APPENDIX G

Geological Reconnaissance

APPENDIX G1

Transmittal of Preliminary Geotechnical Information – Warner Ranch

TRANSMITTAL OF PRELIMINARY GEOTECHNICAL INFORMATION

WARNER RANCH
SAN DIEGO COUNTY, CALIFORNIA

GEOCON
INCORPORATED
GEOTECHNICAL
CONSULTANTS

PREPARED FOR

COASTAL HOLDINGS LLC/
CAPSTONE PARTNERS LLC
RANCHO SANTA FE, CALIFORNIA

MAY 5, 2005
PROJECT NO. 07511-32-01

Project No. 07511-32-01
May 5, 2005

Coastal Holdings LLC / Capstone Partners LLC
16089 San Dieguito Road, Suite H-104
Rancho Santa Fe, California 92067-6221

Attention: Mr. Ali Shapouri

Subject: WARNER RANCH
SAN DIEGO COUNTY, CALIFORNIA
TRANSMITTAL OF PRELIMINARY GEOTECHNICAL INFORMATION

Gentlemen:

Transmitted herewith is the preliminary information from the field portion of our recent geotechnical investigation performed in April 2005. Also included are the results of requested laboratory testing on soil samples obtained during the study (Tables I through III). A formal presentation of this data will be submitted in a geotechnical investigation report in the event that additional work is performed and a geotechnical investigation report is desired. The following information is enclosed herewith:

- Laboratory Test Results (Tables I through III).
- Appendix A: Logs of exploratory trench excavations (Figures A-1 through A-46).
- Figure 1 (map pocket): Draft Geologic Map depicting the exploratory backhoe trench locations. Also shown is the estimated thickness of surficial deposits (including depths to groundwater where encountered). The trenches were excavated with a John Deere 510 rubber-tire backhoe.

The field investigation was performed on April 13, 14, and 15, 2005, and consisted of excavating 46 exploratory trenches. The scope of the study was intended to assist you in the due diligence phase of property acquisition by identifying geotechnical constraints to development, if any. In this regard, the main focus of the field investigation was to determine the presence of a published mapped fault trace shown to extend across the proposed development area (Kennedy, 2000) and perform a geologic reconnaissance of the site. In addition, the study evaluated the thickness, extent, and condition (liquefaction potential) of surficial deposits in selected areas that would require remedial grading. Due to the thickness of the alluvium in several areas, it will be necessary to perform additional work to properly address compression-related settlement and liquefaction.

The exploratory trenches indicate that the fault identified on the published geologic map (see List of References, No. 1) does not exist. A continuous, 150-foot-long trench, in addition to several adjacent trenches, revealed a transitional igneous intrusive boundary between San Marcos Gabbro and Bonsall Tonalite, which evidently was interpreted as a fault-related contact (see Geologic Map, Figure 1, map pocket). This type of contact was identified in the same area on a regional scale in a previous study (Larsen, 1948). This interface represents an ancient (Cretaceous-age) emplacement of magma against

an even older rock type, resulting in an irregular welded contact zone from several feet to several yards wide (see Trench T-2, profile log). The bedrock formations encountered during the study are typically massive, but can have discontinuous joints and fractures.

The trenches excavated within the drainage courses and surrounding areas encountered surficial deposits consisting of younger and older alluvium underlain by bedrock. Limited laboratory testing and our observations indicate that the older alluvium should be suitable for support of proposed embankments and structural loads. Further evaluation of this deposit should be performed during future studies as development plans progress.

The younger alluvium is poorly consolidated and will require removal and compaction in areas of planned development. The estimated thickness and extent of surficial deposits requiring remedial grading is shown on the Geologic Map. A description of the materials is presented on the trench logs. Based on the trenching, remedial grading in the vicinity of the two main drainages will be impacted by the presence of groundwater (see Trenches T-28, T-31, T-32, T-34, T-36, T-37, T-38, and T-39). As a consequence, a portion of the alluvium will remain in-place, requiring short-term settlement considerations. In addition, the grain size characteristics of a sample obtained from Trench T-28 (Figure B-1) suggest that the alluvium may be prone to liquefaction if other conditions, such as low density, are present.

