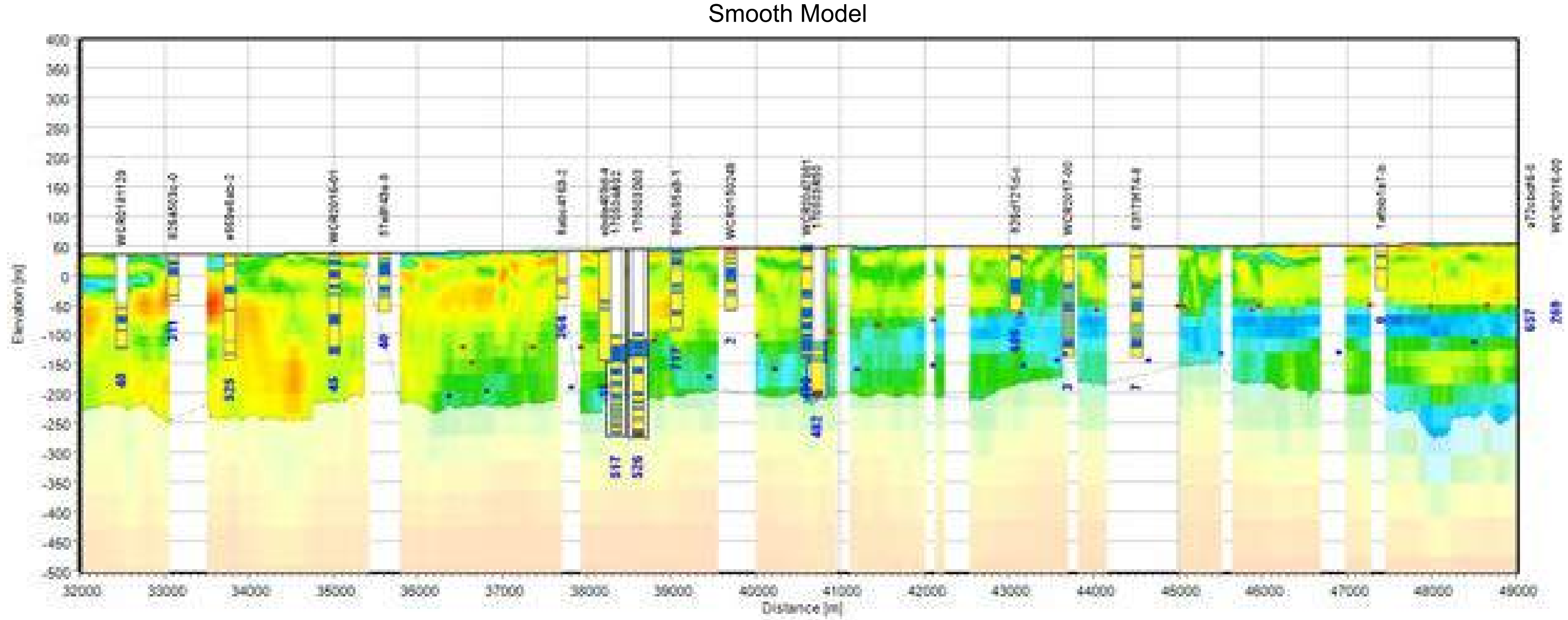
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model



0 5 10 15 km

0 5 10 15 mi

Legend for Model Sections

Resistivity: AEM inversion resullts

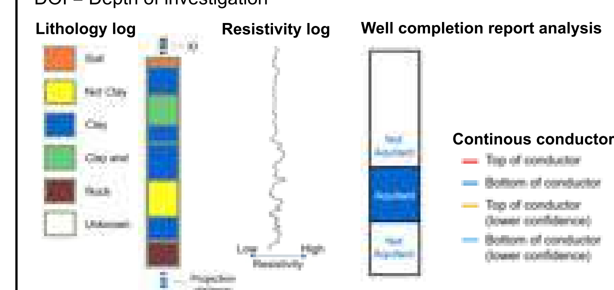
Above DOI*

Below DOI*

3 10 100 300

Resistivity [ohm-m]

*DOI = Depth of investigation

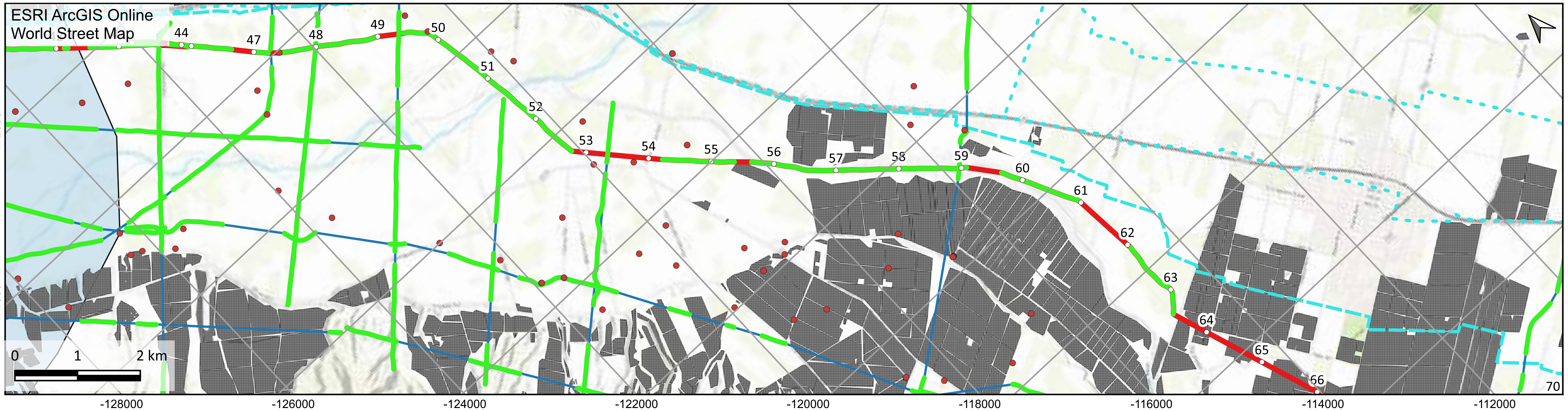


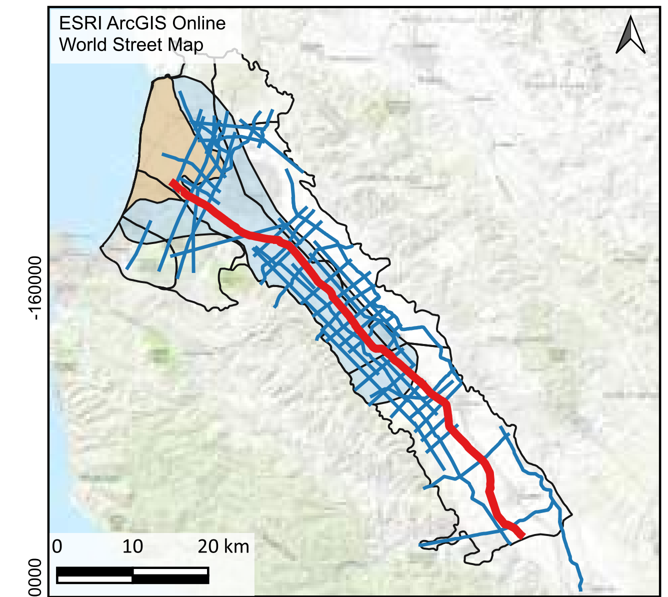
Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA1_103500_4

AEM Model Sections

RAMBOLL





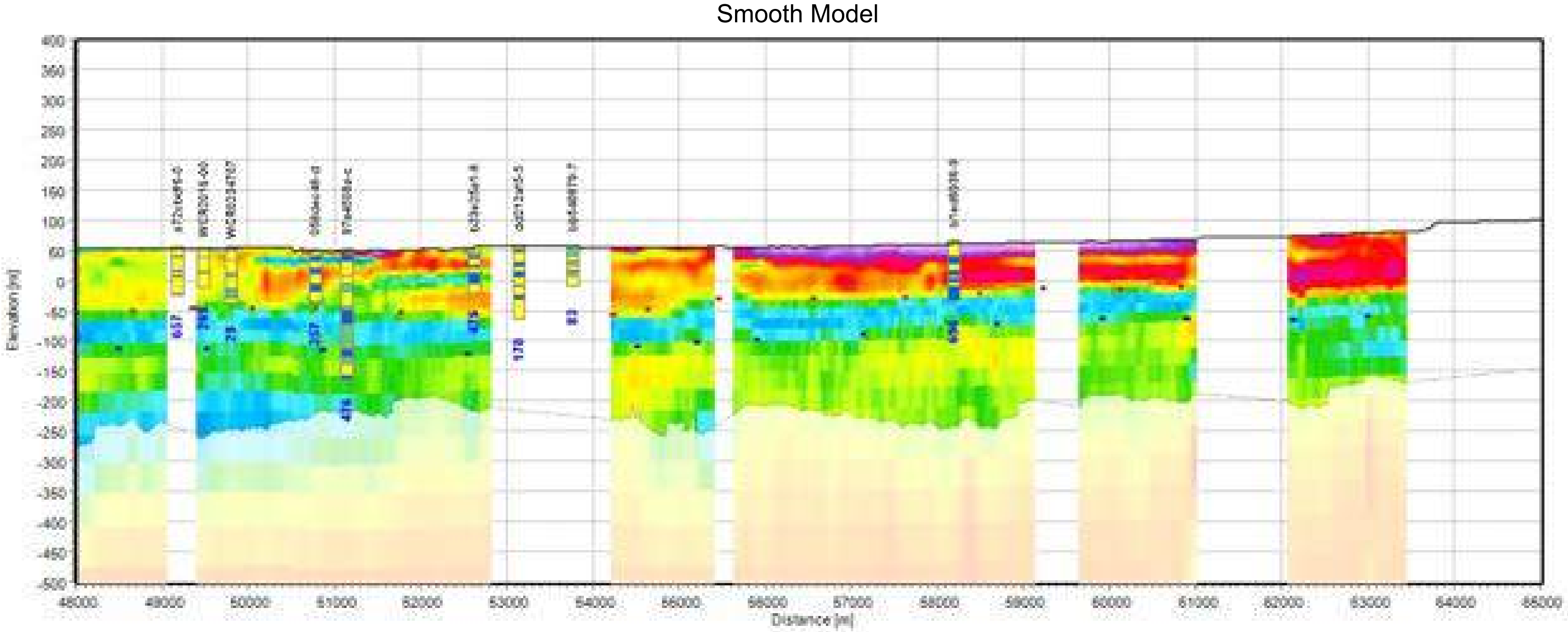
Legend for Maps

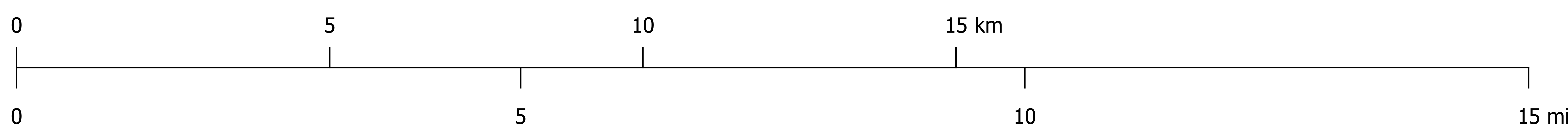
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

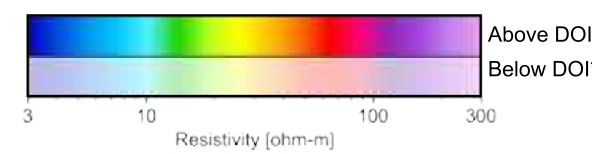
Smooth Model



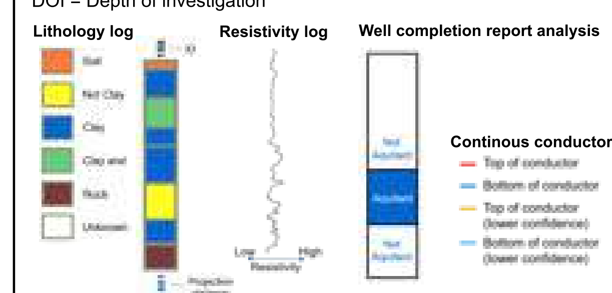


Legend for Model Sections

Resistivity: AEM inversion resullts



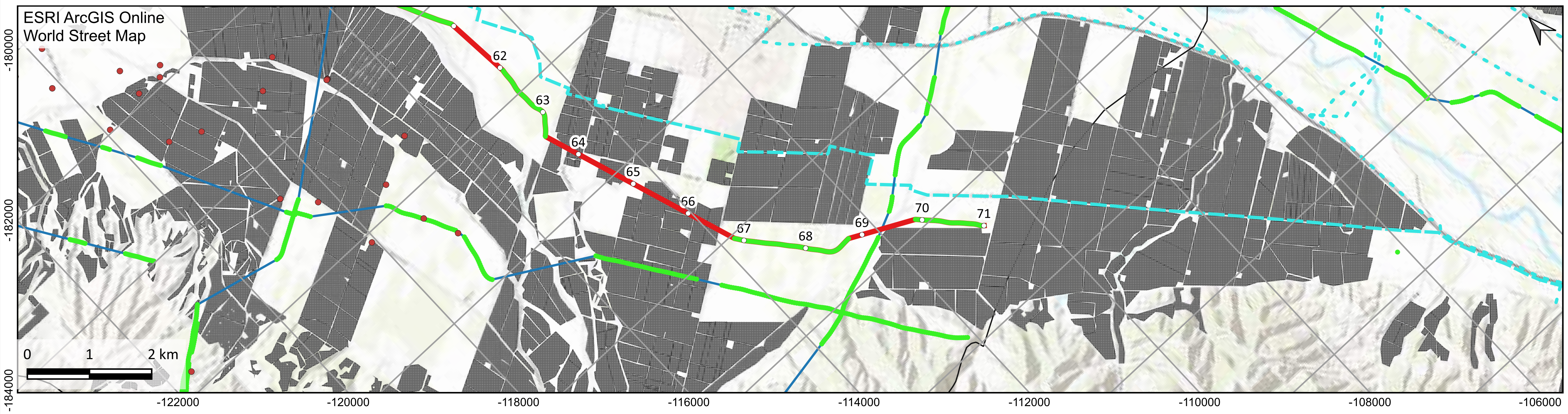
*DOI = Depth of investigation

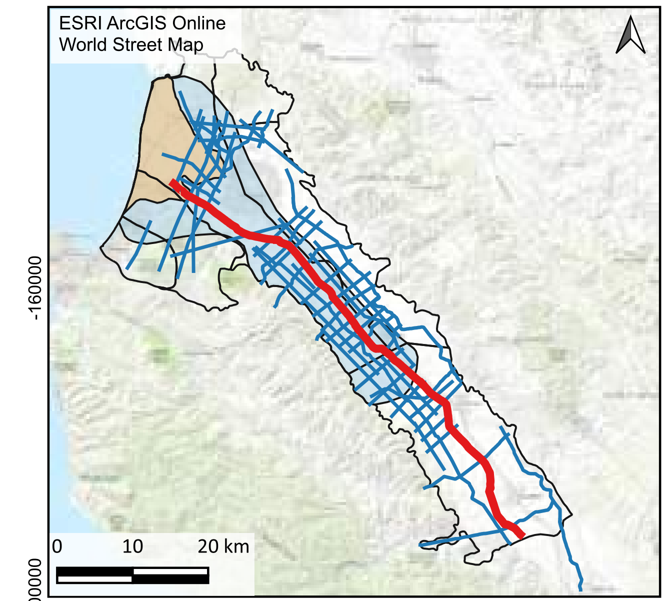


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA1_103500_5

AEM Model Sections





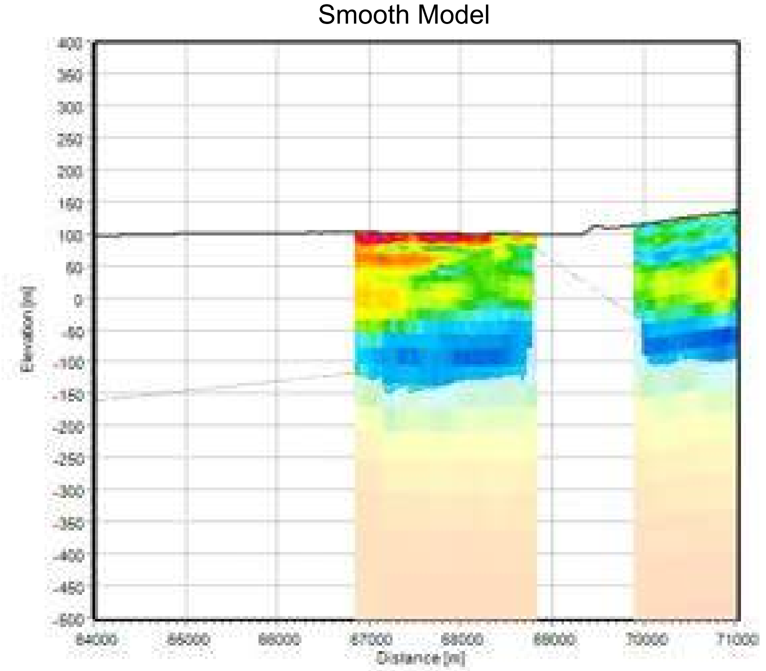
Legend for Maps

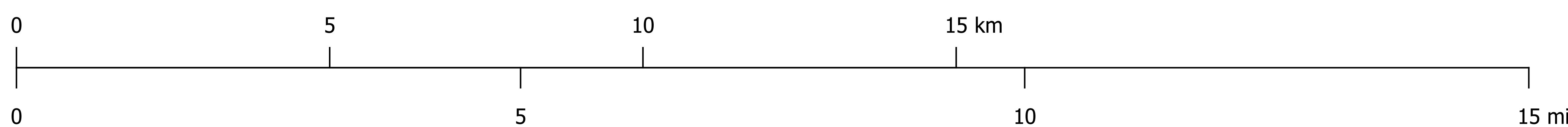
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

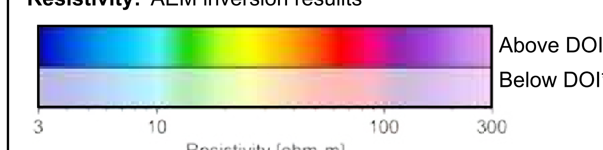
Smooth Model





Legend for Model Sections

Resistivity: AEM inversion resullts



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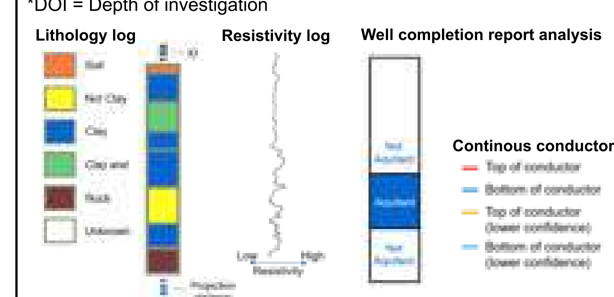
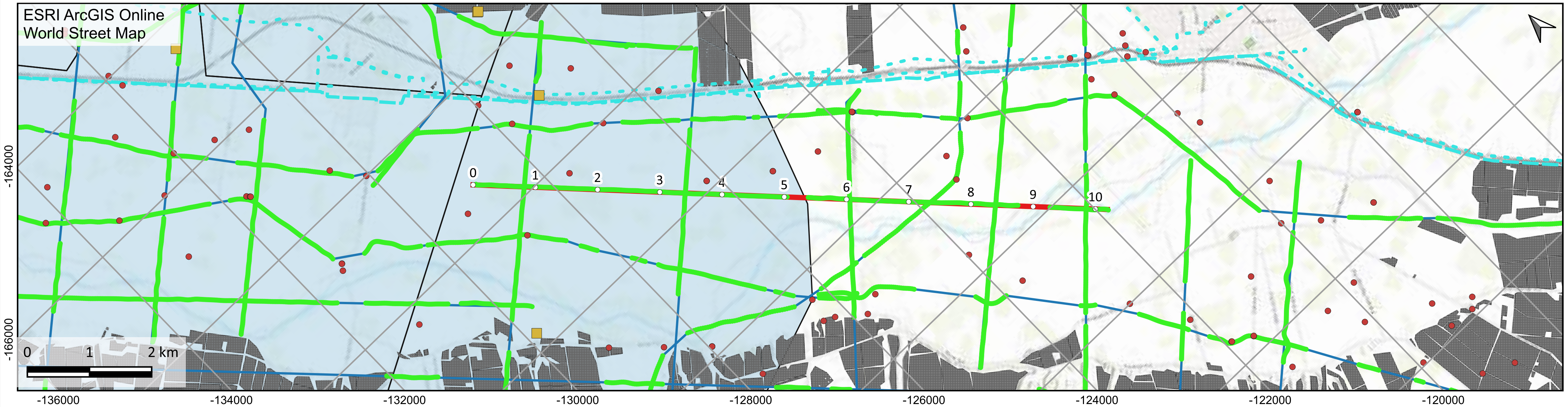
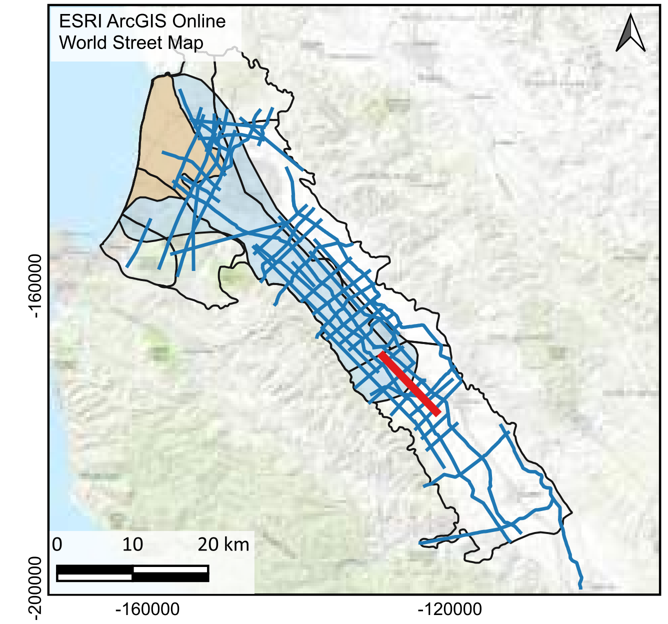


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

AEM Model Sections





Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
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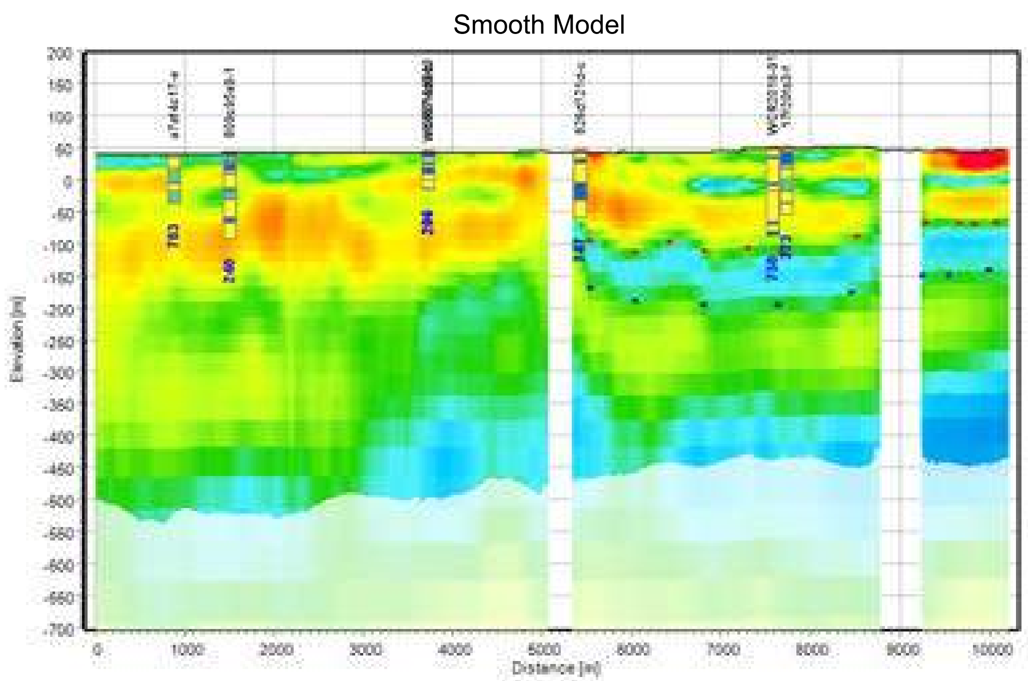
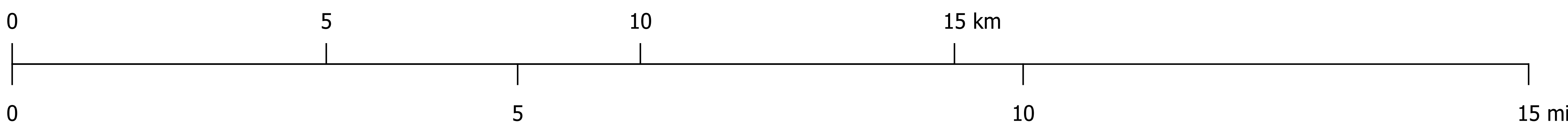
AEM data used for inversion

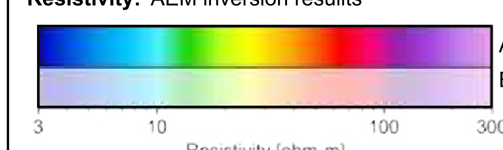
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)





Legend for Model Sections

Resistivity: AEM inversion resullts



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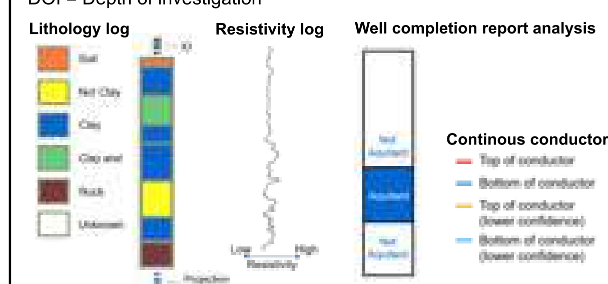
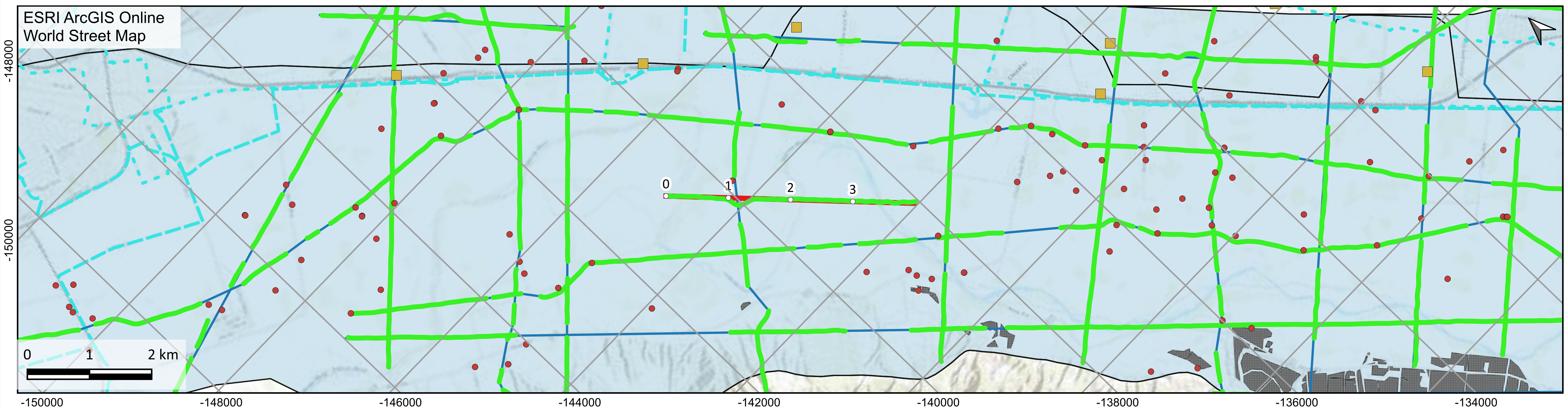
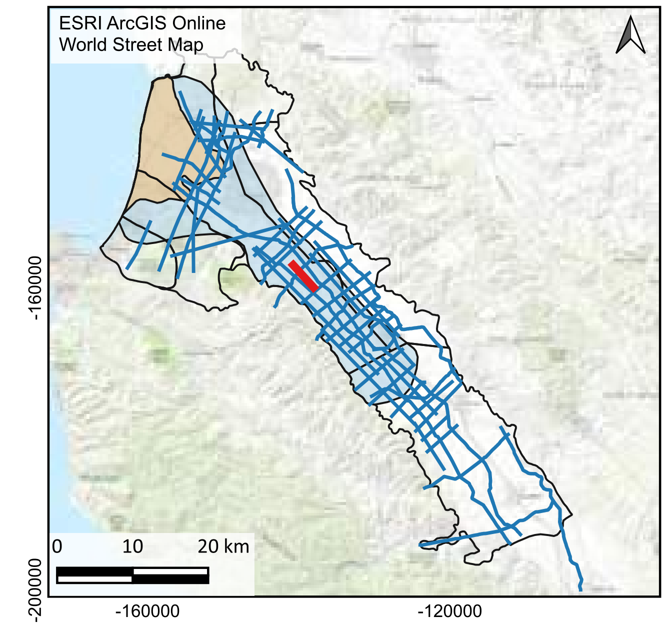


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 200500

AEM Model Sections



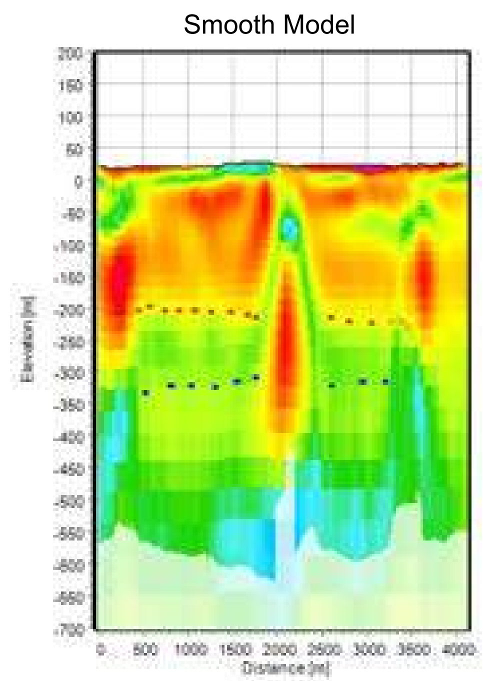


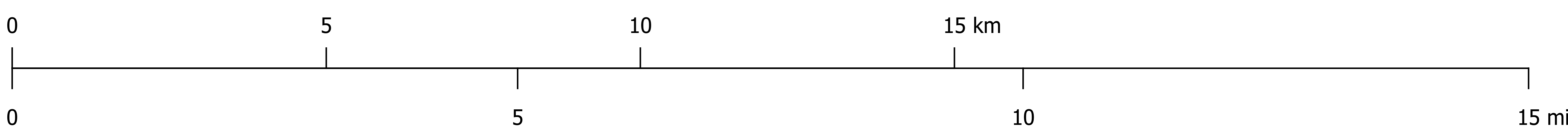
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

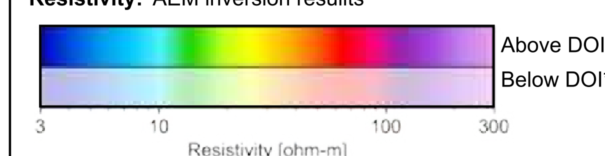
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)





Legend for Model Sections

Resistivity: AEM inversion resullts



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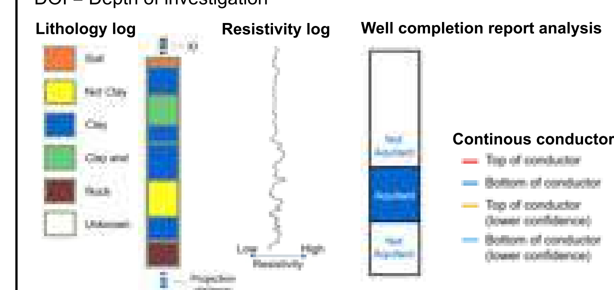
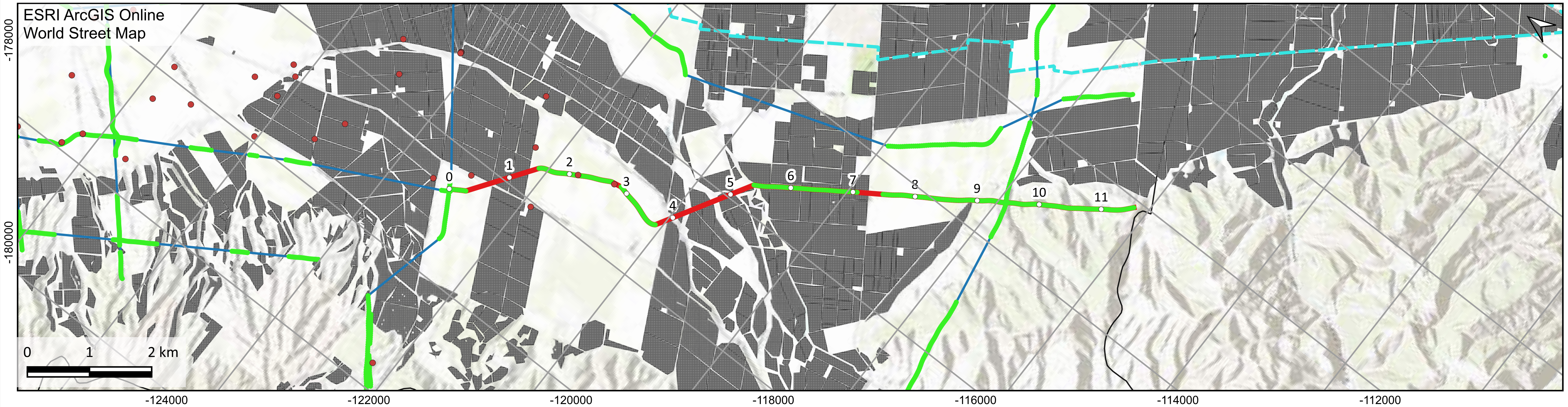
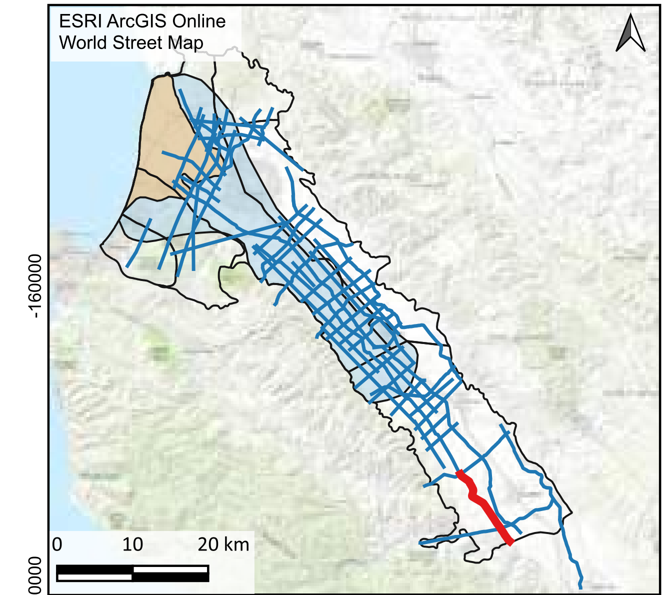


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA1_103302

AEM Model Sections



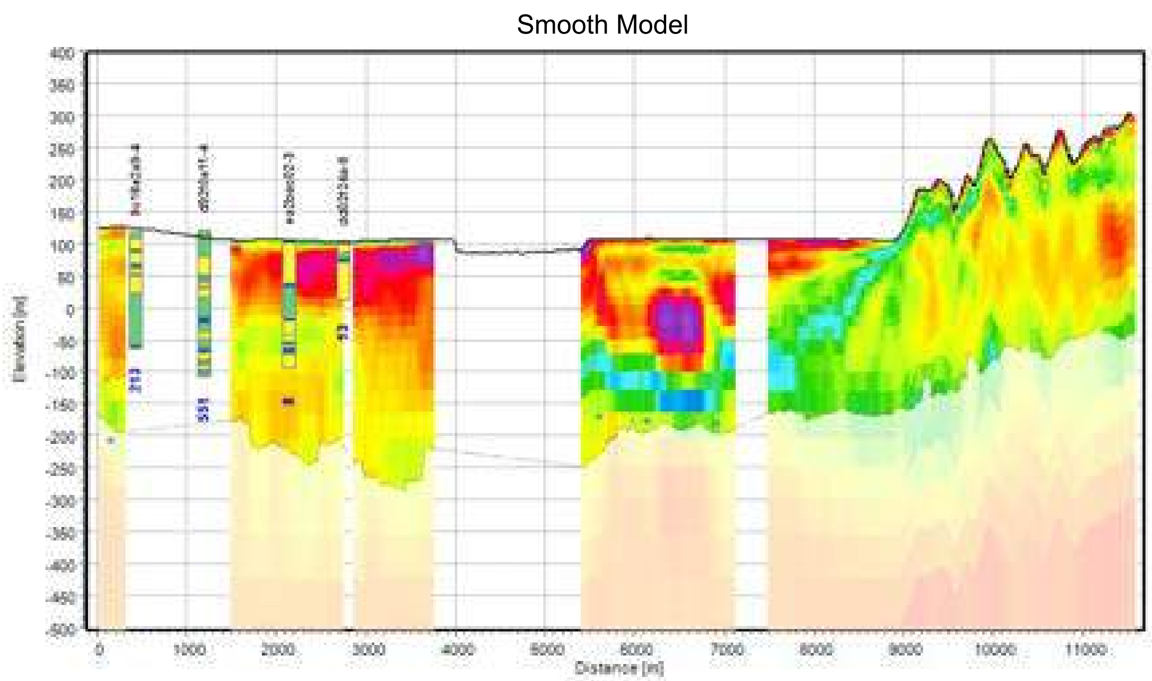


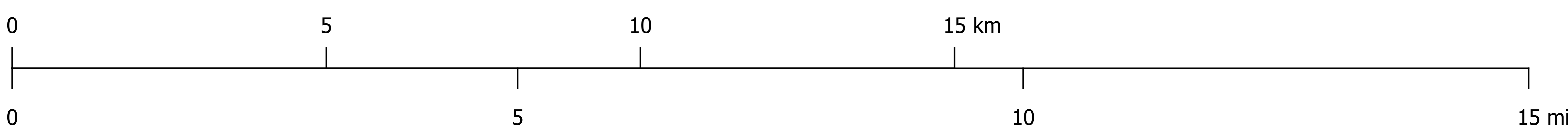
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

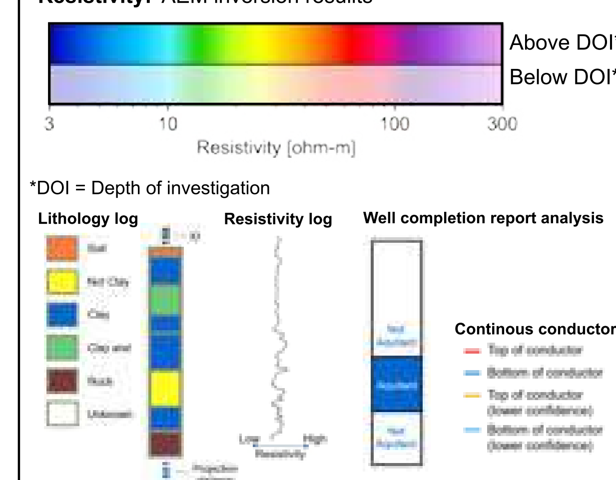
- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)





Legend for Model Sections

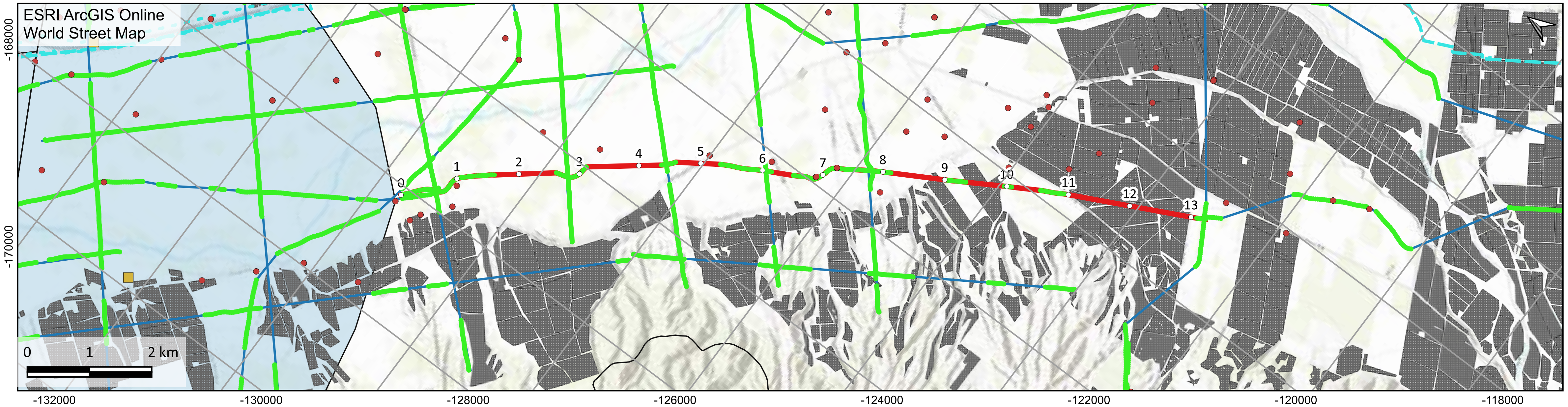
Resistivity: AEM inversion resullts

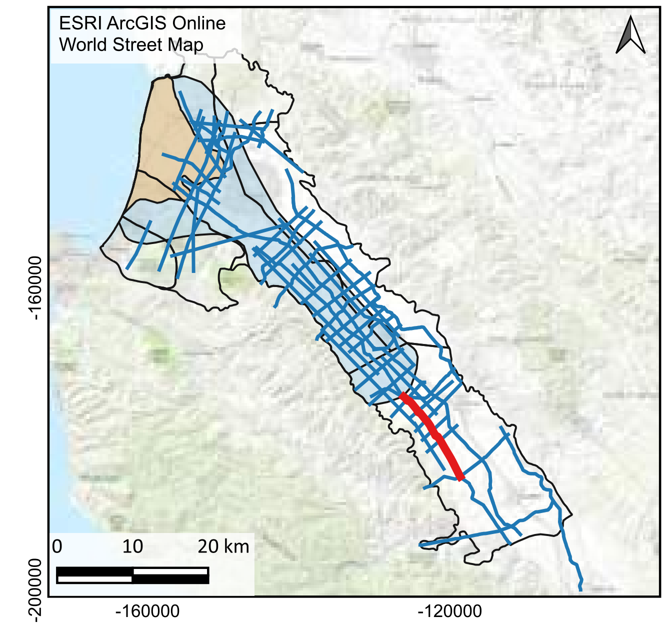


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA1_103304

AEM Model Sections





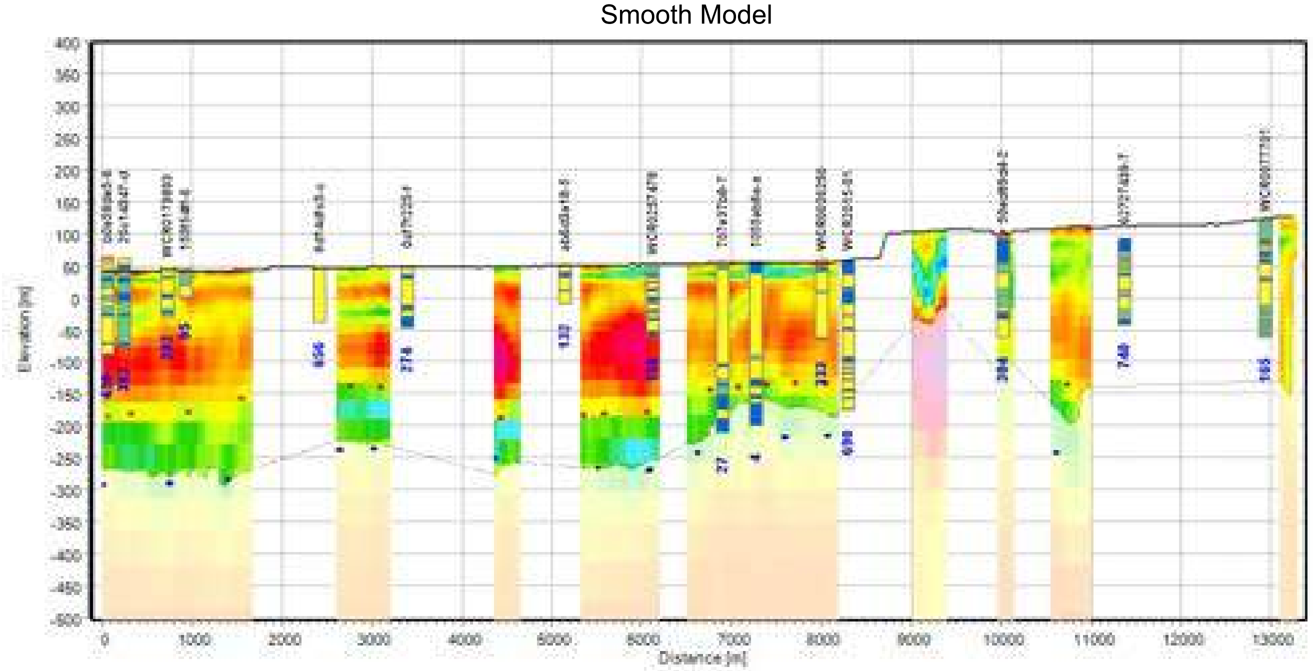
Legend for Maps

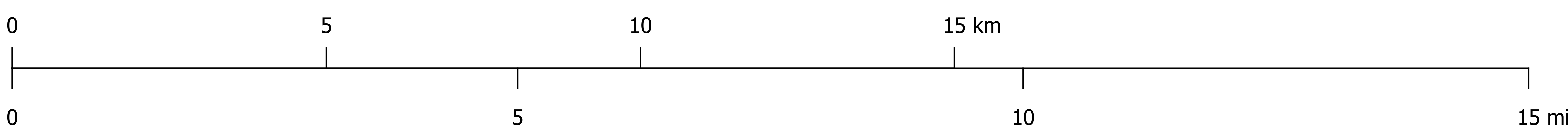
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model





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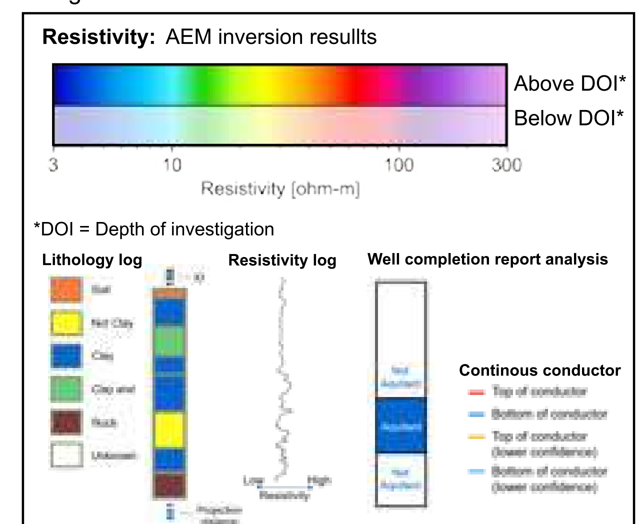
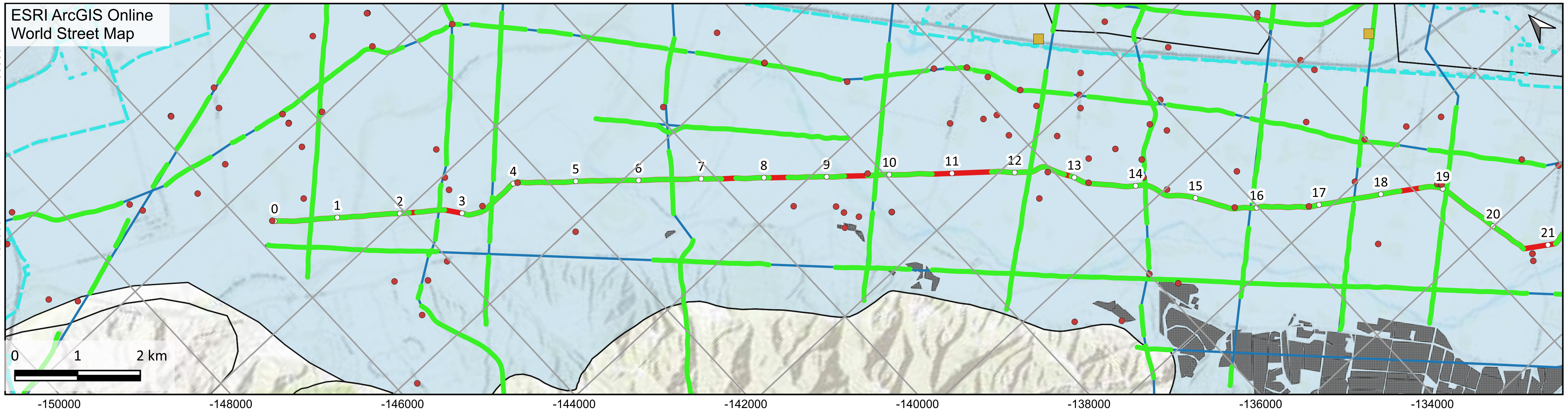


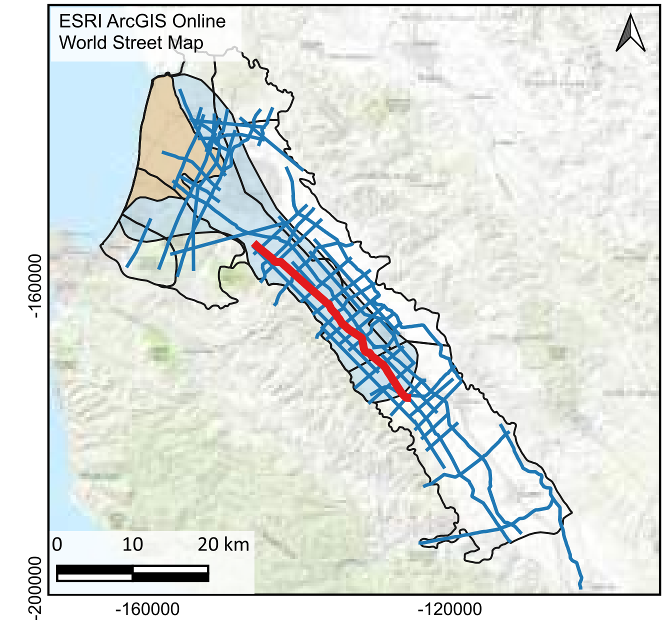
Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA1_103305_1

AEM Model Sections

RAMBOLL





EPSG 3310 - NAD83 / California Albers

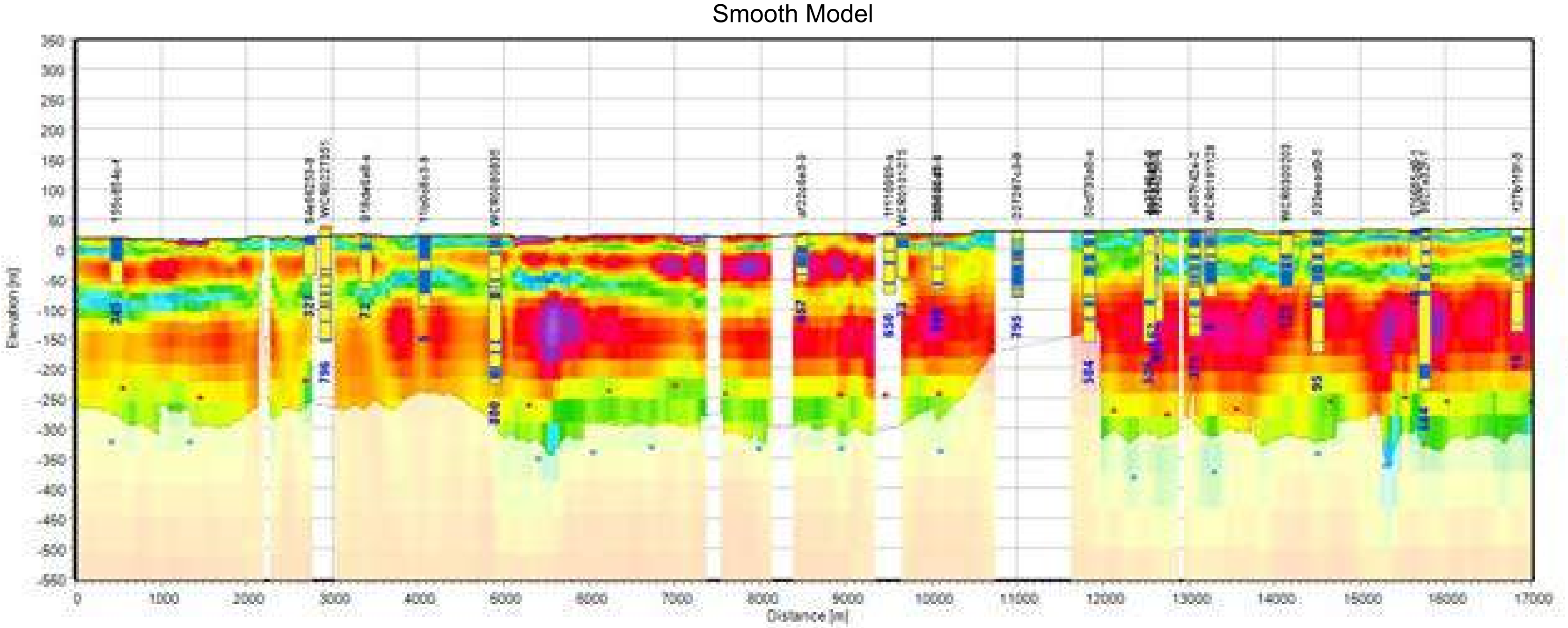
Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

Smooth Model

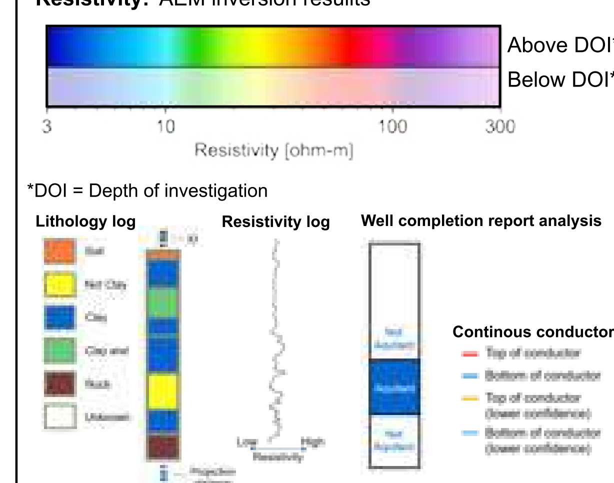


0 5 10 15 km

0 5 10 15 mi

Legend for Model Sections

Resistivity: AEM inversion resullts



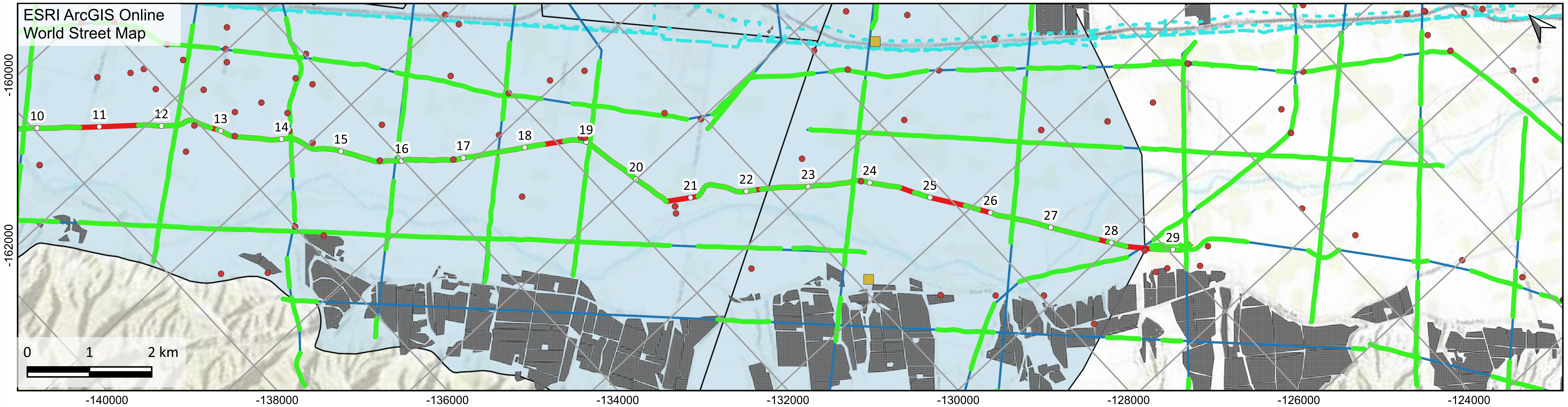
*DOI = Depth of investigation

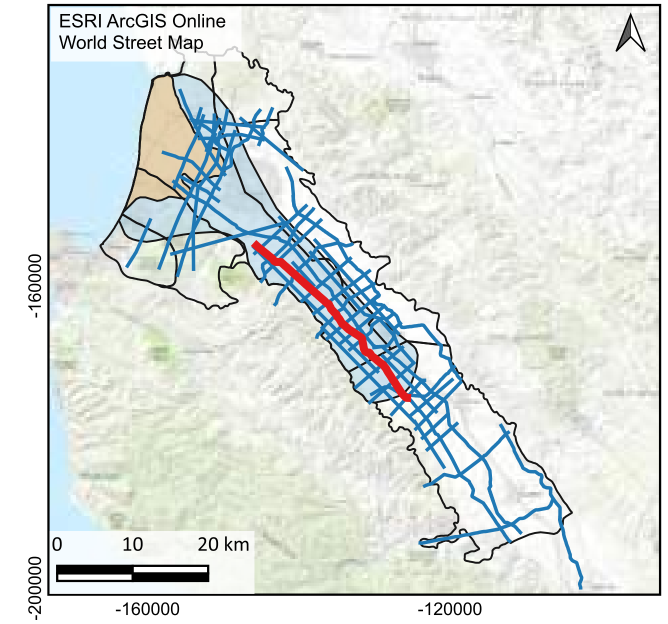
Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line DWR_SA1_103305_2

AEM Model Sections

RAMBOLL





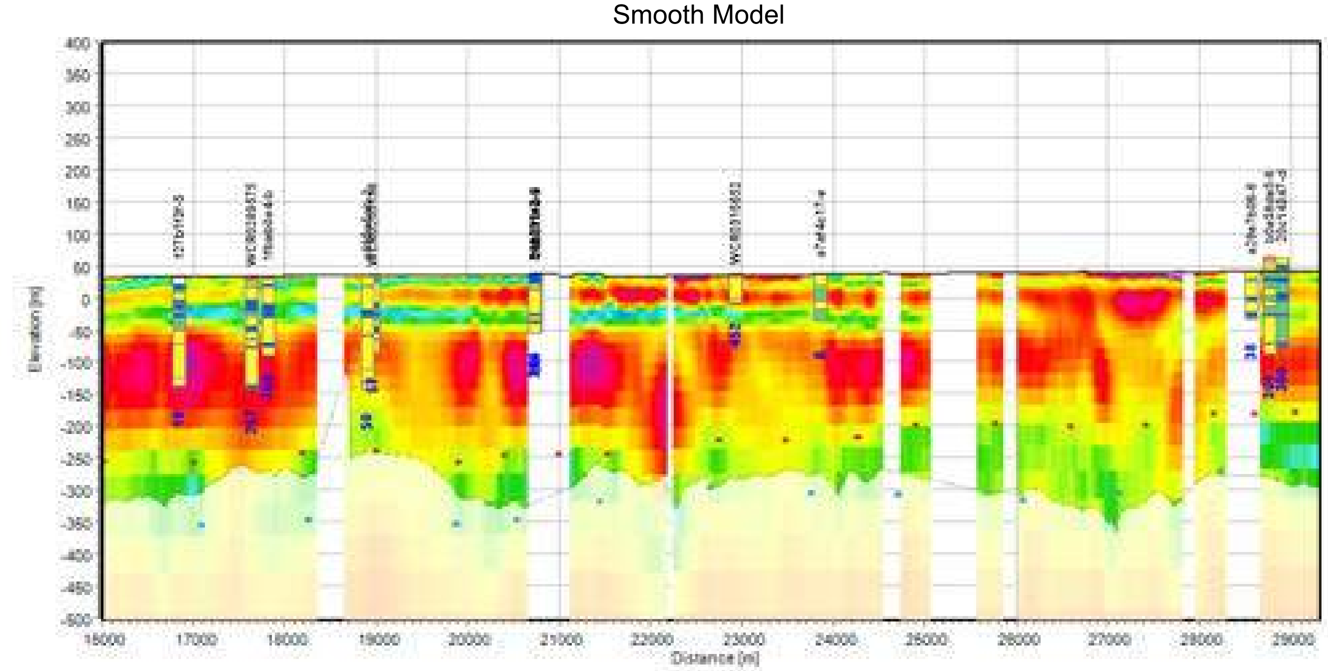
Legend for Maps

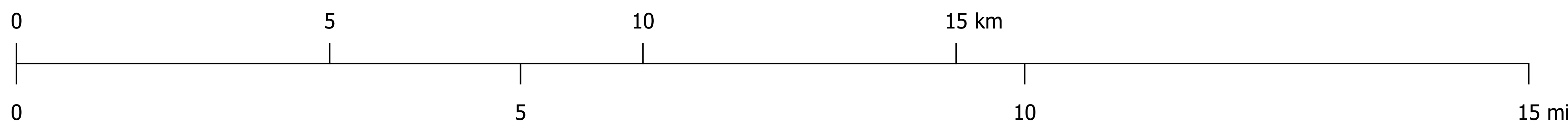
- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

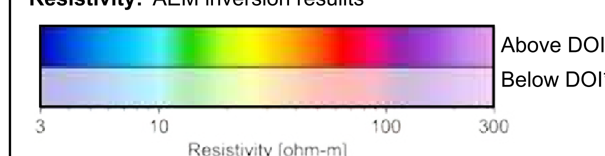
Smooth Model





Legend for Model Sections

Resistivity: AEM inversion resullts



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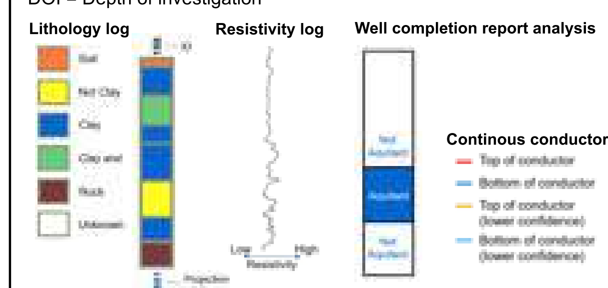
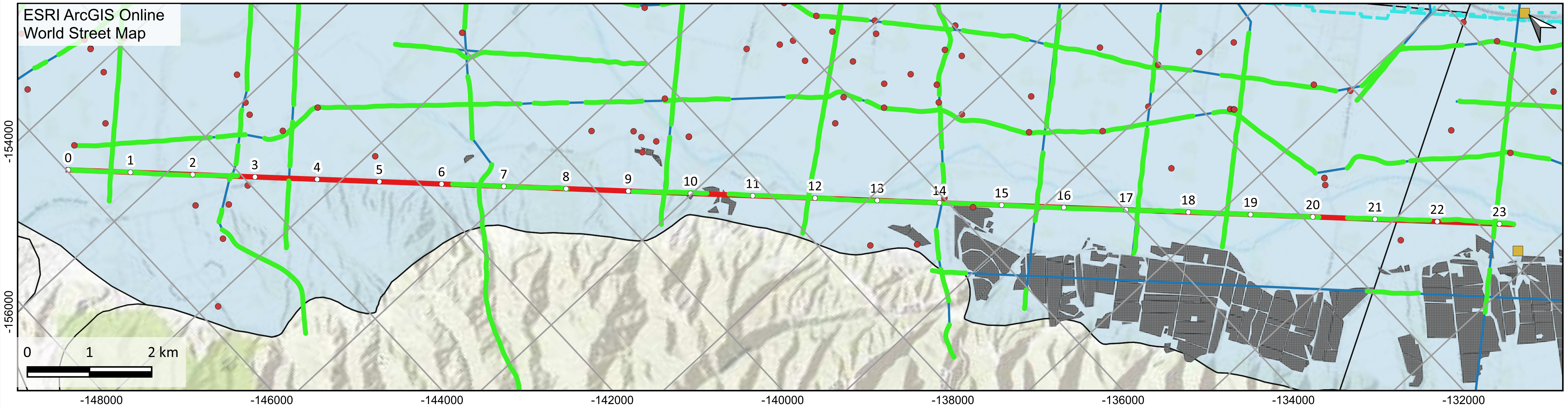
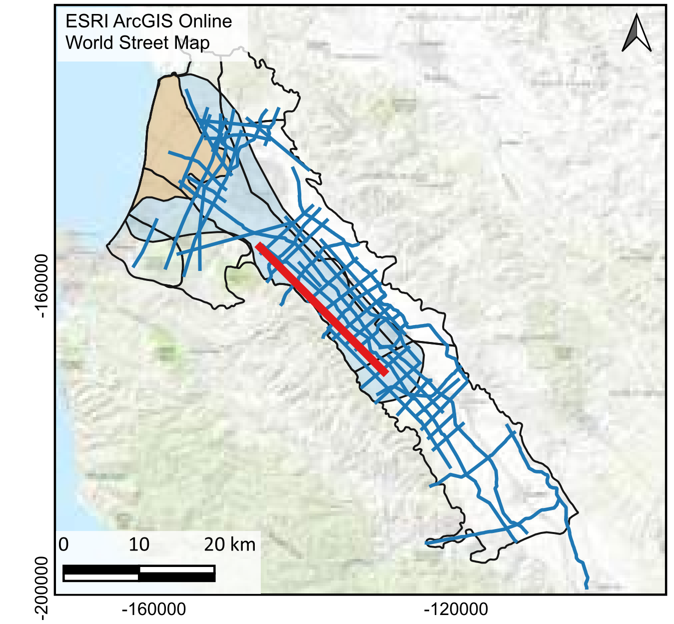


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 200700 **AEM Model Sections**





Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
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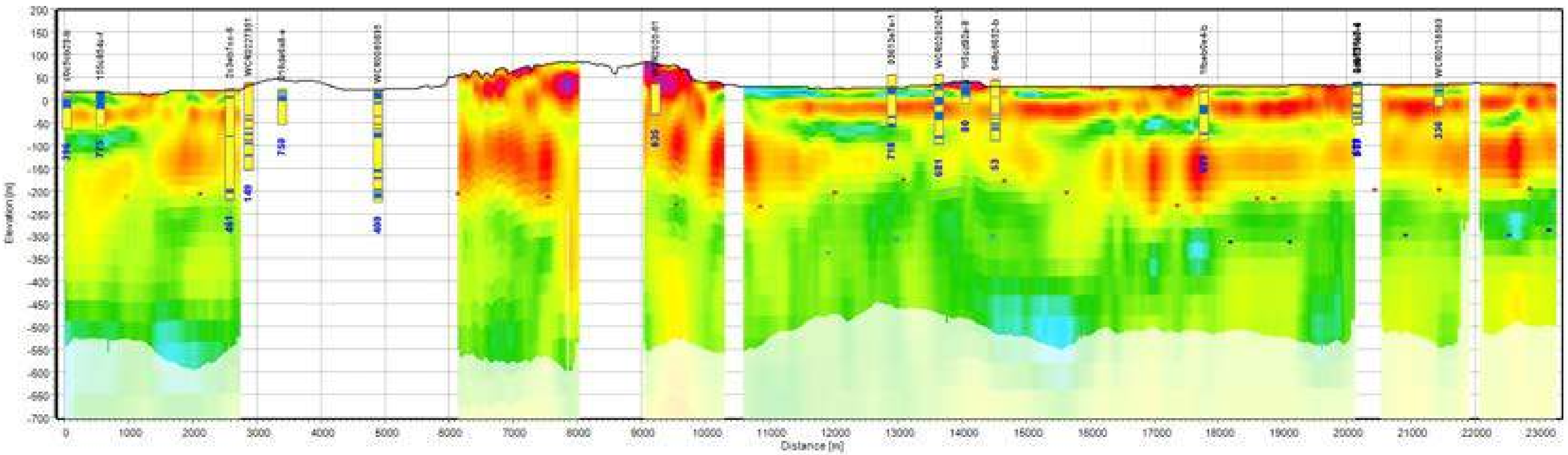
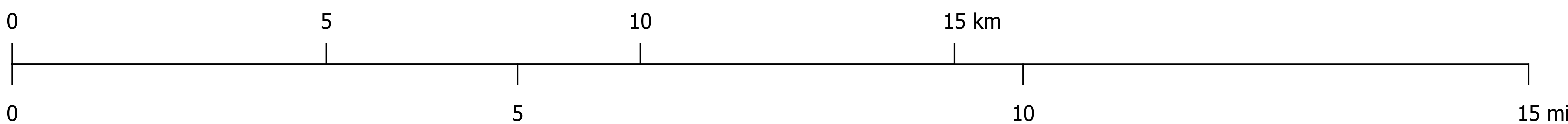
AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

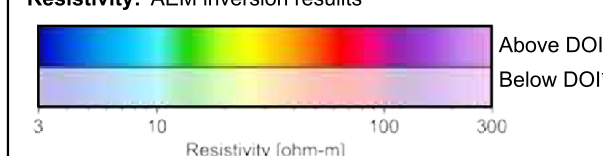
Smooth Model





Legend for Model Sections

Resistivity: AEM inversion resullts



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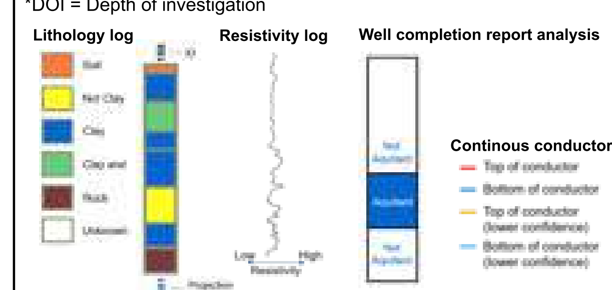
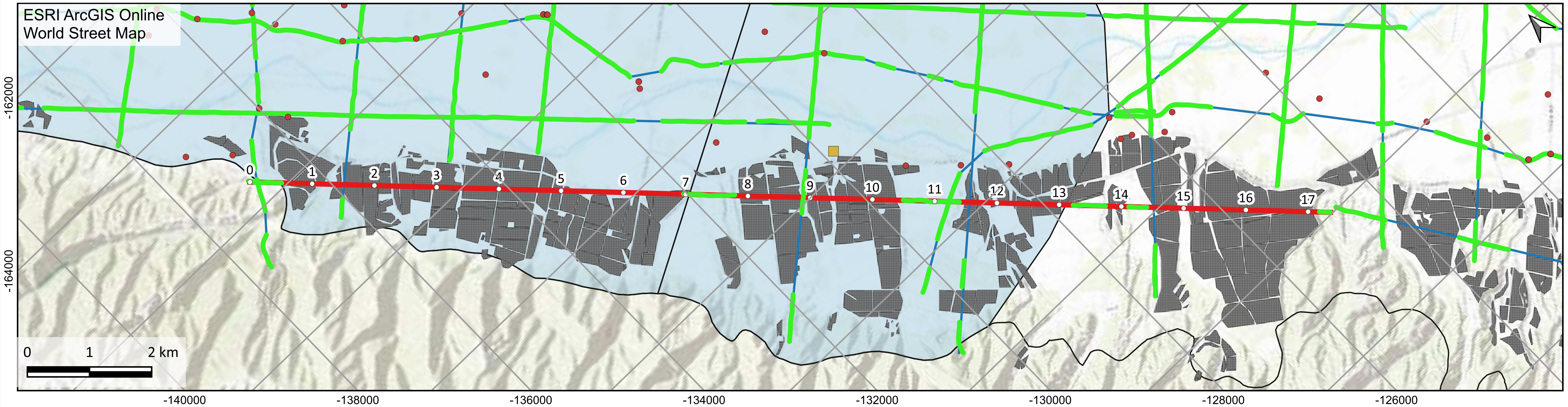
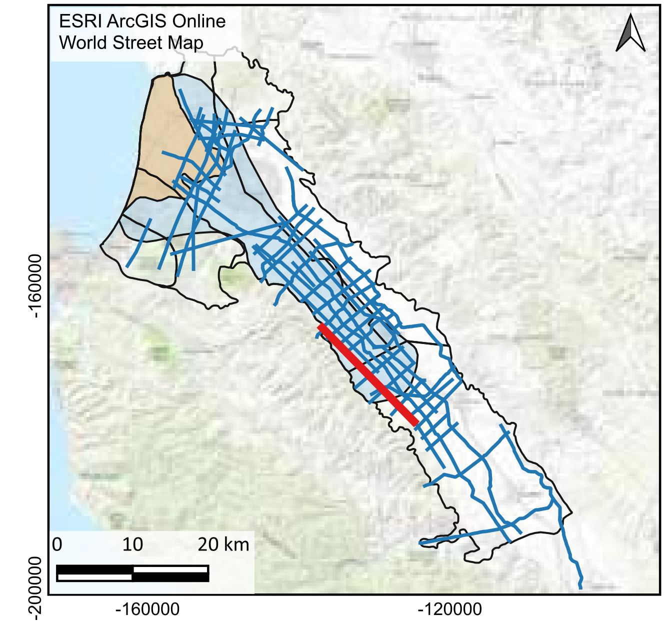


