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Alameda County
Environmental Health

**REPORT FOR
REMEDIAL INVESTIGATION/FEASIBILITY STUDY**

**ABE Petroleum LLC
17715 Mission Boulevard
Hayward, California 94539**

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ABE Petroleum LLC**

**Prepared by
Sierra Environmental, Inc.**

**September 29, 2009
Project 09-103.10**

TABLE OF CONTENT

		Page
1.0	EXECUTIVE SUMMARY	2
2.0	SITE SPECIFIC INFORMATION AND BACKGROUND	3
2.1	Tank Removal Information.....	3
2.2	Preliminary Subsurface Assessment.....	3
3.0	LOCAL GEOLOGY AND HYDROLOGY INFORMATION.....	4
4.0	SOURCE, EXTEND, AND NATURE OF CONTAMINATION.....	5
4.1	Source of Contamination	5
4.2	Extend of Contamination	5
4.3	Nature of Contamination	5
4.4	Water Quality at the Site	5
5.0	OBJECTIVES.....	5
6.0	SCOPE OF WORK	6
7.0	PREFIELD ACTIVITIES.....	6
8.0	FIELD ACTIVITIES	6
8.1	Drilling and Sampling Activities.....	6
	8.1.1 MIP Test.....	6
	8.1.2 Confirmatory Soil Sampling	7
	8.1.3 Groundwater Sampling	8
9.0	CHEMICAL ANALYSIS & PERMEABILITY, GRADATION, SOD TESTS.....	8
10.0	ANALYTICAL / TEST RESULTS	9
10.1	MIP Results.....	9
10.2	Analytical Results.....	9
10.3	Permeability and Gradation Test Results	9
10.4	SOD Test Results	10
11.0	EVALUATING CORRECTIVE ACTIONS	10
11.1	Soil Excavation	10
11.2	Injection of Oxidation Agent or Surfactant	11
11.3	DPE System Using High Vacuum Liquid Ring Pump	11
12.0	RECOMMENDATIONS.....	12
13.0	DPE SYSTEM DESCRIPTIONS.....	12
13.1	Application	12
13.2	Operation Principles.....	12
14.0	DPE TEST PROCEDURES	13
14.1	Chemical Analysis	14
15.0	REPORT PREPARATION	14
16.0	LIMITATION.....	14
17.0	SIGNATURE PAGE	15

ATTACHMENTS:

- Appendix A - Figures (1-5)
- Appendix B - Soil Boring Log & Table II and II
- Appendix C - MIP Results
- Appendix D - Certified Analytical Results, Chain-Of-Custody Documentation For Soil and Groundwater Samples
- Appendix E - SOD and Gradation and Permeability Test Results

1.0 Executive Summary

Sierra Environmental, Inc. (Sierra) is pleased to present this report of remedial investigation/feasibility study (RI/FS) for the property located at 17715 Mission Boulevard, Hayward, California, hereafter, referred to as Site. Site location is shown in Figure 1 of Appendix A. Scope of the RI/FS work was documented in a work plan and an addendum to the work plan prepared by Sierra dated July 28 and November 19, 2008, respectively. The work was approved in a letter prepared by Alameda County Health Care Services (ACHCS) dated March 27, 2009.

On August 27, 28, and 31 2009, Sierra had 9 membrane interface probes [MIP (B1 through B9)] advanced at the Site. The MIPs were extended to 40 feet below ground surface (bgs). Before advancing the MIPs, on August 27, 2009, Sierra had confirmatory soil-boring S1 advanced near monitoring well MW1 to explore depth of first encountered groundwater, and collected soil and groundwater samples for chemical analysis, soil oxygen demand (SOD), permeability, and gradations tests. The confirmatory soil and MIP boring locations are shown in Figure 2 of Appendix A. Soil explored/tested at the Site consisted of silty clay/silty sandy clay to approximately 35 feet bgs and sandy gravel encountered at 35 through 40 feet below ground surface. Groundwater was first encountered in boring S1 at approximately 31 feet bgs and raised to 25 feet bgs.

The MIP results suggest that soil impacted with the gasoline constituents exist from approximately 10 feet bgs to the saturated zone. The horizontal extend of impacted soil is within approximately 25 feet radius of MW1. MIP results depicted higher contaminant concentrations at 20-25 feet and 30-32 feet bgs. (Figure 3 of Appendix A shows approximate horizontal extend of soil contamination at the Site.

Up to 320,000 $\mu\text{g}/\text{kg}$ total petroleum hydrocarbons as gasoline (TPHG), 1170 $\mu\text{g}/\text{kg}$ benzene, and 1150 $\mu\text{g}/\text{kg}$ methyl tert butyl ether (MTBE) were detected in the soil representing 20-25 feet bgs in boring S1 (confirmatory boring), at the source area. Also, up to 59,900 $\mu\text{g}/\text{l}$ of TPHG, 1680 $\mu\text{g}/\text{l}$ benzene, and 893 $\mu\text{g}/\text{l}$ MTBE were detected in a grab groundwater sample collected from the same boring. High/moderate concentrations of the gasoline constituents were also detected in grab groundwater samples collected at all the MIP borings. Summary of the analytical results are presented in Table I and II of Appendix B. Figure 2 shows groundwater contamination data at each boring.

Sierra evaluated soil and groundwater remediation options for the Site, and concluded that utilization of a dual phase extraction (DPE) system equipped with high vacuum liquid ring pump is the best remedial option, at this time. Sierra recommends performing 5-day DPE test at the Site to confirm feasibility of utilizing this remedial option at the Site.

2.0 SITE'S SPECIFIC INFORMATION AND BACKGROUND

The Site is located in commercial/residential areas of Hayward, California. The Site is bounded by Mission Boulevard to the north, northeast, and east, Lewelling Boulevard to the south & southwest, and traffic ramp to the west. The Site has been used as a gas station.

2.1 Tank Removal Information

On September 16, 1997, Balch Petroleum Contractors & Builders, Inc. (Balch) of Milpitas, California, removed one 2,000-gallon, two 6,000-gallon, one 10,000-gallon single-wall steel gasoline, and one 500-gallon single-wall steel waste oil USTs from the Site. Former UST locations are shown in Figure 4 of Appendix A.

No hole or damage was observed in the tanks. No groundwater was encountered in the tank excavations. After UST removal, Sierra collected soil samples from the tank excavations for chemical analysis.

Up to 2,300 mg/kg TPHG was detected in the soil samples collected from beneath the tanks at approximately 14 feet below ground surface bgs. The soil sample locations are shown in Figure 4.

On August 14, 2000, Sierra drilled three exploratory soil borings and converted them to groundwater monitoring well MW1 through MW3. The wells are approximately 35 feet deep. Sierra collected soil and groundwater samples from the borings/wells for chemical analysis. The analytical results showed up to 720 mg/kg TPHG, 2.2 mg/kg benzene, and 3.4 mg/kg MTBE in the soil samples. Up to 290,000 µg/l TPHG, 10,000 µg/l benzene, and 4,300 µg/l MTBE were detected in the groundwater samples. Gasoline constituents were detected in groundwater samples collected from all three monitoring wells. Groundwater monitoring well locations are shown in Figure 2 of Appendix A.

2.2 Preliminary Subsurface Assessment

On May 4, 2006, Sierra retained services of Vironex Environmental Services (Vironex) to drill soil borings B1 through B4 at the Jack In The Box and Cal/Trans properties. Sierra collected grab groundwater samples from the borings for chemical analysis. Up to 370 µg/l TPHG, 16 µg/l toluene, 15 µg/l ethylbenzene, and 100 µg/l xylenes were detected in the water sample collected from the borings (B3 and B4) advanced at the Jack In The Box property. No benzene or MTBE was detected in water samples collected at this property. 3.2 µg/l MTBE was detected in the water samples collected from the borings advanced at the Cal/Trans properties. The MTBE was detected in boring B2 located within 300 feet northwest

at hydraulic down gradient of the Site. On May 10 and 11, 2006, Sierra retained services of Hew Drilling Company, Inc. (Hew) to construct 4 groundwater monitoring wells (MW4 through MW7) at the Cal/Trans properties, and Langton Drive. No gasoline constituents were detected in the groundwater samples collected from the wells. The analytical results for the soil and groundwater samples collected from the boring and the wells suggest the tip of the dissolved MTBE plume in the groundwater is confined within 200-300 feet northwest of the Site. The length of the dissolved plume of other gasoline constituents in groundwater is shorter than the MTBE plume. Figure 5 shows the historical boring and groundwater monitoring well locations.

Sierra has been monitoring the groundwater at on-site and off-site wells on quarterly intervals.

3.0 LOCAL GEOLOGY AND HYDROGEOLOGY INFORMATION

Much of Hayward is flat, leveled land underlain by a relatively stable geologic formation. Underlying Hayward is a deep bedrock trough, which rises to form the steep hills in the eastern part of the City, east of where the Site is located. This trough has been with alluvium deposited by stream flowing from the hills, and with Bay mud sediments. Moving from east to west, subsurface materials include progressively more clay and silt and less sand and gravel. In most areas these materials are mixed, due to the wandering pattern of streambeds.

Soil types explored at the Site consist of silty clay to an approximate 10 feet bgs, silty clay/clayey silty sand to an approximate depth of 30 feet bgs, gravelly sand to an approximate 35 feet bgs, and sandy gravel to an approximate 40 feet bgs.

The Site is located within the East Bay Plain Groundwater Basin. This Basin is located between San Francisco Bay and the Hayward Fault; the Basin underlies the flatlands between Richmond and Hayward.

Groundwater was a major part of the water supply for the East Bay during the period from 1860 to 1930, before Sierra water was imported to the area. Most of this was produced from a band of well fields stretching from the southeastern end of Alameda Island to 98th Street in Oakland. Well fields in Richmond were also a major water source. Most of these wells were not properly abandoned and thus may provide a conduit between shallow contamination and deeper usable aquifers.

There is very little current use of groundwater in the East Bay Plain for drinking water purposes. However, parts of East Bay Plain may be used for domestic uses in the future.

Shallow groundwater beneath the Site has been encountered at approximately 31 feet bgs and raised to approximate static levels of 21-24 bgs with northwesterly flow direction and an approximate gradient of 0.02 ft/ft.

4.0 SOURCE, EXTENT, AND NATURE OF CONTAMINATION

4.1 Source of Contamination

The primary source of contamination at the Site appears to be the former UST area within proximity of monitoring well MW1 (see Figure 2 and 3). The secondary source of contamination is impacted soil in the above area.

4.2 Extent of Contamination

Horizontal extent of soil contamination appears to be within approximately 25 feet radius of MW1 (within proximity of the former UST excavation boundaries). The vertical extent of the soil contamination near the source area is from 10 feet to the saturated zone (35 feet bgs).

Extent of groundwater contamination is within approximately 200-300 feet down gradient (west/northwest) of MW1.

4.3 Nature of contamination

Chemicals of concern (COC) at the Site consist of TPHG, benzene, toluene, ethyl benzene, xylenes (BTEX), and MTBE.

4.4 Water Quality at the Site

Groundwater at and near the Site is not being used for drinking, at this time.

5.0 OBJECTIVE

The objectives of the work consisted of the followings:

- Delineate horizontal and vertical extent of soil contamination at the Site
- Characterize contaminant concentrations in relation with soil permeability
- Obtain relevant subsurface information such as SOD and soil gradation
- Utilize the above information to prepare feasibility study/corrective action plan for the Site.

6.0 SCOPE OF WORK

Sierra marked and cleared drilling locations, and coordinated the fieldwork schedule with Mr. John Shouldice of Alameda County Department of Works (ACDPW), Mr. Mark Detterman of ACHCS, and the client. Sierra utilized a MIP to identify horizontal and vertical extent of contamination near the source area (MW1) at the Site. Sierra prepared this report summarizing the findings.

7.0 PREFIELD ACTIVITIES

Sierra completed drilling permit application and submitted to ACDPW with appropriate fee and obtained drilling permit. Sierra coordinated the fieldwork with a State-licensed drilling contractor, a State-certified analytical laboratory, and the client. Sierra notified Underground Services Alert (USA) to identify all the utilities, and clear the drilling locations. Sierra prepared a health and safety plan for its workers and sub-contractors. Sierra notified ACHCS and ACDPW of the drilling time and date. Copy of the drilling permit is presented in Appendix B.

On August 26, 2009, Sierra retained services of Cruz Brothers Locator, Inc. (a private underground utility locating company) to clear the drilling areas. Sierra prepared necessary field equipment and material.

8.0 FIELD ACTIVITIES

8.1 Drilling and Sampling Activities

8.1.1 MIP Test: On August 27, 28, and 31 2009, Sierra retained Vironex of Pacheco, California, to advance the MIPs/borings at the Site. The boring locations are shown in Figure 2 of Appendix A. They were selected to (1) obtain contaminant concentrations in depths exhibiting different soil permeability, and (2) to define the none detected (ND) boundaries near the source area.

MIP is a screening tool with semi-quantitative capabilities acting as an interface between the contaminants in the ground and gas phase detectors at the surface. The membrane is semi-permeable and is comprised of a thin film polymer impregnated into a stainless steel screen for support. The membrane is placed in a heated block attached to the probe. This block is heated to approximately 100-120 degrees C and is raised at the leading edge to protect the membrane. Heating the block helps accelerate diffusion of the contaminate through the membrane.

Diffusion occurs because of a concentration gradient between the contaminated soil and the clean carrier gas behind the membrane. A constant gas flow of 35-45

ml/min sweeps behind the membrane and carries the contaminants to the gas phase detectors at the surface.

Vironex utilized photoionization detector (PID), electron capture detector (ECD) and the flame ionization detector (FID) to analyze contaminants concentration in each sample location. These detectors may be used in series with the least destructive detector being first and the most destructive detector coming last. The MIP system processed four detector signals at one time. These detector signals, in conjunction with the time in which a contaminant takes to return to the surface, were graphed versus depth. The concentrations were averaged at 1-foot intervals to the bottom of each soil boring. Vironex advanced all the borings (B1 through B9) to approximately 40 feet bgs.

The detector information and the electrical conductivity of the soil (measured by another detector placed at the tip of the probe) were graphed by the FC4000 field instrument. The graphs were presented to Sierra to determine the location of the contaminant, the relative concentration of the contaminant, and the physical characteristics of soil in which the contaminant is located. MIP graphs are presented in Appendix C.

8.1.2 Confirmatory Soil Sampling: Before, starting MIP activities, Sierra had Vironex to advance one soil boring (S1) at the source area near MW1 having the highest concentrations of the contaminants. The boring location was selected in a manner to characterize soil type and permeability, and contaminant concentrations to compare with MIP results. It was also advanced to confirm 1st encountered groundwater level depth. Vironex used Geoprobe[®] direct push equipped with 3.5-inch diameter sampling barrel lined with 2-inch diameter acetate tube collecting continuous soil samples. Sierra documented soil conditions in boring logs, and collected undisturbed soil samples at approximately 5-foot intervals from 5-40 feet bgs. Sierra submitted two soil samples (S1-20 and S1-35) at approximately 20 and 35 feet bgs, respectively for chemical analysis. Soil samples S20-25 and S30-35 were used for permeability and gradation tests. Additionally, these samples were also tested for soil oxygen demand (SOD). After collection, the samples were sealed with Teflon tape and plastic end-caps, labeled, placed on ice in a cooler to be delivered to laboratory for chemical analysis. The duplicate samples were submitted to soil and analytical laboratories for permeability, gradation, and SOD tests. Analytical results for the soil samples are presented in Table I of Appendix B. Boring log for S1 is also presented in Appendix B.

8.1.3 Groundwater Sampling

Sierra collected ten grab groundwater samples (B1W through B9W and S1W) from MIP/borings B1 through B9 and S1 for chemical analysis. Analytical results for the groundwater sample are presented in Table II of Appendix B.

1-inch-diameter slotted and solid PVC piping was inserted in the boring for sample collection. A Teflon[®] tube equipped with a small ball valve at the tip of the tube, acting as bailer, was placed inside of the perforated pipe to collect groundwater sample at each boring. The groundwater was collected by making up and down motions on the Teflon[®] tube. After collection, groundwater from each boring was transferred into clean volatile organic analysis (VOA) vials. The vials were sealed with Teflon-septum screw caps. The containers were labeled, placed on ice in a cooler, and delivered to Accutest together with chain-of-custody documentation for chemical analysis.

All drilling and sampling/testing equipment were washed with Liqui-Nox[®] (a phosphate-free laboratory detergent) and rinsed with clean tap water at each sampling interval. The wash and rinse water placed in a 55-gallon drum and placed at the Site for future profiling and disposal.

Vironex sealed the borings with Portland cement and Bentonite mixture, after completing the drilling activities.

9.0 CHEMICAL ANALYSIS & PERMEABILITY, GRADATION AND SOD TEST PROCEDURES

The soil and groundwater samples were delivered to Accutest of San Jose, California for chemical analysis. Accutest is an independent State-certified analytical laboratory (#2346).

The samples were analyzed for TPHG using the United States Environmental Protection Agency (EPA) GC-MS/8260B method. The samples were also analyzed for benzene, toluene, ethyl benzene, total xylenes (BTEX), and fuel oxygenates using EPA method 8260B.

Two of the soil samples (S20-25 and S35-40) collected from the confirmatory boring were delivered to United Soil Engineering, Inc. (USEI) of Santa Clara, California for permeability test using ASTM D5084 method, and gradation analysis using ASTM D422 method. Additionally, duplicate samples S20-25 and S35-40 were also submitted to Prima Environmental, Inc. of El Dorado Hills California for SOD Test using persulfate.

10.0 ANALYTICAL/TEST RESULTS

10.1 MIP Results

MIP results confirmed vertical extend of soil contamination to be from approximately 10 feet to first encountered groundwater level at approximately 31 feet bgs at and near the former UST complex. The results also indicated that contaminants are at the highest concentration at approximately 20-25 feet, and at 30-32 feet bgs. Boring B2 and B4 depicted elevated concentrations of the contaminants (Figure 2).

Furthermore, the MIP results indicated that the soil material in all borings have consistent electrical conductivity (EC) at specific depths. The results indicated lower EC at 15-18 and 30-35 feet bgs. 18-28 feet bgs showed highest EC. The lower EC represents higher soil permeability. MIP field graphs/results are presented in Appendix C.

10.2 Analytical Results

Analytical results for soil and water samples suggest that the gasoline constituents have migrated vertically to first encountered groundwater, with the highest contaminant mass being detected at approximately 20-30 feet bgs. Analytical results for the soil samples are presented in Table I of Appendix B.

COC have been detected in all groundwater samples collected from the MIP borings confirming the previous assessment that contaminant in groundwater have migrated off-site, within 200-300 feet northwest of the Site. Analytical results for the off-site groundwater monitoring well MW6 have consistently been ND. Summary of the analytical results for the groundwater samples is presented in Table II of Appendix B. Certified analytical results and chain-of-custody documentation are presented in Appendix D.

10.3 Permeability and Gradation Test Results

Soil sample S20-25 and S35-40 collected at 20'-25' and 35'-40' feet bgs, respectively, were submitted to USEI for gradation and permeability test. The test results showed 4%-5% fine material in the sample collected from unsaturated zone at 20'-25' feet bgs. Approximately 1%-2% fine material was measured in sample S35-40 collected at 35-40 feet bgs. The coefficient of permeability (k) was 1.2×10^{-5} and 1.6×10^{-4} cm/sec for sample S20-25 and S35-40 collected from the unsaturated and saturated zones, respectively. Laboratory report is provided in Appendix E.

10.4 SOD Test Results

PRIMA used low (5.1 g/L), medium (10.0 g/L), and high (20.8 g/L) doses of sodium persulfate ($\text{Na}_2\text{S}_2\text{O}_8$) for both samples S20-25 and S35-40 to complete the SOD tests. The results showed 6.5, 12, and 22 g $\text{Na}_2\text{S}_2\text{O}_8$ /kg soil was consumed per dose for sample S20-25 and 4.0, 6.0, and 7.5 g $\text{Na}_2\text{S}_2\text{O}_8$ /kg soil was consumed per dose for sample S35-40, respectively. A copy of the laboratory report is also provided in Appendix E

11.0 EVALUATING CORRECTIVE ACTIONS

Sierra shared the field information with Vironex and Frontier Environmental Solution, Inc. to evaluate feasible remedial option and associated corrective action costs for the Site.

Sierra considered the following conditions for evaluating corrective actions at the Site:

- Soil Permeability and oxidation demand versus contaminant concentrations
- Physical and chemical characteristics of the contaminants
- Extend of soil and groundwater impact
- Possible volatilization of oxidation by-products and entering into occupied buildings, and their influence on the fueling system construction materials
- Possibility of pushing groundwater plume further down-gradient of the source and the Site
- Corrective action cost

11.1 Soil Excavation

Available information indicates that vertical extend of the soil contamination is from surface ground to groundwater (approximately 31 feet bgs). The horizontal extend of the contaminated soil is within 25 feet radius of MW1, within the former UST complex, and the present product delivery and pump island area at the Site (see Figure 3). Due to deep extend of the impacted soil, and partially extending beneath the present pump island and product delivery piping, soil excavation is not a viable remedial option. Furthermore, the Site is an active business and remedial cost will include revenue losses.

11.2 Injection of Oxidation Agent or Surfactant

Considering high concentrations of the petroleum hydrocarbon contaminants in the unsaturated zone, reaction of oxidation agents with the petroleum hydrocarbons may result in volatilization and migration of contaminant into nearby building. Furthermore, a groundwater extraction mechanism must be considered using this option to prevent possibility of pushing groundwater plume further down gradient by injecting high volume of oxidation agent into the ground. Existing UST at the Site is constructed with steel; it is located within proximity to the source area. Chemical reactions resulting from the oxidation process may undermine the tank integrity. However, considering volatility characteristics of the gasoline constituents, contaminant concentrations could first be reduced using a DPE equipped with high vacuum liquid ring system. If necessary, then injection of oxidation agent with lower intensity could be considered.

Approximate cost of 10% persulfate solution over 25 foot radius of influence from 10 to 40 feet bgs is \$75,000-\$100,000 of which, \$20,000-\$40,000 would be the caustic persulfate cost. This would include 15,000-30,000 gallons of a caustic activated persulfate solution and would take about 9-12 days for injection.

11.3 DPE System Using High Vacuum Liquid Ring Pump

Considering volatile characteristic of the COC, and relatively limited horizontal extend of soil impact, a DPE equipped with high vacuum liquid ring pump could be used to remove contaminant mass from soil and groundwater.

Groundwater monitoring well MW1 (source area) is extended to 35 feet bgs with 15 feet of perforated section. Please note that groundwater has been first encountered at approximately 28-34 feet bgs at the Site. This well could be used as an extraction point to evacuate groundwater and soil vapor at 20-35 feet bgs zone. Sierra proposes to also construct one 4-inch diameter 18 feet deep and one 4-inch diameter 27 feet deep soil vapor extraction well (SV1 and SV2) perforated 8-18 feet bgs, and 20-27 feet bgs. Sierra proposes to initially rent the DPE system for 5 days field test. The proposed new soil vapor extraction well locations are shown in Figure 3 of Appendix A).

Sierra will collect pertinent information such as radius of influence, volume of water, soil vapor removed, and contaminant mass removed.

The approximate cost for the 5-day DPE test, water disposal, and soil vapor extraction well construction is \$50,000.00.

12.0 RECOMMENDATIONS

Based on the conditions explained above, Sierra recommends performing a 5-day field test utilizing a DPE system equipped with high vacuum liquid ring pump to evaluate its radius of influence and efficiency in removing contaminant mass from soil and groundwater at the Site, at this time.

13.0 DPE SYSTEM DESCRIPTIONS

The following description of DPE is an excerpt from chapter XI of OUST's publication: ***How to Evaluate Alternative Cleanup Technologies for Underground Storage Tank Sites: A Guide for Corrective Action Plan Reviewers.*** (EPA 510-B-95-007).

DPE, also known as multi-phase extraction, vacuum-enhanced extraction, or sometimes bioslurping, is an *in-situ* technology that uses pumps to remove various combinations of contaminated groundwater, separate-phase petroleum product, and hydrocarbon vapor from the subsurface. Extracted liquids and vapor are treated and collected for disposal, or re-injected to the subsurface (where permissible under applicable state laws).

13.1 Application

DPE systems can be effective in removing separate-phase product (free product) from the subsurface, thereby reducing concentrations of petroleum hydrocarbons in both the saturated and unsaturated zones of the subsurface. DPE systems are typically designed to maximize extraction rates; however, the technology also stimulates biodegradation of petroleum constituents in the unsaturated zone by increasing the supply of oxygen, in a manner similar to that of bioventing.

DPE is often selected because it enhances groundwater and/or product recovery rates, especially in layered, fine-grained soils. The application of DPE also maximizes the effectiveness of soil vapor extraction (SVE) by lowering the water table and therefore increasing air-phase permeability in the vadose zone.

13.2 Operation Principles

The vacuum applied to the subsurface with DPE systems creates vapor-phase pressure gradients toward the vacuum wells. These vapor-phase pressure gradients are also transmitted directly to the subsurface liquids present, and those liquids existing in a continuous phase (*e.g.*, water and "free" petroleum product) will flow toward the vacuum well in response to the imposed gradients (the term "free" product is a commonly used, though imprecise term because a greater fraction of resident petroleum product may be recovered using vacuum-enhanced DPE compared to the fraction of product recoverable using gravity drainage alone).

The higher the applied vacuum, the larger the hydraulic gradients that can be achieved in both vapor and liquid phases, and thus the greater the vapor and liquid recovery rates.

Dramatic enhancements in both water and petroleum product recovery rates resulting from the large hydraulic gradients attainable with DPE systems have been reported in the literature (Blake and Gates, 1986; Blake, *et al.*, 1990; Bruce, *et al.*, 1992). The depressed groundwater table that results from these high recovery rates serves both to hydraulically control groundwater migration and to increase the efficiency of vapor extraction. The remedial effectiveness of DPE within the zone of dewatering that commonly develops during DPE application should be greater than that of air sparging due to the more uniform air flow developed using DPE (Johnson, *et al.*, 1992).

14.0 DPE TEST PROCEDURES

Sierra will retain CalClean Inc. (CCI) of Tustin, California to perform the DPE test at the Site. CCI will use a 450 cubic feet per minute (CFM) high vacuum liquid ring pump. A generator will operate the pump. Additionally, the system will include a thermal oxidation unit operating with propane to perform destruction of contaminant vapor extracted from the wells. CCI will obtain a permit from Bay Area Air Quality Management District (BAAQMD) for the temporary operation of the thermal oxidation system. All the above equipments will be mounted on a truck as a self-contained DPE system. CCI will connect the system to groundwater monitoring well MW1 (2-inch diameter), and soil vapor extraction well (4-inch diameter) SV1 through SV2 using flexible hoses. Groundwater extracted from MW1 will be first accumulated in a small storage tank on the truck (separator), then pumped through a totalizer attached to carbon drums into sewer inlet at the Site. CCI will obtain a temporary wastewater treatment permit from East Bay Mud for treatment and disposal of the wastewater in the sewer system.

Vapor concentrations (undiluted) will be periodically checked with Horiba field organic vapor analyzer, and documented on field forms by CCI. CCI also will collect undiluted individual soil-vapor samples from sampling ports connected to each extraction well as well as a sampling port representing total extracted soil vapor. One vapor sample will be collected from each well at the beginning and end of the test. One total inlet vapor sample will be collected at the beginning, middle, and end of the test for chemical analysis. The samples will be collected in Tedlar[®] bags and submitted to a State-certified analytical laboratory for chemical analysis.

14.1 Chemical Analysis

The vapor samples will be analyzed for the gasoline range hydrocarbons using EPA modified method 8015B, and for BTEX and MTBE using EPA method 8021B.

15.0 REPORT PREPARATION

After completion of the DPE test, Sierra will prepare a report summarizing construction of the soil vapor extraction wells at the Site. The report will also include results of the DPE test including radius of influence, mass of contaminants removed, volume of extracted groundwater, analytical results for soil vapor samples, and it will have all pertinent filed notes as well as CCI's report. A copy of the report will be submitted to the client. Electronic copies of the report will be submitted to the State Geotracker and ACHCS.

16.0 LIMITATIONS

The content and conclusion provided by Sierra in this report are based on information collected during its investigation, which include, but are not limited to field observations, analytical and field test results for the soil and groundwater samples collected at the Site.

Sierra assumes that the samples collected and laboratory results are reasonably representative of the whole Site/area, which may not be the case at unsampled areas. This assessment was performed in accordance with generally accepted principles and practices of environmental engineering and assessment in Northern California at the time of the work. This report presents our professional opinion based on our findings, technical knowledge, and experience working on similar projects. No warranty, either expressed or implied, is made.

17.0 SIGNATURE PAGE

Please feel welcome to call us if you have questions.

Very Truly Yours,
Sierra Environmental, Inc.



OCT 3 / 2009
ml

Reza Baradaran, PE, GE
Principal

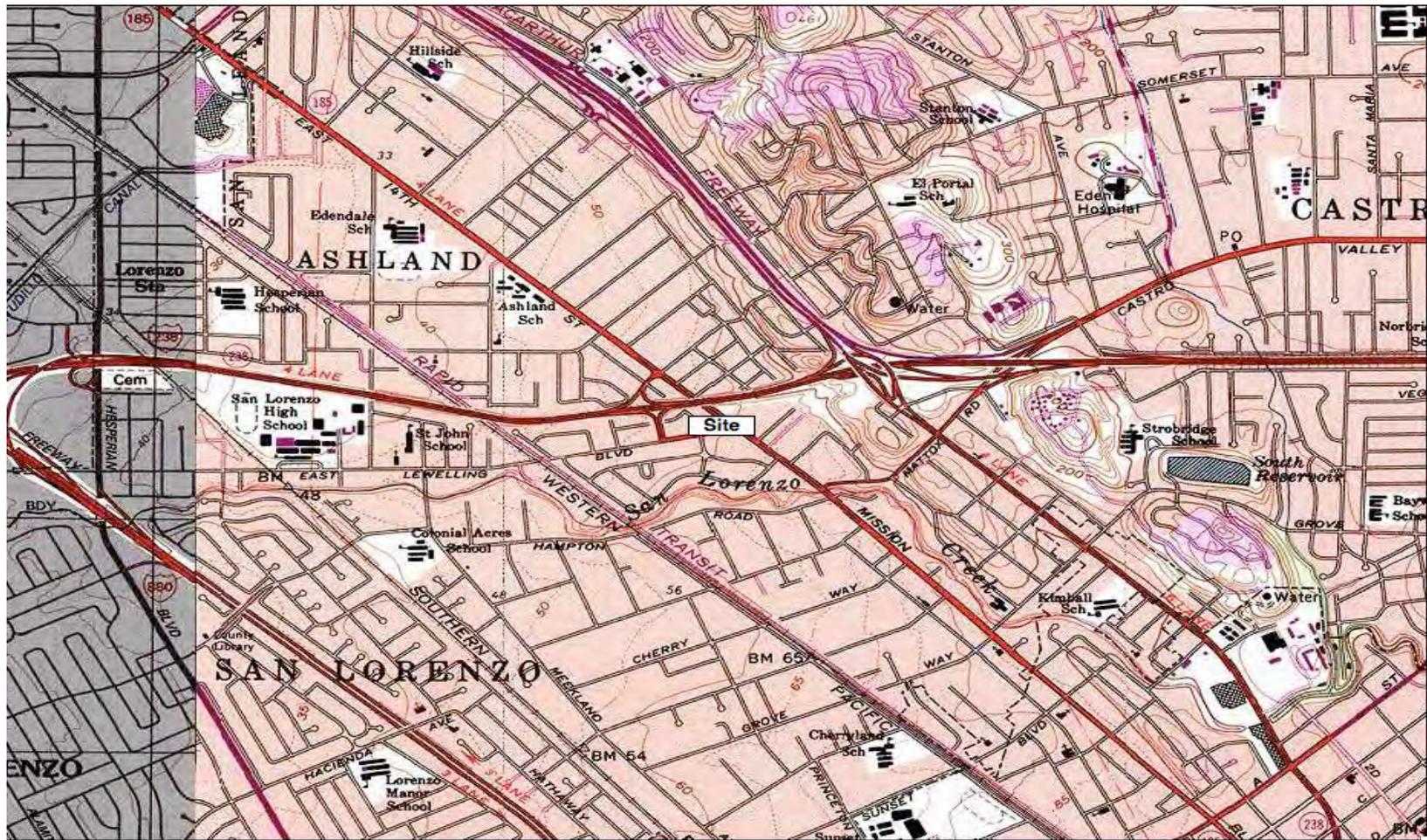
A handwritten signature in black ink, appearing to read 'Reza Baradaran'.

Mitch Hajlaghai, REA II, CAC
Principal

cc: Mr. Mark Detterman ACHCS (1 copy)

R09-103.10\RI\FS.VM\09292009

Appendix A
FIGURE 1 THROUGH 5



TN \star MN
15°

0 1000 FEET 0 500 1000 METERS
Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)



SIERRA ENVIRONMENTAL, INC.
Environmental Consultants

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SITE LOCATION MAP

**Remedial Investigation/Feasibility Study
ABE Petroleum LLC**

17715 Mission Boulevard • Hayward • California

FIGURE

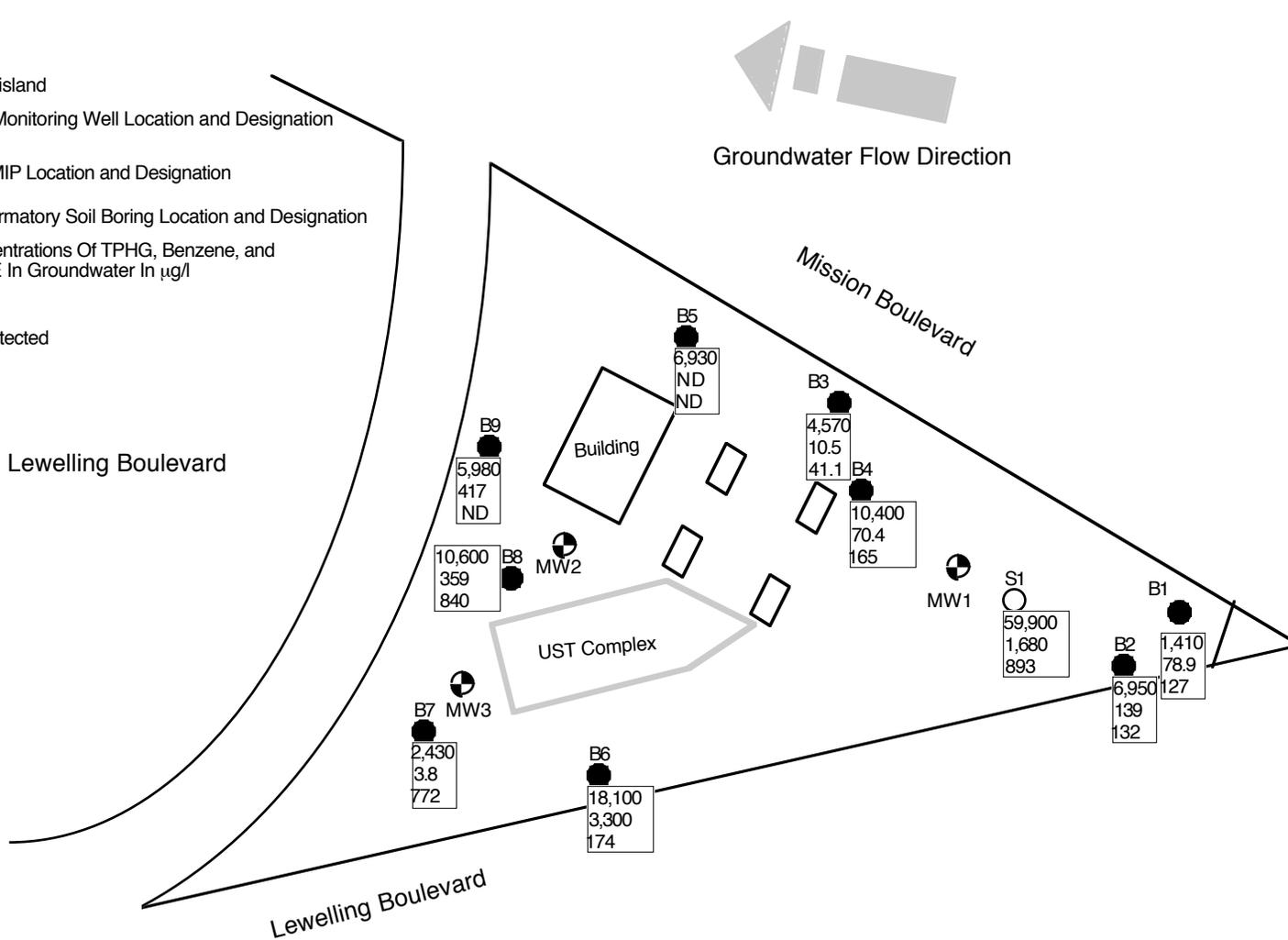
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Project 09-103.10

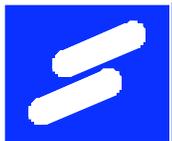
LEGEND

-  Pump island
 -  MW1 Monitoring Well Location and Designation
 -  B1 MIP Location and Designation
 -  S1 Confirmatory Soil Boring Location and Designation
- | | |
|-------|--|
| 1,410 | Concentrations Of TPHG, Benzene, and MTBE In Groundwater In µg/l |
| 78.9 | |
| 127 | |
- ND Not Detected

970 & 982 E. Lewelling Boulevard



Approximate Scale: 



SIERRA ENVIRONMENTAL, INC.
Environmental Consultants

980 W. Taylor St., San Jose, CA 95126
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Soil Boring Locations

Remedial Investigation/Feasibility Study
ABE Petroleum LLC

17715 Mission Boulevard • Hayward • California

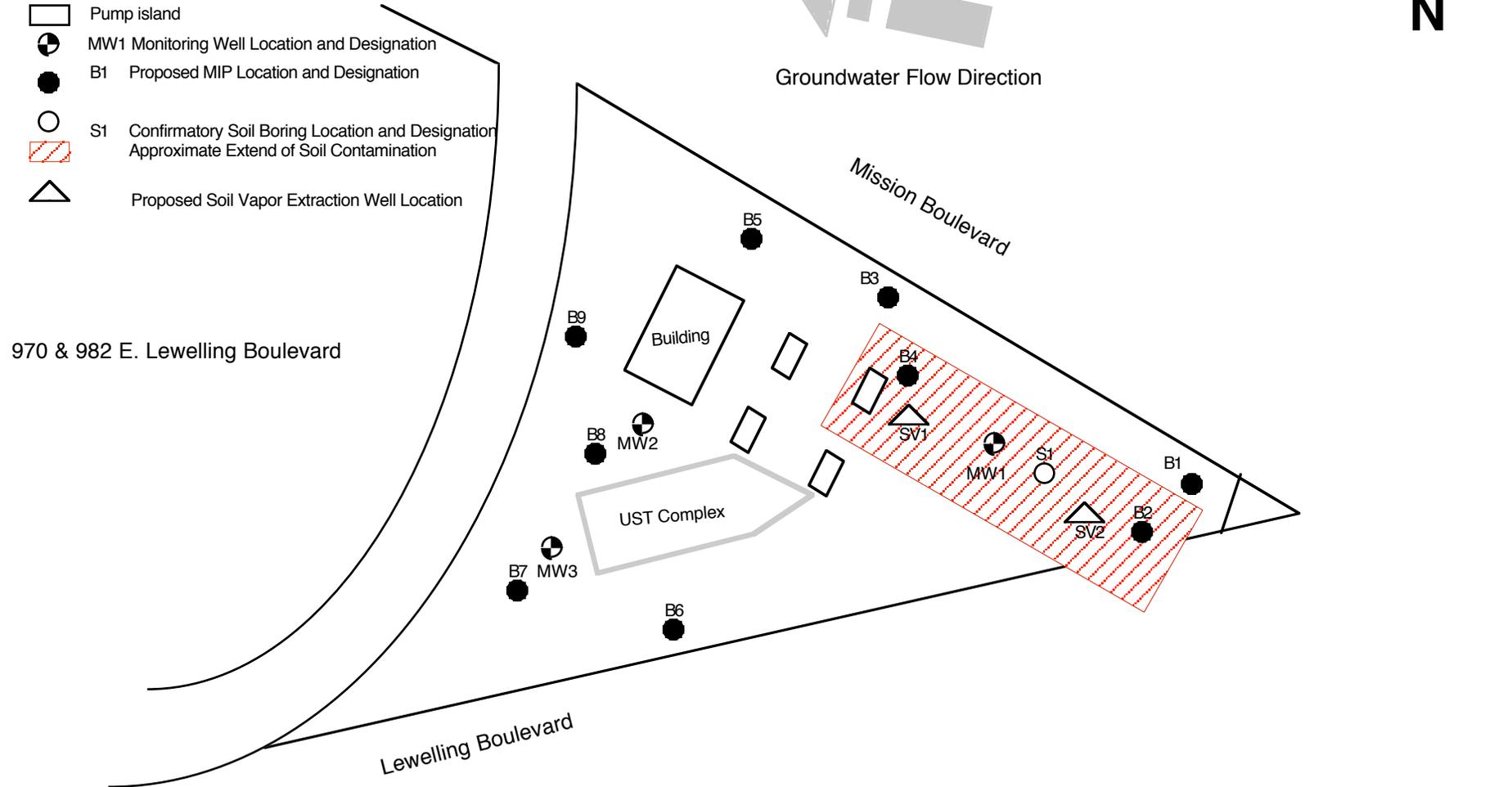
FIGURE

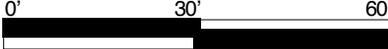
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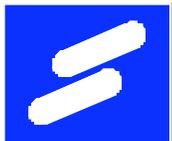
Sep. 29, 2009
Project 09-103.10

LEGEND

-  Pump island
-  MW1 Monitoring Well Location and Designation
-  B1 Proposed MIP Location and Designation
-  S1 Confirmatory Soil Boring Location and Designation
-  Approximate Extend of Soil Contamination
-  Proposed Soil Vapor Extraction Well Location



Approximate Scale: 



SIERRA ENVIRONMENTAL, INC.
Environmental Consultants

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Approximate Extend of Soil Contamination

Remedial Investigation/Feasibility Study
ABE Petroleum LLC

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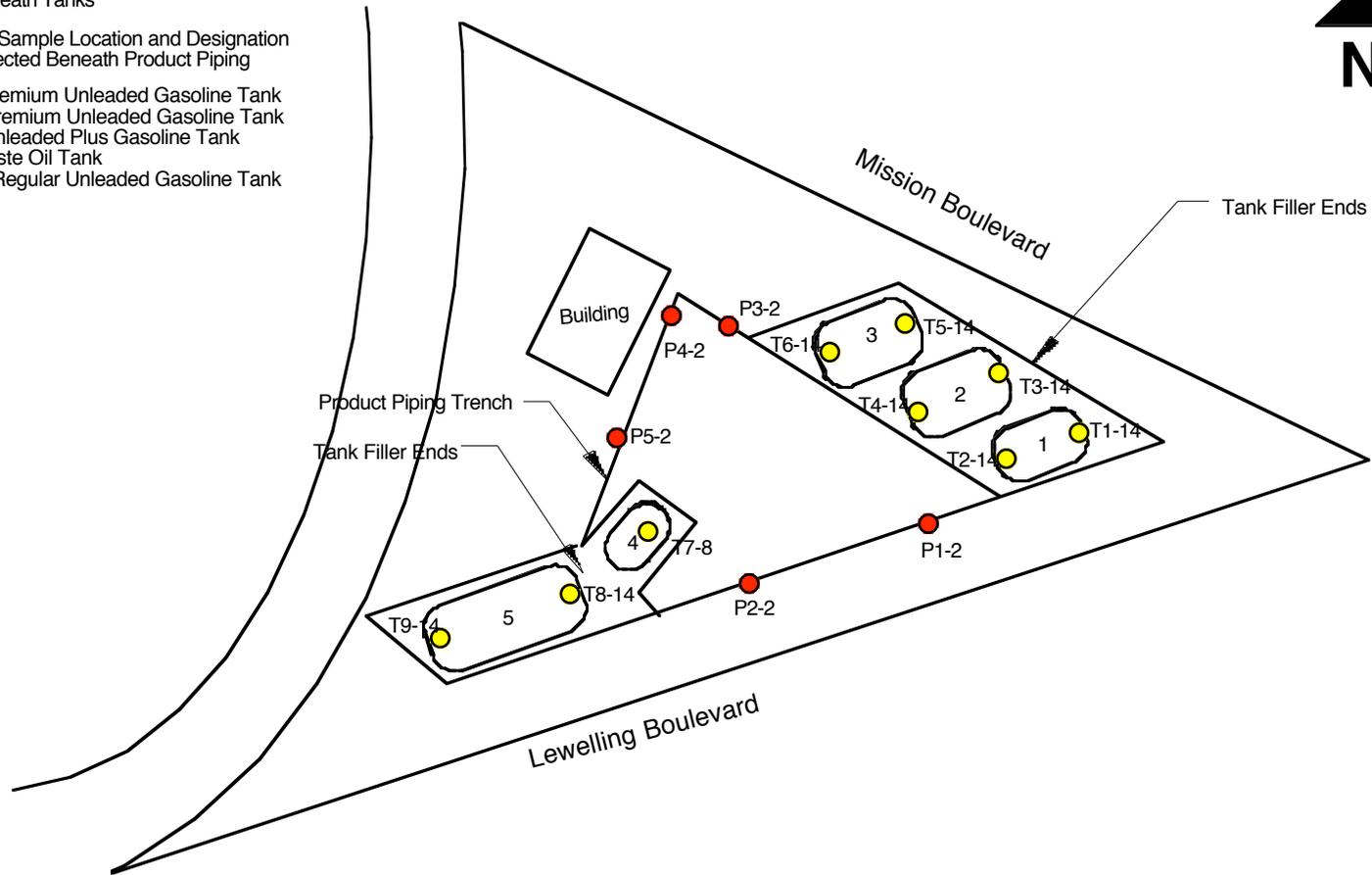
FIGURE

3

Sep. 29, 2009
Project 09-103.10

LEGEND

- T1-14 Soil Sample Location and Designation Collected Beneath Tanks
 - P1-2 Soil Sample Location and Designation Collected Beneath Product Piping
- 1 = 2,000-Gallon Premium Unleaded Gasoline Tank
 2 = 6,000-Gallon Premium Unleaded Gasoline Tank
 3 = 6,000-Gallon Unleaded Plus Gasoline Tank
 4 = 500-Gallon Waste Oil Tank
 5 = 10,000-Gallon Regular Unleaded Gasoline Tank



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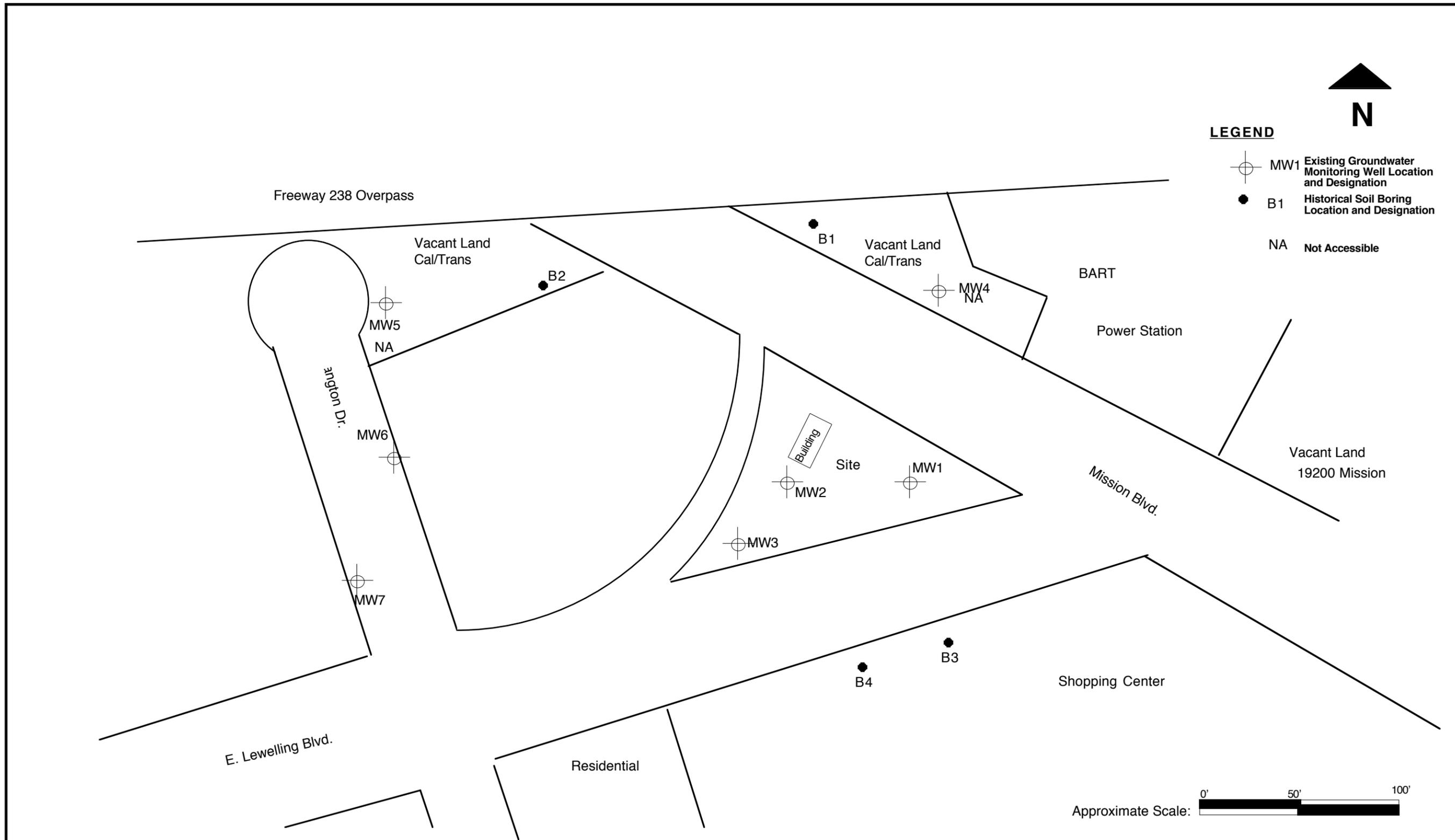
**Former UST and Soil Sample Locations
 Remedial Investigation/Feasibility Study**

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**FIGURE
 4**

Sep. 29, 2008
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On-Site & Off-Site Groundwater Monitoring Well and Soil Boring Locations

Remedial Investigation/Feasibility Study

ABE Petroleum LLC

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FIGURE

5

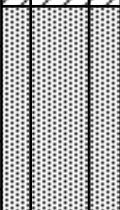
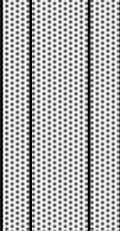
Sept. 29, 2009
Project 09-103.10

Appendix B

**SOIL BORING LOG & TABLE I AND II
ANALYTICAL RESULTS FOR SOIL AND GROUNDWATER SAMPLES**

EXPLORATORY BORING LOG

17715 Mission Boulevard, Hayward, CA

PID Reading ppm	Blows per foot	Sample N°	Depth/ft	Graphic Log	Soil Description
			0		
			0		3" of asphalt and 6" of baserock
4.4			5		Dark gray silty clay, damp, hydrocarbons odor
			10		Light gray silty clay, damp, hydrocarbons odor
440			15		Light gray clayey sand, damp, hydrocarbons odor
537			20		Light gray silty sandy clay, damp, hydrocarbons odor
550		S1-20	20		

Remarks: Approximately the first 5 feet of the soil boring was advanced with a hand auger.



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Page 1 of 2

Drilling Date : 08-27-09

Drilling Co. : Vironex

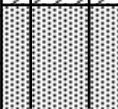
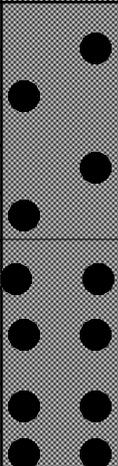
Boring N°: S1

Project N°: 09-103.10

Field Personnel: M.H.

EXPLORATORY BORING LOG

17715 Mission Boulevard, Hayward, CA

PID Reading ppm	Blows per foot	Sample N°	Depth/ft	Graphic Log	Soil Description
133			25		Light brown silty clay, damp, stiff, hydrocarbons odor
79			30		Light brown silty sandy clay, moist, soft, hydrocarbons odor
8.5		S1-35	35		Light brown gravelly sand, wet, hydrocarbons odor
58			40		Light brown sandy gravel, wet, hydrocarbons odor
<p>The boring was terminated at 40' bellow ground surface and it was sealed with portland cement, the same day</p>					

Remarks:



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Environmental Consultants

Page 2 of 2

Drilling Date : 08-27-09

Drilling Co. : Vironex

Boring N°: S1

Project N°: 09-103.10

Field Personnel: M.H.

**TABLE I
ANALYTICAL RESULTS FOR THE SOIL SAMPLES**

Sample ID	Sample Date	Sample Location	Sample Depth (ft)	TPHG ¹ µg/kg	Benzene µg/kg	Toluene µg/kg	Ethyl Benzene µg/kg	Xylenes µg/kg	MTBE ³ µg/kg	Total Petroleum Hydrocarbons µg/kg
S1-20	08-27-09	S1	20	320,000	1,170	30,700	13,500	56,800	1,150	423,320
S1-35	08-27-09	B7	30	52,600	ND ²	ND	967	2,470	157	56,194

1. TPHG = Total Petroleum Hydrocarbons as Gasoline
2. ND = Not Detected
3. MTBE = Methyl Tertiary Butyl Ether

**TABLE II
ANALYTICAL RESULTS FOR THE GROUNDWATER SAMPLES**

Sample ID	Sample Date	Sample Location	Sample Depth (ft)	TPHG µg/l	Benzene µg/l	Toluene µg/l	Ethyl Benzene µg/l	Xylenes µg/l	MTBE µg/l	Total Petroleum Hydrocarbons µg/l
B1W	08-27-09	B1	40	1,410	78.9	147	42.7	188	127	1,993.6
B2W	08-27-09	B2	40	6,950	139	902	230	1,040	132	9,393
B3W	08-28-09	B3	40	4,570	10.5	7.1	220	377	41.1	5,225.7
B4W	08-27-09	B4	40	10,400	70.4	13.8	454	1,350	165	12,453.2
B5W	08-28-09	B5	40	6,930	ND	ND	8.4	ND	ND	6,938.4
B6W	08-31-09	B6	40	18,100	3,300	34.6	505	703	174	24,756.6
B7W	08-31-09	B7	40	2,430	3.8	ND	76.3	96.4	772	3,693.5
B8W	08-28-09	B8	40	10,600	359	12.6	145	68.1	840	12,125.7
B9W	08-28-09	B9	40	5,980	417	ND	17.4	9.9	ND	6,434.3
S1W	08-27-09	S1	40	59,900	1,680	2,570	2,940	10,500	893	78,493

NOTE: 1940 µg/l, 315 µg/l, 1340 µg/l, and 915 µg/l of tert-butyl alcohol were detected in water samples B6W, B7W, B8W, and B9W respectively. Also, 2.4 µg/l tert-amyl methyl ether was detected in sample B1W.

Appendix C
MIP RESULTS

Report
Membrane Interface Probe Services
ABE Petroleum
17715 Mission Blvd, Hayward, CA



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“Expect Performance”

Table of Contents

<u>Description</u>	<u>Page</u>
Table of Contents.....	2
Project Background.....	3
MIP System Overview.....	4
MIP QA/QC.....	6
Physical Properties Chart.....	Appendix A
MIP Borings.....	Appendix B

1. Project Background

- a. Site History - This site is an active gas station.

Target Area	120' X 100'
Target Interval	Surface to 40' bgs.
Target Interval Lithology	Sand, Silty Sand, Silt, Clay
Depth to Groundwater	34' bgs to 37' bgs
Contaminants of Concern	Gasoline
Groundwater mg/l	21,000 min / 280,000 max
Soil mg/kg	130 min / 720 max
DNAPL / Free Product	Unknown

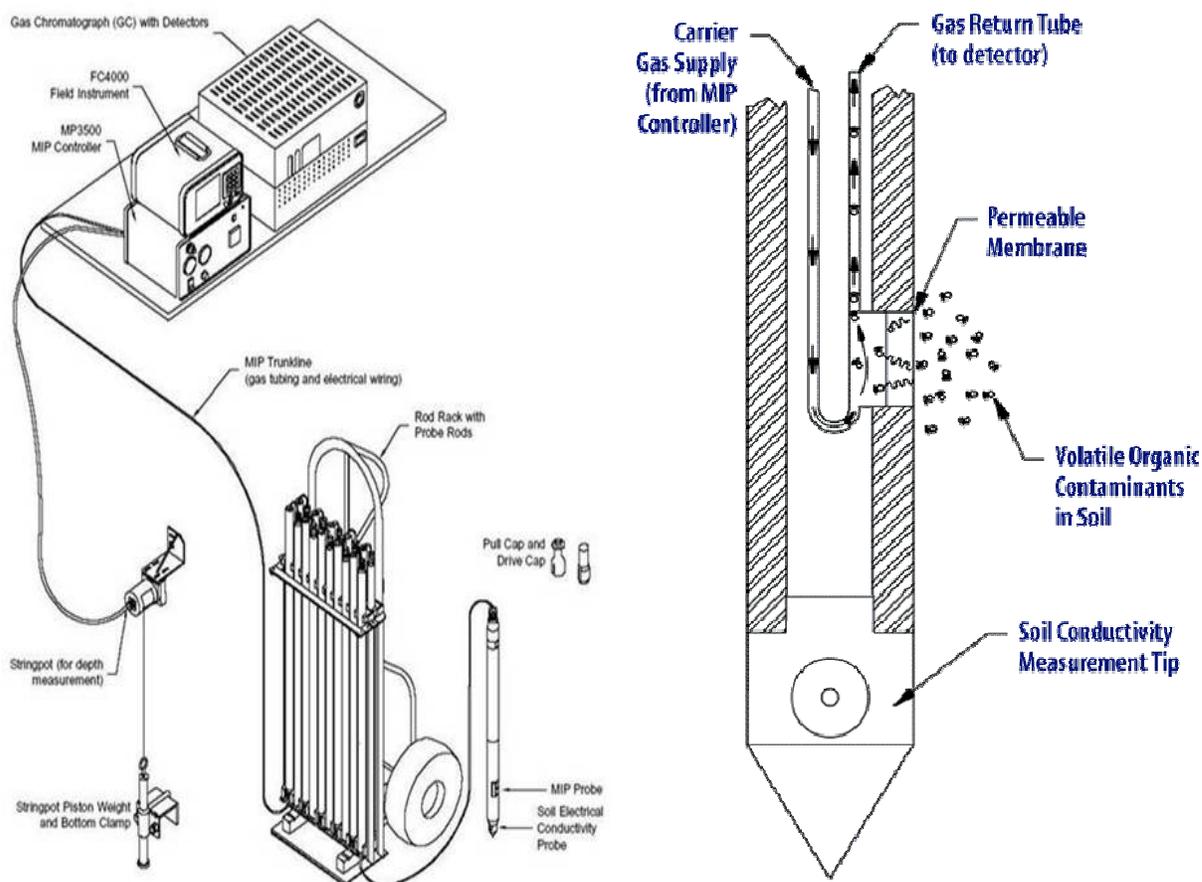
- b. Objectives – Define the vertical and lateral extent of a gasoline plume.
- c. MIP Scope - Collect MIP data from 9 locations, samples as shallow as 5' bgs to as deep as 40' bgs.
- d. Notes

MIP Boring	Date	Notes
B4	08/27/09	Hand auger to 5' bgs.
B1	08/27/09	Hand auger to 5' bgs.
B2	08/27/09	Hand auger to 5' bgs.
B3	08/28/09	Hand auger to 5' bgs.
B5	08/28/09	Hand auger to 5' bgs.
B9	08/28/09	Hand auger to 5' bgs.
B8	08/28/09	Hand auger to 5' bgs.
B7	08/31/09	Hand auger to 5' bgs.
B6	08/31/09	Hand auger to 5' bgs.

2. MIP System Overview:

The MIP is a direct push tool that produces continuous chemical and physical logs of the vadose and saturated zones. It locates VOCs in-situ and shows you where they occur relative to the geologic and hydrologic units. Vertical profiles, transects, 3D pictures and maps can all be made from the electronic data generated by the MIP logs. Its unique capability of providing reliable, real-time information allows you to make better and timely decisions while your team is still in the field.

The MIP is a down hole tool that heats the soils and groundwater adjacent to the probe to 120 degrees C. This increases volatility and the vapor phase diffuses across a membrane into a closed, inert gas loop that carries these vapors to a series of detectors housed at the surface. Continuous chemical logs or profiles are generated from each hole. Soil conductivity is also measured and these logs can be compared to the chemical logs to better understand where the VOCs occur. The MIP technology is only appropriate for volatile organic compounds (VOCs). The gas stream can be analyzed with multiple detectors, for example an electron capture detector is used to detect chlorinated solvents, a photo-ionization detector is used to detect petroleum hydrocarbons, and a flame ionization detector is used to detect methane.



2.a Equipment Used:

- Geoprobe 6600
- MIP Controller (Nitrogen Flow and Heater)
- Geoprobe FC 5000 Computer
- HP 5890 Gas Chromatograph
- ECD (Electron Capture Detector)
- PID (Photo Ionization Detector) 10.2 eV Lamp
- FID (Photo Ionization Detector)
- 150' Geoprobe Trunkline
- 1.75" O.D. 6520 MIP Probe
- 1.5" O.D. Drive Rods

2.b Detector Overview

- ECD – Electron Capture Detector uses a radioactive Beta emitter (electrons) to ionize some of the carrier gas and produce a current between a biased pair of electrodes. When organic molecules contain electronegative functional groups, such as halogens, phosphorous, and nitro groups pass by the detector, they capture some of the electrons and reduce the current measured between the electrodes.
- PID – Photo Ionization Detector sample stream flows through the detector's reaction chamber where it is continuously irradiated with high energy ultraviolet light. When compounds are present that have a lower ionization potential than that of the irradiation energy (10.2 electron volts with standard lamp) they are ionized. The ions formed are collected in an electrical field, producing an ion current that is proportional to compound concentration. The ion current is amplified and output by the gas chromatograph's electrometer.
- FID – Flame Ionization Detector consists of a hydrogen / air flame and a collector plate. The effluent from the GC (trunkline) passes through the flame, which breaks down organic molecules and produces ions. The ions are collected on a biased electrode and produce an electric signal.

2.c MIP Data Collected

- Depth - Data is collected from twenty data points per foot. 0.05', 0.10', 0.15', etc...
- Electrical Conductivity - Electrical Conductivity data is measured/collected in milli-siemens per Meter (ms/M). The conductivity of soils is different for each type of media. Finer grained sediments, such as silts or clays, will have a higher EC signal. While coarser grained sediments, sands and gravel, will have a lower EC signal. The coarser grained sediments will allow the migration of contaminants and the finer grained sediments will trap the contaminant.
- Speed / Advancement Rate - Speed data is measured/collected in feet per minute (ft/min). Speed is an indication of the physical advancement rate of the MIP probe. Speed of the MIP probe can vary due to operator advancement and dense soil types. Speed log can provide soil type information which can be

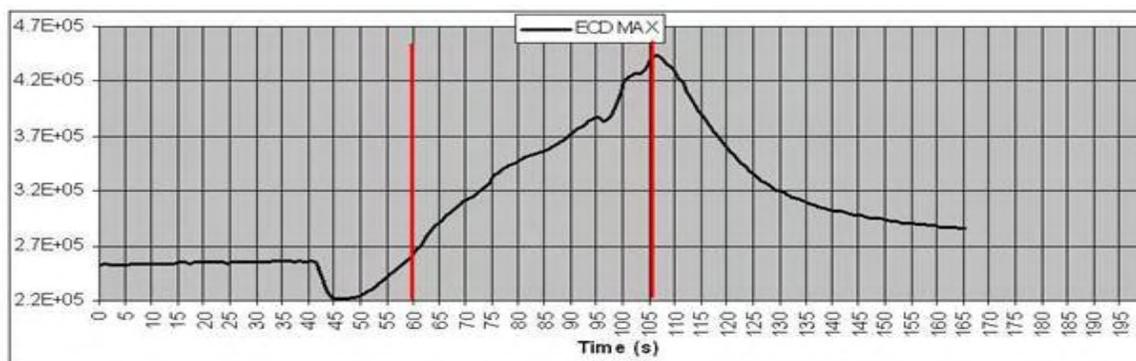
correlated with electrical conductivity. Lower advancement speed, correlated with lower conductivity or larger grained soils would more than likely be associated with dense or compacted sands.

- Temperature - Temperature data is measured/collected in Degrees Celsius. Temperature is an indication of the physical temperature of the MIP block. Minimum and Maximum temperature is collected at each vertical interval. Vironex's temperature protocol indicates that the MIP probe temperature shall maintain a minimum temperature of 75 Degrees Celsius.
- Pressure - Pressure data is measured/collected in PSI. Pressure is an indication of the internal pressure of the nitrogen lines located within the trunkline and the pressure behind the membrane. Minimum and Maximum pressure is collected at each vertical interval. Geoprobe's pressure protocol indicates that the MIP probe pressure shall not exceed 1.5 PSI difference from baseline.
- Detector (ECD, PID, FID) - Detector responses are measured/collected in micro Volts (uV). Detector responses are an indication of relative contaminant responses. Minimum and Maximum detector responses are collected at each vertical interval.

3. MIP QA/QC

Vironex adheres to Geoprobe's Standard Operating Procedure, technical Bulletin No. MK3010, prepared: May, 2003. The response testing is a necessary part of the MIP logging process because it ensures that the system is working correctly and also enables the operator to measure the response time. Response time is the time it takes for the contaminant to go from the probe, through the trunk line, and to the detectors. This time is entered into the FC5000 computer for depth calculations. A response test is completed at the beginning of the day, between each boring, and at the end of each day. The response time will vary due to weather temperatures and length of the trunkline.

Per Geoprobe's SOP, a pass response is indicated as double the noise above the baseline.





APPENDIX A

Physical Properties Chart



Compound	Formula	Density	Flashpoint* (°C)	Molecular Weight	Melting Point (°C)	Boiling Point (°C)	Water Solubility**	ECD	PID	FID
1,1,1,2-Tetrachloroethane	C ₂ H ₂ Cl ₄	1.5532	6	167.8498	-70.2	130.5	<0.1 g/100 mL at 20.5 C	•		
1,1,1-Trichloroethane	C ₂ H ₃ Cl ₃	1.3376	N/A	133.4047	-32.6	74.1	Slightly soluble. 0.1495 g/100 mL	•		
1,1,2,2-Tetrachloroethane	C ₂ H ₂ Cl ₄	1.595	N/A	167.8498	-43	146.3	Soluble. 0.2962 g/100 mL	•		
1,1,2-Trichloroethane	C ₂ H ₃ Cl ₃	1.4411	N/A	133.4047	-36.5	113.8	Insoluble. 0.442 g/100 mL	•		
1,1-Dichloroethane	C ₂ H ₄ Cl ₂	1.176	-5	98.9596	-97.4	57.3	Slightly soluble. 0.506 g/100 mL	•		
1,1-Dichloroethene	C ₂ H ₂ Cl ₂	1.213	-28	96.9438	-122.1	31.7	Insoluble. 0.225 g/100 mL	•	•	
2,3-Dichloropropene	C ₃ H ₄ Cl ₂	1.204	10	110.9706	10	94	<0.1 g/100 mL at 22 C	•	•	
1,2,3-Trichlorobenzene	C ₆ H ₃ Cl ₃	1.69	126	181.4487	52.6	219	Insoluble	•	•	
1,2,3-Trichloropropane	C ₃ H ₅ Cl ₃	1.389	82	147.4315	-14.7	156	insoluble. 0.18 g/100 mL	•		
1,2,4-Trichlorobenzene	C ₆ H ₃ Cl ₃	1.4634	110	181.4487	16.95	214.4	Insoluble. 0.0049 g/100 mL	•	•	
1,2-Dichlorobenzene	C ₆ H ₄ Cl ₂	1.306	67	147.0036	-15	180.5	slightly soluble. 0.008396 g/100 mL	•	•	
1,2-Dichloroethane	C ₂ H ₄ Cl ₂	1.253	13	98.9596	-35.3	83.5	Slightly soluble. 0.8608 g/100 mL	•		
1,2-Dichloropropane	C ₃ H ₆ Cl ₂	1.1558	15	112.9864	-100.4	96.8	Slightly soluble. 0.27 g/100 mL	•		
1,3-Dichlorobenzene	C ₆ H ₄ Cl ₂	1.288	67	147.0036	-24.76	173	insoluble. 0.0125 g/100 mL	•	•	
1,4-Dichlorobenzene	C ₆ H ₄ Cl ₂	1.2417	67	147.0036	53.1	173.4	Insoluble. 0.00813 g/100 mL	•	•	
1,2-Dichloropropane	C ₃ H ₆ Cl ₂	1.1558	15	112.9864	-100.4	96.8	Slightly soluble. 0.27 g/100 mL	•		
2-Chloropropane	C ₃ H ₇ Cl	0.862	-32	78.5413	-117.18	35.74	0.31 g/100 mL at 20 C	•		
2-Chlorotoluene	C ₇ H ₇ Cl	1.082	47	126.5853	-35.1	158.97	Slightly soluble	•	•	
3-Chloropropene	C ₃ H ₅ Cl	0.938	-29	76.5255	-134.5	44 - 46	Slightly soluble. 0.337 g/100 mL	•	•	
4-Chlorotoluene	C ₇ H ₇ Cl	1.07	49	126.5853	7.5	161.9	<0.1 g/100 mL at 20 C	•	•	
Carbon tetrachloride	CCl ₄	1.594	N/A	153.823	-22.9	76.7	Slightly sol. 0.08048 g/100 mL	•		
Chlorobenzene	C ₆ H ₅ Cl	1.1066	29	112.5585	-45.6	130	Slightly soluble. 0.0497 g/100 mL	•	•	
Chloroethane	C ₂ H ₅ Cl	0.92	-50	64.5145	-136.4	12.3	Soluble. 0.574 g/100 mL at 20 C	•		
Chloroform	CHCl ₃	1.49845	N/A	119.3779	-63.7	61.7	Slightly sol. 0.795 g/100 mL	•		
Chloromethane	CH ₃ Cl	0.991	N/A	50.4877	-97.1	-24.2	insoluble. 0.5325 g/100 mL	•		
cis-1,2-Dichloroethene	C ₂ H ₂ Cl ₂	1.284	6	96.9438	-80.5	60	0.08 g/100 mL	•	•	
cis-1,3-Dichloropropene	C ₃ H ₄ Cl ₂	1.22	N/A	110.9706	-50	104.3	<0.1 g/100 mL at 20.5 C	•	•	
cis-1,4-Dichloro-2-butene	C ₄ H ₆ Cl ₂	1.188	56	124.9974	-48	152	0.058 g/100 mL	•	•	
Methylene Chloride	CH ₂ Cl ₂	1.3255	N/A	84.9328	-96.7	39.8	Slightly sol. 1.32 g/100 mL	•		
Tetrachloroethene	C ₂ Cl ₄	1.623	N/A	165.834	-22.3	121.1	Almost insoluble 0.015 g/100 mL	•	•	
Trans-1,2-Dichloroethene	C ₂ H ₂ Cl ₂	1.257	6	96.9438	-50	47.5	Slightly. 0.63 g/100 mL	•	•	



Compound	Formula	Density	Flashpoint* (°C)	Molecular Weight	Melting Point (°C)	Boiling Point (°C)	Water Solubility**	ECD	PID	FID
trans-1,3-Dichloropropene	C ₃ H ₄ Cl ₂	1.217	27	110.9706	N/A	112	<0.1 g/100 mL at 20.5 C	•	•	
trans-1,4-Dichloro-2-butene	C ₄ H ₆ Cl ₂	1.183	N/A	124.9974	2	155.5	0.085 g/100 mL at 25 C	•	•	
Trichloroethene	C ₂ HCl ₃	1.462	N/A	131.3889	-86	86.7	Slightly soluble. 0.11 g/100 mL	•	•	
Vinyl Chloride	C ₂ H ₃ Cl	0.9106	42	62.4987	-153.7	-13.9	Slightly soluble 0.11 g/100 mL	•	•	
Benzene	C ₆ H ₆	0.8786	-11	78.1134	5.5	80.1	Slightly sol. 0.18 g/100 mL		•	•
Hexane	C ₆ H ₁₄	0.6548	-22	86.1766	-95	69	Slightly sol. .000947 g/100 mL		•	•
n-Butylbenzene	C ₁₀ H ₁₄	0.86	59	134.2206	-88	183	insoluble		•	•
1,2,4-Trimethylbenzene	C ₉ H ₁₂	0.876	48	120.1938	-43.8	169	Slightly soluble		•	•
1,3,5-Trimethylbenzene	C ₉ H ₁₂	0.865	44	120.1938	-44.7	165	insoluble		•	•
Ethyl Benzene	C ₈ H ₁₀	0.867	15	106.167	-94.9	136.2	0.0206 g/100 mL		•	•
m,p-Xylene	C ₈ H ₁₀	0.862	25	106.167	-50	140	Insoluble. 0.0175 g/100 mL		•	•
Naphthalene	C ₁₀ H ₈	0.997	78	128.1732	80.6	218	Slightly soluble. 0.0031 g/100 mL		•	•
o-Xylene	C ₈ H ₁₀	0.897	32	106.167	-25.2	144	0.00 g/100 mL. Insoluble		•	•
n-Propylbenzene	C ₉ H ₁₂	0.862	47	120.1938	-101.6	159	insoluble		•	•
Toluene	C ₇ H ₈	0.867	4	92.1402	-93	110.6	Slightly sol. 0.0526 g/100 mL		•	•
1,2-Dibromo-3-chloropropane	C ₃ H ₅ Br ₂ Cl	2.05	N/A	236.3335	6	195	0.123 g/100 mL	•		
1,2-Dibromoethane	C ₂ H ₄ Br ₂	2.17	1	187.8616	9.97	131.7	Slightly sol. 0.4152 g/100 mL	•		
1,3-Dichloropropane	C ₃ H ₆ Cl ₂	1.188	20	112.9864	-99	120.4	insoluble	•		
Acrylonitrile	C ₃ H ₃ N	0.8075	-5	53.0634	-83.55	77.3	Soluble. 7.45 g/100 mL		•	
Bromobenzene	C ₆ H ₅ Br	1.495	51	157.0095	-30.8	155	insoluble. <0.1 g/100 mL at 20.5 C	•	•	
Bromochloromethane	CH ₂ BrCl	1.991	N/A	129.3838	-88	67.8	Slightly soluble. 0.1-0.5 g/100 mL at 20 C	•		
Bromodichloromethane	CHBrCl ₂	1.971	N/A	163.8289	-57.1	90.1	Slightly soluble. 0.6735 g/100 mL	•		
Bromoform	CHBr ₃	2.894	N/A	252.7309	8.3	149.5	Slightly soluble. 0.301 g/100 mL	•		
Bromomethane	CH ₃ Br	1.732	N/A	94.9387	-93.7	3.56	Very slightly soluble. 1.522 g/100 mL	•		
Carbon disulfide	CS ₂	1.2632	-30	76.131	-110	46.2	Slightly sol. 0.1185 g/100 mL		•	
Cumene	C ₉ H ₁₂	0.862	31	120.1938	-96	151	insoluble. 0.00499 g/100 mL		•	
Dibromochloromethane	CHBr ₂ Cl	2.451	N/A	208.2799	-22	120	0.4 g/100 mL	•		
Dibromomethane	CH ₂ Br ₂	2.497	N/A	173.8348	-53	97	Soluble. 1.193 g/100 mL	•		
Freon 11	CCl ₃ F	1.494	N/A	137.3684	-111	23.8	insoluble. 0.124 g/100 mL	•		
Freon 113	C ₂ Cl ₃ F ₃	1.575	N/A	187.3762	-36.4	47.6	0.02 g/100 mL. Slightly soluble. Insoluble	•		



Compound	Formula	Density	Flashpoint* (°C)	Molecular Weight	Melting Point (°C)	Boiling Point (°C)	Water Solubility**	ECD	PID	FID
Hexachlorobutadiene	C ₄ Cl ₆	1.68	N/A	260.762	-21	210	Insoluble. 0.00032 g/100 mL	•	•	
p-Cymene	C ₁₀ H ₁₄	0.86	47	134.2206	-67	176 - 178	insoluble		•	
sec-Butylbenzene	C ₁₀ H ₁₄	0.862	45	134.2206	-75	173	0.00176 g/100mL		•	
Styrene	C ₈ H ₈	0.9045	32	104.1512	-30.6	145.2	0.032 g/100 mL		•	•
tert-Butylbenzene	C ₁₀ H ₁₄	0.867	44	134.2206	-58	169	0.00295 g/100 mL		•	

* Compound with no flashpoint are not ignitable.

** If temperature is not otherwise noted, assume 25° C.

• indicates a possible response on specific detector

Associated Parent Compound
Chlorinated
Gasoline
Diesel
Gasoline and Diesel
Not typical of primary compounds



APPENDIX B

MIP BORINGS



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Boring Name: B4

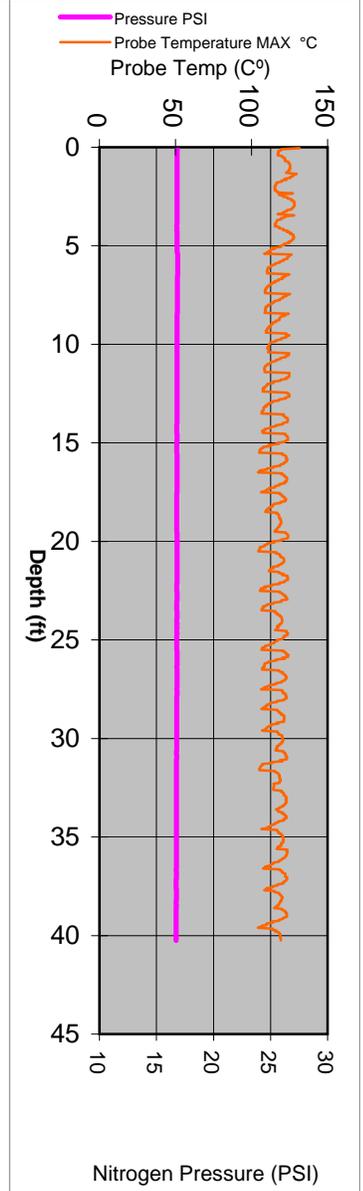
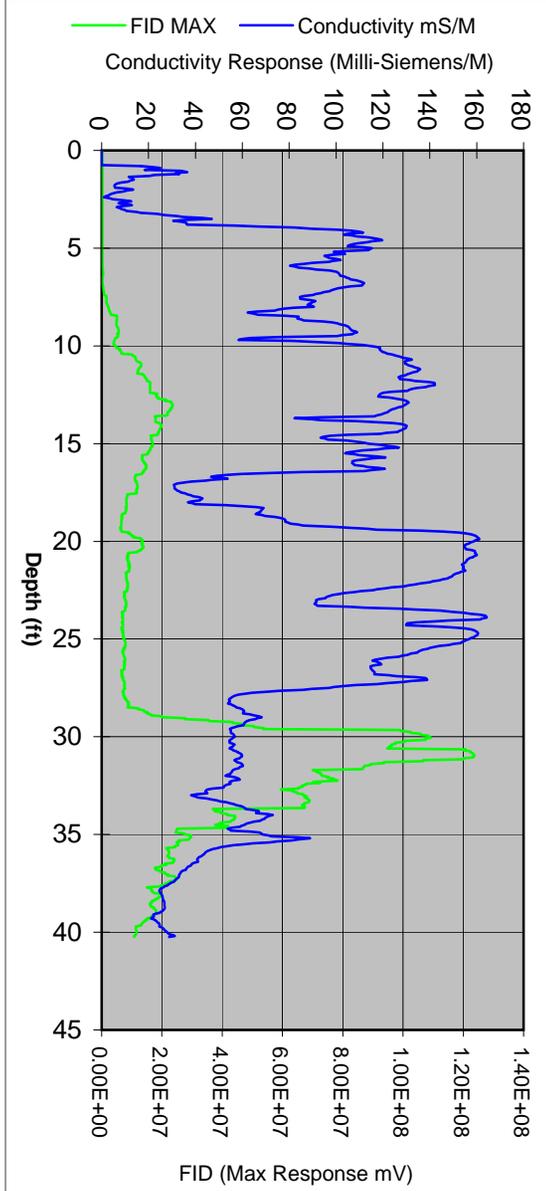
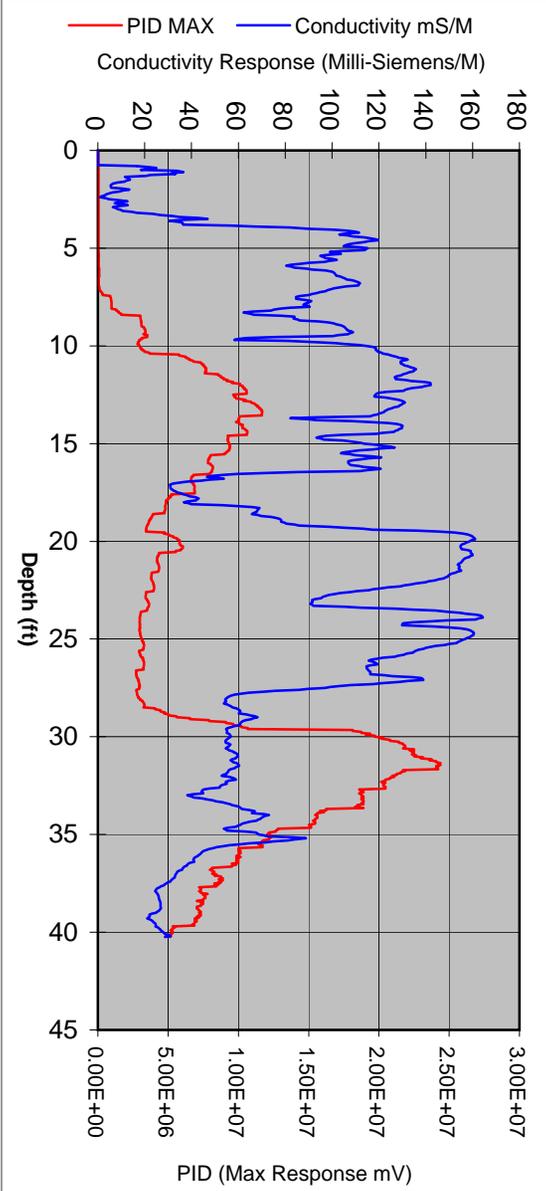
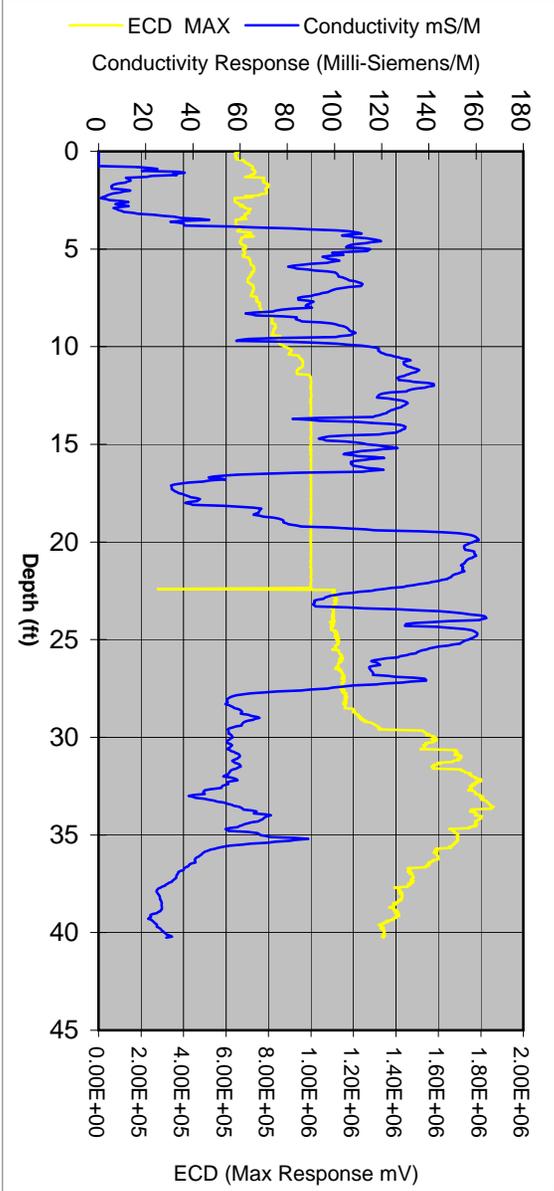
Total Depth (ft):

40.25

Notes: Hand auger to 5' bgs.

GW Depth (ft): █
 Depth of GW Provided by Client

Job Information		MIP Sampling Information	
Client Company:	SIERRA ENVIRONMENTAL	Trunkline Length:	150'
Project Name:	ABE Petroleum	Probe Type:	6520
Site Address:	17715 Mission Blvd - Hayward, CA	Rig Type:	Geoprobe 6600
		Start Boring Time:	Thu Aug 27 2009 11:13
		End Boring Time:	Thu Aug 27 2009 11:55
		MIP Specialist:	Jeff Paul





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Boring Name: B1

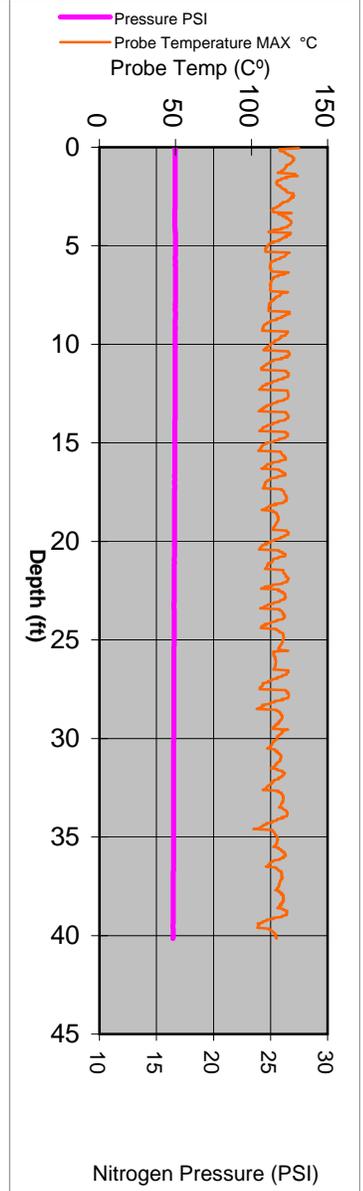
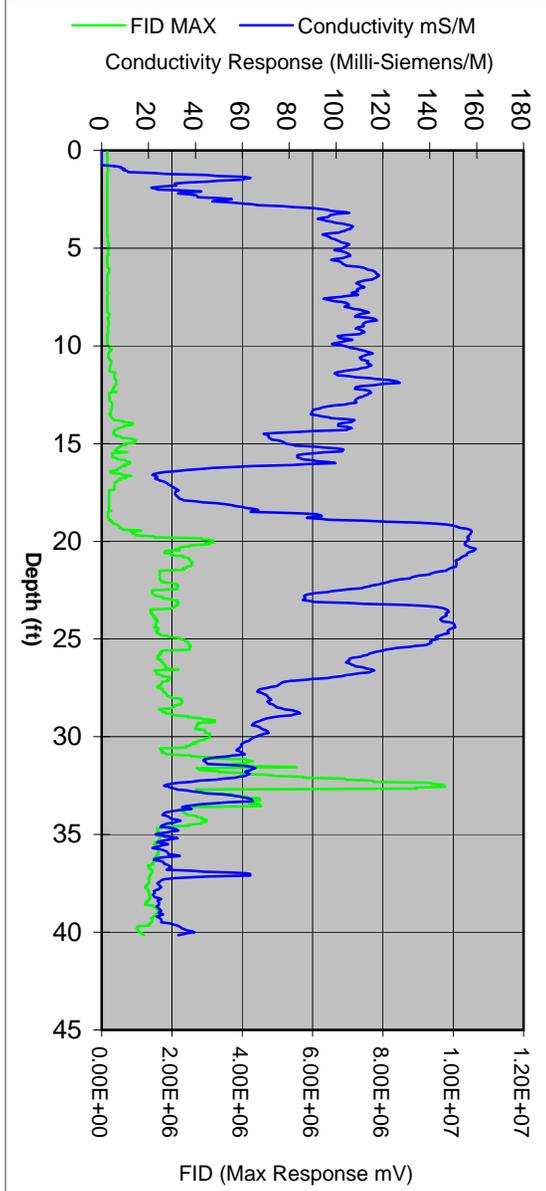
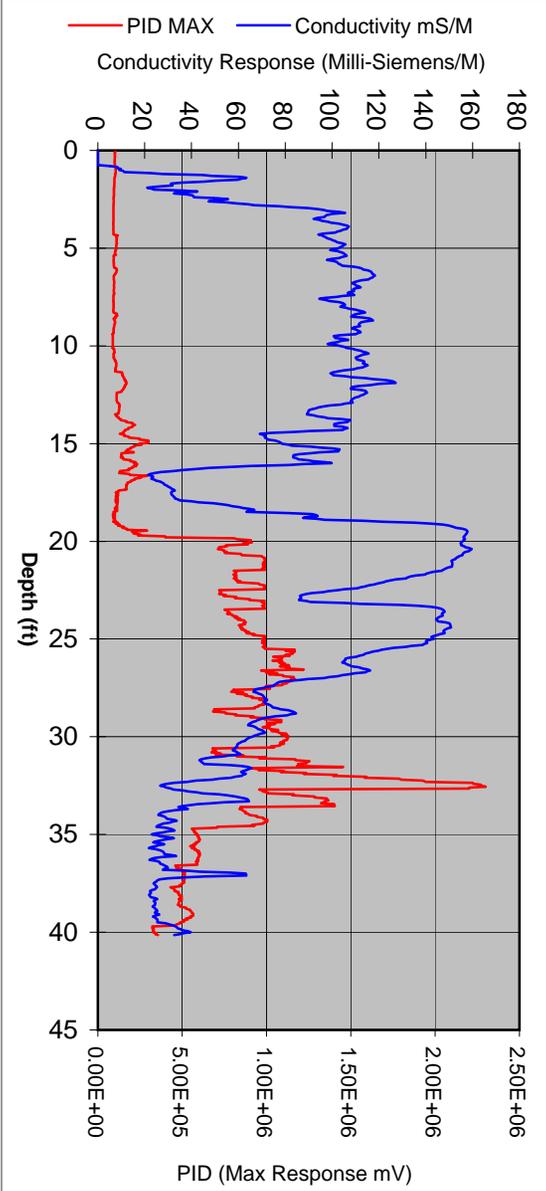
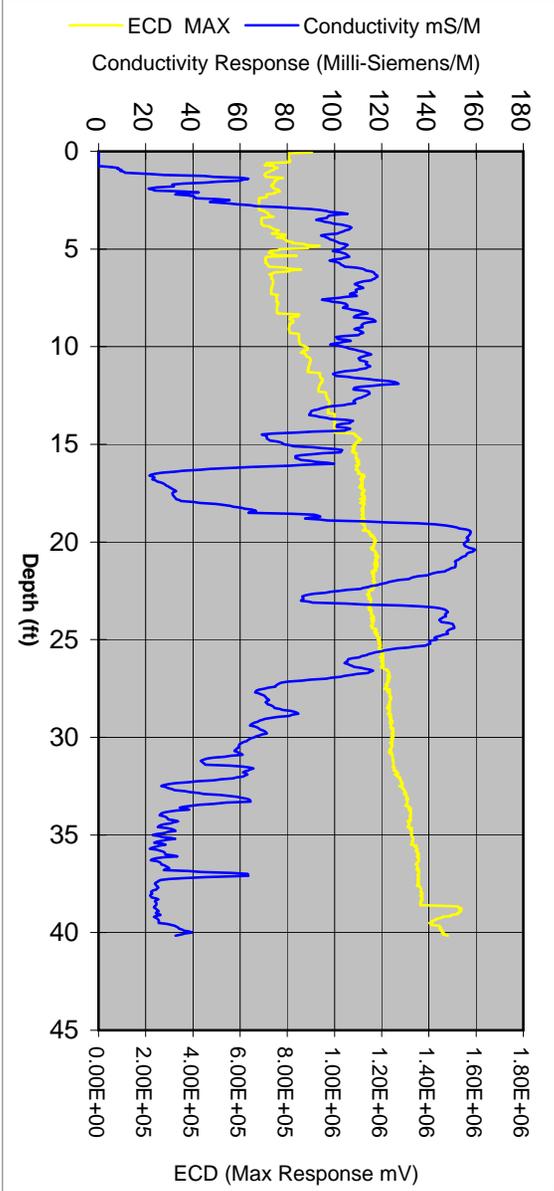
Total Depth (ft):

40.15

Notes: Hand auger to 5' bgs.

GW Depth (ft): █
 Depth of GW Provided by Client

Job Information		MIP Sampling Information	
Client Company:	SIERRA ENVIRONMENTAL	Trunkline Length:	150'
Project Name:	ABE Petroleum	Probe Type:	6520
Site Address:	17715 Mission Blvd - Hayward, CA	Rig Type:	Geoprobe 6600
		Start Boring Time:	Thu Aug 27 2009 13:10
		End Boring Time:	Thu Aug 27 2009 13:52
		MIP Specialist:	Jeff Paul





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Boring Name: B2

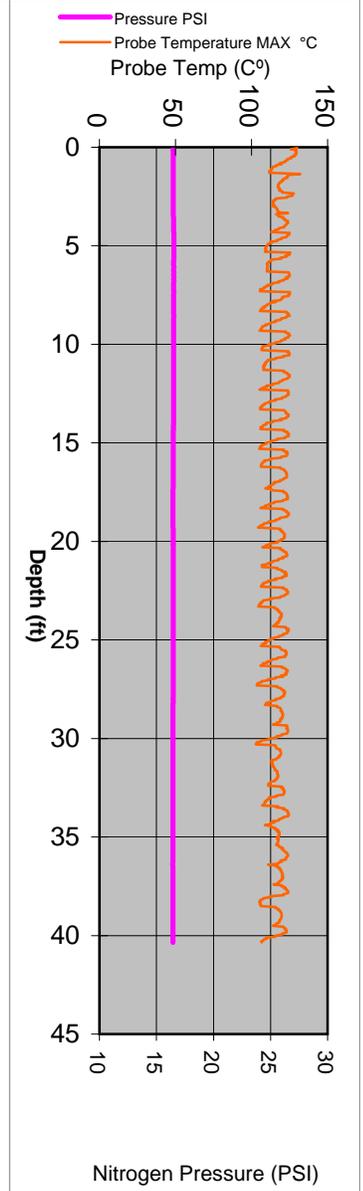
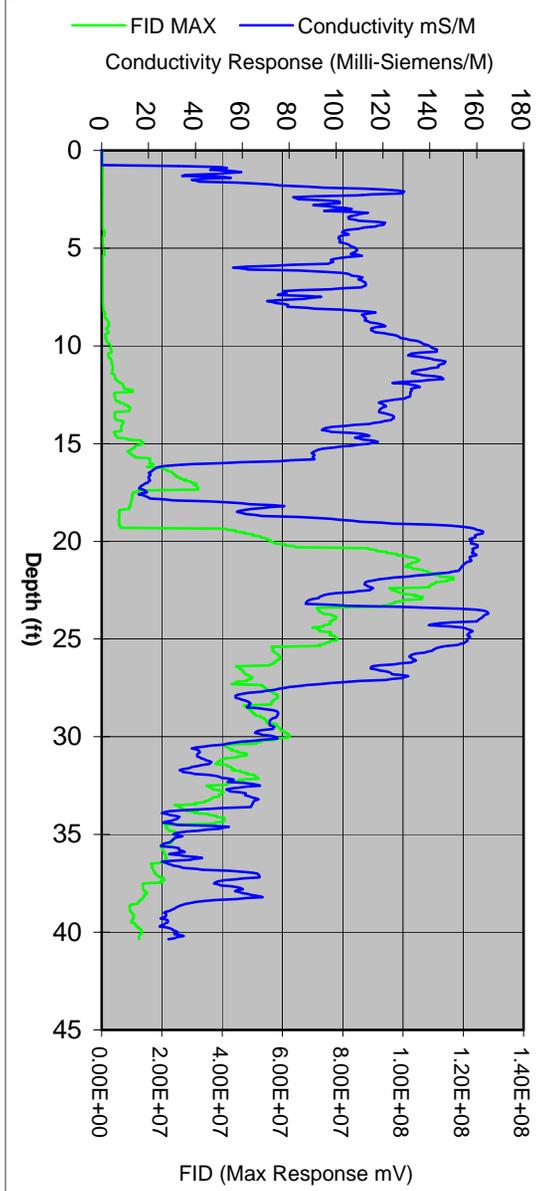
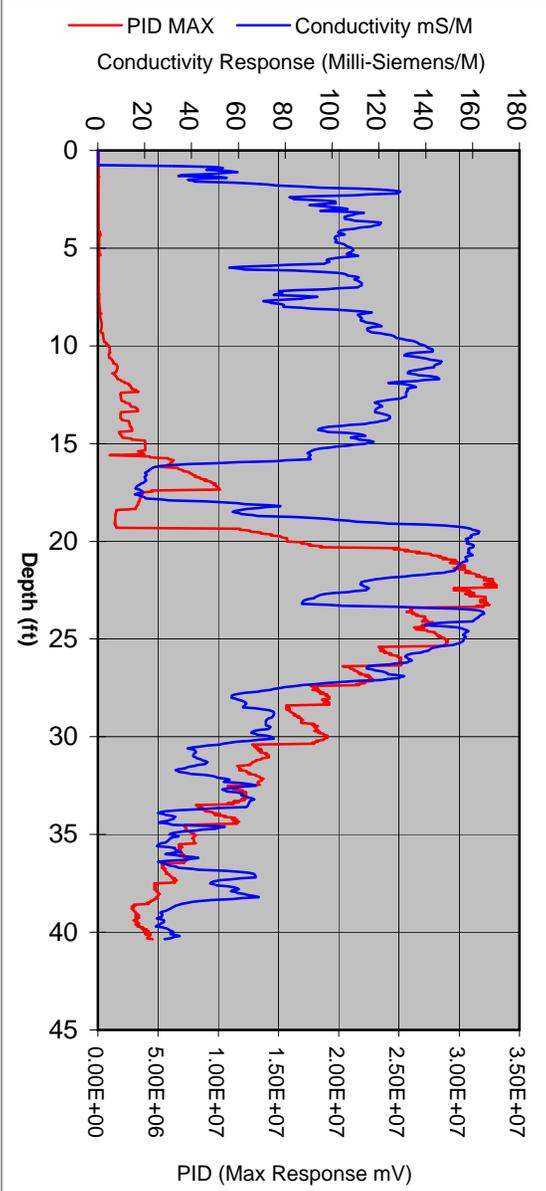
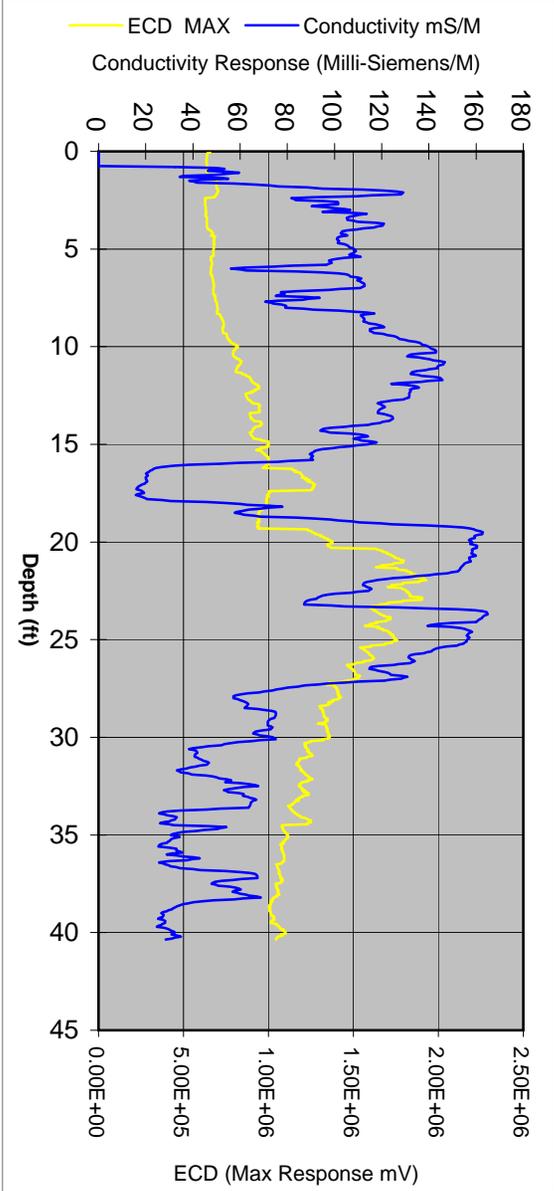
Total Depth (ft):

40.35

Notes: Hand auger to 5' bgs.

GW Depth (ft): █
 Depth of GW Provided by Client

Job Information		MIP Sampling Information	
Client Company:	SIERRA ENVIRONMENTAL	Trunkline Length:	150'
Project Name:	ABE Petroleum	Probe Type:	6520
Site Address:	17715 Mission Blvd - Hayward, CA	Rig Type:	Geoprobe 6600
		Start Boring Time:	Thu Aug 27 2009 14:49
		End Boring Time:	Thu Aug 27 2009 15:31
		MIP Specialist:	Jeff Paul





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Boring Name: B3

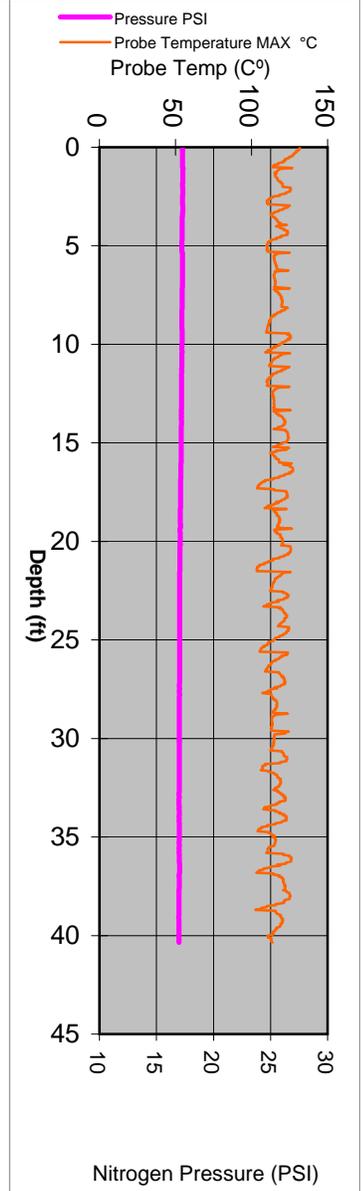
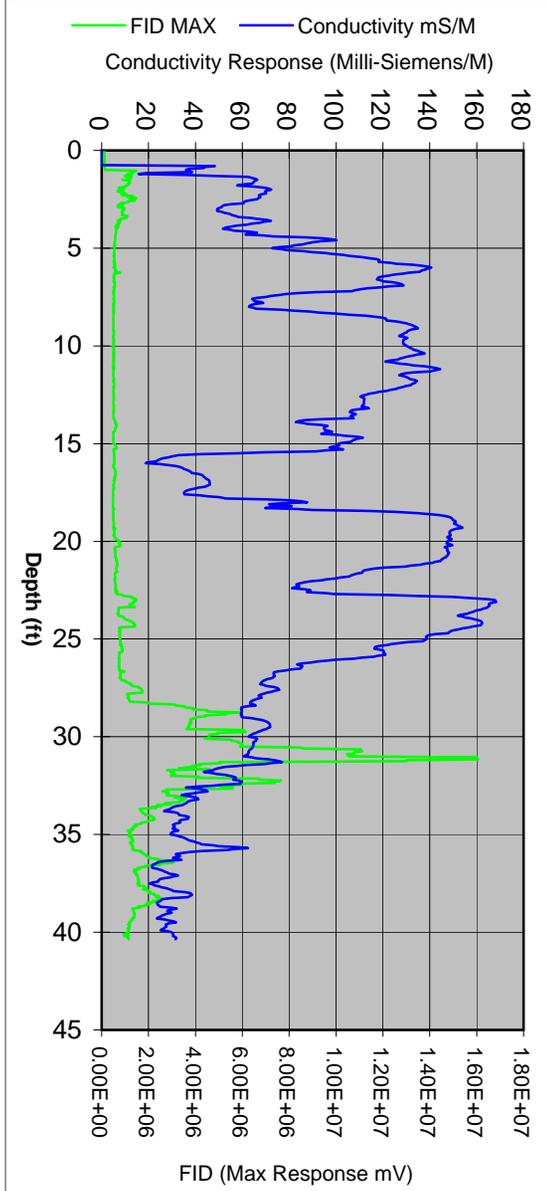
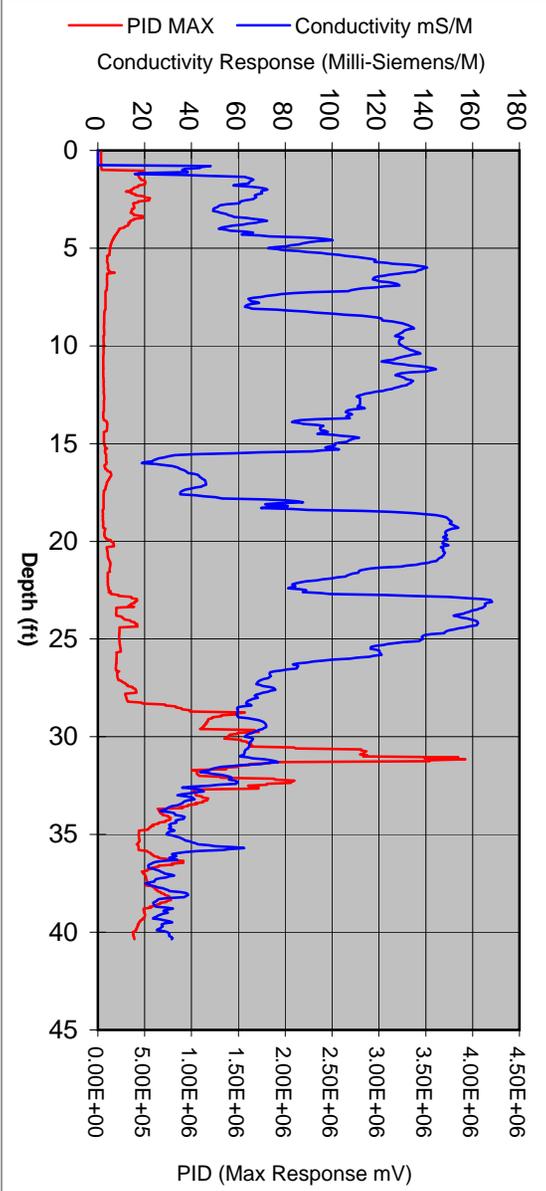
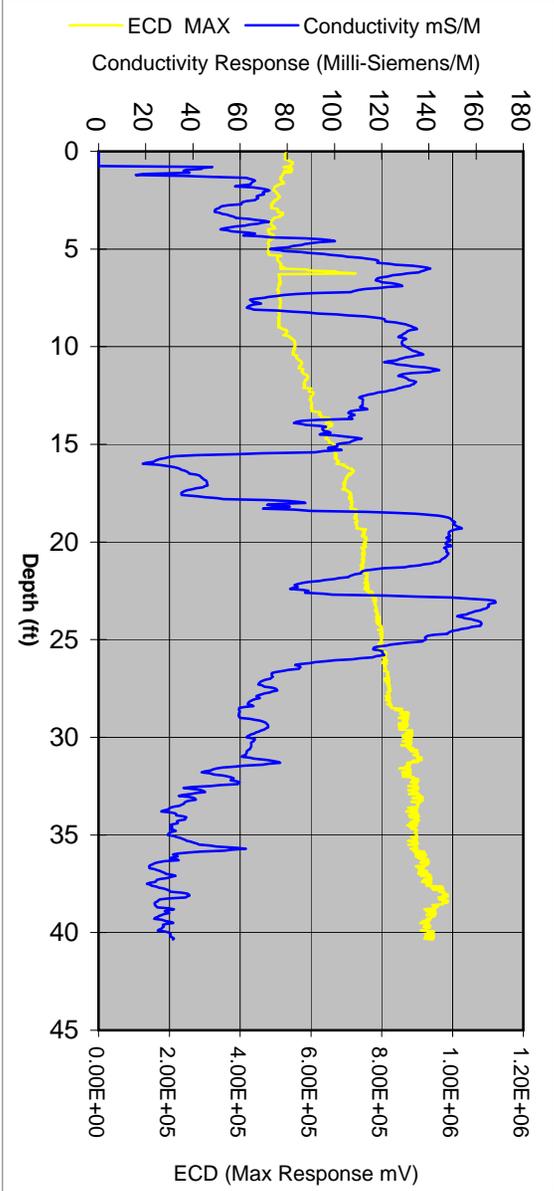
Total Depth (ft):

40.35

Notes: Hand auger to 5' bgs.

