March 20, 2014

Mr. Travis Westmoreland
McCaffery Interests
2200 Clarendon Boulevard
Suite 1125
Arlington, Virginia 22201

ECS Project No. 01:22509

Reference: Geophysical Subsurface Exploration and Analysis Letter Report, 3220 Prospect Street, NW, Washington, D.C.

Dear Mr. Westmoreland:

As authorized by your acceptance of ECS Proposal No. 01:46651-GP, ECS Mid-Atlantic, LLC (ECS) has completed the geophysical subsurface exploration and analysis for the proposed development at 3220 Prospect Street, NW Washington, DC 20036.

In preparing this report, we have had the opportunity to discuss the preliminary project details with you and have reviewed the topographic and boundary survey provided by you. This letter report includes the results of our subsurface 2-Dimensional (2-D) Refraction Microtremor (ReMi) exploration and analysis, a 2-D ReMi Survey Location Diagram, and three 2-D ReMi profiles. The recommendations presented are intended for use by your office and for use by other professionals involved in the development of this site only.

Project Description

The existing site, which is located south of Prospect Street NW in Washington, D.C., consists of an active at-grade asphalt parking lot. It does not contain any structures at this time. In addition, there is a brick paver sidewalk between the asphalt parking lot and Prospect Street.

At this time limited information regarding the proposed development was provided; however, we anticipate that an above grade building consisting of four- to five-stories of residential and retail development is being considered. Below existing grade, we understand that there may be both underground parking levels and/or additional retail space. Based on this information we anticipate the entire structure to likely be four to eight levels in total. Limited information on construction type as well as building loads, or information of that nature, was available at this writing.

Regional Geology

The site is located west of the Fall Zone, which separates two very different geologic provinces in the eastern United States. Areas west of the Fall Zone are identified as the Central Appalachian Piedmont, and areas to the east of the Fall Zone are identified as the Atlantic

Coastal Plain. The Appalachian Piedmont is generally characterized as a gently rolling erosional surface underlain by Proterozoic and Paleozoic rocks of metamorphic and igneous origin. The Coastal Plain is comprised of much younger and more poorly consolidated sedimentary rocks which have weathered in-place. The primary costal plain sediments have been topped by the eroded sediments of the formerly massive Appalachian Mountains. In addition, terrace deposits exist throughout these regions which were deposited as the Potomac River shaped the surrounding landscape over time.

In particular, this site is shown on the "Geologic Map of the Washington West Quadrangle", as being underlain by the bitotite-hornblende tonalite (Ogh) member of the Georgetown Intrusive Suite. This meta-igneous rock is characterized by its medium- to coarse-grained and foliated characteristics. Above the bedrock, the Piedmont consists of residual soils which are predominately fine sandy silts and silty fine sands containing varying amounts of mica which have developed in-place from the chemical and physical weathering of the, oftentimes, underlying micaceous metamorphic and igneous bedrock. The weathering occurs in an irregular fashion and creates a zone of decomposed, weathered rock which can possess rock-like qualities that can extend to a significant depth. The decomposed, weathered rock thickness can be highly variable over short horizontal distances. In addition, and as with many urban sites in DC, man-placed fill soils likely exist to various depths based on previous site use and adjacent construction.

Geophysical Exploration with Refraction Microtremor (ReMi)

Purpose of Exploration

The purpose of our geophysical exploration was to characterize the subsurface materials by measuring seismic velocities of the subsurface materials via shear wave (S-wave) utilizing the ReMi method. The results of the S-wave seismic survey include 2-dimensional profiles (cross-sections) showing the approximate interfaces between predominately soil, a soil to rock transition zone, and non-rippable weathered to un-weathered rock. Since seismic energy of earthen materials travels at different rates depending on its compressive strength (typically related to and proportional to density and weathering), an estimate of subsurface materials can be derived from geophysical measurements.