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 200800 | **AEM Model Sections**





EPSG 3310 - NAD83 / California Albers

Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
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- Section (Current page)
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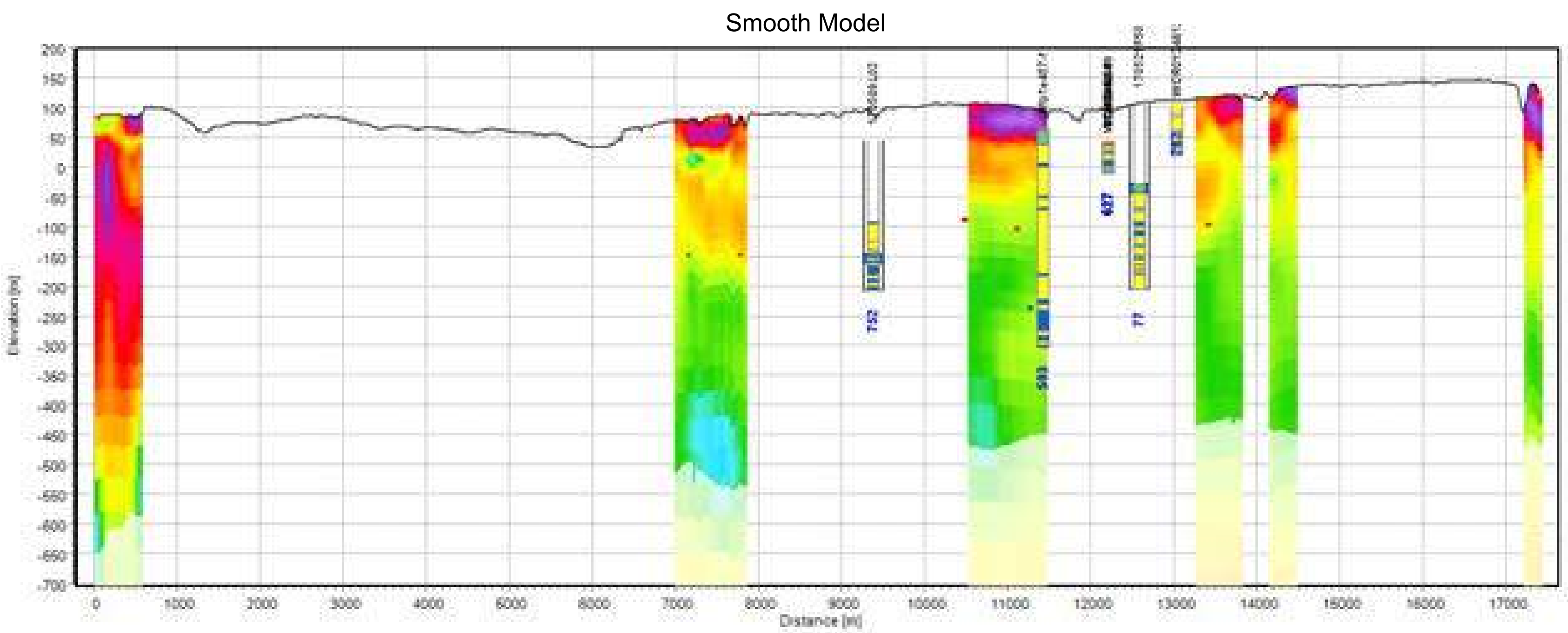
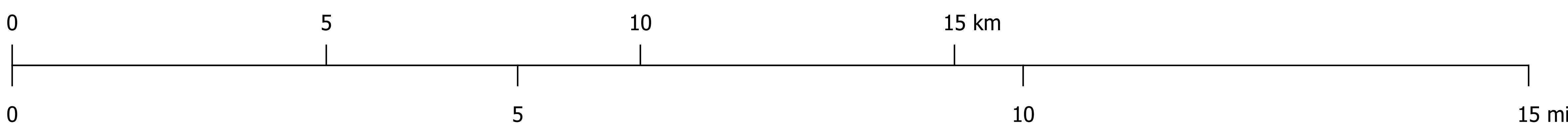
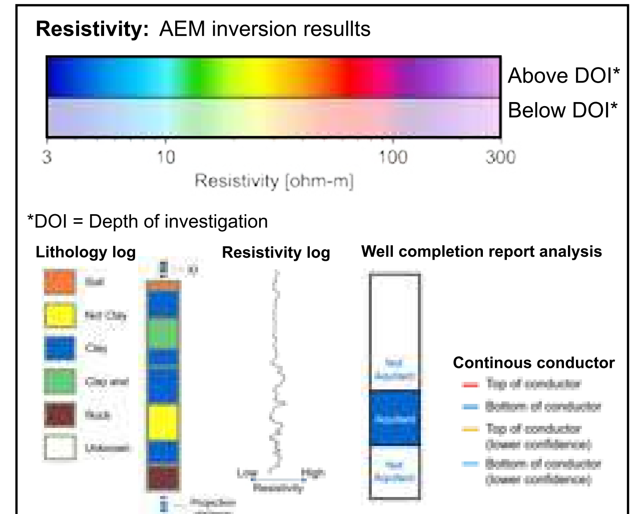
AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)





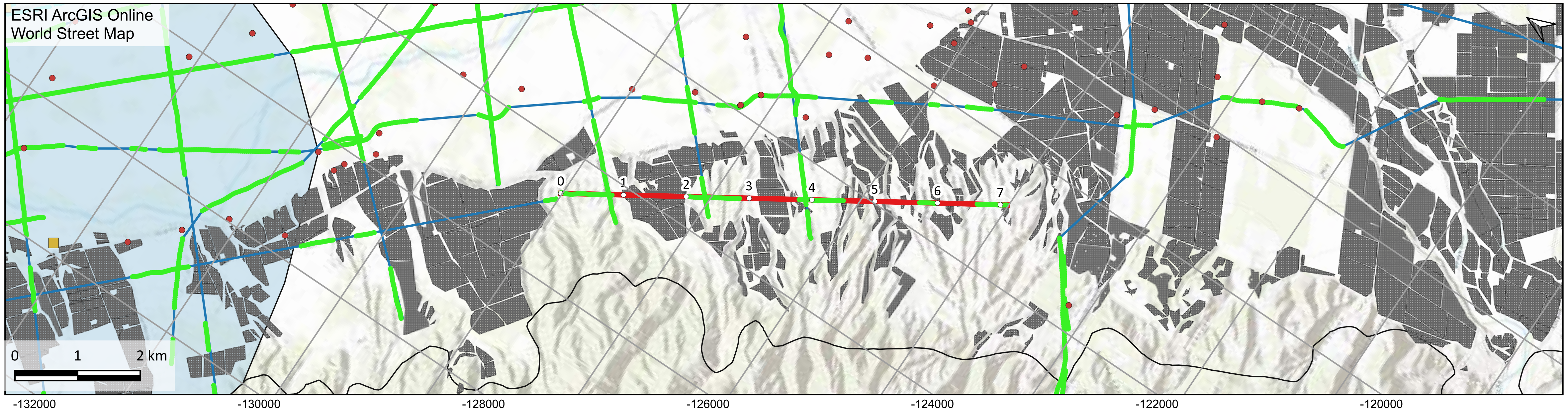
Legend for Model Sections

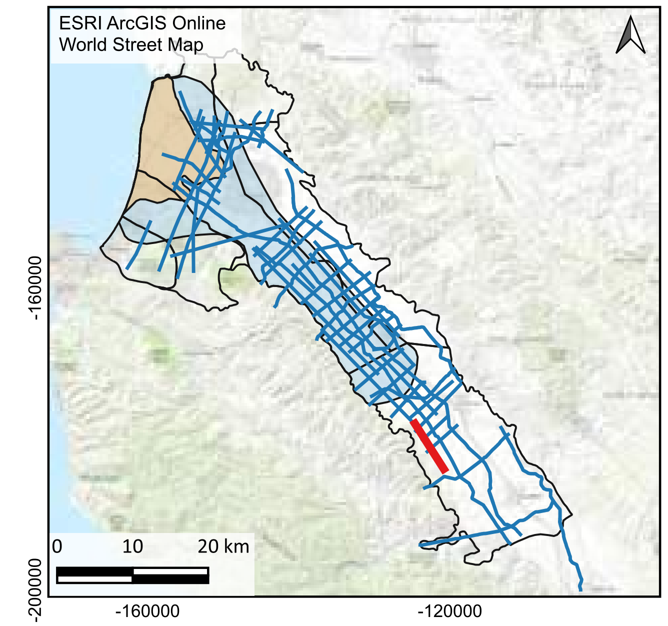


Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Salinas Line 200900 — AEM Model Sections

RAMBOLL



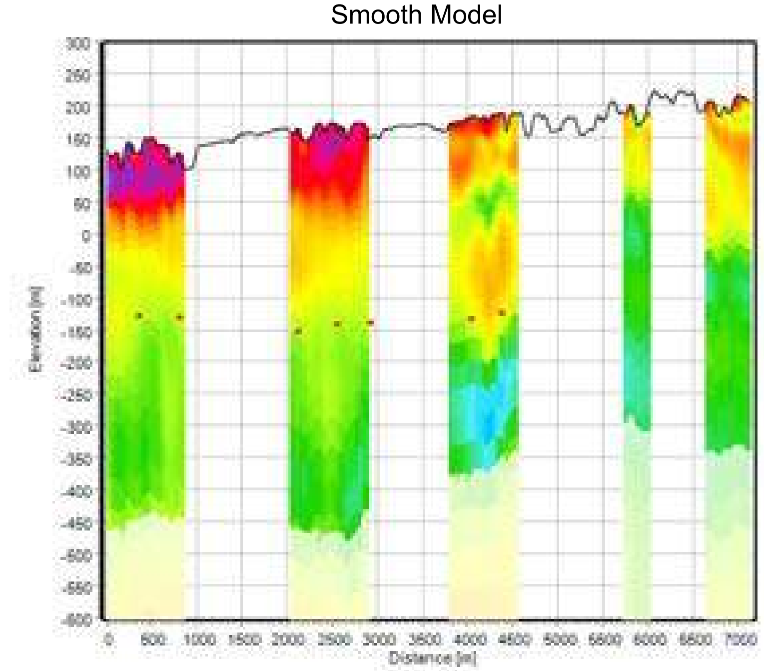


Legend for Maps

- Groundwater Basin Boundary (DWR - B118)
- Vineyards
- Phase 1 Aquitard Extent
- 180-Foot Aquifer Cl- Contour
- Section (Current page)
- Section (Other pages)

AEM data used for inversion

- Lithology logs
- Resistivity logs
- Electric transmission lines (CA State Geoportal, 2020)
- Pipelines (AmeriGEOSS, 2022)

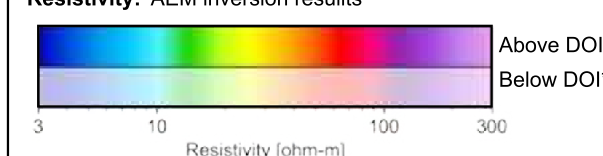


0 5 10 15 km

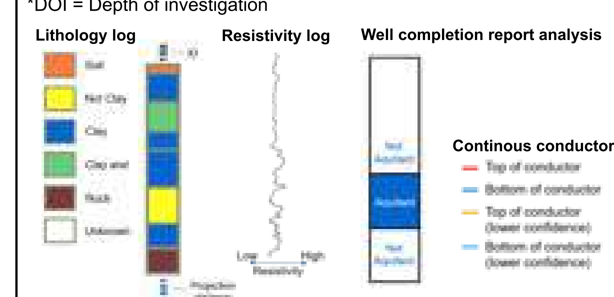
0 5 10 15 mi

Legend for Model Sections

Resistivity: AEM inversion resullts



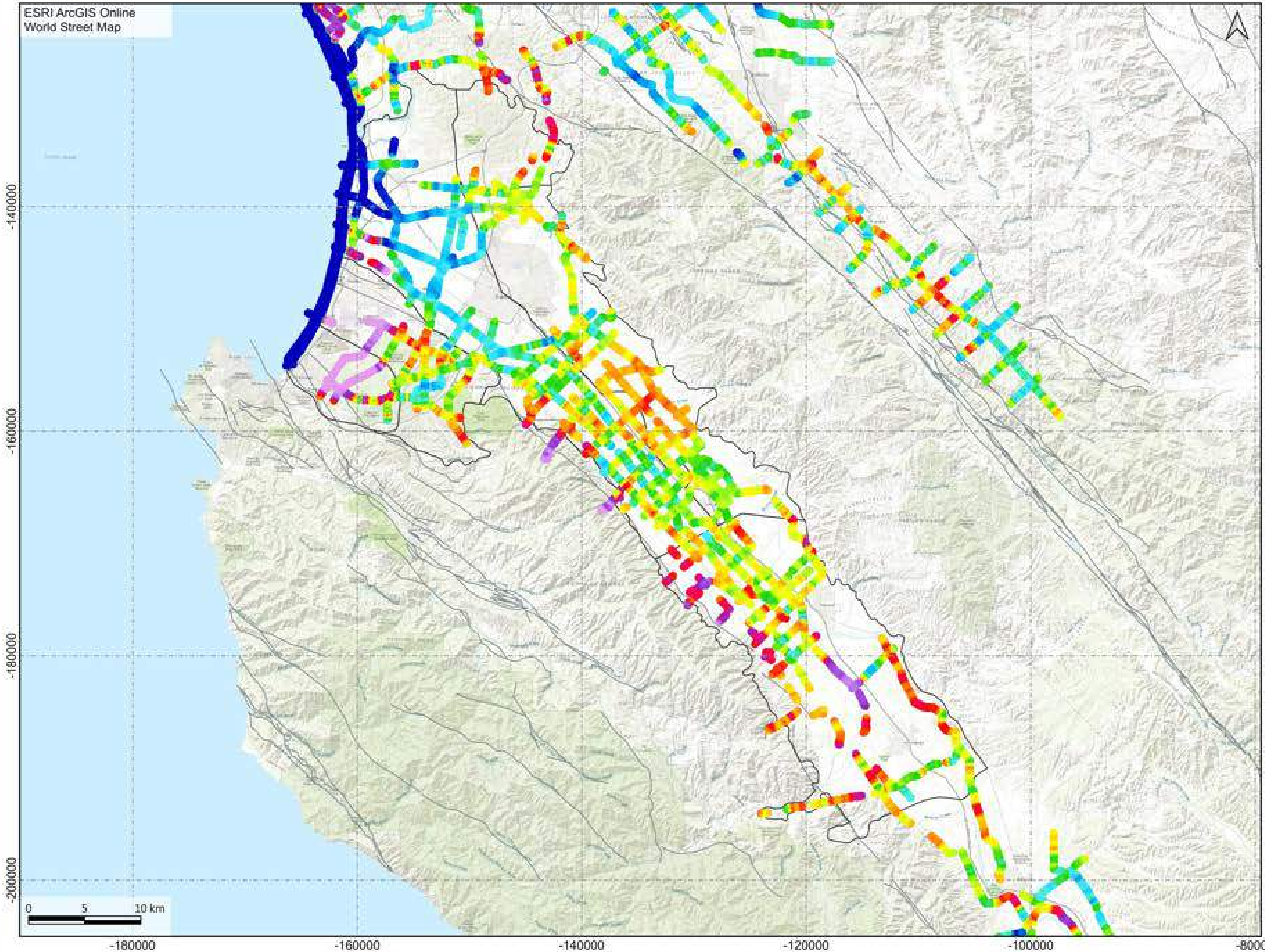
*DOI = Depth of investigation



Date: 2023-07-27, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

Appendix 4
AEM Inversion Mean Resistivity Maps

Depth Interval 5-15 m **AEM Mean Resistivity** RAMBOLL



Groundwater Basin Boundaries

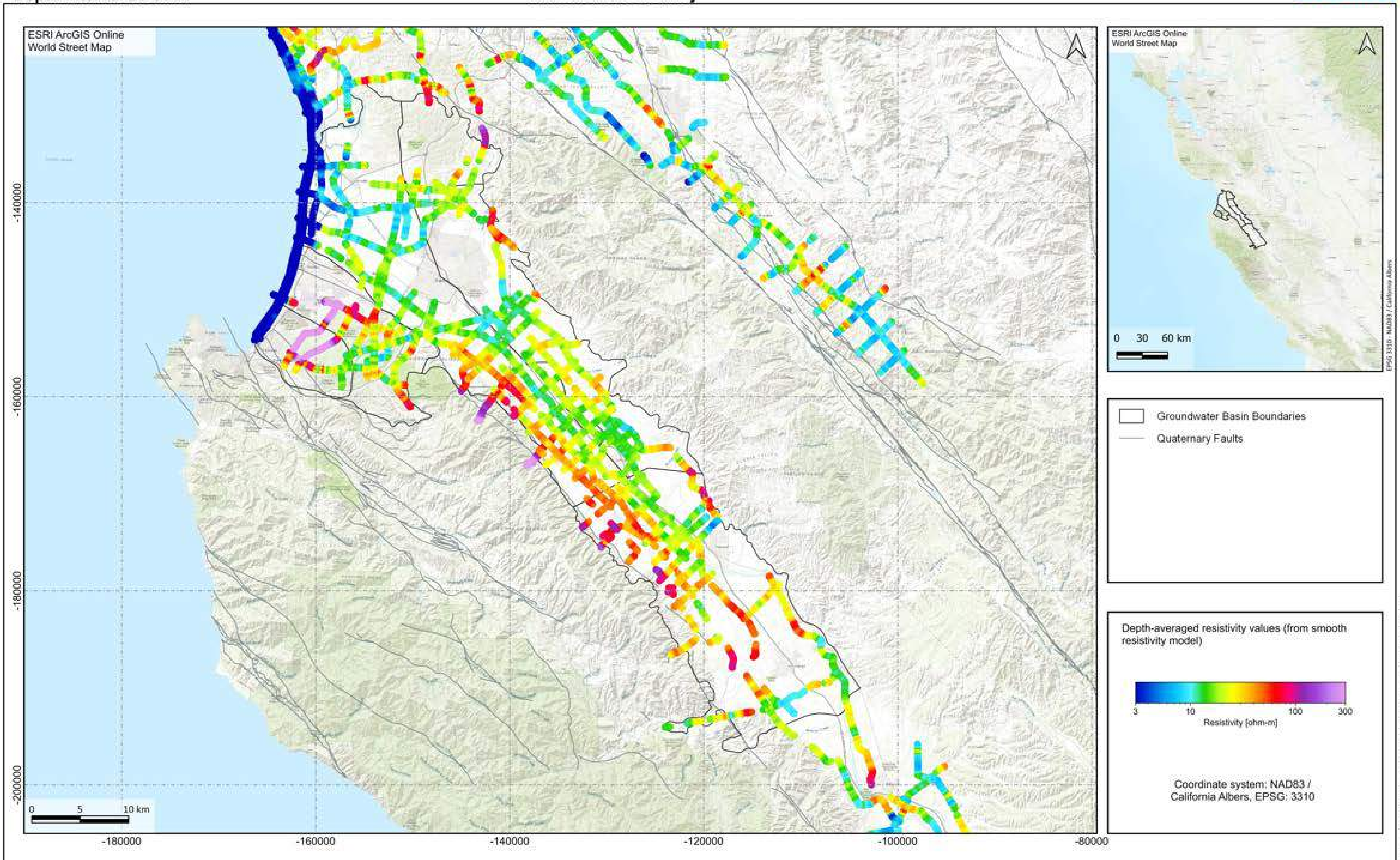
Quaternary Faults

Depth-averaged resistivity values (from smooth resistivity model)

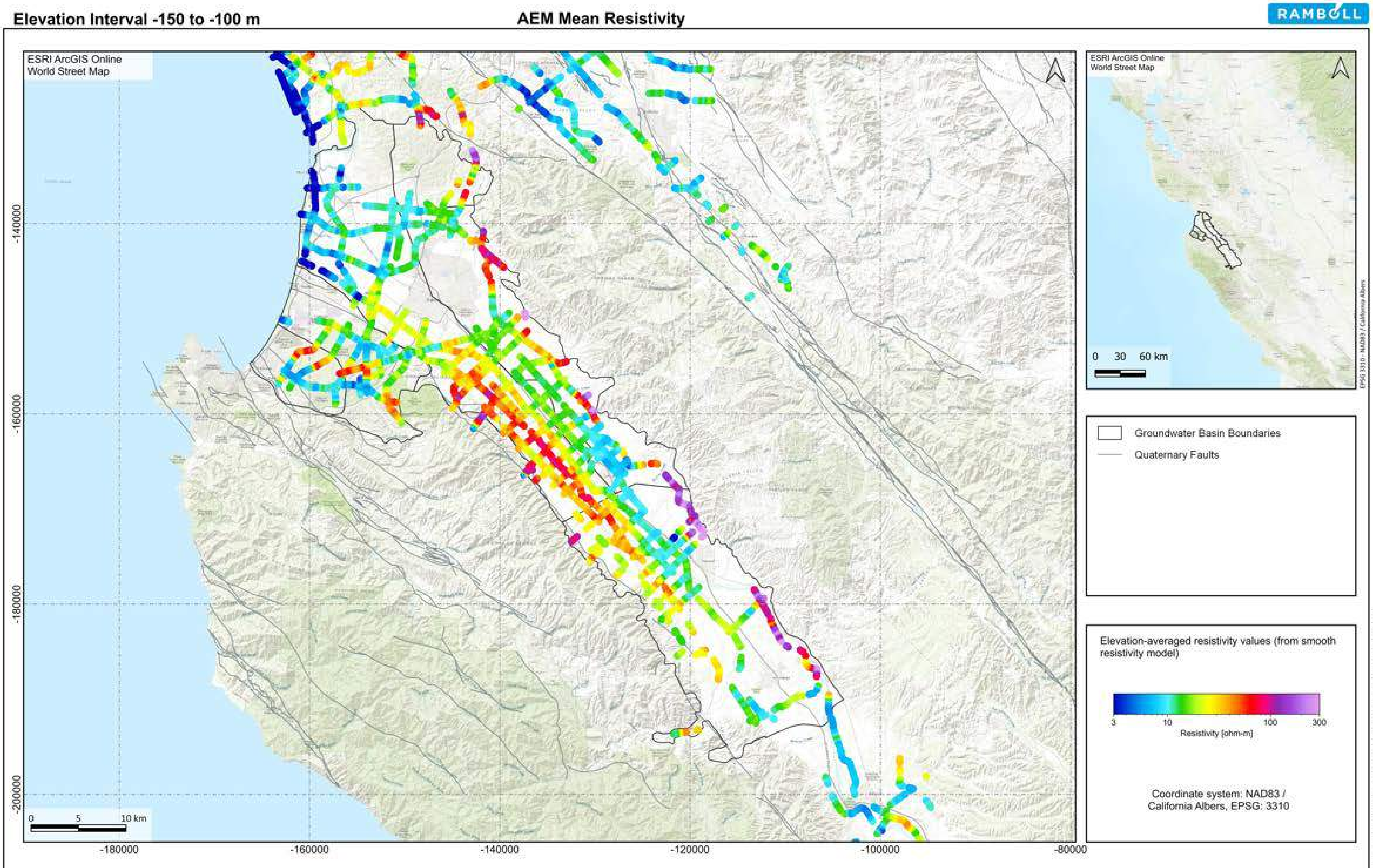
Coordinate system: NAD83 / California Albers, EPSG: 3310

Depth Interval 25-50 m

AEM Mean Resistivity

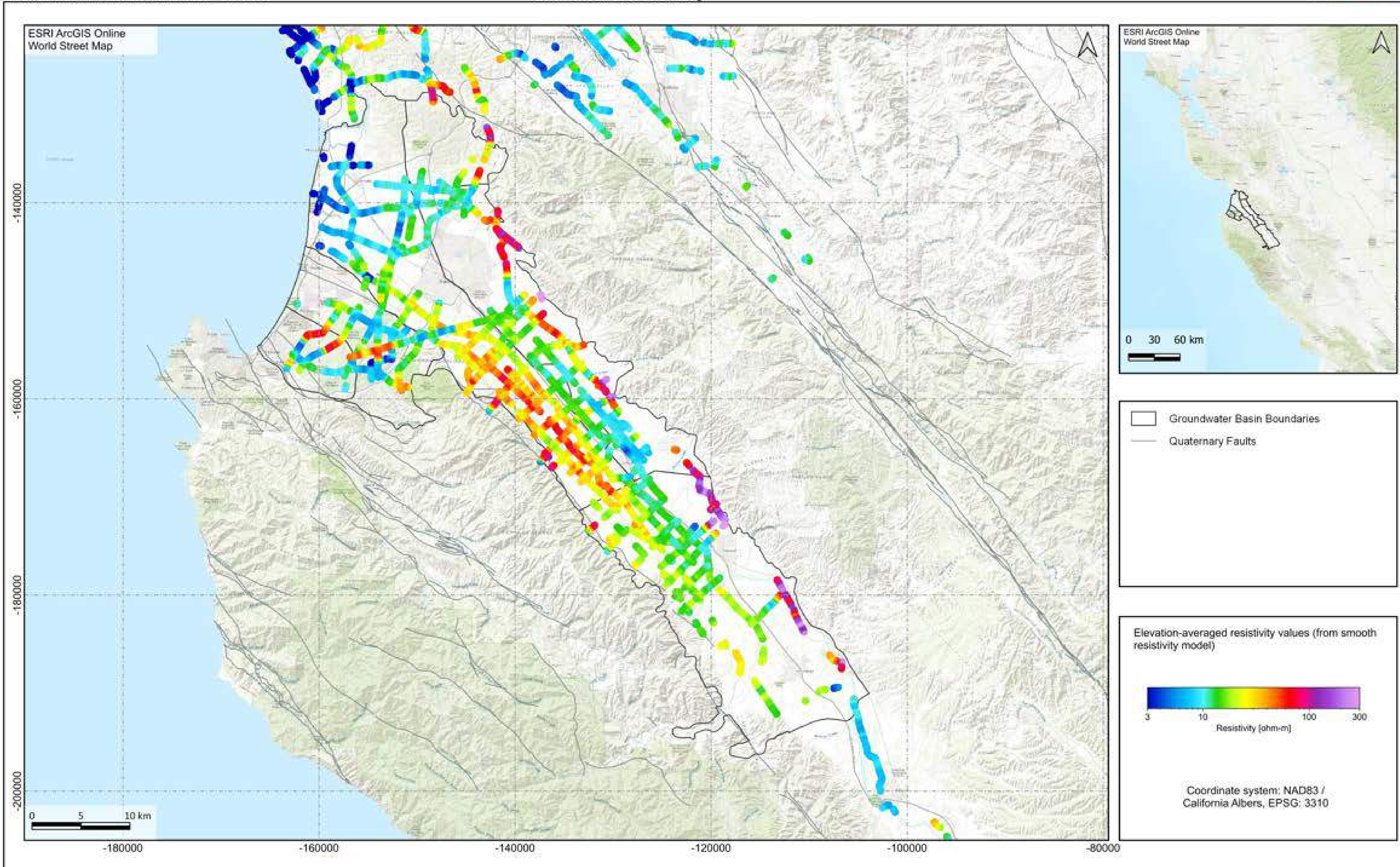


Elevation Interval -150 to -100 m AEM Mean Resistivity



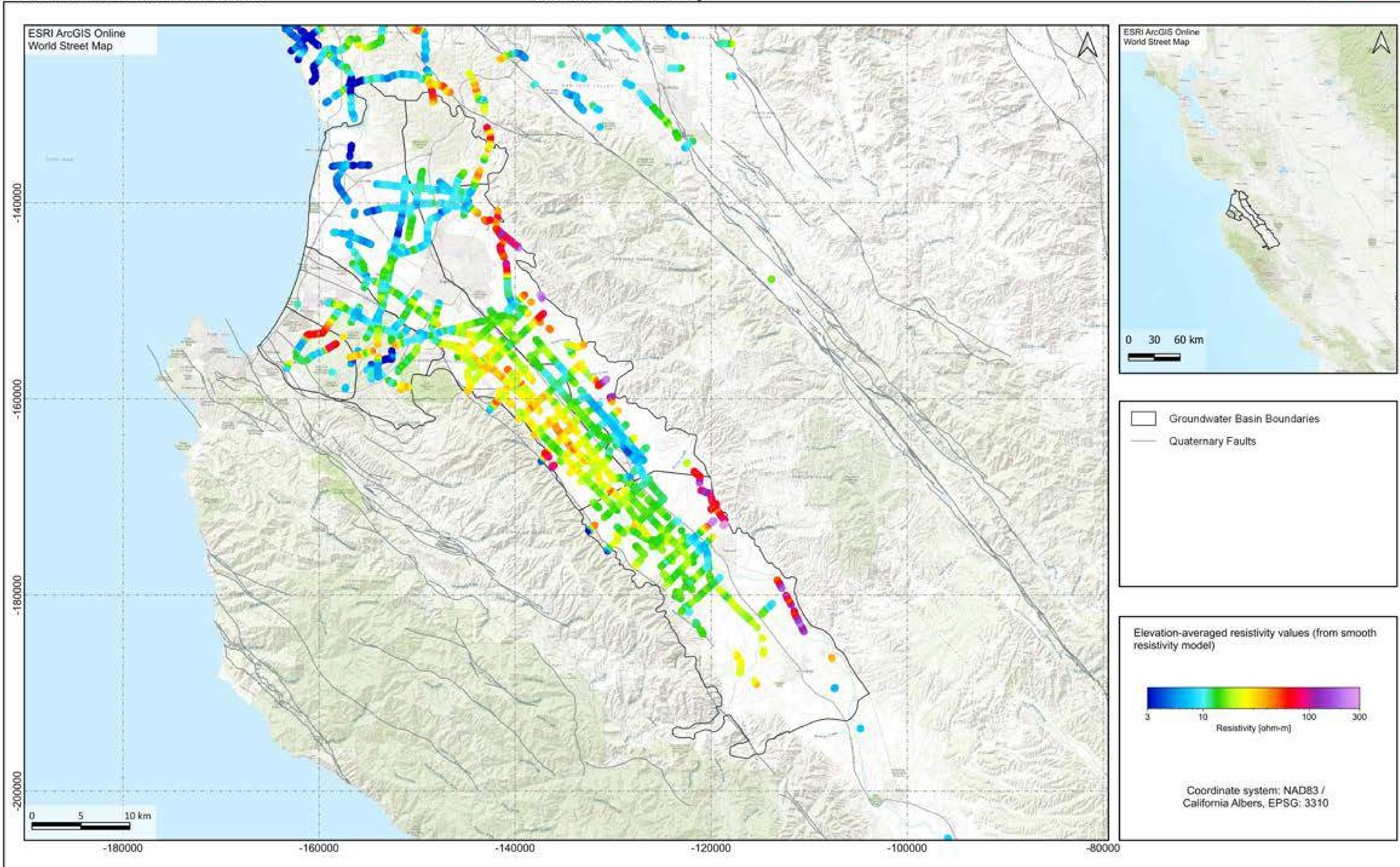
Elevation Interval -200 to -150 m

AEM Mean Resistivity



Elevation Interval -250 to -200 m

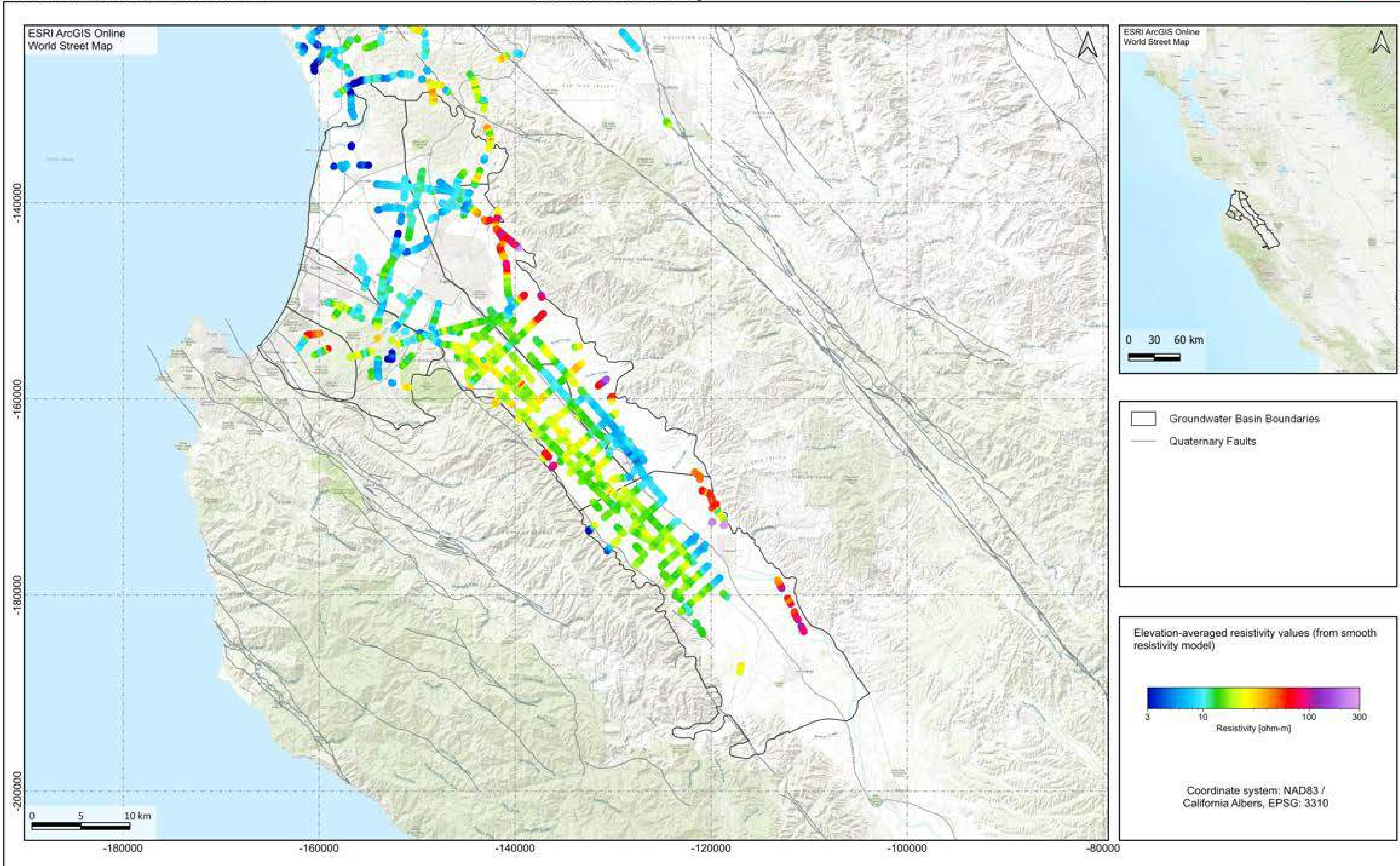
AEM Mean Resistivity



Elevation Interval -300 to -250 m

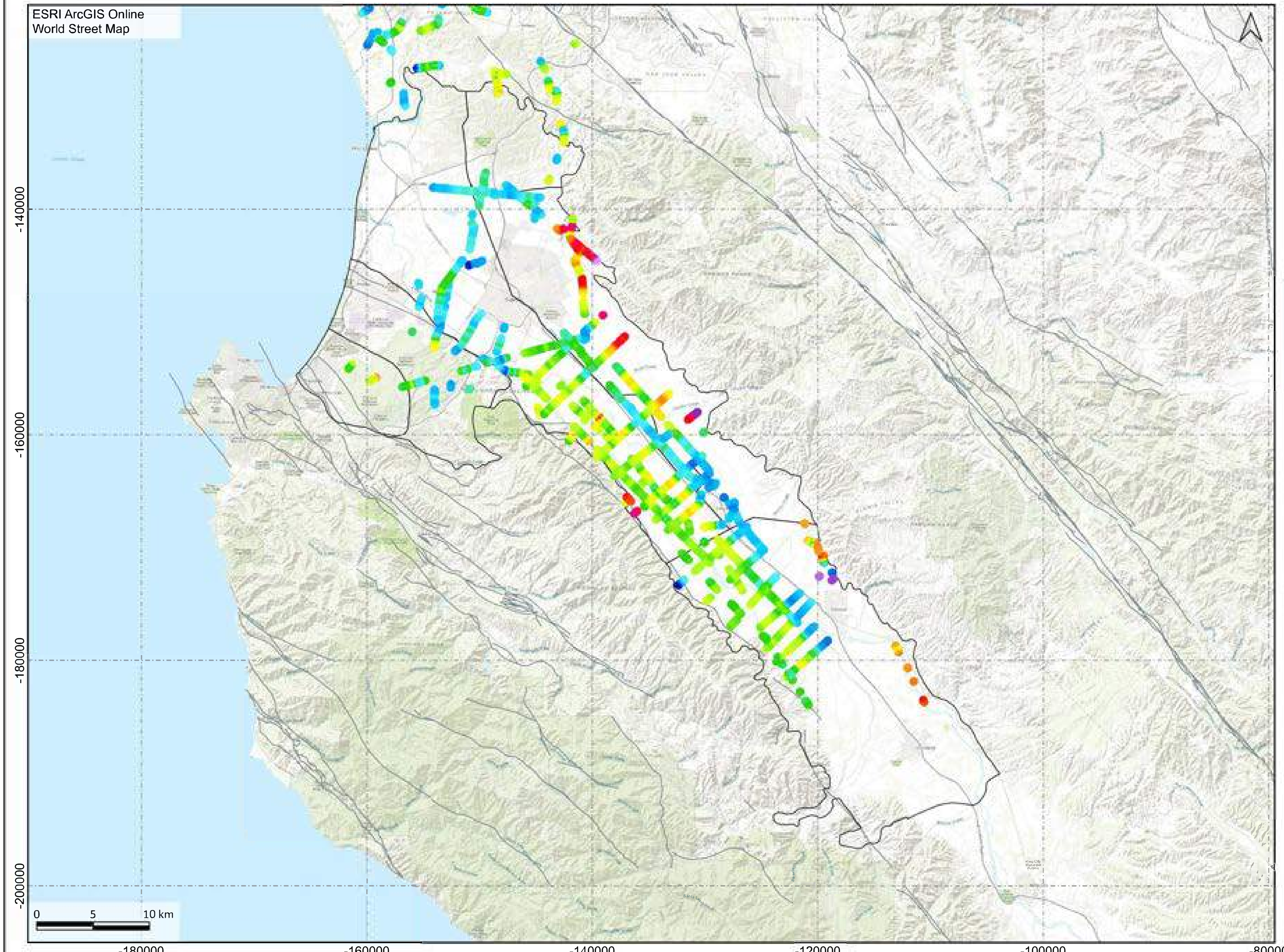
AEM Mean Resistivity

RAMBOLL



Elevation Interval -350 to -300 m

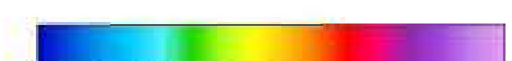
AEM Mean Resistivity



Groundwater Basin Boundaries

Quaternary Faults

Elevation-averaged resistivity values (from smooth resistivity model)



Coordinate system: NAD83 / California Albers, EPSG: 3310

Date: 2023-04-28, Created by: MTDL, Checked by: IGOTTSCHALK, Approved by: IGOTTSCHALK

MONTGOMERY & ASSOCIATES

Appendix C

Results of 2023 Pumping Tests at Deep Wells 17S/05E-04A02 and 16S/04E-03G53 in Gonzales and Chualar

TECHNICAL MEMORANDUM

DATE: July 14, 2023 **PROJECT #:** 9100

TO: Salinas Valley Basin Groundwater Sustainability Agency

FROM: Trevor Pontifex and Staffan Schorr

PROJECT: 180/400-Foot Aquifer Subbasin Implementation

SUBJECT: Results of Pumping Tests at Deep Wells 17S/05E-04A02 and 16S/04E-03G53 in Gonzales and Chualar

INTRODUCTION

Montgomery & Associates (M&A) conducted constant-rate pumping tests at 2 deep wells: 1 near Gonzales and the other near Chualar. The tests were within the Phase I extent of the Deep Aquifers as identified through the preliminary investigation of the Deep Aquifers Study; however, they are just outside of the final extent of the Deep Aquifers based on refined AEM data. Therefore, they may be more representative of deep portions of the Eastside Aquifers. Figure 1 shows the test sites in relation to the Phase I and Phase II extents of the Deep Aquifers.

The first test was conducted at agricultural well 17S/05E-04A02 in Gonzales on April 1, 2023; the second was conducted at municipal well 16S/04E-03G53 in Chualar on May 28, 2023. The objective of the tests is to estimate aquifer properties at locations where information on deep aquifer properties is scarce. While these wells are not located within the extent of the Deep Aquifers, the test results provide useful information about groundwater conditions adjacent to the Deep Aquifers. This information will be used to support groundwater modeling and management decisions, and for assessing potential hydraulic connection between the Deep Aquifers and the adjacent aquifer system at these locations in the Salinas Valley.

Figure 1. Aquifer Test Locations and Deep Aquifers Extents

PUMPING TEST LAYOUTS AND PROCEDURES

Test Layouts

M&A conducted 8-hour constant-rate tests in Gonzales and Chualar. At each test location, data were collected from the pumped well, 1 observation well in the deep aquifer adjacent to the pumped well, and 1 observation well in the overlying 400-Foot Aquifer or its stratigraphic equivalent (referred to the 400-Foot Aquifer for the remainder of the memo). The Gonzales test well (17S/05E-04A02) location and specifications are shown in Table 1 and on Figure 2. The Chualar test well (16S/04E-03G53) location and specifications are shown in Table 2 and on Figure 3.

Table 1. Summary of Gonzales Pumping Test and Monitoring Locations

Location	Lanini Ranch, Tavernetti Road, Gonzales, California
Test Type	8-hour constant-rate
Average Flowrate	1,581 gpm[a]
Pumping Test Start Date and Time	April 1, 2023, 10:00 a.m.
Pumped Well	17S/05E-04A02 16-inch diameter casing Screened from 630 to 1,020 ft bls[b] Completed to 1,020 ft bls
Deep Observation Well	17S/05E-03D03 780 ft SE from pumped well 16-inch diameter casing Screened from 440 to 560 and 600 to 1,040 ft bls Completed to 1,040 ft bls
400-Foot Aquifer Observation Well	16S/05E-34M50 1,720 ft NNE from pumped well Casing diameter unknown Screened from 330 to 630 ft bls Completed to 630 ft bls

[a]gpm = gallons per minute
[b]ft bls = feet below land surface

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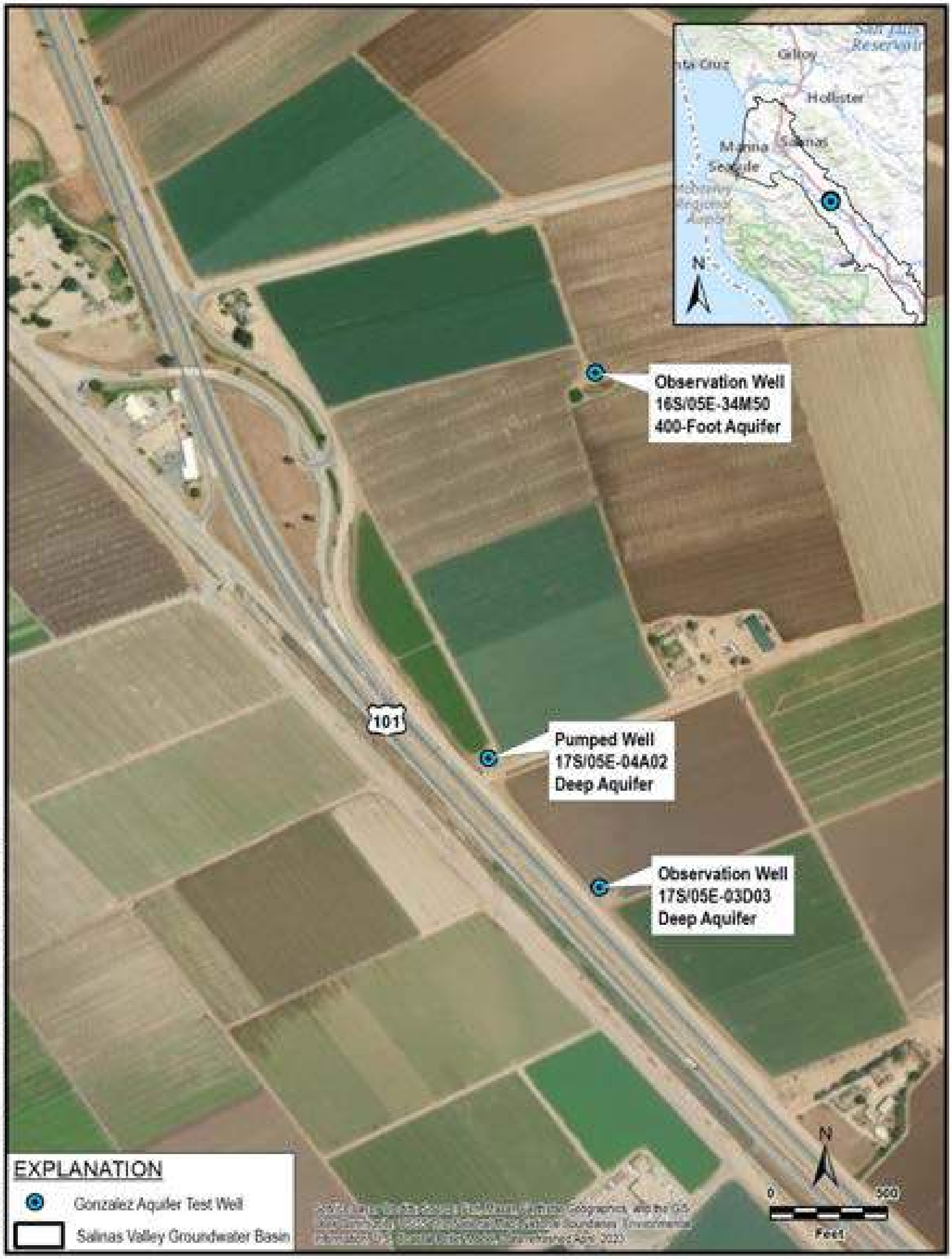

Figure 2. Gonzales Deep Well 17S/05E-04A02 Pumping Test Location

Table 2. Summary of Chualar Pumping Test and Monitoring Locations

Location	California American Water Company (Cal-Am) pumping and storage facility, Chualar California
Test Type	8-hour constant-rate
Average Flowrate	400 gpm[a]
Pumping Test Start Date and Time	May 28, 2023, 11:00 a.m.
Pumped Well	16S/04E-03G53 (Cal-Am Well #4) 12-inch diameter casing Screened from 760 to 900 ft bls[b] Completed to 920 ft bls
Deep Observation Well	16S/04E-03G52 (Cal-Am Well #3) 470 ft NW from pumped well 12-inch diameter casing Screened from 750 to 900 ft bls Completed to 920 ft bls
400-Foot Aquifer Observation Well	Chualar Union Elementary School well 910 ft NNW from pumped well 12-inch diameter casing Screened from 448 to 466 and 527 to 539 ft bls Completed to 600 ft bls

[a]gpm = gallons per minute
[b]ft bls = feet below land surface

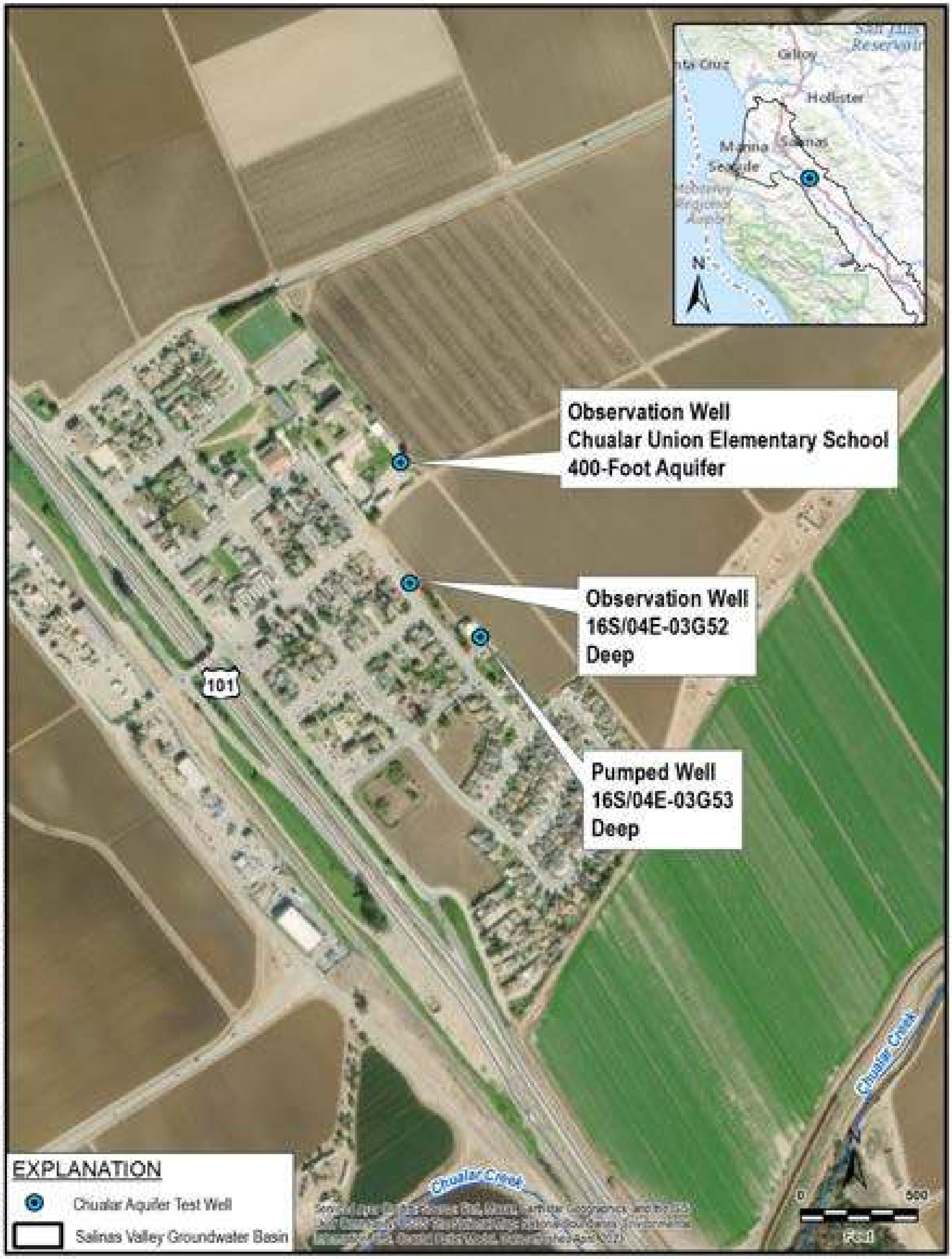

Figure 3. Chualar Deep Well 16S/04E-03G53 Pumping Test Location

Water Level Monitoring Equipment and Procedures

Water levels were monitored in the pumped well and the observation wells using an In-Situ electric water level sounder and In-Situ Level TROLL 400 and Van Essen Micro-Diver datalogging pressure transducers. The 3 transducers at the Gonzales test site wells automatically recorded water levels at 1-minute intervals. M&A field staff collected manual measurements with an electric sounder at all 3 wells throughout the test to support the transducer data and provide secondary data.

Transducers in both Chualar deep wells automatically recorded water levels at 1-minute intervals. However, the wells had no room for sounder access after the transducers were installed. M&A staff calibrated the transducer data with manual measurements taken immediately before the transducers were installed and immediately after they were removed. The 400-Foot Aquifer observation well located at Chualar Union Elementary School did not have an access tube wide enough for a transducer. M&A field staff obtained manual water level measurements at this well throughout the test.

Background water level monitoring started the day before the aquifer tests and continued for at least 16 hours after pumping stopped, except for the transducer in the 400-Foot Aquifer observation well at Gonzales, which due to time constraints started 2 hours before the test and ended 15 hours after pumping stopped. Water levels in the pumping wells were allowed to equilibrate to background conditions as much as possible, considering the pumping wells are active agricultural water production wells. The Gonzales test began after 19 hours of recovery at pumped well 17S/05E-04A02. The Chualar test began after 12 hours of recovery at pumped well 16S/04E-03G53. It is possible that some nearby wells were pumping during the testing period.

Flow Monitoring and Discharge Equipment and Procedures

M&A staff monitored flow rates approximately every hour at the Gonzales pumping well and every half hour at the Chualar well using totalizer readings from McCrometer propeller flow meters. Flow rates were not manually adjusted during the tests because rates remained relatively stable. At the Gonzales site, flow rates declined slightly over the 8-hour pumping period, starting at approximately 1,600 gallons per minute (gpm) and ending at approximately 1,560 gpm, with an average rate of 1,581 gpm. The Chualar test flow rate fluctuated slightly from 397 to 403 gpm, with an average rate of 400 gpm.

Pumped water was routed via 4-inch-diameter pipes to agricultural drainage ditches adjacent to the pumped wells. The Gonzales discharge line was part of the permanent farm infrastructure, while the Chualar discharge line was a temporary pipe installed for the tests.

Aquifer Hydraulic Parameters Estimation Procedures

Transmissivity, hydraulic conductivity, storativity, and specific yield generally define the hydraulic characteristics of an aquifer and control yield to a well (Driscoll, 1986). Drawdown and recovery data from the pumped wells and observation wells at the Gonzales and Chualar sites were processed and analyzed to estimate hydraulic aquifer properties. Data were analyzed using standard analytical solutions provided in the software AQTESOLV Professional 4.50 (HydroSOLVE, 2015). AQTESOLV estimates parameters values by matching theoretical hydraulic responses to observed data at pumping wells and monitoring locations. The analysis workflow involved an iterative process of evaluating various curve-matching solutions for the water level response data based on aquifer assumptions.

Using type-curve matching solutions (Theis, 1935) and semi-log straight-line graphical methods (Cooper and Jacob, 1946), estimates of aquifer parameters were estimated for aquifer transmissivity, hydraulic conductivity, and storativity. Accurate estimations of storativity often require longer term testing and the use of water level response in an observation well separate from the pumped well.

Transmissivity (T) is the product of hydraulic conductivity (K) multiplied by aquifer thickness (b) and is defined as the rate of flow of groundwater through a 1-foot-wide vertical column of aquifer extending through its full saturated thickness under a unit hydraulic gradient (Lohman, 1972). In this report, transmissivity is expressed in cubic feet per day per foot width of aquifer ($ft^3/d/ft$), which simplifies to square feet per day (ft^2/d). Hydraulic conductivity is the quotient of transmissivity divided by aquifer thickness and is defined as the rate of flow under groundwater through a square foot of aquifer under a unit hydraulic gradient (Lohman, 1972). In this report, hydraulic conductivity is expressed in feet per day (ft/d).

Storativity is defined as the volume of water that an aquifer releases or takes into storage per unit surface area of the aquifer per unit change in head (Lohman, 1972), and is dimensionless.

GONZALES PUMPING TEST RESULTS AND ANALYSIS

The Gonzales 8-hour constant-rate pumping test was conducted on April 1, 2023. The test consisted of 480 minutes (8 hours) of pumping at approximately 1,581 gpm, followed by 16 hours of monitored recovery, which ended on April 2, 2023.

Prior to initiating the Gonzales test, groundwater levels were allowed to recover to near-background conditions. Groundwater levels gradually rose at approximately 0.005 feet per hour (ft/hr) during most of this recovery period, reaching a height of 102.6 feet below land surface (bls) by 8 a.m. the day of the test, then dropping to 102.7 feet bls by the 10 a.m. start time. The pre-pumping water level in the pumped well was 102.7 feet bls.

The maximum measured drawdown during the test was approximately 30 feet in the pumped well and approximately 5 feet in deep observation well 17S/05E-03D03. Monitoring data collected at 400-Foot Aquifer observation well 16S/05E-34M50, located approximately 1,700 feet from the pumped well, did not show a water level response to pumping. Manual sounder measurements collected at the pumped and deep observation well closely matched automated transducer measurements.

Pumping stopped at 6 p.m. on April 1. By noon the next day, water levels in both deep wells had recovered to within approximately 1 foot of initial water levels. Figure 4 shows the hydrograph of transducer data from the Gonzales pumping well during the pumping and recovery periods. Figure 5 shows the hydrograph of transducer data from the Gonzales deep monitoring well during the pumping and recovery periods.

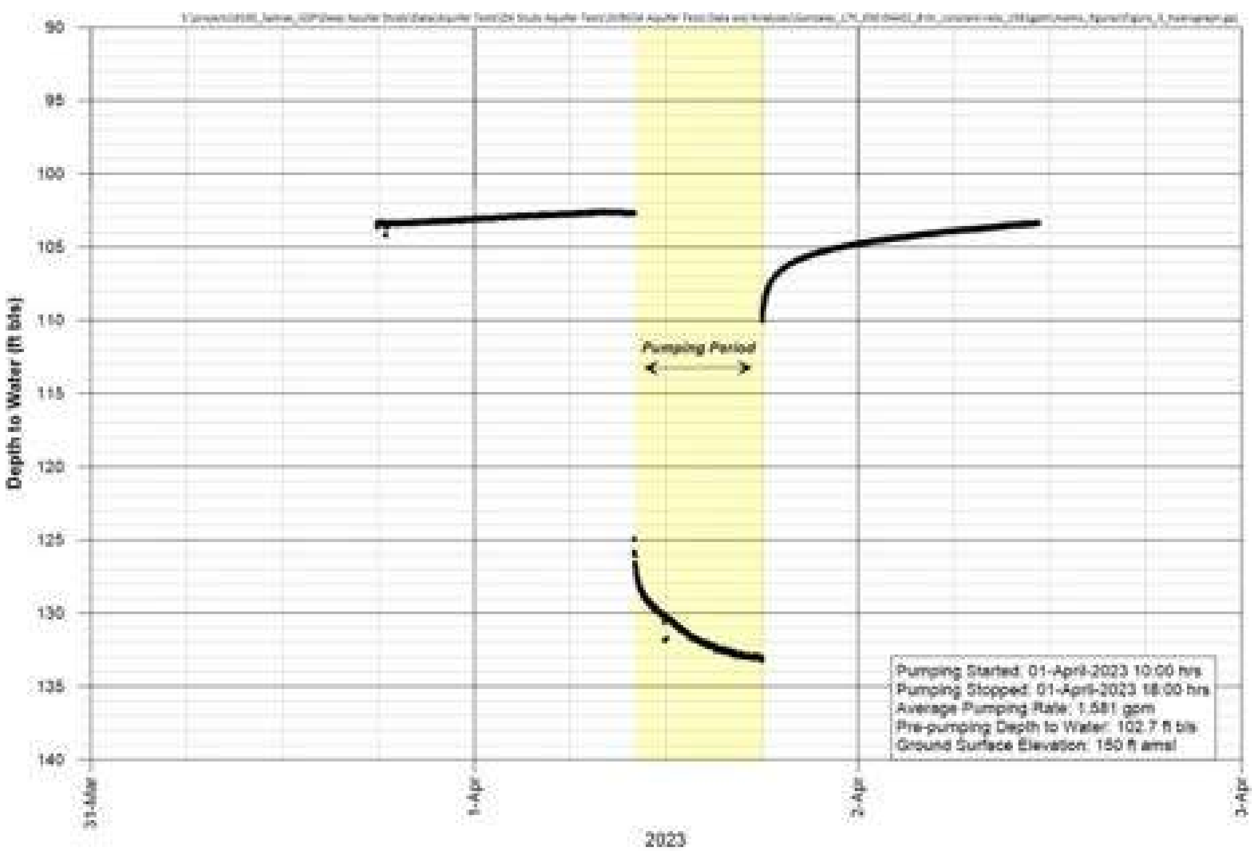

Figure 4. Pumped Well (17S/05E-04A02) Water Level Before, During, and After Constant-Rate Pumping Test at Gonzales

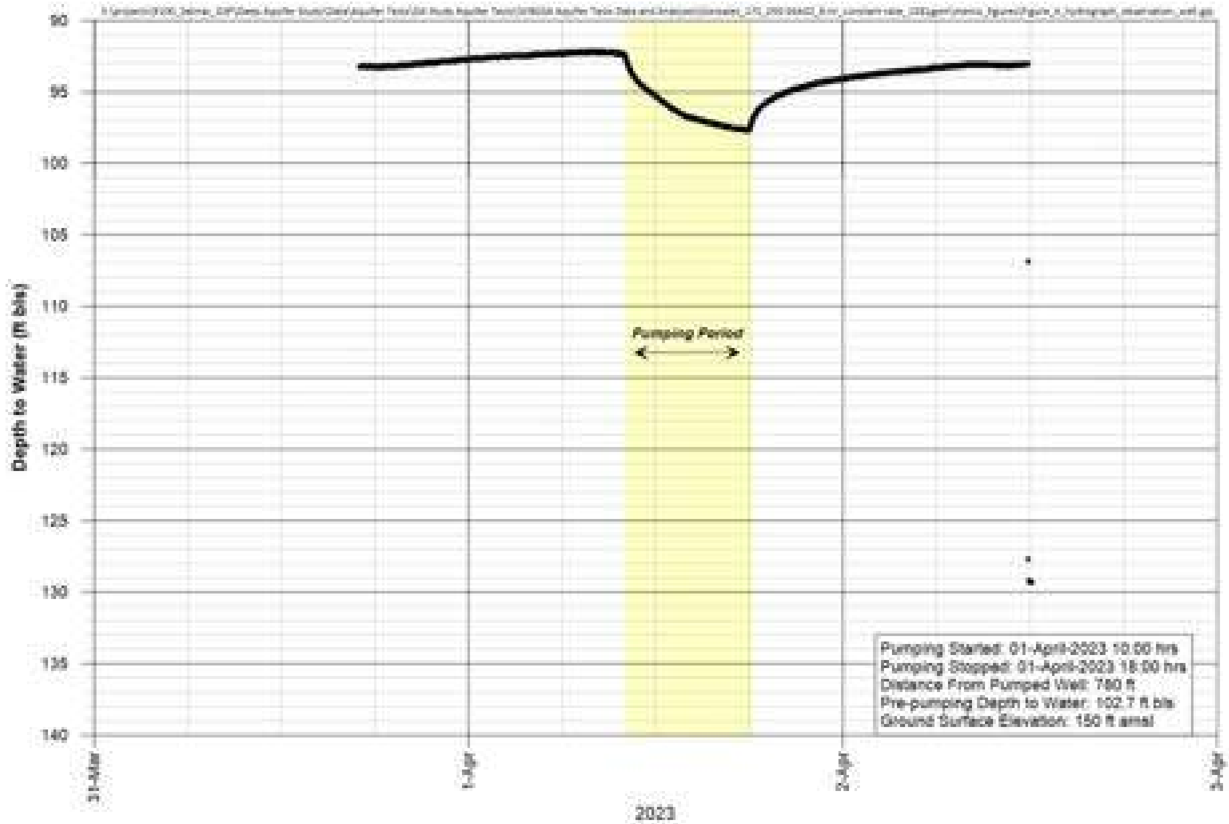

Figure 5. Observation Well (17S/05E-03D03) Water Level Before, During, and After Constant-Rate Pumping Test at Gonzales

The hydrographs on Figure 3 and Figure 4 have a few irregularities where the recovery and drawdown curves are not perfectly smooth. For example, the pretest water levels in the pumped well and the deep observation well stop recovering a couple hours before the test and drop slightly, perhaps due to pumping at a nearby well. The farm that owns the monitored wells agreed not to pump any other wells during the test and M&A staff did not notice any other pumping while they were on site. However, there are several wells on nearby properties that may have been pumping.

Aquifer test analyses included type-curve matching and semi-log straight-line methods, as previously described. These analyses assume a confined aquifer system with a saturated thickness of 410 feet. Saturated thickness is based on the screened intervals of the Gonzales test wells. M&A also tested a leaky aquifer solution (Hantush and Jacob, 1955) that returned largely the same results.

Aquifer test analysis results are shown in Table 3. More detailed summaries of each AQTESOLV analysis are included in Attachment 1. M&A calculated 2 solutions (Theis and Cooper-Jacob) for the pumped well and for the deep observation well for a total of 4 solutions.

At Gonzales, all solutions return a transmissivity of approximately 13,000 ft^2/d. Dividing transmissivity by the estimated aquifer saturated thickness of 410 ft gives a hydraulic conductivity of approximately 32 ft/d. Analytical results from the 2 observation well solutions are used to determine storativity, which ranges from 8 x 10^{-4} to 9 x 10^{-4}. Dividing the storativity by the saturated thickness of 410 ft yields a range of specific storages of between 1.95 x 10^{-6} and 2.20 x 10^{-6}.

Table 3. Summary of Estimated Hydraulic Parameters at Gonzales Pumping Test Wells

Parameter	Solution Method	Pumped Well 17S/05E-04A02	Observation Well 17S/05E-03D03
Initial (Pumping) Water Level (feet bls)		102.7	92.3
Saturated Thickness (feet)[a]		410	410
Transmissivity, feet²/day			
Type-curve Matching Method	Theis, 1935	13,100	12,900
Semi-Log Straight Line Graphical Method	Cooper-Jacob, 1946	12,800	13,300
Hydraulic Conductivity, feet/day			
Type-curve Matching Method	Theis, 1935	32	31
Semi-Log Straight Line Graphical Method	Cooper-Jacob, 1946	31	32
Storativity (dimensionless)[b]			
Type-curve Matching Method	Theis, 1935	--	0.0009
Semi-Log Straight Line Graphical Method	Cooper-Jacob, 1946	--	0.0008

[a] Saturated thickness is based on the length between the top of the Deep Aquifers equivalent in the adjacent aquifer and bottom of the pumped well's screened interval.
[b] Storage parameters are not considered reliable estimates for single-well tests where only the pumped well response is analyzed.

The deep observation well has 2 screened intervals. The shallower screen interval extends from 440 to 560 feet bls and may be in connection with water from the overlying 400-Foot Aquifer. The impact of this potential connection on the results of the pumping test analyses is uncertain.

CHUALAR PUMPING TEST RESULTS AND ANALYSIS

The Chualar 8-hour constant-rate pumping test was conducted on May 28, 2023. The test consisted of 480 minutes (8 hours) of pumping at approximately 400 gpm, followed by 16 hours of monitored recovery

On May 27, the night before the pumping test, the pump in the test well automatically turned on when water levels in the storage tanks dropped below a minimum threshold. The pump was on from approximately 7 p.m. to 11 p.m. Due to this unplanned pumping event, M&A delayed the start of the test the next morning to allow water levels to recover. The water level in the pumped well rose linearly at approximately 0.3 ft/hr for most of this recovery time prior to the test, before leveling off at 118.2 feet bls. The pre-pumping water level at the pumped well was 118.2 feet bls.

The maximum measured drawdown during the test was approximately 9 feet in the pumped well and approximately 2 feet in the deep observation well. Monitoring data collected at the 400-Foot Aquifer observation well at the Chualar school, located approximately 900 feet from the pumped well, did not show a water level response to pumping from the pumped well.

Pumping stopped at 7 p.m. on May 28, and within a few hours groundwater levels in the 2 deep wells recovered to the initial water levels. After 16 hours, water levels in the 2 deep wells were approximately 3 feet higher than initial water levels. Figure 6 shows the hydrograph of transducer data from the Chualar pumping well during the pumping and recovery periods. Figure 7 shows the hydrograph of transducer data from the Chualar deep monitoring well during the pumping and recovery periods.

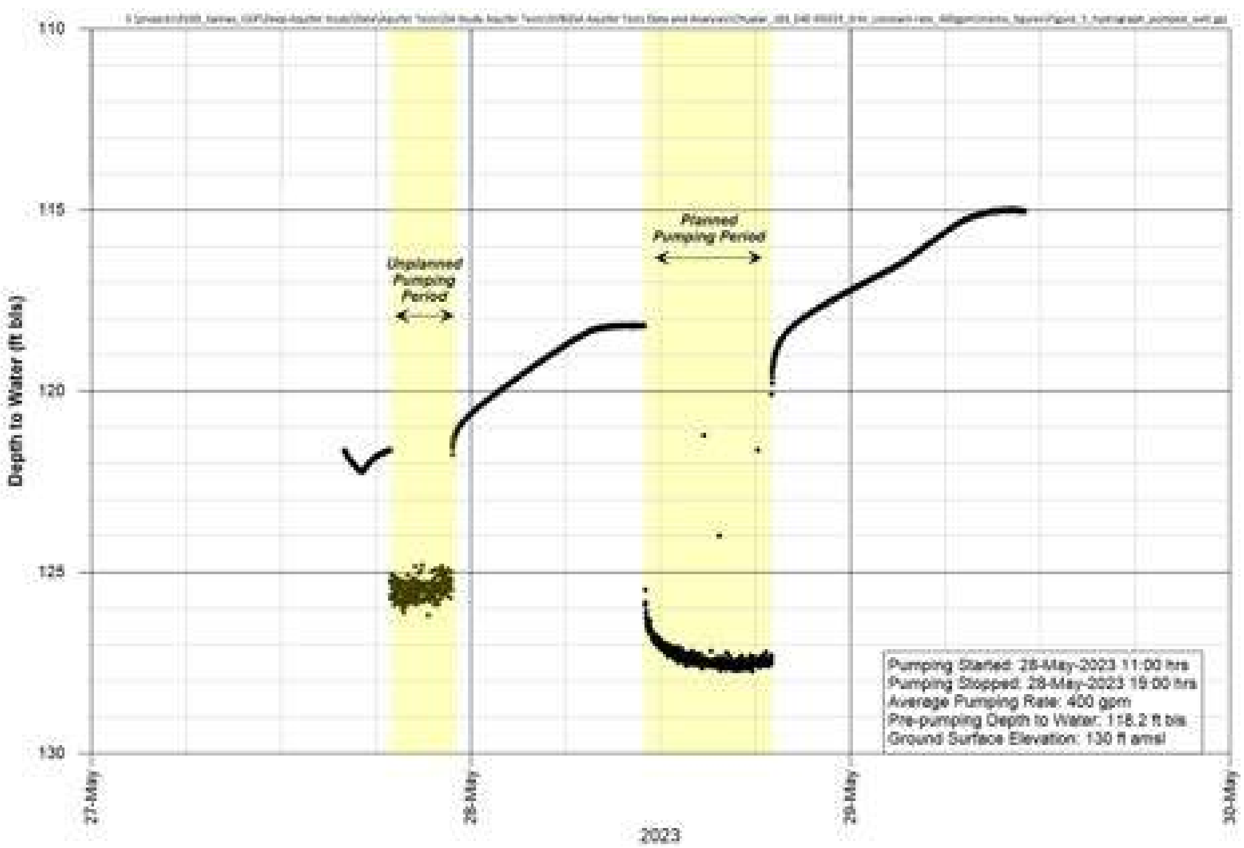

Figure 6. Pumped Well (16S/04E-03G53) Water Level Before, During, and After Constant-Rate Pumping Test at Chualar

Montgomery & Associates

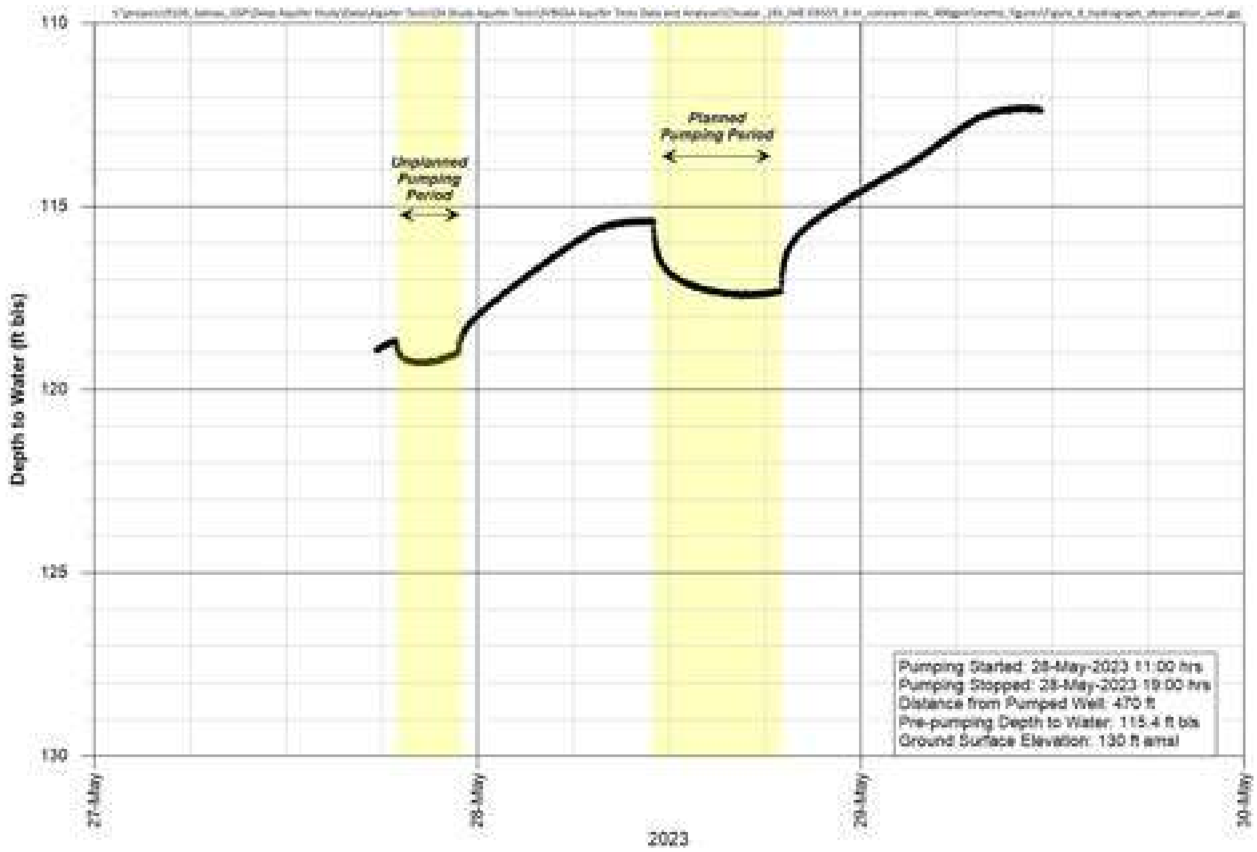

Figure 7. Observation Well (16S/04E-03G52) Water Level Before, During, and After Constant-Rate Pumping Test at Chualar

The Chualar recovery data appear to show pumping interference from 1 or more nearby wells. Water levels at both deep wells were stable in the hour before the test, giving the impression of static water levels; however, post-test water levels recovered 3 feet higher than pre-test levels.

