

**Survey Report**  
of the  
**October 03, 2011**  
**Portuguese Landslide Monitoring Survey**  
for the  
**City of Rancho Palos Verdes**  
by  
**McGee Surveying Consulting**

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ATTACHMENTS

FULL DATA POSTING (Monitoring point overall movements and periodical movements)  
COORDINATE LIST-Oct. 2011 Survey (Current NAD83 Geodetic, Grid Coordinates, NAVD88 Heights)

**Survey Report**  
of the  
**October 03, 2011**  
**Portuguese Landslide Monitoring Survey**  
for the  
**City of Rancho Palos Verdes**  
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**McGee Surveying Consulting**

**Client:** City of Rancho Palos Verdes;

**Surveyed by:** McGee Surveying Consulting

**Project Name:** Portuguese Bend Landslide Monitoring Program

**Location:** City of Rancho Palos Verdes, California; **County:** Los Angeles; **State:** California

**PROJECT OVERVIEW:**

McGee Surveying Consulting performed slide monitoring and control surveys in October 2011 at Portuguese Bend on behalf of the City of Rancho Palos Verdes. The purpose of the survey was to establish accurate positions on monitoring points to determine overall and periodic movements. The results of the survey are described in this Report and reported on spreadsheets attached hereto.

The field survey was planned, coordinated and executed by Michael McGee, PLS3945 of McGee Surveying Consulting, Santa Barbara, California. Michael McGee, PLS was responsible for the final processing of the observations, network adjustments, analysis and reports. The monitoring points cover approximately a 1½ mile square area and are measured annually or more often as necessary to determine the rate and extent of ground movement. Global Navigation Satellite System (GNSS formerly referred to as GPS) technology was used to measure positions based on the North American Datum of 1983 (NAD83) and the North American Vertical Datum of 1988 (NAVD 88) as referenced to the California CGPS (Continuous GPS) Stations in the region which are permanently mounted GNSS receivers for monitoring seismic activity. The CGPS in California are similar to the national CORS (Continuously Operated Reference Stations).

Many of the points move a few inches or less per year; therefore, the accuracy requirement is to meet a standard of one centimeter (0.033 feet) at the 95% Level of Confidence. In the active slide area where the movements approach a foot or more per year (PB and UB points in the central portion), two centimeters (0.066 feet) is sufficient. Field procedures are designed to accomplish this purpose and Quality Control-Quality Assurance (QAQC) processes discussed hereafter are incorporated to verify these accuracies are attained.

The movements reported between October 25, 2010 and October 3, 2011 (11.3 months) statistically attained an overall average accuracy of 0.03 feet at the 95% Level of Confidence. The actual accuracies of these measurements approach 0.02 feet as demonstrated by the measured vector residuals, repeatability of measurements at points considered stable, and the Deflection Analysis. Refer to the sections titled ACCURACY, DEFLECTION ANALYSIS and SUMMARY at the end of this Report for more information.

**HISTORY**

This survey is a continuation of a monitoring survey program initiated by the County of Los Angeles and taken over by the City of Rancho Palos Verdes circa 1994. McGee Surveying Consulting has conducted the field surveys and reporting since September 2007. See the September 2007 Survey Report for a detailed history of the previous survey process between 1994 and 2007. See the subsequent Survey Reports for the December 2008, November 2009 and October 2010 campaigns.

**PROJECT DATUMS, REFERENCE SYSTEM**

**Horizontal Datum:** North American Datum of 1983 (NAD83) established by the National Geodetic Survey (NGS); **Epoch:** 2007.00 referred to as NAD83(2007.00).; **Units:** Feet

**Reference Network:** The survey is referenced to the CGPS Stations (continuously operating GNSS receivers) mounted on a stabile platform. For more information see NGS Data Sheets for the PID's listed below (no data sheet exists for PVE3). The positions listed below were obtained from the California Spatial Reference Center (CSRC). CSRC provides NGS sanctioned positions for the California CGPS Stations.

CGPS	Latitude (dms)	Longitude (dms)	EH (feet)	NGS PID	NAME
PVE3	33 44 35.853290	-118 24 15.269036	235.42	none	PALOS VERDES CORS
PVHS	33 46 46.020150	-118 22 19.741258	853.99	AJ1915	PENINSULA HIGH SCH
PVRS	33 46 25.891904	-118 19 14.067218	198.63	AJ1916	PALOS VERDES RES
VTIS	33 42 45.489584	-118 17 37.712290	197.52	AJ1936	MARINE EXCHANGE

Note: PVRS falls in the proximity of a Fault Line as shown below but appears unaffected to date



**Vertical Datum:** North American Vertical Datum of 1988 (NAVD88) established by the NGS  
**Geoid Model:** Geoid 03; note Geoid09 became available from the NGS in late 2009; however, Geoid03 is retained to be consistent with prior reported heights and the purpose of determining relative changes.

**Reference Network:** CGPS Station VTIS is also a Second Order leveled benchmark and the basis for the published heights by this survey (see NGS Data Sheets, PID's listed above)

CGPS	NAVD 88 Ht(feet)	
PVE3	none	
PVHS	972.1	Based on a Refined Geoid Model
PVRS	316.3	Based on a Refined Geoid Model
VTIS	315.26	Based on Second Order Leveling by CSRC and original basis for this survey

**Projection:** NAD83 California State Plane Coordinates Zone 5: The State Plane Coordinate Parameters follow. The average Scale Factor is 1.00007543, the Ellipsoid Height Reduction Factor based on the average ellipsoid heights is 0.99999092, and the average Combined Grid Factor is 1.00006635. Distances in this survey are grid. To obtain ground distances divide grid distances by the Combined Grid Factor. Grid bearings resulting from this survey must be rotated by a Convergence Angle to obtain geodetic (true) bearings. The average convergence angle is -0-12-30± (rotate left 0-12-30).

**Datum Stability:** The NAD83, 2007.00 Epoch adjustment is one of a series of adjustments of NAD83 since its adoption in 1986 and is the datum used for the monitoring surveys since 2007. Rancho Palos Verdes sits on the Pacific Plate which is moving west-northwesterly relative to the North American Plate about 4 centimeters (0.14 feet) per year. The area southwesterly of the Fault Line shown on the above map includes the City and is moving at a constant rate as exhibited by the N, E, Up velocities of the CGPS Stations listed below. These CGPS Stations provide a rigid reference frame for the Portuguese Landslide Monitoring Program that is validated during each monitoring campaign. See the Adjustment results on Page 8 and the September 2007 Monitoring Survey Report by McGee Surveying Consulting for additional information.

Annual Velocities in Feet			
Reference Epoch 2011.55			
CGPS	North	East	Up
PVE3	0.065	-0.130	-0.003
PVHS	0.064	-0.129	-0.005
PVRS	0.063	-0.129	0.000
VTIS	0.065	-0.129	-0.002

## FIELD SURVEYS, DATA COLLECTION, EQUIPMENT & PROCESSING

Sixty-nine monitoring points were occupied and reported in this October 2011 survey. Site photographs and recovery sheets detailing the location, character of the monuments and obstructions were updated. See the Appendix for "Monitoring Point Status as of October 2011"

Monument AB61 was established in September 2007 on Portuguese Point and is used as the primary base station for Monitoring Surveys. The location is secured behind a locked gate, has a mostly clear horizon above 10 degrees, and sits on a stable basalt geological formation. A 5/8" x 2' rebar with a plastic cap and tack named "AB61ECC" was set for a reference monument on 10/23/2010 to test local stability of AB61.

The field survey commenced each day by setting a GNSS receiver on a fixed height pole on AB61 while two GNSS receivers roamed freely collecting observations on fixed height poles at 68 on-site points. Many of the points are over-shadowed by mature trees and shrubberies which interfere with signals received from satellites and can affect the quality of measurements. To obtain the best possible accuracies, the satellite constellation is compared with obstruction diagrams to estimate the best time for observing a point. On site, those satellites obstructed by foliage and trees are either turned off or noted for removal in post-processing. If 5 or more unobstructed satellites with a GDOP (measure of the geometry of the constellation) of 4 or less are available, then the measurement commenced for a minimum of 10 minutes of data collection. If the geometry and number of

## McGEE SURVEYING CONSULTING

satellites are insufficient then the receiver is moved to the next point and returned later when satellite availability improves. This process is followed until all points are occupied twice under a different constellation of satellites on a different day. If the two measurements are within 0.03 feet in slow movement areas or 0.06 feet in active slide areas, then they are accepted, otherwise a third measurement is obtained.

Three Leica geodetic GNSS receivers and antennas listed below were utilized to collect, and store satellite signal data. Three, 2 meter fixed height poles were used at the base station and for the observations of the monitoring points. Prior to initiating the field observations a calibration of the fixed height poles was conducted with a theodolite to verify their height and plumb. The top of the poles were found to be plumb within 0.002 feet of the bottom consistent with prior years. Additional checks were made each day. There were no equipment failures.

### GNSS Survey Parameters:

Date of Field Surveys: 10/01/11 to 10/06/11 (10/03/2011 mean date) 0600-1800 PDST (+7 hrs for UTC).

Constellation: 30 NAVSTAR GPS satellites and 23 GLONASS satellites.

Observables: L1 & L2 Carrier Waves and Codes

Epoch Rate & Occupation Times: 10 seconds for 10-15 minutes and 4-11 hours for CGPS connections.

Minimum Satellites: 11; GDOP < 4 ; Elevation Mask for Data Collection and Processing: 15 degrees;

Ephemeris: Rapid for Static Post-Processing for CGPS connections and Broadcast for on site.

Weather conditions: Generally clear skies and mild temperatures.

Space Weather: Boulder K Index was 1-3 on a scale of 0-9 (<5 preferred) which gauges ionospheric activity.

Equipment:

GNSS Base Receiver Unit No.: M5, Operator: M. McGee, PLS; Station Identification: AB61 (Base)

Make & Model: Leica GS15; Antenna Leica GS15; Mount: Fixed Height Pole #2; Antenna Height: 2.086m

GNSS Rover Receiver Unit No.: M6, Operator: M. McGee, PLS;

Make & Model: Leica GS15; Antenna Leica GS15; Mount: Fixed Height Pole #1; Antenna Height: 2.087m

GNSS Rover Receiver Unit No.: M7, Operator: R. Reese, PLS,

Make & Model: Leica GS15; Antenna Leica GS15; Mount: Fixed Height Pole #3; Antenna Height: 2.085m

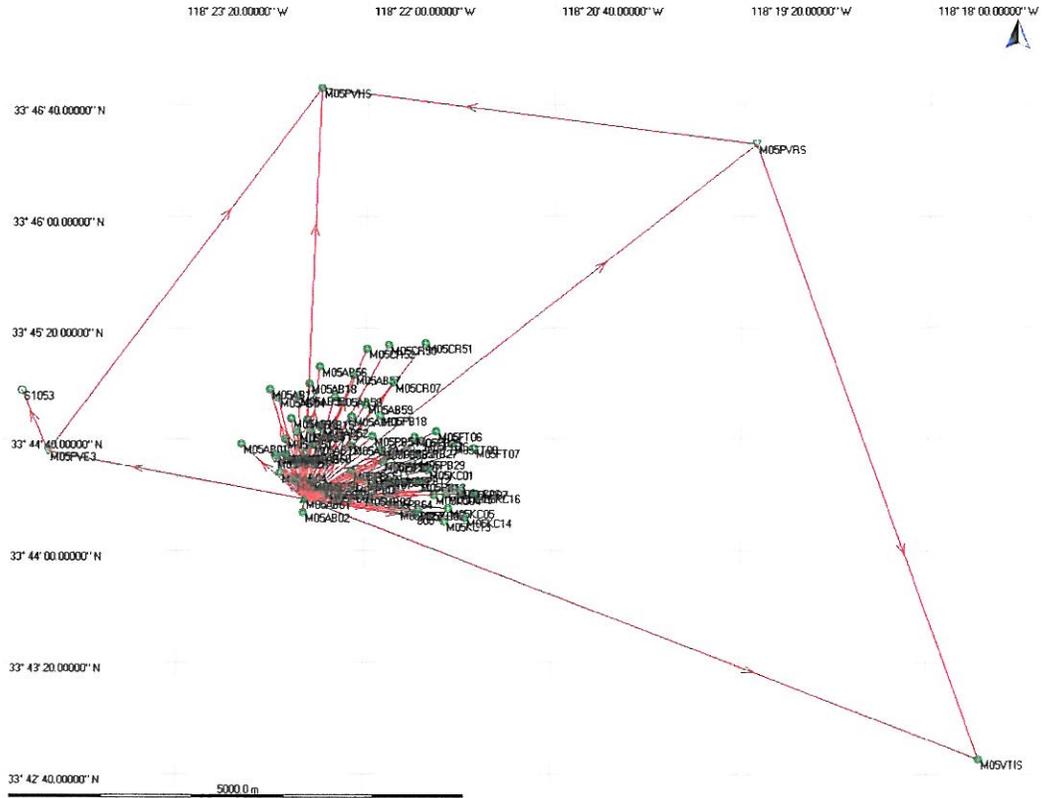
Vectors were processed using Leica LGO v8.1 post processing software. Analysis of residuals led to the rejection of 7 out of 37 vectors connecting the CGPS Stations and AB61, and 3 out of 129 vectors connecting monitoring points. Network adjustments and analysis were performed with "Starnet-PRO" version 6.0 software. Rinex files of the satellite measurements for the CGPS Stations were downloaded from the SOPAC website. The Rapid Ephemeris and Absolute Antenna Models were downloaded from the NGS website. The Absolute Antenna Models recently published by the NGS replaced the Relative Models used in previous years and were used for the first time in the processing of vectors.