The 2D ReMi profiles are included as attachments to this letter report. Shear wave velocity (Vs) values of 3,600 feet per second or less (fps) for soil, shear wave velocity (Vs) values between 3,600 to 4,000 fps for weathered rock, and shear wave velocity (Vs) values of 4,00 fps or greater for un-weathered rock were determined based on correlations to nearby boring logs (where applicable) and known shear wave velocity (Vs) values for non-rippable metamorphic and igneous rock and our extensive experience in the Washington, DC area.

Data Acquisition

The shear wave (S-wave) ReMi survey for the project consisted of three (3) lines (transects/arrays). All lines, denoted as Lines 1 through 3, were oriented east to west. Line 1 was 160± linear feet, Line 2 was 190± linear feet, and Line 3 was 440± linear feet. Due to

horizontal space constraints and the depths needed for analysis, 2-D seismic velocity information could not be obtained for approximately 25± feet on either end of each line. As such, the 2-D characterization of the lines does not represent the full length of the line shown in plan view on the sheet titled 2-D ReMi Line Location Plan.

The data gathering process in the field used standard seismic refraction equipment to measure subsurface soil and/or rock characteristics using ambient vibrations (microtremors) as a seismic source. The equipment used for the survey was a SeisDAQ III ReMi recording unit capable of storing record lengths up to about 30 seconds and up to 24, 4.5 and 10-Hz geophones. A single geophone sensor was used at each one of the channel geophone locations, spaced at 10-foot intervals, to record surface wave velocity dispersion. The analysis presented here was developed using up to 45 channels with the geophones set along a relatively straight-line.

Data Processing

The data were processed using SeisOpt® ReMi™ software to reveal one and two-dimensional average shear-wave (S-wave) velocity images for each array line. The method provides an effective and efficient way to generate information on the subsurface profile in one or two dimensions along each line in order to define trends in shear wave velocity that can be related to subsurface conditions. ReMi geophysical testing techniques are capable of identifying differing soil and rock types. The shear wave velocities (feet/second) measured by ReMi techniques were correlated to differing soil and rock properties utilizing published correlations.

ReMi processing requires three steps: (1) Velocity Spectral analysis, (2) Rayleigh Phase velocity dispersion picking and (3) Shear Wave Velocity modeling. The seismic data records collected above were processed using proprietary software and the refraction microtremor method described by Louie (2001) and Pullammanappallil et. al. (2003). A brief discussion of each of the three steps is presented in the attachment titled: “Reference Notes for Refraction Microtremor (ReMi) Testing” included in the Appendix of this report.

Geophysical Exploration Characterization (2-D Analysis)

The subsurface profiles generated from the in-situ testing show the approximate soil, transitional weathered rock, and non-rippable rock interfaces. These profiles are designated as Lines 1 through 3 and are included as attachments to this letter report. The locations of the profiles are shown on the attached 2-D ReMi Line Location Diagram. The profiles provide subsurface information based on modeled S-wave (shear wave, Vs) seismic velocities derived from dispersion of surface wave energy via the ReMi dispersion curve modeling technique as mentioned above.

Based on our exploration, we have interpreted the data to represent the following groupings based on the shear wave profiles:

1. “Soil” – Shear wave velocities less than 3,600 feet per second (fps)
2. “Weathered-” or “Marginally Rippable- Rock” – 3,600 fps to 4,000 fps
3. “Bedrock” or “Non-rippable Rock” – greater than 4,000 fps

Bedrock at the site was, therefore, interpreted to be present at depths ranging from as shallow as 26 feet to greater than 54 feet.

Closing

This report has been prepared in order to aid in the evaluation of this project and provide information necessary for the preliminary design of the proposed development. Our project scope is limited to the specific project and location described herein, and the project description represents our understanding of the significant aspects relevant to geotechnical design issues. The shear wave seismic velocity information included herein may be used for informational purposes; however, ECS assumes no responsibility for the misinterpretation of these data. In the event that changes in the development are planned, we should be informed so the changes can be reviewed and the conclusions of this report modified or approved in writing by the Geotechnical Engineer of Record. As a check, we recommend that we be authorized to review the project plans and specifications, once complete, to confirm that our report recommendations have been interpreted in accordance with our intent. Without this review, we will not be responsible for misinterpretation of our data, our analysis, and/or our recommendations nor how these are incorporated into this final design.