Additionally, there are a few anomalous data points during the planned pumping period on Figure 5 that could be the result of the pump turning off momentarily. However, this phenomenon was not observed by M&A field personnel during the test.

As previously described, aquifer test analyses included type-curve matching and semi-log straight-line methods. These analyses assumes a confined aquifer system with a saturated thickness of 400 feet. Saturated thickness is based on the screened intervals of the deep test wells at Gonzales.

Summaries of each AQTESOLV analysis are included in Attachment 1. Aquifer properties calculated from the Chualar data should be used more cautiously than the Gonzales numbers but may still serve as rough estimates of the true values.

M&A calculated 2 solutions (Cooper-Jacob drawdown and Theis Recovery) for the pumped well and for the deep observation well for a total of 4 solutions. The Cooper-Jacob solutions were fit to the first 200 minutes of drawdown data, excluding any significant pumping interference from other wells. These data also excluded the few data points collected when the pumped well may have momentarily shut off. The Theis Recovery solutions were fitted to only the first 50 minutes of recovery data, excluding any significant pumping interference from other wells. M&A chose these analysis cutoff times based on the AQTESOLV graphs in Attachment 1.

Results are shown in Table 4. Estimated transmissivities ranged between 14,000 and 18,000 ft^2/d. Dividing transmissivity by estimated aquifer thickness (400 ft) gives hydraulic conductivities ranging from approximately 36 to 44 ft/d. Only the Cooper-Jacob solution for the observation well is used to determine storativity, which is approximately 2×10^{-4}. Dividing the storativity by the saturated thickness of 400 feet yields a specific storage of 4×10^{-7}.

Table 4. Summary of Estimated Hydraulic Parameters at Chualar Pumping Test Wells

Parameter	Solution Method	Pumped Well 16S/04E-03G53	Observation Well 16S/04E-03G52
Initial (Pumping) Water Level (feet bls)		118.2	115.4
Saturated Thickness (feet)[a]		400	400
Transmissivity, feet²/day			
Semi-Log Straight Line Graphical Method	Cooper-Jacob, 1946	17,600	16,000
Semi-Log Straight Line Graphical Method	Theis Recovery, 1935	14,400	15,900
Hydraulic Conductivity, feet/day			
Semi-Log Straight Line Graphical Method	Cooper-Jacob, 1946	44	40
Semi-Log Straight Line Graphical Method	Theis Recovery, 1935	36	40
Storativity (dimensionless)[b]			
Semi-Log Straight Line Graphical Method	Cooper-Jacob, 1946	--	0.0002
Semi-Log Straight Line Graphical Method	Theis Recovery, 1935	--	--

[a] Saturated thickness is based on the length between the top of the Deep Aquifers equivalent in the adjacent aquifer and bottom of the Gonzales pumped well's screened interval.
[b] Storage parameters cannot be calculated from a pumped well response.

SUMMARY

The 8-hour pumping periods in these aquifer tests provided adequate data for estimating properties of the deep aquifer system adjacent to the Deep Aquifers. This information will be informative for future modeling for assessing aquifer conditions and future project implementation. Based on these results, hydraulic conductivity is on the order of 30 to 50 ft/d and storativity is on the order of 2×10^{-4} to 9×10^{-4}.

While the tests were successful for providing estimates of aquifer properties, the methods and analyses have some limitations. Due to the relatively short pumping duration, the results are representative of the aquifer in relatively close vicinity of the pumped well, not regional conditions. Longer duration pumping tests were not possible given the water needs of the well owners. A longer duration test could reveal additional information by drawing water from much greater distances. Longer pumping durations could reveal aquifer boundary conditions far from the pumped well and also provide better estimates of regional aquifer properties. Longer tests also make it easier to identify static water levels and patterns in pumping interference.

Analytical solutions generally assume that the aquifer is homogenous and of uniform saturated thickness. In reality, aquifers frequently have heterogenous properties that change across space; the saturated thickness of an aquifer may change based on the gradient of the water table, distribution of underlying confining units, or the variation in the physical framework of the aquifer. Some of the subtle water level responses observed during the pumping and recovery periods could be caused by the heterogenous nature of the aquifer system adjacent to the Deep Aquifers.

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MONTGOMERY
& ASSOCIATES

Attachment 1

Summaries of AQTESOLV Analysis

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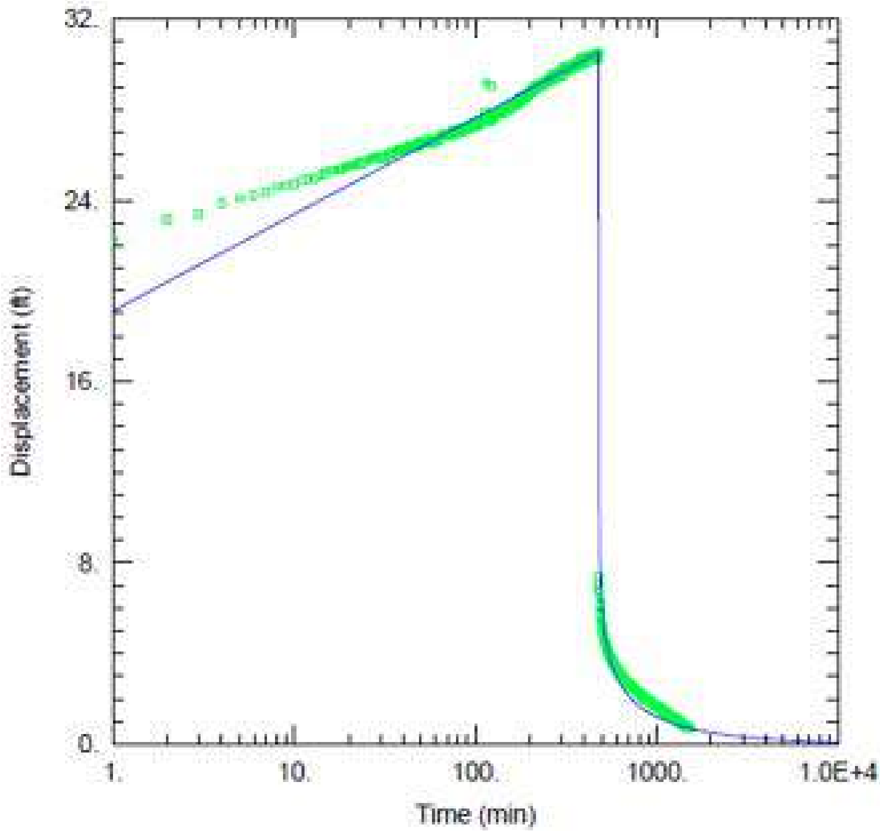


17S/05E-04A02 8-HOUR TEST 1,581 GPM

Data Set: S:\...\04A02_Theis-Hantush.aqt
Date: 06/15/23 Time: 14:09:27

PROJECT INFORMATION

Company: M&A
Client: SVBGSA
Project: 9100.3608
Location: Gonzalez, CA
Test Well: 17S/05E-04A02
Test Date: April 1, 2023

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
17S/05E-04A02	0	0

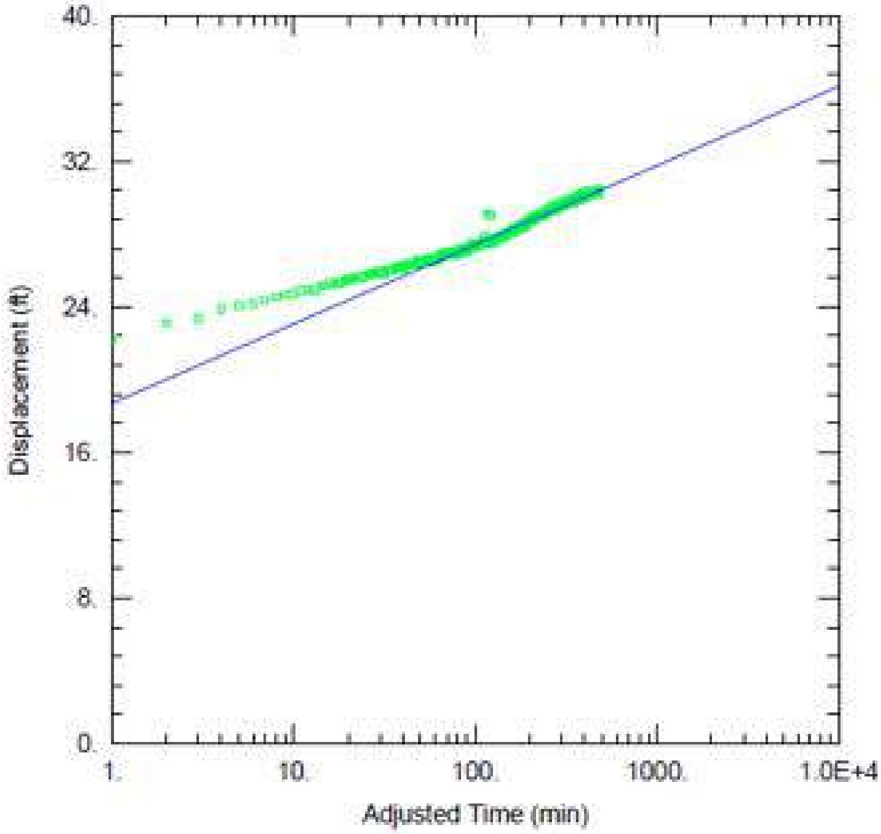
Observation Wells

Well Name	X (ft)	Y (ft)
17S/05E-04A02	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 1.314E+4 ft^2/day
S = 0.0009142
Kz/Kr = 0.1
b = 410. ft



17S/05E-04A02 8-HOUR TEST 1,581 GPM

Data Set: \...\04A02_Cooper-Jacob_manualMatch.aqt
Date: 07/05/23 Time: 14:56:06

PROJECT INFORMATION

Company: M&A
Client: SVBGSA
Project: 9100.3608
Location: Gonzalez, CA
Test Well: 17S/05E-04A02
Test Date: April 1, 2023

AQUIFER DATA

Saturated Thickness: 410. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
17S/05E-04A02	0	0

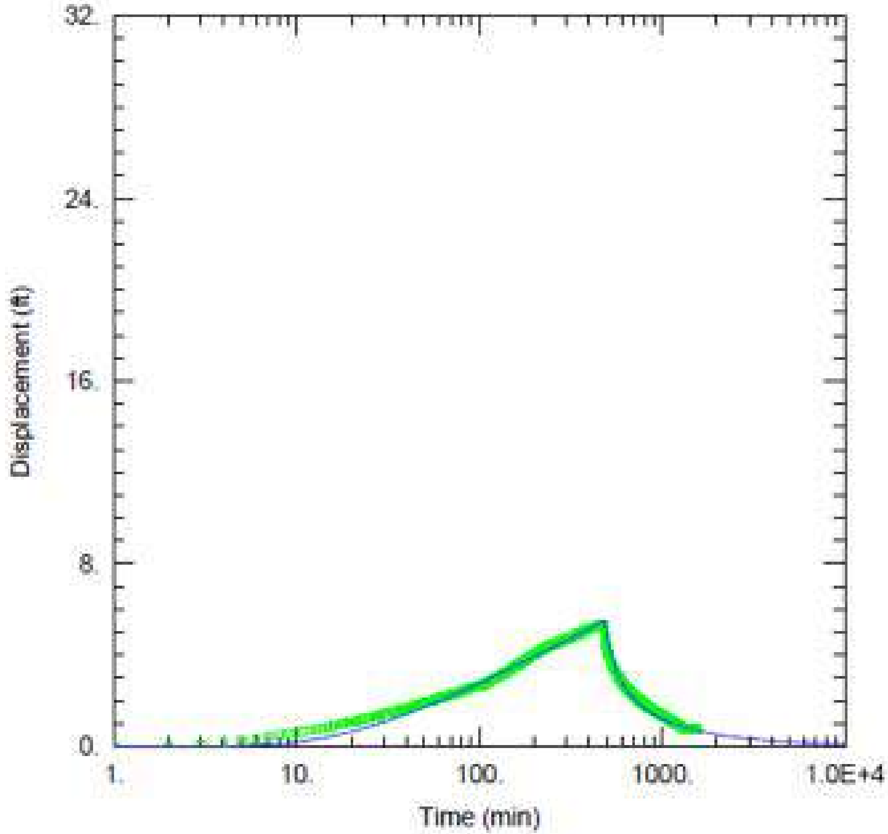
Observation Wells

Well Name	X (ft)	Y (ft)
17S/05E-04A02	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

$T = 1.28E+4\ ft^2/day$ $S = 0.00094$



17S/05E-04A02 8-HOUR TEST 1,581 GPM

Data Set: S:\...\03D03_Theis-Hantush.aqt
Date: 06/15/23 Time: 14:13:43

PROJECT INFORMATION

Company: M&A
Client: SVBGSA
Project: 9100.3608
Location: Gonzalez, CA
Test Well: 17S/05E-04A02
Test Date: April 1, 2023

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
17S/05E-04A02	0	0

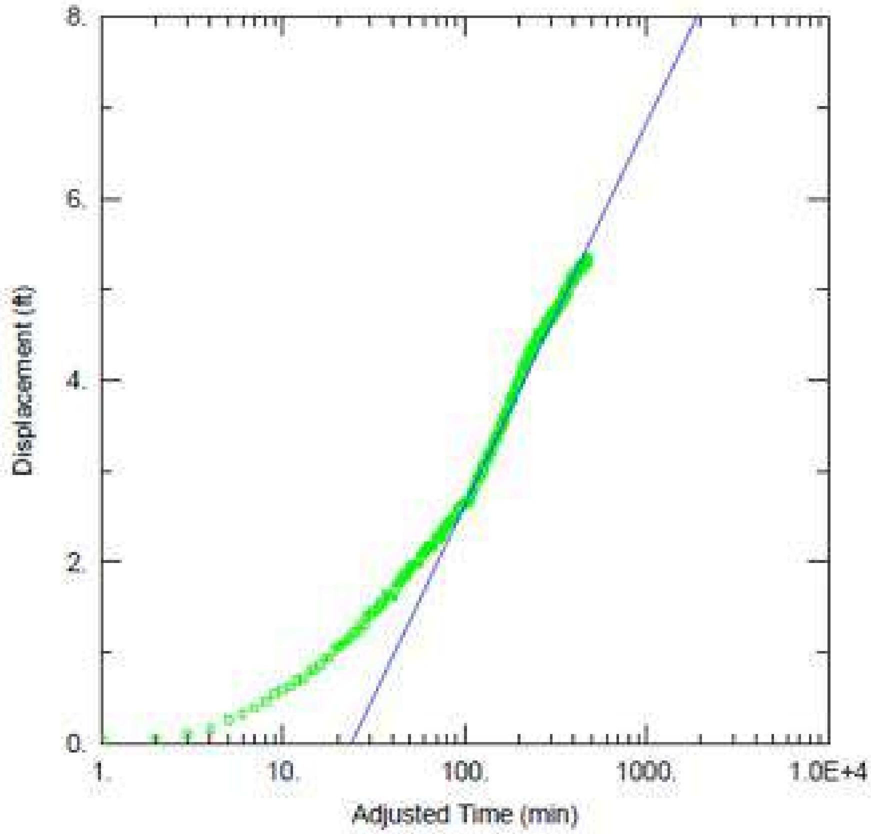
Observation Wells

Well Name	X (ft)	Y (ft)
17S/05E-03D03	552	-552

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 1.288E+4 ft^2/day
S = 0.0008862
Kz/Kr = 0.1
b = 410. ft



17S/05E-04A02 8-HOUR TEST 1,581 GPM

Data Set: S:\...\03D03_Cooper-Jacob_manualMatch.aqt
Date: 07/12/23 Time: 13:18:03

PROJECT INFORMATION

Company: M&A
Client: SVBGSA
Project: 9100.3608
Location: Gonzalez, CA
Test Well: 17S/05E-04A02
Test Date: April 1, 2023

AQUIFER DATA

Saturated Thickness: 410. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
17S/05E-04A02	0	0

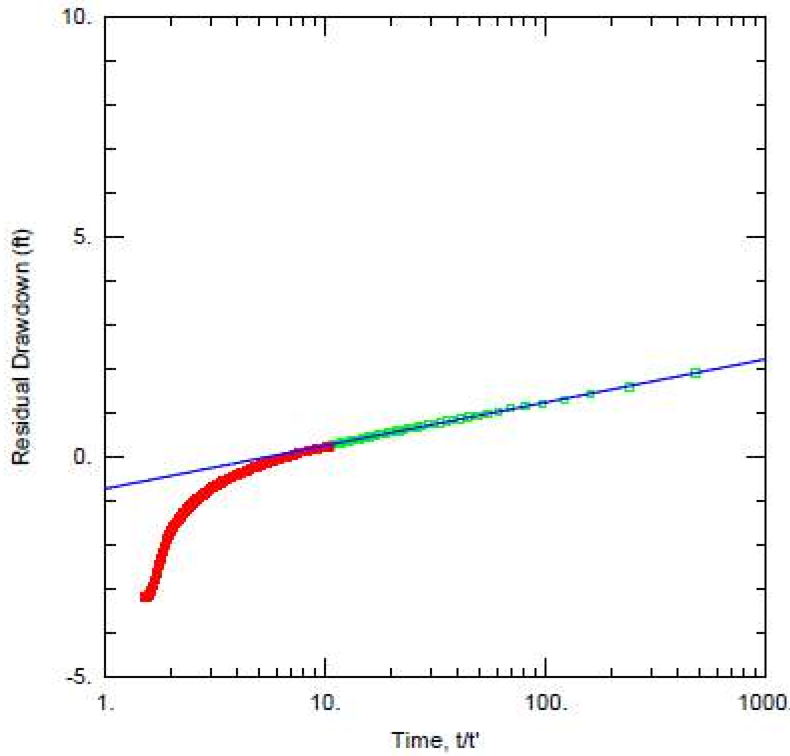
Observation Wells

Well Name	X (ft)	Y (ft)
17S/05E-03D03	552	-552

SOLUTION

Aquifer Model: Confined
Solution Method: Cooper-Jacob

T = 1.325E+4 ft^2/day
S = 0.0008111



WELL TEST ANALYSIS

Data Set: S:\...\03G53_Theis_Recovery.aqt
Date: 07/12/23 Time: 13:29:57

PROJECT INFORMATION

Company: M&A
Client: SVBGSA
Project: 9100.3608
Location: Chualar, CA
Test Well: 16S/04E-03G53
Test Date: May 28, 2023

AQUIFER DATA

Saturated Thickness: 400. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
16S/04E-03G53 (good data)	5823582	2100132

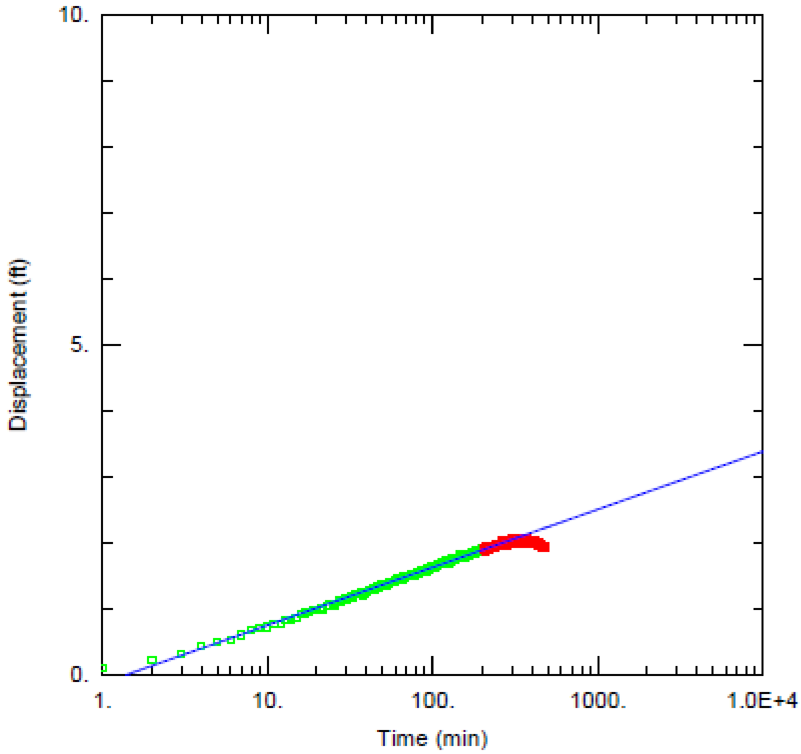
Observation Wells

Well Name	X (ft)	Y (ft)
16S/04E-03G53 (good data	5823582	2100132
16S/04E-03G53 (bad data)	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Theis (Recovery)

T = 1.438E+4 ft^2/day S/S' = 5.495



WELL TEST ANALYSIS

Data Set: S:\...\03G52_Cooper-Jacob.aqt
Date: 07/12/23 Time: 13:27:39

PROJECT INFORMATION

Company: M&A
Client: SVBGSA
Project: 9100.3608
Location: Chualar, CA
Test Well: 16S/04E-03G53
Test Date: May 28, 2023

AQUIFER DATA

Saturated Thickness: 400. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
16S/04E-03G53	5823582	2100132

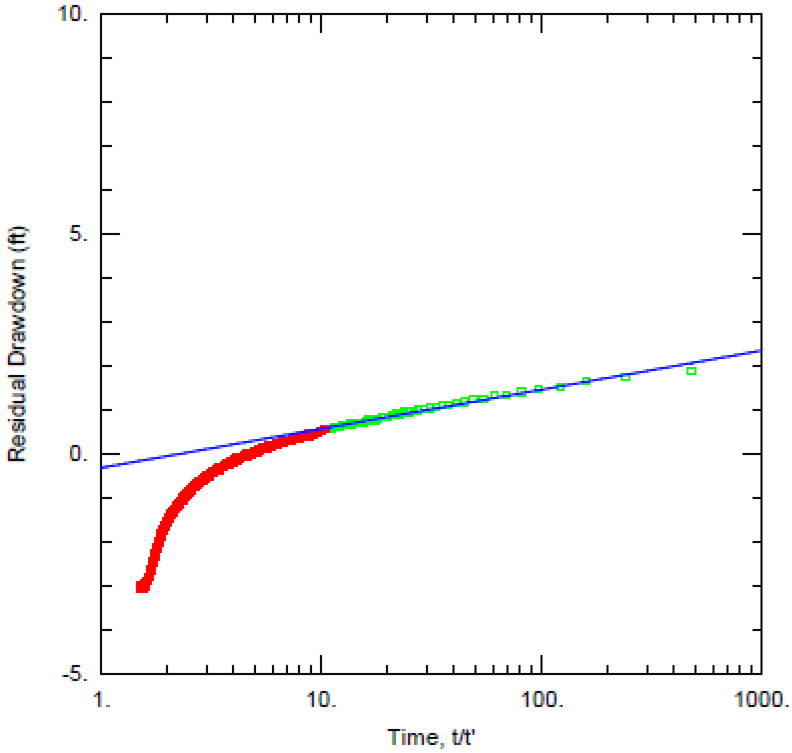
Observation Wells

Well Name	X (ft)	Y (ft)
16S/04E-03G52 (good data	5823216	2100428
16S/04E-03G52 (bad data)	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 1.607E+4 ft^2/day S = 0.0001585



WELL TEST ANALYSIS

Data Set: S:\...\03G52_Theis_Recovery.aqt
Date: 07/12/23 Time: 13:28:20

PROJECT INFORMATION

Company: M&A
Client: SVBGSA
Project: 9100.3608
Location: Chualar, CA
Test Well: 16S/04E-03G53
Test Date: May 28, 2023

AQUIFER DATA

Saturated Thickness: 400. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
16S/04E-03G53	5823582	2100132

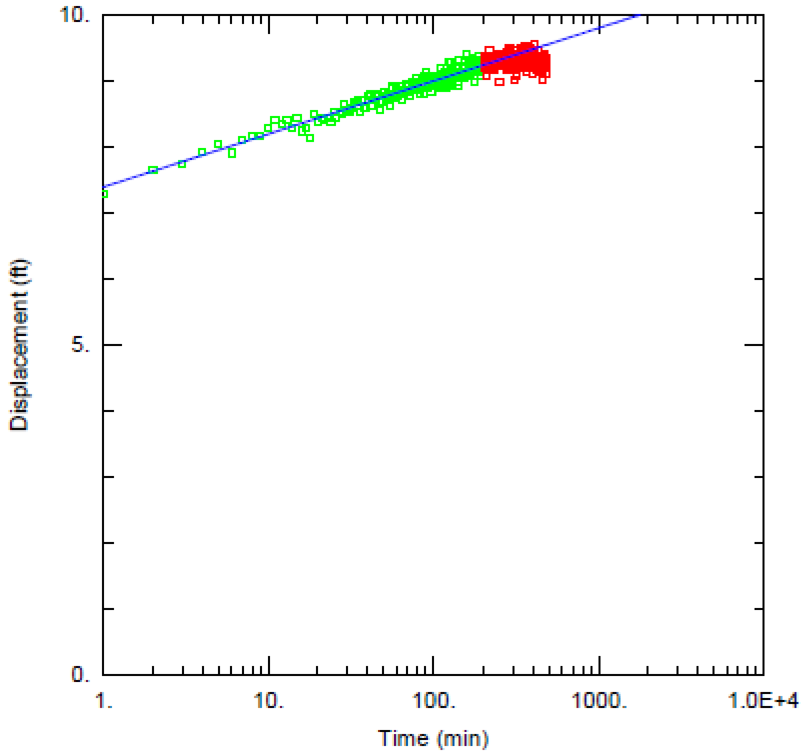
Observation Wells

Well Name	X (ft)	Y (ft)
16S/04E-03G52 (good data	5823216	2100428
16S/04E-03G52 (bad data)	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Theis (Recovery)

T = 1.589E+4 ft^2/day S/S' = 2.282



WELL TEST ANALYSIS

Data Set: S:\...\03G53_Cooper-Jacob.aqt
Date: 07/12/23 Time: 13:28:38

PROJECT INFORMATION

Company: M&A
Client: SVBGSA
Project: 9100.3608
Location: Chualar, CA
Test Well: 16S/04E-03G53
Test Date: May 28, 2023

AQUIFER DATA

Saturated Thickness: 400. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
16S/04E-03G53 (good data)	5823582	2100132

Observation Wells

Well Name	X (ft)	Y (ft)
16S/04E-03G53 (good data)	5823582	2100132
16S/04E-03G53 (bad data)	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 1.756E+4 ft^2/day S = 1.745E-8

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Appendix D

Aquifer Properties Data

Appendix Table D-1. Summary of Available Aquifer Properties for Deep Aquifers Wells

No.	Well	Subbasin	Within Final Extent?	Aquitard Top (WCR)	Aquitard Bottom (WCR)	Screen Top (ft bls)	Screen Bottom (ft bls)	Screen Length (ft)	Aquifer Test Date	Aquifer Test Type	K (ft/d)	T (ft^2/d)	Storage/ Storativity	Aquifer Properties Data Source
1	13S01E25R01	180/400	Yes	660	890	1,255	1,400	145			20.2			Feeney & Rosenberg, 2003
2	13S01E36J01	180/400	Yes	749	921	1,298	1,448	150	June 1, 1984	Production/Specific Capacity	10.3	1,550		HLA, 1994
3	13S02E19Q03	180/400	Yes	433	975	1,280	1,550	270			6.3	1,700		Feeney & Rosenberg, 2003
									April 1, 1980	Production/Specific Capacity	6.8	1,900		HLA, 1994
4	13S02E32M02	180/400	Yes	665	780	780	1,590	810		Pump Test	3.9	3,200		Feeney & Rosenberg, 2003
5	14S02E06L01	180/400	Yes	840	1,153	860	1,540	680	July 1, 1979	Production/Specific Capacity	6.6	4,400		Thorup, 1976-1983
6	14S02E24L02 DMW1-1	Monterey	Yes	700	900	1,820	1,860	40			14.5	600		Feeney & Rosenberg, 2003
										Slug tests (geomean)	2.4		0.00001*	Hanson et al 2002
										Slug tests (geomean)	2		0.000001*	Hanson et al 2002
7	14S02E24L03 DMW1-2	Monterey	Yes	700	900	1,410	1,430	20			7.6	200		Feeney & Rosenberg, 2003
										Slug tests (geomean)	13.8		0.00001*	Hanson et al 2002
										Slug tests (geomean)	11.2		0.000001*	Hanson et al 2002
8	14S02E24L04 DMW1-3	Monterey	Yes	700	900	1,040	1,060	20			13.8	300		Feeney & Rosenberg, 2003
										Slug tests (geomean)	7.6		0.00001*	Hanson et al 2002
										Slug tests (geomean)	6.2		0.000001*	Hanson et al 2002
9	14S02E24L05 DMW1-4	Monterey	Yes	700	900	930	950	20			2.4	48		Feeney & Rosenberg, 2003
										Slug tests (geomean)	14.5		0.00001*	Hanson et al 2002
										Slug tests (geomean)	11.6		0.000001*	Hanson et al 2002
10	14S02E30G03 MCWD-12	Monterey	Yes	690	930	1,390	1,940	550	March 1, 2003	Aquifer Tests	16.5	3,970		Hanson et al, 2002; Geoconsultants Inc., 1993
11	14S02E31H01 MCWD-10	Monterey	Yes	545	885	930	1,540	610		Specific Capacity Test	36.1			HLA, 1994
										Aquifer Tests	18	2,887		From EKI
									March 1, 2003	Aquifer Tests	25.4	4,070		Hanson et al, 2002; Geoconsultants Inc., 1993
											4.6			Feeney & Rosenberg, 2003
12	14S02E32D04 MCWD-11	Monterey	Yes	670	920	970	1,650	680	March 1, 2003		16.4	3,280		Hanson et al, 2002; Geoconsultants Inc., 1993
											30.1	6,016		From EKI
13	15S02E04A04 MCWD-34	Monterey	Yes	605	725	705	1,085	380			12.9	4,893		From EKI

NOTE: * Indicates assumed value used for estimating aquifer transmissivity for slug test analyses. See Hanson et al, 2002 for more details.

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Appendix E

Water Chemistry and Isotopes Data, Methods, and Results

INTRODUCTION

The Deep Aquifers Study analyzed all available water chemistry data for the Deep Aquifers and collected isotope data. This data provides the basis for the water chemistry and isotope sections of the Hydrogeologic Conceptual Model. This appendix provides the raw data collected and used in the analysis and additional results.

DATA

Regularly Collected Data

Water chemistry data is collected on a regular basis by 3 agencies:

- **Monterey County Water Resources Agency (MCWRA)** samples wells in the Deep Aquifers and overlying 400-Foot Aquifer mainly for the purpose of detecting seawater intrusion. They sample twice each summer to confirm findings.

- **Monterey Peninsula Water Management District (MPWMD)** is contracted by the Seaside Watermaster to sample wells in the Seaside Subbasin and adjacent part of the Monterey Subbasin. The City of Seaside and Cal-Am collect water quality for their own wells and report their data to the Seaside Watermaster, who reports it to MPWMD.

- **Division of Drinking Water (DDW)** collects groundwater quality data from public drinking water systems. This data was used to supplement the data from MCWRA and MPWMD. The use of this data is limited by the ability to match wells in MCWRA and MPWMD's datasets. Wells can be matched only when screen information is submitted to DDW along with water quality data.

Table E-1 summarizes the number of wells analyzed in this study. More wells in the overlying and adjacent aquifers are monitored regularly; however, only a subset of them were used in this Study. Not all wells are currently being monitored; monitoring frequency and collecting agency for each well is listed in the Data Tables section. All wells are sampled or have been sampled for general minerals (major cations and anions) at a minimum.

Table E-1. Summary of Wells Monitored for Water Chemistry

Aquifer	Collecting Agency	Well Count
Deep Aquifers	MCWRA	40
	MPWMD	22
400-Foot Aquifer	MCWRA	52
	MPWMD	1
Adjacent Aquifers*	MCWRA	4
	MPWMD	1
	GAMA	2
400-Foot and Deep Aquifers	MCWRA	5

*Adjacent aquifers with wells include the Deep Zone of the Eastside Aquifer and the Deep Zone in the Seaside Subbasin which comprises the Purisima and Santa Margarita Formations.

Data Collected for Deep Aquifers Study

Montgomery & Associates (M&A) conducted additional isotope sampling and analyses as part of this Study. M&A partnered with MCWRA and sent 108 samples to a laboratory for analysis of stable isotopes. Most stable isotope samples were collected by MCWRA in June and August 2022, while some were collected on various dates in 2023. Adding to prior Deep Aquifers isotope data that included 2 carbon-14 samples, this Study adds 9 samples analyzed for tritium and stable oxygen and hydrogen isotopes, some of which are outside of the Deep Aquifers extent to add data for assessing potential connectivity and recharge. These were collected in select deep wells, with samples collected by M&A, MCWD, MCWRA, California Water Service, Corral de Tierra Country Club, and the City of Seaside. M&A selected these wells based on the Phase 1 extent of the Deep Aquifers and interest in adjacent aquifers. After the delineation of the final extent of the Deep Aquifers, M&A determined 23 wells are located in the Deep Aquifers, 6 of the samples are located outside of the Deep Aquifers, and 7 are screened at least partially in the overlying aquifer. The tritium and stable isotope data used for this Study is in the Data Tables section below.

Previously Collected Data

In addition to the new samples collected, this Study included tritium and carbon-14 data from the USGS GAMA program and USGS testing of DMW1 well.

Status and Understanding of Groundwater Quality in the Monterey Bay and Salinas Valley Basins, 2005: California GAMA Priority Basin Project (Kulongoski and Belitz, 2011) reported water quality data collected by the USGS from 97 wells. Although it focused on shallower aquifers, it includes some samples from the Deep Aquifers analyzed for tritium and carbon-14. Carbon-14 data for GAMA wells MSMB-03 and MSMB-12 show small percent modern carbon indicating that Deep Aquifers water has long residence times and is thousands of years old.

Geohydrology of a Deep-Aquifer Monitoring-Well Site at Marina, Monterey County, California (Hanson *et al.*, 2002) reported on hydraulic testing at DMW1, a set of deep monitoring wells on the coast of the City of Marina that has 4 discretely screened intervals in the Deep Aquifers. No tritium was detected in samples from the wells, and carbon-14 analyses indicate the groundwater is thousands of years old.

RESULTS

Water Chemistry

M&A developed trilinear (Piper) plots and stiff diagrams to analyze available water chemistry data and assess whether the Deep Aquifers have a unique water type and whether the water type varies across the lateral extent of the Deep Aquifers. The water chemistry analysis was an iterative process between the water chemistry data and the lateral extent analysis that assessed well logs and AEM surveys. The water chemistry of the Deep Aquifers was compared to the 400-Foot Aquifer samples to evaluate potential relationships between the aquifers. Initial comparison of trilinear and stiff diagrams also led to the identification of 3 water types across the lateral extent of the Deep Aquifers, where wells in the north coastal area grouped together, wells in the Seaside area grouped together, and wells closer to Salinas and within the southeastern extent grouped together. When the final lateral extent was delineated, deep wells outside of the extent were shifted to the adjacent aquifer grouping. Samples were reviewed to look for evidence of leakage between aquifers and historical changes over time. Through the iterative process, some well logs were reanalyzed together with the nearest AEM cross section and recategorized as screened in the 400-Foot Aquifer. After the final extent adjustment and reclassification of wells, the 3 initial groups were reduced to 2 regions—the Northern and Seaside Regions. Figure E-1 shows that generally Deep Aquifers water is sodium dominated, with most samples demonstrating high concentrations of sodium and low concentrations of calcium. This is further supported by the 2 main shapes depicted on the stiff diagrams on Figure E-2 and Figure E-3 for the Northern Region and Figure E-4 and Figure E-5 for the Seaside Region.

In the Northern Region, however, there are 2 anomalous wells (14S/02E-25A03 and 14S/02E-23P02). The water chemistry at these wells is slightly higher calcium and lower sodium concentrations than most other wells in the Deep Aquifers, and is more similar to some wells in the 400-Foot Aquifer and Deep Zone of the Eastside Aquifer. Despite the similarities in water chemistry with the overlying and adjacent aquifers, review of the nearest AEM cross section and well 14S/02E-25A03's well completion report showed that it is completely screened below a thick layer of clay indicative of the aquitard below the 400-Foot Aquifer. The well completion report for well 14S/02E-23P02 and the nearest AEM cross section indicate that it is partially completed in the aquitard below the 400-Foot Aquifer, but the top of the aquitard at this location is about 230 feet above the top of the screen. The reason for this anomalous water chemistry is unknown but it could suggest a connection between the Deep Aquifers and the 400-Foot Aquifer or Eastside Deep Zone. The stiff diagrams for 14S/02E-25A03 and 14S/02E-23P02 are on Figure E-3; and Figure E-7 and Figure E-8 show the stiff diagrams for well 14S/02E-22R01 (a nearby 400-Foot Aquifer well) and well 16S/04E-03G53 (an Eastside Deep Zone well), respectively. The similar shapes of the stiff diagrams illustrate the similarities in water chemistry between two anomalous wells and the 400-Foot Aquifer and Eastside Deep Zone.

Figure E-6 and Figure E-7 show the stiff diagrams for wells completed in the 400-Foot Aquifer or sediments overlying the 400/Deep Aquitard. Figure E-8 shows the stiff diagrams for wells in adjacent deep aquifers. Comparison of these stiff diagrams with the previous Deep Aquifers stiff diagrams shows the differing water chemistries between the aquifers.

Figure E-9 shows the stiff diagrams for wells completed in both the 400-Foot and Deep Aquifers. These wells, as previously mentioned, were not used in the analysis because it is unclear whether these wells are influenced more by the 400-Foot Aquifer or the Deep Aquifers. This is demonstrated by the different shapes of the stiff diagrams in these wells than in other Deep Aquifers wells.

The stiff diagrams for 400-Foot Aquifer wells located southeast of Salinas are shown on Figure E-10. These stiff diagrams are similar to those of other 400-Foot Aquifer wells in the Northern and Seaside Regions. There are no general mineral chemistry data collected for true Deep Aquifers wells within the Southeastern Region.

Historical trends are also analyzed by producing trilinear plot for example wells in the Deep Aquifers, shown on Figure E-11 and Figure E-12. None of Deep Aquifers wells assessed have experienced substantial changes in water chemistry.

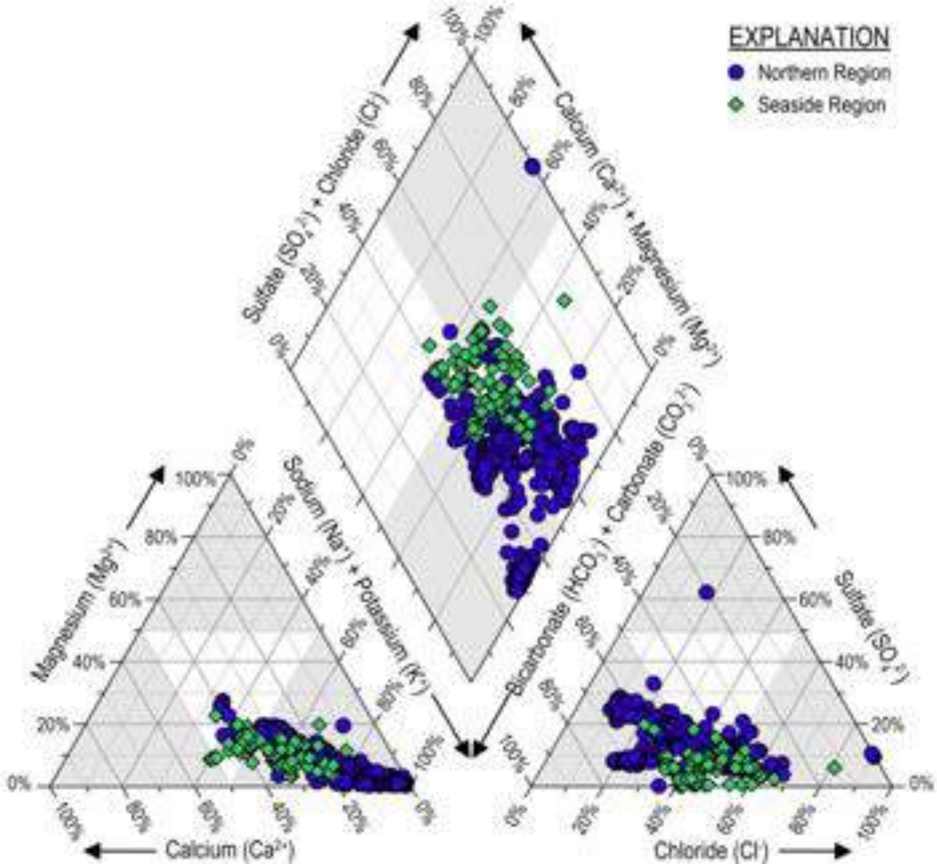


Figure E-1. Trilinear plot of Historical Samples for All Deep Aquifers Wells

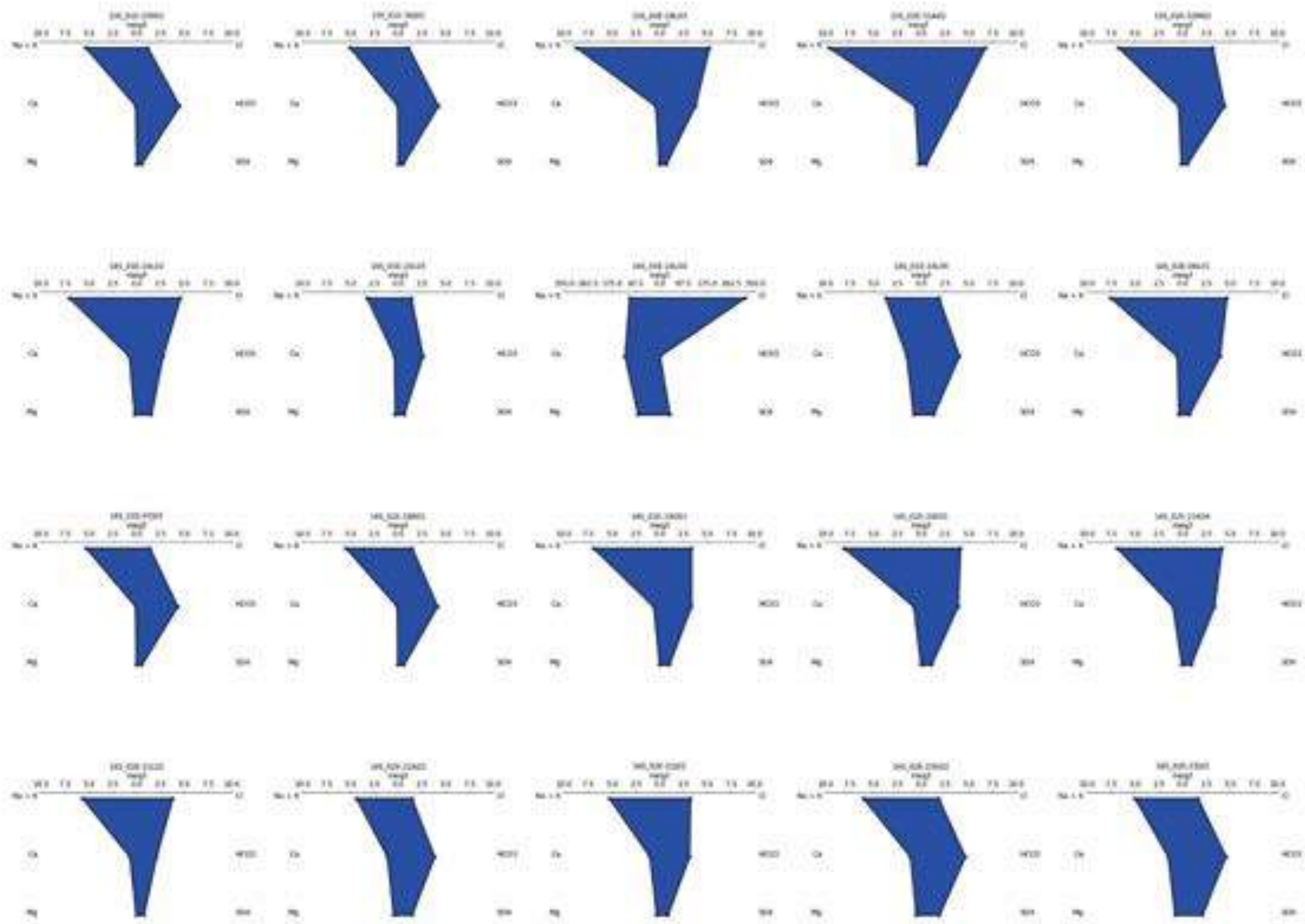


Figure E-2. Stiff Diagrams for the Deep Aquifers Wells in the Northern Region (part 1)

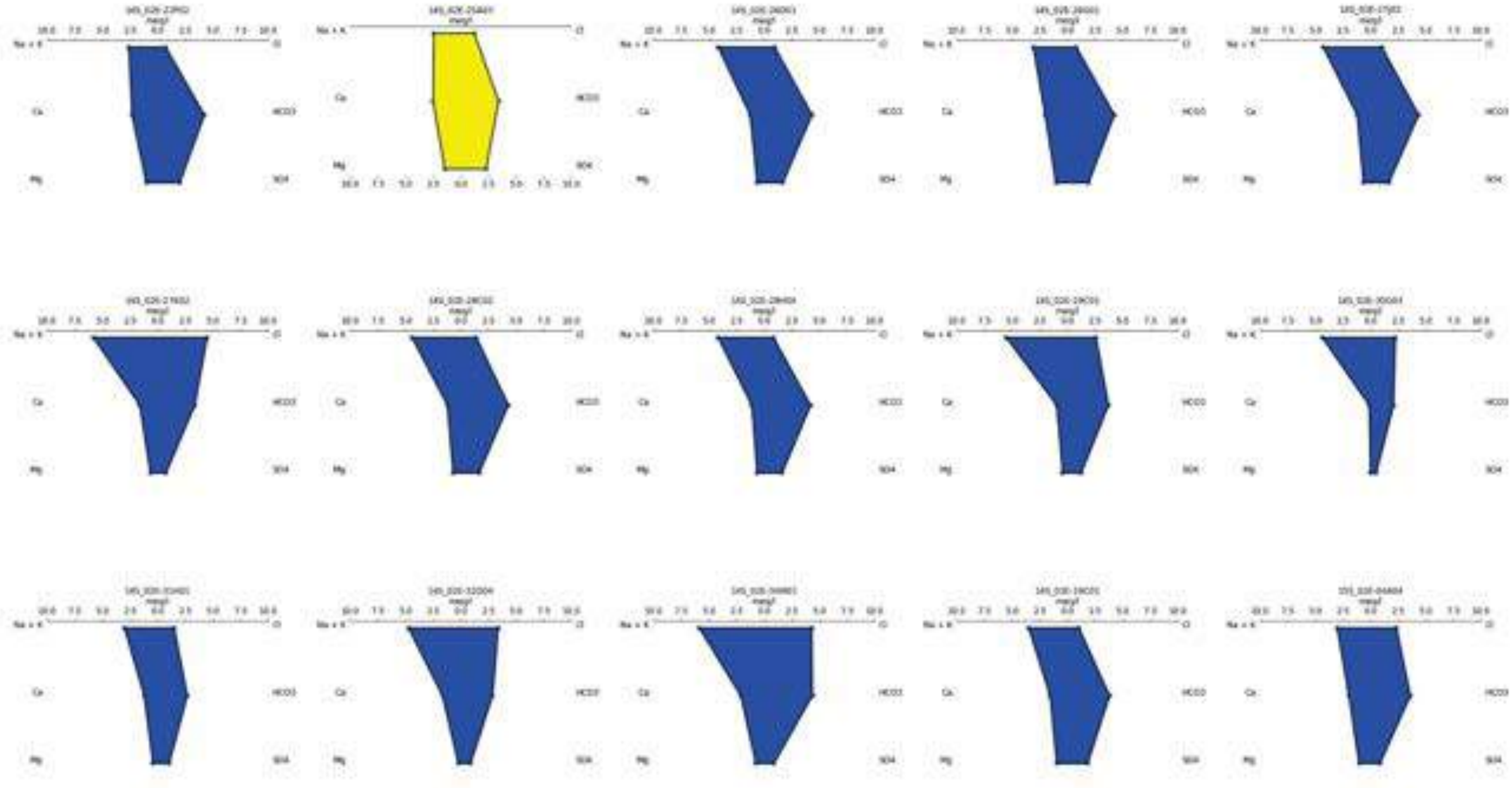


Figure E-3. Stiff Diagrams for the Deep Aquifers Wells in the Northern Region (part 2; yellow indicates well with anomalous water chemistry)

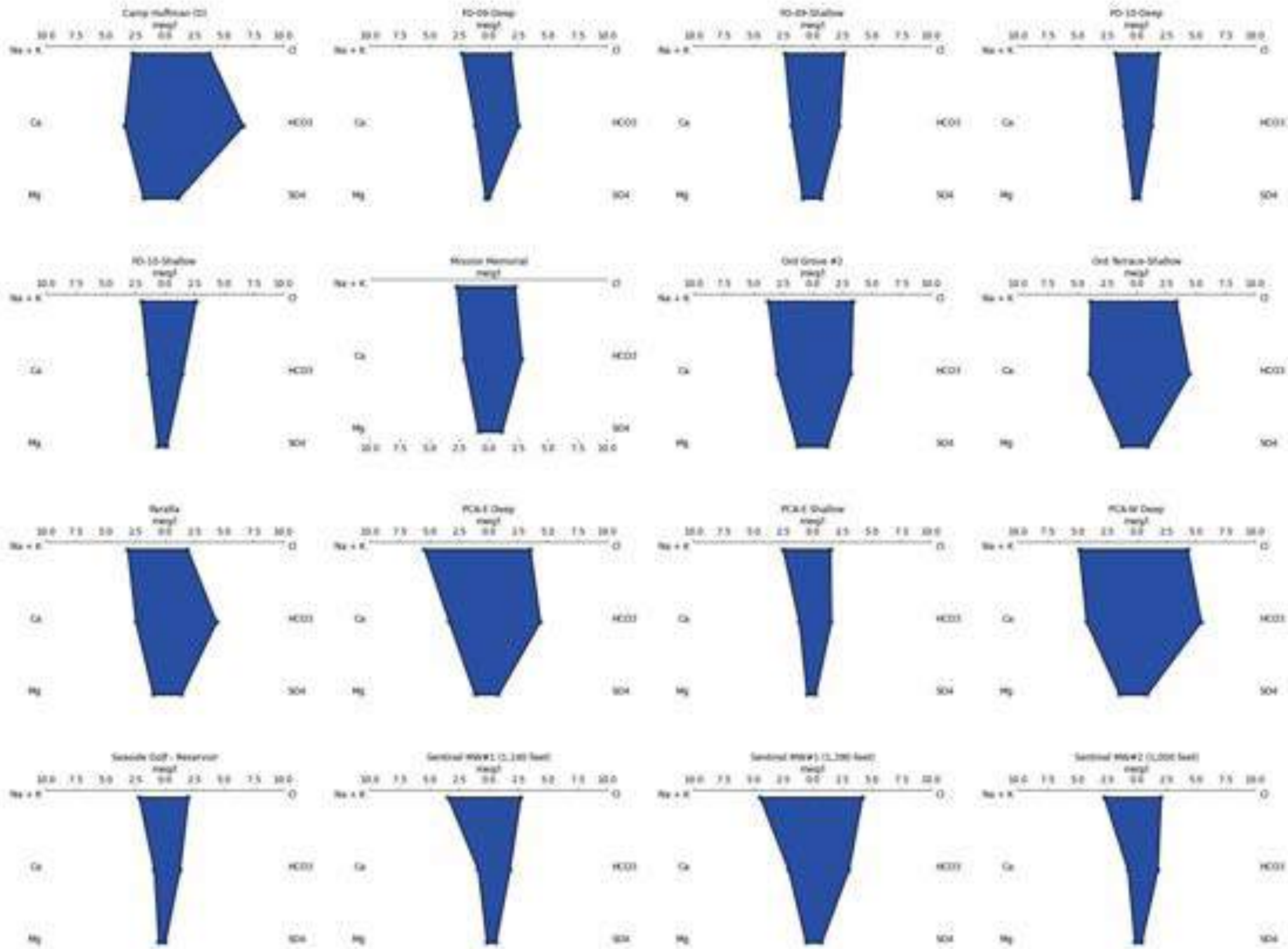


Figure E-4. Stiff Diagrams for the Deep Aquifers Wells in the Seaside Region (part 1)

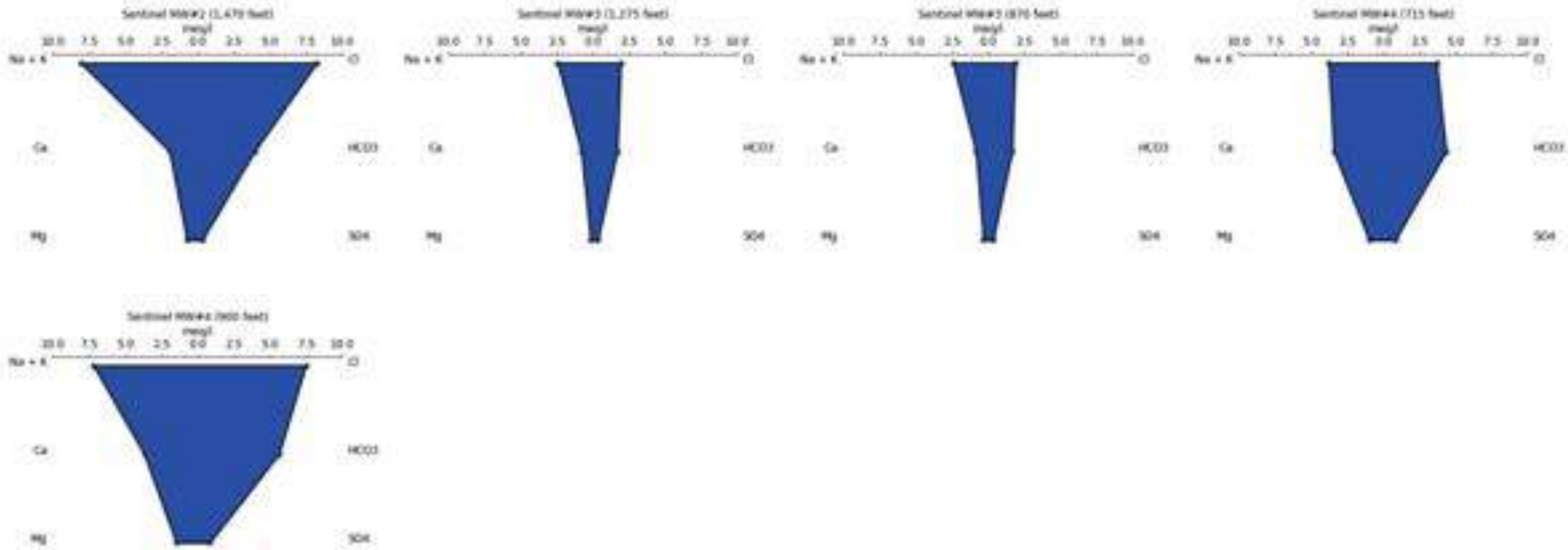


Figure E-5. Stiff Diagrams for the Deep Aquifers Wells in the Seaside Region (part 2)

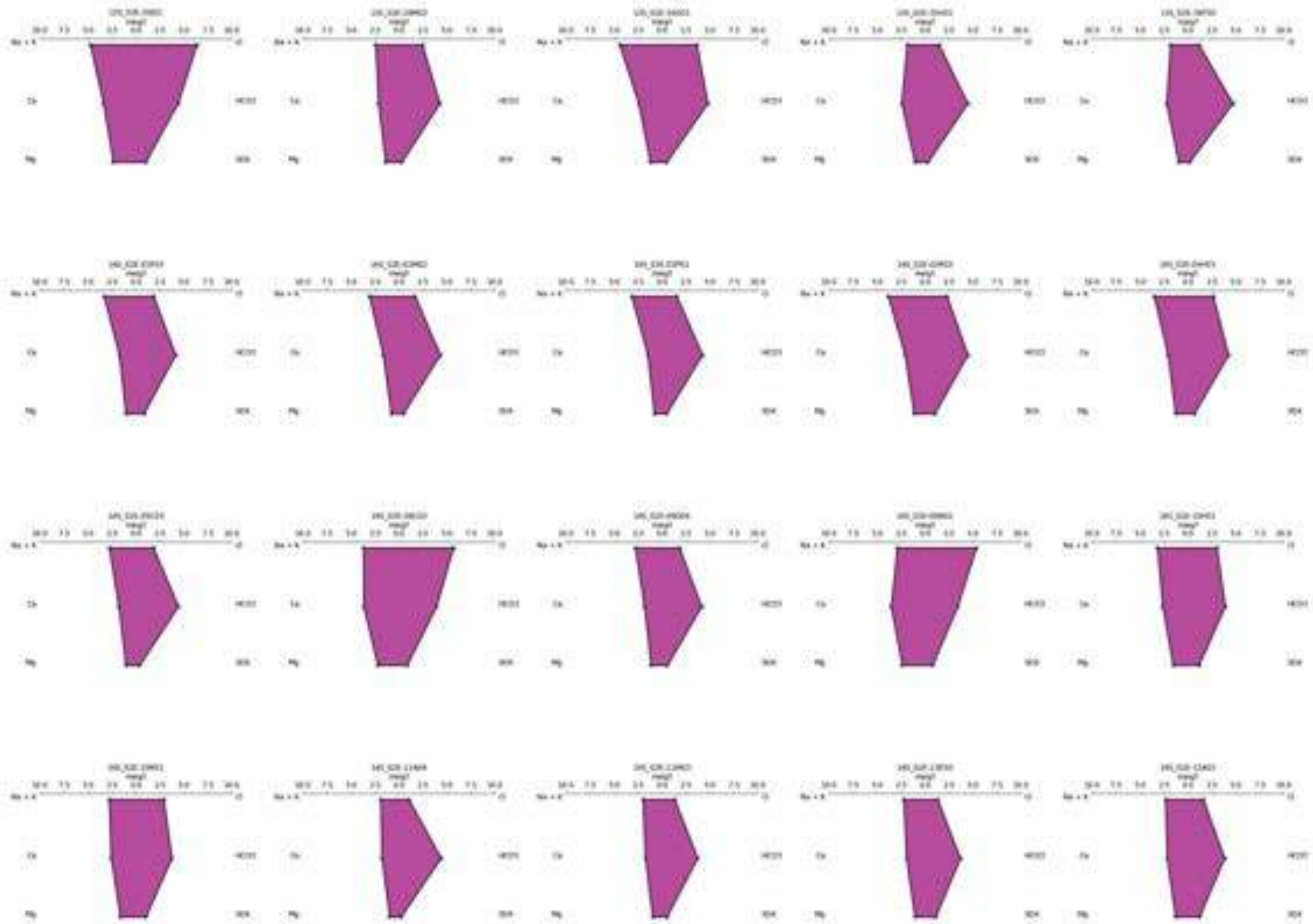


Figure E-6. Stiff Diagrams for the 400-Foot Aquifer Wells in the Northern Region (part 1)

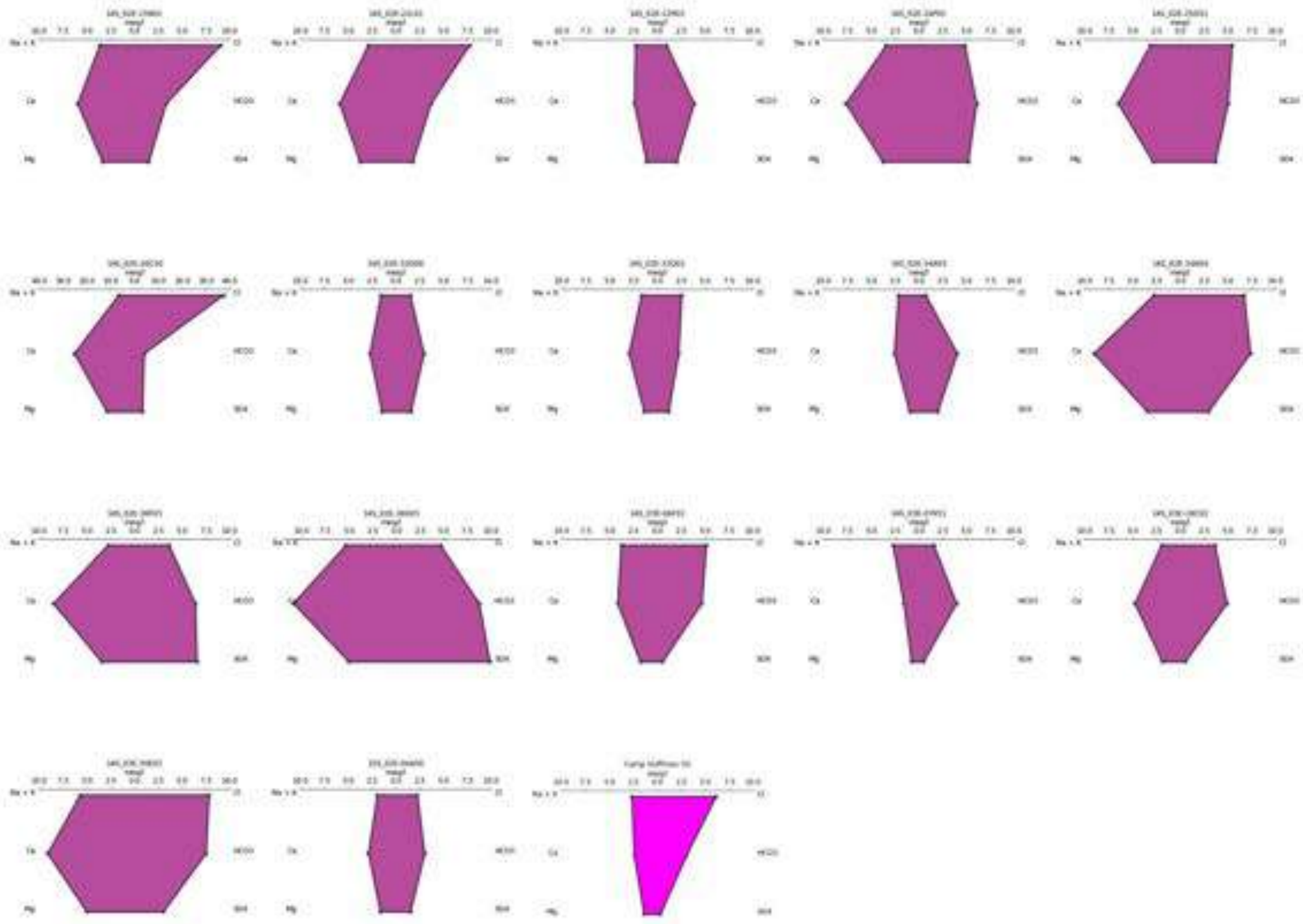


Figure E-7. Stiff Diagrams for the 400-Foot Aquifer Wells in the Northern Region (part 2) and Seaside Region (bright pink indicates well in Seaside)

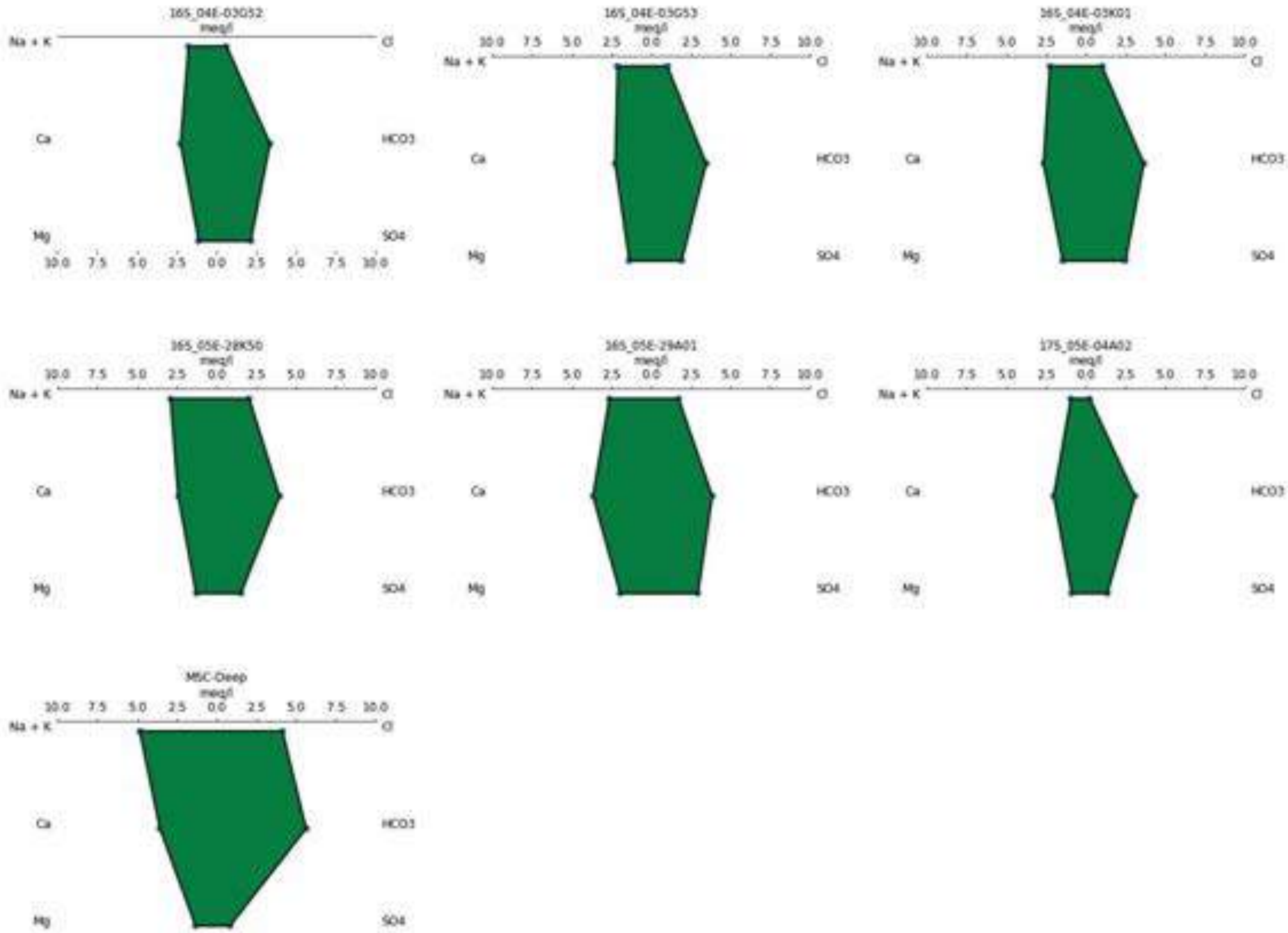


Figure E-8. Stiff Diagrams for Wells in Adjacent Aquifers (All wells are in the Eastside Aquifer Deep Zone, except MSC-Deep)

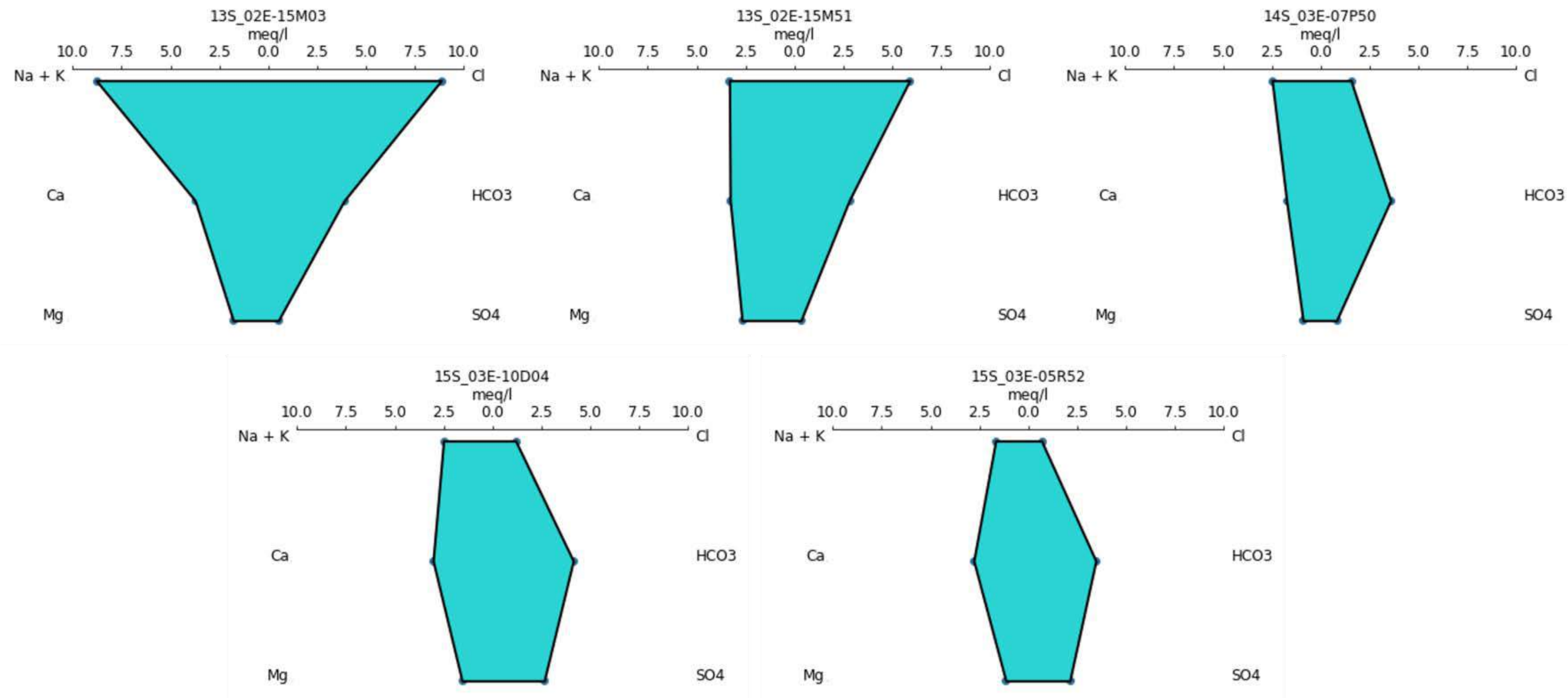


Figure E-9. Stiff Diagrams for Wells Screened in both the 400-Foot and Deep Aquifers

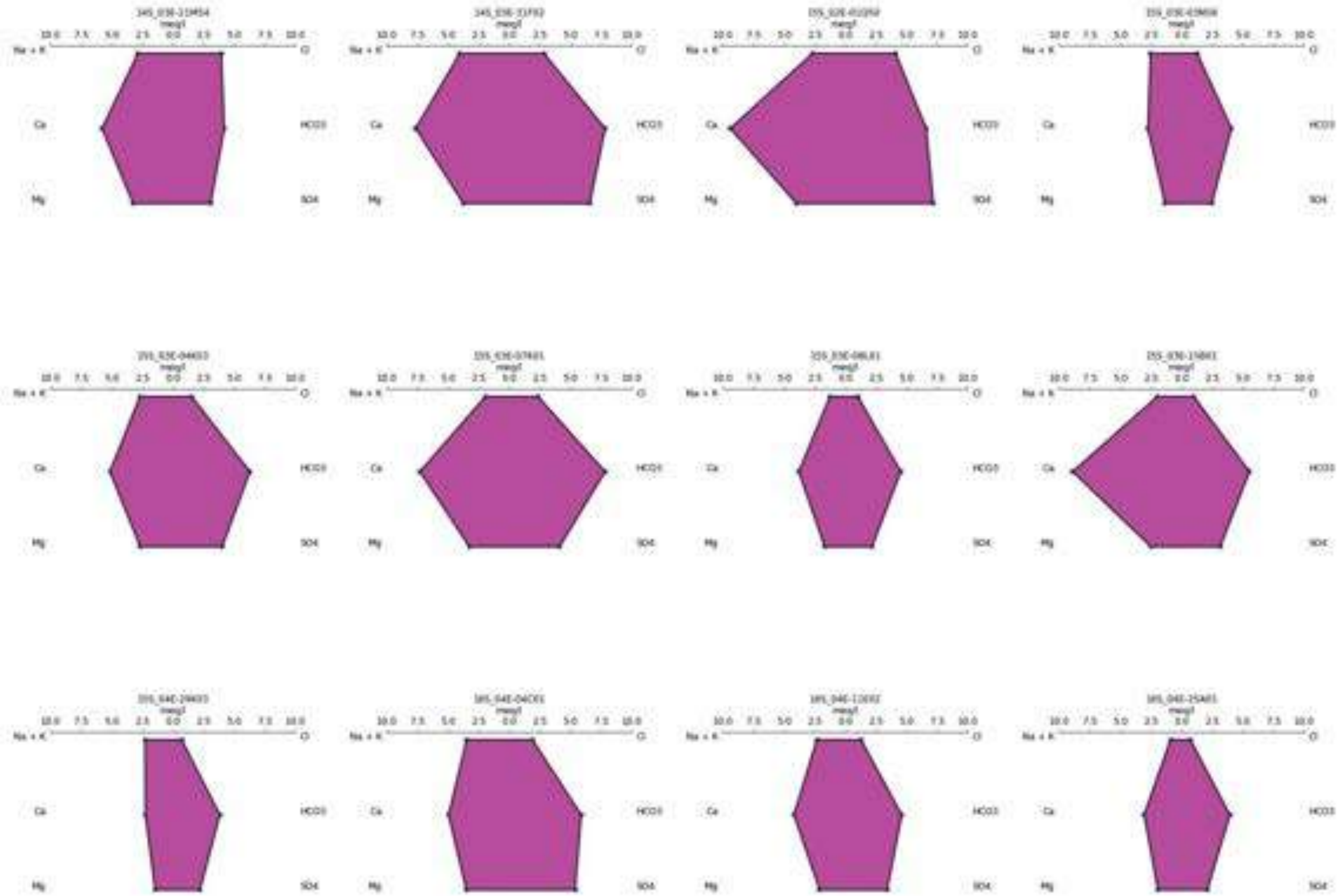


Figure E-10. Stiff Diagrams for the 400-Foot Aquifer Wells in the Southeastern Region

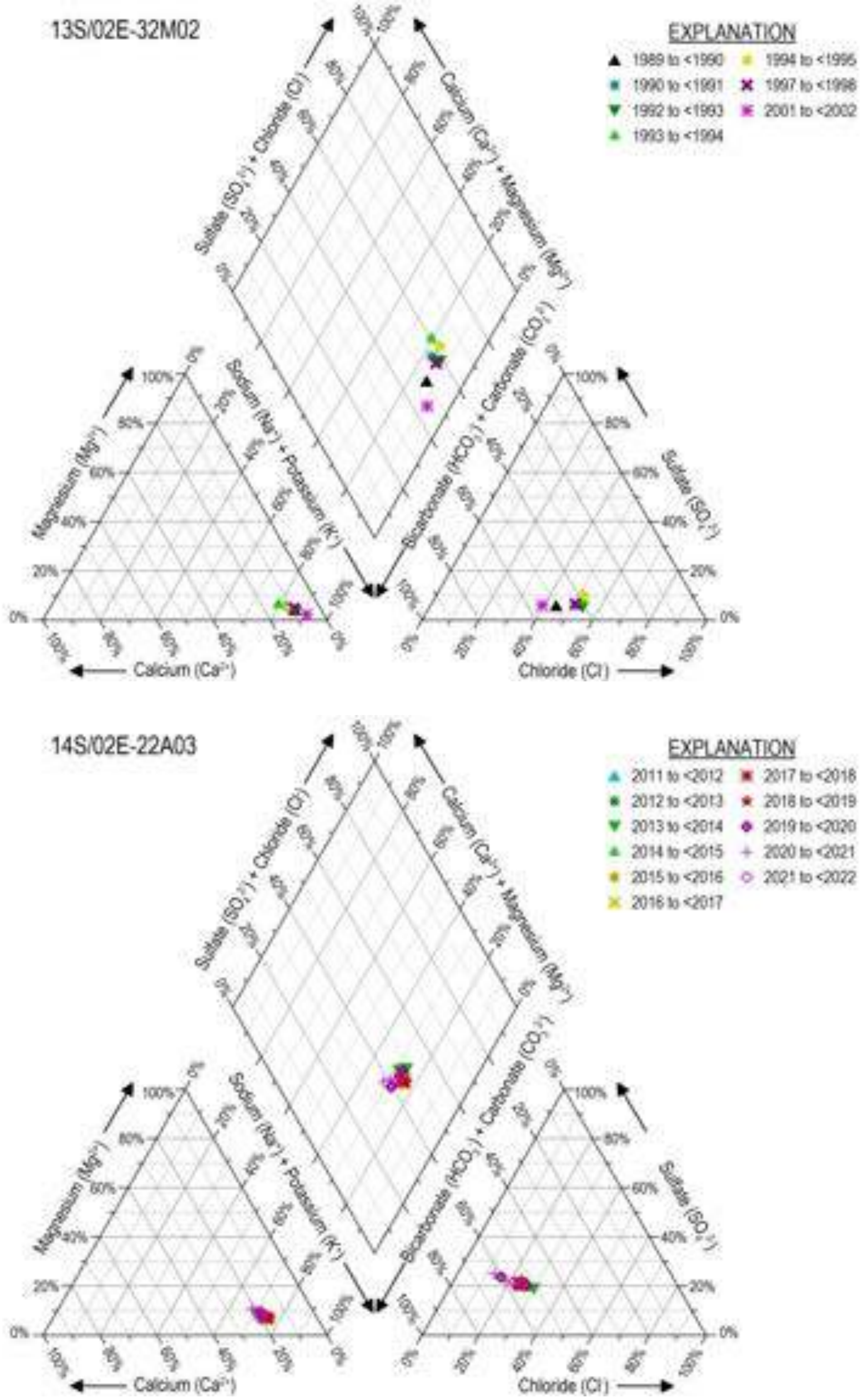
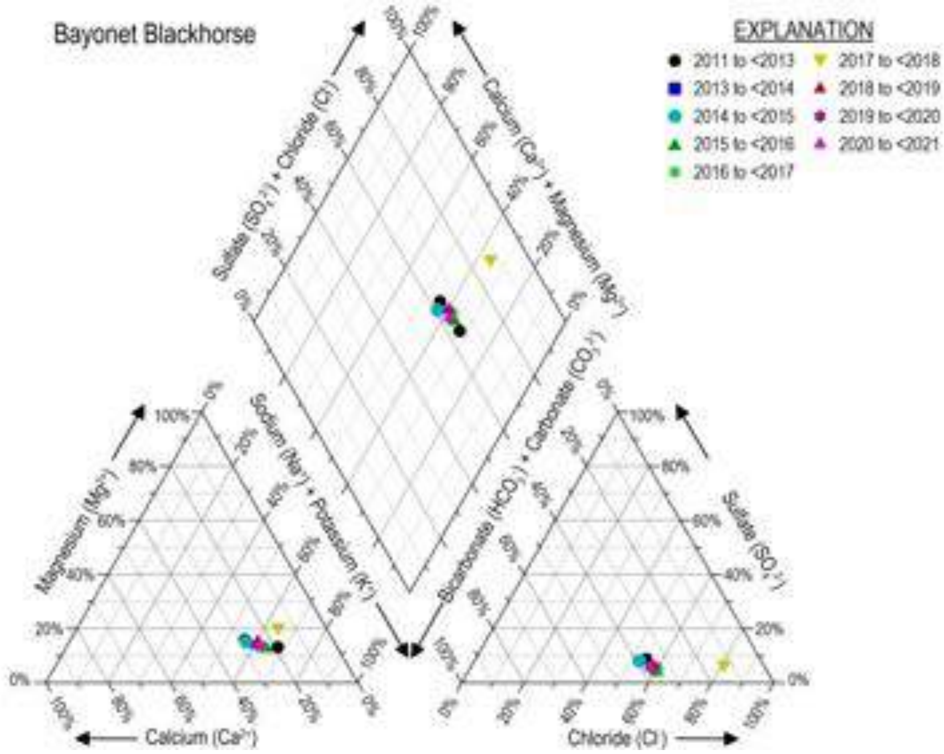


Figure E-11. Trilinear plot of historical samples for selected Deep Aquifers wells: Northern Region



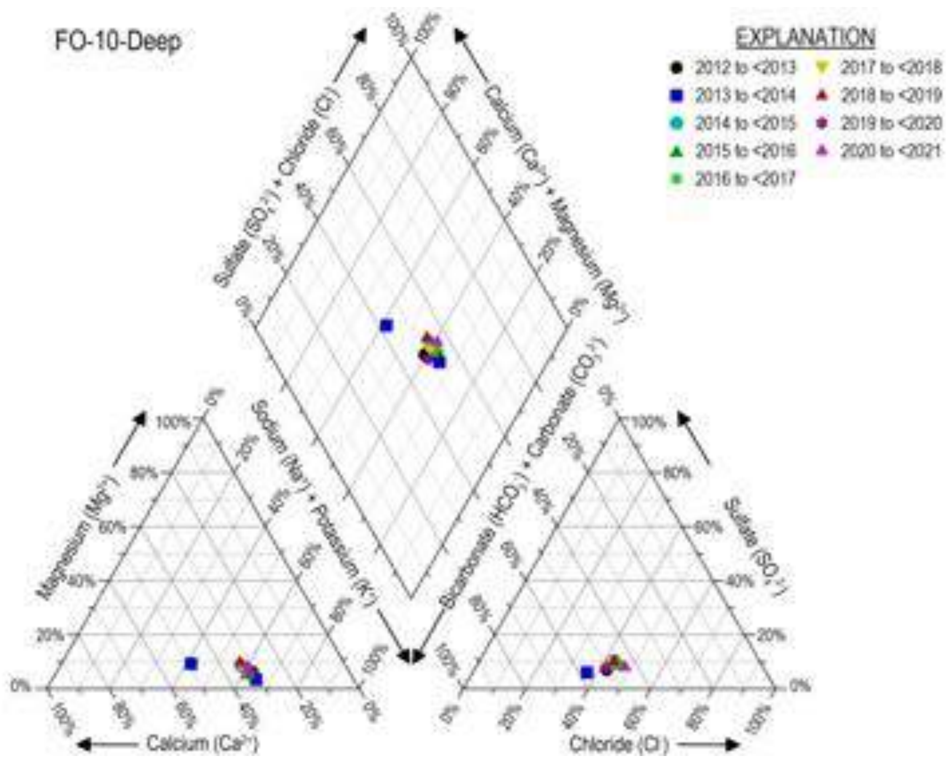


Figure E-12. Trilinear plot of historical samples for selected Deep Aquifers wells: Seaside Region

Isotopic Analysis

This Study analyzed the results of 108 stable isotope samples for $\partial^{18}O$ and $\partial^{2}H$. As summarized in Section 3.4.3 of the report, data points for the Deep Aquifers generally plot close to the Global Mean Water Line (GMWL), and groundwater in the Deep Aquifers is generally isotopically lighter (more negative values) than the surface waters and groundwater in the 400-Foot Aquifer. Figure E-13 shows the spatial distribution of the stable isotope values. Although there is no strong spatial trend apparent in the data, groundwater near the coast appears to be slightly isotopically heavier than groundwater more inland towards Salinas.