GW Depth (ft): █
 Depth of GW Provided by Client

Job Information		MIP Sampling Information	
Client Company:	SIERRA ENVIRONMENTAL	Trunkline Length:	150'
Project Name:	ABE Petroleum	Probe Type:	6520
Site Address:	17715 Mission Blvd - Hayward, CA	Rig Type:	Geoprobe 6600
		Start Boring Time:	Fri Aug 28 2009 09:25
		End Boring Time:	Fri Aug 28 2009 10:12
		MIP Specialist:	Jeff Paul





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Boring Name: B5

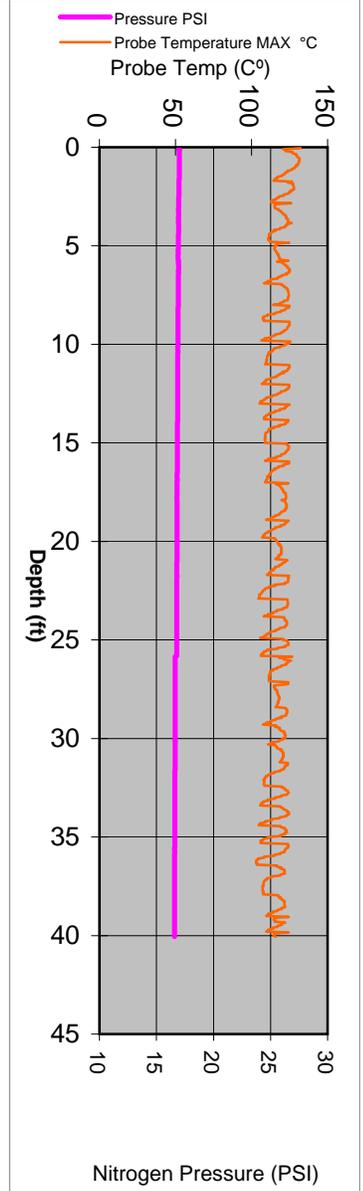
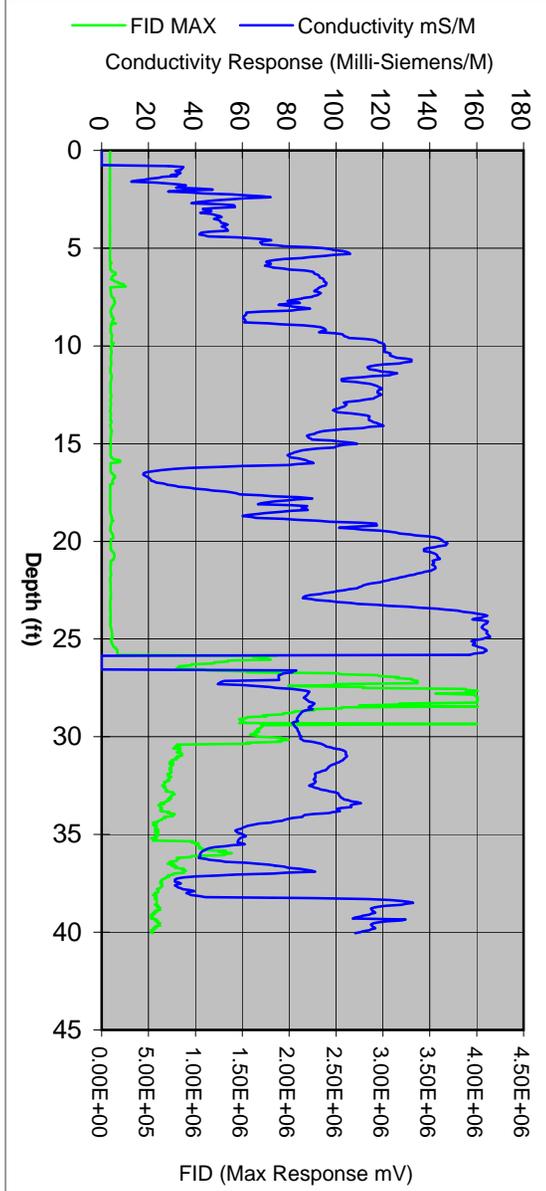
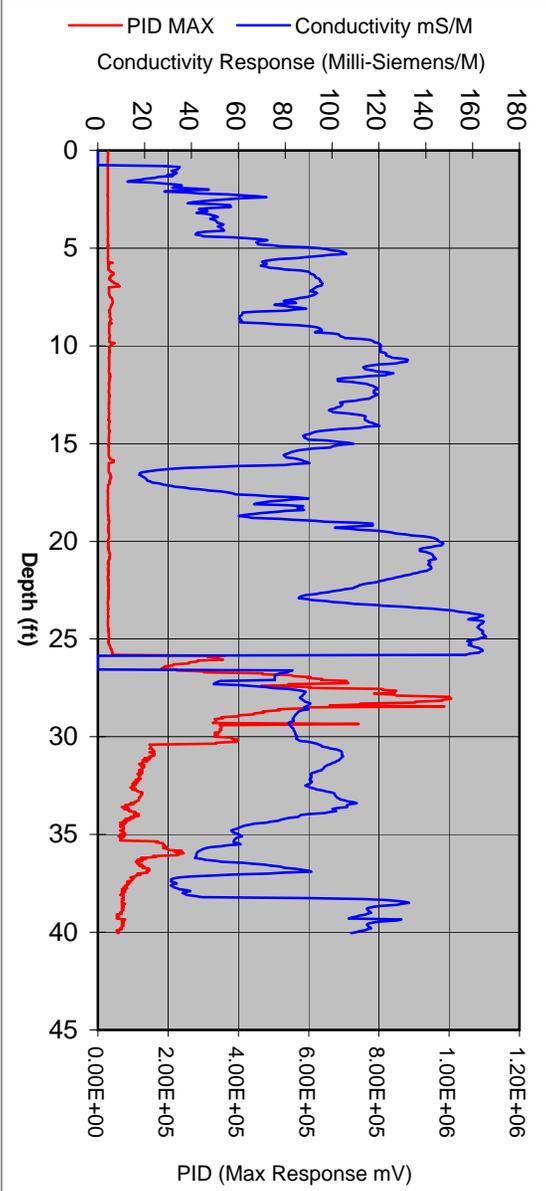
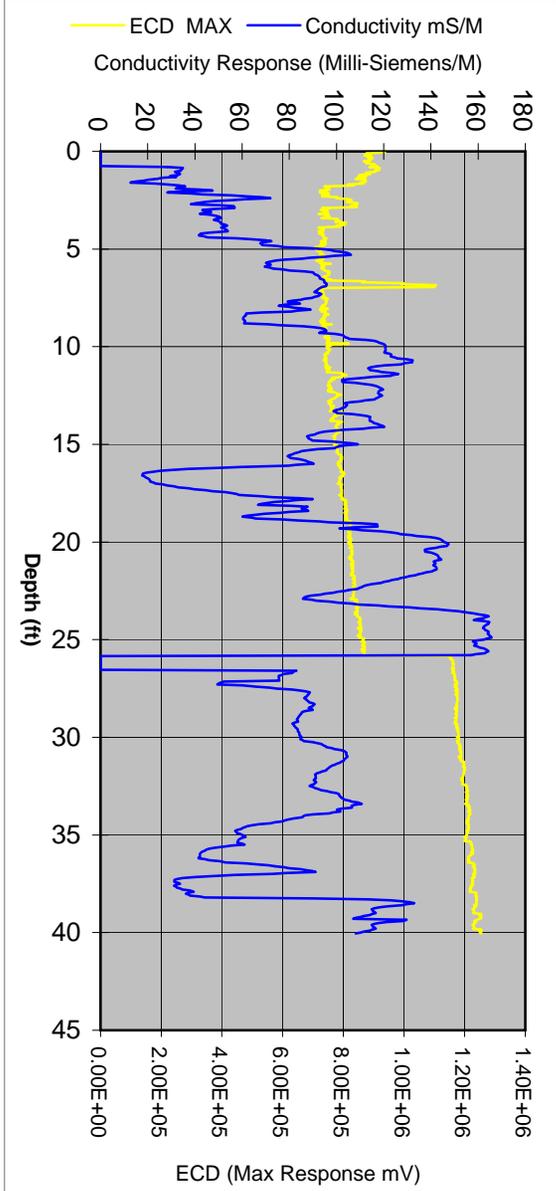
Total Depth (ft):

40.05

Notes: Hand auger to 5' bgs. FC5000 froze at 26.75' bgs. Started new log at 26.75' bgs. This log combines raw data files B5 and B5A.

GW Depth (ft): █
 Depth of GW Provided by Client

Job Information		MIP Sampling Information	
Client Company:	SIERRA ENVIRONMENTAL	Trunkline Length:	150'
Project Name:	ABE Petroleum	Probe Type:	6520
Site Address:	17715 Mission Blvd - Hayward, CA	Rig Type:	Geoprobe 6600
		Start Boring Time:	Fri Aug 28 2009 10:59
		End Boring Time:	Fri Aug 28 2009 12:02
		MIP Specialist:	Jeff Paul





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Boring Name: B9

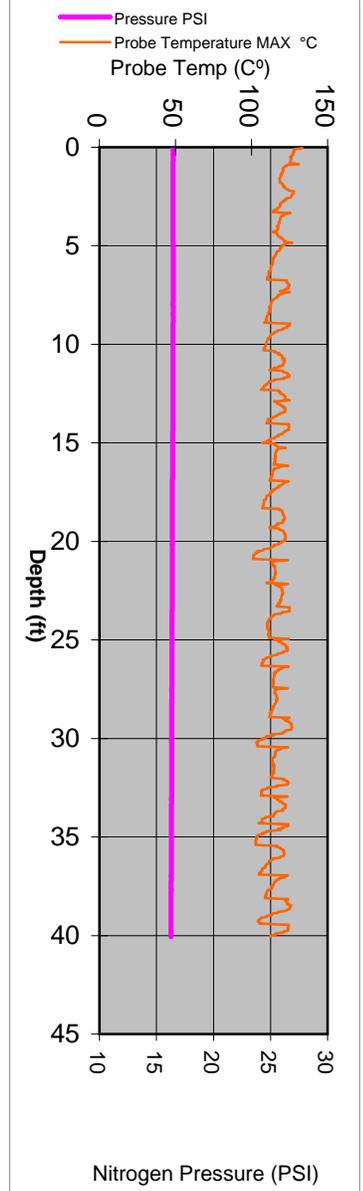
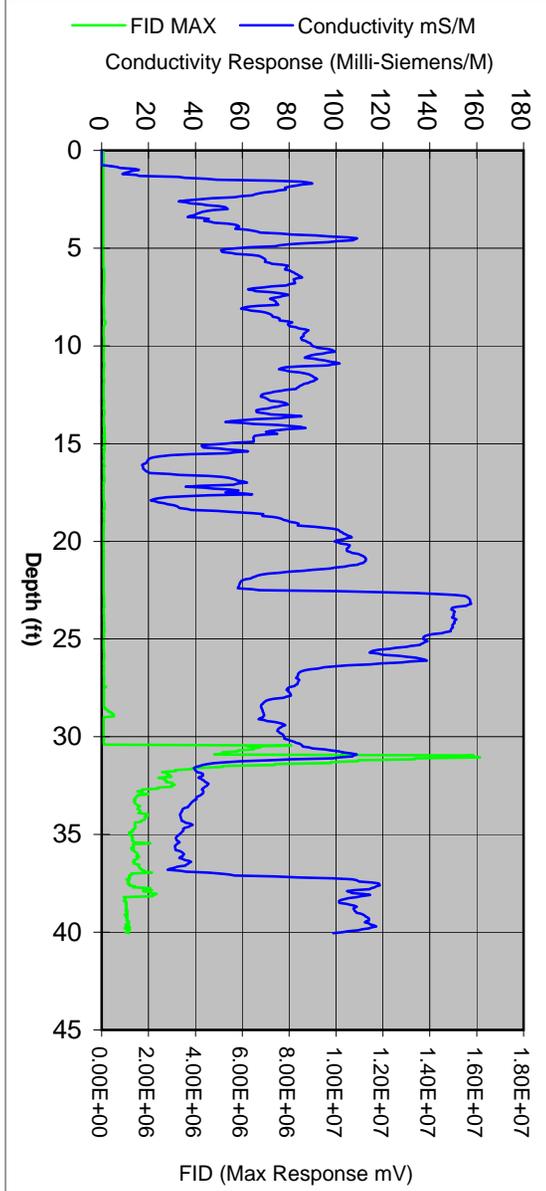
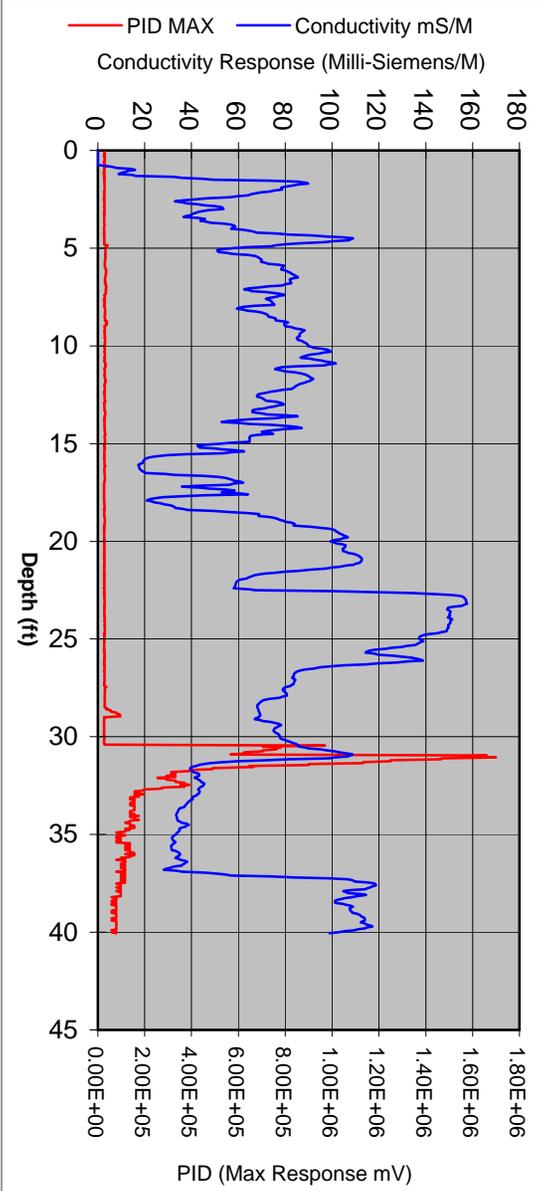
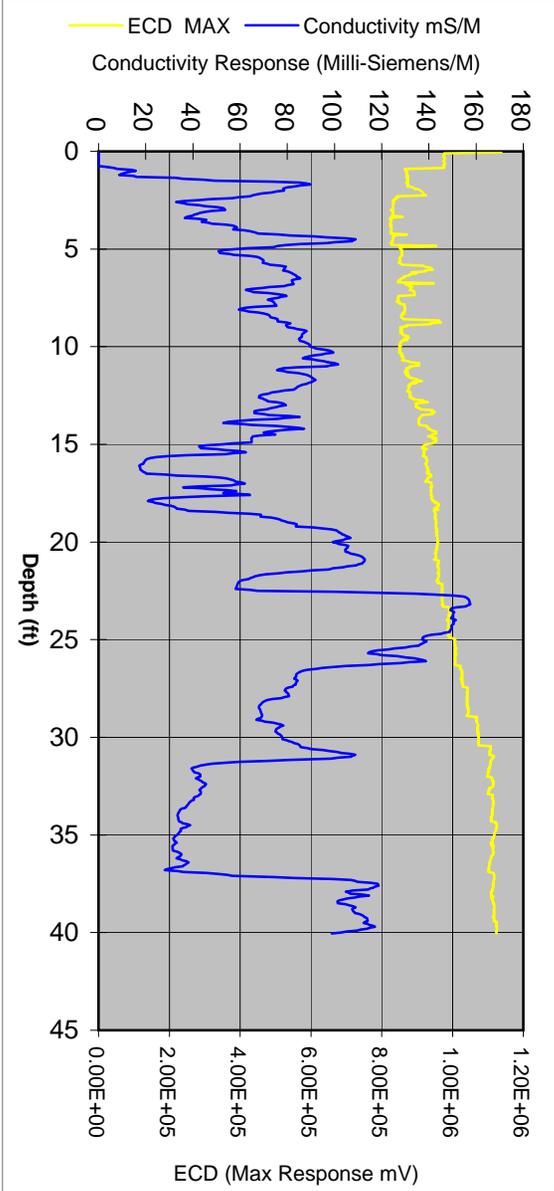
Total Depth (ft):

40.05

Notes: Hand auger to 5' bgs.

GW Depth (ft): █
 Depth of GW Provided by Client

Job Information		MIP Sampling Information	
Client Company:	SIERRA ENVIRONMENTAL	Trunkline Length:	150'
Project Name:	ABE Petroleum	Probe Type:	6520
Site Address:	17715 Mission Blvd - Hayward, CA	Rig Type:	Geoprobe 6600
		Start Boring Time:	Fri Aug 28 2009 13:16
		End Boring Time:	Fri Aug 28 2009 14:03
		MIP Specialist:	Jeff Paul





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Boring Name: B8

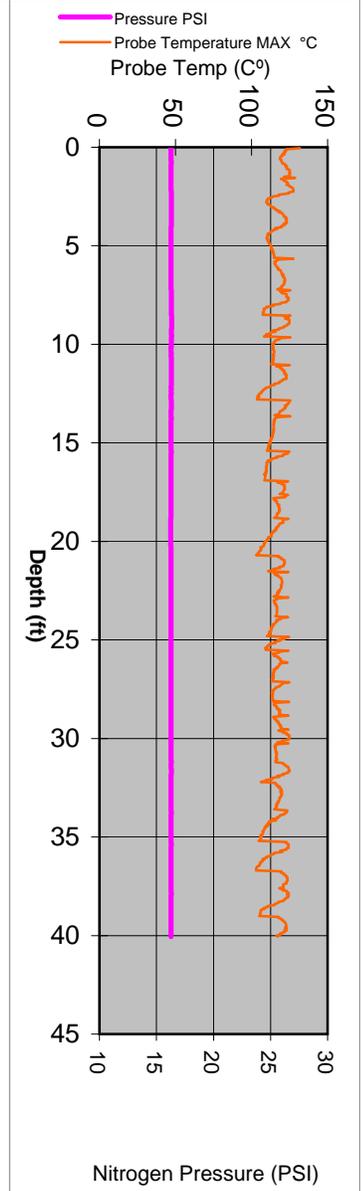
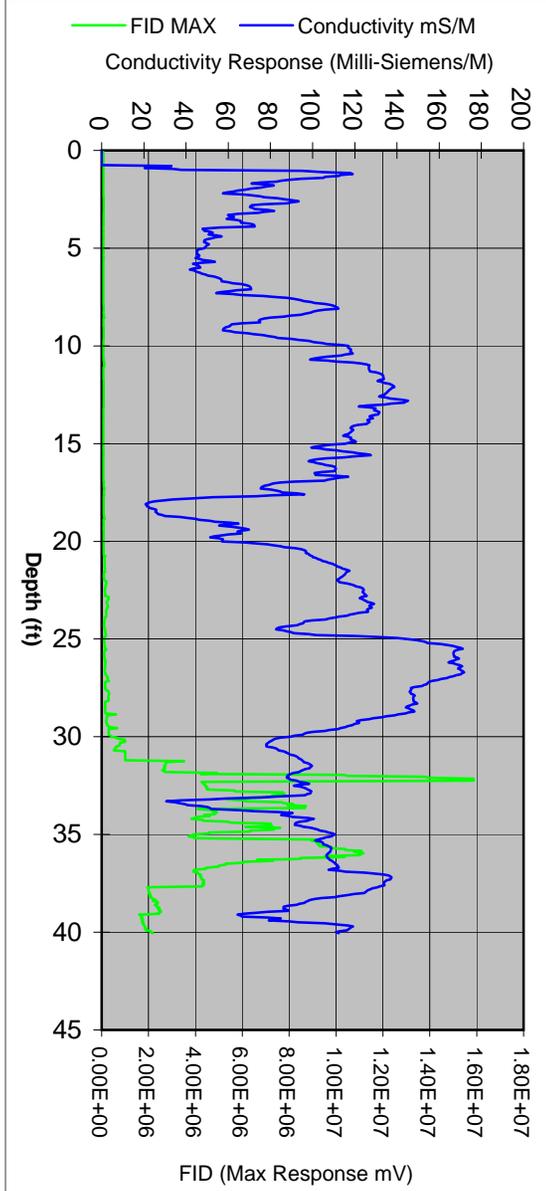
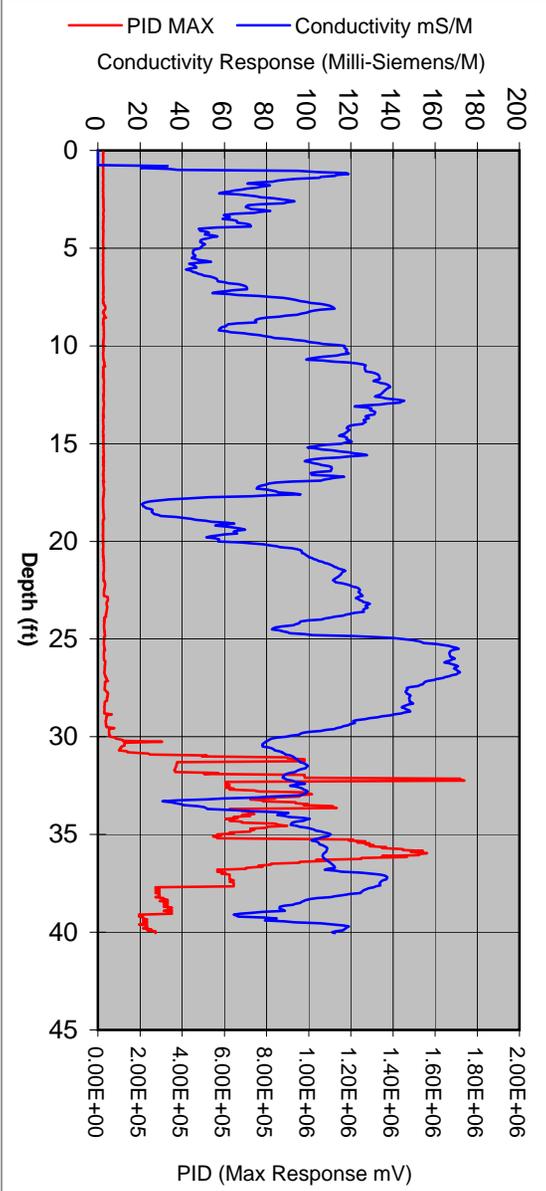
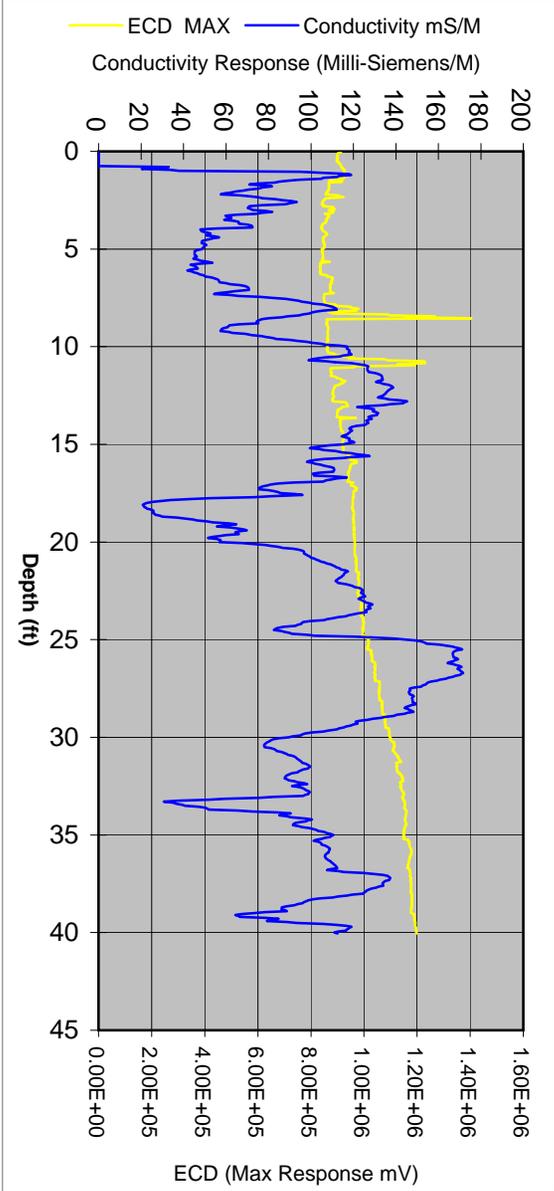
Total Depth (ft):

40.05

Notes: Hand auger to 5' bgs.

GW Depth (ft): █
 Depth of GW Provided by Client

Job Information		MIP Sampling Information	
Client Company:	SIERRA ENVIRONMENTAL	Trunkline Length:	150'
Project Name:	ABE Petroleum	Probe Type:	6520
Site Address:	17715 Mission Blvd - Hayward, CA	Rig Type:	Geoprobe 6600
		Start Boring Time:	Fri Aug 28 2009 14:54
		End Boring Time:	Fri Aug 28 2009 15:51
		MIP Specialist:	Jeff Paul





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Boring Name: B7

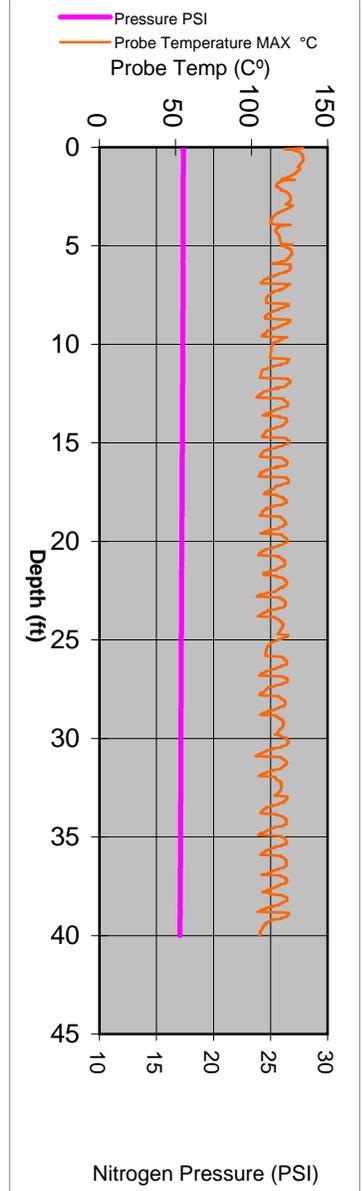
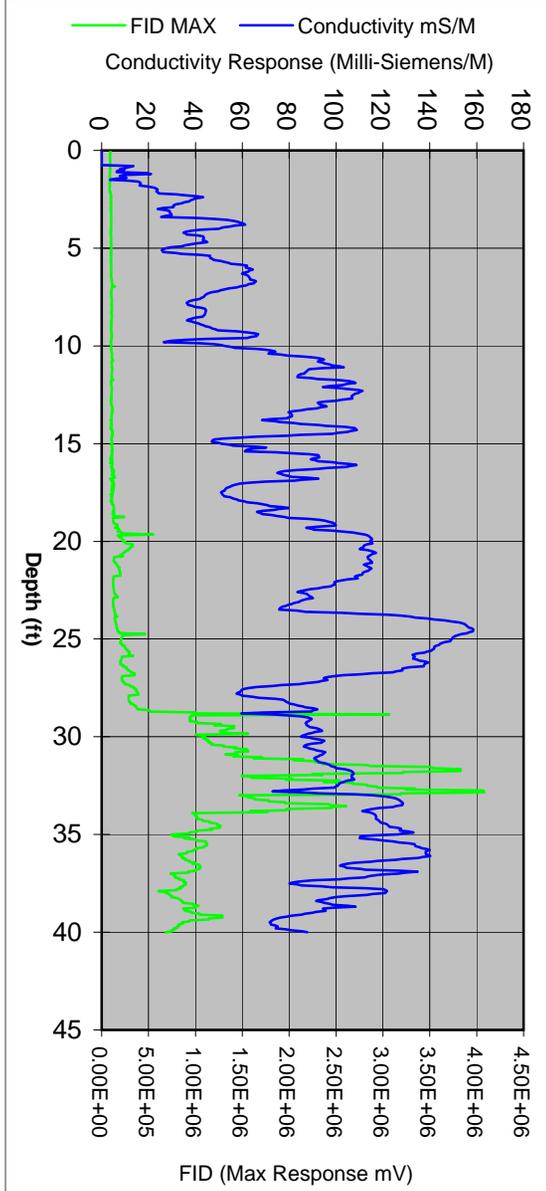
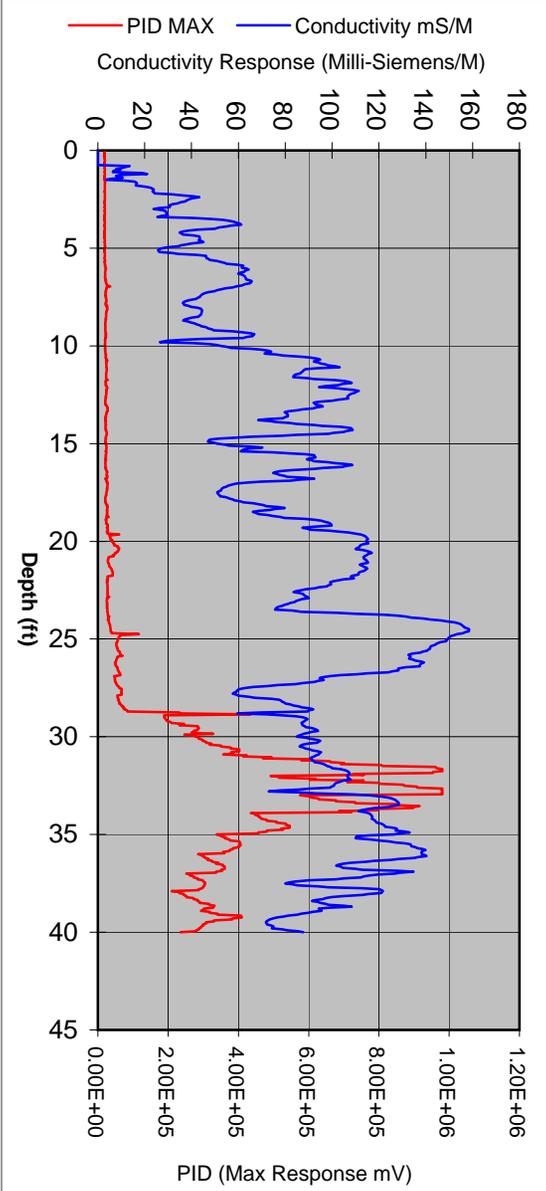
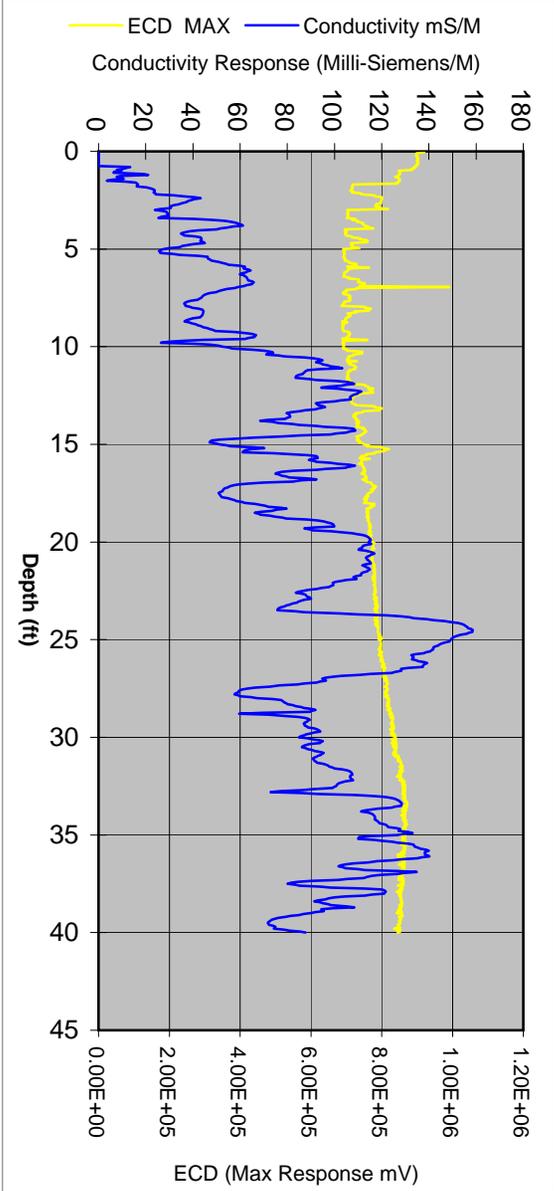
Total Depth (ft):

40

Notes: Hand auger to 5' bgs.

GW Depth (ft): █
 Depth of GW Provided by Client

Job Information		MIP Sampling Information	
Client Company:	SIERRA ENVIRONMENTAL	Trunkline Length:	150'
Project Name:	ABE Petroleum	Probe Type:	6520
Site Address:	17715 Mission Blvd - Hayward, CA	Rig Type:	Geoprobe 6600
		Start Boring Time:	Mon Aug 31 2009 09:06
		End Boring Time:	Mon Aug 31 2009 09:49
		MIP Specialist:	Jeff Paul





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Boring Name: B6

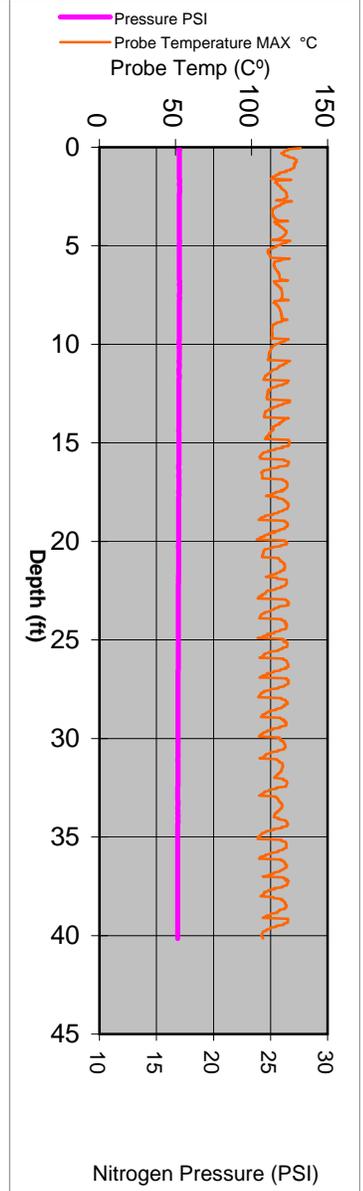
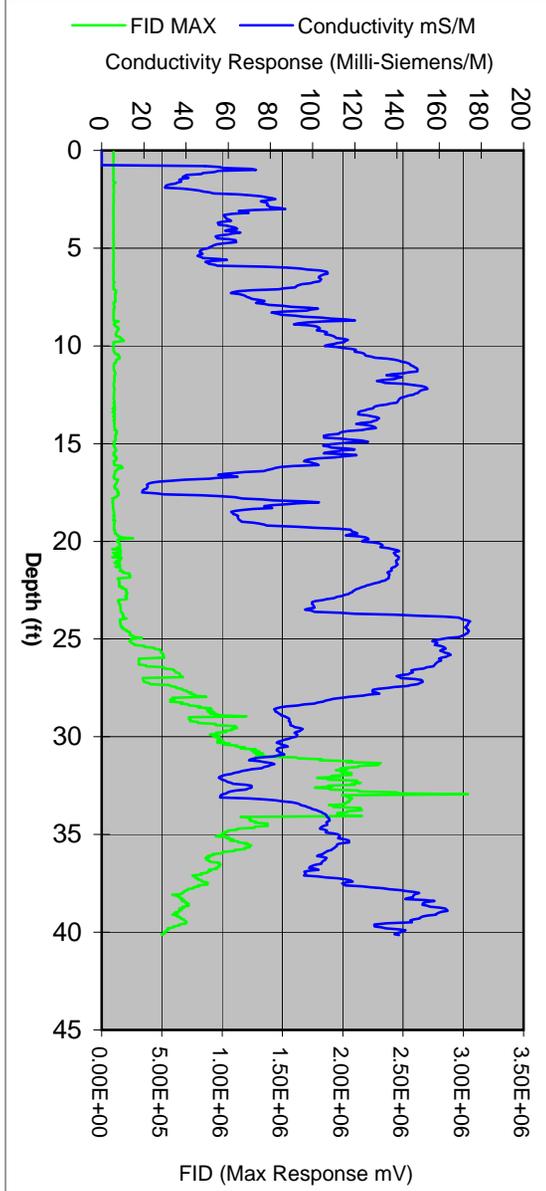
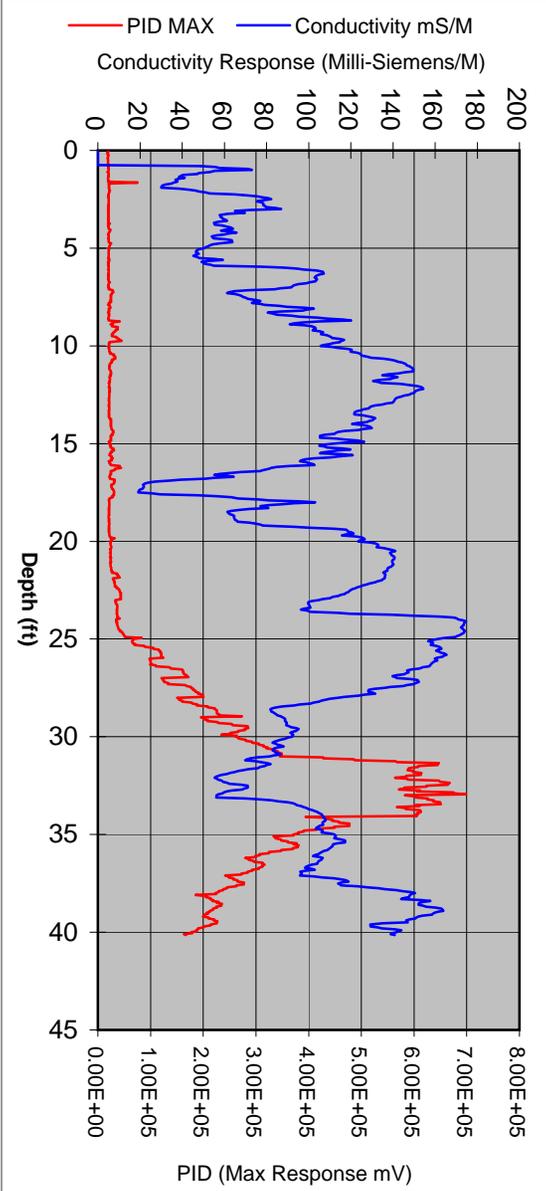
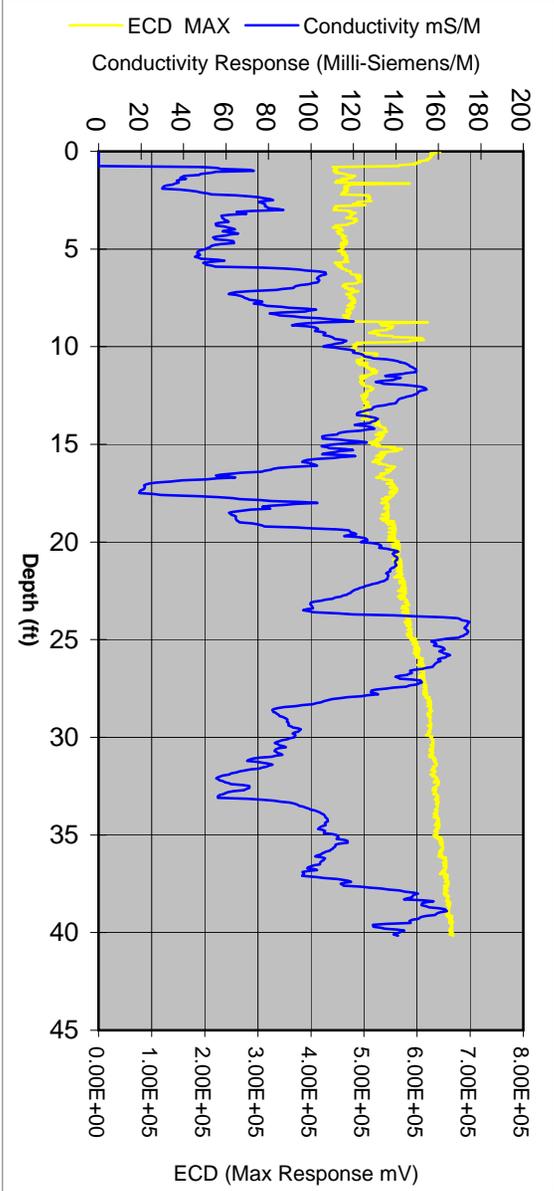
Total Depth (ft):

40.15

Notes: Hand auger to 5' bgs.

GW Depth (ft): █
 Depth of GW Provided by Client

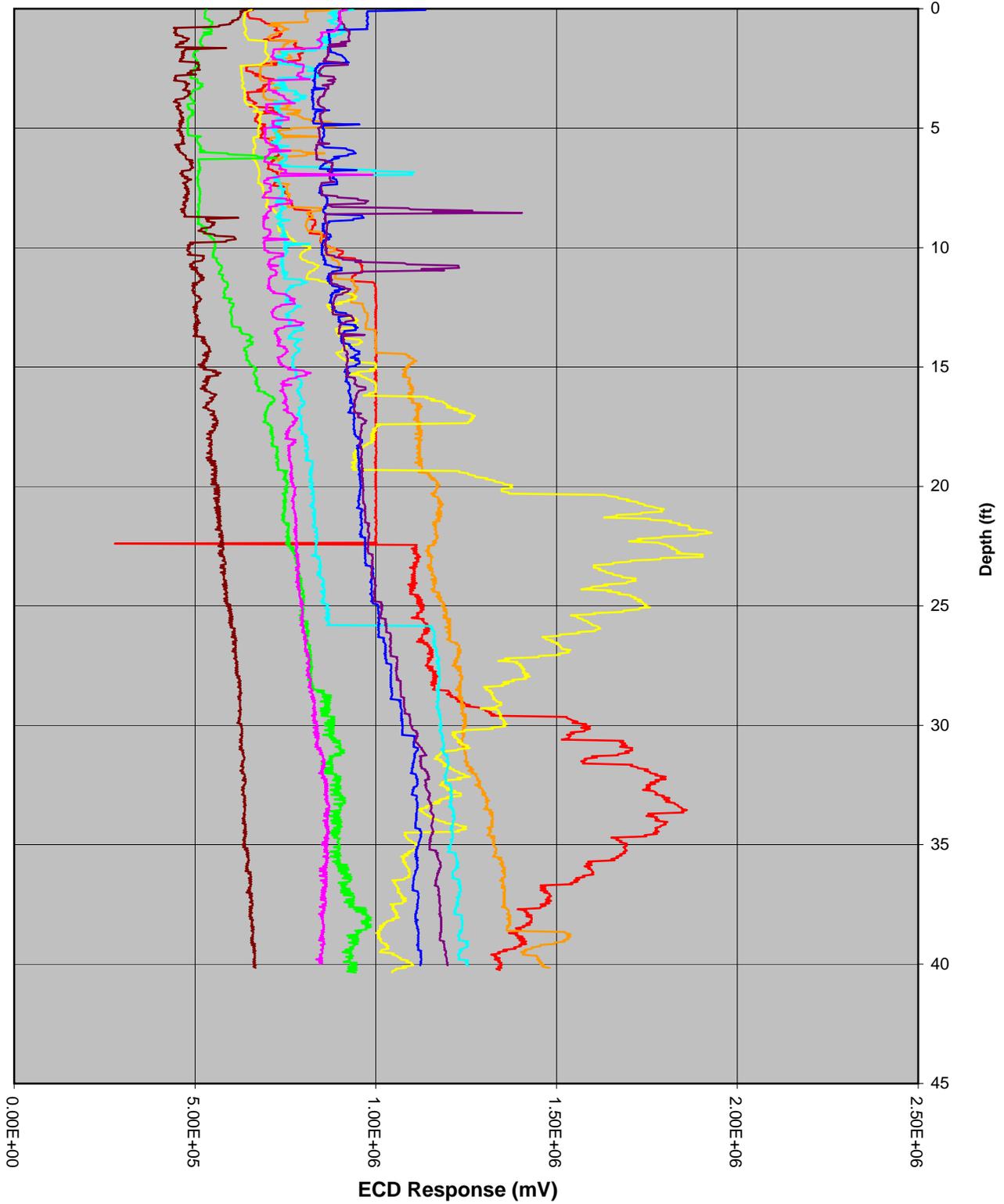
Job Information		MIP Sampling Information	
Client Company:	SIERRA ENVIRONMENTAL	Trunkline Length:	150'
Project Name:	ABE Petroleum	Probe Type:	6520
Site Address:	17715 Mission Blvd - Hayward, CA	Rig Type:	Geoprobe 6600
		Start Boring Time:	Mon Aug 31 2009 11:06
		End Boring Time:	Mon Aug 31 2009 11:48
		MIP Specialist:	Jeff Paul





ECD Consolidation

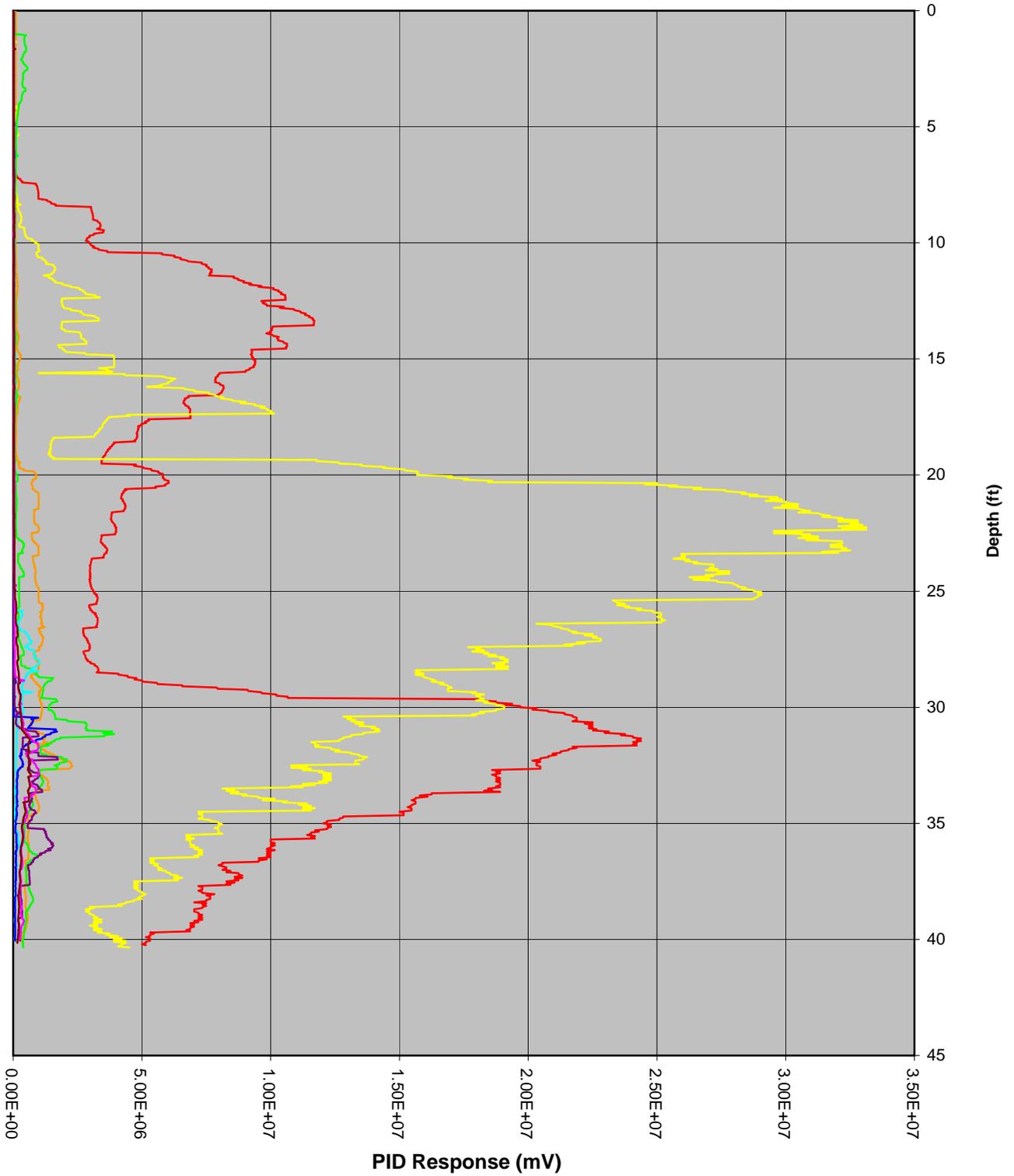
B4 B1 B2 B3 B5 B9 B8 B7 B6





PID Consolidation

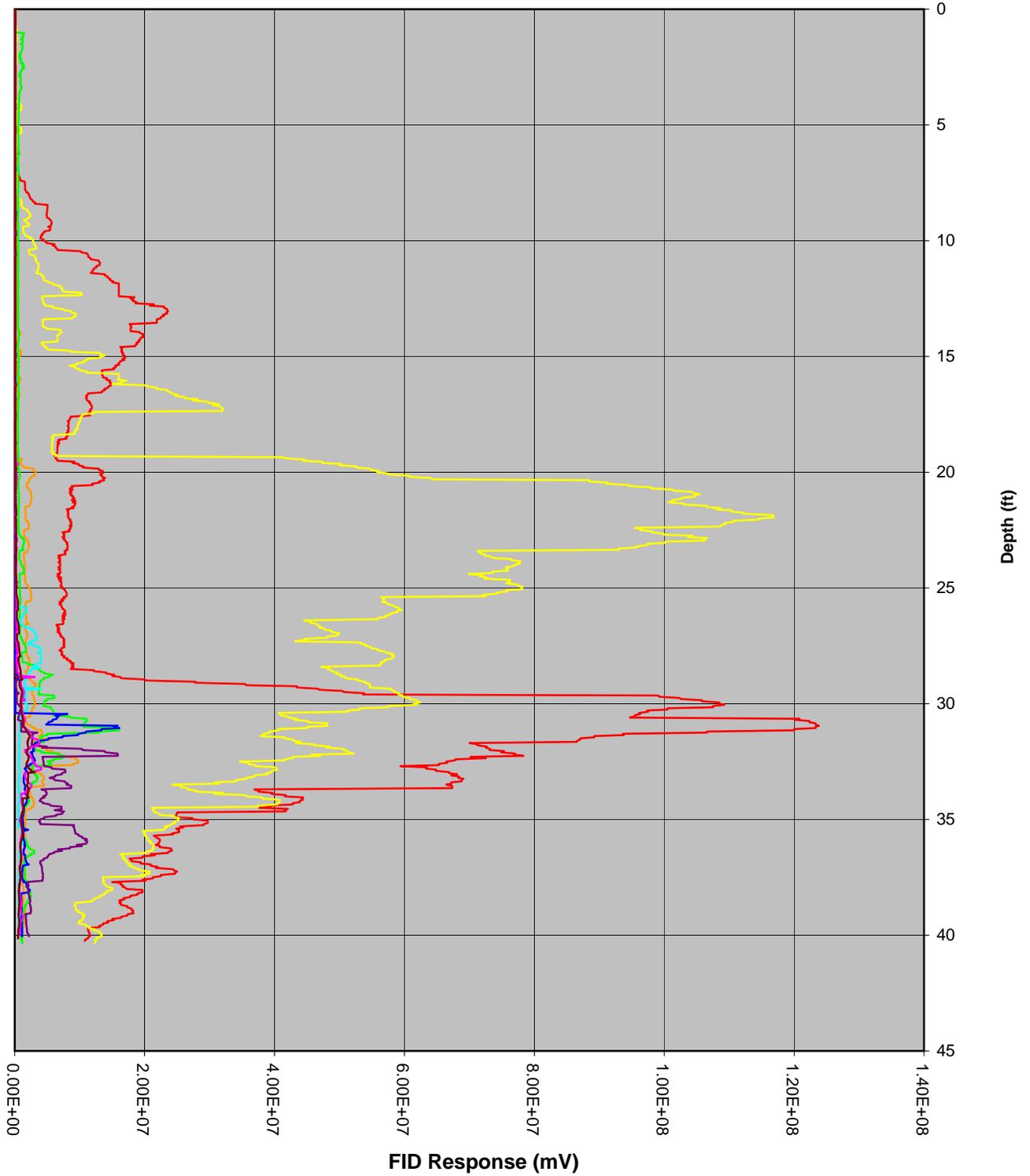
— B4 — B1 — B2 — B3 — B5 — B9 — B8 — B7 — B6





FID Consolidation

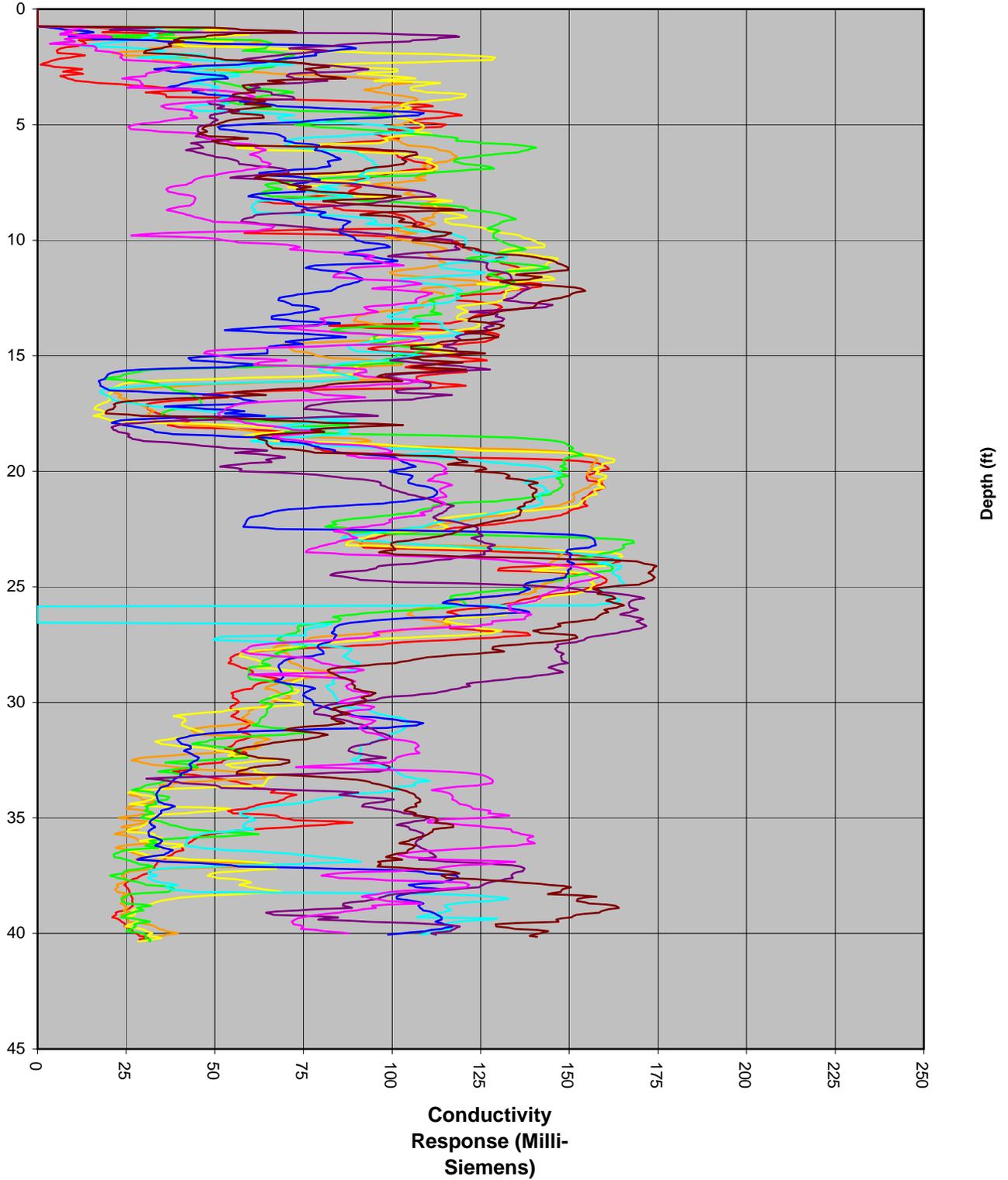
— B4 — B1 — B2 — B3 — B5 — B9 — B8 — B7 — B6



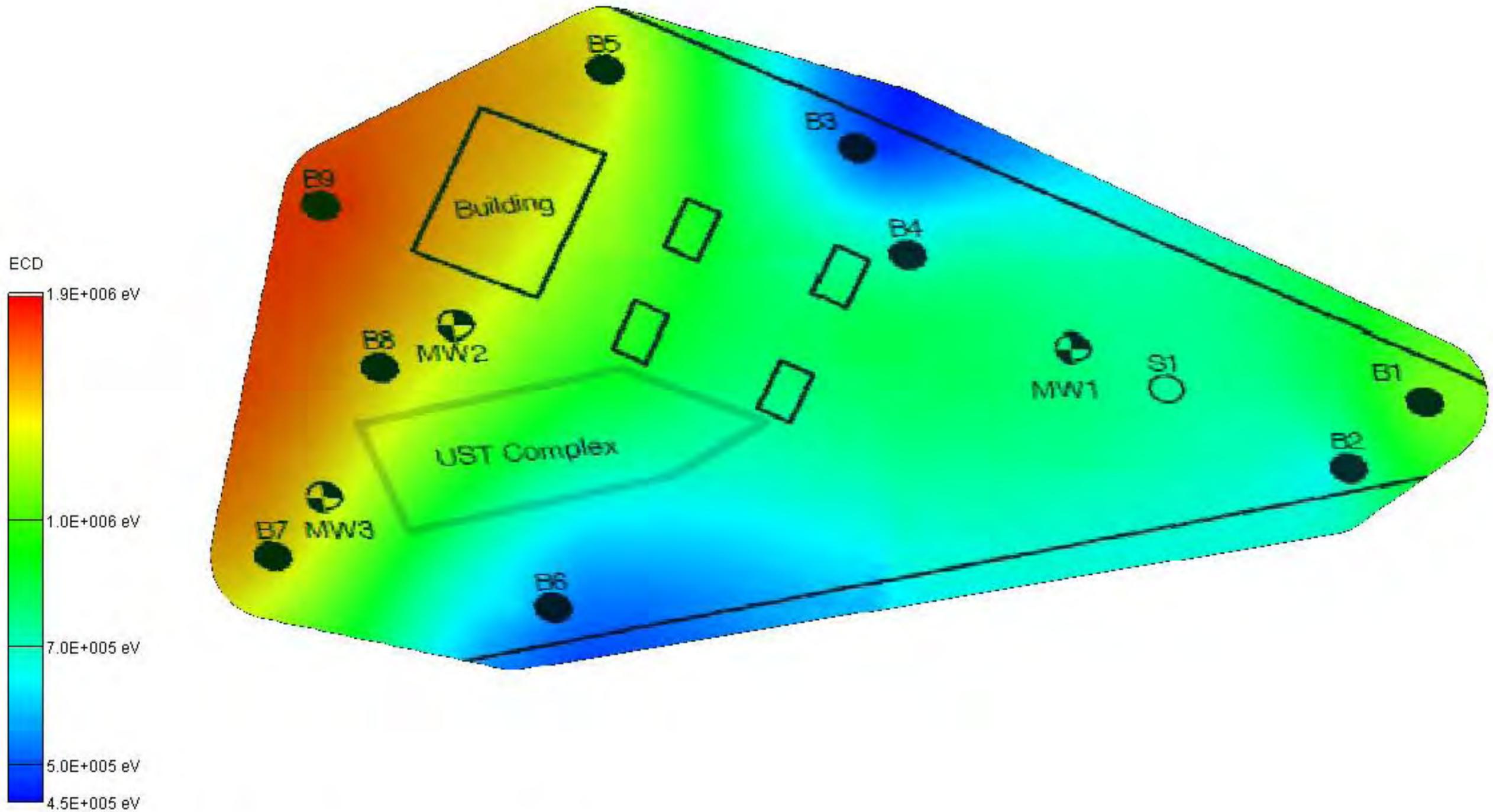


Conductivity Consolidation

— B4 — B1 — B2 — B3 — B5 — B9 — B8 — B7 — B6

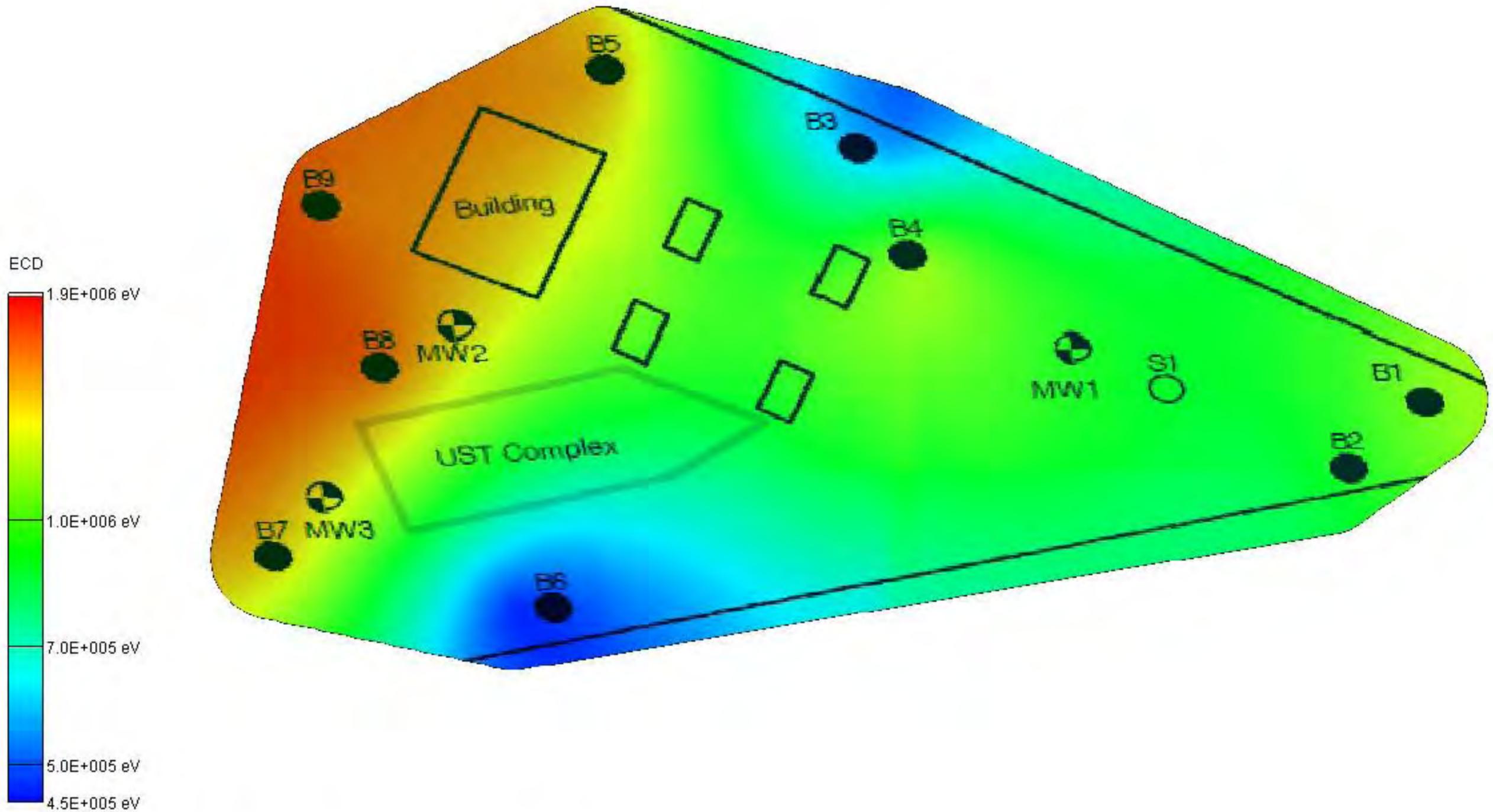


ECD
Depth 0 ft (MSL)



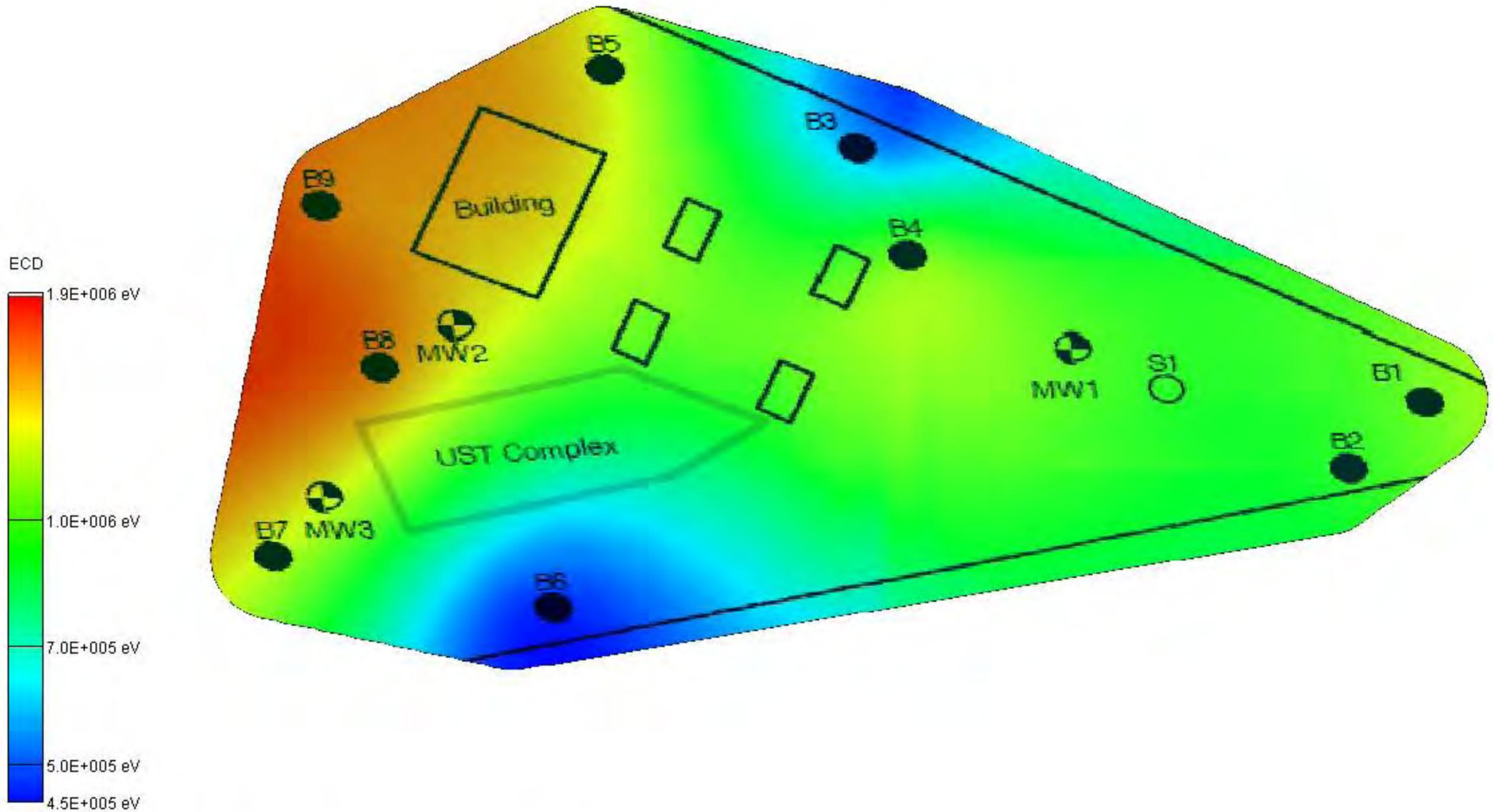
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -1 ft (MSL)



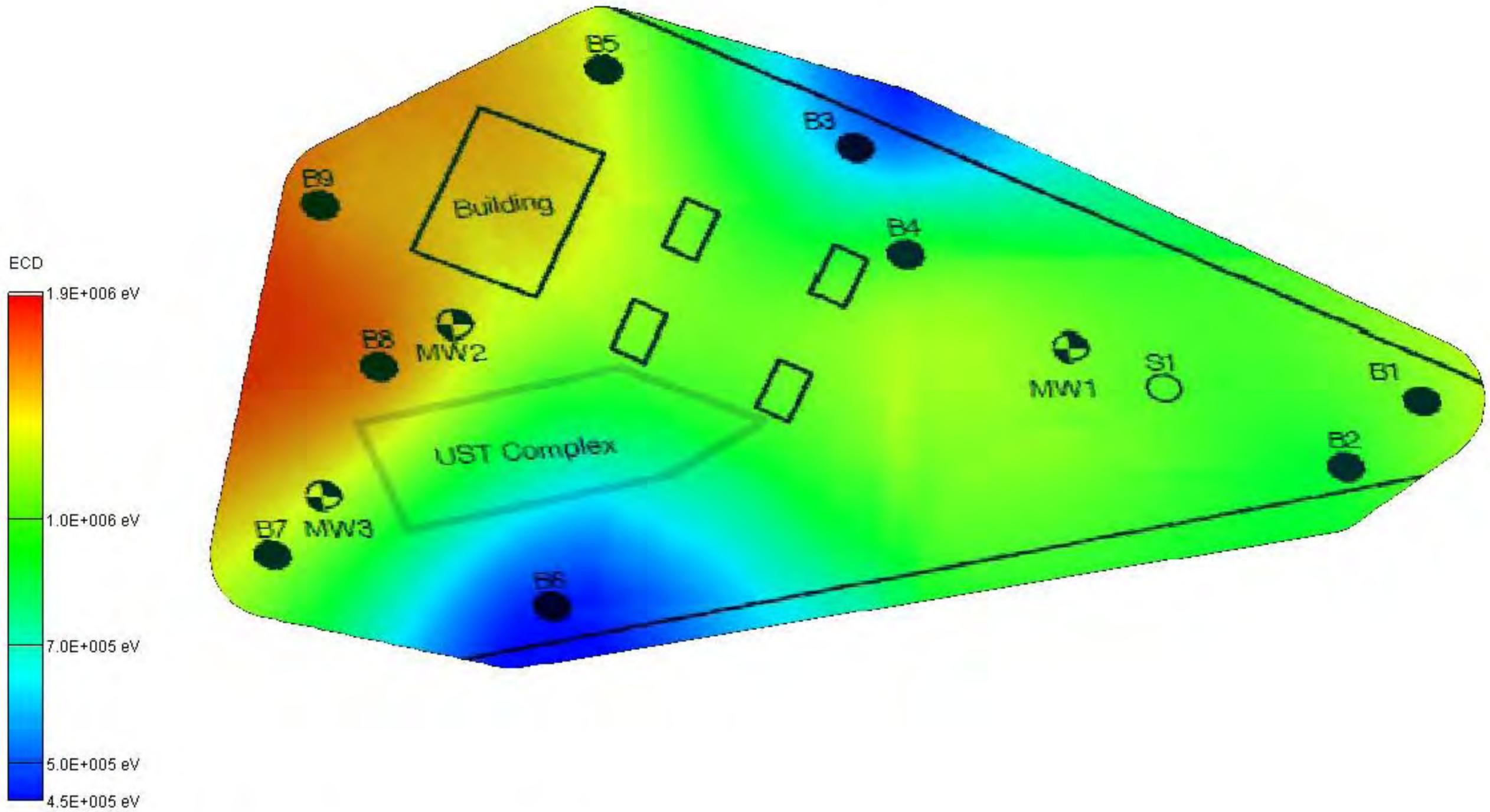
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -2 ft (MSL)



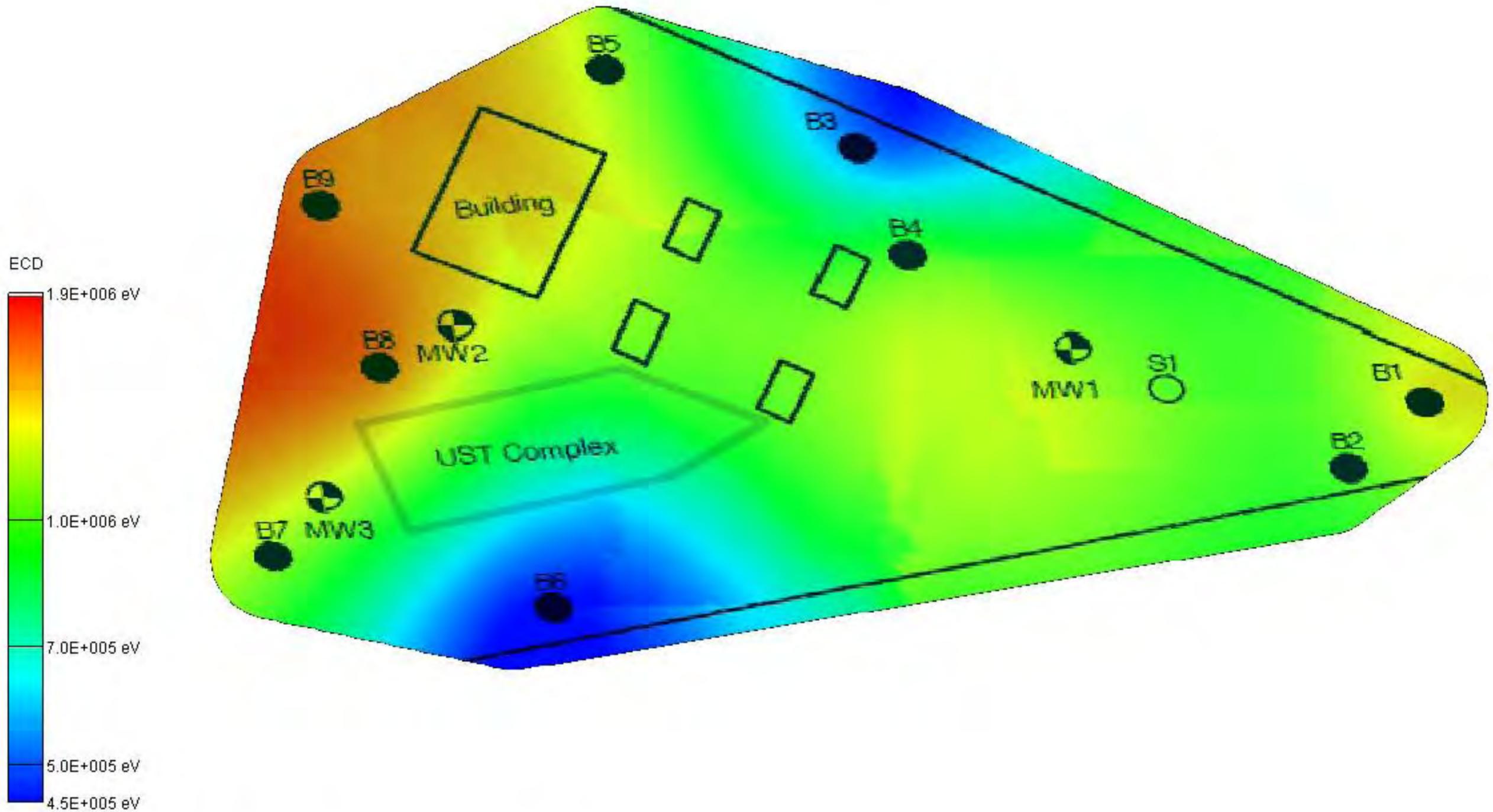
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -3 ft (MSL)



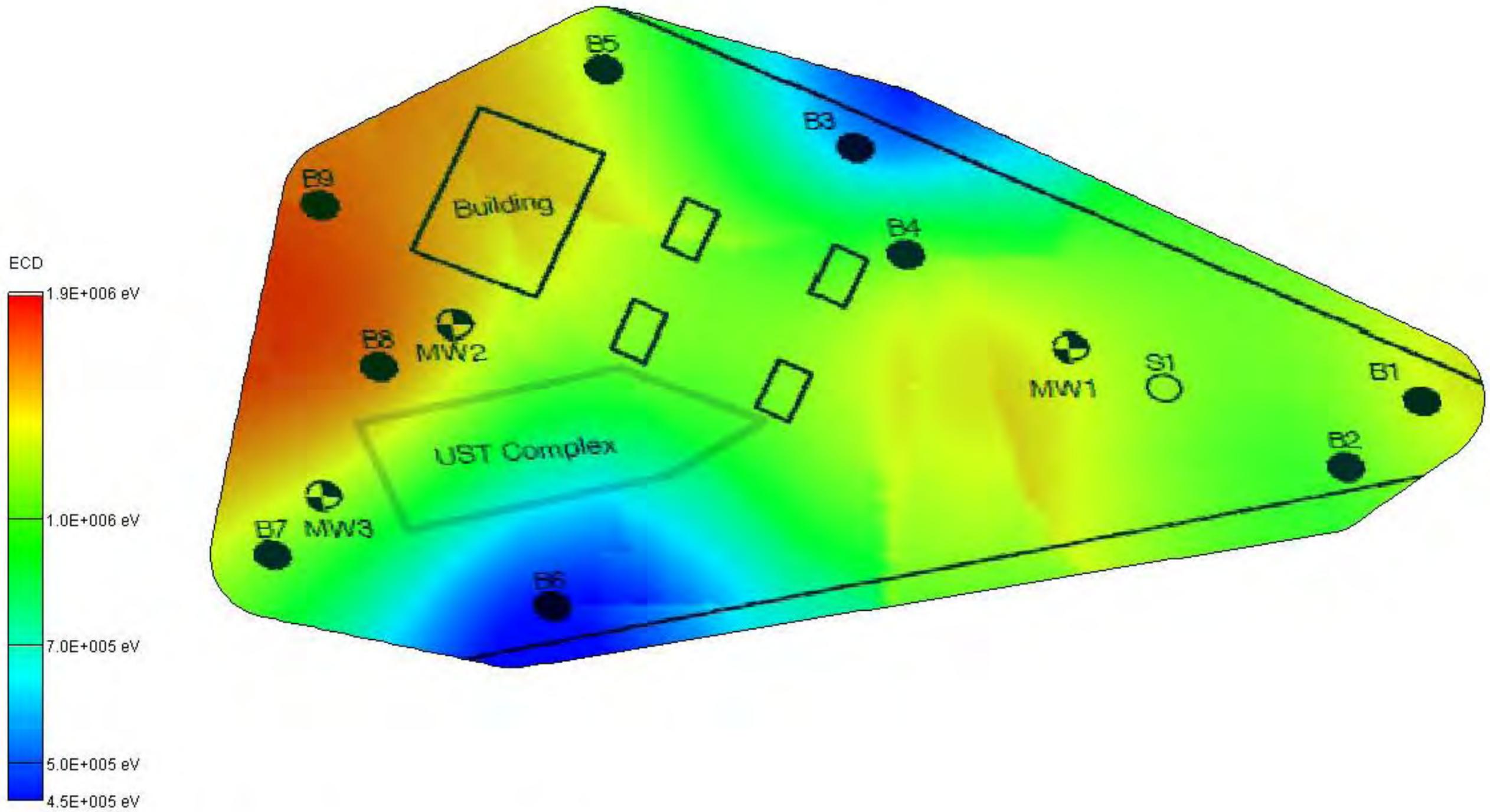
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -4 ft (MSL)



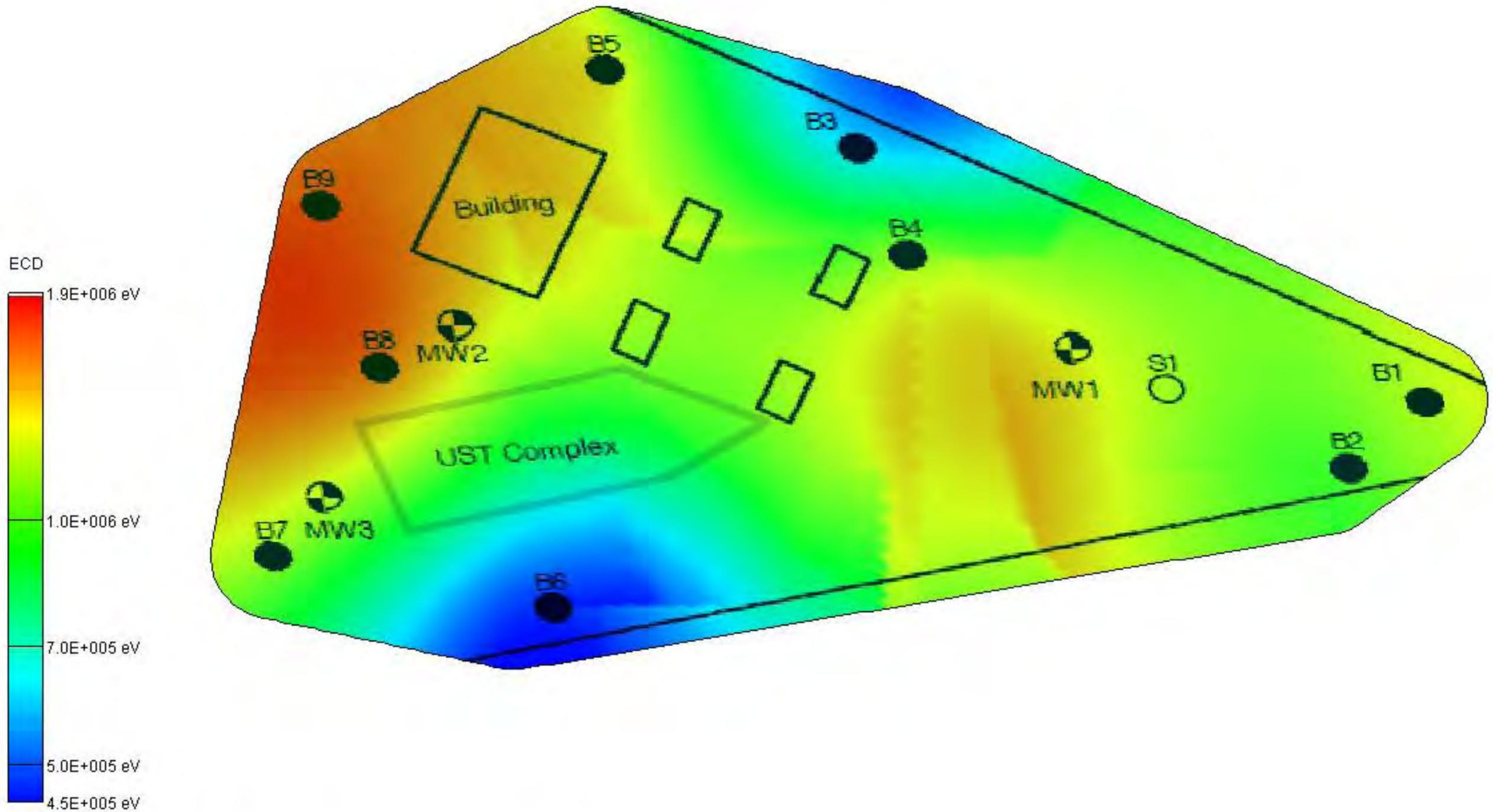
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -5 ft (MSL)



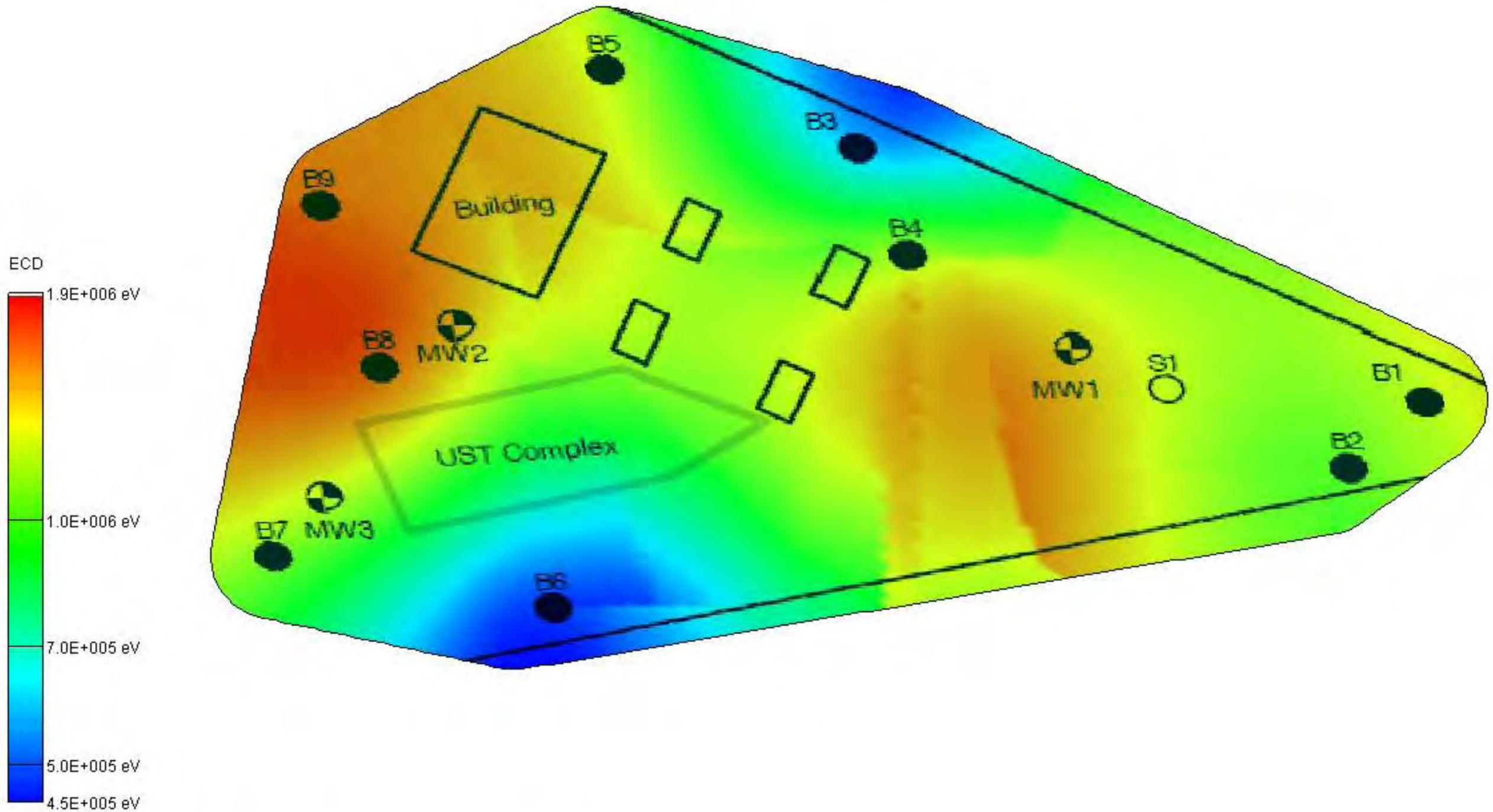
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -6 ft (MSL)



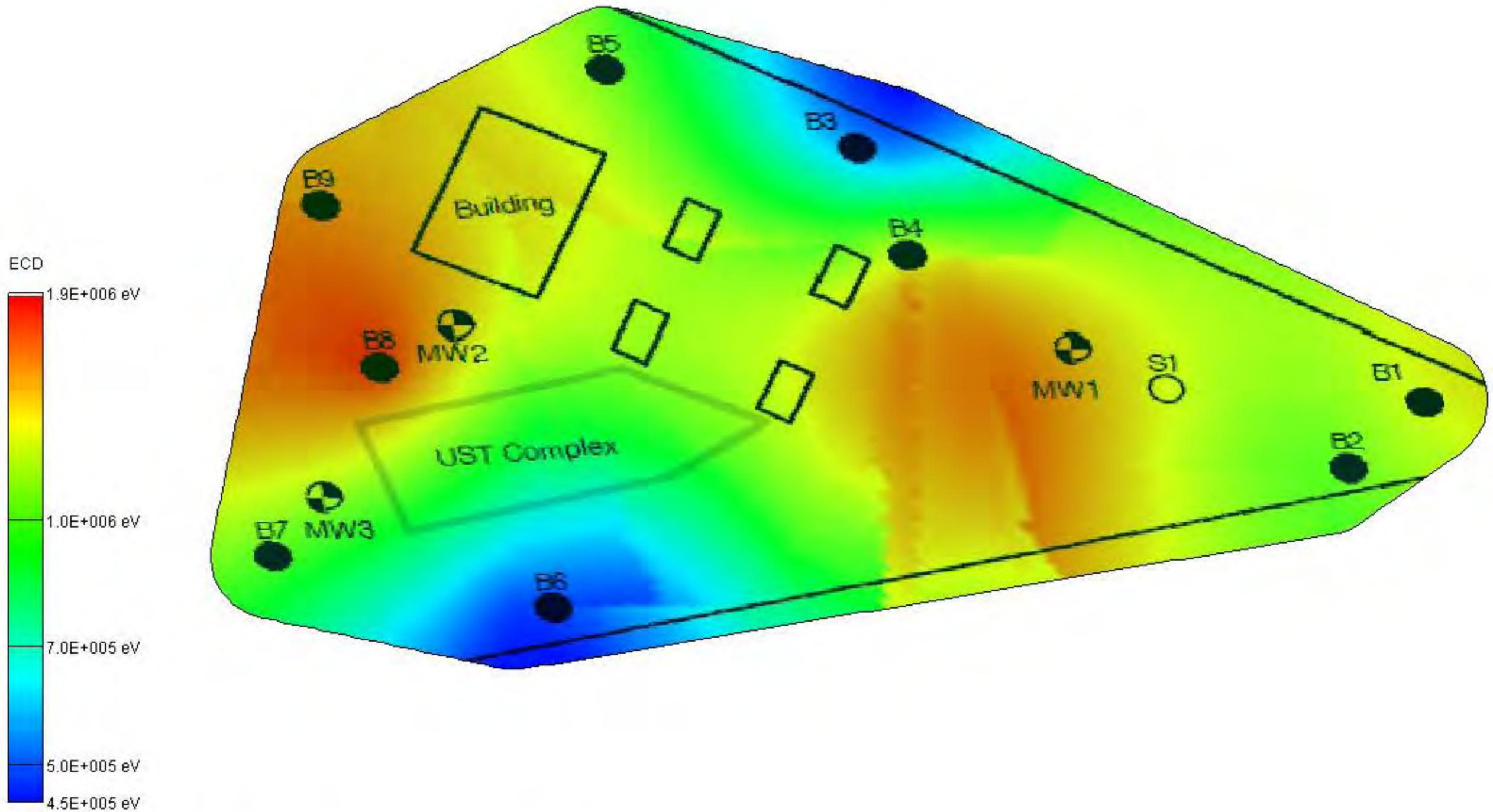
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -7 ft (MSL)



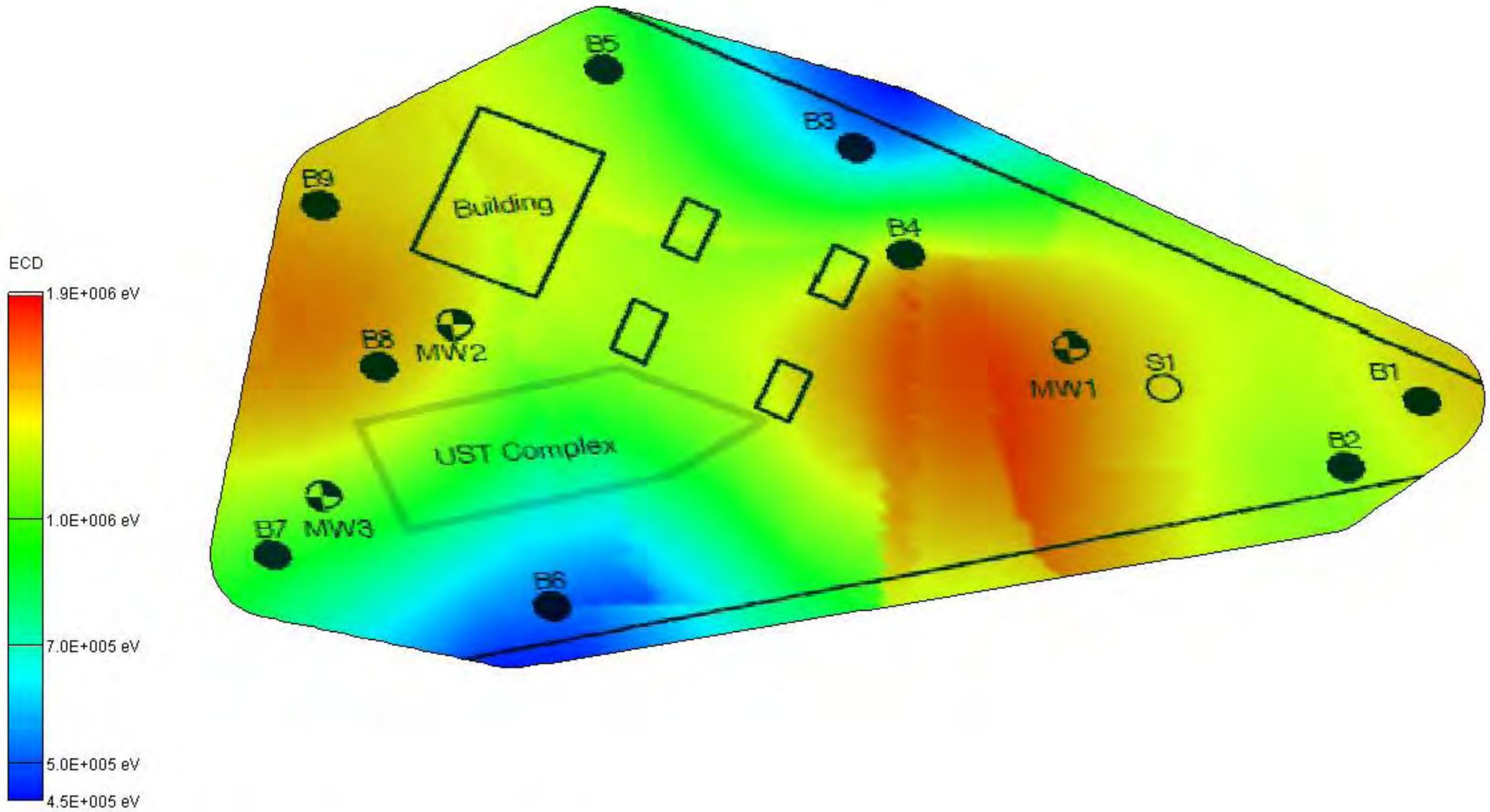
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -8 ft (MSL)



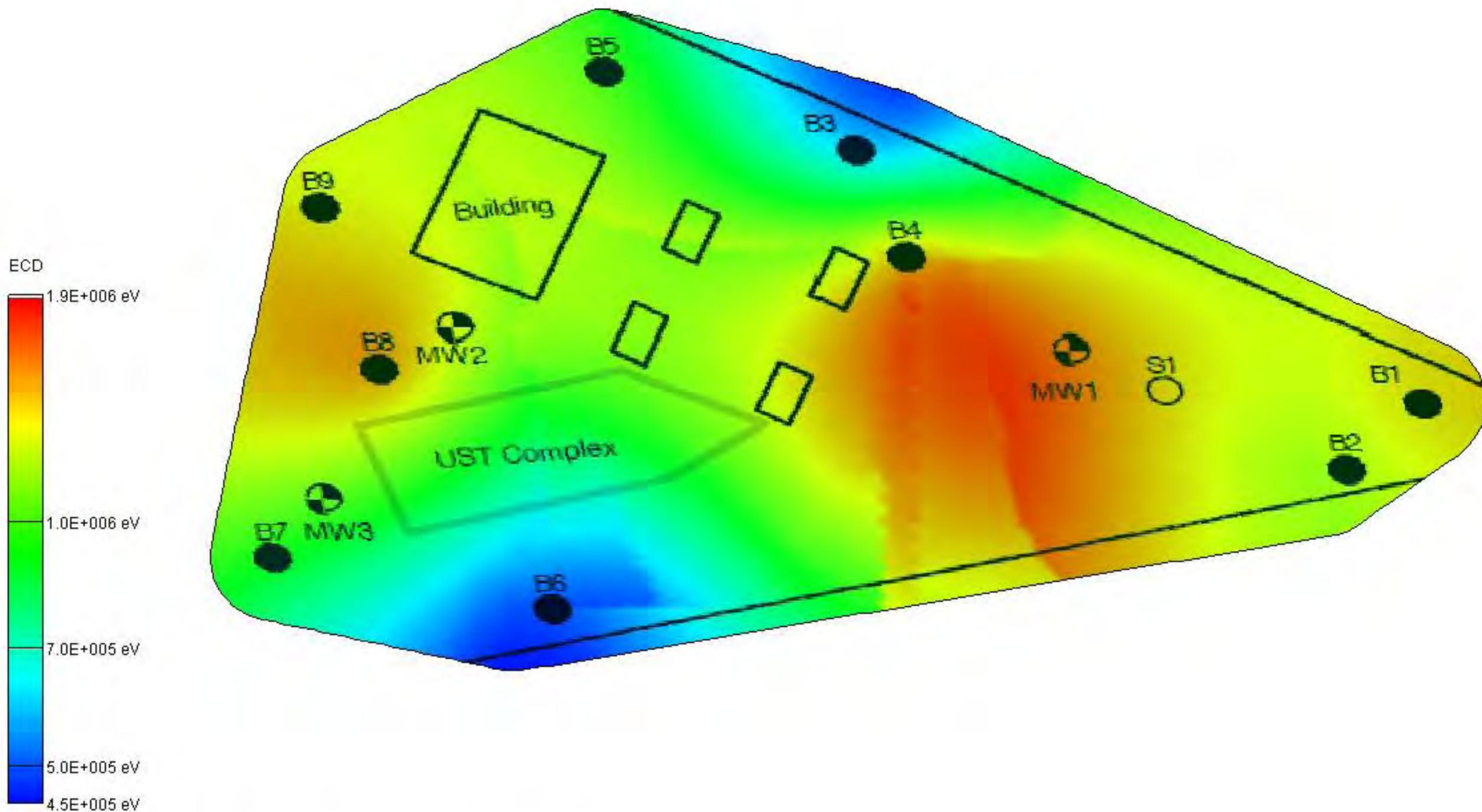
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -9 ft (MSL)



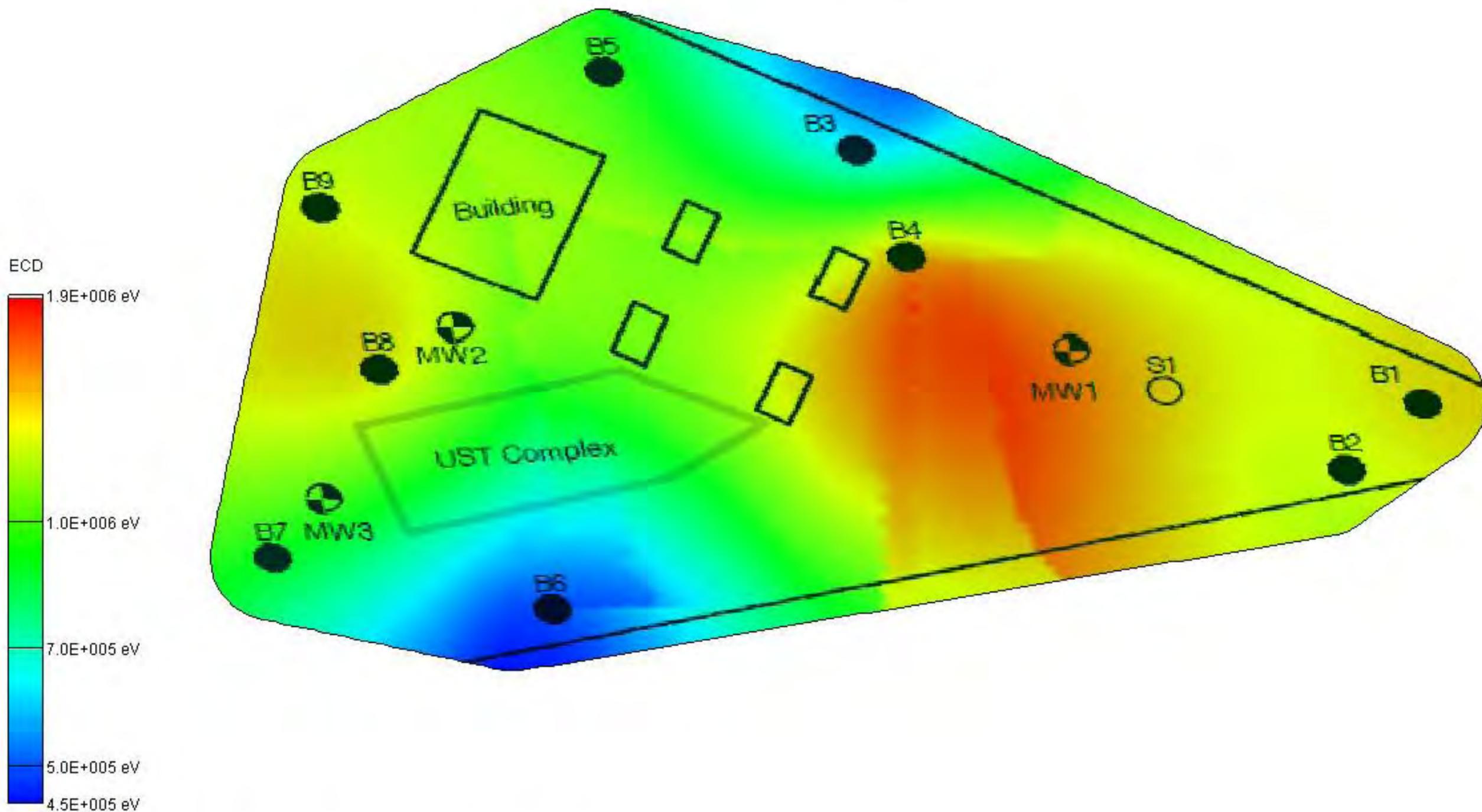
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -10 ft (MSL)