We appreciate this opportunity to be of service to you in preparing this geophysical evaluation. If there are any questions regarding the information and recommendations contained in this report, or with respect to any work performed to date, please contact either of the undersigned.

Respectfully,

ECS MID-ATLANTIC, LLC

Katelyn E. Vieten
Project Manager

R. Drew Thomas, C.P.G.
Senior Engineering Geologist

Attachments: 2-D ReMi Line Location Diagram
Line 1 2-D ReMi Profile
Line 2 2-D ReMi Profile
Line 3 2-D ReMi Profile

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2-D ReMi Survey Location Diagram

3220 Prospect Street NW

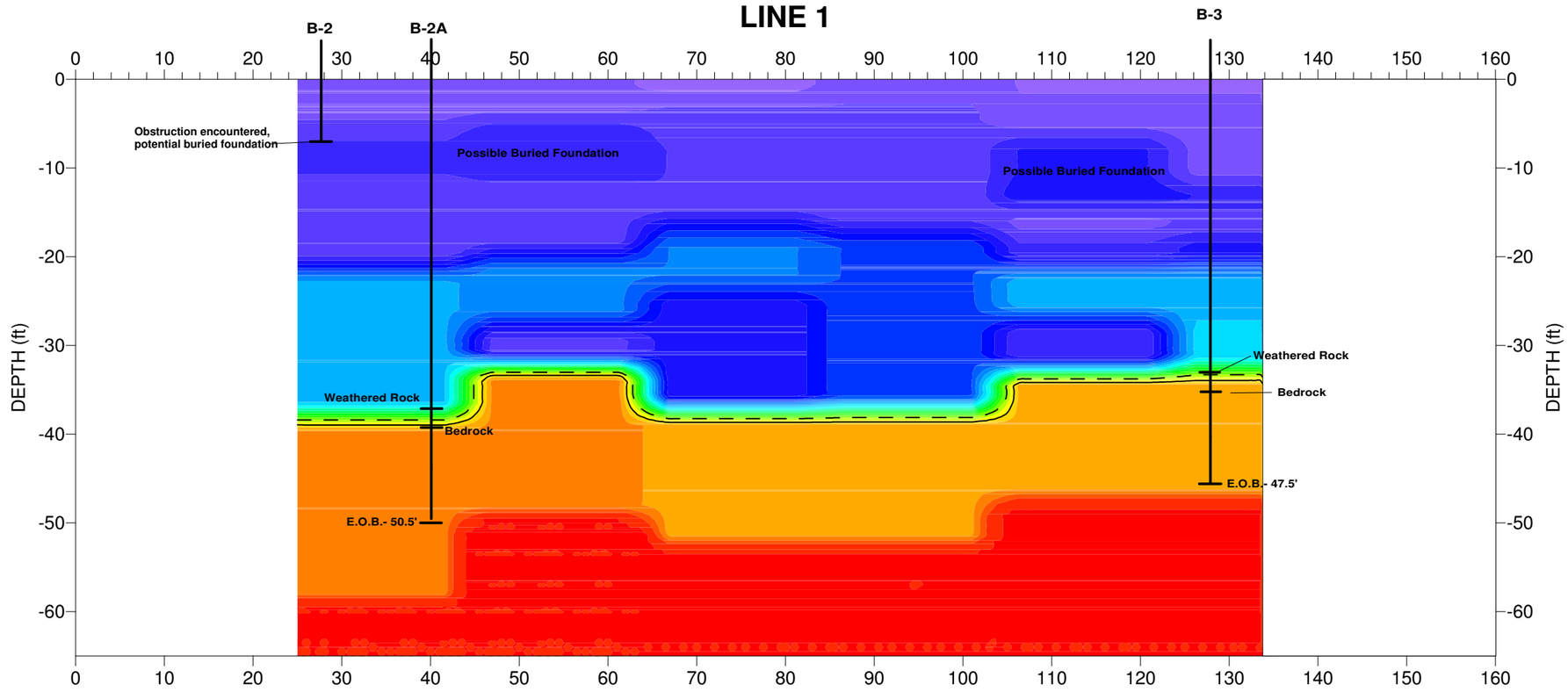
Washington, DC

ECS Project No: 01:22509

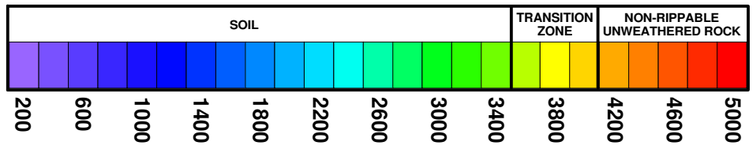
Date: March 20, 2014

Scale: NTS

LINE 1

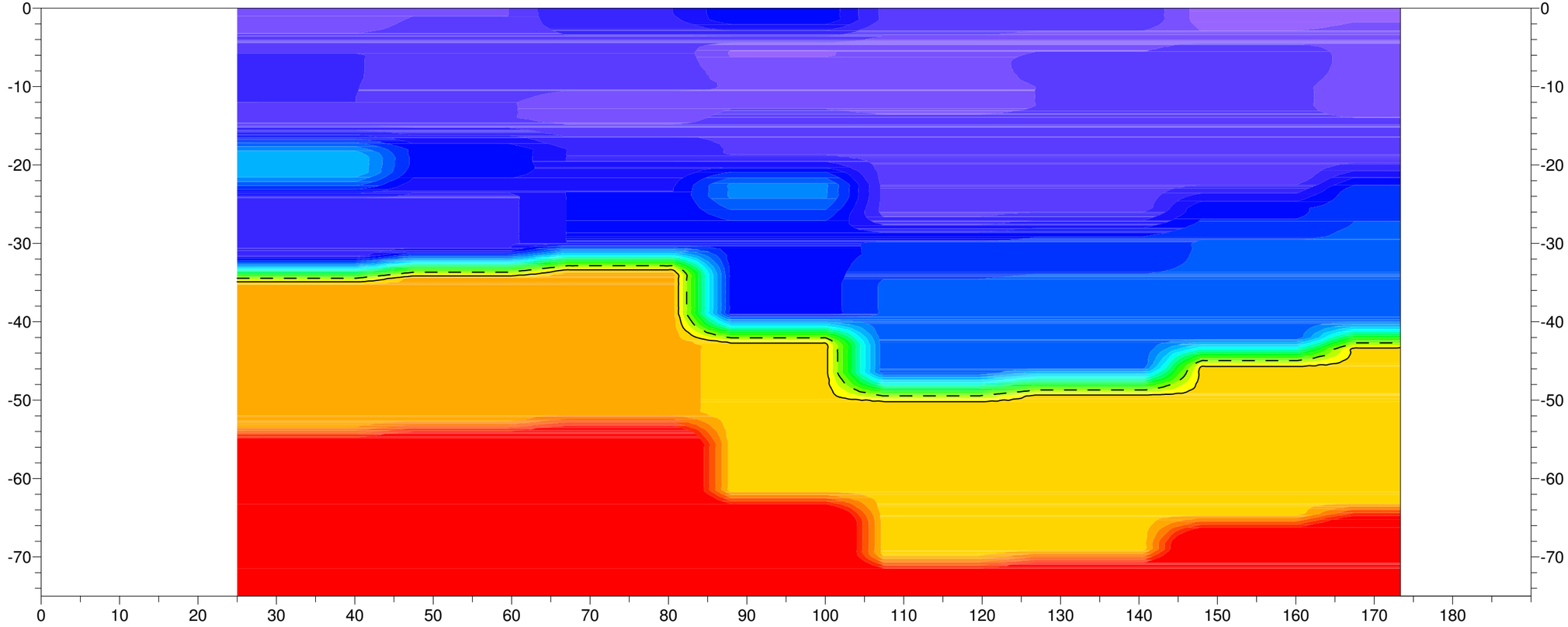


MODELED S-WAVE VELOCITY
(FEET/SECOND)