### NETWORK

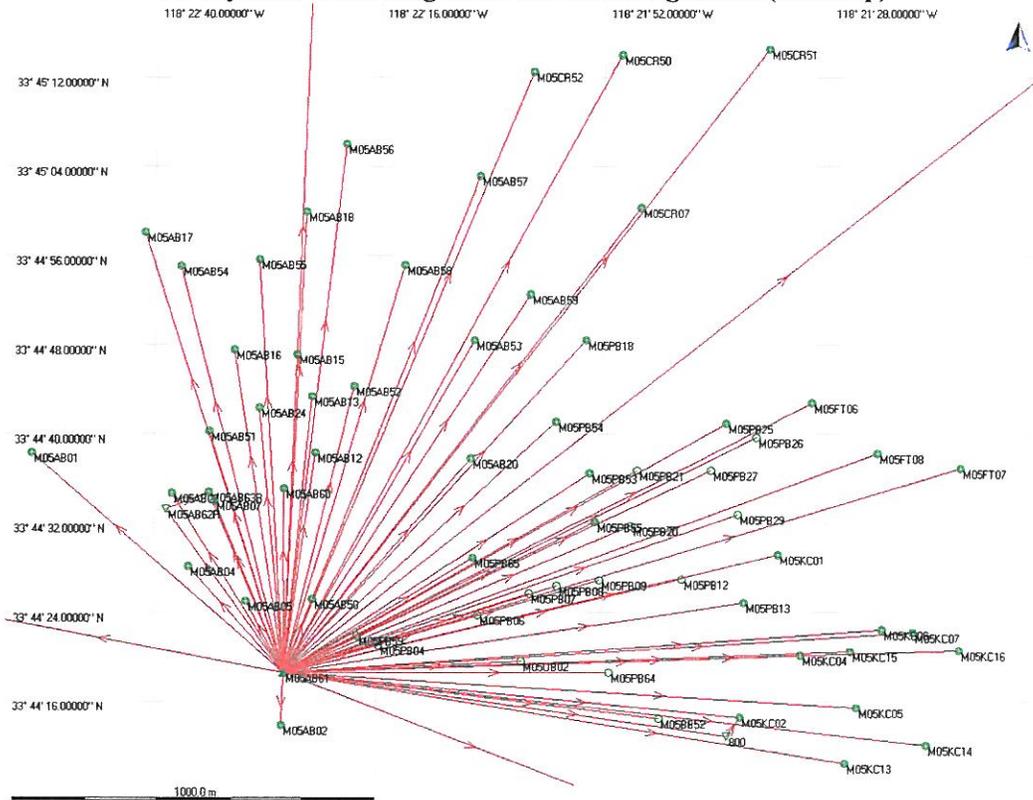
AB61, the primary Base Station, sits on Portuguese Point and is the focal point of the static network connecting the monitoring points and CGPS Stations. Sixty-nine on site points and 4 CGPS Stations were connected with 77 vectors measured 1-3 times. See the Network Maps on the next page and the Aerial View in the Appendix.

The monitoring plan uses the four CGPS Stations to verify the stability of the reference frame. The primary station is CGPS Station PVE3 located near City Hall 1.8 miles west-northwest of the on-site Base Station AB61. CGPS Station PVHS is 2.8 miles north, PVRS is 3.9 miles northeast, and VTIS is 4.9 miles east-southeast of AB61 as shown on the Network diagram.

### Survey Network with CGPS Stations (north up)



### Survey Network Enlargement of Monitoring Points (north up)



## MONITORING POINT STATUS

For data management purposes during the field survey and data processing, the point names were prefixed with "M05" to distinguish between different monitoring surveys i.e. AB61 was named M05AB61. M05 indicates this survey is the fifth monitoring since the initial September 2007 Monitoring Survey. The prefix is stripped in the final Report. In the initial 2007 survey, the field and office procedures were modified to increase the accuracy and reliability of measurements and provide for queries between epochs that include statistical information about the precisions of the reported movements.

Between 1994 and 2006, 149 monitoring points were established to monitor Portuguese Bend Slides, many of which are lost or destroyed. Sixty of the original points were recovered in 2007. Eight of the 60 points were deleted because they were in close proximity of other points better suited for GNSS leaving 52 points monitored and reported between September 2006 and September 2007. Three of the 52 points (AB09, KC11, PB51) were monitored in September 2007 for the last time because they were replaced by new points, set nearby and better suited for satellite observations. Eighteen new points set in 2007 had their movements reported for the first time in the December 2008 survey. In December 2008, 49 original and 18 new points were surveyed for a total of 67 monitoring points.

In the September 2007 Report, it was noted that KC01 was previously reported by others on 9/14/2006 to have moved N 29°E 1.24' from its 12/9/2005 position. In the 2008 survey, a buried partially illegible brass cap in concrete stamped "COUNTY ENGINEER RE8869 1956 STA ??IELDS" was found S31°29'W 1.48 feet from the 1" IP that was found and used in the initial September 2007 and subsequent surveys. The original 1994 position of KC01 was adjusted to be consistent with the 1" IP, resulting in correct overall reported movements.

In the December 2008 Report, it was noted that AB05 had been disturbed by a mowing machine. AB05 was found chipped and leaning to southerly about 0.4'. The movement reporting resumed in 2009. Analysis of the movement and historic data made it possible to estimate the disturbance to within 0.05'. The original 1995 position of AB05 was adjusted S14°02'E 0.29' to be consistent with the disturbed position, resulting in correct overall reported movements.

In 2009, a new point PB64 was set on the east of the Archery Range to replace PB63 (set 2007) which had become unsafe to access was lost sometime in 2010. PB64 was reported for the first time in October 2010.

In 2010, points AB03 and BB25 were discontinued for the following reasons. AB03 is 192 feet west-southwest of AB61 on the edge of a cliff, and BB25 is on an unstable rock affected by the surf. In the summer of 2010, PB62 was destroyed by road construction. In October 2010, PB65 was set 24' south-southwest of PB62. Movement of PB65 is reported for the first time in October 2011. The following points may have been disturbed as of October 2010. AB05 appears to have been disturbed by mower machinery, AB15 (½" GIP in a meter box) is being driven over by vehicles occasionally accessing an adjacent field, and KC02 (½" GIP in a meter box) is occasionally parked on by vehicles occasionally accessing an adjacent field. Raising the boxes at AB15 and KC02 will eliminate this problem.

In October 2011, new temporary reference points named AB62R to replace AB06 and AB63R to replace AB07 were set. AB06 and AB07 will be discontinued due to their location within the traveled way of Palos Verde Drive South. A deep set permanent monument will be constructed in 2012 near AB62R and AB63R and the positions will be transferred.

The present list and status of monitored points is provided in the Appendix under "Monitoring Point Status as of October 2011".

**ADJUSTMENTS & ANALYSIS**

**Adjustment 1:** Minimally Constrained Adjustment processed to develop Geodetic, Ellipsoid and State Plane Coordinates in NAD83 (2007.00)

**Fixed Control:** CGPS Station PVE3 was fixed at its published position in a Minimally Constrained Adjustment to determine latitude, longitude, ellipsoid heights, state plane coordinates, and to check the stability of other points. PVE3 located 2 miles west of the slide area has been fixed in all adjustments since 2007. The CSRC publishes a Time Series for the horizontal and vertical stability of PVE3 which indicate the position has been stable over a ten year period to date. The primary base station AB61 and three other CGPS Station’s are measured relative to PVE3 and used to assess stability of the reference frame. The positions are based on 4 to 11 hour measurements collected on six days. The coordinate differences at the CGPS Stations from previous positions to the present are listed below in feet.

10/2010 Positions to 10/2011					9/2007 Positions to 10/2011			
Station	dN	dE	dZ		Station	dN	dE	dZ
PVE3	0.000	0.000	0.000	Fixed 2010	PVE3	0.000	0.000	0.000
PVHS	0.004	0.004	0.001		PVHS	-0.001	0.010	0.012
PVRS	0.004	0.004	0.017		PVRS	-0.003	0.013	0.024
VTIS	0.004	0.006	0.019		VTIS	-0.001	0.010	0.018
AB61	-0.002	-0.010	-0.037	Base Station	AB61	-0.022	0.001	-0.032

In regard to the stability of the reference frame, the following is noted: (1) the two dimensional (2D) differences from the October 25, 2010 to the October 3, 2011 measured positions of the three free CGPS Stations range 0.006 to 0.007 feet and 0.010 feet at AB61, (2) the 2D differences of the CGPS Stations since the initial 2007 survey to the present, range 0.010 to 0.013 feet and 0.022 feet at AB61, (3) the CGPS, points AB54, AB61, CR50, KC07 and KC16 have a stable history and comparing their previous positions with this survey indicates repeatable stability at less than 0.02 feet as listed in the attached “FULL DATA POSTING”.

The survey reference frame is deemed stable and successfully recovered at the level indicated. An adjustment constrained to the CGPS Stations is not necessary because the purpose here is to track their relative positions over time to test the stability of the reference frame. See the attached file “COORDINATE LIST–October 3, 2011” for a list of coordinates resulting from this adjustment. See prior Reports for coordinates resulting from earlier surveys.

**Adjustment 2:** Minimally Constrained Adjustment processed to develop Orthometric Heights (Elevations) in NAVD88

**Fixed Control:** The CGPS Station PVE3 was fixed horizontally and vertically at its NAVD88 orthometric height determined in the September 2007 survey. The 2007 height was based on the published 2<sup>nd</sup> Order NAVD88 Height of CGPS Station VTIS. This Adjustment combined the measured ellipsoid height differences with the NGS Geoid 03 (models the separation between the ellipsoid and geoid surfaces) to determine NAVD88 orthometric heights of other CGPS Stations and the monitoring points. The differences from prior surveys to the heights determined in the present survey are listed below in feet.

10/2010 to 10/2011				9/2007 to 10/2010	
		Fixed			
PVE3	0.000		PVE3	0.000	
PVHS	0.001		PVHS	0.009	
PVRS	0.017		PVRS	0.028	
VTIS	0.018		VTIS	0.016	

**Note:** This survey’s measurements from PVE3 to VTIS check the 2010 height +0.018 feet and the 2007 survey +0.016 feet both very acceptable for GNSS considering the distance. The NGS Benchmark S1053 located at the intersection of Rancho Palos Verdes South with Hawthorne Blvd. was measured on another survey and found -0.016 feet from its records position validating the height of VTIS and the use of the Geoid03 Model. See the attached file “COORDINATE LIST-Oct 2011 Survey” for a list of heights resulting from this survey.

**ACCURACY**

These surveys conform to the intent of the Federal Geodetic Control Subcommittee (FGCS) “Specifications for GPS Relative Positioning” (1988) and the California Geodetic Control Committee (CGCC) “Specifications for High-Production GPS Surveying Techniques” (1993). The vector residuals at each point and the closures on stable control points discussed in “Adjustment 1” are good indications of the accuracies obtained by this survey

**Vector Residuals:** The two dimensional vector residuals and the absolute value of the vertical residuals resulting from Adjustment #1 are listed below in feet.

	Two Dimensional Residuals			Vertical Residuals (absolute values)		
	Average	Std.Dev.	Maximum	Average	Std.Dev.	Range
Monitoring Pts	0.009	0.007	0.036	0.011	0.011	-0.04 to +0.04
CGPS Stations	0.006	0.004	0.018	0.013	0.011	-0.03 to +0.04

**Vector Accuracy:** The lengths, precisions and relative distance errors resulting from the adjustment at the 95% Level of Confidence for the vectors (baselines) are listed below in feet.

	Lengths		PPM Precisions		Relative Dist.Error		
	Vary	Average	Vary	Average	Average	Maximum	Precision
Monitoring Pts	192-7134	3468	2.2-108	9.0 ppm	0.019	0.034	1: 183,000
CGPS Stations	9396-26103	18842	0.2-0.4	0.3 ppm	0.005	0.006	1:3,768,000

The precision ratio based on the averages for the vectors connecting the Monitoring Points exceeds the criteria for a First Order (C-1) by a factor of 1.8, and the vectors connecting AB61 and the CGPS Stations exceeds the criteria for a B Order survey by a factor of 3.8 per the FGCS requirements for the former classification system.

**Coordinate Accuracy:** The Standard Deviations (68% Level of Confidence) of the coordinates derived from Adjustment #1, relative to the CGPS Station PVE3 follow in feet.

	Monitoring Point			CGPS Stations		
	North	East	Up	North	East	Up
Average Standard Deviation	0.008	0.007	0.027	0.002	0.002	0.004
Maximum Standard Deviation	0.016	0.015	0.050	0.003	0.003	0.006

**Absolute Coordinate Accuracy:** The network accuracy is expected to be less than 0.02 feet horizontal relative to the NAD83 Datum based on the CGPS Station PVE3 fixed in Adjustment #1.

**NAVD88 Heights:** The North American Vertical Datum of 1988 orthometric heights resulting from Adjustment #2 are derived from the difference in ellipsoid heights combined with the Geoid 03 model and constrained to the height of PVE3 determined in 2007 based on VTIS. The measured ellipsoid heights relative to PVE3 are expected to be within 0.03 feet but may be greater at obstructed sites. The absolute accuracy of the heights relative to the datum is dependent on the published value on the CGPS Station VTIS.

Although relative elevation accuracies can be within 0.03 feet, up until October 2011 there were no requirements for vertical accuracies. In October 2011, a preference of 0.03 foot relative vertical accuracy was instigated for the following points: AB17, AB57, CR07, CR50 and CR51.

**Movement Accuracy:** For the movements reported in this period, the statistical analysis of points moving 0.30 feet or less returned an average relative error at the 95% Level of Confidence of 0.029 feet with a standard deviation of 0.006 feet and a range of 0.008 to 0.047 feet. Overall, the relative error averaged 0.031 feet with a standard deviation of 0.009 feet and a range of 0.008 to 0.062 feet. No movement is considered detected unless the movement exceeds the 95% Error for individual points. See Page 5 of the attached “FULL DATA POSTING” for the estimated relative error at the 95% Level of Confidence for individual points.

