June 30, 2015

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**REPORT**
**Seismic Profiling Surveys for Subsurface Investigation of Cemetery Bluff Intake and Discharge HDD Alignments for Proposed Desalination System**
**Montecito, California**

## 1.0 INTRODUCTION

This report presents the results of the seismic profiling surveys recently completed by Q&S Engineering and Advanced Geoscience. These geophysical surveys were conducted in general accordance with our proposal dated May 11, 2015. A combination of onshore and offshore seismic profiling was performed to investigate subsurface geologic conditions for the horizontal directional drilling (HDD) alignments shown in Figure 1.

Seismic reflection, refraction tomography, and multi-channel analysis of surface waves (MASW) data were first recorded along two survey lines setup onshore designated as Lines 1 and 2 (Figure 1). The data underwent computer processing to prepare subsurface profiles for Lines 1 and 2 showing seismic reflection patterns from subsurface layering, and seismic compressional-wave and shear-wave velocity variations. To extend subsurface coverage offshore seismic refraction tomography data were also recorded along Line OS-1 (Figure 1). The data from this offshore survey was used to prepare a profile of seismic compressional-wave velocity variations beneath the sea floor.

The seismic velocity profiles for Lines 1 and 2 were correlated to geologic mapping and nearby outcrops to evaluate the subsurface positioning of harder rock layers, such as the “cobble layer” outcropping along the base of the cliff. The seismic reflection profiles were used to interpret the structure of the deeper geologic units. The subsurface profiles for Lines 1 and 2 were extrapolated approximately 650 feet across the surf zone (where no seismic data was recorded) and correlated with the compressional-wave velocity profile for Line OS-1 and deeper patterns of seismic reflections to develop an interpreted geologic cross section along the D3 alignment.

The following sections summarize our field data collection program and data processing and display procedures. The concluding sections discuss our current interpretation of subsurface geologic conditions and our recommendations for acquiring additional subsurface data. This interpretation is subject to revision and may be revised once the seismic profiles are correlated to additional subsurface data.

## 2.0 FIELD DATA COLLECTION

### 2.1 Onshore Seismic Surveys

The onshore seismic surveys were performed May 18 and 19, 2015. Line 1 was first set up along a 387-foot long survey line positioned on the bluff in the southeast corner of the Santa Barbara Cemetery. This survey line was positioned along points identifying the location of the D3 alignment. Line 2 was set up along a 780-foot long survey line positioned on the beach parallel to the shoreline. The setup for Line 2 required the seismic recording equipment to be hand carried from the public beach access 0.3-miles to the east. This setup also required close coordination with the calculated tide charts to record the west end of Line 2 during a morning period of lower tide levels.

The seismic data on Lines 1 and 2 were recorded by generating and recording seismic waves at “shot points” positioned along each survey line. The seismic waves from each shot point were recorded by geophones (vibration transducers) set up along the length of the survey lines.

Line 1 was set up with 60 geophones positioned along the line at 2 meter (6.56 foot) intervals, from distance stations 0 to 118 meters (387 feet). The geophones consisted of 4.5-Hertz, vertically-aligned, velocity transducers mounted into the ground by metal spikes. The 60-channel geophone array was connected to a Seistronix EX-6 data recording system with 24-bit analog to digital conversion.

The seismic reflection and refraction data were recorded with the first shot point positioned 1 meter north of the first geophone position (at station 0). The recording continued at 2-meter intervals at shot points positioned between the geophones with the last shot point 1 meter south of the last geophone position. A total of sixty-one 60-channel field records were recorded. Each field record was recorded for 0.8 seconds with a 0.25 millisecond sample rate.

The multi-channel analysis of surface waves (MASW) data were recorded only at three positions set up along Line 1. This was due to the limited length of Line 1. The data were recorded in an end-on recording configuration, with the shot point positioned off the north end of three patterns of 54 geophones spaced 2-meters apart (active recording length 106 meters). The first shot point was positioned a fixed distance of 15 meters from the first geophone position (at station 0) to record surface waves into the geophone array positioned from stations 0 to 106 meters. The second shot point was positioned at station 12 meters to record into the next geophone array positioned from stations 12 to 118 meters. The third shot point was at station 24 meters to record into the last geophone array positioned from stations 24 to 130 meters. At each shot point several 54-channel field records were recorded. The field records were recorded for 20 seconds with a 2 millisecond sample rate. This longer recording time was used to record surface waves from both the induced seismic energy source and background seismic waves to provide deeper shear-wave velocity profiles.

A compressional-wave seismic energy source was generated at each shot point for the reflection, refraction, and MASW data recording. This seismic energy was generated using a 20-pound sledge hammer impacting a metal plate on the ground surface. For the reflection and refraction recording multiple impacts to the plate were made at each shot point and summed together to cancel out random noise from background vibrations and increase the amplitude of the returning seismic waves.

The longer-length Line 2 was set up with multiple, overlapping 60-channel geophone arrays, with geophones also positioned at 2-meter intervals. The first geophone array was positioned from stations 0 to 118 meters. The last geophone array was positioned from stations 120 to 238 meters (781 feet). The geophone arrays were also connected to the Seistronix EX-6 data recording system.

The seismic reflection and MASW data were recorded on Line 2 in an end-on, roll-along configuration with the seismic energy source positioned off the west end of a pattern of 42 geophones (active recording length 82 meters). The first shot point was positioned a fixed distance of 6 meters from the first geophone position (at station 0) to record data into the first 42-channel geophone array. After each recording the shot point was moved along Line 2 to the east at 2-meter intervals as the 42-channel geophone array was also shifted to the east at 2-meter increments. The last shot point was positioned at station 148 meters to record into the 42-channel geophone array positioned from stations 154 to 236 meters. A total of seventy-eight 42-channel field records were recorded. Each field record was recorded for 0.6 seconds with a 0.25 millisecond sample rate.

The seismic refraction data on Line 2 were recorded from separate shot points positioned along Line 2 into the overlapping 60-channel geophone arrays. The first shot point was positioned 2 meters west of the first geophone position and recorded into the geophone array from stations 0 to 118 meters. The shot points continued along Line 2 at mostly 12 to 14 meter intervals, except for the west part of Line 2 where the rising tide level required a wider spacing between shot points to avoid getting the equipment wet. The last shot point was positioned off the end of Line 2 at station 239 meters and recorded into the geophone array positioned from stations 120 to 238 meters. A total of nineteen 60-channel field records were recorded. Each field record was recorded for 0.6 seconds with a 0.25 millisecond sample rate.