PROJECT NO: 01:22509	**3220 PROSPECT STREET**	ECS™	**2D REMI SHEAR WAVE MODELED VELOCITY PROFILES**	NOTES
DATE: 03/20/2014				DATA ACQUISTION: - 4.5 & 10 HERTZ GEOPHONES AT 10 FOOT SPACINGS - RECORDED WITH SEISMIC SOURCE DAQ III UNIT - ACQUISITION TIME = 30 SECONDS - SAMPLE INTERVAL = 2 MILLISECONDS
SCALE: 1" = 15'	**WASHINGTON, D.C.**		**McCaffery Interests**	
2D REMI LINE 1				

LINE 2



MODELED S-WAVE VELOCITY (FEET/SECOND)

PROJECT NO: 01:22509	**3220 PROSPECT STREET**	ECS	**2D REMI SHEAR WAVE MODELED VELOCITY PROFILES**	NOTES
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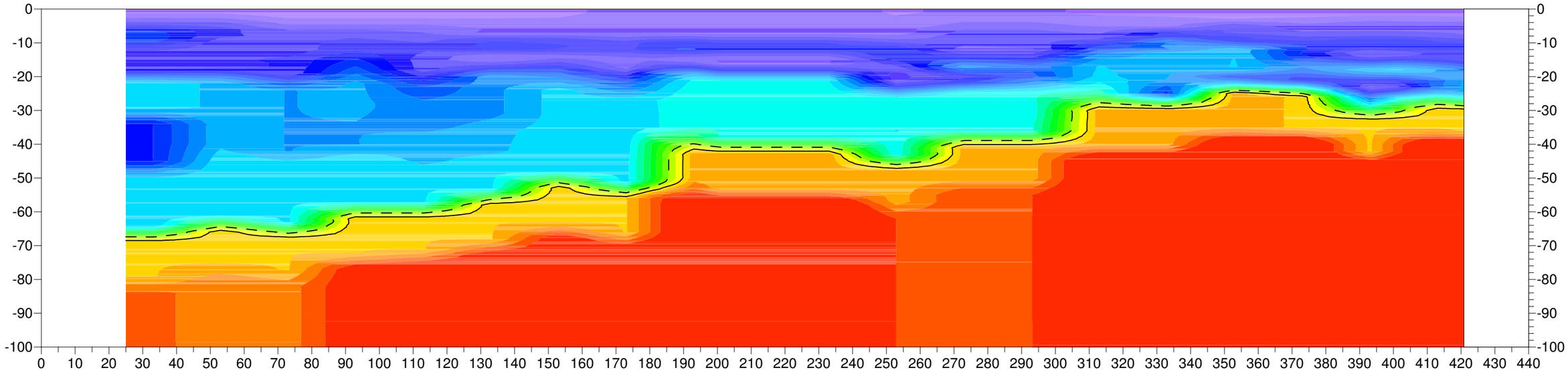
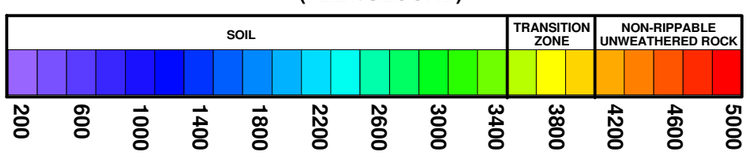
SCALE: 1" = 15'	**WASHINGTON, D.C.**		**McCaffery Interests**	
2D REMI LINE 2				

LINE 3



MODELED S-WAVE VELOCITY (FEET/SECOND)



PROJECT NO: 01:22509 DATE: 03/20/2014 SCALE: 1" = 30' 2D REMI LINE 3	**3220 PROSPECT STREET** **WASHINGTON, D.C.**	ECS™	**2D REMI SHEAR WAVE MODELED VELOCITY PROFILES** **McCaffery Interests**	NOTES DATA ACQUISTION: - 4.5 & 10 HERTZ GEOPHONES AT 10 FOOT SPACINGS - RECORDED WITH SEISMIC SOURCE DAQ III UNIT - ACQUISITION TIME = 30 SECONDS - SAMPLE INTERVAL = 2 MILLISECONDS