### **QUALITY CONTROL - QUALITY ASSURANCE (QAQC) ANALYSIS**

To ensure the accuracy and validity of the systems used to obtain the accuracies reported in these GNSS surveys, an independent test was made using conventional terrestrial based instruments as reported in the "QAQC ANALYSIS" section of the September 2007 Monitoring Survey Report. Comparing the results of the GNSS systems with conventional instrumentation found horizontal measurements agreed 0.01 feet on average. In November of 2011 the GNSS instruments used in this survey were calibrated on the Santa Maria National Geodetic Survey Baseline and found to agree with published values 0.003 to 0.006 feet.

To validate the radial survey method used in these surveys to position points from a single base station (AB61), independent GNSS cross connections were measured and compared with the computed inverse distances in the 2007, 2008 and 2009 surveys. The results found the two dimensional accuracy to agree 0.01 feet on average, indicating the radial method of measurements is reliable and the extra labor cost of measuring cross connection between points is not warranted. See the "QAQC ANALYSIS" section of the September 2007 and the December 2008 Monitoring Survey Reports for detailed analysis.

### **DEFLECTION ANALYSIS**

Deflection Analysis is a method established by this surveyor to assess the consistency of the direction of movements reported year over year. Not including points in the Portuguese Bend Landslide (UB and PB points) with movements larger than 0.7 feet, analysis of deflections indicate that: AB05 and AB15 were disturbed in the previous period as noted in the 2010 Report and have resumed their previous direction of movement.

It is noted that AB12, AB51, AB58 and CR07 exhibited inconsistent movement directions in previous periods which may be normal activity for these sites. This survey reports this as a matter of information and defers to the opinion of the City Geologist for the meaning of these findings.

Excluding the above points, for the remaining 37 points the movements averaged 0.09 feet with a maximum of 0.30 feet and the average separation was 0.02 feet with a standard deviation of 0.01 feet indicating for the most part small movements are linear. Additionally, assuming that movements are linear over small distances, the separation or the deflection between the direction of the previous and present periods taken over the moved distance, is an implied indication of the accuracy of the measurements.

### **SUMMARY**

A modernization of field procedures and processing techniques began with the initial September 2007 survey. Thereafter, temporal movements are based on a rigorous simultaneous least squares adjustment of multiple observations at two different epochs on each point. The statistical results of the October 2010 to October 2011 monitoring period shows the relative accuracy of the reported movements averaged 0.032 feet at the 95% Level of Confidence. Prior to September 2007, successive coordinate differences were used to compute movements which did not provide statistical information about the relative accuracies.

Results of the adjustment indicate the probability at the 95% level of confidence that movement (signal) has occurred at a point when the horizontal distance between two epochs is greater than the 95% Error (noise). See the "Full Data Posting" for a listing of the 95% Error estimates (ranges 0.008 to 0.062 feet). Using these criteria, 9 points have not moved and 56 points have moved. Between October 25, 2010 and October 3, 2011 (11.3 months), points in the Portuguese Bend Landslide (PB points) moved between 0.22 and 21.83 feet. Points in the Abalone Cove Landslide (AB points) west of the Portuguese Bend Landslide moved between 0.04 and 0.30 feet. Points in the Klondike Canyon (KC points) east of the Portuguese Bend Landslide moved between 0.04 and 0.16 feet. See the Contours of Horizontal Movement in the Appendix for a graphical representation of the movements across the site.

Velocity Analysis: Points moving 0.06 to 0.30 feet in the present period (11.3 month) are on average 2.5 times the movements for the previous period (11.1 months) and range 1.5 to 6 times. Points moving 0.74 to 21.83 feet (mostly PB points) in the present period are on average 1.1 times the movements for the previous period and range 0.7 to 2.7 times. This is about double the velocity for the former and half for the latter as reported in the October 2010 Report. The City Geologist should be referred to for assessment and interpretation of the movements.

See the attached "FULL DATA POSTING" spreadsheet for overall and periodic movements of each point. The movements are given in north, east and up or down as well as a vector of distance and direction relative to north. The direction is given as an azimuth in degrees where 0° is north and increases clockwise (180° is south). The overall movements are from the beginning position of each point which varies between 1994 and 2010.

The present listing and status of monitored points is provided in the Appendix under "Monitoring Point Status as of October 2011". The historical status of all monitoring points is provided in the September 2007 Survey Report. The historical 1994-2006 positions of all points are listed in the Charles Abbott Associates Inc. file "ALL POINTS MOST RECENT OBSERVED POSITION AS OF SEPTEMBER 15, 2006.xls" attached as an electronic file to the 2007 Report.

### **RECOMMENDATION**

A program was agreed on in the 2011 Planning Meeting for the establishment or replacement of monitoring points with deep set monuments to better detect sub-surface movements. An ongoing re-location program for monuments will have long term benefits resulting in lower survey costs and a better understanding of sub-surface movements. It is proposed that monuments as deep as 10 feet be constructed with the upper 4 feet separated from surface movement. Presently, monuments are believed to be within 2-4 feet of the surface. At the recommendation and direction of Robert Douglas, Geologist, 4 monuments will be constructed in the spring of 2012. A \$6500 budget has been set aside for this work. As discussed on Page 7, a temporary monument was set during the present survey about 160' south-southwest of AB06 and 90' northwest of AB07. Deep set monuments will be constructed nearby to replace the temporary monuments. Additionally, a new monument is to be set about 440' south-southeast of AB07 and a replacement monument 800' north-northeast of AB54.

**Attachments:** Find the following documents attached to this Report.

"FULL DATA POSTING" lists the coordinates of the initial positions and the overall and periodic movements of monitoring point since 2007 in NAD83(2007.00) State Plane Coordinates and NAVD88 Heights.

"COORDINATE LIST- October 3, 2011 Survey" current NAD83 (2007.00) Geodetic, Grid Coordinates, NAVD88 Heights of all points

### **SURVEYOR'S STATEMENT**

This Report on the criteria, procedures and results of the Rancho Palos Verdes Portuguese Landslide Monitoring Survey was prepared by me January 12, 2011 at the request of Ron Drago, Assistant City Engineer of the City of Rancho Palos Verdes.

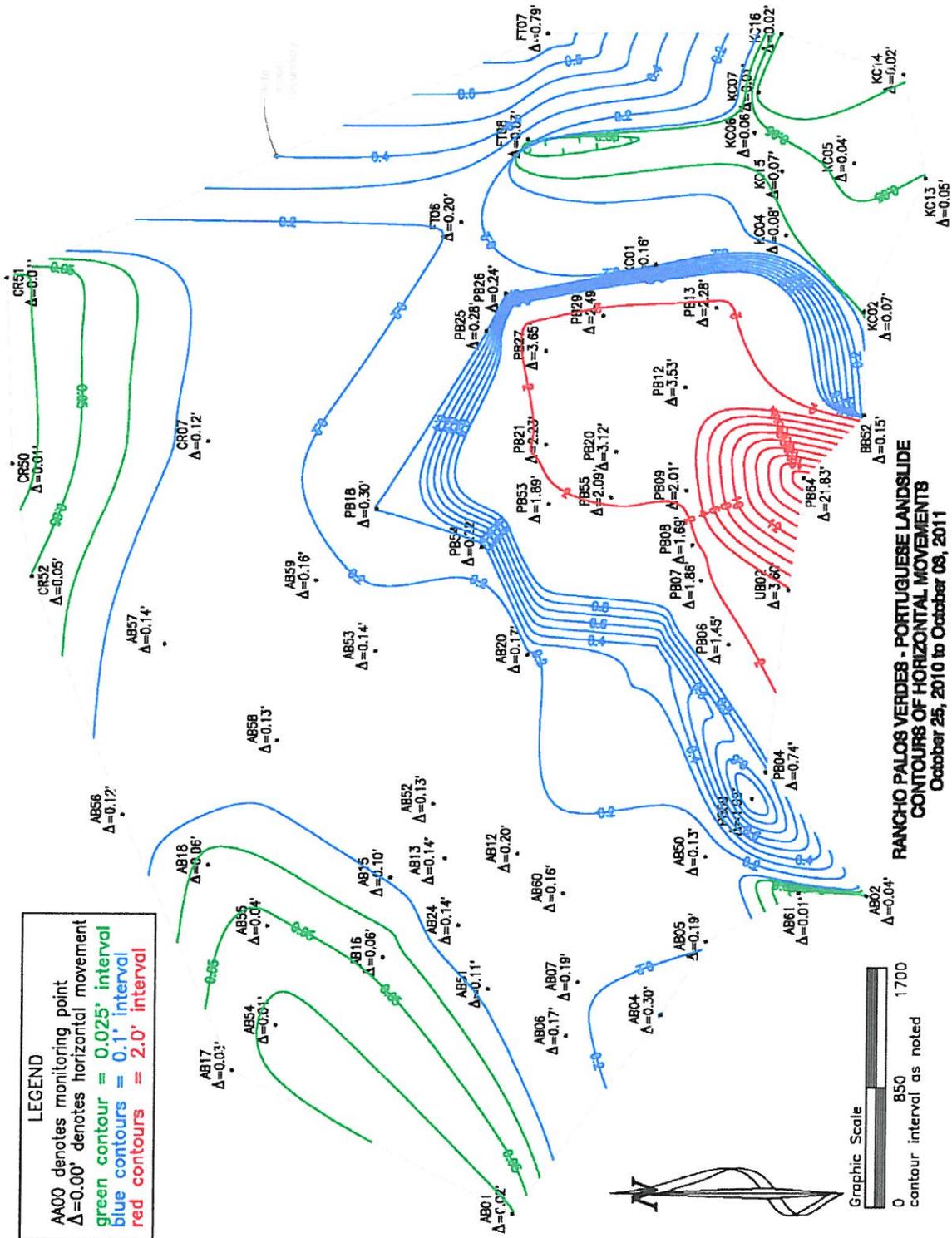
  
Michael R. McGee P.L.S. 3945

### **APPENDIX**

- 1- Contours of Horizontal Movements
- 2- Aerial Photo View of Monitoring Points
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- 4- Oblique Aerial View of Monitoring Points
- 5- Monitoring Point Status as of October 2011



1- Contours of Horizontal Movements (north left) Oct. 2010 to Oct. 2011 (Contours at 0.025, 0.10 and 2.00 feet providing a general visual representation of movements; see the City Geologist for interpretation of movements) (This is a general visual representation of movements; see the Full Data Posting for actual movements)



2- Aerial Photo View of Monitoring Points – (Photography Dated 03/08/2011) (north left)





McGEE SURVEYING CONSULTING

5- Monitoring Point Status as of October 2011

RANCHO PALOS VERDES - PORTUGUESE LAND SLIDE MONITORING							
Monitoring Point Status for 2012 Prepared 12/02/2011							
Notes:	154 Monitoring Points established since 1994						
Sep-07	71 Points Monitored: 60 old points found with 52 monitored plus 19 new points						
Dec-08	67 Points Monitored: AB09, KC11, PB51 discontinued; BB53 destroyed; AB05 disturbed						
Nov-09	68 Points Monitored: Set PB64 to replace PB63 destroyed subsequently						
Oct-10	65 Points Monitored: Discontinued AB03, BB25; set PB65 to replace PB62 destroyed by paving						
11-Oct	69 Points to Monitored: Set AB62R & AB63R to replace AB06 & AB07						
2012	67 Points to Monitor.; Discontinue AB06 & AB07; Add 2 new points AB62 & AB63						
Pt ID	Last Obs'd	Comments	GNSS	Pt ID	Last Obs'd	Comments	GNSS
AB01	10/3/2011	Base 1994-2006	G	FT06	10/3/2011		G
AB02	10/3/2011		G	FT07	10/3/2011		G
AB04	10/3/2011		G	FT08	10/3/2011		G
AB05	10/3/2011		G				
AB06	10/3/2011		G	KC01	10/3/2011	NE'ly of 2 pipes	G
AB07	10/3/2011		G	KC02	10/3/2011		G
AB12	10/3/2011		G	KC04	10/3/2011		G
AB13	10/3/2011		P	KC05	10/3/2011		G
AB15	10/3/2011		F	KC06	10/3/2011		G
AB16	10/3/2011		P	KC07	10/3/2011		G
AB17	10/3/2011		F	KC13	10/3/2011		G
AB18	10/3/2011		P	KC14	10/3/2011		G
AB20	10/3/2011	NE'ly of 2 pipes	G	KC15	10/3/2011		F
AB24	10/3/2011		F	KC16	10/3/2011		G
AB50	10/3/2011		G				
AB51	10/3/2011		G	PB04	10/3/2011		G
AB52	10/3/2011		P	PB06	10/3/2011		G
AB53	10/3/2011		F	PB07	10/3/2011		G
AB54	10/3/2011		P	PB08	10/3/2011		G
AB55	10/3/2011		G	PB09	10/3/2011		G
AB56	10/3/2011		F	PB12	10/3/2011		G
AB57	10/3/2011		G	PB13	10/3/2011		G
AB58	10/3/2011		P	PB18	10/3/2011		G
AB59	10/3/2011		G	PB20	10/3/2011	S'ly of 2 pipes	G
AB60	10/3/2011		G	PB21	10/3/2011		F
AB61	10/3/2011	BASE 2007+	G	PB25	10/3/2011		G
AB62R	11/13/2011	Replaces AB06	G	PB26	10/3/2011		F
AB63R	11/13/2011	Replaces AB07	G	PB27	10/3/2011		G
				PB29	10/3/2011		G
BB52	11/13/2011		G	PB53	10/3/2011		P
				PB54	10/3/2011		F
CR07	10/3/2011		F	PB55	10/3/2011		F
CR50	10/3/2011		G	PB59	10/3/2011		G
CR51	10/3/2011		G	PB64	10/3/2011	Replaced PB63	G
CR52	10/3/2011		P	PB65	10/3/2011	Replaced PB62	G
				UB02	10/3/2011		G
GNSS column indicates site is Good, Fair or Poor for Satellite Visibility Conditions							