The 60-channel field records from Lines 1 and 2 showed some noise from background train traffic and heavier surf vibrations. However, the overall data quality was judged to be good and sufficient for the purposes of this investigation.

After the data recording was competed the positions of Lines 1 and 2 were mapped in the field on a Google Earth site map (Figure 1). Elevation profiles along Lines 1 and 2 were also estimated from the topographic contour maps available online at the Santa Barbara County's website.

## 2.2 Offshore Seismic Surveys

The offshore seismic refraction survey on Line OS-1 was performed on June 3 through 5, 2015. Line OS-1 was set up as a 950-foot long survey line positioned on the end of the D3 alignment (Figure 1). No offshore seismic survey data was collected from the surf zone out to approximately 650 feet along the D3 alignment (Figure 1).

A team of professional divers from Harbor Offshore (in Ventura, California) was subcontracted to help us setup and record the seismic data along Line OS-1. Safety was emphasized during underwater operations. All divers used dive helmets and surface supplied air with redundant back up air and hardwired communications. Each wet diver was furthermore equipped with a bail out tank that could be deployed as emergency air supply in event of surface supply air total failure. Prior to beginning work, we prepared a detailed step by step work plan, a job safety analysis, health & safety plan for underwater work, and a site specific emergency response plan for diving work. The upfront effort in planning and accident prevention paid off. The underwater work was completed without an accident or incident to report.

The work was performed on aboard a 24' foot work boat, C-Forest out of Santa Barbara Harbor, CA. A marine wildlife monitor was contracted fulltime to perform daily observations and record any encounters or unusual behavior of marine mammals during the survey in accordance to the permit conditions for the survey. No marine mammals were encountered in the immediate work area or safety observation zone during generation of seismic energy.

A series of buoys were first positioned along the survey line using the GPS coordinates for the D3 alignment provided by Michael Baker International. The buoys were setup at 240-foot increments to mark locations for positioning the dive team and recording vessels. The divers also used these buoy points to position a 950-foot long control line on the water bottom. The control line was marked in advance with 10-foot increments and tightened at each end to form a straight-line traverse on the water bottom. This control line was used to establish the distance stationing along Line OS-1.

The seismic refraction data were recorded into a series of hydrophone arrays set up on the water bottom from seismic energy shot points also positioned on the water bottom. A 24-channel hydrophone "bay cable" was used to record the data with a Geometrics Geode seismograph. The hydrophones consisted of greater than 10-Hertz sensitive pressure transducers connected to the bay cable at 10-foot increments. The first 24-channel hydrophone array was positioned on the water bottom from stations 0 to 230 feet. Three other hydrophone arrays were set up on the water bottom at 240-foot increments to the south.

The seismic data were recorded from two overlapping patterns of shot points spaced 60-feet apart into the four hydrophone arrays set up on the water bottom. The positioning of these hydrophone arrays and shot point were as follows:

| | |
|---|---|
| Hydrophone Array 1: stations 0 to 230 feet | Shot Points: stations -5 to 715 feet |
| Hydrophone Array 2: stations 240 to 470 feet | Shot Points: stations -5 to 715 feet |
| Hydrophone Array 3: stations 480 to 710 feet | Shot Points: stations 235 to 955 feet |
| Hydrophone Array 4: stations 720 to 950 feet | Shot Points: stations 235 to 955 feet |

This seismic energy was generated at each shot point using a weight drop method. A steel weight was attached to a steel pipe which was used by the divers to force the weight downward on to an aluminum plate on the water bottom. The aluminum plated was placed along the bay cable between the hydrophone positions. Multiple impacts were made to the plate at each shot point and separately recorded for later computer processing to enhance the data.

A separate hydrophone "trigger cable" was also moved along the water bottom with the weight drop and plate. This cable was connected to the seismograph and extended to a single hydrophone which was positioned alongside the plate at each shot point. The voltage transmitted from the impact at the plate was used to trigger the start of recording (t=0) on the seismograph.

A water bottom elevation profile along Line OS-1 was also estimated from water depth measurements provided by the divers during the data recording. These measurements were corrected to approximate mean sea level elevations using the tide levels measured in this area.

## 3.0 DATA PROCESSING AND DISPLAY

The seismic refraction data processing for onshore Lines 1 and 2 was completed first. The field records from shot points along the survey lines were used to conduct seismic refraction tomography imaging of compressional-wave velocity variations using the RAYFRACT computer program written by Intelligent Resources, Inc. (Vancouver, Canada). Thirteen field records were selected from Line 1 from shot points spaced 10 to 12-meters apart. Nineteen field records were used from Line 2 from shot points spaced 11 to 22-meters apart.

The field records were used to pick first arrival times ("first breaks") for seismic waves traveling through the surface layer and refracted along deeper higher-velocity layers. These time picks were plotted as a series of travel time curves for each shot point and evaluated for reciprocal time consistency. The final time picks were input together with their geophone and shot point coordinates and elevations into the program RAYFRACT. RAYFRACT was used to generate an initial velocity-depth model using the Delta-TV method. This initial model was then refined to produce a closer fit to the first breaks using the Wavepath Eikonal Traveltime (WET) inversion method with 50 to 60 iterations. This best-fit velocity-depth model was then gridded and color contoured with the program SURFER (Golden Software, Inc.) to show estimated vertical and lateral velocity variations. The resulting compressional-wave velocity profiles for Lines 1 and 2 are shown in Figures 2 and 3.

The field records from the offshore refraction data on Line OS-1 were first evaluated and selected duplicate records were summed together (vertically-stacked) to enhance the data. These 24-channel data records were also re-organized into 48 and 96-channel field records. These records underwent seismic refraction tomography imaging using the RAYFRACT program as discussed above. The resulting compressional-wave velocity profile for Line OS-1 is shown in Figure 4.

The seismic reflection processing for Lines 1 and 2 was conducted using the computer program Visual SUNT (developed by W_Geosoft in Geneva, Switzerland). The complete set of reflection field records together with shot point and geophone coordinates and elevations were input into this program to generate seismic reflection time profiles for Lines 1 and 2.