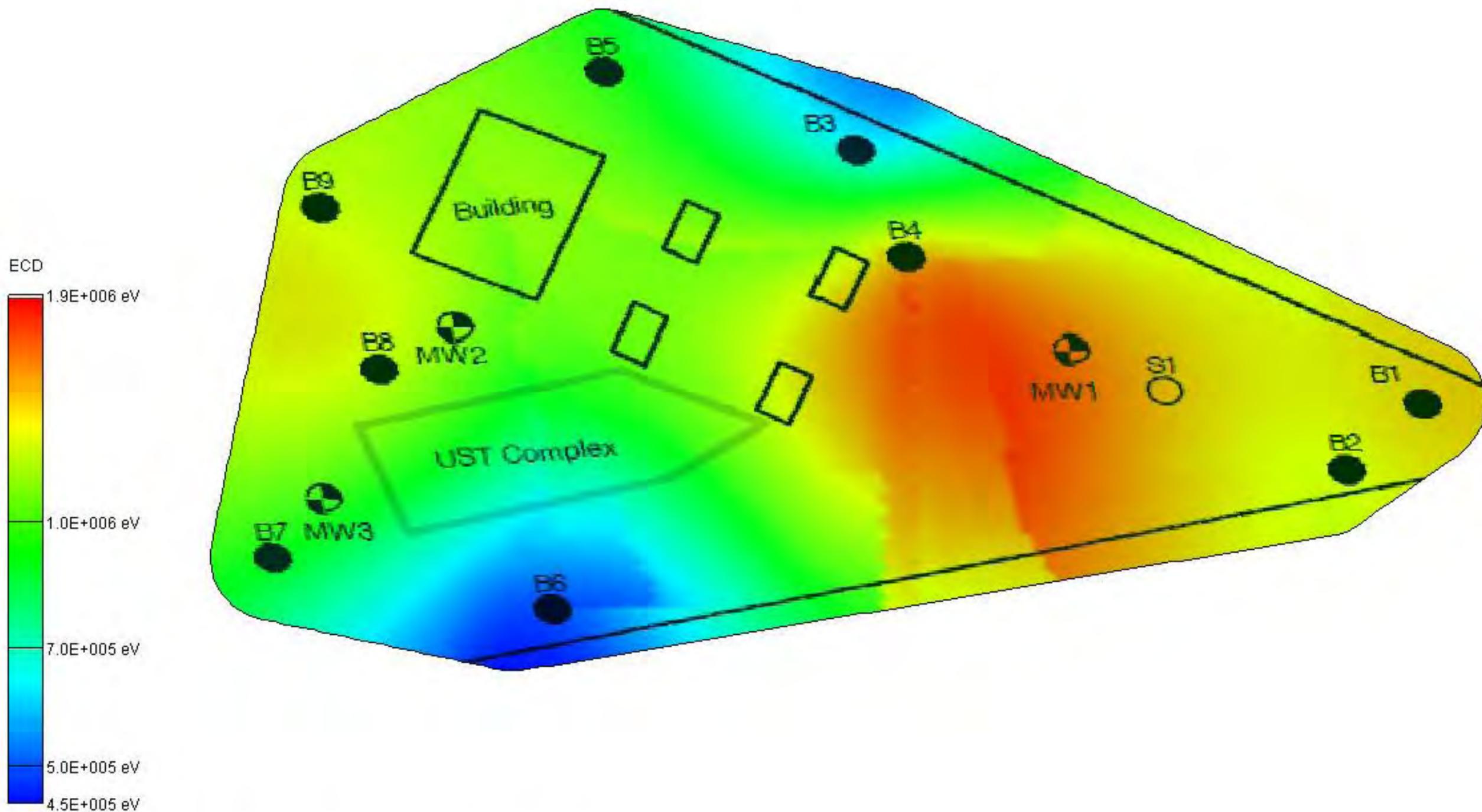
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -11 ft (MSL)



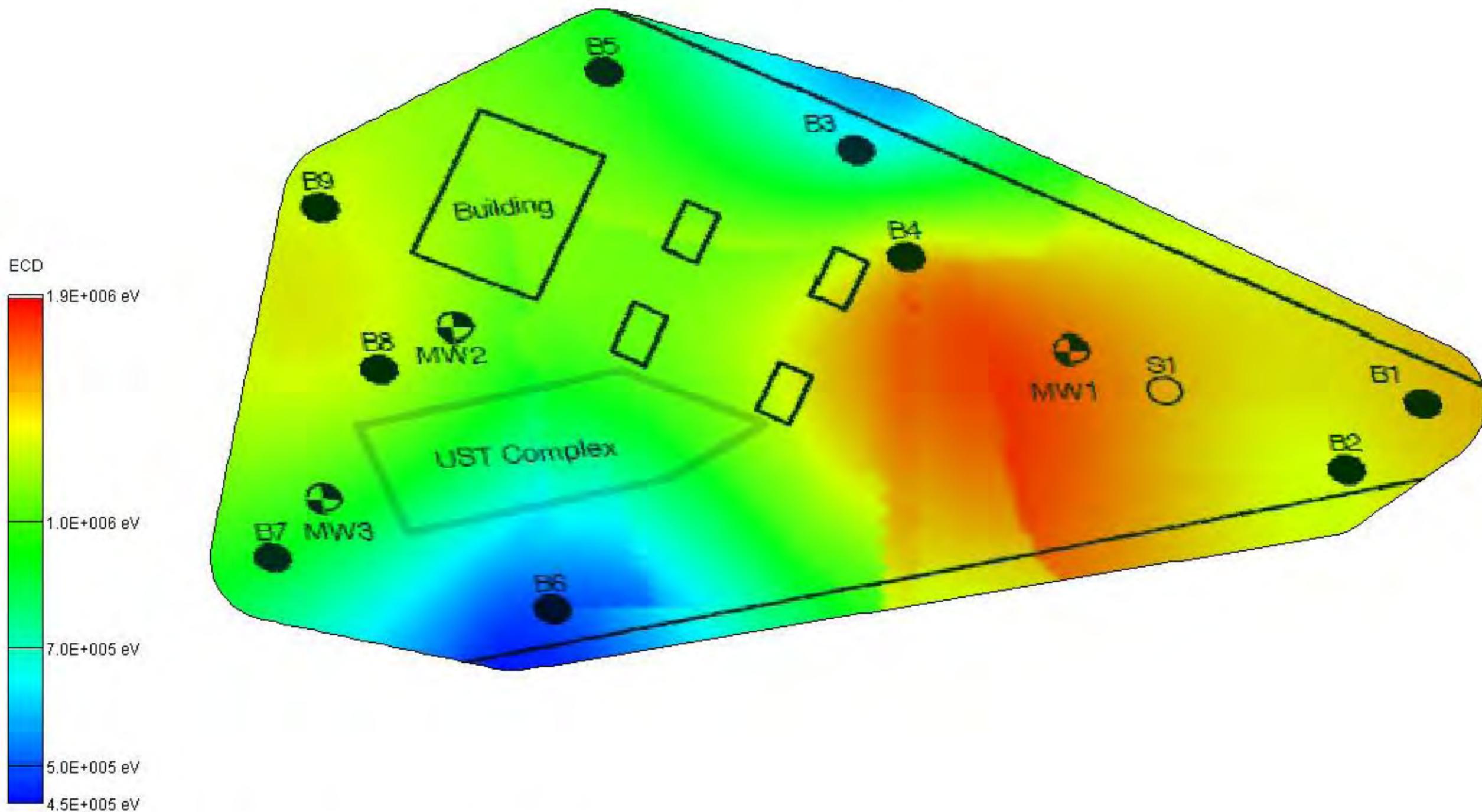
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -12 ft (MSL)



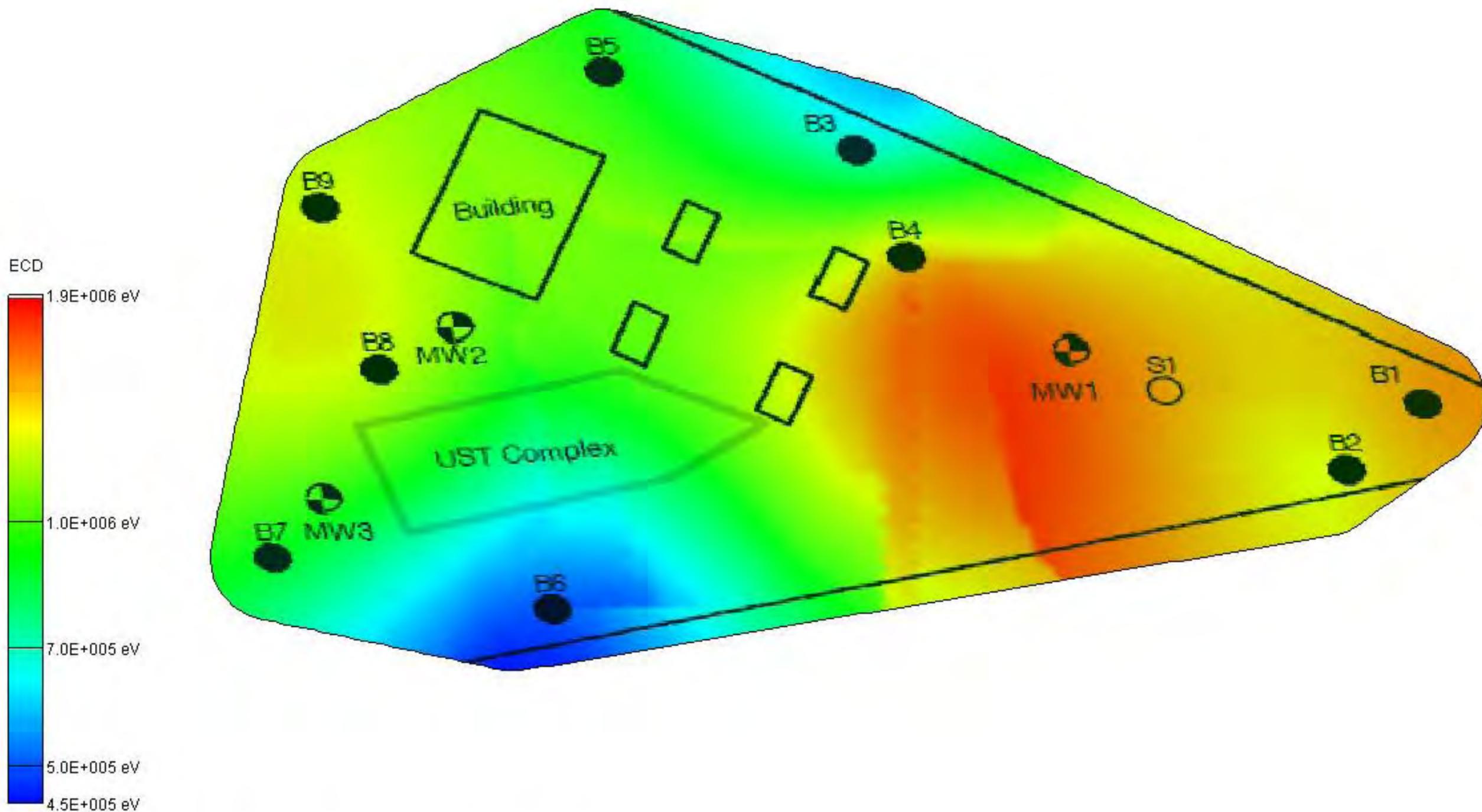
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -13 ft (MSL)



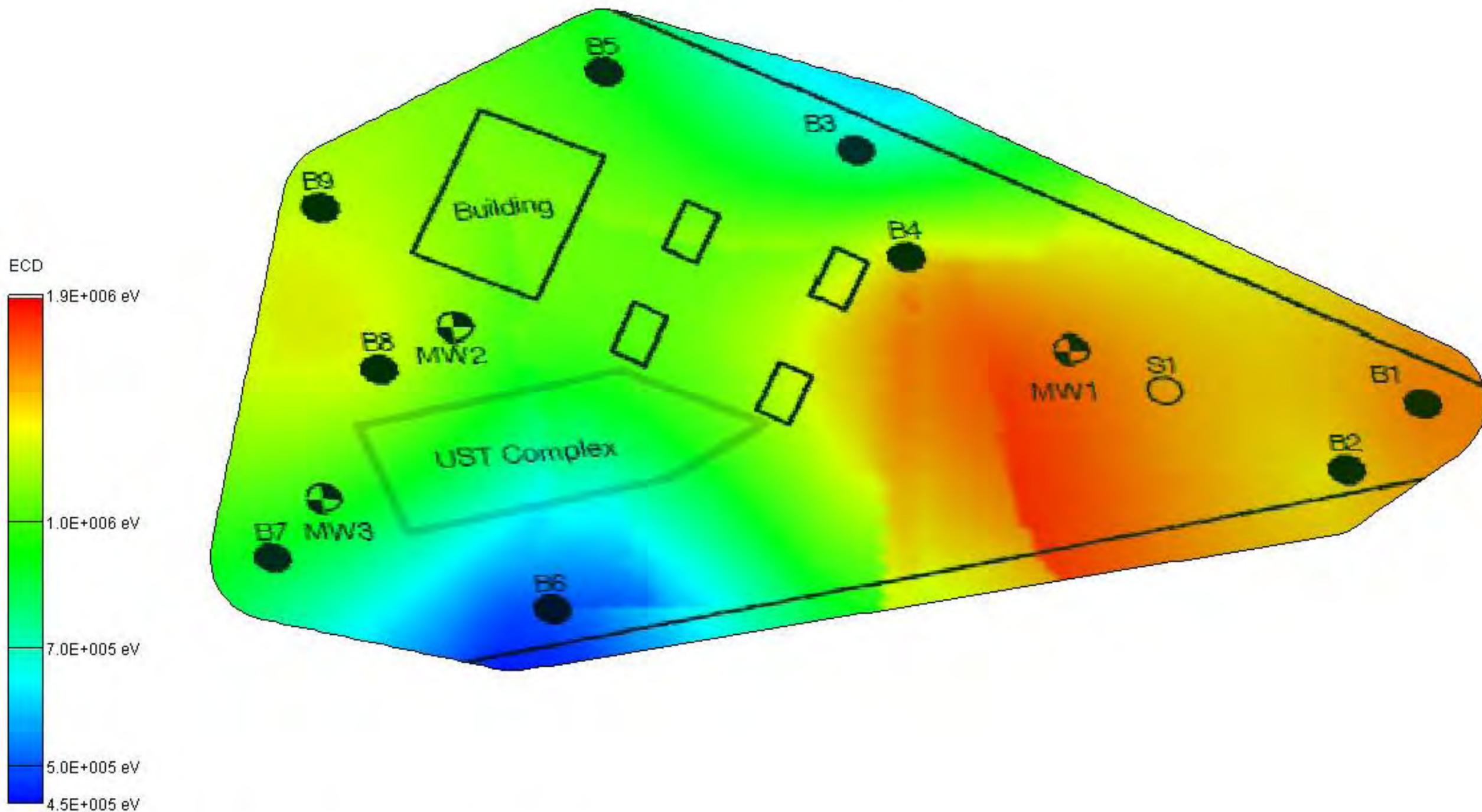
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -14 ft (MSL)



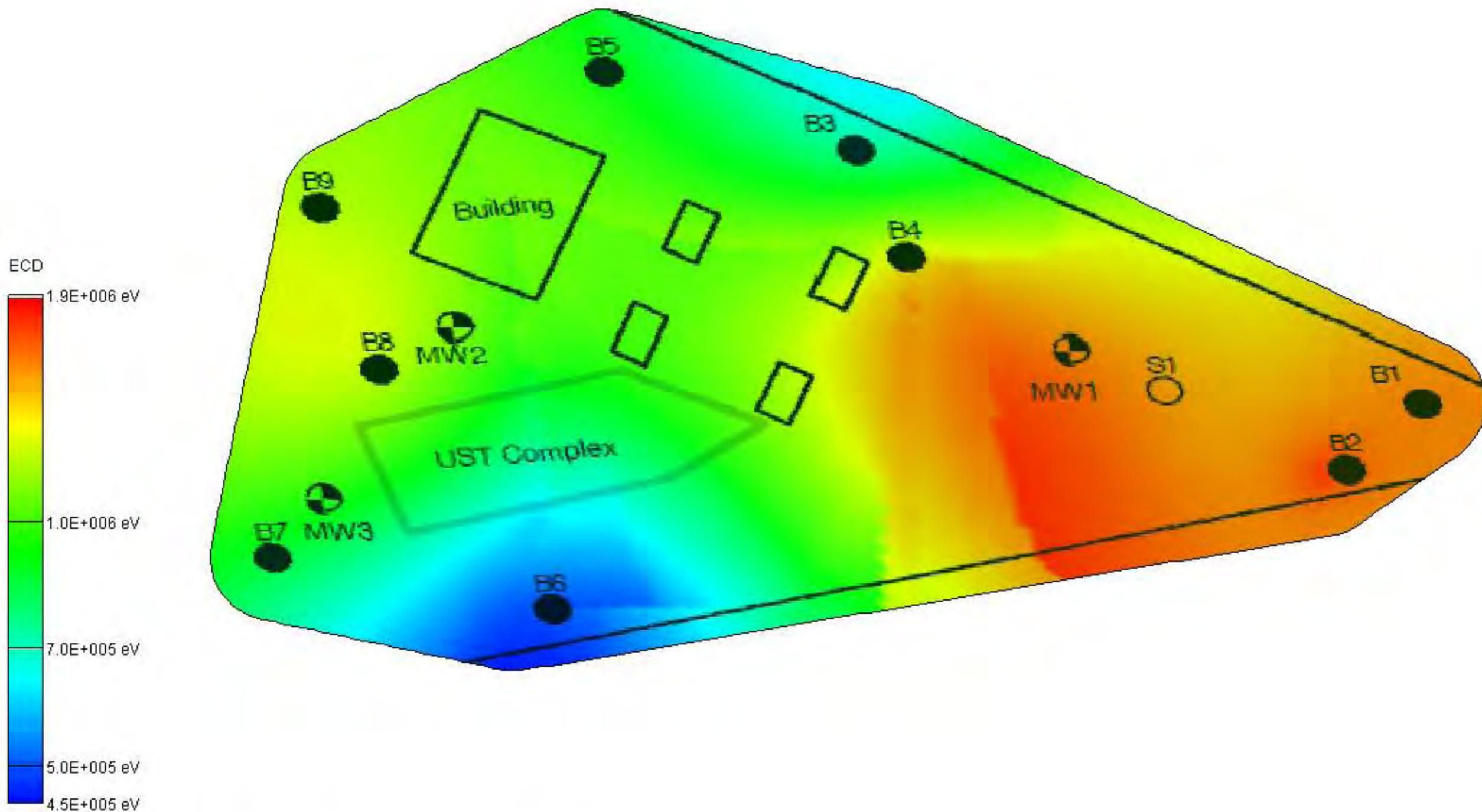
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -15 ft (MSL)



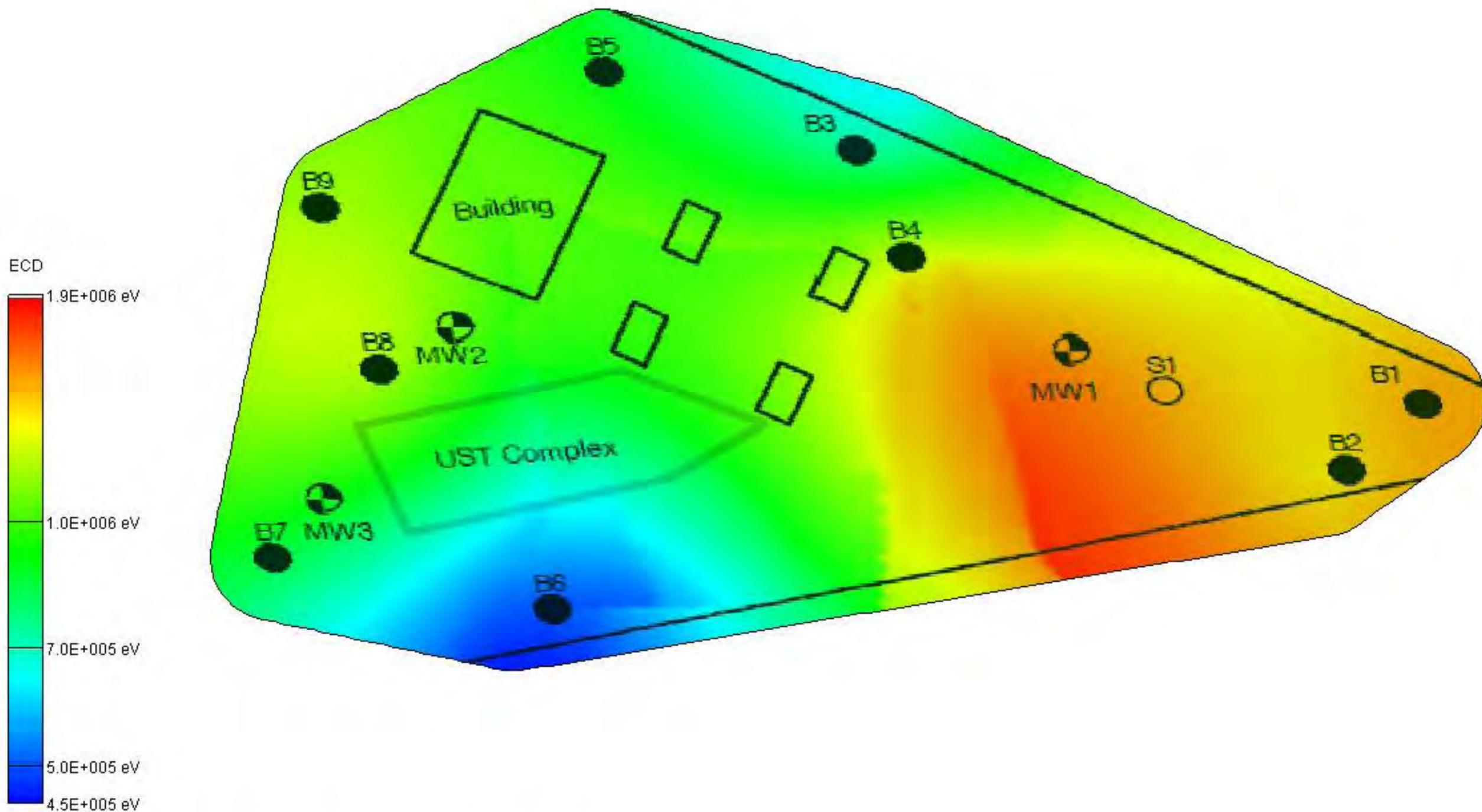
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -16 ft (MSL)



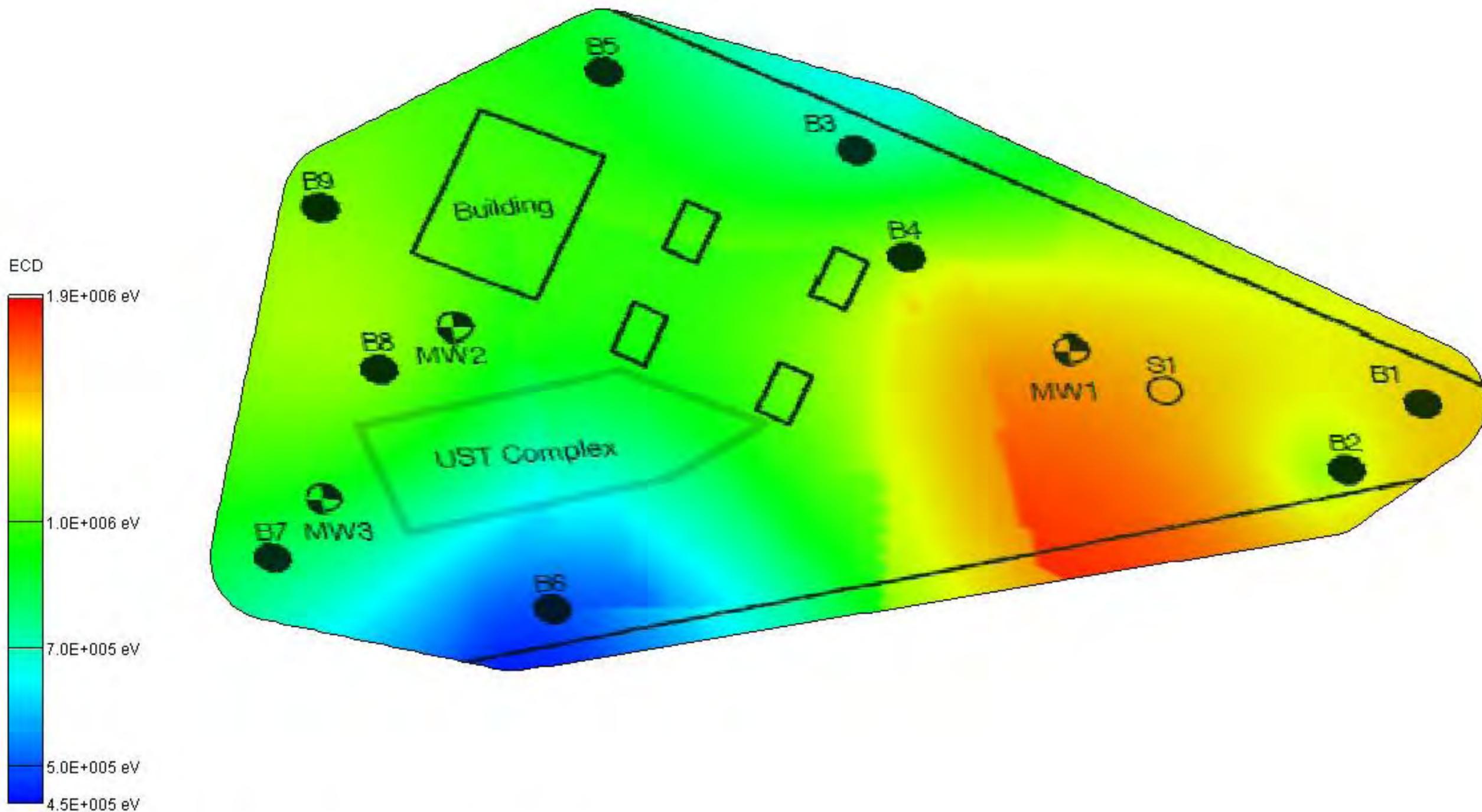
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -17 ft (MSL)



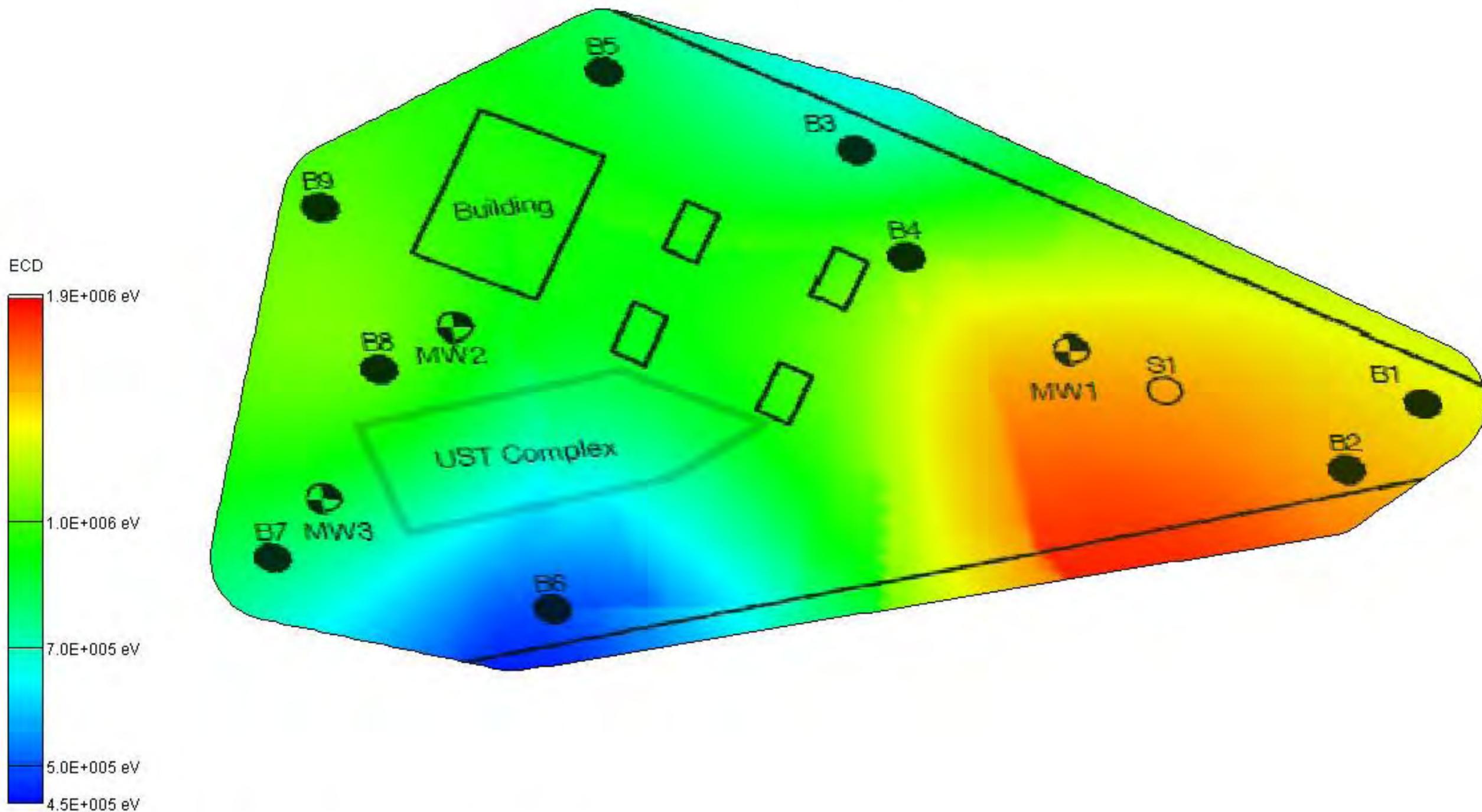
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -18 ft (MSL)



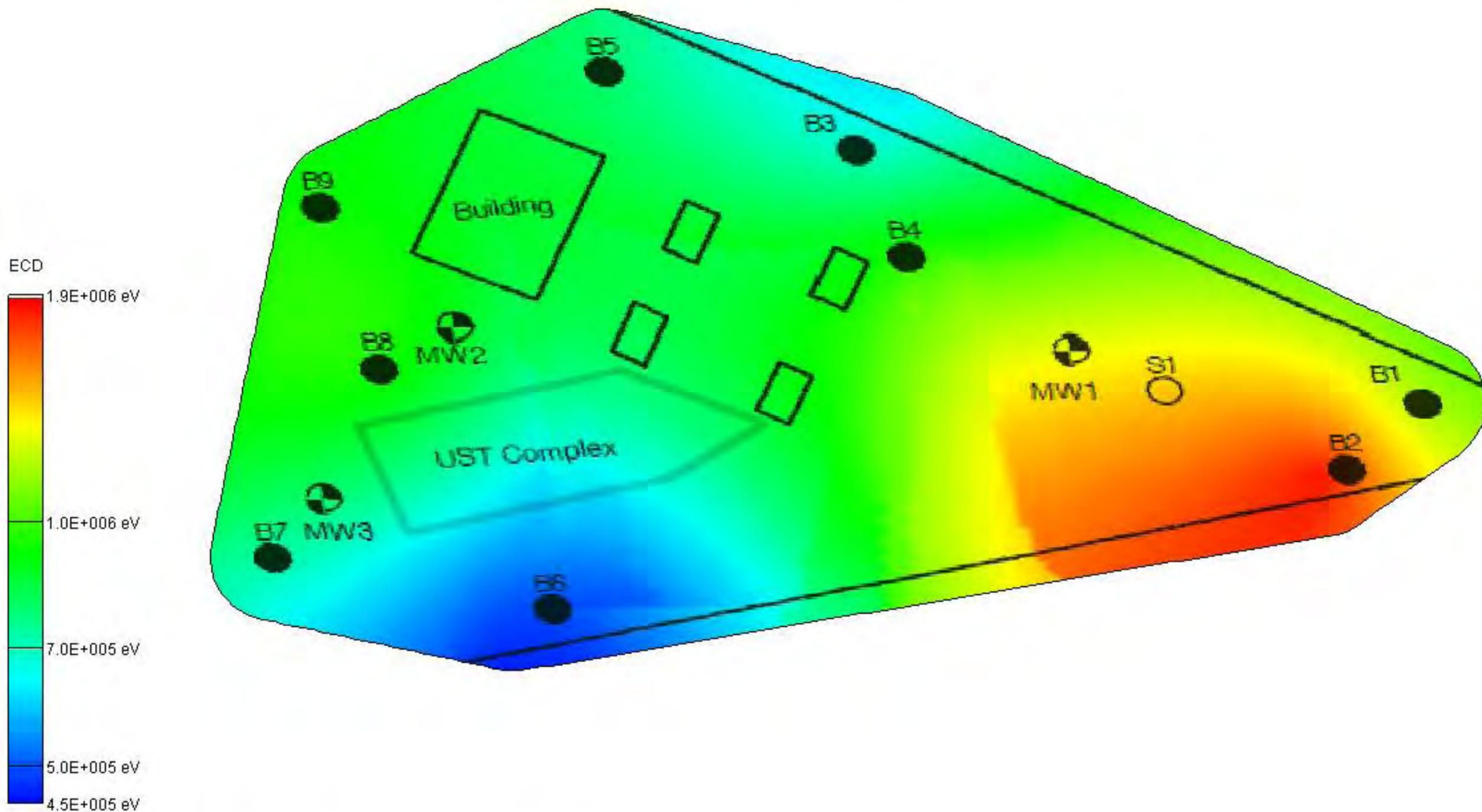
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -19 ft (MSL)



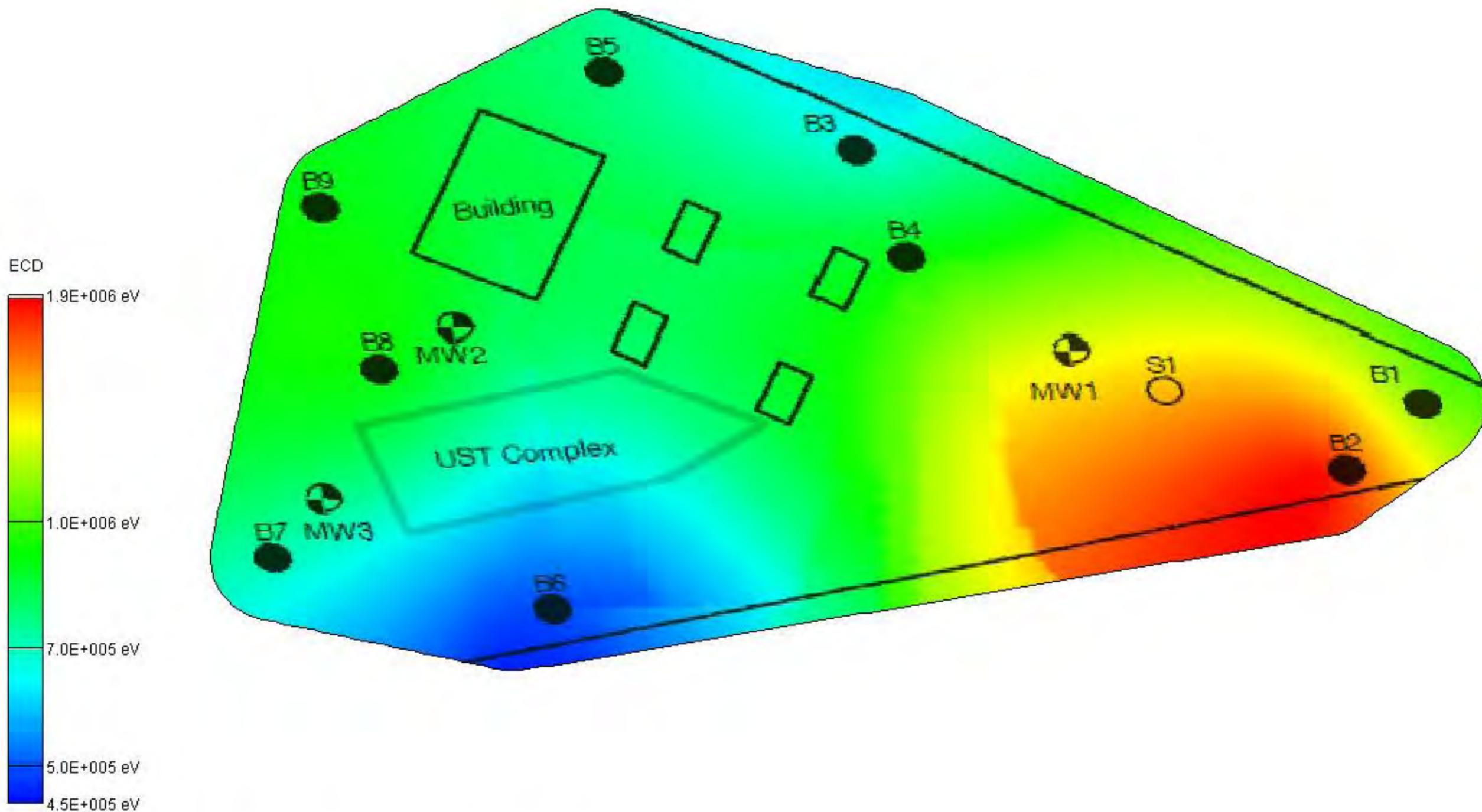
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -21 ft (MSL)



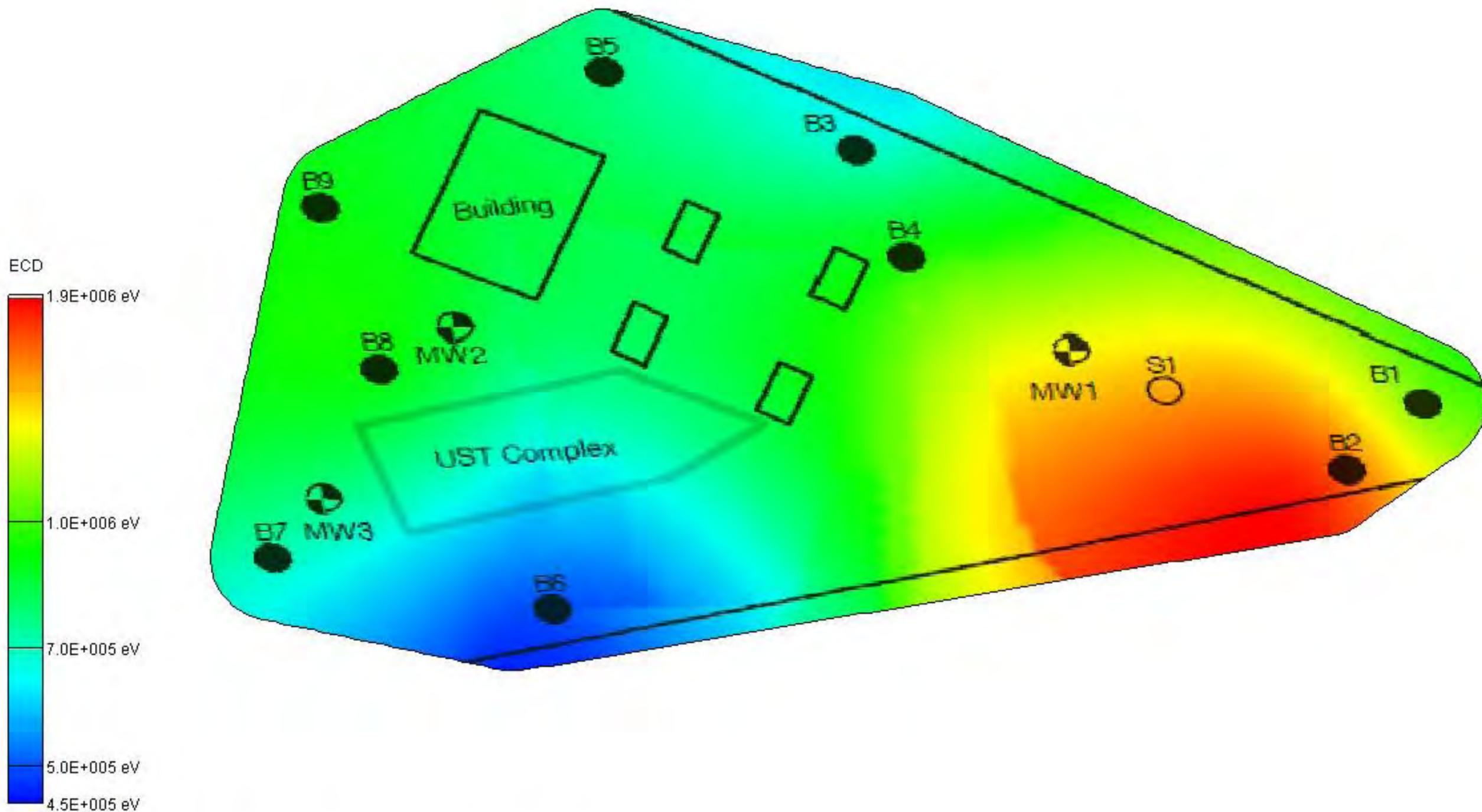
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -22 ft (MSL)



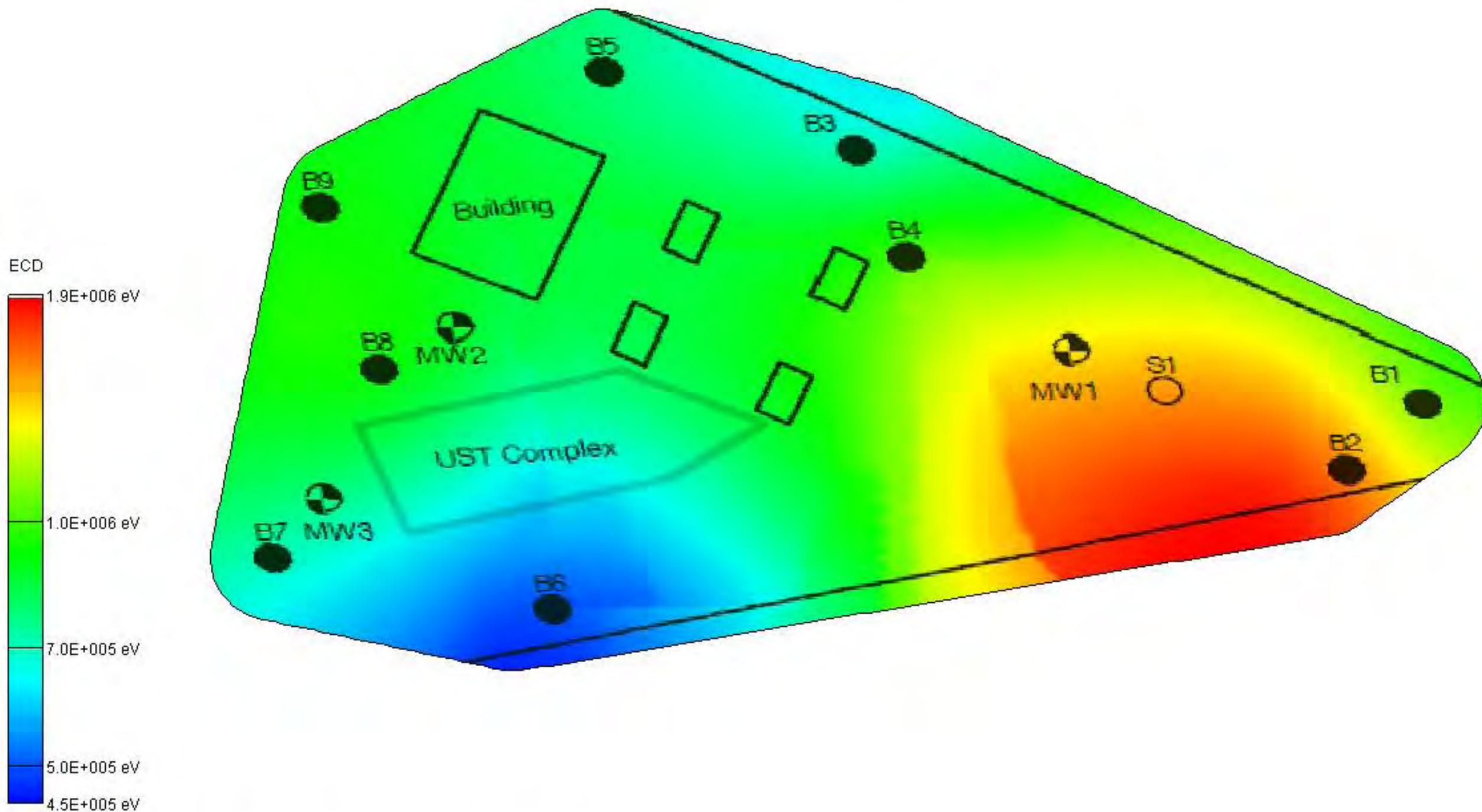
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -23 ft (MSL)



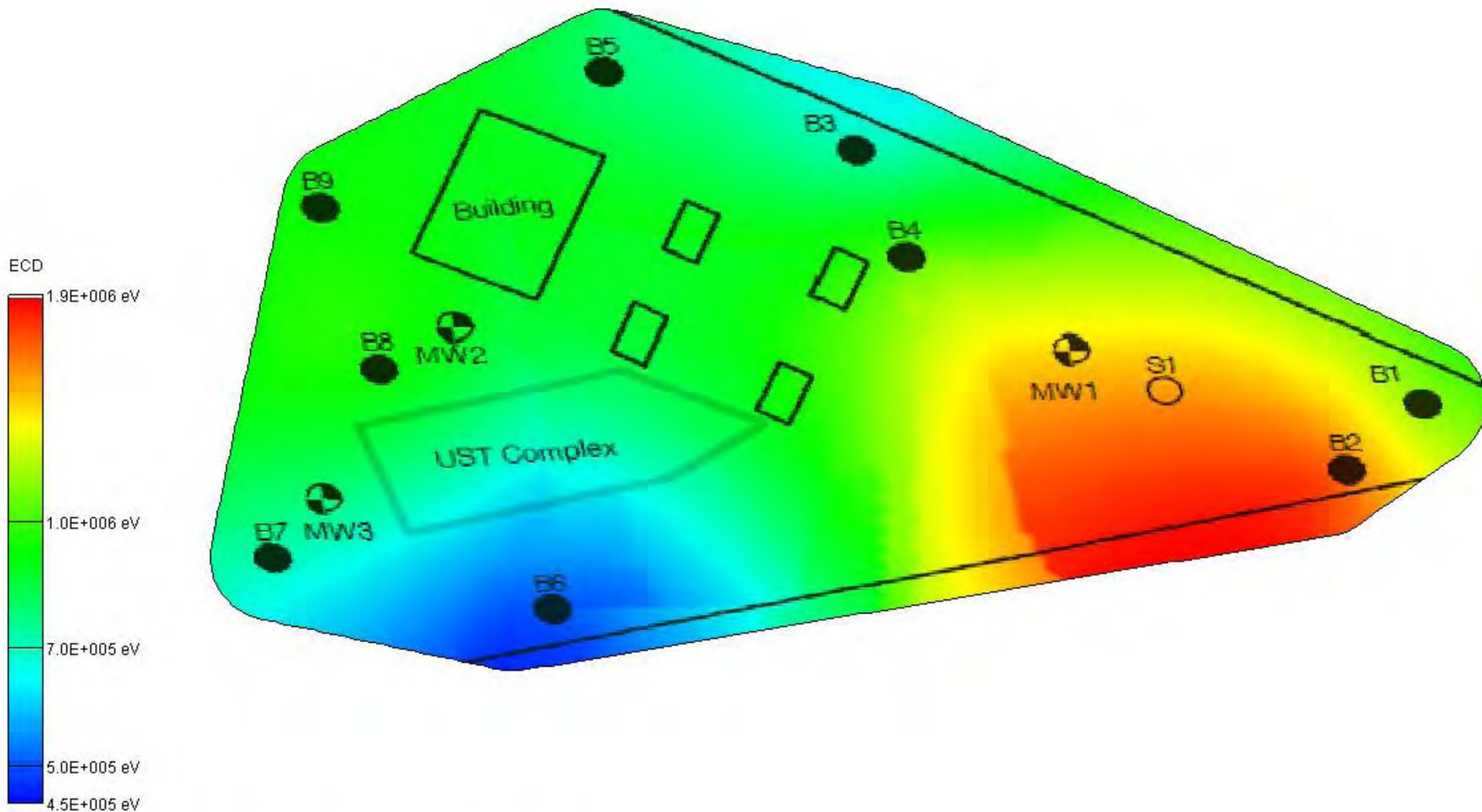
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -24 ft (MSL)



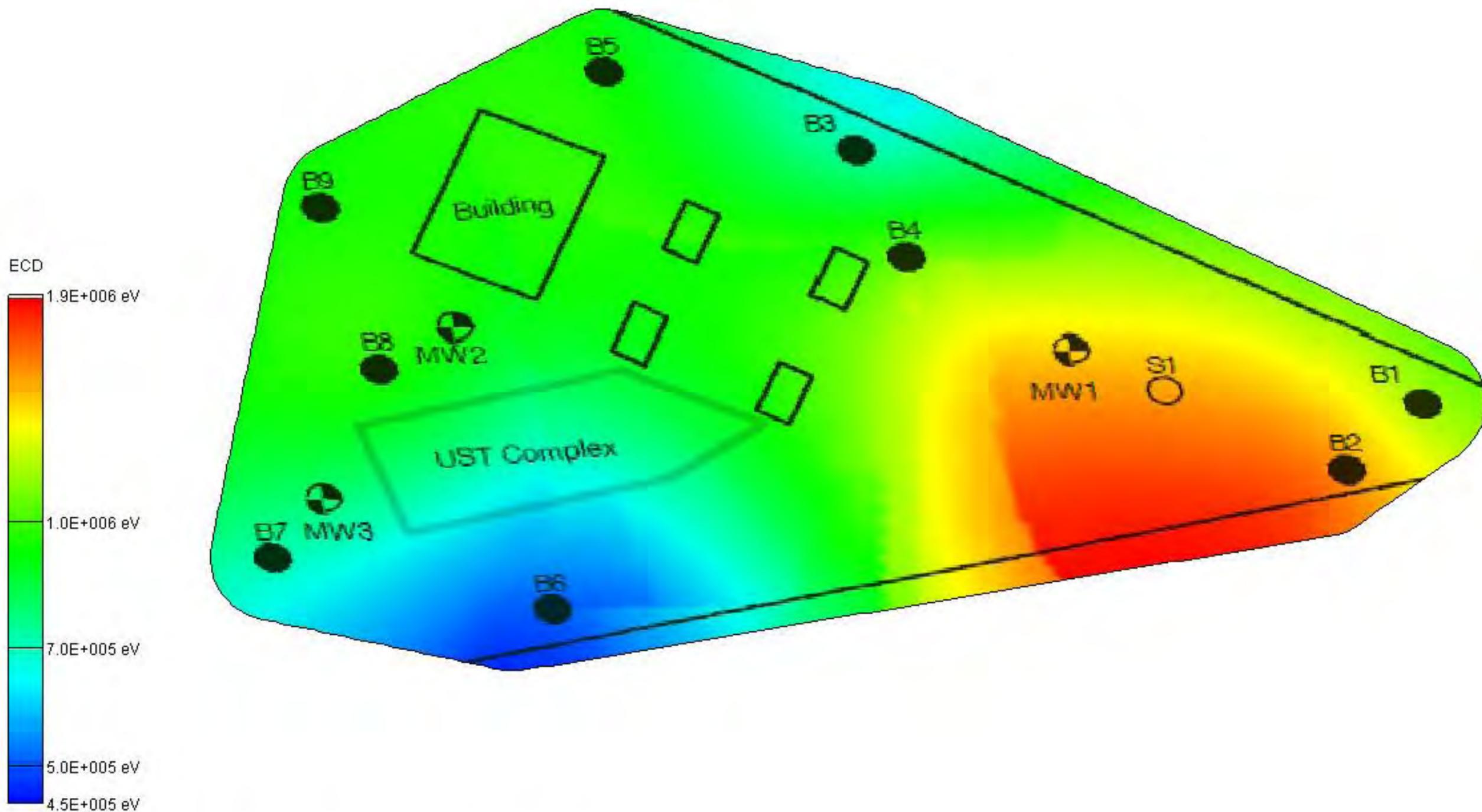
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -25 ft (MSL)



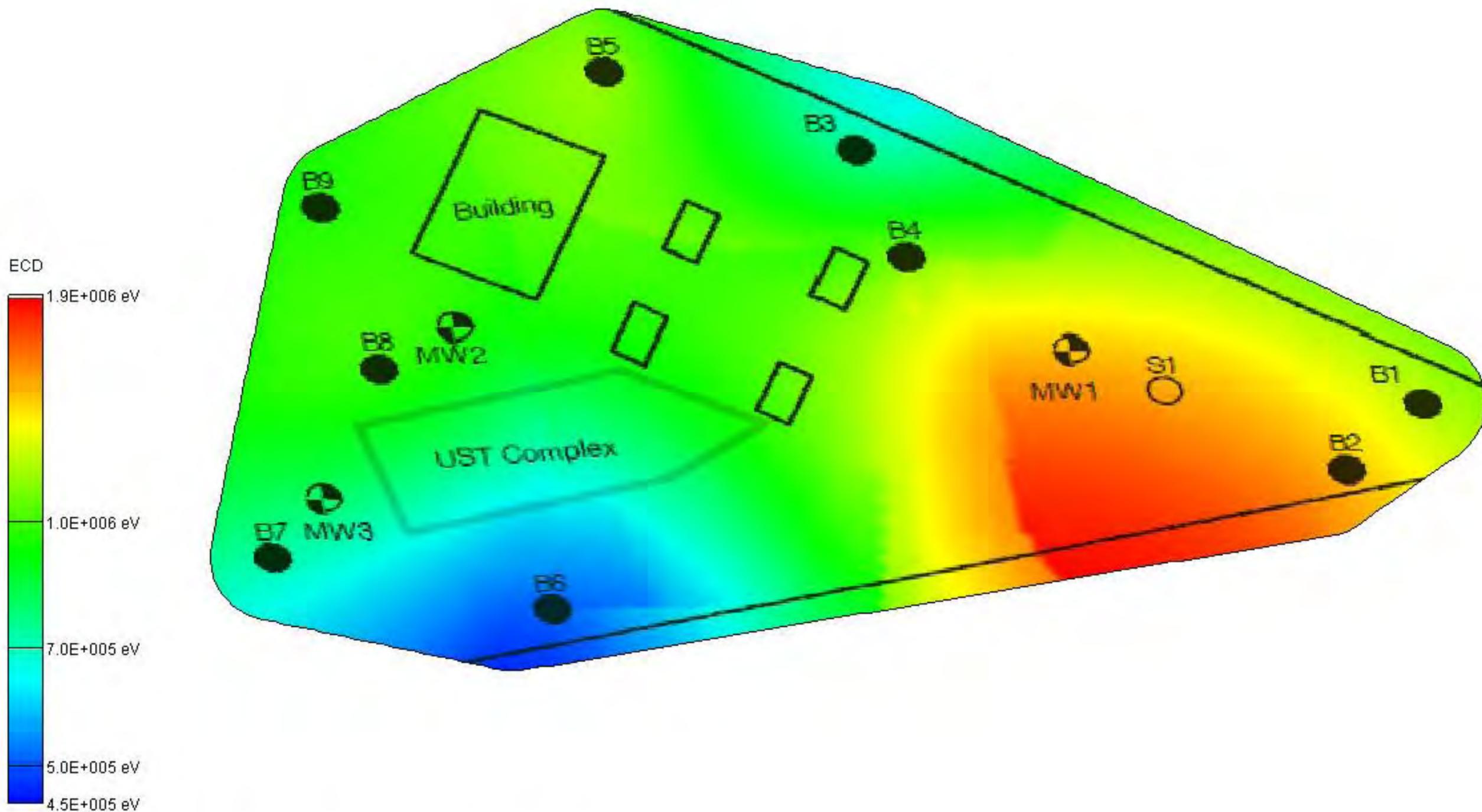
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -26 ft (MSL)



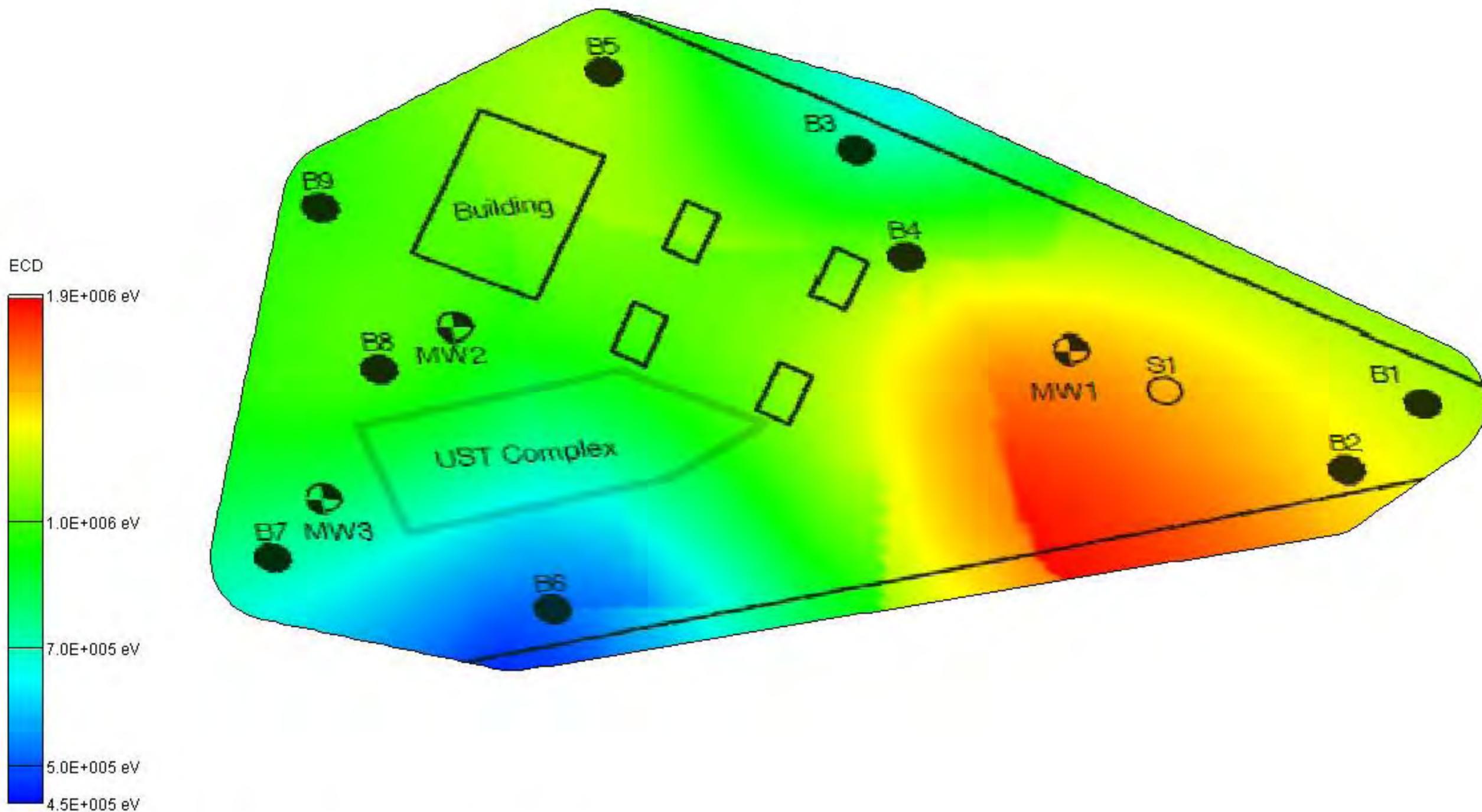
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -27 ft (MSL)



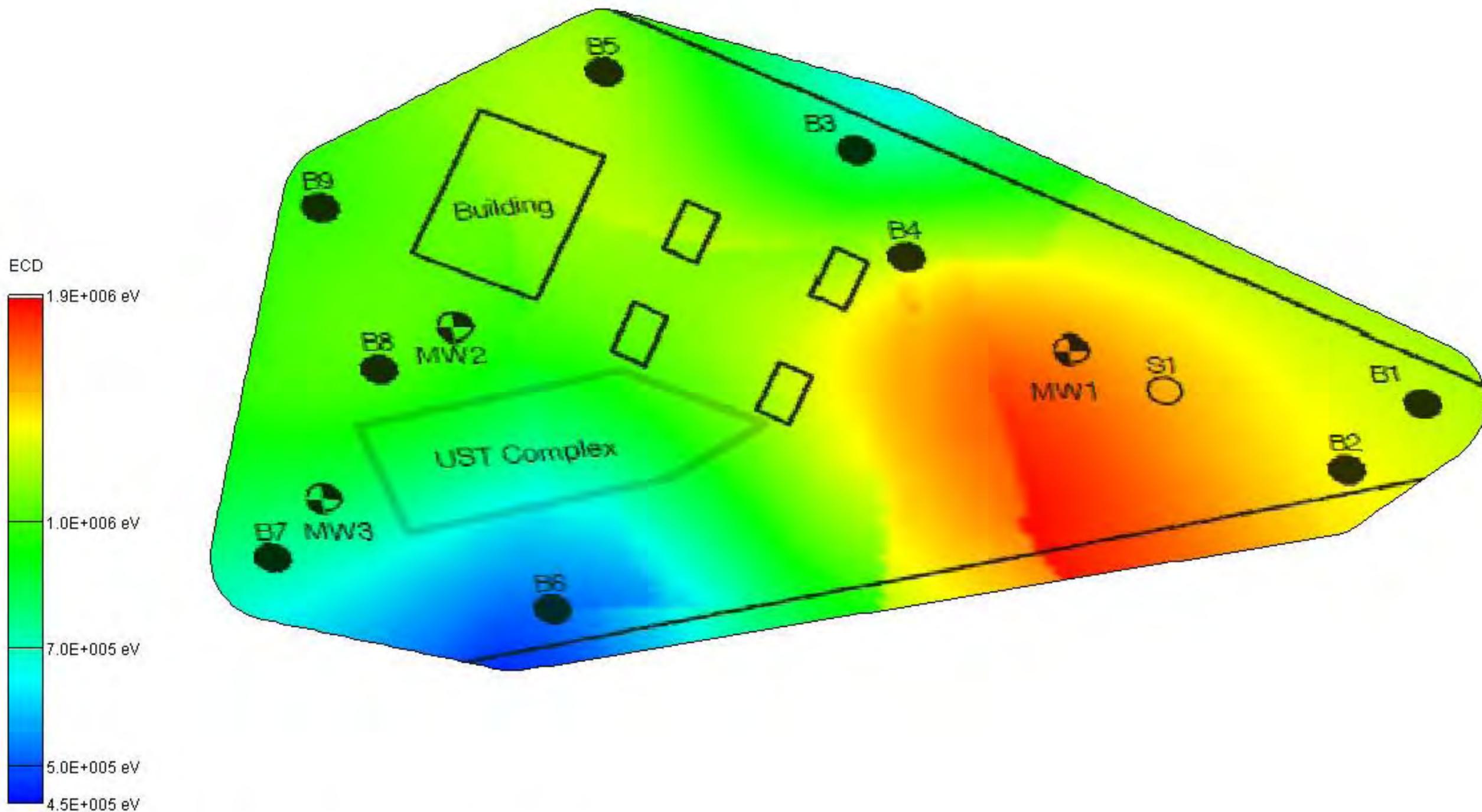
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -28 ft (MSL)



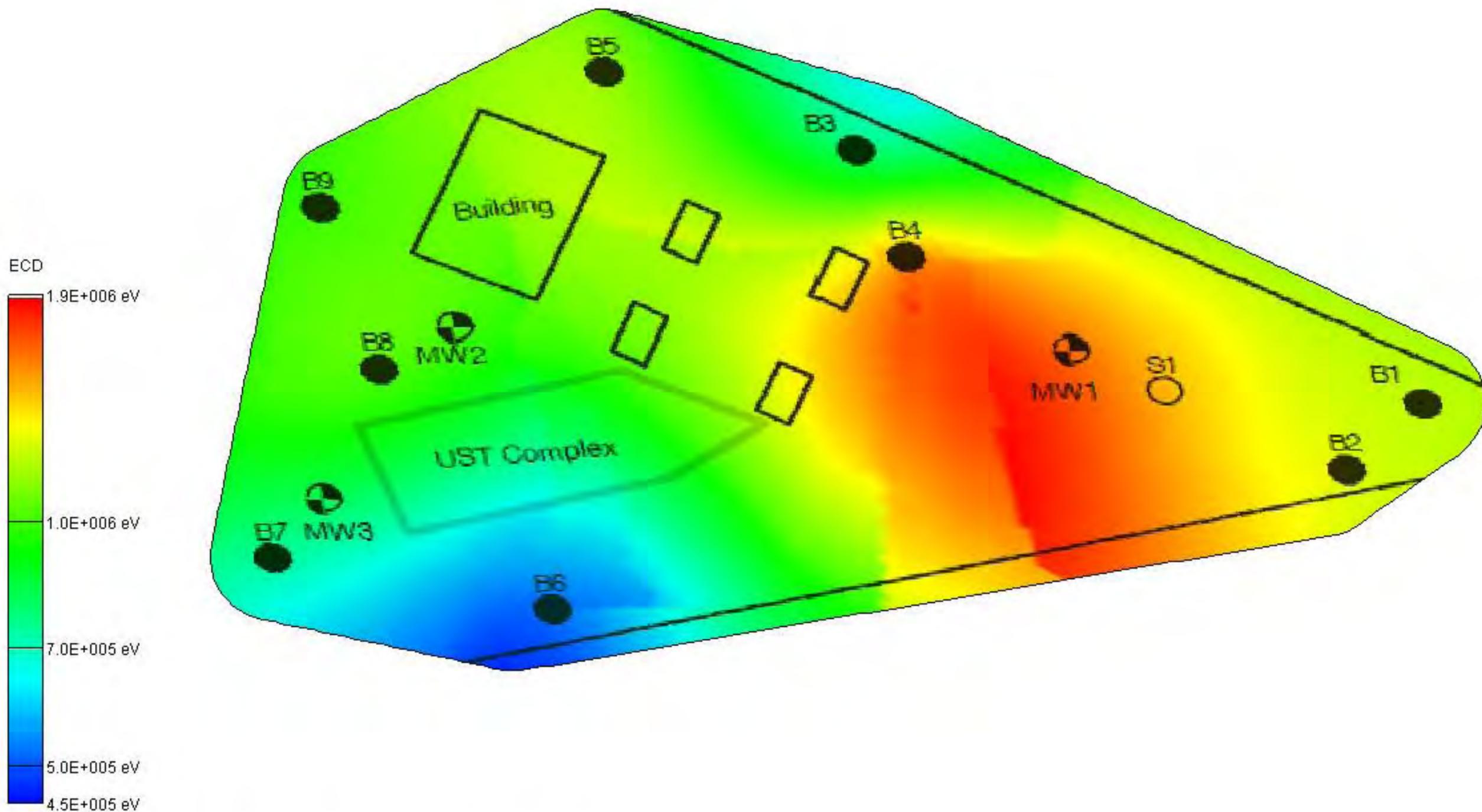
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ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -29 ft (MSL)



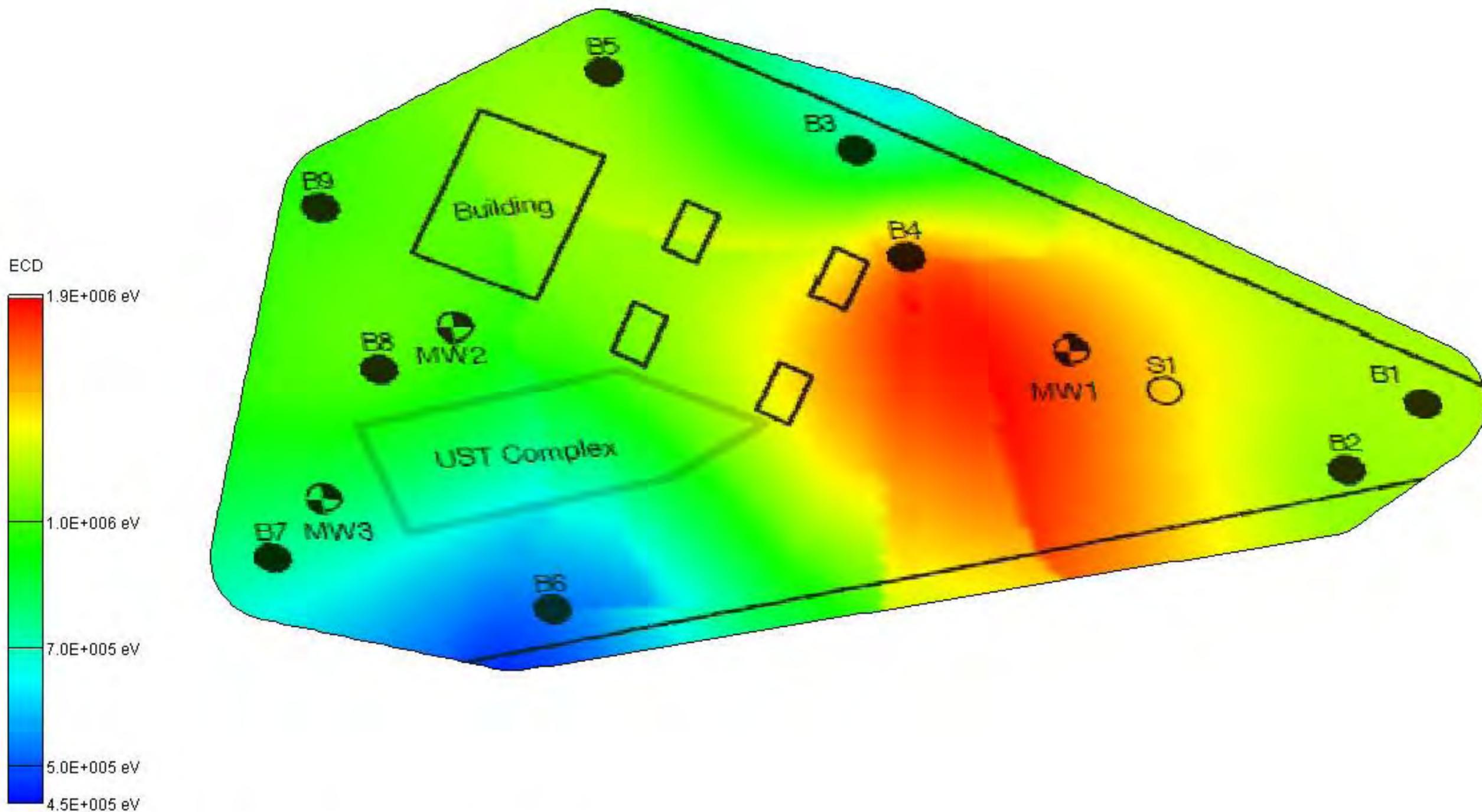
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -30 ft (MSL)



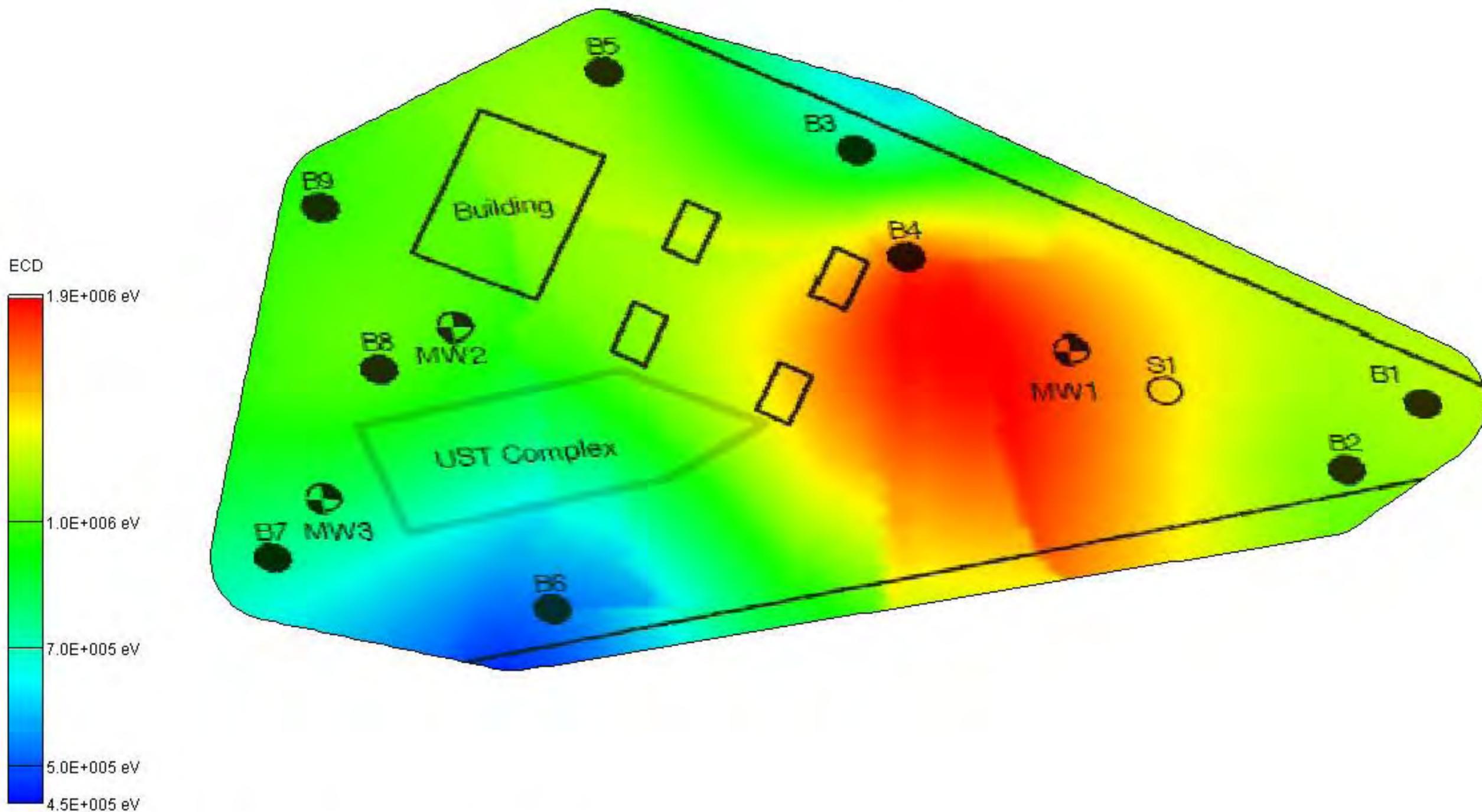
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -31 ft (MSL)



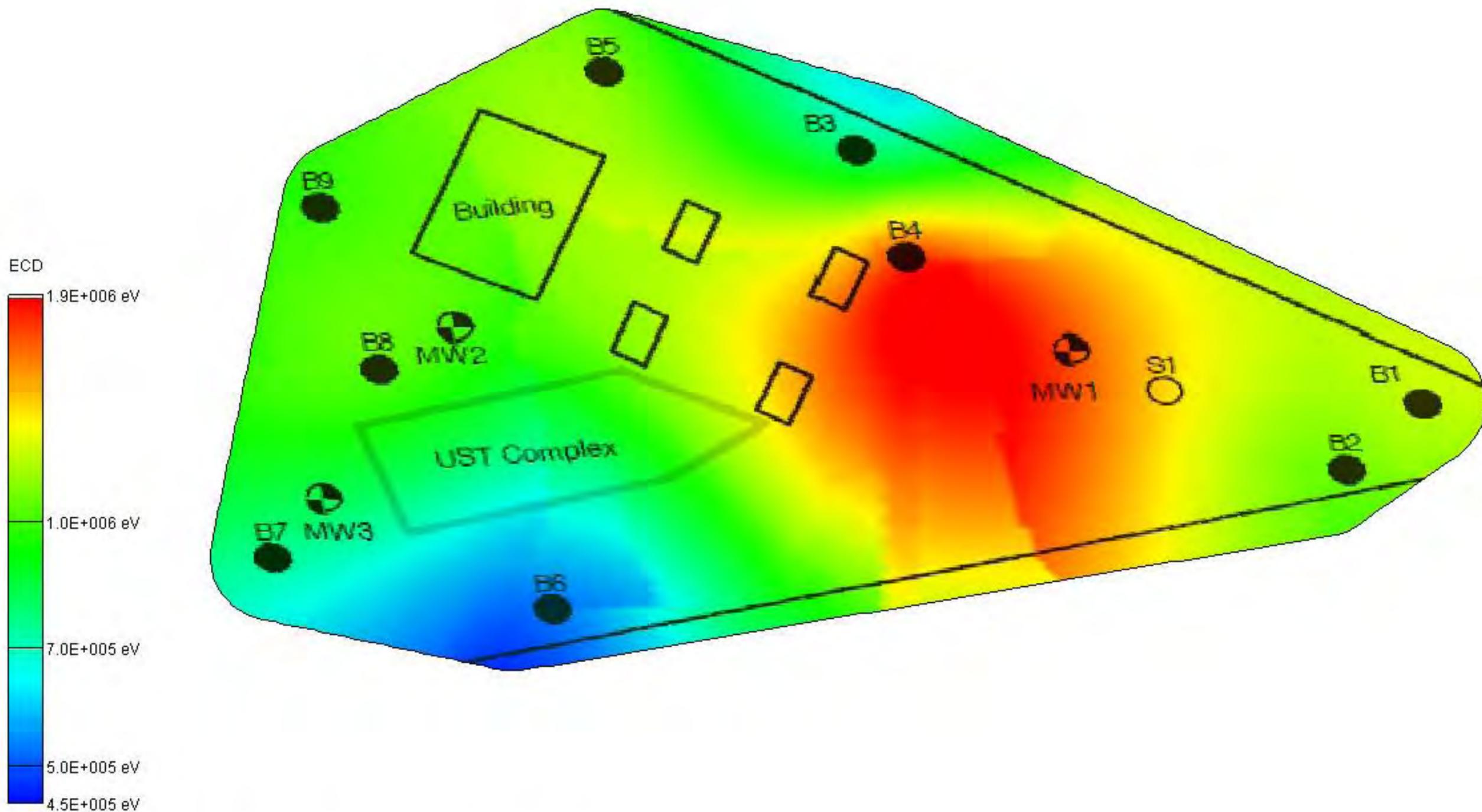
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -32 ft (MSL)



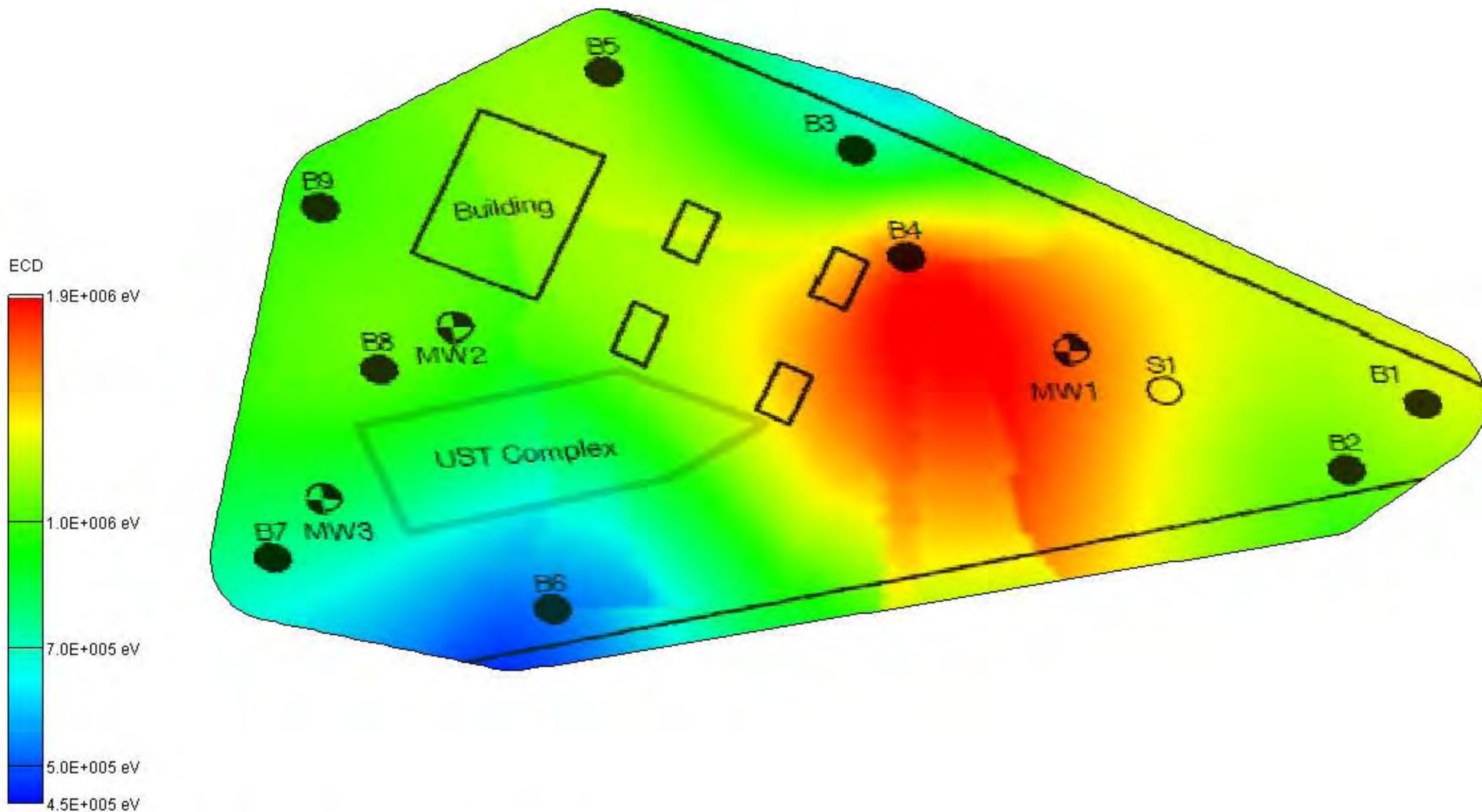
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ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -33 ft (MSL)



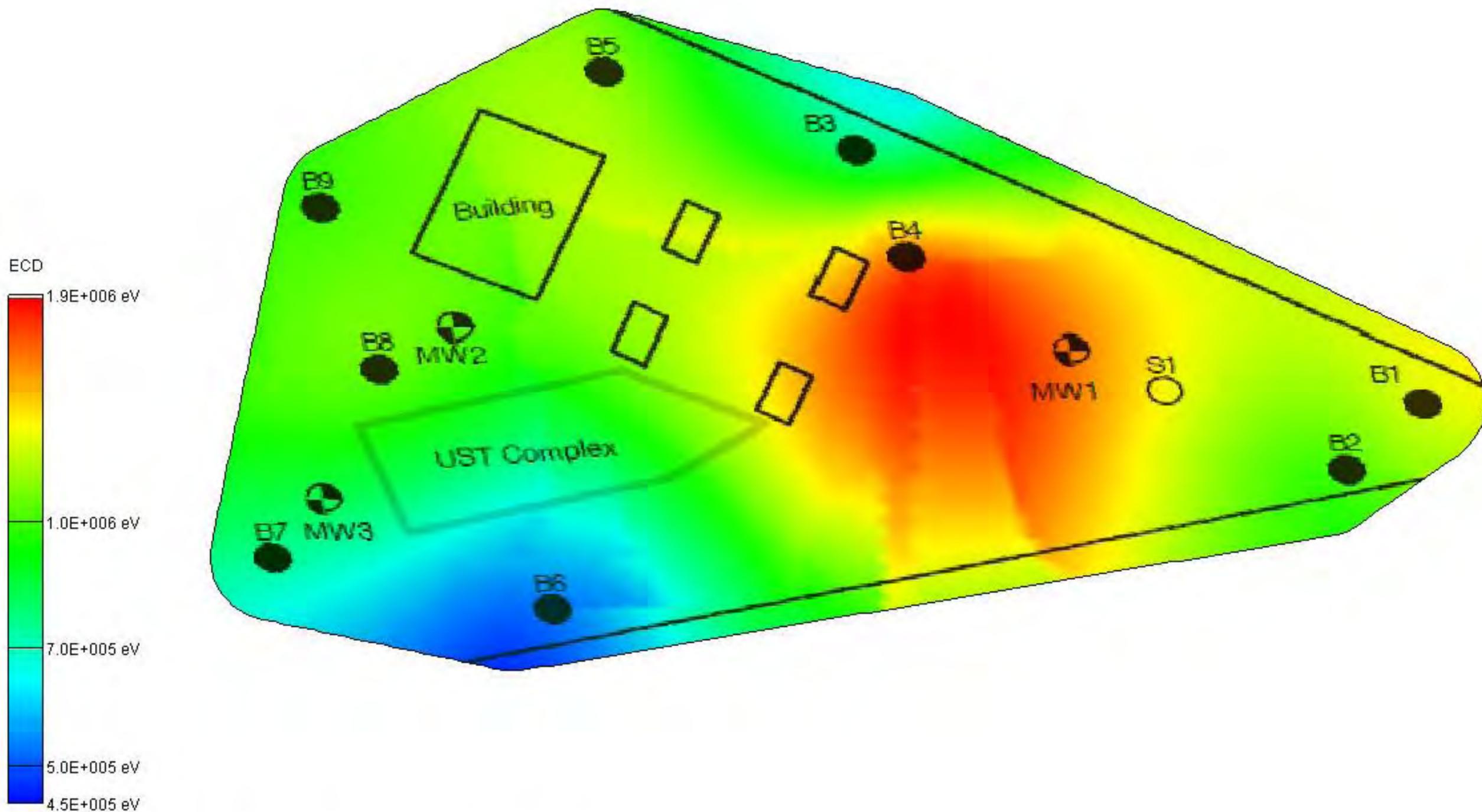
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -34 ft (MSL)



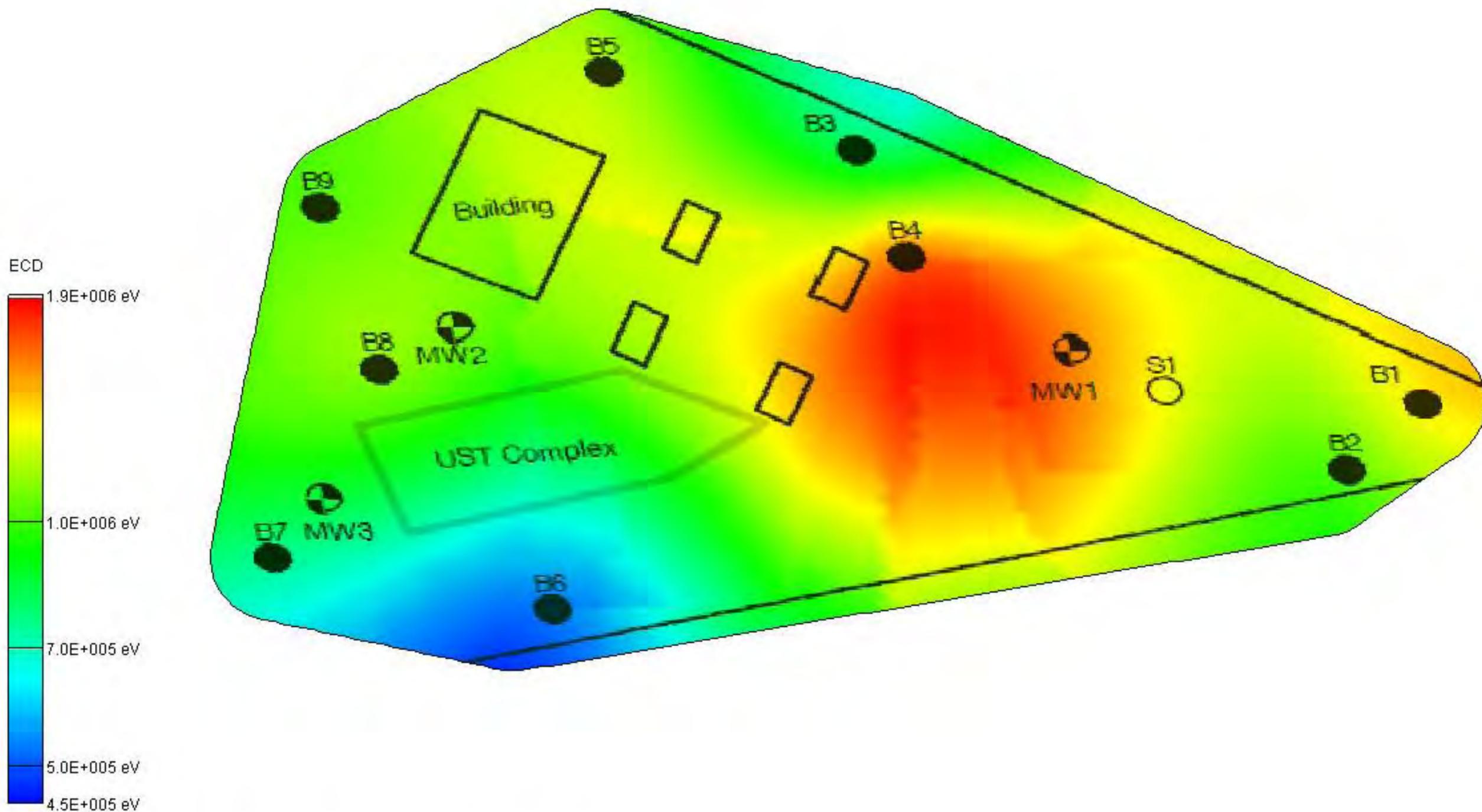
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -35 ft (MSL)



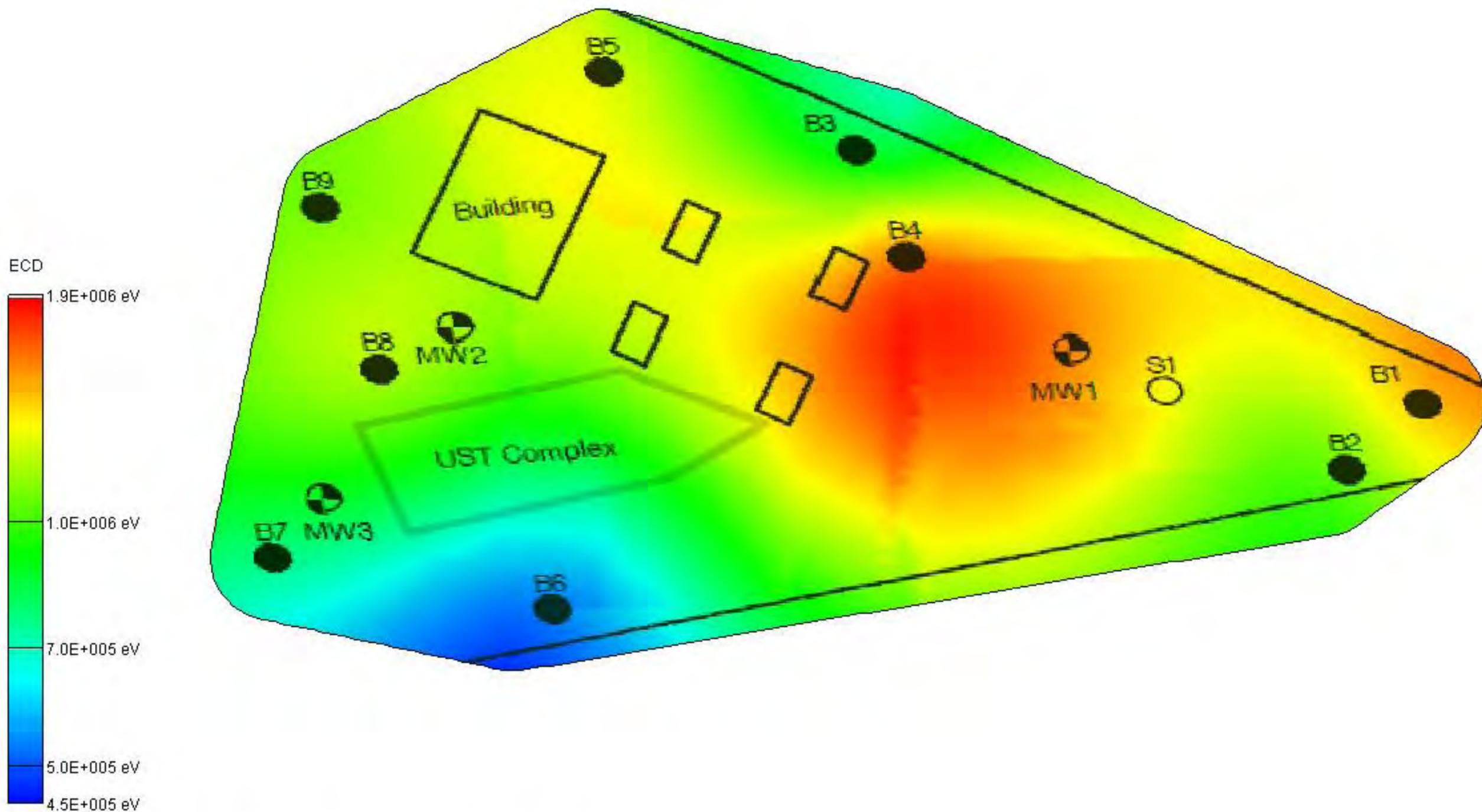
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -36 ft (MSL)



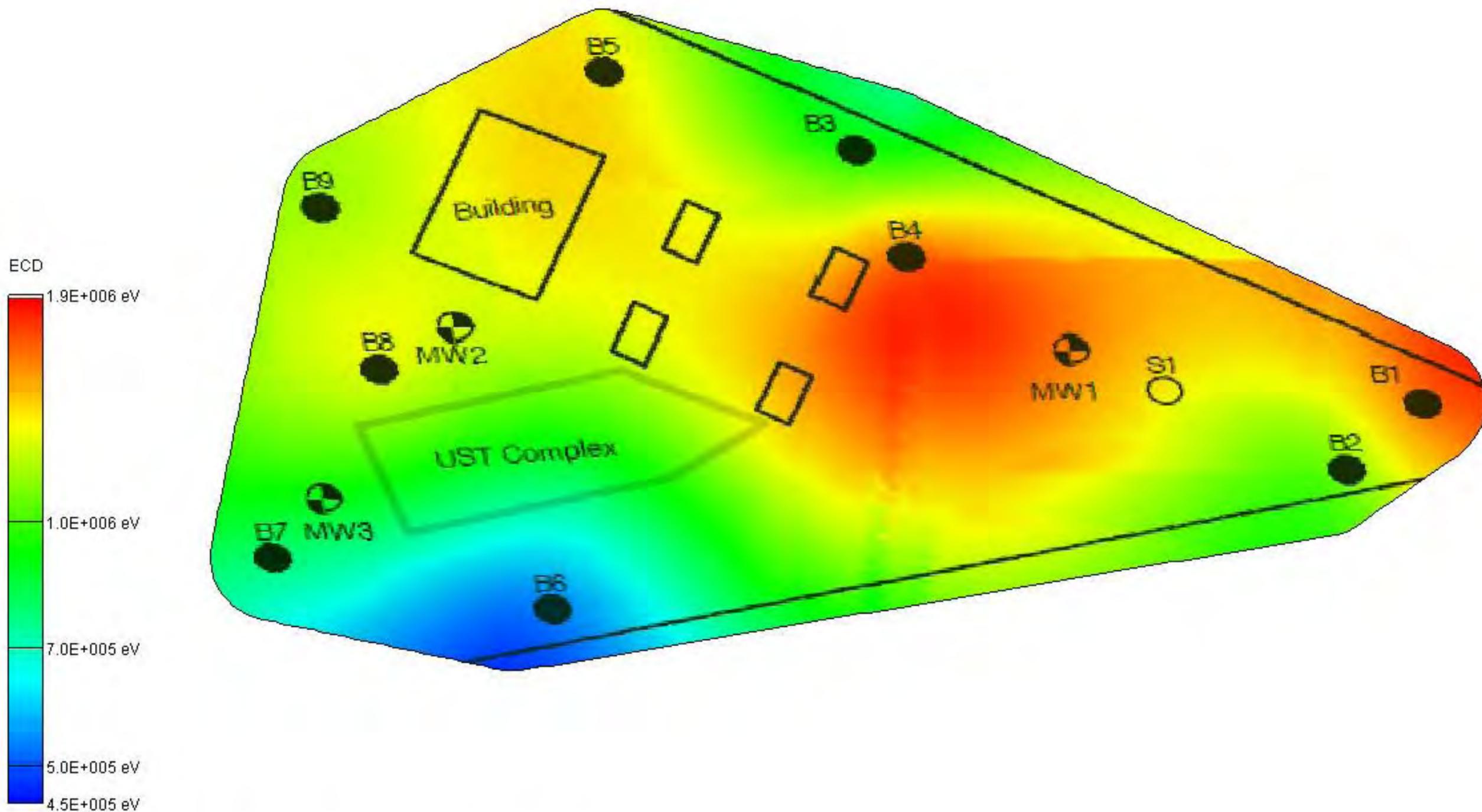
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -37 ft (MSL)



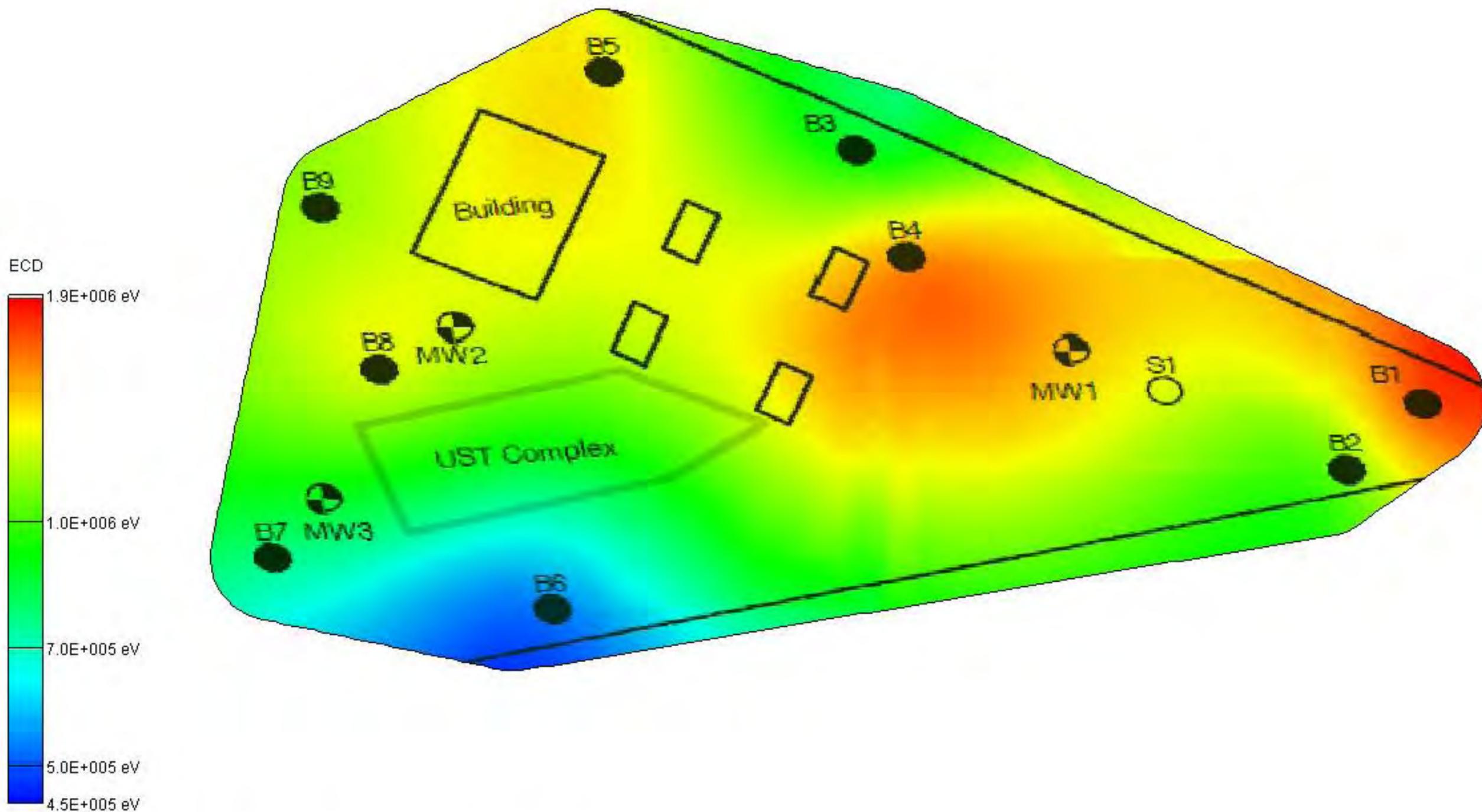
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -38 ft (MSL)



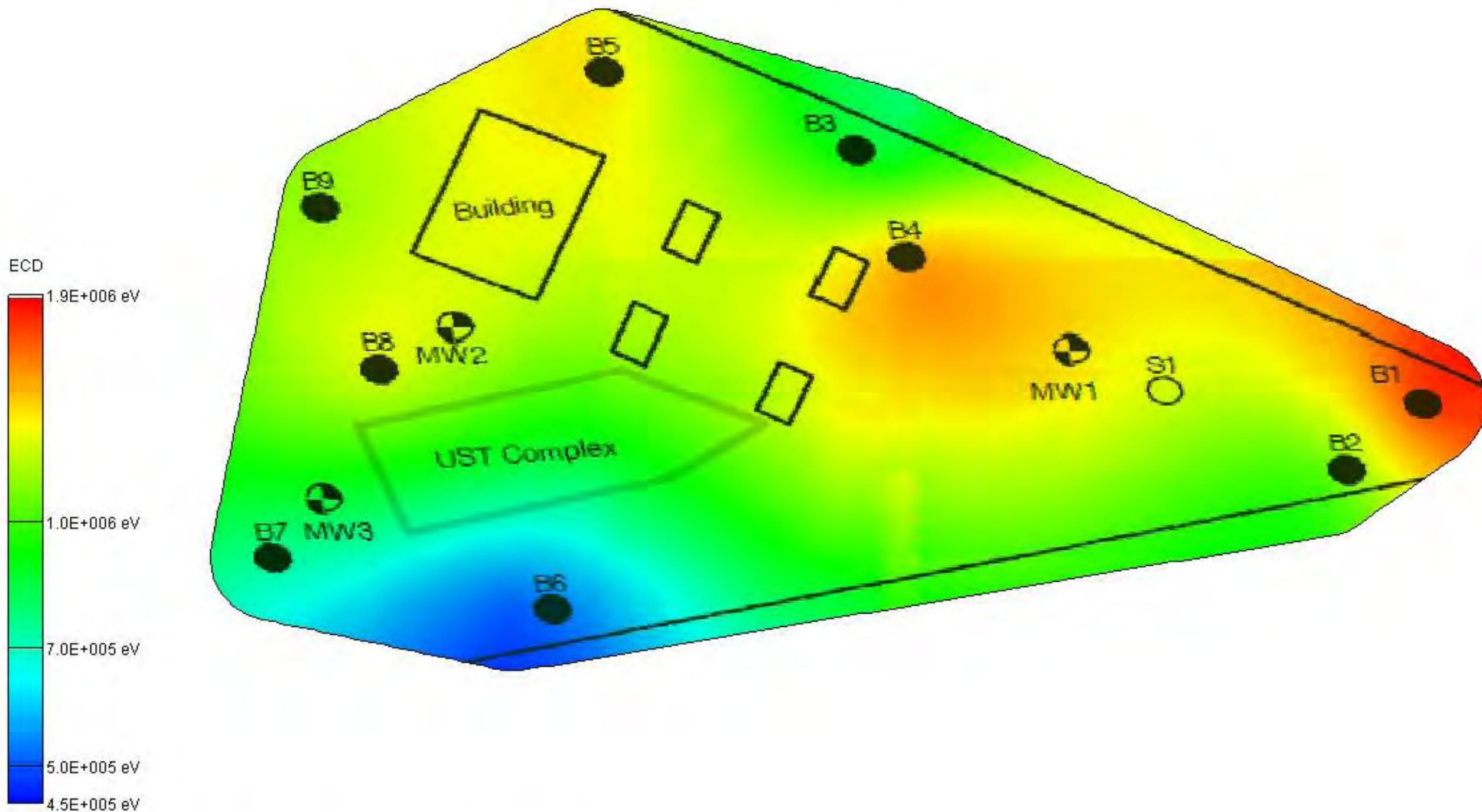
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -39 ft (MSL)