# Attachments

Find the following documents attachments to this Report

FULL DATA POSTING - Lists the overall and periodic movements of monitoring point including coordinates of the initial positions, 2007 and post 2007 positions in NAD83(2007.00) and NAVD88 Systems

COORDINATE LIST- Current NAD83(2007.00) Geodetic, Grid Coordinates, NAVD88 Heights of all points

NAD83(2007) COORDINATES and NAVD88 ELEVATIONS of BEGINNING, 2007 & POST 2007 MONITORING POINT POSITIONS

Notes:

# Indicates stable points, not moving

\* Indicates no movement detected

1= 2005 and prior surveys used a nearby monument S31-29W 1.48', the original position is adjusted here to be relative to the 1" IP used presently, resulting in correct Overall Movements, see Reports

Point	Date	Original Positions			Sept. 24, 2007 Positions			Overall Movements (US Feet)						
		NAD83 SPC Zone 5 (Ft)		NAVD88	NAD83 SPC Zone 5 (Ft)		NAVD88	Original Position to Sept. 24, 2007		Azim.°	Dist.	Note		
		North (ft)	East (ft)	Elev(ft)	North (ft)	East (ft)	Elev(ft)	North	East				Height	
AB01	12/1/1994	1729427.58	6445709.61	178.62	1729427.55	6445709.64	178.62	-0.03	0.03	0.00	-	0	#	
AB02	11/30/1994	1726946.97	6447968.65	116.45	1726946.98	6447968.69	116.48	0.01	0.04	0.03	72	0.04	#	
AB03	12/1/1994	1727338.34	6447818.82	139.60	1727338.39	6447818.81	139.59	0.04	-0.01	-0.01	351	0.04	#	
AB04	11/30/1994	1728391.99	6447123.34	67.57	1728390.55	6447122.03	67.31	-1.44	-1.32	-0.26	222	1.95		
AB05	3/14/1995	1728075.72	6447645.17	80.90										
AB06	4/27/1995	1729059.73	6446976.26	165.28	1729058.58	6446975.91	164.91	-1.15	-0.35	-0.37	197	1.21		
AB07	11/30/1994	1728982.79	6447358.41	159.92	1728981.51	6447357.74	159.40	-1.28	-0.67	-0.52	208	1.44		
AB12	11/30/1994	1729416.49	6448271.64	283.43	1729415.67	6448271.30	283.19	-0.82	-0.35	-0.24	203	0.89		
AB13	11/30/1994	1729928.90	6448236.04	365.03	1729928.25	6448235.90	364.54	-0.65	-0.13	-0.49	192	0.66		
AB15	11/30/1994	1730312.09	6448099.38	397.28	1730311.64	6448099.31	396.90	-0.45	-0.07	-0.38	189	0.45		
AB16	11/30/1994	1730358.89	6447532.12	376.62	1730358.70	6447532.17	376.44	-0.19	0.04	-0.18	168	0.19		
AB17	11/30/1994	1731421.14	6446727.77	443.05	1731421.12	6446727.77	442.80	-0.02	0.00	-0.25	167	0.02	#	
AB18	12/1/1994	1731602.62	6448187.49	457.19	1731602.37	6448187.58	456.93	-0.26	0.09	-0.26	162	0.27		
AB20	3/16/1995	1729360.63	6449686.27	396.43	1729360.00	6449686.03	396.23	-0.62	-0.23	-0.20	201	0.67		
AB24	3/12/1997	1729830.35	6447759.96	335.92	1729829.83	6447759.82	335.74	-0.52	-0.14	-0.18	196	0.54		
AB50	1/16/1998	1728085.00	6448248.18	181.98	1728084.71	6448247.54	182.03	-0.29	-0.65	0.05	246	0.71		
AB51	3/22/2002	1729617.01	6447306.54	305.42	1729616.73	6447306.52	305.25	-0.28	-0.02	-0.17	184	0.28		
AB52	3/22/2002	1730016.10	6448624.44	368.61	1730015.79	6448624.36	368.39	-0.31	-0.08	-0.22	195	0.32		
AB53	3/22/2002	1730431.11	6449712.37	353.13	1730430.77	6449712.33	352.90	-0.34	-0.04	-0.23	187	0.34		
AB54	9/24/2007	1731111.94	6447047.87	407.31	1731111.94	6447047.87	407.31							
AB55	9/24/2007	1731174.77	6447753.57	405.38	1731174.77	6447753.57	405.38							
AB56	9/24/2007	1732214.31	6448545.46	571.65	1732214.31	6448545.46	571.65							
AB57	9/24/2007	1731926.91	6449759.36	564.93	1731926.91	6449759.36	564.93							
AB58	9/24/2007	1731118.02	6449074.93	405.67	1731118.02	6449074.93	405.67							
AB59	9/24/2007	1730850.87	6450212.56	434.37	1730850.87	6450212.56	434.37							
AB60	9/24/2007	1729089.70	6447987.57	179.45	1729089.70	6447987.57	179.45							
AB61	9/24/2007	1727424.50	6447990.26	140.47	1727424.50	6447990.26	140.47							
AB62	11/13/2011	Replacement for AB06												
AB63	11/13/2011	Replacement for AB07												
BB25	11/4/1998	1727200.54	6449932.73	3.81	1727200.25	6449932.73	4.12	-0.29	-0.01	0.31	182	0.29		
BB25	9/24/2007	1726996.36	6451384.38	3.83	1726996.36	6451384.38	3.83							
BB53	9/24/2007	1726831.16	6451840.89	13.81	1726831.16	6451840.89	13.81							
CR07	11/30/1994	1731628.78	6451203.19	633.28	1731628.37	6451203.29	632.48	-0.41	0.10	-0.80	166	0.42		
CR50	1/16/1998	1733013.55	6451037.38	873.04	1733013.62	6451037.38	872.66	0.07	0.00	-0.38	358	0.07		
CR51	1/16/1998	1733061.90	6452361.82	976.75	1733062.03	6452361.86	976.25	0.13	0.04	-0.50	17	0.14		
CR52	1/16/1998	1732867.54	6450239.34	780.01	1732867.58	6450239.32	779.63	0.03	-0.02	-0.38	333	0.04	#	
FT06	9/24/2007	1729855.61	6452760.21	489.06	1729855.61	6452760.21	489.06							
FT07	9/24/2007	1729253.24	6454104.75	589.01	1729253.24	6454104.75	589.01							
FT08	9/24/2007	1729388.68	6453350.51	658.44	1729388.68	6453350.51	658.44							
KC01	11/30/1994	1728476.78	6452458.23	312.88	1728476.36	6452457.91	312.42	-0.42	-0.32	-0.46	217	0.52	1	
KC02	3/14/1995	1727002.89	6452118.99	13.84	1727002.74	6452118.89	13.74	-0.15	-0.11	-0.10	216	0.18		
KC04	3/14/1995	1727559.56	6452667.24	238.84	1727559.46	6452667.09	238.51	-0.10	-0.15	-0.33	236	0.18		
KC05	11/30/1994	1727082.00	6453179.09	227.86	1727082.01	6453178.94	227.53	0.01	-0.15	-0.33	273	0.15		
KC06	11/30/1994	1727784.91	6453396.67	300.35	1727784.94	6453396.40	299.97	0.03	-0.26	-0.38	276	0.26		
KC07	11/30/1994	1727759.19	6453683.92	313.83	1727759.37	6453683.85	313.51	0.18	-0.07	-0.32	340	0.19		
KC13	9/24/2007	1726581.16	6453069.63	191.20	1726581.16	6453069.63	191.20							
KC14	9/24/2007	1726742.44	6453806.05	259.94	1726742.44	6453806.05	259.94							
KC15	9/24/2007	1727590.45	6453121.10	287.10	1727590.45	6453121.10	287.10							
KC16	9/24/2007	1727602.25	6454098.23	326.90	1727602.25	6454098.23	326.90							
PB04	11/30/1994	1727675.94	6448851.74	170.52	1727667.25	6448849.17	167.49	-8.69	-2.57	-3.03	196	9.06		
PB06	3/15/1995	1727968.45	6449761.84	183.06	1727941.12	6449758.81	178.25	-27.33	-3.03	-4.81	186	27.50		
PB07	3/14/1995	1728175.93	6450219.76	200.21	1728141.60	6450213.44	198.02	-34.32	-6.32	-2.19	190	34.90		
PB08	12/1/1994	1728237.51	6450469.80	193.68	1728204.81	6450463.98	194.09	-32.70	-5.82	0.41	190	33.21		
PB09	11/30/1994	1728288.58	6450851.02	192.52	1728252.20	6450849.11	189.84	-36.38	-1.91	-2.68	183	36.43		
PB12	11/30/1994	1728330.49	6451604.57	193.29	1728268.52	6451587.83	186.93	-61.97	-16.74	-6.36	195	64.19		
PB13	3/14/1995	1728085.97	6452164.34	210.54	1728050.44	6452151.18	207.21	-35.53	-13.16	-3.33	200	37.89		
PB18	3/15/1995	1730446.88	6450711.00	367.58	1730431.80	6450719.76	363.24	-15.08	8.77	-4.34	150	17.44		
PB20	3/14/1995	1728812.77	6451135.67	243.54	1728753.50	6451126.52	234.48	-59.27	-9.16	-9.06	189	59.97		
PB21	3/14/1995	1729298.22	6451172.05	280.02	1729249.90	6451177.92	273.29	-48.32	5.87	-6.73	173	48.68		
PB25	12/1/1994	1729702.31	6451985.65	328.99	1729671.12	6451986.48	326.10	-31.19	0.83	-2.89	178	31.20		
PB26	3/14/1995	1729562.65	6452249.56	285.34	1729539.22	6452252.23	282.95	-23.42	2.67	-2.39	174	23.58		
PB27	3/14/1995	1729339.34	6451836.06	284.42	1729257.91	6451842.02	273.51	-81.43	5.96	-10.91	176	81.65		
PR29	3/15/1995	1728888.95	6452120.49	185.93	1728849.86	6452097.03	173.29	-39.08	-23.46	-12.64	211	45.58		
PS53	12/4/1997	1729252.77	6450753.92	297.75	1729224.25	6450754.60	291.85	-28.52	0.67	-5.90	179	28.53		
PS54	12/4/1997	1729694.90	6450448.69	358.62	1729691.38	6450448.62	357.73	-3.52	-0.07	-0.89	181	3.52		
PS55	1/21/1998	1728812.28	6450804.04	246.33	1728782.51	6450801.87	241.07	-29.77	-2.18	-5.26	184	29.85		
PS59	6/26/2001	1727766.36	6448661.67	163.39	1727761.30	6448660.42	160.61	-5.07	-1.24	-2.78	194	5.22		
PB62	9/24/2007	1728476.64	6449717.56	287.25	1728476.64	6449717.56	287.25							
PB63	9/24/2007	1727734.04	6451488.11	126.06	1727734.04	6451488.11	126.06							
PB64	11/18/2009	1727466.29	6450946.95	72.76										
PB65	10/25/2010	1728454.67	6449707.82	287.75										
UB02	7/23/1997	1727581.11	6450133.78	67.15	1727534.46	6450140.57	63.20	-46.66	6.78	-3.95	172	47.15		

PORTUGUESE POINT LANDSLIDE MONITORING - FULL DATA POSTING as of Dec.2008  
 Prepared by McGee Surveying Consulting - Document Date: 12/02/11

Notes:

# Indicates stable points, not moving

\* Indicates no movement detected

2 = Hit by mower sometime between 09/07 and 12/08 with an estimated displacement \$14E 0.29', the original position is adjusted here to be relative to monitored position used presently, resulting in correct Overall Movements, see Rpt