Visual_SUNT was used to perform a specialized sequence of data editing, trace sorting, and digital processing to first prepare a common mid-point (CMP) stacked, reflection time profile. Digital filtering such as band pass filtering, deconvolution, and time-space (FK) filtering were applied in the beginning stages of this processing to attenuate ground roll on the field records and reduce the amplitude of lower-frequency noise. Elevation differences along Lines 1 and 2 were also accounted for in the processing by applying datum static shifts to the field record traces. These time shifts reduced the reference time (t=0) on the reflection time profile to flat datum elevations. Several analyses of normal moveout (NMO) velocity corrections were then performed and applied to prepare CMP-stacked reflection time profiles. The resulting reflection time profiles for Lines 1 and 2 are shown in Figures 2 and 3.

The re-organized field records from Line OS-1 also underwent processing with the Visual_SUNT software to attempt to generate a reflection profile. The 60-foot shot point spacing used for this refraction data did not provide an adequate density of subsurface coverage to generate a continuous image of subsurface reflection patterns. However, reflection patterns from deeper subsurface layering were visible on the processing-enhanced shot records as shown in Figure 4.

The MASW data processing for Lines 1 and 2 were performed using the computer program SURFSEIS developed by the Kansas Geological Survey. The complete set of MASW field records together with source point and geophone coordinates were input into this program to generate shear-wave velocity profiles for Lines 1 and 2.

The active and passive energy source records recorded on Lines 1 and 2 were used in SURFSEIS to perform a specialized sequence of processing to prepare dispersion curves showing Rayleigh-wave phase velocity versus frequency for each MASW shot point and geophone array position. These curves were used to calculate 1-D models of shear-wave velocity layering for the center of each geophone array. For Line 1, three 1-D shear-wave velocity profiles were generated from the three MASW shot points spaced 12 meters apart. For Line 2, seventy-eight 1-D models were generated from the seventy-eight MASW shot points spaced 2 meters apart. These 1-D models were computer gridded and color contoured by SURFER to prepare the estimated 2-D shear-wave velocity profiles shown in Figure 5. For comparison, Figure 5 also re-displays the compressional-wave velocity profiles at the same horizontal positioning and scale.

## 4.0 SUBSURFACE INTERPRETATION

The seismic reflection and refraction profiles for Lines 1 and 2 (Figures 2 and 3) show subsurface layering that can be correlated to geologic units mapped in the area and the observations of a harder "cobble layer" outcropping along the base of the cliff. The onshore geologic units were described in the preliminary geologic investigation completed by Adam Simmons, Consulting Geologist (Summary Letter dated September 30, 2014). The cobble layer was observed during our field surveys along the base of the cliff at locations east and west of the D3 alignment. This cobble layer is part of the Quaternary-age, non-marine Casitas Formation (Qca) and is composed mostly of consolidated, reddish-brown sandstone with abundant cobble-size clasts. The groundwater permeability of this layer appears to be lower relative to the other alluvial units in the area. The upper surface of this layer also dips to the north which is consistent with the geologic mapping in this area which shows the axis of an east-west anticline positioned just south of the shoreline. Based on this geologic information the following subsurface interpretation is made.

The seismic refraction profile for Line 1 (Figure 2) shows a harder 7,000+ ft/sec compressional-wave velocity layer which is part of the Casitas Formation. The depth of this velocity layer is about 110 feet below the ground surface at the center of Line 1 near the start of the D3 alignment. This layer also dips to the north which is consistent with the positioning of the axis of an east-west anticline south of the shoreline. On the south end of Line 1 this 7,000+ ft/sec velocity layer projects up towards the base of the cliff where the cobble layer outcrops. Based on this correlation, we interpret the 7,000+ ft/sec velocity layer on Line 1 to be the cobble layer described above. The reflection profile for Line 1 also shows a north-dipping reflection pattern identified by the dashed pink line that is interpreted as the upper surface of this cobble layer.

The seismic refraction profile for the east-west orientated Line 2 (Figure 3) shows a similar 7,000+ ft/sec velocity layer that is also interpreted to be the upper part of this intact cobble layer. The subsurface profile of this velocity layer dips to the west and reveals an undulating surface which indicates the cobble layer is cut by stream channeling or wave erosion along the shoreline. This subsurface structure is consistent with the localized occurrence of unconsolidated deposits of cobble-size rocks found on the shoreline in this area.

The reflection profiles for Lines 1 and 2 also show reflection patterns from deeper geologic units below the cobble layer. The Line 2 profile shows two different deeper reflection horizons indicating a conformable stratigraphic sequence with “apparent dip” to the east. These reflection patterns (identified by the dashed red and blue lines in Figure 3) reveal the upper surfaces of two different older geologic units. The red reflection horizon is interpreted to be the top of the Santa Barbara Formation (Qsb), based on the stronger, uniform amplitude of this reflection. At point D on the D3 alignment the depth of this red reflection horizon is estimated to be 125 feet. The deeper blue reflection horizon is interpreted to be the top of the Miocene-age Monterey Formation (Tm). This blue reflection horizon reveals the surface of an unconformity where deeper bedding planes (identified by the dashed cyan line) are truncated.

The offshore seismic refraction profile for Line OS-1 starts 750 feet north of Line 2 on the D3 alignment. Beyond this subsurface data gap this profile also reveals a 7,000+ ft/sec velocity layer which could be interpreted as a continuation of the cobble layer. The south dipping structure of this velocity layer is also consistent with the crossing of an anticline structure in this area. On the north edge of Line OS-1 this 7,000+ ft/sec velocity profile dips steeply southward from an apparent outcrop on the water bottom. Beyond station 200 feet the depth of this 7,000+ ft/sec layer is over 100 feet below the water bottom. Based on our experience, the 6,000 ft/sec and lower velocities in this area indicate that the alluvium within 100 feet of the water bottom is more permeable on this end of the D3 alignment.

It is also noted that the sudden, sharply south-sloping change in profile of the 7,000+ ft/sec velocity layer near station 480 feet on Line OS-1 could indicate the location of an ancient wave-cut shoreline. The presence of this ancient shoreline would indicate the 6,000 ft/sec and lower velocity, younger alluvium south of this point should continue further offshore.

Subsurface geologic cross section A-A’ in Figure 5 was prepared to depict our current interpretation of the subsurface geology along the D3 alignment. This cross section was prepared based on the above correlations to geologic units and the elevations estimated for depth points A through I. The elevations of these depth points were made from the reflection horizons interpreted on Lines 1 and 2, and the reflection patterns identified on the shot records from Line OS-1. The travel times to these depth points and their estimated average velocity (Vrms) were used to make these approximate calculations.