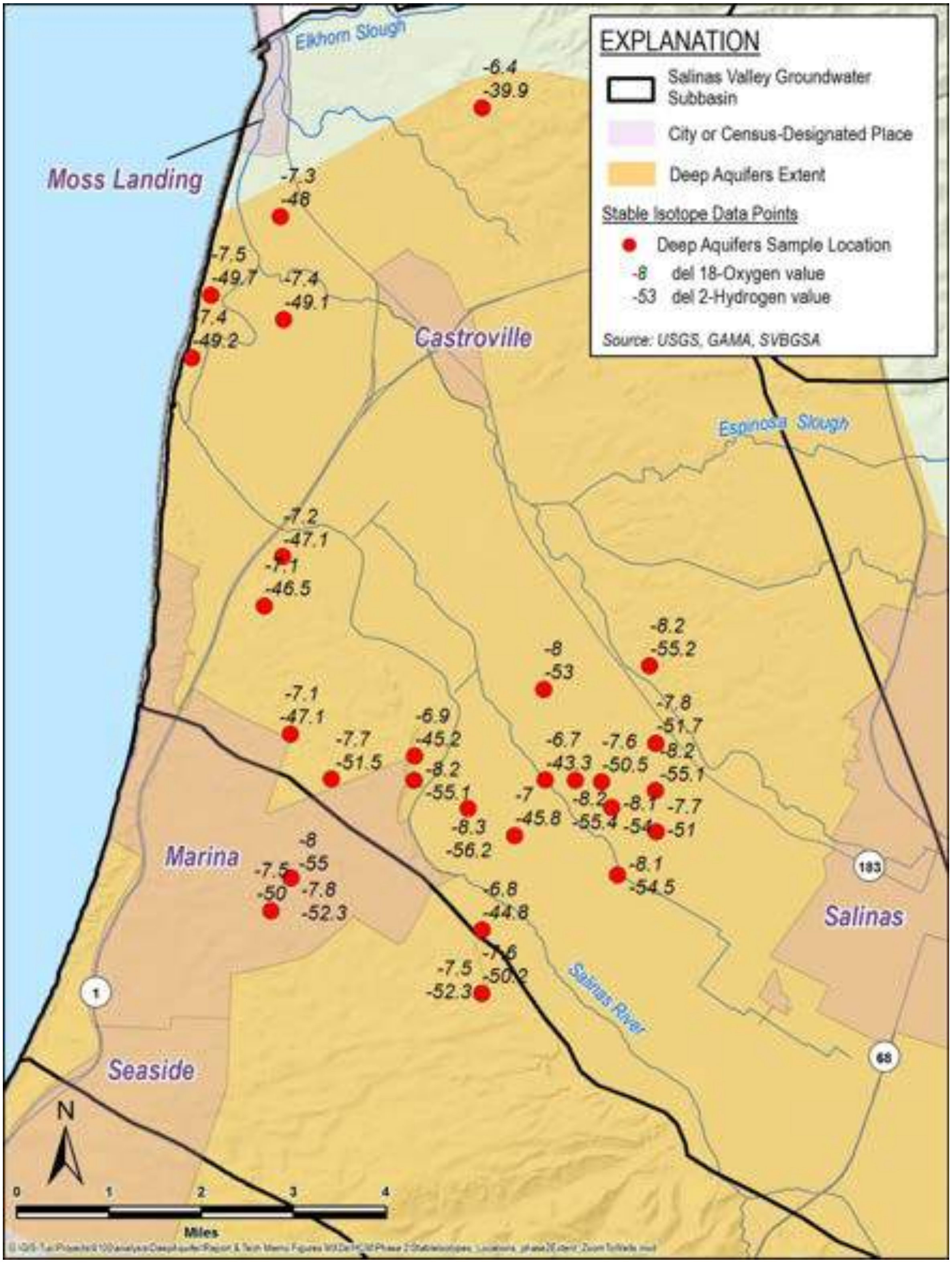


Figure E-13. Stable Isotope Measurements for 2023 at Deep Aquifers Wells

DATA TABLES

Table E-2 lists the wells used to characterize the Deep Aquifers. It also lists wells in the overlying and adjacent aquifers. A larger number of wells in the overlying and adjacent aquifers are monitored regularly; however, only a subset of them were used in this Study and included in the summary table. The monitoring frequency field in Table E-2 lists whether the well is still being monitored. A number of wells are no longer monitored for water chemistry. The wells completed in both the 400-Foot and Deep Aquifers that are monitored for water chemistry are also listed below. These wells were not used in the main analysis because the waters from the 400-Foot and Deep Aquifers is likely mixing in these wells. Table E-3 lists the water chemistry data used to make the trilinear and stiff diagrams in milliequivalents per liter (mEq/L) units.

Table E-4 and Table E-5 show the tritium and stable isotope data for the wells completed in the 400-Foot Aquifer, Deep Aquifers, and in both aquifers that were analyzed in this Study.

Table E-2. Wells Monitored for Water Chemistry

Well Name	Well Type	Monitoring Frequency	Collecting Agency	Aquifer
13S/01E-25R01	Domestic	June and August	MCWRA	Deep Aquifers
13S/01E-36J02	Domestic	June and August	MCWRA	Deep Aquifers
13S/02E-19Q03	Irrigation	June and August	MCWRA	Deep Aquifers
13S/02E-28L03	Irrigation	June and August	MCWRA	Deep Aquifers
13S/02E-31A02	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-07J03	Industrial	June and August	MCWRA	Deep Aquifers
14S/02E-14R02	Monitoring	June and August	MCWRA	Deep Aquifers
14S/02E-18B01	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-19G01	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-20E01	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-21K04	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-21L02	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-22A03	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-22J02	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-23G02	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-23J02	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-23P02	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-25A03	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-26A10	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-26D01	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-26G01	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-26J04	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-27J02	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-27K02	Irrigation	June and August	MCWRA	Deep Aquifers

Well Name	Well Type	Monitoring Frequency	Collecting Agency	Aquifer
14S/02E-28C02	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-28H04	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-29C01	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-30G03	Municipal	June and August	MCWRA	Deep Aquifers
14S/02E-31H01	Municipal	June and August	MCWRA	Deep Aquifers
14S/02E-32D04	Municipal	June and August	MCWRA	Deep Aquifers
14S/02E-34M01	Irrigation	June and August	MCWRA	Deep Aquifers
14S/02E-35B01	Monitoring	June and August	MCWRA	Deep Aquifers
14S/03E-19C01	Irrigation	June and August	MCWRA	Deep Aquifers
15S/02E-04A04	Municipal	June and August	MCWRA	Deep Aquifers
13S/02E-32M02	Irrigation	No longer sampled	MCWRA	Deep Aquifers
14S/01E-24L02	Monitoring	No longer sampled	MCWRA	Deep Aquifers
14S/01E-24L03	Monitoring	No longer sampled	MCWRA	Deep Aquifers
14S/01E-24L04	Monitoring	No longer sampled	MCWRA	Deep Aquifers
14S/01E-24L05	Monitoring	No longer sampled	MCWRA	Deep Aquifers
14S/02E-06L01	Irrigation	No longer sampled	MCWRA	Deep Aquifers
FO-09-Deep	Monitoring	Quarterly	MPWMD	Deep Aquifers
FO-09-Shallow	Monitoring	Quarterly	MPWMD	Deep Aquifers
FO-10-Deep	Monitoring	Annually	MPWMD	Deep Aquifers
FO-10-Shallow	Monitoring	Annually	MPWMD	Deep Aquifers
Mission Memorial	Municipal	Annually	MPWMD	Deep Aquifers
Ord Grove #2	Municipal	Annually	MPWMD	Deep Aquifers
Ord Terrace-Deep	Monitoring	Annually	MPWMD	Deep Aquifers
Ord Terrace-Shallow	Monitoring	Annually	MPWMD	Deep Aquifers
Paralta*	Municipal	Annually	MPWMD	Deep Aquifers
PCA-E Deep	Monitoring	Annually	MPWMD	Deep Aquifers
PCA-E Shallow	Monitoring	Annually	MPWMD	Deep Aquifers
PCA-W Deep	Monitoring	Quarterly	MPWMD	Deep Aquifers
Seaside Golf - Reservoir	Municipal	Annually	MPWMD	Deep Aquifers
Camp Huffman (D)	Monitoring	No longer sampled	MPWMD	Deep Aquifers
Sentinel MW#1 (1,140 feet)	Monitoring	No longer sampled	MPWMD	Deep Aquifers
Sentinel MW#1 (1,390 feet)	Monitoring	No longer sampled	MPWMD	Deep Aquifers
Sentinel MW#2 (1,000 feet)	Monitoring	No longer sampled	MPWMD	Deep Aquifers
Sentinel MW#2 (1,470 feet)	Monitoring	No longer sampled	MPWMD	Deep Aquifers
Sentinel MW#3 (1,275 feet)	Monitoring	No longer sampled	MPWMD	Deep Aquifers
Sentinel MW#3 (870 feet)	Monitoring	No longer sampled	MPWMD	Deep Aquifers

Well Name	Well Type	Monitoring Frequency	Collecting Agency	Aquifer
Sentinel MW#4 (715 feet)	Monitoring	No longer sampled	MPWMD	Deep Aquifers
Sentinel MW#4 (900 feet)	Monitoring	No longer sampled	MPWMD	Deep Aquifers
13S/02E-20J01	Domestic	June and August	MCWRA	400-Foot Aquifer
13S/02E-28M02	Irrigation	June and August	MCWRA	400-Foot Aquifer
13S/02E-34G01	Municipal	June and August	MCWRA	400-Foot Aquifer
13S/02E-35H01	Irrigation	June and August	MCWRA	400-Foot Aquifer
13S/02E-36F50	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-03F03	Monitoring	June and August	MCWRA	400-Foot Aquifer
14S/02E-03M02	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-03P01	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-03R02	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-04H01	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-05C03	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-08C03	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-09D04	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-09N02	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-10H01	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-10N51	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-11A04	Monitoring	June and August	MCWRA	400-Foot Aquifer
14S/02E-11M03	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-13E50	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-15A01	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-15N01	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-22L01	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-22R01	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-24P02	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-25D51	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-26C50	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-32D06	Industrial	No longer sampled	MCWRA	400-Foot Aquifer
14S/02E-33Q01	Municipal	No longer sampled	MCWRA	400-Foot Aquifer
14S/02E-34A03	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-34A04	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-36F03	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-36G01	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/03E-06F01	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/03E-07K51	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/03E-18C02	Monitoring	June and August	MCWRA	400-Foot Aquifer
14S/03E-21M54	Municipal	June and August	MCWRA	400-Foot Aquifer
14S/03E-30E03	Irrigation	June and August	MCWRA	400-Foot Aquifer

Well Name	Well Type	Monitoring Frequency	Collecting Agency	Aquifer
14S/03E-31F02	Irrigation	June and August	MCWRA	400-Foot Aquifer
15S/02E-01Q50	Irrigation	June and August	MCWRA	400-Foot Aquifer
15S/02E-04A50	Municipal	No longer sampled	MCWRA	400-Foot Aquifer
15S/03E-03N58	Industrial	June and August	MCWRA	400-Foot Aquifer
15S/03E-04K03	Irrigation	No	MCWRA	400-Foot Aquifer
15S/03E-07K01	Irrigation	June and August	MCWRA	400-Foot Aquifer
15S/03E-08L01	Irrigation	June and August	MCWRA	400-Foot Aquifer
15S/03E-15B01	Irrigation	No	MCWRA	400-Foot Aquifer
15S/04E-29K03	Irrigation	No longer sampled	MCWRA	400-Foot Aquifer
16S/04E-04C01	Irrigation	No	MCWRA	400-Foot Aquifer
16S/04E-11E02	Irrigation	No longer sampled	MCWRA	400-Foot Aquifer
16S/04E-25A01	Irrigation	No longer sampled	MCWRA	400-Foot Aquifer
Camp Huffman (S)	Monitoring	No longer sampled	MPWMD	400-Foot Aquifer
16S/04E-03G52	Municipal	Quarterly	GAMA	Eastside Deep
16S/04E-03G53	Municipal	Quarterly	GAMA	Eastside Deep
16S/04E-03K01	Irrigation	June and August	MCWRA	Eastside Deep
16S/05E-28K50	Irrigation	Quarterly	MCWRA	Eastside Deep
16S/05E-29A01	Municipal	Quarterly	MCWRA	Eastside Deep
17S/05E-04A02	Irrigation	No longer sampled	MCWRA	Eastside Deep
MSC-Deep	Monitoring	Quarterly	MPWMD	Tsm (Seaside)
13S/02E-15M03	Industrial	No longer sampled	MCWRA	400-Foot and Deep Aquifers
13S/02E-15M51	Industrial	No longer sampled	MCWRA	400-Foot and Deep Aquifers
14S/02E-02A02	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-02C03	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/02E-03H01	Irrigation	June and August	MCWRA	400-Foot Aquifer
14S/03E-07P50	Irrigation	June and August	MCWRA	400-Foot and Deep Aquifers
15S/03E-05R52	Irrigation	June and August	MCWRA	400-Foot and Deep Aquifers
15S/03E-10D04	Municipal	June and August	MCWRA	400-Foot and Deep Aquifers

Table E-3. Summary of Water Chemistry Data Used for Piper Plots and Stiff Diagrams (in mEq/L)

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
Deep Aquifers	13S/01E-25R01	Northern	0.06986	0.04114	1.49506	0.60378	5.43720	0.09463	3.48639	4.25340	7/1/1992	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.09981	0.08229	1.52327	0.58296	5.30671	0.09208	3.44677	4.20506	9/2/1994	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.09981	0.08229	1.21298	0.52050	5.08922	0.08696	3.60525	4.39840	6/16/1997	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.09981	0.08229	1.43865	0.49968	5.08922	0.09463	3.44677	4.20506	8/3/1999	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.09482	0.04937	1.41044	0.52050	5.08922	0.08952	3.60525	4.39840	6/29/2004	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.12476	0.07406	1.66432	0.43722	5.35021	0.08952	3.52601	4.30173	6/16/2005	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.10480	0.05760	1.46685	0.56214	5.69819	0.09463	3.60525	4.39840	6/15/2006	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.10480	0.06583	1.43865	0.49968	5.48070	0.11254	3.68448	4.49507	7/27/2007	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.18464	0.18926	1.72073	0.49968	5.00223	0.10742	3.48639	4.25340	9/2/2008	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.07984	0.06418	1.55148	0.52050	5.21971	0.08184	3.56563	4.35007	6/5/2009	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.08483	0.04937	1.46685	0.52050	5.26321	0.08184	3.58544	4.37423	7/10/2009	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.13474	0.07406	3.49788	0.52050	6.22016	0.10486	2.69403	3.28672	8/12/2009	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.08982	0.04937	1.46685	0.49968	5.26321	0.08696	3.54582	4.32590	7/27/2010	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.06487	0.01646	1.35402	0.49968	5.04572	0.07929	3.42696	4.18090	7/14/2011	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.02994	0.06583	1.43865	0.52050	5.17622	0.08184	3.44677	4.20506	8/3/2011	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.09981	0.06665	1.32581	0.49968	5.21971	0.09208	3.76372	4.59174	1/27/2012	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.10979	0.07406	1.91819	0.52050	5.52420	0.09463	3.34773	4.08423	7/19/2012	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.08483	0.04937	1.35402	0.49968	5.13272	0.07929	3.48639	4.25340	8/16/2012	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.12975	0.09052	1.55148	0.49968	5.21971	0.09719	3.38735	4.13256	7/17/2013	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.09981	0.05760	1.29760	0.49968	5.26321	0.08440	3.42696	4.18090	8/6/2013	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.28944	0.27978	5.92384	0.66624	6.95962	0.17648	1.98090	2.41670	12/16/2015	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.08982	0.03292	1.26939	0.47886	5.26321	0.08440	3.46658	4.22923	6/9/2016	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.10480	0.03292	1.24118	0.47886	5.13272	0.08440	3.70429	4.51923	6/27/2017	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.06986	0.02469	1.26939	0.49968	5.21971	0.08696	3.70429	4.51923	8/24/2017	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.07485	0.04114	1.24118	0.49968	5.00223	0.07929	3.60525	4.39840	6/25/2018	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.07485	0.04114	1.26939	0.49968	5.52420	0.08696	3.52601	4.30173	8/7/2018	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.07485	0.04937	1.26939	0.47886	5.21971	0.08696	3.44677	4.20506	6/27/2019	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.07485	0.04114	1.18477	0.47886	5.04572	0.07673	3.48639	4.25340	8/7/2019	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.18464	0.04937	1.18477	0.47886	4.95873	0.07161	3.54582	4.32590	6/5/2020	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.09482	0.04114	1.21298	0.45804	5.04572	0.08184	3.64486	4.44673	8/7/2020	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.10979	0.03292	1.15656	0.49968	5.26321	0.05115	3.54582	4.32590	6/18/2021	TRUE
Deep Aquifers	13S/01E-25R01	Northern	0.11977	0.03292	1.15656	0.49968	5.30671	0.07161	3.70429	4.51923	8/13/2021	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.10979	0.04114	1.43865	0.45804	4.87173	0.07673	3.36754	4.10840	6/16/2005	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.02495	0.14812	1.24118	0.49968	4.52375	0.08440	3.12983	3.81839	6/15/2006	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.19462	0.04937	1.24118	0.47886	4.91523	0.07161	3.50620	4.27756	7/11/2008	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.08483	0.04114	1.24118	0.49968	4.82823	0.06906	3.32792	4.06006	6/5/2009	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.06487	0.03292	1.24118	0.49968	4.91523	0.06650	3.36754	4.10840	7/10/2009	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.05988	0.02469	1.24118	0.52050	4.78474	0.06650	3.22887	3.93923	8/12/2009	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.07984	0.03292	1.41044	0.49968	5.00223	0.08440	3.28830	4.01173	7/27/2010	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.06986	0.04937	1.26939	0.49968	4.69774	0.07673	3.18926	3.89089	7/14/2011	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
Deep Aquifers	13S/01E-36J02	Northern	0.09482	0.05184	1.46685	0.49968	4.78474	0.08952	3.36754	4.10840	1/27/2012	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.06986	0.04114	1.26939	0.49968	4.78474	0.07161	3.18926	3.89089	8/16/2012	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.09981	0.05760	1.43865	0.49968	4.87173	0.08696	3.12983	3.81839	7/17/2013	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.08982	0.04937	1.21298	0.47886	4.95873	0.07929	3.20906	3.91506	8/6/2013	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.08483	0.04114	1.26939	0.49968	5.26321	0.06906	3.26849	3.98756	7/30/2014	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.13973	0.04937	1.29760	0.49968	5.08922	0.05371	3.26849	3.98756	8/27/2014	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.09232	0.05143	1.41044	0.49968	5.00223	0.08312	3.32792	4.06006	6/10/2015	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.08982	0.04937	1.38223	0.49968	5.17622	0.07417	3.28830	4.01173	7/15/2015	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.08483	0.04937	1.72073	0.47886	5.30671	0.10486	3.14964	3.84256	6/9/2016	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.07485	0.04114	1.52327	0.52050	4.95873	0.08184	3.16945	3.86672	8/25/2016	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.11977	0.04114	1.55148	0.47886	5.04572	0.08696	3.30811	4.03589	6/27/2017	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.07984	0.02469	1.46685	0.49968	5.13272	0.08952	3.38735	4.13256	8/24/2017	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.07984	0.03292	1.15656	0.49968	4.74124	0.07161	3.36754	4.10840	6/25/2018	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.07485	0.04114	1.52327	0.49968	5.39370	0.08184	3.28830	4.01173	8/7/2018	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.08982	0.06583	2.08745	0.47886	5.43720	0.10231	2.99117	3.64922	6/27/2019	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.08483	0.04114	1.29760	0.47886	4.91523	0.07417	3.12983	3.81839	8/7/2019	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.18963	0.05760	1.10014	0.47886	4.69774	0.06650	3.36754	4.10840	6/5/2020	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.10979	0.03292	1.12835	0.47886	4.82823	0.07417	3.42696	4.18090	8/7/2020	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.10480	0.02469	1.10014	0.47886	4.61075	0.03325	3.26849	3.98756	6/18/2021	TRUE
Deep Aquifers	13S/01E-36J02	Northern	0.06986	0.02469	1.10014	0.49968	5.00223	0.06650	3.46658	4.22923	8/13/2021	TRUE
400-ft and Deep Aquifers	13S/02E-15M03	Northern	3.74270	1.79387	8.85755	0.52050	8.69952	0.10231	3.18926	3.89089	7/19/2021	TRUE
400-ft and Deep Aquifers	13S/02E-15M51	Northern	3.29358	2.68258	5.89563	0.33312	3.26232	0.06650	2.29785	2.80338	7/19/2021	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.44329	2.46863	5.13399	0.77034	3.56680	0.07929	3.66467	4.47090	9/4/1980	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.19377	1.97490	3.80818	0.60378	3.47981	0.11254	3.68448	4.49507	7/23/1985	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.29358	2.55092	5.69817	0.68706	3.95828	0.07673	3.56563	4.35007	7/9/1990	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.64290	2.46863	5.86742	1.29083	4.21927	0.08184	3.56563	4.35007	7/18/1991	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.19377	2.38634	5.41608	1.74887	4.17577	0.07417	3.64486	4.44673	8/26/1994	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.79260	2.71549	6.88293	1.45739	4.69774	0.07417	3.52601	4.30173	7/5/1995	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.54309	2.55092	6.51622	1.10345	4.52375	0.07673	3.54582	4.32590	8/13/1996	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.84251	2.46863	6.77010	1.16591	4.34976	0.07417	3.52601	4.30173	6/16/1997	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.54309	2.63320	6.31876	1.02017	4.43676	0.08184	3.32792	4.06006	8/20/1998	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.64290	2.46863	6.51622	1.08263	4.26277	0.07417	3.32792	4.06006	9/20/2000	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.99222	2.79778	7.61636	1.10345	4.91523	0.07161	3.24868	3.96339	6/27/2001	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	4.04212	2.88007	8.32158	1.18673	5.00223	0.08184	3.28830	4.01173	7/10/2002	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.89241	2.88007	7.67278	1.14509	5.30671	0.07929	3.24868	3.96339	9/16/2003	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.99222	2.79778	7.92666	1.18673	4.82823	0.07929	3.48639	4.25340	6/24/2004	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.79260	2.79778	7.27786	0.79116	4.30626	0.07417	3.48639	4.25340	6/23/2005	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.59299	2.46863	6.60085	0.91608	4.52375	0.06394	3.40716	4.15673	6/23/2006	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.44329	2.46863	6.40339	0.87444	4.69774	0.07417	3.46658	4.22923	8/2/2007	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.64290	2.63320	7.10860	0.97853	4.39326	0.07417	3.38735	4.13256	6/25/2008	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.74270	3.04464	6.79831	0.95771	4.48025	0.07417	3.52601	4.30173	9/18/2008	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	13S/02E-20J01	Northern	3.69280	2.71549	6.57264	0.97853	4.61075	0.06138	3.38735	4.13256	6/18/2009	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.69280	2.71549	6.85472	0.95771	4.48025	0.06138	3.38735	4.13256	7/24/2009	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.79260	2.88007	6.88293	0.93689	4.56725	0.06650	3.42696	4.18090	8/28/2009	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.74270	2.79778	6.71368	0.95771	4.48025	0.07161	3.42696	4.18090	7/29/2010	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.74270	2.55092	7.27786	1.08263	4.52375	0.06906	3.28830	4.01173	7/20/2011	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.74270	2.55092	7.16502	1.10345	4.48025	0.07161	3.28830	4.01173	8/19/2011	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.89241	2.79778	6.85472	1.02017	4.65424	0.07161	3.34773	4.08423	7/27/2012	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.84251	2.71549	6.71368	0.99935	4.61075	0.06650	3.40716	4.15673	9/6/2012	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.59299	2.55092	6.37518	0.95771	4.61075	0.07417	3.32792	4.06006	7/30/2013	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.49319	2.46863	6.40339	0.95771	4.56725	0.07161	3.36754	4.10840	8/29/2013	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.74270	2.63320	6.85472	0.97853	5.08922	0.07161	3.50620	4.27756	8/7/2014	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.94231	2.79778	7.22144	1.08263	5.39370	0.05883	3.40716	4.15673	9/3/2014	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.59299	2.71549	6.82652	0.97853	4.95873	0.07161	3.42696	4.18090	7/16/2015	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.24367	2.88007	6.12130	0.95771	4.56725	0.07161	3.46658	4.22923	8/11/2016	TRUE
400-Foot Aquifer	13S/02E-20J01	Northern	3.39338	2.38634	6.34697	0.99935	4.69774	0.07929	3.58544	4.37423	8/31/2017	TRUE
Deep Aquifers	13S/02E-28L03	Northern	0.84835	0.24686	7.89845	0.62460	10.00445	0.06138	2.95155	3.60089	3/13/2007	TRUE
Deep Aquifers	13S/02E-28L03	Northern	0.29942	0.08229	3.86460	0.72870	7.78607	0.05115	3.05059	3.72172	6/16/2015	TRUE
Deep Aquifers	13S/02E-28L03	Northern	0.29942	0.08229	3.92102	0.70788	7.65558	0.04860	3.05059	3.72172	1/17/2018	TRUE
Deep Aquifers	13S/02E-28L03	Northern	0.30441	0.04114	4.00564	0.70788	7.22060	0.04348	3.16945	3.86672	6/27/2018	TRUE
Deep Aquifers	13S/02E-28L03	Northern	0.32936	0.04937	4.20310	0.70788	8.00356	0.04860	3.16945	3.86672	9/11/2018	TRUE
Deep Aquifers	13S/02E-28L03	Northern	0.34932	0.04937	4.45698	0.70788	7.74257	0.04092	3.09021	3.77006	6/18/2019	TRUE
Deep Aquifers	13S/02E-28L03	Northern	0.37427	0.05760	4.42877	0.68706	8.09056	0.05115	3.11002	3.79422	8/15/2019	TRUE
Deep Aquifers	13S/02E-28L03	Northern	0.46909	0.04937	3.94922	0.70788	7.09011	0.03836	3.07040	3.74589	6/5/2020	TRUE
Deep Aquifers	13S/02E-28L03	Northern	0.32437	0.04114	3.75176	0.70788	7.35110	0.04604	3.14964	3.84256	8/5/2020	TRUE
Deep Aquifers	13S/02E-28L03	Northern	0.39922	0.06583	4.42877	0.72870	8.52553		3.11002	3.79422	1/19/2021	TRUE
Deep Aquifers	13S/02E-28L03	Northern	0.39423	0.06583	4.73907	0.70788	8.17755	0.05115	3.12983	3.81839	7/6/2021	TRUE
Deep Aquifers	13S/02E-28L03	Northern	0.43914	0.07406	5.21862	0.68706	8.74302	0.04348	3.07040	3.74589	8/6/2021	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	1.54698	1.15203	1.29760	0.33312	2.17488	0.05883	3.56563	4.35007	9/4/1992	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.09591	1.39889	2.65162	0.45804	3.08833	0.06906	3.72410	4.54340	8/29/1994	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	1.99611	1.39889	2.25670	0.20820	2.78385	0.06138	3.60525	4.39840	7/5/1995	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.09591	1.31660	2.59520	0.35394	3.00134	0.06138	3.68448	4.49507	6/27/1996	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	1.94620	1.23431	1.88999	0.24984	2.39237	0.05115	3.64486	4.44673	6/18/1997	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	1.89630	1.23431	1.72073	0.29148	2.60986	0.06394	3.68448	4.49507	8/20/1998	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.09591	1.39889	2.48237	0.22902	2.34887	0.05371	3.32792	4.06006	6/27/2001	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.09591	1.39889	2.22849	0.27066	2.21838	0.05371	3.44677	4.20506	7/3/2002	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.19572	1.48118	2.28491	0.29148	2.43587	0.06650	3.24868	3.96339	9/19/2003	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.24562	1.31660	2.28491	0.27066	2.56636	0.08440	3.58544	4.37423	7/19/2004	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	1.99611	1.31660	2.08745	0.20820	2.17488	0.05371	3.44677	4.20506	6/29/2005	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.09591	1.39889	2.25670	0.24984	2.26188	0.05115	3.28830	4.01173	6/28/2006	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.09591	1.56346	2.31312	0.24984	2.43587	0.06906	3.36754	4.10840	7/27/2007	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.14582	1.56346	2.51058	0.27066	2.43587	0.05371	3.22887	3.93923	7/9/2008	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	13S/02E-28M02	Northern	2.14582	1.48118	2.39774	0.27066	2.52286	0.06138	3.32792	4.06006	9/2/2008	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.09591	1.39889	2.48237	0.27066	2.30537	0.04604	3.38735	4.13256	6/11/2009	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.19572	1.48118	2.53879	0.27066	2.30537	0.05115	3.18926	3.89089	7/15/2009	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.14582	1.48118	2.53879	0.29148	2.26188	0.04348	3.30811	4.03589	8/13/2009	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.19572	1.48118	2.45416	0.27066	2.30537	0.05627	3.32792	4.06006	7/27/2010	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.14582	1.48118	2.42595	0.27066	2.26188	0.04860	3.22887	3.93923	7/12/2011	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.14582	1.39889	2.56700	0.29148	2.30537	0.05115	3.20906	3.91506	8/2/2011	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.29552	1.48118	2.59520	0.27066	2.34887	0.05371	3.22887	3.93923	7/16/2012	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.24562	1.48118	2.67983	0.29148	2.43587	0.05371	3.18926	3.89089	7/26/2012	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.34543	1.56346	3.15938	0.29148	2.34887	0.05115	3.05059	3.72172	8/15/2012	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.24562	1.48118	2.39774	0.27066	2.30537	0.05883	3.18926	3.89089	7/10/2013	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.14582	1.39889	2.36953	0.27066	2.21838	0.05627	3.16945	3.86672	8/7/2013	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	1.89630	1.31660	2.05924	0.24984	2.43587	0.05115	3.24868	3.96339	7/30/2014	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.04601	1.39889	2.42595	0.27066	2.43587	0.05115	3.26849	3.98756	8/22/2014	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.14582	1.39889	2.45416	0.22902	2.43587	0.05115	3.28830	4.01173	6/15/2015	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.04601	1.39889	2.42595	0.27066	2.43587	0.05627	3.30811	4.03589	7/20/2015	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.04601	1.31660	2.39774	0.27066	2.30537	0.05627	3.20906	3.91506	6/22/2016	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.04601	1.48118	2.36953	0.27066	2.43587	0.06138	3.07040	3.74589	8/5/2016	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.09591	1.39889	2.39774	0.27066	2.34887	0.05883	3.46658	4.22923	6/13/2017	TRUE
400-Foot Aquifer	13S/02E-28M02	Northern	2.14582	1.39889	2.42595	0.27066	2.39237	0.06138	3.48639	4.25340	8/31/2017	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.64873	0.24686	6.79831	0.47886	10.00445	0.13044	3.24868	3.96339	9/13/1989	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.64873	0.32915	6.20592	0.60378	8.69952	0.13044	3.24868	3.96339	7/27/1990	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.59883	0.24686	6.31876	1.02017	10.43943	0.13556	3.16945	3.86672	7/2/1992	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.59883	0.24686	6.65726	0.60378	9.13450	0.12533	3.36754	4.10840	7/13/1993	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.84835	0.32915	8.99859	0.49968	11.30938	0.14579	3.09021	3.77006	6/29/1995	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.79844	0.32915	7.50353	0.47886	11.74435	0.15346	2.99117	3.64922	9/3/1996	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.74854	0.27978	7.55994	0.58296	8.26455	0.12788	3.16945	3.86672	6/24/1997	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.74854	0.32915	6.88293	0.56214	9.56947	0.14579	3.05059	3.72172	9/8/1998	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.54893	0.23863	5.95205	0.58296	9.00401	0.14067	3.24868	3.96339	7/13/2012	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.64873	0.23041	6.20592	0.58296	8.65602	0.12788	3.14964	3.84256	8/13/2012	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.54893	0.25509	6.03667	0.56214	9.00401	0.14323	3.18926	3.89089	7/11/2013	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.54893	0.23863	6.03667	0.58296	8.87351	0.13556	3.11002	3.79422	8/8/2013	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.45411	0.22218	5.66996	0.58296	8.83001	0.14323	3.24868	3.96339	8/15/2016	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.26947	0.17280	3.94922	0.62460	7.48159	0.15346	3.62505	4.42257	6/9/2017	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.54893	0.20572	5.89563	0.56214	8.83001	0.15346	3.34773	4.08423	8/17/2017	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.54893	0.26332	6.23413	0.58296	8.96051	0.14067	3.24868	3.96339	6/12/2018	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.49903	0.24686	6.06488	0.58296	9.52598	0.14834	3.24868	3.96339	8/9/2018	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.47408	0.24686	6.09309	0.58296	9.00401	0.15346	3.12983	3.81839	6/27/2019	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.49903	0.24686	5.92384	0.58296	9.04750	0.13556	3.12983	3.81839	8/8/2019	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.54893	0.25509	6.51622	0.56214	8.91701	0.12533	3.14964	3.84256	6/4/2020	TRUE
Aquitard + Deep Aquifers	13S/02E-31A02	Northern	0.64873	0.27155	6.74189	0.52050	9.56947	0.14579	3.01097	3.67339	8/6/2020	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
Deep Aquifers	13S/02E-32M02	Northern	0.74854	0.32915	3.89281	0.52050	6.74213	0.10231	3.60525	4.39840	9/13/1989	TRUE
Deep Aquifers	13S/02E-32M02	Northern	0.94815	0.49373	4.62623	0.54132	7.04661	0.08440	3.20906	3.91506	7/12/1990	TRUE
Deep Aquifers	13S/02E-32M02	Northern	0.84835	0.32915	5.24683	0.52050	7.82957	0.09208	3.28830	4.01173	8/12/1992	TRUE
Deep Aquifers	13S/02E-32M02	Northern	1.09786	0.49373	5.07757	0.77034	6.08967	0.08440	3.12983	3.81839	7/22/1993	TRUE
Deep Aquifers	13S/02E-32M02	Northern	1.09786	0.49373	5.47250	1.08263	8.26455	0.08440	3.28830	4.01173	10/25/1994	TRUE
Deep Aquifers	13S/02E-32M02	Northern	0.79844	0.41144	4.90832	0.62460	7.39459	0.09208	3.40716	4.15673	6/17/1997	TRUE
Deep Aquifers	13S/02E-32M02	Northern	0.44912	0.16458	3.15938	0.47886	6.65513	0.09719	3.60525	4.39840	6/27/2001	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.89436	1.39889	3.10296	0.41640	4.30626	0.07673	3.76372	4.59174	2/7/2001	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.44523	1.31660	3.46968	0.68706	4.04528	0.07673	3.64486	4.44673	6/22/2001	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.54504	1.31660	3.69535	0.60378	3.95828	0.07161	3.88257	4.73674	7/8/2002	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.59494	1.39889	3.61072	0.54132	4.34976	0.07417	3.96181	4.83341	8/22/2003	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.29552	1.23431	2.96192	0.93689	4.04528	0.07673	3.62505	4.42257	4/7/2004	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.44523	1.31660	3.18759	0.68706	3.87129	0.07929	3.90238	4.76090	6/23/2004	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.44523	1.31660	3.77997	0.54132	4.34976	0.07673	3.96181	4.83341	6/15/2005	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	1.99611	1.23431	2.53879	1.14509	3.78429	0.06906	3.48639	4.25340	6/21/2006	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.69475	1.39889	3.30042	0.49968	3.91478	0.06650	3.90238	4.76090	7/16/2008	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.49513	1.31660	3.49788	0.45804	4.00178	0.08440	3.96181	4.83341	9/2/2008	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.34543	1.23431	3.38505	0.54132	4.04528	0.06138	3.86276	4.71257	6/16/2009	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.24562	1.23431	3.18759	0.93689	4.00178	0.06650	3.68448	4.49507	7/16/2009	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.29552	1.23431	2.82087	0.77034	3.95828	0.07673	3.60525	4.39840	8/20/2009	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.89436	0.77350	2.79267	0.41640	3.34932	0.07673	4.00143	4.88174	7/27/2010	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.19572	1.48118	3.04654	0.87444	3.82779	0.06138	3.56563	4.35007	7/6/2011	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.49513	1.15203	3.30042	0.45804	3.65380	0.06650	3.82314	4.66424	8/17/2011	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.39533	1.23431	3.63893	0.66624	4.17577	0.06906	3.82314	4.66424	7/18/2012	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.49513	1.31660	3.63893	0.49968	4.08878	0.06650	3.82314	4.66424	8/15/2012	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.54504	1.23431	3.46968	0.47886	4.08878	0.07161	3.78353	4.61590	7/10/2013	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.49513	1.31660	3.49788	0.47886	4.21927	0.07161	3.82314	4.66424	8/7/2013	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.64484	1.31660	3.55430	0.47886	4.43676	0.07673	3.94200	4.80924	3/13/2014	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.19572	1.15203	2.99013	0.81198	4.39326	0.06394	3.62505	4.42257	7/24/2014	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.34543	1.23431	3.46968	0.47886	4.48025	0.06650	3.84295	4.68840	8/18/2014	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.19572	1.23431	3.21580	0.72870	4.39326	0.06394	3.70429	4.51923	6/11/2015	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.29552	1.23431	3.27221	0.70788	4.56725	0.07161	3.72410	4.54340	7/20/2015	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.04601	1.15203	2.96192	0.85362	4.08878	0.07673	3.58544	4.37423	6/2/2016	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.09591	1.39889	2.87729	0.87444	4.08878	0.07161	3.54582	4.32590	8/12/2016	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.24562	1.15203	3.27221	0.66624	4.04528	0.07417	3.84295	4.68840	6/22/2017	TRUE
400-Foot Aquifer	13S/02E-34G01	Northern	2.44523	1.23431	3.61072	0.47886	4.34976	0.07929	3.90238	4.76090	8/30/2017	TRUE
400-Foot Aquifer	13S/02E-35H01	Northern	2.34543	0.98745	1.18477	0.20820	1.73990	0.04604	3.62505	4.42257	7/7/2011	TRUE
400-Foot Aquifer	13S/02E-35H01	Northern	2.14582	0.98745	1.24118	0.22902	1.73990	0.04860	3.60525	4.39840	8/2/2011	TRUE
400-Foot Aquifer	13S/02E-35H01	Northern	2.34543	1.06974	1.18477	0.20820	1.73990	0.04604	3.76372	4.59174	7/20/2012	TRUE
400-Foot Aquifer	13S/02E-35H01	Northern	2.39533	1.06974	1.24118	0.20820	1.73990	0.04604	3.62505	4.42257	8/15/2012	TRUE
400-Foot Aquifer	13S/02E-35H01	Northern	2.44523	1.06974	1.35402	0.27066	1.73990	0.05371	3.56563	4.35007	7/10/2013	TRUE

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Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	13S/02E-35H01	Northern	2.39533	1.06974	1.26939	0.22902	1.73990	0.05627	3.62505	4.42257	8/7/2013	TRUE
400-Foot Aquifer	13S/02E-35H01	Northern	2.49513	1.06974	1.55148	0.31230	1.82690	0.05115	3.46658	4.22923	7/18/2014	TRUE
400-Foot Aquifer	13S/02E-35H01	Northern	2.34543	0.98745	1.32581	0.24984	1.91389	0.04860	3.64486	4.44673	8/26/2014	TRUE
400-Foot Aquifer	13S/02E-35H01	Northern	2.39533	1.06974	1.69252	0.33312	1.87040	0.04860	3.38735	4.13256	6/15/2015	TRUE
400-Foot Aquifer	13S/02E-35H01	Northern	2.24562	0.98745	1.29760	0.24984	1.82690	0.05371	3.58544	4.37423	7/13/2015	TRUE
400-Foot Aquifer	13S/02E-35H01	Northern	2.24562	1.15203	1.29760	0.24984	1.82690	0.05883	3.56563	4.35007	6/8/2016	TRUE
400-Foot Aquifer	13S/02E-35H01	Northern	2.29552	1.15203	1.35402	0.29148	1.87040	0.05627	3.58544	4.37423	8/10/2016	TRUE
400-Foot Aquifer	13S/02E-35H01	Northern	2.39533	0.98745	1.38223	0.27066	1.82690	0.05627	3.56563	4.35007	6/14/2017	TRUE
400-Foot Aquifer	13S/02E-35H01	Northern	2.44523	1.06974	1.43865	0.29148	1.82690	0.05883	3.64486	4.44673	8/14/2017	TRUE
EAST SIDE DEEP	13S/02E-36F50	Northern	2.24562	0.98745	1.24118	0.16656	1.91389	0.04604	3.76372	4.59174	8/2/2011	TRUE
EAST SIDE DEEP	13S/02E-36F50	Northern	2.34543	1.06974	1.18477	0.16656	1.91389	0.04860	3.84295	4.68840	7/18/2012	TRUE
EAST SIDE DEEP	13S/02E-36F50	Northern	2.29552	1.06974	1.10014	0.14574	1.82690	0.04348	3.80334	4.64007	8/15/2012	TRUE
EAST SIDE DEEP	13S/02E-36F50	Northern	2.34543	1.06974	1.12835	0.16656	1.82690	0.05115	3.82314	4.66424	7/10/2013	TRUE
EAST SIDE DEEP	13S/02E-36F50	Northern	2.24562	1.06974	1.12835	0.14574	1.82690	0.05115	3.78353	4.61590	8/7/2013	TRUE
EAST SIDE DEEP	13S/02E-36F50	Northern	2.34543	0.98745	1.21298	0.16031	2.04439	0.04860	3.84295	4.68840	7/18/2014	TRUE
EAST SIDE DEEP	13S/02E-36F50	Northern	2.19572	1.06974	1.21298	0.16656	1.95739	0.04860	3.82314	4.66424	8/21/2014	TRUE
EAST SIDE DEEP	13S/02E-36F50	Northern	2.24562	1.06974	1.01551	0.12492	1.65291	0.04604	3.90238	4.76090	6/15/2015	TRUE
EAST SIDE DEEP	13S/02E-36F50	Northern	2.04601	0.98745	1.24118	0.16656	2.04439	0.04860	3.86276	4.71257	7/14/2015	TRUE
EAST SIDE DEEP	13S/02E-36F50	Northern	2.04601	1.06974	1.18477	0.15823	1.87040	0.05371	3.76372	4.59174	6/6/2016	TRUE
EAST SIDE DEEP	13S/02E-36F50	Northern	2.09591	1.06974	1.18477	0.18322	1.91389	0.05115	3.94200	4.80924	8/9/2016	TRUE
EAST SIDE DEEP	13S/02E-36F50	Northern	2.29552	0.98745	1.15656	0.16448	1.78340	0.04860	3.84295	4.68840	6/6/2017	TRUE
EAST SIDE DEEP	13S/02E-36F50	Northern	2.24562	0.98745	1.12835	0.15407	1.78340	0.05115	3.82314	4.66424	8/14/2017	TRUE
Deep Aquifers	14S/01E-24L02	Northern	0.89825	0.16458	4.40056	1.43657	6.87262	0.07929	2.25823	2.75504	11/7/2001	TRUE
Deep Aquifers	14S/01E-24L02	Northern	0.79844	1.72804	4.71086	1.58231	6.30715	0.05371	2.25823	2.75504	12/12/2001	TRUE
Deep Aquifers	14S/01E-24L02	Northern	0.79844	0.24686	4.59803	1.54067	7.04661	0.07417	2.25823	2.75504	1/17/2002	TRUE
Deep Aquifers	14S/01E-24L03	Northern	0.44912	0.24686	1.10014	0.56214	3.00134	0.13811	2.29785	2.80338	6/1/2001	TRUE
Deep Aquifers	14S/01E-24L03	Northern	0.39922	0.24686	1.24118	0.56214	3.17533	0.13556	2.25823	2.75504	9/12/2001	TRUE
Deep Aquifers	14S/01E-24L03	Northern	0.44912	0.24686	1.32581	0.60378	3.26232	0.15346	2.29785	2.80338	11/14/2001	TRUE
Deep Aquifers	14S/01E-24L03	Northern	0.39922	0.24686	1.46685	0.64542	3.34932	0.13300	2.33747	2.85171	12/12/2001	TRUE
Deep Aquifers	14S/01E-24L03	Northern	0.39922	0.32915	1.38223	0.62460	3.17533	0.12277	2.13938	2.61004	1/17/2002	TRUE
Deep Aquifers	14S/01E-24L04	Northern	125.25575	89.69348	327.81382	34.56101	110.91890	0.89518	0.91122	1.11168	9/12/2001	TRUE
Deep Aquifers	14S/01E-24L04	Northern	133.24018	90.51635	338.50494	36.85120	117.44354	0.94633	0.95083	1.16002	11/14/2001	TRUE
Deep Aquifers	14S/01E-24L04	Northern	128.74894	84.75622	318.95628	37.55908	110.04895	0.92076	0.99045	1.20835	12/12/2001	TRUE
Deep Aquifers	14S/01E-24L04	Northern	128.24991	79.81897	315.26093	37.68400	110.48393	0.58826	0.99045	1.20835	1/17/2002	TRUE
Deep Aquifers	14S/01E-24L05	Northern	1.64679	0.98745	1.55148	1.16591	3.39281	0.08184	3.36754	4.10840	6/1/2001	TRUE
Deep Aquifers	14S/01E-24L05	Northern	1.84640	0.82288	1.88999	1.31165	3.61030	0.08696	3.28830	4.01173	9/18/2001	TRUE
Deep Aquifers	14S/01E-24L05	Northern	1.89630	0.82288	1.83357	1.24919	3.52331	0.10231	3.24868	3.96339	11/7/2001	TRUE
Deep Aquifers	14S/01E-24L05	Northern	1.64679	0.82288	1.94640	1.37411	3.47981	0.08440	3.28830	4.01173	12/12/2001	TRUE
Deep Aquifers	14S/01E-24L05	Northern	1.54698	0.82288	1.86178	1.31165	3.69730	0.05627	3.28830	4.01173	1/17/2002	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.49513	1.15203	2.14386	0.33312	2.60986	0.06394	3.86276	4.71257	8/30/1996	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.39533	1.15203	2.00282	0.35394	2.39237	0.06138	3.72410	4.54340	9/24/1997	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-02A02	Northern	2.44523	1.23431	1.60790	0.29148	2.08789	0.06138	3.68448	4.49507	8/19/1998	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.64484	1.23431	1.66432	0.27066	2.04439	0.06650	3.94200	4.80924	7/28/1999	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.44523	1.06974	2.00282	0.37476	2.65335	0.05883	3.92219	4.78507	7/16/2002	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.29552	1.15203	2.14386	0.45804	3.00134	0.06906	3.80334	4.64007	8/28/2003	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.09591	1.15203	3.21580	0.81198	4.39326	0.07673	3.88257	4.73674	6/28/2004	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.39533	1.15203	2.25670	0.31230	2.65335	0.06138	3.92219	4.78507	6/8/2005	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.34543	1.15203	2.00282	0.37476	2.65335	0.04860	3.84295	4.68840	7/6/2006	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.39533	1.23431	2.48237	0.49968	3.08833	0.09719	3.92219	4.78507	6/12/2007	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.44523	1.23431	2.08745	0.35394	2.13138	0.07929	3.84295	4.68840	6/27/2008	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.29552	1.48118	1.86178	0.39558	2.69685	0.06138	4.00143	4.88174	9/10/2008	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.39533	1.15203	2.20028	0.37476	2.60986	0.04860	3.82314	4.66424	6/10/2009	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.44523	1.15203	2.14386	0.37476	2.74035	0.05371	3.92219	4.78507	7/8/2009	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.44523	1.15203	2.03103	0.33312	2.60986	0.04860	3.74391	4.56757	8/19/2009	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.59494	1.06974	2.00282	0.33312	2.47936	0.05371	3.86276	4.71257	7/14/2010	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.64484	1.15203	2.34133	0.37476	2.65335	0.05883	3.76372	4.59174	8/25/2010	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.79455	1.15203	2.08745	0.27066	2.08789	0.06394	3.70429	4.51923	9/22/2010	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.69475	1.23431	2.25670	0.35394	2.65335	0.05371	3.68448	4.49507	7/13/2011	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.54504	1.15203	2.45416	0.41640	2.60986	0.05627	3.66467	4.47090	8/10/2011	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.64484	1.23431	2.42595	0.37476	2.69685	0.05627	3.80334	4.64007	7/17/2012	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.89436	1.31660	2.53879	0.29148	2.17488	0.05115	3.70429	4.51923	8/14/2012	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.99416	1.39889	2.31312	0.31230	2.26188	0.06138	3.70429	4.51923	7/11/2013	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.64484	1.23431	2.11566	0.29148	2.21838	0.05627	3.70429	4.51923	8/28/2013	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.69475	1.23431	2.34133	0.29148	2.47936	0.06138	3.74391	4.56757	1/29/2014	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.49513	1.15203	2.34133	0.37476	2.91434	0.05627	3.76372	4.59174	7/30/2014	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.54504	1.23431	2.45416	0.37476	2.82734	0.05627	3.80334	4.64007	6/17/2015	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.39533	1.23431	2.51058	0.37476	2.95784	0.06138	3.76372	4.59174	7/21/2015	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.74465	1.48118	2.62341	0.33312	2.69685	0.06906	3.72410	4.54340	6/9/2016	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.49513	1.39889	2.51058	0.37476	2.78385	0.04348	3.76372	4.59174	8/3/2016	TRUE
400-Foot Aquifer	14S/02E-02A02	Northern	2.99416	1.48118	2.87729	0.35394	2.39237	0.06394	3.90238	4.76090	6/28/2017	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.04601	0.98745	2.03103	0.45804	2.95784	0.07161	4.95226	6.04176	8/24/1994	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	1.94620	1.06974	2.00282	0.47886	3.26232	0.06650	3.84295	4.68840	7/20/1995	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	1.99611	1.06974	2.28491	0.39558	3.13183	0.08696	3.72410	4.54340	8/4/1997	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.04601	1.06974	2.08745	0.33312	3.08833	0.07161	3.72410	4.54340	8/19/1998	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.24562	1.15203	2.34133	0.33312	3.13183	0.07161	3.80334	4.64007	8/13/1999	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.54504	0.98745	2.34133	0.37476	2.87084	0.07161	3.72410	4.54340	8/29/2001	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.19572	1.06974	2.25670	0.37476	2.91434	0.06650	3.76372	4.59174	7/2/2002	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.19572	1.06974	2.25670	0.35394	3.08833	0.07929	3.68448	4.49507	8/28/2003	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.24562	1.15203	2.48237	0.37476	3.30582	0.07673	3.90238	4.76090	6/23/2004	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.29552	1.15203	2.70804	0.31230	3.13183	0.06650	3.80334	4.64007	6/8/2005	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.29552	1.15203	2.62341	0.37476	3.08833	0.06138	3.84295	4.68840	6/28/2006	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.29552	1.23431	2.73625	0.41640	3.17533	0.08184	3.88257	4.73674	6/12/2007	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.19572	1.31660	2.53879	0.39558	3.43631	0.08184	3.78353	4.61590	6/27/2008	TRUE

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Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-02C03	Northern	2.19572	1.48118	2.65162	0.37476	3.30582	0.06650	3.90238	4.76090	9/10/2008	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.29552	1.15203	2.76446	0.41640	3.21882	0.05627	3.72410	4.54340	6/10/2009	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.34543	1.15203	2.70804	0.41640	3.26232	0.05883	3.78353	4.61590	7/8/2009	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.54504	1.31660	2.93371	0.43722	3.00134	0.04604	3.32792	4.06006	8/19/2009	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.49513	1.06974	2.96192	0.35394	3.43631	0.06906	3.76372	4.59174	7/14/2010	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.44523	1.15203	2.96192	0.41640	3.34932	0.06650	3.70429	4.51923	8/25/2010	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.49513	1.15203	3.15938	0.37476	3.43631	0.06650	3.64486	4.44673	9/22/2010	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.54504	1.23431	3.18759	0.35394	3.47981	0.06138	3.54582	4.32590	7/13/2011	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.54504	1.23431	3.66714	0.41640	3.56680	0.06394	3.52601	4.30173	8/10/2011	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.69475	1.31660	3.63893	0.39558	3.65380	0.06906	3.66467	4.47090	7/17/2012	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.64484	1.31660	3.80818	0.41640	3.61030	0.06394	3.54582	4.32590	8/14/2012	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.84445	1.39889	3.75176	0.37476	3.74079	0.07673	3.46658	4.22923	7/11/2013	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.74465	1.31660	3.92102	0.37476	3.74079	0.07161	3.52601	4.30173	1/29/2014	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.64484	1.23431	3.44147	0.37476	3.74079	0.06650	3.58544	4.37423	7/30/2014	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.79455	1.39889	3.92102	0.37476	3.74079	0.06650	3.60525	4.39840	6/17/2015	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.79455	1.48118	4.31594	0.39558	3.91478	0.06906	3.54582	4.32590	7/21/2015	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.89436	1.64575	4.09027	0.37476	3.69730	0.08184	3.46658	4.22923	6/9/2016	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	2.79455	1.64575	4.06206	0.37476	3.65380	0.07161	3.44677	4.20506	8/3/2016	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	3.19377	1.64575	4.68265	0.37476	3.61030	0.07673	3.68448	4.49507	6/28/2017	TRUE
400-Foot Aquifer	14S/02E-02C03	Northern	3.79260	1.89261	5.86742	0.35394	4.21927	0.08952	3.58544	4.37423	9/28/2017	TRUE
400-Foot Aquifer	14S/02E-03F03	Northern	3.54309	1.39889	2.82087	0.87444	3.21882	0.06138	3.84295	4.68840	9/12/2006	TRUE
400-Foot Aquifer	14S/02E-03F03	Northern	2.14582	1.31660	2.42595	0.66624	3.17533	0.03836	3.46658	4.22923	9/29/2011	TRUE
400-Foot Aquifer	14S/02E-03F03	Northern	2.14582	1.06974	2.14386	0.62460	3.04483	0.04860	3.50620	4.27756	9/20/2012	TRUE
400-Foot Aquifer	14S/02E-03F03	Northern	2.09591	1.06974	2.03103	0.64542	3.04483	0.05371	3.60525	4.39840	9/26/2013	TRUE
400-Foot Aquifer	14S/02E-03F03	Northern	1.94620	1.06974	1.97461	0.74952	3.21882	0.04092	3.42696	4.18090	9/8/2014	TRUE
400-Foot Aquifer	14S/02E-03F03	Northern	1.89630	1.06974	1.88999	0.74952	3.17533	0.05371	3.52601	4.30173	8/31/2015	TRUE
400-Foot Aquifer	14S/02E-03F03	Northern	1.89630	1.15203	1.86178	0.79116	3.04483	0.05371	3.36754	4.10840	9/22/2016	TRUE
400-Foot Aquifer	14S/02E-03F03	Northern	1.74659	1.06974	1.83357	0.81198	3.30582	0.04348	3.36754	4.10840	10/10/2017	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.19572	1.15203	2.08745	0.35394	2.52286	0.05371	3.56563	4.35007	9/6/1994	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	3.04406	1.39889	3.27221	0.52050	3.00134	0.06650	3.60525	4.39840	8/7/1995	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.19572	1.06974	2.20028	0.66624	3.21882	0.06394	3.68448	4.49507	6/28/1996	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.84445	1.23431	2.53879	0.37476	2.52286	0.05115	3.56563	4.35007	6/24/1997	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.44523	1.31660	2.31312	0.35394	2.52286	0.06138	3.44677	4.20506	8/19/1998	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.49513	1.23431	2.36953	0.35394	2.52286	0.06138	3.48639	4.25340	8/13/1999	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.34543	1.15203	2.53879	0.41640	2.78385	0.05627	3.56563	4.35007	7/1/2002	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.19572	1.15203	2.31312	0.33312	2.60986	0.06394	3.36754	4.10840	9/4/2003	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.34543	1.23431	2.73625	0.41640	3.04483	0.06650	3.68448	4.49507	6/23/2004	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.49513	1.31660	2.73625	0.29148	2.74035	0.05883	3.64486	4.44673	6/6/2005	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.34543	1.23431	2.82087	0.45804	3.00134	0.05371	3.60525	4.39840	6/28/2006	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.49513	1.64575	3.10296	0.45804	3.00134	0.09463	3.58544	4.37423	6/12/2007	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.39533	1.23431	2.87729	0.47886	3.08833	0.05115	3.28830	4.01173	7/11/2008	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.24562	1.64575	2.96192	0.43722	3.00134	0.05883	3.64486	4.44673	9/10/2008	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-03H01	Northern	2.49513	1.31660	3.24401	0.45804	3.08833	0.04604	3.46658	4.22923	6/10/2009	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.49513	1.31660	3.10296	0.45804	3.08833	0.04860	3.48639	4.25340	7/8/2009	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.29552	1.15203	2.65162	0.39558	3.34932	0.05627	3.60525	4.39840	8/19/2009	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	3.09397	1.48118	3.44147	0.39558	2.65335	0.05115	3.42696	4.18090	8/25/2010	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.59494	1.23431	2.79267	0.35394	2.65335	0.05115	3.38735	4.13256	9/22/2010	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.84445	1.39889	3.04654	0.33312	2.65335	0.04860	3.34773	4.08423	7/13/2011	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.69475	1.39889	3.30042	0.41640	2.74035	0.05115	3.30811	4.03589	8/10/2011	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	3.04406	1.56346	3.83639	0.37476	2.95784	0.05627	3.38735	4.13256	7/17/2012	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.84445	1.48118	4.00564	0.45804	3.17533	0.05115	3.28830	4.01173	8/14/2012	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	3.04406	1.56346	3.52609	0.37476	2.87084	0.05883	3.36754	4.10840	7/11/2013	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.84445	1.48118	3.32863	0.35394	2.82734	0.05883	3.30811	4.03589	8/15/2013	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	2.89436	1.48118	4.17489	0.43722	3.34932	0.06138	3.32792	4.06006	1/29/2014	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	3.19377	1.64575	4.59803	0.41640	3.74079	0.05627	3.32792	4.06006	7/30/2014	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	3.34348	1.81033	5.02116	0.43722	3.74079	0.05883	3.34773	4.08423	6/17/2015	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	3.39338	1.89261	5.41608	0.43722	3.78429	0.06138	3.32792	4.06006	7/21/2015	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	3.79260	2.38634	5.81100	0.45804	3.74079	0.07417	3.24868	3.96339	6/9/2016	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	4.19183	2.55092	6.43159	0.45804	3.74079	0.07161	3.30811	4.03589	8/9/2016	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	3.74270	2.13948	5.64175	0.41640	3.43631	0.06650	3.42696	4.18090	6/28/2017	TRUE
400-Foot Aquifer	14S/02E-03H01	Northern	4.09202	2.13948	5.83921	0.43722	3.61030	0.07161	3.40716	4.15673	9/28/2017	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.84640	0.98745	1.91819	0.37476	3.21882	0.07673	3.48639	4.25340	8/10/1983	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.79650	0.98745	1.83357	0.41640	3.17533	0.06138	3.56563	4.35007	8/10/1989	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.69669	0.98745	1.88999	0.35394	3.08833	0.06138	3.56563	4.35007	8/26/1994	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.84640	0.98745	2.20028	0.52050	3.21882	0.06138	3.76372	4.59174	6/23/1995	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.69669	0.98745	1.80536	0.39558	3.04483	0.05883	3.56563	4.35007	7/12/1996	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	2.09591	0.90516	2.03103	0.43722	2.95784	0.05115	3.52601	4.30173	6/24/1997	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.89630	0.98745	1.88999	0.43722	3.04483	0.06394	3.56563	4.35007	8/2/1999	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	2.04601	0.90516	1.83357	0.39558	3.04483	0.06906	3.48639	4.25340	9/26/2001	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.74659	0.90516	1.77715	0.37476	2.87084	0.05115	3.56563	4.35007	7/3/2002	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.74659	0.98745	1.80536	0.41640	3.17533	0.05627	3.60525	4.39840	8/22/2003	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.74659	0.98745	1.86178	0.41640	3.04483	0.06138	3.62505	4.42257	6/29/2004	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.84640	0.98745	2.05924	0.33312	3.04483	0.07417	3.64486	4.44673	6/9/2005	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.74659	0.98745	1.80536	0.41640	3.00134	0.05371	3.48639	4.25340	6/27/2006	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.94620	1.15203	1.80536	0.33312	2.82734	0.06138	3.74391	4.56757	8/10/2007	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.54698	1.06974	1.66432	0.33312	3.13183	0.05627	3.54582	4.32590	7/8/2008	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.69669	0.98745	1.77715	0.39558	3.21882	0.07929	3.52601	4.30173	9/2/2008	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.69669	0.98745	1.74894	0.39558	3.04483	0.04604	3.72410	4.54340	6/4/2009	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.74659	0.90516	1.77715	0.41640	3.08833	0.05371	3.58544	4.37423	7/14/2009	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.64679	0.90516	1.74894	0.41640	2.95784	0.04092	3.44677	4.20506	8/12/2009	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.79650	0.80642	1.69252	0.41640	2.95784	0.05371	3.58544	4.37423	8/9/2010	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.69669	0.90516	1.72073	0.41640	2.95784	0.04604	3.38735	4.13256	7/12/2011	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.69669	0.90516	1.94640	0.45804	3.08833	0.04860	3.44677	4.20506	8/1/2011	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-03M02	Northern	1.79650	0.98745	1.97461	0.45804	3.17533	0.05371	3.46658	4.22923	7/18/2012	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.69669	0.90516	1.86178	0.43722	3.04483	0.04604	3.44677	4.20506	8/13/2012	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.79650	0.98745	1.88999	0.45804	3.17533	0.06394	3.46658	4.22923	7/17/2013	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.74659	0.98745	1.91819	0.45804	3.08833	0.05883	3.42696	4.18090	8/7/2013	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.74659	0.90516	1.86178	0.43722	3.43631	0.05115	3.48639	4.25340	7/21/2014	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.64679	0.90516	1.60790	0.41640	3.26232	0.05115	3.54582	4.32590	8/25/2014	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.59689	0.90516	1.69252	0.43722	3.17533	0.04860	3.44677	4.20506	6/16/2015	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.59689	0.90516	1.86178	0.45804	3.26232	0.05115	3.52601	4.30173	7/15/2015	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.54698	0.90516	1.57969	0.41640	2.95784	0.05627	3.46658	4.22923	6/6/2016	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.49708	0.98745	1.60790	0.41640	2.95784	0.05115	3.38735	4.13256	8/3/2016	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.59689	0.90516	1.57969	0.41640	3.00134	0.05115	3.40716	4.15673	6/6/2017	TRUE
400-Foot Aquifer	14S/02E-03M02	Northern	1.64679	0.82288	1.66432	0.43722	3.04483	0.05883	3.52601	4.30173	8/28/2017	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.89630	1.06974	2.82087	0.89526	4.17577	0.09463	3.60525	4.39840	8/1/2007	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	2.19572	1.48118	3.58251	0.77034	4.21927	0.06394	3.44677	4.20506	7/8/2008	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	2.29552	1.48118	3.75176	0.93689	4.08878	0.07161	3.40716	4.15673	9/2/2008	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	2.24562	1.48118	3.41326	0.87444	4.04528	0.05627	3.62505	4.42257	6/4/2009	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	2.29552	1.23431	3.44147	0.91608	4.08878	0.05883	3.50620	4.27756	7/9/2009	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	2.14582	1.15203	3.13117	0.87444	3.87129	0.05115	3.36754	4.10840	8/12/2009	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.69669	0.90516	1.88999	0.45804	3.13183	0.05371	3.50620	4.27756	8/6/2010	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.59689	0.90516	1.86178	0.49968	3.08833	0.05115	3.38735	4.13256	7/21/2011	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.59689	0.90516	1.91819	0.54132	3.08833	0.04860	3.38735	4.13256	8/11/2011	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.94620	1.06974	2.48237	0.79116	3.61030	0.05371	3.34773	4.08423	7/23/2012	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.99611	1.06974	2.56700	0.81198	3.56680	0.05627	3.46658	4.22923	8/29/2012	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.84640	0.98745	2.11566	0.70788	3.43631	0.05883	3.46658	4.22923	7/18/2013	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.69669	0.90516	2.14386	0.74952	3.34932	0.05627	3.34773	4.08423	8/28/2013	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.64679	0.90516	1.83357	0.66624	3.56680	0.05115	3.38735	4.13256	7/21/2014	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.74659	0.98745	2.20028	0.79116	3.87129	0.05371	3.38735	4.13256	8/19/2014	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.64679	0.90516	1.86178	0.64542	3.52331	0.05115	3.44677	4.20506	6/9/2015	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.59689	0.98745	1.88999	0.68706	3.52331	0.05371	3.42696	4.18090	7/13/2015	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.44718	0.81465	1.52327	0.47886	3.13183	0.05371	3.38735	4.13256	6/2/2016	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.39728	0.90516	1.49506	0.45804	3.04483	0.05371	3.36754	4.10840	8/3/2016	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.59689	0.90516	1.57969	0.47886	3.17533	0.05627	3.34773	4.08423	6/6/2017	TRUE
400-Foot Aquifer	14S/02E-03P01	Northern	1.49708	0.81465	1.52327	0.45804	3.13183	0.05627	3.44677	4.20506	9/1/2017	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.09591	1.15203	2.42595	0.89526	3.52331	0.11765	4.04104	4.93007	8/24/1994	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.14582	1.23431	3.15938	0.68706	3.95828	0.06906	3.68448	4.49507	7/11/1995	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	1.94620	1.15203	2.51058	0.72870	3.52331	0.06906	3.74391	4.56757	8/16/1996	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.34543	1.06974	2.56700	0.72870	3.47981	0.07673	3.76372	4.59174	6/24/1997	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.14582	1.15203	2.14386	0.70788	3.08833	0.07673	3.52601	4.30173	8/19/1998	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.24562	1.23431	2.53879	0.81198	3.43631	0.07161	3.88257	4.73674	8/13/1999	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.49513	1.06974	2.59520	1.06181	3.47981	0.05627	3.52601	4.30173	11/6/2002	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.09591	1.06974	2.67983	1.12427	4.56725	0.07929	3.56563	4.35007	7/7/2004	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-03R02	Northern	2.14582	1.23431	2.59520	1.14509	3.78429	0.07161	3.52601	4.30173	7/19/2006	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.14582	1.23431	2.56700	1.08263	3.69730	0.09463	3.58544	4.37423	6/12/2007	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.04601	1.15203	2.53879	1.02017	3.82779	0.06138	3.60525	4.39840	7/11/2008	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.19572	1.56346	2.42595	0.81198	3.21882	0.06138	3.76372	4.59174	9/10/2008	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	1.94620	1.06974	2.65162	1.24919	4.08878	0.05371	3.50620	4.27756	6/10/2009	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.14582	1.15203	2.51058	1.02017	3.82779	0.05627	3.62505	4.42257	7/8/2009	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.04601	1.06974	2.34133	0.97853	3.82779	0.05115	3.48639	4.25340	8/19/2009	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.29552	1.06974	2.51058	0.87444	3.52331	0.06138	3.60525	4.39840	7/14/2010	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.54504	1.23431	2.79267	0.95771	3.34932	0.06138	3.42696	4.18090	8/25/2010	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.44523	1.15203	2.53879	0.85362	3.26232	0.06394	3.42696	4.18090	9/22/2010	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.49513	1.23431	2.48237	0.81198	3.21882	0.05883	3.42696	4.18090	7/13/2011	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.44523	1.23431	2.87729	0.97853	3.30582	0.06394	3.40716	4.15673	8/10/2011	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.44523	1.23431	2.79267	0.93689	3.34932	0.06394	3.52601	4.30173	7/17/2012	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.39533	1.23431	2.82087	1.02017	3.43631	0.06138	3.46658	4.22923	8/14/2012	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.39533	1.23431	2.56700	1.04099	3.61030	0.06906	3.42696	4.18090	7/11/2013	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.34543	1.23431	2.65162	0.91608	3.34932	0.06650	3.44677	4.20506	8/28/2013	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.14582	1.15203	2.42595	1.06181	3.78429	0.06394	3.48639	4.25340	1/29/2014	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	1.99611	1.06974	2.31312	0.97853	3.95828	0.05371	3.54582	4.32590	7/30/2014	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	1.99611	1.06974	2.36953	0.97853	3.91478	0.05627	3.56563	4.35007	6/17/2015	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	1.89630	1.15203	2.36953	0.97853	3.95828	0.06138	3.52601	4.30173	7/21/2015	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	1.99611	1.15203	2.28491	0.95771	3.82779	0.06906	3.50620	4.27756	6/9/2016	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	1.99611	1.15203	2.31312	0.97853	3.82779	0.06394	3.60525	4.39840	8/9/2016	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.09591	1.23431	2.28491	0.83280	3.34932	0.06394	3.68448	4.49507	6/28/2017	TRUE
400-Foot Aquifer	14S/02E-03R02	Northern	2.09591	1.15203	2.28491	0.99935	3.78429	0.07161	3.64486	4.44673	9/28/2017	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.24757	0.90516	1.91819	0.91608	3.17533	0.06138	3.52601	4.30173	9/9/1992	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.74659	0.98745	1.97461	0.29148	2.95784	0.05627	3.96181	4.83341	6/30/1995	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.89630	0.90516	1.77715	0.43722	2.87084	0.05371	3.52601	4.30173	7/12/1996	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.74659	0.98745	1.77715	0.43722	3.13183	0.06138	3.64486	4.44673	8/5/1997	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.74659	0.98745	1.77715	0.49968	3.08833	0.06138	3.56563	4.35007	9/8/1998	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.79650	1.06974	1.94640	0.49968	3.04483	0.06138	3.44677	4.20506	6/2/1999	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.79650	0.98745	1.86178	0.49968	2.91434	0.05627	3.40716	4.15673	8/17/2000	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	2.04601	0.90516	1.88999	0.52050	2.95784	0.06650	3.60525	4.39840	9/26/2001	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.79650	0.98745	1.97461	0.54132	3.08833	0.05115	3.60525	4.39840	7/3/2002	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.74659	0.98745	1.83357	0.52050	3.34932	0.05627	3.56563	4.35007	8/22/2003	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.74659	0.98745	1.88999	0.54132	3.13183	0.06138	3.62505	4.42257	6/29/2004	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.84640	0.98745	2.11566	0.43722	3.08833	0.05883	3.60525	4.39840	6/8/2005	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	2.04601	1.15203	2.56700	0.56214	3.17533	0.05371	3.44677	4.20506	6/27/2006	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.79650	1.23431	2.31312	0.49968	3.47981	0.05627	3.54582	4.32590	7/8/2008	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.79650	0.98745	2.11566	0.49968	3.21882	0.05883	3.48639	4.25340	9/4/2008	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.94620	1.06974	2.36953	0.54132	3.30582	0.04860	3.54582	4.32590	6/12/2009	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.99611	1.06974	2.45416	0.58296	3.34932	0.05371	3.56563	4.35007	7/14/2009	TRUE