Point	Dec. 10, 2008 Positions			Overall Movements (US Feet)						Periodic (14.5 months) Movements (US Feet)						
	NAD83 SPC Zone 5 (Ft)			Original Position to Dec. 10, 2008						Sept. 24, 2007 Position to Dec. 10, 2008						
	North (ft)	East (ft)	Elev(ft)	North	East	Height	Azim.	Dist.	Note	North	East	Height	Azimuth	Distance	95%Error	Note
AB01	1729427.54	6445709.63	178.59	-0.05	0.02	-0.03	161	0.05	#	-0.01	-0.01	-0.03	231	0.02	0.017	#
AB02	1726946.99	6447968.68	116.46	0.02	0.03	0.01	61	0.03	#	0.00	-0.01	-0.02	297	0.01	0.016	#
AB03	1727338.39	6447818.81	139.58	0.04	-0.01	-0.02	348	0.04	#	0.00	0.00	-0.01	270	0.00	0.015	#
AB04	1728390.43	6447121.92	67.27	-1.56	-1.43	-0.30	222	2.12		-0.12	-0.11	-0.04	222	0.16	0.016	
AB05	1728074.86	6447644.04	80.59	-0.86	-1.13	-0.31	233	1.42	2							2
AB06	1729058.49	6446975.88	164.85	-1.24	-0.38	-0.43	197	1.30		-0.09	-0.03	-0.06	198	0.09	0.019	
AB07	1728981.40	6447357.70	159.34	-1.39	-0.71	-0.58	207	1.56		-0.11	-0.04	-0.06	202	0.12	0.021	
AB12	1729415.57	6448271.26	283.19	-0.92	-0.38	-0.24	203	0.99		-0.10	-0.03	0.00	199	0.11	0.018	
AB13	1729928.17	6448235.89	364.54	-0.73	-0.15	-0.49	192	0.74		-0.08	-0.01	0.00	191	0.08	0.019	
AB15	1730311.56	6448099.30	396.88	-0.53	-0.08	-0.40	189	0.53		-0.08	-0.01	-0.02	188	0.08	0.024	
AB16	1730358.65	6447532.17	376.46	-0.24	0.05	-0.16	168	0.24		-0.05	0.01	0.02	170	0.05	0.024	
AB17	1731421.12	6446727.77	442.79	-0.02	0.00	-0.26	171	0.02	#	0.00	0.00	-0.01	194	0.00	0.020	#
AB18	1731602.31	6448187.61	456.91	-0.32	0.11	-0.28	160	0.34		-0.06	0.03	-0.02	155	0.07	0.023	
AB20	1729359.84	6449685.99	396.23	-0.79	-0.28	-0.20	199	0.83		-0.16	-0.04	0.00	195	0.17	0.012	
AB24	1729829.75	6447759.77	335.76	-0.61	-0.19	-0.16	197	0.63		-0.09	-0.04	0.02	205	0.10	0.022	
AB50	1728084.66	6448247.47	181.98	-0.34	-0.71	0.00	245	0.79		-0.05	-0.07	-0.05	235	0.08	0.019	
AB51	1729616.65	6447306.51	305.26	-0.36	-0.03	-0.16	185	0.36		-0.09	-0.01	0.01	190	0.09	0.019	
AB52	1730015.70	6448624.32	368.38	-0.40	-0.12	-0.23	196	0.42		-0.10	-0.03	-0.01	200	0.10	0.028	
AB53	1730430.62	6449712.30	352.90	-0.49	-0.07	-0.23	188	0.50		-0.15	-0.03	0.00	189	0.15	0.028	
AB54	1731111.93	6447047.87	407.30	-0.01	0.00	-0.01	165	0.01	*	-0.01	0.00	-0.01	165	0.01	0.028	*
AB55	1731174.72	6447753.58	405.39	-0.05	0.01	0.01	166	0.05		-0.05	0.01	0.01	166	0.05	0.018	
AB56	1732214.21	6448545.49	571.64	-0.10	0.03	-0.01	161	0.11		-0.10	0.03	-0.01	161	0.11	0.018	
AB57	1731926.78	6449759.40	564.90	-0.13	0.03	-0.03	166	0.13		-0.13	0.03	-0.03	166	0.13	0.018	
AB58	1731117.90	6449074.93	405.65	-0.12	0.00	-0.02	178	0.12		-0.12	0.00	-0.02	178	0.12	0.020	
AB59	1730850.70	6450212.53	434.35	-0.17	-0.02	-0.02	188	0.17		-0.17	-0.02	-0.02	188	0.17	0.020	
AB60	1729089.63	6447987.54	179.39	-0.08	-0.03	-0.06	200	0.08		-0.08	-0.03	-0.06	200	0.08	0.021	
AB61	1727424.49	6447990.27	140.43	-0.01	0.01	-0.04	114	0.01	*	-0.01	0.01	-0.04	114	0.01	0.003	#
BB25	1727200.25	6449932.58	4.15	-0.29	-0.16	0.34	208	0.33		0.00	-0.15	0.03	269	0.15	0.017	
BB52	1726996.24	6451384.35	3.83	-0.12	-0.03	0.00	194	0.13		-0.12	-0.03	0.00	194	0.13	0.024	
BB53	Destroyed															
CR07	1731628.24	6451203.32	632.36	-0.54	0.13	-0.92	166	0.55		-0.13	0.03	-0.12	168	0.13	0.024	
CR50	1733013.62	6451037.38	872.71	0.08	0.01	-0.33	5	0.08		0.01	0.01	0.05	45	0.01	0.017	*
CR51	1733062.02	6452361.86	976.24	0.12	0.04	-0.51	20	0.13		-0.01	0.00	-0.01	171	0.01	0.019	*
CR52	1732867.58	6450239.31	779.64	0.03	-0.03	-0.37	315	0.04		0.00	-0.01	0.01	258	0.01	0.023	*
FT06	1729855.42	6452760.17	488.97	-0.19	-0.04	-0.09	192	0.19		-0.19	-0.04	-0.09	192	0.19	0.025	
FT07	1729253.01	6454104.39	588.99	-0.23	-0.36	-0.02	237	0.43		-0.23	-0.36	-0.02	237	0.43	0.015	
FT08	1729388.67	6453350.53	658.47	-0.01	0.02	0.03	114	0.02		-0.01	0.02	0.03	114	0.02	0.015	*
KC01	1728476.25	6452457.85	312.38	-0.53	-0.38	-0.50	215	0.66	1	-0.12	-0.06	-0.04	208	0.13	0.020	
KC02	1727002.67	6452118.88	13.72	-0.22	-0.11	-0.12	207	0.25		-0.07	-0.01	-0.02	185	0.07	0.021	
KC04	1727559.42	6452667.06	238.47	-0.14	-0.18	-0.37	233	0.23		-0.04	-0.04	-0.04	223	0.05	0.017	
KC05	1727081.98	6453178.94	227.52	-0.02	-0.15	-0.34	261	0.15		-0.03	0.00	-0.01	180	0.03	0.020	
KC06	1727784.92	6453396.36	299.93	0.01	-0.30	-0.42	273	0.30		-0.01	-0.04	-0.04	252	0.05	0.021	
KC07	1727759.38	6453683.87	313.50	0.18	-0.05	-0.33	346	0.19		0.00	0.02	-0.01	84	0.02	0.018	*
KC13	1726581.12	6453069.62	191.23	-0.04	-0.01	0.03	194	0.04		-0.04	-0.01	0.03	194	0.04	0.018	
KC14	1726742.44	6453806.04	259.91	0.00	-0.02	-0.03	259	0.02	*	0.00	-0.02	-0.03	259	0.02	0.020	*
KC15	1727590.41	6453121.06	287.13	-0.05	-0.04	0.03	220	0.06		-0.05	-0.04	0.03	220	0.06	0.022	
KC16	1727602.24	6454098.24	326.92	-0.01	0.00	0.02	135	0.01	*	-0.01	0.00	0.02	135	0.01	0.016	*
PB04	1727666.83	6448849.07	167.37	-9.10	-2.67	-3.15	196	9.49		-0.41	-0.10	-0.12	194	0.43	0.017	
PB06	1727939.65	6449758.62	177.96	-28.80	-3.22	-5.10	186	28.98		-1.47	-0.18	-0.29	187	1.48	0.021	
PB07	1728139.82	6450213.09	197.88	-36.10	-6.67	-2.33	190	36.72		-1.78	-0.35	-0.14	191	1.82	0.020	
PB08	1728203.20	6450463.68	194.13	-34.31	-6.12	0.45	190	34.85		-1.61	-0.30	0.04	190	1.64	0.024	
PB09	1728250.32	6450848.98	189.58	-38.26	-2.04	-2.94	183	38.31		-1.88	-0.13	-0.26	184	1.88	0.021	
PB12	1728265.36	6451586.81	186.31	-65.13	-17.76	-6.98	195	67.51		-3.16	-1.03	-0.62	198	3.32	0.019	
PB13	1728048.48	6452150.38	207.09	-37.49	-13.96	-3.45	200	40.01		-1.96	-0.80	-0.12	202	2.12	0.019	
PB18	1730431.47	6450719.84	363.18	-15.41	8.85	-4.40	150	17.77		-0.33	0.08	-0.06	166	0.34	0.020	
PB20	1728750.65	6451126.05	233.99	-62.12	-9.63	-9.55	189	62.86		-2.85	-0.47	-0.49	189	2.89	0.020	
PB21	1729247.73	6451178.08	273.02	-50.49	6.03	-7.00	173	50.85		-2.17	0.16	-0.27	176	2.17	0.021	
PB25	1729670.88	6451986.42	326.07	-31.44	0.77	-2.92	179	31.45		-0.25	-0.07	-0.03	195	0.26	0.019	
PB26	1729539.03	6452252.21	282.94	-23.62	2.65	-2.40	174	23.77		-0.20	-0.02	-0.01	187	0.20	0.018	
PB27	1729254.41	6451842.14	272.98	-84.93	6.08	-11.44	176	85.15		-3.50	0.13	-0.53	178	3.50	0.023	
PB29	1728847.75	6452096.03	172.60	-41.20	-24.46	-13.33	211	47.91		-2.11	-1.01	-0.69	205	2.34	0.020	
PB53	1729222.48	6450754.60	291.44	-30.28	0.68	-6.31	179	30.29		-1.76	0.00	-0.41	180	1.76	0.024	
PB54	1729691.20	6450448.58	357.73	-3.70	-0.11	-0.89	182	3.70		-0.18	-0.04	0.00	193	0.18	0.019	
PB55	1728780.51	6450801.66	240.62	-31.77	-2.38	-5.71	184	31.86		-2.01	-0.21	-0.45	186	2.02	0.031	
PB59	1727760.70	6448660.28	160.34	-5.66	-1.39	-3.05	194	5.83		-0.59	-0.15	-0.27	194	0.61	0.017	
PB62	1728476.42	6449717.52	287.22	-0.21	-0.04	-0.03	192	0.22		-0.21	-0.04	-0.03	192	0.22	0.016	
PB63	1727724.58	6451485.79	121.78	-9.45	-2.32	-4.28	194	9.73		-9.45	-2.32	-4.28	194	9.73	0.020	
UB02	1727530.48	6450141.10	63.00	-50.63	7.31	-4.15	172	51.16		-3.97	0.53	-0.20	172	4.01	0.023	

PORTUGUESE POINT LANDSLIDE MONITORING - FULL DATA POSTING as of Nov. 2009  
 Prepared by McGee Surveying Consulting - Document Date: 12/02/11

Notes:

- # Indicates stable points, not moving
- \* Indicates no movement detected

Point	Nov. 18, 2009 Positions			Overall Movements (US Feet)						Periodic (11.3 months) Movements (US Feet)						
	NAD83 SPC Zone 5 (FT)			Original Position to Nov. 18, 2009						Dec. 10, 2008 Position to Nov. 18, 2009						
	North (ft)	East (ft)	Elev(ft)	North	East	Height	Azim. <sup>o</sup>	Dist.	Note	North	East	Height	Azim. <sup>o</sup>	Dist.	95%Error	Note
AB01	1729427.54	6445709.62	178.540	-0.04	0.01	-0.08	167	0.04		0.00	-0.01	-0.05	304	0.01	0.020	#
AB02	1726946.97	6447968.68	116.460	0.00	0.03	0.01	95	0.03	*	-0.02	0.00	0.00	171	0.02	0.020	#
AB03	1727338.38	6447818.82	139.570	0.04	0.00	-0.03	4	0.04		-0.01	0.01	-0.01	117	0.01	0.017	#
AB04	1728390.36	6447121.86	67.250	-1.63	-1.48	-0.32	222	2.20		-0.07	-0.05	-0.02	217	0.09	0.019	
AB05	1728074.78	6447643.96	80.570	-0.94	-1.21	-0.33	232	1.53		-0.08	-0.08	-0.02	226	0.11	0.018	
AB06	1729058.43	6446975.87	164.840	-1.31	-0.39	-0.44	197	1.36		-0.06	-0.01	-0.01	191	0.06	0.019	
AB07	1728981.35	6447357.67	159.330	-1.44	-0.74	-0.59	207	1.62		-0.05	-0.03	-0.01	207	0.06	0.022	
AB12	1729415.50	6448271.24	283.190	-0.98	-0.41	-0.24	203	1.07		-0.07	-0.03	0.00	202	0.07	0.019	
AB13	1729928.13	6448235.87	364.540	-0.77	-0.16	-0.49	192	0.78		-0.04	-0.02	0.00	201	0.04	0.020	
AB15	1730311.51	6448099.30	396.880	-0.57	-0.08	-0.40	188	0.58		-0.05	0.00	0.00	180	0.05	0.026	
AB16	1730358.64	6447532.17	376.450	-0.25	0.04	-0.17	170	0.25		-0.01	-0.01	-0.01	203	0.02	0.021	*
AB17	1731421.11	6446727.77	442.800	-0.03	0.00	-0.25	173	0.03	*	0.00	0.00	0.01	180	0.00	0.019	#
AB18	1731602.26	6448187.60	456.870	-0.36	0.11	-0.32	163	0.38		-0.04	-0.01	-0.04	189	0.04	0.025	
AB20	1729359.78	6449685.97	396.230	-0.85	-0.30	-0.20	199	0.90		-0.06	-0.02	0.00	200	0.06	0.013	
AB24	1729829.68	6447759.75	335.760	-0.67	-0.21	-0.16	197	0.70		-0.06	-0.02	0.00	198	0.07	0.024	
AB50	1728084.64	6448247.44	182.000	-0.36	-0.74	0.02	244	0.83		-0.02	-0.03	0.02	238	0.04	0.024	
AB51	1729616.60	6447306.48	305.250	-0.41	-0.06	-0.17	188	0.41		-0.04	-0.02	-0.01	208	0.05	0.020	
AB52	1730015.65	6448624.32	368.350	-0.45	-0.12	-0.26	195	0.47		-0.05	0.00	-0.03	181	0.05	0.031	
AB53	1730430.55	6449712.28	352.890	-0.55	-0.09	-0.24	189	0.56		-0.06	-0.02	-0.01	198	0.06	0.026	
AB54	1731111.92	6447047.87	407.360	-0.03	0.00	0.05	178	0.03	*	-0.02	0.00	0.06	187	0.02	0.029	*
AB55	1731174.68	6447753.58	405.390	-0.09	0.02	0.01	169	0.09		-0.04	0.01	0.00	171	0.04	0.017	
AB56	1732214.16	6448545.51	571.690	-0.15	0.05	0.04	162	0.16		-0.05	0.02	0.05	164	0.05	0.024	
AB57	1731926.73	6449759.41	564.860	-0.18	0.04	-0.07	166	0.18		-0.05	0.01	-0.04	167	0.05	0.022	
AB58	1731117.85	6449074.94	405.640	-0.17	0.01	-0.03	175	0.17		-0.05	0.01	-0.01	168	0.05	0.022	
AB59	1730850.64	6450212.52	434.340	-0.23	-0.03	-0.03	188	0.23		-0.06	-0.01	-0.01	190	0.06	0.022	
AB60	1729089.58	6447987.53	179.390	-0.12	-0.04	-0.06	199	0.13		-0.04	-0.01	0.00	196	0.05	0.019	
AB61	1727424.49	6447990.27	140.420	-0.01	0.01	-0.05	128	0.02	*	0.00	0.00	-0.01	158	0.01	0.004	#
BB25	1727200.19	6449932.57	4.210	-0.35	-0.16	0.40	204	0.39		-0.06	0.00	0.06	183	0.06	0.024	
BB52	1726996.18	6451384.34	3.860	-0.18	-0.04	0.03	193	0.19		-0.06	-0.01	0.03	191	0.06	0.019	
CR07	1731628.18	6451203.34	632.390	-0.60	0.15	-0.89	166	0.62		-0.06	0.02	0.03	161	0.07	0.024	
CR50	1733013.61	6451037.39	872.690	0.06	0.01	-0.35	10	0.06		-0.01	0.00	-0.02	162	0.02	0.022	*
CR51	1733062.01	6452361.87	976.220	0.11	0.05	-0.53	26	0.12		-0.01	0.01	-0.02	143	0.02	0.024	*
CR52	1732867.56	6450239.31	779.730	0.02	-0.03	-0.28	300	0.03	*	-0.01	0.00	0.09	176	0.01	0.026	*
FT06	1729855.34	6452760.16	488.920	-0.27	-0.05	-0.14	191	0.28		-0.08	-0.01	-0.05	189	0.08	0.020	
FT07	1729252.92	6454104.25	588.900	-0.33	-0.51	-0.11	237	0.60		-0.10	-0.14	-0.09	236	0.17	0.020	
FT08	1729388.69	6453350.52	658.480	0.00	0.02	0.04	74	0.02	*	0.01	0.00	0.01	348	0.01	0.027	#
KC01	1728476.18	6452457.81	312.350	-0.60	-0.42	-0.53	215	0.74		-0.07	-0.04	-0.03	209	0.08	0.019	
KC02	1727002.64	6452118.86	13.690	-0.26	-0.13	-0.15	207	0.29		-0.03	-0.02	-0.03	207	0.04	0.021	
KC04	1727559.39	6452667.04	238.450	-0.17	-0.20	-0.39	231	0.27		-0.03	-0.02	-0.02	216	0.04	0.019	
KC05	1727081.97	6453178.92	227.510	-0.03	-0.17	-0.35	259	0.18		-0.01	-0.02	-0.01	244	0.03	0.020	
KC06	1727784.90	6453396.33	299.910	-0.01	-0.33	-0.44	268	0.33		-0.02	-0.03	-0.02	227	0.04	0.025	
KC07	1727759.37	6453683.87	313.470	0.18	-0.05	-0.36	344	0.19		0.00	0.00	-0.03	256	0.00	0.021	*
KC13	1726581.11	6453069.63	191.180	-0.04	-0.01	-0.02	188	0.04		-0.01	0.00	-0.05	153	0.01	0.017	*
KC14	1726742.43	6453806.03	259.920	-0.01	-0.03	-0.02	253	0.03	*	0.00	-0.01	0.01	247	0.01	0.023	*
KC15	1727590.38	6453121.03	287.090	-0.07	-0.06	-0.01	222	0.09		-0.02	-0.02	-0.04	226	0.03	0.027	
KC16	1727602.24	6454098.24	326.870	-0.01	0.00	-0.03	159	0.01	*	0.00	0.00	-0.05	214	0.00	0.018	#
PB04	1727666.56	6448848.99	167.310	-9.38	-2.75	-3.21	196	9.77		-0.27	-0.07	-0.06	195	0.28	0.020	
PB06	1727938.80	6449758.52	177.820	-29.65	-3.32	-5.24	186	29.83		-0.85	-0.10	-0.14	187	0.85	0.022	
PB07	1728138.83	6450212.89	197.800	-37.09	-6.86	-2.41	190	37.72		-0.99	-0.19	-0.08	191	1.01	0.019	
PB08	1728202.31	6450463.52	194.120	-35.20	-6.28	0.44	190	35.75		-0.89	-0.16	-0.01	190	0.90	0.020	
PB09	1728249.30	6450848.91	189.460	-39.28	-2.11	-3.06	183	39.34		-1.02	-0.07	-0.12	184	1.02	0.022	
PB12	1728263.70	6451586.25	185.940	-66.79	-18.32	-7.35	195	69.25		-1.66	-0.55	-0.37	199	1.75	0.022	
PB13	1728047.43	6452149.98	206.980	-38.54	-14.36	-3.56	200	41.13		-1.05	-0.41	-0.11	201	1.12	0.019	
PB18	1730431.35	6450719.86	363.140	-15.53	8.87	-4.44	150	17.89		-0.12	0.02	-0.04	170	0.12	0.021	
PB20	1728749.18	6451125.82	233.690	-63.59	-9.86	-9.85	189	64.35		-1.47	-0.23	-0.30	189	1.49	0.022	
PB21	1729246.60	6451178.17	272.840	-51.62	6.12	-7.18	173	51.98		-1.13	0.09	-0.18	175	1.14	0.024	
PB25	1729670.78	6451986.39	326.040	-31.53	0.74	-2.95	179	31.54		-0.09	-0.02	-0.03	194	0.10	0.022	
PB26	1729538.93	6452252.19	282.930	-23.71	2.63	-2.41	174	23.86		-0.09	-0.02	-0.01	190	0.10	0.022	
PB27	1729252.59	6451842.20	272.730	-86.75	6.14	-11.69	176	86.97		-1.82	0.06	-0.25	178	1.82	0.026	
PB29	1728846.62	6452095.51	172.230	-42.32	-24.98	-13.70	211	49.15		-1.13	-0.52	-0.37	205	1.24	0.022	
PB53	1729221.54	6450754.61	291.200	-31.22	0.68	-6.55	179	31.23		-0.94	0.01	-0.24	180	0.94	0.026	
PB54	1729691.12	6450448.57	357.710	-3.78	-0.12	-0.91	182	3.78		-0.08	-0.01	-0.02	188	0.08	0.023	
PB55	1728779.41	6450801.58	240.500	-32.87	-2.47	-5.83	184	32.97		-1.10	-0.08	-0.12	184	1.10	0.030	
PB59	1727760.31	6448660.19	160.160	-6.05	-1.48	-3.23	194	6.23		-0.39	-0.09	-0.18	193	0.40	0.020	
PB62	1728476.31	6449717.49	287.200	-0.32	-0.07	-0.05	192	0.33		-0.11	-0.02	-0.02	193	0.11	0.017	
PB63	1727717.72	6451483.29	116.990	-16.31	-4.82	-9.07	196	17.01		-6.86	-2.50	-4.79	200	7.30	0.022	
PB64	1727466.29	6450946.95	72.760													
UB02	1727527.87	6450141.46	62.920	-53.24	7.67	-4.23	172	53.79		-2.61	0.36	-0.08	172	2.64	0.022	

PORTUGUESE POINT LANDSLIDE MONITORING - FULL DATA POSTING as of Oct. 2010  
 Prepared by McGee Surveying Consulting - Document Date: 12/02/11

Notes:

\* Indicates no movement detected

Point	Oct. 25, 2010 Positions			Overall Movements (US Feet)						Periodic (11.1 months) Movements (US Feet)						
	NAD83 SPC Zone 5 (Ft)		NAVD88	Original Position to Oct. 25, 2010						Nov. 18, 2009 Position to Oct. 25, 2010						
	North (ft)	East (ft)	Elev.(ft)	North	East	Height	Azim.°	Dist.	Note	North	East	Height	Azim.°	Dist.	95%Error	Note
AB01	1729427.53	6445709.61	178.52	-0.05	-0.01	-0.10	187	0.05		-0.01	-0.02	-0.02	241	0.02	0.032	*
AB02	1726946.97	6447968.66	116.45	0.00	0.01	0.00	111	0.01	*	0.00	-0.02	-0.01	270	0.02	0.024	*
AB03	Discontinued															
AB04	1728390.27	6447121.79	67.25	-1.72	-1.56	-0.32	222	2.32		-0.09	-0.08	0.00	220	0.12	0.023	
AB05	1728074.67	6447643.89	80.53	-1.05	-1.28	-0.37	231	1.66		-0.12	-0.07	-0.04	211	0.14	0.026	
AB06	1729058.36	6446975.83	164.82	-1.37	-0.43	-0.46	197	1.44		-0.07	-0.03	-0.02	207	0.07	0.026	
AB07	1728981.28	6447357.64	159.31	-1.51	-0.77	-0.61	207	1.70		-0.07	-0.03	-0.02	207	0.08	0.032	
AB12	1729415.46	6448271.20	283.20	-1.03	-0.44	-0.23	203	1.12		-0.04	-0.04	0.01	219	0.06	0.017	
AB13	1729928.09	6448235.85	364.53	-0.81	-0.19	-0.50	193	0.83		-0.04	-0.02	-0.01	208	0.05	0.021	
AB15	1730311.47	6448099.25	396.86	-0.62	-0.14	-0.42	192	0.63		-0.04	-0.05	-0.02	232	0.07	0.023	
AB16	1730358.61	6447532.16	376.46	-0.28	0.03	-0.16	173	0.28		-0.03	-0.01	0.01	197	0.03	0.028	*
AB17	1731421.10	6446727.76	442.80	-0.04	-0.01	-0.25	188	0.04		-0.01	-0.01	0.00	217	0.01	0.021	*
AB18	1731602.22	6448187.61	456.82	-0.40	0.12	-0.37	164	0.42		-0.04	0.01	-0.05	165	0.04	0.031	
AB20	1729359.72	6449685.94	396.23	-0.90	-0.32	-0.20	200	0.96		-0.06	-0.02	0.00	203	0.06	0.012	
AB24	1729829.65	6447759.73	335.77	-0.71	-0.23	-0.15	198	0.75		-0.04	-0.02	0.01	212	0.04	0.024	
AB50	1728084.62	6448247.38	182.00	-0.38	-0.80	0.02	244	0.89		-0.02	-0.06	0.00	247	0.06	0.031	
AB51	1729616.56	6447306.49	305.24	-0.45	-0.05	-0.18	186	0.45		-0.05	0.01	-0.01	172	0.05	0.022	
AB52	1730015.61	6448624.30	368.38	-0.49	-0.14	-0.23	196	0.51		-0.04	-0.02	0.03	209	0.04	0.037	
AB53	1730430.49	6449712.26	352.91	-0.61	-0.11	-0.22	190	0.62		-0.06	-0.02	0.02	196	0.07	0.027	
AB54	1731111.92	6447047.87	407.34	-0.02	0.00	0.03	182	0.02		0.00	0.00	-0.02	326	0.00	0.036	*
AB55	1731174.66	6447753.58	405.40	-0.11	0.02	0.02	171	0.11		-0.02	0.00	0.01	183	0.02	0.018	*
AB56	1732214.12	6448545.51	571.63	-0.19	0.05	-0.02	165	0.20		-0.04	0.00	-0.06	179	0.04	0.028	
AB57	1731926.67	6449759.42	564.92	-0.23	0.06	-0.01	165	0.24		-0.05	0.01	0.06	164	0.06	0.027	
AB58	1731117.80	6449074.93	405.69	-0.22	0.00	0.02	180	0.22		-0.05	-0.01	0.05	196	0.05	0.026	
AB59	1730850.56	6450212.51	434.35	-0.31	-0.04	-0.02	188	0.31		-0.08	-0.01	0.01	185	0.08	0.028	
AB60	1729089.53	6447987.50	179.42	-0.17	-0.07	-0.03	201	0.18		-0.05	-0.02	0.03	207	0.06	0.020	
AB61	1727424.48	6447990.27	140.47	-0.02	0.01	0.00	150	0.02	*	-0.01	0.00	0.05	193	0.01	0.005	*
BB25	Discontinued															
BB52	1726996.13	6451384.34	3.85	-0.23	-0.04	0.02	190	0.24		-0.05	0.00	-0.01	180	0.05	0.029	
BB53	Destroyed															
CR07	1731628.12	6451203.32	632.33	-0.66	0.13	-0.95	169	0.67		-0.06	-0.02	-0.06	202	0.06	0.027	
CR50	1733013.59	6451037.37	872.67	0.04	0.00	-0.37	354	0.04		-0.02	-0.02	-0.02	217	0.03	0.023	
CR51	1733062.01	6452361.88	976.18	0.11	0.06	-0.57	29	0.12		0.00	0.01	-0.04	98	0.01	0.026	*
CR52	1732867.55	6450239.31	779.65	0.01	-0.03	-0.36	283	0.03	*	-0.01	0.00	-0.08	186	0.01	0.031	*
FT06	1729855.25	6452760.13	488.89	-0.35	-0.08	-0.17	193	0.36		-0.08	-0.03	-0.03	199	0.09	0.019	
FT07	1729252.76	6454104.00	588.85	-0.49	-0.75	-0.16	237	0.90		-0.16	-0.25	-0.05	237	0.30	0.026	
FT08	1729388.66	6453350.51	658.43	-0.02	0.00	-0.01	166	0.02	*	-0.02	-0.01	-0.05	206	0.03	0.028	*
KC01	1728476.12	6452457.77	312.38	-0.67	-0.46	-0.50	215	0.81		-0.06	-0.04	0.03	216	0.07	0.023	
KC02	1727002.62	6452118.86	13.72	-0.28	-0.14	-0.12	206	0.31		-0.02	-0.01	0.03	197	0.02	0.033	*
KC04	1727559.36	6452667.01	238.44	-0.20	-0.23	-0.40	228	0.30		-0.03	-0.02	-0.01	215	0.04	0.027	
KC05	1727081.96	6453178.92	227.47	-0.04	-0.17	-0.39	256	0.18		-0.01	0.00	-0.04	180	0.01	0.029	*
KC06	1727784.89	6453396.32	299.89	-0.02	-0.35	-0.46	266	0.35		-0.01	-0.02	-0.02	233	0.02	0.027	*
KC07	1727759.39	6453683.87	313.47	0.19	-0.04	-0.36	347	0.20		0.01	0.01	0.00	32	0.01	0.031	*
KC13	1726581.08	6453069.61	191.18	-0.07	-0.02	-0.02	195	0.08		-0.03	-0.01	0.00	204	0.03	0.021	
KC14	1726742.43	6453806.02	259.89	-0.01	-0.03	-0.05	258	0.03	*	0.00	0.00	-0.03	333	0.00	0.036	*
KC15	1727590.38	6453121.02	287.10	-0.07	-0.07	0.00	227	0.10		0.00	-0.01	0.01	265	0.01	0.027	*
KC16	1727602.23	6454098.24	326.88	-0.02	0.01	-0.02	148	0.02	*	-0.01	0.01	0.01	139	0.01	0.023	*
PB04	1727665.94	6448848.86	167.11	-9.99	-2.88	-3.41	196	10.40		-0.62	-0.13	-0.20	192	0.63	0.030	
PB06	1727937.25	6449758.35	177.58	-31.19	-3.49	-5.48	186	31.39		-1.55	-0.17	-0.24	186	1.56	0.032	
PB07	1728137.00	6450212.58	197.66	-38.93	-7.18	-2.55	190	39.58		-1.83	-0.32	-0.14	190	1.86	0.030	
PB08	1728200.66	6450463.24	194.16	-36.85	-6.56	0.48	190	37.43		-1.65	-0.28	0.04	190	1.67	0.033	
PB09	1728247.35	6450848.79	189.24	-41.23	-2.24	-3.28	183	41.29		-1.95	-0.13	-0.22	184	1.95	0.032	
PB12	1728260.50	6451585.29	185.30	-69.99	-19.28	-7.99	195	72.60		-3.20	-0.96	-0.64	197	3.35	0.027	
PB13	1728045.47	6452149.17	206.87	-40.50	-15.17	-3.67	201	43.25		-1.96	-0.81	-0.11	202	2.12	0.025	
PB18	1730431.24	6450719.88	363.10	-15.64	8.89	-4.48	150	17.99		-0.11	0.02	-0.04	169	0.11	0.024	
PB20	1728746.32	6451125.33	233.20	-66.45	-10.35	-10.34	189	67.25		-2.86	-0.49	-0.49	190	2.91	0.038	
PB21	1729244.44	6451178.35	272.60	-53.78	6.30	-7.42	173	54.14		-2.15	0.18	-0.24	175	2.16	0.029	
PB25	1729670.68	6451986.36	326.01	-31.64	0.71	-2.98	179	31.64		-0.10	-0.03	-0.03	196	0.11	0.021	
PB26	1729538.86	6452252.16	282.99	-23.79	2.60	-2.35	174	23.93		-0.08	-0.03	0.06	200	0.08	0.028	
PB27	1729249.12	6451842.31	272.17	-90.22	6.25	-12.25	176	90.44		-3.47	0.11	-0.56	178	3.47	0.029	
PB29	1728844.53	6452094.53	171.59	-44.42	-25.96	-14.34	210	51.45		-2.10	-0.97	-0.64	205	2.31	0.032	
PB53	1729219.81	6450754.71	290.67	-32.96	0.78	-7.08	179	32.97		-1.73	0.10	-0.53	177	1.74	0.035	
PB54	1729691.04	6450448.55	357.73	-3.86	-0.13	-0.89	182	3.87		-0.08	-0.02	0.02	191	0.08	0.026	
PB55	1728777.36	6450801.45	240.18	-34.92	-2.59	-6.15	184	35.02		-2.05	-0.13	-0.32	184	2.05	0.044	
PB59	1727759.39	6448659.97	159.70	-6.98	-1.69	-3.69	194	7.18		-0.93	-0.21	-0.47	193	0.95	0.032	
PB62	Destroyed															
PB63	Destroyed															
PB64	1727439.04	6450942.07	69.69	-27.25	-4.88	-3.08	190	27.68		-27.25	-4.88	-3.08	190	27.68	0.031	
PB65	1728454.67	6449707.82	287.75													