The cross section A-A’ shows that the D3 HDD alignment will encounter a repeated sequence of younger alluvial deposits, Casitas Formation, and Santa Barbara Formation units as it continues offshore at a depth of about 80 feet below the water bottom. At the start of the alignment, as it slopes downward from near the center of Line 1 it will drill through the younger alluvium and encounter the Casitas Formation and the 7,000+ ft/sec cobble layer. At a distance of roughly 150 feet from the shoreline the horizontal part of the alignment should encounter the Santa Barbara Formation as it crosses the axis of the anticline. Continuing offshore the alignment will again pass through the Casitas Formation and possibly the cobble layer observed at the base of the onshore cliff. Beyond station 150 feet on Line OS-1 the alignment should pass back into the younger alluvium. The following table summarizes our estimated seismic velocity ranges for these geologic units and some of the anticipated geologic conditions. The general lithologic descriptions are summarized from Adam Simmons' investigation.

| Geologic Unit | Estimated Range of Seismic Compressional-Wave Velocity | Estimated Range of Seismic Shear-Wave Velocity | Anticipated Geologic Conditions |
|---|---|---|---|
| **Younger Alluvium** (Includes units mapped as Qs, Qa, and Qoa.) | Less than 3,000 ft/sec Unsaturated Beneath Line 1<br><br>4,000 to 6,500 ft/sec Saturated Beneath Lines 1, 2, and OS-1 | 800 to 1,800 ft/sec Beneath Lines 1 and 2 | Marine deposited sand and cobbles (Qs). Younger and older stream deposited alluvium (Qa and Qao) with unconsolidated to weakly consolidated clay, silt, sand, and gravel interbeds with occasional cobbles and boulders. Beneath Line OS-1 lithologic conditions are anticipated to be sandy with good permeability. |
| **Casitas Formation** (Qca) | 3,000 to 8,500+ ft/sec Unsaturated and Saturated Beneath Line 1<br><br>6,500 to 8,500+ ft/sec Beneath Lines 2 and OS-1 | 1,100 to 3,000 ft/sec Beneath Lines 1 and 2 | Non-marine poorly consolidated gravels, sands, silts, and clays with occasional sandstone cobbles and boulders. Contact between the Younger Alluvium and Casitas Fm. appears to be above the 7,000+ ft/sec cobble layer. The cobble layer has a more consolidated sandstone matrix with cobble-size clasts and is expected to have lower permeability relative to younger units positioned above. |
| **Santa Barbara Formation** (Qsb) | No data is available | 3,000+ ft/sec Beneath Line 2 | Marine deposited weakly consolidated, massive, fine grained sandstone with interbedded clays and occasional gravels. Permeability may be higher or lower than units above. Higher estimated shear-wave velocity indicates this unit could be more consolidated along alignment. |

## 5.0 RECOMMENDATIONS

Further subsurface investigation is recommended along the proposed intake and discharge HDD alignments to prepare a more detailed interpretation of subsurface conditions. Additional seismic refraction profiling on the water bottom along the D3 alignment between the shoreline and Line OS-1 will help confirm the present interpretation. The positioning of other seismic refraction profiles across the offshore alignments would also be helpful in preparing more of a 3D interpretation of subsurface conditions. The collection of geologic core samples from onshore geotechnical borings and from the water bottom vibrocoring techniques and diver jet probes is also recommended.

## 6.0 LIMITATIONS

This subsurface geophysical investigation was performed in accordance with the generally accepted practice of consultants performing similar investigations at this time. This investigation is intended to provide an initial interpretation of subsurface geologic structure and stratigraphic conditions.

This report is not intended to be a geotechnical design report on subsurface conditions and is not intended to be all-inclusive, to identify all of the potential concerns and hazards during the horizontal directional drilling (HDD), or to address all possible problems that could be encountered during HDD and construction of the proposed desalination system.

Q&S Engineering and Advanced Geoscience also assume that Michael Baker International will continue to collect subsurface data for the purposes of the geotechnical and hydrogeologic design of the HDD and desalination system.

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Q&S Engineering and Advanced Geoscience appreciate this opportunity to be of service to Michael Baker International and the Montecito Water District.

Please contact the undersigned for any additional information or requests concerning this geophysical investigation. Thank you.