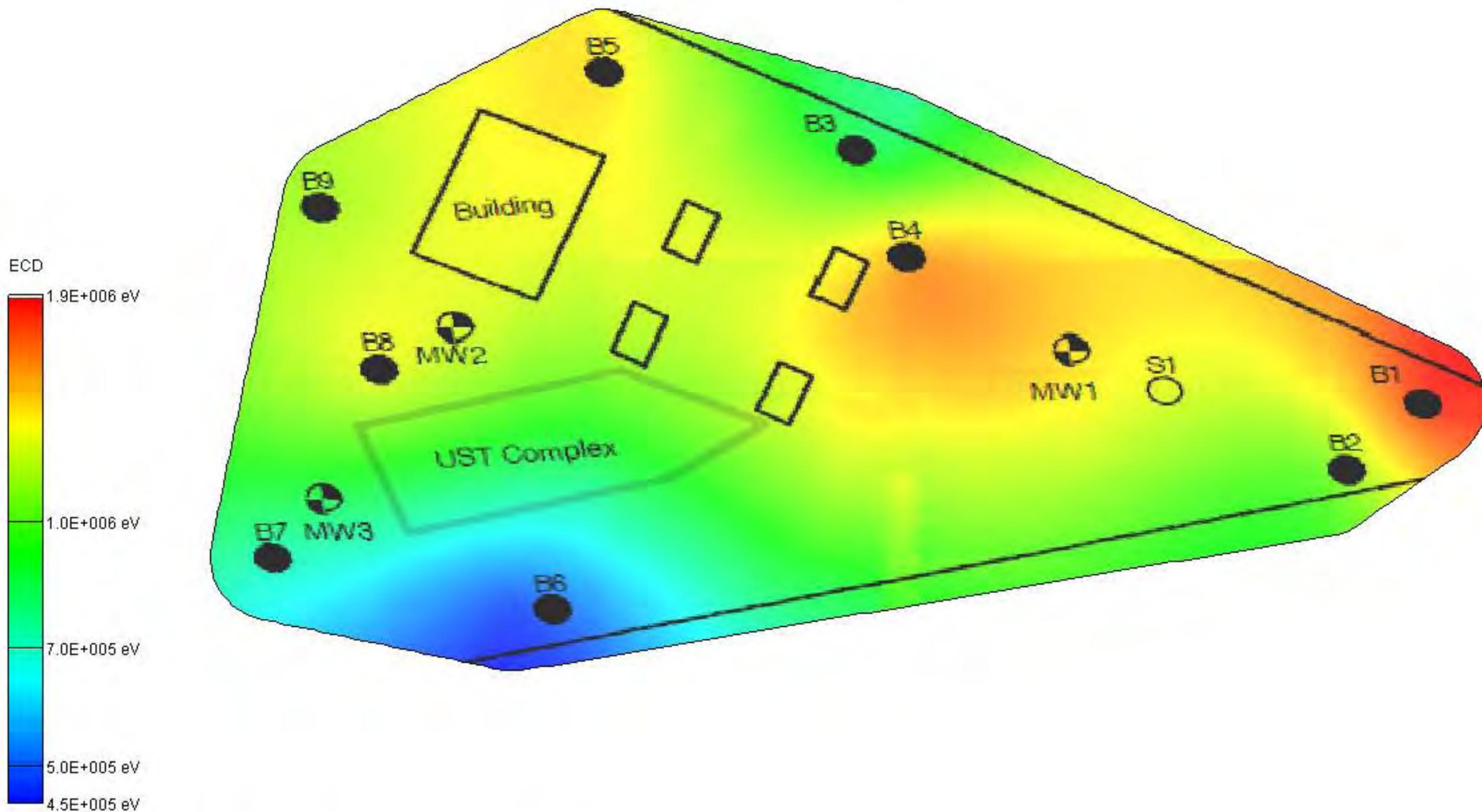
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -40 ft (MSL)



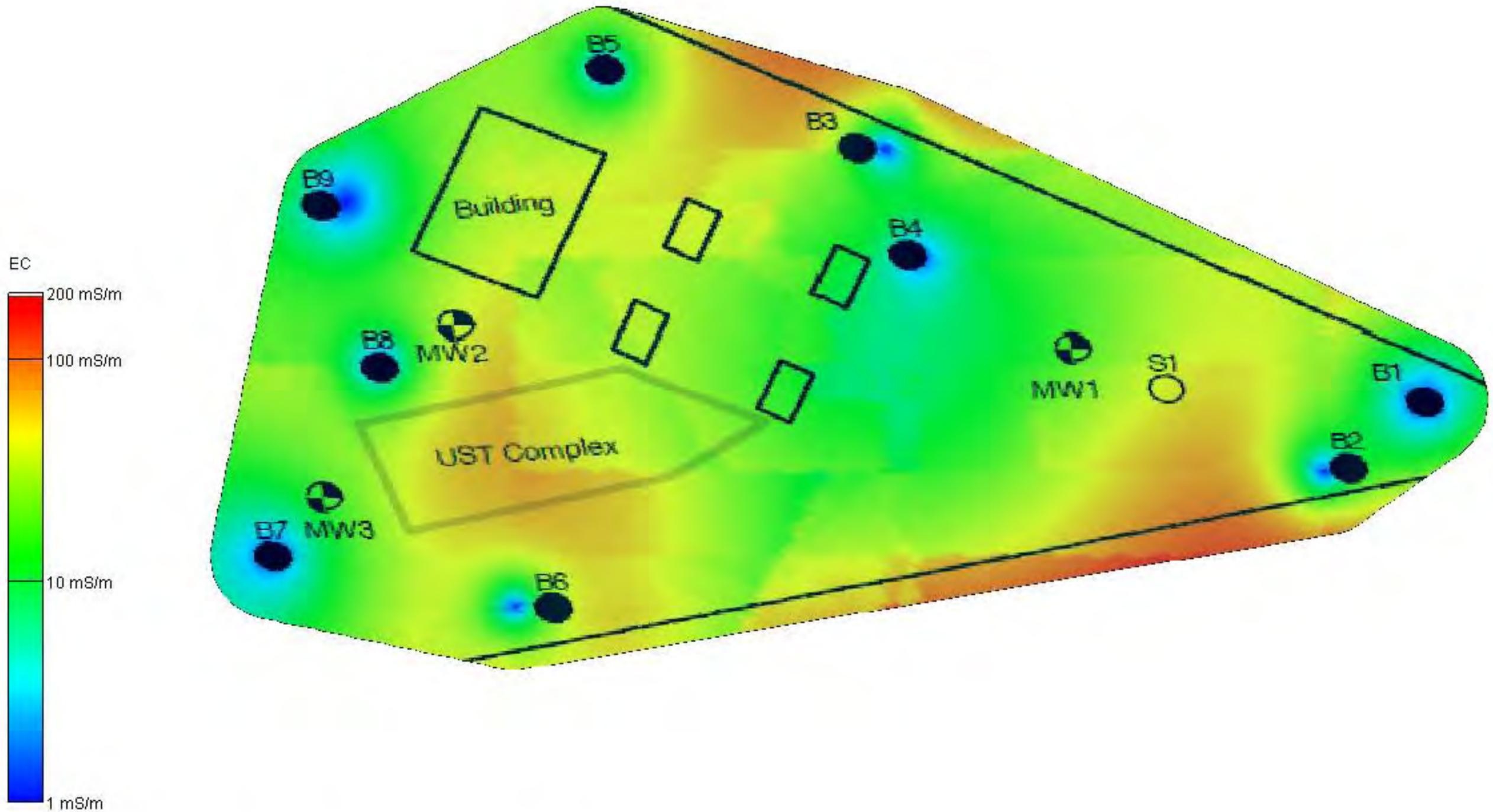
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

ECD
Depth -41 ft (MSL)



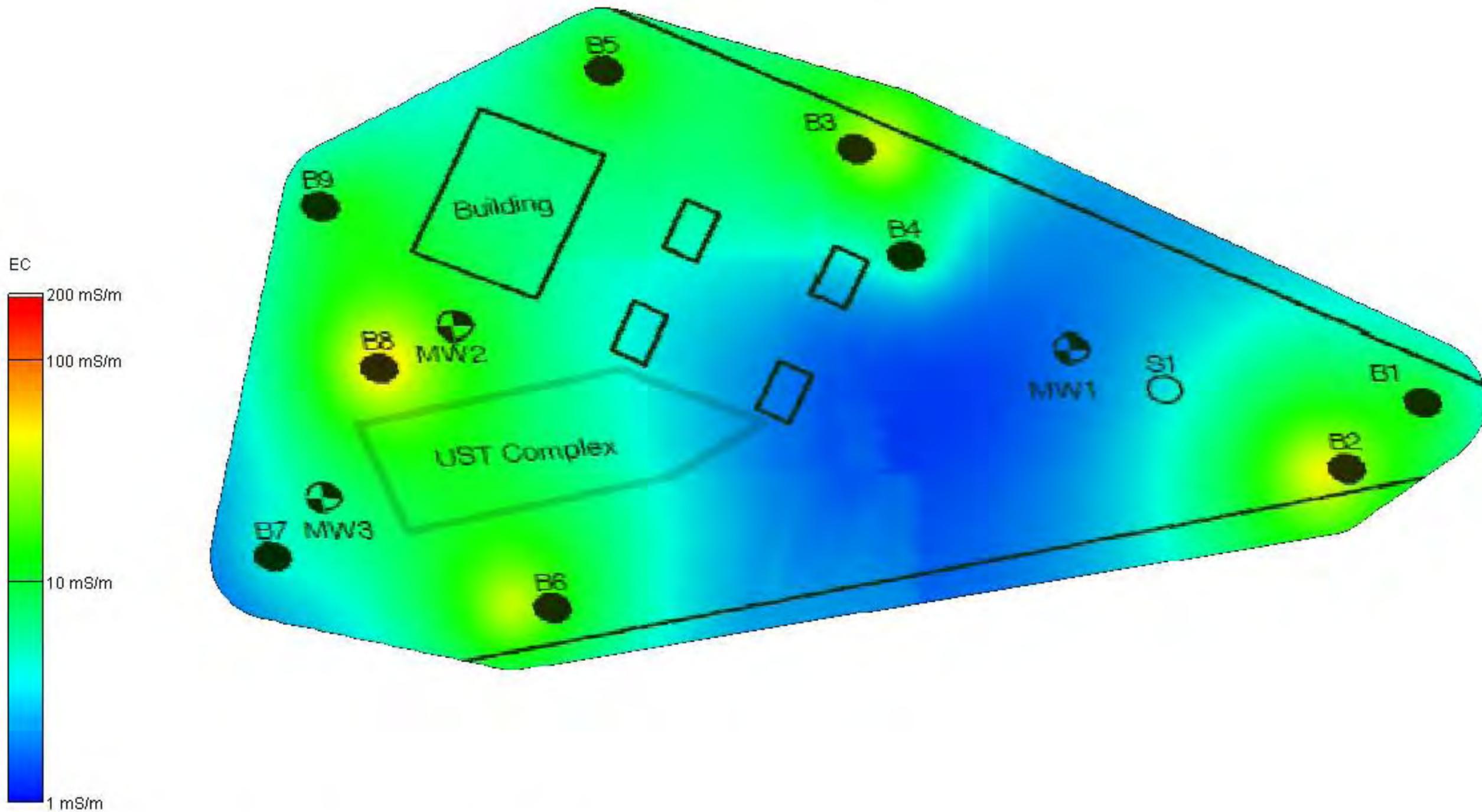
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth 0 ft (MSL)



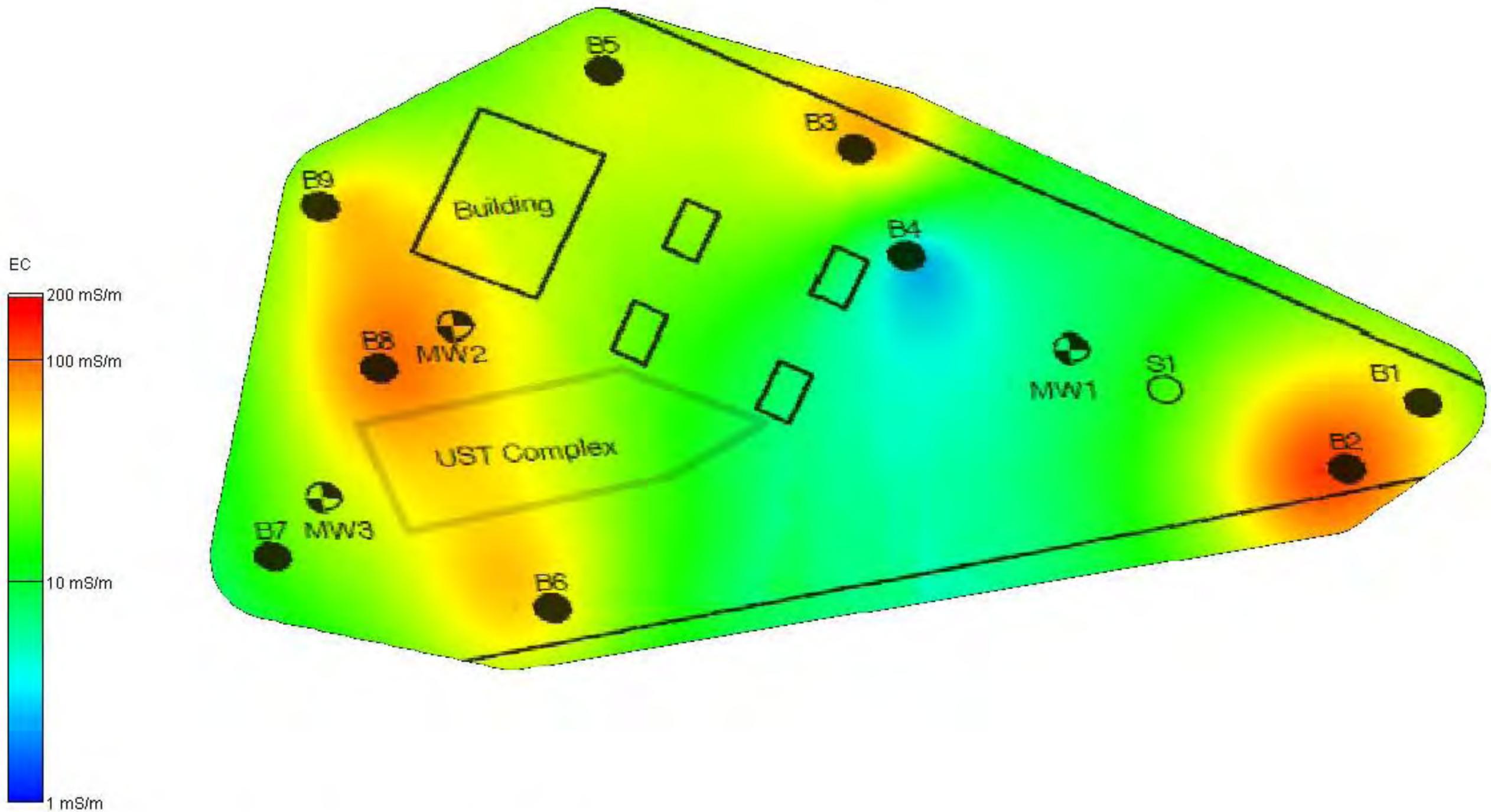
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -1 ft (MSL)



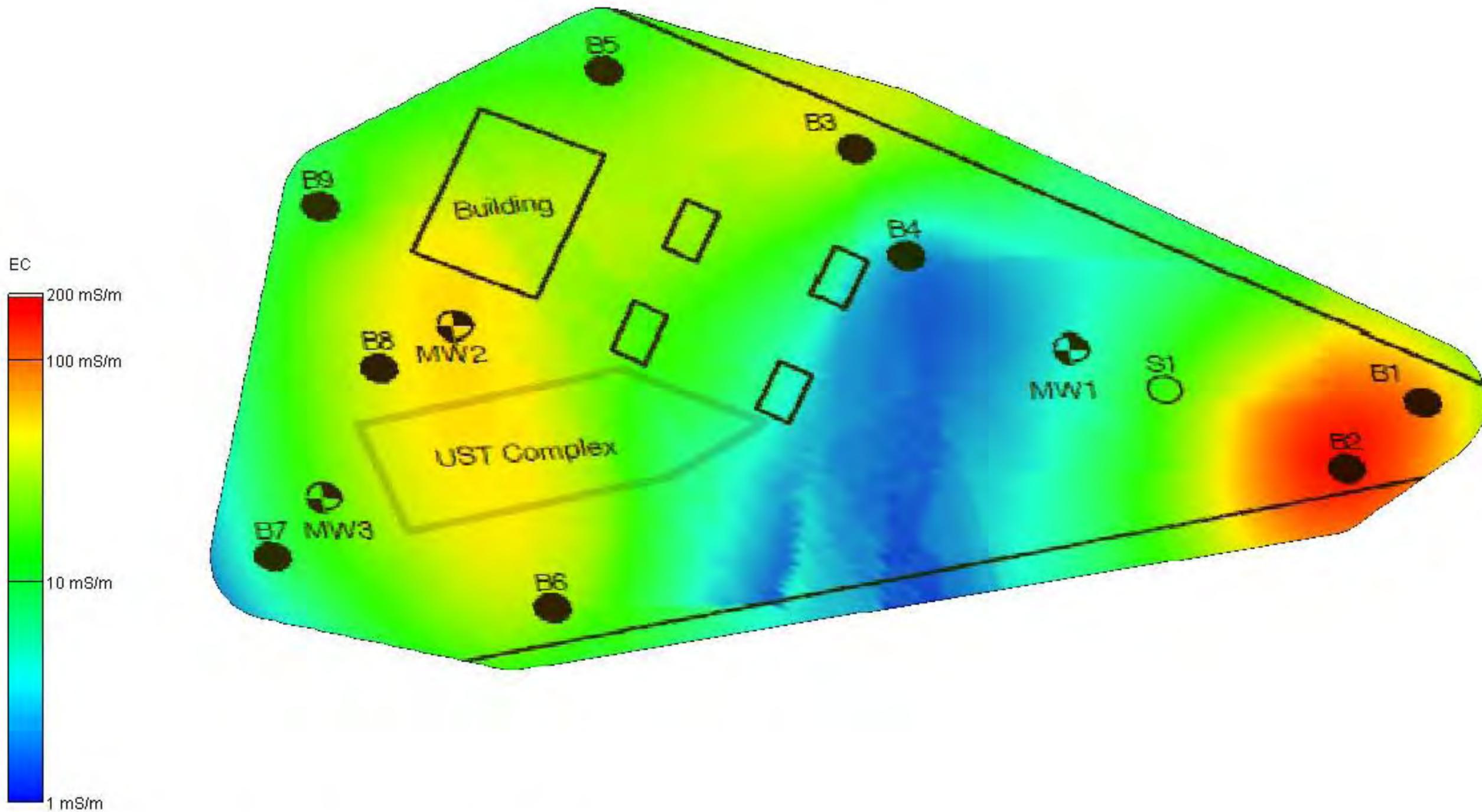
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -2 ft (MSL)



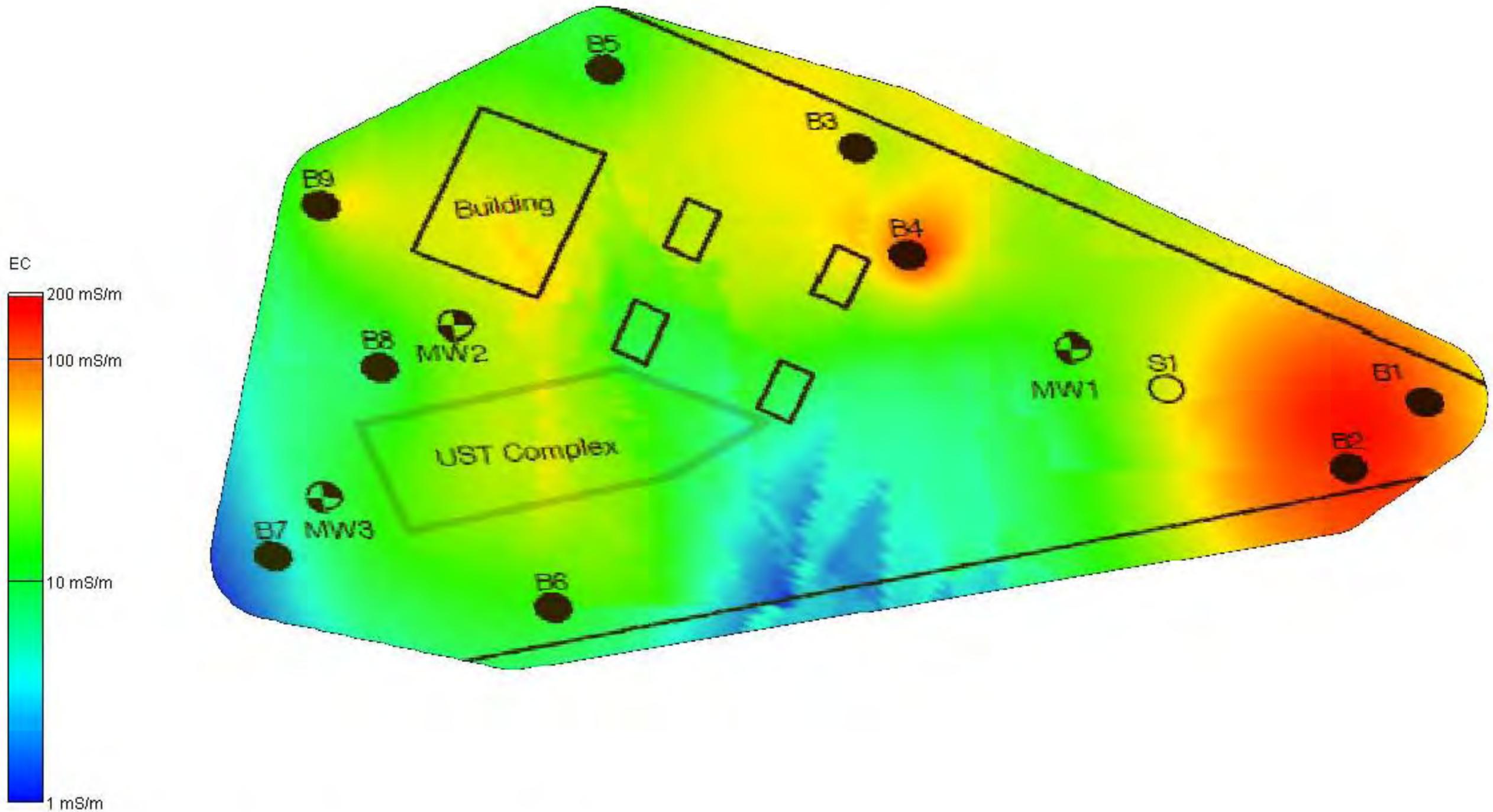
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -3 ft (MSL)



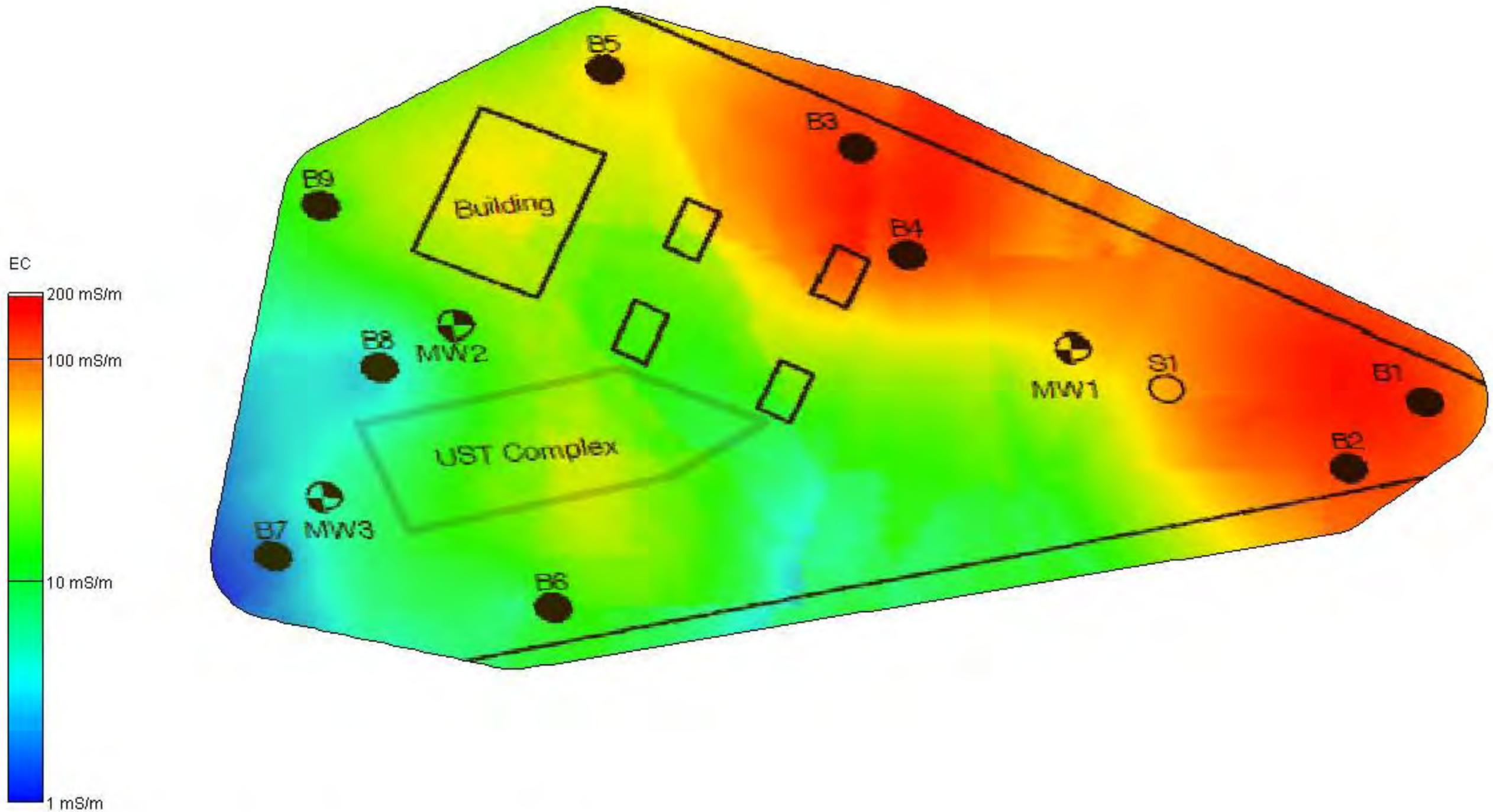
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

**Electrical Conductivity
Depth -4 ft (MSL)**



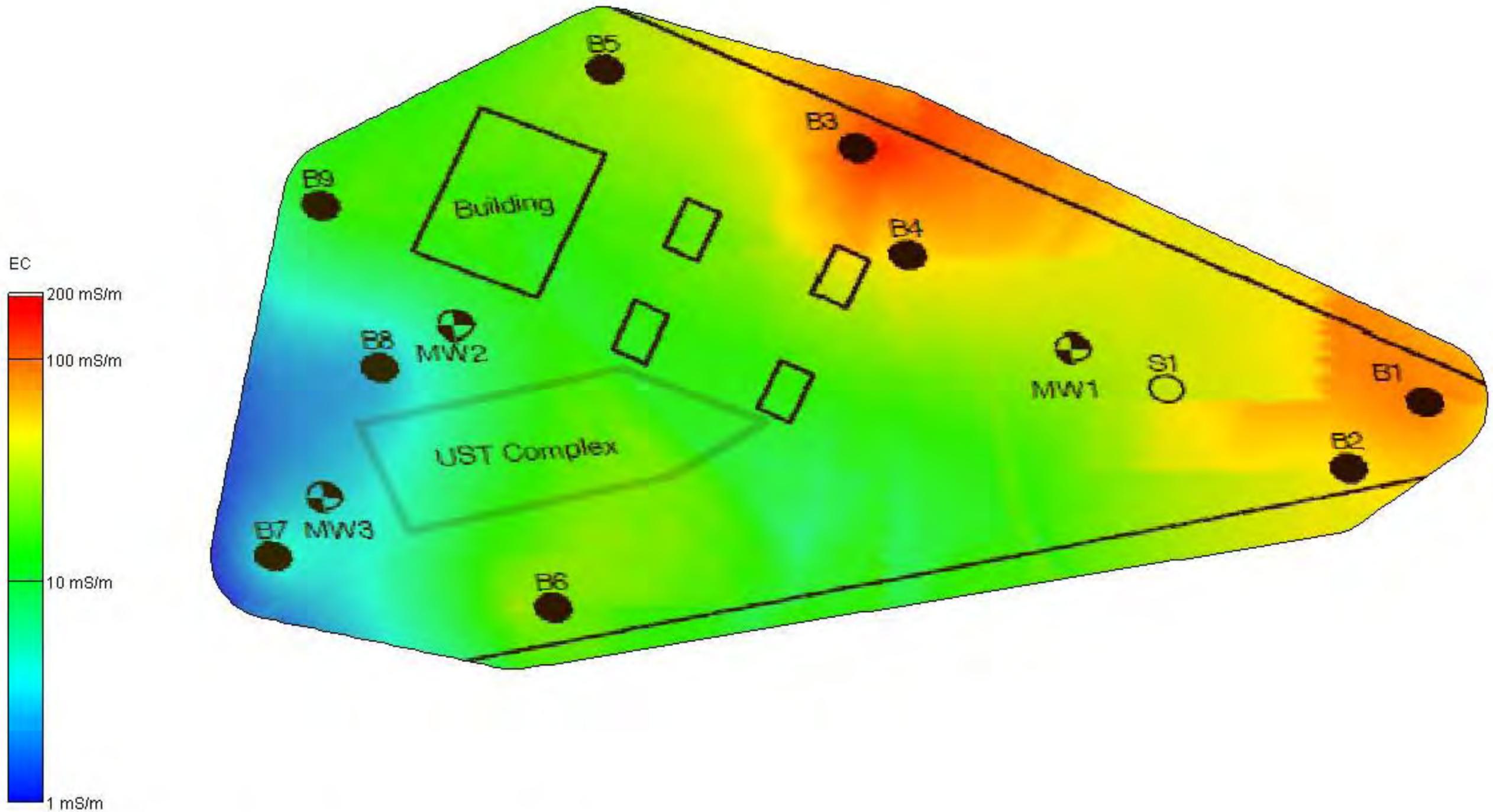
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -5 ft (MSL)



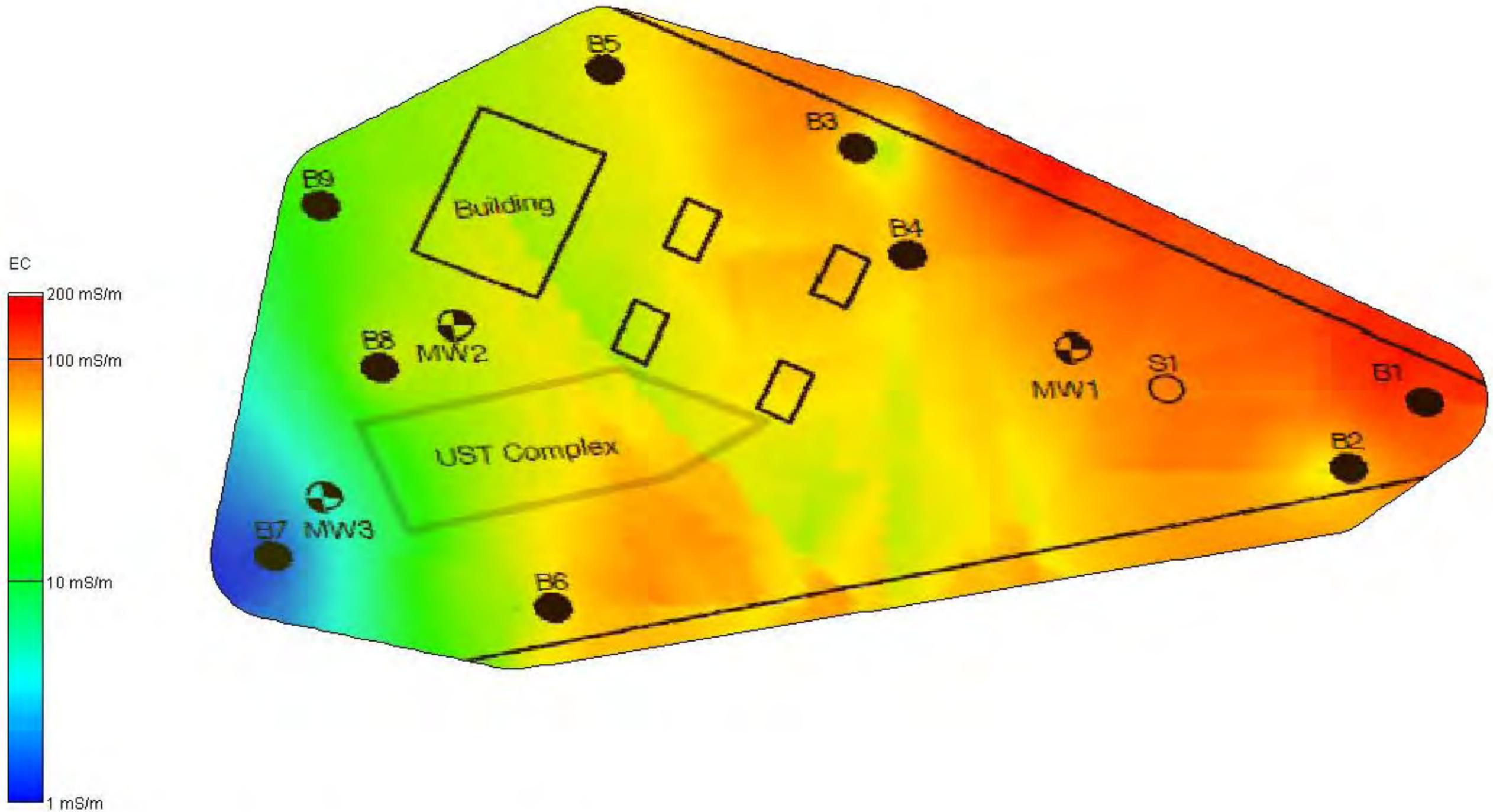
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -6 ft (MSL)



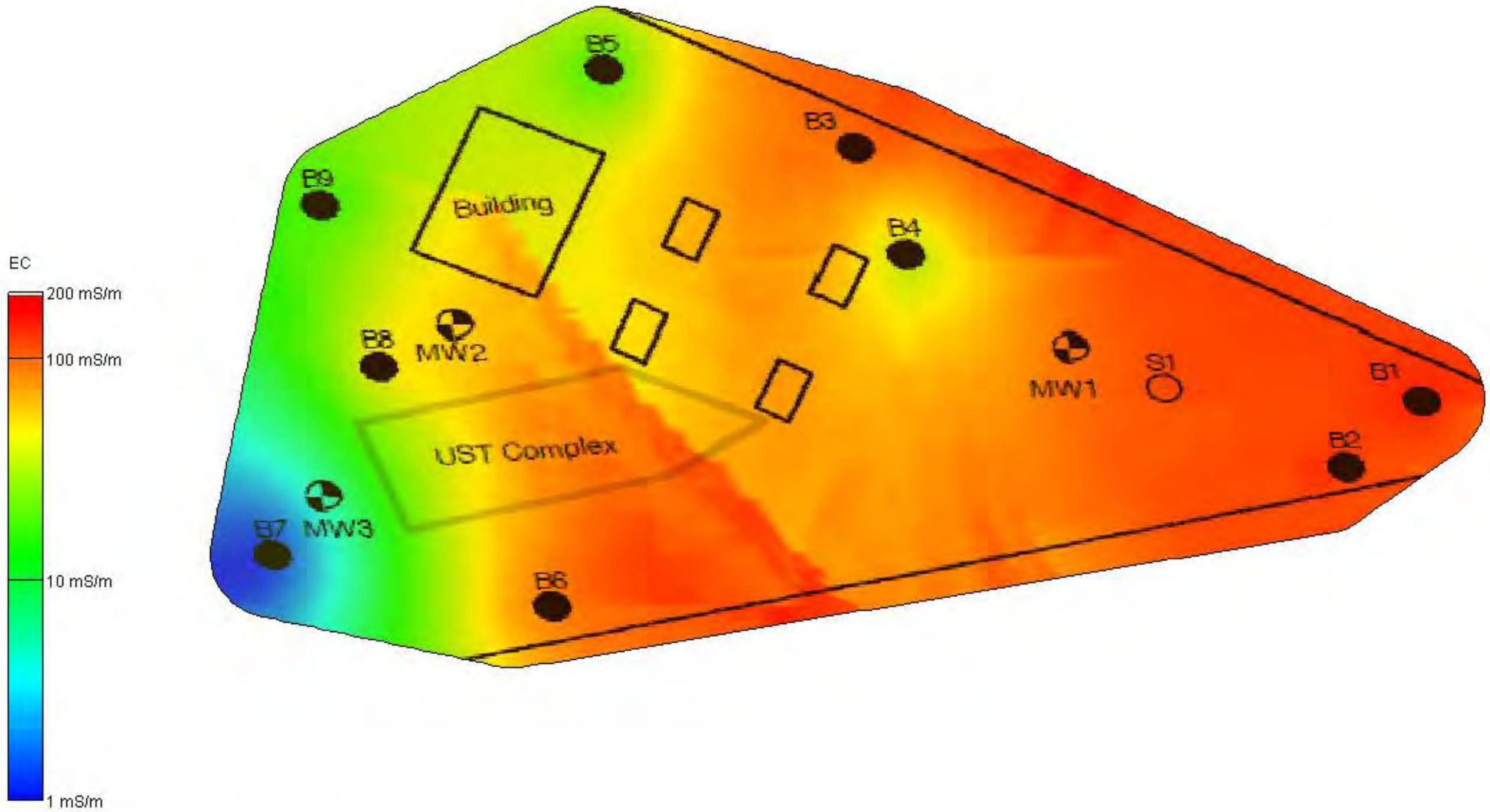
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

**Electrical Conductivity
Depth -7 ft (MSL)**



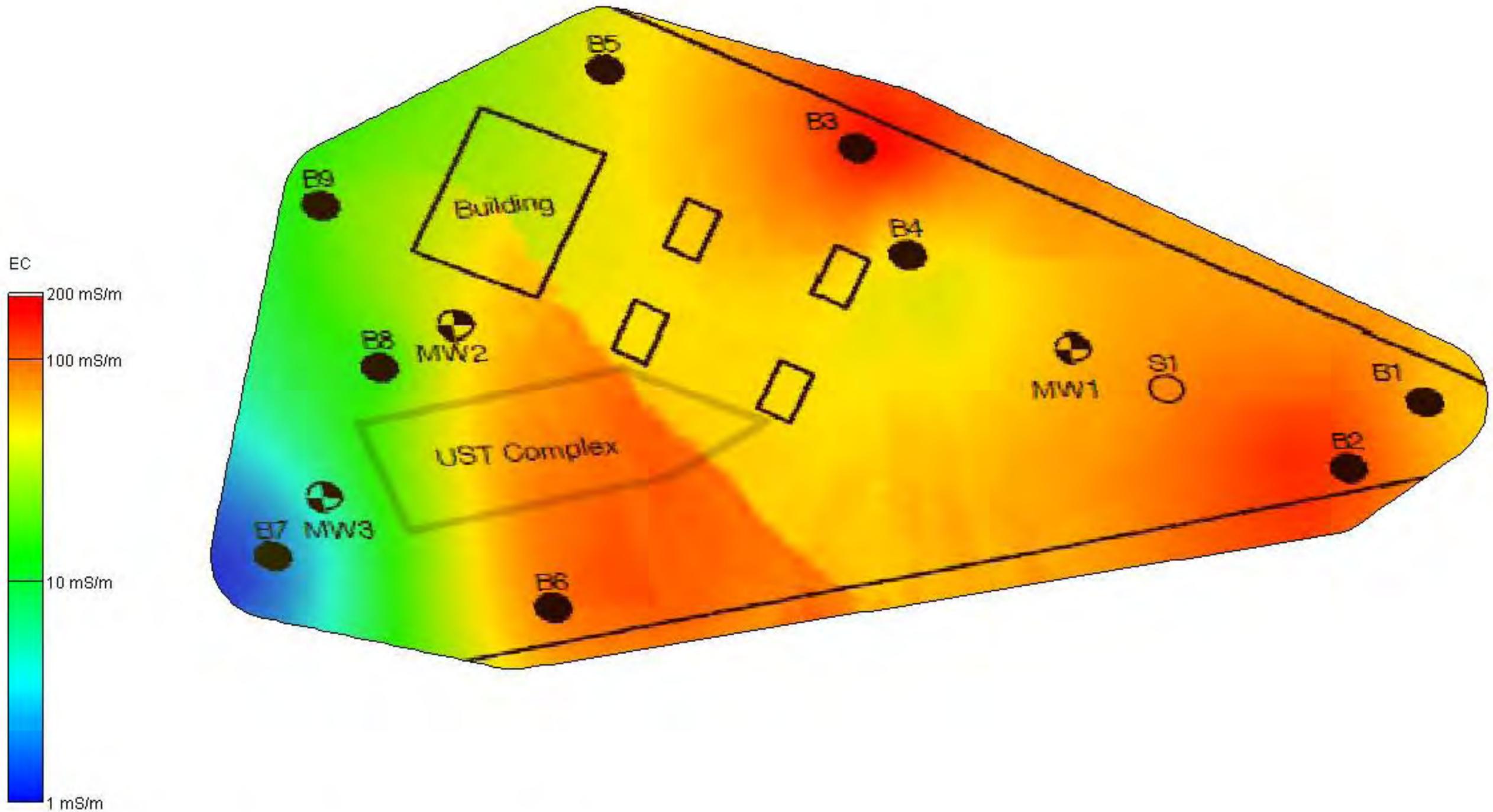
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -8 ft (MSL)



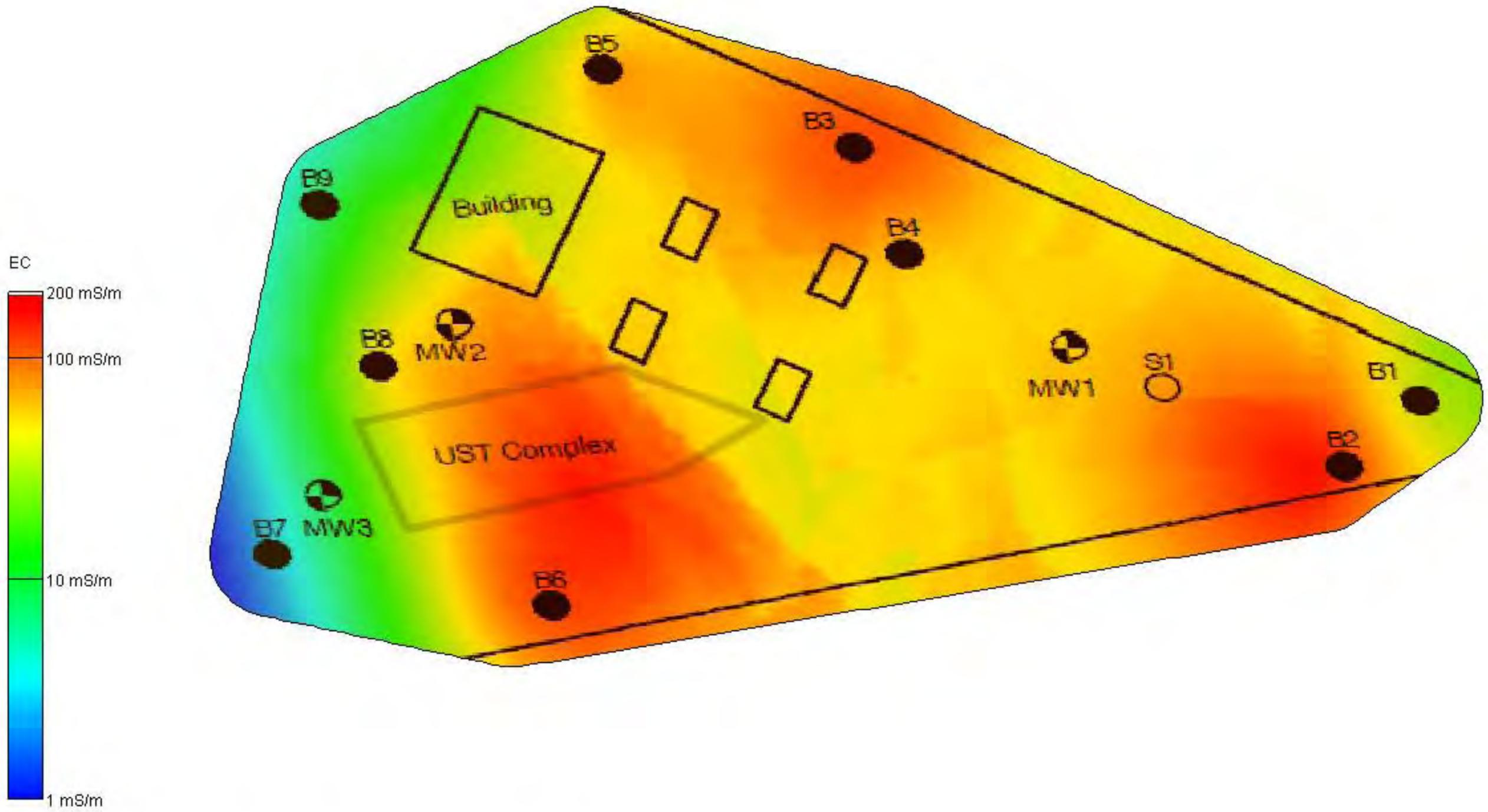
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

**Electrical Conductivity
Depth -9 ft (MSL)**



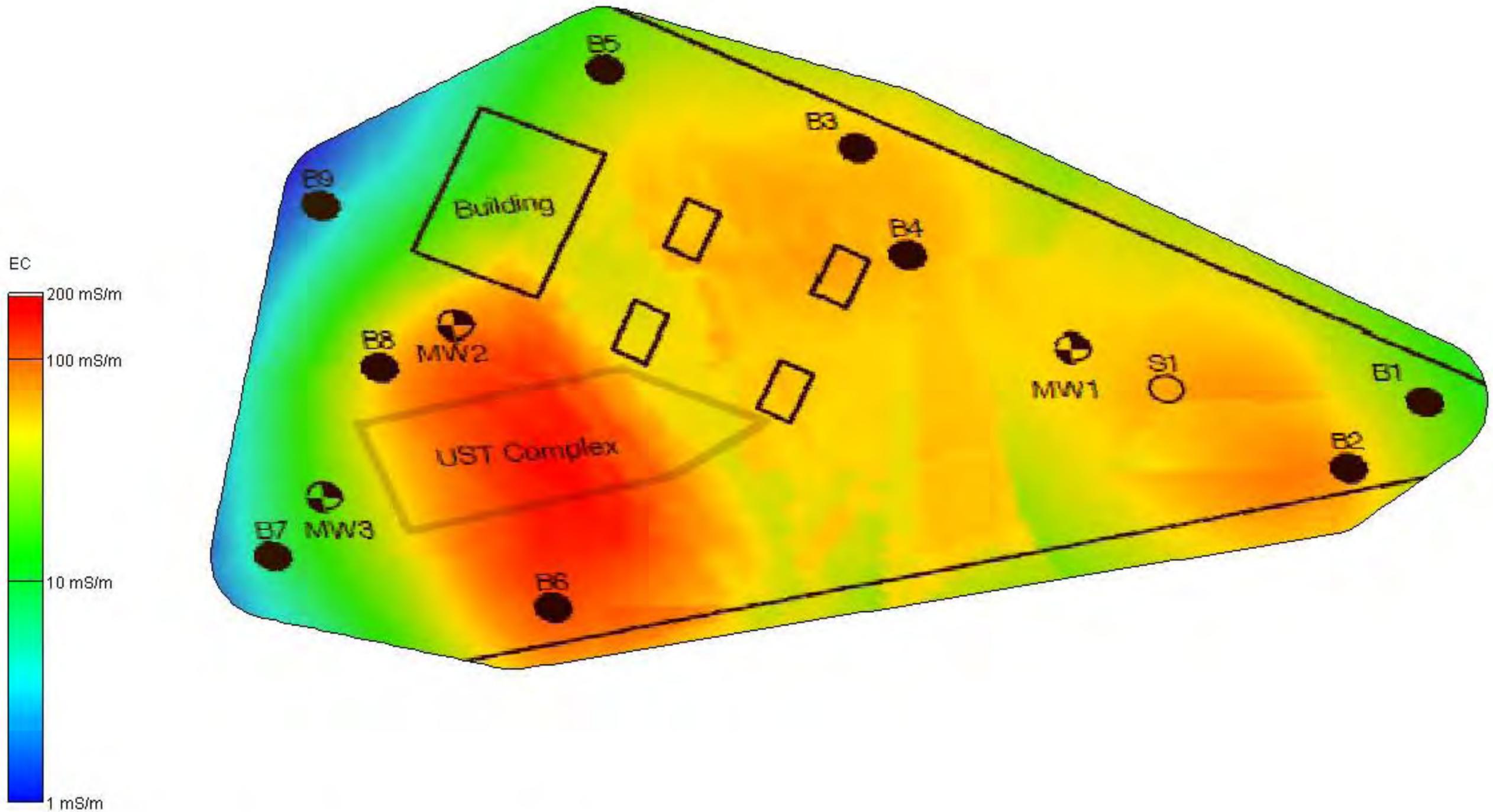
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -10 ft (MSL)



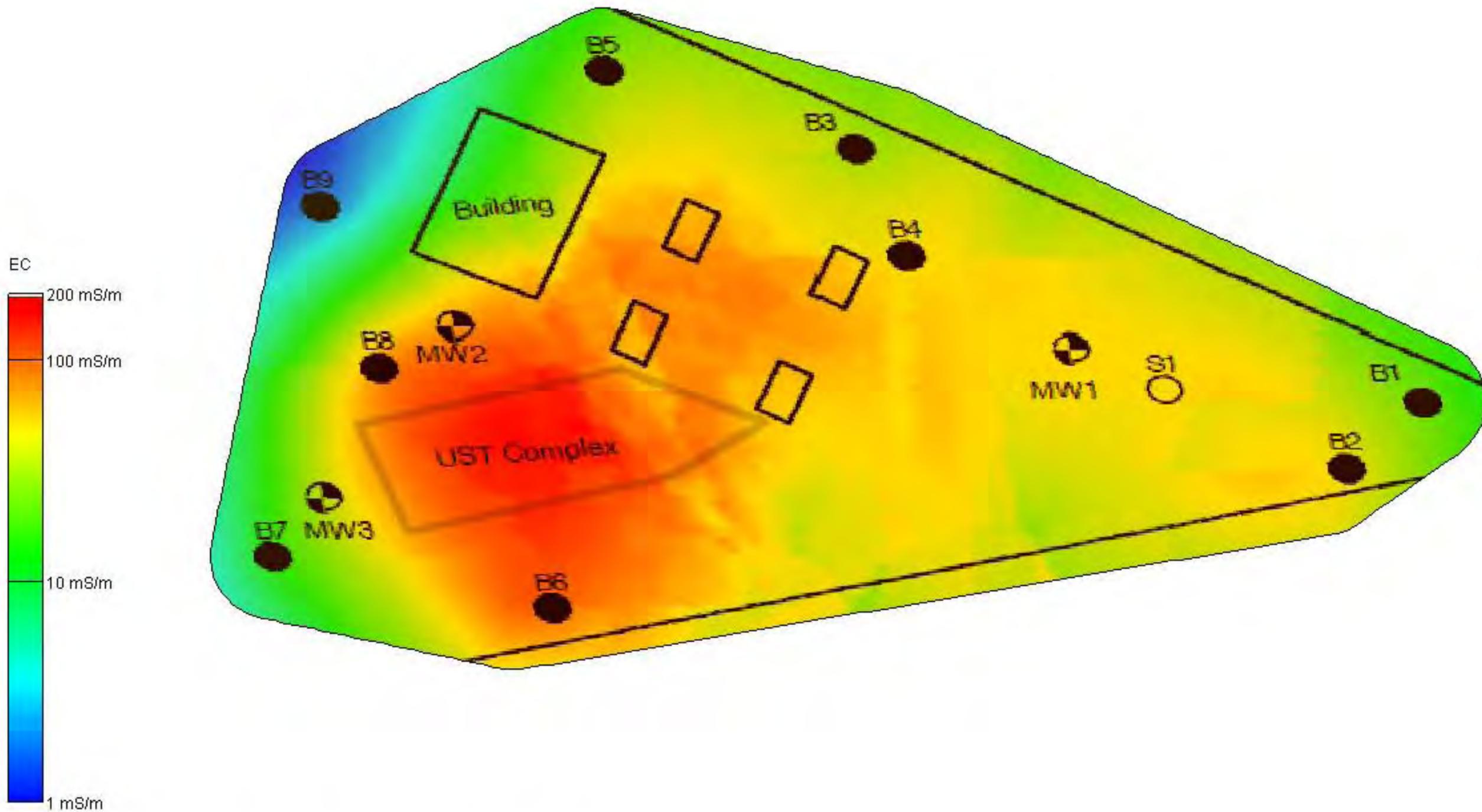
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -11 ft (MSL)



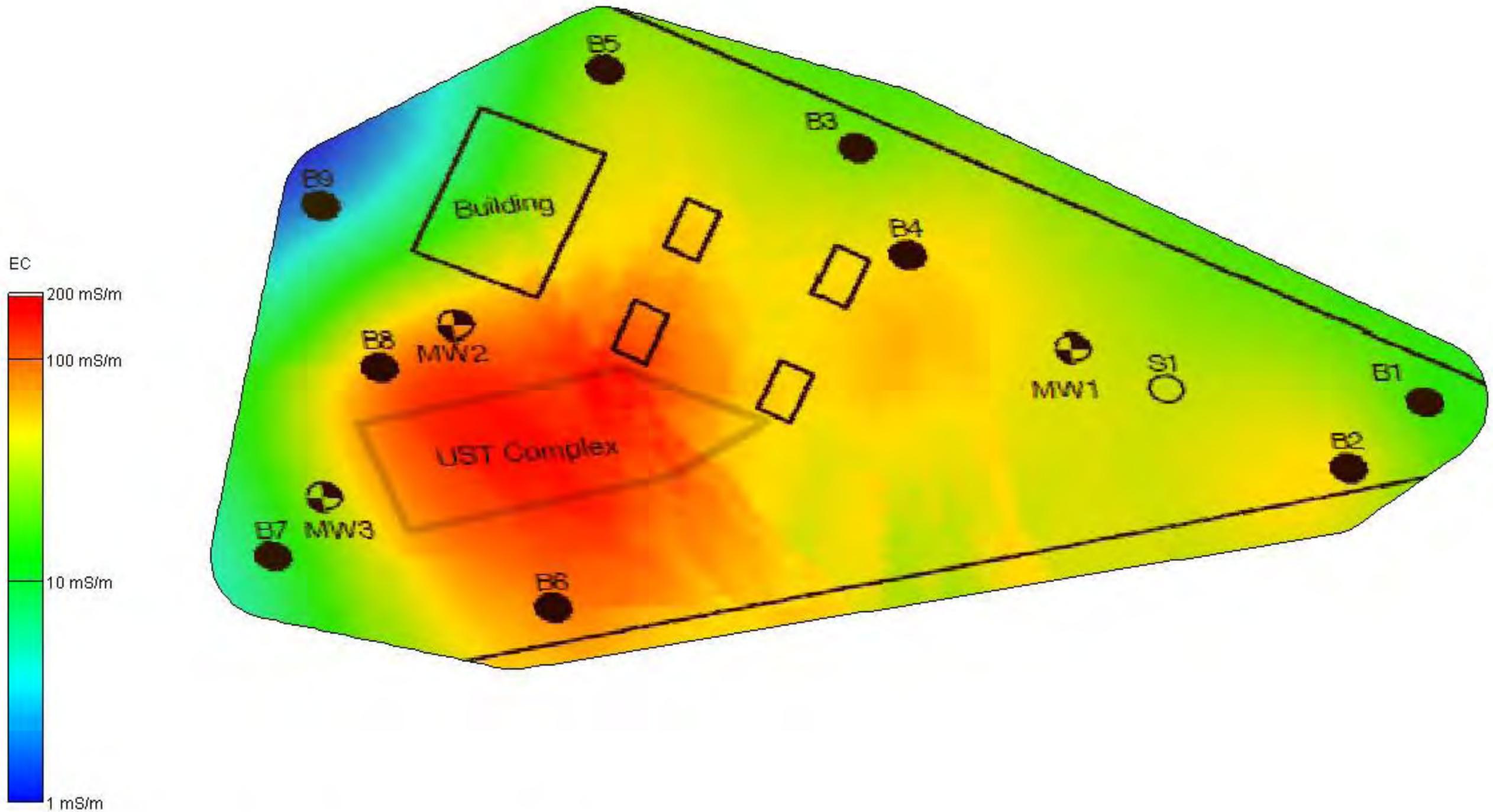
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

**Electrical Conductivity
Depth -12 ft (MSL)**



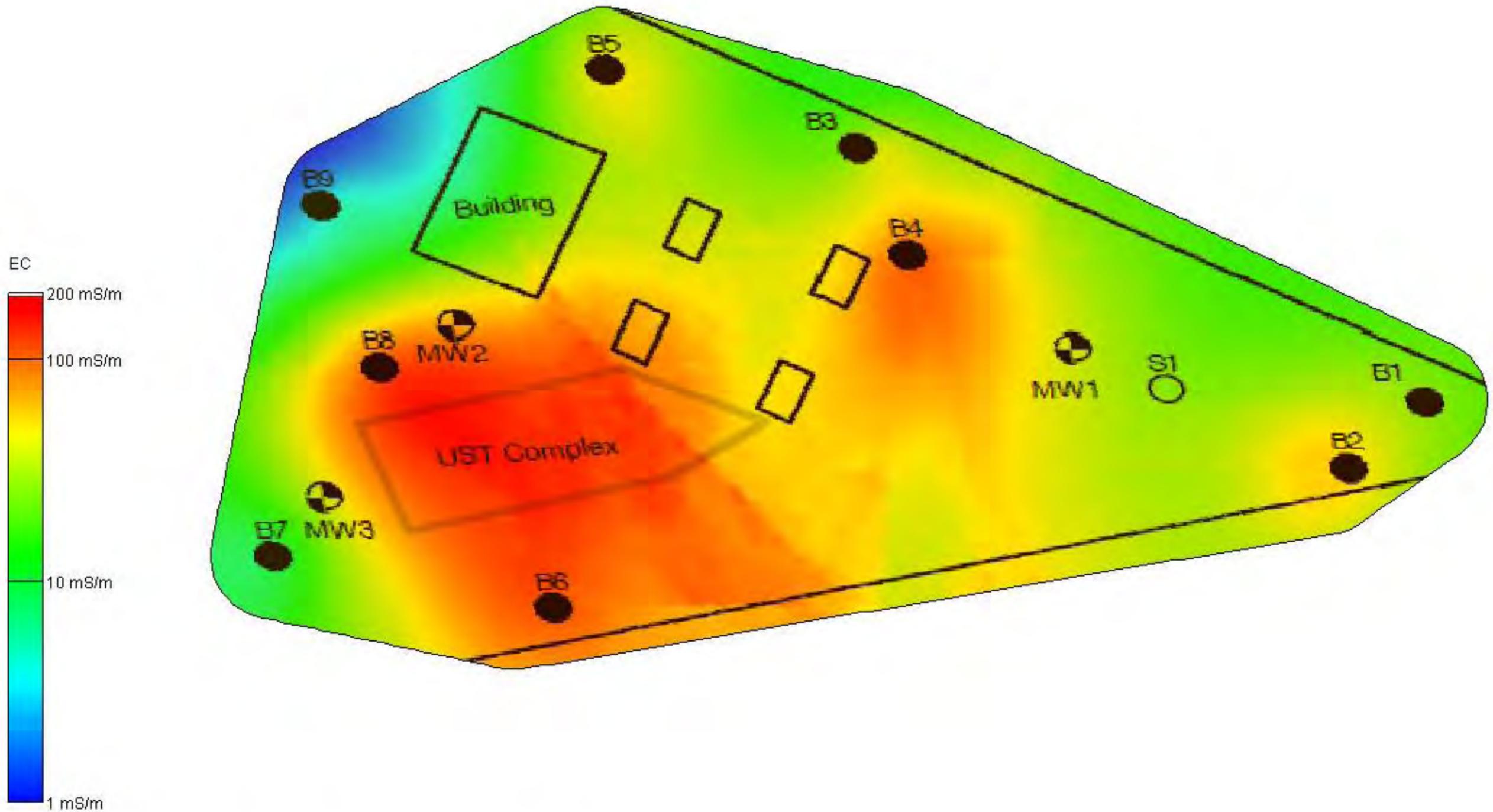
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -13 ft (MSL)



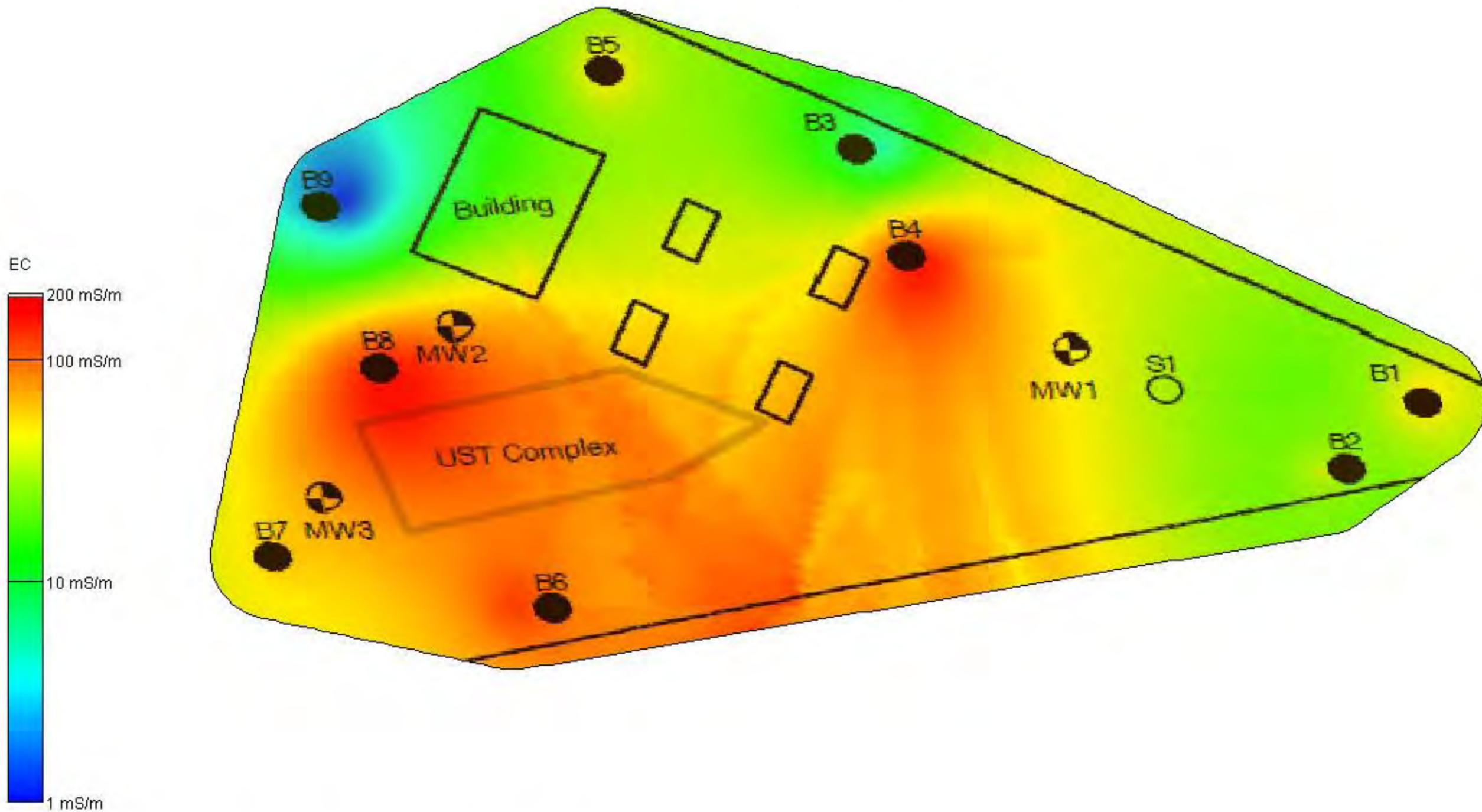
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -14 ft (MSL)



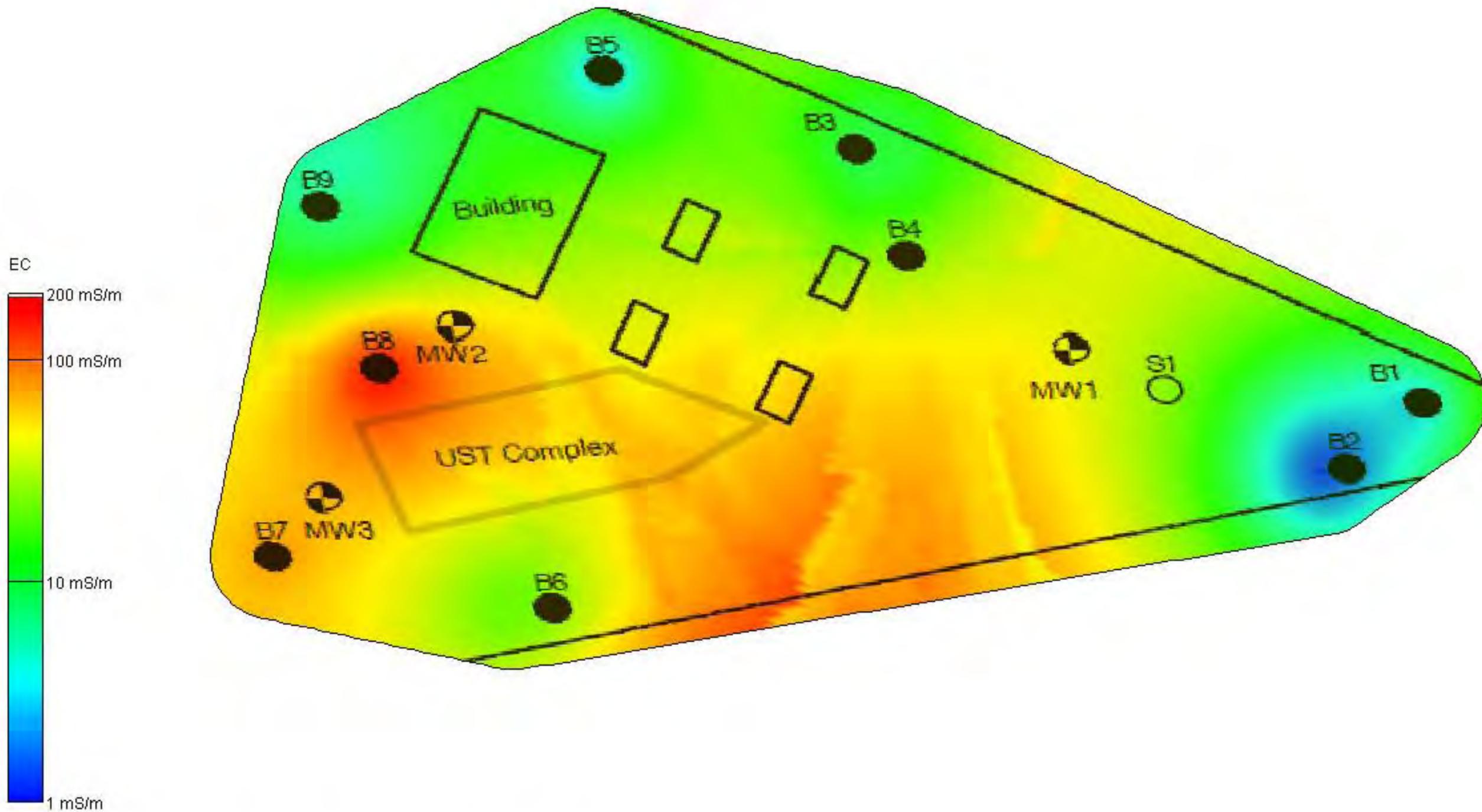
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -15 ft (MSL)



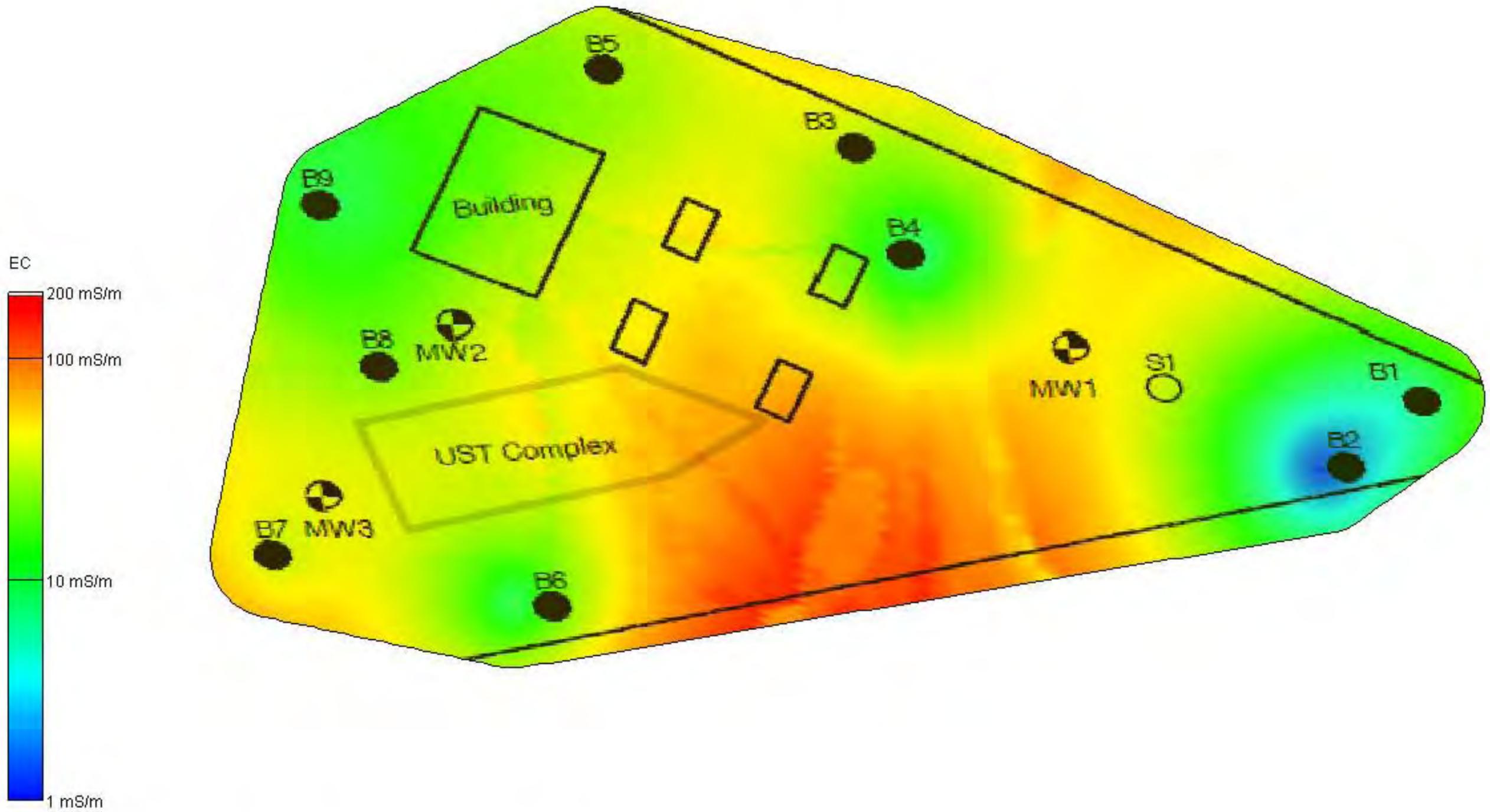
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -16 ft (MSL)



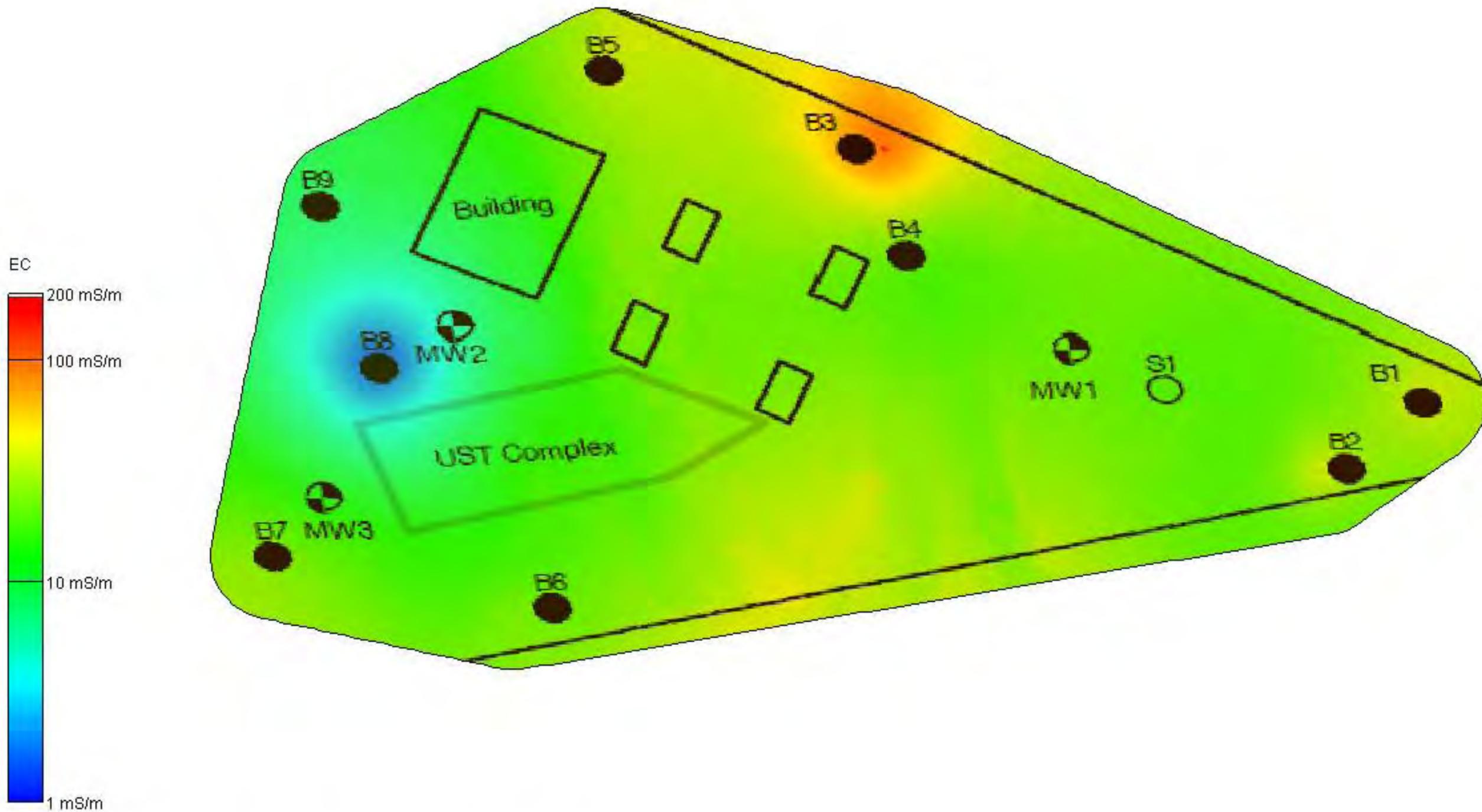
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -17 ft (MSL)



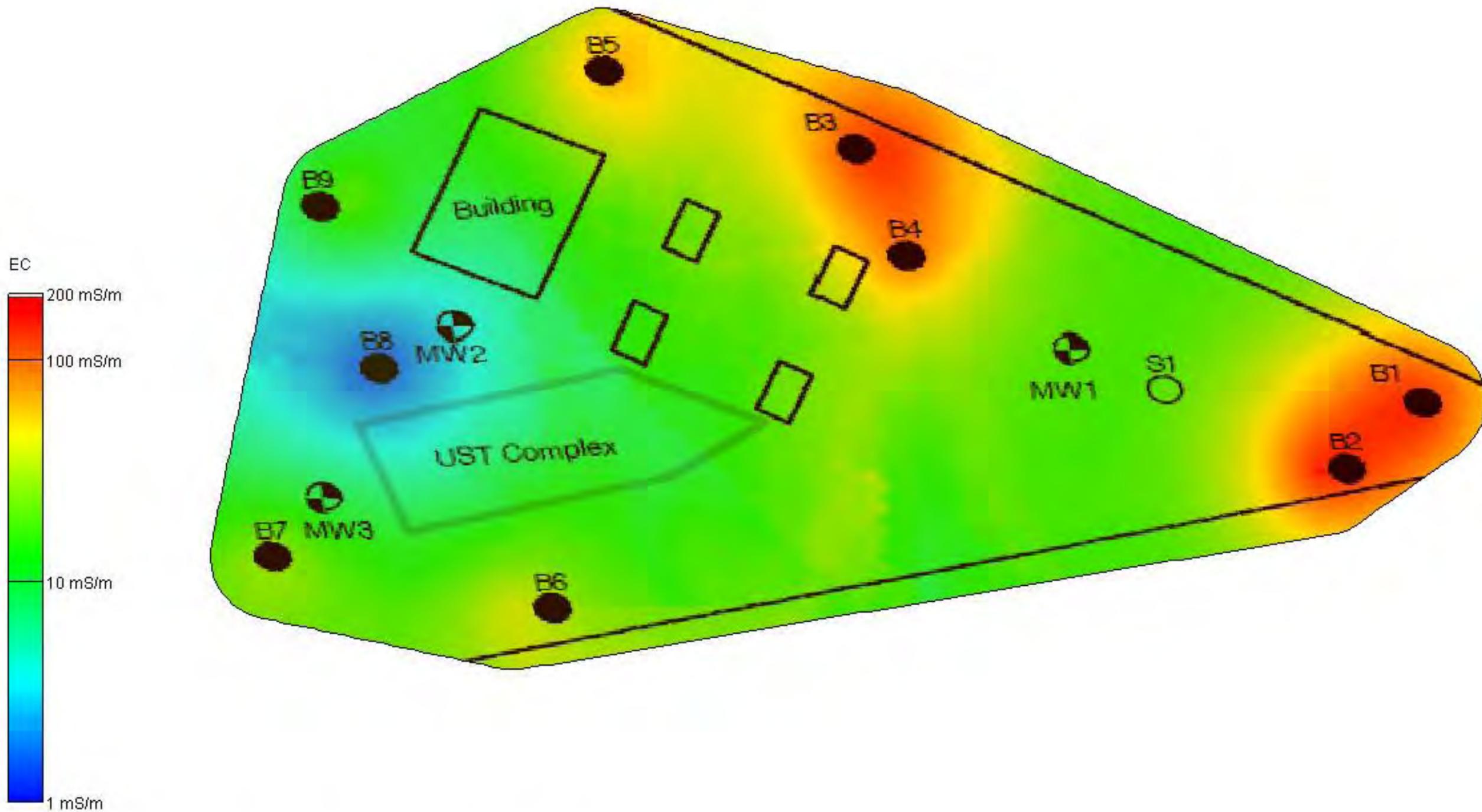
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

**Electrical Conductivity
Depth -18 ft (MSL)**



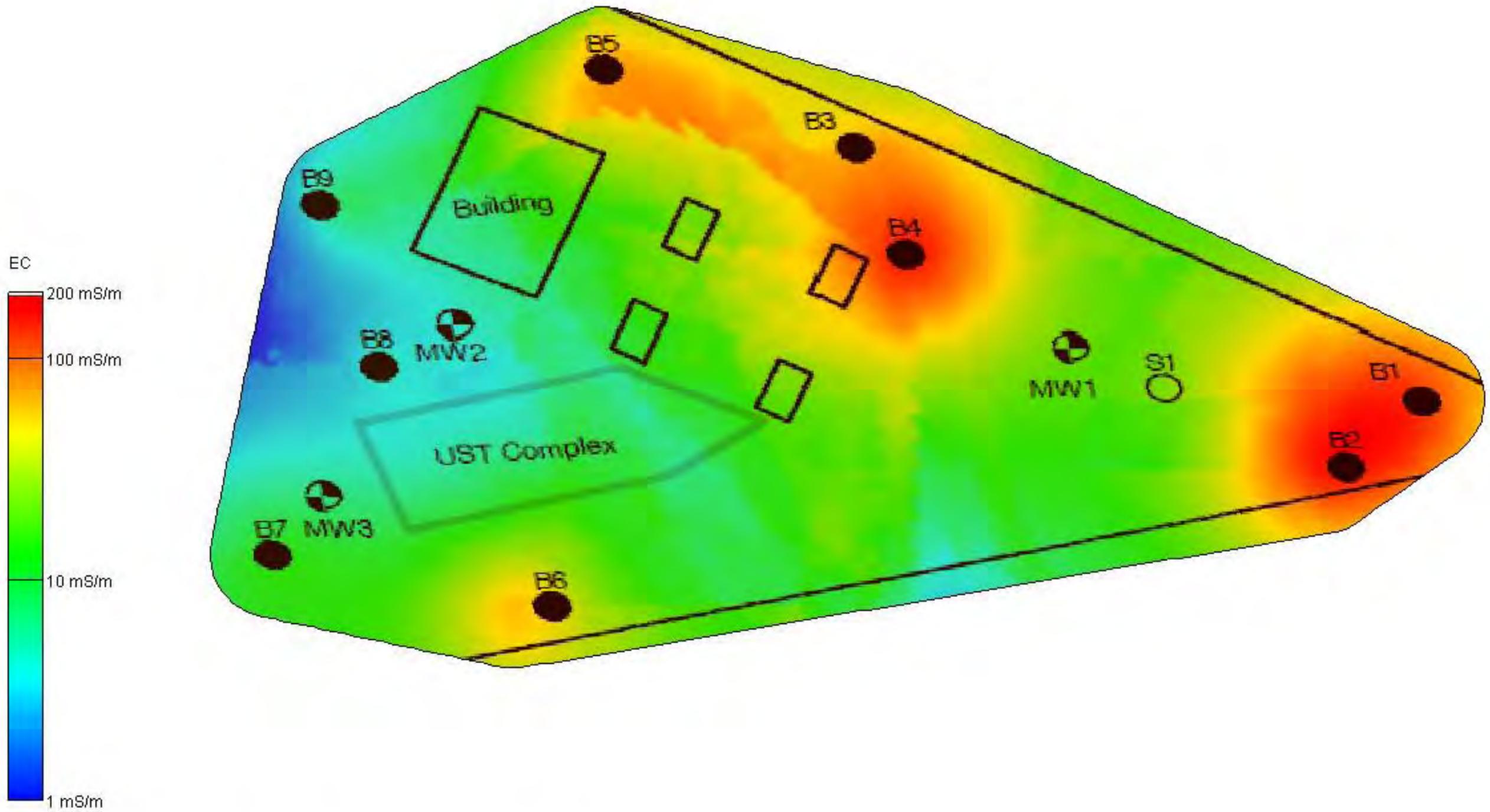
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -19 ft (MSL)



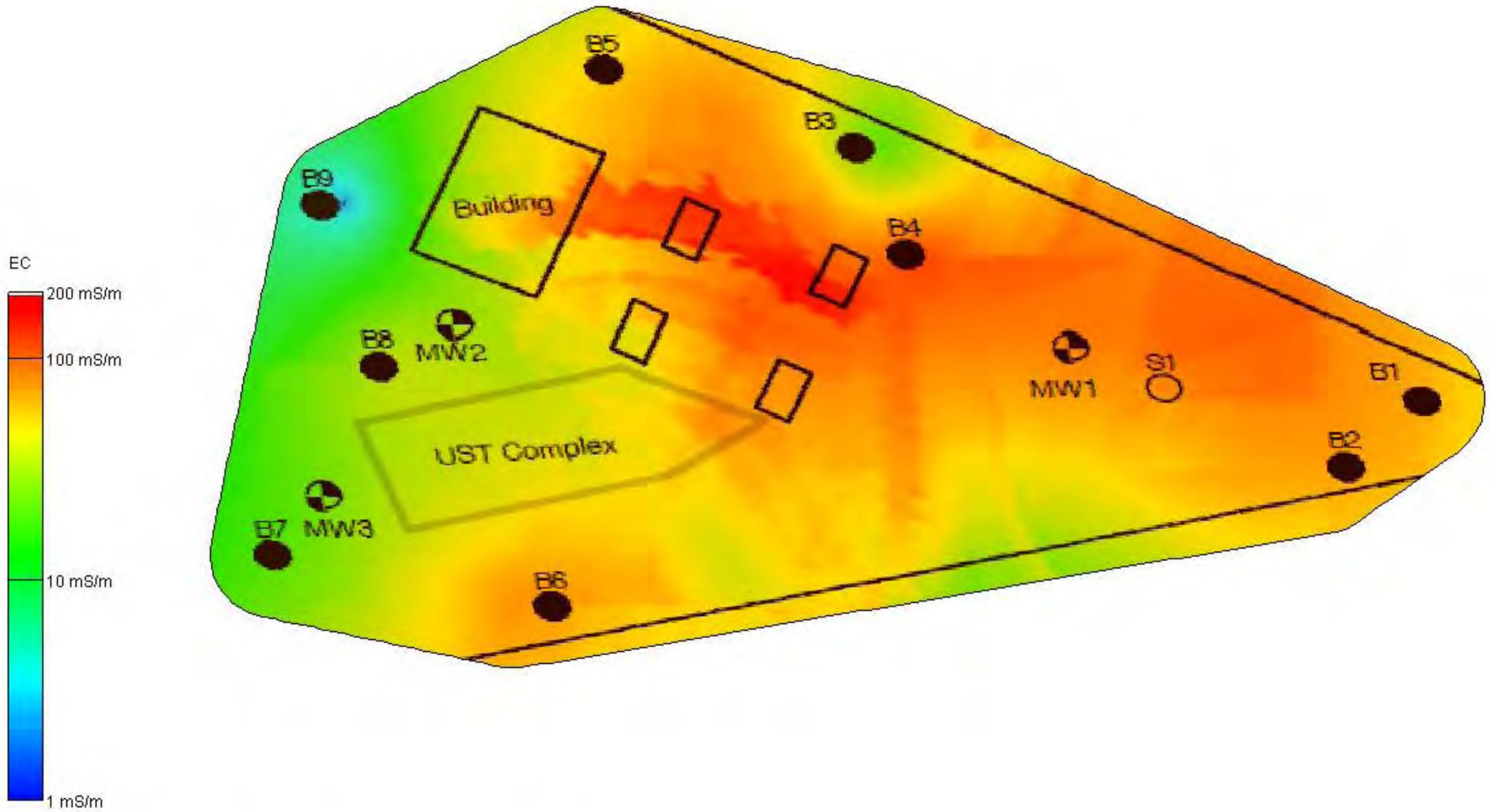
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

**Electrical Conductivity
Depth -21 ft (MSL)**



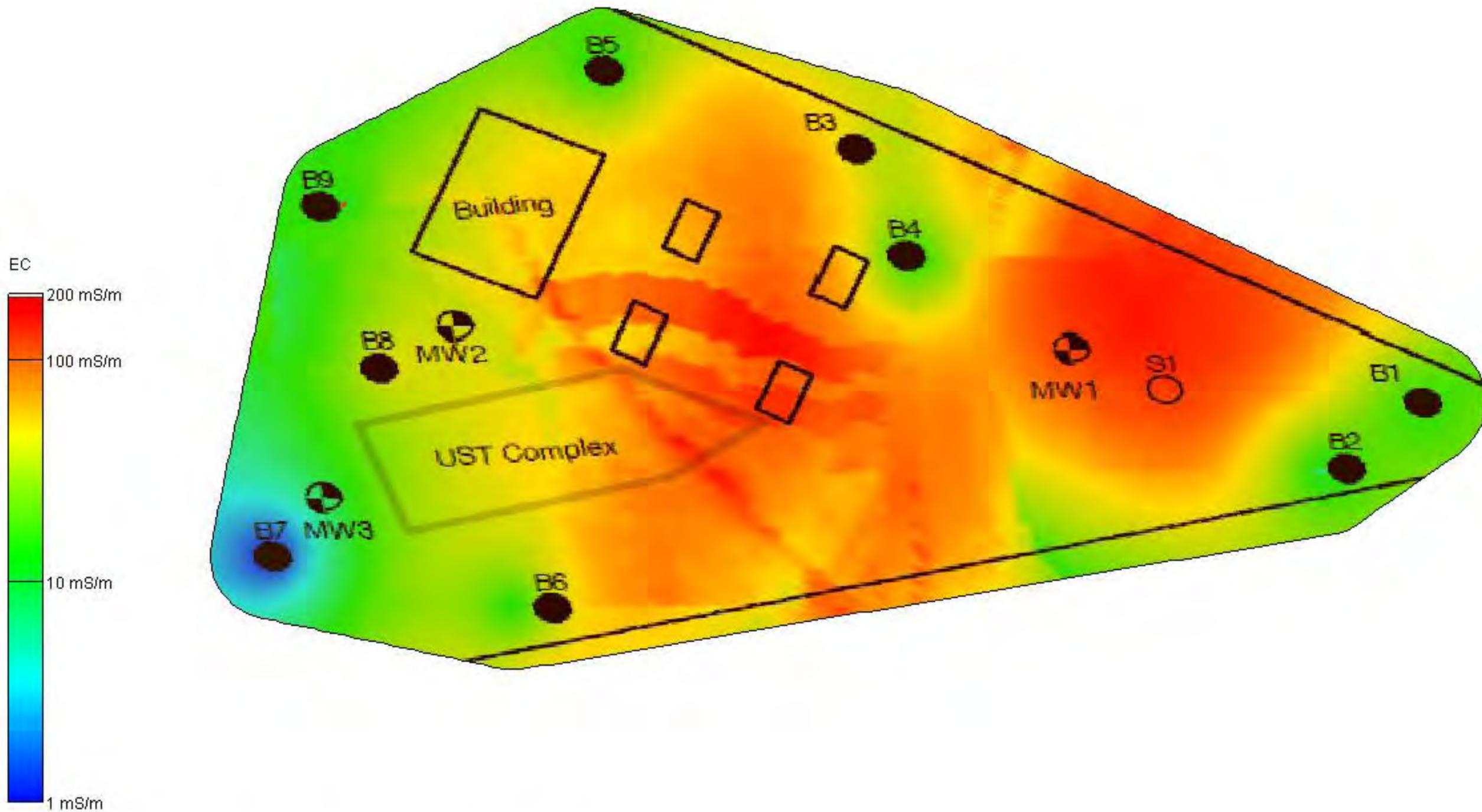
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -22 ft (MSL)



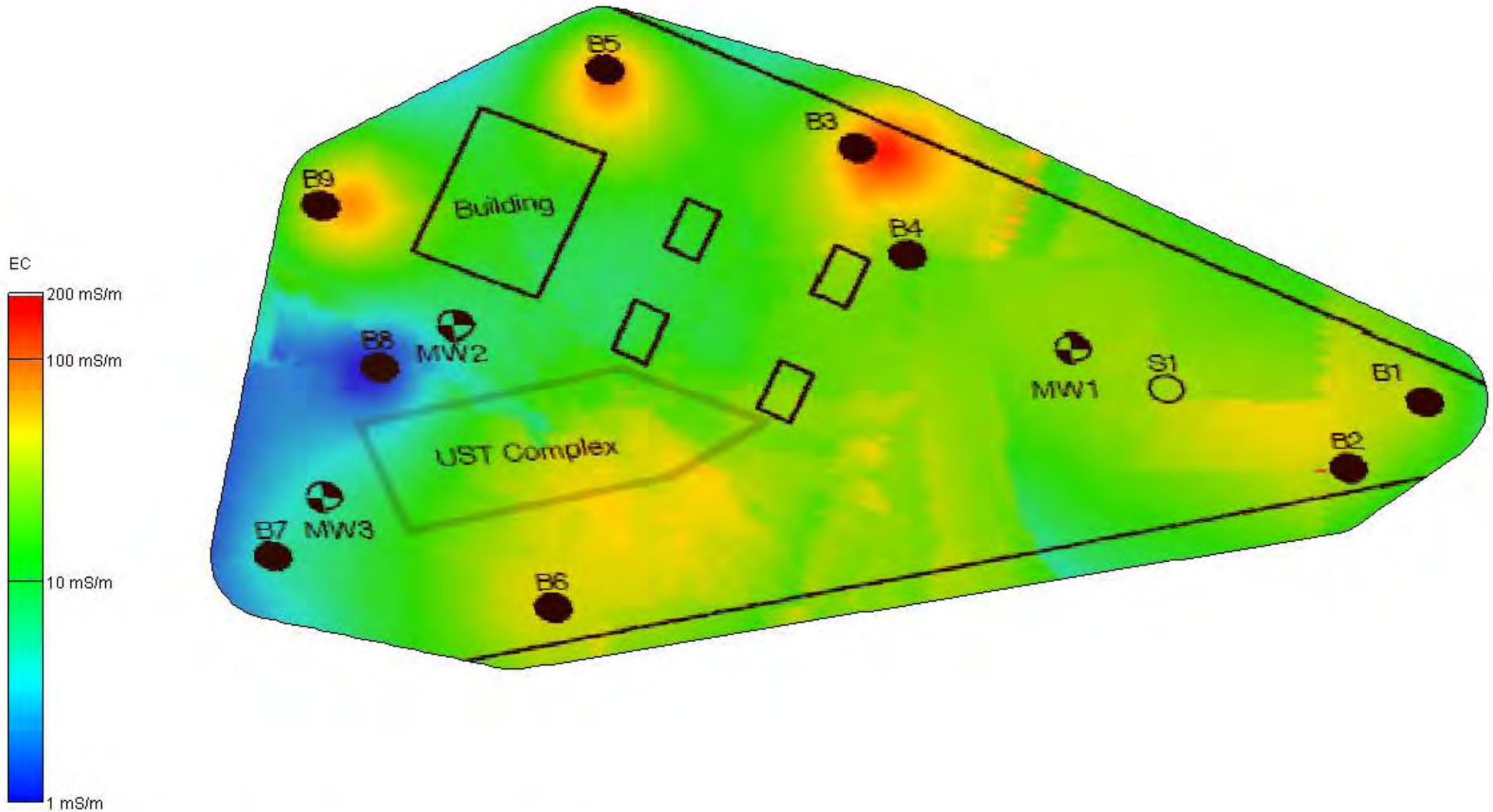
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -23 ft (MSL)



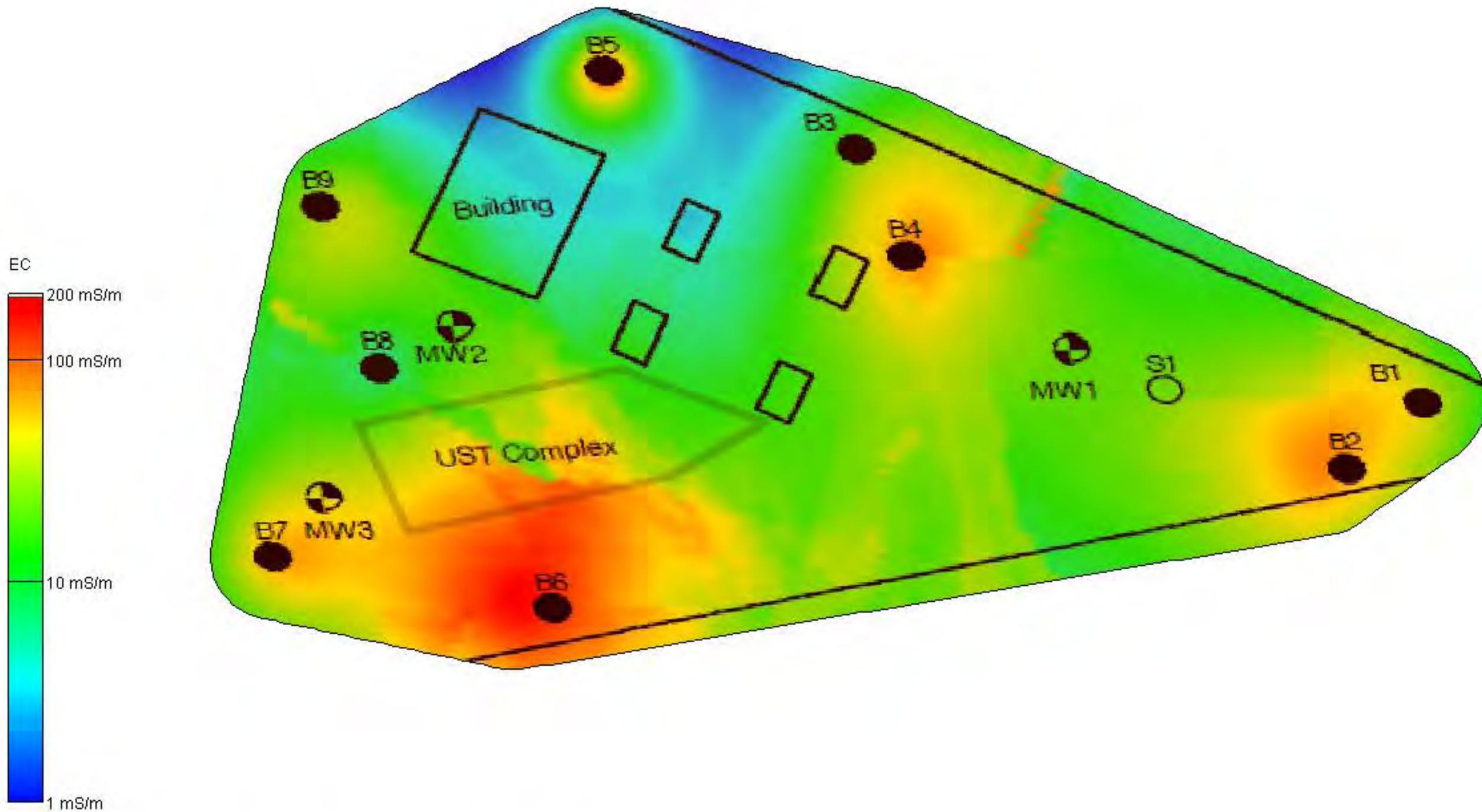
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

**Electrical Conductivity
Depth -24 ft (MSL)**



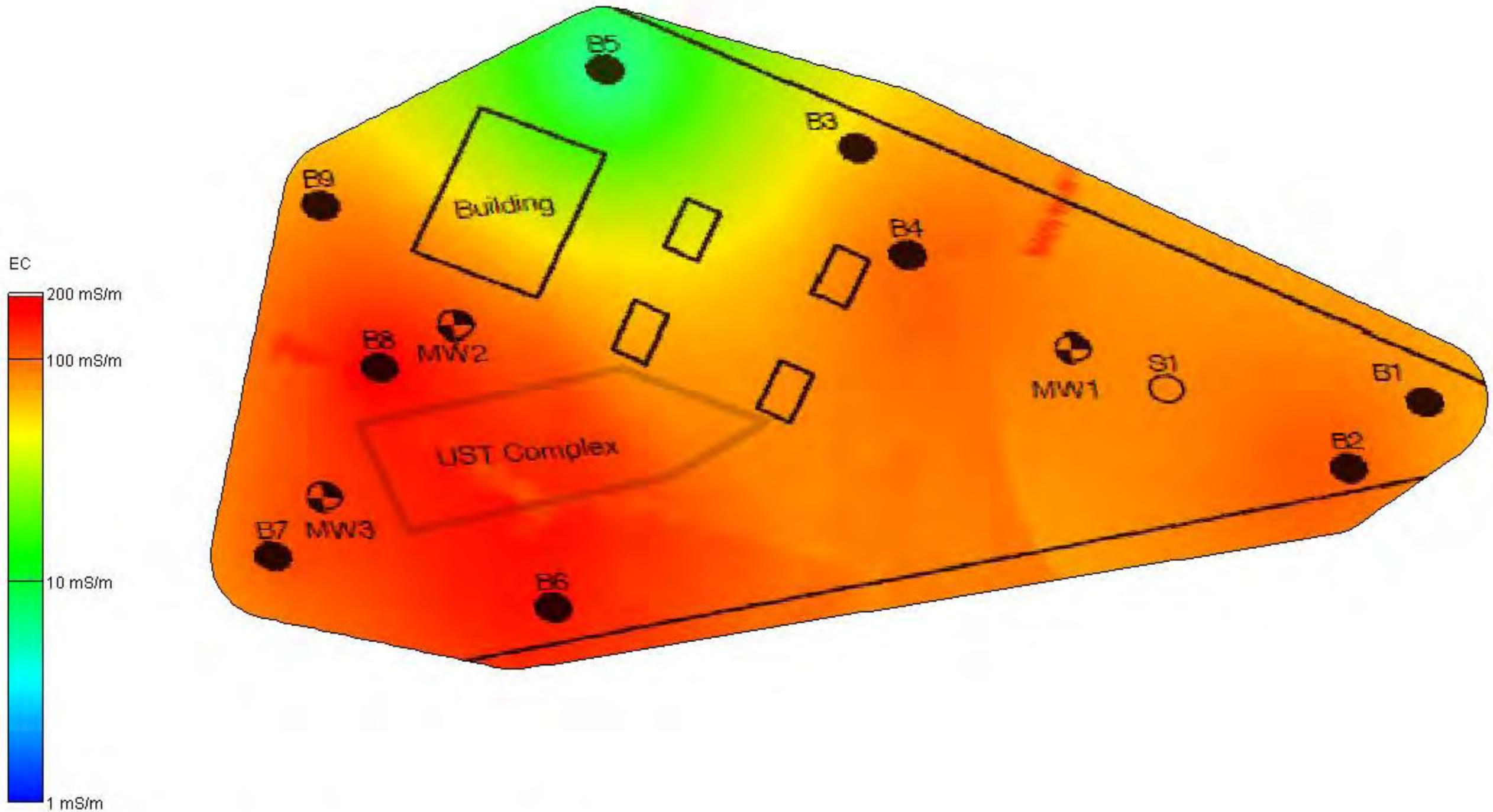
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -25 ft (MSL)



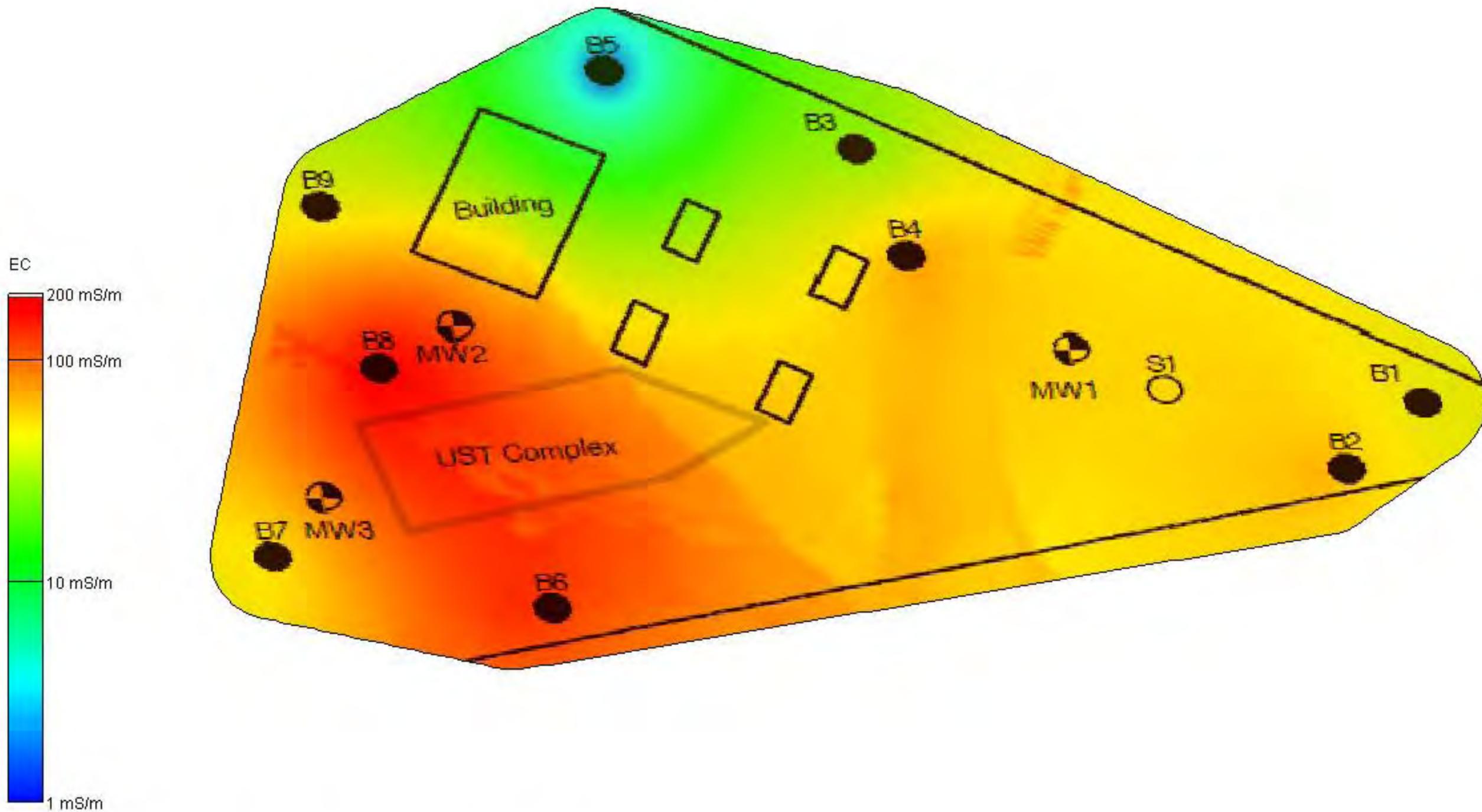
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -26 ft (MSL)