PORTUGUESE POINT LANDSLIDE MONITORING - FULL DATA POSTING as of Oct. 03, 2011  
 Prepared by McGee Surveying Consulting - Document Date: 12/02/11

Notes:

\* Indicates no movement detected

Point	Oct. 03, 2011 Positions			Overall Movements (US Feet)						Periodic (11.3 months) Movements (US Feet)						
	NAD83 SPC Zone 5 (Ft)		NAVD88	Original Position to Oct. 03, 2011						Oct. 25, 2010 Position to Oct. 03, 2011						
	North (ft)	East (ft)	Elev(ft)	North	East	Height	Azim. <sup>o</sup>	Dist.	Note	North	East	Height	Azim. <sup>o</sup>	Dist.	95%Error	Note
AB01	1729427.55	6445709.59	178.50	-0.04	-0.02	-0.12	213	0.04		0.02	-0.02	-0.02	313	0.02	0.030	*
AB02	1726946.97	6447968.70	116.45	0.00	0.05	0.00	85	0.05		0.01	0.04	0.00	81	0.04	0.023	
AB04	1728390.04	6447121.59	67.21	-1.95	-1.75	-0.36	222	2.62		-0.23	-0.20	-0.03	221	0.30	0.025	
AB05	1728074.57	6447643.73	80.49	-1.15	-1.45	-0.41	232	1.84		-0.09	-0.16	-0.04	240	0.19	0.027	
AB06	1729058.21	6446975.77	164.77	-1.53	-0.49	-0.51	198	1.60		-0.16	-0.06	-0.05	202	0.17	0.031	
AB07	1728981.13	6447357.52	159.24	-1.66	-0.89	-0.68	208	1.88		-0.15	-0.12	-0.06	218	0.19	0.041	
AB12	1729415.28	6448271.12	283.19	-1.21	-0.52	-0.24	203	1.32		-0.18	-0.08	-0.01	204	0.20	0.026	
AB13	1729927.96	6448235.79	364.50	-0.93	-0.25	-0.53	195	0.97		-0.12	-0.06	-0.03	205	0.14	0.033	
AB15	1730311.37	6448099.26	396.87	-0.72	-0.13	-0.41	190	0.73		-0.10	0.01	0.00	174	0.10	0.032	
AB16	1730358.55	6447532.15	376.44	-0.34	0.03	-0.18	175	0.34		-0.06	0.00	-0.02	185	0.06	0.029	
AB17	1731421.09	6446727.74	442.78	-0.05	-0.03	-0.27	211	0.06		-0.01	-0.03	-0.02	246	0.03	0.036	*
AB18	1731602.16	6448187.62	456.84	-0.46	0.13	-0.35	165	0.48		-0.06	0.01	0.01	173	0.06	0.032	
AB20	1729359.56	6449685.89	396.23	-1.07	-0.38	-0.20	200	1.13		-0.16	-0.06	0.00	199	0.17	0.026	
AB24	1729829.52	6447759.68	335.77	-0.84	-0.28	-0.15	198	0.88		-0.13	-0.04	0.01	200	0.13	0.024	
AB50	1728084.56	6448247.27	182.01	-0.44	-0.92	0.03	244	1.02		-0.06	-0.11	0.02	243	0.13	0.027	
AB51	1729616.46	6447306.45	305.17	-0.55	-0.09	-0.25	189	0.56		-0.10	-0.04	-0.07	200	0.11	0.025	
AB52	1730015.49	6448624.26	368.35	-0.61	-0.18	-0.26	197	0.64		-0.12	-0.04	-0.03	200	0.13	0.036	
AB53	1730430.36	6449712.24	352.87	-0.75	-0.13	-0.26	190	0.76		-0.14	-0.02	-0.04	189	0.14	0.028	
AB54	1731111.92	6447047.87	407.31	-0.02	0.01	0.00	164	0.03	*	0.00	0.01	-0.02	97	0.01	0.033	*
AB55	1731174.61	6447753.58	405.37	-0.15	0.02	-0.01	173	0.16		-0.04	0.00	-0.03	179	0.04	0.027	
AB56	1732214.00	6448545.55	571.57	-0.31	0.09	-0.08	164	0.32		-0.12	0.04	-0.06	162	0.12	0.026	
AB57	1731926.54	6449759.46	564.83	-0.37	0.09	-0.10	166	0.38		-0.14	0.03	-0.10	166	0.14	0.026	
AB58	1731117.67	6449074.94	405.64	-0.35	0.00	-0.03	179	0.35		-0.13	0.00	-0.05	178	0.13	0.038	
AB59	1730850.40	6450212.51	434.27	-0.47	-0.05	-0.10	186	0.47		-0.16	-0.01	-0.07	182	0.16	0.030	
AB60	1729089.38	6447987.45	179.39	-0.32	-0.12	-0.06	200	0.34		-0.15	-0.05	-0.03	199	0.16	0.025	
AB61	1727424.48	6447990.26	140.43	-0.02	0.00	-0.04	177	0.02	*	0.00	-0.01	-0.04	259	0.01	0.008	*
AB62R																
AB63R																
BB52	1726995.98	6451384.32	3.89	-0.38	-0.06	0.06	188	0.39		-0.15	-0.01	0.04	185	0.15	0.032	
CR07	1731628.00	6451203.34	632.26	-0.78	0.15	-1.02	169	0.79		-0.12	0.02	-0.07	171	0.12	0.034	
CR50	1733013.59	6451037.37	872.65	0.04	-0.01	-0.39	344	0.04		0.00	-0.01	-0.02	254	0.01	0.032	*
CR51	1733062.00	6452361.87	976.18	0.09	0.05	-0.57	28	0.11		-0.01	-0.01	0.00	216	0.01	0.031	*
CR52	1732867.53	6450239.26	779.68	-0.01	-0.08	-0.33	261	0.08		-0.02	-0.05	0.02	247	0.05	0.047	
FT06	1729855.05	6452760.09	488.79	-0.55	-0.12	-0.27	192	0.57		-0.20	-0.04	-0.11	191	0.20	0.027	
FT07	1729252.33	6454103.33	588.72	-0.91	-1.42	-0.29	237	1.69		-0.43	-0.67	-0.13	238	0.79	0.027	
FT08	1729388.67	6453350.48	658.45	-0.01	-0.02	0.01	251	0.02	*	0.01	-0.03	0.02	293	0.03	0.024	*
KC01	1728475.98	6452457.69	312.35	-0.80	-0.54	-0.53	214	0.97		-0.14	-0.08	-0.03	211	0.16	0.028	
KC02	1727002.55	6452118.84	13.73	-0.34	-0.16	-0.11	205	0.38		-0.07	-0.02	0.01	199	0.07	0.030	
KC04	1727559.31	6452666.95	238.46	-0.25	-0.29	-0.38	229	0.38		-0.05	-0.06	0.02	230	0.08	0.030	
KC05	1727081.92	6453178.90	227.47	-0.08	-0.19	-0.39	248	0.21		-0.03	-0.02	0.00	210	0.04	0.028	
KC06	1727784.89	6453396.26	299.88	-0.02	-0.41	-0.47	268	0.41		0.01	-0.06	-0.01	277	0.06	0.030	
KC07	1727759.39	6453683.87	313.48	0.20	-0.05	-0.35	346	0.21		0.01	-0.01	0.01	315	0.01	0.034	*
KC13	1726581.05	6453069.58	191.13	-0.11	-0.05	-0.07	206	0.12		-0.04	-0.03	-0.05	222	0.05	0.029	
KC14	1726742.44	6453806.00	259.92	0.00	-0.05	-0.02	271	0.05		0.01	-0.02	0.02	288	0.02	0.032	*
KC15	1727590.34	6453120.97	287.06	-0.11	-0.13	-0.04	229	0.17		-0.04	-0.05	-0.04	233	0.07	0.025	
KC16	1727602.24	6454098.22	326.88	-0.01	-0.01	-0.02	233	0.02	*	0.01	-0.02	0.00	288	0.02	0.031	*
PB04	1727665.23	6448848.66	166.92	-10.71	-3.08	-3.60	196	11.14		-0.71	-0.21	-0.19	196	0.74	0.042	
PB06	1727935.82	6449758.16	177.36	-32.63	-3.68	-5.70	186	32.84		-1.44	-0.20	-0.22	188	1.45	0.042	
PB07	1728135.18	6450212.21	197.54	-40.74	-7.55	-2.67	190	41.44		-1.82	-0.37	-0.12	191	1.86	0.035	
PB08	1728199.00	6450462.93	194.19	-38.50	-6.87	0.51	190	39.11		-1.66	-0.31	0.03	191	1.69	0.035	
PB09	1728245.34	6450848.65	188.99	-43.24	-2.37	-3.53	183	43.30		-2.01	-0.13	-0.25	184	2.01	0.036	
PB12	1728257.11	6451584.30	184.73	-73.38	-20.27	-8.56	195	76.13		-3.39	-0.99	-0.57	196	3.53	0.037	
PB13	1728043.37	6452148.28	206.76	-42.60	-16.06	-3.78	201	45.53		-2.10	-0.89	-0.11	203	2.28	0.030	
PB18	1730430.95	6450719.94	363.04	-15.94	8.95	-4.54	151	18.28		-0.30	0.06	-0.06	169	0.30	0.033	
PB20	1728743.25	6451124.73	232.60	-69.51	-10.95	-10.95	189	70.37		-3.06	-0.60	-0.60	191	3.12	0.042	
PB21	1729242.22	6451178.53	272.35	-55.99	6.48	-7.67	173	56.37		-2.22	0.18	-0.25	175	2.23	0.041	
PB25	1729670.41	6451986.30	326.01	-31.90	0.65	-2.98	179	31.91		-0.27	-0.06	0.01	193	0.28	0.029	
PB26	1729538.62	6452252.15	282.96	-24.02	2.59	-2.38	174	24.16		-0.23	-0.02	-0.03	184	0.23	0.044	
PB27	1729245.47	6451842.40	271.66	-93.87	6.34	-12.76	176	94.09		-3.65	0.09	-0.51	179	3.65	0.062	
PB29	1728842.25	6452093.51	170.88	-46.69	-26.98	-15.05	210	53.93		-2.28	-1.02	-0.71	204	2.49	0.039	
PB53	1729217.92	6450754.81	290.10	-34.85	0.89	-7.65	179	34.86		-1.89	0.10	-0.57	177	1.89	0.047	
PB54	1729690.83	6450448.49	357.73	-4.07	-0.20	-0.89	183	4.08		-0.21	-0.06	0.00	197	0.22	0.029	
PB55	1728775.28	6450801.26	239.73	-37.00	-2.78	-6.60	184	37.11		-2.08	-0.19	-0.45	185	2.09	0.039	
PB59	1727758.34	6448659.68	159.21	-8.02	-1.99	-4.18	194	8.27		-1.04	-0.30	-0.48	196	1.09	0.040	
PB64	1727417.65	6450937.67	67.14	-48.64	-9.27	-5.62	191	49.51		-21.39	-4.40	-2.55	192	21.83	0.038	
PB65	1728454.34	6449707.76	287.70	-0.32	-0.06	-0.05	191	0.33		-0.32	-0.06	-0.05	191	0.33	0.025	
UB02	1727519.20	6450142.56	62.65	-61.91	8.78	-4.51	172	62.53		-3.57	0.44	-0.				