Sincerely,

**Q&S Engineering, Inc.**

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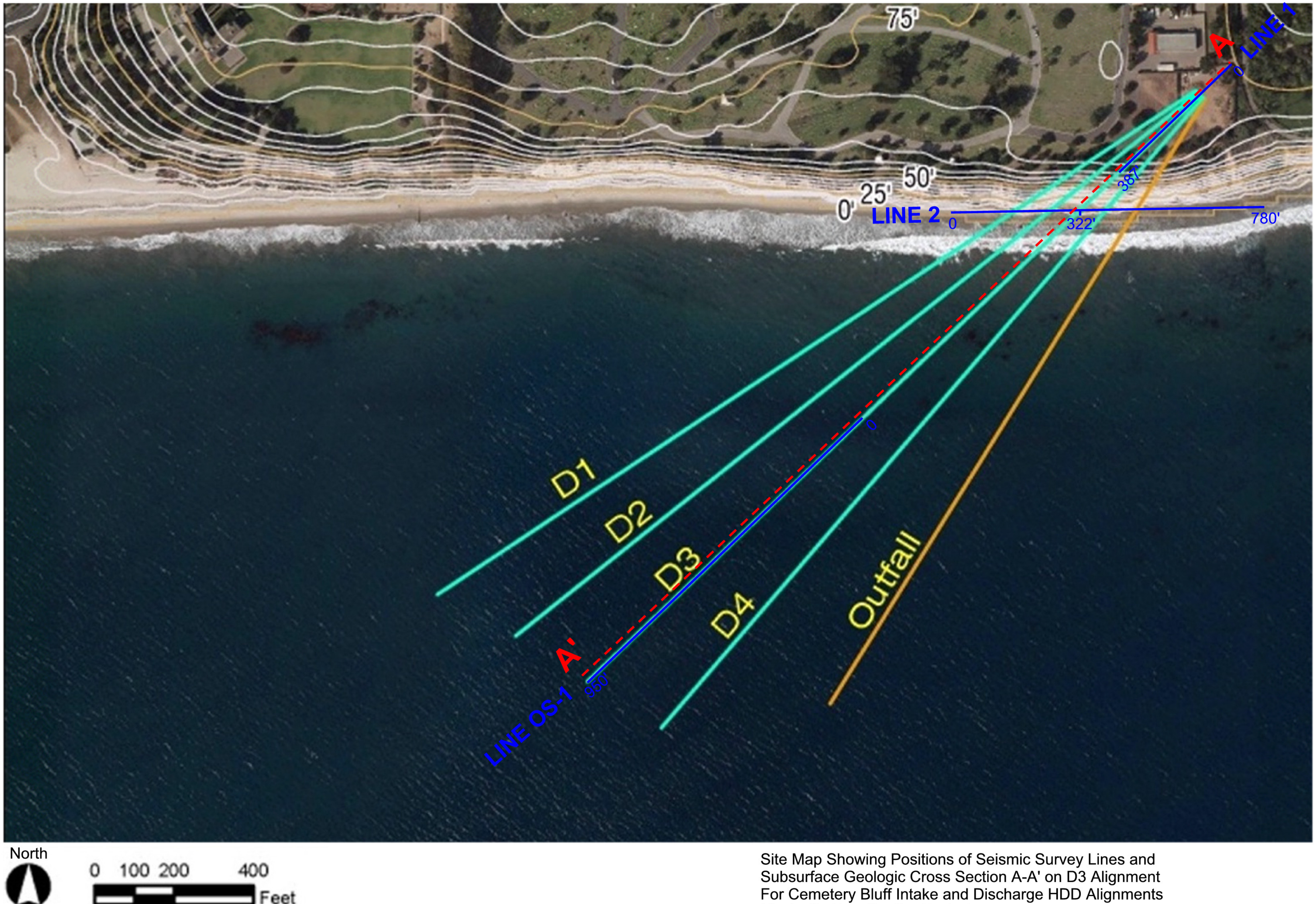
List of Attachments:

Figure 1- Site Map Showing Locations of Seismic Lines and Cross Section A-A'
Figure 2- Line 1 Seismic Reflection and Refraction Profiles
Figure 3- Line 2 Seismic Reflection and Refraction Profiles
Figure 4- Line OS-1 Seismic Refraction Profile and Selected Shot Records
Figure 5- Lines 1 and 2 MASW Seismic Shear-Wave Velocity Profiles
Figure 6- Subsurface Geologic Cross Section A-A'




Site Map Showing Positions of Seismic Survey Lines and
Subsurface Geologic Cross Section A-A' on D3 Alignment
For Cemetery Bluff Intake and Discharge HDD Alignments
Montecito Desalination Project

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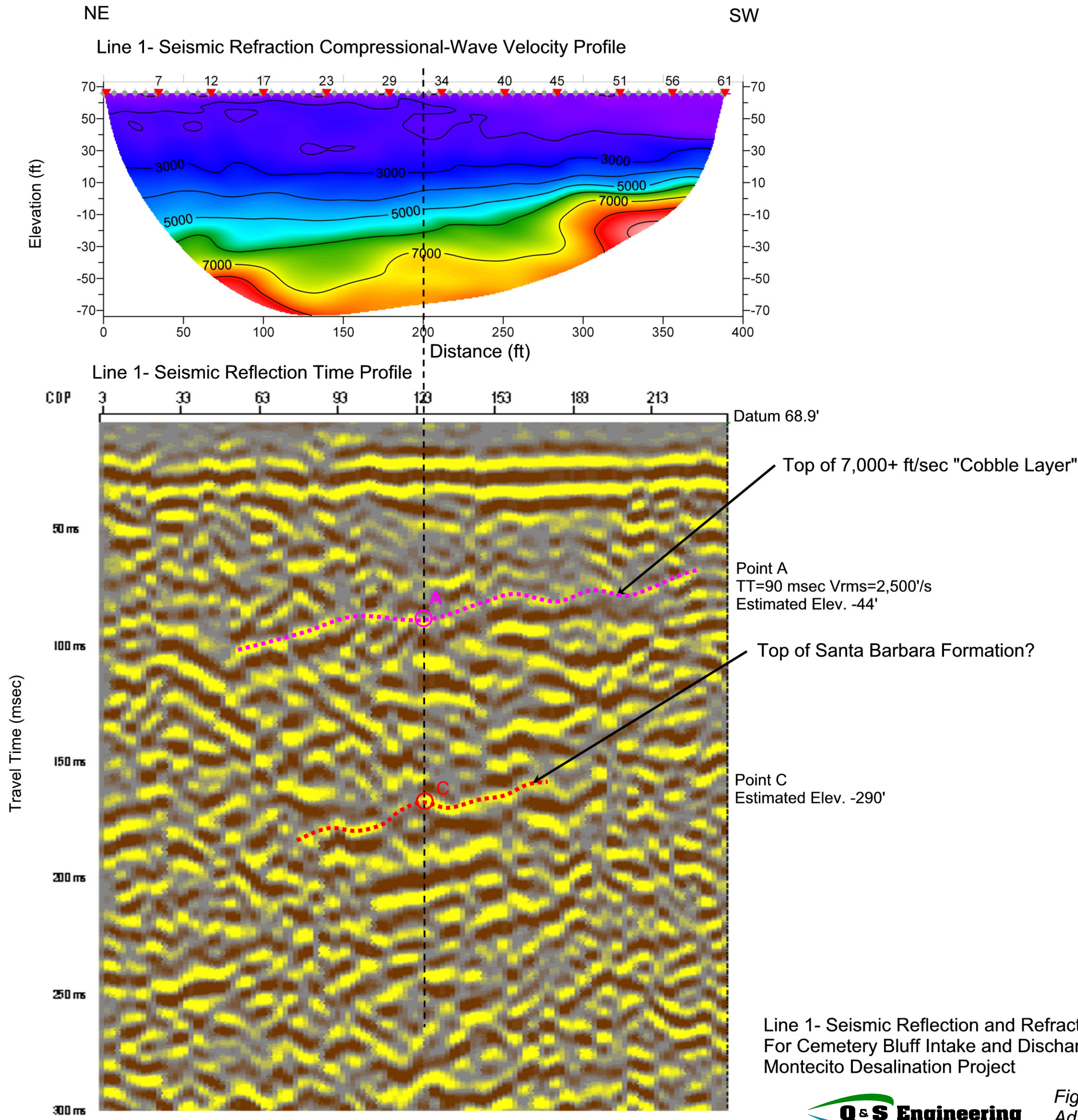
*Figure 1*
*Advanced Geoscience, Inc.*
*June, 2015*