In summary, the subsurface study revealed that the fault identified on the published geologic map is not present. With respect to alluvium thickness and liquefaction potential, the lower portions of the two primary drainages exhibited an alluvium thickness greater than the reach of the backhoe. A portion of the alluvium is in a saturated condition which will warrant settlement considerations during site development. In addition, potentially unfavorable grain size characteristics in the saturated portion were encountered within some of the trenches. Although these areas are relatively limited compared to the overall project, we recommend further evaluation of the deposit to adequately address the potential for liquefaction and compression related settlement.

Should you have any questions regarding this transmittal, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

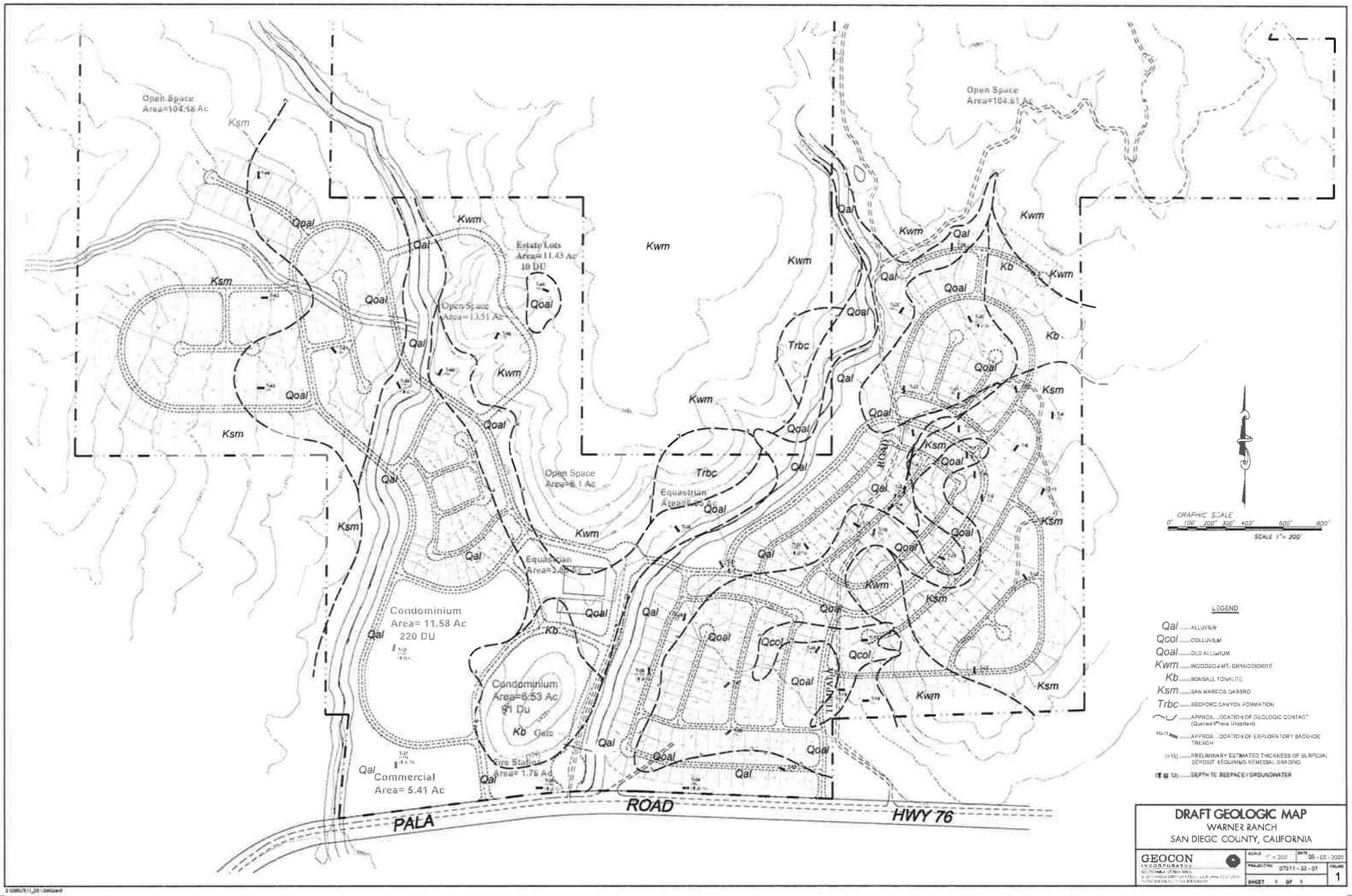
GEOCON INCORPORATED

Thomas V. Langpap
GE 503

David B. Evans
CEG 1860

TVL:DBE:anh

(8/del) Addressee



DRAFT GEOLOGIC MAP

WARNER RANCH

SAN DIEGO COUNTY, CALIFORNIA

GEOCON INCORPORATED

SCALE 1" = 200' DATE 05 - 05 - 2005

PROJECT NO. 07511 - 32 - 01 FIGURE 1

SHEET 1 OF 1

TABLE I
SUMMARY OF LABORATORY POTENTIAL OF HYDROGEN (pH) AND RESISTIVITY TEST RESULTS

Sample No.	pH	Resistivity (ohm centimeters)
T3-1	6.7	4,800
T19-2	7.2	2,907
T28-1	7.1	18,252

TABLE II
SUMMARY OF LABORATORY WATER-SOLUBLE SULFATE TEST RESULTS, CALIFORNIA TEST NO. 417

Sample No.	Water-Soluble Sulfate	Sulfate Exposure
T3-1	0.005	Negligible*
T19-2	0.006	Negligible
T28-1	0.002	Negligible

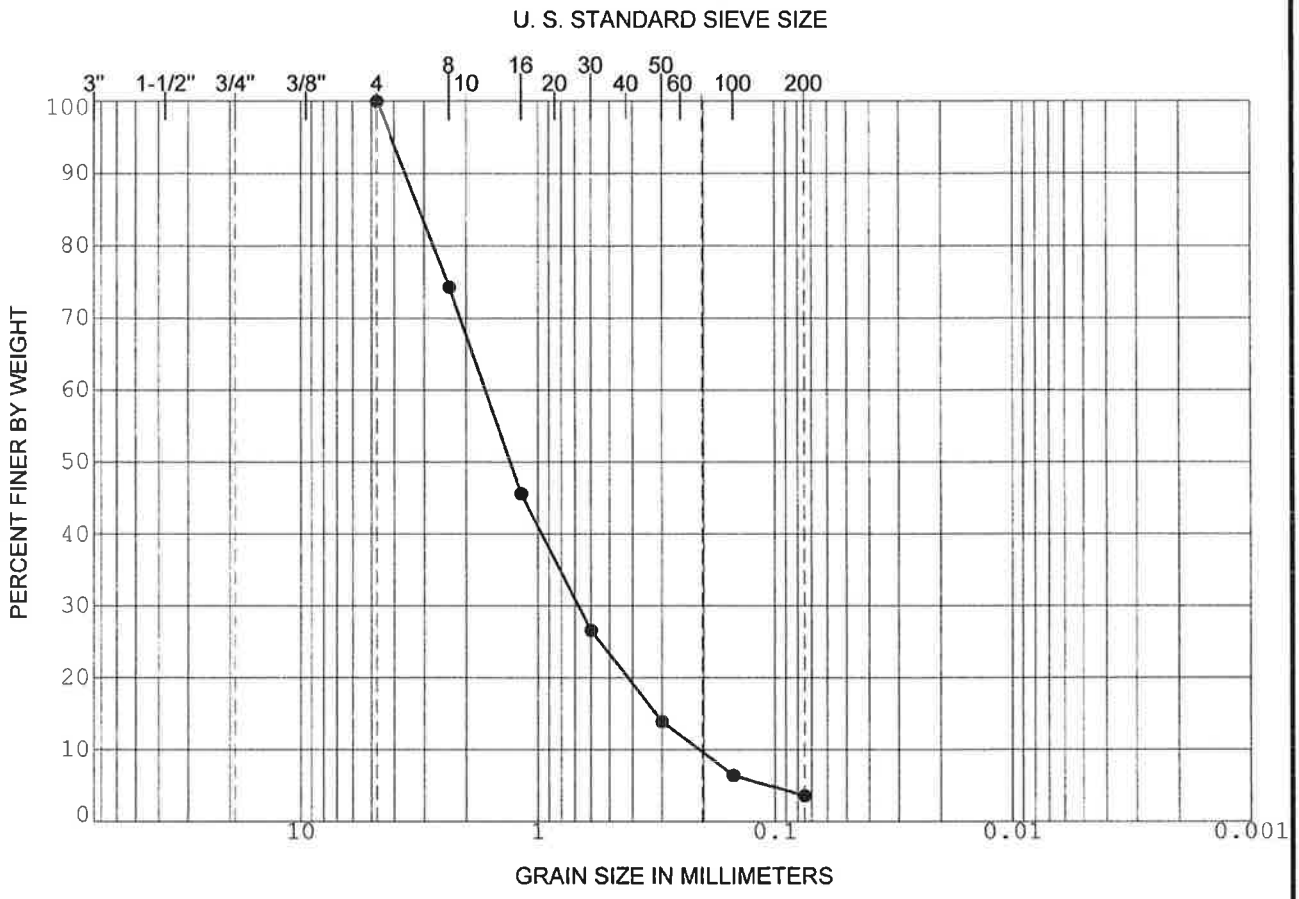
*Reference: Table 19-A-4, Uniform Building Code, 2000 Edition.