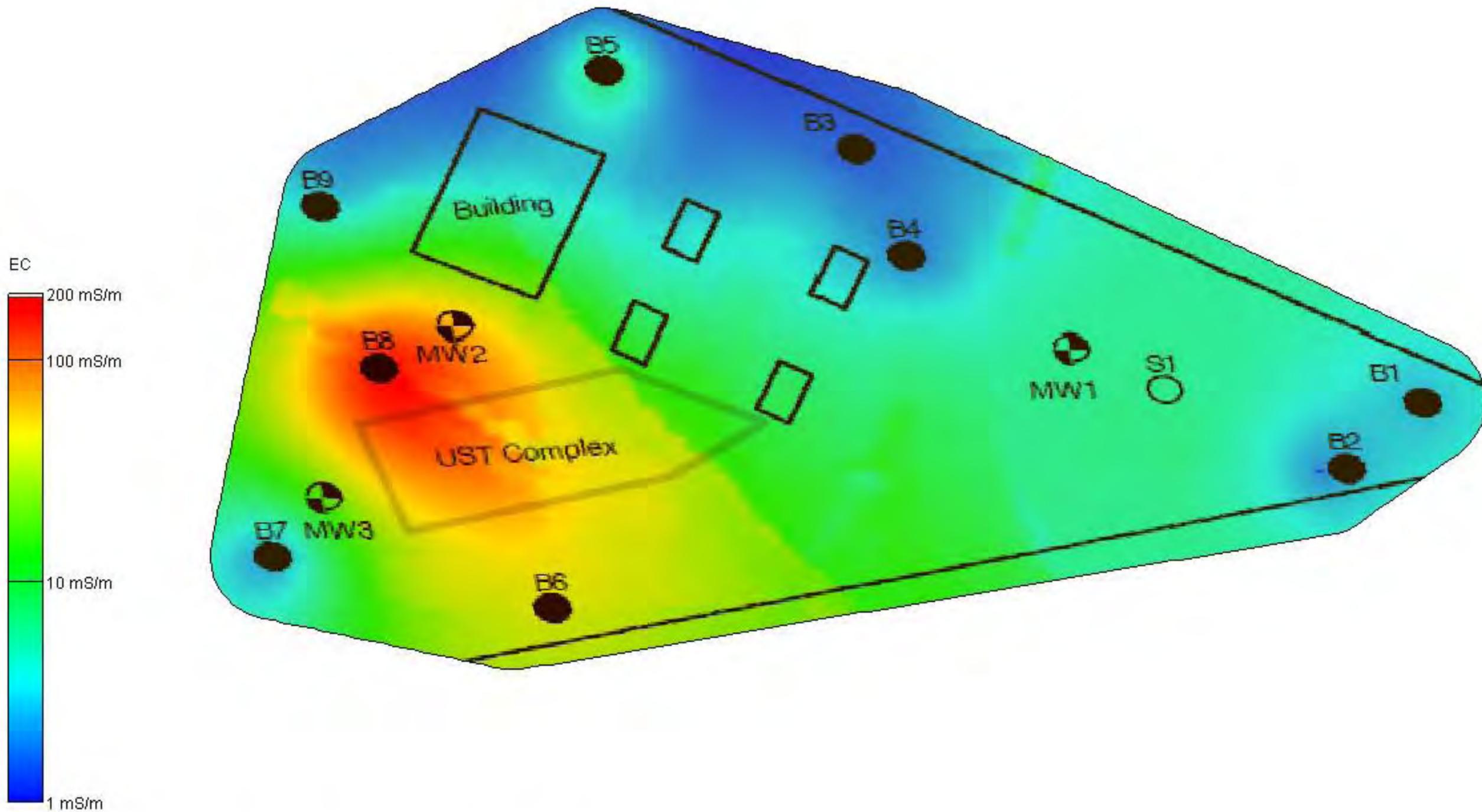
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -27 ft (MSL)



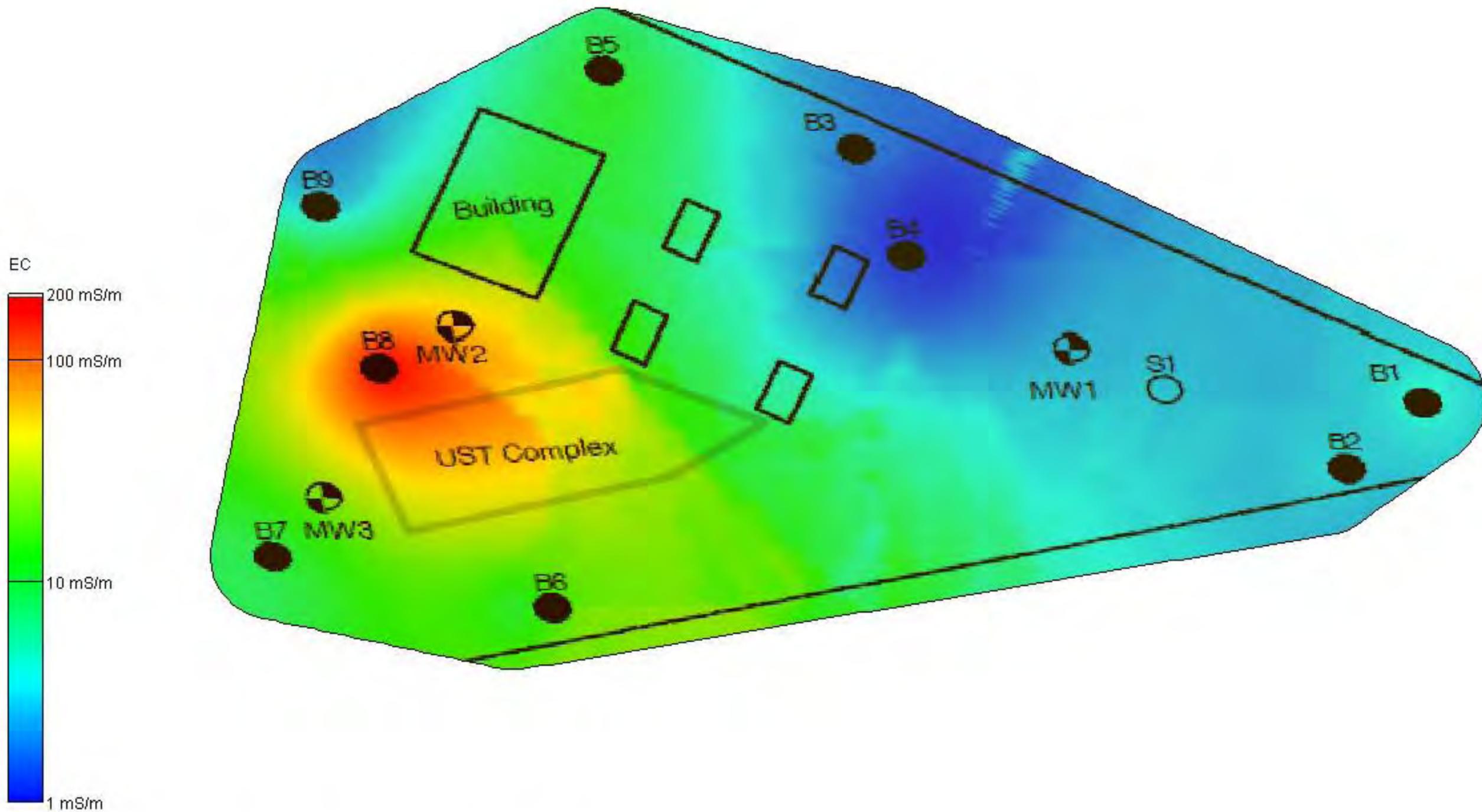
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -28 ft (MSL)



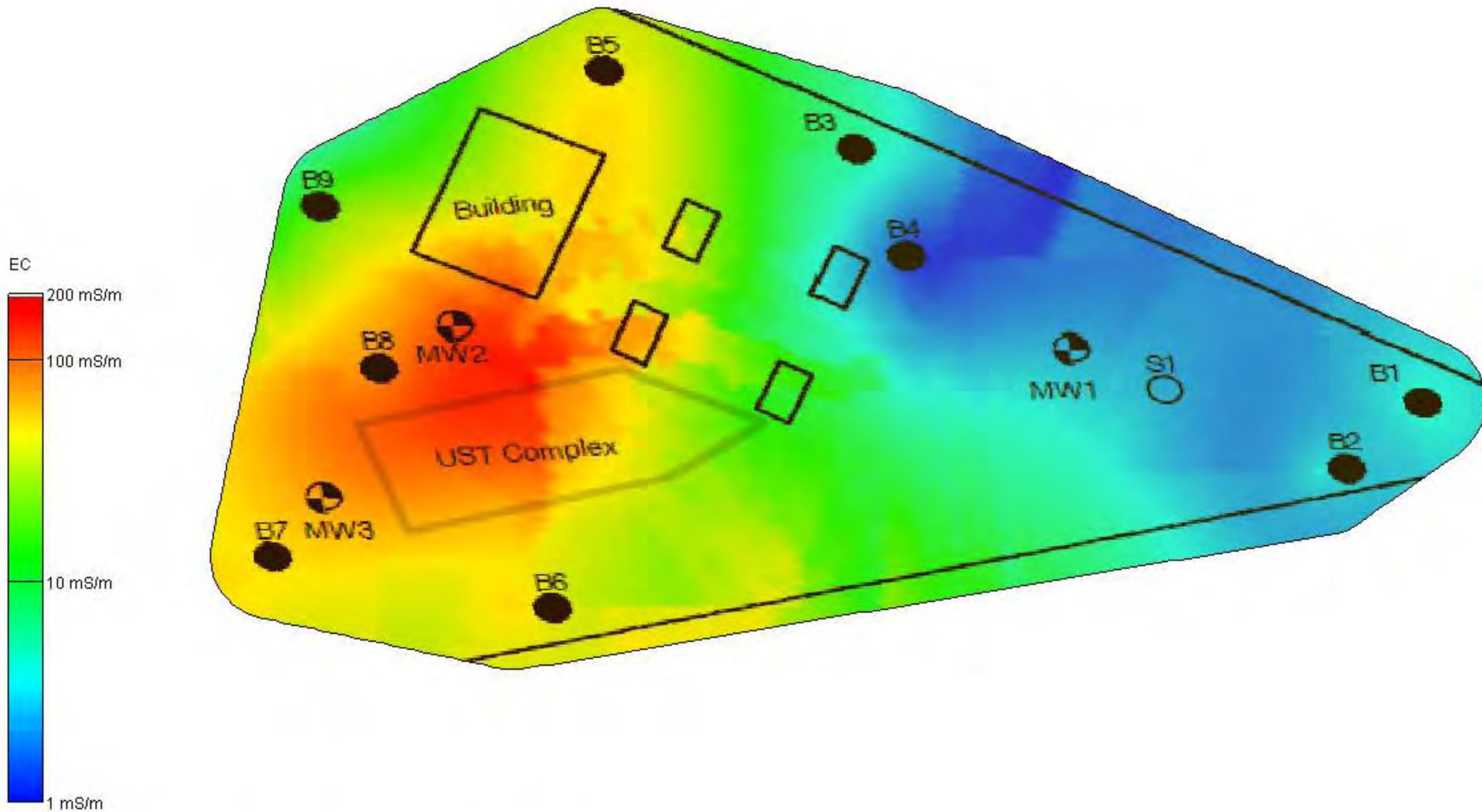
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -29 ft (MSL)



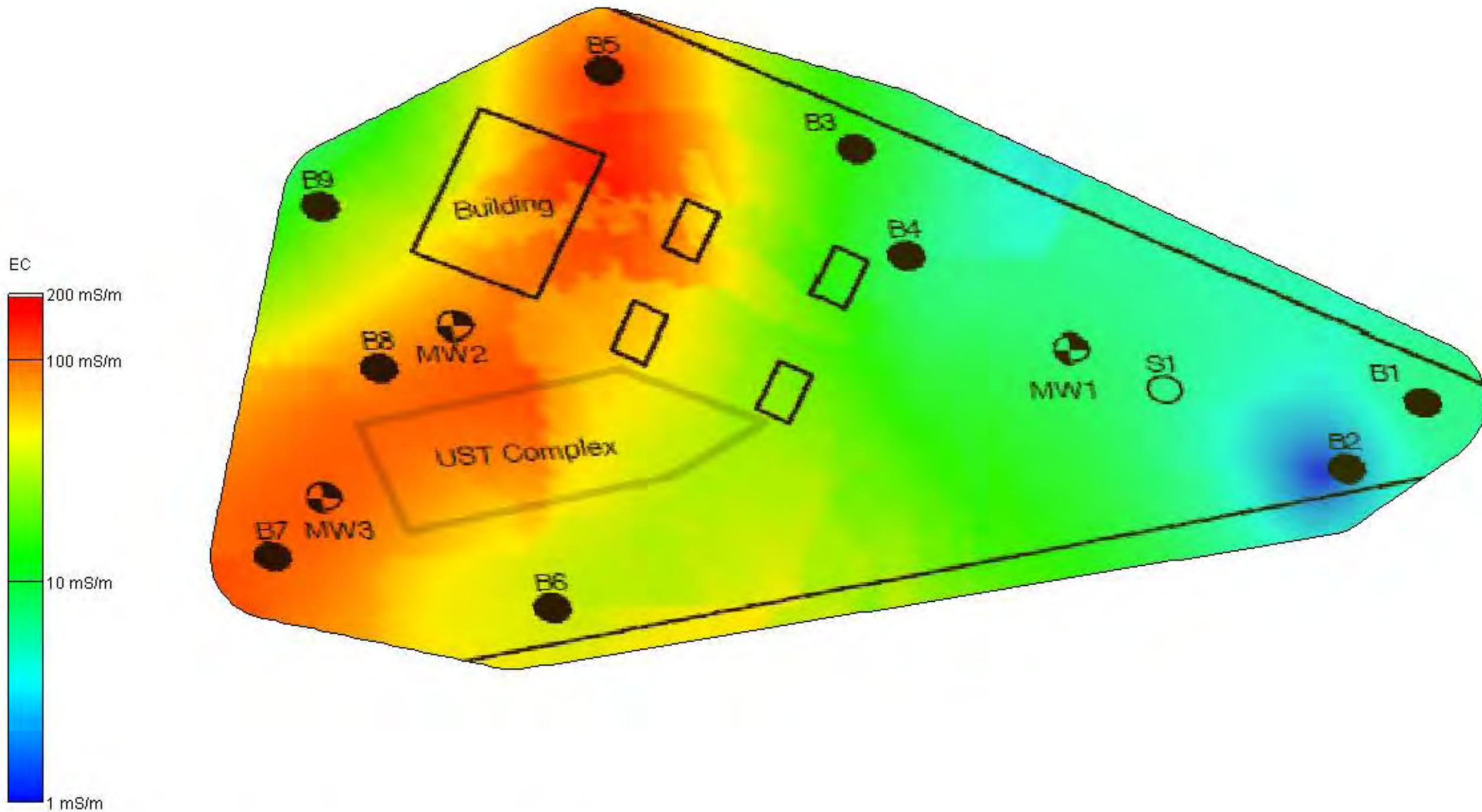
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -30 ft (MSL)



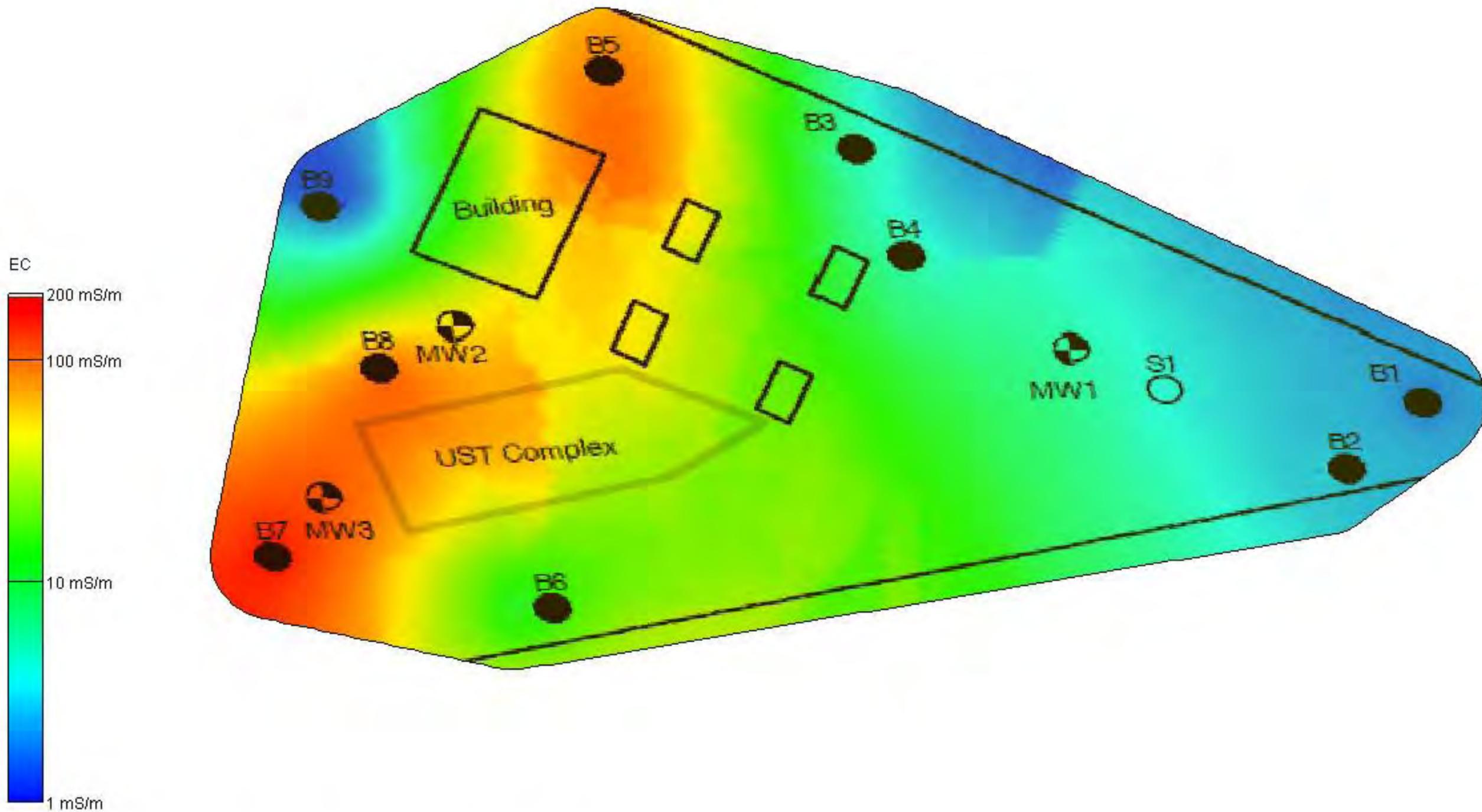
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -31 ft (MSL)



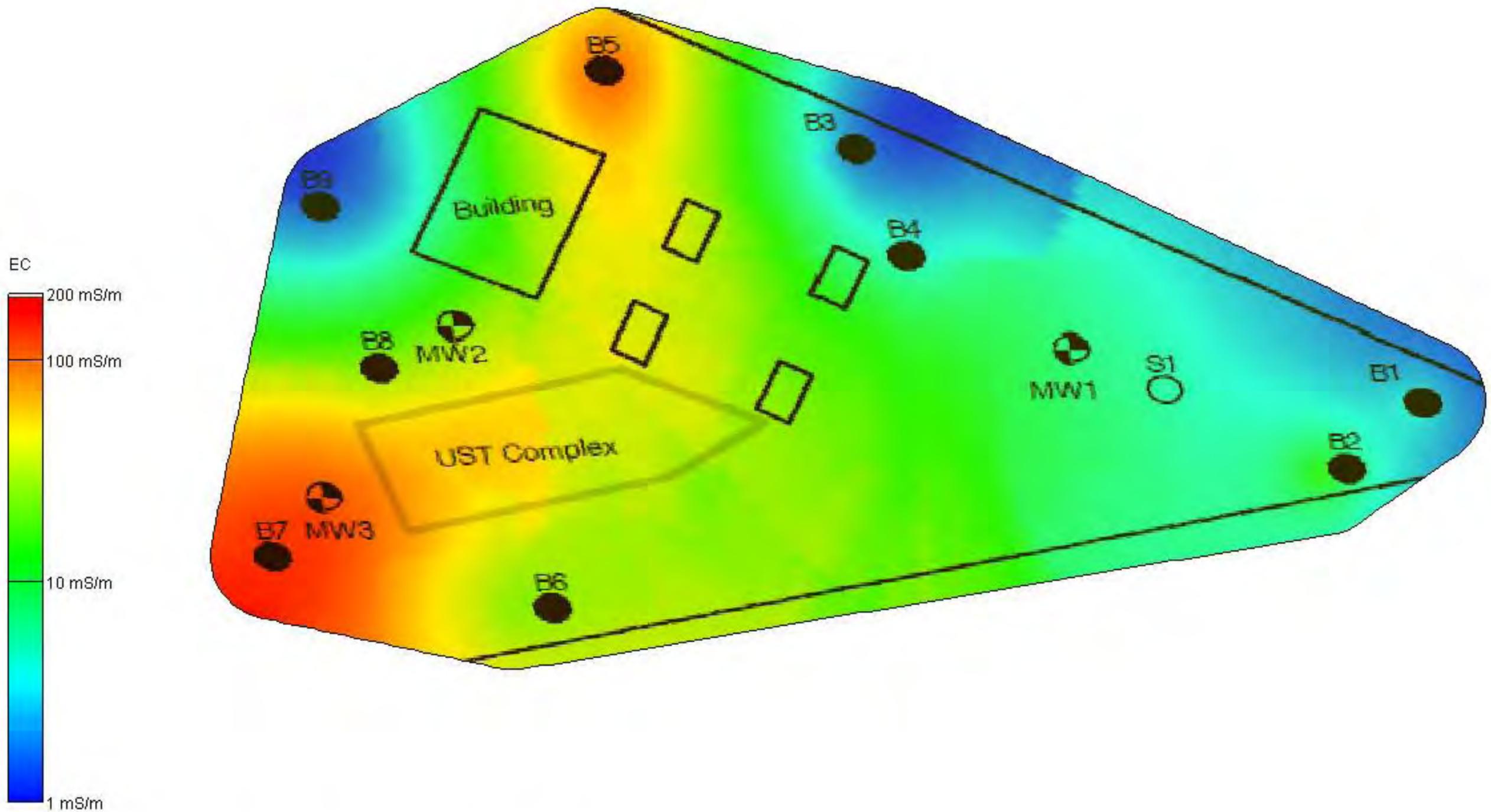
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -32 ft (MSL)



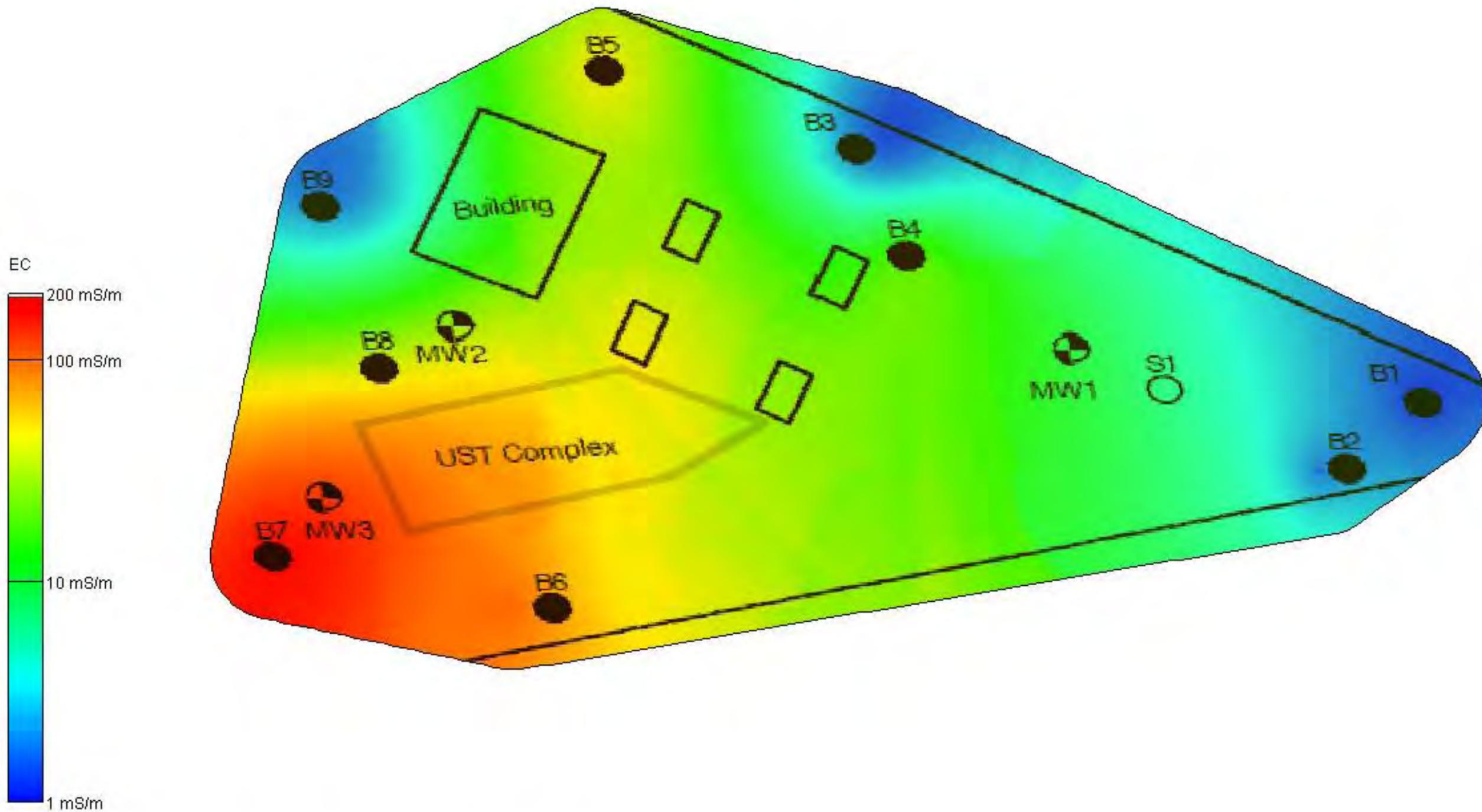
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -33 ft (MSL)



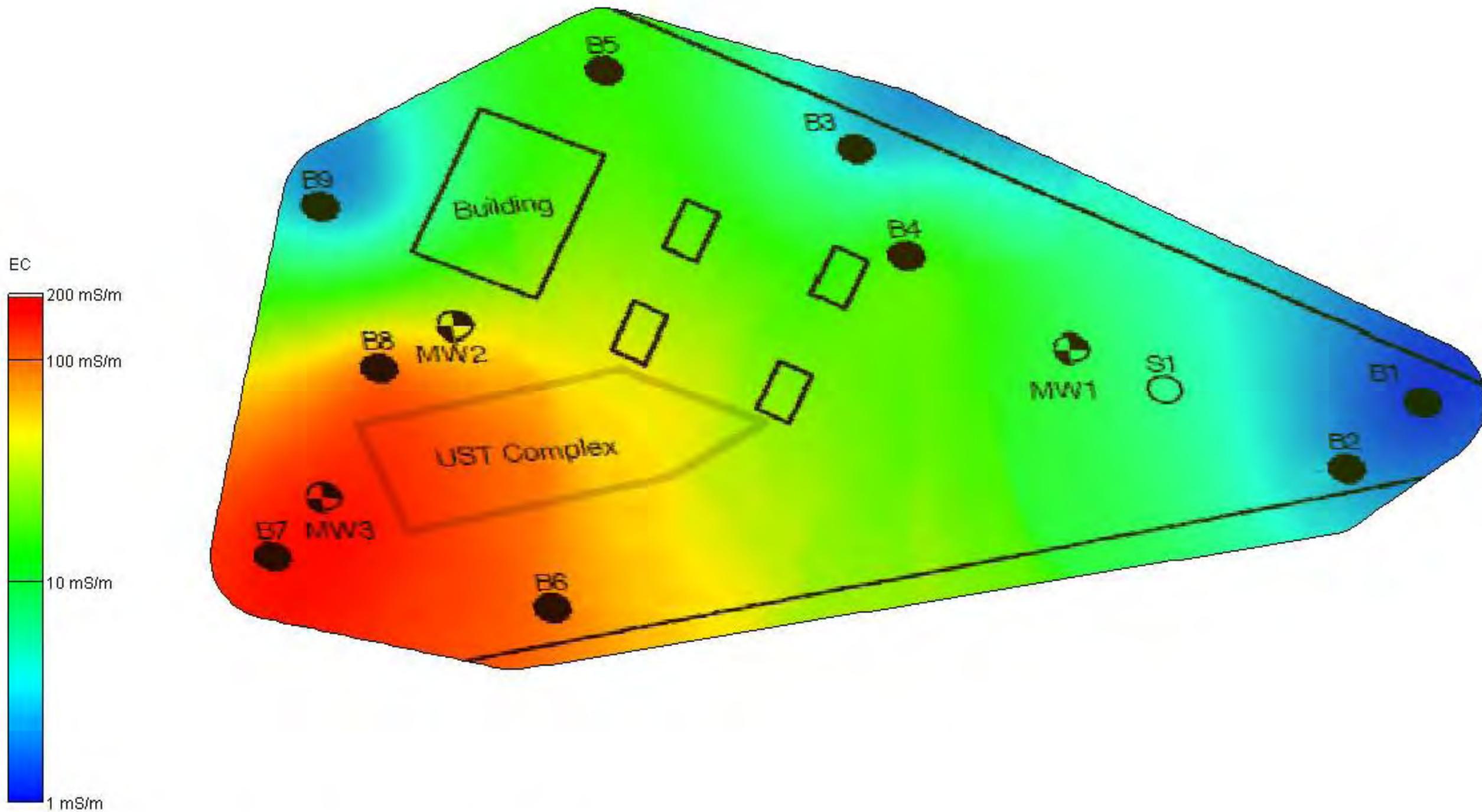
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -34 ft (MSL)



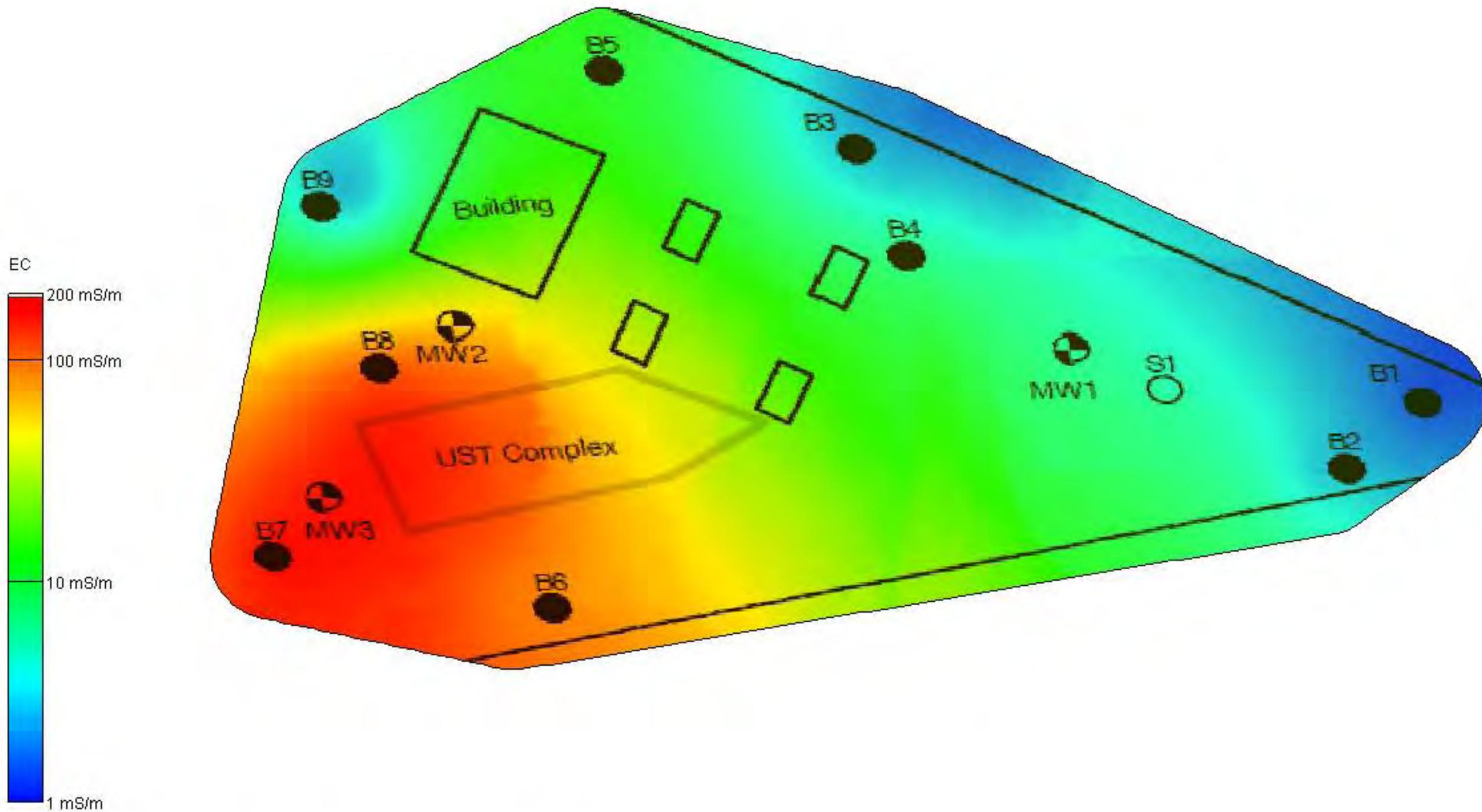
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

**Electrical Conductivity
Depth -35 ft (MSL)**



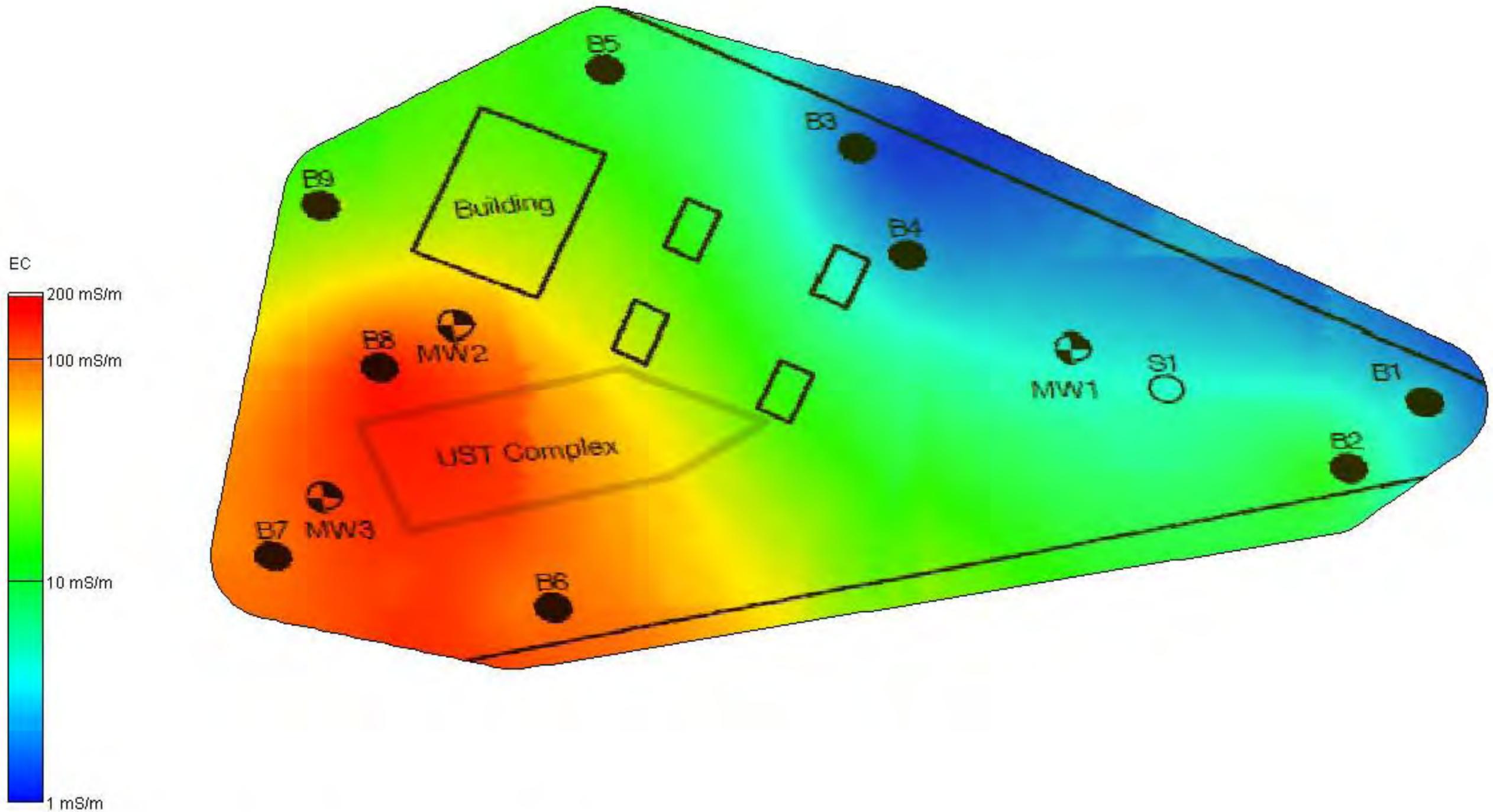
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -36 ft (MSL)



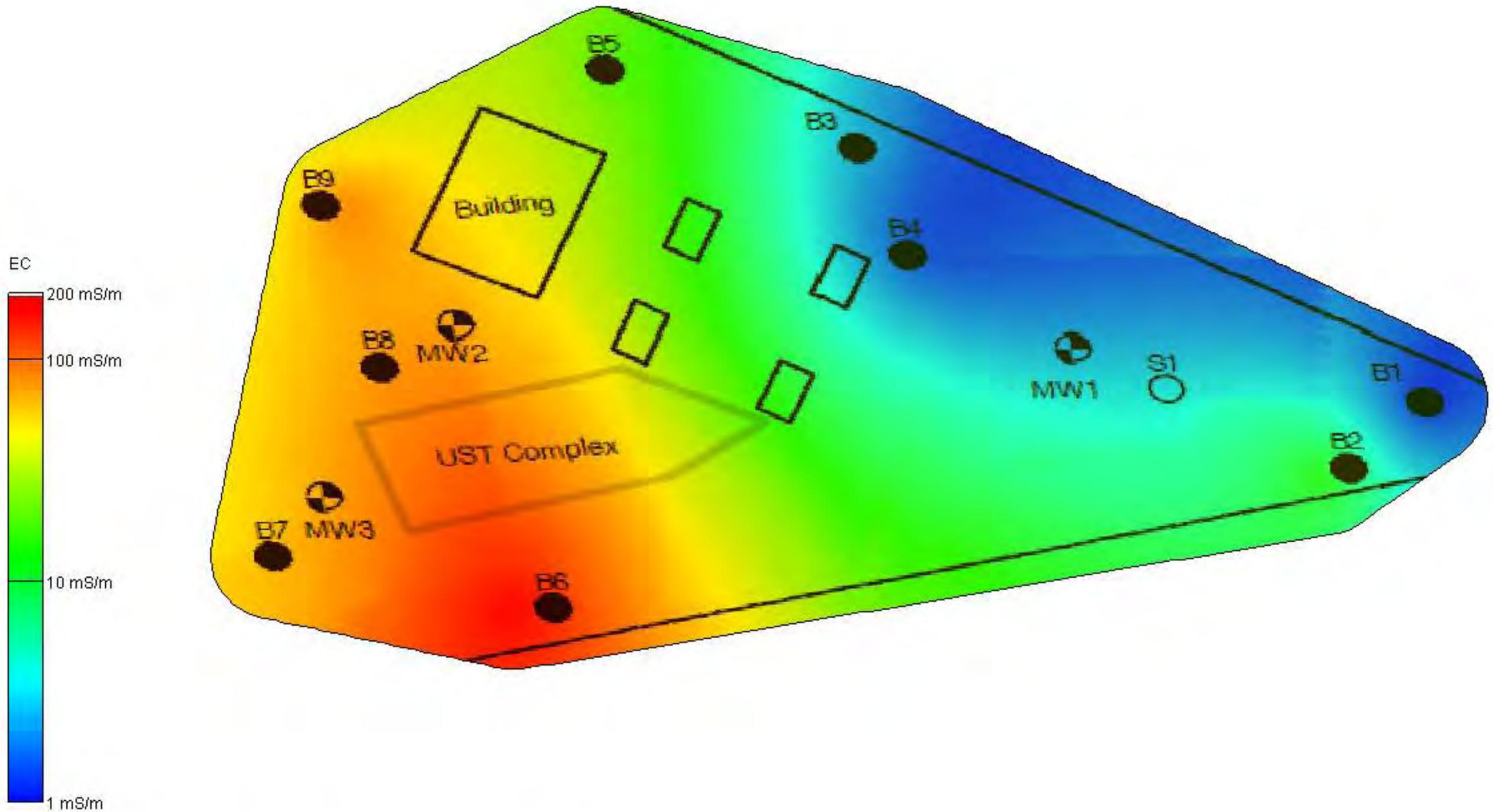
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -37 ft (MSL)



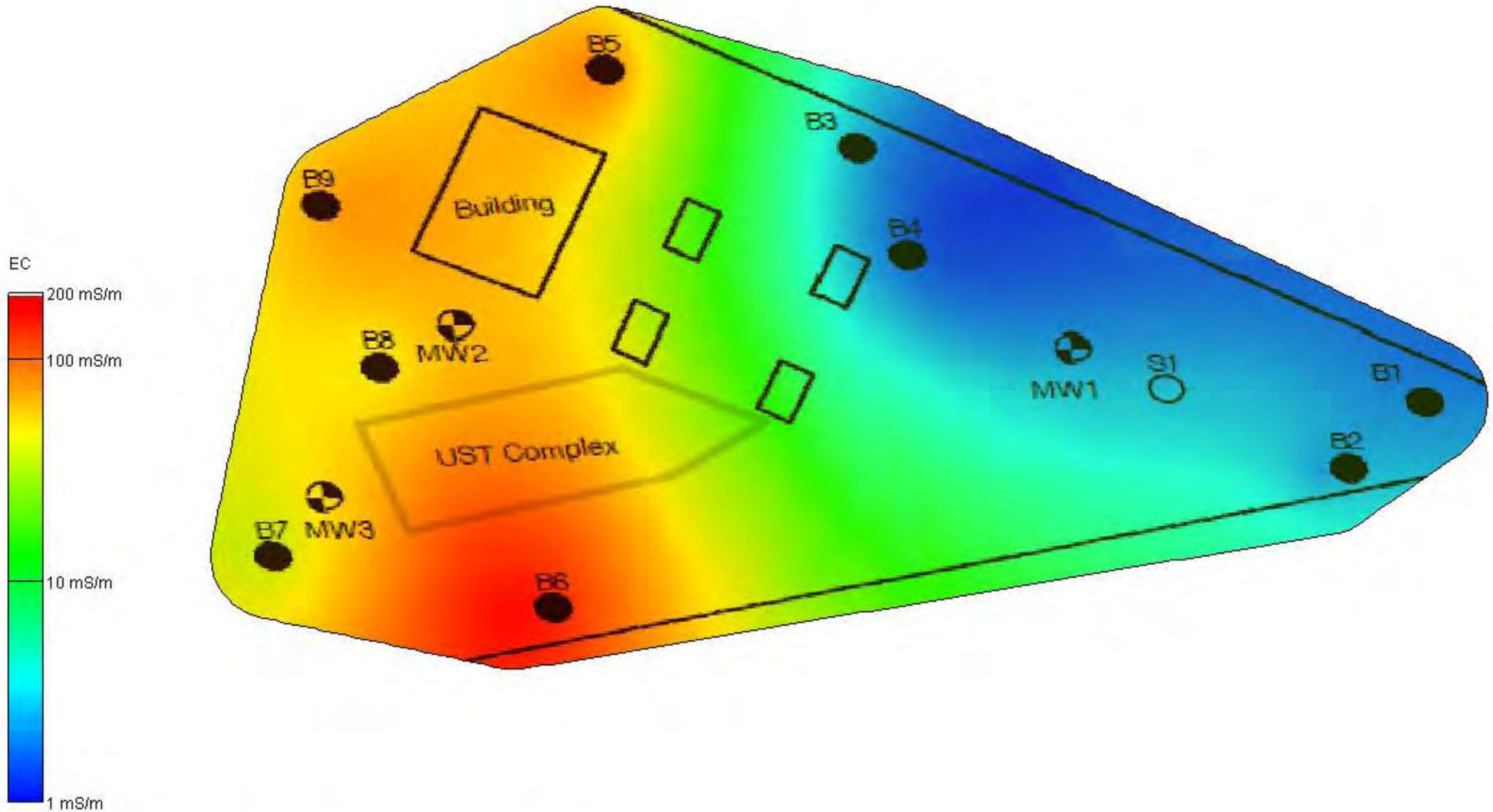
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -38 ft (MSL)



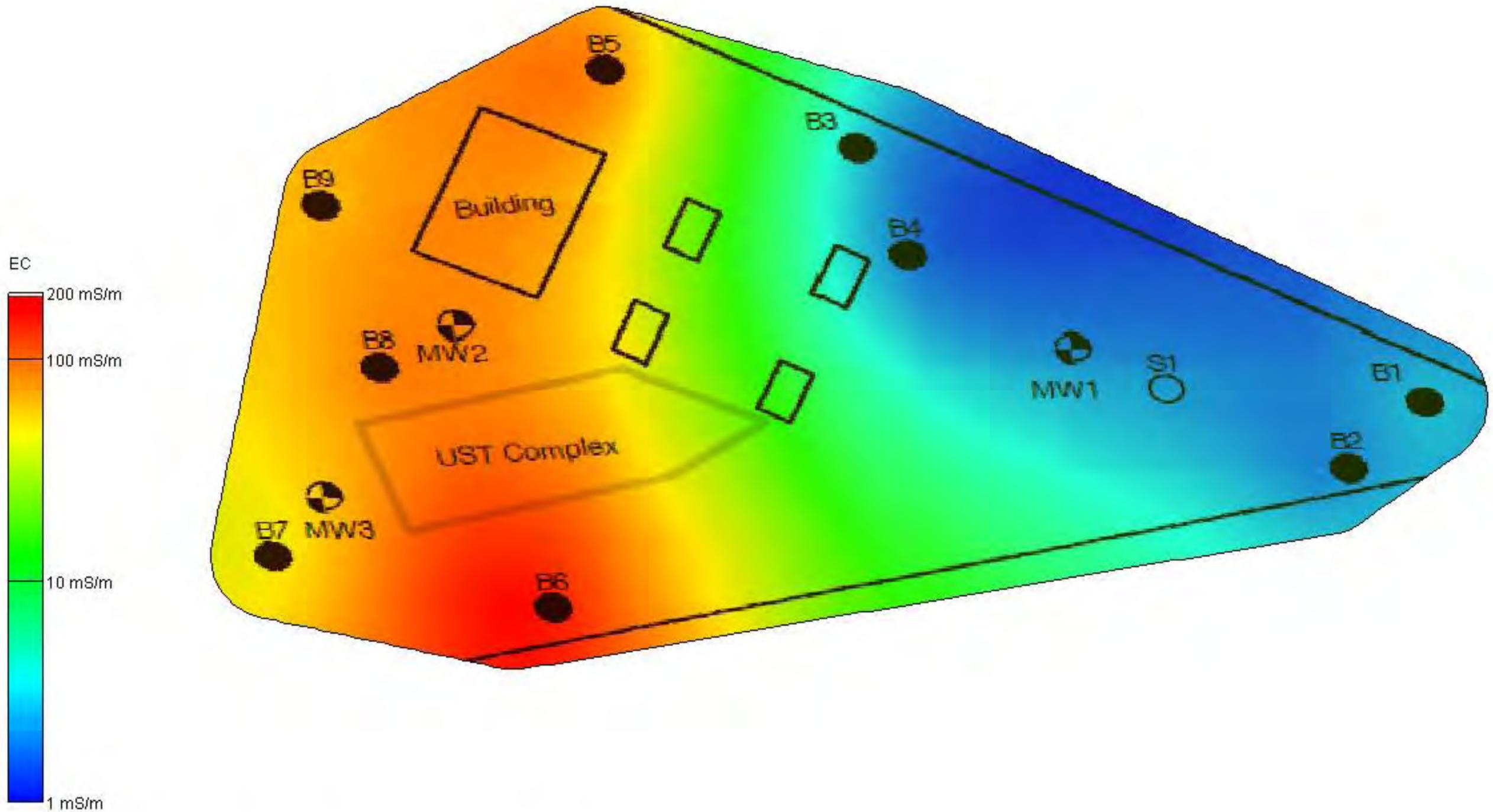
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -39 ft (MSL)



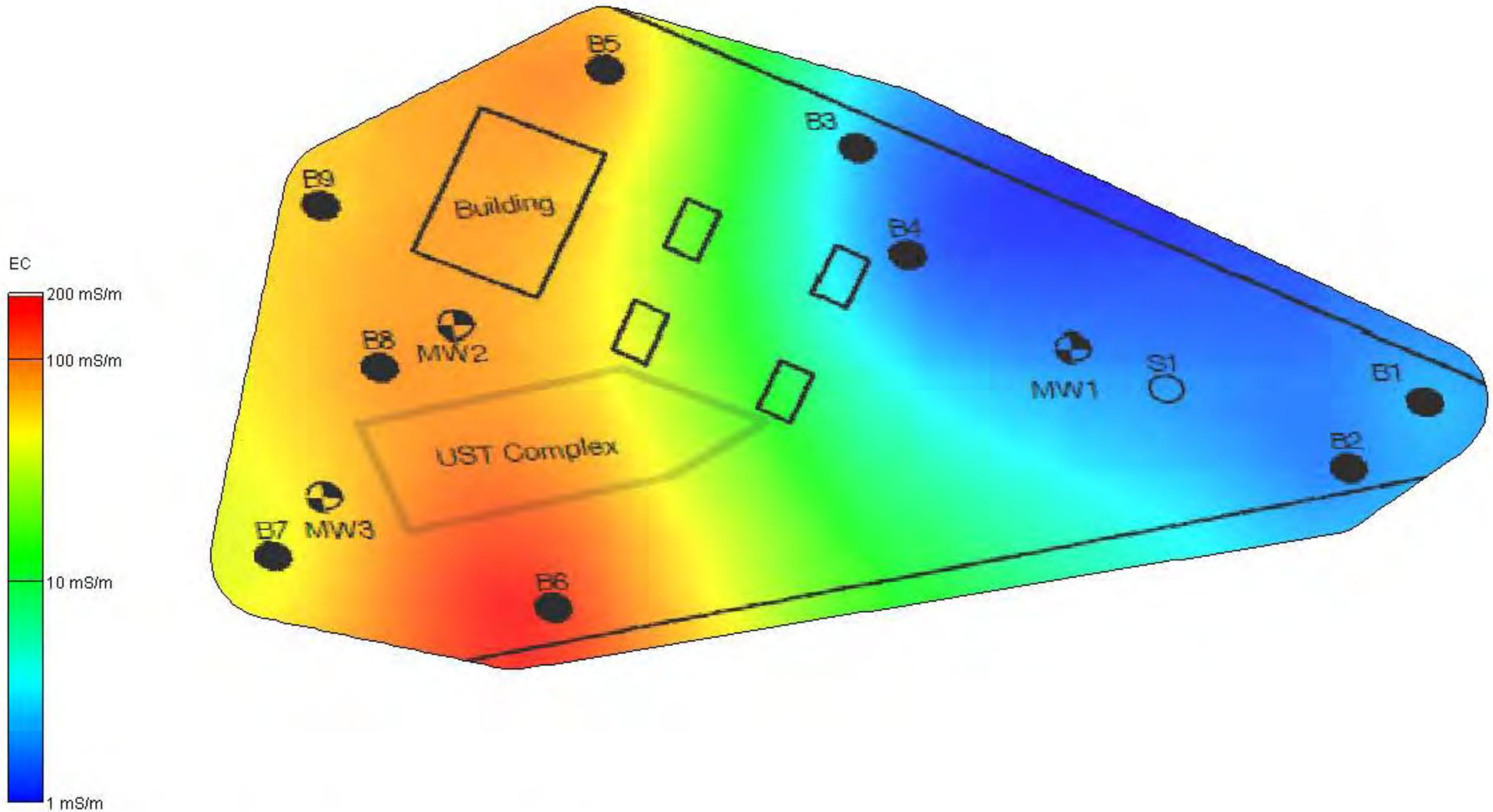
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -40 ft (MSL)



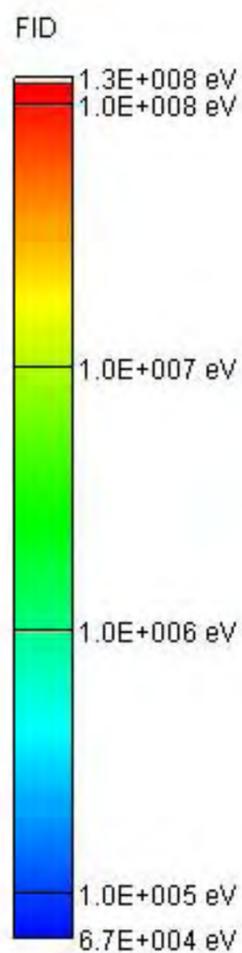
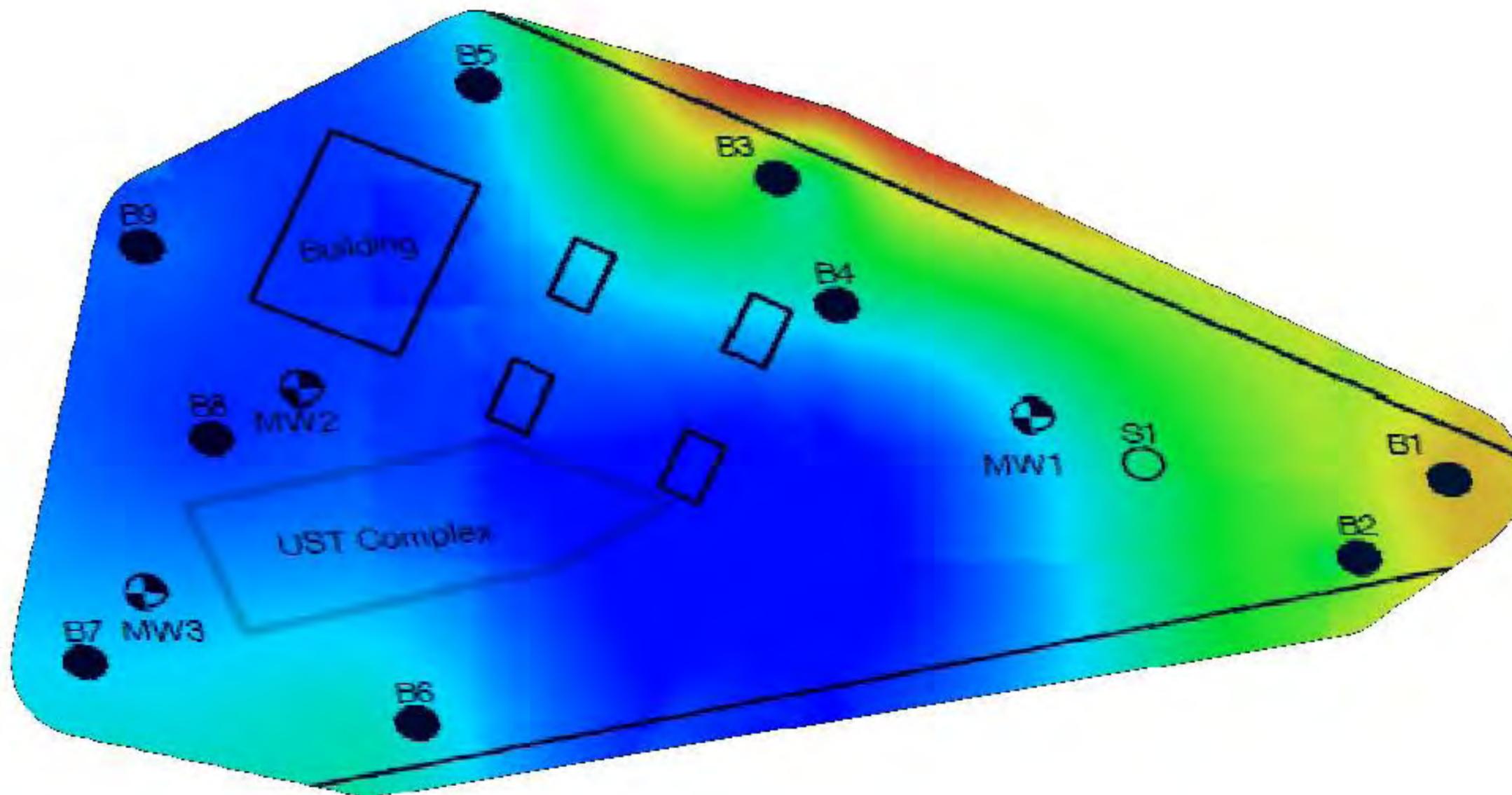
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Electrical Conductivity Depth -41 ft (MSL)



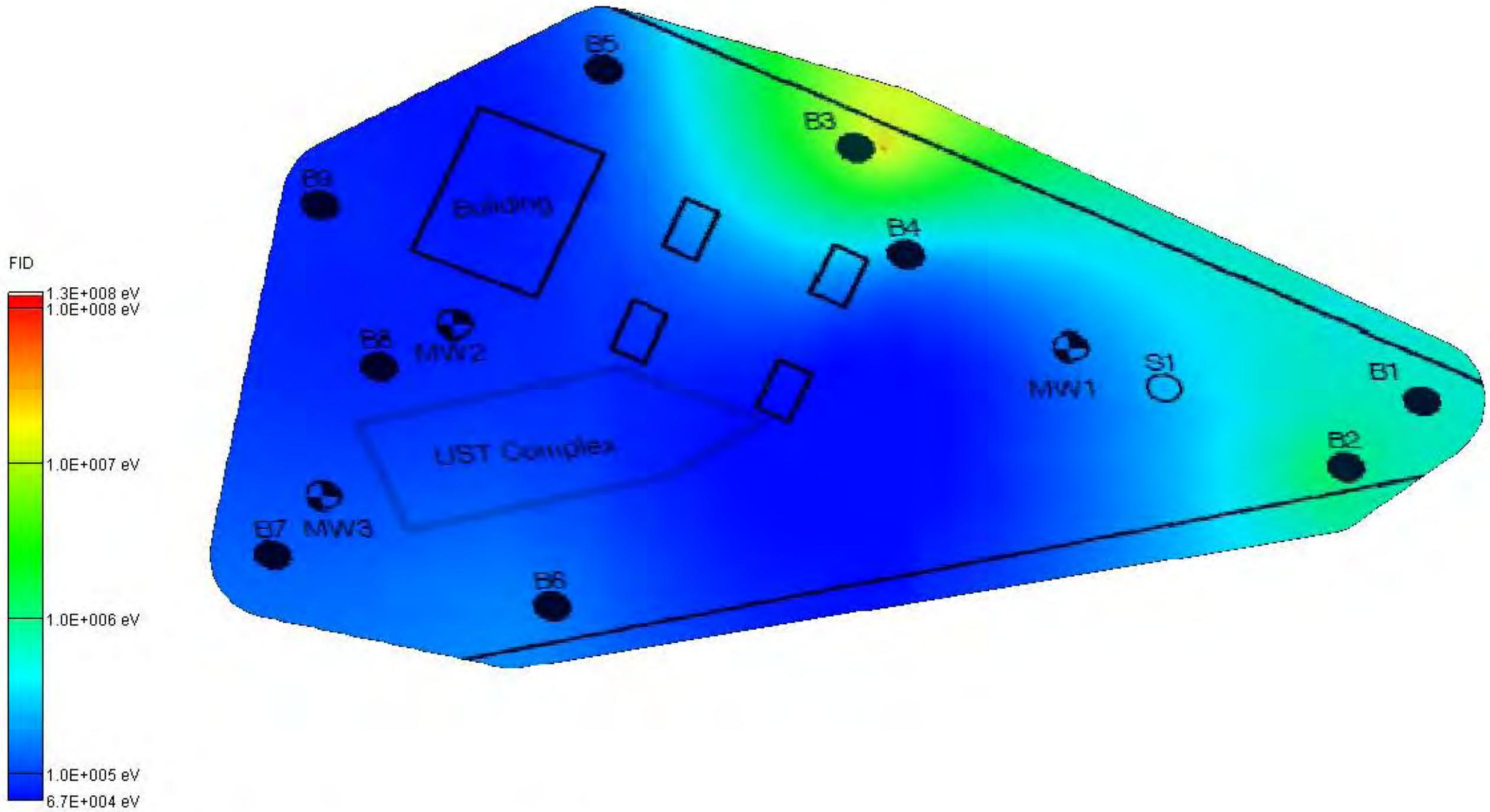
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth 0 ft (MSL)



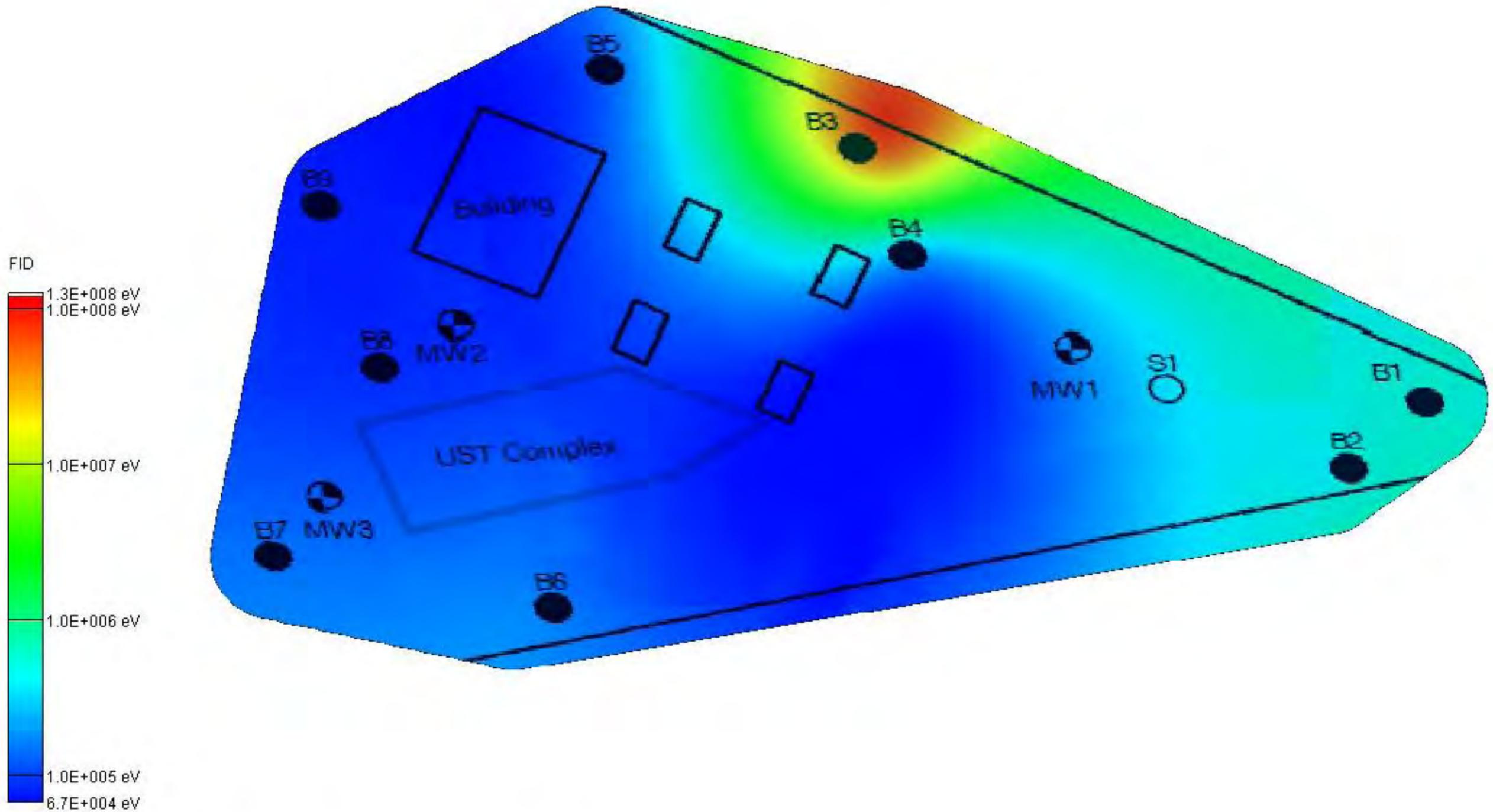
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -1 ft (MSL)



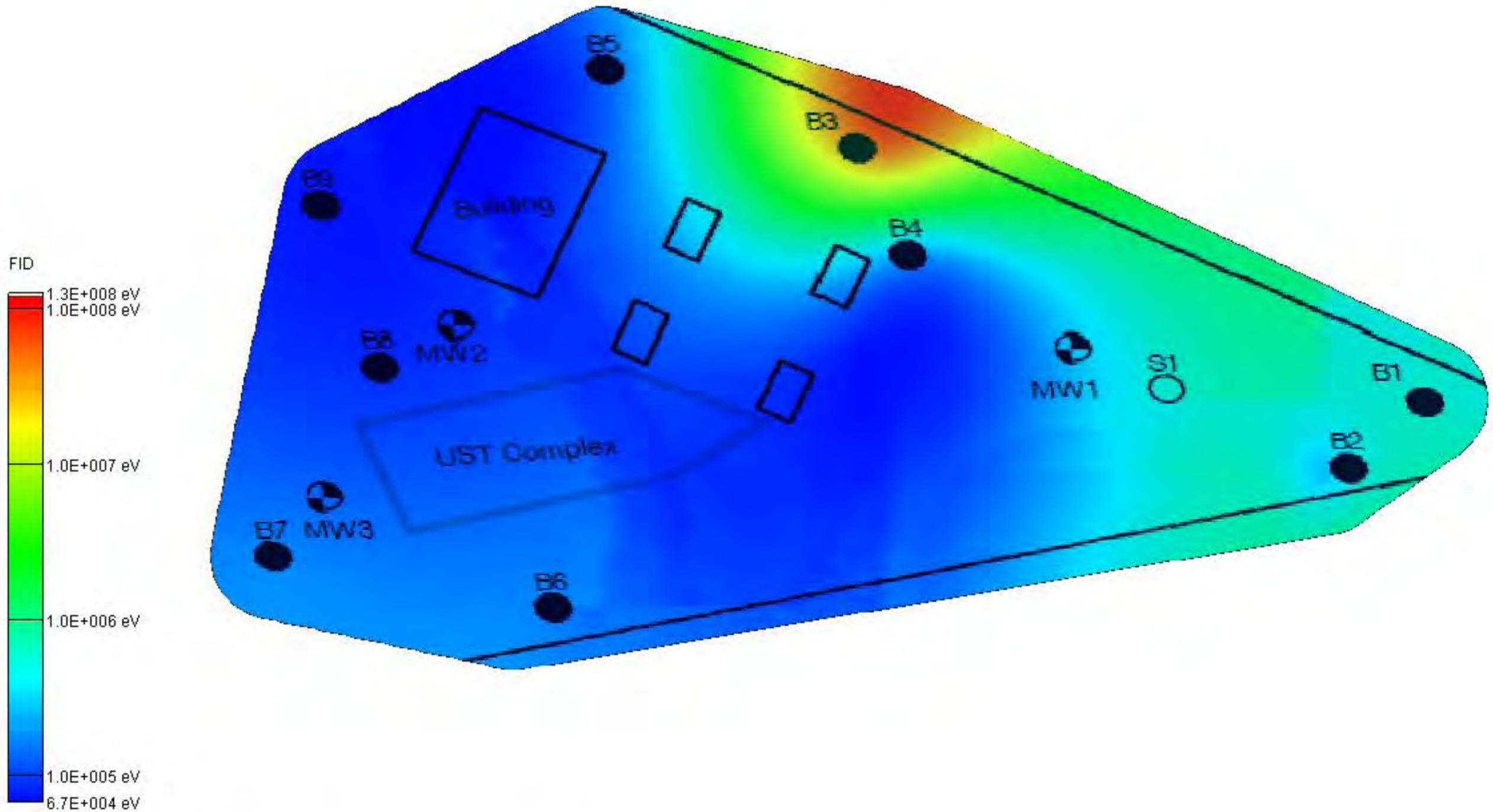
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -2 ft (MSL)



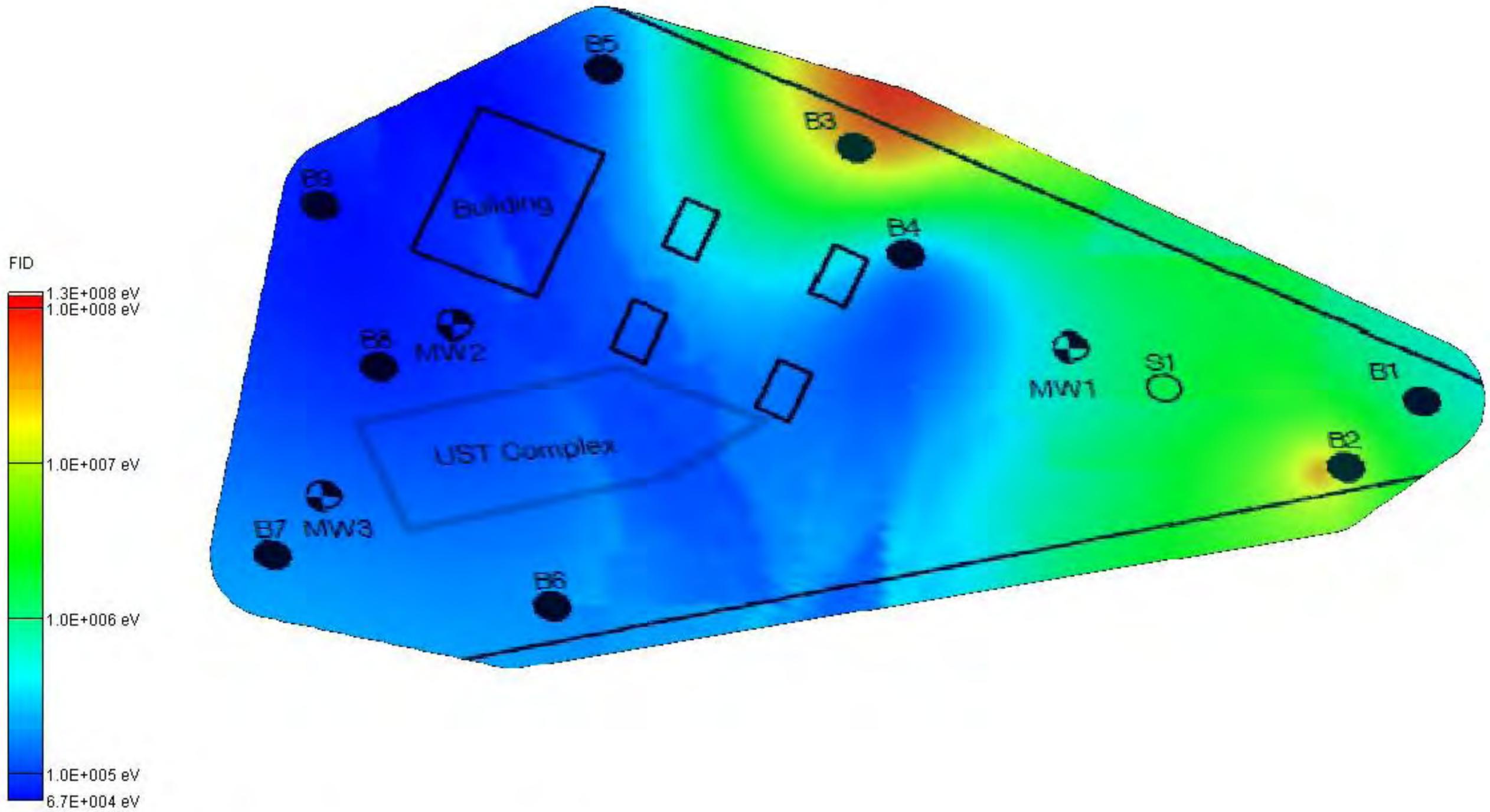
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -3 ft (MSL)



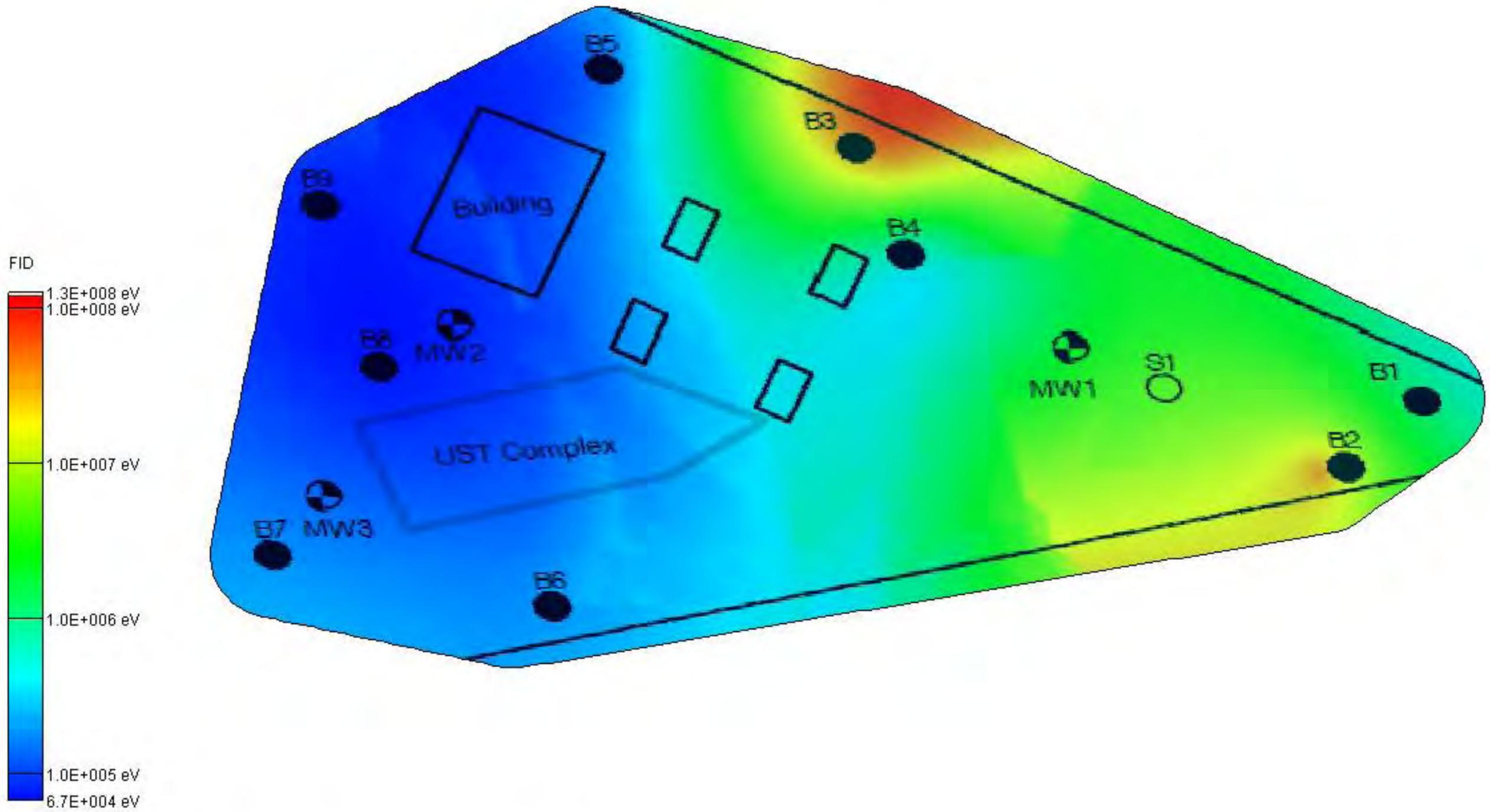
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -4 ft (MSL)



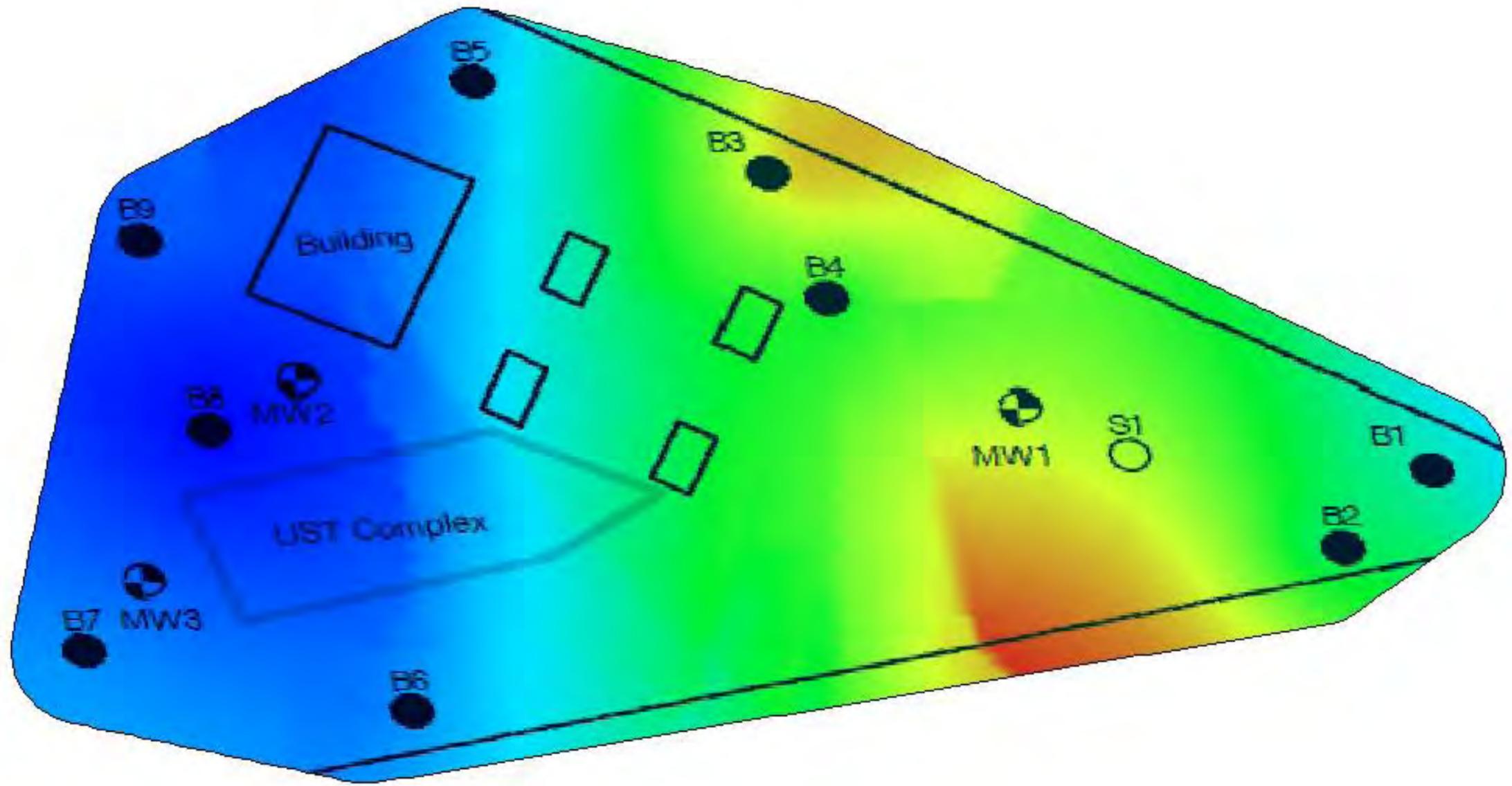
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -5 ft (MSL)



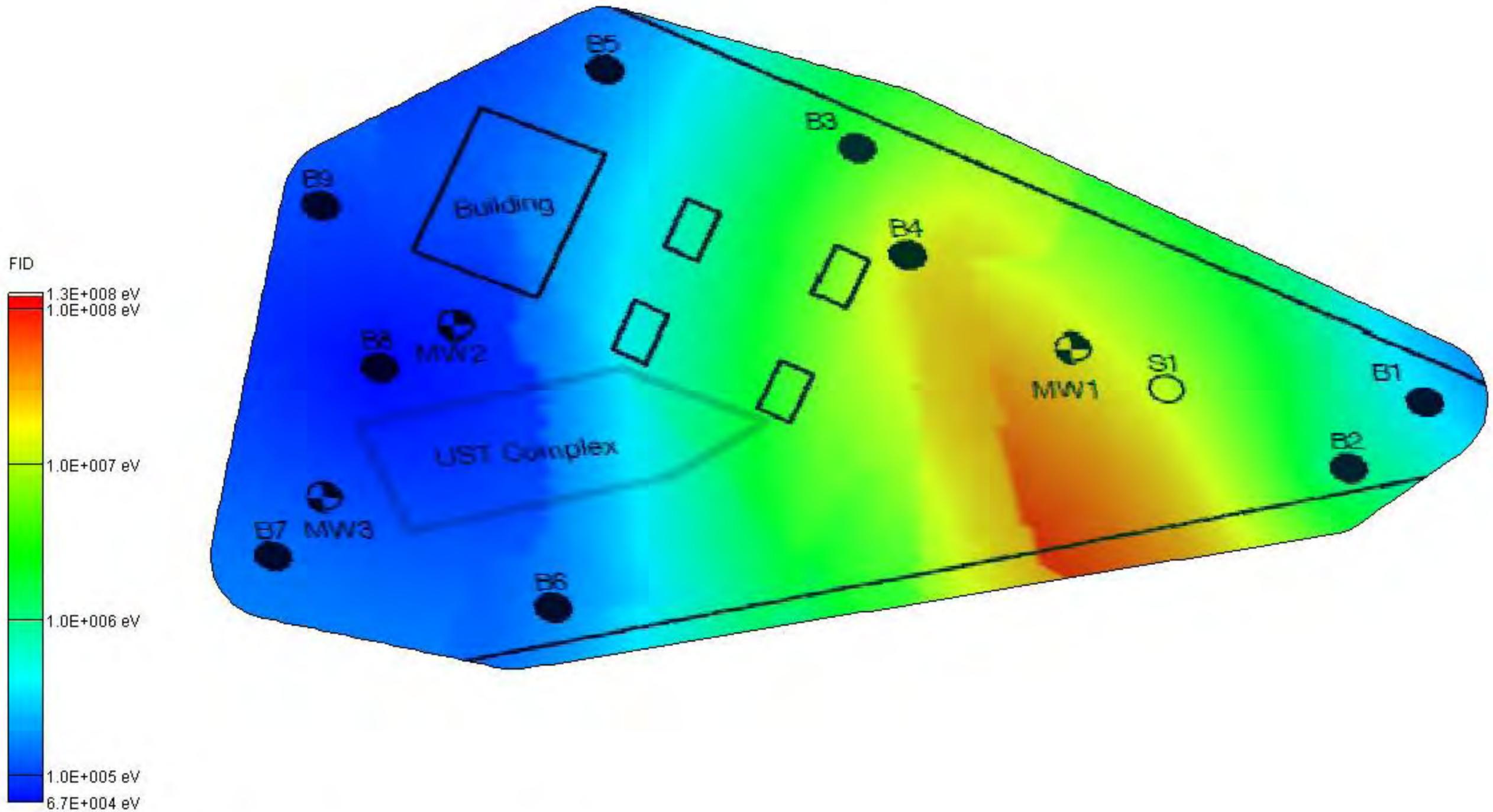
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -6 ft (MSL)



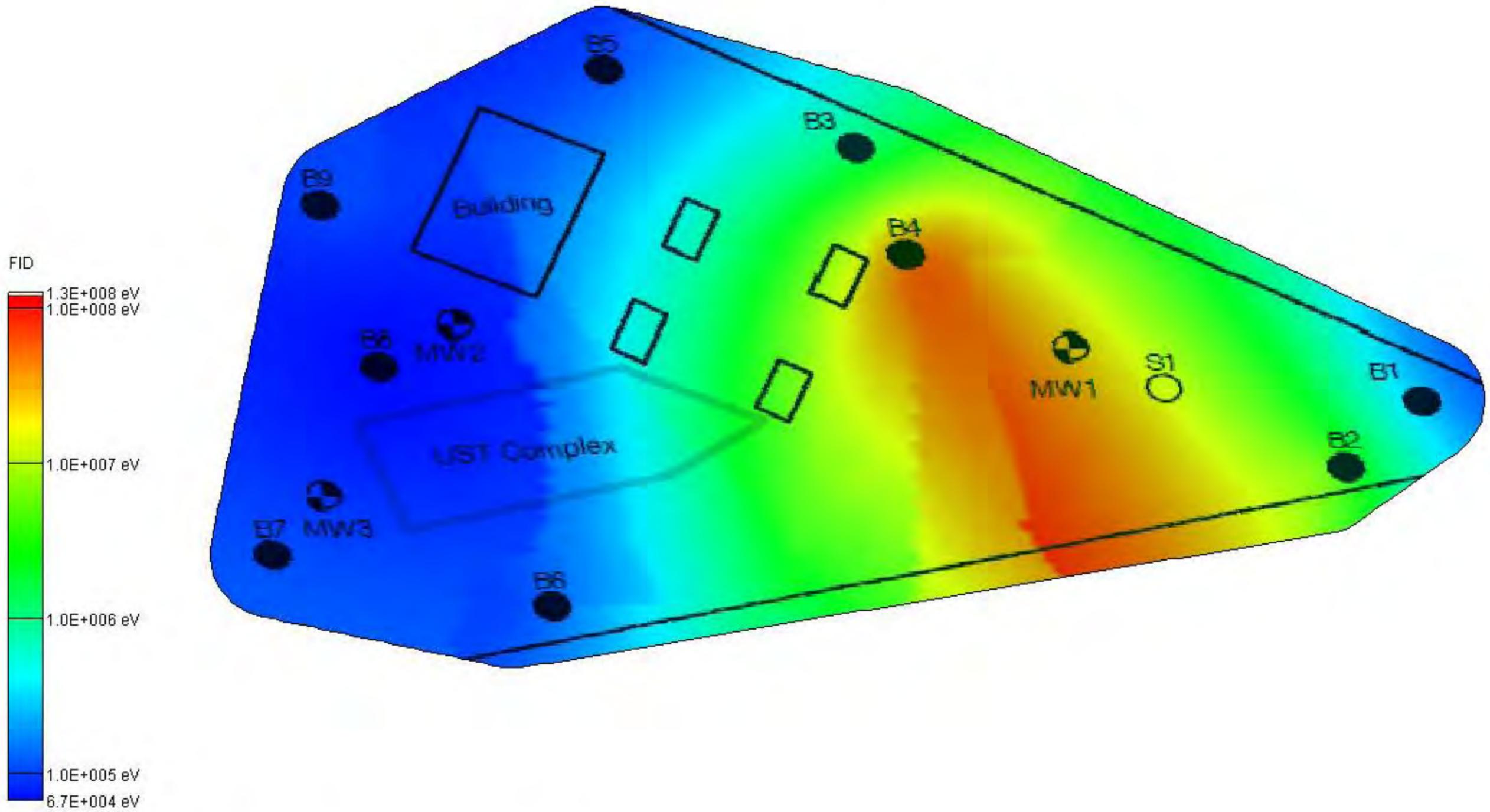
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -7 ft (MSL)



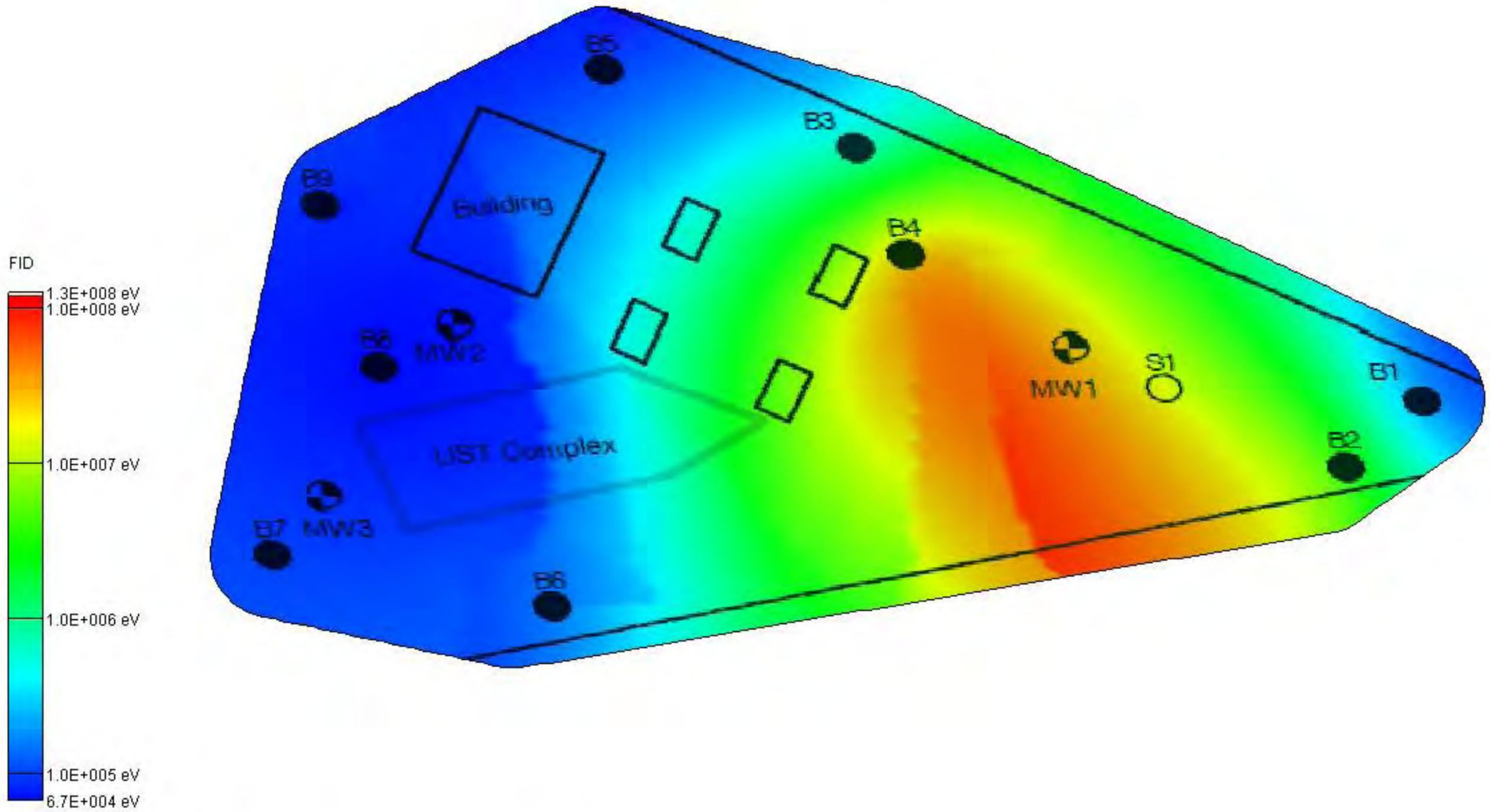
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -8 ft (MSL)



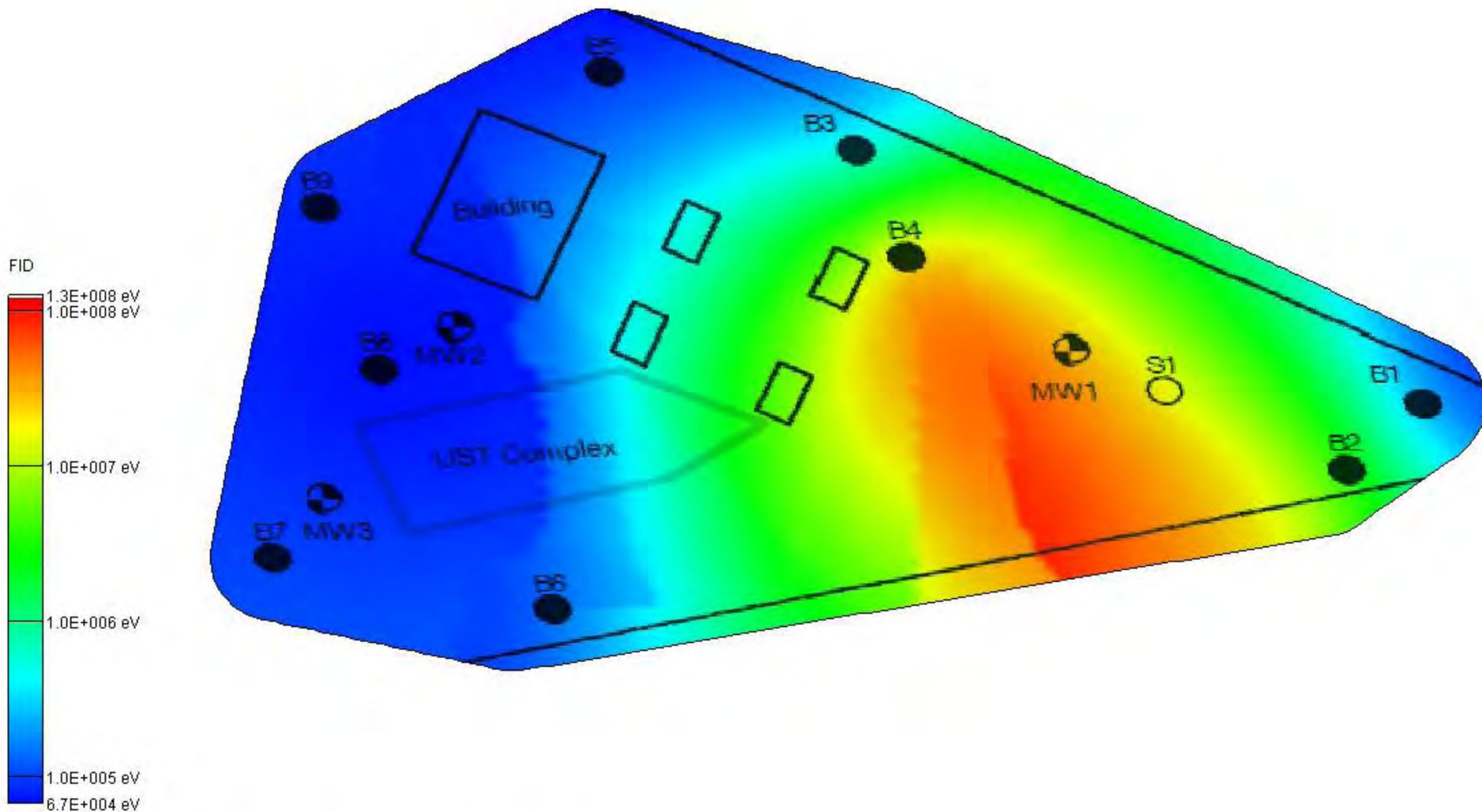
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -9 ft (MSL)



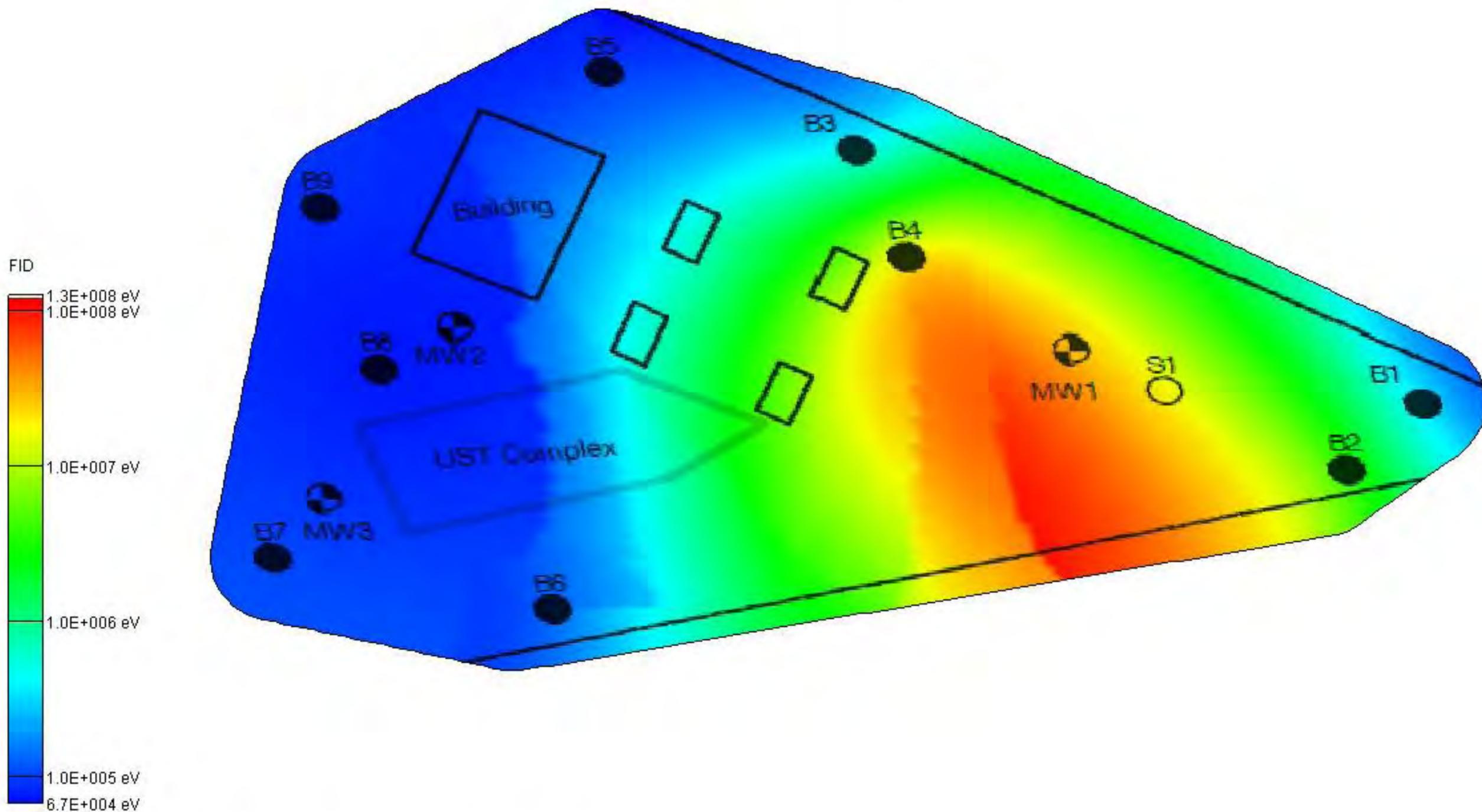
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -10 ft (MSL)



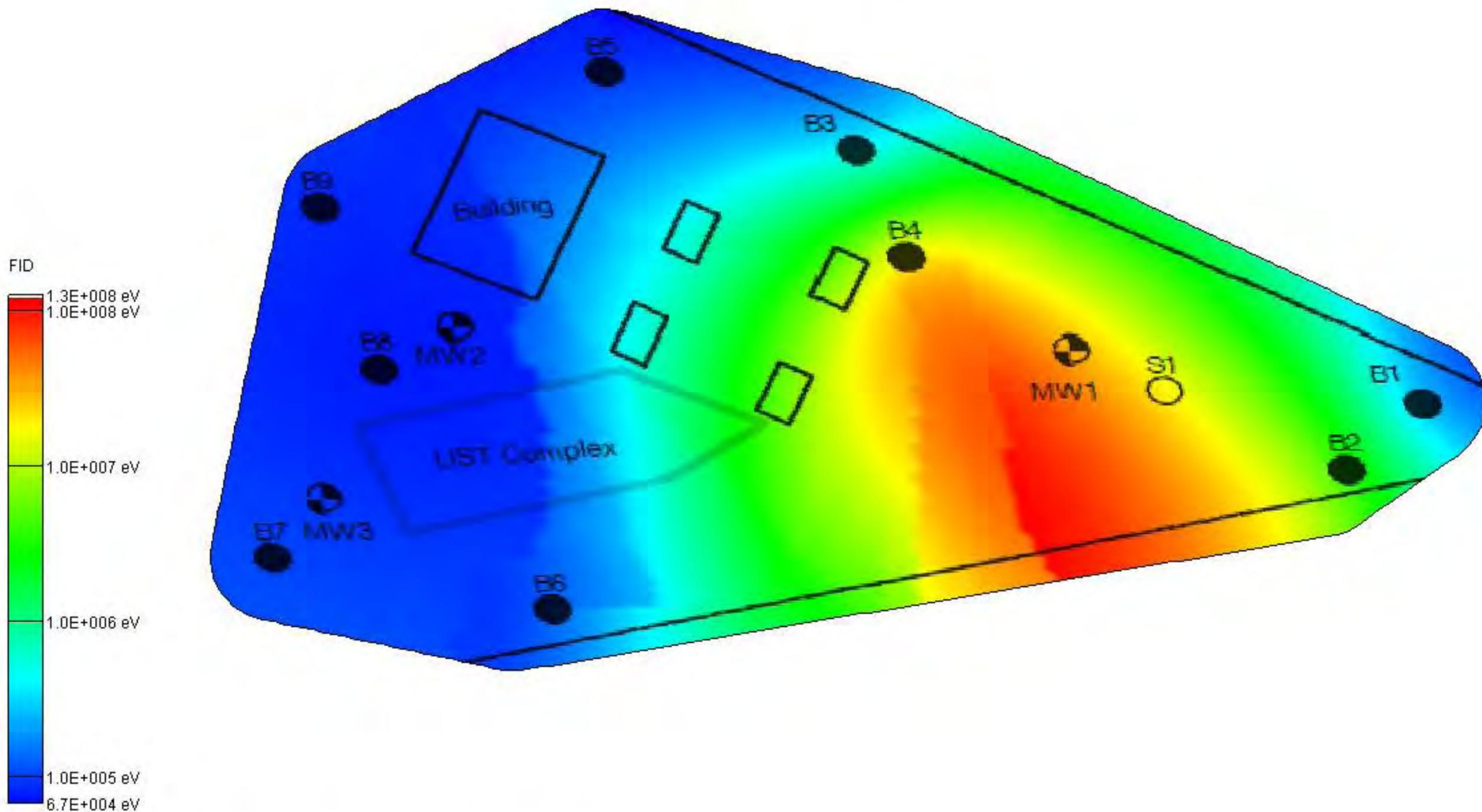
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -11 ft (MSL)



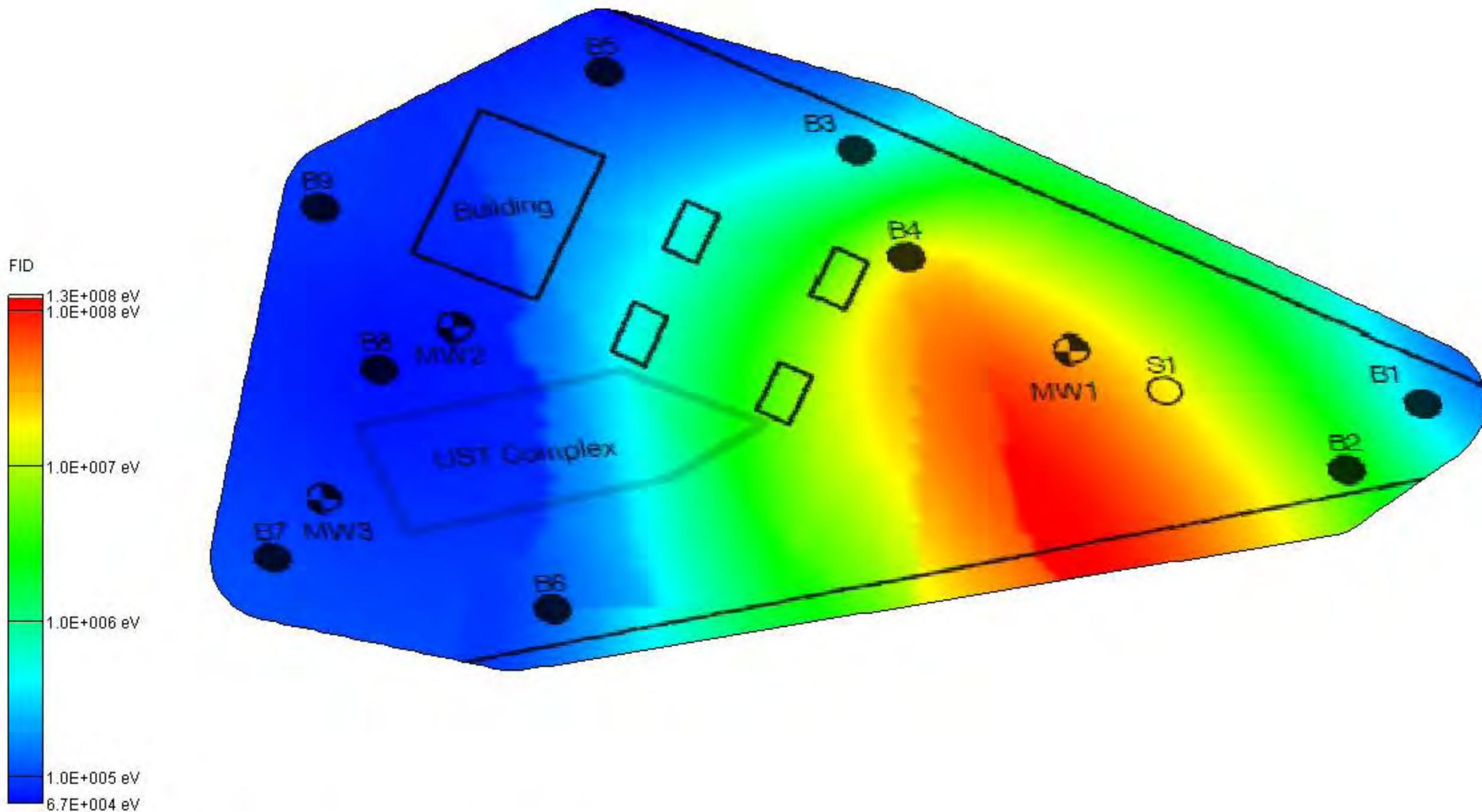
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -12 ft (MSL)