Original Scale:
Horizontal and Vertical 1 inch= 60 feet

Line 1- Seismic Reflection and Refraction Profiles
For Cemetery Bluff Intake and Discharge HDD Alignments
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*Figure 2*
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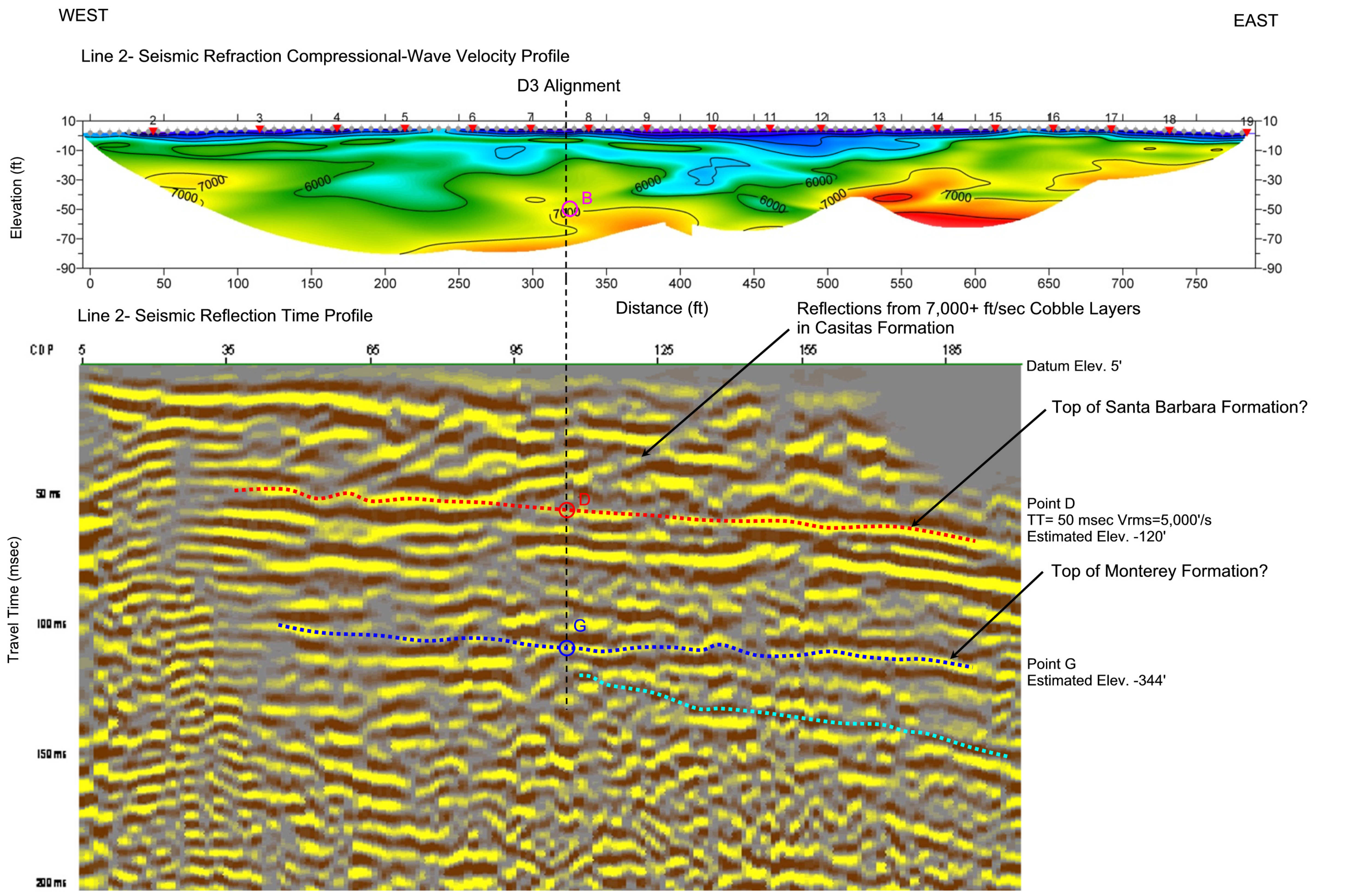
*June, 2015*




Original Scale:
Horizontal and Vertical 1 inch= 60 feet

Line 2- Seismic Reflection and Refraction Profiles
For Cemetery Bluff Intake and Discharge HDD Alignments
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*Figure 3*
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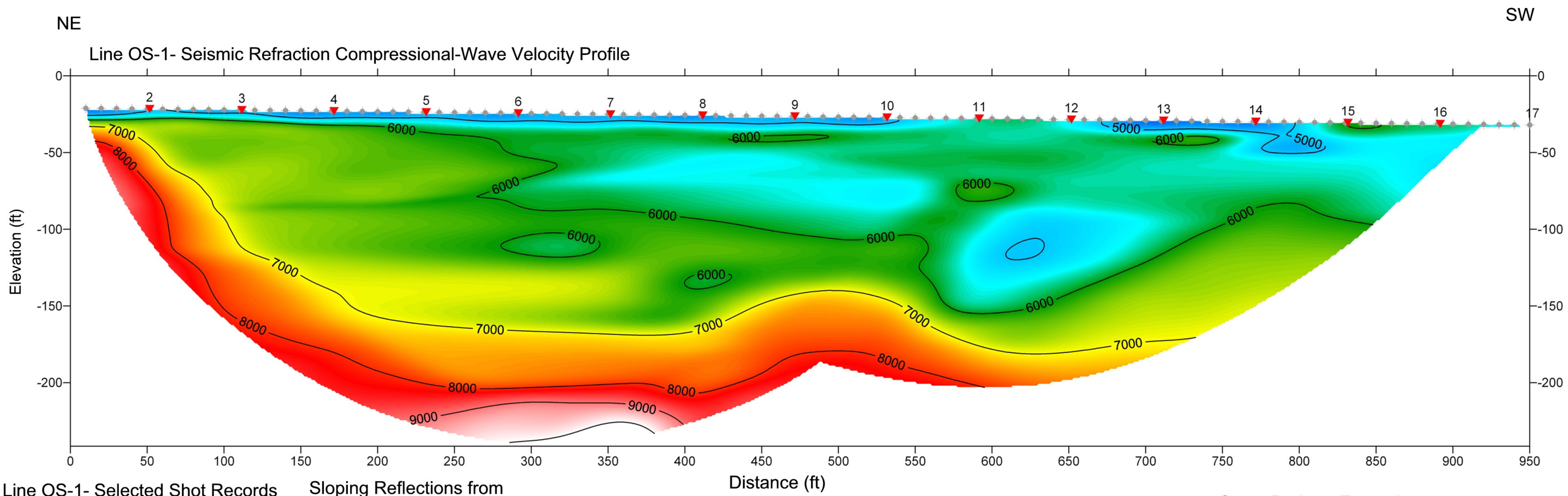