TABLE III
SUMMARY OF LABORATORY WATER-SOLUBLE CHLORIDE (Cl) ASTM D 1557

Sample No.	Description	Cl (%)
T19-1	Old Alluvium	0.006
T28-1	Alluvium	0.007

PROJECT NO. 07511-32-01

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



	SAMPLE	DEPTH (ft)	CLASSIFICATION	NAT WC	LL	PL	PI
●	T28-1	6.0	SW				

GRADATION CURVE

WARNER RANCH

SAN DIEGO COUNTY, CALIFORNIA

07511-32-01.GPJ

Figure B-1

APPENDIX A

APPENDIX A

TRENCH LOGS

FOR

WARNER RANCH
SAN DIEGO COUNTY, CALIFORNIA

PROJECT NO. 07511-32-01

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 1 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**ALLUVIUM** Loose, damp, dark brown, Silty, fine to coarse SAND; very porous, massive, textave with few clean sand layers (well-graded)			
2								
4								
				SM				
6								
8					-Becomes moist			
10								
12		+ + + + + +			**BONSALL TONALITE** Very weathered, light to medium yellow-brown, moderately strong GRANITIC ROCK; excavates to a silty, very coarse sand			
					TRENCH TERMINATED AT 12½ FEET No groundwater encountered			

Figure A-1,
Log of Trench T 1, Page 1 of 1

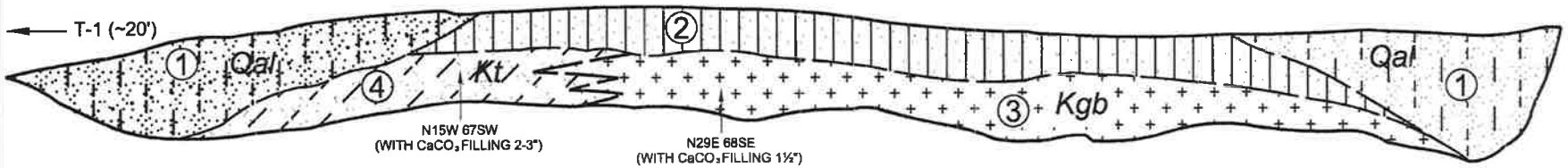
07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