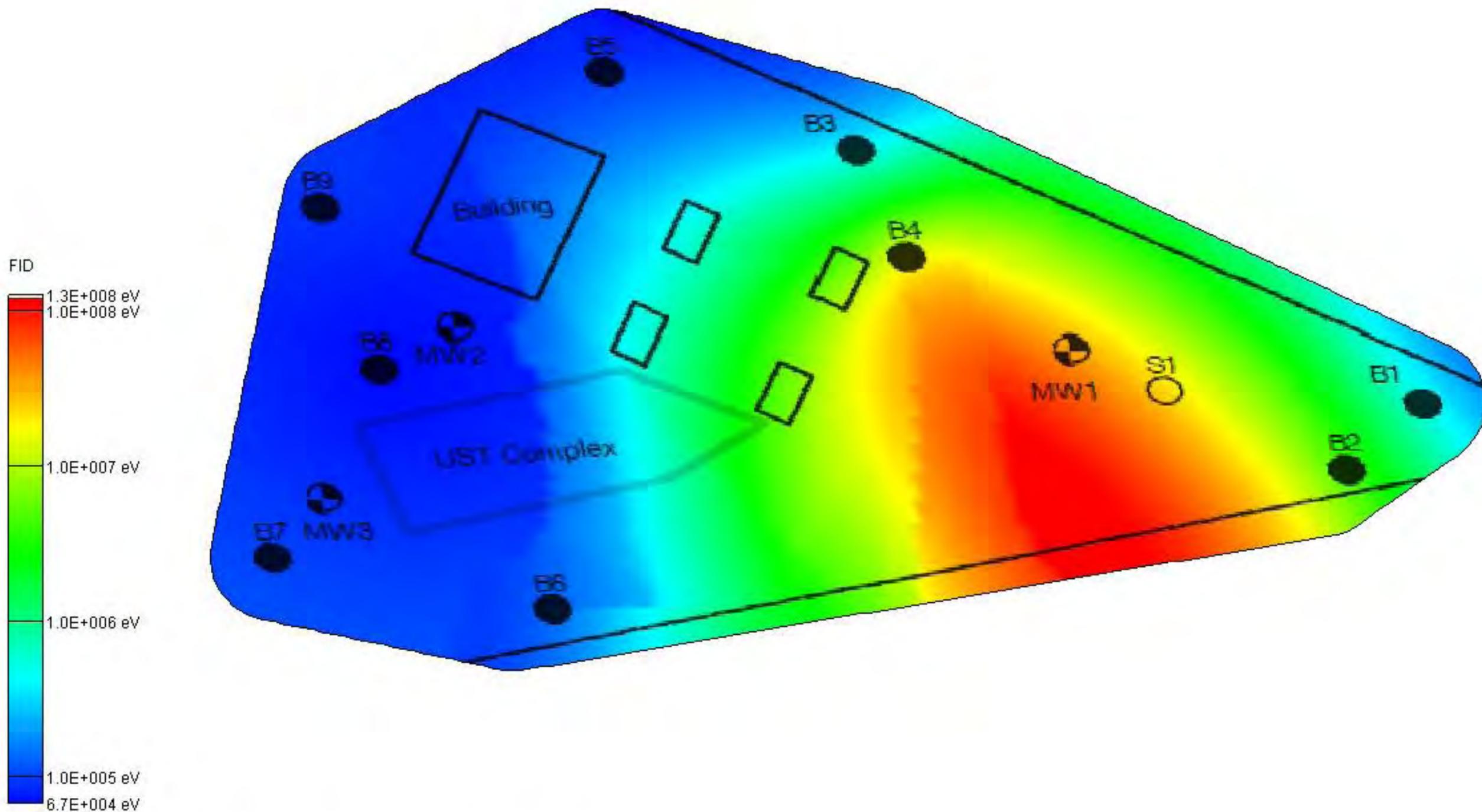
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -13 ft (MSL)



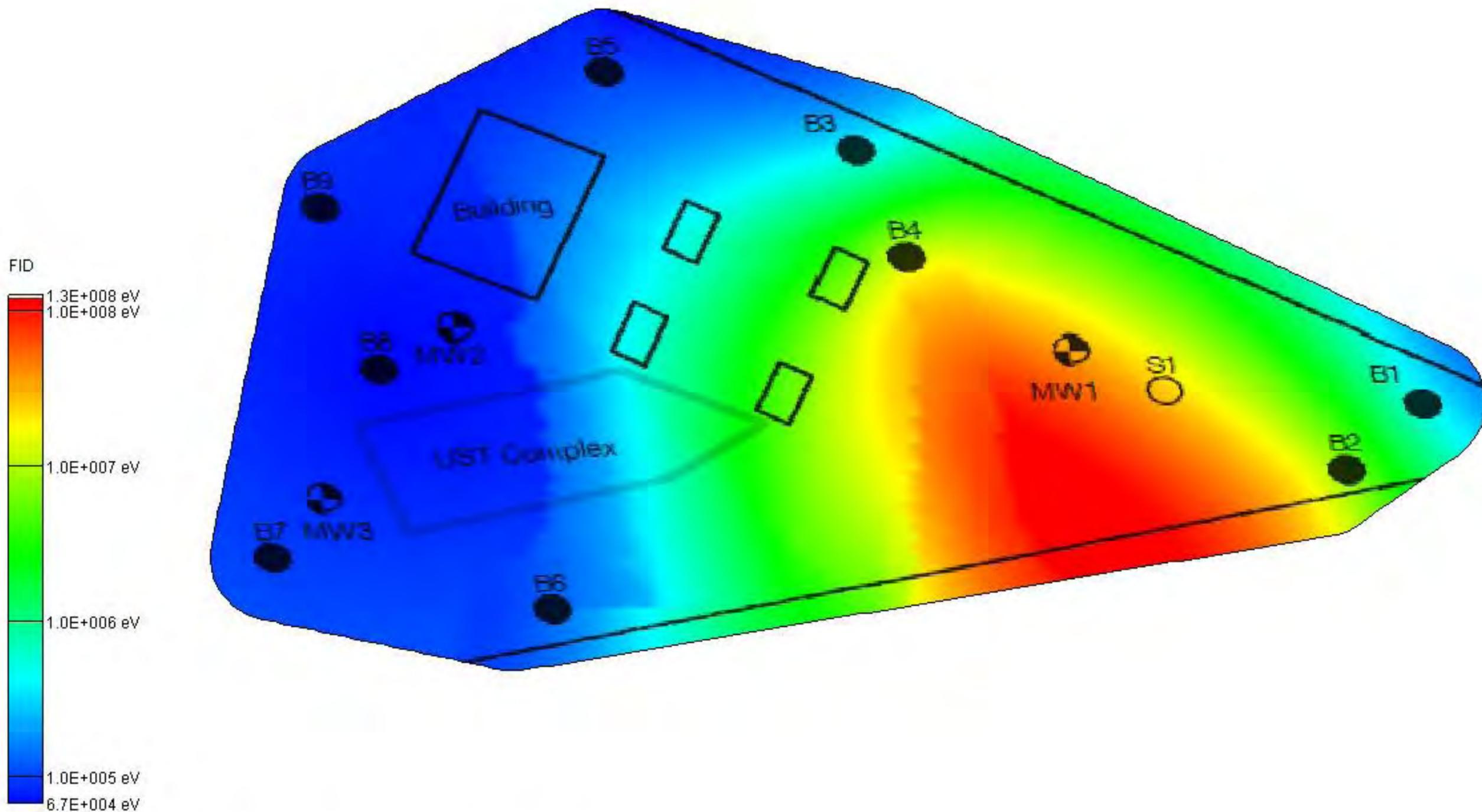
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -14 ft (MSL)



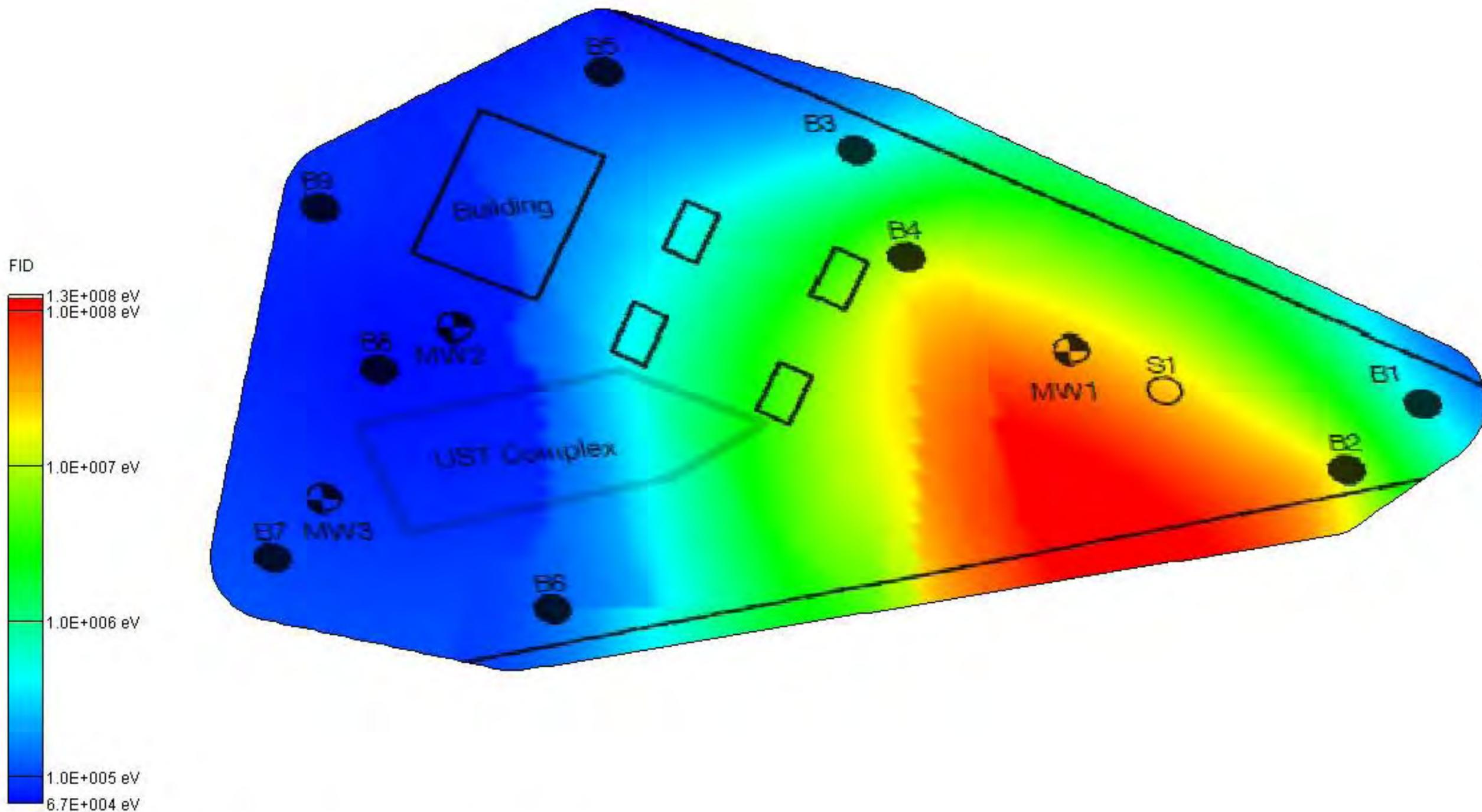
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -15 ft (MSL)



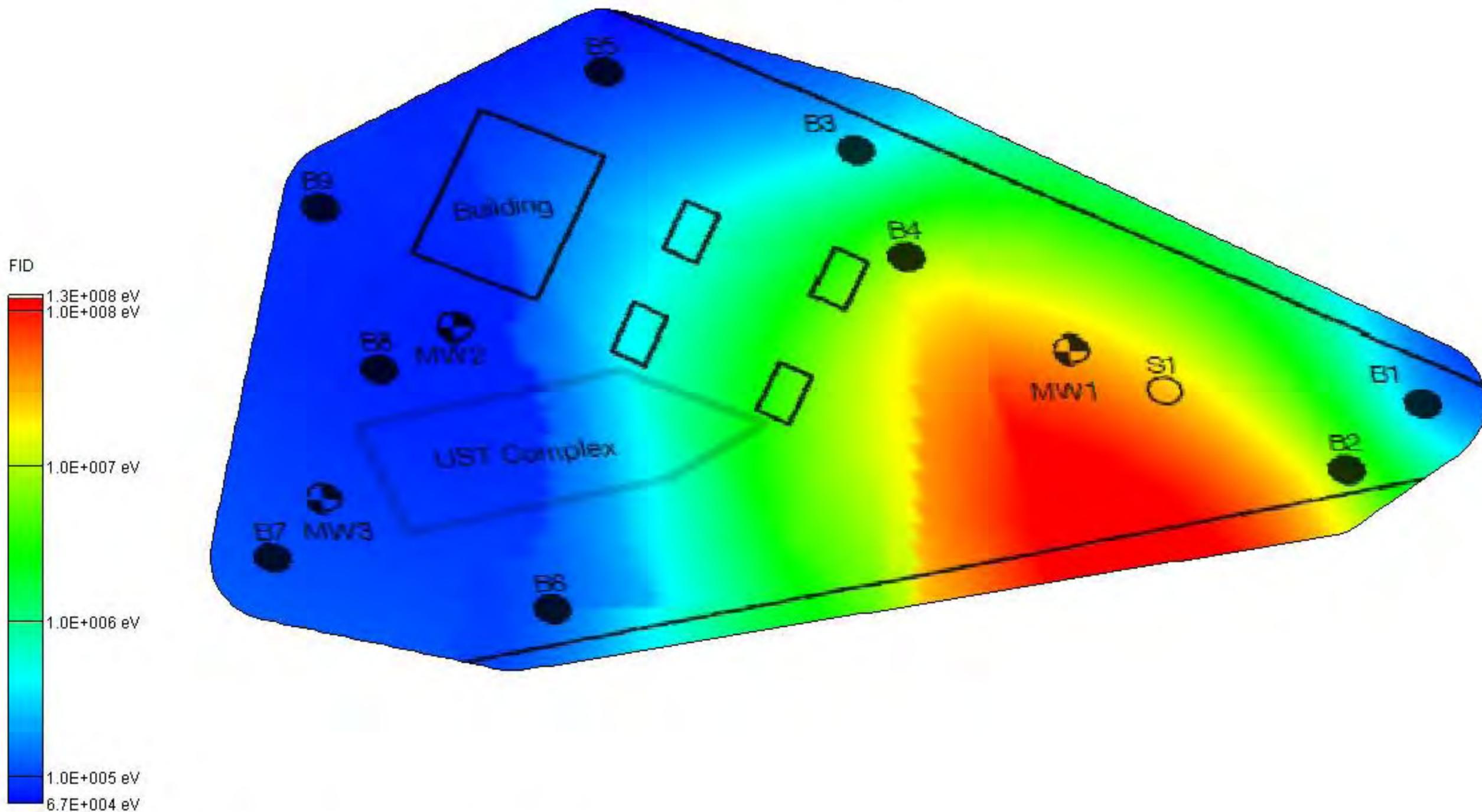
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -16 ft (MSL)



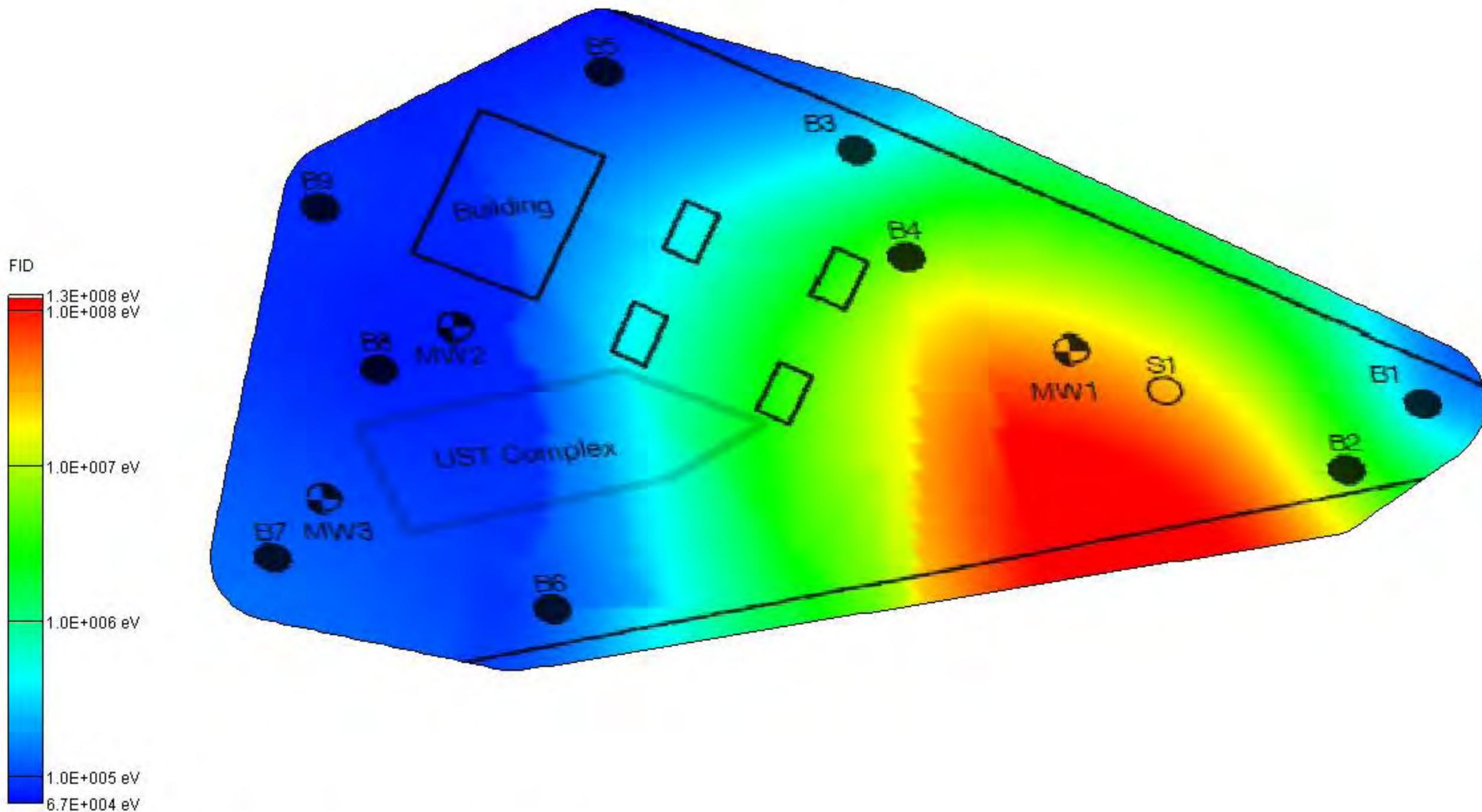
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -17 ft (MSL)



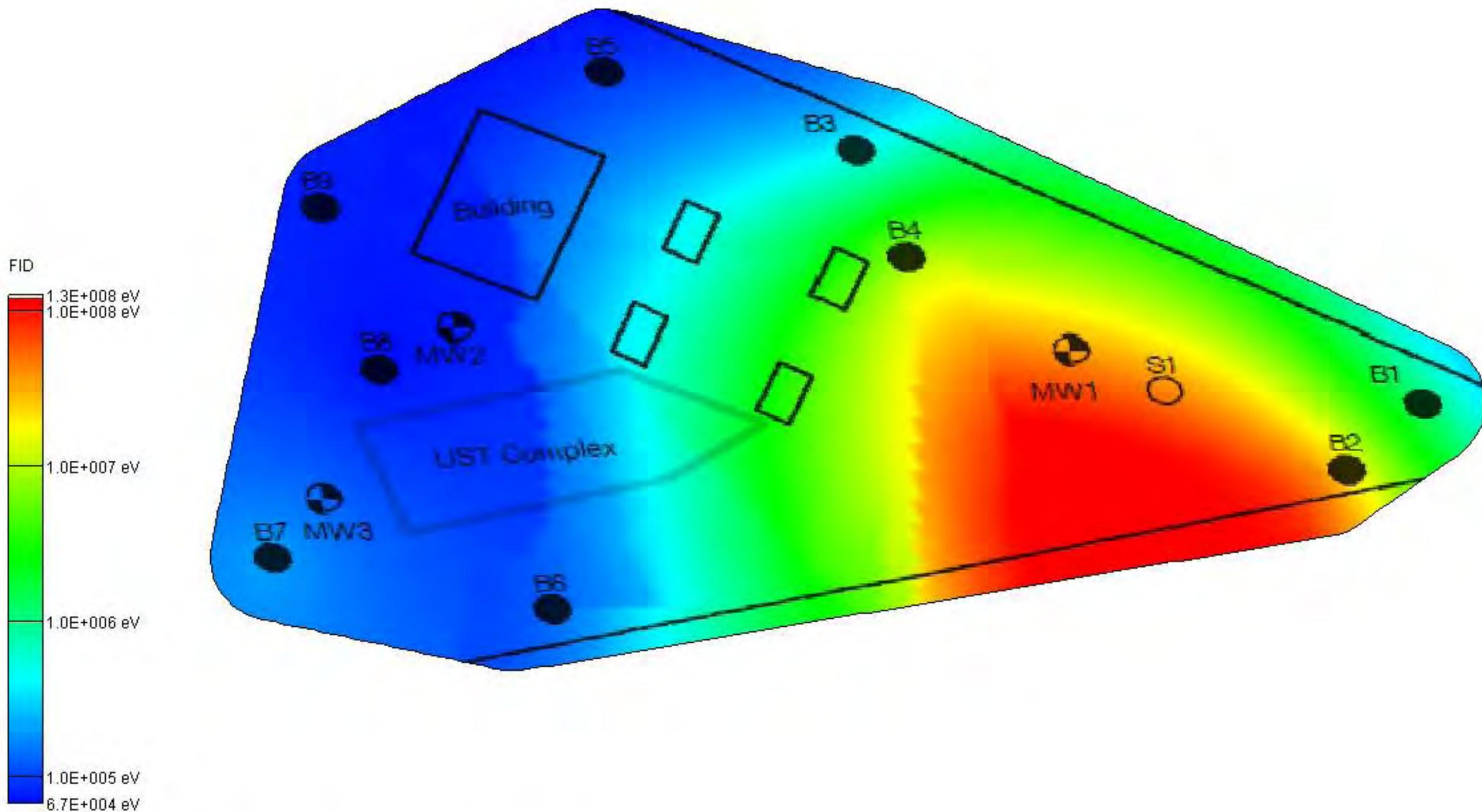
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -18 ft (MSL)



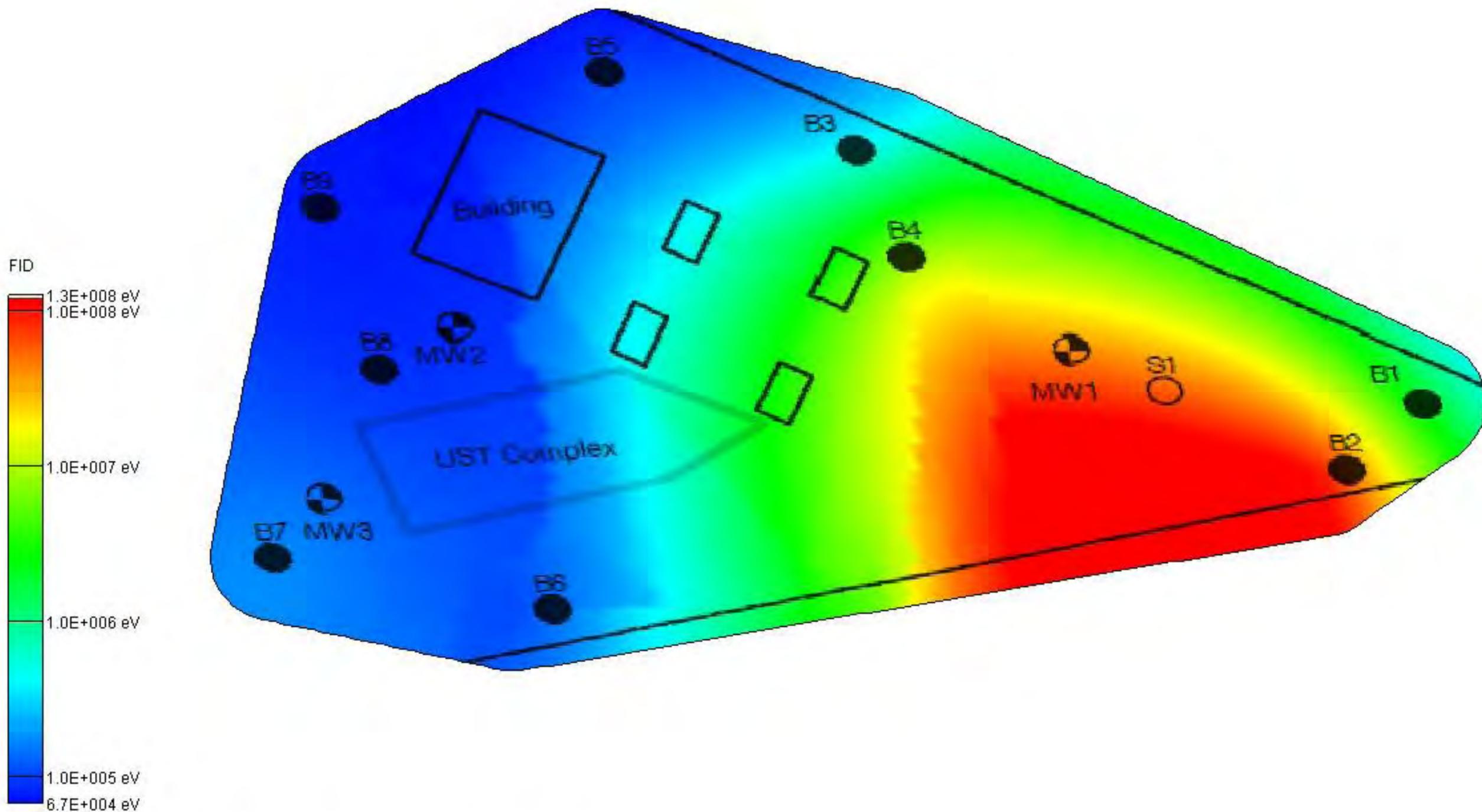
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -19 ft (MSL)



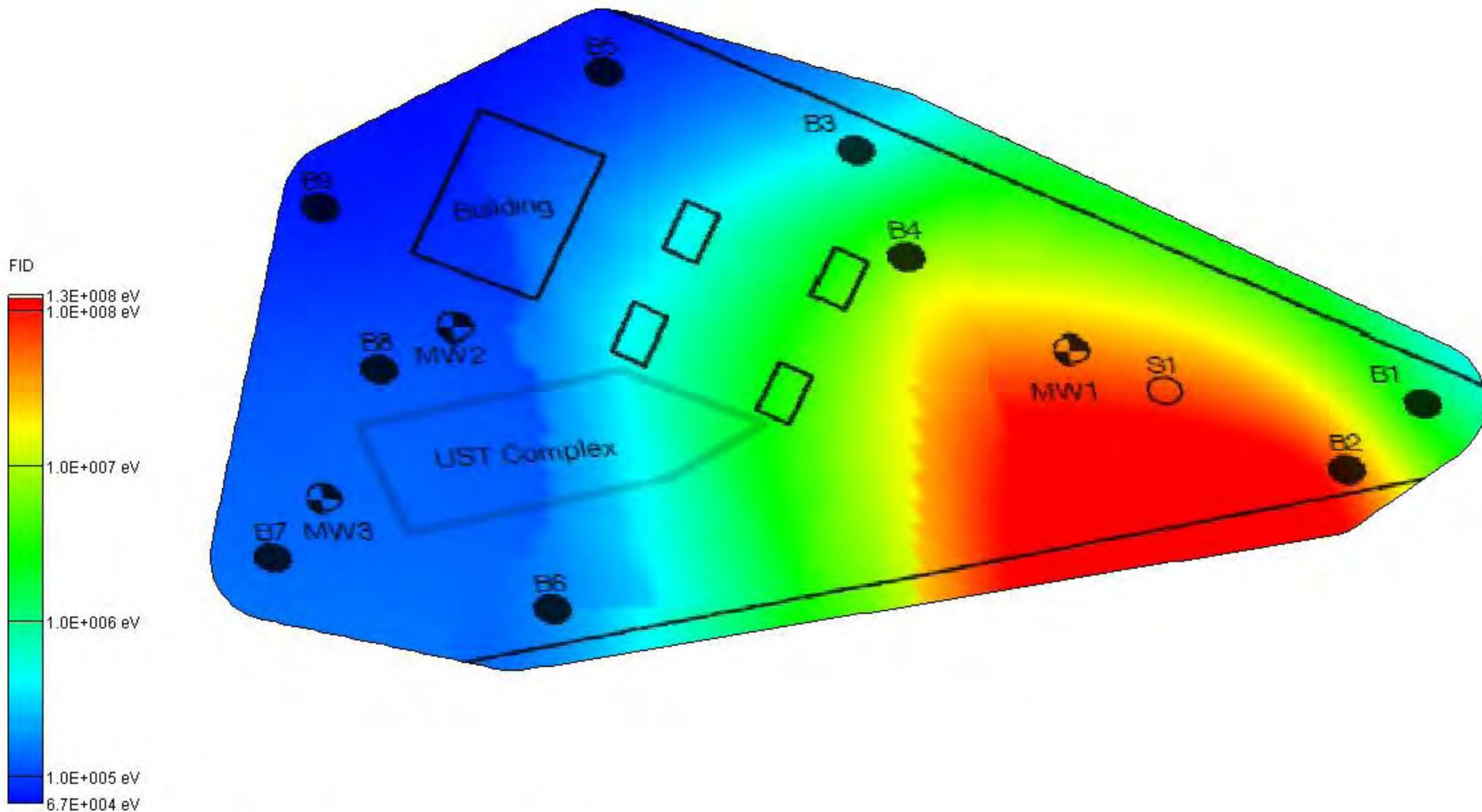
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -21 ft (MSL)



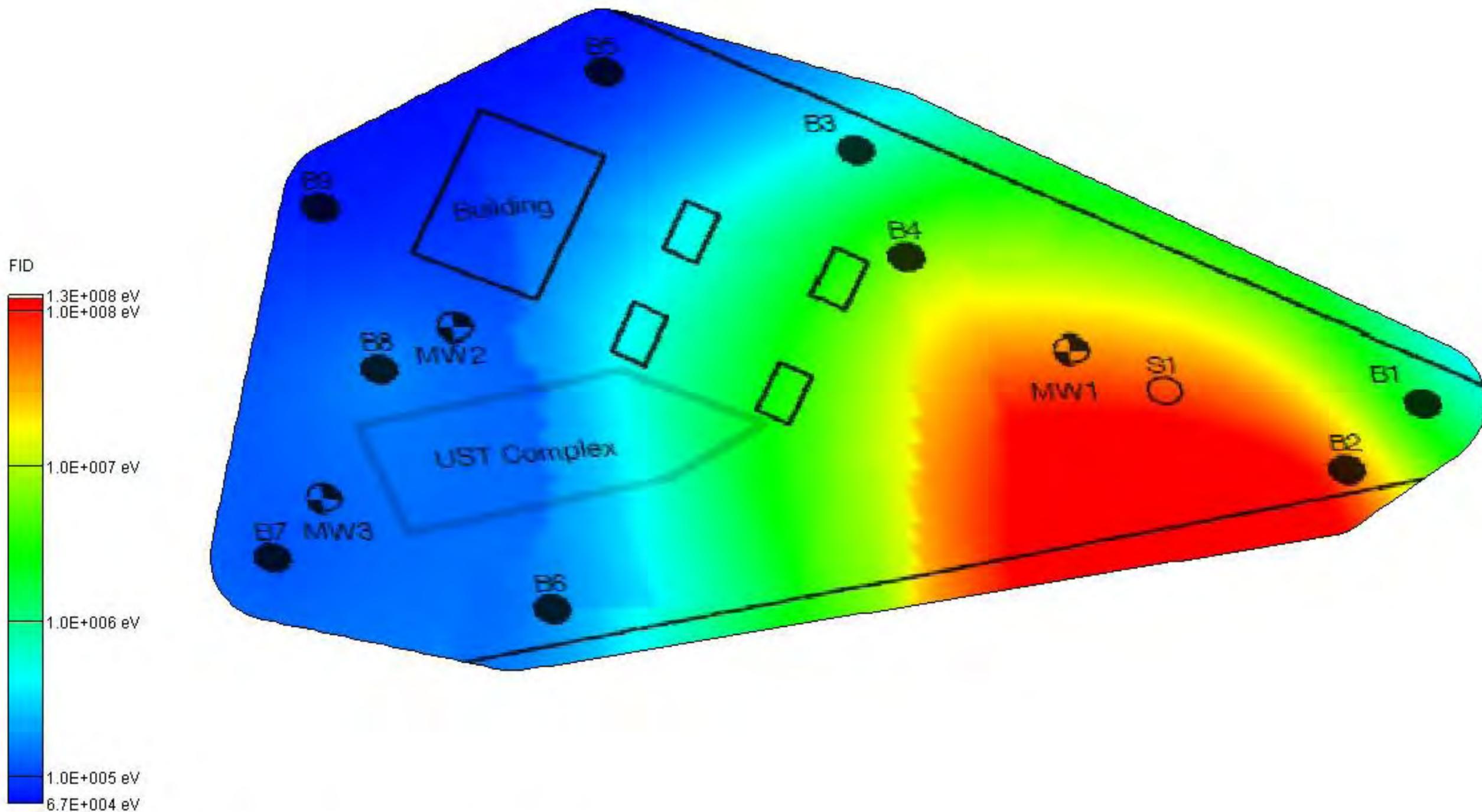
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -22 ft (MSL)



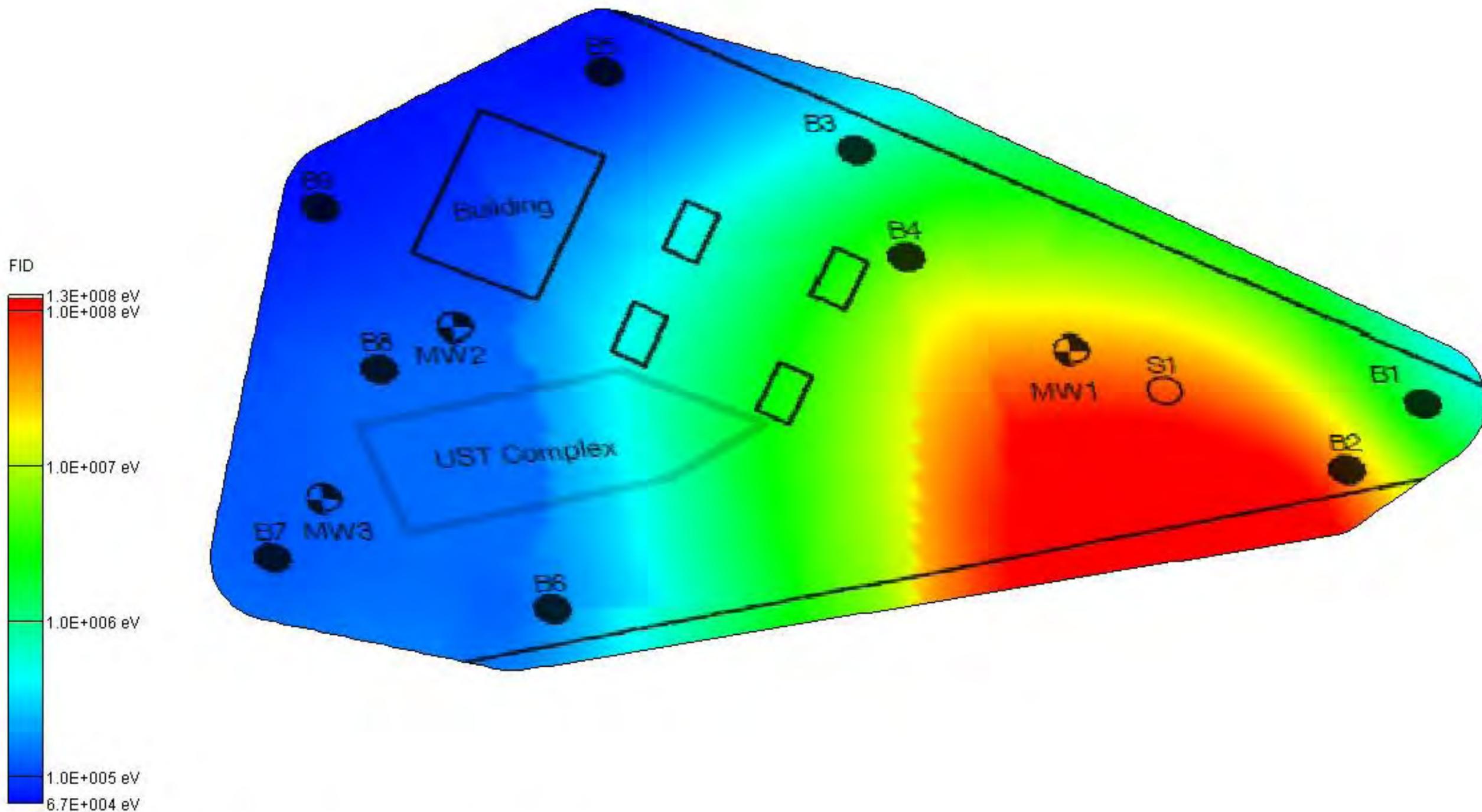
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -23 ft (MSL)



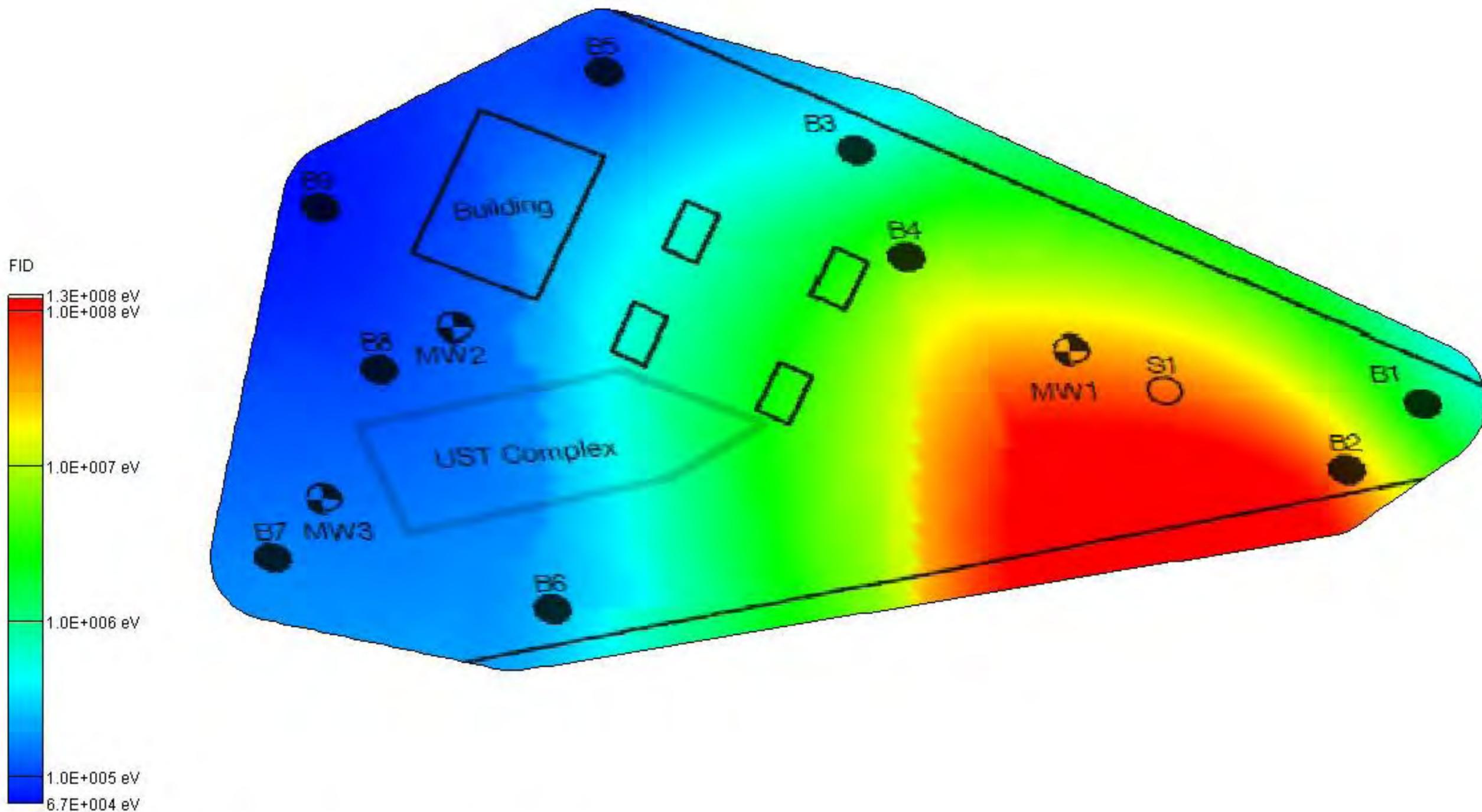
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -24 ft (MSL)



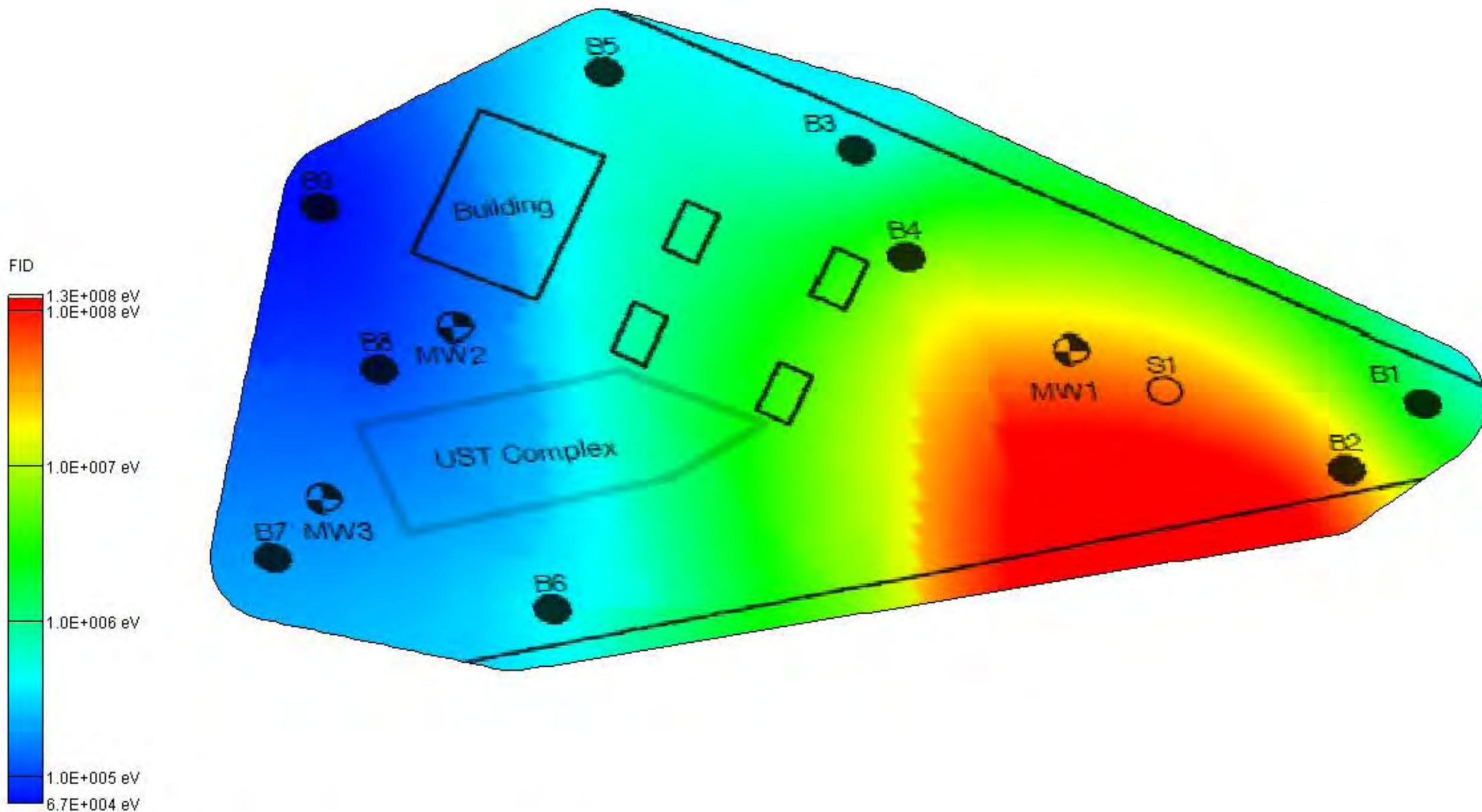
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -25 ft (MSL)



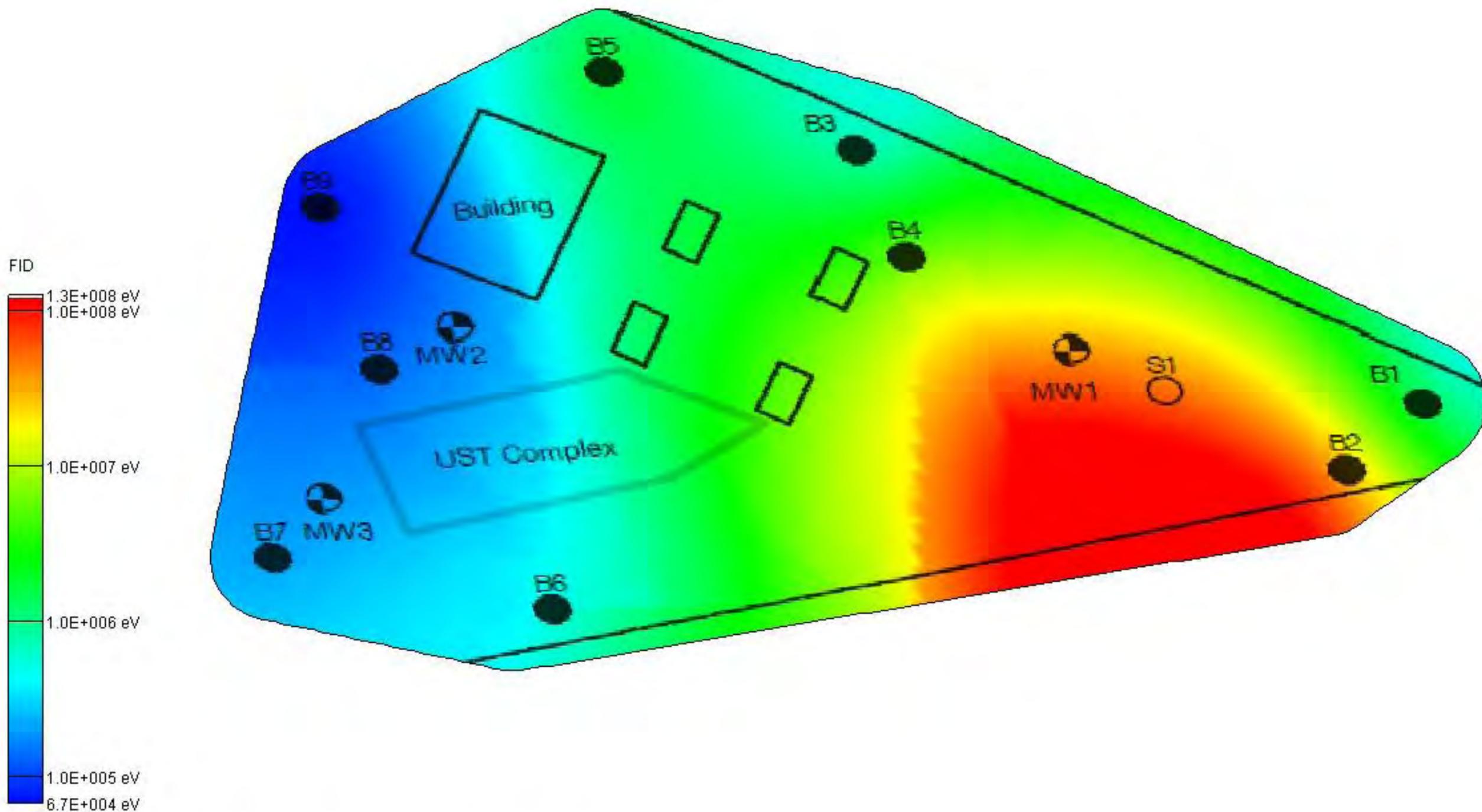
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -26 ft (MSL)



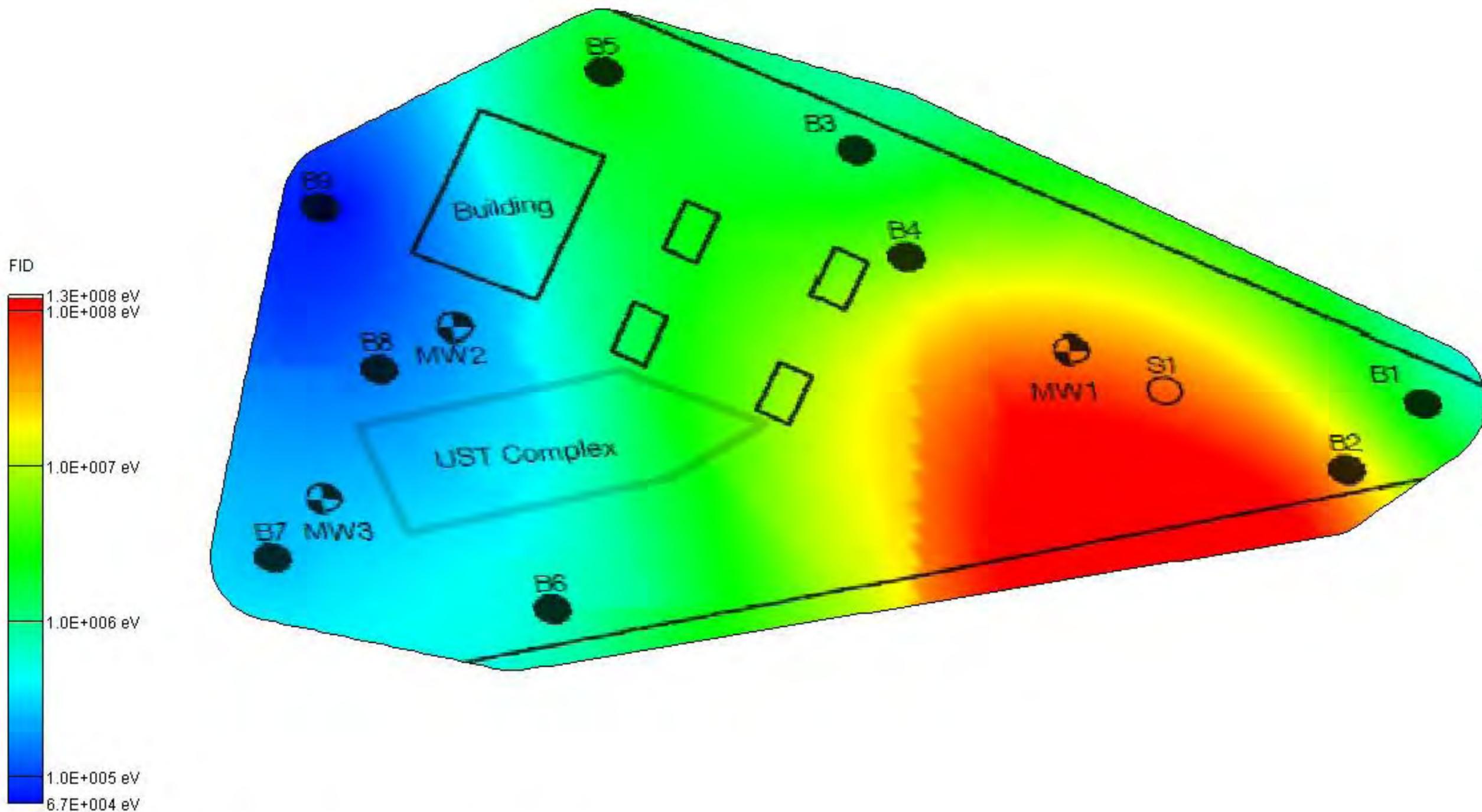
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -27 ft (MSL)



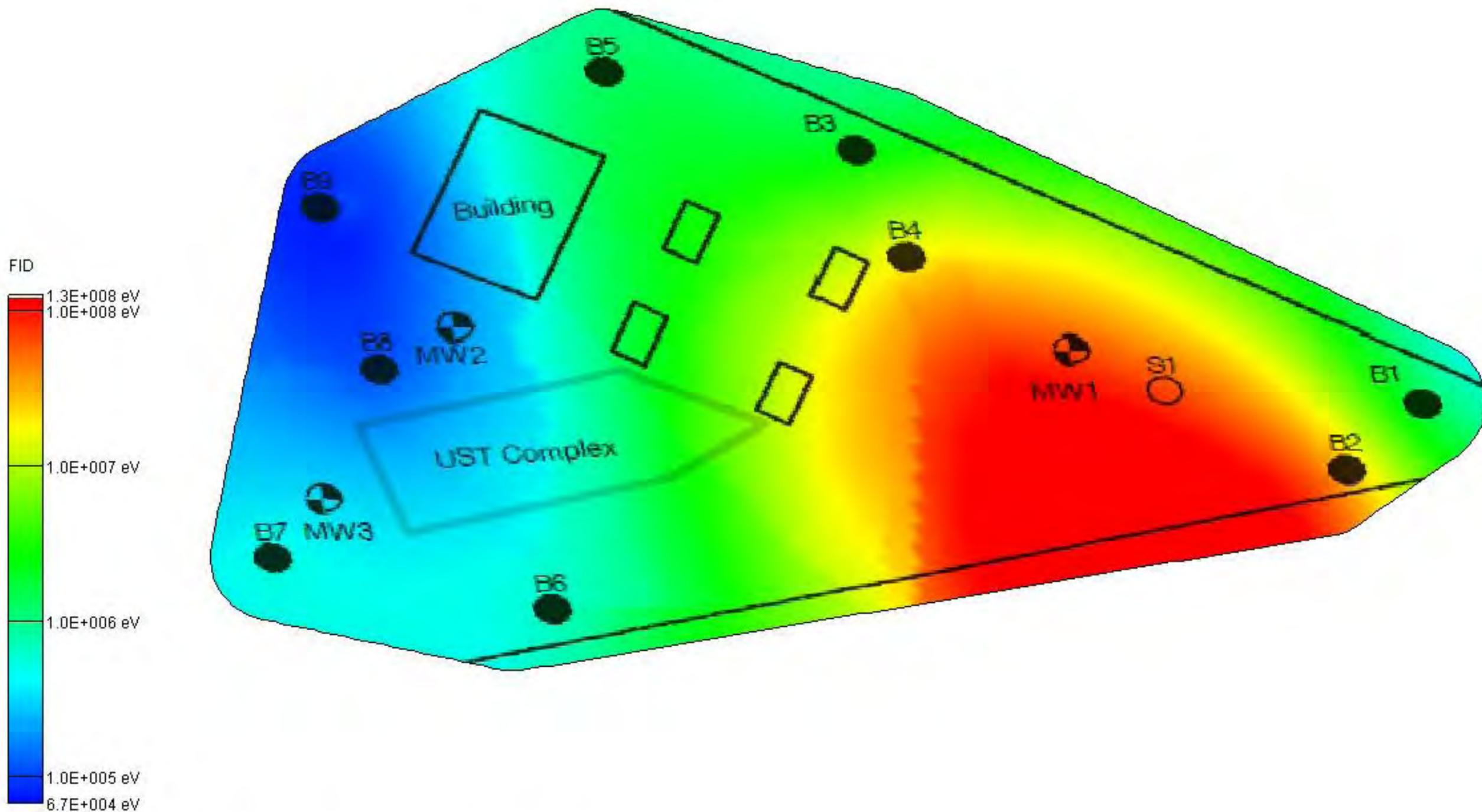
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -28 ft (MSL)



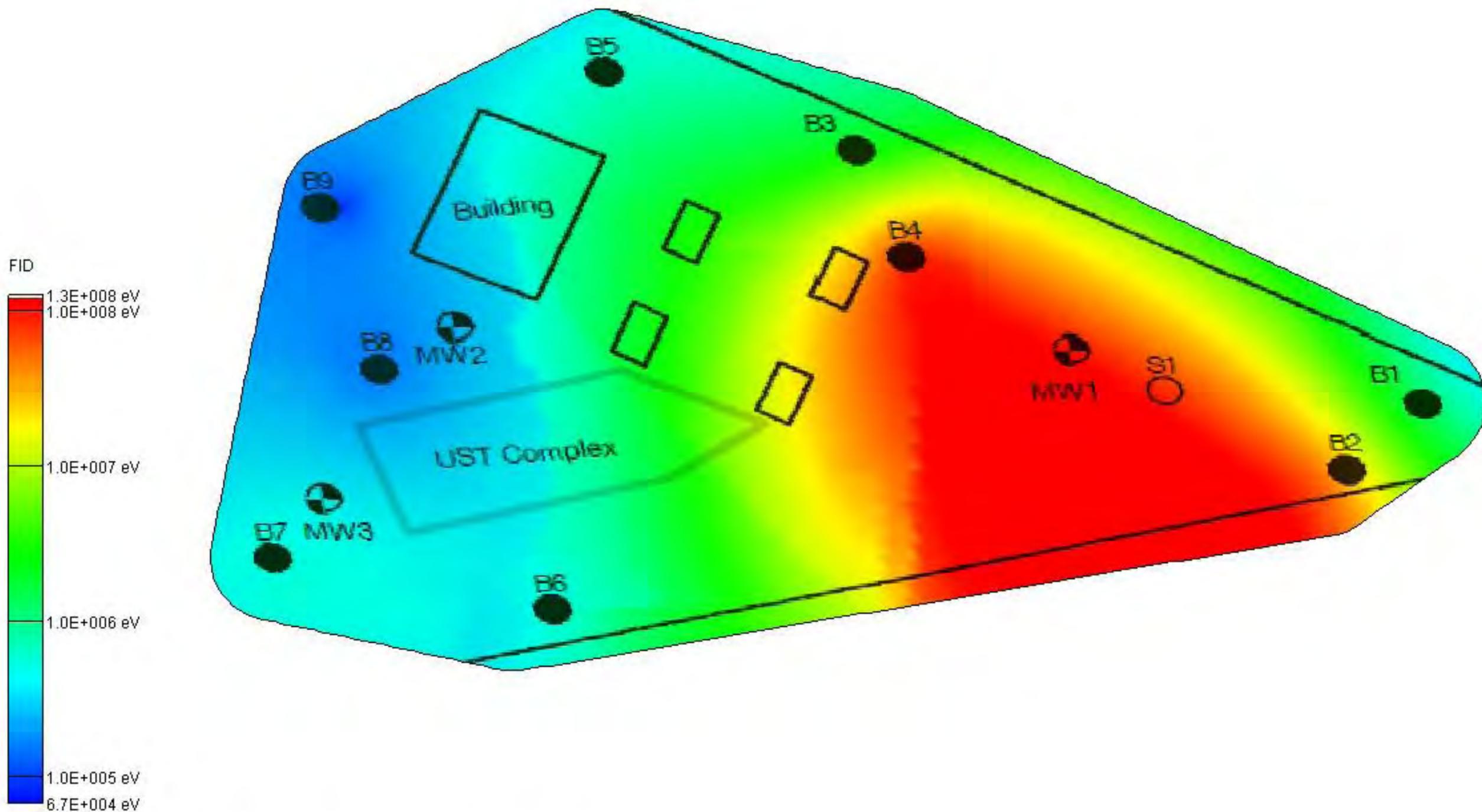
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -29 ft (MSL)



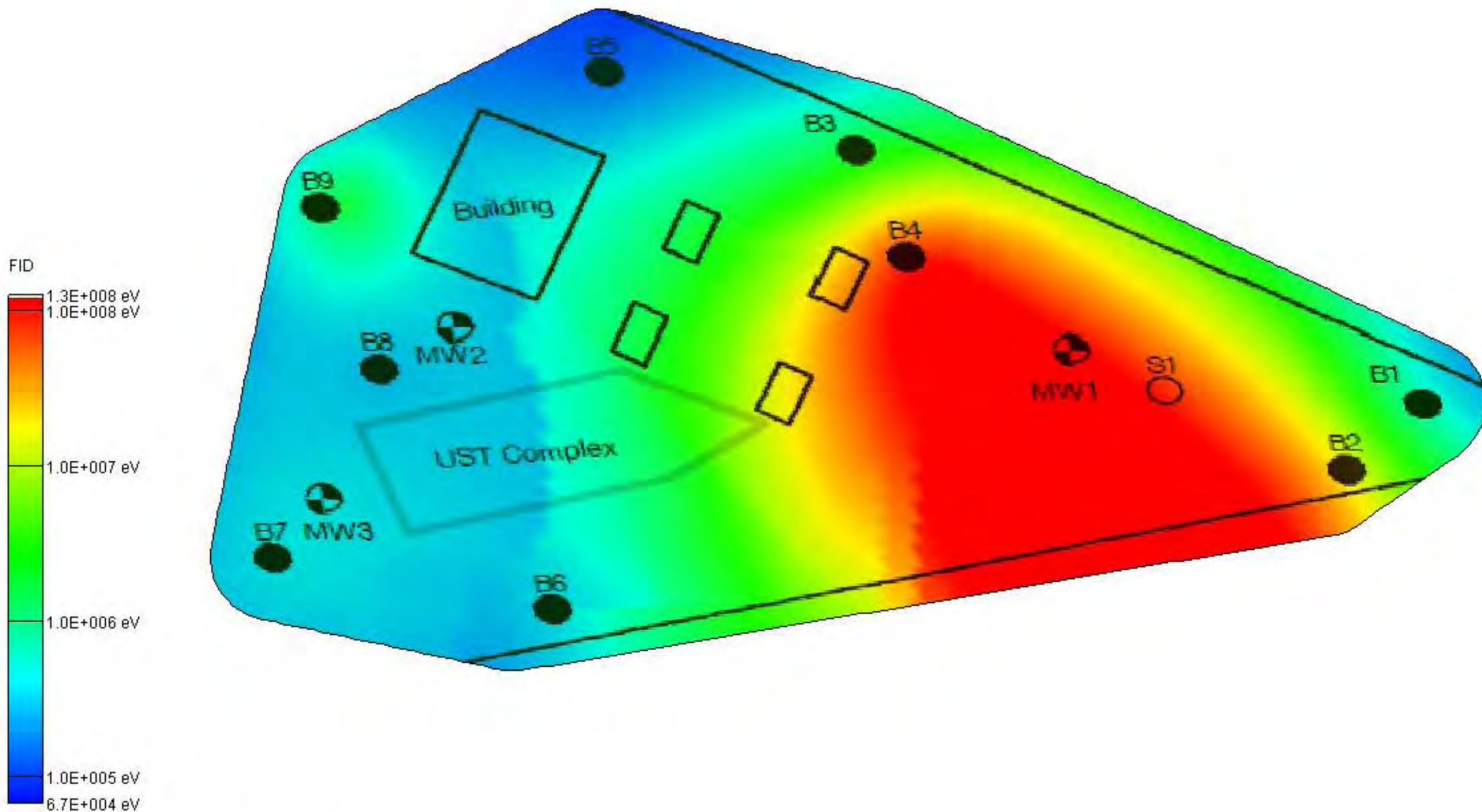
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -30 ft (MSL)



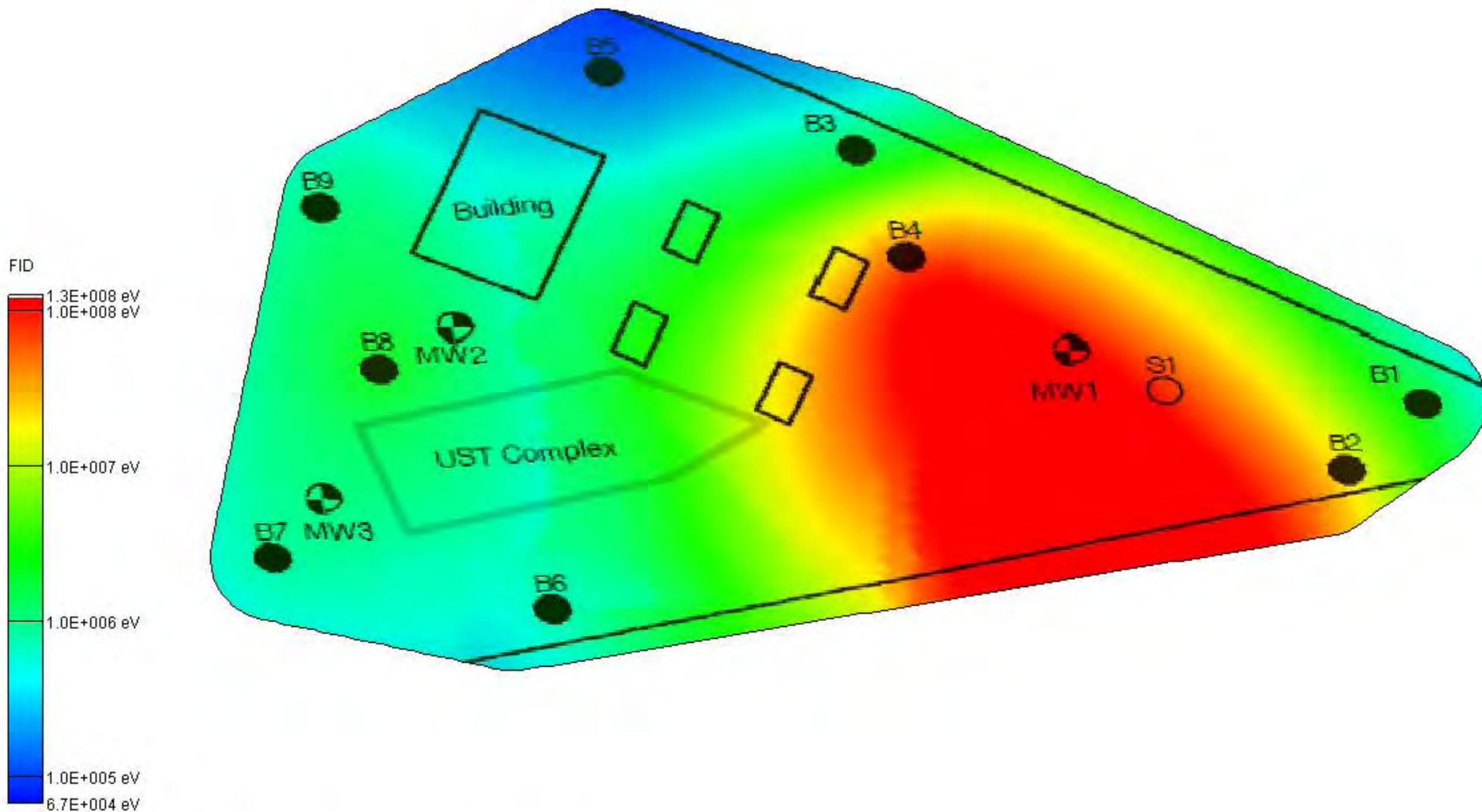
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -31 ft (MSL)



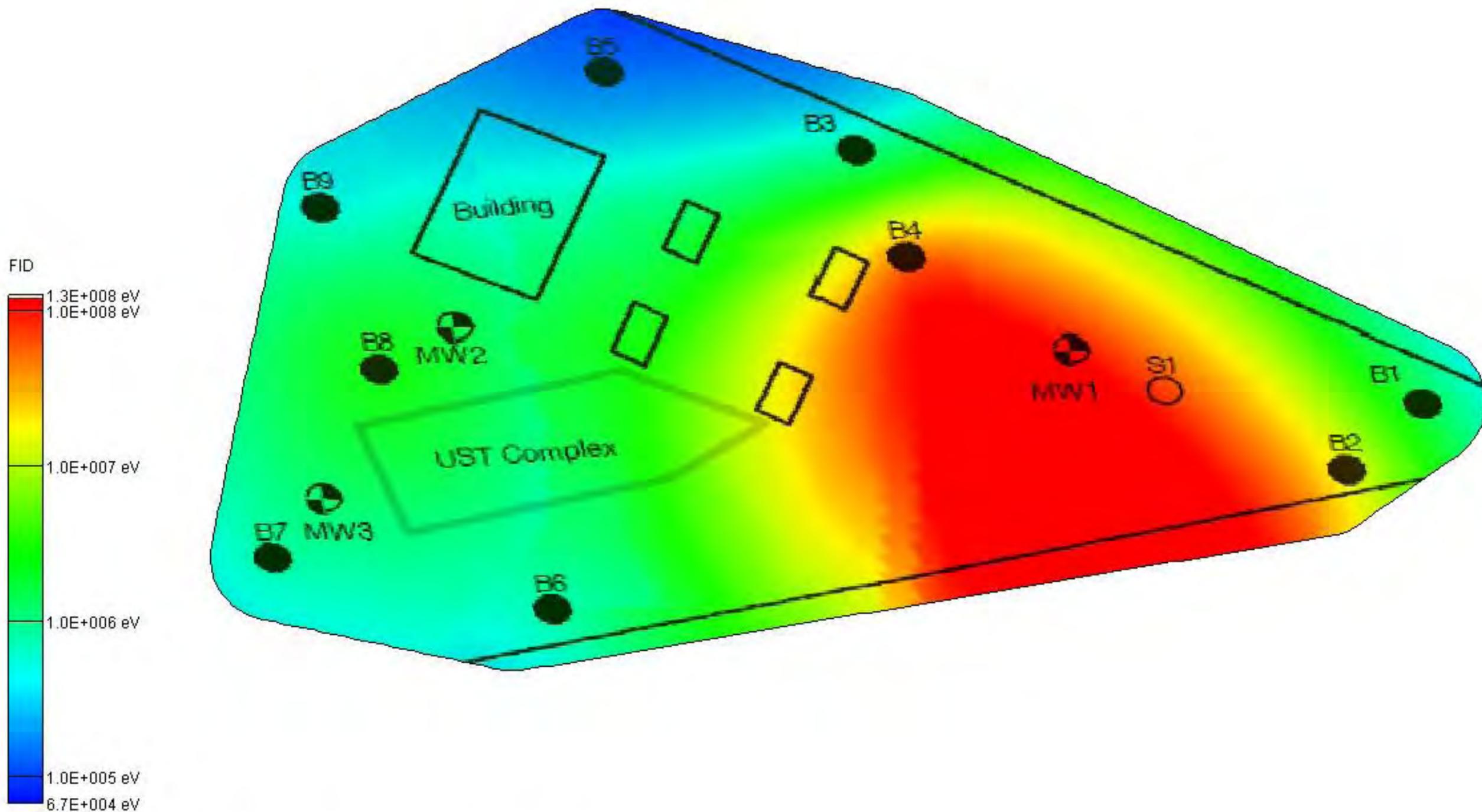
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -32 ft (MSL)



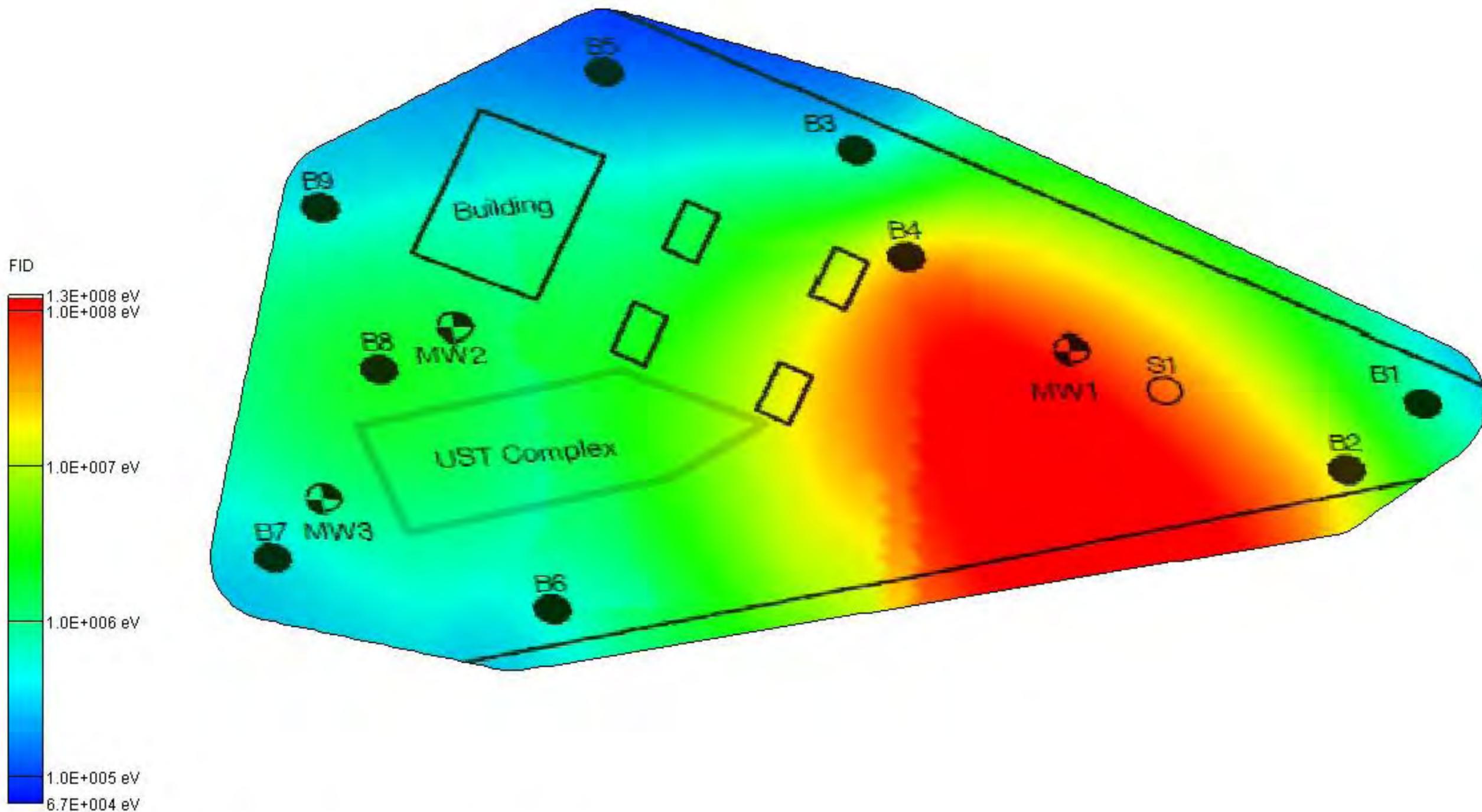
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -33 ft (MSL)



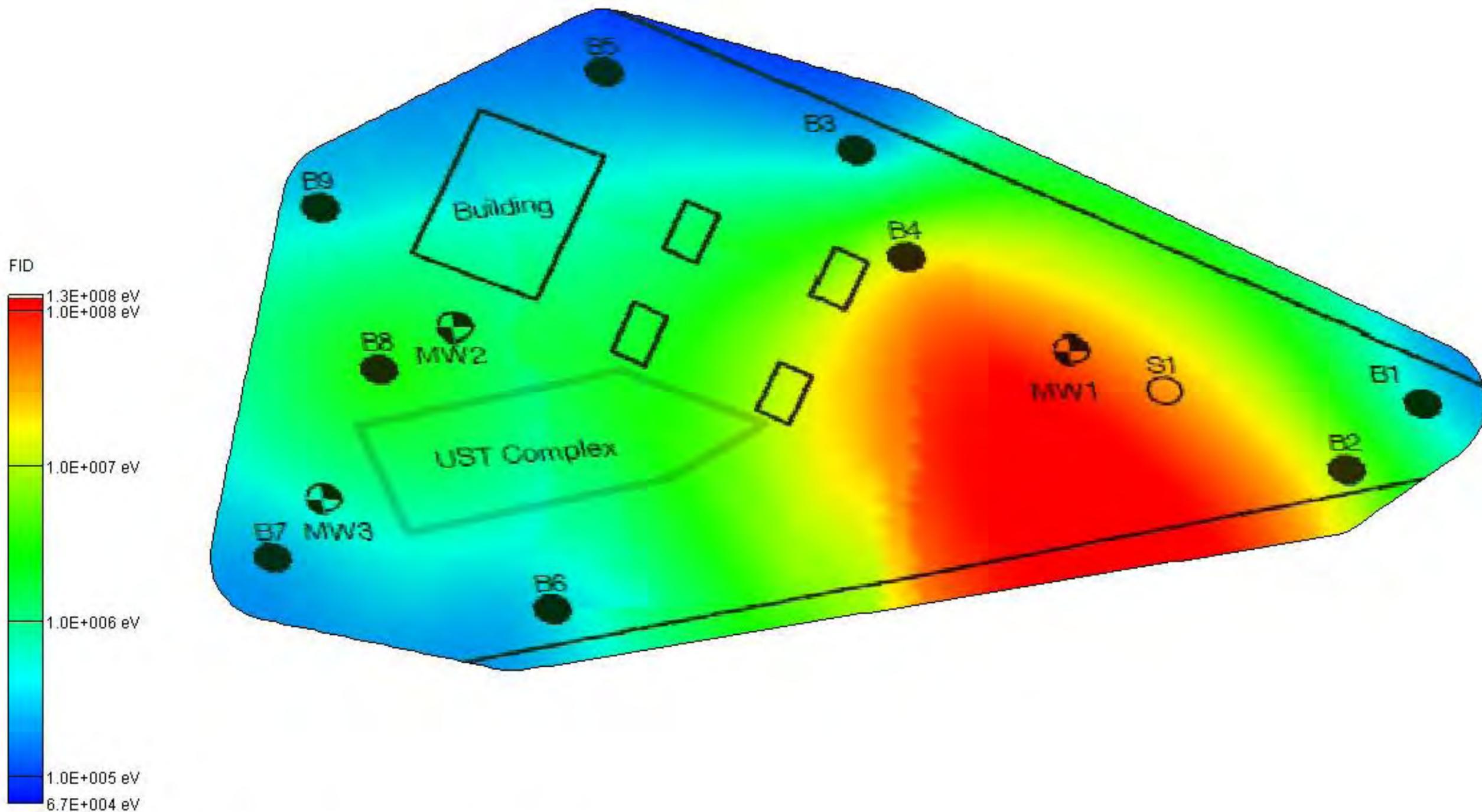
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -34 ft (MSL)



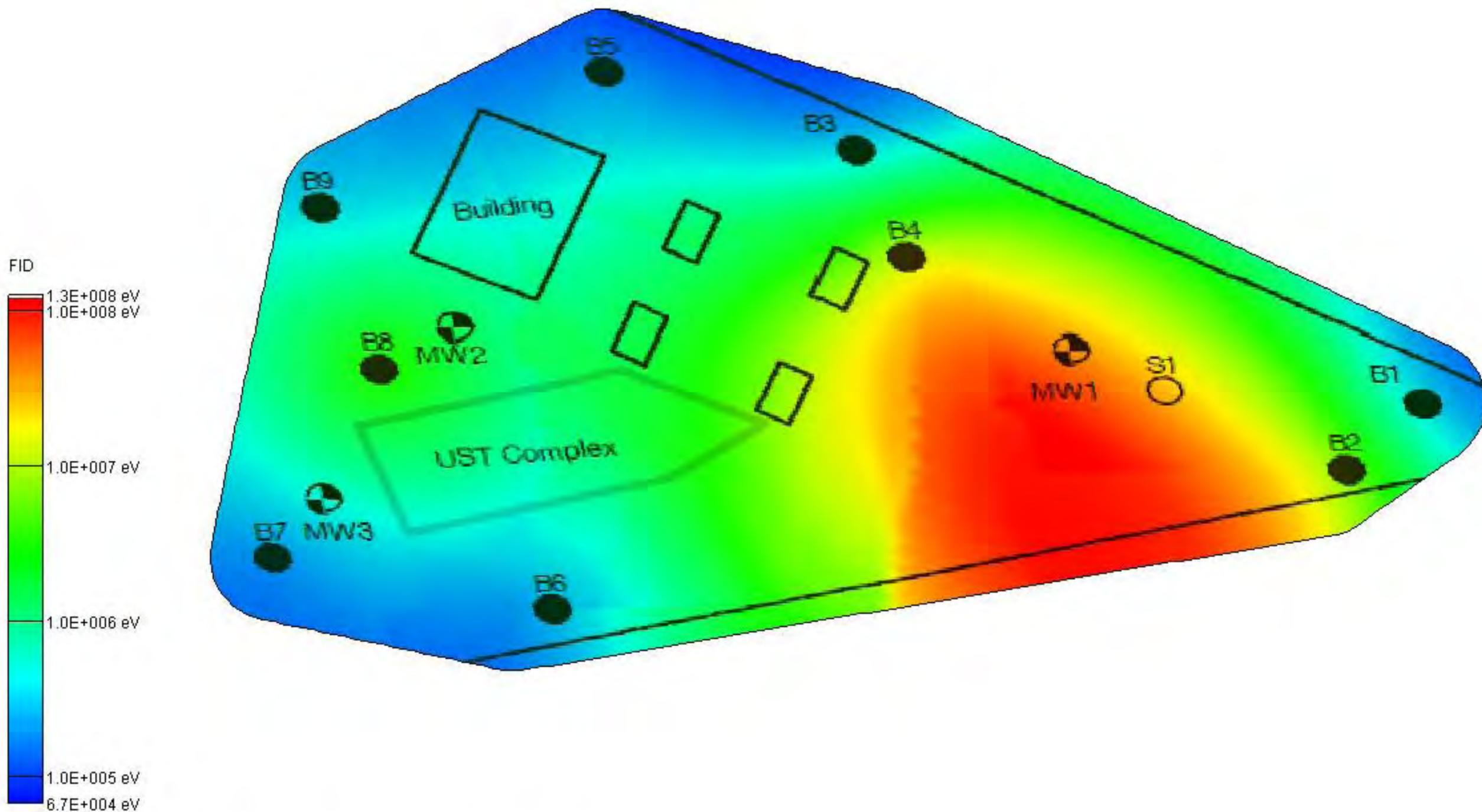
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -35 ft (MSL)



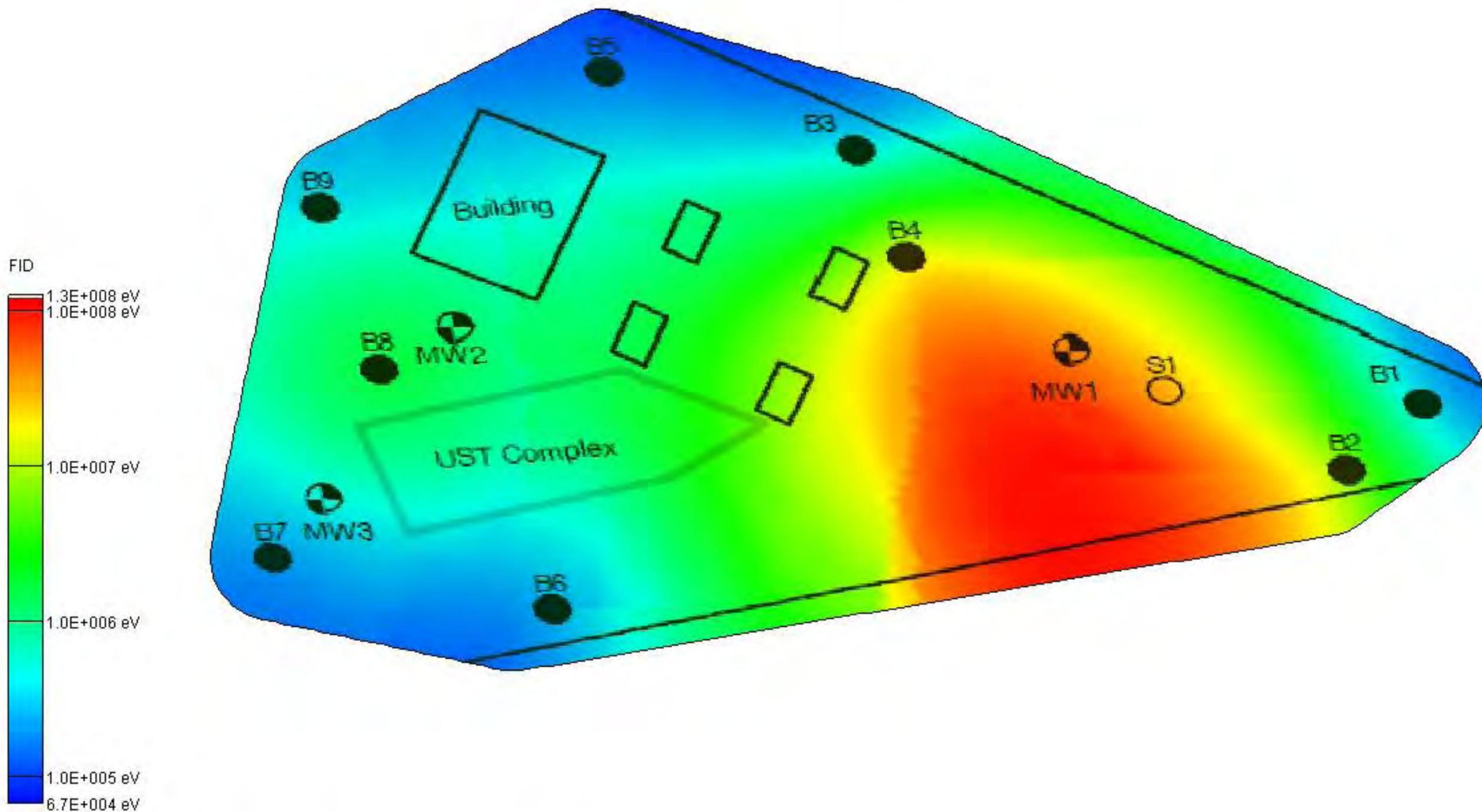
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -36 ft (MSL)



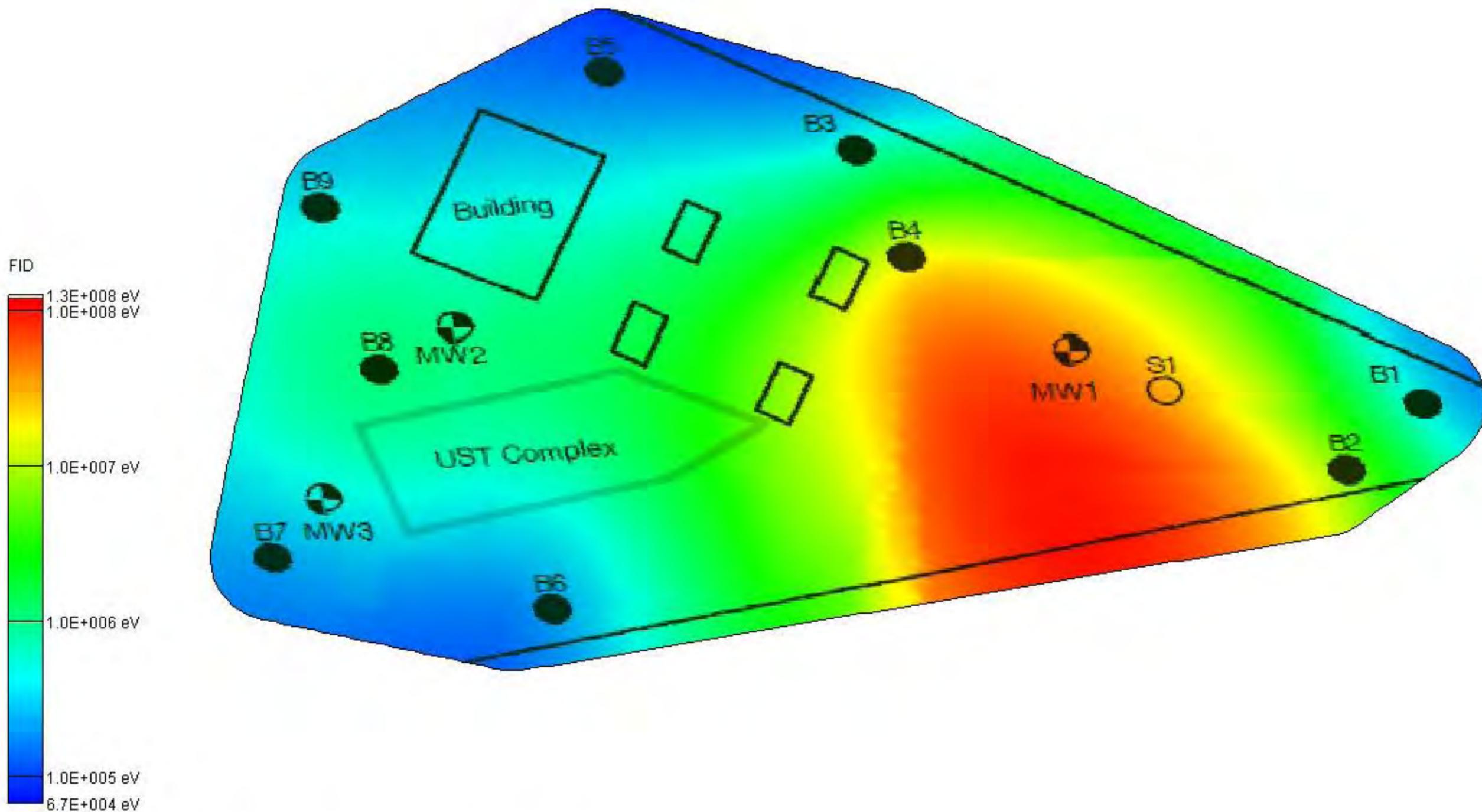
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -37 ft (MSL)



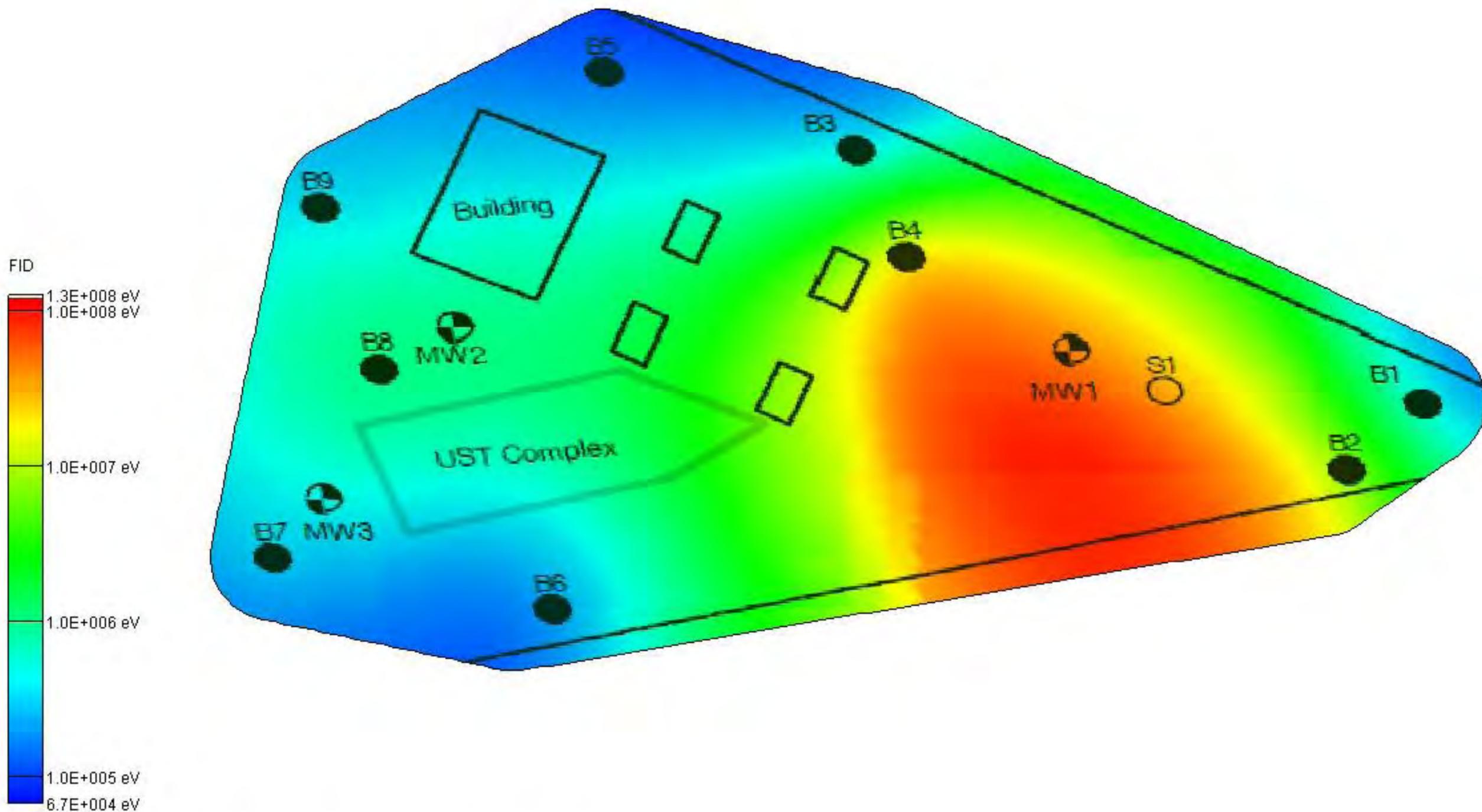
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -38 ft (MSL)



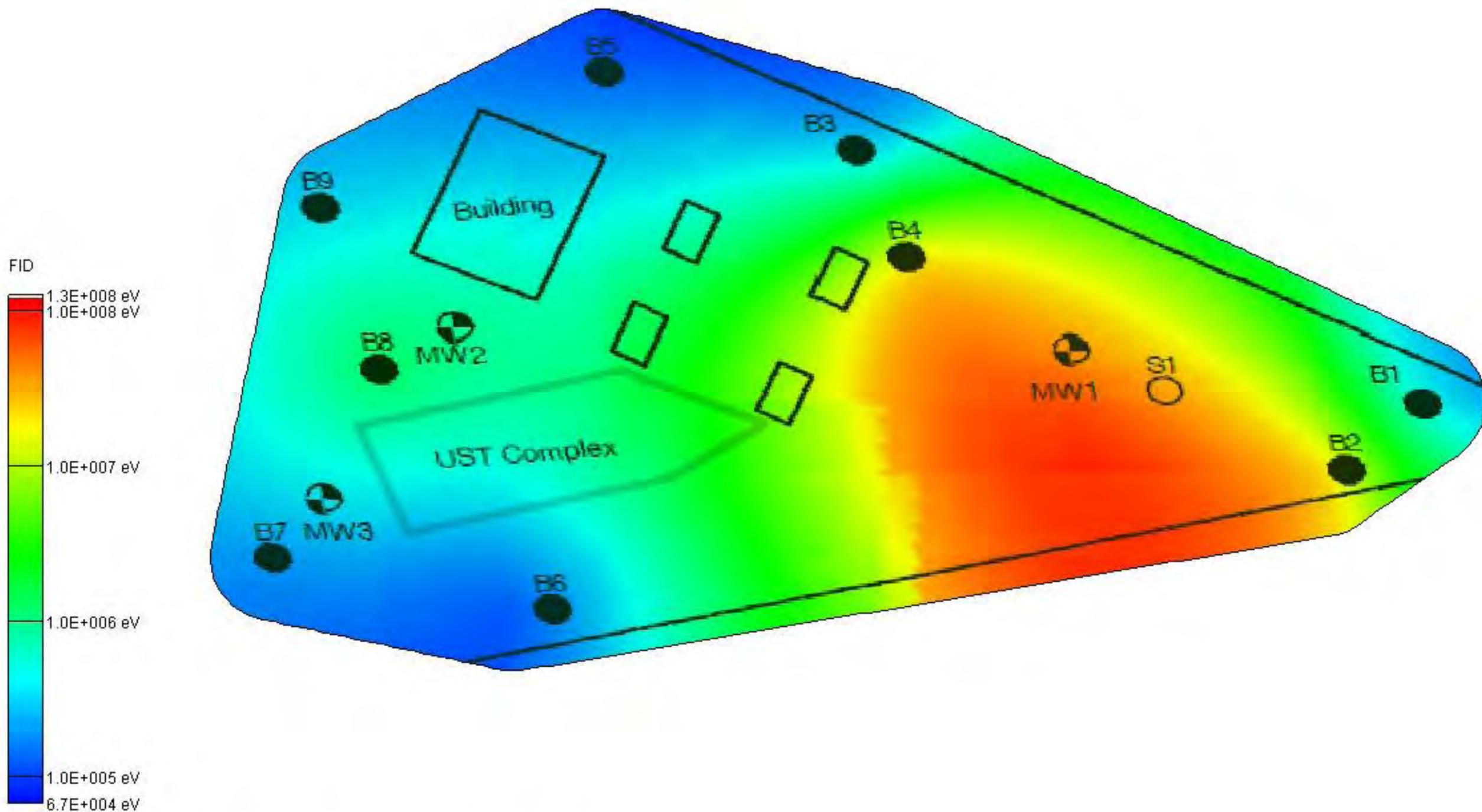
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -39 ft (MSL)



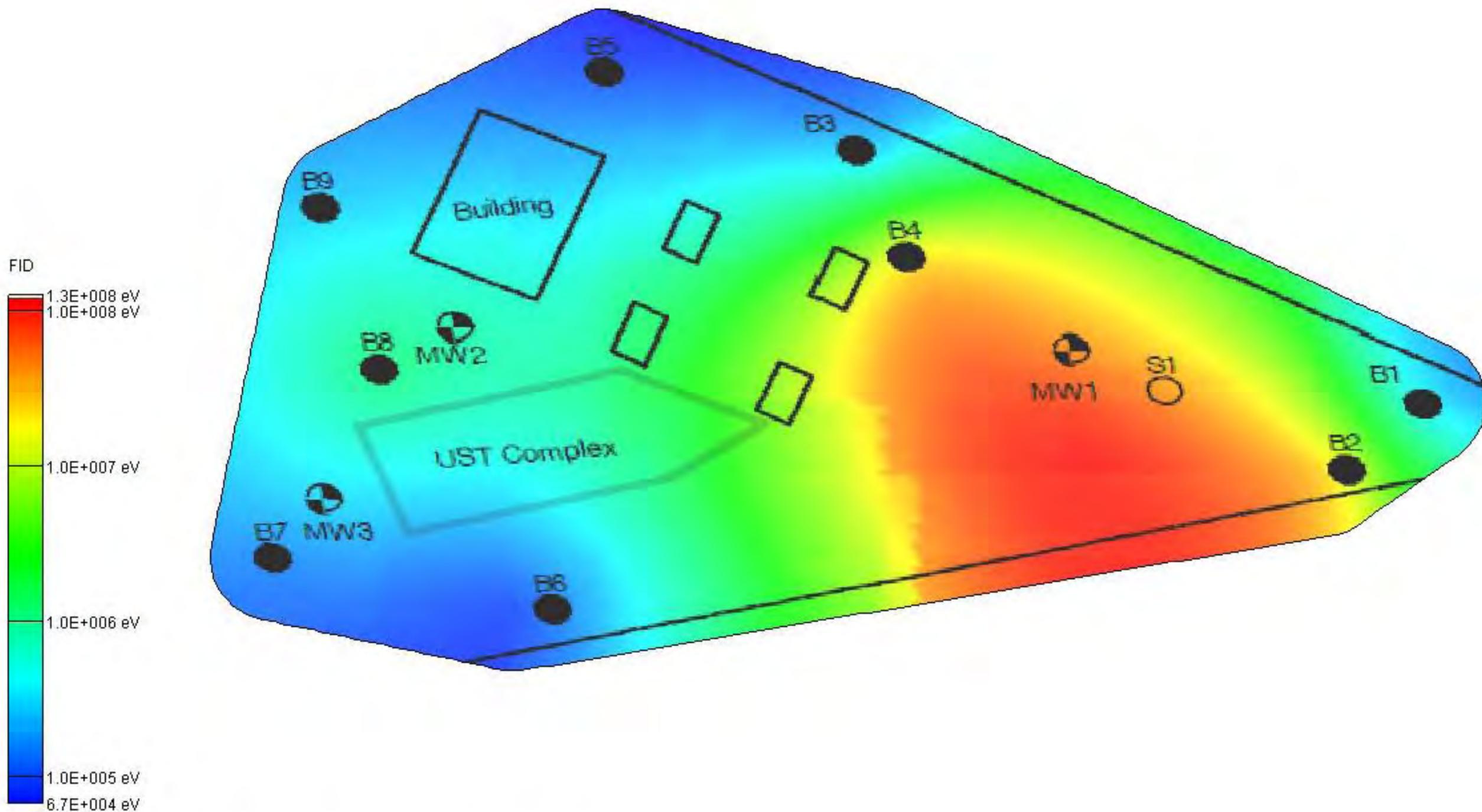
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -40 ft (MSL)



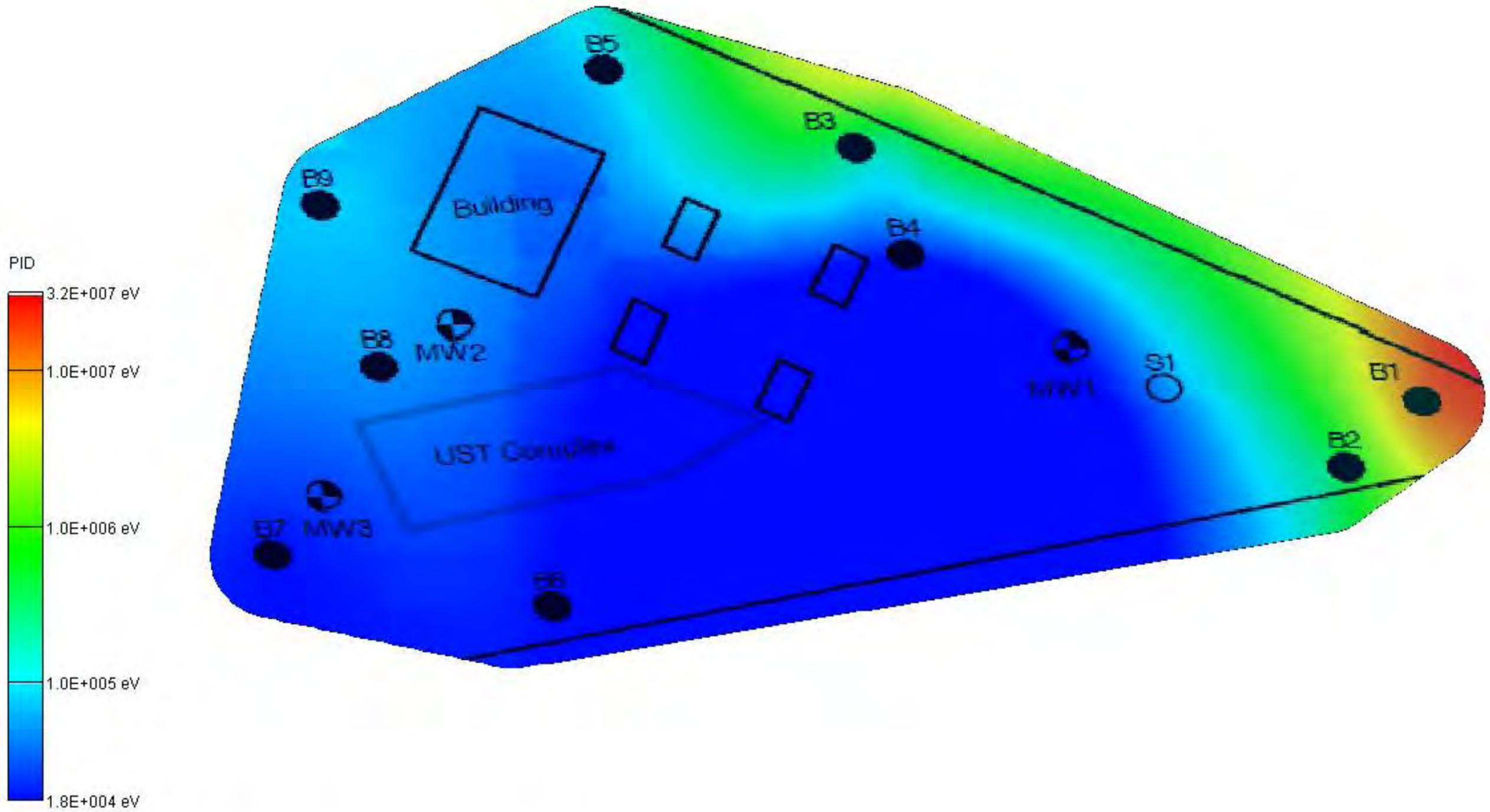
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