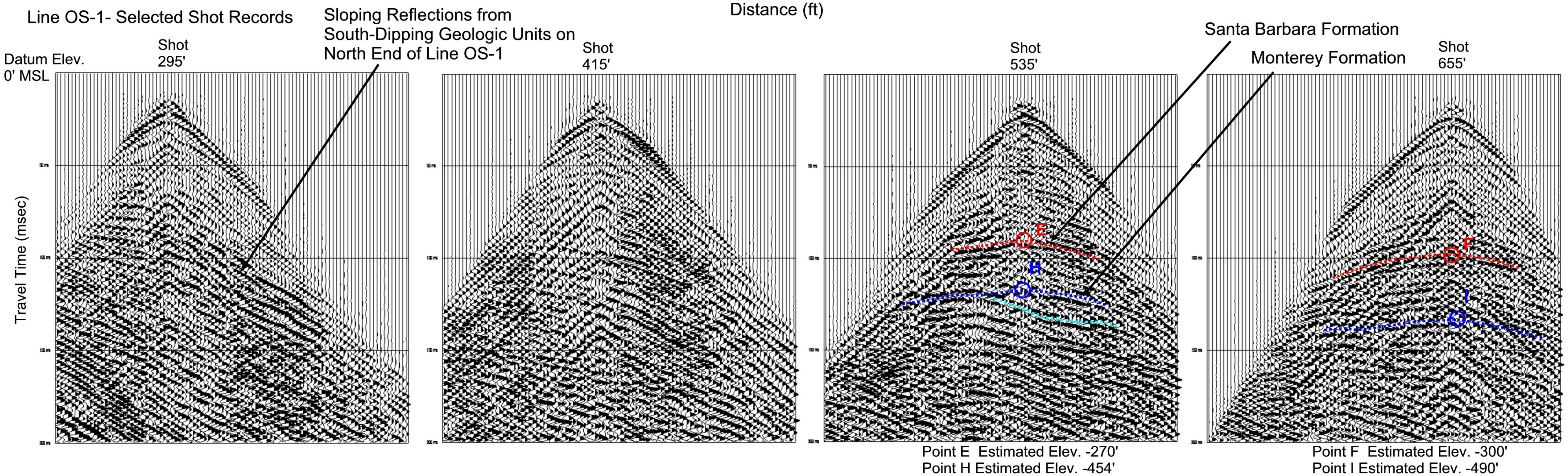


Line OS-1- Seismic Refraction Profile and Selected Shot Records Showing Deeper Subsurface Reflections For Cemetery Bluff Intake and Discharge HDD Alignments Montecito Desalination Project

Original Scale:
Horizontal and Vertical 1 inch= 60 feet

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*Figure 4*
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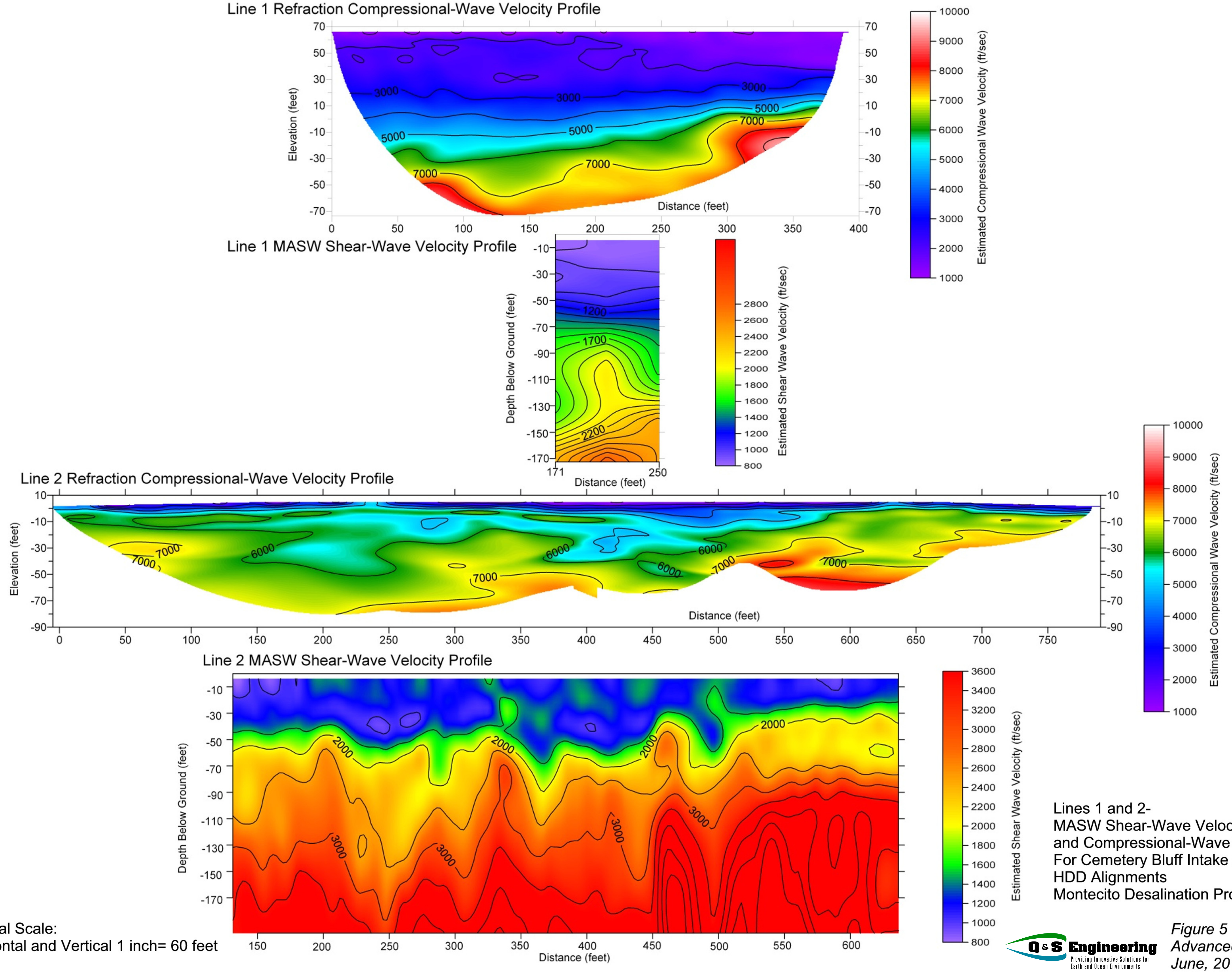