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Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-04H01	Northern	1.89630	1.06974	2.36953	0.56214	3.26232	0.04604	3.42696	4.18090	8/12/2009	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.79650	0.82288	1.91819	0.52050	3.17533	0.05371	3.58544	4.37423	8/9/2010	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.79650	0.98745	2.05924	0.54132	3.13183	0.05115	3.42696	4.18090	7/12/2011	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.89630	0.98745	2.25670	0.60378	3.21882	0.04860	3.42696	4.18090	8/1/2011	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.89630	0.98745	2.17207	0.58296	3.26232	0.05371	3.44677	4.20506	7/18/2012	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.89630	1.06974	2.20028	0.58296	3.21882	0.05115	3.40716	4.15673	8/13/2012	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.94620	1.06974	2.14386	0.58296	3.26232	0.05883	3.42696	4.18090	7/17/2013	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.94620	1.06974	2.25670	0.58296	3.21882	0.05883	3.42696	4.18090	8/7/2013	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	2.04601	1.15203	2.53879	0.58296	3.65380	0.05371	3.44677	4.20506	7/21/2014	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	2.04601	1.15203	2.39774	0.56214	3.61030	0.05627	3.52601	4.30173	8/25/2014	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.94620	1.15203	2.42595	0.58296	3.52331	0.05627	3.42696	4.18090	6/8/2015	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	1.89630	1.06974	2.48237	0.60378	3.47981	0.05627	3.48639	4.25340	7/14/2015	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	2.24562	1.48118	2.99013	0.64542	3.61030	0.07161	3.44677	4.20506	6/8/2016	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	2.04601	1.39889	2.79267	0.64542	3.47981	0.06138	3.44677	4.20506	8/3/2016	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	2.09591	1.15203	2.62341	0.64542	3.52331	0.06138	3.42696	4.18090	6/6/2017	TRUE
400-Foot Aquifer	14S/02E-04H01	Northern	2.09591	1.31660	2.62341	0.64542	3.47981	0.06138	3.44677	4.20506	8/21/2017	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	2.59494	1.64575	3.58251	0.35394	3.00134	0.07161	3.56563	4.35007	8/25/1989	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	2.64484	1.56346	3.10296	0.33312	2.95784	0.06906	3.76372	4.59174	6/26/1990	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	2.29552	1.31660	2.82087	1.02017	3.00134	0.06906	2.69403	3.28672	8/24/1994	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	2.39533	1.31660	3.10296	0.66624	3.04483	0.06906	3.12983	3.81839	6/23/1995	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	2.39533	1.39889	3.24401	0.62460	3.13183	0.07161	3.20906	3.91506	8/27/1996	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	2.64484	1.48118	3.38505	0.64542	3.26232	0.07673	3.28830	4.01173	8/4/1997	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	2.89436	1.64575	3.75176	0.77034	3.34932	0.07417	3.12983	3.81839	8/17/1998	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	2.74465	1.64575	3.61072	0.70788	3.17533	0.07161	3.20906	3.91506	9/8/1998	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.84640	1.06974	1.66432	0.33312	2.47936	0.05371	3.52601	4.30173	7/25/2001	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.94620	0.98745	1.66432	0.35394	2.43587	0.05371	3.52601	4.30173	7/31/2002	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.89630	1.15203	1.66432	0.37476	2.60986	0.06650	3.44677	4.20506	9/9/2003	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.79650	1.06974	1.66432	0.35394	2.56636	0.06138	3.64486	4.44673	6/25/2004	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.94620	1.15203	1.69252	0.27066	2.65335	0.05883	3.64486	4.44673	6/22/2005	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.84640	1.06974	1.66432	0.35394	2.56636	0.05115	3.60525	4.39840	6/22/2006	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.79650	1.15203	1.69252	0.35394	2.78385	0.05883	3.72410	4.54340	8/9/2007	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.69669	1.31660	1.74894	0.35394	2.74035	0.06138	3.58544	4.37423	6/26/2008	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.69669	1.15203	1.74894	0.35394	2.65335	0.06394	3.58544	4.37423	9/8/2008	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.79650	1.06974	1.69252	0.35394	2.65335	0.04860	3.64486	4.44673	6/12/2009	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.84640	1.06974	1.80536	0.37476	2.65335	0.04604	3.58544	4.37423	7/24/2009	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.84640	1.15203	1.69252	0.35394	2.60986	0.05115	3.60525	4.39840	8/24/2009	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.64679	0.98745	1.66432	0.29148	2.65335	0.05627	3.54582	4.32590	8/10/2010	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.84640	1.15203	1.72073	0.35394	2.56636	0.04860	3.48639	4.25340	7/14/2011	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.84640	1.06974	1.97461	0.41640	2.74035	0.06138	3.54582	4.32590	8/4/2011	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.94620	1.15203	1.83357	0.37476	2.74035	0.05371	3.54582	4.32590	7/19/2012	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.89630	1.15203	1.83357	0.37476	2.65335	0.05115	3.52601	4.30173	8/28/2012	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-05C03	Northern	1.84640	1.06974	1.72073	0.35394	2.56636	0.05627	3.56563	4.35007	7/23/2013	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.89630	1.15203	1.69252	0.35394	2.65335	0.06138	3.50620	4.27756	8/13/2013	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.79650	1.06974	1.74894	0.35394	2.82734	0.05371	3.54582	4.32590	8/27/2014	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.79650	1.06974	1.80536	0.33312	2.82734	0.05371	3.54582	4.32590	6/15/2015	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.74659	1.15203	1.74894	0.35394	2.91434	0.05627	3.50620	4.27756	7/21/2015	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.84640	0.98745	1.74894	0.35394	2.69685	0.06394	3.48639	4.25340	6/24/2016	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.79650	1.15203	1.77715	0.37476	2.74035	0.05883	3.52601	4.30173	8/23/2016	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.79650	1.06974	1.77715	0.35394	2.60986	0.05627	3.54582	4.32590	6/21/2017	TRUE
400-Foot Aquifer	14S/02E-05C03	Northern	1.79650	1.06974	1.80536	0.35394	2.74035	0.06138	3.60525	4.39840	8/30/2017	TRUE
Aquitard + Deep Aquifers	14S/02E-06L01	Northern	0.59883	0.24686	3.94922	0.64542	6.69863	0.09975	3.32792	4.06006	8/13/1979	TRUE
Aquitard + Deep Aquifers	14S/02E-06L01	Northern	0.84835	0.32915	4.23131	0.66624	7.13361	0.30692	3.09021	3.77006	9/23/1981	TRUE
Aquitard + Deep Aquifers	14S/02E-06L01	Northern	0.79844	0.24686	4.31594	0.64542	7.65558	0.13556	3.16945	3.86672	8/25/1983	TRUE
Aquitard + Deep Aquifers	14S/02E-06L01	Northern	0.84835	0.32915	4.59803	0.77034	7.26410	0.13556	3.12983	3.81839	8/28/1985	TRUE
Aquitard + Deep Aquifers	14S/02E-06L01	Northern	0.79844	0.32915	4.45698	0.54132	7.43809	0.15346	3.09021	3.77006	8/22/1986	TRUE
Aquitard + Deep Aquifers	14S/02E-06L01	Northern	0.79844	0.32915	4.48519	0.87444	7.04661	0.12021	2.93174	3.57672	8/15/1989	TRUE
Aquitard + Deep Aquifers	14S/02E-06L01	Northern	0.69864	0.35384	2.51058	0.01041	7.00312	0.12021	3.76372	4.59174	7/12/1990	TRUE
Aquitard + Deep Aquifers	14S/02E-06L01	Northern	0.49903	0.32915	4.45698	0.70788	7.82957	0.15346	3.32792	4.06006	8/12/1992	TRUE
Aquitard + Deep Aquifers	14S/02E-06L01	Northern	1.54698	0.57601	6.82652	0.79116	8.69952	0.08952	2.65441	3.23838	7/23/1993	TRUE
Aquitard + Deep Aquifers	14S/02E-06L01	Northern	0.49903	0.32915	4.73907	1.35329	7.82957	0.14834	5.26920	6.42843	8/23/1994	TRUE
Aquitard + Deep Aquifers	14S/02E-06L01	Northern	0.59883	0.41144	4.88011	0.64542	7.22060	0.15857	3.40716	4.15673	9/3/1997	TRUE
Aquitard + Deep Aquifers	14S/02E-06L01	Northern	0.59883	0.41144	4.62623	0.70788	7.43809	0.15857	3.20906	3.91506	9/4/1998	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.19961	0.08229	1.49506	0.43722	5.04572	0.07929	3.56563	4.35007	6/23/2005	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.16468	0.08229	1.43865	0.56214	5.04572	0.08696	3.56563	4.35007	6/15/2006	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.54893	0.06583	1.46685	0.52050	5.04572	0.09719	3.64486	4.44673	7/27/2007	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.25450	0.09052	1.35402	0.49968	4.91523	0.08952	3.48639	4.25340	9/3/2008	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.13973	0.05760	1.46685	0.54132	5.17622	0.07161	3.62505	4.42257	6/11/2009	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.16468	0.05760	1.46685	0.56214	5.26321	0.07673	3.44677	4.20506	7/15/2009	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.13474	0.05760	1.46685	0.54132	5.17622	0.07673	3.54582	4.32590	8/13/2009	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.13973	0.05760	1.43865	0.54132	5.17622	0.07673	3.58544	4.37423	8/10/2010	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.09981	0.07406	1.43865	0.54132	5.17622	0.07673	3.40716	4.15673	7/11/2011	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.09981	0.04114	1.52327	0.58296	5.04572	0.06650	3.28830	4.01173	8/2/2011	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.15969	0.07406	1.52327	0.56214	5.30671	0.08440	3.48639	4.25340	7/11/2012	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.14971	0.05760	1.55148	0.58296	5.17622	0.07161	3.44677	4.20506	8/14/2012	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.16967	0.08229	1.63611	0.56214	5.17622	0.08184	3.46658	4.22923	7/9/2013	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.20460	0.07406	1.38223	0.54132	5.17622	0.07929	3.38735	4.13256	8/13/2013	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.15969	0.08229	1.46685	0.56214	5.65469	0.07673	3.60525	4.39840	8/4/2014	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.15470	0.07406	1.41044	0.54132	5.43720	0.06906	3.52601	4.30173	8/27/2014	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.15969	0.07406	1.41044	0.54132	5.43720	0.07161	3.52601	4.30173	6/15/2015	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.15470	0.08229	1.41044	0.54132	5.56769	0.07673	3.50620	4.27756	7/16/2015	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.14472	0.04937	1.35402	0.54132	5.35021	0.08952	3.52601	4.30173	6/8/2016	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.12975	0.04114	1.35402	0.54132	5.26321	0.08184	3.50620	4.27756	8/2/2016	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
Deep Aquifers	14S/02E-07J03	Northern	0.15969	0.05760	1.35402	0.52050	5.13272	0.08184	3.64486	4.44673	6/27/2017	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.14971	0.04937	1.41044	0.54132	5.39370	0.09208	3.72410	4.54340	8/29/2017	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.17466	0.08229	1.38223	0.54132	5.17622	0.07929	3.54582	4.32590	6/4/2018	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.13973	0.06583	1.41044	0.54132	5.52420	0.08952	3.58544	4.37423	8/15/2018	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.15470	0.07406	1.38223	0.54132	5.21971	0.07161	3.42696	4.18090	6/19/2019	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.13973	0.06583	1.32581	0.52050	5.26321	0.08184	3.40716	4.15673	8/14/2019	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.16468	0.07406	1.35402	0.52050	5.17622	0.08184	3.66467	4.47090	6/25/2020	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.14472	0.06583	1.35402	0.52050	5.21971	0.08440	3.62505	4.42257	8/13/2020	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.16468	0.06583	1.35402	0.52050	5.39370	0.03325	3.50620	4.27756	6/18/2021	TRUE
Deep Aquifers	14S/02E-07J03	Northern	0.13474	0.05760	1.38223	0.54132	5.26321	0.07673	3.52601	4.30173	8/6/2021	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	1.79650	0.90516	1.26939	0.54132	2.60986	0.09975	3.20906	3.91506	8/29/1985	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	1.64679	0.90516	2.48237	0.66624	2.65335	0.06906	4.04104	4.93007	7/19/1993	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	1.64679	0.90516	1.29760	0.54132	2.30537	0.05883	3.12983	3.81839	9/9/1994	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	1.74659	0.98745	1.46685	0.60378	2.21838	0.13044	3.12983	3.81839	7/12/1995	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	1.94620	0.82288	1.35402	0.60378	2.39237	0.04860	3.22887	3.93923	9/16/1997	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	2.24562	1.31660	3.07475	0.39558	2.91434	0.06394	2.93174	3.57672	6/28/2001	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	2.09591	1.23431	2.42595	0.77034	2.74035	0.07673	3.12983	3.81839	7/10/2002	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	3.19377	1.89261	4.76728	0.62460	3.30582	0.07929	2.93174	3.57672	9/19/2003	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	4.14192	2.79778	6.68547	0.72870	3.95828	0.09463	2.99117	3.64922	7/8/2004	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	4.14192	2.55092	7.33427	0.60378	3.74079	0.08184	2.89212	3.52839	6/17/2005	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	3.79260	2.22177	5.69817	0.64542	3.26232	0.06906	2.89212	3.52839	7/6/2006	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	3.19377	1.89261	4.76728	0.64542	3.78429	0.09463	3.09021	3.77006	8/1/2007	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	2.94426	1.97490	4.25952	0.79116	3.13183	0.07417	3.12983	3.81839	6/26/2008	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	3.89241	2.30405	6.17772	0.77034	3.39281	0.08440	3.03078	3.69756	9/5/2008	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	2.64484	1.56346	3.38505	0.83280	2.91434	0.05627	3.09021	3.77006	6/18/2009	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	2.74465	1.64575	3.52609	0.85362	3.00134	0.06138	3.16945	3.86672	7/16/2009	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	2.69475	1.64575	3.52609	0.87444	2.87084	0.05371	3.14964	3.84256	8/13/2009	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	3.54309	1.89261	4.99295	0.83280	3.17533	0.07161	3.18926	3.89089	8/19/2010	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	3.09397	1.89261	4.20310	0.70788	3.04483	0.06138	3.09021	3.77006	7/12/2011	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	2.64484	1.56346	3.41326	0.87444	2.95784	0.06138	3.05059	3.72172	8/3/2011	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	3.29358	1.89261	4.56982	0.79116	3.21882	0.06650	3.14964	3.84256	7/19/2012	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	3.74270	2.22177	5.24683	0.81198	3.21882	0.06650	3.03078	3.69756	8/22/2012	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	2.64484	1.56346	3.30042	0.74952	2.87084	0.06394	3.18926	3.89089	7/23/2013	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	2.69475	1.56346	3.10296	0.83280	3.04483	0.06906	3.05059	3.72172	8/6/2013	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	3.64290	2.13948	5.35966	0.79116	3.65380	0.06906	3.09021	3.77006	7/21/2014	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	2.54504	1.48118	3.49788	0.70788	3.21882	0.05627	3.16945	3.86672	8/26/2014	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	2.39533	1.39889	3.07475	0.74952	3.08833	0.05627	3.18926	3.89089	6/17/2015	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	2.69475	1.64575	3.83639	0.70788	3.26232	0.06394	3.16945	3.86672	7/21/2015	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	2.44523	1.56346	3.10296	0.83280	2.95784	0.07161	3.16945	3.86672	6/17/2016	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	2.99416	2.13948	4.51340	0.79116	3.34932	0.05627	3.07040	3.74589	8/2/2016	TRUE
400-Foot Aquifer	14S/02E-08C03	Northern	3.69280	2.22177	5.66996	0.83280	3.65380	0.07417	3.18926	3.89089	6/22/2017	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-09D04	Northern	1.79650	0.98745	1.35402	0.70788	2.43587	0.05883	3.14964	3.84256	4/27/1996	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	2.04601	1.23431	1.35402	1.08263	2.43587	0.06906	3.12983	3.81839	9/18/1998	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.84640	1.06974	1.46685	0.56214	2.17488	0.05883	3.24868	3.96339	6/2/1999	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.94620	1.15203	1.41044	0.81198	2.34887	0.05883	3.05059	3.72172	7/27/2000	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.94620	1.15203	1.35402	1.02017	2.21838	0.05883	3.05059	3.72172	8/17/2000	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.74659	1.15203	1.41044	1.02017	2.47936	0.05883	3.09021	3.77006	9/22/2000	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	2.04601	1.15203	1.52327	0.93689	2.34887	0.05883	3.16945	3.86672	7/25/2002	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.84640	1.23431	1.41044	0.97853	2.30537	0.05883	3.05059	3.72172	9/16/2003	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.94620	1.15203	1.52327	0.97853	2.21838	0.06394	2.97136	3.62505	6/24/2004	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.94620	1.15203	1.60790	0.74952	2.26188	0.06138	3.20906	3.91506	6/9/2005	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.89630	1.15203	1.43865	0.66624	2.30537	0.04860	3.24868	3.96339	7/6/2006	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.94620	1.23431	1.52327	0.81198	2.43587	0.07673	3.28830	4.01173	6/12/2007	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.94620	1.31660	1.57969	0.83280	2.60986	0.06906	3.22887	3.93923	6/27/2008	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.79650	1.56346	1.46685	0.68706	2.43587	0.06138	3.40716	4.15673	9/10/2008	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.94620	1.15203	1.74894	0.81198	2.43587	0.04860	3.20906	3.91506	6/10/2009	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.99611	1.15203	1.46685	0.91608	2.43587	0.05115	3.20906	3.91506	7/8/2009	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.84640	1.15203	1.35402	0.56214	2.30537	0.04604	3.20906	3.91506	8/19/2009	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.94620	1.06974	1.60790	0.58296	2.39237	0.06138	3.16945	3.86672	9/22/2010	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	2.29552	1.56346	3.72355	0.95771	4.08878	0.06138	3.11002	3.79422	7/13/2011	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	2.19572	1.64575	4.42877	0.89526	4.43676	0.06650	3.18926	3.89089	8/10/2011	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	2.29552	2.63320	11.53738	1.66559	11.96184	0.10742	3.24868	3.96339	7/11/2013	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.74659	1.81033	5.75458	1.29083	6.78563	0.07673	3.20906	3.91506	8/15/2013	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	2.54504	1.89261	4.51340	0.91608	4.17577	0.07161	3.11002	3.79422	6/1/2016	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	2.59494	1.64575	4.28773	0.85362	4.17577	0.04860	3.05059	3.72172	8/4/2016	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.89630	1.23431	2.17207	0.58296	2.87084	0.05371	3.40716	4.15673	6/28/2017	TRUE
400-Foot Aquifer	14S/02E-09D04	Northern	1.84640	1.15203	1.80536	0.54132	2.74035	0.06138	3.36754	4.10840	9/28/2017	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	2.34543	1.31660	1.74894	1.29083	2.47936	0.06394	3.05059	3.72172	6/27/2001	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	2.24562	1.31660	1.77715	1.24919	2.47936	0.07417	3.16945	3.86672	7/11/2002	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	2.49513	1.39889	1.88999	1.20755	2.52286	0.08952	3.01097	3.67339	9/9/2003	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	2.44523	1.56346	2.14386	1.22837	2.74035	0.08696	3.18926	3.89089	7/8/2004	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	2.29552	1.39889	2.28491	1.04099	2.60986	0.07673	3.05059	3.72172	6/16/2005	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	2.34543	1.39889	2.14386	1.06181	2.43587	0.06906	3.05059	3.72172	6/22/2006	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	2.39533	1.56346	2.34133	0.97853	2.65335	0.07161	3.05059	3.72172	7/30/2007	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	2.49513	1.72804	2.70804	0.93689	2.65335	0.08952	3.01097	3.67339	7/2/2008	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	2.54504	1.64575	2.73625	0.91608	2.69685	0.07417	2.93174	3.57672	9/3/2008	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	2.49513	1.48118	2.87729	0.95771	2.56636	0.05883	2.97136	3.62505	6/15/2009	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	2.74465	1.64575	3.24401	0.99935	2.74035	0.06906	2.93174	3.57672	7/16/2009	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	2.69475	1.56346	3.27221	0.99935	2.60986	0.06138	2.89212	3.52839	8/13/2009	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	2.79455	1.48118	3.13117	0.87444	2.56636	0.06906	2.95155	3.60089	8/24/2010	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	2.99416	1.81033	3.69535	0.91608	2.69685	0.07161	2.77327	3.38338	7/11/2011	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	3.09397	1.89261	3.92102	0.99935	2.78385	0.07161	2.77327	3.38338	8/1/2011	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-09N02	Northern	3.04406	1.81033	3.61072	0.93689	2.52286	0.06138	2.77327	3.38338	7/23/2012	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	2.99416	1.81033	3.58251	0.91608	2.56636	0.06138	2.77327	3.38338	8/22/2012	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	3.04406	1.81033	3.94922	0.87444	2.47936	0.06906	2.71384	3.31088	7/24/2013	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	3.04406	1.81033	3.89281	0.85362	2.52286	0.07417	2.67422	3.26255	8/12/2013	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	3.19377	1.89261	4.79549	0.79116	2.82734	0.06906	2.65441	3.23838	6/16/2015	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	3.19377	1.97490	4.56982	0.77034	2.87084	0.07161	2.67422	3.26255	7/13/2015	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	3.14387	2.13948	4.71086	0.87444	2.65335	0.07417	2.67422	3.26255	8/25/2016	TRUE
400-Foot Aquifer	14S/02E-09N02	Northern	3.54309	2.38634	5.33145	0.77034	2.82734	0.07929	2.77327	3.38338	6/29/2017	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.64679	1.06974	1.35402	1.14509	2.78385	0.06394	2.89212	3.52839	9/14/1992	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.74659	0.90516	1.41044	1.16591	2.65335	0.06138	3.05059	3.72172	8/30/1994	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.79650	1.06974	1.29760	1.06181	2.65335	0.06394	2.97136	3.62505	8/20/1998	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.74659	0.98745	1.41044	1.10345	2.43587	0.06138	2.93174	3.57672	6/8/1999	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.89630	1.06974	1.46685	1.08263	2.60986	0.06650	3.01097	3.67339	7/28/1999	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.09591	0.98745	1.66432	1.14509	2.65335	0.06650	3.05059	3.72172	8/29/2001	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.74659	0.98745	1.66432	1.18673	3.26232	0.06138	3.12983	3.81839	7/3/2002	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.79650	1.06974	1.49506	1.02017	2.91434	0.07417	3.05059	3.72172	8/28/2003	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.79650	0.98745	1.57969	0.99935	2.82734	0.06650	3.24868	3.96339	6/29/2004	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.84640	1.06974	1.74894	0.77034	3.00134	0.05627	3.20906	3.91506	7/13/2005	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.79650	1.06974	1.63611	0.97853	2.74035	0.04604	3.16945	3.86672	6/23/2006	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.84640	1.15203	1.80536	1.04099	3.17533	0.08184	3.16945	3.86672	6/12/2007	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.79650	1.23431	1.80536	0.95771	3.17533	0.06650	3.14964	3.84256	6/27/2008	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.84640	1.48118	2.00282	0.93689	2.82734	0.06138	3.22887	3.93923	9/10/2008	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.89630	1.15203	2.00282	1.04099	2.91434	0.04860	3.12983	3.81839	6/10/2009	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.99611	1.15203	2.00282	1.02017	2.95784	0.05371	3.14964	3.84256	7/8/2009	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	1.94620	1.15203	1.91819	0.99935	2.87084	0.04860	3.07040	3.74589	8/19/2009	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.34543	1.15203	2.39774	0.93689	2.91434	0.05883	3.07040	3.74589	7/14/2010	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.49513	1.23431	2.62341	0.97853	2.95784	0.05883	2.97136	3.62505	8/25/2010	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.44523	1.31660	2.53879	0.97853	2.91434	0.07673	2.97136	3.62505	9/22/2010	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.39533	1.31660	2.62341	0.93689	2.82734	0.05627	2.93174	3.57672	7/13/2011	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.54504	1.48118	3.07475	1.12427	2.95784	0.05627	2.89212	3.52839	8/10/2011	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.69475	1.48118	3.15938	1.08263	3.04483	0.06138	3.01097	3.67339	7/17/2012	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.54504	1.48118	3.04654	1.10345	2.87084	0.05371	2.95155	3.60089	8/14/2012	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.64484	1.48118	2.99013	1.08263	2.95784	0.06394	2.97136	3.62505	7/11/2013	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.59494	1.48118	2.93371	1.06181	2.91434	0.06394	2.95155	3.60089	8/15/2013	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.29552	1.23431	2.45416	1.10345	3.08833	0.06138	3.07040	3.74589	1/29/2014	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.09591	1.23431	2.28491	1.02017	3.13183	0.05627	3.11002	3.79422	7/30/2014	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.14582	1.23431	2.31312	1.06181	3.08833	0.05627	3.14964	3.84256	6/17/2015	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.14582	1.31660	2.36953	1.08263	3.21882	0.13044	3.12983	3.81839	7/21/2015	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.14582	1.39889	2.34133	1.06181	3.00134	0.06650	3.09021	3.77006	6/2/2016	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.29552	1.48118	2.56700	1.08263	3.04483	0.06394	3.11002	3.79422	8/9/2016	TRUE
400-Foot Aquifer	14S/02E-10H01	Northern	2.54504	1.56346	2.84908	1.10345	2.91434	0.06394	3.18926	3.89089	6/28/2017	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-10H01	Northern	2.64484	1.56346	2.99013	1.12427	3.13183	0.06906	3.16945	3.86672	9/28/2017	TRUE
400-Foot Aquifer	14S/02E-10N51	Northern	2.34543	1.39889	2.34133	1.10345	2.65335	0.06650	2.99117	3.64922	6/17/2015	TRUE
400-Foot Aquifer	14S/02E-10N51	Northern	2.29552	1.39889	2.45416	1.04099	2.78385	0.06906	3.01097	3.67339	7/22/2015	TRUE
400-Foot Aquifer	14S/02E-10N51	Northern	2.29552	1.39889	2.48237	0.99935	2.65335	0.07673	2.95155	3.60089	6/3/2016	TRUE
400-Foot Aquifer	14S/02E-10N51	Northern	2.24562	1.56346	2.65162	1.04099	2.69685	0.07161	2.95155	3.60089	8/2/2016	TRUE
400-Foot Aquifer	14S/02E-10N51	Northern	2.44523	1.56346	2.73625	0.99935	2.60986	0.07673	3.05059	3.72172	6/29/2017	TRUE
400-Foot Aquifer	14S/02E-10N51	Northern	2.59494	1.64575	2.87729	1.02017	2.74035	0.07673	3.05059	3.72172	8/17/2017	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.14582	0.98745	1.07193	0.35394	1.91389	0.05883	3.64486	4.44673	10/11/1994	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.49513	0.98745	1.01551	0.16656	1.82690	0.05627	4.12028	5.02674	4/25/1995	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	1.94620	0.98745	1.01551	0.14574	1.78340	0.05627	3.52601	4.30173	7/24/1995	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	1.99611	0.98745	0.78984	0.18738	1.78340	0.05883	3.68448	4.49507	10/26/1995	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	1.99611	0.98745	0.90268	0.12492	1.60941	0.05883	3.54582	4.32590	4/23/1996	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.04601	0.98745	1.15656	0.20820	1.78340	0.05627	3.62505	4.42257	7/16/1996	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.14582	1.06974	1.04372	0.18738	1.78340	0.07673	3.70429	4.51923	1/21/1997	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.04601	0.98745	1.15656	0.22902	1.69641	0.05883	3.70429	4.51923	4/24/1997	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	1.94620	0.98745	0.90268	0.18738	1.56591	0.05627	3.52601	4.30173	7/7/1997	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.09591	0.98745	0.98731	0.27066	1.65291	0.05883	3.56563	4.35007	4/17/1998	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.04601	1.06974	1.01551	0.31230	1.82690	0.06138	3.56563	4.35007	7/27/1998	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.19572	1.06974	1.15656	0.20820	1.78340	0.06138	3.68448	4.49507	8/2/1999	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.09591	0.90516	0.95910	0.20820	1.65291	0.05627	3.48639	4.25340	8/9/2000	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.34543	0.98745	1.01551	0.20820	1.60941	0.06138	3.60525	4.39840	8/10/2001	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.04601	1.06974	1.04372	0.20820	1.78340	0.06650	3.60525	4.39840	8/26/2002	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.24562	1.06974	1.15656	0.20820	1.91389	0.10231	3.64486	4.44673	8/15/2003	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	1.99611	0.98745	1.07193	0.22902	1.73990	0.05627	3.68448	4.49507	8/13/2004	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	1.99611	0.98745	1.15656	0.22902	1.73990	0.05883	3.60525	4.39840	8/29/2005	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	1.99611	0.98745	1.10014	0.22902	1.87040	0.05115	3.52601	4.30173	8/16/2006	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.14582	0.98745	1.12835	0.22902	1.82690	0.04348	3.54582	4.32590	8/5/2009	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	1.89630	0.98745	1.01551	0.18738	1.69641	0.03836	3.56563	4.35007	10/3/2011	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.09591	0.98745	1.12835	0.20820	1.78340	0.04860	3.52601	4.30173	9/19/2012	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.04601	0.98745	1.04372	0.20820	1.73990	0.05627	3.48639	4.25340	9/24/2013	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	2.04601	0.98745	1.10014	0.20820	1.95739	0.05115	3.70429	4.51923	9/2/2014	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	1.89630	0.98745	1.01551	0.20820	1.69641	0.05883	3.56563	4.35007	9/3/2015	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	1.89630	0.90516	1.01551	0.20820	1.78340	0.05883	3.50620	4.27756	9/21/2016	TRUE
400-Foot Aquifer	14S/02E-11A04	Northern	1.79650	0.98745	1.01551	0.20612	1.87040	0.04604	3.58544	4.37423	10/9/2017	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.49708	0.82288	1.12835	0.41640	1.87040	0.05115	2.93174	3.57672	8/30/1994	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.59689	0.90516	1.41044	0.35394	2.08789	0.05115	2.97136	3.62505	8/2/1995	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.49708	0.82288	1.07193	0.18738	1.87040	0.05627	2.95155	3.60089	8/27/1996	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.49708	0.90516	1.07193	0.18738	1.82690	0.05115	2.93174	3.57672	9/24/1997	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.64679	0.90516	1.15656	0.24984	1.87040	0.05627	2.89212	3.52839	7/28/1999	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.99611	0.90516	1.43865	0.49968	1.95739	0.05627	2.93174	3.57672	8/29/2001	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.69669	0.98745	1.35402	0.49968	2.00089	0.05371	3.05059	3.72172	7/1/2002	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-11M03	Northern	1.54698	0.90516	1.29760	0.39558	2.04439	0.06394	2.93174	3.57672	9/4/2003	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.64679	0.90516	1.32581	0.47886	2.08789	0.05627	3.07040	3.74589	6/28/2004	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.79650	0.98745	1.43865	0.54132	2.21838	0.05627	3.05059	3.72172	6/8/2005	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.74659	0.98745	1.32581	0.56214	2.04439	0.04092	2.97136	3.62505	6/23/2006	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.74659	1.06974	1.43865	0.66624	2.30537	0.03069	3.01097	3.67339	6/12/2007	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.69669	0.80642	1.29760	0.27066	1.87040	0.04604	2.91193	3.55255	7/14/2010	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.74659	0.90516	1.35402	0.31230	1.91389	0.04348	2.83269	3.45589	8/25/2010	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.69669	0.90516	1.26939	0.27066	1.87040	0.04604	2.81288	3.43172	9/22/2010	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.69669	0.90516	1.24118	0.31230	1.78340	0.04092	2.81288	3.43172	7/13/2011	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.69669	0.98745	1.46685	0.39558	1.91389	0.03836	2.79307	3.40755	8/10/2011	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.74659	0.90516	1.38223	0.31230	1.91389	0.04604	2.87231	3.50422	7/17/2012	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.69669	0.90516	1.43865	0.33312	1.87040	0.04092	2.81288	3.43172	8/14/2012	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.74659	0.98745	1.29760	0.31230	1.87040	0.04860	2.81288	3.43172	7/11/2013	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.74659	0.98745	1.29760	0.33312	1.87040	0.05115	2.85250	3.48005	8/15/2013	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.74659	0.90516	1.29760	0.37476	2.04439	0.04860	2.87231	3.50422	1/29/2014	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.69669	0.90516	1.26939	0.60378	2.21838	0.04604	2.89212	3.52839	7/30/2014	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.69669	0.98745	1.32581	0.43722	2.13138	0.04604	2.89212	3.52839	6/17/2015	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	2.24562	1.23431	1.32581	0.62460	2.30537	0.05371	2.91193	3.55255	7/21/2015	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.69669	1.06974	1.29760	0.64542	2.17488	0.05627	2.87231	3.50422	6/9/2016	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.69669	1.06974	1.29760	0.72870	2.21838	0.05371	2.99117	3.64922	8/9/2016	TRUE
400-Foot Aquifer	14S/02E-11M03	Northern	1.74659	0.98745	1.29760	0.49968	1.95739	0.05115	3.03078	3.69756	6/28/2017	TRUE
400-Foot Aquifer	14S/02E-13E50	Northern	2.04601	1.15203	1.41044	1.06181	2.08789	0.04860	2.89212	3.52839	7/7/2011	TRUE
400-Foot Aquifer	14S/02E-13E50	Northern	2.04601	1.15203	1.46685	1.14509	2.13138	0.05371	2.87231	3.50422	8/1/2011	TRUE
400-Foot Aquifer	14S/02E-13E50	Northern	2.14582	1.23431	1.43865	1.14509	2.21838	0.05627	2.97136	3.62505	7/13/2012	TRUE
400-Foot Aquifer	14S/02E-13E50	Northern	2.14582	1.23431	1.38223	1.12427	2.13138	0.05115	2.87231	3.50422	8/16/2012	TRUE
400-Foot Aquifer	14S/02E-13E50	Northern	2.09591	1.15203	1.29760	1.12427	2.21838	0.05883	2.97136	3.62505	7/8/2013	TRUE
400-Foot Aquifer	14S/02E-13E50	Northern	1.94620	1.15203	1.26939	1.12427	2.08789	0.05627	2.89212	3.52839	8/29/2013	TRUE
400-Foot Aquifer	14S/02E-13E50	Northern	1.99611	1.15203	1.26939	1.08263	2.26188	0.05371	2.91193	3.55255	7/21/2014	TRUE
400-Foot Aquifer	14S/02E-13E50	Northern	1.99611	1.15203	1.38223	1.18673	2.30537	0.05371	2.93174	3.57672	8/26/2014	TRUE
400-Foot Aquifer	14S/02E-13E50	Northern	1.94620	1.15203	1.24118	1.08263	2.26188	0.05371	2.87231	3.50422	6/8/2015	TRUE
400-Foot Aquifer	14S/02E-13E50	Northern	1.89630	1.15203	1.32581	1.12427	2.21838	0.05627	2.97136	3.62505	7/13/2015	TRUE
400-Foot Aquifer	14S/02E-13E50	Northern	1.89630	1.15203	1.26939	1.08263	2.17488	0.05883	2.91193	3.55255	6/1/2016	TRUE
400-Foot Aquifer	14S/02E-13E50	Northern	1.94620	1.23431	1.32581	1.14509	2.21838	0.05883	2.95155	3.60089	8/9/2016	TRUE
400-Foot Aquifer	14S/02E-13E50	Northern	1.99611	1.15203	1.26939	1.08263	2.13138	0.05883	2.95155	3.60089	6/21/2017	TRUE
400-Foot Aquifer	14S/02E-13E50	Northern	1.94620	1.06974	1.29760	1.10345	2.17488	0.06138	3.01097	3.67339	8/28/2017	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.09591	0.90516	1.10014	1.04099	2.26188	0.10231	2.97136	3.62505	8/21/1986	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	1.64679	1.06974	1.24118	1.41575	2.13138	0.06906	2.93174	3.57672	9/4/1992	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	1.94620	1.23431	1.41044	0.93689	2.21838	0.03581	3.11002	3.79422	8/15/1997	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.39533	1.31660	0.93089	1.93625	2.04439	0.08440	2.73365	3.33505	8/20/1998	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.14582	1.15203	1.21298	1.37411	1.82690	0.07673	2.85250	3.48005	6/8/1999	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.34543	1.23431	1.26939	1.41575	1.95739	0.07673	2.97136	3.62505	8/13/1999	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-15A01	Northern	2.14582	1.15203	1.04372	1.33247	1.78340	0.07929	2.81288	3.43172	6/21/2001	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.24562	1.23431	1.38223	1.43657	2.17488	0.06906	2.93174	3.57672	7/17/2002	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.19572	1.31660	1.32581	1.35329	2.26188	0.07161	2.89212	3.52839	9/4/2003	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.19572	1.23431	1.38223	1.47821	2.13138	0.07417	2.95155	3.60089	6/24/2004	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.34543	1.31660	1.46685	1.43657	2.04439	0.07673	2.93174	3.57672	6/9/2005	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.29552	1.31660	1.41044	1.49903	2.08789	0.06906	2.97136	3.62505	6/20/2006	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.34543	1.56346	1.46685	1.56149	2.30537	0.09463	3.03078	3.69756	6/12/2007	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.34543	1.48118	1.46685	1.49903	2.34887	0.07161	2.91193	3.55255	7/29/2008	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.24562	1.72804	1.49506	1.43657	2.26188	0.07417	3.01097	3.67339	9/10/2008	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.24562	1.31660	1.35402	1.54067	2.13138	0.05883	2.93174	3.57672	6/10/2009	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.29552	1.31660	1.38223	1.56149	2.26188	0.06394	2.97136	3.62505	7/8/2009	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.29552	1.31660	1.43865	1.35329	2.17488	0.05883	2.89212	3.52839	8/19/2009	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.44523	1.31660	1.35402	1.51985	2.13138	0.06906	2.95155	3.60089	7/14/2010	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.49513	1.23431	1.55148	1.35329	2.13138	0.06906	2.93174	3.57672	8/25/2010	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.39533	1.31660	1.63611	1.06181	2.08789	0.05883	2.91193	3.55255	7/13/2011	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.34543	1.31660	1.63611	1.45739	2.13138	0.06138	2.85250	3.48005	8/10/2011	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.39533	1.31660	1.63611	1.35329	2.21838	0.06650	2.97136	3.62505	7/17/2012	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.29552	1.31660	2.05924	0.95771	2.17488	0.05627	2.97136	3.62505	8/14/2012	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.39533	1.31660	1.43865	1.29083	2.13138	0.06650	2.97136	3.62505	7/18/2013	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.29552	1.23431	1.57969	1.08263	2.08789	0.06650	2.93174	3.57672	8/15/2013	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.29552	1.23431	1.63611	1.20755	2.30537	0.06650	2.91193	3.55255	1/29/2014	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.19572	1.23431	1.32581	1.51985	2.30537	0.06394	2.91193	3.55255	7/30/2014	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.19572	1.23431	1.32581	1.58231	2.26188	0.06394	2.93174	3.57672	6/17/2015	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.14582	1.31660	1.35402	1.60313	2.39237	0.07161	2.91193	3.55255	7/21/2015	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.14582	1.39889	1.29760	1.56149	2.26188	0.08184	2.85250	3.48005	6/9/2016	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.19572	1.31660	1.38223	1.60313	2.30537	0.07161	2.95155	3.60089	8/9/2016	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.24562	1.31660	1.46685	1.27001	2.08789	0.06138	3.05059	3.72172	6/28/2017	TRUE
400-Foot Aquifer	14S/02E-15A01	Northern	2.19572	1.31660	1.57969	1.18673	2.30537	0.06650	3.11002	3.79422	9/28/2017	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	2.29552	1.23431	1.21298	1.35329	2.13138	0.06394	3.09021	3.77006	6/13/2001	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	2.59494	1.48118	2.28491	1.47821	2.47936	0.06906	2.93174	3.57672	7/17/2002	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	2.54504	1.48118	1.86178	1.51985	2.43587	0.07417	2.81288	3.43172	9/8/2003	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	2.74465	1.56346	2.62341	1.43657	2.43587	0.07673	2.91193	3.55255	6/25/2004	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	2.54504	1.48118	1.88999	1.22837	2.17488	0.07673	3.24868	3.96339	6/9/2005	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	2.64484	1.48118	2.08745	1.41575	2.26188	0.07161	2.97136	3.62505	6/22/2006	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	2.54504	1.81033	2.36953	1.49903	2.74035	0.10998	2.93174	3.57672	8/2/2007	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	2.89436	1.64575	2.93371	1.43657	2.60986	0.07161	3.01097	3.67339	7/11/2008	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	2.69475	1.81033	2.90550	1.41575	2.52286	0.08184	2.81288	3.43172	9/8/2008	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	3.04406	1.72804	3.10296	1.45739	2.47936	0.06650	2.83269	3.45589	6/18/2009	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	3.14387	1.89261	3.49788	1.51985	2.65335	0.06906	2.79307	3.40755	7/23/2009	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	3.19377	1.97490	3.46968	1.43657	2.60986	0.07161	2.73365	3.33505	8/21/2009	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	3.89241	2.22177	4.65444	1.43657	2.69685	0.08184	2.79307	3.40755	8/5/2010	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-15N01	Northern	3.89241	2.22177	4.76728	1.39493	2.82734	0.07673	2.65441	3.23838	7/12/2011	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	4.34153	2.38634	5.98025	1.51985	2.82734	0.08184	2.61479	3.19005	8/15/2011	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	4.99027	2.79778	6.57264	1.47821	3.00134	0.08696	2.65441	3.23838	7/25/2012	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	4.94037	2.79778	5.95205	1.45739	2.95784	0.08696	2.69403	3.28672	8/27/2012	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	4.99027	2.71549	6.34697	1.43657	2.95784	0.09208	2.67422	3.26255	7/23/2013	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	4.79066	2.63320	6.54443	1.49903	3.26232	0.08696	2.79307	3.40755	8/6/2014	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	4.89046	2.71549	6.74189	1.45739	3.26232	0.08440	2.75346	3.35922	8/27/2014	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	5.43939	3.04464	7.61636	1.41575	3.34932	0.08952	2.75346	3.35922	6/10/2015	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	5.33959	3.12693	7.70099	1.45739	3.43631	0.09719	2.77327	3.38338	7/20/2015	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	5.73881	3.94980	8.12412	1.43657	3.30582	0.10231	2.77327	3.38338	6/3/2016	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	5.78871	3.70294	8.06770	1.45739	3.47981	0.08440	2.69403	3.28672	8/4/2016	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	5.73881	3.53837	8.34979	1.45739	3.43631	0.10486	2.75346	3.35922	6/14/2017	TRUE
400-Foot Aquifer	14S/02E-15N01	Northern	5.98832	3.37379	9.02680	1.47821	3.56680	0.10742	2.71384	3.31088	8/28/2017	TRUE
Deep Aquifers	14S/02E-18B01	Northern	0.11478	0.06583	1.46685	0.60378	5.35021	0.07929	3.24868	3.96339	8/15/2019	TRUE
Deep Aquifers	14S/02E-18B01	Northern	0.17965	0.06583	1.52327	0.56214	5.08922	0.10486	3.36754	4.10840	6/16/2021	TRUE
Deep Aquifers	14S/02E-18B01	Northern	0.12975	0.05760	1.46685	0.60378	5.43720	0.06906	3.38735	4.13256	8/13/2021	TRUE
Aquitard + Deep Aquifers	14S/02E-19G01	Northern	0.64873	0.02469	3.32863	0.99935	6.87262	0.12277	2.73365	3.33505	6/16/2021	TRUE
Deep Aquifers	14S/02E-20E01	Northern	0.79844	0.04937	4.11848	1.08263	8.00356	0.14579	3.16945	3.86672	6/16/2021	TRUE
Deep Aquifers	14S/02E-21K04	Northern	1.14776	0.11520	4.20310	0.89526	7.04661	0.14834	2.67422	3.26255	6/15/2021	TRUE
Deep Aquifers	14S/02E-21K04	Northern	1.04796	0.10697	4.11848	0.89526	6.82912	0.09719	2.73365	3.33505	8/9/2021	TRUE
Deep Aquifers	14S/02E-21L02	Northern	0.64873	0.05760	3.44147	0.93689	5.48070	0.06650	1.96110	2.39254	6/8/2018	TRUE
Deep Aquifers	14S/02E-21L02	Northern	0.59883	0.04937	3.66714	0.74952	5.43720	0.06650	1.66396	2.03003	8/3/2020	TRUE
Deep Aquifers	14S/02E-21L02	Northern	0.69864	0.04937	3.69535	0.72870	5.74168	0.10231	1.62434	1.98170	6/15/2021	TRUE
Deep Aquifers	14S/02E-21L02	Northern	0.74854	0.05760	3.77997	0.74952	5.65469	0.05883	1.70358	2.07836	8/13/2021	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.09786	0.52664	1.83357	1.37411	4.30626	0.06650	2.89212	3.52839	7/20/2011	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.04796	0.41144	1.77715	1.33247	4.21927	0.06138	2.89212	3.52839	8/12/2011	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.19766	0.49373	1.74894	1.35329	4.30626	0.06906	3.01097	3.67339	7/13/2012	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.19766	0.49373	1.74894	1.31165	4.17577	0.06906	2.87231	3.50422	8/16/2012	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.19766	0.52664	1.63611	1.39493	4.21927	0.07161	2.95155	3.60089	7/9/2013	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.14776	0.41967	1.94640	1.22837	4.34976	0.07161	2.73365	3.33505	8/8/2013	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.09786	0.47727	1.57969	1.33247	4.43676	0.06394	2.99117	3.64922	7/18/2014	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.09786	0.49373	1.77715	1.37411	4.74124	0.06394	2.89212	3.52839	8/19/2014	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.04796	0.46081	1.74894	1.33247	4.52375	0.06138	2.91193	3.55255	6/18/2015	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.04796	0.48550	1.57969	1.35329	4.48025	0.06394	3.01097	3.67339	7/14/2015	TRUE
Deep Aquifers	14S/02E-22A03	Northern	0.99805	0.37029	1.57969	1.29083	4.26277	0.07161	2.91193	3.55255	6/1/2016	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.04796	0.41144	1.66432	1.33247	4.43676	0.07161	2.97136	3.62505	8/9/2016	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.04796	0.40321	1.55148	1.31165	4.34976	0.07417	2.89212	3.52839	6/6/2017	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.14776	0.45258	1.57969	1.39493	4.39326	0.07673	3.07040	3.74589	8/29/2017	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.09786	0.50195	1.55148	1.47821	4.34976	0.06650	2.89212	3.52839	5/29/2018	TRUE
Deep Aquifers	14S/02E-22A03	Northern	0.99805	0.44435	1.63611	1.33247	4.61075	0.06906	2.85250	3.48005	8/2/2018	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.19766	0.52664	1.77715	1.35329	4.56725	0.06650	2.89212	3.52839	6/14/2019	TRUE