WARNER RANCH
SAN DIEGO COUNTY, CALIFORNIA



IGNEOUS TRANSITION ~20'+ WITH
INCLUSIONS (XENOLITHS) OF GABBRO IN Kt

SCALE:
HORIZONTAL 1" ≅ 15'
VERTICAL 1" = 10'

① ALLUVIUM

② TOPSOIL / COLLUVIUM

③ SAN MARCOS GABBRO (Biotite-hornblende rich, medium to dark gray-brown, fine to medium crystalline texture

④ GREEN VALLEY TONALITE (Coarse crystalline texture, light to medium brown)

TRENCH T 2

GEOCON
INCORPORATED
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159
PROJECT NO. 007511 - 32 - 01
FIGURE A-2
DATE

X:/R14TEMP/1_GEOTECH/1_GEOTECH_MICAELA/2005/007511-32-01Warner Ranch

PROJECT NO. 07511-32-01

TRENCH T 3

ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005

EQUIPMENT JD 510 24"

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				SM	**ALLUVIUM** Loose, damp, medium to dark gray-brown, Silty, fine to medium SAND; porous, roots, pinhole pores			
4								
6								
8				SM	**OLD ALLUVIUM** Medium dense, damp to moist, medium reddish brown, Silty, fine to medium SAND with some clay; grit, well-graded and indurated			
10					-Becomes very moist			
12			▼		-Seepage at 12 feet			
	T3-1	+ + + +			**SAN MARCOS GABBRO** Weathered, damp, brownish gray, strong, biotite-hornblende GABBRO ROCK			
					TRENCH TERMINATED AT 13½ FEET Seepage at 12 feet			

Figure A-3,
Log of Trench T 3, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

TRENCH T 4

ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005

EQUIPMENT _____

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				SM	**ALLUVIUM** Loose, dry to damp, dark grayish brown, Silty, fine to medium SAND: very porous, roots			
4					**OLD ALLUVIUM** Medium dense, humid to damp, reddish brown, Silty, fine- to medium-grained SAND; trace clay, minor pinhole pores in upper 3-5 feet			
6								
8								
10				SM				
12					-Becomes moist, less porous, massive, well-graded, with silt-to-grit size sand, and well indurated			
14								
16								
18								
					TRENCH TERMINATED AT 19½ FEET No groundwater encountered			

07511-32-01.GPJ

Figure A-4,
Log of Trench T 4, Page 1 of 1

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 5 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, moist, dark brown, Silty, fine to medium SAND; porous			
2					**SAN MARCOS GABBRO** Very weathered, damp, brownish gray, strong biotite-hornblende GABBRO ROCK			
4								
					TRENCH TERMINATED AT 5 FEET No groundwater encountered			

Figure A-5,
Log of Trench T 5, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 6 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, very moist, dark brown, Silty, fine SAND; porous			
2					**SAN MARCOS GABBRO** Weathered, damp, brownish gray, strong biotite-hornblende GABBRO ROCK; excavates to silty, medium to coarse sand			
4					TRENCH TERMINATED AT 5½ FEET No groundwater encountered			

Figure A-6,
Log of Trench T 6, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 7 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, very moist, dark brown, Silty, fine SAND; porous			
2			▼		-Seepage			
4				SM	**OLD ALLUVIUM** Extremely dense, damp, reddish brown, cemented, Silty, coarse SAND; massive, well-graded			
					TRENCH TERMINATED AT 4½ FEET (Refusal) Seepage at 3 feet			

Figure A-7,
Log of Trench T 7, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◹ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**TRENCH T 8** ELEV. (MSL.) _____ DATE COMPLETED **04-13-2005** EQUIPMENT **JD 510 24"**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**SAN MARCOS GABBRO** Weathered, damp, medium dark brownish gray, strong biotite-hornblende GABBRO ROCK			
2								
4								
					TRENCH TERMINATED AT 5 FEET No groundwater encountered			

Figure A-8,
Log of Trench T 8, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 9 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SC	**TOPSOIL** Loose, very moist, dark brown, Clayey to Silty, fine to medium SAND; porous			
2					**SAN MARCOS GABBRO** Weathered, very moist, dark reddish brown to olive, moderately strong, biotite-hornblende GABBRO ROCK; with thin strong peg. dikes and selvages of metasedimentary (quartz)			
4					TRENCH TERMINATED AT 5 FEET (Refusal on dikes and siliceous metasedimentary selvages) No groundwater encountered			