Original Scale:
Horizontal and Vertical 1 inch= 60 feet

Lines 1 and 2-
MASW Shear-Wave Velocity profiles
and Compressional-Wave Velocity Profiles
For Cemetery Bluff Intake and Discharge
HDD Alignments
Montecito Desalination Project

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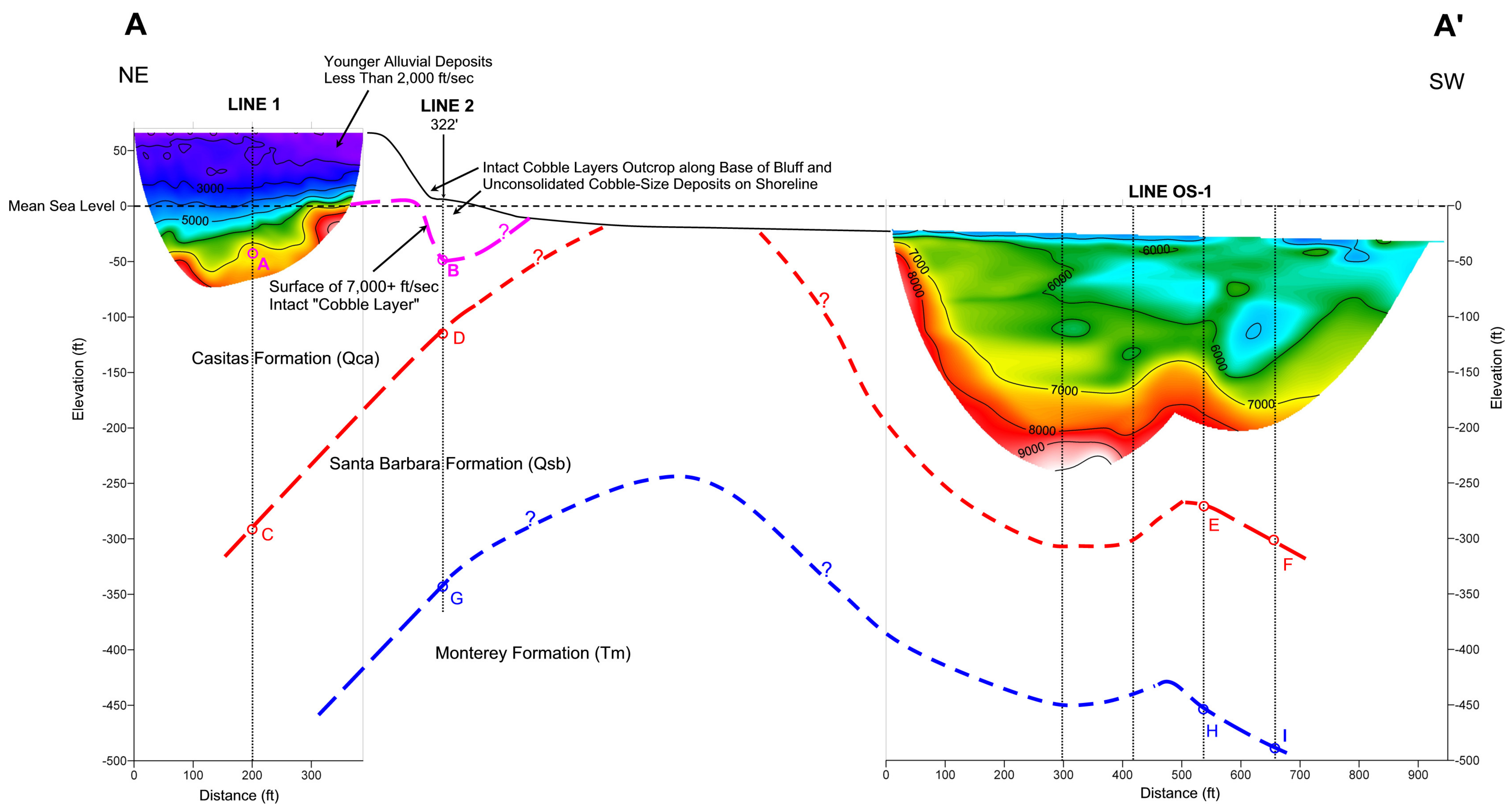
*Figure 5*
*Advanced Geoscience, Inc.*
*June, 2015*

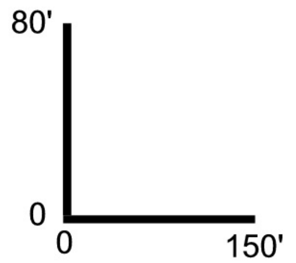



Explanation:

Cross section shows seismic compressional-wave velocity profiles for Line 1 and Line OS-1 positioned along D3 Alignment.

G Points where seismic reflection profiles were used to interpret elevations of geologic units

Interptreted contacts between geologic units




Original Scale:
Horizontal 1 inch= 150 ft
Vertical 1 inch= 80 ft (x1.88 Horizontal)

Subsurface Geologic Cross Section A-A'
Positioned Along D3 Alignment
Based on Seismic Reflection and Refraction Profiles
For Cemetery Bluff Intake and Discharge HDD Alignments
Montecito Desalination Project

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Providing Innovative Solutions for Earth and Ocean Environments

*Figure 6*
*Advanced Geoscience, Inc.*
*June, 2015*