MONTGOMERY & ASSOCIATES

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
Deep Aquifers	14S/02E-22A03	Northern	1.14776	0.57601	1.04372	1.54067	4.34976	0.07673	3.22887	3.93923	8/7/2019	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.19766	0.57601	1.21298	1.49903	4.08878	0.06650	3.22887	3.93923	6/4/2020	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.24757	0.64184	0.84626	1.64477	4.00178	0.07673	3.34773	4.08423	8/4/2020	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.19766	0.48550	1.57969	1.37411	4.43676	0.11254	2.97136	3.62505	6/9/2021	TRUE
Deep Aquifers	14S/02E-22A03	Northern	1.14776	0.49373	1.43865	1.45739	4.34976	0.06138	3.12983	3.81839	8/2/2021	TRUE
Deep Aquifers	14S/02E-22J02	Northern	1.19766	0.30446	3.44147	0.77034	5.65469	0.01535	2.51575	3.06921	6/17/2021	TRUE
Deep Aquifers	14S/02E-22J02	Northern	1.04796	0.32915	3.21580	0.85362	5.26321	0.03836	2.55537	3.11755	8/5/2021	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	2.29552	1.39889	1.15656	1.91543	1.82690	0.06906	3.11002	3.79422	9/1/1994	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	2.54504	1.64575	1.21298	1.91543	2.04439	0.07417	3.01097	3.67339	8/5/1997	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	2.69475	1.48118	1.21298	1.76969	1.78340	0.07161	3.05059	3.72172	7/29/1999	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	2.59494	1.48118	1.10014	1.70723	2.00089	0.06650	3.56563	4.35007	7/17/2002	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	2.79455	1.64575	1.52327	1.76969	1.95739	0.07673	3.18926	3.89089	6/16/2004	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	2.84445	1.64575	1.72073	1.58231	1.91389	0.06906	3.09021	3.77006	6/6/2005	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	2.79455	1.64575	1.77715	1.87379	2.26188	0.07673	3.01097	3.67339	6/14/2006	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	2.89436	1.97490	1.80536	1.81133	2.04439	0.09463	3.09021	3.77006	6/12/2007	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	3.09397	1.81033	2.05924	1.81133	2.30537	0.07673	2.59498	3.16588	6/27/2008	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	3.14387	2.38634	2.70804	1.79051	2.21838	0.07929	3.09021	3.77006	9/10/2008	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	3.19377	1.89261	2.45416	1.83215	2.17488	0.06138	3.03078	3.69756	6/10/2009	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	3.39338	1.97490	2.76446	1.85297	2.26188	0.06906	3.05059	3.72172	7/8/2009	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	3.44329	2.05719	2.73625	1.72805	2.13138	0.06138	2.93174	3.57672	8/19/2009	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	3.84251	2.22177	3.18759	1.74887	2.26188	0.07417	3.05059	3.72172	7/14/2010	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	3.89241	2.13948	3.30042	1.76969	2.26188	0.07417	3.01097	3.67339	8/25/2010	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	3.79260	2.22177	3.18759	1.70723	2.21838	0.07417	2.95155	3.60089	9/22/2010	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	3.84251	2.13948	3.30042	1.64477	2.21838	0.06906	2.95155	3.60089	7/13/2011	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	3.94231	2.30405	3.77997	1.93625	2.30537	0.07161	2.91193	3.55255	8/10/2011	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	4.04212	2.30405	3.97743	1.83215	2.34887	0.07673	2.97136	3.62505	7/17/2012	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	4.04212	2.30405	4.00564	1.91543	2.26188	0.06906	2.95155	3.60089	8/14/2012	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	4.24173	2.38634	3.89281	1.83215	2.34887	0.08184	2.95155	3.60089	7/11/2013	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	4.19183	2.38634	3.89281	1.81133	2.34887	0.08184	2.97136	3.62505	8/15/2013	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	4.09202	2.30405	4.00564	1.93625	2.47936	0.07929	2.95155	3.60089	1/29/2014	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	3.74270	2.13948	3.61072	1.83215	2.47936	0.07161	2.95155	3.60089	7/30/2014	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	4.29163	2.55092	4.71086	1.81133	2.60986	0.07673	2.97136	3.62505	6/17/2015	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	3.99222	2.38634	4.17489	1.85297	2.56636	0.07929	2.93174	3.57672	7/21/2015	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	4.49124	3.12693	5.10578	1.74887	2.56636	0.09208	2.87231	3.50422	6/1/2016	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	4.94037	3.37379	5.69817	1.79051	2.78385	0.09463	2.95155	3.60089	8/4/2016	TRUE
400-Foot Aquifer	14S/02E-22L01	Northern	5.93842	3.78523	7.72920	1.76969	2.82734	0.09208	3.01097	3.67339	6/28/2017	TRUE
400-Foot Aquifer	14S/02E-22R01	Northern	2.54504	1.31660	0.95910	2.01953	2.13138	0.07417	2.87231	3.50422	7/25/2012	TRUE
400-Foot Aquifer	14S/02E-22R01	Northern	2.49513	1.23431	0.93089	1.99871	2.08789	0.07417	2.87231	3.50422	8/13/2012	TRUE
400-Foot Aquifer	14S/02E-22R01	Northern	2.44523	1.23431	0.90268	1.97789	2.08789	0.08184	2.91193	3.55255	7/17/2013	TRUE
400-Foot Aquifer	14S/02E-22R01	Northern	2.54504	1.23431	0.90268	1.99871	2.17488	0.08184	2.93174	3.57672	8/6/2013	TRUE
400-Foot Aquifer	14S/02E-22R01	Northern	2.39533	1.15203	0.87447	1.87379	2.26188	0.07417	2.95155	3.60089	7/24/2014	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-22R01	Northern	2.49513	1.23431	0.95910	2.04035	2.30537	0.07673	2.99117	3.64922	8/19/2014	TRUE
400-Foot Aquifer	14S/02E-22R01	Northern	2.34543	1.23431	0.90268	1.91543	2.21838	0.07673	3.01097	3.67339	6/8/2015	TRUE
400-Foot Aquifer	14S/02E-22R01	Northern	2.34543	1.23431	0.93089	1.93625	2.21838	0.07673	3.07040	3.74589	7/13/2015	TRUE
400-Foot Aquifer	14S/02E-22R01	Northern	2.34543	1.23431	0.90268	1.93625	2.13138	0.08440	2.99117	3.64922	6/3/2016	TRUE
400-Foot Aquifer	14S/02E-22R01	Northern	2.34543	1.31660	0.93089	1.97789	2.21838	0.06394	3.01097	3.67339	8/2/2016	TRUE
400-Foot Aquifer	14S/02E-22R01	Northern	2.34543	1.23431	0.93089	1.91543	2.08789	0.08184	3.07040	3.74589	6/9/2017	TRUE
400-Foot Aquifer	14S/02E-22R01	Northern	2.44523	1.15203	0.95910	1.99871	2.21838	0.08696	3.14964	3.84256	8/28/2017	TRUE
Deep Aquifers	14S/02E-23G02	Northern	1.19766	0.63361	1.72073	1.85297	5.35021	0.06906	3.68448	4.49507	6/9/2020	TRUE
Deep Aquifers	14S/02E-23G02	Northern	1.09786	0.53487	2.22849	2.10281	6.39415	0.06650	3.60525	4.39840	8/10/2020	TRUE
Deep Aquifers	14S/02E-23G02	Northern	1.14776	0.51841	1.80536	1.89461	6.00267	0.03069	3.88257	4.73674	6/23/2021	TRUE
Deep Aquifers	14S/02E-23G02	Northern	1.14776	0.54310	1.83357	1.91543	6.04617	0.05883	3.78353	4.61590	8/16/2021	TRUE
Deep Aquifers	14S/02E-23J02	Northern	1.64679	0.82288	1.57969	2.01953	5.17622	0.12788	3.78353	4.61590	6/17/2021	TRUE
Deep Aquifers	14S/02E-23J02	Northern	1.54698	0.82288	1.60790	2.06117	4.95873	0.06906	3.72410	4.54340	8/5/2021	TRUE
Aquitard + Deep Aquifers	14S/02E-23P02	Northern	2.84445	1.06974	0.70522	1.91543	2.52286	0.07161	3.60525	4.39840	6/4/2020	TRUE
Aquitard + Deep Aquifers	14S/02E-23P02	Northern	2.54504	1.15203	0.70522	1.91543	2.60986	0.08184	3.58544	4.37423	8/3/2020	TRUE
Aquitard + Deep Aquifers	14S/02E-23P02	Northern	2.39533	0.98745	0.67701	1.93625	2.65335	0.06138	3.50620	4.27756	6/8/2021	TRUE
Aquitard + Deep Aquifers	14S/02E-23P02	Northern	2.34543	1.06974	0.70522	1.97789	2.56636	0.07417	3.44677	4.20506	8/5/2021	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	3.44329	1.72804	2.34133	1.85297	3.04483	0.09719	3.68448	4.49507	8/19/1982	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	3.34348	2.22177	3.27221	1.56149	4.00178	0.13044	4.59570	5.60675	7/27/1987	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	3.94231	2.05719	3.15938	2.70659	3.13183	0.10742	4.19952	5.12341	6/26/1992	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	6.93647	3.78523	4.88011	3.53938	3.82779	0.13300	6.10118	7.44345	8/12/1998	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	6.88657	3.86752	5.30324	3.41446	3.87129	0.13811	5.94271	7.25011	8/9/1999	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	5.83861	3.37379	4.48519	3.22708	3.74079	0.12277	5.34844	6.52510	6/12/2001	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	6.33764	3.37379	4.96474	3.60184	3.69730	0.12788	5.94271	7.25011	7/9/2002	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.03628	3.86752	5.13399	3.85168	4.34976	0.12533	5.98233	7.29844	8/22/2003	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.03628	3.70294	5.27504	3.85168	4.30626	0.13044	6.41813	7.83012	6/25/2004	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.83472	4.27895	6.43159	3.87250	4.74124	0.13811	6.85393	8.36179	6/17/2005	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	6.83667	3.94980	5.75458	4.18480	4.95873	0.14067	6.33889	7.73345	6/14/2006	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	6.18793	4.03209	5.44429	3.47692	5.30671	0.17648	6.33889	7.73345	8/2/2007	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.73492	4.11438	6.29055	3.83086	4.65424	0.14323	6.23985	7.61261	6/25/2008	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.13608	4.03209	6.12130	3.68512	4.56725	0.14067	6.02195	7.34678	9/4/2008	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.83472	4.44353	6.45980	3.93496	4.78474	0.12788	6.43794	7.85428	6/3/2009	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	8.08424	4.27895	6.88293	4.08070	4.95873	0.13044	6.22004	7.58845	7/9/2009	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	8.33375	4.52582	7.08039	3.89332	4.95873	0.12788	6.20023	7.56428	8/12/2009	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	9.03239	4.11438	8.06770	3.60184	5.26321	0.14067	6.59641	8.04762	8/26/2010	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	8.53336	4.03209	7.27786	3.51856	4.87173	0.14323	5.90309	7.20177	7/18/2011	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	9.08229	4.27895	8.71650	3.76840	5.08922	0.14834	5.94271	7.25011	8/9/2011	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	6.78677	3.04464	4.34415	4.08070	2.95784	0.12021	4.23913	5.17174	7/13/2012	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.03628	3.20922	4.42877	4.20562	2.87084	0.11765	4.31837	5.26841	8/20/2012	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.53531	3.37379	4.51340	4.68447	3.04483	0.12788	4.33818	5.29258	7/9/2013	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.28579	3.29150	4.31594	4.51792	3.13183	0.12533	4.39761	5.36508	8/5/2013	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-24P02	Northern	7.28579	3.20922	4.42877	4.58038	3.30582	0.11765	4.61551	5.63092	7/21/2014	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.48540	3.29150	4.76728	4.99677	3.43631	0.11765	4.57589	5.58258	8/18/2014	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.13608	3.29150	4.34415	4.49710	3.34932	0.12277	4.59570	5.60675	6/8/2015	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.13608	3.29150	4.51340	4.60120	3.34932	0.12277	4.67493	5.70342	7/13/2015	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.28579	4.36124	4.59803	4.80939	3.30582	0.14323	4.63532	5.65508	6/1/2016	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.23589	3.86752	4.76728	4.89267	3.34932	0.13300	4.81360	5.87259	8/2/2016	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.23589	3.53837	4.62623	4.70529	3.26232	0.12533	4.65512	5.67925	6/8/2017	TRUE
400-Foot Aquifer	14S/02E-24P02	Northern	7.68501	3.78523	4.82370	5.16333	3.30582	0.14323	4.95226	6.04176	8/9/2017	TRUE
Deep Aquifers	14S/02E-25A03	Northern	2.54504	1.48118	1.18477	2.24855	2.39237	0.08696	2.77327	3.38338	8/16/2021	TRUE
400-Foot Aquifer	14S/02E-25D51	Northern	5.28969	2.30405	2.93371	3.49774	2.52286	0.10231	3.86276	4.71257	7/25/2013	TRUE
400-Foot Aquifer	14S/02E-25D51	Northern	5.63900	2.46863	3.04654	3.58102	2.74035	0.11254	3.98162	4.85757	8/13/2013	TRUE
400-Foot Aquifer	14S/02E-25D51	Northern	4.64095	1.97490	2.56700	3.03970	2.60986	0.09208	3.72410	4.54340	7/21/2014	TRUE
400-Foot Aquifer	14S/02E-25D51	Northern	4.64095	1.97490	2.67983	3.20626	2.69685	0.09463	3.66467	4.47090	8/18/2014	TRUE
400-Foot Aquifer	14S/02E-25D51	Northern	5.04017	2.22177	2.96192	3.16462	2.74035	0.09463	3.88257	4.73674	6/10/2015	TRUE
400-Foot Aquifer	14S/02E-25D51	Northern	5.53920	2.46863	3.46968	3.58102	2.95784	0.10742	4.10047	5.00258	7/13/2015	TRUE
400-Foot Aquifer	14S/02E-25D51	Northern	5.38949	3.04464	3.75176	3.49774	2.91434	0.11765	3.96181	4.83341	6/1/2016	TRUE
400-Foot Aquifer	14S/02E-25D51	Northern	5.63900	3.12693	4.09027	3.45610	2.82734	0.09208	3.90238	4.76090	8/15/2016	TRUE
400-Foot Aquifer	14S/02E-25D51	Northern	6.38754	2.63320	5.07757	3.43528	3.04483	0.12277	4.08066	4.97841	6/21/2017	TRUE
400-Foot Aquifer	14S/02E-25D51	Northern	6.53725	2.88007	5.41608	3.66430	3.04483	0.12277	4.10047	5.00258	8/7/2017	TRUE
400-Foot Aquifer	14S/02E-26C50	Northern	10.92869	4.60811	13.22990	2.29019	3.65380	0.13811	3.38735	4.13256	7/18/2011	TRUE
400-Foot Aquifer	14S/02E-26C50	Northern	10.92869	4.85497	15.26093	2.64413	3.56680	0.12277	3.34773	4.08423	8/11/2011	TRUE
400-Foot Aquifer	14S/02E-26C50	Northern	14.42188	6.74758	20.39492	2.49839	4.17577	0.15346	3.26849	3.98756	7/25/2012	TRUE
400-Foot Aquifer	14S/02E-26C50	Northern	16.61760	7.81732	23.58251	2.51921	4.43676	0.15090	3.24868	3.96339	8/28/2012	TRUE
400-Foot Aquifer	14S/02E-26C50	Northern	14.97081	6.74758	19.88717	2.62331	4.13227	0.15857	3.30811	4.03589	7/9/2013	TRUE
400-Foot Aquifer	14S/02E-26C50	Northern	13.57353	6.25386	17.54584	2.51921	4.04528	0.15346	3.28830	4.01173	8/5/2013	TRUE
400-Foot Aquifer	14S/02E-26C50	Northern	14.27217	6.50072	19.35120	2.51921	4.39326	0.14067	3.36754	4.10840	7/21/2014	TRUE
400-Foot Aquifer	14S/02E-26C50	Northern	16.36808	7.40588	23.07475	2.64413	4.78474	0.15346	3.34773	4.08423	8/19/2014	TRUE
400-Foot Aquifer	14S/02E-26C50	Northern	16.11857	7.65275	24.31594	2.72741	4.65424	0.15857	3.30811	4.03589	6/8/2015	TRUE
400-Foot Aquifer	14S/02E-26C50	Northern	14.77120	6.99445	20.87447	2.64413	4.43676	0.14834	3.40716	4.15673	7/13/2015	TRUE
400-Foot Aquifer	14S/02E-26C50	Northern	21.70767	12.67229	31.87588	3.03970	5.48070	0.19182	3.14964	3.84256	8/15/2016	TRUE
400-Foot Aquifer	14S/02E-26C50	Northern	21.30845	10.77967	31.59379	3.06052	5.35021	0.19950	3.22887	3.93923	6/9/2017	TRUE
400-Foot Aquifer	14S/02E-26C50	Northern	25.30066	11.60255	37.37659	3.31036	6.43765	0.22507	3.22887	3.93923	9/1/2017	TRUE
Aquitard + Deep Aquifers	14S/02E-26D01	Northern	1.39728	0.75705	0.84626	1.64477	3.69730	0.06138	3.48639	4.25340	6/4/2020	TRUE
Aquitard + Deep Aquifers	14S/02E-26D01	Northern	1.34737	0.76527	0.76164	1.66559	3.69730	0.07161	3.36754	4.10840	8/6/2020	TRUE
Aquitard + Deep Aquifers	14S/02E-26D01	Northern	1.29747	0.67476	0.90268	1.64477	4.21927	0.05883	3.50620	4.27756	6/11/2021	TRUE
Aquitard + Deep Aquifers	14S/02E-26D01	Northern	1.29747	0.66653	0.93089	1.66559	4.13227	0.06394	3.52601	4.30173	8/5/2021	TRUE
Deep Aquifers	14S/02E-26G01	Northern	2.04601	0.98745	0.78984	1.87379	3.17533	0.10231	3.58544	4.37423	6/17/2021	TRUE
Deep Aquifers	14S/02E-26G01	Northern	2.04601	1.06974	0.78984	1.89461	3.04483	0.07673	3.46658	4.22923	8/10/2021	TRUE
Aquitard + Deep Aquifers	14S/02E-27J02	Northern	1.19766	0.70767	1.01551	1.60313	4.08878	0.04604	3.46658	4.22923	6/25/2021	TRUE
Aquitard + Deep Aquifers	14S/02E-27J02	Northern	1.24757	0.67476	0.98731	1.62395	4.26277	0.05627	3.54582	4.32590	8/3/2021	TRUE
Deep Aquifers	14S/02E-27K02	Northern	1.64679	0.76527	3.94922	0.89526	4.91523	0.07161	2.85250	3.48005	6/2/2020	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
Deep Aquifers	14S/02E-27K02	Northern	1.64679	0.78996	3.94922	0.85362	5.21971	0.08184	2.91193	3.55255	8/5/2020	TRUE
Deep Aquifers	14S/02E-27K02	Northern	1.69669	0.75705	3.41326	1.04099	5.26321	0.11254	2.97136	3.62505	6/15/2021	TRUE
Deep Aquifers	14S/02E-27K02	Northern	1.64679	0.69122	4.45698	0.72870	5.78518	0.08184	2.73365	3.33505	8/3/2021	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.34737	0.82288	1.32581	1.66559	4.17577	0.05883	3.46658	4.22923	6/19/2009	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.49708	0.98745	0.67701	1.76969	3.39281	0.05883	3.52601	4.30173	7/23/2009	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.54698	0.98745	0.62059	1.60313	3.26232	0.06394	3.50620	4.27756	8/21/2009	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.39728	0.80642	1.41044	1.79051	4.21927	0.07673	3.56563	4.35007	8/19/2010	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.49708	0.98745	0.67701	1.70723	3.13183	0.05883	3.42696	4.18090	7/7/2011	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.59689	0.98745	0.70522	1.81133	3.26232	0.05883	3.46658	4.22923	8/4/2011	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.34737	0.82288	1.38223	1.70723	4.34976	0.07417	3.42696	4.18090	7/12/2012	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.59689	0.98745	0.67701	1.74887	3.21882	0.06138	3.42696	4.18090	8/23/2012	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.49708	0.90516	1.04372	1.68641	3.87129	0.06906	3.44677	4.20506	7/22/2013	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.29747	0.80642	1.32581	1.62395	4.39326	0.07161	3.42696	4.18090	8/8/2013	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.19766	0.74059	1.29760	1.60313	4.69774	0.06394	3.48639	4.25340	7/22/2014	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.14776	0.71590	1.38223	1.72805	4.56725	0.06138	3.44677	4.20506	8/20/2014	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.24757	0.82288	1.18477	1.66559	4.21927	0.06138	3.42696	4.18090	6/16/2015	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.24757	0.82288	1.12835	1.66559	4.17577	0.06394	3.44677	4.20506	7/14/2015	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.19766	0.81465	1.26939	1.58231	4.43676	0.07673	3.46658	4.22923	6/8/2016	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.14776	0.70767	1.32581	1.62395	4.61075	0.07161	3.48639	4.25340	8/1/2016	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.19766	0.70767	1.29760	1.58231	4.26277	0.06906	3.48639	4.25340	6/9/2017	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.24757	0.77350	1.26939	1.64477	4.17577	0.06906	3.62505	4.42257	8/17/2017	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.19766	0.75705	1.32581	1.70723	4.48025	0.06650	3.48639	4.25340	5/29/2018	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.19766	0.77350	1.35402	1.66559	4.65424	0.07673	3.46658	4.22923	8/15/2018	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.29747	0.81465	1.41044	1.62395	4.61075	0.06650	3.44677	4.20506	6/13/2019	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.19766	0.75705	1.35402	1.58231	4.48025	0.06650	3.36754	4.10840	8/8/2019	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.29747	0.78996	1.35402	1.60313	4.26277	0.06394	3.46658	4.22923	6/1/2020	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.29747	0.78996	1.32581	1.58231	4.34976	0.07161	3.52601	4.30173	8/3/2020	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.24757	0.72413	1.38223	1.60313	4.21927	0.11254	3.46658	4.22923	6/15/2021	TRUE
Aquitard + Deep Aquifers	14S/02E-28C02	Northern	1.24757	0.73236	1.38223	1.62395	4.39326	0.06394	3.50620	4.27756	8/9/2021	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	0.99805	0.65830	0.90268	1.43657	3.95828	0.08696	3.70429	4.51923	8/10/2007	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.19766	0.90516	0.87447	1.49903	4.13227	0.06906	3.46658	4.22923	7/17/2008	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.09786	0.70767	0.81805	1.51985	3.95828	0.07673	3.58544	4.37423	9/4/2008	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.04796	0.65830	0.84626	1.54067	3.95828	0.06138	3.50620	4.27756	6/16/2009	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.09786	0.66653	0.84626	1.62395	3.95828	0.06394	3.52601	4.30173	7/21/2009	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.09786	0.70767	0.78984	1.49903	4.04528	0.06650	3.44677	4.20506	8/21/2009	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.04796	0.60070	0.95910	1.51985	4.34976	0.07161	3.78353	4.61590	8/9/2010	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.04796	0.69122	0.90268	1.66559	4.04528	0.07417	3.34773	4.08423	7/21/2011	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	0.99805	0.59247	0.90268	1.58231	3.95828	0.06650	3.34773	4.08423	8/12/2011	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.14776	0.70767	0.90268	1.62395	4.00178	0.06650	3.48639	4.25340	7/20/2012	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.14776	0.71590	0.98731	1.68641	4.04528	0.06906	3.52601	4.30173	8/29/2012	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.09786	0.68299	0.84626	1.58231	4.08878	0.07417	3.36754	4.10840	7/17/2013	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.14776	0.70767	0.81805	1.58231	3.95828	0.07161	3.36754	4.10840	8/12/2013	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.09786	0.67476	0.81805	1.56149	4.21927	0.06650	3.54582	4.32590	7/18/2014	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.09786	0.67476	0.87447	1.66559	4.30626	0.06650	3.46658	4.22923	8/21/2014	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.04796	0.68299	0.78984	1.54067	4.21927	0.06650	3.42696	4.18090	6/8/2015	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.04796	0.67476	0.81805	1.56149	4.21927	0.06650	3.44677	4.20506	7/13/2015	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	0.99805	0.63361	0.81805	1.58231	4.04528	0.07673	3.42696	4.18090	5/31/2016	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.09786	0.72413	0.81805	1.60313	4.26277	0.07417	3.48639	4.25340	8/10/2016	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.09786	0.70767	0.81805	1.54067	4.17577	0.08184	3.38735	4.13256	6/6/2017	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.14776	0.65007	0.84626	1.64477	4.00178	0.07673	3.58544	4.37423	8/9/2017	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.09786	0.72413	0.81805	1.60313	4.04528	0.07161	3.50620	4.27756	6/4/2018	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.04796	0.67476	0.84626	1.62395	4.26277	0.07417	3.30811	4.03589	8/7/2018	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.19766	0.72413	0.90268	1.60313	4.26277	0.06906	3.42696	4.18090	6/14/2019	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.04796	0.65830	0.78984	1.54067	4.08878	0.07417	3.32792	4.06006	8/6/2019	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.14776	0.69122	0.81805	1.56149	4.08878	0.07161	3.54582	4.32590	8/12/2020	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.04796	0.61716	0.81805	1.58231	4.17577	0.08696	3.42696	4.18090	6/18/2021	TRUE
Aquitard + Deep Aquifers	14S/02E-28H04	Northern	1.14776	0.65830	0.81805	1.60313	4.13227	0.06394	3.42696	4.18090	8/3/2021	TRUE
Aquitard + Deep Aquifers	14S/02E-29C01	Northern	0.89825	0.50195	2.59520	1.20755	5.30671	0.05371	3.05059	3.72172	6/8/2018	TRUE
Aquitard + Deep Aquifers	14S/02E-29C01	Northern	0.39922	0.05760	4.03385	0.79116	6.35065	0.04860	1.92148	2.34420	8/15/2018	TRUE
Aquitard + Deep Aquifers	14S/02E-29C01	Northern	0.94815	0.50195	2.70804	1.20755	5.61119	0.05115	2.93174	3.57672	6/12/2019	TRUE
Aquitard + Deep Aquifers	14S/02E-29C01	Northern	0.84835	0.45258	2.56700	1.18673	5.43720	0.05627	2.85250	3.48005	8/6/2019	TRUE
Aquitard + Deep Aquifers	14S/02E-29C01	Northern	0.89825	0.46904	2.59520	1.20755	5.26321	0.05371	3.05059	3.72172	6/25/2020	TRUE
Aquitard + Deep Aquifers	14S/02E-29C01	Northern	0.94815	0.46904	2.56700	1.18673	5.39370	0.05371	3.05059	3.72172	8/13/2020	TRUE
Aquitard + Deep Aquifers	14S/02E-29C01	Northern	0.99805	0.42790	2.56700	1.20755	5.52420	0.02558	2.91193	3.55255	6/23/2021	TRUE
Aquitard + Deep Aquifers	14S/02E-29C01	Northern	0.99805	0.45258	2.56700	1.22837	5.52420	0.04604	3.03078	3.69756	8/13/2021	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.89825	0.09052	3.38505	1.22837	1.30493	0.28134	2.77327	3.38338	7/3/1991	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.94815	0.04855	3.38505	1.20755	6.52464	0.11765	2.77327	3.38338	7/7/1993	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.84835	0.05925	3.38505	1.08263	6.52464	0.05627	2.37708	2.90004	7/6/1994	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.74854	0.05020	3.10296	0.99935	5.65469	0.10231	2.57518	3.14171	7/5/1995	TRUE
Deep Aquifers	14S/02E-30G03	Northern	1.04796	0.05925	3.10296	0.81198	6.52464	0.12277	2.77327	3.38338	7/3/1996	TRUE
Deep Aquifers	14S/02E-30G03	Northern	1.04796	0.06748	3.66714	1.02017	6.52464	0.07673	2.97136	3.62505	7/7/1999	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.72359	0.04937	3.15938	1.00560	5.65469	0.08312	2.71384	3.31088	7/5/2000	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.20959	0.02057	2.82087	0.54132	4.78474	0.05883	1.98090	2.41670	7/2/2001	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.21957	0.02057	2.56700	0.43722	4.65424	0.04860	1.74320	2.12670	7/2/2002	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.74854	0.02057	2.59520	0.47886	5.65469	0.10231	2.35728	2.87588	7/7/2003	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.94815	0.05431	3.38505	0.93689	6.08967	0.11765	2.47613	3.02088	7/6/2004	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.99805	0.05596	3.66714	1.02017	6.08967	0.12021	2.61479	3.19005	7/12/2005	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.99805	0.05513	3.66714	1.02017	6.52464	0.11765	2.63460	3.21421	7/11/2006	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.29942	0.03127	2.70804	0.54132	4.78474	0.06138	2.07995	2.53754	7/10/2007	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.18963	0.03045	2.56700	0.45804	4.30626	0.05115	1.82243	2.22337	7/15/2008	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.26947	0.02551	2.51058	0.43722	4.34976	0.05627	1.80262	2.19920	7/14/2009	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.24951	0.04773	2.25670	1.35329	4.78474	0.05115	1.82243	2.22337	7/14/2010	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.79844	0.05184	3.38505	0.89526	5.65469	0.09719	2.57518	3.14171	8/3/2010	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.18464	0.03292	2.59520	0.45804	4.26277	0.05115	1.76300	2.15087	7/20/2011	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
Deep Aquifers	14S/02E-30G03	Northern	0.18464	0.03868	2.53879	0.45804	4.78474	0.05883	1.68377	2.05420	7/24/2012	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.16967	0.03456	2.45416	0.45804	4.26277	0.05115	1.74320	2.12670	7/16/2013	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.15969	0.03209	2.28491	0.43722	4.21927	0.05627	1.48568	1.81253	7/8/2014	TRUE
Deep Aquifers	14S/02E-30G03	Northern	0.14971	0.03868	2.22849	0.47886	4.34976	0.06394	1.68377	2.05420	7/7/2015	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.54698	0.45258	1.46685	1.29083	3.26232	0.10231	2.17899	2.65837	1/2/1985	TRUE
Deep Aquifers	14S/02E-31H01	Northern	0.64873	0.16458	2.20028	0.81198	3.30582	0.10231	1.42625	1.74003	1/6/1986	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.29747	0.49373	1.49506	1.16591	2.95784	0.10231	2.37708	2.90004	1/5/1987	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.14776	0.38675	1.69252	1.08263	2.69685	0.12788	2.02052	2.46504	12/31/1987	TRUE
Deep Aquifers	14S/02E-31H01	Northern	0.79844	0.04114	2.14386	0.47886	3.04483	0.10742	1.18854	1.45002	12/7/1988	TRUE
Deep Aquifers	14S/02E-31H01	Northern	0.79844	0.10697	1.69252	6.03777	3.65380		1.62434	1.98170	2/14/1990	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.24757	0.29624	1.60790	1.04099	3.43631	0.05883	2.17899	2.65837	1/23/1991	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.09786	0.46081	1.69252	1.06181	2.60986	0.02558	2.17899	2.65837	7/3/1991	TRUE
Deep Aquifers	14S/02E-31H01	Northern	0.64873	0.03703	2.00282	0.49968	2.87084	0.05371	1.52530	1.86086	7/15/1992	TRUE
Deep Aquifers	14S/02E-31H01	Northern	0.64873	0.05925	2.00282	0.52050	3.08833	0.05115	1.50549	1.83669	7/7/1993	TRUE
Deep Aquifers	14S/02E-31H01	Northern	0.84835	0.22218	1.72073	0.54132	3.17533	0.02558	1.66396	2.03003	7/6/1994	TRUE
Deep Aquifers	14S/02E-31H01	Northern	0.69864	0.13166	1.74894	0.85362	3.00134	0.05371	1.56491	1.90920	7/5/1995	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.09786	0.41144	1.43865	0.81198	3.13183	0.05627	2.37708	2.90004	7/3/1996	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.19766	0.49373	1.41044	0.95771	3.08833	0.00064	2.17899	2.65837	7/7/1999	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.20265	0.54886	1.28914	1.18882	2.92304	0.04834	2.45632	2.99671	7/5/2000	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.14776	0.49373	1.46685	1.04099	3.30582	0.06138	2.29785	2.80338	7/2/2001	TRUE
Deep Aquifers	14S/02E-31H01	Northern	0.69864	0.02057	2.00282	0.49968	3.17533	0.04604	1.54511	1.88503	7/2/2002	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.14776	0.55133	1.41044	1.02017	3.08833	0.05627	2.25823	2.75504	7/7/2003	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.19766	0.52664	1.43865	0.93689	3.08833	0.05627	2.07995	2.53754	7/6/2004	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.19766	0.54310	1.49506	1.04099	3.08833	0.05627	2.17899	2.65837	7/12/2005	TRUE
Deep Aquifers	14S/02E-31H01	Northern	0.74854	0.08229	2.22849	0.47886	3.08833	0.05371	1.38663	1.69169	7/15/2008	TRUE
Deep Aquifers	14S/02E-31H01	Northern	0.99805	0.33738	0.62059	0.87444	2.95784	0.05627	1.96110	2.39254	7/14/2009	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.19766	0.52664	1.49506	0.99935	2.95784	0.04860	2.17899	2.65837	7/14/2010	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.19766	0.53487	1.52327	0.97853	3.04483	0.05627	2.17899	2.65837	7/20/2011	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.19766	0.53487	1.52327	0.95771	3.21882	0.05883	1.94129	2.36837	7/24/2012	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.09786	0.52664	1.52327	0.99935	2.91434	0.04860	1.98090	2.41670	7/16/2013	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.14776	0.52664	1.46685	0.99935	3.08833	0.05115	1.98090	2.41670	7/8/2014	TRUE
Deep Aquifers	14S/02E-31H01	Northern	0.79844	0.04279	2.34133	0.54132	3.34932	0.05883	1.28759	1.57086	7/7/2015	TRUE
Deep Aquifers	14S/02E-31H01	Northern	0.79844	0.04444	2.31312	0.52050	3.30582	0.04860	1.28759	1.57086	7/12/2016	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.14776	0.49373	1.72073	0.97853	2.95784	0.05115	1.98090	2.41670	7/18/2017	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.04796	0.48550	1.52327	0.97853	2.91434	0.04604	2.19880	2.68254	6/18/2018	TRUE
Deep Aquifers	14S/02E-31H01	Northern	0.69864	0.09052	2.28491	0.54132	3.39281	0.05115	1.36682	1.66753	9/10/2018	TRUE
Deep Aquifers	14S/02E-31H01	Northern	0.69864	0.07406	2.22849	0.52050	3.21882	0.04348	1.36682	1.66753	6/24/2019	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.04796	0.45258	1.55148	0.95771	3.00134	0.04860	2.04033	2.48920	8/12/2019	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.09786	0.41967	1.69252	0.95771	2.95784	0.04604	2.07995	2.53754	6/8/2020	TRUE
Deep Aquifers	14S/02E-31H01	Northern	0.89825	0.23863	1.97461	0.66624	3.17533	0.05115	1.64415	2.00586	8/18/2020	TRUE
Deep Aquifers	14S/02E-31H01	Northern	1.24757	0.45258	1.46685	1.02017	3.00134	0.04092	2.17899	2.65837	8/11/2021	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
Deep Aquifers	14S/02E-32D04	Northern	1.09786	0.49373	2.25670	1.24919	4.34976	0.11509	2.57518	3.14171	1/6/1986	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.24757	0.08229	2.70804	1.16591	3.65380	0.04604	1.42625	1.74003	4/2/1987	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.19766	0.63361	2.14386	0.97853	3.82779	0.09975	2.17899	2.65837	12/7/1988	TRUE
Deep Aquifers	14S/02E-32D04	Northern	0.99805	0.44435	1.97461	0.77034	4.34976		1.90167	2.32003	2/14/1990	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.19766	0.21395	3.10296	0.79116	4.78474	0.10742	1.82243	2.22337	1/23/1991	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.09786	0.24686	2.79267	0.74952	4.26277	0.02558	1.90167	2.32003	7/3/1991	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.19766	0.60070	2.00282	1.20755	4.21927	0.04092	2.97136	3.62505	7/1/1992	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.14776	0.44435	2.82087	0.77034	4.13227	0.07417	2.17899	2.65837	7/7/1993	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.24757	0.59247	1.66432	1.20755	4.34976	0.08696	3.16945	3.86672	7/6/1994	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.24757	0.50195	2.65162	0.91608	4.04528	0.07417	2.77327	3.38338	7/5/1995	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.29747	0.60893	1.74894	1.04099	4.21927	0.07673	2.97136	3.62505	7/3/1996	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.24757	0.61716	1.74894	1.16591	4.13227	0.03581	2.97136	3.62505	7/7/1999	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.25256	0.63691	1.75458	1.30541	3.96263	0.05806	3.11002	3.79422	7/5/2000	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.24757	0.60893	1.88999	1.24919	4.34976	0.07417	2.95155	3.60089	7/2/2001	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.24757	0.26332	3.10296	0.79116	3.95828	0.08440	2.00071	2.44087	7/2/2002	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.24757	0.68299	1.83357	1.27001	4.21927	0.06650	2.93174	3.57672	7/7/2003	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.34737	0.60070	1.83357	1.20755	4.21927	0.07161	2.65441	3.23838	7/6/2004	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.34737	0.66653	1.88999	1.31165	4.34976	0.06906	2.81288	3.43172	7/12/2005	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.34737	0.62539	1.88999	1.31165	4.78474	0.07161	2.49594	3.04505	7/11/2006	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.19766	0.24686	3.10296	0.79116	3.87129	0.08184	2.97136	3.62505	7/10/2007	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.24757	0.64184	1.97461	1.39493	4.00178	0.06650	2.95155	3.60089	7/15/2008	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.24757	0.27155	2.82087	0.72870	4.08878	0.08952	2.17899	2.65837	7/14/2009	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.34737	0.64184	1.91819	1.29083	4.17577	0.06394	2.97136	3.62505	7/14/2010	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.29747	0.65007	1.91819	1.31165	4.00178	0.06394	2.77327	3.38338	7/20/2011	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.39728	0.24686	3.10296	0.79116	4.34976	0.09719	1.70358	2.07836	7/24/2012	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.39728	0.64184	2.14386	1.20755	4.34976	0.07929	2.77327	3.38338	7/30/2013	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.44718	0.25509	3.10296	0.79116	4.34976	0.09463	1.90167	2.32003	7/22/2014	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.49708	0.19749	3.10296	0.79116	4.78474	0.10231	1.98090	2.41670	7/7/2015	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.29747	0.63361	1.94640	1.27001	4.21927	0.06650	2.77327	3.38338	7/12/2016	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.49708	0.13989	3.38505	0.81198	4.34976	0.09975	2.17899	2.65837	7/18/2017	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.44718	0.12343	3.27221	0.81198	4.34976	0.09208	2.17899	2.65837	6/18/2018	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.24757	0.58424	2.03103	1.31165	4.43676	0.06906	2.91193	3.55255	9/10/2018	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.24757	0.61716	1.97461	1.29083	4.17577	0.05627	2.85250	3.48005	6/24/2019	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.39728	0.18926	3.21580	0.79116	4.48025	0.09208	2.11957	2.58587	8/12/2019	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.59689	0.09052	3.38505	0.81198	4.52375	0.10742	2.25823	2.75504	6/8/2020	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.34737	0.58424	1.97461	1.24919	4.26277	0.06394	2.95155	3.60089	8/18/2020	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.69669	0.98745	1.77715	1.10345	3.08833	0.04860	2.95155	3.60089	6/30/2021	TRUE
Deep Aquifers	14S/02E-32D04	Northern	1.69669	0.25509	3.35684	0.85362	4.69774	0.08696	2.33747	2.85171	8/11/2021	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.89436	1.31660	2.48237	1.02017	1.26143	0.05883	1.34701	1.64336	7/14/2000	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.79455	1.39889	2.45416	1.04099	1.21793	0.05883	1.34701	1.64336	8/15/2000	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.59494	1.39889	2.28491	1.14509	1.26143	0.06138	1.46587	1.78836	9/19/2000	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-32D06	Northern	2.94426	1.31660	2.48237	1.06181	1.21793	0.05627	1.38663	1.69169	6/27/2001	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.64484	1.23431	2.53879	1.10345	1.21793	0.06138	1.74320	2.12670	7/9/2002	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.69475	1.31660	2.25670	1.06181	1.30493	0.07673	1.58472	1.93336	9/8/2003	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.74465	1.31660	2.36953	1.10345	1.26143	0.06906	1.64415	2.00586	6/16/2004	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.74465	1.31660	2.42595	0.95771	1.26143	0.05883	1.62434	1.98170	6/15/2005	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.69475	1.31660	2.25670	1.20755	1.52242	0.06138	1.66396	2.03003	6/14/2006	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.59494	1.39889	1.91819	1.22837	1.60941	0.08440	1.88186	2.29587	8/1/2007	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.74465	1.31660	1.74894	1.39493	1.26143	0.05371	1.90167	2.32003	7/15/2009	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.69475	1.31660	1.66432	1.45739	1.21793	0.04860	2.06014	2.51337	8/13/2009	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.64484	1.23431	1.63611	1.39493	1.26143	0.06138	2.06014	2.51337	8/5/2010	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.74465	1.31660	1.60790	1.33247	1.30493	0.05371	2.00071	2.44087	7/11/2011	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.69475	1.39889	1.72073	1.45739	1.30493	0.05883	1.94129	2.36837	8/2/2011	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.74465	1.31660	1.69252	1.41575	1.30493	0.06138	1.94129	2.36837	7/10/2012	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.64484	1.31660	1.52327	1.47821	1.26143	0.05371	1.96110	2.39254	8/14/2012	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.74465	1.31660	1.43865	1.45739	1.26143	0.06138	2.06014	2.51337	7/11/2013	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.74465	1.31660	1.41044	1.45739	1.26143	0.06394	2.09976	2.56171	8/8/2013	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.64484	1.23431	1.41044	1.47821	1.39192	0.05883	2.21861	2.70671	7/18/2014	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.59494	1.23431	1.49506	1.56149	1.43542	0.05883	2.23842	2.73087	8/21/2014	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.59494	1.23431	1.43865	1.43657	1.39192	0.05627	2.27804	2.77921	6/10/2015	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.49513	1.23431	1.38223	1.54067	1.43542	0.06138	2.27804	2.77921	7/21/2015	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.49513	1.39889	1.41044	1.49903	1.39192	0.06650	2.29785	2.80338	6/6/2016	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.54504	1.31660	1.35402	1.54067	1.43542	0.06650	2.33747	2.85171	8/1/2016	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.69475	1.31660	1.43865	1.49903	1.43542	0.06650	2.37708	2.90004	6/20/2017	TRUE
400-Foot Aquifer	14S/02E-32D06	Northern	2.74465	1.48118	1.49506	1.56149	1.52242	0.06906	2.39689	2.92421	8/22/2017	TRUE
400-Foot Aquifer	14S/02E-33Q01	Northern	3.64290	1.64575	3.58251	1.10345	1.56591	0.07673	1.90167	2.32003	6/25/2001	TRUE
400-Foot Aquifer	14S/02E-33Q01	Northern	3.44329	1.64575	3.38505	1.16591	1.69641	0.08184	1.92148	2.34420	7/2/2002	TRUE
400-Foot Aquifer	14S/02E-33Q01	Northern	3.39338	1.72804	3.38505	1.14509	1.73990	0.07929	1.92148	2.34420	7/7/2003	TRUE
400-Foot Aquifer	14S/02E-33Q01	Northern	3.19377	1.56346	3.10296	1.08263	1.65291	0.07417	1.81055	2.20887	7/6/2004	TRUE
400-Foot Aquifer	14S/02E-33Q01	Northern	2.99416	1.39889	2.53879	1.16591	1.60941	0.07417	1.80857	2.20645	7/12/2005	TRUE
400-Foot Aquifer	14S/02E-34A03	Northern	2.49513	1.15203	0.59238	2.66495	1.95739	0.07929	3.16945	3.86672	9/3/1997	TRUE
400-Foot Aquifer	14S/02E-34A03	Northern	2.79455	1.15203	0.73343	1.99871	2.00089	0.08184	3.16945	3.86672	8/4/1999	TRUE
400-Foot Aquifer	14S/02E-34A03	Northern	2.79455	1.15203	0.81805	2.08199	1.91389	0.06394	3.16945	3.86672	7/23/2009	TRUE
400-Foot Aquifer	14S/02E-34A03	Northern	2.94426	1.15203	0.81805	1.99871	1.82690	0.07673	3.03078	3.69756	7/10/2012	TRUE
400-Foot Aquifer	14S/02E-34A03	Northern	2.74465	1.15203	0.84626	1.97789	2.04439	0.07161	3.16945	3.86672	8/13/2012	TRUE
400-Foot Aquifer	14S/02E-34A03	Northern	2.74465	1.15203	0.73343	2.01953	2.04439	0.07929	3.16945	3.86672	7/9/2013	TRUE
400-Foot Aquifer	14S/02E-34A03	Northern	2.94426	1.15203	0.70522	1.91543	1.78340	0.07673	3.01097	3.67339	8/8/2013	TRUE
400-Foot Aquifer	14S/02E-34A03	Northern	2.64484	1.06974	0.67701	1.89461	2.17488	0.07161	3.20906	3.91506	7/22/2014	TRUE
400-Foot Aquifer	14S/02E-34A03	Northern	2.84445	1.06974	0.76164	2.04035	1.82690	0.06906	3.05059	3.72172	8/19/2014	TRUE
400-Foot Aquifer	14S/02E-34A03	Northern	2.69475	1.06974	0.70522	1.95707	1.69641	0.06906	3.05059	3.72172	6/9/2015	TRUE
400-Foot Aquifer	14S/02E-34A03	Northern	2.69475	1.06974	0.73343	1.97789	1.78340	0.07161	3.12983	3.81839	7/20/2015	TRUE
400-Foot Aquifer	14S/02E-34A03	Northern	2.64484	1.06974	0.73343	1.93625	1.73990	0.08184	3.05059	3.72172	5/31/2016	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-34A03	Northern	2.59494	1.15203	0.70522	1.95707	2.04439	0.07929	3.22887	3.93923	8/1/2016	TRUE
400-Foot Aquifer	14S/02E-34A03	Northern	2.79455	0.98745	0.73343	1.89461	1.78340	0.07417	3.01097	3.67339	6/6/2017	TRUE
400-Foot Aquifer	14S/02E-34A03	Northern	2.59494	0.98745	0.70522	1.95707	2.08789	0.08184	3.28830	4.01173	8/30/2017	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	5.18988	2.13948	1.69252	2.91478	1.95739	0.10742	5.15035	6.28343	7/11/2002	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	5.63900	2.22177	1.88999	2.74823	1.95739	0.11254	5.07111	6.18676	9/19/2003	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	5.68891	2.22177	2.08745	2.76904	1.91389	0.11254	5.70500	6.96010	6/28/2004	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	5.93842	2.30405	2.25670	2.20691	1.95739	0.10998	5.90309	7.20177	6/22/2005	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	5.43939	2.30405	2.20028	2.49839	1.91389	0.10486	5.54653	6.76677	7/5/2006	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	5.63900	2.63320	2.28491	2.37347	2.13138	0.13044	5.82386	7.10511	8/9/2007	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	6.28774	2.46863	2.53879	2.51921	2.08789	0.10998	5.80405	7.08094	6/23/2008	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	7.48540	2.88007	2.84908	2.76904	2.30537	0.12788	6.47756	7.90262	9/25/2008	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	6.38754	2.63320	2.62341	2.49839	2.04439	0.10231	6.20023	7.56428	6/3/2009	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	6.33764	2.46863	2.59520	2.62331	2.04439	0.09975	5.86348	7.15344	7/10/2009	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	6.43745	2.38634	2.34133	2.26937	2.00089	0.09975	5.74462	7.00844	8/14/2009	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	6.98638	2.55092	2.76446	2.58167	2.08789	0.11254	6.16061	7.51595	8/20/2010	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	6.73686	2.38634	2.87729	2.74823	2.13138	0.10742	6.04176	7.37094	7/19/2011	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	6.98638	2.63320	3.10296	3.03970	2.13138	0.11509	5.92290	7.22594	8/11/2011	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	7.08618	2.79778	3.07475	2.95642	2.21838	0.11765	6.16061	7.51595	7/10/2012	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	7.33570	2.88007	3.04654	2.91478	2.17488	0.11254	6.43794	7.85428	8/20/2012	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	7.43550	2.79778	2.93371	2.91478	2.21838	0.12277	6.25966	7.63678	7/17/2013	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	7.43550	2.88007	3.04654	2.99806	2.34887	0.11765	6.27947	7.66095	8/6/2013	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	7.68501	2.88007	4.14669	2.85232	2.52286	0.11254	6.10118	7.44345	7/24/2014	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	7.98443	3.04464	4.88011	2.99806	2.56636	0.11765	6.02195	7.34678	8/19/2014	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	8.18404	3.20922	5.07757	2.87314	2.52286	0.12021	6.04176	7.37094	6/10/2015	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	8.08424	3.29150	5.52891	2.85232	2.56636	0.12533	6.04176	7.37094	7/15/2015	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	8.48346	3.86752	5.72638	2.81068	2.47936	0.13556	5.94271	7.25011	6/17/2016	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	8.68307	3.94980	6.62906	2.81068	2.56636	0.13300	5.66539	6.91177	8/2/2016	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	8.43355	3.53837	5.83921	2.89396	2.43587	0.12277	6.02195	7.34678	6/9/2017	TRUE
400-Foot Aquifer	14S/02E-34A04	Northern	9.08229	3.45608	6.68547	2.93560	2.65335	0.15346	6.02195	7.34678	9/1/2017	TRUE
Aquitard + Deep Aquifers	14S/02E-34M01	Northern	2.19572	0.74059	4.17489	0.81198	5.87218	0.18415	3.54582	4.32590	6/17/2021	TRUE
Aquitard + Deep Aquifers	14S/02E-34M01	Northern	2.14582	0.77350	4.28773	0.85362	5.78518	0.12788	3.56563	4.35007	8/5/2021	TRUE
400-Foot Aquifer	14S/02E-36F03	Southeastern	8.63317	3.62065	3.35684	6.22515	2.34887	0.11765	4.83341	5.89676	7/26/2012	TRUE
400-Foot Aquifer	14S/02E-36F03	Southeastern	8.08424	3.37379	3.01834	5.55891	2.26188	0.11509	4.65512	5.67925	8/15/2012	TRUE
400-Foot Aquifer	14S/02E-36F03	Southeastern	7.88462	3.20922	2.87729	5.66301	2.21838	0.11509	4.55608	5.55842	7/10/2013	TRUE
400-Foot Aquifer	14S/02E-36F03	Southeastern	7.48540	3.04464	2.70804	5.30907	2.26188	0.11254	4.55608	5.55842	8/5/2013	TRUE
400-Foot Aquifer	14S/02E-36F03	Southeastern	7.88462	3.20922	2.79267	5.30907	2.52286	0.10742	4.99188	6.09009	7/28/2014	TRUE
400-Foot Aquifer	14S/02E-36F03	Southeastern	7.78482	3.12693	3.04654	5.80875	2.52286	0.10998	4.73436	5.77592	8/20/2014	TRUE
400-Foot Aquifer	14S/02E-36F03	Southeastern	7.78482	3.29150	3.10296	5.85039	2.47936	0.10998	4.93245	6.01759	6/15/2015	TRUE
400-Foot Aquifer	14S/02E-36F03	Southeastern	7.63511	3.29150	3.13117	5.89203	2.47936	0.11509	4.93245	6.01759	7/14/2015	TRUE
400-Foot Aquifer	14S/02E-36F03	Southeastern	7.78482	4.11438	3.15938	5.85039	2.43587	0.13300	4.87302	5.94509	6/1/2016	TRUE
400-Foot Aquifer	14S/02E-36F03	Southeastern	7.58521	3.62065	3.24401	5.97531	2.39237	0.11509	4.99188	6.09009	8/1/2016	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/02E-36F03	Southeastern	7.73492	3.20922	3.18759	5.74629	2.34887	0.10998	4.99188	6.09009	6/8/2017	TRUE
400-Foot Aquifer	14S/02E-36F03	Northern	8.53336	3.45608	3.61072	6.53744	2.65335	0.13811	5.22959	6.38010	9/1/2017	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	2.19572	0.98745	0.42313	1.54067	1.30493	0.07929	2.45632	2.99671	8/14/1980	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	2.54504	0.82288	0.42313	1.64477	1.56591	0.10486	5.07111	6.18676	7/22/1985	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	4.89046	2.22177	2.03103	4.03906	1.82690	0.10231	3.44677	4.20506	8/28/1992	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	4.79066	2.38634	2.36953	3.93496	1.73990	0.10486	3.80334	4.64007	7/8/1993	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	5.93842	2.71549	3.66714	4.74693	1.73990	0.10486	4.35799	5.31675	6/27/1995	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	6.93647	2.96235	2.76446	5.26743	2.04439	0.11254	4.23913	5.17174	9/7/1995	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	6.53725	2.79778	2.76446	5.08005	2.39237	0.10231	4.23913	5.17174	6/25/1996	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	6.28774	2.96235	2.73625	4.91349	2.08789	0.12788	4.23913	5.17174	7/21/1999	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	6.08813	2.55092	2.45416	5.08005	1.91389	0.10742	4.15990	5.07508	6/13/2001	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	7.03628	2.96235	3.10296	5.24661	2.13138	0.12021	4.67493	5.70342	7/8/2002	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	8.18404	3.62065	3.63893	6.05859	2.74035	0.14323	5.15035	6.28343	8/27/2003	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	7.93453	3.45608	3.52609	5.89203	2.56636	0.13300	5.17016	6.30759	6/28/2004	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	8.18404	3.53837	3.44147	5.32989	2.65335	0.13044	5.22959	6.38010	6/22/2005	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	7.13608	3.37379	3.44147	6.12105	3.00134	0.13300	4.95226	6.04176	6/14/2006	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	8.08424	3.62065	3.66714	6.05859	3.43631	0.15346	5.46730	6.67010	7/30/2007	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	9.18209	3.70294	3.80818	6.43335	3.00134	0.14323	5.40787	6.59760	6/23/2008	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	8.68307	3.70294	3.61072	6.28761	3.13183	0.14834	5.30882	6.47676	9/3/2008	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	9.23200	4.19667	3.94922	7.05794	3.26232	0.13556	5.90309	7.20177	6/3/2009	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	9.68112	4.11438	4.09027	7.34942	3.39281	0.14067	5.78424	7.05677	7/9/2009	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	10.08034	4.44353	4.25952	7.59926	3.52331	0.14067	5.70500	6.96010	8/12/2009	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	10.03044	3.94980	4.14669	7.43270	3.47981	0.14834	5.88329	7.17761	8/5/2010	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	9.58132	3.53837	3.97743	6.95384	3.34932	0.14323	5.50691	6.71843	7/14/2011	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	10.08034	3.70294	4.23131	7.55762	3.43631	0.14834	5.56634	6.79094	8/1/2011	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	9.83083	4.11438	4.34415	7.68254	3.65380	0.15346	5.74462	7.00844	7/9/2012	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	10.27995	4.27895	4.28773	7.62008	3.69730	0.14834	5.80405	7.08094	8/15/2012	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	10.72908	4.36124	4.34415	8.57779	3.95828	0.16113	5.94271	7.25011	7/9/2013	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	10.27995	4.27895	4.03385	8.05730	4.04528	0.16113	6.04176	7.37094	8/5/2013	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	10.47956	4.27895	4.17489	8.09894	4.56725	0.15346	6.22004	7.58845	7/22/2014	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	10.82888	4.44353	4.48519	8.99419	4.74124	0.15346	5.94271	7.25011	8/22/2014	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	10.82888	4.52582	4.54161	9.24403	4.87173	0.16369	6.65584	8.12012	6/15/2015	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	10.37976	4.44353	4.48519	9.11911	4.78474	0.16369	6.69546	8.16846	7/14/2015	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	10.47956	4.93726	4.45698	9.13993	4.82823	0.19182	6.59641	8.04762	6/2/2016	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	10.32986	4.85497	4.56982	9.32731	4.87173	0.14579	5.76443	7.03261	8/1/2016	TRUE
400-Foot Aquifer	14S/02E-36G01	Southeastern	10.52947	4.60811	4.54161	9.24403	5.00223	0.18415	6.89355	8.41013	6/8/2017	TRUE
400-Foot Aquifer	14S/02E-36G01	Northern	10.87879	5.01954	4.65444	9.86863	5.13272	0.19950	7.17087	8.74846	8/9/2017	TRUE
EAST SIDE DEEP	14S/03E-06F01	Northern	3.14387	1.48118	4.93653	0.58296	4.69774	0.06138	3.70429	4.51923	7/14/2015	TRUE
EAST SIDE DEEP	14S/03E-06F01	Northern	3.89241	1.81033	4.85190	0.47886	3.74079	0.07417	3.72410	4.54340	6/6/2016	TRUE
EAST SIDE DEEP	14S/03E-06F01	Northern	4.04212	2.05719	4.73907	0.47886	3.52331	0.07161	3.78353	4.61590	8/10/2016	TRUE
EAST SIDE DEEP	14S/03E-06F01	Northern	4.19183	1.81033	5.13399	0.52050	3.74079	0.07673	3.80334	4.64007	8/29/2017	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
EAST SIDE DEEP	14S/03E-07K51	Northern	1.39728	0.73236	1.57969	0.33312	2.74035	0.03325	3.14964	3.84256	7/20/2011	TRUE
EAST SIDE DEEP	14S/03E-07K51	Northern	1.49708	0.76527	1.60790	0.35394	2.74035	0.03581	3.11002	3.79422	8/11/2011	TRUE
EAST SIDE DEEP	14S/03E-07K51	Northern	1.54698	0.78173	1.52327	0.33312	2.82734	0.04092	3.22887	3.93923	7/13/2012	TRUE
EAST SIDE DEEP	14S/03E-07K51	Northern	1.54698	0.78996	1.52327	0.31230	2.74035	0.03581	3.11002	3.79422	8/16/2012	TRUE
EAST SIDE DEEP	14S/03E-07K51	Northern	1.54698	0.78173	1.43865	0.33312	2.82734	0.04348	3.24868	3.96339	7/8/2013	TRUE
EAST SIDE DEEP	14S/03E-07K51	Northern	1.54698	0.79819	1.43865	0.35394	2.74035	0.04348	3.12983	3.81839	8/13/2013	TRUE
EAST SIDE DEEP	14S/03E-07K51	Northern	1.49708	0.77350	1.52327	0.37476	3.00134	0.03836	3.26849	3.98756	8/6/2014	TRUE
EAST SIDE DEEP	14S/03E-07K51	Northern	1.54698	0.82288	1.52327	0.35394	2.95784	0.03836	3.18926	3.89089	8/19/2014	TRUE
EAST SIDE DEEP	14S/03E-07K51	Northern	1.44718	0.78996	1.41044	0.33312	2.78385	0.03836	3.20906	3.91506	6/9/2015	TRUE
EAST SIDE DEEP	14S/03E-07K51	Northern	1.44718	0.78173	1.46685	0.39558	2.82734	0.03836	3.14964	3.84256	7/13/2015	TRUE
EAST SIDE DEEP	14S/03E-07K51	Northern	1.44718	0.73236	1.46685	0.41640	2.74035	0.04604	3.09021	3.77006	6/2/2016	TRUE
EAST SIDE DEEP	14S/03E-07K51	Northern	1.44718	0.81465	1.46685	0.39558	2.74035	0.04348	3.14964	3.84256	8/2/2016	TRUE
EAST SIDE DEEP	14S/03E-07K51	Northern	1.49708	0.82288	1.46685	0.37476	2.69685	0.03836	3.14964	3.84256	6/6/2017	TRUE
EAST SIDE DEEP	14S/03E-07K51	Northern	1.59689	0.78996	1.55148	0.45804	2.69685	0.04604	3.22887	3.93923	8/9/2017	TRUE
400-ft and Deep Aquifers	14S/03E-07P50	Northern	1.69669	0.90516	1.63611	0.62460	2.43587	0.04092	2.89212	3.52839	7/20/2011	TRUE
400-ft and Deep Aquifers	14S/03E-07P50	Northern	1.64679	0.98745	1.63611	0.58296	2.26188	0.04092	2.79307	3.40755	8/15/2011	TRUE
400-ft and Deep Aquifers	14S/03E-07P50	Northern	1.74659	0.98745	1.60790	0.64542	2.52286	0.04092	2.99117	3.64922	7/17/2012	TRUE
400-ft and Deep Aquifers	14S/03E-07P50	Northern	1.74659	0.98745	1.63611	0.66624	2.56636	0.04348	2.97136	3.62505	8/16/2012	TRUE
400-ft and Deep Aquifers	14S/03E-07P50	Northern	1.74659	0.98745	1.52327	0.64542	2.52286	0.04604	2.89212	3.52839	7/22/2013	TRUE
400-ft and Deep Aquifers	14S/03E-07P50	Northern	1.64679	0.90516	1.57969	0.70788	2.60986	0.04604	2.93174	3.57672	8/29/2013	TRUE
400-ft and Deep Aquifers	14S/03E-07P50	Northern	1.59689	0.90516	1.55148	0.72870	2.87084	0.04348	2.99117	3.64922	7/30/2014	TRUE
400-ft and Deep Aquifers	14S/03E-07P50	Northern	1.59689	0.90516	1.60790	0.70788	2.74035	0.04604	2.97136	3.62505	8/20/2014	TRUE
400-ft and Deep Aquifers	14S/03E-07P50	Northern	1.64679	0.98745	1.52327	0.66624	2.65335	0.04348	3.03078	3.69756	6/9/2015	TRUE
400-ft and Deep Aquifers	14S/03E-07P50	Northern	1.84640	0.98745	1.52327	0.66624	2.52286	0.04348	3.03078	3.69756	7/16/2015	TRUE
400-ft and Deep Aquifers	14S/03E-07P50	Northern	1.64679	0.82288	1.55148	0.70788	2.60986	0.04604	3.01097	3.67339	6/2/2016	TRUE
400-ft and Deep Aquifers	14S/03E-07P50	Northern	1.64679	0.90516	1.55148	0.72870	2.69685	0.04860	2.85250	3.48005	8/4/2016	TRUE
400-ft and Deep Aquifers	14S/03E-07P50	Northern	1.79650	0.98745	1.55148	0.72870	2.60986	0.04860	3.07040	3.74589	6/20/2017	TRUE
400-ft and Deep Aquifers	14S/03E-07P50	Northern	1.74659	0.90516	1.55148	0.81198	2.43587	0.04860	2.93174	3.57672	8/7/2017	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.19572	0.98745	0.90268	0.18738	1.47892	0.05115	3.48639	4.25340	10/6/1994	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	1.74659	0.90516	0.90268	0.18738	1.47892	0.04860	2.89212	3.52839	4/25/1995	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.09591	0.98745	0.81805	0.10410	1.34843	0.04860	3.52601	4.30173	7/25/1995	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.04601	0.90516	1.01551	0.14574	1.26143	0.04860	3.28830	4.01173	10/25/1995	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	1.99611	0.98745	1.07193	0.06246	1.34843	0.05115	3.38735	4.13256	4/22/1996	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.09591	0.98745	0.84626	0.08328	1.30493	0.04860	3.36754	4.10840	7/17/1996	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.14582	0.98745	0.76164	0.12492	1.34843	0.05115	3.54582	4.32590	1/27/1997	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.34543	0.98745	0.78984	0.12492	1.26143	0.04860	3.76372	4.59174	4/23/1997	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.34543	1.15203	0.76164	0.10410	1.30493	0.05115	3.72410	4.54340	7/14/1997	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.44523	0.98745	0.78984	0.18738	1.26143	0.05115	3.68448	4.49507	4/16/1998	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.39533	0.98745	0.78984	0.24984	1.39192	0.05371	3.72410	4.54340	7/17/1998	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.29552	0.98745	0.78984	0.12492	1.30493	0.05115	3.76372	4.59174	4/21/1999	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.54504	0.98745	0.78984	0.12492	1.21793	0.04860	3.72410	4.54340	8/9/1999	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/03E-18C02	Northern	2.54504	0.98745	0.73343	0.10410	1.26143	0.05371	3.72410	4.54340	8/8/2000	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.69475	0.98745	0.70522	0.12492	1.13094	0.05115	3.76372	4.59174	8/9/2001	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.54504	0.90516	0.78984	0.12492	1.26143	0.04860	3.76372	4.59174	8/27/2002	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.39533	0.98745	0.78984	0.12492	1.26143	0.04860	3.76372	4.59174	8/19/2003	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.34543	0.98745	0.78984	0.12492	1.30493	0.04860	3.92219	4.78507	8/16/2004	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.29552	0.90516	0.81805	0.12492	1.21793	0.04604	3.80334	4.64007	8/23/2005	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.44523	0.98745	0.81805	0.14574	1.26143	0.05627	3.80334	4.64007	8/15/2006	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.44523	0.98745	0.84626	0.12492	1.26143	0.03581	3.78353	4.61590	8/10/2009	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.49513	0.98745	0.93089	0.12492	1.30493	0.03581	3.68448	4.49507	9/28/2011	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.69475	1.06974	1.07193	0.14574	1.34843	0.03836	3.64486	4.44673	9/18/2012	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.69475	1.06974	1.18477	0.14574	1.34843	0.04604	3.66467	4.47090	9/25/2013	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.59494	0.98745	1.26939	0.16656	1.43542	0.03581	3.68448	4.49507	9/15/2014	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	2.69475	0.98745	1.26939	0.16656	1.47892	0.03325	3.68448	4.49507	9/9/2015	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	3.54309	1.39889	2.48237	0.33312	1.60941	0.05627	3.68448	4.49507	9/27/2016	TRUE
400-Foot Aquifer	14S/03E-18C02	Northern	4.79066	1.89261	3.61072	0.49968	1.91389	0.06650	4.00143	4.88174	10/5/2017	TRUE
Deep Aquifers	14S/03E-19C01	Northern	1.59689	1.06974	0.81805	1.72805	3.04483	0.06906	3.14964	3.84256	8/18/2020	TRUE
Deep Aquifers	14S/03E-19C01	Northern	1.54698	0.98745	0.87447	1.74887	3.17533	0.03581	3.14964	3.84256	6/16/2021	TRUE
Deep Aquifers	14S/03E-19C01	Northern	1.59689	0.98745	1.01551	1.81133	3.47981	0.05883	3.11002	3.79422	8/18/2021	TRUE
400-Foot Aquifer	14S/03E-21M54	Southeastern	5.78871	3.29150	4.31594	2.66495	2.65335	0.05883	4.85322	5.92092	7/28/2011	TRUE
400-Foot Aquifer	14S/03E-21M54	Southeastern	5.13998	2.46863	3.46968	1.99871	2.30537	0.06394	4.33818	5.29258	8/19/2011	TRUE
400-Foot Aquifer	14S/03E-21M54	Southeastern	6.18793	3.29150	4.25952	2.78986	2.82734	0.07161	4.81360	5.87259	7/9/2012	TRUE
400-Foot Aquifer	14S/03E-21M54	Southeastern	5.78871	3.12693	3.66714	2.35265	2.60986	0.06650	4.61551	5.63092	8/22/2012	TRUE
400-Foot Aquifer	14S/03E-21M54	Southeastern	5.88852	3.12693	3.75176	2.72741	2.60986	0.06906	4.75417	5.80009	7/24/2013	TRUE
400-Foot Aquifer	14S/03E-21M54	Southeastern	5.73881	3.04464	3.83639	2.74823	2.91434	0.06394	4.99188	6.09009	8/5/2014	TRUE
400-Foot Aquifer	14S/03E-21M54	Southeastern	5.28969	2.79778	3.66714	2.51921	2.74035	0.06138	4.69474	5.72759	8/20/2014	TRUE
400-Foot Aquifer	14S/03E-21M54	Southeastern	5.93842	3.20922	3.94922	2.87314	3.00134	0.06394	5.01169	6.11426	6/15/2015	TRUE
400-Foot Aquifer	14S/03E-21M54	Southeastern	5.98832	3.29150	3.92102	2.97724	3.04483	0.06906	5.07111	6.18676	7/22/2015	TRUE
400-Foot Aquifer	14S/03E-21M54	Southeastern	5.68891	3.62065	3.75176	2.74823	2.82734	0.08184	4.99188	6.09009	6/14/2016	TRUE
400-Foot Aquifer	14S/03E-21M54	Southeastern	5.53920	3.29150	3.80818	2.72741	2.78385	0.06650	4.49665	5.48592	8/8/2016	TRUE
400-Foot Aquifer	14S/03E-21M54	Southeastern	5.83861	3.29150	3.92102	3.03970	2.82734	0.07417	3.40716	4.15673	6/26/2017	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	7.08618	3.70294	5.02116	3.16462	5.21971	0.16881	5.54653	6.76677	8/22/1985	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	7.18599	4.19667	5.07757	2.62331	5.26321	0.15346	5.66539	6.91177	7/22/1987	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	7.48540	5.59556	7.55994	1.87379	6.17666	0.11254	6.53698	7.97512	7/9/1990	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	7.83472	4.52582	6.03667	5.12169	5.65469	0.16881	6.69546	8.16846	7/19/1993	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	7.98443	4.52582	6.91114	4.66365	5.82868	0.16369	6.61622	8.07179	8/11/1998	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	7.28579	4.77268	6.29055	4.87185	6.00267	0.16369	6.85393	8.36179	6/7/1999	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	7.68501	4.60811	6.43159	4.87185	5.87218	0.16113	6.89355	8.41013	7/29/1999	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	8.23394	4.03209	6.31876	5.05923	5.35021	0.31715	6.89355	8.41013	6/26/2001	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	7.38560	5.01954	6.37518	4.99677	7.09011	0.11765	6.61622	8.07179	7/25/2002	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	7.78482	4.60811	6.17772	4.72611	6.43765	0.15090	6.97278	8.50679	8/22/2003	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	7.98443	4.52582	6.48801	4.62201	6.48114	0.16369	7.28973	8.89347	6/17/2004	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/03E-30E03	Southeastern	7.88462	4.36124	6.65726	4.22644	5.91567	0.14834	7.13125	8.70013	6/8/2005	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	6.83667	4.03209	6.03667	3.85168	5.74168	0.14834	7.01240	8.55513	6/20/2006	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	7.33570	4.27895	5.64175	3.08134	5.95917	0.16625	7.19068	8.77263	8/13/2007	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	6.78677	4.03209	5.58533	2.81068	6.13316	0.15090	6.85393	8.36179	7/8/2008	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	6.13803	3.78523	5.35966	2.78986	5.00223	0.14067	6.79450	8.28929	9/5/2008	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	6.08813	4.03209	5.21862	2.56085	5.26321	0.11765	6.83412	8.33763	6/4/2009	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	6.28774	3.70294	5.50071	2.81068	5.30671	0.12021	6.45775	7.87845	7/14/2009	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	6.13803	3.45608	5.33145	2.26937	4.95873	0.12021	6.12099	7.46761	8/18/2010	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	5.88852	3.04464	5.55712	2.31101	4.87173	0.11254	5.76443	7.03261	7/19/2011	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	6.38754	3.70294	5.92384	2.31101	5.04572	0.12788	5.86348	7.15344	7/9/2012	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	6.53725	3.78523	6.20592	2.41511	4.95873	0.11254	5.80405	7.08094	8/29/2012	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	6.53725	3.70294	5.64175	2.22773	4.95873	0.12533	5.70500	6.96010	7/17/2013	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	6.38754	3.62065	5.58533	2.16527	4.82823	0.12277	5.66539	6.91177	8/12/2013	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	6.88657	3.86752	6.06488	2.16527	5.56769	0.11509	5.88329	7.17761	7/29/2014	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	6.78677	3.86752	6.57264	2.33183	5.48070	0.11765	5.78424	7.05677	8/21/2014	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	7.13608	4.19667	6.40339	2.26937	5.52420	0.12277	5.88329	7.17761	6/8/2015	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	7.13608	4.19667	6.54443	2.33183	5.52420	0.12277	5.82386	7.10511	7/13/2015	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	7.93453	5.34869	6.88293	2.49839	5.48070	0.14834	5.82386	7.10511	6/9/2016	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	8.08424	5.67784	6.99577	2.58167	5.61119	0.14067	5.56634	6.79094	8/5/2016	TRUE
400-Foot Aquifer	14S/03E-30E03	Southeastern	8.58326	5.18412	7.30606	2.72741	5.30671	0.13811	5.88329	7.17761	6/8/2017	TRUE
400-Foot Aquifer	14S/03E-30E03	Northern	9.13219	5.01954	7.81382	2.99806	5.56769	0.15090	6.14080	7.49178	8/30/2017	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	2.79455	1.31660	0.87447	2.41511	1.87040	0.08440	2.83269	3.45589	8/29/1979	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	2.54504	1.06974	0.64880	1.91543	1.82690	0.09463	2.69403	3.28672	9/22/1983	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	3.04406	1.39889	1.04372	1.95707	2.00089	0.08952	3.05059	3.72172	7/11/1990	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	3.39338	1.56346	1.18477	2.76904	2.00089	0.08952	3.72410	4.54340	6/29/1995	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	3.54309	1.64575	1.18477	2.93560	2.21838	0.09208	3.16945	3.86672	9/7/1995	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	3.59299	1.72804	1.29760	3.01888	1.95739	0.10486	3.20906	3.91506	6/25/1996	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	3.94231	1.81033	1.46685	3.28954	2.39237	0.10231	3.56563	4.35007	7/23/1999	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	4.04212	1.81033	1.46685	3.58102	2.47936	0.09719	3.64486	4.44673	7/25/2001	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	6.23784	2.96235	2.31312	4.83021	3.43631	0.12533	5.15035	6.28343	8/24/2009	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	6.98638	3.20922	2.73625	5.49645	3.65380	0.14067	5.36825	6.54927	7/10/2012	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	7.13608	3.29150	2.65162	5.28825	3.61030	0.13044	5.46730	6.67010	8/16/2012	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	7.08618	3.20922	2.56700	5.74629	3.56680	0.13044	5.64558	6.88760	7/25/2013	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	7.38560	3.37379	2.56700	5.66301	3.87129	0.14067	5.62577	6.86344	8/6/2013	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	7.43550	3.37379	2.62341	5.76711	4.21927	0.13044	6.00214	7.32261	7/29/2014	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	6.48735	3.45608	2.62341	5.87121	4.30626	0.13556	6.18042	7.54011	8/25/2014	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	7.33570	3.45608	2.65162	6.01695	4.13227	0.13556	5.94271	7.25011	6/8/2015	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	7.28579	3.45608	2.70804	6.01695	4.08878	0.13556	6.14080	7.49178	7/13/2015	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	7.38560	3.86752	2.65162	6.03777	4.00178	0.15857	6.06157	7.39511	6/1/2016	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	7.58521	3.78523	2.84908	6.45417	4.13227	0.14323	5.82386	7.10511	8/5/2016	TRUE
400-Foot Aquifer	14S/03E-31F02	Southeastern	7.38560	3.70294	2.70804	6.03777	3.87129	0.14834	6.16061	7.51595	6/9/2017	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	14S/03E-31F02	Southeastern	7.68501	3.78523	2.79267	6.55826	3.91478	0.15602	6.39832	7.80595	8/7/2017	TRUE
400-Foot Aquifer	15S/02E-01Q50	Southeastern	9.23200	3.70294	4.23131	6.43335	2.56636	0.13300	4.83341	5.89676	7/10/2012	TRUE
400-Foot Aquifer	15S/02E-01Q50	Southeastern	9.18209	3.62065	4.06206	6.16269	2.47936	0.11765	4.87302	5.94509	8/16/2012	TRUE
400-Foot Aquifer	15S/02E-01Q50	Southeastern	9.38171	3.62065	3.94922	6.53744	2.47936	0.13044	4.87302	5.94509	7/9/2013	TRUE
400-Foot Aquifer	15S/02E-01Q50	Southeastern	9.13219	3.62065	3.69535	6.20433	2.56636	0.13044	4.87302	5.94509	8/5/2013	TRUE
400-Foot Aquifer	15S/02E-01Q50	Southeastern	9.23200	3.53837	3.72355	6.26679	2.78385	0.12277	5.03150	6.13843	7/22/2014	TRUE
400-Foot Aquifer	15S/02E-01Q50	Southeastern	8.88268	3.53837	4.14669	6.97466	2.74035	0.11765	4.06085	4.95424	8/20/2014	TRUE
400-Foot Aquifer	15S/02E-01Q50	Southeastern	8.93258	3.62065	3.83639	6.59990	2.65335	0.12533	5.07111	6.18676	6/8/2015	TRUE
400-Foot Aquifer	15S/02E-01Q50	Southeastern	9.03239	3.62065	3.97743	6.70400	2.69685	0.12788	5.17016	6.30759	7/13/2015	TRUE
400-Foot Aquifer	15S/02E-01Q50	Southeastern	8.88268	4.27895	3.86460	6.59990	2.52286	0.13300	5.03150	6.13843	6/3/2016	TRUE
400-Foot Aquifer	15S/02E-01Q50	Southeastern	9.28190	4.27895	4.06206	6.89138	2.60986	0.12021	5.22959	6.38010	8/1/2016	TRUE
400-Foot Aquifer	15S/02E-01Q50	Southeastern	9.23200	3.94980	4.00564	6.62072	2.52286	0.13556	5.22959	6.38010	6/8/2017	TRUE
400-Foot Aquifer	15S/02E-01Q50	Southeastern	9.43161	4.03209	4.06206	7.14122	2.56636	0.13556	5.38806	6.57343	8/7/2017	TRUE
Aquitard + Deep Aquifers	15S/02E-04A04	Northern	2.54504	1.72804	5.64175	0.85362	4.78474	0.07929	3.36754	4.10840	12/7/2011	TRUE
Aquitard + Deep Aquifers	15S/02E-04A04	Northern	2.64484	1.81033	5.07757	0.74952	4.78474	0.08952	3.56563	4.35007	7/16/2013	TRUE
Aquitard + Deep Aquifers	15S/02E-04A04	Northern	2.74465	1.97490	5.35966	0.81198	5.65469	0.09975	3.76372	4.59174	7/8/2014	TRUE
Aquitard + Deep Aquifers	15S/02E-04A04	Northern	2.84445	1.97490	5.35966	0.77034	5.21971	0.09719	3.36754	4.10840	7/7/2015	TRUE
Aquitard + Deep Aquifers	15S/02E-04A04	Northern	2.69475	1.89261	5.35966	0.72870	5.21971	0.09208	3.56563	4.35007	7/12/2016	TRUE
Aquitard + Deep Aquifers	15S/02E-04A04	Northern	2.64484	1.81033	5.64175	0.72870	5.21971	0.09208	3.56563	4.35007	7/18/2017	TRUE
Aquitard + Deep Aquifers	15S/02E-04A04	Northern	1.59689	0.98745	1.74894	1.06181	2.87084	0.05883	2.93174	3.57672	6/18/2018	TRUE
Aquitard + Deep Aquifers	15S/02E-04A04	Northern	1.79650	1.15203	2.11566	0.89526	2.87084	0.05627	2.83269	3.45589	9/17/2018	TRUE
Aquitard + Deep Aquifers	15S/02E-04A04	Northern	1.84640	1.15203	2.17207	0.85362	2.82734	0.05371	2.83269	3.45589	6/24/2019	TRUE
Aquitard + Deep Aquifers	15S/02E-04A04	Northern	1.74659	1.06974	2.11566	0.81198	2.82734	0.05883	2.73365	3.33505	8/12/2019	TRUE
Aquitard + Deep Aquifers	15S/02E-04A04	Northern	1.84640	1.06974	2.20028	0.83280	2.82734	0.05371	2.79307	3.40755	6/8/2020	TRUE
Aquitard + Deep Aquifers	15S/02E-04A04	Northern	1.74659	0.98745	1.72073	1.12427	3.17533	0.06650	2.97136	3.62505	8/18/2020	TRUE
Aquitard + Deep Aquifers	15S/02E-04A04	Northern	1.99611	1.06974	2.31312	0.83280	3.00134	0.05371	2.93174	3.57672	8/11/2021	TRUE
400-Foot Aquifer	15S/02E-04A50	Northern	3.04406	1.56346	2.20028	1.56149	1.87040	0.07673	2.71384	3.31088	6/25/2001	TRUE
400-Foot Aquifer	15S/02E-04A50	Northern	3.09397	1.64575	2.51058	1.60313	1.95739	0.07929	2.63460	3.21421	7/2/2002	TRUE
400-Foot Aquifer	15S/02E-04A50	Northern	3.04406	1.81033	2.48237	1.60313	2.08789	0.07929	2.77327	3.38338	7/7/2003	TRUE
400-Foot Aquifer	15S/02E-04A50	Northern	3.04406	1.72804	2.36953	1.43657	2.04439	0.07929	2.35728	2.87588	7/6/2004	TRUE
400-Foot Aquifer	15S/02E-04A50	Northern	2.89436	1.64575	2.22849	1.51985	1.91389	0.07673	2.45632	2.99671	7/12/2005	TRUE
400-Foot Aquifer	15S/03E-03N58	Northern	3.29358	1.89261	1.21298	3.18544	2.47936	0.07673	3.56563	4.35007	7/20/2012	TRUE
400-Foot Aquifer	15S/03E-03N58	Northern	2.79455	1.64575	1.21298	2.54003	2.39237	0.07161	3.16945	3.86672	6/18/2019	TRUE
400-Foot Aquifer	15S/03E-03N58	Northern	2.74465	1.56346	1.18477	2.41511	2.39237	0.07417	3.09021	3.77006	8/8/2019	TRUE
400-Foot Aquifer	15S/03E-03N58	Northern	2.74465	1.48118	1.18477	2.41511	2.34887	0.06906	3.12983	3.81839	6/3/2020	TRUE
400-Foot Aquifer	15S/03E-03N58	Northern	2.84445	1.56346	1.18477	2.41511	2.43587	0.07929	3.20906	3.91506	8/13/2020	TRUE
400-Foot Aquifer	15S/03E-03N58	Northern	2.79455	1.39889	1.24118	2.43593	2.52286	0.05371	3.30811	4.03589	6/23/2021	TRUE
400-Foot Aquifer	15S/03E-04K03	Southeastern	4.49124	1.89261	1.41044	3.85168	2.74035	0.12788	4.08066	4.97841	8/16/1984	TRUE
400-Foot Aquifer	15S/03E-04K03	Southeastern	4.24173	2.13948	1.29760	4.05988	2.69685	0.10231	4.55608	5.55842	8/25/1994	TRUE
400-Foot Aquifer	15S/03E-04K03	Southeastern	4.39144	2.30405	1.24118	3.78922	2.78385	0.09975	4.51646	5.51008	7/6/1995	TRUE
400-Foot Aquifer	15S/03E-04K03	Southeastern	4.04212	3.12693	1.12835	3.70594	2.69685	0.10486	3.74391	4.56757	7/12/1996	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	15S/03E-04K03	Southeastern	4.29163	2.05719	1.04372	3.66430	2.56636	0.09463	4.47684	5.46175	7/31/2001	TRUE
400-Foot Aquifer	15S/03E-04K03	Southeastern	5.18988	2.71549	1.49506	3.97660	2.65335	0.08696	5.13054	6.25926	7/14/2009	TRUE
400-ft and Deep Aquifers	15S/03E-05R52	Northern	2.64484	1.23431	0.67701	2.20691	1.65291	0.07161	2.79307	3.40755	5/29/2018	TRUE
400-ft and Deep Aquifers	15S/03E-05R52	Northern	2.64484	1.23431	0.70522	2.14445	1.69641	0.07673	2.79307	3.40755	8/10/2018	TRUE
400-ft and Deep Aquifers	15S/03E-05R52	Northern	2.64484	1.23431	0.70522	2.12363	1.56591	0.06650	2.81288	3.43172	6/18/2019	TRUE
400-ft and Deep Aquifers	15S/03E-05R52	Northern	2.69475	1.23431	0.67701	2.08199	1.56591	0.06650	2.81288	3.43172	6/8/2020	TRUE
400-ft and Deep Aquifers	15S/03E-05R52	Northern	2.74465	1.23431	0.67701	2.08199	1.56591	0.07417	2.77327	3.38338	8/13/2020	TRUE
400-ft and Deep Aquifers	15S/03E-05R52	Northern	2.89436	1.23431	0.67701	2.06117	1.65291	0.05883	2.91193	3.55255	6/14/2021	TRUE
400-ft and Deep Aquifers	15S/03E-05R52	Northern	2.79455	1.15203	0.67701	2.12363	1.60941	0.06394	2.83269	3.45589	8/12/2021	TRUE
400-Foot Aquifer	15S/03E-07K01	Southeastern	5.18988	3.20922	2.31312	3.58102	1.87040	0.09975	3.86276	4.71257	8/7/2014	TRUE
400-Foot Aquifer	15S/03E-07K01	Southeastern	7.53531	3.29150	2.48237	3.83086	1.87040	0.09719	5.46730	6.67010	8/22/2014	TRUE
400-Foot Aquifer	15S/03E-07K01	Southeastern	7.23589	3.20922	2.28491	3.70594	1.91389	0.10231	6.22004	7.58845	6/8/2015	TRUE
400-Foot Aquifer	15S/03E-07K01	Southeastern	6.93647	3.12693	2.28491	3.72676	1.87040	0.10231	6.22004	7.58845	7/14/2015	TRUE
400-Foot Aquifer	15S/03E-07K01	Southeastern	7.13608	3.53837	2.25670	3.76840	1.78340	0.11254	6.23985	7.61261	5/31/2016	TRUE
400-Foot Aquifer	15S/03E-07K01	Southeastern	7.13608	3.53837	2.34133	3.95578	1.87040	0.09719	6.23985	7.61261	8/1/2016	TRUE
400-Foot Aquifer	15S/03E-07K01	Southeastern	7.08618	3.04464	2.28491	3.78922	1.82690	0.10742	6.31908	7.70928	6/15/2017	TRUE
400-Foot Aquifer	15S/03E-07K01	Southeastern	7.33570	3.29150	2.31312	4.08070	1.87040	0.11254	6.39832	7.80595	8/7/2017	TRUE
400-Foot Aquifer	15S/03E-08L01	Southeastern	3.84251	1.48118	0.93089	1.97789	1.13094	0.06906	3.34773	4.08423	7/24/2012	TRUE
400-Foot Aquifer	15S/03E-08L01	Southeastern	3.74270	1.48118	1.12835	1.95707	1.08744	0.06906	3.24868	3.96339	8/16/2012	TRUE
400-Foot Aquifer	15S/03E-08L01	Southeastern	3.84251	1.48118	1.01551	2.10281	1.13094	0.08184	3.30811	4.03589	7/9/2013	TRUE
400-Foot Aquifer	15S/03E-08L01	Southeastern	3.89241	1.48118	0.90268	2.01953	1.13094	0.08440	3.30811	4.03589	8/8/2013	TRUE
400-Foot Aquifer	15S/03E-08L01	Southeastern	3.79260	1.48118	0.95910	2.14445	1.21793	0.07929	3.56563	4.35007	8/4/2014	TRUE
400-Foot Aquifer	15S/03E-08L01	Southeastern	3.74270	1.39889	0.98731	2.18609	1.21793	0.07673	3.44677	4.20506	8/20/2014	TRUE
400-Foot Aquifer	15S/03E-08L01	Southeastern	3.64290	1.48118	0.93089	2.08199	1.17444	0.07673	3.44677	4.20506	6/8/2015	TRUE
400-Foot Aquifer	15S/03E-08L01	Southeastern	3.59299	1.48118	0.93089	2.08199	1.17444	0.07673	3.52601	4.30173	7/14/2015	TRUE
400-Foot Aquifer	15S/03E-08L01	Southeastern	3.64290	1.64575	0.95910	2.08199	1.17444	0.08952	3.48639	4.25340	5/31/2016	TRUE
400-Foot Aquifer	15S/03E-08L01	Southeastern	3.54309	1.56346	0.98731	2.12363	1.17444	0.07673	3.48639	4.25340	8/1/2016	TRUE
400-Foot Aquifer	15S/03E-08L01	Southeastern	3.74270	1.56346	0.95910	2.04035	1.17444	0.07929	3.72410	4.54340	6/13/2017	TRUE
400-Foot Aquifer	15S/03E-08L01	Southeastern	3.84251	1.72804	0.98731	2.14445	1.21793	0.08184	3.68448	4.49507	8/17/2017	TRUE
400-ft and Deep Aquifers	15S/03E-10D04	Northern	2.94426	1.64575	1.12835	2.54003	2.34887	0.07929	3.44677	4.20506	6/25/2020	TRUE
400-ft and Deep Aquifers	15S/03E-10D04	Northern	2.99416	1.64575	1.12835	2.51921	2.39237	0.07929	3.42696	4.18090	8/6/2020	TRUE
400-ft and Deep Aquifers	15S/03E-10D04	Northern	3.19377	1.56346	1.18477	2.60249	2.60986	0.08184	3.48639	4.25340	6/15/2021	TRUE
400-ft and Deep Aquifers	15S/03E-10D04	Northern	3.04406	1.56346	1.18477	2.64413	2.43587	0.07161	3.38735	4.13256	8/5/2021	TRUE
400-Foot Aquifer	15S/03E-15B01	Southeastern	4.99027	2.79778	1.29760	4.01824	2.43587	0.07929	5.13054	6.25926	8/17/1979	TRUE
400-Foot Aquifer	15S/03E-15B01	Southeastern	2.89436	2.46863	1.12835	2.95642	2.95784	0.12788	4.63532	5.65508	7/30/1986	TRUE
400-Foot Aquifer	15S/03E-15B01	Southeastern	3.49319	2.05719	0.90268	3.16462	2.08789	0.08184	4.43723	5.41341	7/2/1990	TRUE
400-Foot Aquifer	15S/03E-15B01	Southeastern	3.94231	2.22177	0.95910	3.14380	1.95739	0.07673	4.12028	5.02674	7/5/1995	TRUE
400-Foot Aquifer	15S/03E-15B01	Southeastern	3.59299	1.97490	0.95910	3.10216	1.95739	0.07673	4.08066	4.97841	7/2/1996	TRUE
400-Foot Aquifer	15S/03E-15B01	Southeastern	3.69280	2.05719	0.93089	2.89396	1.82690	0.07673	3.80334	4.64007	7/19/2001	TRUE
400-Foot Aquifer	15S/03E-15B01	Southeastern	8.93258	2.55092	0.95910	3.12298	1.95739	0.06906	4.51646	5.51008	6/4/2009	TRUE
400-Foot Aquifer	15S/04E-29K03	Southeastern	2.19572	1.23431	0.70522	2.49839	2.08789	0.07161	2.81288	3.43172	7/6/1993	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	15S/04E-29K03	Southeastern	2.19572	1.23431	0.62059	1.87379	2.30537	0.07161	2.77327	3.38338	8/3/1994	TRUE
400-Foot Aquifer	15S/04E-29K03	Southeastern	2.09591	1.23431	0.95910	1.70723	2.08789	0.06650	2.73365	3.33505	7/13/1995	TRUE
400-Foot Aquifer	15S/04E-29K03	Southeastern	2.34543	1.31660	0.73343	2.39429	2.21838	0.07161	2.93174	3.57672	7/30/2001	TRUE
400-Foot Aquifer	15S/04E-29K03	Southeastern	2.29552	1.48118	0.67701	2.16527	2.26188	0.05883	3.11002	3.79422	6/5/2009	TRUE
Eastside Deep	16S/04E-03G52	N/A	2.69475	1.48118	1.15656	1.95707	2.26188	0.03325	2.97136	3.62505	7/7/1998	FALSE
Eastside Deep	16S/04E-03G52	N/A	2.44523	1.39889	1.07193	2.01953	1.95739	0.07673	2.89212	3.52839	7/3/2001	FALSE
Eastside Deep	16S/04E-03G52	N/A	2.54504	1.39889	0.90268	1.97789	2.08789	0.05115	2.97136	3.62505	9/4/2001	FALSE
Eastside Deep	16S/04E-03G52	N/A	2.49513	1.44003	0.95346	1.98622	2.00089	0.12788	2.97136	3.62505	7/22/2003	FALSE
Eastside Deep	16S/04E-03G52	N/A	2.44523	1.35775	0.92807	1.99455	1.91389	0.00000	3.16945	3.86672	8/11/2004	FALSE
Eastside Deep	16S/04E-03G52	N/A	2.19572	1.11088	0.45698	1.91959	1.60941	0.00000	2.77327	3.38338	7/19/2007	FALSE
Eastside Deep	16S/04E-03G52	N/A	2.29552	1.19317	0.56982	2.03827	1.70076	0.12788	2.97136	3.62505	7/19/2010	FALSE
Eastside Deep	16S/04E-03G52	N/A	2.39533	1.15203	0.47673	1.98205	1.62681	0.12788	2.80298	3.41963	7/17/2013	FALSE
Eastside Deep	16S/04E-03G52	N/A	2.34543	1.23431	0.61777	2.00912	1.76165	0.12788	2.61479	3.19005	7/13/2016	FALSE
Eastside Deep	16S/04E-03G52	N/A	2.29552	1.15203	0.60367	2.11946	1.66596	0.12788	2.73365	3.33505	3/13/2019	FALSE
Eastside Deep	16S/04E-03G53	N/A	2.32048	1.23431	0.53597	1.95499	1.73990	0.12788	2.77327	3.38338	7/22/2003	FALSE
Eastside Deep	16S/04E-03G53	N/A	2.32048	1.19317	0.49929	1.93000	1.65291	0.00000	2.97136	3.62505	8/11/2004	FALSE
Eastside Deep	16S/04E-03G53	N/A	2.17077	1.15203	0.43441	1.85922	1.60941	0.00000	2.77327	3.38338	7/18/2007	FALSE
Eastside Deep	16S/04E-03G53	N/A	2.07096	1.06974	0.48801	1.88628	1.63986	0.12788	2.77327	3.38338	7/19/2010	FALSE
Eastside Deep	16S/04E-03G53	N/A	2.04601	1.15203	0.44006	1.85713	1.71381	0.12788	2.79307	3.40755	7/17/2013	FALSE
Eastside Deep	16S/04E-03G53	N/A	2.19572	1.23431	0.60931	1.86754	1.79645	0.12788	2.83269	3.45589	7/13/2016	FALSE
Eastside Deep	16S/04E-03G53	N/A	2.29552	1.39889	0.98731	1.89461	2.00959	0.12788	2.81288	3.43172	3/13/2019	FALSE
Eastside Deep	16S/04E-03K01	N/A	2.59494	1.56346	1.01551	2.43593	2.17488	0.06650	2.95155	3.60089	6/24/2019	FALSE
Eastside Deep	16S/04E-03K01	N/A	2.19572	1.23431	0.70522	2.01953	1.91389	0.06394	2.75346	3.35922	8/12/2019	FALSE
Eastside Deep	16S/04E-03K01	N/A	2.54504	1.48118	0.98731	2.41511	2.13138	0.07161	2.97136	3.62505	6/22/2020	FALSE
Eastside Deep	16S/04E-03K01	N/A	2.59494	1.48118	0.98731	2.41511	2.13138	0.07161	3.05059	3.72172	8/5/2020	FALSE
Eastside Deep	16S/04E-03K01	N/A	2.44523	1.23431	0.78984	2.16527	2.30537	0.05883	2.93174	3.57672	6/4/2021	FALSE
Eastside Deep	16S/04E-03K01	N/A	2.69475	1.48118	0.98731	2.47757	2.21838	0.06394	2.97136	3.62505	8/12/2021	FALSE
400-Foot Aquifer	16S/04E-03L01	N/A	2.34543	1.23431	0.67701	1.85297	1.82690	0.06394	3.24868	3.96339	8/10/2004	FALSE
400-Foot Aquifer	16S/04E-03L01	N/A	2.39533	1.31660	0.67701	1.72805	1.78340	0.06138	3.20906	3.91506	8/3/2005	FALSE
400-Foot Aquifer	16S/04E-03L01	N/A	2.44523	1.39889	0.73343	1.95707	1.82690	0.06906	3.12983	3.81839	8/14/2006	FALSE
400-Foot Aquifer	16S/04E-04C01	Southeastern	4.44134	3.04464	2.08745	4.74693	3.52331	0.09975	4.25894	5.19591	8/16/1979	TRUE
400-Foot Aquifer	16S/04E-04C01	Southeastern	3.84251	3.62065	2.31312	4.95513	4.43676	0.12788	4.67493	5.70342	9/11/1986	TRUE
400-Foot Aquifer	16S/04E-04C01	Southeastern	5.68891	3.78523	2.31312	6.14187	4.26277	0.09463	5.26920	6.42843	8/5/1994	TRUE
400-Foot Aquifer	16S/04E-04C01	Southeastern	4.99027	3.53837	1.86178	5.35071	3.43631	0.08184	4.79379	5.84842	8/4/1998	TRUE
400-Foot Aquifer	16S/04E-11E02	Southeastern	2.04601	1.39889	0.78984	2.18609	2.08789	0.10231	2.89212	3.52839	9/10/1986	TRUE
400-Foot Aquifer	16S/04E-11E02	Southeastern	2.84445	1.48118	0.87447	1.74887	1.95739	0.07161	2.93174	3.57672	7/10/1990	TRUE
400-Foot Aquifer	16S/04E-11E02	Southeastern	2.89436	1.48118	0.78984	2.29019	2.04439	0.07929	3.01097	3.67339	7/3/1991	TRUE
400-Foot Aquifer	16S/04E-11E02	Southeastern	3.29358	1.64575	1.12835	2.51921	1.95739	0.07161	3.12983	3.81839	7/13/1995	TRUE
400-Foot Aquifer	16S/04E-11E02	Southeastern	3.19377	1.64575	0.95910	2.89396	2.00089	0.06906	3.11002	3.79422	7/24/1996	TRUE
400-Foot Aquifer	16S/04E-11E02	Southeastern	4.24173	2.13948	1.24118	3.37282	2.30537	0.06906	3.74391	4.56757	6/29/2009	TRUE
400-Foot Aquifer	16S/04E-25A01	Southeastern	2.49513	1.56346	0.67701	1.66559	0.82645	0.04092	2.75346	3.35922	8/27/1979	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
400-Foot Aquifer	16S/04E-25A01	Southeastern	3.04406	1.48118	0.62059	1.97789	0.82645	0.07673	2.81288	3.43172	8/20/1984	TRUE
400-Foot Aquifer	16S/04E-25A01	Southeastern	3.14387	1.72804	0.90268	1.89461	1.00045	0.03581	2.97136	3.62505	8/24/1992	TRUE
400-Foot Aquifer	16S/04E-25A01	Southeastern	2.79455	1.72804	0.56417	2.04035	1.00045	0.03836	3.01097	3.67339	7/13/2001	TRUE
400-Foot Aquifer	16S/04E-25A01	Southeastern	3.09397	1.97490	0.67701	2.06117	0.91345	0.03325	3.20906	3.91506	6/11/2009	TRUE
Eastside Deep	16S/05E-28K50	N/A	2.44523	1.31660	2.03103	1.49903	2.87084	0.06138	3.22887	3.93923	9/16/2009	FALSE
Aquitard + Deep Aquifers	16S/05E-29A01	N/A	2.59494	1.72804	1.69252	1.66559	2.21838	0.11509	2.77327	3.38338	4/4/1988	FALSE
Aquitard + Deep Aquifers	16S/05E-29A01	N/A	3.36344	1.55524	1.55148	1.72805	2.32712		2.87231	3.50422	12/20/1993	FALSE
Aquitard + Deep Aquifers	16S/05E-29A01	N/A	1.84640	0.90516	0.28209	1.93625	1.65291	0.05371	2.37708	2.90004	6/7/1999	FALSE
Aquitard + Deep Aquifers	16S/05E-29A01	N/A	2.74465	1.48118	1.43865	1.72805	2.21838	0.07673	2.77327	3.38338	5/28/2002	FALSE
Aquitard + Deep Aquifers	16S/05E-29A01	N/A	2.99416	1.64575	1.04372	1.62395	2.34887	0.07673	2.65441	3.23838	4/12/2005	FALSE
Aquitard + Deep Aquifers	16S/05E-29A01	N/A	2.69475	1.64575	1.74894	2.08199	3.04483	0.09463	3.07040	3.74589	4/15/2008	FALSE
Aquitard + Deep Aquifers	16S/05E-29A01	N/A	2.29552	1.15203	0.67701	1.74887	1.69641	0.04860	2.59498	3.16588	4/5/2011	FALSE
Aquitard + Deep Aquifers	16S/05E-29A01	N/A	3.39338	1.72804	1.63611	2.62331	2.65335	0.08696	3.12983	3.81839	4/8/2014	FALSE
Aquitard + Deep Aquifers	16S/05E-29A01	N/A	3.44329	1.81033	1.74894	2.85232	2.60986	0.08440	3.11002	3.79422	4/4/2017	FALSE
Eastside Deep	16S/05E-29A01	N/A	3.69280	1.97490	1.69252	2.91478	2.56636	0.09463	3.12983	3.81839	4/7/2020	FALSE
Eastside Deep	17S/05E-04A02	N/A	2.19572	0.90516	0.28209	1.41575	0.95695	0.06138	2.53556	3.09338	8/10/2004	FALSE
Eastside Deep	17S/05E-04A02	N/A	2.19572	0.90516	0.22567	1.29083	0.91345	0.06138	2.57518	3.14171	8/3/2005	FALSE
Eastside Deep	17S/05E-04A02	N/A	2.19572	0.90516	0.22567	1.37411	0.86995	0.06394	2.49594	3.04505	8/14/2006	FALSE
Eastside Deep	17S/05E-04A02	N/A	2.04601	0.90516	0.22567	1.33247	0.91345	0.05627	2.51575	3.06921	9/26/2007	FALSE
Deep Aquifers	Camp Huffman (D)	Seaside	2.89436	1.56346	5.13399	0.27066	3.56680	0.09208	2.33747	2.85171	7/19/2012	TRUE
Deep Aquifers	Camp Huffman (D)	Seaside	3.79260	1.97490	3.49788	1.06181	4.08878	0.12533	5.24940	6.40426	7/22/2014	TRUE
Deep Aquifers	Camp Huffman (D)	Seaside	3.39338	1.81033	3.77997	1.10345	2.65335	0.10231	5.40787	6.59760	9/12/2017	TRUE
400-Foot Aquifer	Camp Huffman (S)	Seaside	3.64290	1.97490	3.04654	0.81198	4.08878	0.12277	5.20978	6.35593	7/19/2012	TRUE
400-Foot Aquifer	Camp Huffman (S)	Seaside	2.89436	1.56346	5.35966	0.27066	3.65380	0.09975	2.39689	2.92421	7/22/2014	TRUE
400-Foot Aquifer	Camp Huffman (S)	Seaside	2.44523	1.39889	6.09309	0.29148	2.60986	0.07673	2.47613	3.02088	9/12/2017	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.29747	0.32915	1.83357	0.22902	2.30537	0.08696	1.76300	2.15087	3/29/2012	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.79650	0.32915	1.38223	0.24984	1.39192	0.08440	1.86205	2.27170	6/18/2012	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.69669	0.32915	1.88999	0.27066	2.13138	0.08184	1.82243	2.22337	9/26/2012	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.19766	0.24686	1.52327	0.18738	2.08789	0.08696	1.94129	2.36837	3/22/2013	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.19766	0.24686	1.80536	0.06246	2.08789	0.08440	1.86205	2.27170	6/26/2014	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.14776	0.32915	2.17207	0.02082	2.30537	0.09208	1.94129	2.36837	9/11/2014	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.24757	0.24686	1.88999	0.02082	2.26188	0.08952	1.92148	2.34420	3/25/2015	TRUE
Deep Aquifers	FO-09-Deep	Seaside	0.89825	0.32915	1.91819	0.02082	2.21838	0.08696	1.12912	1.37752	6/29/2015	TRUE
Deep Aquifers	FO-09-Deep	Seaside	0.34932	0.32915	1.88999	0.02082	2.08789	0.09719	1.26778	1.54669	12/17/2015	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.34737	0.32915	2.00282	0.02082	2.26188	0.09975	1.96110	2.39254	10/23/2017	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.34737	0.32915	2.03103	0.02082	2.43587	0.11791	1.72339	2.10253	1/24/2018	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.34737	0.32915	1.97461	0.04164	2.39237	0.09719	1.94129	2.36837	5/2/2018	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.29747	0.32915	2.00282	0.08328	2.47936	0.09463	1.98090	2.41670	8/13/2018	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.19766	0.24686	1.91819	0.12492	2.17488	0.09208	2.02052	2.46504	5/13/2019	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.19766	0.32915	1.86178	0.02082	2.39237	0.10742	2.21861	2.70671	7/8/2019	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.34737	0.32915	1.97461	0.14574	2.17488	0.09463	1.92148	2.34420	8/26/2019	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
Deep Aquifers	FO-09-Deep	Seaside	1.24757	0.29624	1.89563	0.06246	2.21838	0.08952	1.90167	2.32003	5/13/2020	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.24757	0.28801	1.91819	0.04164	2.17488	0.09719	1.86205	2.27170	8/4/2020	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.24757	0.27978	1.86742	0.02082	2.08789	0.09719	2.11957	2.58587	9/28/2020	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.29747	0.31269	1.90691	0.00000	2.34887	0.09975	2.17899	2.65837	1/5/2021	TRUE
Deep Aquifers	FO-09-Deep	Seaside	1.14776	0.27978	1.83075	0.02082	2.17488	0.11509	2.06014	2.51337	9/2/2021	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.74659	0.32915	1.46685	0.20820	1.39192	0.08440	1.86205	2.27170	3/29/2012	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.59689	0.41144	1.63611	0.22902	1.47892	0.08952	1.72339	2.10253	6/18/2012	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.29747	0.24686	1.41044	0.24984	2.21838	0.08696	1.94129	2.36837	9/26/2012	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.94620	0.32915	1.35402	0.27066	1.43542	0.08696	1.94129	2.36837	12/14/2012	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.84640	0.32915	1.43865	0.22902	1.39192	0.08952	2.06014	2.51337	3/22/2013	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.24757	0.32915	1.86178	0.27066	2.21838	0.08952	1.76300	2.15087	7/17/2013	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.29747	0.32915	1.41044	0.08328	1.39192	0.08696	1.68377	2.05420	6/26/2014	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.34737	0.41144	1.69252	0.10410	1.47892	0.09208	1.62434	1.98170	9/11/2014	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.19766	0.32915	1.46685	0.08328	1.39192	0.08696	1.60453	1.95753	3/25/2015	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.24757	0.41144	1.46685	0.08328	1.47892	0.09208	1.50549	1.83669	6/29/2015	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.24757	0.41144	1.43865	0.08328	1.43542	0.09463	1.48568	1.81253	12/17/2015	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.24757	0.41144	1.49506	0.27066	1.52242	0.09719	1.32721	1.61919	10/23/2017	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.29747	0.49373	1.49506	0.29148	1.69641	0.11023	1.30740	1.59502	1/24/2018	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.24757	0.41144	1.52327	0.29148	1.52242	0.10231	1.30740	1.59502	3/19/2018	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.29747	0.41144	1.46685	0.29148	1.56591	0.09719	1.28759	1.57086	5/2/2018	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.19766	0.41144	1.63611	0.33312	1.43542	0.09208	1.32721	1.61919	8/13/2018	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.59689	0.65830	2.25670	0.54132	1.95739	0.10998	1.68377	2.05420	5/13/2019	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.54698	0.57601	2.00282	0.45804	1.95739	0.11254	1.54511	1.88503	7/8/2019	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.69669	0.65830	2.17207	0.45804	1.91389	0.11509	1.62434	1.98170	8/26/2019	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.84640	0.78996	2.37800	0.41640	2.08789	0.10998	1.84224	2.24753	5/13/2020	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.84640	0.78996	2.45134	0.70788	2.13138	0.11509	1.74320	2.12670	8/4/2020	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.79650	0.79819	2.55007	0.64542	2.08789	0.10998	1.88186	2.29587	9/28/2020	TRUE
Deep Aquifers	FO-09-Shallow	Seaside	1.79650	0.85579	2.60085	0.68706	2.26188	0.11765	1.82243	2.22337	1/5/2021	TRUE
Deep Aquifers	FO-10-Deep	Seaside	0.79844	0.16458	1.18477	0.29148	1.56591	0.05115	1.04988	1.28085	7/16/2012	TRUE
Deep Aquifers	FO-10-Deep	Seaside	1.29747	0.32915	1.77715	0.29148	2.26188	0.09208	1.74320	2.12670	12/14/2012	TRUE
Deep Aquifers	FO-10-Deep	Seaside	1.74659	0.32915	1.49506	0.24984	1.39192	0.08952	1.92148	2.34420	7/17/2013	TRUE
Deep Aquifers	FO-10-Deep	Seaside	0.74854	0.08229	1.18477	0.24984	1.52242	0.04348	1.04988	1.28085	7/24/2013	TRUE
Deep Aquifers	FO-10-Deep	Seaside	0.99805	0.24686	1.32581	0.31230	1.65291	0.08440	1.18854	1.45002	7/31/2014	TRUE
Deep Aquifers	FO-10-Deep	Seaside	0.94815	0.16458	1.26939	0.27066	1.69641	0.06394	1.12912	1.37752	8/4/2015	TRUE
Deep Aquifers	FO-10-Deep	Seaside	0.84835	0.16458	1.29760	0.24984	1.60941	0.05115	1.06969	1.30502	8/1/2016	TRUE
Deep Aquifers	FO-10-Deep	Seaside	0.84835	0.16458	1.26939	0.27066	1.47892	0.05115	1.16873	1.42585	9/12/2017	TRUE
Deep Aquifers	FO-10-Deep	Seaside	1.09786	0.32915	1.52327	0.35394	1.78340	0.09208	1.34701	1.64336	9/5/2018	TRUE
Deep Aquifers	FO-10-Deep	Seaside	0.79844	0.16458	1.21016	0.22902	1.47892	0.04604	1.18854	1.45002	9/20/2019	TRUE
Deep Aquifers	FO-10-Deep	Seaside	0.94815	0.20572	1.48378	0.24984	1.73990	0.05883	1.12912	1.37752	9/16/2020	TRUE
Deep Aquifers	FO-10-Deep	Seaside	1.04796	0.31269	1.83075	0.20820	1.73990	0.07417	1.04988	1.28085	9/2/2021	TRUE
Deep Aquifers	FO-10-Shallow	Seaside	0.59883	0.16458	1.15656	0.16656	1.52242	0.05371	1.01026	1.23252	7/16/2012	TRUE