Portuguese Landelide Monitoring Survey - COORDINATE LIST

Prepared by McGee Surveying Consulting for the October 03, 2011 Survey

Document Date: 01/12/2012

Datum: Horizontal & EH NAD83 (2007) Epoch; California State Plane Zone 5; Vertical: NAVD88

Note, Fixed CGPS Station PVE3 at Record 3D Position & Orthometric Height per 09/2007 Survey; See Survey Reports

Point	Latitude	Longitude	EH (ft)	North (ft)	East (ft)	OrthoHt (ft)	Description
M05AB01	33-44-38.30248	118-22-53.05149	60.02	1729427.55	6445709.59	178.50	Punched 1/2" GIP in meter box
M05AB02	33-44-13.84878	118-22-26.19229	-2.04	1726946.97	6447968.70	116.45	4" BC "SAN PEDRO 1936" on conc. block
M05AB04	33-44-28.09221	118-22-36.28605	-51.25	1728390.04	6447121.59	67.21	BC "CO ENG STA Q2.." on 2"GIP in mass of conc.
M05AB05	33-44-24.99094	118-22-30.08976	-37.95	1728074.57	6447643.73	80.49	BC "CO ENG STA Q3.." on 2"GIP in mass of conc.
M05AB06	33-44-34.69625	118-22-38.04233	46.34	1729058.21	6446975.77	164.77	PK Nail in top/curb in median
M05AB07	33-44-33.94797	118-22-33.51863	40.83	1728981.13	6447357.52	159.24	PK Nail in north top/curb
M05AB12	33-44-38.27621	118-22-22.72004	164.84	1729415.28	6448271.12	283.19	BC "CO ENG STA 7A.." in mass of conc.
M05AB13	33-44-43.34635	118-22-23.16090	246.18	1729927.96	6446935.79	364.50	Punched 1/2" GIP in meter box
M05AB15	33-44-47.13393	118-22-24.79450	278.56	1730311.37	6448099.26	396.87	Punched 1/2" GIP in meter box
M05AB16	33-44-47.57976	118-22-31.51182	258.11	1730358.55	6447532.15	376.44	Punched 1/2" GIP in meter box
M05AB17	33-44-58.06052	118-22-41.08444	324.45	1731421.09	6446727.74	442.78	Punched 1/2" GIP in meter box
M05AB18	33-44-59.90565	118-22-23.80493	338.59	1731602.16	6448187.62	456.84	Punched spike in center cul-de-sac
M05AB20	33-44-37.77664	118-22-05.96547	277.96	1729359.56	6449685.89	396.23	BC "CO ENG STA W. FIX 1956.." in mass of conc.
M05AB24	33-44-42.35504	118-22-28.79421	217.42	1729209.52	6447759.68	335.77	Cotton spindle in conc. In road
M05AB50	33-44-25.11194	118-22-22.94403	63.60	1728084.56	6448247.27	182.01	Nail & shiner in conc. collar of well
M05AB51	33-44-40.23069	118-22-34.15152	186.79	1729616.46	6447306.45	305.17	PK mag nail in plastic plug "LS6957" in 1"GIP
M05AB52	33-44-44.22639	118-22-18.56485	250.06	1730015.49	6448624.26	368.35	Punched spike in center cul-de-sac
M05AB53	33-44-48.36985	118-22-05.69987	234.65	1730430.36	6449712.24	352.87	Chisled + on s edge conc. Vault
M05AB54	33-44-55.01413	118-22-37.27977	288.98	1731111.92	6447047.87	407.31	Cotton spindle in intersection
M05AB55	33-44-55.66039	118-22-28.92581	287.08	1731174.61	6447753.58	405.37	Cotton spindle in intersection
M05AB56	33-45-05.97111	118-22-19.59328	453.36	1732214.00	6448545.55	571.57	6" mag nail & washer in conc. in 2"x 36" GIP
M05AB57	33-45-03.17170	118-22-05.20566	446.67	1731926.54	6449759.46	564.83	6" mag nail & washer in conc. in 2"x 36" GIP
M05AB58	33-44-55.14555	118-22-13.27642	287.42	1731117.67	6449074.94	405.64	Punched RR spike on s side road
M05AB59	33-44-52.54299	118-21-59.79419	316.10	1730850.40	6450212.51	434.27	6" mag nail & washer in conc. in 2"x 36" GIP
M05AB60	33-44-35.04203	118-22-26.06461	61.02	1729089.38	6447987.45	179.39	6" mag nail & washer in conc. in 2"x 28" GIP
M05AB61	33-44-18.57298	118-22-25.95804	21.97	1727424.48	6447990.26	140.43	6" mag nail & washer in conc. in 2"x 24" GIP
M05AB61ECC	33-44-18.71704	118-22-26.13970	22.64	1727439.10	6447974.97	141.10	Tack in plastic plug in 5/8 x 24" rebar
M05AB62R	33-44-33.23180	118-22-38.63146	24.57	1728910.35	6446925.46	143.01	6" mag nail & washer in conc. in 1"x 24" GIP
M05AB63R	33-44-34.71931	118-22-34.11995	62.43	1729059.30	6447307.03	180.84	Punched 1/2 x 48" rebar
M05BB52	33-44-14.45733	118-21-45.73530	-114.41	1726995.98	6451384.32	3.89	PK mag nail in drill hole top large rock mass
M05CR07	33-45-00.27059	118-21-48.09460	514.17	1731628.00	6451203.34	632.26	6" mag nail & washer in conc. in old 1" IP
M05CR50	33-45-13.97078	118-21-50.11940	754.59	1733013.59	6451037.37	872.65	Tack & shiner on lower rock wall
M05CR51	33-45-14.49682	118-21-34.43623	858.18	1733062.00	6452361.87	976.18	Tack & shiner on conc pad
M05CR52	33-45-12.49733	118-21-59.56449	661.58	1732867.53	6450239.26	779.68	Tackail & shiner on rock retaining wall
M05FT06	33-44-42.78794	118-21-29.58505	370.70	1729855.05	6452760.09	488.79	6" mag nail & washer in conc. in 2"x 36" GIP
M05FT07	33-44-36.87290	118-21-13.65447	470.67	1729252.33	6454103.33	588.72	6" mag nail & washer in conc. in 2"x 36" GIP
M05FT08	33-44-38.19530	118-21-22.57457	540.37	1729388.67	6453350.48	658.45	6" mag nail & washer in conc. in 2"x 36" GIP
M05KC01	33-44-29.13554	118-21-33.10747	194.18	1728475.98	6452457.69	312.35	6" mag nail & washer in conc. in old 1" IP
M05KC02	33-44-14.54847	118-21-37.05714	-104.54	1727002.55	6452118.84	13.73	Punched 1/2" GIP in meter box
M05KC04	33-44-20.07532	118-21-30.59092	120.25	1727559.31	6452666.95	238.46	BC "CO ENG STA K6.." on 2"GIP in mass of conc.
M05KC05	33-44-15.37101	118-21-24.50929	109.27	1727081.92	6453178.90	227.47	Punched 1/2" GIP in meter box
M05KC06	33-44-22.33239	118-21-21.96524	181.73	1727784.89	6453396.26	299.88	Punched 1/2" GIP in meter box
M05KC07	33-44-22.09019	118-21-18.55881	195.33	1727759.39	6453683.87	313.48	Punched 1/2" GIP in meter box
M05KC13	33-44-10.41253	118-21-25.78263	72.90	1726581.05	6453069.58	191.13	Cotton spindle in AC turnout
M05KC14	33-44-12.03485	118-21-17.07021	141.73	1726742.44	6453806.00	259.92	Punched spike in center road
M05KC15	33-44-20.39824	118-21-25.21660	168.88	1727590.34	6453120.97	287.06	Cotton spindle in cul-de-sac
M05KC16	33-44-20.55009	118-21-13.64619	208.75	1727602.24	6454098.22	326.88	Punched spike in intersection
M05PB04	33-44-20.98598	118-22-15.80500	48.52	1727665.23	6448848.66	166.92	Nail & tag "RCE21610" in conc. in 3" pipe
M05PB06	33-44-23.69567	118-22-05.04804	59.01	1727935.82	6449758.16	177.36	Punched cap on 2" GIP
M05PB07	33-44-25.68419	118-21-59.68050	79.23	1728135.18	6450212.21	197.54	Brass tag "LA CO DFW" in conc. in 2" GIP
M05PB08	33-44-26.32455	118-21-56.71460	75.90	1728199.00	6450462.93	194.19	Punched cap on 2" GIP
M05PB09	33-44-26.79680	118-21-52.14945	70.72	1728245.34	6450848.65	188.99	Punched cap on 2" GIP in cable box
M05PB12	33-44-26.93949	118-21-43.43952	66.50	1728257.11	6451584.30	184.73	Punched cap on 2" GIP in cable box
M05PB13	33-44-24.84521	118-21-36.75270	88.55	1728043.37	6452148.28	206.76	Punched cap on 2" GIP in cable box
M05PB18	33-44-48.41204	118-21-53.76737	244.87	1730430.95	6450719.94	363.04	Punched 1/2" GIP in meter box
M05PB20	33-44-31.73200	118-21-48.90191	114.37	1728743.25	6451124.73	232.60	Punched cap on 2" GIP in cable box
M05PB21	33-44-36.66969	118-21-48.28623	154.15	1729242.22	6451178.53	272.35	Punched cap on 2" GIP in cable box
M05PB25	33-44-40.93408	118-21-38.73971	207.87	1729670.41	6451986.30	326.01	Punched cap on 2" GIP in cable box
M05PB26	33-44-39.63989	118-21-35.58626	164.83	1729538.62	6452252.15	282.96	Brass tag "LA CO DFW" in conc. in 2" GIP
M05PB27	33-44-36.72546	118-21-40.42561	153.50	1729245.47	6451842.40	271.66	Punched cap on 2" GIP in cable box
M05PB29	33-44-32.74579	118-21-37.43505	52.72	1728842.25	6452093.51	170.88	Brass tag "LA CO DFW" in conc. in 2" GIP
M05PB53	33-44-36.41407	118-21-53.30237	171.88	1729217.92	6450754.81	290.10	PK mag nail in plastic plug "LS6957" in 1"GIP
M05PB54	33-44-41.08106	118-21-56.94984	239.51	1729690.83	6450448.49	357.73	PK mag nail in plastic plug "LS6957" in 1"GIP
M05PB55	33-44-32.03720	118-21-52.73339	121.49	1728775.28	6450801.26	239.73	PK mag nail in plastic plug "LS6957" in 1"GIP
M05PB59	33-44-21.90012	118-22-18.04664	40.80	1727758.34	6448659.68	159.21	PK mag nail in plastic plug "LS?" in 1" GIP
M05PB64	33-44-18.61255	118-21-51.05990	-51.17	1727417.65	6450937.67	67.14	2" alum. cap "MCGEE SURVEYING.." on 1"x36"GIP
M05PB65	33-44-28.82309	118-22-05.66722	169.38	1728454.34	6449707.76	287.70	2" alum. cap "MCGEE SURVE.." on 5/8"x24" rebar
M05UB02	33-44-19.58845	118-22-00.47852	-55.70	1727519.20	6450142.56	62.65	PK mag nail in plastic plug "??" in 1"GIP
M05PVE3	33-44-35.85329	118-24-15.26904	235.42	1729207.09	6438765.18	354.36	CGPS Record Position Fixed All Surveys
M05PVH3	33-46-46.02019	118-22-19.74134	854.03	1728328.08	6448570.49	972.05	CGPS Pos. Determined Oct. 2011 Survey
M05PVR3	33-46-25.89206	118-19-14.06720	198.62	1740239.31	6464237.89	316.33	CGPS Pos. Determined Oct. 2011 Survey
M05VTR3	33-42-45.48966	118-17-37.71220	197.53	1717933.68	6472307.23	315.28	CGPS Pos. Determined Oct. 2011 Survey