FID
Depth -41 ft (MSL)



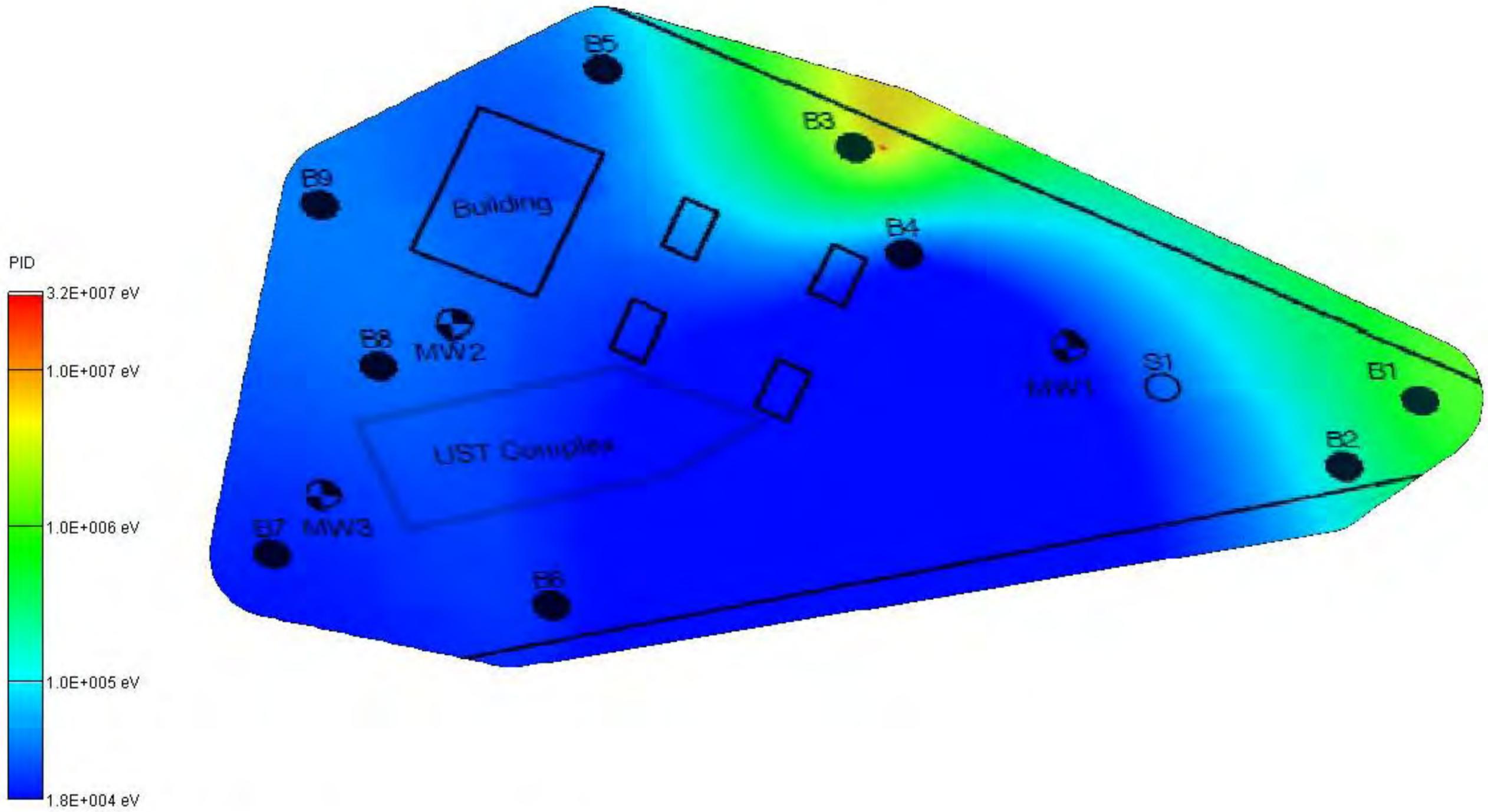
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth 0 ft (MSL)



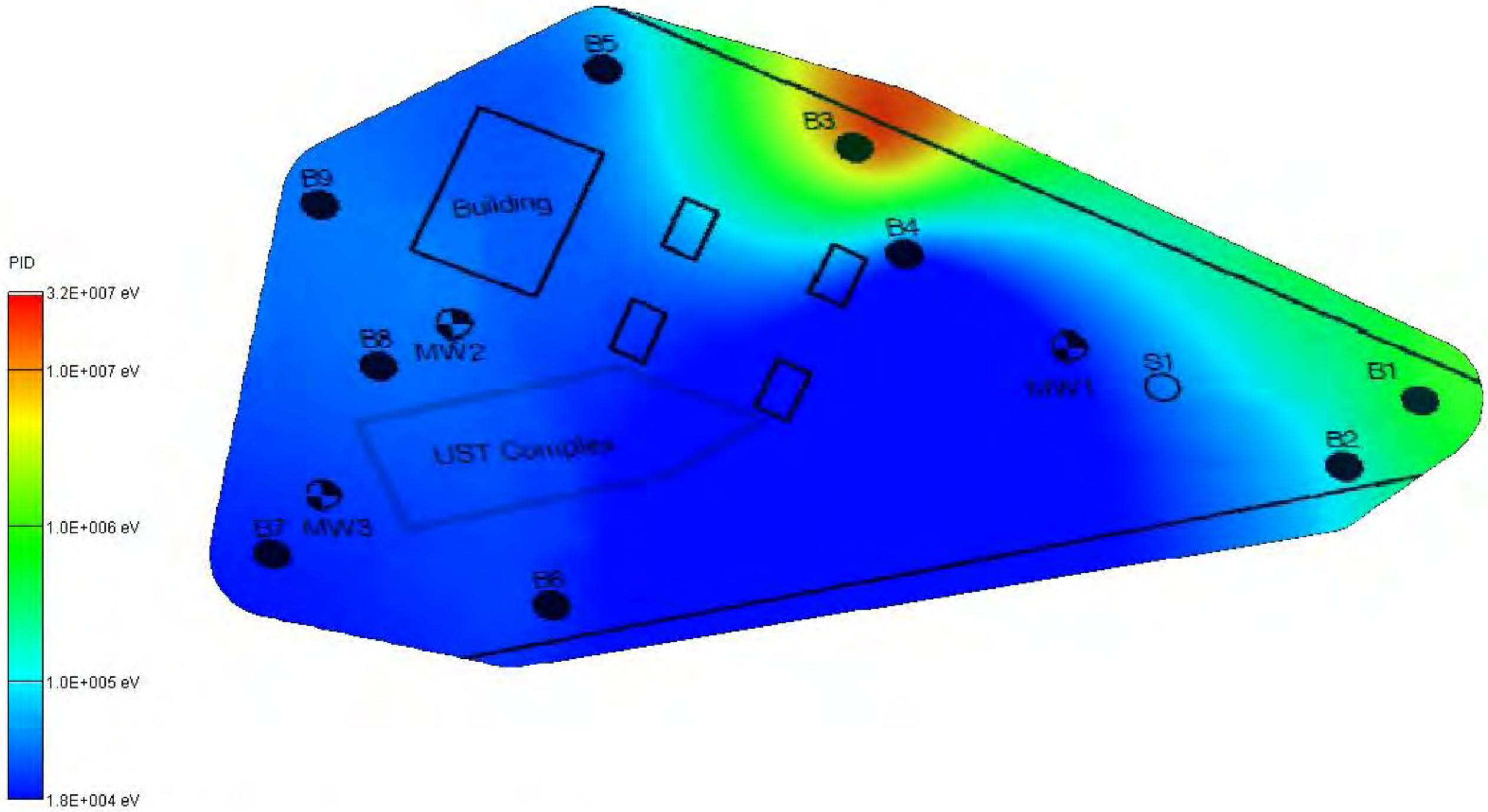
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -1 ft (MSL)



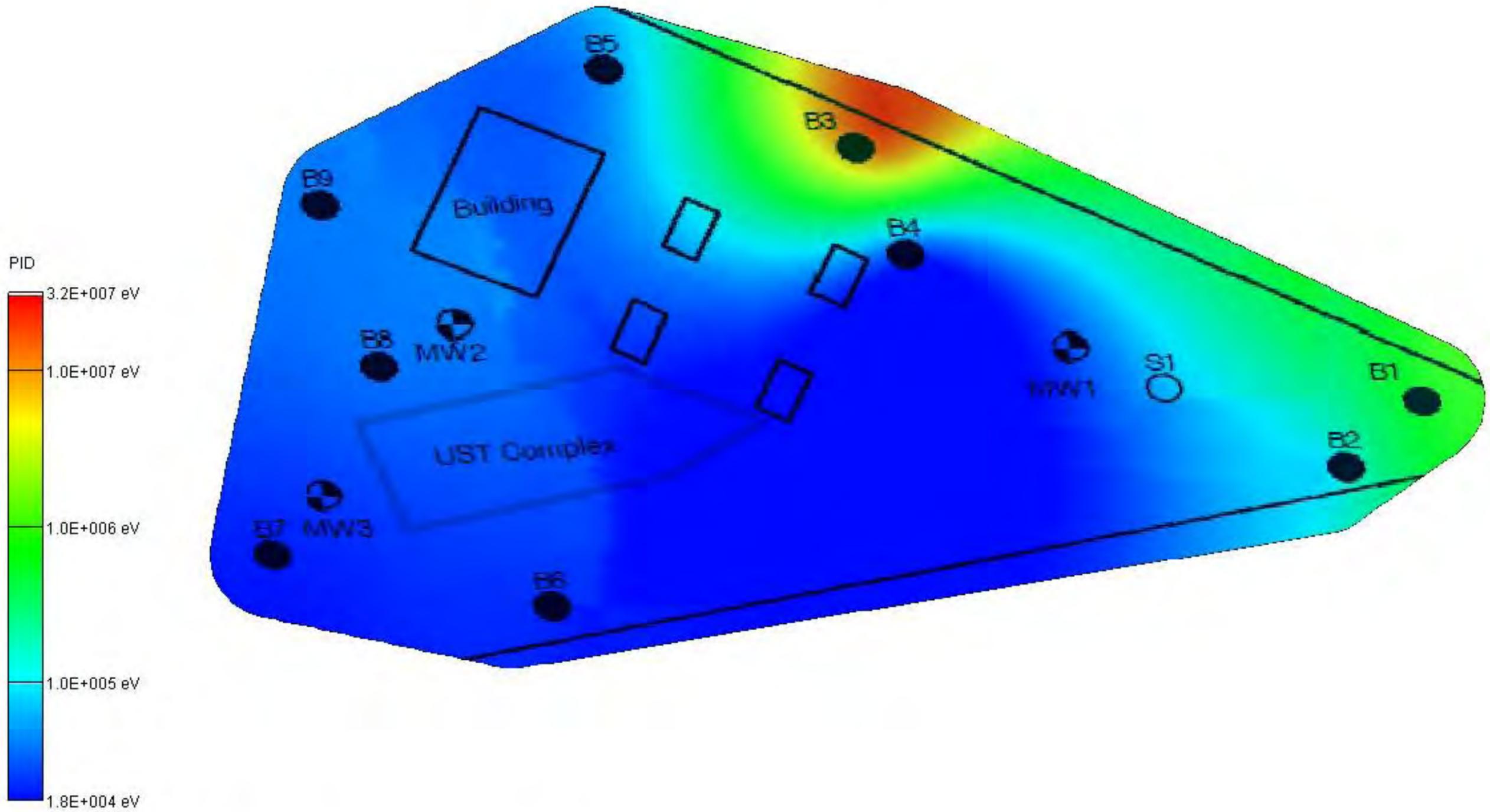
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -2 ft (MSL)



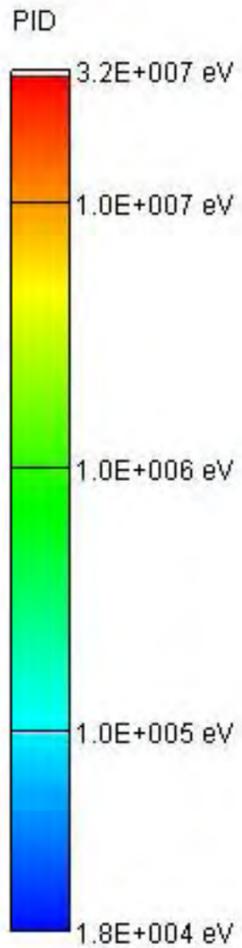
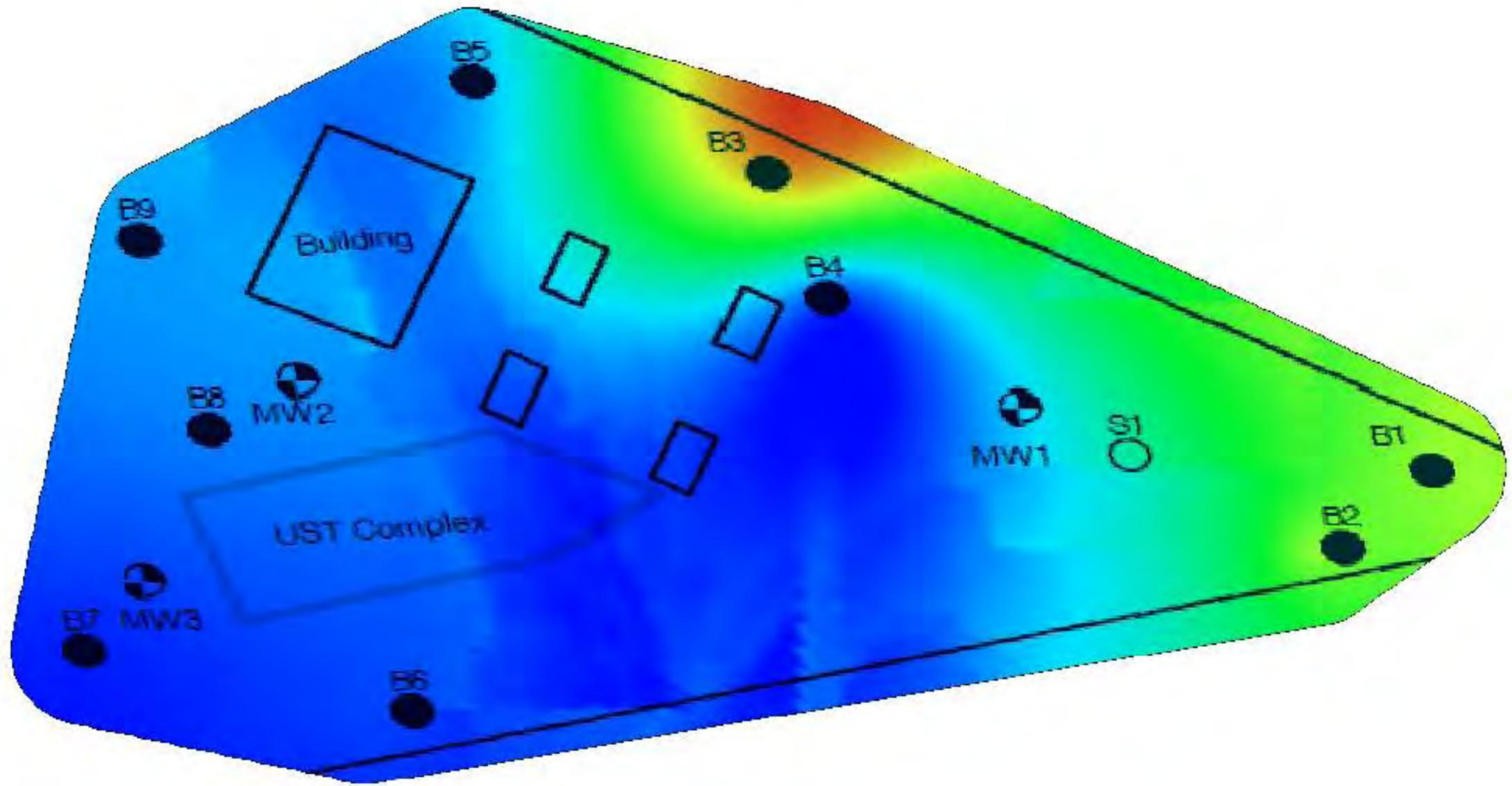
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -3 ft (MSL)



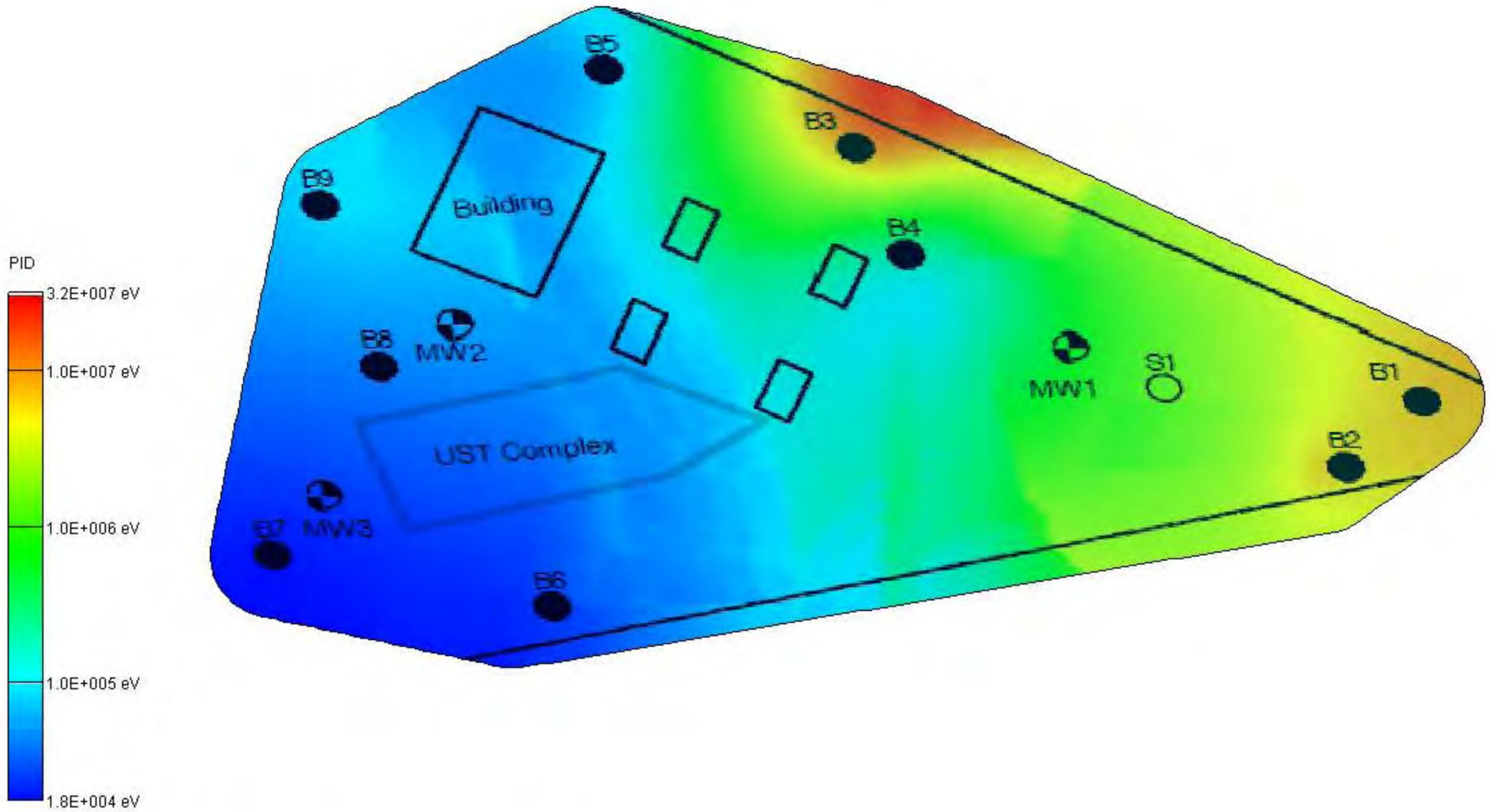
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -4 ft (MSL)



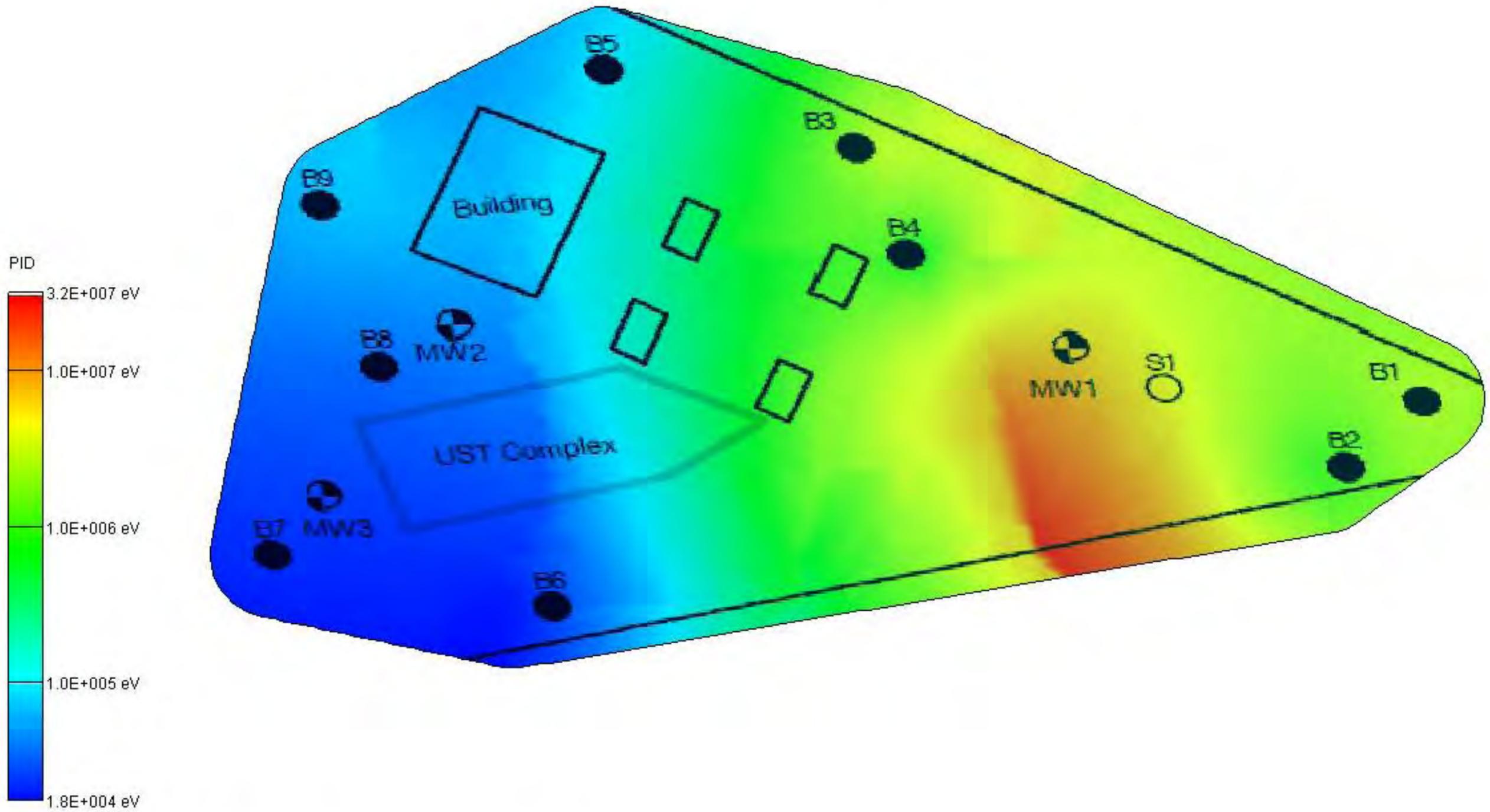
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -5 ft (MSL)



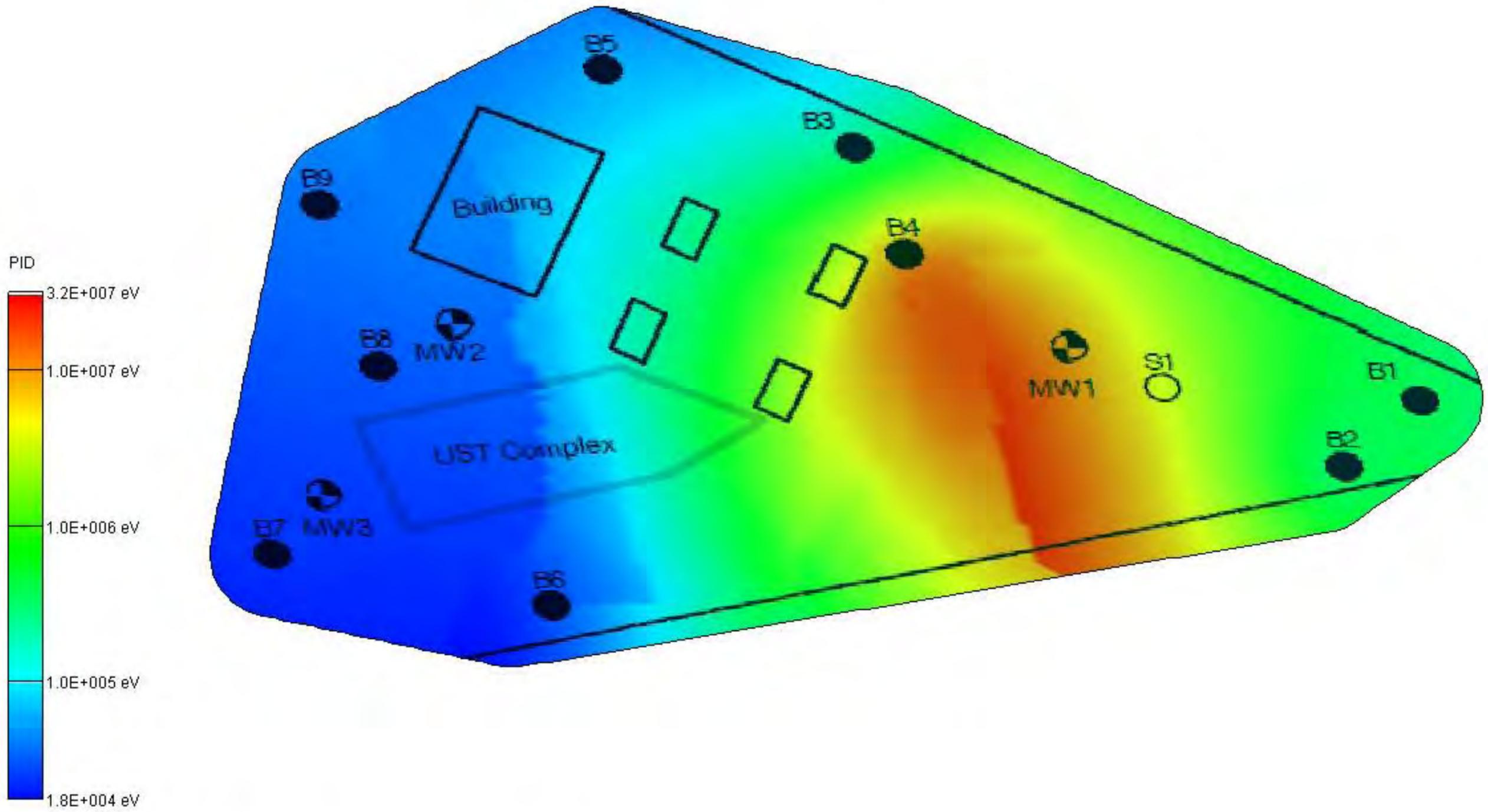
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -6 ft (MSL)



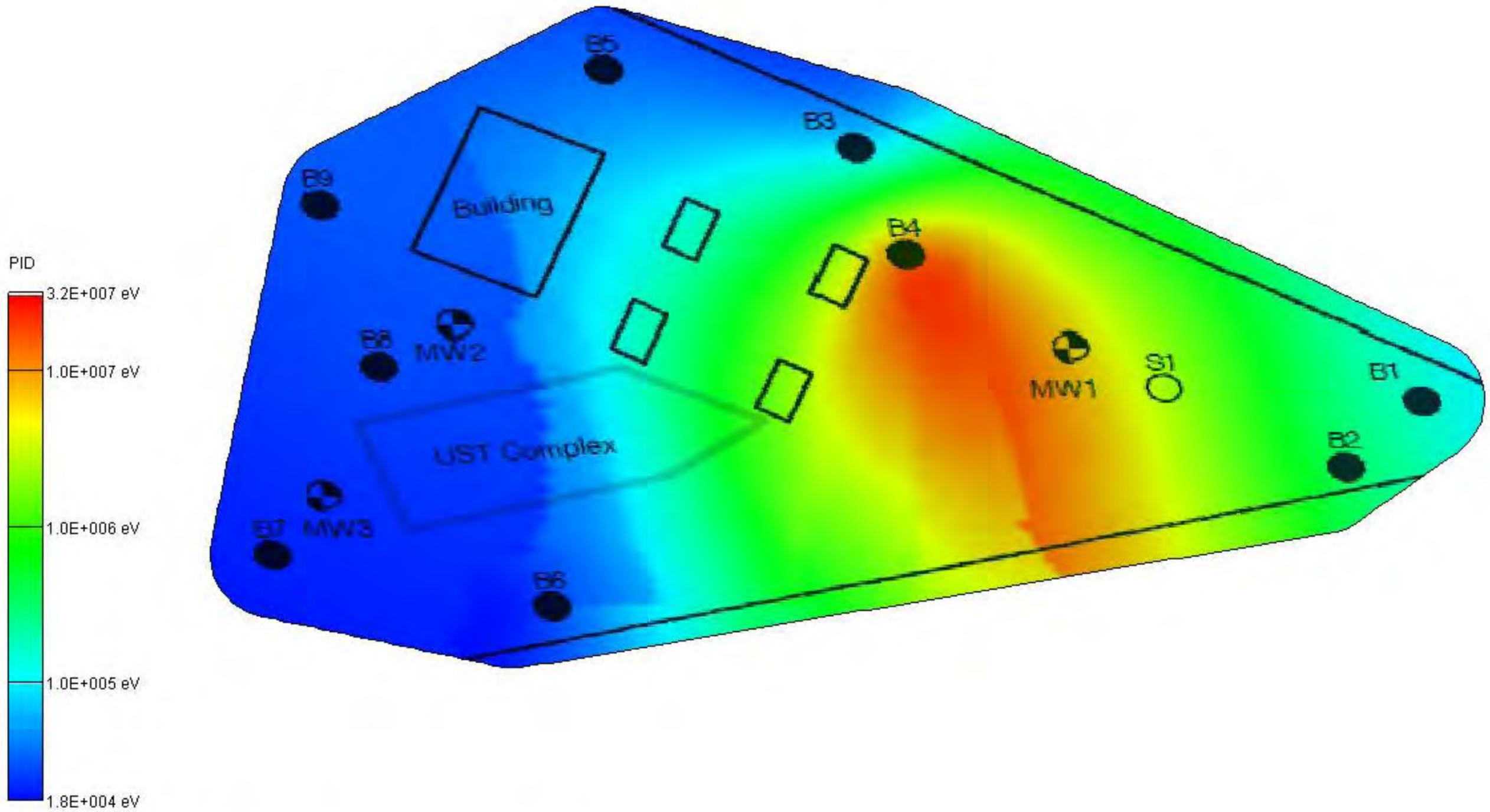
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -7 ft (MSL)



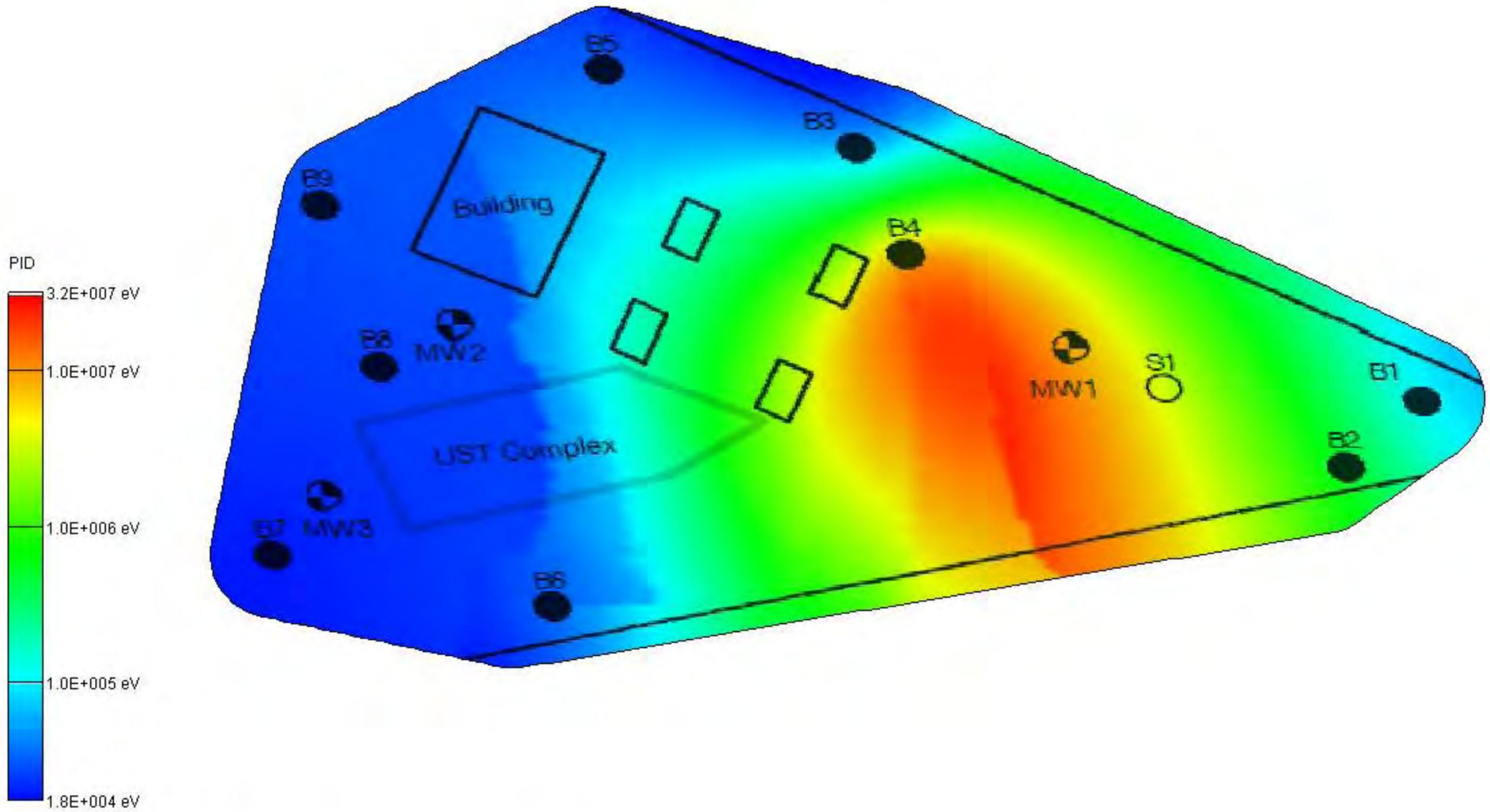
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -8 ft (MSL)



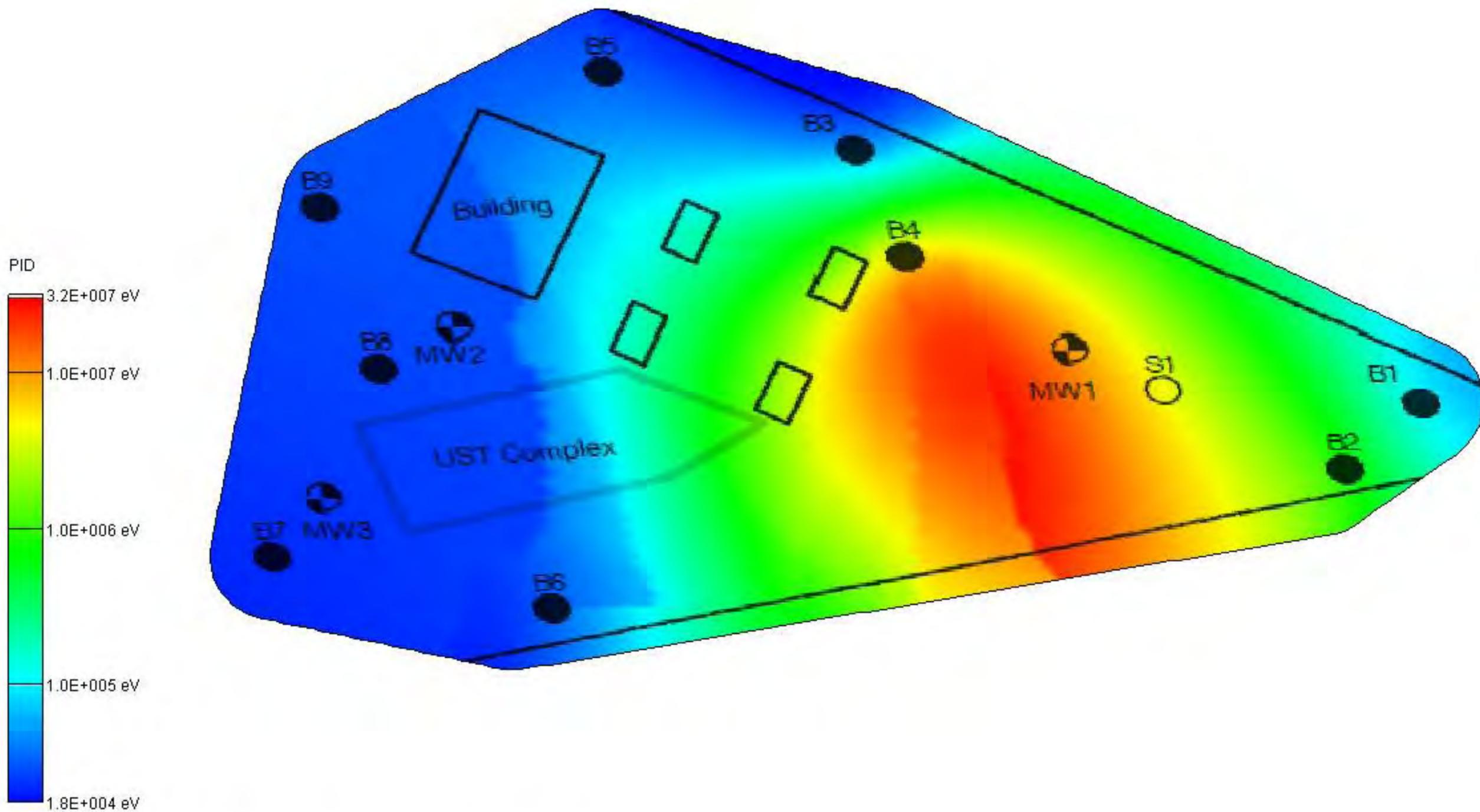
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -9 ft (MSL)



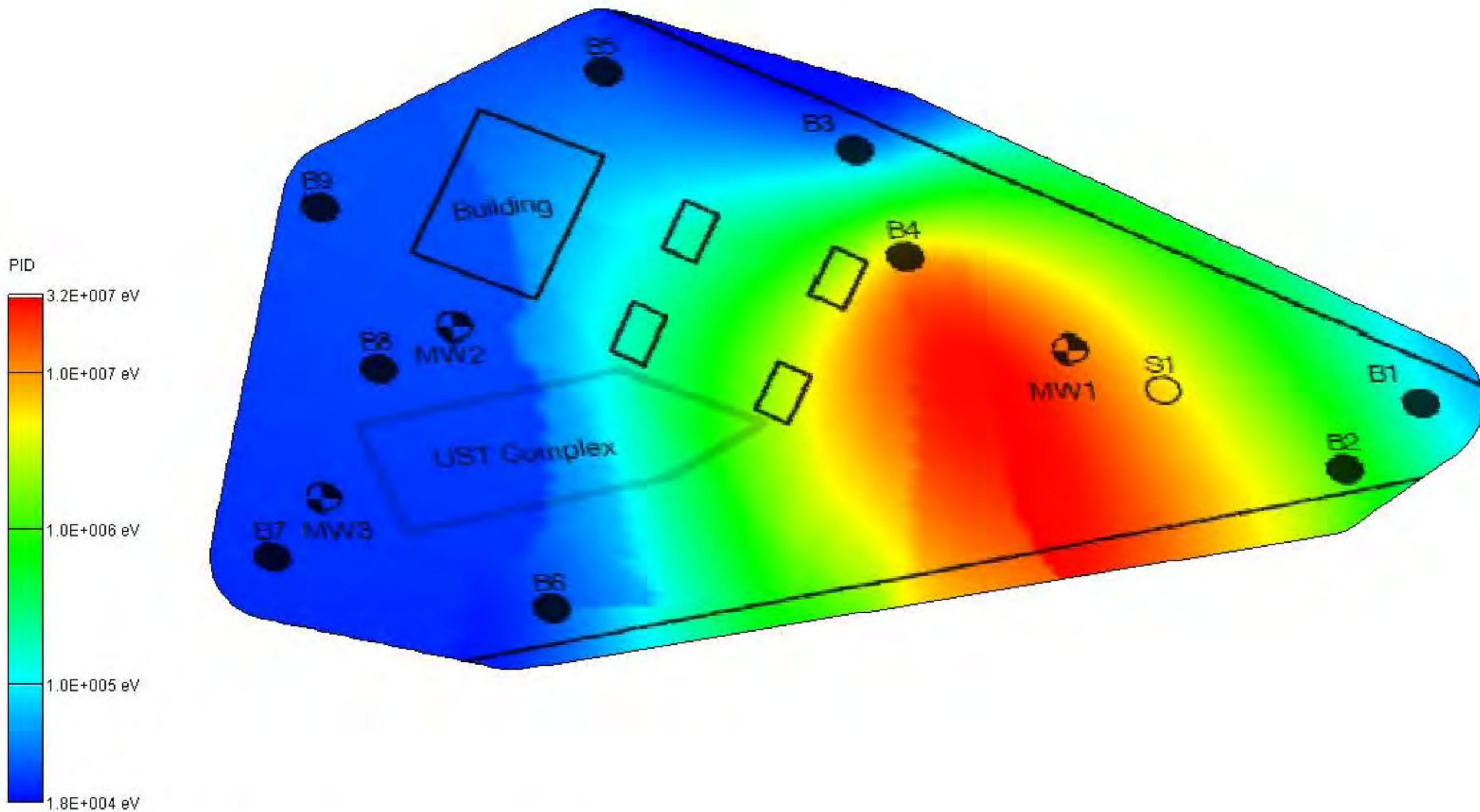
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -10 ft (MSL)



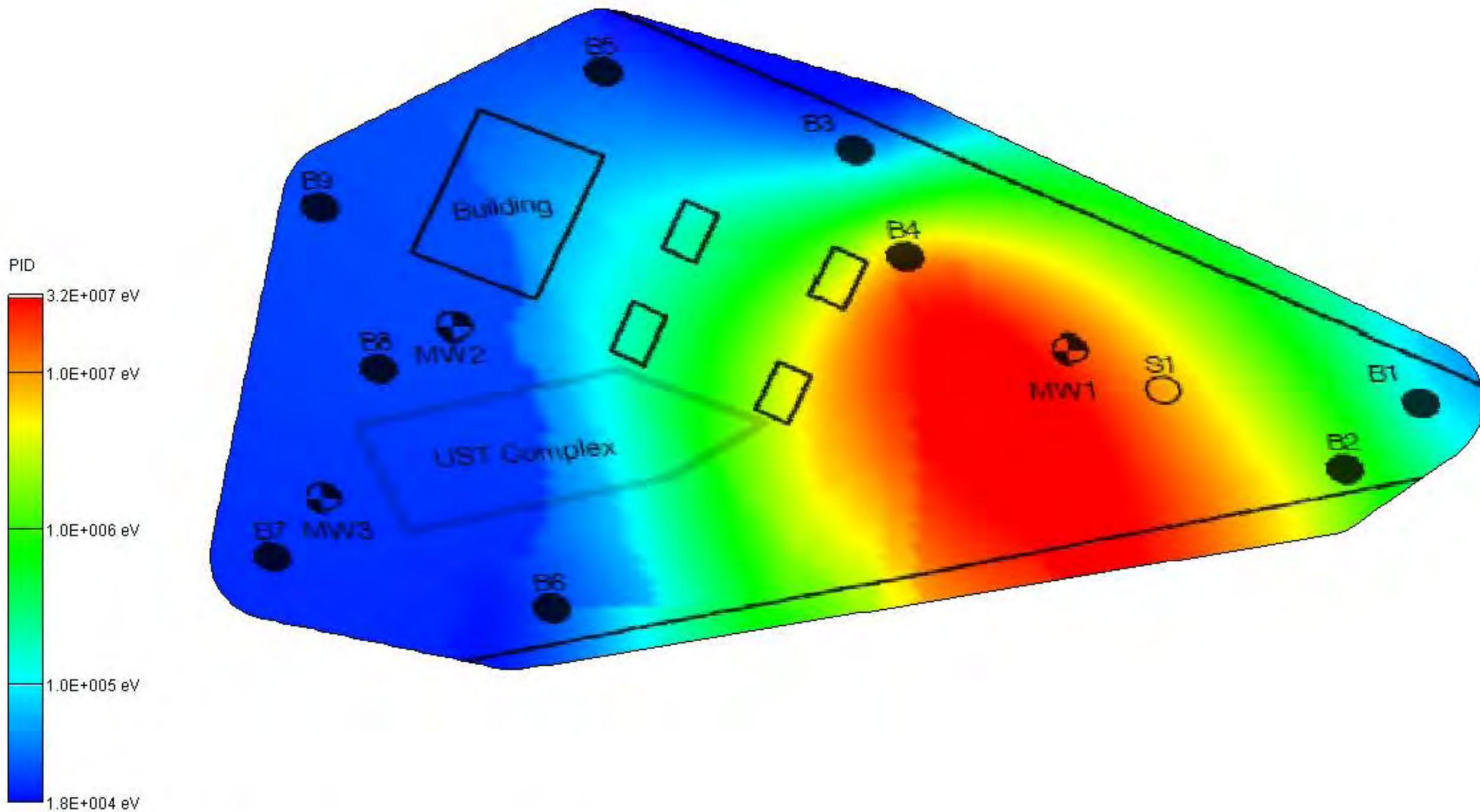
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -11 ft (MSL)



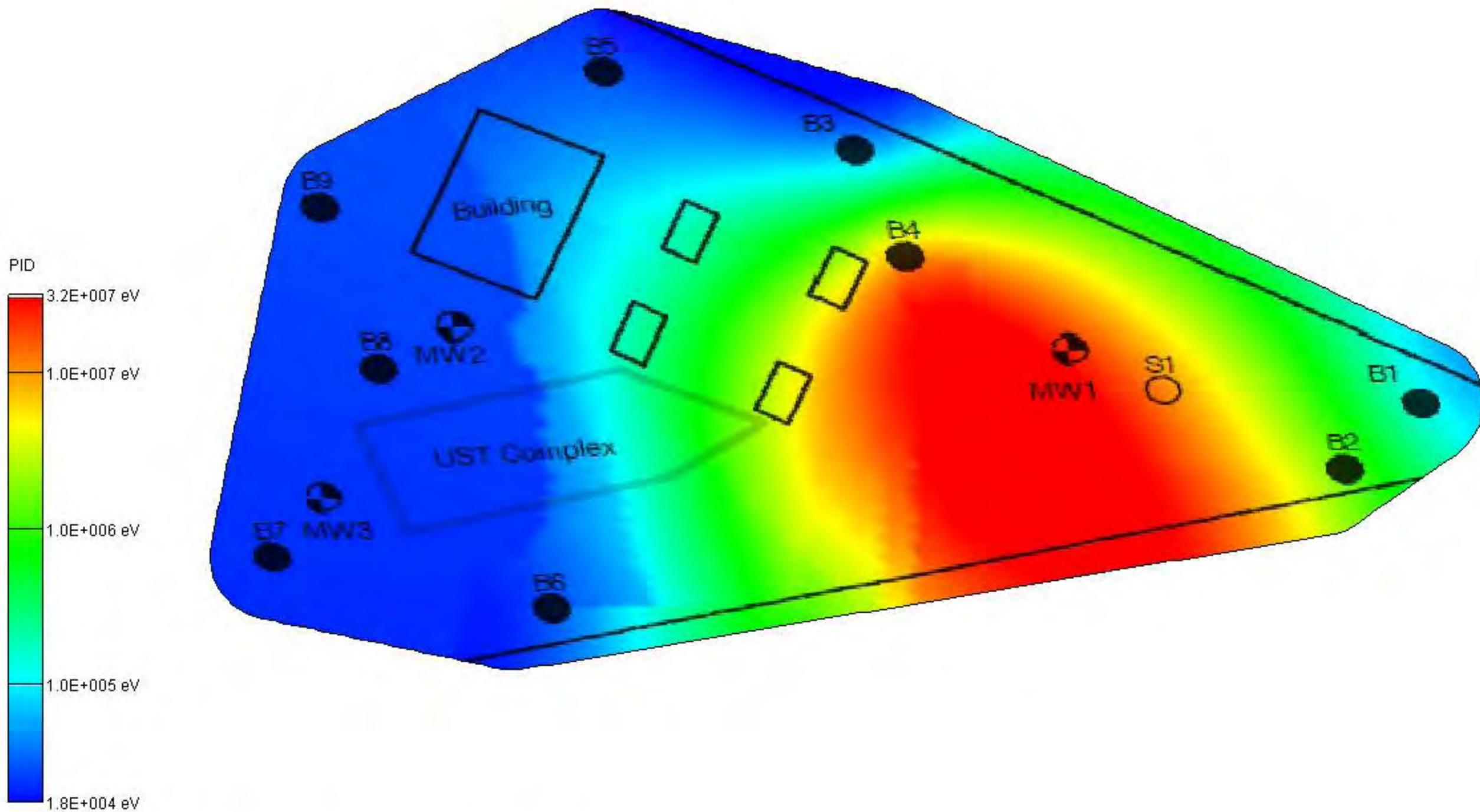
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -12 ft (MSL)



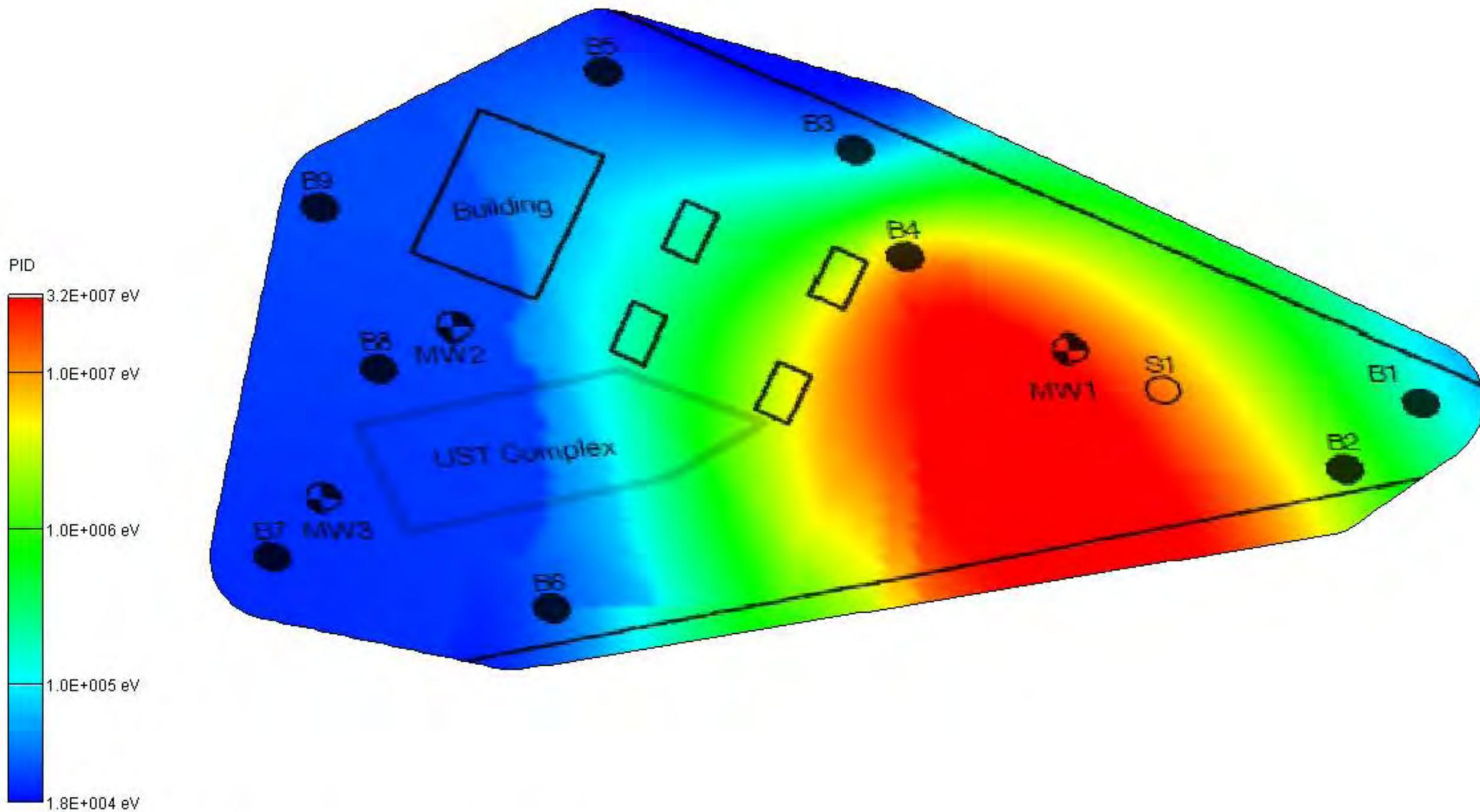
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -13 ft (MSL)



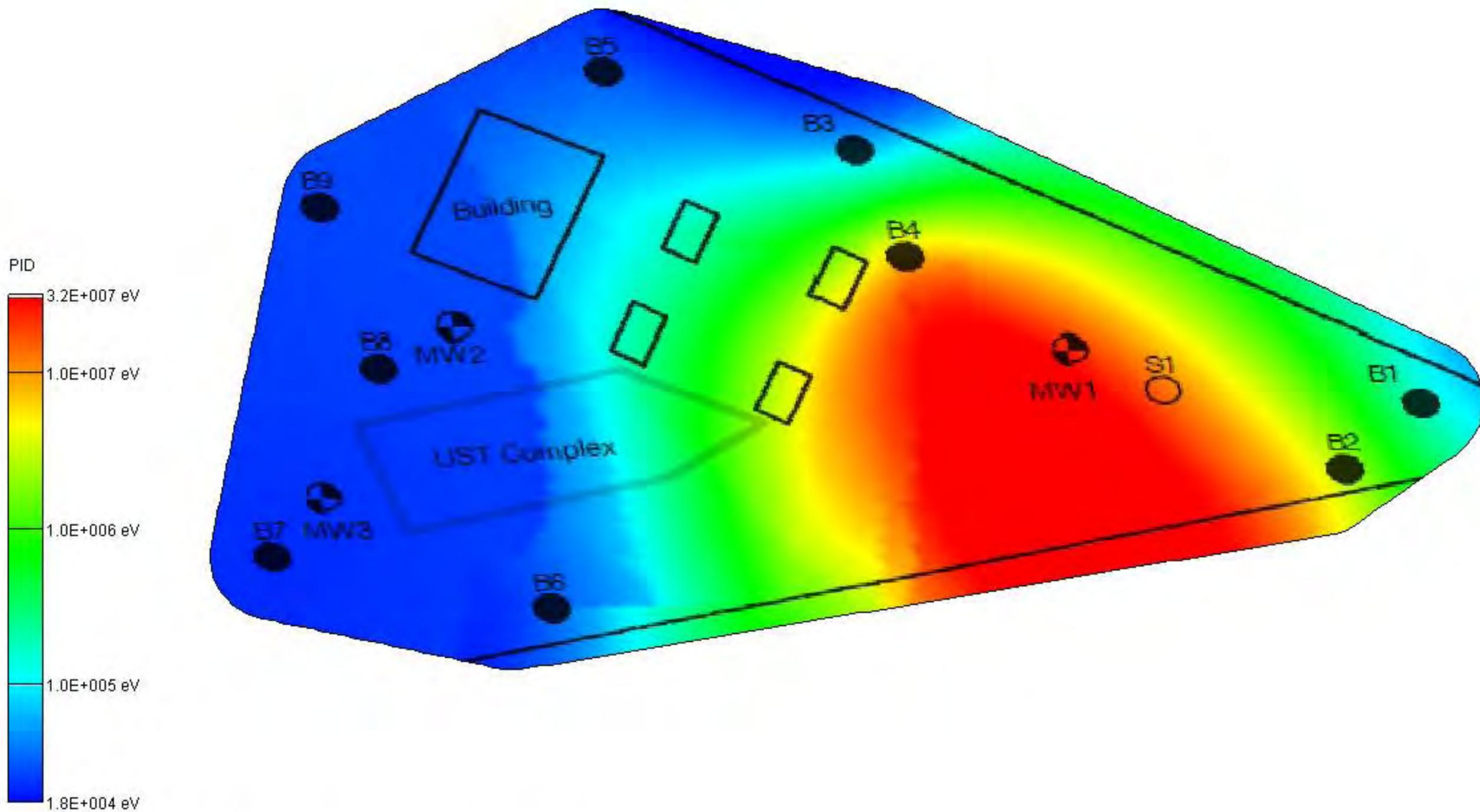
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -14 ft (MSL)



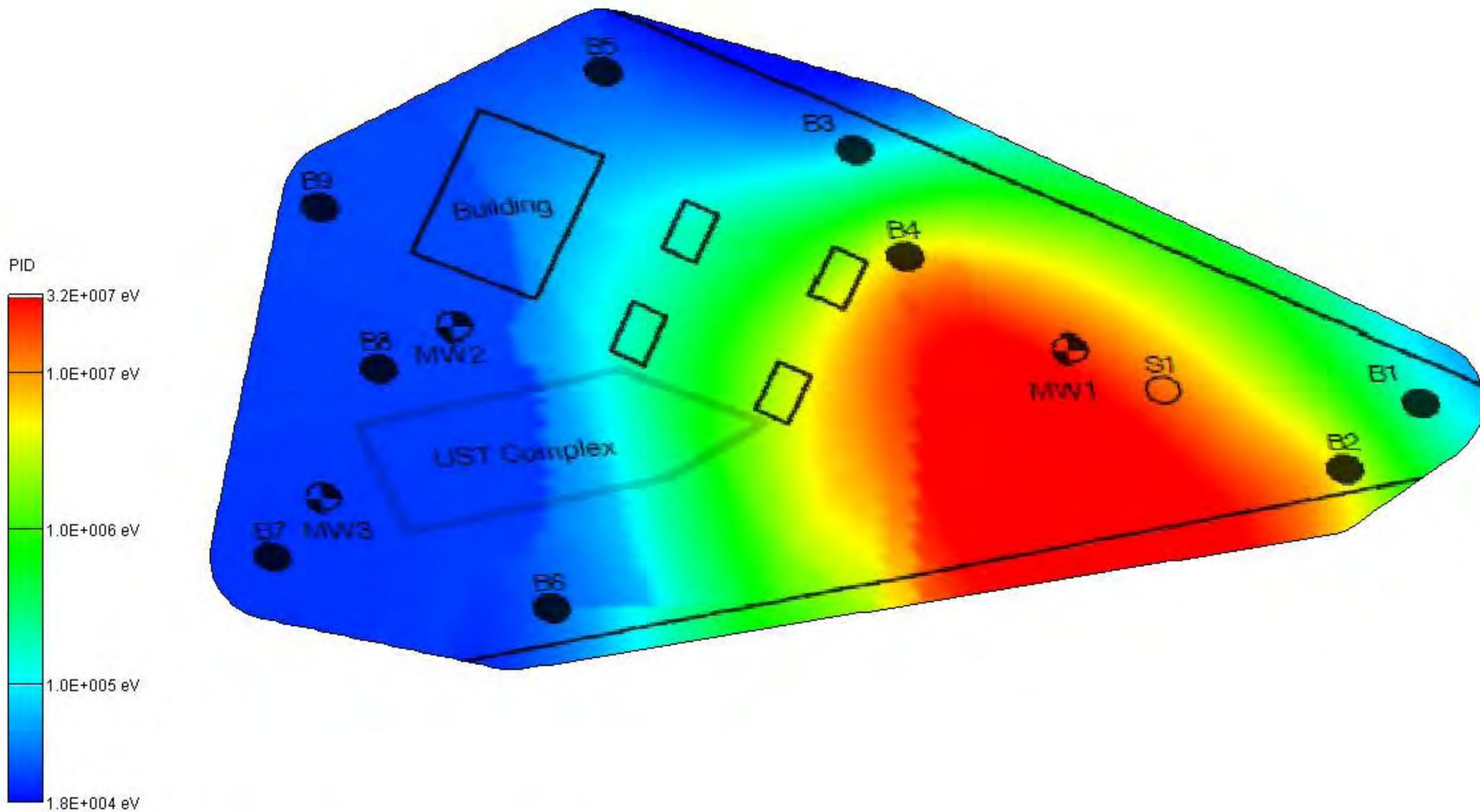
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -15 ft (MSL)



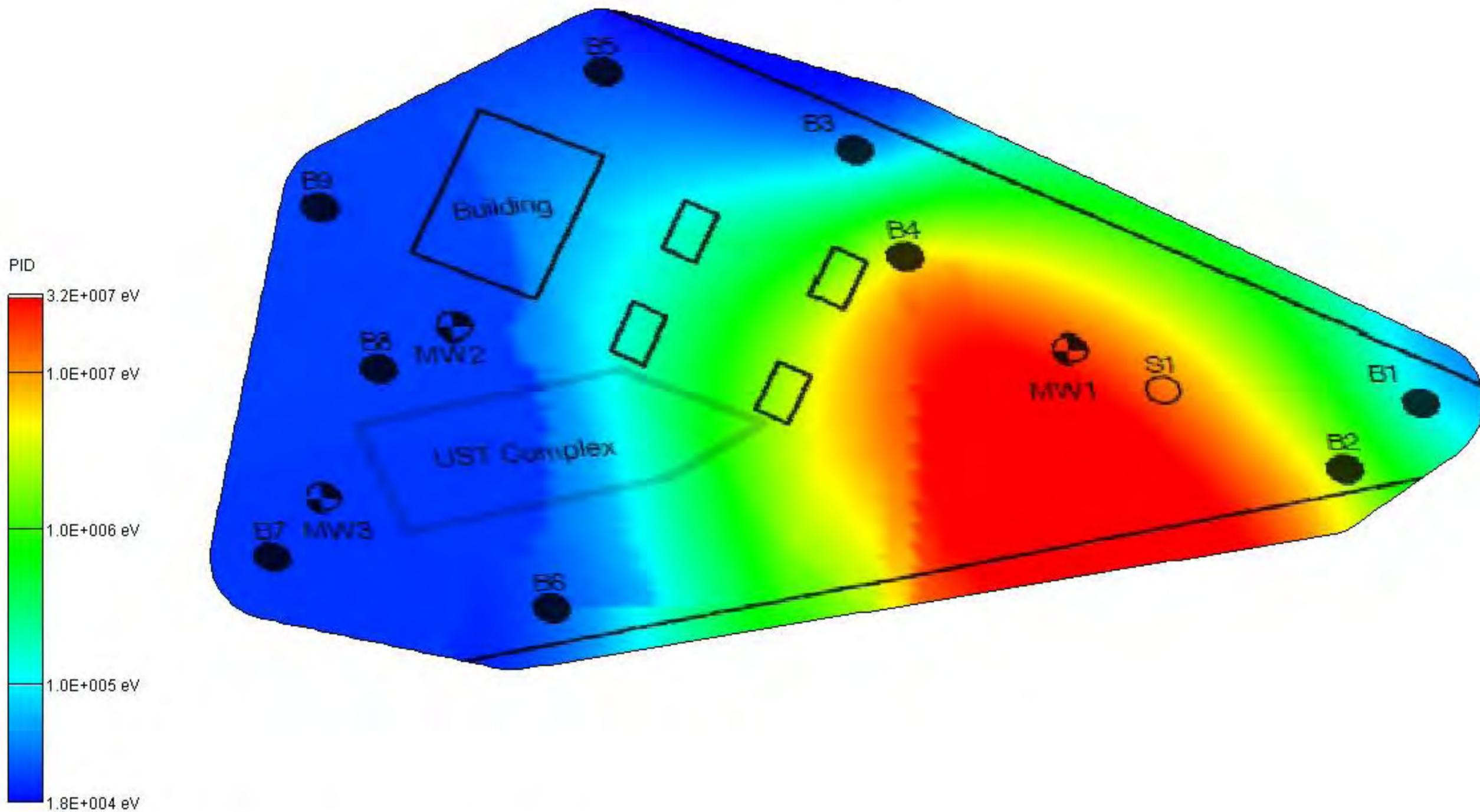
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -16 ft (MSL)



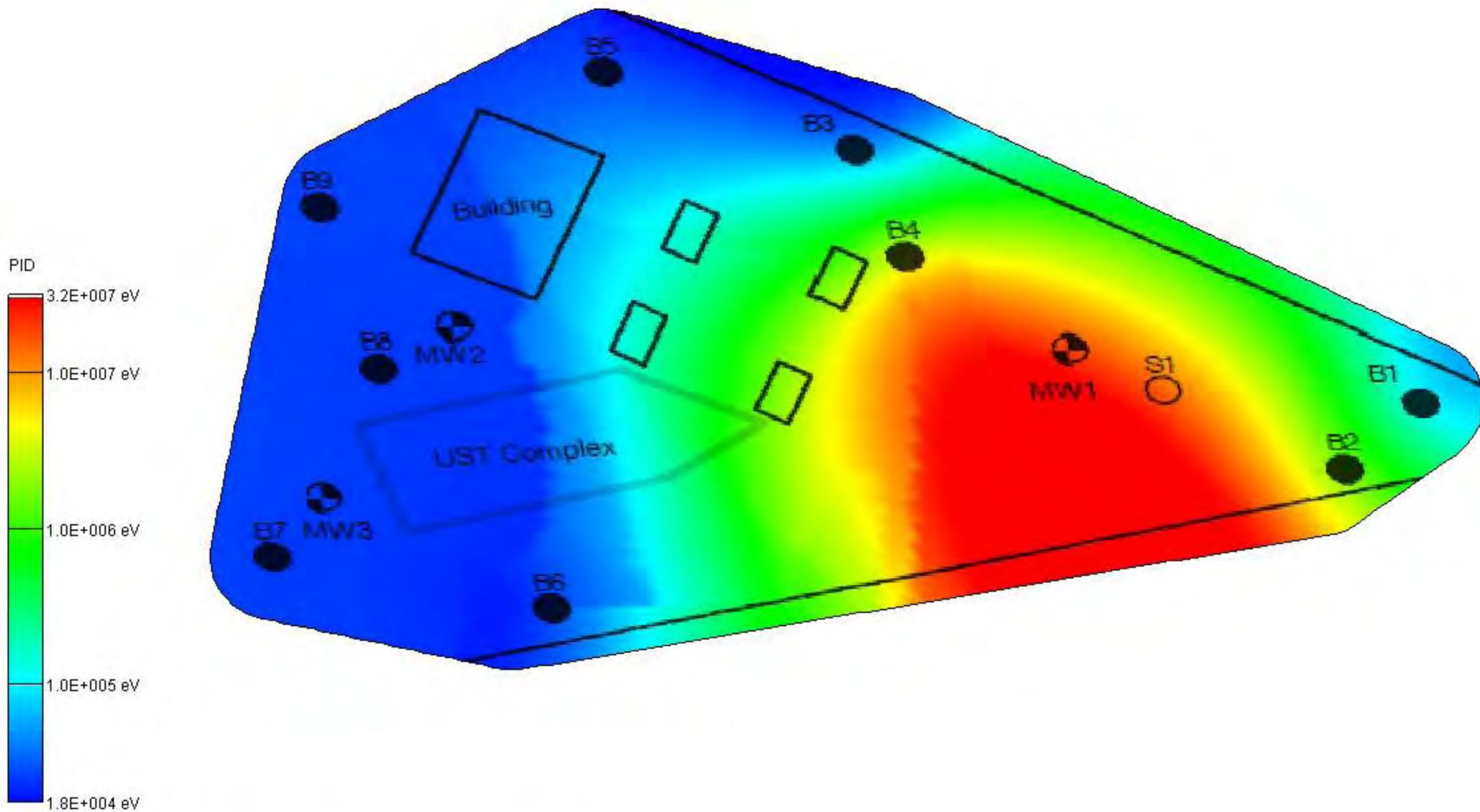
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -17 ft (MSL)



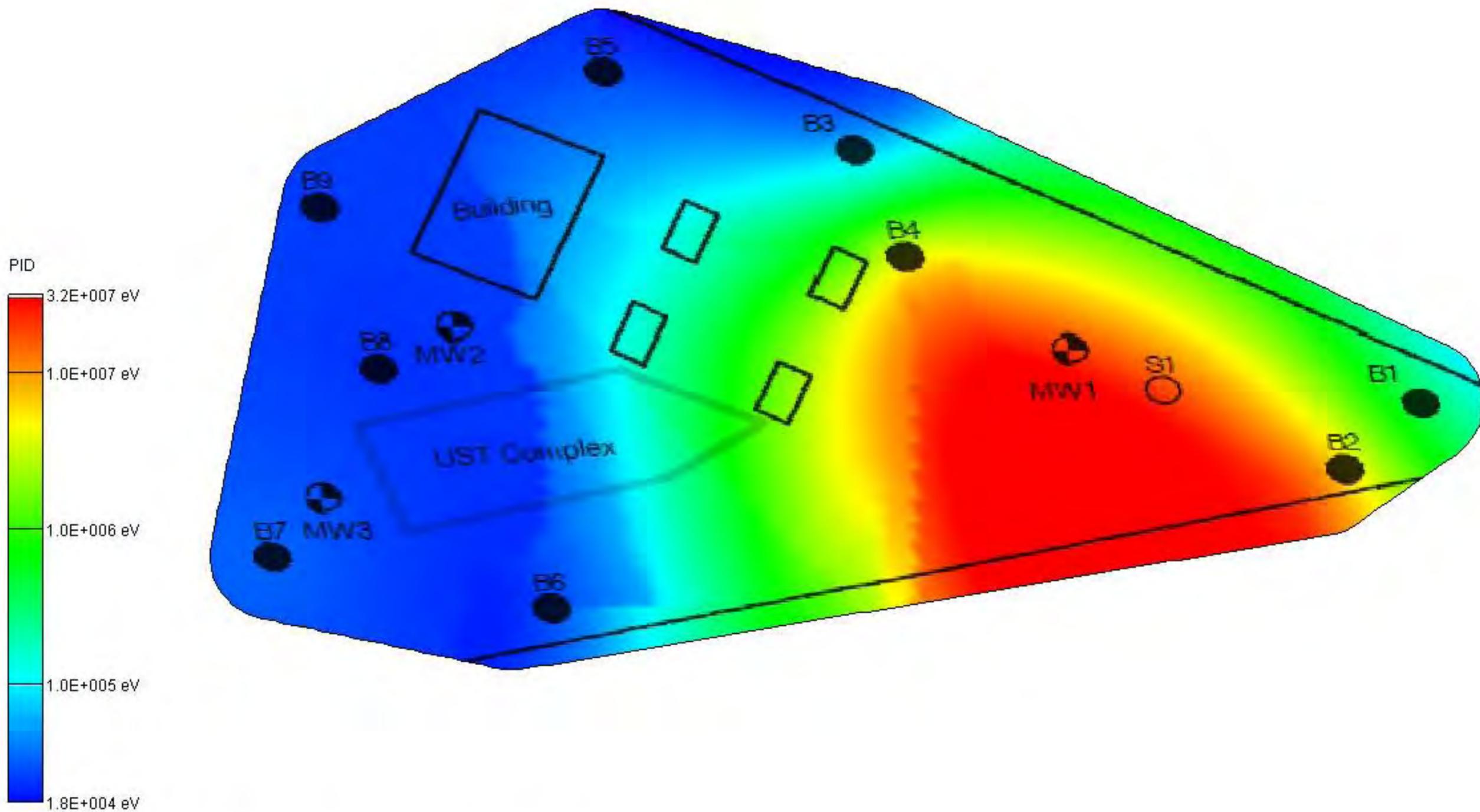
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -18 ft (MSL)



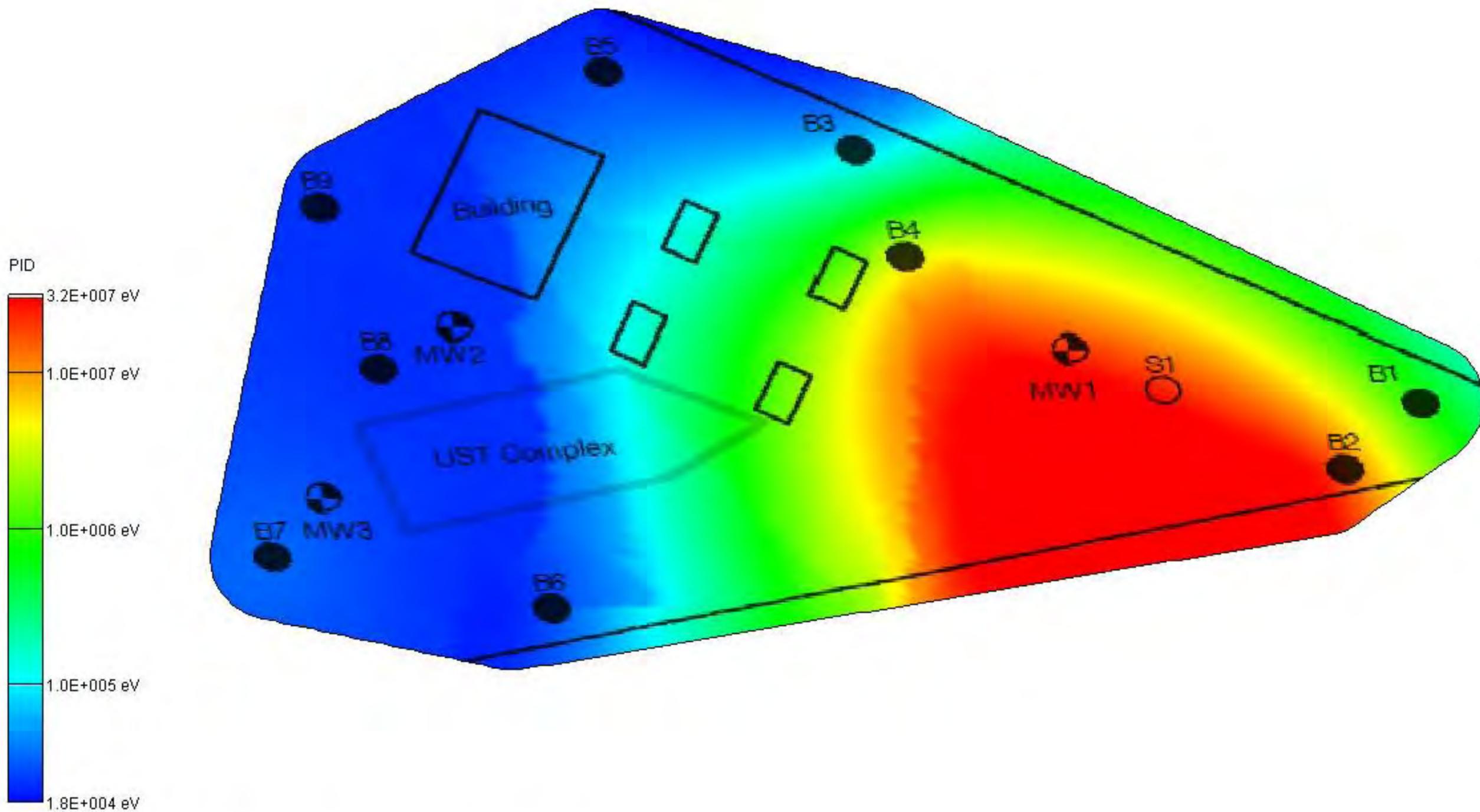
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -19 ft (MSL)



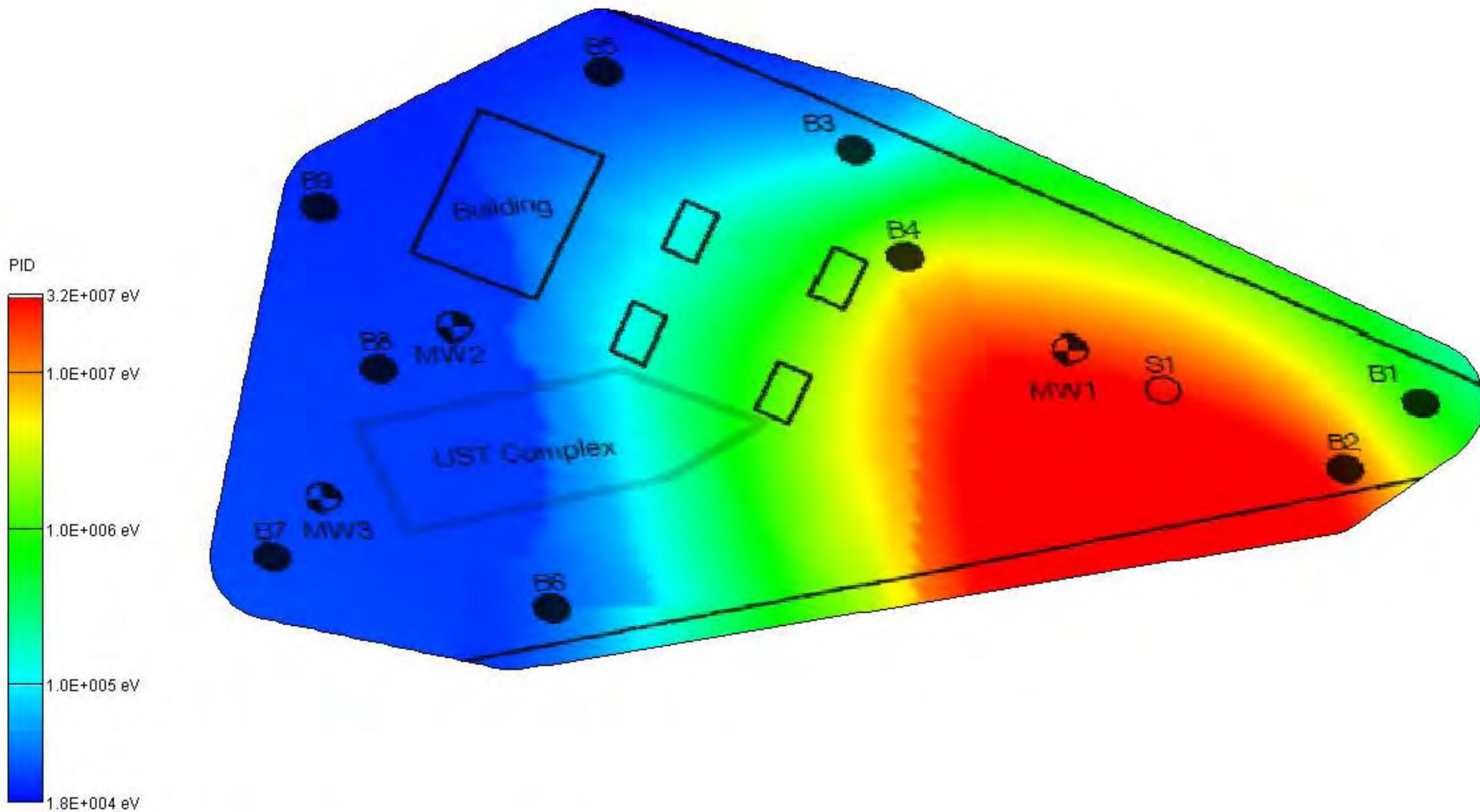
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -21 ft (MSL)



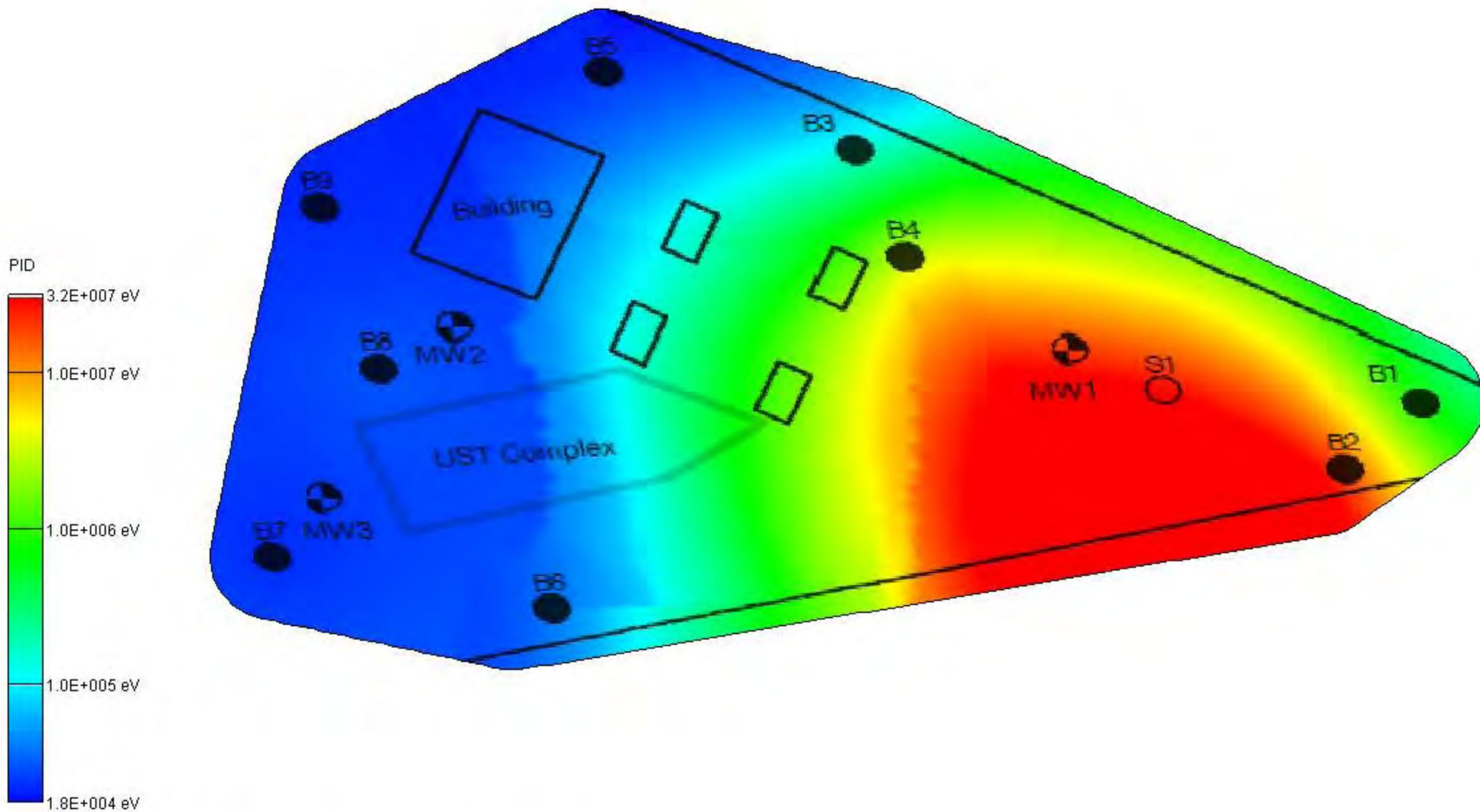
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -22 ft (MSL)



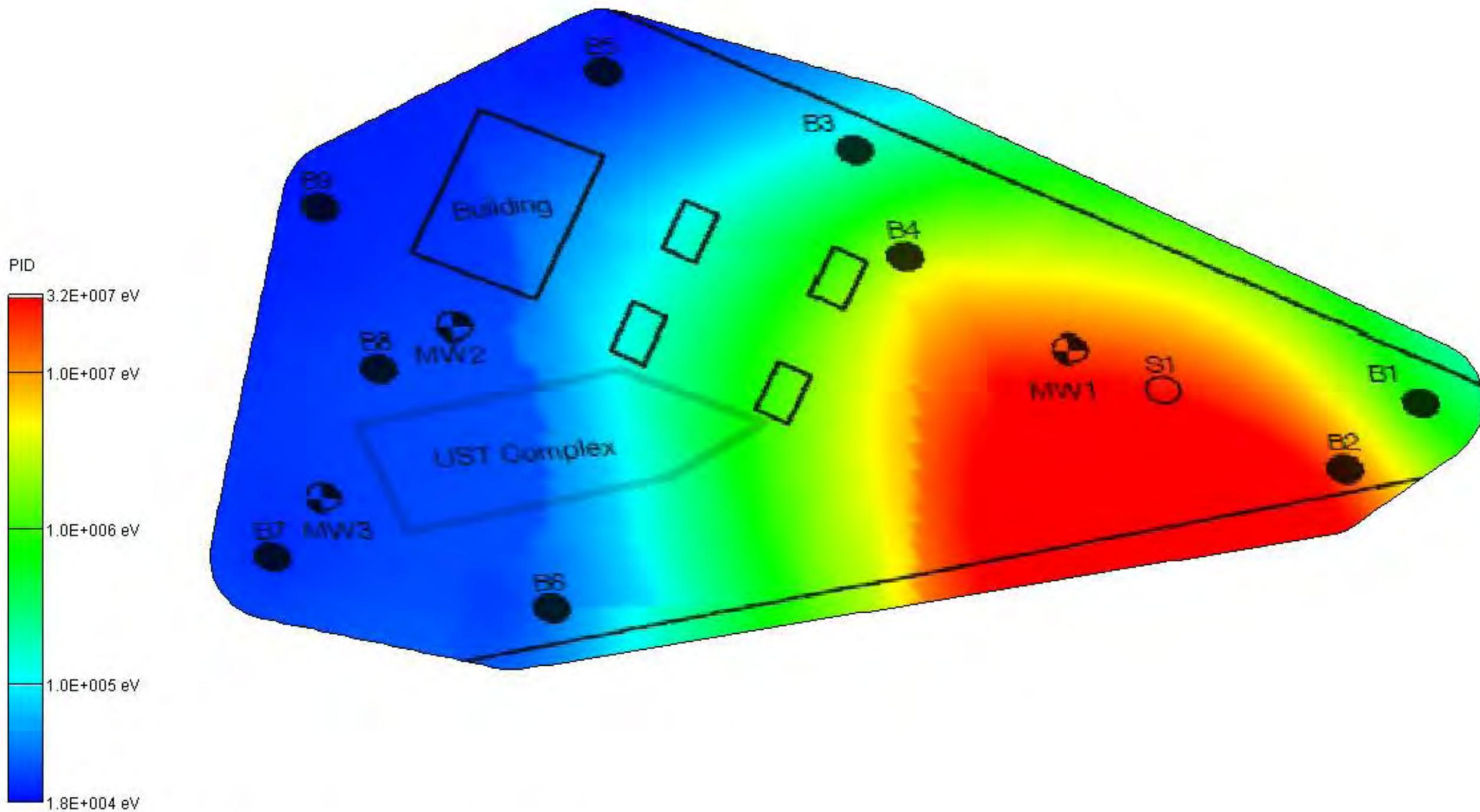
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
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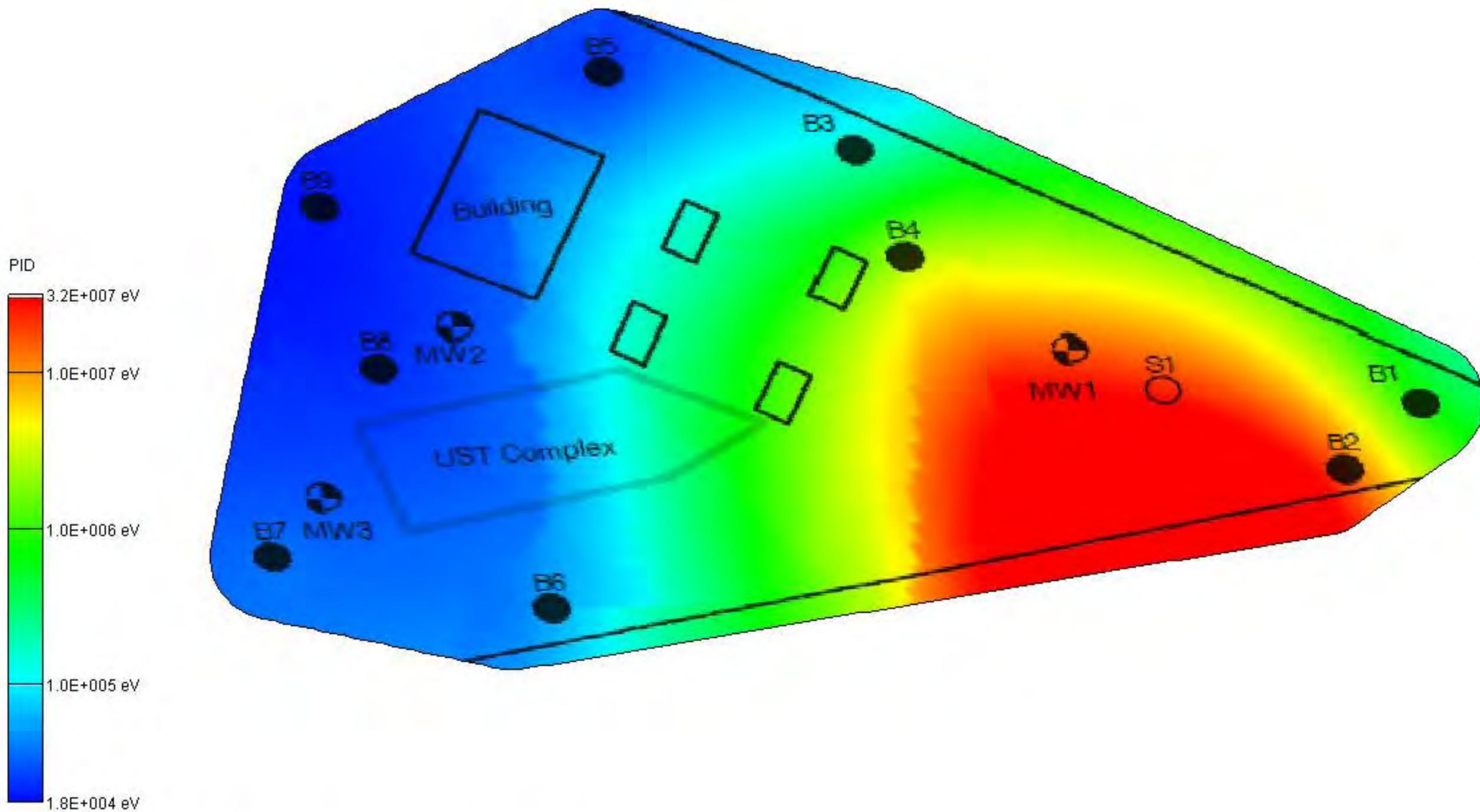
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
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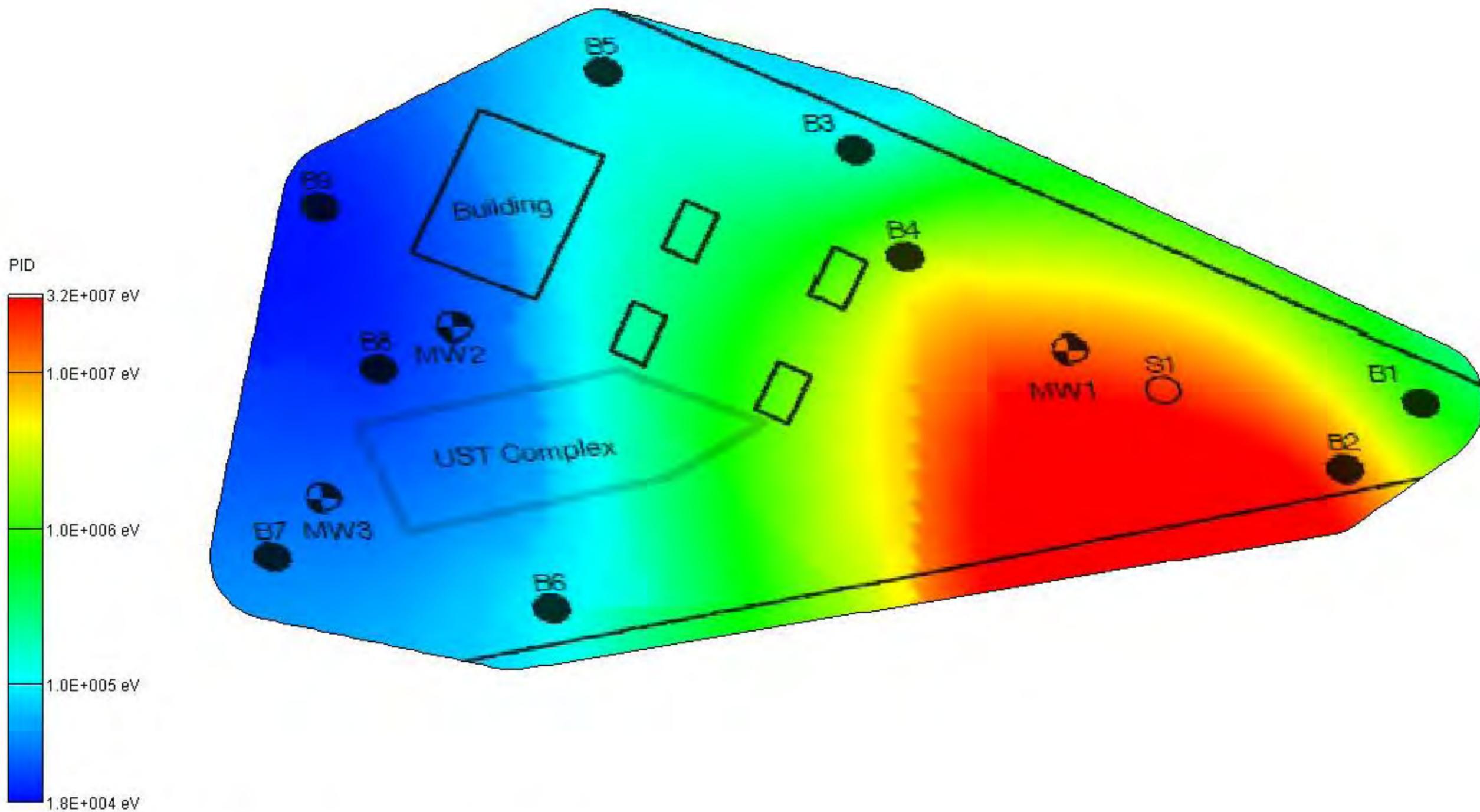
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ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
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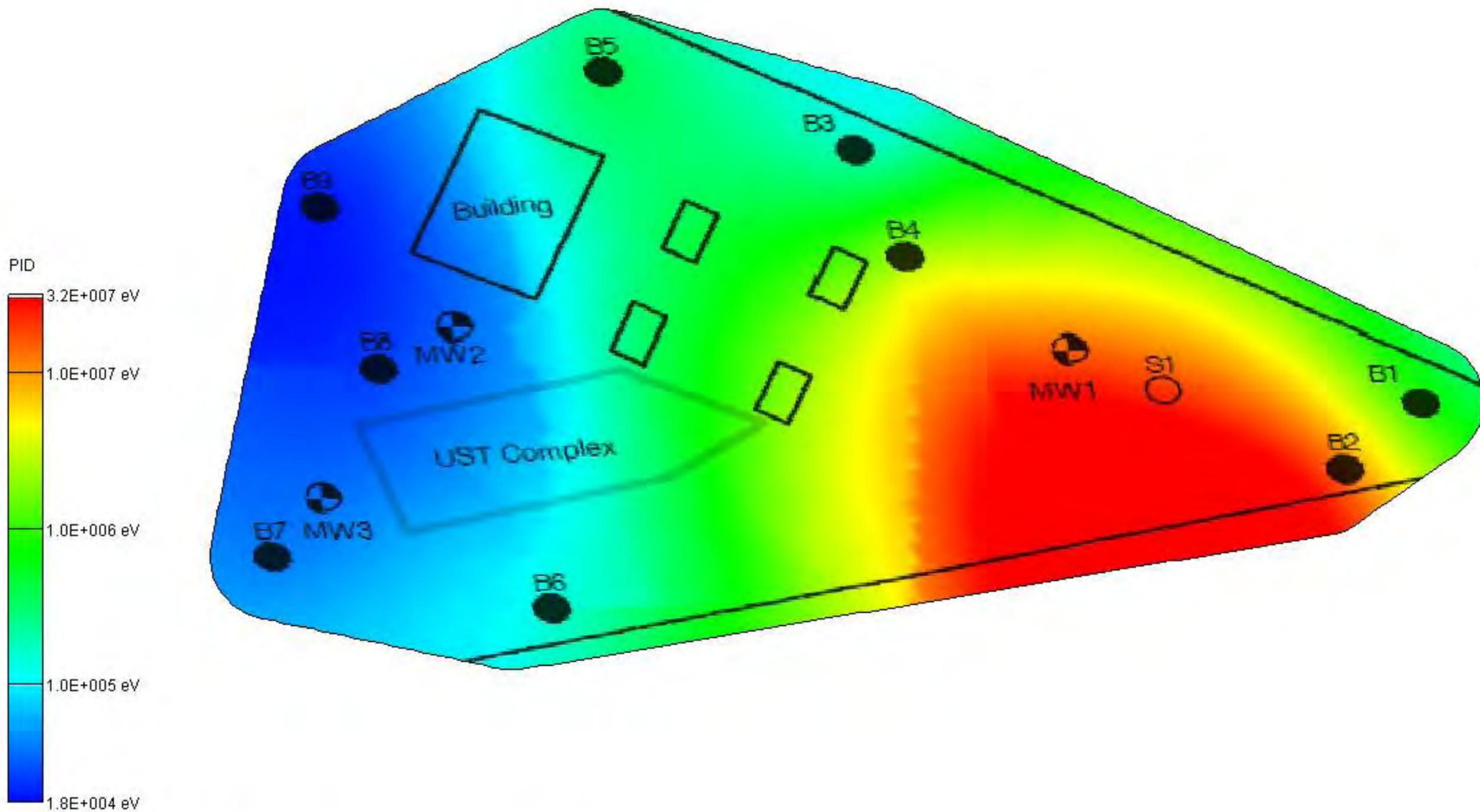
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ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -26 ft (MSL)



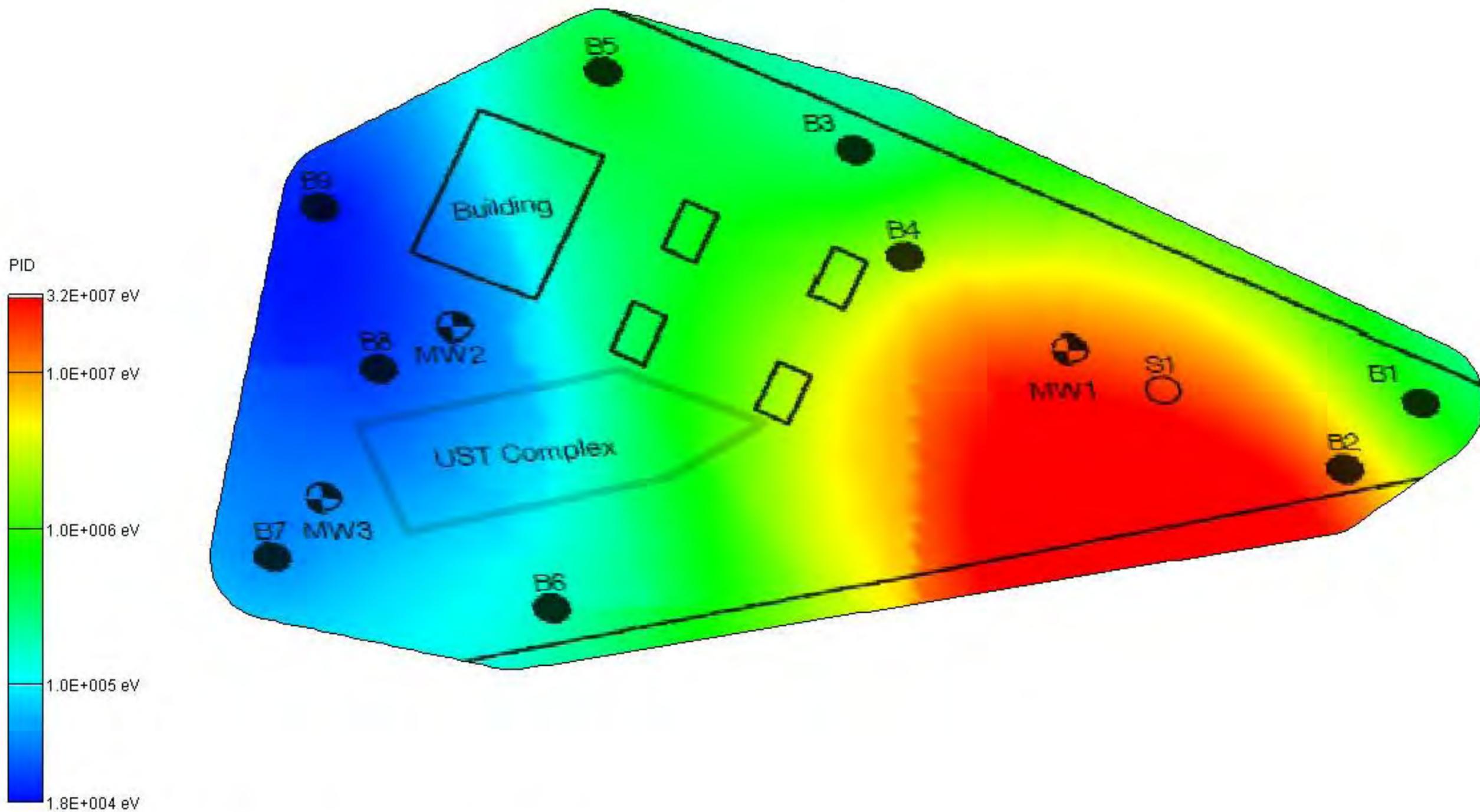
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ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
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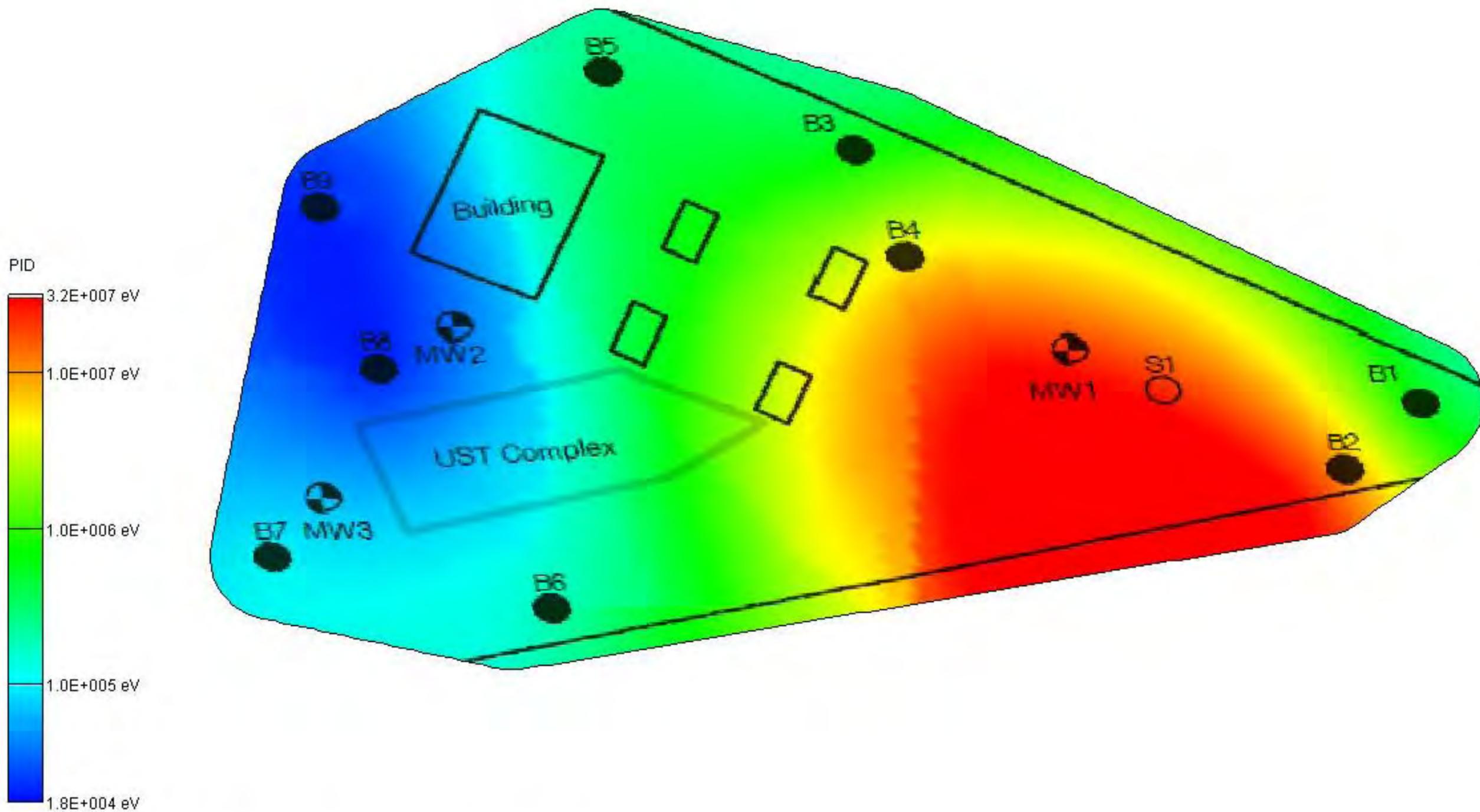
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ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -28 ft (MSL)