Aquifer	Well Name	Region	Calcium	Magnesium	Chloride	Sulfate	Sodium	Potassium	Alkalinity (as CaCO3)	Alkalinity (as HCO3)	Sample Date	In Phase 2 Extent?
Deep Aquifers	FO-10-Shallow	Seaside	0.74854	0.08229	1.15656	0.24984	1.47892	0.04348	1.04988	1.28085	7/24/2013	TRUE
Deep Aquifers	FO-10-Shallow	Seaside	0.44912	0.16458	1.15656	0.12492	1.56591	0.06138	0.89141	1.08752	7/31/2014	TRUE
Deep Aquifers	FO-10-Shallow	Seaside	0.64873	0.16458	1.24118	0.16656	1.69641	0.06650	1.03007	1.25669	8/4/2015	TRUE
Deep Aquifers	FO-10-Shallow	Seaside	0.74854	0.16458	1.29760	0.20820	1.60941	0.06138	1.04988	1.28085	8/1/2016	TRUE
Deep Aquifers	FO-10-Shallow	Seaside	1.04796	0.32915	1.66432	0.24984	1.65291	0.07673	1.22816	1.49836	9/12/2017	TRUE
Deep Aquifers	FO-10-Shallow	Seaside	0.89825	0.16458	1.24118	0.27066	1.78340	0.06650	1.06969	1.30502	9/5/2018	TRUE
Deep Aquifers	FO-10-Shallow	Seaside	0.74854	0.16458	1.19041	0.22902	1.47892	0.04604	1.04988	1.28085	9/20/2019	TRUE
Deep Aquifers	FO-10-Shallow	Seaside	1.29747	0.51841	2.53597	0.14574	2.00089	0.06650	1.12912	1.37752	9/16/2020	TRUE
Deep Aquifers	FO-10-Shallow	Seaside	1.09786	0.39498	1.87588	0.24984	1.73990	0.07417	1.12912	1.37752	4/13/2021	TRUE
Deep Aquifers	FO-10-Shallow	Seaside	1.34737	0.58424	2.61777	0.14574	1.91389	0.06906	1.20835	1.47419	9/2/2021	TRUE
Deep Aquifers	Paralta	Seaside	2.24562	0.90516	1.32581	1.22837	2.52286	0.07929	2.97136	3.62505	9/18/2019	TRUE
Deep Aquifers	Paralta	Seaside	2.44523	0.98745	1.90691	1.39493	3.04483	0.10231	3.56563	4.35007	10/13/2020	TRUE
Deep Aquifers	Seaside Golf - Reservoir	Seaside	0.59883	0.41144	1.94640	0.18738	2.08789	0.03325	0.97064	1.18418	10/19/2011	TRUE
Deep Aquifers	Seaside Golf - Reservoir	Seaside	1.09786	0.61716	2.56700	0.41640	2.13138	0.04604	1.40644	1.71586	10/2/2012	TRUE
Deep Aquifers	Seaside Golf - Reservoir	Seaside	1.14776	0.61716	2.20028	0.33312	2.26188	0.04860	1.32721	1.61919	6/23/2014	TRUE
Deep Aquifers	Seaside Golf - Reservoir	Seaside	0.69864	0.41144	1.88999	0.14574	1.91389	0.04860	0.91122	1.11168	7/20/2015	TRUE
Deep Aquifers	Seaside Golf - Reservoir	Seaside	1.99611	2.55092	9.30889	0.68706	8.22105	0.12788	1.22816	1.49836	9/14/2017	TRUE
Deep Aquifers	Seaside Golf - Reservoir	Seaside	0.79844	0.49373	2.05924	0.20820	1.91389	0.04860	1.01026	1.23252	8/23/2018	TRUE
Deep Aquifers	Seaside Golf - Reservoir	Seaside	0.94815	0.51841	2.00846	0.20820	2.17488	0.06138	0.99045	1.20835	10/17/2019	TRUE
Deep Aquifers	Seaside Golf - Reservoir	Seaside	0.79844	0.46081	2.03667	0.20820	2.00089	0.05115	1.06969	1.30502	9/16/2020	TRUE
Deep Aquifers	Seaside Golf - Reservoir	Seaside	0.89825	0.51841	1.97743	0.02082	2.13138	0.05371	1.03007	1.25669	10/12/2021	TRUE
Tsm	MSC-Deep	N/A	3.59299	1.34952	4.11848	0.81198	4.74124	0.12788	4.59570	5.60675	9/7/2022	FALSE
Deep Aquifers	Mission Memorial	Seaside	2.09580	0.88050	2.18628	1.10346	2.65350	0.07418	2.28385	2.78630	9/2/2020	TRUE
Deep Aquifers	Ord Grove #2	Seaside	2.99400	1.31664	3.38520	1.22838	3.65400	0.11511	2.61971	3.19605	9/17/2020	TRUE
Deep Aquifers	Ord Terrace-Shallow	Seaside	3.99200	1.26727	3.32878	0.91608	3.78450	0.12534	3.64073	4.44169	9/16/2020	TRUE
Deep Aquifers	PCA-W Deep	Seaside	4.24150	1.45653	4.28792	0.85362	4.74150	0.13046	4.44680	5.42509	5/13/2020	TRUE
Deep Aquifers	PCA-E Deep	Seaside	3.34330	1.18498	3.49804	0.79116	5.30700	0.13813	3.54669	4.32696	9/17/2020	TRUE
Deep Aquifers	PCA-E Shallow	Seaside	1.14770	0.49374	1.48103	0.22902	2.43600	0.08441	1.26284	1.54066	9/17/2020	TRUE
Deep Aquifers	Sentinel MW#1 (1,140 feet)	Seaside	0.89820	0.16458	2.67995	0.58296	3.34950	0.10232	1.43748	1.75373	9/28/2017	TRUE
Deep Aquifers	Sentinel MW#1 (1,390 feet)	Seaside	2.04590	0.57603	4.17508	0.72870	4.30650	0.15348	2.48537	3.03215	9/28/2017	TRUE
Deep Aquifers	Sentinel MW#2 (1,000 feet)	Seaside	0.74850	0.16458	2.03112	0.39558	2.65350	0.10232	1.43748	1.75373	9/28/2017	TRUE
Deep Aquifers	Sentinel MW#2 (1,470 feet)	Seaside	1.94610	0.74061	8.23732	0.31230	7.83000	0.25580	3.22426	3.93360	9/28/2017	TRUE
Deep Aquifers	Sentinel MW#3 (1,275 feet)	Seaside	0.79840	0.16458	1.91828	0.33312	2.34900	0.10232	1.37031	1.67178	9/28/2017	TRUE
Deep Aquifers	Sentinel MW#3 (870 feet)	Seaside	0.84830	0.32916	1.86186	0.33312	2.30550	0.12790	1.34344	1.63900	9/28/2017	TRUE
Deep Aquifers	Sentinel MW#4 (715 feet)	Seaside	3.44310	0.98748	3.66730	0.81198	3.61050	0.17906	3.54669	4.32696	9/28/2017	TRUE
Deep Aquifers	Sentinel MW#4 (900 feet)	Seaside	3.69260	1.48122	7.47565	0.83280	6.96000	0.25580	4.60801	5.62177	9/28/2017	TRUE

Table E-4. Tritium Data

Well Name	Sample Date	Tritium (TU)	Aquifer	Source
MSMB-17	8/20/2014	-0.13	400-Foot and Deep Aquifers	GAMA_USGS
MSMB-37	8/21/2014	0.13	400-Foot and Deep Aquifers	GAMA_USGS
MSMB-37	8/18/2020	0.25	400-Foot and Deep Aquifers	GAMA_USGS
MSSV-19	7/27/2005	-0.09	400-Foot and Deep Aquifers	GAMA_USGS
MSMB-13	8/17/2005	0.19	400-Foot Aquifer	GAMA_USGS
MSMB-13	8/19/2014	0.28	400-Foot Aquifer	GAMA_USGS
MSMB-16	8/17/2005	0.31	400-Foot Aquifer	GAMA_USGS
MSMB-16	8/19/2008	1.60	400-Foot Aquifer	GAMA_USGS
MSMB-24	8/9/2005	0.31	400-Foot Aquifer	GAMA_USGS
MSMB-26	8/11/2005	0.41	400-Foot Aquifer	GAMA_USGS
MSMB-26	8/14/2014	0.16	400-Foot Aquifer	GAMA_USGS
MSMB-27	8/3/2005	0.19	400-Foot Aquifer	GAMA_USGS
MSMB-28	8/3/2005	0.50	400-Foot Aquifer	GAMA_USGS
MSMB-28	8/21/2008	0.63	400-Foot Aquifer	GAMA_USGS
MSMB-28	8/13/2014	0.19	400-Foot Aquifer	GAMA_USGS
MSMB-30	8/8/2005	0.09	400-Foot Aquifer	GAMA_USGS
MSMB-36	8/10/2005	0.50	400-Foot Aquifer	GAMA_USGS
MSMB-38	8/11/2005	0.60	400-Foot Aquifer	GAMA_USGS
MSMB-38	8/13/2014	0.60	400-Foot Aquifer	GAMA_USGS
MSMB-46	9/20/2005	2.19	400-Foot Aquifer	GAMA_USGS
S-MS-SV03	10/31/2012	0.38	400-Foot Aquifer	GAMA_USGS
S-MS-SV09	10/29/2012	1.50	400-Foot Aquifer	GAMA_USGS
S-MS-SV22	3/14/2013	1.88	400-Foot Aquifer	GAMA_USGS
S-MS-SV33-T1	11/6/2012	0.06	400-Foot Aquifer	GAMA_USGS
S-MS-SV35	3/7/2013	0.22	400-Foot Aquifer	GAMA_USGS
S-MS-SV36	11/6/2012	1.16	400-Foot Aquifer	GAMA_USGS
MSMB-03	8/20/2008	-0.06	Deep Aquifers	GAMA_USGS
MSMB-03	8/31/2005	-0.09	Deep Aquifers	GAMA_USGS
MSMBFP-01	8/17/2005	0.19	Deep Aquifers	GAMA_USGS
15S03E10D04	5/11/2023	< 0.96	400-Foot and Deep Aquifers	SVBGSA
16S04E03G53	5/28/2023	< 0.70	400-Foot and Deep Aquifers	SVBGSA
14S02E32D04	5/2/2023	< 0.73	Deep Aquifers	SVBGSA
14S03E19C01	6/30/2023	< 0.53	Deep Aquifers	SVBGSA
MCWD-34	5/2/2023	< 0.81	Deep Aquifers	SVBGSA
14S03E20A51	5/11/2023	< 0.53	Eastside Deep	SVBGSA
17S05E04A02	3/29/2023	< 0.60	Eastside Deep	SVBGSA
16S02E03J50	5/1/2023	< 1.16	El Toro Primary Aquifer System (Corral de Tierra)	SVBGSA
15S01E23T55	5/24/2023	0.89	QTc, Tsm	SVBGSA

Table E-5. Stable Isotope Data

Well Name	Sample date	delta18O (‰ VSMOW)	delta 2H (‰ VSMOW)	Aquifer
13S02E34G01	6/1/2023	-7.02	-45.74	400-Foot Aquifer
13S02E34G01	8/1/2023	-6.72	-43.13	400-Foot Aquifer
13S02E35H01	6/1/2023	-6.22	-38.62	400-Foot Aquifer
13S02E35H01	8/1/2023	-6.24	-38.62	400-Foot Aquifer
14S02E03M02	6/1/2023	-6.54	-41.70	400-Foot Aquifer
14S02E03M02	8/1/2023	-6.56	-41.80	400-Foot Aquifer
14S02E03P01	6/1/2023	-6.57	-42.17	400-Foot Aquifer
14S02E03P01	8/1/2023	-6.81	-43.74	400-Foot Aquifer
14S02E04H01	6/1/2023	-6.59	-42.18	400-Foot Aquifer
14S02E04H01	8/1/2023	-6.64	-42.22	400-Foot Aquifer
14S02E05C03	6/1/2023	-5.91	-38.73	400-Foot Aquifer
14S02E05C03	8/1/2023	-6.48	-41.69	400-Foot Aquifer
14S02E09N02	8/1/2023	-6.66	-42.89	400-Foot Aquifer
14S02E11A04	8/1/2023	-6.21	-38.98	400-Foot Aquifer
14S02E11M03	6/1/2023	-6.59	-42.32	400-Foot Aquifer
14S02E11M03	8/1/2023	-6.66	-42.51	400-Foot Aquifer
14S02E15A01	6/1/2023	-6.88	-44.67	400-Foot Aquifer
14S02E15A01	8/1/2023	-6.92	-44.73	400-Foot Aquifer
14S02E22R01	6/1/2023	-7.10	-45.69	400-Foot Aquifer
14S02E22R01	8/1/2023	-7.04	-45.15	400-Foot Aquifer
14S02E26C50	6/1/2023	-6.28	-40.23	400-Foot Aquifer
14S02E26C50	8/1/2023	-6.29	-39.96	400-Foot Aquifer
14S02E33Q01	6/1/2023	-6.55	-41.50	400-Foot Aquifer
14S02E33Q01	8/1/2023	-6.58	-41.51	400-Foot Aquifer
14S02E34A04	6/1/2023	-5.51	-35.91	400-Foot Aquifer
14S02E34A04	8/1/2023	-5.57	-36.82	400-Foot Aquifer
14S02E36F03	6/1/2023	-6.51	-41.29	400-Foot Aquifer

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Well Name	Sample date	delta18O (‰ VSMOW)	delta 2H (‰ VSMOW)	Aquifer
14S02E36F03	8/1/2023	-6.49	-41.14	400-Foot Aquifer
14S03E30E03	6/1/2023	-5.36	-34.76	400-Foot Aquifer
14S03E30E03	8/1/2023	-5.40	-34.65	400-Foot Aquifer
15S03E08L01	6/1/2023	-6.75	-42.15	400-Foot Aquifer
15S03E08L01	8/1/2023	-6.80	-42.23	400-Foot Aquifer
14S02E02A02	6/1/2023	-6.35	-40.75	400-Foot Aquifer
14S02E02A02	8/1/2023	-6.49	-41.07	400-Foot Aquifer
14S02E02C03	6/1/2023	-6.36	-40.78	400-Foot Aquifer
14S02E02C03	8/1/2023	-6.44	-40.81	400-Foot Aquifer
14S02E03H01	6/1/2023	-6.48	-41.89	400-Foot Aquifer
14S02E03H01	8/1/2023	-6.53	-41.92	400-Foot Aquifer
14S03E07P50	6/1/2023	-6.60	-42.85	400-Foot and Deep Aquifers
14S03E07P50	8/1/2023	-6.63	-42.79	400-Foot and Deep Aquifers
15S03E05R52	6/1/2023	-6.86	-43.11	400-Foot and Deep Aquifers
15S03E10D04	6/1/2023	-6.43	-40.43	400-Foot and Deep Aquifers
15S03E10D04	8/1/2023	-8.43	-56.13	400-Foot and Deep Aquifers
16S04E11D51	6/1/2023	-6.44	-39.85	400-Foot Aquifer
16S04E11D51	8/1/2023	-6.54	-40.29	400-Foot Aquifer
13S01E25R01	6/1/2023	-7.48	-49.73	Deep Aquifers
13S01E25R01	8/1/2023	-7.48	-49.56	Deep Aquifers
13S01E36J02	6/1/2023	-7.41	-49.16	Deep Aquifers
13S01E36J02	8/1/2023	-7.42	-49.12	Deep Aquifers
13S02E15M01	6/1/2023	-6.39	-39.88	400-Foot and Deep Aquifers
13S02E15M01	8/1/2023	-6.41	-39.82	400-Foot and Deep Aquifers
13S02E19Q03	6/1/2023	-7.26	-48.02	Deep Aquifers
13S02E28L03	8/1/2023	-7.48	-49.55	Deep Aquifers
13S02E31A02	6/1/2023	-7.44	-49.06	Deep Aquifers
13S02E31A02	8/1/2023	-7.43	-49.00	Deep Aquifers
14S02E07J03	6/1/2023	-7.21	-47.07	Deep Aquifers

Well Name	Sample date	delta18O (‰ VSMOW)	delta 2H (‰ VSMOW)	Aquifer
14S02E07J03	8/1/2023	-7.22	-47.89	Deep Aquifers
14S02E14R02	6/1/2023	-8.23	-55.17	Deep Aquifers
14S02E14R02	8/1/2023	-8.23	-55.05	Deep Aquifers
14S02E18B01	6/1/2023	-7.07	-46.49	Deep Aquifers
14S02E20E01	6/1/2023	-7.08	-47.08	Deep Aquifers
14S02E20E01	8/1/2023	-7.13	-47.25	Deep Aquifers
14S02E21L02	6/1/2023	-6.88	-45.17	Deep Aquifers
14S02E22A03	6/1/2023	-7.95	-53.01	Deep Aquifers
14S02E22A03	8/1/2023	-8.25	-55.09	Deep Aquifers
14S02E22J02	6/1/2023	-6.74	-43.28	Deep Aquifers
14S02E22J02	8/1/2023	-6.77	-43.42	Deep Aquifers
14S02E23J02	6/1/2023	-7.78	-51.70	Deep Aquifers
14S02E23J02	8/1/2023	-8.01	-53.35	Deep Aquifers
14S02E23P02	6/1/2023	-7.64	-50.49	Deep Aquifers
14S02E23P02	8/1/2023	-7.66	-50.44	Deep Aquifers
14S02E26A10	6/1/2023	-8.15	-55.11	Deep Aquifers
14S02E26D01	6/1/2023	-8.21	-55.38	Deep Aquifers
14S02E26D01	8/1/2023	-8.32	-55.71	Deep Aquifers
14S02E26G01	6/1/2023	-8.06	-54.01	Deep Aquifers
14S02E26G01	8/1/2023	-7.94	-52.91	Deep Aquifers
14S02E26J04	6/1/2023	-7.73	-50.95	Deep Aquifers
14S02E26J04	8/1/2023	-7.77	-51.20	Deep Aquifers
14S02E27J02	8/1/2023	-8.32	-55.57	Deep Aquifers
14S02E27K02	6/1/2023	-7.01	-45.82	Deep Aquifers
14S02E27K02	8/1/2023	-6.98	-45.42	Deep Aquifers
14S02E28C02	6/1/2023	-8.19	-55.07	Deep Aquifers
14S02E28C02	8/1/2023	-8.25	-55.26	Deep Aquifers
14S02E28H04	6/1/2023	-8.34	-56.24	Deep Aquifers
14S02E28H04	8/1/2023	-6.48	-41.24	Deep Aquifers

Well Name	Sample date	delta18O (‰ VSMOW)	delta 2H (‰ VSMOW)	Aquifer
14S02E29C01	6/1/2023	-7.72	-51.52	Deep Aquifers
14S02E29C01	8/1/2023	-7.77	-51.73	Deep Aquifers
14S02E31H01	6/1/2023	-7.55	-49.99	Deep Aquifers
14S02E31H01	8/1/2023	-7.51	-49.87	Deep Aquifers
14S02E32D04	6/1/2023	-7.82	-52.26	Deep Aquifers
14S02E32D04	8/1/2023	-7.86	-52.63	Deep Aquifers
14S02E34M01	6/1/2023	-6.81	-44.83	Deep Aquifers
14S02E34M01	8/1/2023	-6.83	-44.87	Deep Aquifers
14S02E35B01	6/1/2023	-8.10	-54.55	Deep Aquifers
14S02E35B01	8/1/2023	-8.13	-54.66	Deep Aquifers
15S02E04A04	6/1/2023	-7.59	-50.19	Deep Aquifers
15S02E04A04	8/1/2023	-7.60	-50.23	Deep Aquifers
16S04E03K01	6/1/2023	-6.80	-42.85	Eastside Deep
16S04E03K01	8/1/2023	-6.81	-42.89	Eastside Deep
16S04E03G53	5/28/2023	-7.02	-45.90	Eastside Deep
14S02E32D04	5/2/2023	-7.98	-55.00	Deep Aquifers
16S02E03J50	5/1/2023	-6.45	-44.10	El Toro Primary Aquifer System (Corral de Tierra)
14S03E20A51	5/11/2023	-6.56	-43.70	Eastside Deep
15S03E10D04	5/11/2023	-6.65	-44.20	400-Foot and Deep Aquifers
MCWD-34	5/2/2023	-7.52	-52.30	Deep Aquifers
17S05E04A02	3/29/2023	-7.08	-45.10	Eastside Deep
15S01E23T55	5/24/2023	-6.50	-42.60	QTc, Tsm
14S03E19C01	6/30/2023	-8.06	-55.50	Deep Aquifers

‰ SMOW = per mil VSMOW = parts per thousand difference from the isotope ratio of the reference standard

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Appendix F

Water Budget Tool Selection and Development

TOOL SELECTION

This Study uses the best available tools for the development of the water budget. Chapter 4 provides a summary for the justification for selecting the Salinas Valley SWI Model and the SVIHM for development of the Deep Aquifers water budgets. This section provides additional information on the models used and the calibration for each model.

Description of tools

Three existing models cover overlapping portions of the Deep Aquifers extent:

1. Salinas Valley Integrated Hydrologic Model[1] (SVIHM)
2. Monterey Subbasin Groundwater Flow Model (MBGWFM)
3. Salinas Valley Seawater Intrusion Model (SWI Model)

The SVIHM is currently under development by the United States Geological Survey (USGS). The SVIHM is a numerical groundwater-surface water model that is constructed using version 2 of the MODFLOW-OWHM code (Boyce *et al.*, 2020). This code is a version of the USGS groundwater flow code MODFLOW that estimates agricultural supply and demand through the Farm Process. The model area covers the entire Salinas Valley Groundwater Basin from the Monterey-San Luis Obispo County Line in the south to the Pajaro Basin in the north, including the offshore extent of the major aquifers. The model includes operations of the Nacimiento and San Antonio Reservoirs. The SVIHM is supported by 2 sub models: a geologic model known as the Salinas Valley Geologic Model (SVGM) and a watershed model known as the Hydrologic Simulation Program – Fortran (HSPF). The Deep Aquifers are represented in the SVIHM as the seventh and eighth layer of the 9-layer model. The USGS had only released a provisional version of the SVIHM at the time of the development of this Deep Aquifers Study. Details regarding source data, model construction, and calibration will be summarized in the model documentation once the model is publicly released.

EKI Environment & Water developed the MBGWFM for MCWD. It uses the USGS Newton formulation of the Modular Three-Dimensional Groundwater Modeling platform (MODFLOW-

[1] These data (model and/or model results) are preliminary or provisional and are subject to revision. This model and model results are being provided to meet the need for timely best science. The model has not received final approval by the U.S. Geological Survey (USGS). No warranty, expressed or implied, is made by the USGS or the U.S. Government as to the functionality of the model and related material nor shall the fact of release constitute any such warranty. The model is provided on the condition that neither the USGS nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the model.

NWT). Since the MBGWFM was not ultimately used for development of Deep Aquifers water budgets, the model will not be described in detail here. Additional details on the design and development of this model are available in the water budget chapter of the Monterey Subbasin Groundwater Sustainability Plan (MCWD and SVBGSA, 2022). The Deep Aquifers are represented in the MBGWFM as a single layer in the bottom active layer of the model.

Montgomery and Associates (M&A) developed the SWI Model. It is a MODFLOW USG-Transport groundwater flow and transport model. USG-Transport is an expanded version of MODFLOW USG, which uses an integrated finite difference framework to simulate heterogeneous, 3D advective-dispersive chemical species flow and transport with equilibrium and non-equilibrium retardation (Panday 2021, Panday *et al.*, 2013). The SWI Model is a density dependent groundwater flow model designed to assess seawater intrusion, primarily in the 180- and 400-Foot Aquifers. This model has the ability to account for the differing densities of freshwater, seawater, and brackish water due to density differences. It builds on existing groundwater models of the region, including the MBGWFM, SVIHM, the North Marina Groundwater Model, and the Seaside Basin Model. The SWI Model simulates groundwater flow and chloride transport using MODFLOW USG Transport V2.2 (Panday 2023). This model covers the Northern and Coastal portions of the Salinas Valley and covers a large portion of the Deep Aquifers. Geologic information from the SVIHM and the MBGWFM was used to inform the layering of the SWI Model. The SWI model contains 11 layers, with the Deep Aquifers represented by model layers 9 and 10.

At present, none of these 3 models can singularly be used to provide a water budget for the full Deep Aquifers. The SVIHM covers the entire Deep Aquifers extent but is poorly calibrated in the Monterey and Seaside areas. The MBGWFM is better calibrated than the other 2 models, but only covers a small portion of the Deep Aquifers. The SWI Model is calibrated in the Deep Aquifers but does not cover the full Deep Aquifers extent in the southern Salinas Valley. Due to the extent and calibration of each model, no single tool can provide dependable water budgets for the Deep Aquifers, and the results of 2 or more models need to be combined to provide an estimate of the water budget. The water budgets presented in Chapter 4 were developed using the SWI Model in conjunction with the SVIHM to cover the Deep Aquifers area outside of the SWI Model extent. This combination of models provides coverage for the entire Deep Aquifers, while minimizing the number of model results that need to be stitched together and using only areas of models that were calibrated.

Some water budget components such as pumping and injection can be directly measured, but most water budget components are either estimated as inputs to the model or simulated by the model. Both estimated and simulated values in the water budgets are underpinned by certain assumptions. These assumptions can lead to uncertainty in the water budget. In each of the above models, selected inputs were developed based on the best available data at the time of model development. While substantial work was completed to reduce the level of uncertainty, uncertainty still exists in model inputs and results. In addition to the model assumptions, additional uncertainty stems from any model's imperfect representation of natural condition and level of calibration.

Calibration Review

To compare the accuracy of each model, observed and simulated water levels from each calibration dataset were extracted and combined into a single calibration dataset. The MBGWFM represents the Deep Aquifers as a single layer. For the SVIHM and SWI Model, which both represent the Deep Aquifers as 2 layers, simulated water levels were averaged for the 2 layers present in each model. Table F-1 lists the scaled root mean square error, or percent error, for the various overlapping areas of the models within the Deep Aquifers. Within the MBGWFM area, the MBGWFM model has the lowest model error and the SVIHM has the highest. Water levels in the Monterey and Seaside Subbasins were not used in the SVIHM calibration. Within the area of the SWI Model east of the MBGWFM boundary, the SWI Model and SVIHM perform similarly. Due to the SVIHM's large model error in the area covered by the MBGWFM and the rest of the Seaside area, the SWI Model performs better overall in the area that it covers.

Table F-1. Percent Error for the Combined Calibration Dataset for Each Model

Model	SWI Model	MBGWFM	SVIHM
Full Basin	12%	-	16%
MBGWFM Deep Aquifers Area	16%	12%	23%
Deep Aquifers Area North and East of MBGWFM	6%	-	6%

The Deep Aquifers was not the focus of the calibration for any of the models considered for this water budget analysis. The calibration for the SWI Model was focused on the 180- and 400-Foot Aquifers where seawater intrusion has been observed. Model error is higher in the Deep Aquifers layers than in other aquifer layers due to limited calibration data available in the majority of the Deep Aquifers and no observed water level elevation data in the portion of the Deep Aquifers calculated by the SVIHM. Additional water level measurements could be used to update the HCM and the models to improve confidence and accuracy of the water budgets in the Deep Aquifers. Despite the limited data for calibration, the SWI Model and the SVIHM are the best available tools to prepare water budgets for the Deep Aquifers.

WATER BUDGET DEVELOPMENT

Time Periods

Water budgets are presented for this historical (2004-2017) and recent periods (2018-2020). These 2 time-periods provide a range of climatic conditions. Selected time periods for the historical and recent water budgets are summarized in Table F-2.

Table F-2. Water Year Types Presented in Water Budget Times Periods

Time Period	Proposed Date Range	Water Year Types Represented in Time Period	Rationale
Historical	Water years 2004 through 2017	Dry: 4 Dry-Normal: 4 Normal: 1 Wet-Normal: 0 Wet: 5	Provides insights on water budget response to a wide range of variations in climate and groundwater use over an extensive period of record. Begins and ends in years with average precipitation.
Recent	Water Year 2018 through 2020	Dry: 1 Dry-Normal: 1 Wet: 1	Best reflection of current land use and water use conditions based on best available data.

The water budget for the Deep Aquifers is calculated using the SWI Model where the SWI Model is active and the SVIHM for the portion of the Deep Aquifers outside the SWI Model extent. For this analysis, water budgets are reported for water year 2004 through 2020, which is the last year the SWI Model runs through. The SVIHM runs through water year 2018, however, simulated groundwater extraction in 2018 does not match reported values in the basin. Consequently, water budgets in 2018 calculated by the SVIHM were excluded and water budget results for water year 2017 were repeated for water year 2018 through 2020. Over the water budget period (2004-2020) both the SWI Model and SVIHM have monthly stress periods. Water budget results were aggregated by water year for each model.

Deep Aquifer Zone Delineation

Water budget results were post-processed using ZoneBudget v 3.01 (Harbaugh, 1990) for the SVIHM and Groundwater Vista's (Rumbaugh, 2023) Hydrostratographic Unit Summary Report for the SWI Model. These tools divide the model results into user-specified zones. Water budgets are then calculated for each zone by aggregating the cell-by-cell water budgets for every node or cell within the zone.

The Deep Aquifers was separated into 3 zones to show spatial variation in the water budgets. The location for the 2 boundaries, between the 3 zones, is based on geology, observed groundwater elevations, and observed water chemistry. As Appendix A describes, the Santa

Margarita formation is present in the Seaside Subbasin and southwestern portion of the Monterey Subbasin and then is not present in the Marina Coast Water District deep wells. In addition, the water chemistry is slightly different between the Northern and Seaside Areas, as shown in Chapter 3. The boundary between the Southeastern Area and the Northern Area is based primarily on the lack of Deep Aquifers data in the Southeastern Area.

The external zones that groundwater flows into and out of the Deep Aquifers are delineated based on groundwater flow direction, geology, as well as geographic location. These zones were developed to match the regions outlined in the HCM. The geology and the connection to the Deep Aquifers for each of these areas is described in more detail in the HCM.

Well Borehole Flow Between Aquifer Layers

In general, outflows exceed inflows for the Southeastern Region, resulting in a loss of groundwater storage in both the historical and recent periods. Groundwater flow is entering from the south and west and exiting the Region into the Gabilan Range Bajada to the east and to the Northern Region of the Deep Aquifers to the north. However, the magnitude of the flow volumes is dependent on the hydraulic parameters within the model, which were not the focus of the calibration for the provisional SVIHM available for this analysis. Future model updates may consider including a sensitivity analysis on hydraulic parameters for the purpose of constraining this flow. A small negligible amount of surficial recharge and stream leakage occurs on the margins of the basin within this Region in portions of the Deep Aquifers that are exposed at the surface within the SVIHM; this is considered an artifact of the model layering and not representative of actual surficial recharge. Given the limited number of known Deep Aquifers wells in this region and the relatively small amount of pumping reported in Table 4-5, the loss of storage could be largely driven by net groundwater outflow to the Eastside Gabilan Bajada area, which could be a result of pumping in that adjacent aquifer. The pumping values in Table 4-5 represent pumping from wells located within the SWI Model boundary. Within the SVIHM, groundwater pumping is included in the SVIHM Net MNW2 term. While a small amount of simulated groundwater is exiting the Deep Aquifers via the MNW2 wells, a significantly larger amount of water is simulated as entering the aquifer via these wells. This occurs as a result of the MODFLOW MNW2 package used for simulating pumping in the SVIHM. This simulated inflow represents groundwater moving through the well bore from 1 aquifer layer to another due to the hydraulic gradient between the well bore and the aquifer layers. Overall, this simulated flow is a net inflow to the Deep Aquifers in the SVIHM. This well flow is further complicated because some of the water is associated with water balance subregions, often referred to as Farms, that are not adjacent to the Southeastern Region. While it is possible that in reality some groundwater is entering the Deep Aquifers via well bores, the magnitude of this flow is likely too high. The MNW well flow is reported as “well bore flow between aquifer layers” in Table 4-5 of the Study.

Combining Water Budget Results from Two Models

As described above, no single model currently available for this analysis is neither calibrated nor has coverage over the entire Deep Aquifers extent. As a result, water budgets from the SWI Model and the SVIHM needed to be combined to prepare water budgets for the entire Deep Aquifers. The Southeastern extent of the SWI Model is located near the middle of the Southeastern Area within the Deep Aquifers. The flows between the 3 models are not consistent across the entire water budget period. Figure F-1 shows the calculated flows across the interface between the SWI Model and the SVIHM along the SWI Model within the Deep Aquifers. The difference between these 2 flow rates is incorporated into the "Error" term presented in the water budgets.

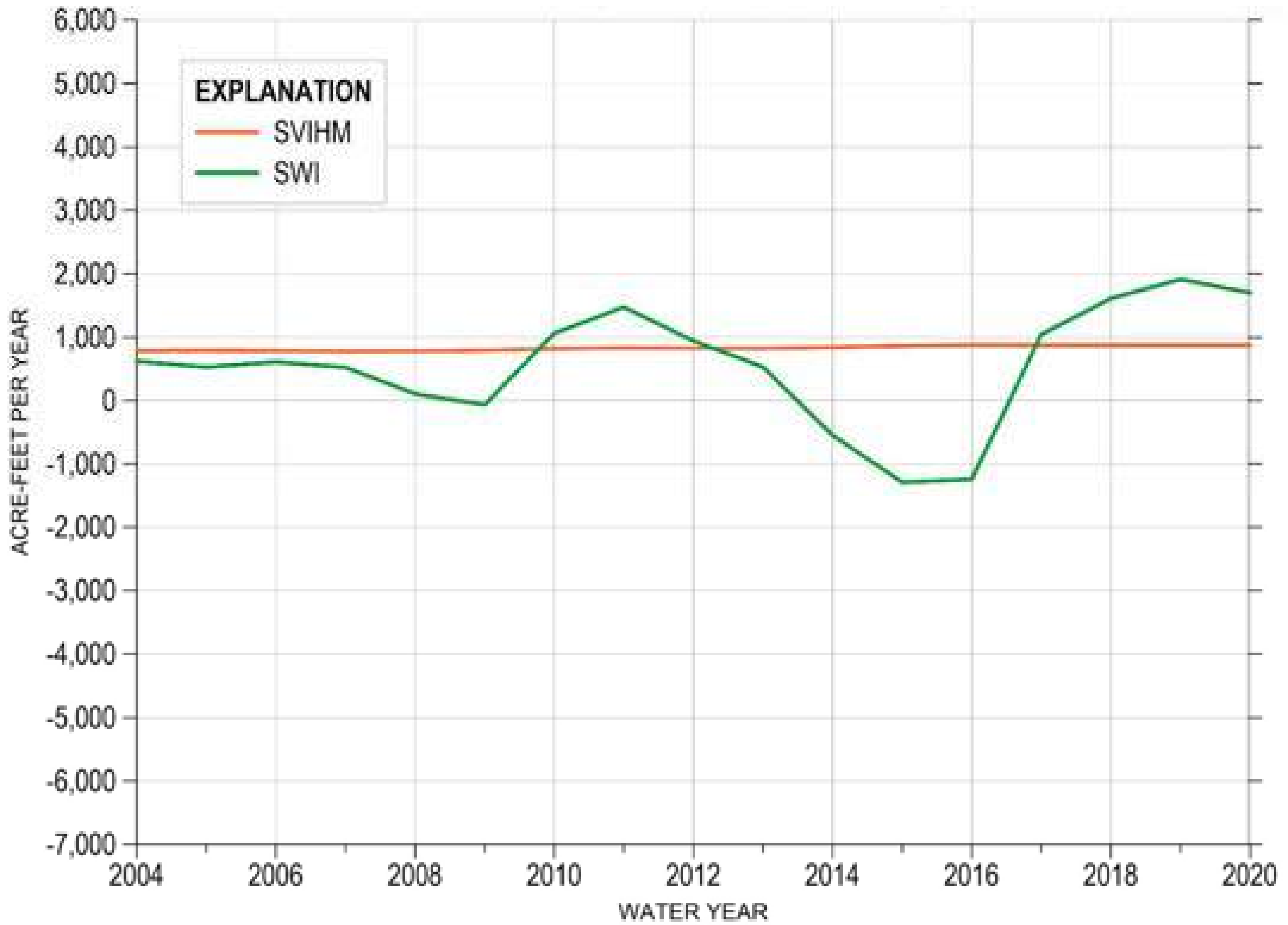

Figure F-1. Net groundwater flow across the SWI Model boundary within the Deep Aquifers

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Appendix G

Current Conditions Data

Introduction

This appendix includes additional analysis and data related to Chapter 5. Current and Historical Conditions. Figures G-1 and G-2 are additional analysis related to the development of the cumulative groundwater elevation plots. Table G-1 lists the wells used to develop current conditions figures and analyses. Table G-2 is the list of wells used for the example hydrographs analysis of groundwater elevations with depth. Table G-3 contains the fall 2022 groundwater elevation measurements used for the development of contours. Figures G-3 through G-16 are adapted MCWRA figures of pressure head difference between the Deep Aquifers and the 400-Foot Aquifer.

Cumulative Groundwater Elevations

Cumulative groundwater level change in the Deep Aquifers shown on Figure 5-5 of the report is calculated by averaging annual change in fall groundwater elevations for wells with available groundwater elevation measurements. Figure G-1 shows groundwater elevations for Deep Aquifers well 14S/02E-28H04 and monthly extraction volumes for wells within 2-mile radius of this selected well from August 2006—when the first groundwater measurement was taken in this well—to December 2022. The red markers shown on Figure G-1 represent August groundwater elevations, and the green markers represent fall groundwater elevations measured from November to December after the irrigation season is complete. The monthly pumping highlighted in green corresponds with the month the fall measurement was collected for that given year.

Well 14S/02E-28H04 is an agricultural supply pumping well, and its groundwater elevations can be highly variable between irrigation seasons as demonstrated by its hydrograph (Figure G-1). The hydrograph also shows that fall groundwater elevations in this well have generally declined since 2006. However, as shown on Figure 5-5 of this report, rises in the cumulative fall groundwater elevations are observed in years like 2019 and 2021, despite increases in total annual extraction in the Northern Region of the Deep Aquifers. Similarly, the hydrograph for well 14S/02E-28H04 shows that groundwater elevations increased in 2019 and 2021. Figure G-1 indicates that groundwater elevation measurements are generally inversely related to total monthly extractions near 14S/02E-28H04. For example, the 2019 fall groundwater elevation was higher than that in 2018 due to lower pumping in December 2019 compared to December 2018. Seasonal reduction in pumping results in a rebound of the potentiometric surface which contributes to the observed seasonal rise in groundwater elevations. Conversely, 2020 fall groundwater elevation was lower than in 2019 due to higher pumping in December 2020. This indicates that groundwater elevations’ sensitivity to groundwater extraction is not being captured by analyzing these data on an annual basis, as was done for the cumulative groundwater elevation hydrograph on Figure 5-5.

Figure G-2 shows a comparison of data correlations using monthly and annual data. The figure shows the correlation between fall groundwater elevations in well 14S/02E-28H04 and monthly pumping corresponding to the month the fall groundwater measurement was taken, and the correlation between fall groundwater elevations measured at well 14S/02E-28H04 and the total annual pumping for the Northern Region of the Deep Aquifers. The fall groundwater elevations at well 14S/02E-28H04 are more strongly correlated to the monthly pumping that occurs in the month that the fall measurement is taken (R = 0.7801) than the annual total Deep Aquifers pumping for the Norther Region (R = 0.5169). This reiterates that comparing annual fall groundwater elevations to total annual extractions does not accurately reflect groundwater elevations' sensitivity to extraction in the Deep Aquifers.

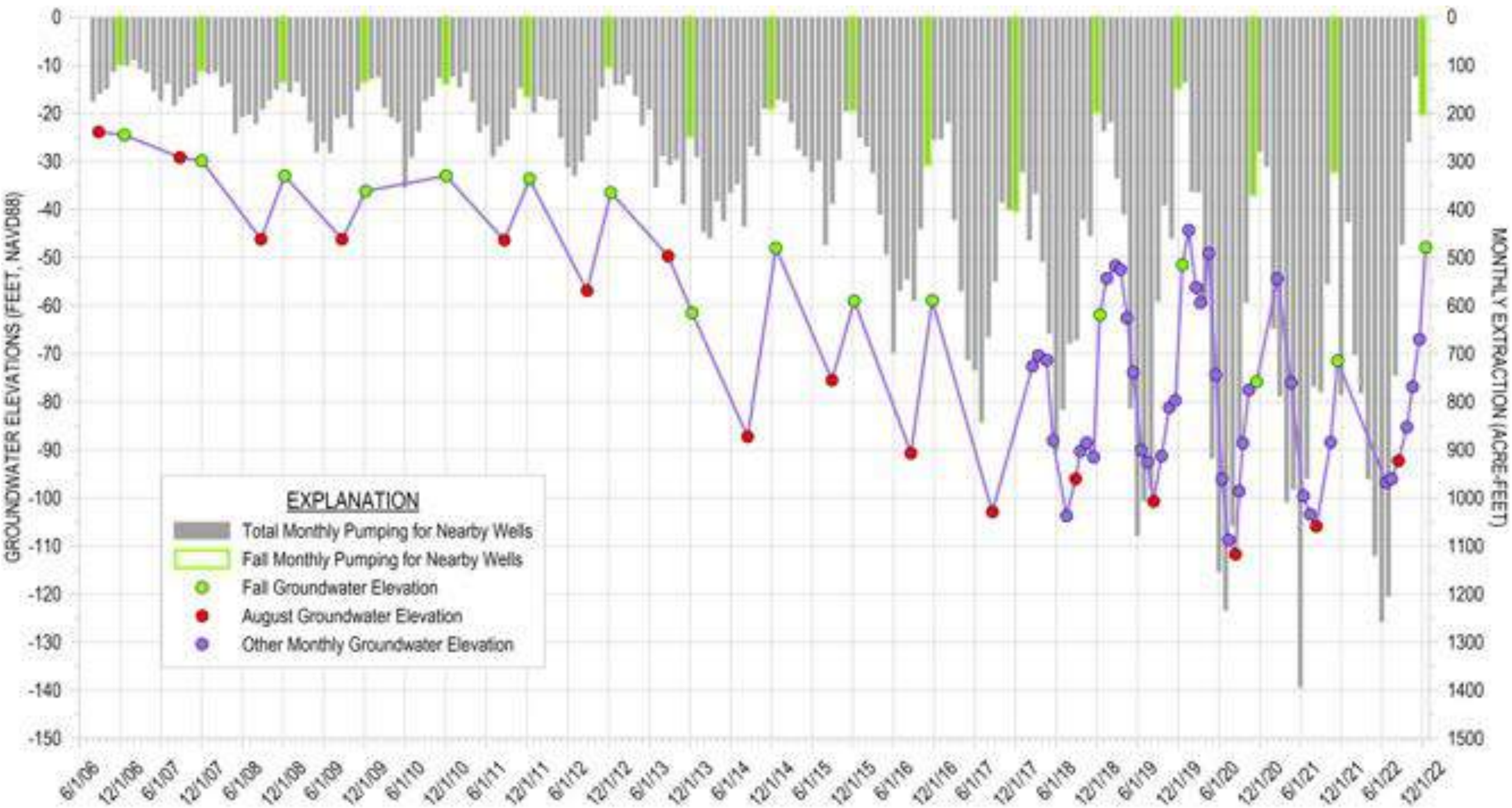

Figure G-1. Comparison of Groundwater Elevations in Well 14S/02E-28H04 and Total Monthly Groundwater Extraction for well 14S/02E-28H04 and Nearby Wells

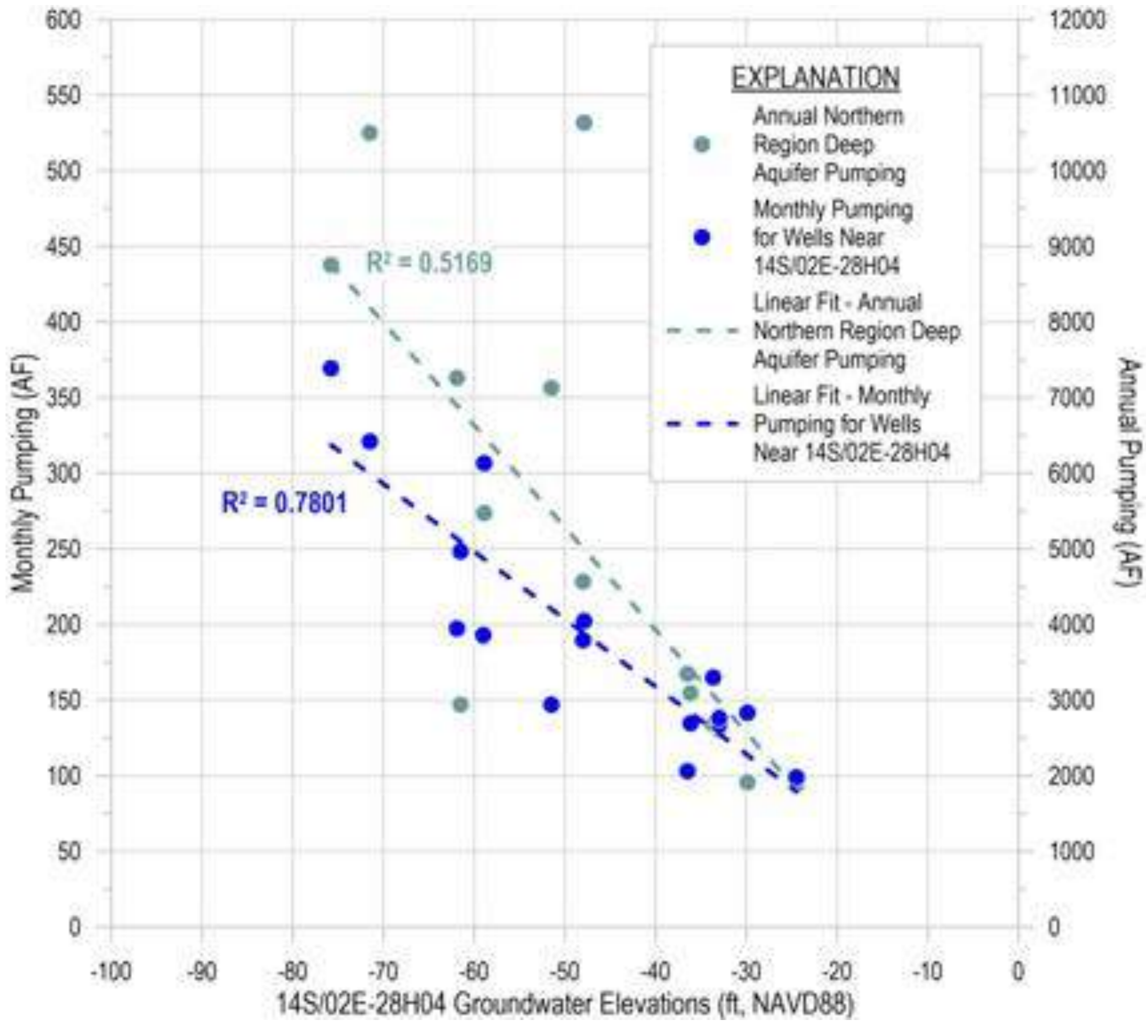

Figure G-2. Correlation Between Fall Groundwater Elevations in Well 14S/02E-28H04 and Total Monthly Groundwater Extraction for Well 14S/02E-28H04 and Nearby Wells and Total Annual Deep Aquifers Pumping in the Northern Region

Table G-1. Summary of Wells used in Current Conditions Figures and Analyses

Well Name	Aquifer	Well Use	Subbasin	Region	Well Used in Current Conditions Figure			
					Extraction/ Injection	Cumulative Hydrographs	Fall 2022 Contours	Example Hydrographs
13S/01E-25R01	Deep Aquifers	Domestic	180/400-ft. Aquifer	Northern	Extraction	X	X	
13S/01E-36J02	Deep Aquifers	Domestic	180/400-ft. Aquifer	Northern	Extraction	X	X	X
13S/02E-19Q03	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	
13S/02E-28L03	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	X
13S/02E-31A02	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	
13S/02E-32E05	Deep Aquifers	Monitoring	180/400-ft. Aquifer	Northern		X	X	
13S/03E-30K50	Deep Aquifers	Agricultural	Langley Area	Northern	Extraction			
14S/01E-24L02	Deep Aquifers	Monitoring	Monterey	Northern		X	X	
14S/01E-24L03	Deep Aquifers	Monitoring	Monterey	Northern		X	X	
14S/01E-24L04	Deep Aquifers	Monitoring	Monterey	Northern		X	X	
14S/01E-24L05	Deep Aquifers	Monitoring	Monterey	Northern		X	X	
14S/02E-06L01	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	X
14S/02E-07J03	Deep Aquifers	Industrial	180/400-ft. Aquifer	Northern	Extraction	X	X	
14S/02E-14R02	Deep Aquifers	Monitoring	180/400-ft. Aquifer	Northern	Extraction			
14S/02E-18B01	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction			
14S/02E-19G01	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	
14S/02E-20E01	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	X
14S/02E-21K04	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	
14S/02E-21L02	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	
14S/02E-22A03	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	X
14S/02E-22J02	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	
14S/02E-23J02	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	
14S/02E-23P02	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	
14S/02E-25A03	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	
14S/02E-26A10	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	
14S/02E-26D01	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction			
14S/02E-26G01	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction			
14S/02E-26J04	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction			

Well Name	Aquifer	Well Use	Subbasin	Region	Well Used in Current Conditions Figure			
					Extraction/ Injection	Cumulative Hydrographs	Fall 2022 Contours	Example Hydrographs
14S/02E-27J02	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	
14S/02E-27K02	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	
14S/02E-28C02	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	
14S/02E-28H04	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	X
14S/02E-33E01	Deep Aquifers	Monitoring	Monterey	Northern		X	X	X
14S/02E-33E02	Deep Aquifers	Monitoring	Monterey	Northern		X	X	X
14S/02E-34M01	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	
14S/02E-35B01	Deep Aquifers	Monitoring	180/400-ft. Aquifer	Northern	Extraction			
14S/03E-19C01	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction	X	X	X
15S/02E-04A03	Deep Aquifers	Monitoring	Monterey	Northern		X	X	
13S/02E-15M03	400-ft and Deep Aquifers	Industrial	180/400-ft. Aquifer	Northern	Extraction			
14S/03E-07P50	400-ft and Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction			
15S/03E-10D04	400-ft and Deep Aquifers	Urban	180/400-ft. Aquifer	Northern	Extraction		X	
Camp Huffman (D)	Deep Aquifers	Monitoring	Seaside	Seaside		X	X	X
FO-07-Deep	Deep Aquifers	Monitoring	Seaside	Seaside		X	X	
FO-08-Deep	Deep Aquifers	Monitoring	Seaside	Seaside		X	X	
FO-09-Deep	Deep Aquifers	Monitoring	Seaside	Seaside		X	X	X
FO-10-Deep	Deep Aquifers	Monitoring	Monterey	Seaside		X	X	
FO-11-Deep	Deep Aquifers	Monitoring	Seaside	Seaside		X	X	X
Military	Deep Aquifers	Urban	Seaside	Seaside	Extraction			
Ord Grove #2	Deep Aquifers	Urban	Seaside	Seaside	Extraction	X	X	
Ord Grove Test	Deep Aquifers	Monitoring	Seaside	Seaside		X	X	X
Ord Terrace-Shallow	Deep Aquifers	Monitoring	Seaside	Seaside		X	X	
Paralta	Deep Aquifers	Urban	Seaside	Seaside	Extraction	X		
Paralta Test Well	Deep Aquifers	Monitoring	Seaside	Seaside		X		
PCA-E Deep	Deep Aquifers	Monitoring	Seaside	Seaside		X		
PCA-E Shallow	Deep Aquifers	Monitoring	Seaside	Seaside		X		
PCA-W Deep	Deep Aquifers	Monitoring	Seaside	Seaside		X	X	
Seaside Golf - Reservoir	Deep Aquifers	Urban	Seaside	Seaside	Extraction	X		

Well Name	Aquifer	Well Use	Subbasin	Region	Well Used in Current Conditions Figure			
					Extraction/ Injection	Cumulative Hydrographs	Fall 2022 Contours	Example Hydrographs
Sentinel MW #1	Deep Aquifers	Monitoring	Monterey	Seaside		X	X	
Sentinel MW #2	Deep Aquifers	Monitoring	Seaside	Seaside		X	X	
Sentinel MW #3	Deep Aquifers	Monitoring	Seaside	Seaside		X	X	
Sentinel MW #4	Deep Aquifers	Monitoring	Seaside	Seaside		X	X	
17S/05E-21F50	Deep Aquifers	Agricultural	Forebay Aquifer	Southeastern	Extraction			
15S/03E-13D01	400-ft and Deep Aquifers	Agricultural	180/400-ft. Aquifer	Southeastern	Extraction			
17S/05E-08L02	400-ft and Deep Aquifers	Agricultural	Forebay Aquifer	Southeastern		X	X	X
16S/04E-03K01	Eastside Deep Zone	Agricultural	180/400-ft. Aquifer	Outside DA Extent	Extraction			X
16S/05E-28K50	Eastside Deep Zone	Agricultural	Eastside Aquifer	Outside DA Extent	Extraction			
13S/01E-36J01*	Deep Aquifers	Urban	180/400-ft. Aquifer	Northern	Extraction	X		
13S/02E-15M51	400-ft and Deep Aquifers	Industrial	180/400-ft. Aquifer	Northern	Extraction			
13S/02E-32M02	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction			
14S/02E-23G02	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction		X	
14S/02E-29C01	Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction			
14S/02E-30G03	Deep Aquifers	Urban	Monterey	Northern	Extraction			
14S/02E-31H01	Deep Aquifers	Urban	Monterey	Northern	Extraction	X		
14S/02E-32D04	Deep Aquifers	Urban	Monterey	Northern	Extraction	X		
14S/03E-06D50	400-ft and Deep Aquifers	Agricultural	Eastside Aquifer	Northern	Extraction			
15S/02E-04A04	Deep Aquifers	Urban	Monterey	Northern	Extraction	X		
15S/03E-05R52	400-ft and Deep Aquifers	Agricultural	180/400-ft. Aquifer	Northern	Extraction		X	X
15S/04E-32H02	400-ft and Deep Aquifers	Agricultural	180/400-ft. Aquifer	Southeastern	Extraction			
Mission Memorial	Deep Aquifers	Urban	Seaside	Seaside	Extraction			
ASR-1	Deep Aquifers	ASR	Seaside	Seaside	Extraction			
ASR-2	Deep Aquifers	ASR	Seaside	Seaside	Injection			
ASR-3	Deep Aquifers	ASR	Seaside	Seaside	Extraction			
ASR-4	Deep Aquifers	ASR	Seaside	Seaside	Injection			
DIW-1	Deep Aquifers	Injection	Seaside	Seaside	Injection			
DIW-2	Deep Aquifers	Injection	Seaside	Seaside	Injection			
DIW-3	Deep Aquifers	Injection	Seaside	Seaside	Injection			

Well Name	Aquifer	Well Use	Subbasin	Region	Well Used in Current Conditions Figure			
					Extraction/ Injection	Cumulative Hydrographs	Fall 2022 Contours	Example Hydrographs
DIW-4	Deep Aquifers	Injection	Seaside	Seaside	Injection			
14S/02E-20B03*	400-ft and Deep Aquifers	Industrial	180/400-ft. Aquifer	Northern	Extraction			X
13S/02E-31N02	400-ft Aquifer	Agricultural	180/400-ft. Aquifer	Northern				X
14S/02E-34A03	400-ft Aquifer	Agricultural	180/400-ft. Aquifer	Northern				X
MP-BW-50-289	Lower 180-Foot, 400-Foot Aquifer	Monitoring	Monterey	Northern				X
FO-11-Shallow	Overlying Aquifer (upper Paso Robles Formation)	Monitoring	Monterey	Seaside				X

*Highlighted well is destroyed.

Table G-2. Wells Used for Example Hydrographs for Analysis of Groundwater Elevations with Depth

Well Name	Deep Aquifers Zone	Screen Interval (ft)	Well Use	Subbasin	Region
13S/01E-36J02	Upper/Lower	1301-1361	Domestic	180/400-ft. Aquifer	Northern
13S/02E-28L03	Upper	1080-1330	Agricultural	180/400-ft. Aquifer	Northern
14S/02E-06L01	Upper	860-1540	Agricultural	180/400-ft. Aquifer	Northern
14S/02E-20E01	Upper	1120-2020	Agricultural	180/400-ft. Aquifer	Northern
14S/02E-22A03	Upper	980-1640	Agricultural	180/400-ft. Aquifer	Northern
14S/02E-28H04	Lower	940-1030	Agricultural	180/400-ft. Aquifer	Northern
14S/02E-33E01	Lower	1045-1095	Monitoring	Monterey	Northern
14S/02E-33E02	Upper/Lower	1680-1760	Monitoring	Monterey	Northern
Camp Huffman (D)	Upper/Lower	950-1320	Monitoring	Seaside	Seaside
FO-09-Deep	Lower	790-830	Monitoring	Seaside	Seaside
FO-11-Deep	Upper/Lower	1090-1120	Monitoring	Seaside	Seaside
Ord Grove Test	Lower	355-480	Monitoring	Seaside	Seaside

Table G-3. Fall 2022 Groundwater Elevations Used for Contours

Well Name	Fall 2022 Groundwater Elevation (feet, NAVD88)	Data Source
13S/01E-25R01	-6.0	MCWRA
13S/01E-36J02	-11.6	MCWRA
13S/02E-19Q03	-10.9	MCWRA
13S/02E-28L03	-56.0	MCWRA
13S/02E-31A02	-11.1	MCWRA
13S/02E-32E05	-16.7	MCWRA
14S/01E-24L02	-29.0	MCWRA
14S/01E-24L03	-11.4	MCWRA
14S/01E-24L04	-27.3	MCWRA
14S/01E-24L05	-22.5	MCWRA
14S/02E-06L01	-14.3	MCWRA
14S/02E-07J03	-13.0	MCWRA
14S/02E-19G01	-29.0	MCWRA
14S/02E-20E01	-30.7	MCWRA
14S/02E-21K04	-33.2	MCWRA
14S/02E-21L02	-36.1	MCWRA
14S/02E-22A03	-52.1	MCWRA
14S/02E-22J02	-47.7	MCWRA
14S/02E-23G02	-109.8	MCWRA
14S/02E-23J02	-52.1	MCWRA
14S/02E-23P02	-37.0	MCWRA

Well Name	Fall 2022 Groundwater Elevation (feet, NAVD88)	Data Source
14S/02E-25A03	-44.0	MCWRA
14S/02E-26A10	-51.1	MCWRA
14S/02E-27J02	-49.5	MCWRA
14S/02E-27K02	-41.8	MCWRA
14S/02E-28C02	-45.5	MCWRA
14S/02E-28H04	-47.9	MCWRA
14S/02E-33E01	-45.2	MCWRA
14S/02E-33E02	-21.5	MCWRA
14S/02E-34M01	-30.1	MCWRA
14S/03E-19C01	-45.5	MCWRA
15S/02E-04A03	-44.7	MCWRA
Camp Huffman (D)	-12.7	Seaside Watermaster
FO-11-Deep	-12.7	Seaside Watermaster
FO-10-Deep	-12.7	Seaside Watermaster
FO-08-Deep	-20.3	Seaside Watermaster
FO-07_Deep	-20.4	Seaside Watermaster
Sentinel MW #1	-19.8	Seaside Watermaster
Sentinel MW #2	-16.7	Seaside Watermaster
Sentinel MW #3	-15.8	Seaside Watermaster
Sentinel MW #4	-15.0	Seaside Watermaster
PCA-W Deep	-23.1	Seaside Watermaster
Ord Grove #2*	-62.6	Seaside Watermaster
Ord Grove Test	-39.7	Seaside Watermaster
FO-09-Deep	-22.4	Seaside Watermaster
Ord Terrace-Shallow	-30.2	Seaside Watermaster
15S/03E-05R52**	-21.9	MCWRA
15S/03E-10D04**	-22.7	MCWRA
17S/05E-08L02**	90.2	MCWRA

*Pump on.
**Well is completed in the 400-Foot and Deep Aquifers and was indirectly used to inform contours where true Deep Aquifers data is lacking.

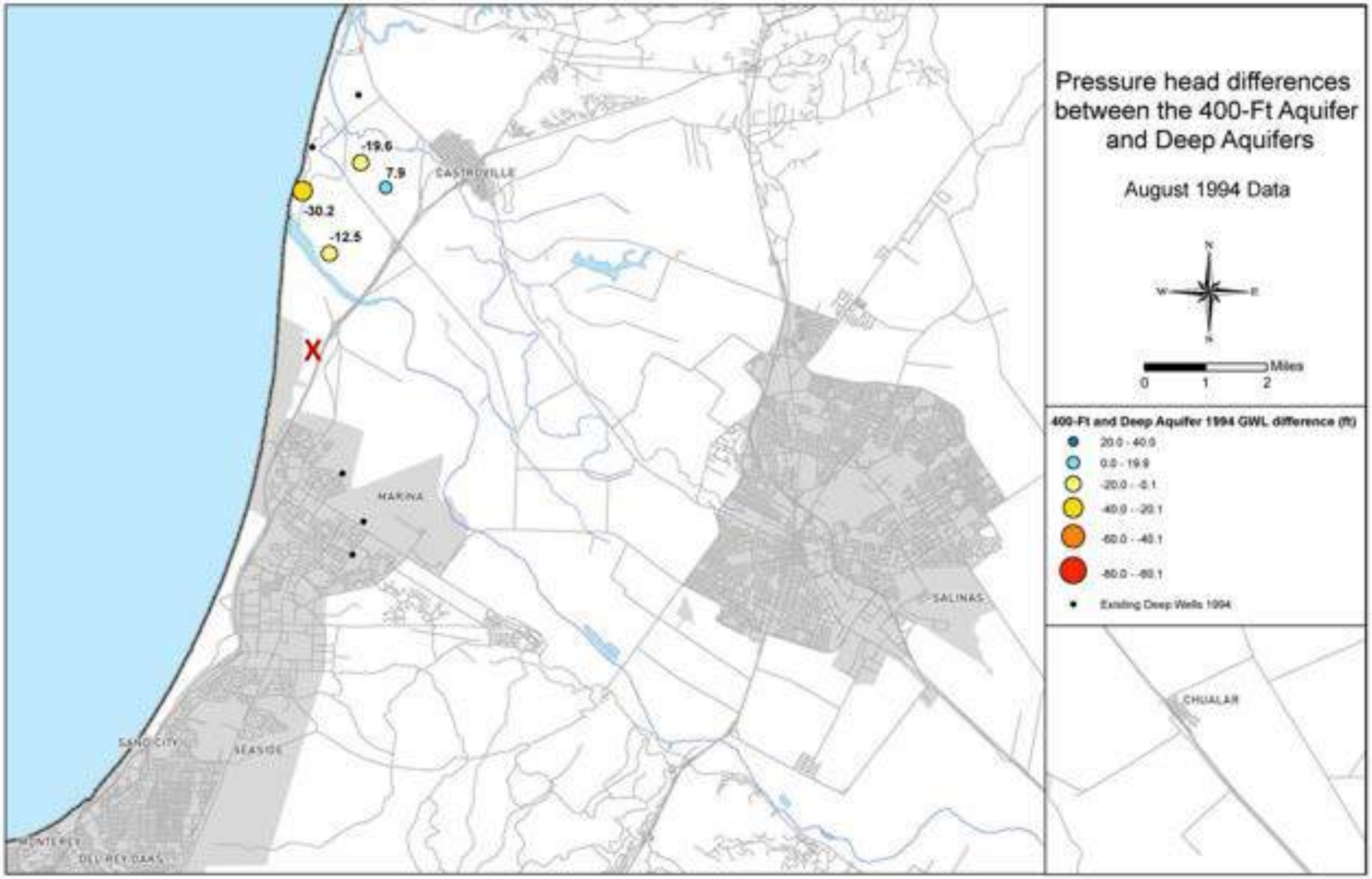

Figure G-3. August 1994 Pressure Head Difference Between the Deep Aquifers and 400-Foot Aquifer
(red X marks wells no longer considered true Deep Aquifers wells based on the definition set forth in this Study; adapted from MCWRA, 2022, personal communication, personal communication)

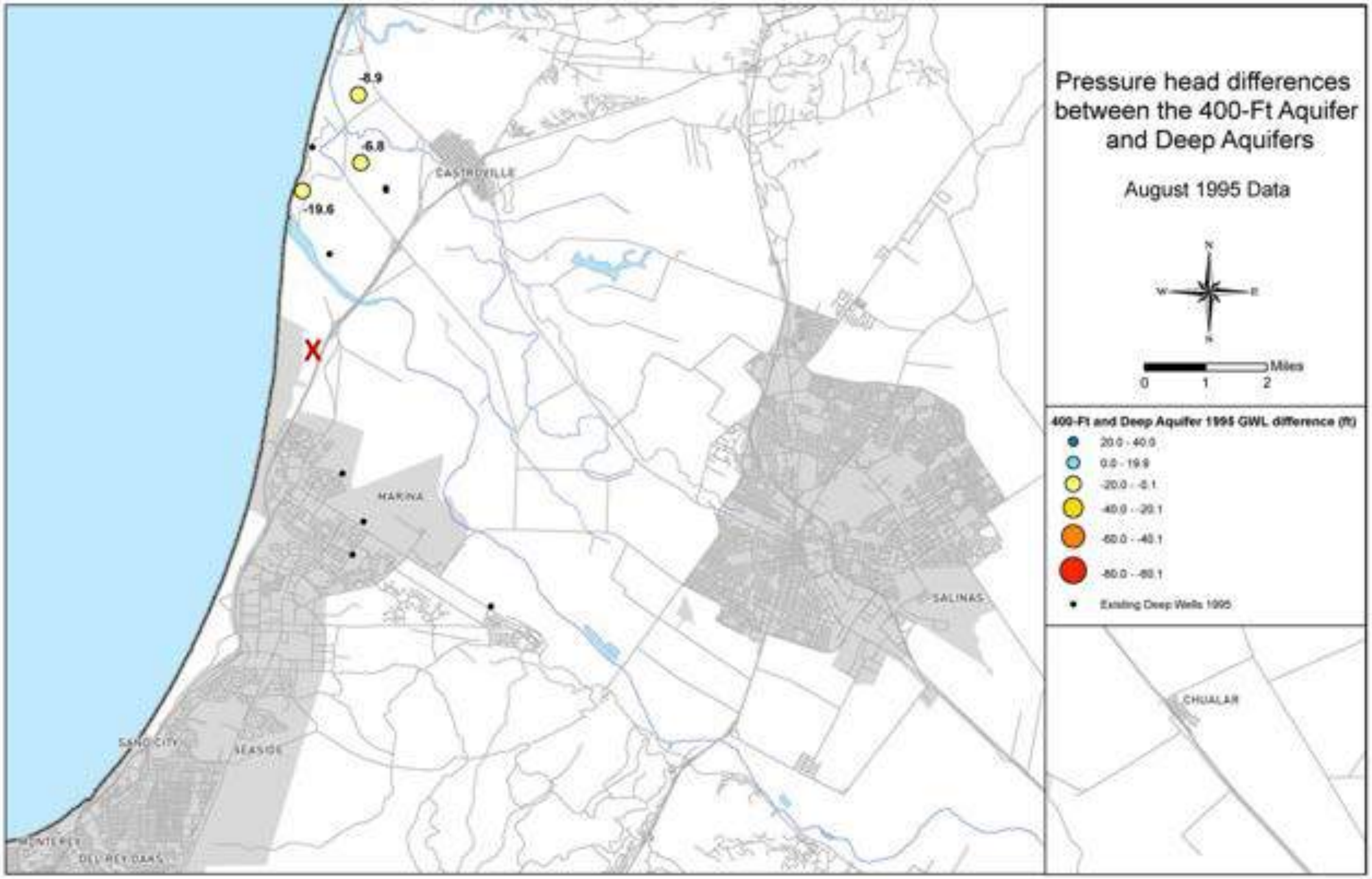

Figure G-4. August 1995 Pressure Head Difference Between the Deep Aquifers and 400-Foot Aquifer
(red X marks wells no longer considered true Deep Aquifers wells based on the definition set forth in this Study; adapted from MCWRA, 2022, personal communication)

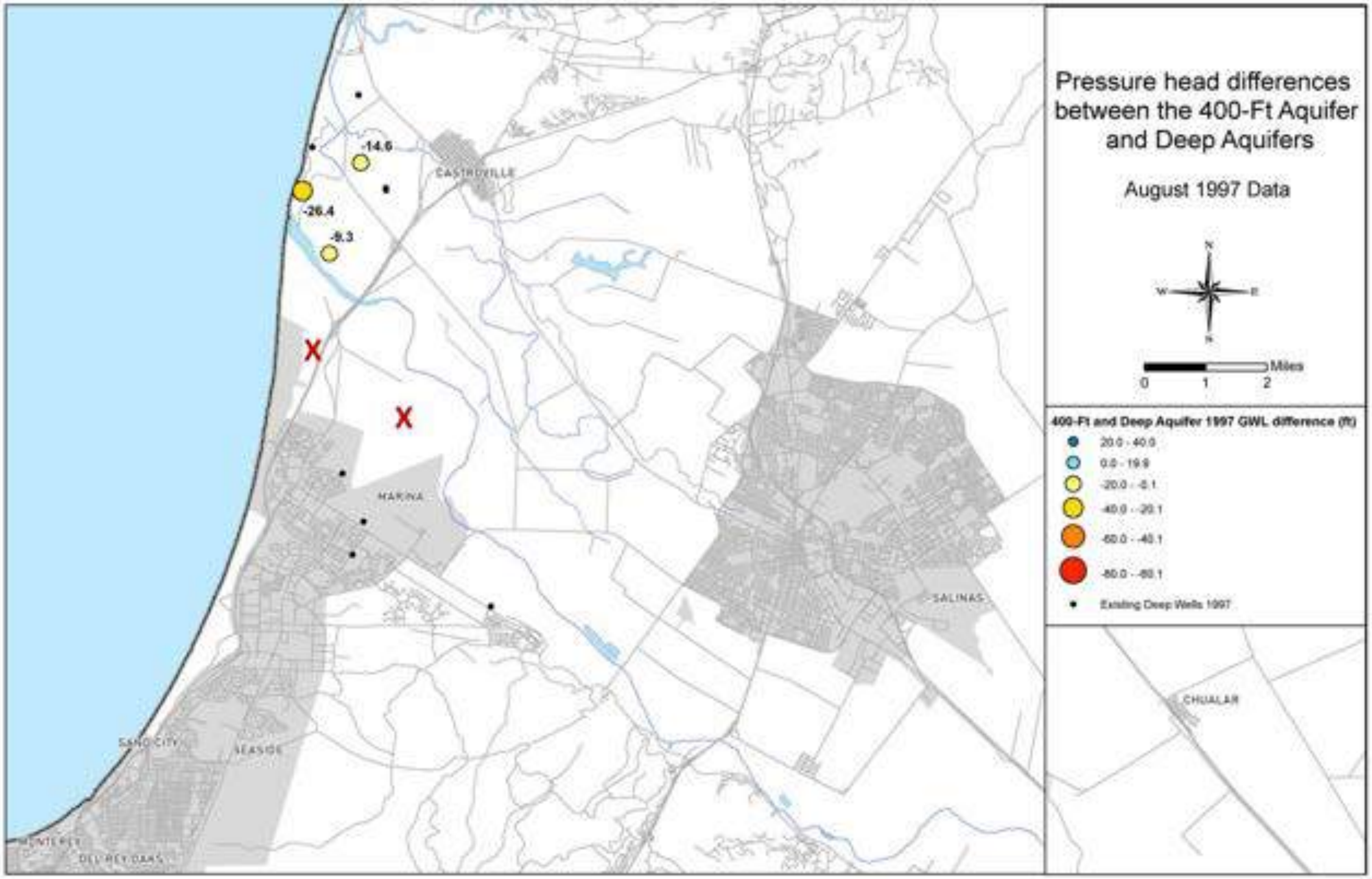

Figure G-5. August 1997 Pressure Head Difference Between the Deep Aquifers and 400-Foot Aquifer
(red X marks wells no longer considered true Deep Aquifers wells based on the definition set forth in this Study; adapted from MCWRA, 2022, personal communication)

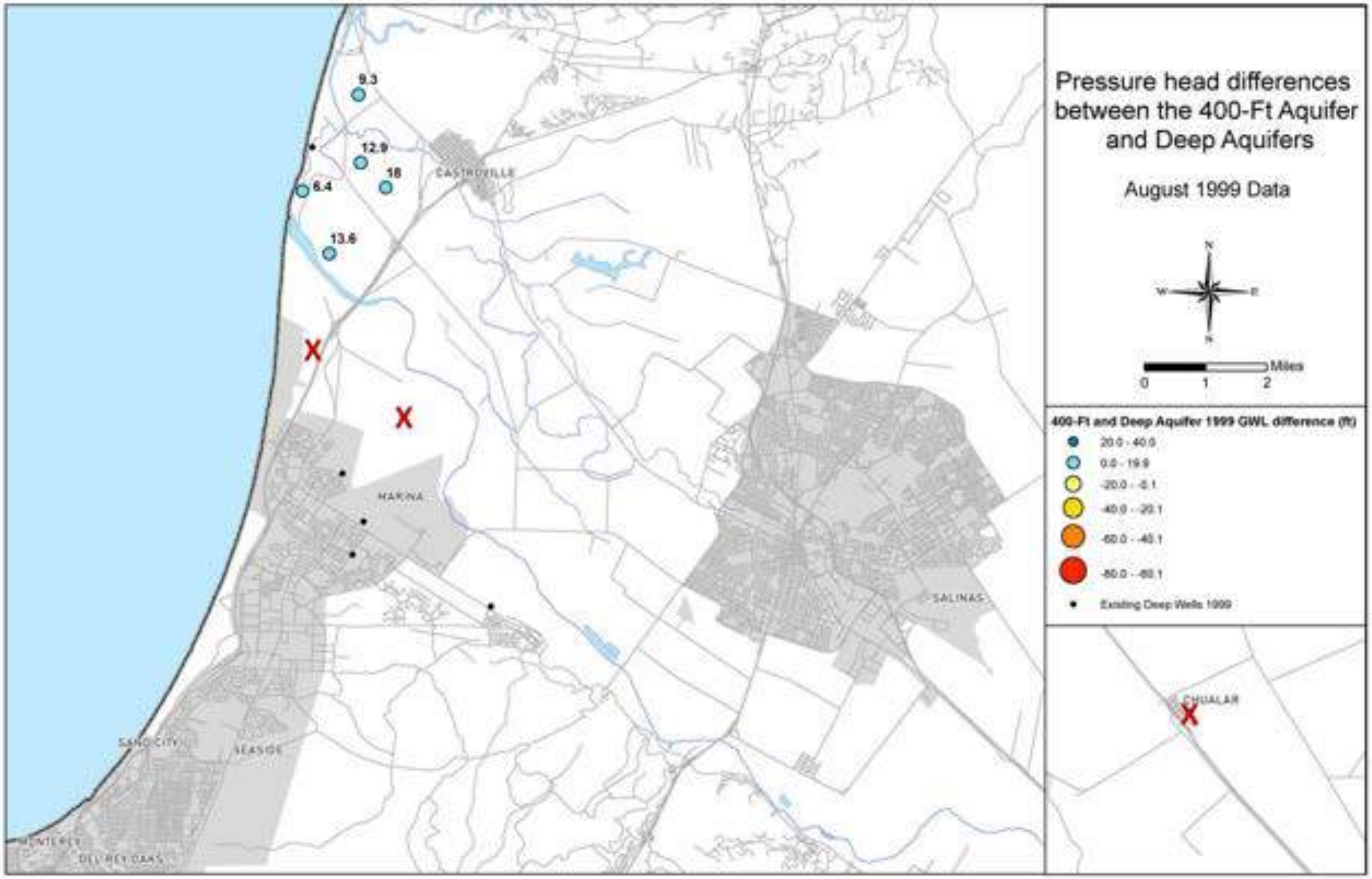

Figure G-6. August 1999 Pressure Head Difference Between the Deep Aquifers and 400-Foot Aquifer
(red X marks wells no longer considered true Deep Aquifers wells based on the definition set forth in this Study; adapted from MCWRA, 2022, personal communication)

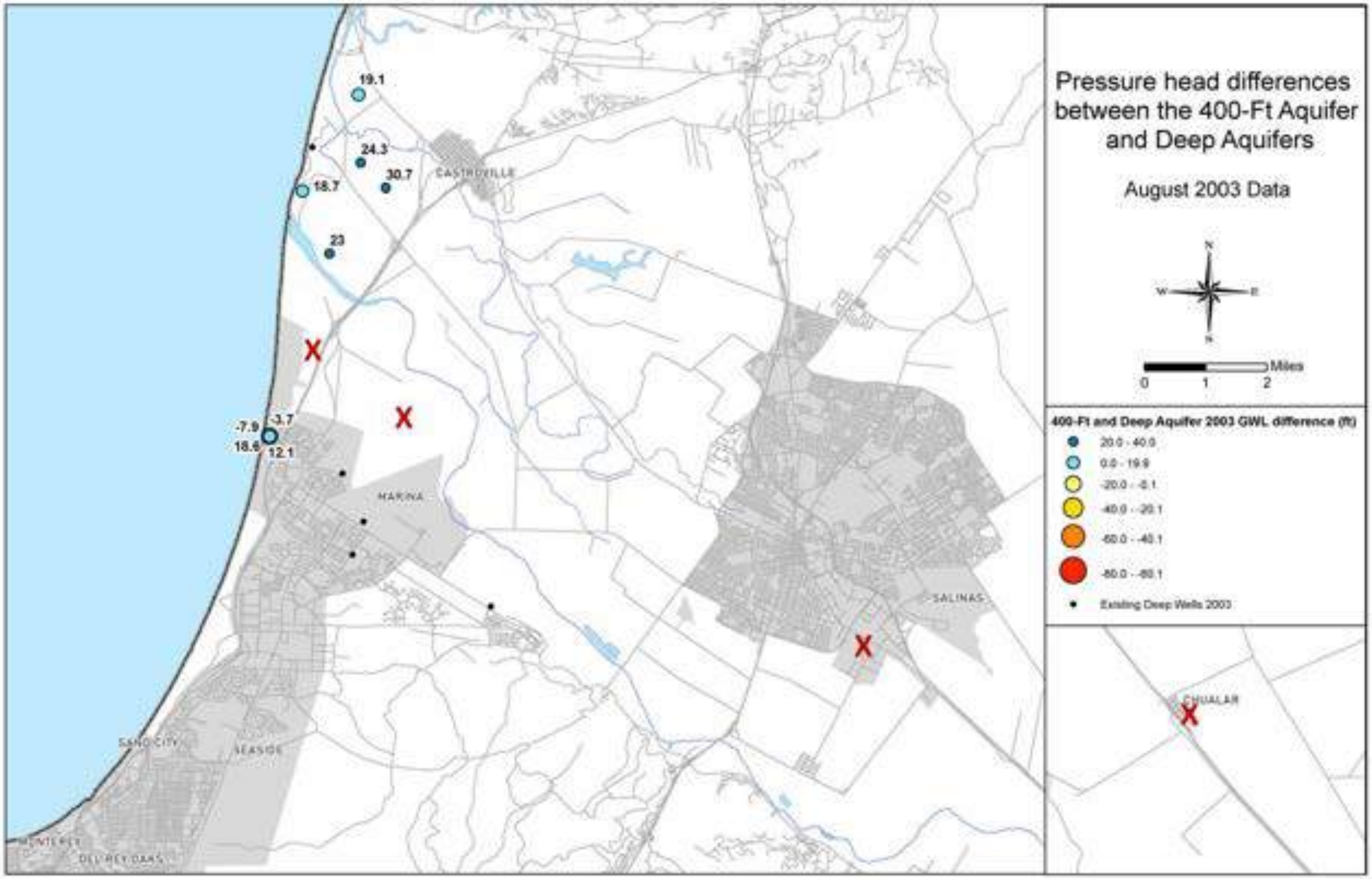

Figure G-7. August 2003 Pressure Head Difference Between the Deep Aquifers and 400-Foot Aquifer
(red X marks wells no longer considered true Deep Aquifers wells based on the definition set forth in this Study; adapted from MCWRA, 2022, personal communication)

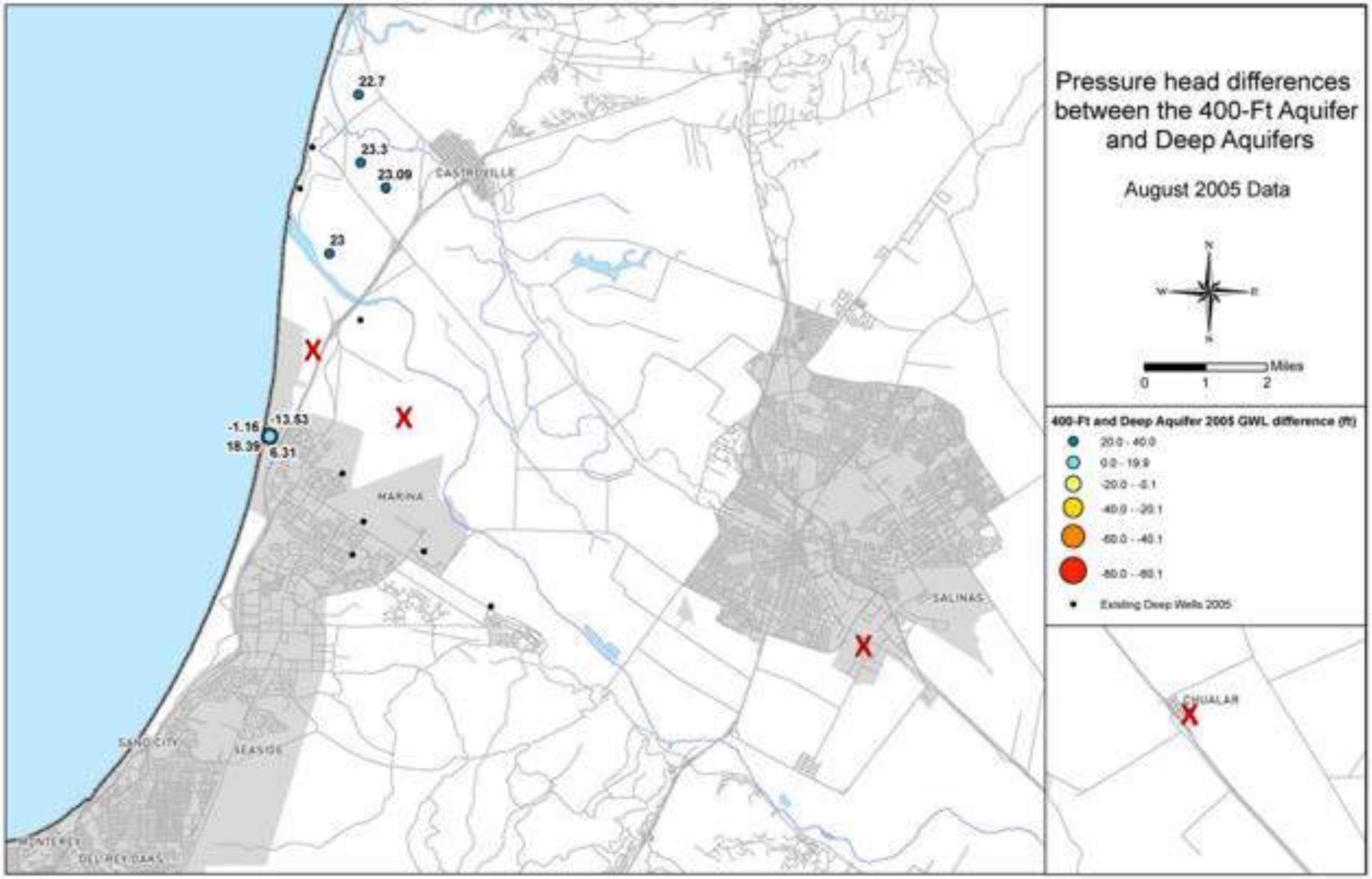

Figure G-8. August 2005 Pressure Head Difference Between the Deep Aquifers and 400-Foot Aquifer
(red X marks wells no longer considered true Deep Aquifers wells based on the definition set forth in this Study; adapted from MCWRA, 2022, personal communication)

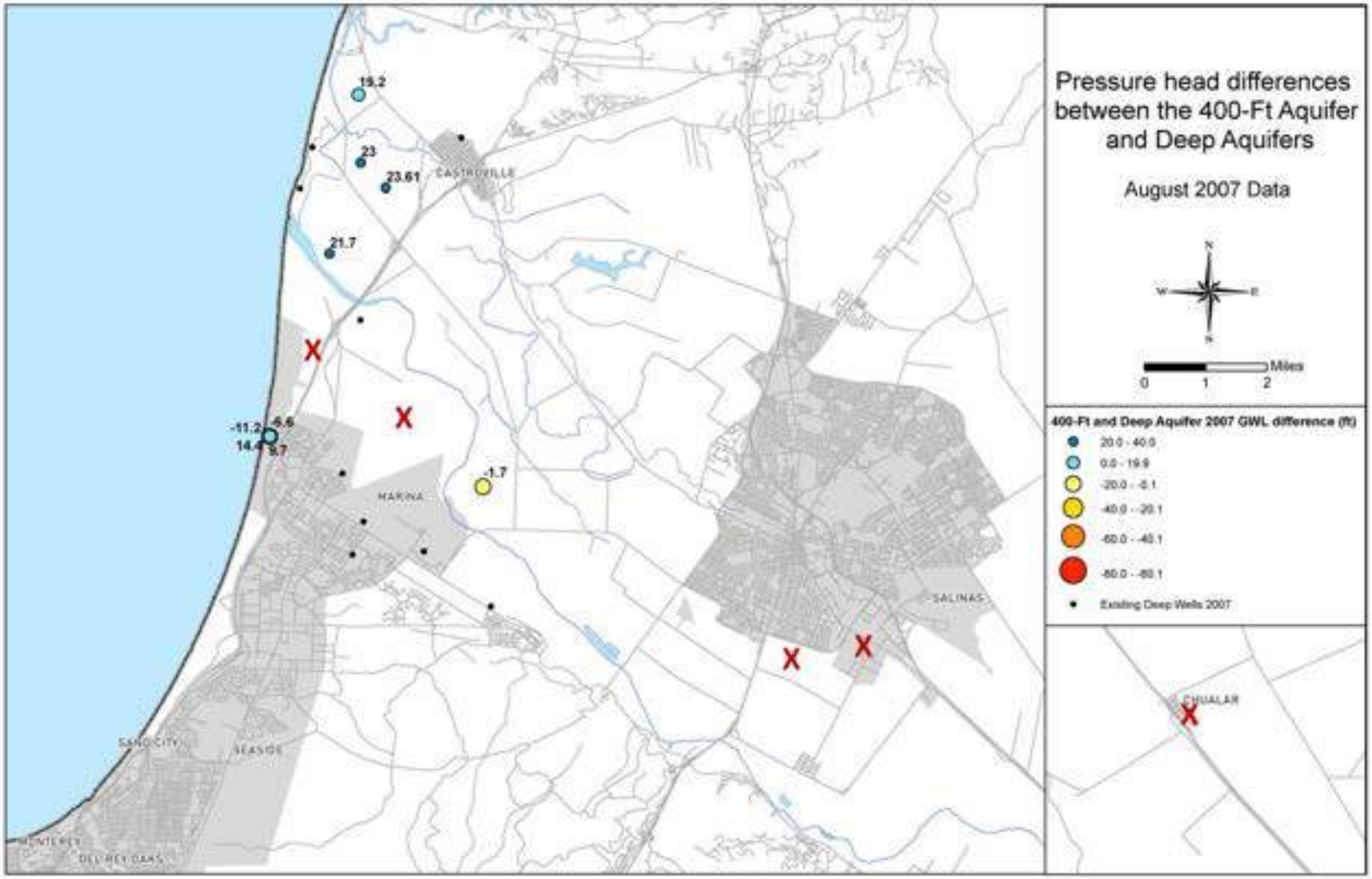

Figure G-9. August 2007 Pressure Head Difference Between the Deep Aquifers and 400-Foot Aquifer
(red X marks wells no longer considered true Deep Aquifers wells based on the definition set forth in this Study; adapted from MCWRA, 2022, personal communication)

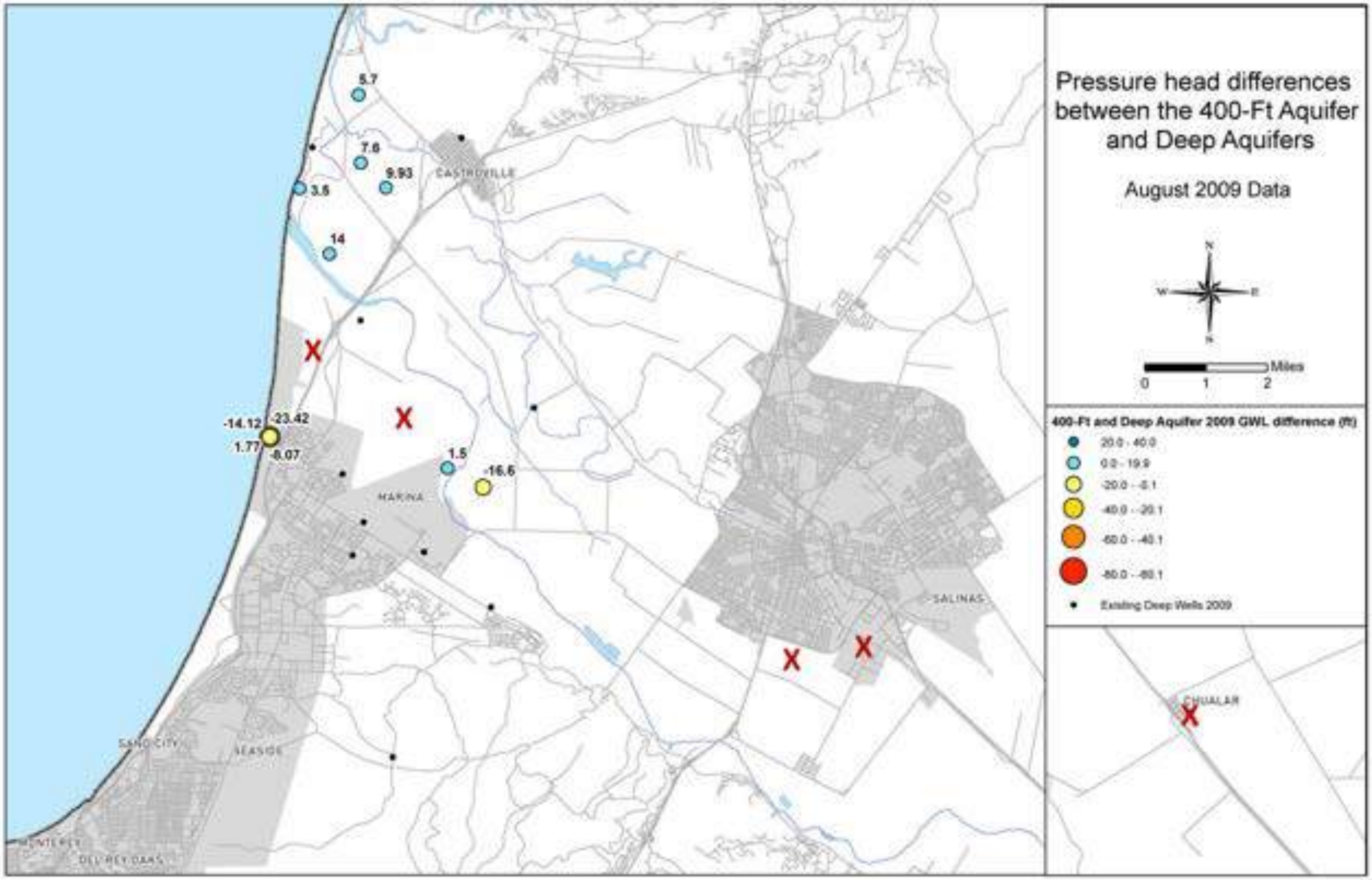

Figure G-10. August 2009 Pressure Head Difference Between the Deep Aquifers and 400-Foot Aquifer
(red X marks wells no longer considered true Deep Aquifers wells based on the definition set forth in this Study; adapted from MCWRA, 2022, personal communication)

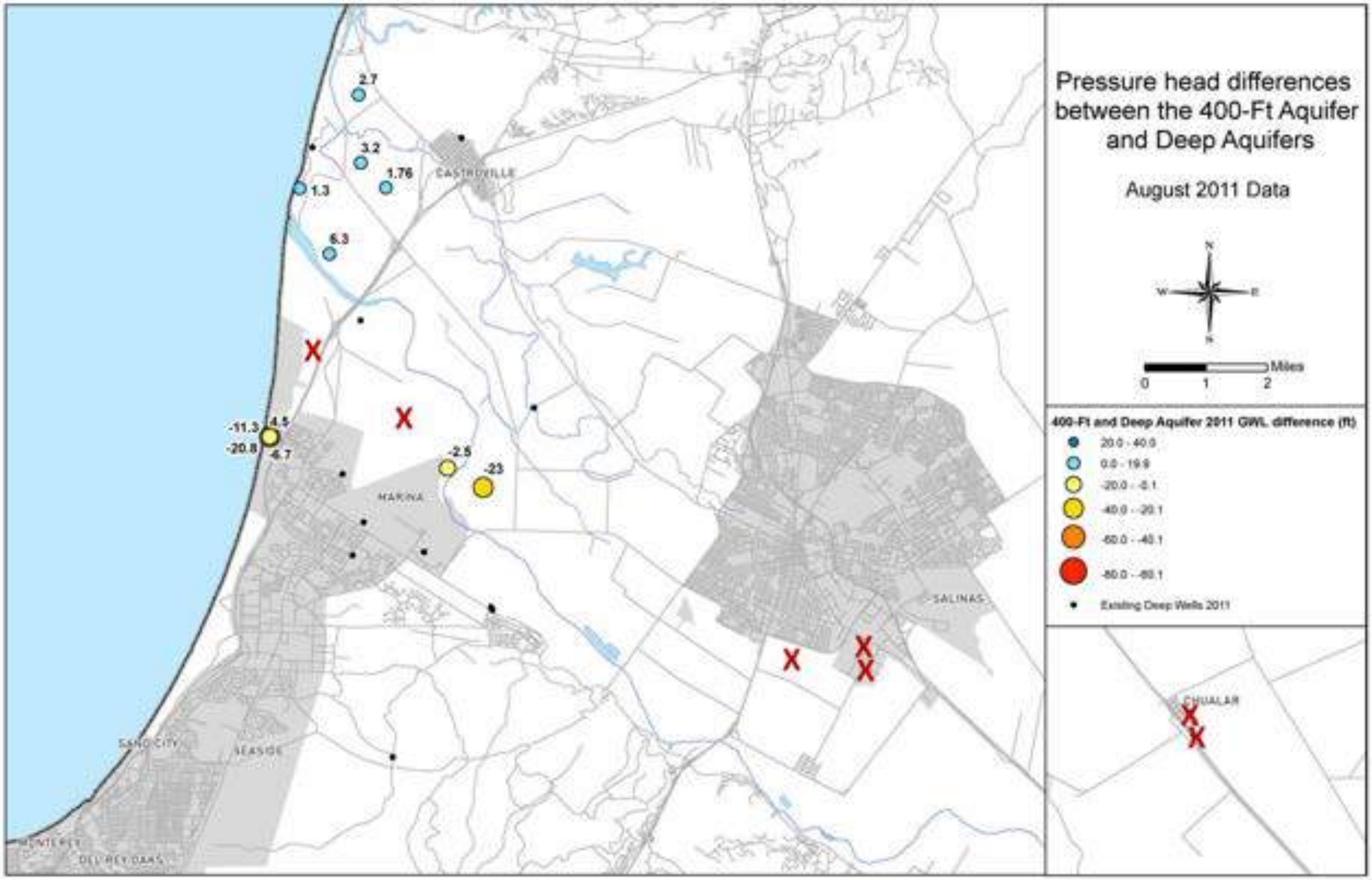

Figure G-11. August 2011 Pressure Head Difference Between the Deep Aquifers and 400-Foot Aquifer
(red X marks wells no longer considered true Deep Aquifers wells based on the definition set forth in this Study; adapted from MCWRA, 2022, personal communication)

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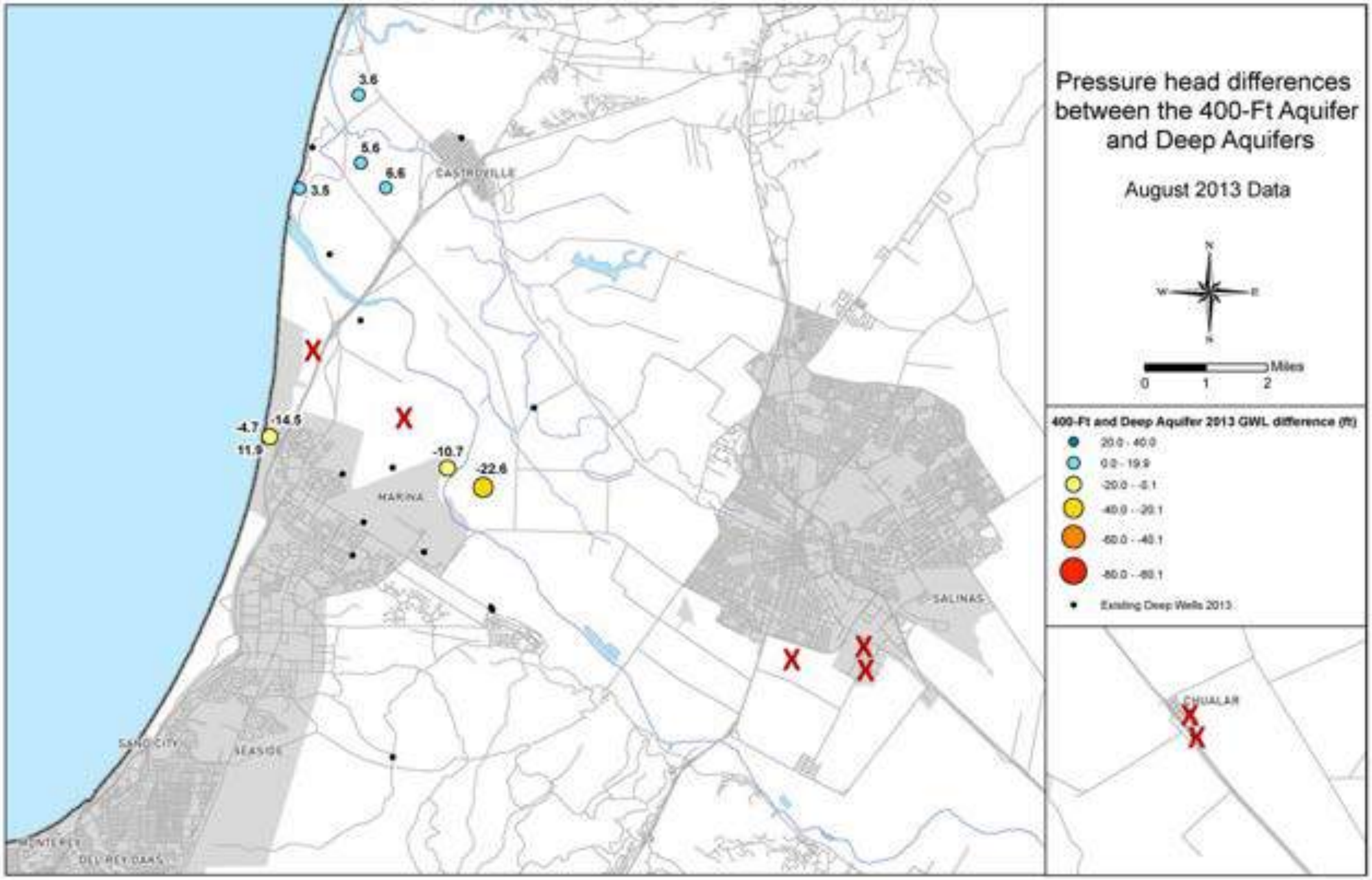

Figure G-12. August 2013 Pressure Head Difference Between the Deep Aquifers and 400-Foot Aquifer
(red X marks wells no longer considered true Deep Aquifers wells based on the definition set forth in this Study; adapted from MCWRA, 2022, personal communication)

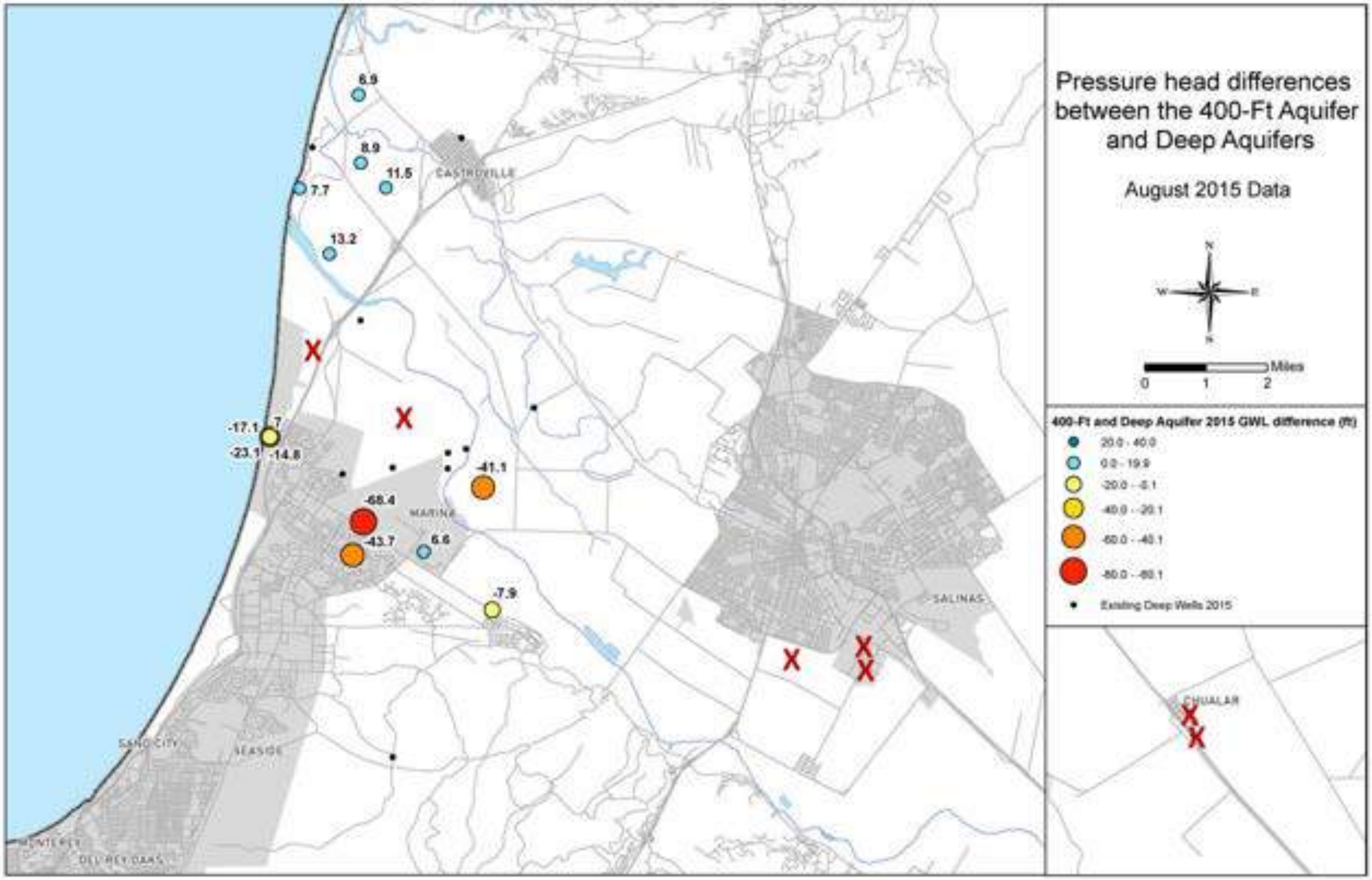

Figure G-13. August 2015 Pressure Head Difference Between the Deep Aquifers and 400-Foot Aquifer
(red X marks wells no longer considered true Deep Aquifers wells based on the definition set forth in this Study; adapted from MCWRA, 2022, personal communication)

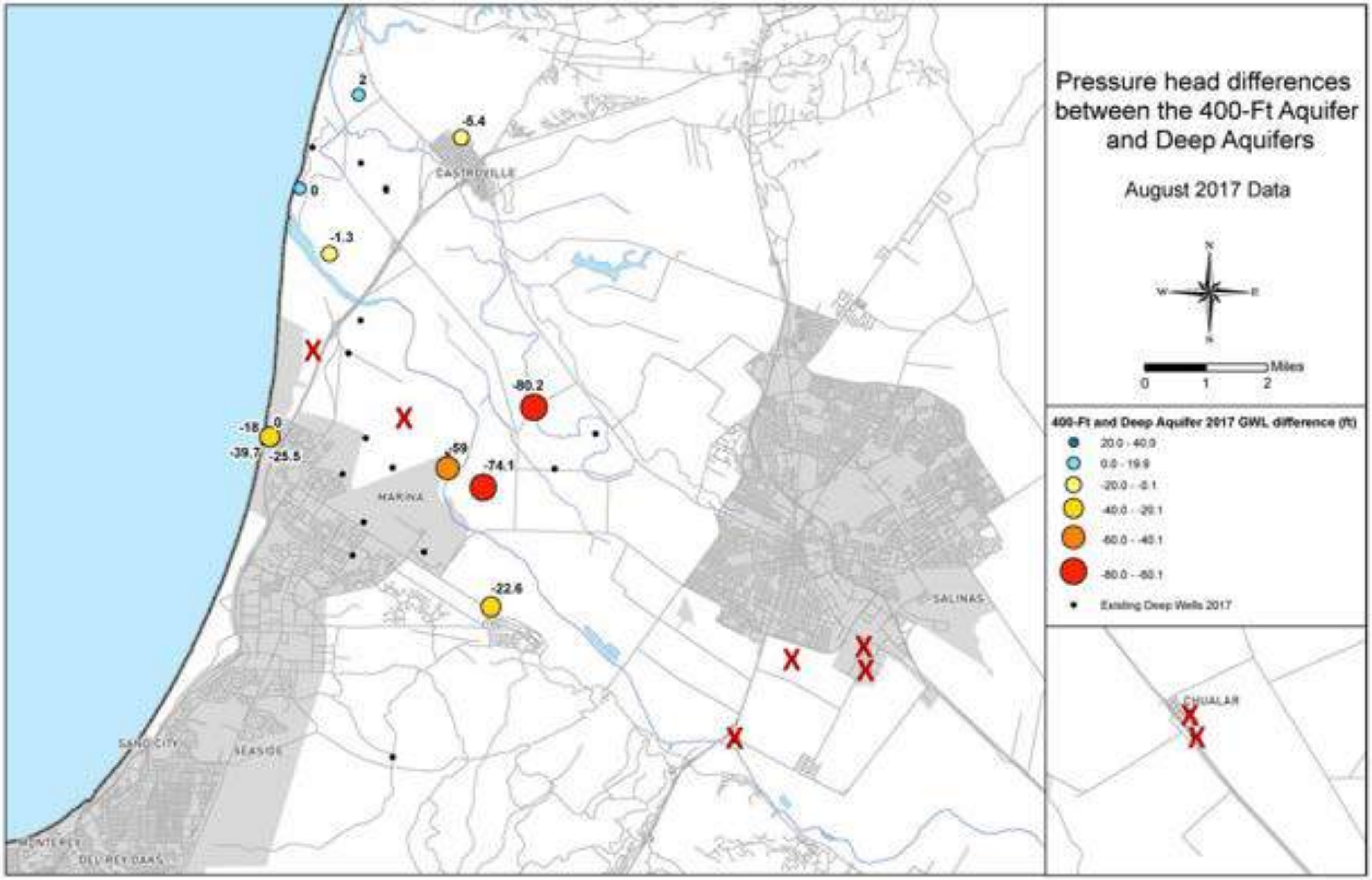

Figure G-14. August 2017 Pressure Head Difference Between the Deep Aquifers and 400-Foot Aquifer
(red X marks wells no longer considered true Deep Aquifers wells based on the definition set forth in this Study; adapted from MCWRA, 2022, personal communication)

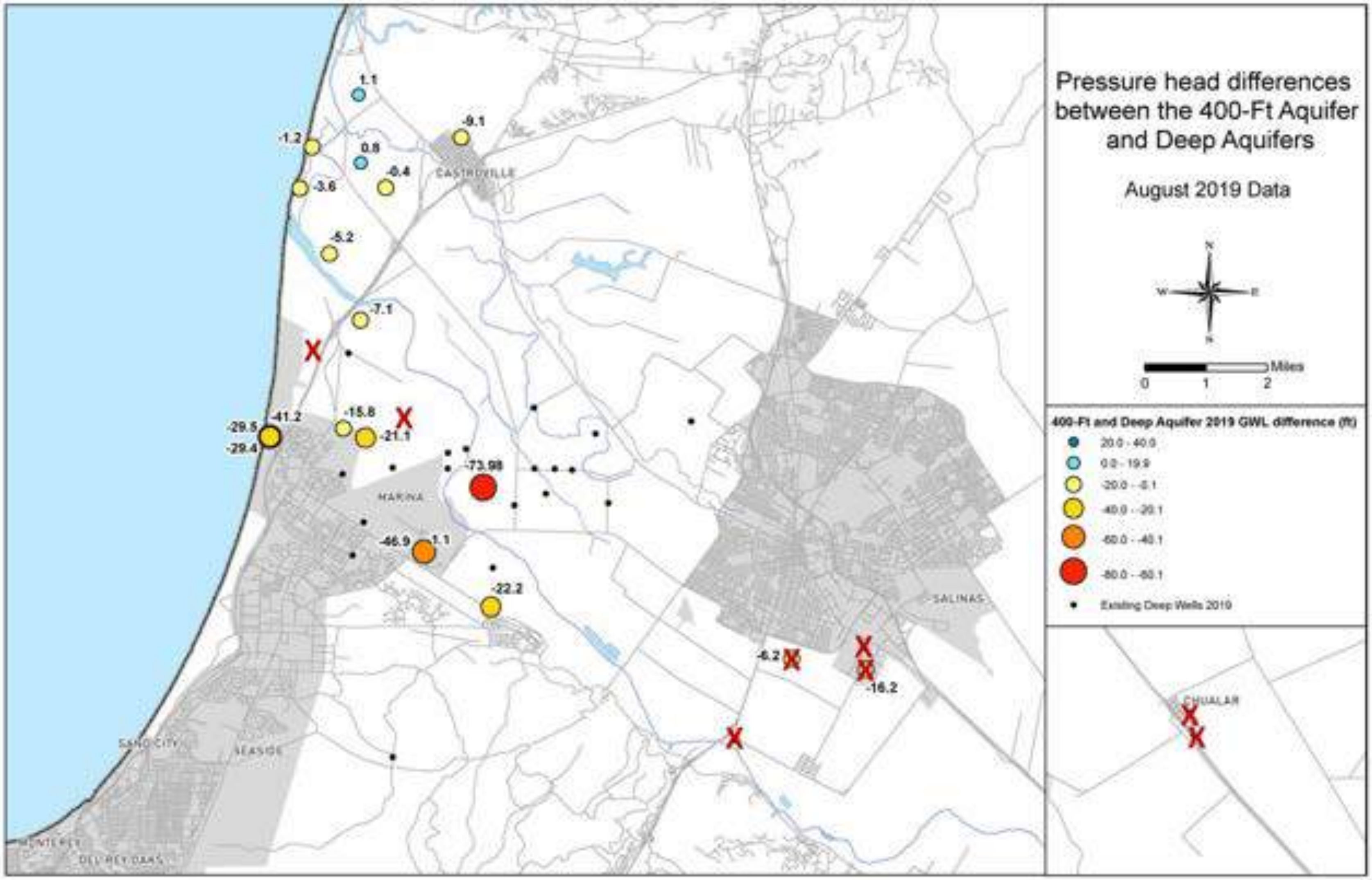

Figure G-15. August 2019 Pressure Head Difference Between the Deep Aquifers and 400-Foot Aquifer
(red X marks wells no longer considered true Deep Aquifers wells based on the definition set forth in this Study; adapted from MCWRA, 2022, personal communication)

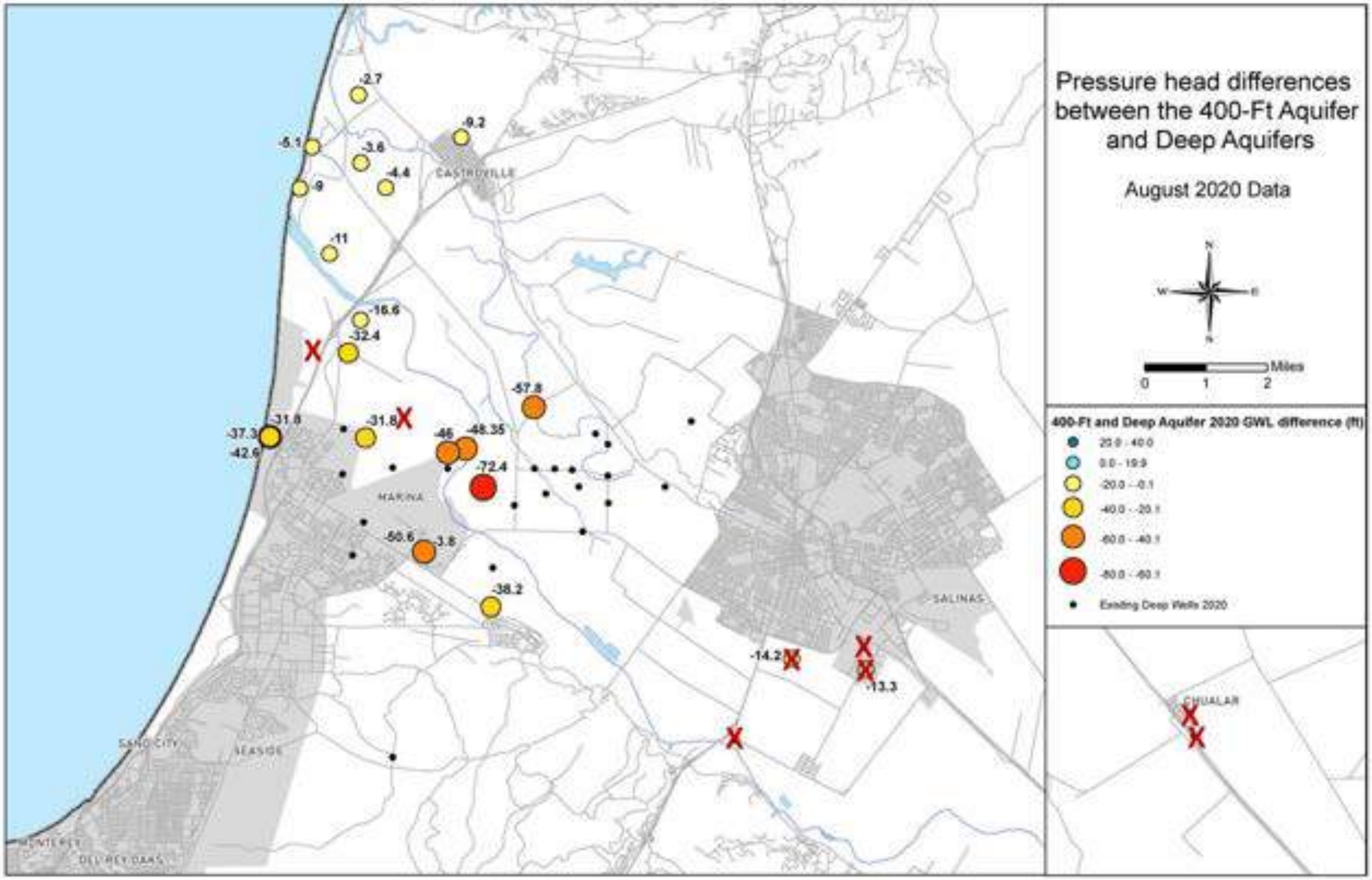

Figure G-16. August 2020 Pressure Head Difference Between the Deep Aquifers and 400-Foot Aquifer
(red X marks wells no longer considered true Deep Aquifers wells based on the definition set forth in this Study; adapted from MCWRA, 2022, personal communication)

References

MCWRA (Monterey County Water Resources Agency). 2022. Personal Communication.

Appendix H

Deep Aquifers Groundwater Elevation and Quality Monitoring Wells

Table H-1. Recommended Groundwater Level Monitoring Well Network

Well Name	Aquifer	Screen Interval (ft)	Well Use	Subbasin	Region	Data Source	Monitoring Frequency	Monitoring Network Type
13S/01E-25R01	Deep Aquifers	1323-1383	Domestic	180/400-ft. Aquifer	Northern	MCWRA	Monthly	RMS
13S/01E-36J02	Deep Aquifers	1301-1361	Domestic	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Alternative
13S/02E-19Q03	Deep Aquifers	1220-1550	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Alternative
13S/02E-28L03	Deep Aquifers	1080-1330	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	RMS
13S/02E-31A02	Deep Aquifers	850-1600	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Alternative
13S/02E-32E05	Deep Aquifers	775-1585	Monitoring	180/400-ft. Aquifer	Northern	MCWRA	Monthly	RMS
13S/03E-30K50	Deep Aquifers	570-900	Agricultural	Langley Area	Northern	MCWRA	None	RMS*
14S/01E-24L02	Deep Aquifers	1820-1860	Monitoring	Monterey	Northern	MCWRA	Monthly	RMS
14S/01E-24L03	Deep Aquifers	1410-1430	Monitoring	Monterey	Northern	MCWRA	Monthly	RMS
14S/01E-24L04	Deep Aquifers	1040-1060	Monitoring	Monterey	Northern	MCWRA	Monthly	RMS
14S/01E-24L05	Deep Aquifers	930-950	Monitoring	Monterey	Northern	MCWRA	Monthly	RMS
14S/02E-06L01	Deep Aquifers	860-1540	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	RMS
14S/02E-07J03	Deep Aquifers	1450-1570	Industrial	180/400-ft. Aquifer	Northern	MCWRA	Monthly	RMS
14S/02E-14R02	Deep Aquifers	880-1680	Monitoring	180/400-ft. Aquifer	Northern	MCWRA	Monthly	RMS
14S/02E-18B01	Deep Aquifers	1120-1680	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Alternative
14S/02E-19G01	Deep Aquifers	1020-1900	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Alternative
14S/02E-20E01	Deep Aquifers	1120-2020	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	RMS
14S/02E-21K04	Deep Aquifers	1240-1800	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	RMS
14S/02E-21L02	Deep Aquifers	1240-1780	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Alternative
14S/02E-22A03	Deep Aquifers	980-1640	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	RMS
14S/02E-22J02	Deep Aquifers	1080-1620	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Alternative
14S/02E-23J02	Deep Aquifers	850-1680	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	RMS
14S/02E-23P02	Deep Aquifers	740-1600	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Alternative
14S/02E-25A03	Deep Aquifers	810-1700	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	RMS
14S/02E-26A10	Deep Aquifers	990-1680	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Alternative
14S/02E-26D01	Deep Aquifers	885-1640	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Alternative
14S/02E-26G01	Deep Aquifers	820-1680	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	RMS
14S/02E-26J04	Deep Aquifers	845-1680	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Alternative

Well Name	Aquifer	Screen Interval (ft)	Well Use	Subbasin	Region	Data Source	Monitoring Frequency	Monitoring Network Type
14S/02E-27J02	Deep Aquifers	810-1680	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Alternative
14S/02E-27K02	Deep Aquifers	850-1680	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	RMS
14S/02E-28C02	Deep Aquifers	720-1140	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Alternative
14S/02E-28H04	Deep Aquifers	940-1030	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Alternative
14S/02E-33E01	Deep Aquifers	1045-1095	Monitoring	Monterey	Northern	MCWRA	Daily	RMS
14S/02E-33E02	Deep Aquifers	1680-1760	Monitoring	Monterey	Northern	MCWRA	Monthly	RMS
14S/02E-34M01	Deep Aquifers	800-1645	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Alternative
14S/02E-35B01	Deep Aquifers	870-1680	Monitoring	180/400-ft. Aquifer	Northern	MCWRA	Monthly	RMS
14S/03E-19C01	Deep Aquifers	833-1723	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Monthly	RMS
15S/02E-04A03	Deep Aquifers	890-910	Monitoring	Monterey	Northern	MCWRA	Monthly	RMS
DA-1	Deep Aquifers	950-1000	Monitoring	180/400-ft. Aquifer	Northern	MCWRA	Not monitored yet	RMS**
DA-2	Deep Aquifers	TBD	Monitoring	180/400-ft. Aquifer	Northern	MCWRA	Not monitored yet	RMS**
13S/02E-15M03	400-ft and Deep Aquifers	800-1050	Industrial	180/400-ft. Aquifer	Northern	MCWRA	None	Ancillary*
14S/03E-07P50	400-ft and Deep Aquifers	510-1125	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	None	Ancillary*
15S/03E-10D04	400-ft and Deep Aquifers	600-950	Urban	180/400-ft. Aquifer	Northern	MCWRA	Monthly	Ancillary
Camp Huffman (D)	Deep Aquifers	950-1320	Monitoring	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
FO-07-Deep	Deep Aquifers	800-840	Monitoring	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
FO-07-Shallow	Deep Aquifers	600-640	Monitoring	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
FO-08-Deep	Deep Aquifers	900-940	Monitoring	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
FO-08-Shallow	Deep Aquifers	740-780	Monitoring	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
FO-09-Deep	Deep Aquifers	790-830	Monitoring	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
FO-09R-Shallow	Deep Aquifers	540-585	Monitoring	Seaside	Seaside	Seaside Watermaster	Not monitored yet	RMS**
FO-10-Deep	Deep Aquifers	1380-1410	Monitoring	Monterey	Seaside	Seaside Watermaster	Monthly	RMS
FO-10-Shallow	Deep Aquifers	620-640	Monitoring	Monterey	Seaside	Seaside Watermaster	Monthly	RMS
FO-11-Deep	Deep Aquifers	1090-1120	Monitoring	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
Military	Deep Aquifers	184-264	Urban	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
Ord Grove #2	Deep Aquifers	356-476	Urban	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
Ord Grove Test	Deep Aquifers	355-480	Monitoring	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
Ord Terrace-Deep	Deep Aquifers	N/A	Monitoring	Seaside	Seaside	Seaside Watermaster	Monthly	RMS

Well Name	Aquifer	Screen Interval (ft)	Well Use	Subbasin	Region	Data Source	Monitoring Frequency	Monitoring Network Type
Ord Terrace-Shallow	Deep Aquifers	356-476	Monitoring	Seaside	Seaside	Seaside Watermaster	Annually	RMS
Paralta	Deep Aquifers	440-810	Urban	Seaside	Seaside	Seaside Watermaster	Monthly	Ancillary
Paralta Test Well	Deep Aquifers	430-800	Monitoring	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
PCA-E Deep	Deep Aquifers	650-700	Monitoring	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
PCA-E Shallow	Deep Aquifers	350-400	Monitoring	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
PCA-W Deep	Deep Aquifers	825-875	Monitoring	Seaside	Seaside	Seaside Watermaster	Quarterly	RMS
PCA-W Shallow	Deep Aquifers	525-575	Monitoring	Seaside	Seaside	Seaside Watermaster	Quarterly	RMS
Seaside Golf - Reservoir	Deep Aquifers	460-620	Urban	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
Sentinel MW #1	Deep Aquifers	1130-1490	Monitoring	Monterey	Seaside	Seaside Watermaster	Monthly	RMS
Sentinel MW #2	Deep Aquifers	990-1480	Monitoring	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
Sentinel MW #3	Deep Aquifers	860-1290	Monitoring	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
Sentinel MW #4	Deep Aquifers	705-930	Monitoring	Seaside	Seaside	Seaside Watermaster	Monthly	RMS
17S/05E-21F50	Deep Aquifers	615-1005	Agricultural	Forebay Aquifer	Southeastern	MCWRA	None	RMS*
DA-3	Deep Aquifers	1150-1200	Monitoring	180/400-ft. Aquifer	Southeastern	MCWRA	Not monitored yet	RMS**
15S/03E-13D01	400-ft and Deep Aquifers	480-900	Agricultural	180/400-ft. Aquifer	Southeastern	MCWRA	None	Ancillary*
17S/05E-08L02	400-ft and Deep Aquifers	330-810	Agricultural	Forebay Aquifer	Southeastern	MCWRA	Annually	Ancillary
16S/04E-03K01	Eastside Deep Zone	762-1060	Agricultural	180/400-ft. Aquifer	Outside DA Extent	MCWRA	Monthly	Ancillary
16S/05E-28K50	Eastside Deep Zone	600-830	Agricultural	Eastside Aquifer	Outside DA Extent	MCWRA	Monthly	Ancillary

*Well is not currently monitored for groundwater elevations.
**Well was recently installed (in 2023) and is yet to be monitored for groundwater elevations.

Table H-2. Recommended Groundwater Quality Monitoring Well Network

Well Name	Aquifer	Screen Interval (ft)	Well Use	Subbasin	Region	Source	Monitoring Frequency	Monitoring Network Type
13S/01E-25R01	Deep Aquifers	1323-1383	Domestic	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
13S/01E-36J02	Deep Aquifers	1301-1361	Domestic	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
13S/02E-19Q03	Deep Aquifers	1220-1550	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
13S/02E-28L03	Deep Aquifers	1080-1330	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
13S/02E-31A02	Deep Aquifers	850-1600	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
13S/03E-30K50	Deep Aquifers	570-900	Agricultural	Langley Area	Northern	MCWRA	None	RMS*
14S/01E-24L02	Deep Aquifers	1820-1860	Monitoring	Monterey	Northern	MCWRA	No longer sampled	RMS*
14S/01E-24L03	Deep Aquifers	1410-1430	Monitoring	Monterey	Northern	MCWRA	No longer sampled	RMS*
14S/01E-24L04	Deep Aquifers	1040-1060	Monitoring	Monterey	Northern	MCWRA	No longer sampled	RMS*
14S/01E-24L05	Deep Aquifers	930-950	Monitoring	Monterey	Northern	MCWRA	No longer sampled	RMS*
14S/02E-07J03	Deep Aquifers	1450-1570	Industrial	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-14R02	Deep Aquifers	880-1680	Monitoring	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-18B01	Deep Aquifers	1120-1680	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-19G01	Deep Aquifers	1020-1900	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-20E01	Deep Aquifers	1120-2020	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-21K04	Deep Aquifers	1240-1800	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-21L02	Deep Aquifers	1240-1780	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-22A03	Deep Aquifers	980-1640	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-22J02	Deep Aquifers	1080-1620	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-23G02	Deep Aquifers	1020-1560	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-23J02	Deep Aquifers	850-1680	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS

Well Name	Aquifer	Screen Interval (ft)	Well Use	Subbasin	Region	Source	Monitoring Frequency	Monitoring Network Type
14S/02E-23P02	Deep Aquifers	740-1600	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-25A03	Deep Aquifers	810-1700	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-26A10	Deep Aquifers	990-1680	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-26D01	Deep Aquifers	885-1640	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-26G01	Deep Aquifers	820-1680	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-26J04	Deep Aquifers	845-1680	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-27J02	Deep Aquifers	810-1680	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-27K02	Deep Aquifers	850-1680	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-28C02	Deep Aquifers	720-1140	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-28H04	Deep Aquifers	940-1030	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-29C01	Deep Aquifers	1030-1780	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-30G03	Deep Aquifers	1390-1700	Urban	Monterey	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-31H01	Deep Aquifers	930-1080	Urban	Monterey	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-32D04	Deep Aquifers	970-1650	Urban	Monterey	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-34M01	Deep Aquifers	800-1645	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/02E-35B01	Deep Aquifers	870-1680	Monitoring	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
14S/03E-19C01	Deep Aquifers	833-1723	Agricultural	180/400-ft. Aquifer	Northern	MCWRA	Summer (June & August)	RMS
15S/02E-04A04	Deep Aquifers	705-1085	Urban	Monterey	Northern	MCWRA	Summer (June & August)	RMS
DA-1	Deep Aquifers	950-1000	Monitoring	180/400-ft. Aquifer	Northern	MCWRA	Not monitored yet	RMS**
DA-2	Deep Aquifers	TBD	Monitoring	180/400-ft. Aquifer	Northern	MCWRA	Not monitored yet	RMS**

Well Name	Aquifer	Screen Interval (ft)	Well Use	Subbasin	Region	Source	Monitoring Frequency	Monitoring Network Type
Camp Huffman (D)	Deep Aquifers	950-1320	Monitoring	Seaside	Seaside	Seaside Watermaster	Annually	RMS
FO-09-Deep	Deep Aquifers	790-830	Monitoring	Seaside	Seaside	Seaside Watermaster	Quarterly	RMS
FO-09R-Shallow	Deep Aquifers	540-585	Monitoring	Seaside	Seaside	Seaside Watermaster	Not monitored yet	RMS**
FO-10-Deep	Deep Aquifers	1380-1410	Monitoring	Monterey	Seaside	Seaside Watermaster	Annually	RMS
FO-10-Shallow	Deep Aquifers	620-640	Monitoring	Monterey	Seaside	Seaside Watermaster	Annually	RMS
Mission Memorial	Deep Aquifers	225-415	Urban	Seaside	Seaside	Seaside Watermaster	Annually	RMS
Ord Grove #2	Deep Aquifers	356-476	Urban	Seaside	Seaside	Seaside Watermaster	Annually	RMS
Ord Terrace-Deep	Deep Aquifers	N/A	Monitoring	Seaside	Seaside	Seaside Watermaster	Annually	RMS
Ord Terrace-Shallow	Deep Aquifers	356-476	Monitoring	Seaside	Seaside	Seaside Watermaster	Annually	RMS
Paralta	Deep Aquifers	440-810	Urban	Seaside	Seaside	Seaside Watermaster	Annually	Ancillary
PCA-E Deep	Deep Aquifers	650-700	Monitoring	Seaside	Seaside	Seaside Watermaster	Annually	RMS
PCA-E Shallow	Deep Aquifers	350-400	Monitoring	Seaside	Seaside	Seaside Watermaster	Annually	RMS
PCA-W Deep	Deep Aquifers	825-875	Monitoring	Seaside	Seaside	Seaside Watermaster	Quarterly	RMS
PCA-W Shallow	Deep Aquifers	525-575	Monitoring	Seaside	Seaside	Seaside Watermaster	Quarterly	RMS
Seaside Golf - Reservoir	Deep Aquifers	460-620	Urban	Seaside	Seaside	Seaside Watermaster	Annually	RMS
17S/05E-21F50	Deep Aquifers	615-1005	Agricultural	Forebay Aquifer	Southeastern	MCWRA	None	RMS*
DA-3	Deep Aquifers	1150-1200	Monitoring	180/400-ft. Aquifer	Southeastern	MCWRA	Not monitored yet	RMS**
16S/04E-03K01	Eastside Deep Zone	762-1060	Agricultural	180/400-ft. Aquifer	Outside DA extent	MCWRA	Summer (June & August)	Ancillary

*Well is not currently monitored for groundwater quality.
**Well was recently installed (in 2023) and is yet to be monitored for groundwater quality.