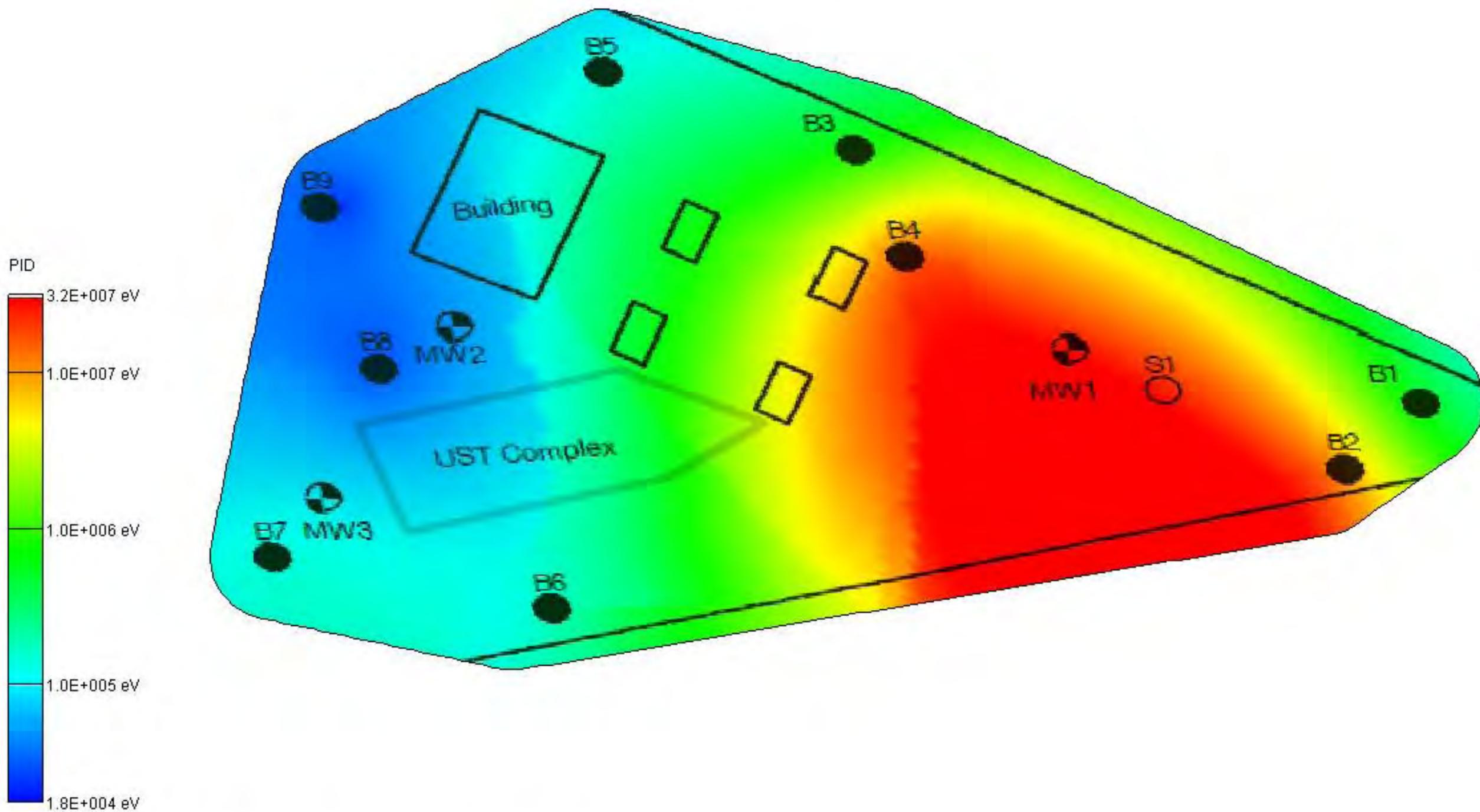
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ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -29 ft (MSL)



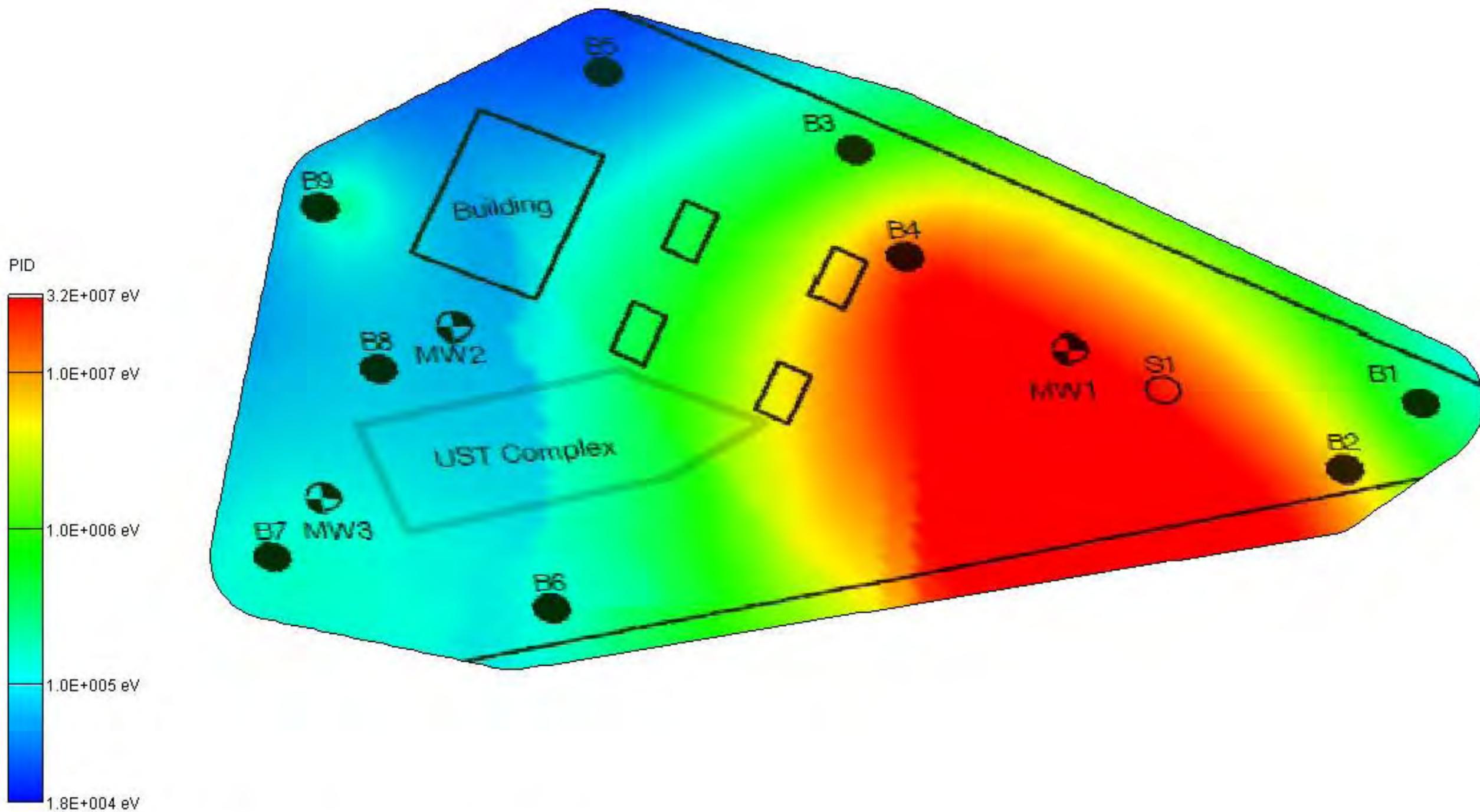
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ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
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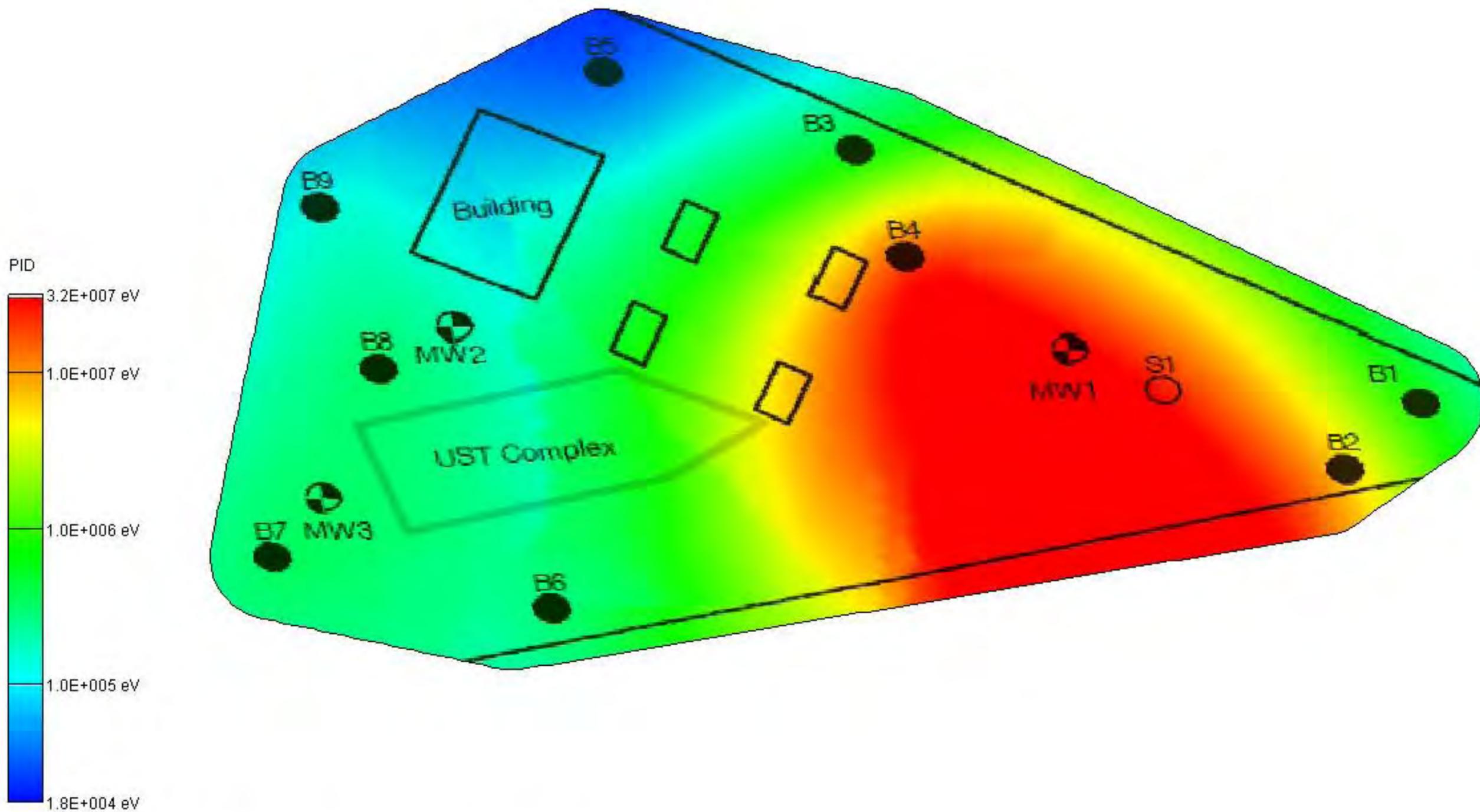
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ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -31 ft (MSL)



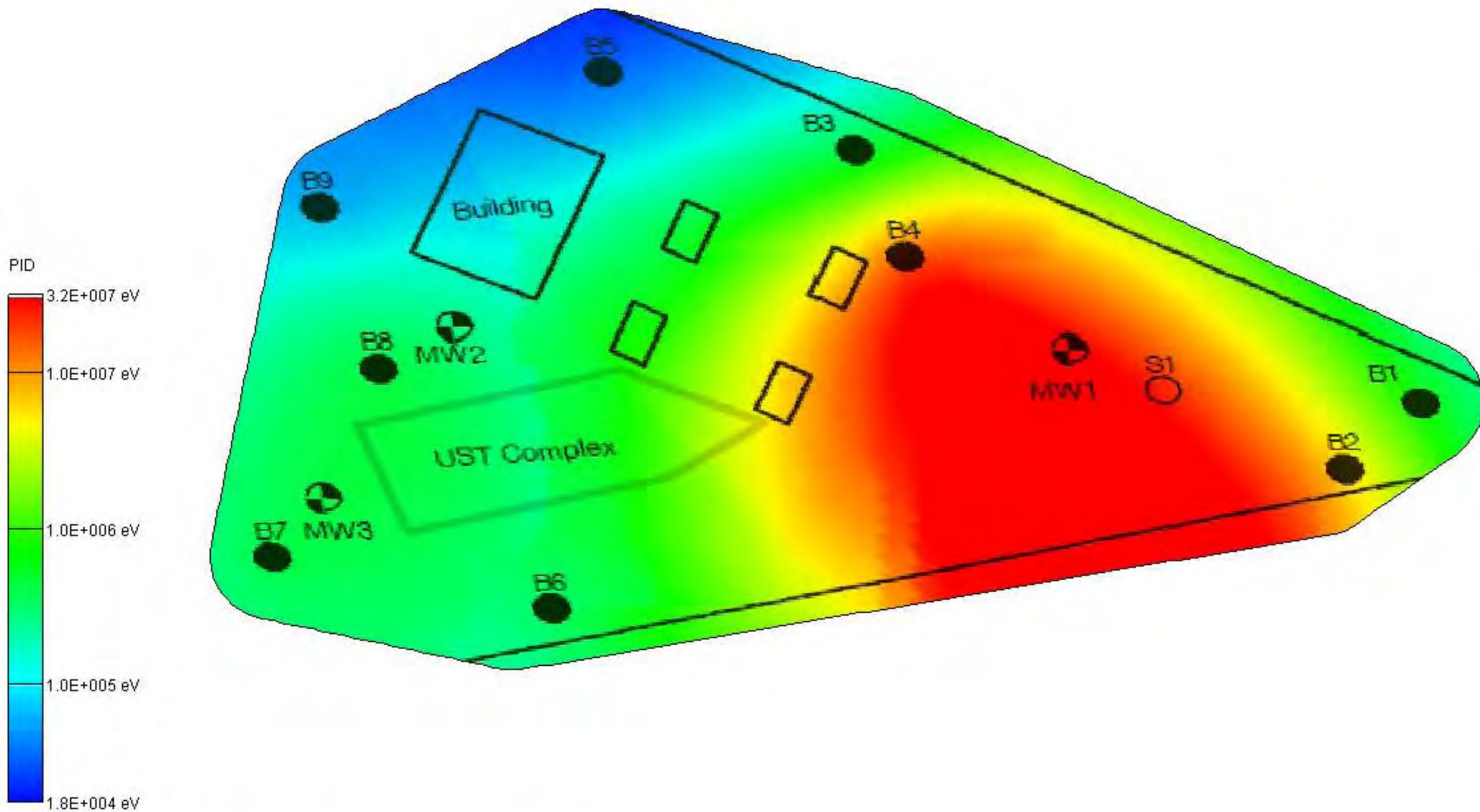
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -32 ft (MSL)



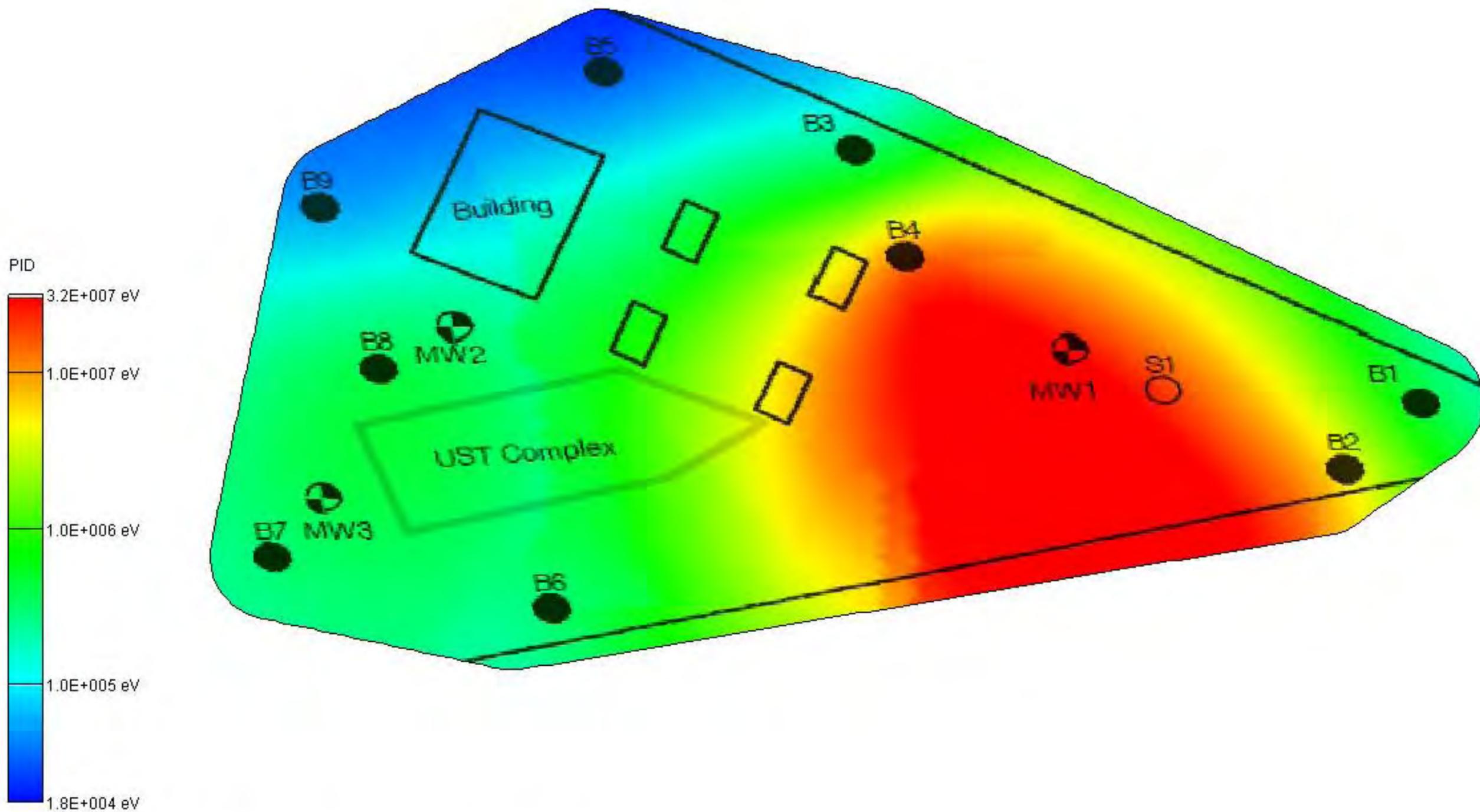
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
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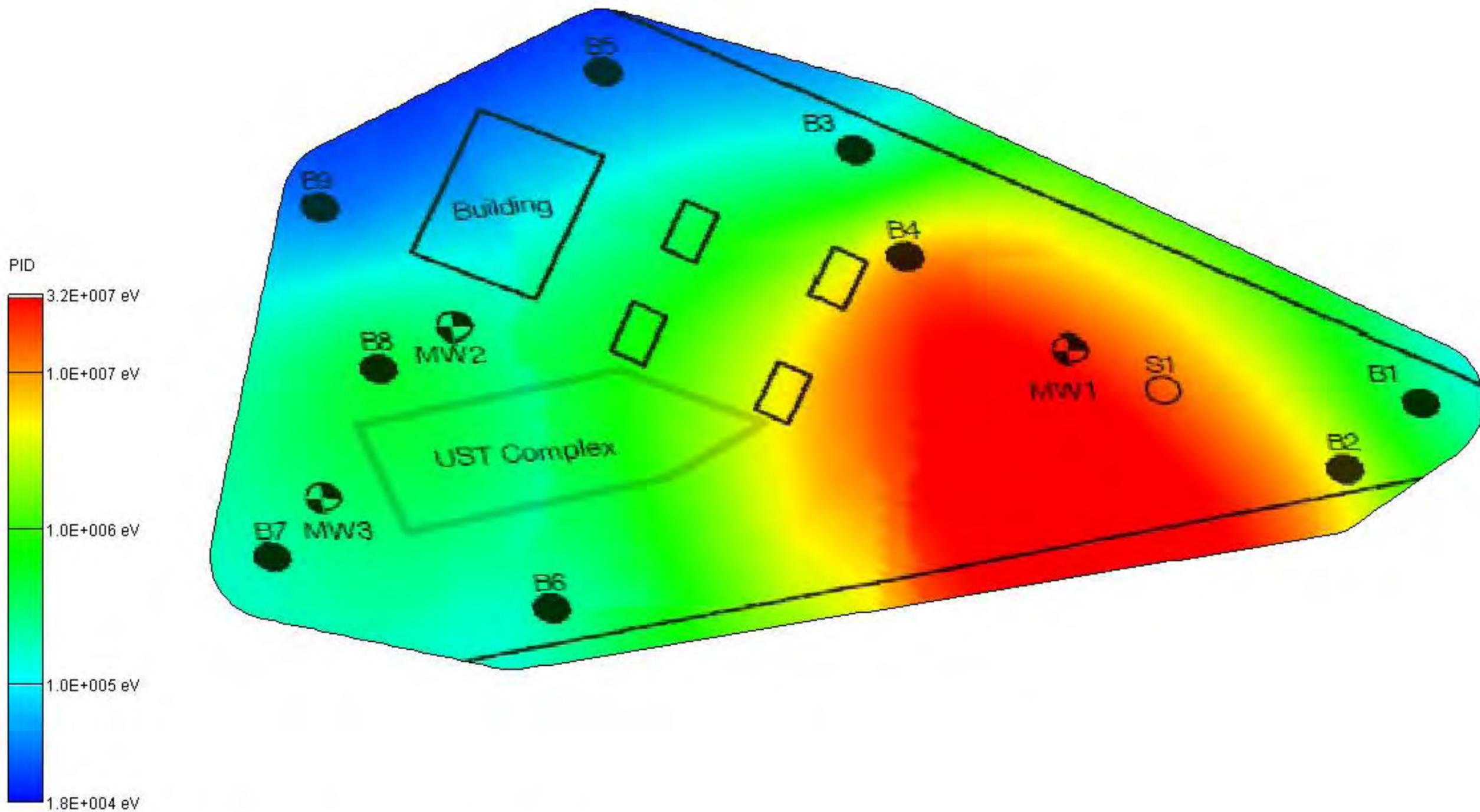
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -34 ft (MSL)



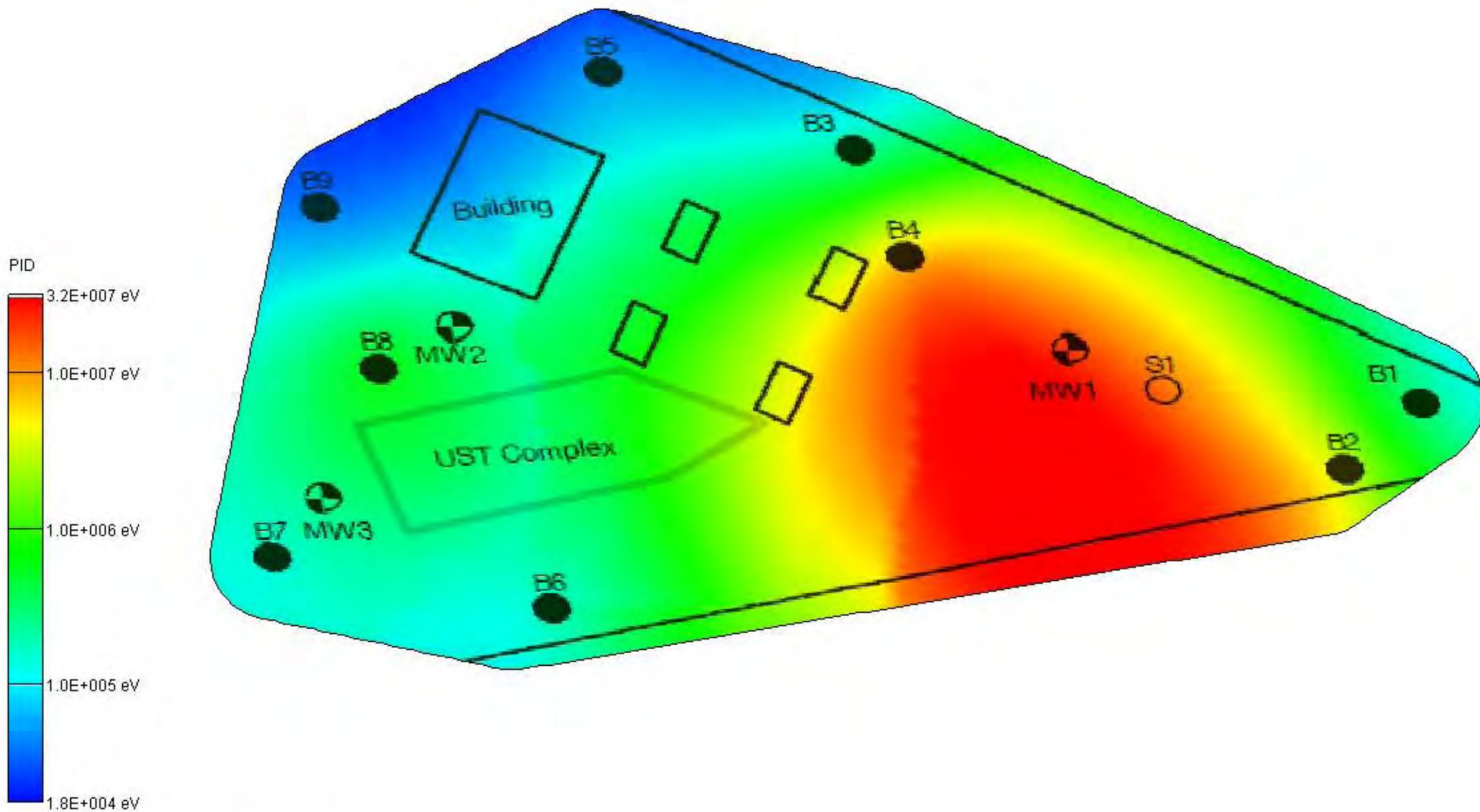
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -35 ft (MSL)



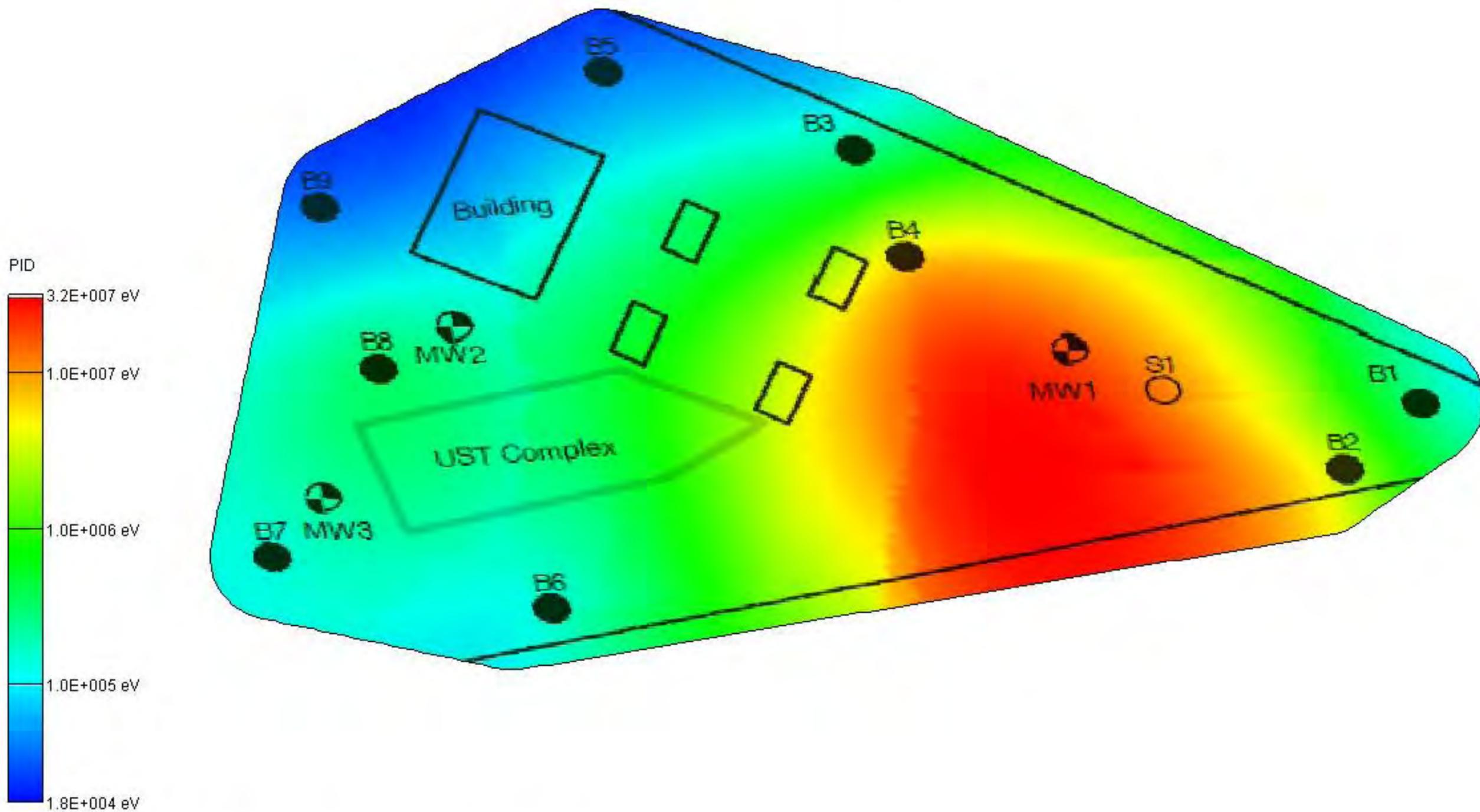
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -36 ft (MSL)



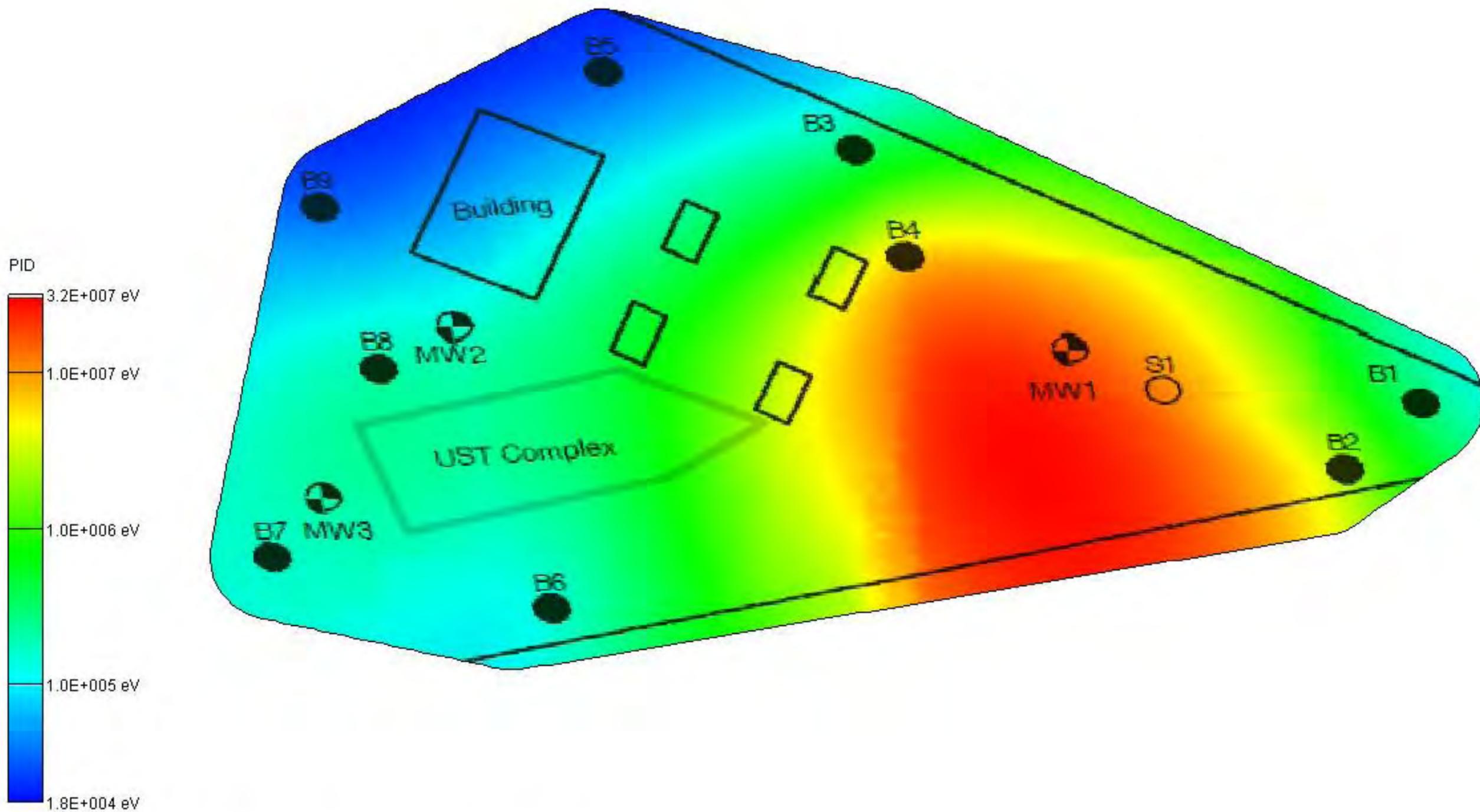
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -37 ft (MSL)



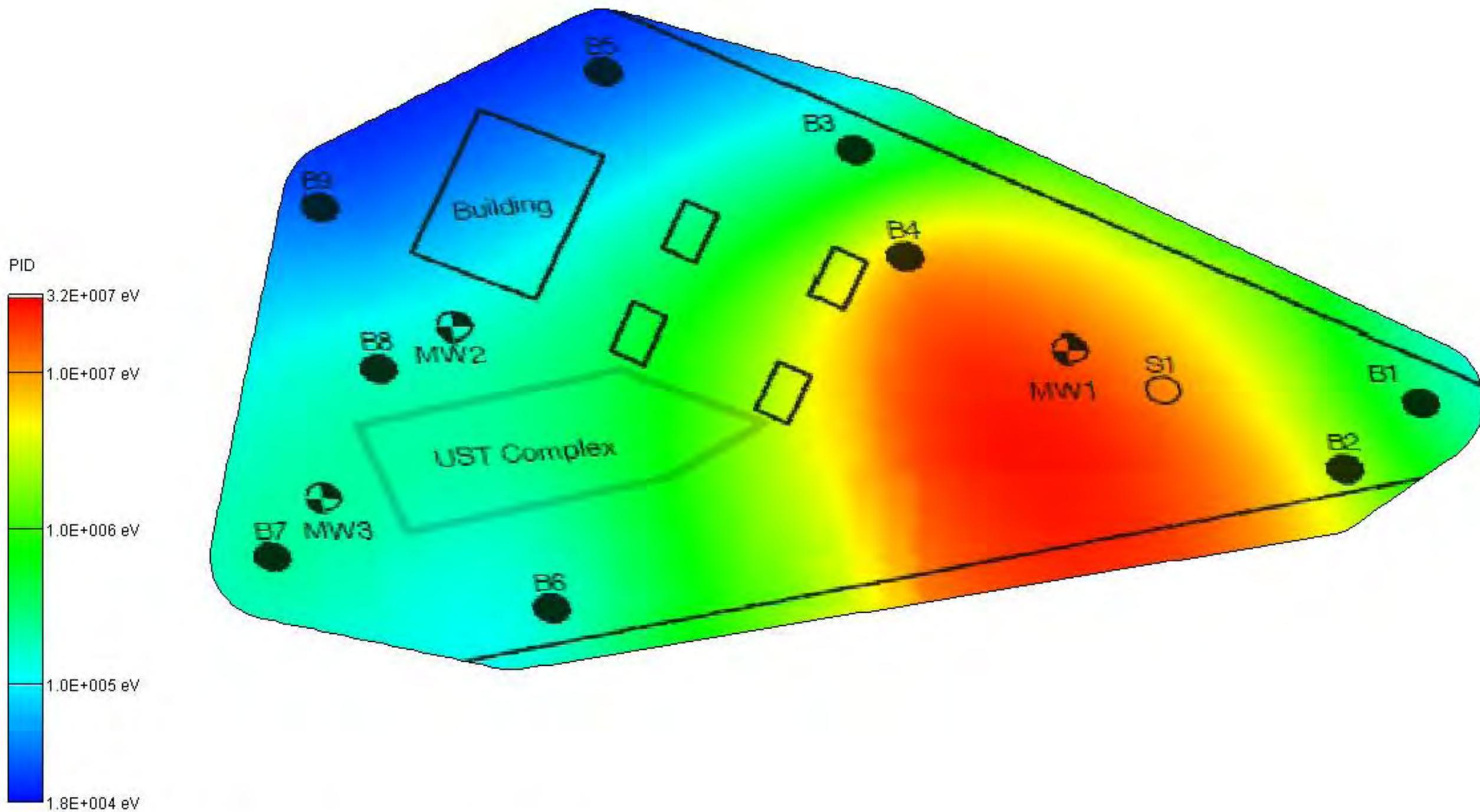
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -38 ft (MSL)



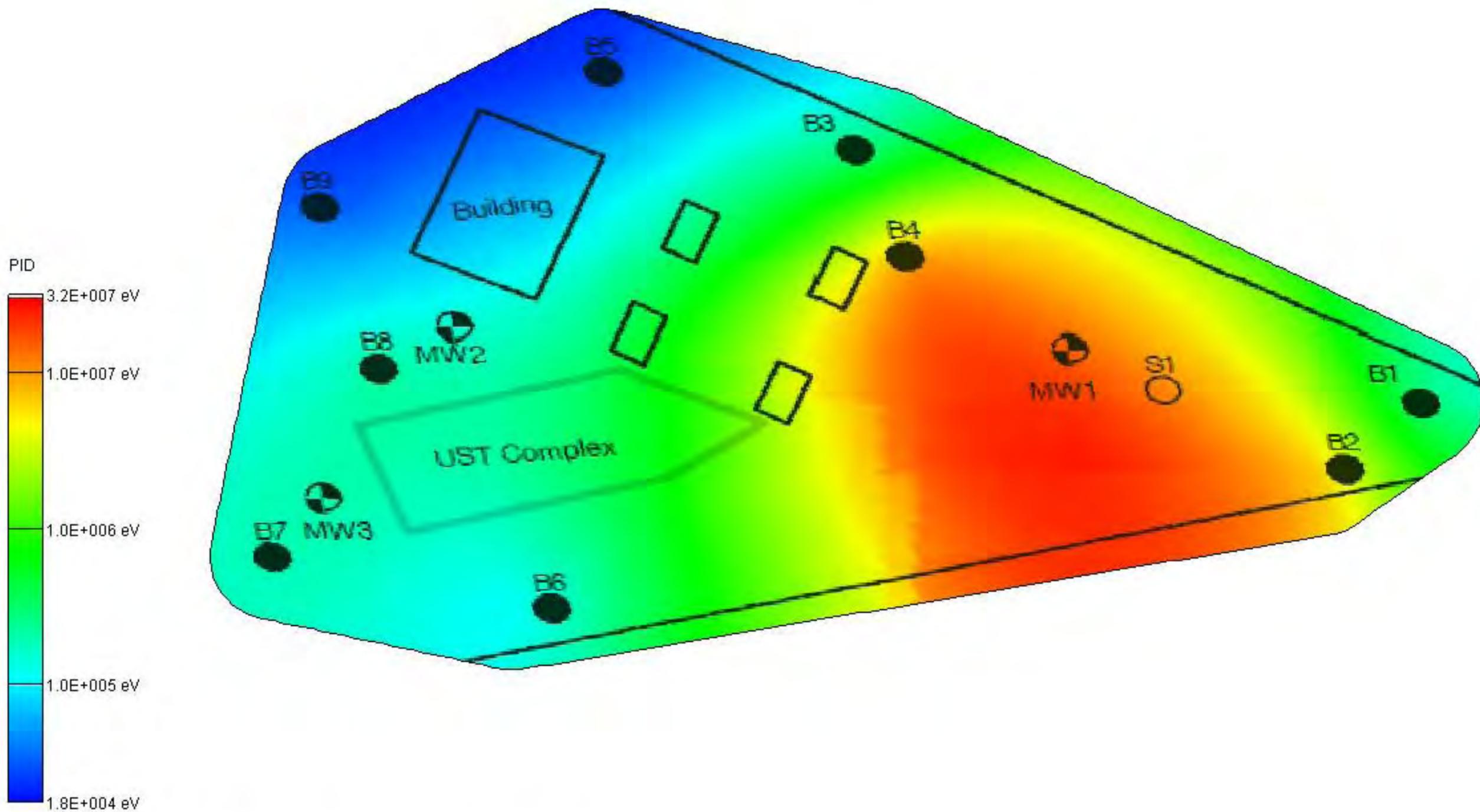
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -39 ft (MSL)



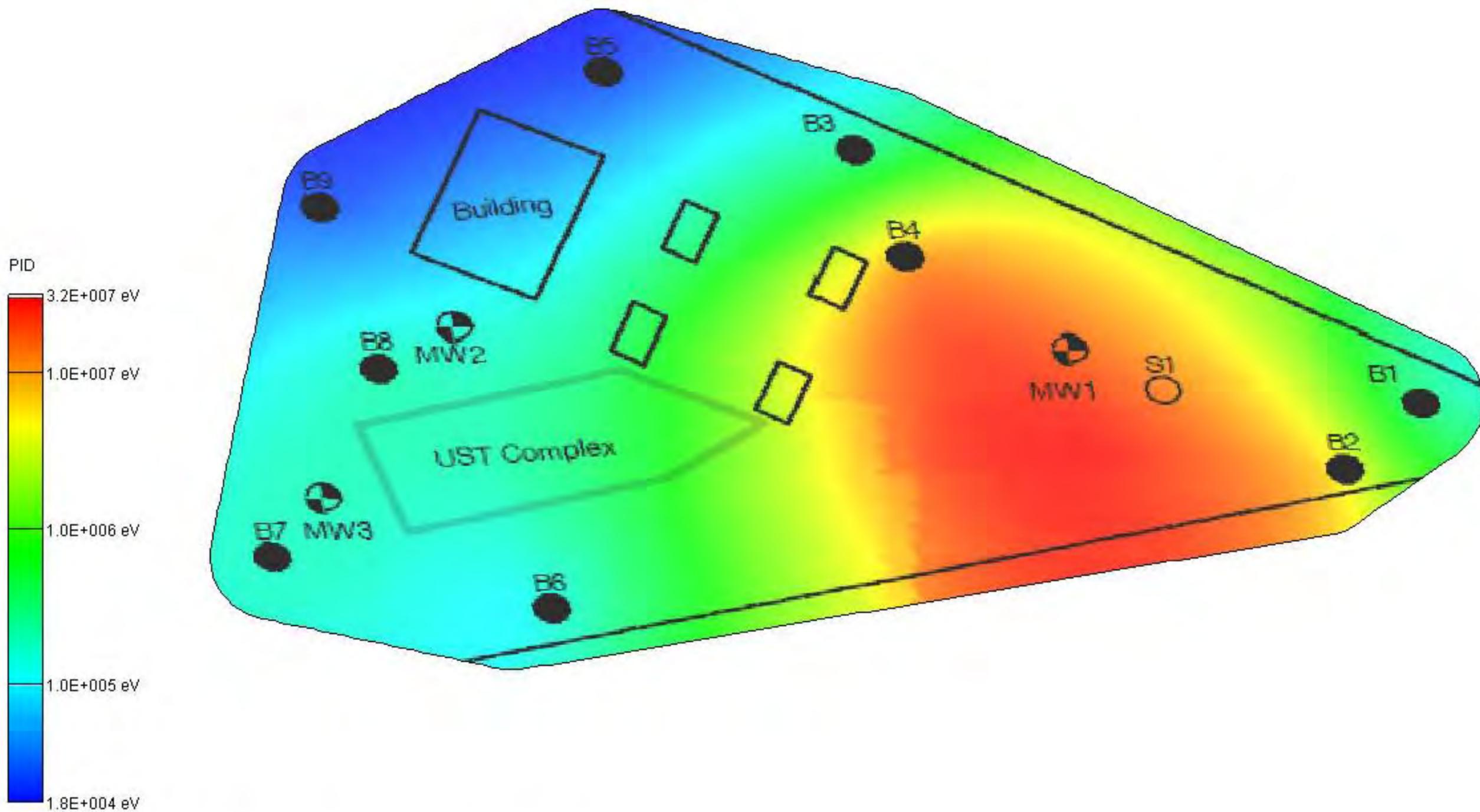
Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -40 ft (MSL)



Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

PID
Depth -41 ft (MSL)



Sierra Environmental, Inc.
ABE Petroleum LLC
17715 Mission Boulevard, Hayward, CA

Appendix D

**CERTIFIED ANALYTICAL RESULTS
CHAIN-OF-CUSTODY DOCUMENTATION
FOR SOIL AND GROUNDWATER SAMPLES**



Technical Report for

Sierra Environmental, Inc.

T0600102154-ABE, 17715 Mission Boulevard, CA

03-103.00

Accutest Job Number: C7292

Sampling Dates: 08/27/09 - 08/28/09

Report to:

Sierra Environmental, Inc.
980 West Taylor Street
San Jose, CA 95126
maz.sierra@sbcglobal.net

ATTN: Mitch Hajiaghai

Total number of pages in report: **39**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Laurie Glantz-Murphy
Laboratory Director

Client Service contact: Diane Theesen 408-588-0200

Certifications: CA (08258CA)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.
Test results relate only to samples analyzed.



Table of Contents

-1-

Section 1: Sample Summary	3
Section 2: Sample Results	4
2.1: C7292-1: S1-20	5
2.2: C7292-2: S1-35	6
2.3: C7292-3: B1W	7
2.4: C7292-4: B2W	8
2.5: C7292-5: B3W	9
2.6: C7292-6: B4W	10
2.7: C7292-7: B5W	11
2.8: C7292-8: B8W	12
2.9: C7292-9: B9W	13
2.10: C7292-10: S1W	14
Section 3: Misc. Forms	15
3.1: Chain of Custody	16
Section 4: GC/MS Volatiles - QC Data Summaries	18
4.1: Method Blank Summary	19
4.2: Blank Spike Summary	25
4.3: Matrix Spike/Matrix Spike Duplicate Summary	35



Sample Summary

Sierra Environmental, Inc.

Job No: C7292

T0600102154-ABE, 17715 Mission Boulevard, CA
 Project No: 03-103.00

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
C7292-1	08/27/09	09:30 MH	08/28/09	SO	Soil	S1-20
C7292-2	08/27/09	10:00 MH	08/28/09	SO	Soil	S1-35
C7292-3	08/27/09	14:30 MH	08/28/09	AQ	Ground Water	B1W
C7292-4	08/27/09	16:00 MH	08/28/09	AQ	Ground Water	B2W
C7292-5	08/28/09	11:00 MH	08/28/09	AQ	Ground Water	B3W
C7292-6	08/27/09	13:30 MH	08/28/09	AQ	Ground Water	B4W
C7292-7	08/28/09	12:00 MH	08/28/09	AQ	Ground Water	B5W
C7292-8	08/28/09	16:00 MH	08/28/09	AQ	Ground Water	B8W
C7292-9	08/28/09	14:30 MH	08/28/09	AQ	Ground Water	B9W
C7292-10	08/27/09	11:00 MH	08/28/09	AQ	Ground Water	S1W

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: S1-20		Date Sampled: 08/27/09
Lab Sample ID: C7292-1		Date Received: 08/28/09
Matrix: SO - Soil		Percent Solids: n/a ^a
Method: SW846 8260B		
Project: T0600102154-ABE, 17715 Mission Boulevard, CA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M8524.D	1	08/31/09	XB	n/a	n/a	VM282
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.14 g	5.0 ml	20.0 ul
Run #2			

BTEX, Oxygenates

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	1170	1200	360	ug/kg	J
108-88-3	Toluene	30700	1200	360	ug/kg	
100-41-4	Ethylbenzene	13500	1200	360	ug/kg	
1330-20-7	Xylene (total)	56800	2400	970	ug/kg	
108-20-3	Di-Isopropyl ether	ND	1200	360	ug/kg	
637-92-3	Ethyl tert-Butyl Ether	ND	1200	360	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	1150	1200	240	ug/kg	J
994-05-8	Tert-Amyl Methyl Ether	ND	1200	290	ug/kg	
75-65-0	Tert Butyl Alcohol	ND	9700	2400	ug/kg	
	TPH-GRO (C6-C10)	320000	24000	12000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		60-130%
2037-26-5	Toluene-D8	116%		60-130%
460-00-4	4-Bromofluorobenzene	106%		60-130%

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: S1-35		Date Sampled: 08/27/09
Lab Sample ID: C7292-2		Date Received: 08/28/09
Matrix: SO - Soil		Percent Solids: n/a ^a
Method: SW846 8260B		
Project: T0600102154-ABE, 17715 Mission Boulevard, CA		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M8527.D	1	08/31/09	XB	n/a	n/a	VM282
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.03 g	5.0 ml	50.0 ul
Run #2			

BTEX, Oxygenates

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	500	150	ug/kg	
108-88-3	Toluene	ND	500	150	ug/kg	
100-41-4	Ethylbenzene	967	500	150	ug/kg	
1330-20-7	Xylene (total)	2470	990	400	ug/kg	
108-20-3	Di-Isopropyl ether	ND	500	150	ug/kg	
637-92-3	Ethyl tert-Butyl Ether	ND	500	150	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	157	500	99	ug/kg	J
994-05-8	Tert-Amyl Methyl Ether	ND	500	120	ug/kg	
75-65-0	Tert Butyl Alcohol	ND	4000	990	ug/kg	
	TPH-GRO (C6-C10)	52600	9900	5000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		60-130%
2037-26-5	Toluene-D8	114%		60-130%
460-00-4	4-Bromofluorobenzene	104%		60-130%

(a) All results reported on wet weight basis.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: B1W	
Lab Sample ID: C7292-3	Date Sampled: 08/27/09
Matrix: AQ - Ground Water	Date Received: 08/28/09
Method: SW846 8260B	Percent Solids: n/a
Project: T0600102154-ABE, 17715 Mission Boulevard, CA	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	M8617.D	3.33	09/02/09	XB	n/a	n/a	VM285
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

BTEX, Oxygenates

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	78.9	3.3	1.0	ug/l	
108-88-3	Toluene	147	3.3	1.7	ug/l	
100-41-4	Ethylbenzene	42.7	3.3	1.0	ug/l	
1330-20-7	Xylene (total)	188	6.7	2.3	ug/l	
108-20-3	Di-Isopropyl ether	ND	17	1.7	ug/l	
637-92-3	Ethyl Tert Butyl Ether	ND	17	1.7	ug/l	
1634-04-4	Methyl Tert Butyl Ether	127	3.3	1.7	ug/l	
994-05-8	Tert-Amyl Methyl Ether	2.4	17	1.7	ug/l	J
75-65-0	Tert-Butyl Alcohol	39.6	33	17	ug/l	
	TPH-GRO (C6-C10)	1410	170	83	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	116%		60-130%
2037-26-5	Toluene-D8	104%		60-130%
460-00-4	4-Bromofluorobenzene	104%		60-130%

(a) Sample was not preserved to a pH < 2.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: B2W		Date Sampled: 08/27/09
Lab Sample ID: C7292-4		Date Received: 08/28/09
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: T0600102154-ABE, 17715 Mission Boulevard, CA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	M8680.D	20	09/04/09	XB	n/a	n/a	VM287
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

BTEX, Oxygenates

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	139	20	6.0	ug/l	
108-88-3	Toluene	902	20	10	ug/l	
100-41-4	Ethylbenzene	230	20	6.0	ug/l	
1330-20-7	Xylene (total)	1040	40	14	ug/l	
108-20-3	Di-Isopropyl ether	ND	100	10	ug/l	
637-92-3	Ethyl Tert Butyl Ether	ND	100	10	ug/l	
1634-04-4	Methyl Tert Butyl Ether	132	20	10	ug/l	
994-05-8	Tert-Amyl Methyl Ether	ND	100	10	ug/l	
75-65-0	Tert-Butyl Alcohol	ND	200	100	ug/l	
	TPH-GRO (C6-C10)	6950	1000	500	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	113%		60-130%
2037-26-5	Toluene-D8	106%		60-130%
460-00-4	4-Bromofluorobenzene	107%		60-130%

(a) Sample was not preserved to a pH < 2.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	B3W		
Lab Sample ID:	C7292-5	Date Sampled:	08/28/09
Matrix:	AQ - Ground Water	Date Received:	08/28/09
Method:	SW846 8260B	Percent Solids:	n/a
Project:	T0600102154-ABE, 17715 Mission Boulevard, CA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	M8681.D	10	09/04/09	XB	n/a	n/a	VM287
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

BTEX, Oxygenates

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	10.5	10	3.0	ug/l	
108-88-3	Toluene	7.1	10	5.0	ug/l	J
100-41-4	Ethylbenzene	220	10	3.0	ug/l	
1330-20-7	Xylene (total)	377	20	7.0	ug/l	
108-20-3	Di-Isopropyl ether	ND	50	5.0	ug/l	
637-92-3	Ethyl Tert Butyl Ether	ND	50	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	41.1	10	5.0	ug/l	
994-05-8	Tert-Amyl Methyl Ether	ND	50	5.0	ug/l	
75-65-0	Tert-Butyl Alcohol	ND	100	50	ug/l	
	TPH-GRO (C6-C10)	4570	500	250	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	110%		60-130%
2037-26-5	Toluene-D8	107%		60-130%
460-00-4	4-Bromofluorobenzene	103%		60-130%

(a) Sample was not preserved to a pH < 2.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: B4W	
Lab Sample ID: C7292-6	Date Sampled: 08/27/09
Matrix: AQ - Ground Water	Date Received: 08/28/09
Method: SW846 8260B	Percent Solids: n/a
Project: T0600102154-ABE, 17715 Mission Boulevard, CA	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	M8682.D	20	09/04/09	XB	n/a	n/a	VM287
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

BTEX, Oxygenates

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	70.4	20	6.0	ug/l	
108-88-3	Toluene	13.8	20	10	ug/l	J
100-41-4	Ethylbenzene	454	20	6.0	ug/l	
1330-20-7	Xylene (total)	1350	40	14	ug/l	
108-20-3	Di-Isopropyl ether	ND	100	10	ug/l	
637-92-3	Ethyl Tert Butyl Ether	ND	100	10	ug/l	
1634-04-4	Methyl Tert Butyl Ether	165	20	10	ug/l	
994-05-8	Tert-Amyl Methyl Ether	ND	100	10	ug/l	
75-65-0	Tert-Butyl Alcohol	ND	200	100	ug/l	
	TPH-GRO (C6-C10)	10400	1000	500	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		60-130%
2037-26-5	Toluene-D8	107%		60-130%
460-00-4	4-Bromofluorobenzene	102%		60-130%

(a) Sample was not preserved to a pH < 2.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: B5W	
Lab Sample ID: C7292-7	Date Sampled: 08/28/09
Matrix: AQ - Ground Water	Date Received: 08/28/09
Method: SW846 8260B	Percent Solids: n/a
Project: T0600102154-ABE, 17715 Mission Boulevard, CA	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	M8728.D	20	09/07/09	XB	n/a	n/a	VM288
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

BTEX, Oxygenates

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	20	6.0	ug/l	
108-88-3	Toluene	ND	20	10	ug/l	
100-41-4	Ethylbenzene	8.4	20	6.0	ug/l	J
1330-20-7	Xylene (total)	ND	40	14	ug/l	
108-20-3	Di-Isopropyl ether	ND	100	10	ug/l	
637-92-3	Ethyl Tert Butyl Ether	ND	100	10	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	20	10	ug/l	
994-05-8	Tert-Amyl Methyl Ether	ND	100	10	ug/l	
75-65-0	Tert-Butyl Alcohol	ND	200	100	ug/l	
	TPH-GRO (C6-C10)	6930	1000	500	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	114%		60-130%
2037-26-5	Toluene-D8	105%		60-130%
460-00-4	4-Bromofluorobenzene	104%		60-130%

(a) Sample vial contained more than 0.5cm of sediment. Sample was not preserved to a pH < 2.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: B8W	
Lab Sample ID: C7292-8	Date Sampled: 08/28/09
Matrix: AQ - Ground Water	Date Received: 08/28/09
Method: SW846 8260B	Percent Solids: n/a
Project: T0600102154-ABE, 17715 Mission Boulevard, CA	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	M8823.D	16.7	09/10/09	XB	n/a	n/a	VM291
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

BTEX, Oxygenates

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	359	17	5.0	ug/l	
108-88-3	Toluene	12.6	17	8.4	ug/l	J
100-41-4	Ethylbenzene	145	17	5.0	ug/l	
1330-20-7	Xylene (total)	68.1	33	12	ug/l	
108-20-3	Di-Isopropyl ether	ND	84	8.4	ug/l	
637-92-3	Ethyl Tert Butyl Ether	ND	84	8.4	ug/l	
1634-04-4	Methyl Tert Butyl Ether	840	17	8.4	ug/l	
994-05-8	Tert-Amyl Methyl Ether	ND	84	8.4	ug/l	
75-65-0	Tert-Butyl Alcohol	1340	170	84	ug/l	
	TPH-GRO (C6-C10)	10600	840	420	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		60-130%
2037-26-5	Toluene-D8	100%		60-130%
460-00-4	4-Bromofluorobenzene	104%		60-130%

(a) Sample was not preserved to a pH < 2.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: B9W		
Lab Sample ID: C7292-9		Date Sampled: 08/28/09
Matrix: AQ - Ground Water		Date Received: 08/28/09
Method: SW846 8260B		Percent Solids: n/a
Project: T0600102154-ABE, 17715 Mission Boulevard, CA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	M8685.D	12.5	09/04/09	XB	n/a	n/a	VM287
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

BTEX, Oxygenates

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	417	13	3.8	ug/l	
108-88-3	Toluene	ND	13	6.3	ug/l	
100-41-4	Ethylbenzene	17.4	13	3.8	ug/l	
1330-20-7	Xylene (total)	9.9	25	8.8	ug/l	J
108-20-3	Di-Isopropyl ether	ND	63	6.3	ug/l	
637-92-3	Ethyl Tert Butyl Ether	ND	63	6.3	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	13	6.3	ug/l	
994-05-8	Tert-Amyl Methyl Ether	ND	63	6.3	ug/l	
75-65-0	Tert-Butyl Alcohol	915	130	63	ug/l	
	TPH-GRO (C6-C10)	5980	630	310	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		60-130%
2037-26-5	Toluene-D8	106%		60-130%
460-00-4	4-Bromofluorobenzene	100%		60-130%

(a) Sample vial contained more than 0.5cm of sediment. Sample was not preserved to a pH < 2.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: S1W	
Lab Sample ID: C7292-10	Date Sampled: 08/27/09
Matrix: AQ - Ground Water	Date Received: 08/28/09
Method: SW846 8260B	Percent Solids: n/a
Project: T0600102154-ABE, 17715 Mission Boulevard, CA	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	M8686.D	200	09/04/09	XB	n/a	n/a	VM287
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

BTEX, Oxygenates

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	1680	200	60	ug/l	
108-88-3	Toluene	2570	200	100	ug/l	
100-41-4	Ethylbenzene	2940	200	60	ug/l	
1330-20-7	Xylene (total)	10500	400	140	ug/l	
108-20-3	Di-Isopropyl ether	ND	1000	100	ug/l	
637-92-3	Ethyl Tert Butyl Ether	ND	1000	100	ug/l	
1634-04-4	Methyl Tert Butyl Ether	893	200	100	ug/l	
994-05-8	Tert-Amyl Methyl Ether	ND	1000	100	ug/l	
75-65-0	Tert-Butyl Alcohol	ND	2000	1000	ug/l	
	TPH-GRO (C6-C10)	59900	10000	5000	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		60-130%
2037-26-5	Toluene-D8	107%		60-130%
460-00-4	4-Bromofluorobenzene	100%		60-130%

(a) Sample was not preserved to a pH < 2.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

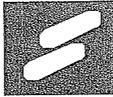


Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY "SECAST137" C7292

Project Name: ABE Project No: 03-103.00 Date: 8/28/09
Project Location: 17715 Mission Boulevard Client: Paul Garg Sampler: Mike Hagi

Sample ID	Date Sampled	Sampling Time	Matrix	N° of Containers	Analysis Requested						Turnaround Time		
					TPHG&BTEX Fuel Oxygenates 8260B						24-hour	Other	
S1-20	8/27/09	9:30	Soil	1	<input checked="" type="checkbox"/>							24-hour	Normal
S1-35		10:00	↓	↓	<input checked="" type="checkbox"/>							24-hour	Normal
B1W		2:30	Water	4	<input checked="" type="checkbox"/>							24-hour	Normal
B2W		4:00	↓	↓	<input checked="" type="checkbox"/>							24-hour	Normal
B3W	8/28/09	11:00	↓	↓	<input checked="" type="checkbox"/>							24-hour	Normal
B4W	8/27/09	1:30	↓	↓	<input checked="" type="checkbox"/>				4 vials each (uthee)			24-hour	Normal
B5W	8/28/09	12:00	↓	↓	<input checked="" type="checkbox"/>				2x Acetate tubes			24-hour	Normal

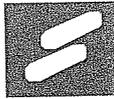
Remarks: Please email the results in EDF format for Geotracker ID# T0600102154 to maz.sierra@sbcglobal.net

Temp: 5.7°C

Relinquished by <i>[Signature]</i>	Date 8/28/09	Time 4:30	Received by <i>[Signature]</i>	Date 08/28/09	Time 17:02
Relinquished by	Date	Time	Received by	Date	Time

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page 1 of 2



C7292

CHAIN OF CUSTODY

Project Name: ABE Project No: 03-103.00 Date: 8/28/09

Project Location: 17715 Mission Boulevard Client: Paul Garg Sampler: Mike Hagi

Sample ID	Date Sampled	Sampling Time	Matrix	N° of Containers	Analysis Requested						Turnaround Time		
					TPHG&BTEX Fuel Oxygenates 8260B						24-hour	Other	
B8W	8/28/09	4:00	water	4	<input checked="" type="checkbox"/>	-8						24-hour	Normal
B9W	↓	2:30	↓	↓	<input checked="" type="checkbox"/>	-9						24-hour	Normal
S1W	8/27/09	11:00	water	↓	<input checked="" type="checkbox"/>	-10						24-hour	Normal
												24-hour	Normal
												24-hour	Normal
												24-hour	Normal
												24-hour	Normal

Remarks: Please email the results in EDF format for Geotracker ID# T0600102154 to maz.sierra@sbcglobal.net

Relinquished by <i>[Signature]</i>	Date <u>8/28/09</u>	Time <u>4:30</u>	Received by <i>[Signature]</i>	Date <u>08/28/09</u>	Time <u>17:02</u>
Relinquished by	Date	Time	Received by	Date	Time

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page 2 of 2

31
3



GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C7292

Account: SECASJ Sierra Environmental, Inc.

Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM282-MB2	M8519.D	1	08/31/09	XB	n/a	n/a	VM282

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-1, C7292-2

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.0	1.5	ug/kg	
108-20-3	Di-Isopropyl ether	ND	5.0	1.5	ug/kg	
100-41-4	Ethylbenzene	ND	5.0	1.5	ug/kg	
637-92-3	Ethyl tert-Butyl Ether	ND	5.0	1.5	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	5.0	1.0	ug/kg	
994-05-8	Tert-Amyl Methyl Ether	ND	5.0	1.2	ug/kg	
75-65-0	Tert Butyl Alcohol	ND	40	10	ug/kg	
108-88-3	Toluene	ND	5.0	1.5	ug/kg	
1330-20-7	Xylene (total)	ND	10	4.0	ug/kg	
	TPH-GRO (C6-C10)	ND	100	50	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	99% 60-130%
2037-26-5	Toluene-D8	113% 60-130%
460-00-4	4-Bromofluorobenzene	101% 60-130%

Method Blank Summary

Job Number: C7292
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM285-MB	M8605.D	1	09/02/09	XB	n/a	n/a	VM285

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-3

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-20-3	Di-Isopropyl ether	ND	5.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
637-92-3	Ethyl Tert Butyl Ether	ND	5.0	0.50	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.50	ug/l	
994-05-8	Tert-Amyl Methyl Ether	ND	5.0	0.50	ug/l	
75-65-0	Tert-Butyl Alcohol	ND	10	5.0	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	
	TPH-GRO (C6-C10)	ND	50	25	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	109% 60-130%
2037-26-5	Toluene-D8	104% 60-130%
460-00-4	4-Bromofluorobenzene	102% 60-130%

4.1.2
4

Method Blank Summary

Job Number: C7292
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM287-MB	M8675.D	1	09/04/09	XB	n/a	n/a	VM287

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-4, C7292-5, C7292-6, C7292-9, C7292-10

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-20-3	Di-Isopropyl ether	ND	5.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
637-92-3	Ethyl Tert Butyl Ether	ND	5.0	0.50	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.50	ug/l	
994-05-8	Tert-Amyl Methyl Ether	ND	5.0	0.50	ug/l	
75-65-0	Tert-Butyl Alcohol	ND	10	5.0	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	
	TPH-GRO (C6-C10)	ND	50	25	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	114% 60-130%
2037-26-5	Toluene-D8	106% 60-130%
460-00-4	4-Bromofluorobenzene	101% 60-130%

Method Blank Summary

Job Number: C7292

Account: SECASJ Sierra Environmental, Inc.

Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM288-MB	M8713.D	1	09/06/09	XB	n/a	n/a	VM288

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-7

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-20-3	Di-Isopropyl ether	ND	5.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
637-92-3	Ethyl Tert Butyl Ether	ND	5.0	0.50	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.50	ug/l	
994-05-8	Tert-Amyl Methyl Ether	ND	5.0	0.50	ug/l	
75-65-0	Tert-Butyl Alcohol	ND	10	5.0	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	
	TPH-GRO (C6-C10)	ND	50	25	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	110% 60-130%
2037-26-5	Toluene-D8	105% 60-130%
460-00-4	4-Bromofluorobenzene	99% 60-130%

Method Blank Summary

Job Number: C7292
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM291-MB	M8808.D	1	09/10/09	XB	n/a	n/a	VM291

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-8

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-20-3	Di-Isopropyl ether	ND	5.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
637-92-3	Ethyl Tert Butyl Ether	ND	5.0	0.50	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.50	ug/l	
994-05-8	Tert-Amyl Methyl Ether	ND	5.0	0.50	ug/l	
75-65-0	Tert-Butyl Alcohol	ND	10	5.0	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	
	TPH-GRO (C6-C10)	ND	50	25	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	111% 60-130%
2037-26-5	Toluene-D8	101% 60-130%
460-00-4	4-Bromofluorobenzene	99% 60-130%

Method Blank Summary

Job Number: C7292

Account: SECASJ Sierra Environmental, Inc.

Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM282-MB	M8497.D	1	08/28/09	XB	n/a	n/a	VM282

The QC reported here applies to the following samples:

Method: SW846 8260B

VM282-BS2, C7272-1MS, C7272-1MSD

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.0	1.5	ug/kg	
108-20-3	Di-Isopropyl ether	ND	5.0	1.5	ug/kg	
100-41-4	Ethylbenzene	ND	5.0	1.5	ug/kg	
637-92-3	Ethyl tert-Butyl Ether	ND	5.0	1.5	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	5.0	1.0	ug/kg	
994-05-8	Tert-Amyl Methyl Ether	ND	5.0	1.2	ug/kg	
75-65-0	Tert Butyl Alcohol	ND	40	10	ug/kg	
108-88-3	Toluene	ND	5.0	1.5	ug/kg	
1330-20-7	Xylene (total)	ND	10	4.0	ug/kg	
	TPH-GRO (C6-C10)	ND	100	50	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	98% 60-130%
2037-26-5	Toluene-D8	113% 60-130%
460-00-4	4-Bromofluorobenzene	97% 60-130%

Blank Spike Summary

Job Number: C7292
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM282-BS2	M8517.D	1	08/31/09	XB	n/a	n/a	VM282

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-1, C7292-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	40	39.3	98	60-130
108-20-3	Di-Isopropyl ether	40	38.9	97	60-130
100-41-4	Ethylbenzene	40	41.2	103	60-130
637-92-3	Ethyl tert-Butyl Ether	40	41.5	104	60-130
1634-04-4	Methyl Tert Butyl Ether	40	37.9	95	60-130
994-05-8	Tert-Amyl Methyl Ether	40	38.3	96	60-130
75-65-0	Tert Butyl Alcohol	200	145	73	60-130
108-88-3	Toluene	40	40.8	102	60-130
1330-20-7	Xylene (total)	120	117	98	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	102%	60-130%
2037-26-5	Toluene-D8	109%	60-130%
460-00-4	4-Bromofluorobenzene	100%	60-130%

4.2.1
4

Blank Spike Summary

Job Number: C7292
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM282-BS2	M8523.D	1	08/31/09	XB	n/a	n/a	VM282

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-1, C7292-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
	TPH-GRO (C6-C10)	250	221	88	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	60-130%
2037-26-5	Toluene-D8	113%	60-130%
460-00-4	4-Bromofluorobenzene	103%	60-130%

4.2.2
4

Blank Spike Summary

Job Number: C7292
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM285-BS	M8601.D	1	09/02/09	XB	n/a	n/a	VM285

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	20	18.3	92	60-130
108-20-3	Di-Isopropyl ether	20	20.1	101	60-130
100-41-4	Ethylbenzene	20	17.4	87	60-130
637-92-3	Ethyl Tert Butyl Ether	20	21.7	109	60-130
1634-04-4	Methyl Tert Butyl Ether	20	21.4	107	60-130
994-05-8	Tert-Amyl Methyl Ether	20	21.0	105	60-130
75-65-0	Tert-Butyl Alcohol	100	101	101	60-130
108-88-3	Toluene	20	16.2	81	60-130
1330-20-7	Xylene (total)	60	51.6	86	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	107%	60-130%
2037-26-5	Toluene-D8	100%	60-130%
460-00-4	4-Bromofluorobenzene	105%	60-130%

4.2.3
4

Blank Spike Summary

Job Number: C7292
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM285-BS	M8604.D	1	09/02/09	XB	n/a	n/a	VM285

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	125	138	110	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	111%	60-130%
2037-26-5	Toluene-D8	103%	60-130%
460-00-4	4-Bromofluorobenzene	102%	60-130%

4.2.4
4

Blank Spike Summary

Job Number: C7292
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM287-BS	M8671.D	1	09/04/09	XB	n/a	n/a	VM287

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-4, C7292-5, C7292-6, C7292-9, C7292-10

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	20	19.7	99	60-130
108-20-3	Di-Isopropyl ether	20	20.5	103	60-130
100-41-4	Ethylbenzene	20	19.5	98	60-130
637-92-3	Ethyl Tert Butyl Ether	20	22.7	114	60-130
1634-04-4	Methyl Tert Butyl Ether	20	21.7	109	60-130
994-05-8	Tert-Amyl Methyl Ether	20	20.6	103	60-130
75-65-0	Tert-Butyl Alcohol	100	93.9	94	60-130
108-88-3	Toluene	20	17.9	90	60-130
1330-20-7	Xylene (total)	60	56.5	94	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	110%	60-130%
2037-26-5	Toluene-D8	104%	60-130%
460-00-4	4-Bromofluorobenzene	106%	60-130%

4.2.5
4

Blank Spike Summary

Job Number: C7292
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM287-BS	M8674.D	1	09/04/09	XB	n/a	n/a	VM287

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-4, C7292-5, C7292-6, C7292-9, C7292-10

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	125	147	118	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	112%	60-130%
2037-26-5	Toluene-D8	105%	60-130%
460-00-4	4-Bromofluorobenzene	101%	60-130%

4.2.6
4

Blank Spike Summary

Job Number: C7292
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM288-BS	M8709.D	1	09/06/09	XB	n/a	n/a	VM288

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	20	20.7	104	60-130
108-20-3	Di-Isopropyl ether	20	20.8	104	60-130
100-41-4	Ethylbenzene	20	20.9	105	60-130
637-92-3	Ethyl Tert Butyl Ether	20	22.8	114	60-130
1634-04-4	Methyl Tert Butyl Ether	20	21.3	107	60-130
994-05-8	Tert-Amyl Methyl Ether	20	20.7	104	60-130
75-65-0	Tert-Butyl Alcohol	100	95.4	95	60-130
108-88-3	Toluene	20	19.0	95	60-130
1330-20-7	Xylene (total)	60	59.6	99	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	108%	60-130%
2037-26-5	Toluene-D8	100%	60-130%
460-00-4	4-Bromofluorobenzene	104%	60-130%

4.2.7
4

Blank Spike Summary

Job Number: C7292
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM288-BS	M8712.D	1	09/06/09	XB	n/a	n/a	VM288

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	125	142	114	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	109%	60-130%
2037-26-5	Toluene-D8	104%	60-130%
460-00-4	4-Bromofluorobenzene	102%	60-130%

4.2.8
4

Blank Spike Summary

Job Number: C7292
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM291-BS	M8804.D	1	09/10/09	XB	n/a	n/a	VM291

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-8

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	20	22.9	115	60-130
108-20-3	Di-Isopropyl ether	20	23.3	117	60-130
100-41-4	Ethylbenzene	20	22.0	110	60-130
637-92-3	Ethyl Tert Butyl Ether	20	24.0	120	60-130
1634-04-4	Methyl Tert Butyl Ether	20	22.5	113	60-130
994-05-8	Tert-Amyl Methyl Ether	20	22.1	111	60-130
75-65-0	Tert-Butyl Alcohol	100	98.0	98	60-130
108-88-3	Toluene	20	20.3	102	60-130
1330-20-7	Xylene (total)	60	65.3	109	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	108%	60-130%
2037-26-5	Toluene-D8	97%	60-130%
460-00-4	4-Bromofluorobenzene	103%	60-130%

4.2.9
4

Blank Spike Summary

Job Number: C7292
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM291-BS	M8807.D	1	09/10/09	XB	n/a	n/a	VM291

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-8

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	125	138	110	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	107%	60-130%
2037-26-5	Toluene-D8	101%	60-130%
460-00-4	4-Bromofluorobenzene	102%	60-130%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C7292

Account: SECASJ Sierra Environmental, Inc.

Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C7272-1MS	M8501.D	1	08/28/09	XB	n/a	n/a	VM282
C7272-1MSD	M8502.D	1	08/28/09	XB	n/a	n/a	VM282
C7272-1	M8498.D	1	08/28/09	XB	n/a	n/a	VM282

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-1, C7292-2

CAS No.	Compound	C7272-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		39.6	40.7	103	38.6	97	5	60-130/30
108-20-3	Di-Isopropyl ether	ND		39.6	39.0	98	37.9	96	3	60-130/30
100-41-4	Ethylbenzene	ND		39.6	42.3	107	40.0	101	6	60-130/30
637-92-3	Ethyl tert-Butyl Ether	ND		39.6	45.1	114	42.2	107	7	60-130/30
1634-04-4	Methyl Tert Butyl Ether	ND		39.6	41.3	104	38.4	97	7	60-130/30
994-05-8	Tert-Amyl Methyl Ether	ND		39.6	40.5	102	38.1	96	6	60-130/30
75-65-0	Tert Butyl Alcohol	ND		198	169	85	148	75	13	60-130/30
108-88-3	Toluene	ND		39.6	41.7	105	39.9	101	4	60-130/30
1330-20-7	Xylene (total)	ND		119	119	100	113	95	5	60-130/30

CAS No.	Surrogate Recoveries	MS	MSD	C7272-1	Limits
1868-53-7	Dibromofluoromethane	104%	104%	102%	60-130%
2037-26-5	Toluene-D8	115%	111%	113%	60-130%
460-00-4	4-Bromofluorobenzene	108%	102%	98%	60-130%

4.3.1
4

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C7292
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C7288-1MS	M8621.D	1	09/02/09	XB	n/a	n/a	VM285
C7288-1MSD	M8622.D	1	09/02/09	XB	n/a	n/a	VM285
C7288-1	M8607.D	1	09/02/09	XB	n/a	n/a	VM285

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-3

CAS No.	Compound	C7288-1 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	20	21.4	107	20.4	102	5	60-130/25
108-20-3	Di-Isopropyl ether	ND	20	22.8	114	22.1	111	3	60-130/25
100-41-4	Ethylbenzene	ND	20	18.5	93	16.3	82	13	60-130/25
637-92-3	Ethyl Tert Butyl Ether	ND	20	24.1	121	22.6	113	6	60-130/25
1634-04-4	Methyl Tert Butyl Ether	ND	20	21.5	108	20.5	103	5	60-130/25
994-05-8	Tert-Amyl Methyl Ether	ND	20	21.6	108	20.7	104	4	60-130/25
75-65-0	Tert-Butyl Alcohol	ND	100	86.4	86	84.4	84	2	60-130/25
108-88-3	Toluene	ND	20	17.9	90	17.1	86	5	60-130/25
1330-20-7	Xylene (total)	ND	60	53.2	89	47.3	79	12	60-130/25

CAS No.	Surrogate Recoveries	MS	MSD	C7288-1	Limits
1868-53-7	Dibromofluoromethane	107%	102%	110%	60-130%
2037-26-5	Toluene-D8	102%	102%	106%	60-130%
460-00-4	4-Bromofluorobenzene	104%	102%	102%	60-130%

4.3.2
4

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C7292
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C7312-5MS	M8690.D	1	09/04/09	XB	n/a	n/a	VM287
C7312-5MSD	M8691.D	1	09/04/09	XB	n/a	n/a	VM287
C7312-5	M8678.D	1	09/04/09	XB	n/a	n/a	VM287

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-4, C7292-5, C7292-6, C7292-9, C7292-10

CAS No.	Compound	C7312-5 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	20	20.8	104	21.4	107	3	60-130/25
108-20-3	Di-Isopropyl ether	ND	20	21.2	106	21.5	108	1	60-130/25
100-41-4	Ethylbenzene	ND	20	19.4	97	19.8	99	2	60-130/25
637-92-3	Ethyl Tert Butyl Ether	ND	20	22.4	112	22.5	113	0	60-130/25
1634-04-4	Methyl Tert Butyl Ether	ND	20	20.4	102	20.5	103	0	60-130/25
994-05-8	Tert-Amyl Methyl Ether	ND	20	20.1	101	20.2	101	0	60-130/25
75-65-0	Tert-Butyl Alcohol	ND	100	78.6	79	81.1	81	3	60-130/25
108-88-3	Toluene	ND	20	18.6	93	19.3	97	4	60-130/25
1330-20-7	Xylene (total)	ND	60	55.4	92	56.7	95	2	60-130/25

CAS No.	Surrogate Recoveries	MS	MSD	C7312-5	Limits
1868-53-7	Dibromofluoromethane	106%	104%	114%	60-130%
2037-26-5	Toluene-D8	103%	104%	110%	60-130%
460-00-4	4-Bromofluorobenzene	102%	101%	102%	60-130%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C7292

Account: SECASJ Sierra Environmental, Inc.

Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D7015-1AMS	M8729.D	1	09/07/09	XB	n/a	n/a	VM288
D7015-1AMSD	M8730.D	1	09/07/09	XB	n/a	n/a	VM288
D7015-1A	M8718.D	1	09/06/09	XB	n/a	n/a	VM288

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-7

CAS No.	Compound	D7015-1A ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	20	20.8	104	20.6	103	1	60-130/25
108-20-3	Di-Isopropyl ether	ND	20	20.8	104	20.8	104	0	60-130/25
100-41-4	Ethylbenzene	ND	20	20.4	102	18.7	94	9	60-130/25
637-92-3	Ethyl Tert Butyl Ether	ND	20	23.2	116	22.7	114	2	60-130/25
1634-04-4	Methyl Tert Butyl Ether	ND	20	20.7	104	20.4	102	1	60-130/25
994-05-8	Tert-Amyl Methyl Ether	ND	20	20.2	101	20.1	101	0	60-130/25
75-65-0	Tert-Butyl Alcohol	ND	100	86.0	86	89.6	90	4	60-130/25
108-88-3	Toluene	ND	20	18.8	94	17.7	89	6	60-130/25
1330-20-7	Xylene (total)	ND	60	58.1	97	51.6	86	12	60-130/25

CAS No.	Surrogate Recoveries	MS	MSD	D7015-1A	Limits
1868-53-7	Dibromofluoromethane	114%	110%	117%	60-130%
2037-26-5	Toluene-D8	106%	102%	107%	60-130%
460-00-4	4-Bromofluorobenzene	108%	103%	101%	60-130%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C7292

Account: SECASJ Sierra Environmental, Inc.

Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D7108-1MS	M8824.D	1	09/10/09	XB	n/a	n/a	VM291
D7108-1MSD	M8825.D	1	09/10/09	XB	n/a	n/a	VM291
D7108-1	M8810.D	1	09/10/09	XB	n/a	n/a	VM291

The QC reported here applies to the following samples:

Method: SW846 8260B

C7292-8

CAS No.	Compound	D7108-1 ug/l	Spike Q	ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	20	20.2	101	18.5	93	9	60-130/25	
108-20-3	Di-Isopropyl ether	ND	20	21.2	106	20.2	101	5	60-130/25	
100-41-4	Ethylbenzene	ND	20	17.5	88	15.1	76	15	60-130/25	
637-92-3	Ethyl Tert Butyl Ether	ND	20	22.0	110	20.8	104	6	60-130/25	
1634-04-4	Methyl Tert Butyl Ether	ND	20	20.4	102	18.9	95	8	60-130/25	
994-05-8	Tert-Amyl Methyl Ether	ND	20	19.5	98	18.4	92	6	60-130/25	
75-65-0	Tert-Butyl Alcohol	ND	100	82.5	83	66.9	67	21	60-130/25	
108-88-3	Toluene	ND	20	17.1	86	15.1	76	12	60-130/25	
1330-20-7	Xylene (total)	ND	60	50.6	84	43.2	72	16	60-130/25	

CAS No.	Surrogate Recoveries	MS	MSD	D7108-1	Limits
1868-53-7	Dibromofluoromethane	106%	102%	108%	60-130%
2037-26-5	Toluene-D8	101%	98%	101%	60-130%
460-00-4	4-Bromofluorobenzene	102%	100%	101%	60-130%

4.3.5
4



Technical Report for

Sierra Environmental, Inc.

T0600102154-ABE, 17715 Mission Boulevard, CA

03-103.00

Accutest Job Number: C7296

Sampling Date: 08/31/09

Report to:

Sierra Environmental, Inc.
980 West Taylor Street
San Jose, CA 95126
maz.sierra@sbcglobal.net

ATTN: Mitch Hajiaghai

Total number of pages in report: **13**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Laurie Glantz-Murphy
Laboratory Director

Client Service contact: Diane Theesen 408-588-0200

Certifications: CA (08258CA)

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Test results relate only to samples analyzed.



Table of Contents

-1-

Section 1: Sample Summary	3
Section 2: Sample Results	4
2.1: C7296-1: B6W	5
2.2: C7296-2: B7W	6
Section 3: Misc. Forms	7
3.1: Chain of Custody	8
Section 4: GC/MS Volatiles - QC Data Summaries	9
4.1: Method Blank Summary	10
4.2: Blank Spike Summary	11
4.3: Matrix Spike/Matrix Spike Duplicate Summary	13



Sample Summary

Sierra Environmental, Inc.

Job No: C7296

T0600102154-ABE, 17715 Mission Boulevard, CA
Project No: 03-103.00

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
C7296-1	08/31/09	10:30 MH	08/31/09	AQ	Ground Water	B6W
C7296-2	08/31/09	12:30 MH	08/31/09	AQ	Ground Water	B7W



Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: B6W		Date Sampled: 08/31/09
Lab Sample ID: C7296-1		Date Received: 08/31/09
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: SW846 8260B		
Project: T0600102154-ABE, 17715 Mission Boulevard, CA		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	W8095.D	50	09/04/09	BD	n/a	n/a	VW283
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

BTEX, Oxygenates

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	3300	50	15	ug/l	
108-88-3	Toluene	34.6	50	25	ug/l	J
100-41-4	Ethylbenzene	505	50	15	ug/l	
1330-20-7	Xylene (total)	703	100	35	ug/l	
108-20-3	Di-Isopropyl ether	ND	250	25	ug/l	
637-92-3	Ethyl Tert Butyl Ether	ND	250	25	ug/l	
1634-04-4	Methyl Tert Butyl Ether	174	50	25	ug/l	
994-05-8	Tert-Amyl Methyl Ether	ND	250	25	ug/l	
75-65-0	Tert-Butyl Alcohol	1940	500	250	ug/l	
	TPH-GRO (C6-C10)	18100	2500	1300	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		60-130%
2037-26-5	Toluene-D8	104%		60-130%
460-00-4	4-Bromofluorobenzene	102%		60-130%

(a) Sample vial contained more than 0.5cm of sediment. Sample was not preserved to a pH < 2.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: B7W	
Lab Sample ID: C7296-2	Date Sampled: 08/31/09
Matrix: AQ - Ground Water	Date Received: 08/31/09
Method: SW846 8260B	Percent Solids: n/a
Project: T0600102154-ABE, 17715 Mission Boulevard, CA	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	W8096.D	10	09/04/09	BD	n/a	n/a	VW283
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

BTEX, Oxygenates

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	3.8	10	3.0	ug/l	J
108-88-3	Toluene	ND	10	5.0	ug/l	
100-41-4	Ethylbenzene	76.3	10	3.0	ug/l	
1330-20-7	Xylene (total)	96.4	20	7.0	ug/l	
108-20-3	Di-Isopropyl ether	ND	50	5.0	ug/l	
637-92-3	Ethyl Tert Butyl Ether	ND	50	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	772	10	5.0	ug/l	
994-05-8	Tert-Amyl Methyl Ether	ND	50	5.0	ug/l	
75-65-0	Tert-Butyl Alcohol	315	100	50	ug/l	
	TPH-GRO (C6-C10)	2430	500	250	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		60-130%
2037-26-5	Toluene-D8	104%		60-130%
460-00-4	4-Bromofluorobenzene	104%		60-130%

(a) Sample vial contained more than 0.5cm of sediment. Sample was not preserved to a pH < 2.

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound



Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: C7296
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VW283-MB	W8091.D	1	09/04/09	BD	n/a	n/a	VW283

The QC reported here applies to the following samples:

Method: SW846 8260B

C7296-1, C7296-2

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-20-3	Di-Isopropyl ether	ND	5.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.30	ug/l	
637-92-3	Ethyl Tert Butyl Ether	ND	5.0	0.50	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.50	ug/l	
994-05-8	Tert-Amyl Methyl Ether	ND	5.0	0.50	ug/l	
75-65-0	Tert-Butyl Alcohol	ND	10	5.0	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
1330-20-7	Xylene (total)	ND	2.0	0.70	ug/l	
	TPH-GRO (C6-C10)	ND	50	25	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	105% 60-130%
2037-26-5	Toluene-D8	103% 60-130%
460-00-4	4-Bromofluorobenzene	104% 60-130%

4.1.1
4

Blank Spike Summary

Job Number: C7296
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VW283-BS	W8088.D	1	09/04/09	BD	n/a	n/a	VW283

The QC reported here applies to the following samples:

Method: SW846 8260B

C7296-1, C7296-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	20	19.3	97	60-130
108-20-3	Di-Isopropyl ether	20	21.0	105	60-130
100-41-4	Ethylbenzene	20	18.9	95	60-130
637-92-3	Ethyl Tert Butyl Ether	20	20.7	104	60-130
1634-04-4	Methyl Tert Butyl Ether	20	20.2	101	60-130
994-05-8	Tert-Amyl Methyl Ether	20	18.8	94	60-130
75-65-0	Tert-Butyl Alcohol	100	111	111	60-130
108-88-3	Toluene	20	18.2	91	60-130
1330-20-7	Xylene (total)	60	57.0	95	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	107%	60-130%
2037-26-5	Toluene-D8	102%	60-130%
460-00-4	4-Bromofluorobenzene	104%	60-130%

4.2.1
4

Blank Spike Summary

Job Number: C7296
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VW283-BS	W8092.D	1	09/04/09	BD	n/a	n/a	VW283

The QC reported here applies to the following samples:

Method: SW846 8260B

C7296-1, C7296-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
	TPH-GRO (C6-C10)	125	101	81	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	99%	60-130%
2037-26-5	Toluene-D8	105%	60-130%
460-00-4	4-Bromofluorobenzene	102%	60-130%

4.2.2
4

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: C7296
Account: SECASJ Sierra Environmental, Inc.
Project: T0600102154-ABE, 17715 Mission Boulevard, CA

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
C7304-2MS	W8108.D	1	09/04/09	BD	n/a	n/a	VW283
C7304-2MSD	W8109.D	1	09/04/09	BD	n/a	n/a	VW283
C7304-2	W8102.D	1	09/04/09	BD	n/a	n/a	VW283

The QC reported here applies to the following samples:

Method: SW846 8260B

C7296-1, C7296-2

CAS No.	Compound	C7304-2		Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
		ug/l	Q							
71-43-2	Benzene	ND		20	18.1	91	19.6	98	8	60-130/25
108-20-3	Di-Isopropyl ether	ND		20	19.8	99	22.3	112	12	60-130/25
100-41-4	Ethylbenzene	ND		20	17.8	89	18.7	94	5	60-130/25
637-92-3	Ethyl Tert Butyl Ether	ND		20	19.7	99	22.8	114	15	60-130/25
1634-04-4	Methyl Tert Butyl Ether	ND		20	19.2	96	22.0	110	14	60-130/25
994-05-8	Tert-Amyl Methyl Ether	ND		20	17.9	90	21.2	106	17	60-130/25
75-65-0	Tert-Butyl Alcohol	ND		100	93.3	93	118	118	23	60-130/25
108-88-3	Toluene	ND		20	17.2	86	18.2	91	6	60-130/25
1330-20-7	Xylene (total)	ND		60	53.1	89	55.9	93	5	60-130/25

CAS No.	Surrogate Recoveries	MS	MSD	C7304-2	Limits
1868-53-7	Dibromofluoromethane	105%	106%	100%	60-130%
2037-26-5	Toluene-D8	102%	101%	104%	60-130%
460-00-4	4-Bromofluorobenzene	104%	104%	102%	60-130%

Appendix E

SOD AND SOIL GRADATION AND PERMIABILITY TEST RESULTS



September 21, 2009

Mitch Hajiaghai
Sierra Environmental
980 W Taylor St
San Jose, CA 95126

**RE: Soil Oxidant Test Results, ABE
Sierra Environmental Job Number 08-103.10**

Dear Mitch:

This letter report describes the results of 48 hour alkaline activated persulfate soil oxidant demand (48hr-SOD) test conducted by PRIMA Environmental on soil from the ABE site located at 17715 Mission Blvd. Alkaline activated persulfate—in which persulfate is activated by increasing the pH above 10.5—is a strong, non-selective oxidant. It can react with a wide range of organic contaminants as well as non-target compounds such as reduced mineral species in soil and natural organic matter.

Sample Receipt and Preparation

Two soil samples (S1-20-25 and S1 35-40) were received on September 4, 2009. Sample S1 20-25 was a hard clay that was black/gray in color. Soil S1 35-40 was a dark gray fine sand with some clay. Both samples had a petroleum odor. Each soil was homogenized prior to use.

Procedures

Base Titration. Each soil was titrated with sodium hydroxide (NaOH) in order to determine the amount needed to maintain pH ~ 11 for 30 minutes. For each soil, 20 g soil was combined with 100 mL of deionized (DI) water. 10 N NaOH was added to bring the pH to ~ 11. The pH was monitored and additional NaOH was added as needed until the pH remained near 11 for 30 minutes.

48hr SOD. For each soil, three reactors containing 50 g soil and 250 mL of alkaline activated persulfate solution were prepared. Each reactor contained a different dose of sodium persulfate ($\text{Na}_2\text{S}_2\text{O}_8$): 5.1 g/L, 10.1 g/L or 20.8 g/L. Each reactor also contained sodium hydroxide (NaOH). The amount used was a 2:1 mole ratio of NaOH to $\text{Na}_2\text{S}_2\text{O}_8$ plus the amount of NaOH needed to maintain pH ~ 11 for 30 minutes. Thus, there was sufficient NaOH to overcome the initially buffering of the soil, plus neutralize all of the

acid that could potentially be generated by decomposition of $\text{Na}_2\text{S}_2\text{O}_8$. The reactors were capped and placed on a shaker table. After 48 hours, each reactor was destructively sampled and the amount of persulfate determined using the FAS/ KMnO_4 titration method. The tests are summarized in Table 1.

Table 1. Test Conditions for 48hr SOD Tests.

Test	Mass Soil, g	Volume Activated Persulfate. Solution, mL	Initial $\text{Na}_2\text{S}_2\text{O}_8$, g/L	Initial NaOH, mole/L	
				S1 20-25	S1 35-40
Low	50	250	5.1	0.065	0.054
Medium	50	250	10.1	0.11	0.097
High	50	250	20.8	0.19	0.18

Results

Base Titration. The amount of NaOH needed to maintain pH~ 11 for 30 minutes is shown in Table 2. Soil S1 20-25 required more NaOH than soil S1 35-409, which is reasonable because soil S1 20-25 was primarily clay, while S1 35-40 contained significant sand.

Table 2. Base Titration Results.

Soil	Initial pH*	Final pH**	moles NaOH/kg soil [^]
S1 20-25	8.28	11.02	0.11
S1 35-40	7.84	11.19	0.16

* Before addition of NaOH.

** After addition of NaOH.

[^] Amount needed to maintain pH ~ 11 for 30 minutes.

48 hr SOD. The results of the SOD tests are shown in Table 3. The $\text{Na}_2\text{S}_2\text{O}_8$ SOD ranged from 6.5-22 g $\text{Na}_2\text{S}_2\text{O}_8$ /kg soil for soil S1 20-25 and from 4.0-7.5 g $\text{Na}_2\text{S}_2\text{O}_8$ /kg soil for soil S1 35-40, with the higher values associated with higher initial concentration of persulfate. Increasing SOD values with increasing initial oxidant concentration is common. The pH was greater than 11.5 after 48 hours in all cases, confirming adequate activator was present.

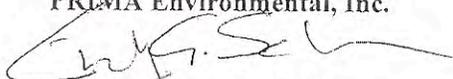
Table 3. Results for 48hr SOD Tests.

Dose	Soil S1 20-25			Soil S1 35-40		
	Initial SP, g/L	Final SP, g/L	SP Consumed, g SP/kg soil	Initial SP, g/L	Final SP, g/L	SP Consumed, g SP/kg soil
Low	5.1	3.8	6.5	5.1	4	4.0
Medium	10	7.7	12	10	9	6.0
High	21	16	22	21	19	7.5

SP = Sodium persulfate, $\text{Na}_2\text{S}_2\text{O}_8$

If you have any questions regarding these results, please give me a call at 916-939-7300.
Thank you for the opportunity to be of service.

Sincerely,
PRIMA Environmental, Inc.



Cindy G. Schreier, Ph.D.
President



UNITED SOIL ENGINEERING, INC.
Geotechnical and Environmental Consultants

File No. 6048-S1
September 23, 2009

Sierra Environmental, Inc.
980 West Taylor Street
San Jose, CA 95126

Attention: Mr. Mitch Hajiaghai

Subject: 17715 Mission Boulevard
Hayward, California
LABORATORY TESTING

Dear Mr. Hajiaghai:

Pursuant to your request, we are pleased to transmit herein our laboratory testing results for the subject site. The subject site is located at 17715 Mission Boulevard in Hayward, California.

Our office received four samples of the subsurface soil material from the subject site. Laboratory tests were performed on the soil samples. Laboratory tests consist of Gradation Analysis per ASTM D422-90 and Falling-Head Permeability Test per ASTM D5084-97. The laboratory test results are enclosed for your reference.

If you have any questions or require additional information, please feel free to contact our office at your convenience.

Very truly yours,

UNITED SOIL ENGINEERING, INC.

A handwritten signature in black ink, appearing to read 'S. Deivert', written over a horizontal line.

Sean Deivert
Project Manager

A handwritten signature in black ink, appearing to read 'Vien Vo', written over a horizontal line.

Vien Vo, P.E.

6048.LT/Copies: 2 to Sierra Environmental, Inc.

Falling-Head Permeability (ASTM D 5084-97)

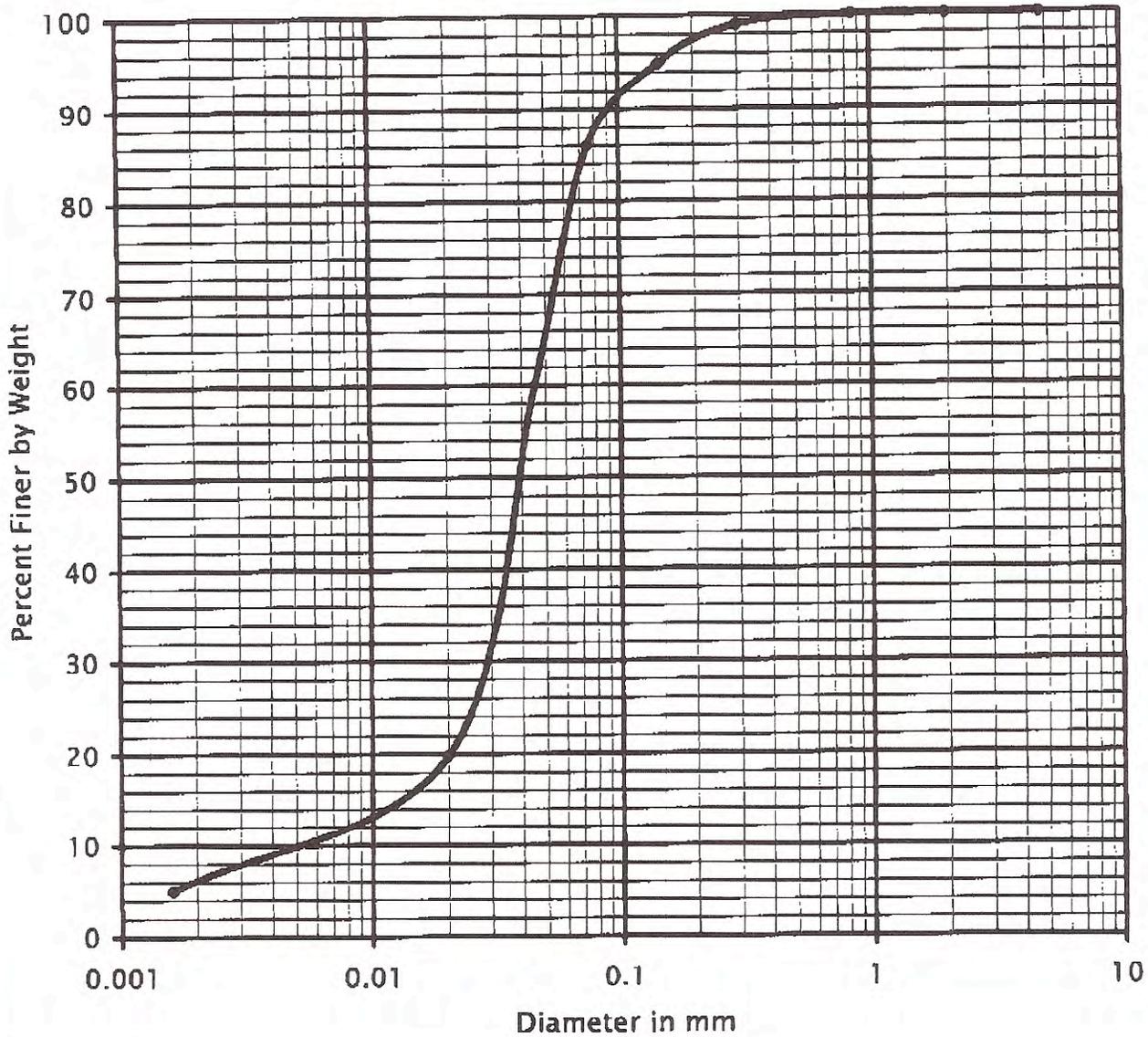
Sample 20' - 25'

Coefficient of permeability $k = 1.2 \times 10^{-5}$ cm/sec

Sample 35' - 40'

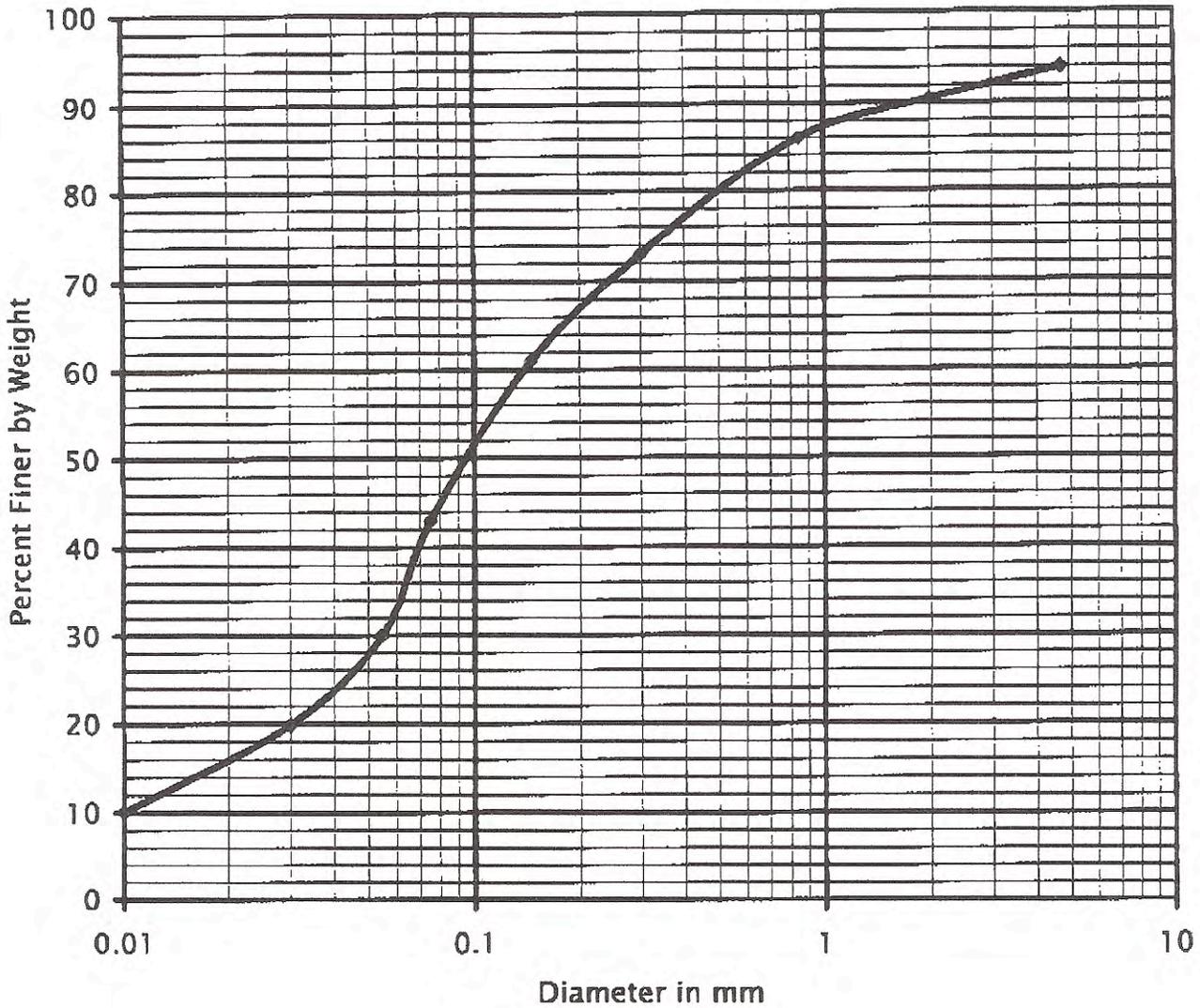
Coefficient of permeability $k = 1.6 \times 10^{-4}$ cm/sec

GRADATION ANALYSIS



United Soil Engineering, Inc. 3476 Edward Avenue Santa Clara, CA 95054 (408) 988-2990	GRAINSIZE DISTRIBUTION (SAMPLE 20'-25')	File No. 6048-S1	FIGURE 1
	17715 Mission Boulevard Hayward, California	Drawn by: B.T.	September 2009
	Scale: NOT TO SCALE		

GRADATION ANALYSIS



United Soil Engineering, Inc.

3476 Edward Avenue
 Santa Clara, CA 95054
 (408) 988-2990

GRAINSIZE DISTRIBUTION (SAMPLE 35'-40')

17715 Mission Boulevard
 Hayward, California

File No. 6048-S1

Drawn by: B.T.

Scale: NOT TO SCALE

FIGURE

2

September
 2009