Figure A-9,
Log of Trench T 9, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 10 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, moist, dark brown, Silty, fine to medium SAND			
2					**SAN MARCOS GABBRO** Weathered, humid, moderately strong, biotite-hornblende GABBRO ROCK			
					TRENCH TERMINATED AT 3½ FEET (Near refusal) No groundwater encountered			

Figure A-10,
Log of Trench T 10, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◣ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 11 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, very moist, dark brown, Silty, medium to coarse SAND; very porous, roots			
2								
4					**SAN MARCOS GABBRO** Very weathered, moist, dark gray-olive, strong GABBRO ROCK; excavates to a silty, medium to coarse sand			
					TRENCH TERMINATED AT 5 FEET No groundwater encountered			

Figure A-11,
Log of Trench T 11, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◣ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 12 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, dry, medium brown, Gravelly, Silty, medium SAND; very porous, roots			
2					**SAN MARCOS GABBRO** Weathered, damp, grayish brown, moderately strong, biotite-hornblende GABBRO ROCK			
4								
6					TRENCH TERMINATED AT 6 FEET No groundwater encountered			

Figure A-12,
Log of Trench T 12, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 13 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, dry to humid, dark brown, Gravelly, Silty, fine to medium SAND			
2					**SAN MARCOS GABBRO** Very weathered, fractured, medium to light brownish gray, strong GABBRO ROCK; excavates to silty, medium to coarse sand			
4								
6								
					TRENCH TERMINATED AT 7 FEET No groundwater encountered			

Figure A-13,
Log of Trench T 13, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 14 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, moist, dark brown, Silty, fine to medium SAND; porous			
2					**SAN MARCOS GABBRO** Very weathered, damp, medium gray-brown, moderately strong GABBRO ROCK; excavates to a coarse sand			
4								
					TRENCH TERMINATED AT 5 FEET No groundwater encountered			

Figure A-14,
Log of Trench T 14, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

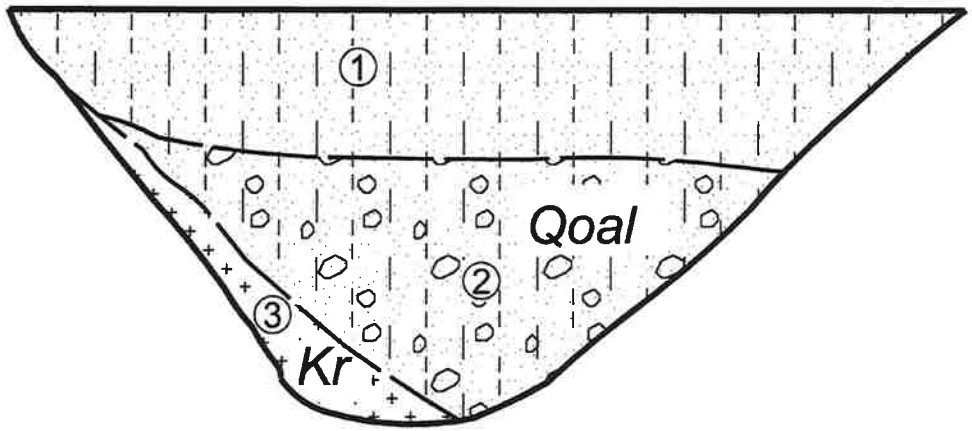
☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

▨ ... DISTURBED OR BAG SAMPLE ◣ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

WARNER RANCH
SAN DIEGO COUNTY, CALIFORNIA

SW NE



SCALE: 1" ≅ 4'
HORIZONTAL = VERTICAL

① TOPSOIL / COLLUVIUM
Loose, very moist, dark brown, Silty, fine SAND: very porous, roots

② OLD ALLUVIUM
Medium dense, moist, light to medium brown to reddish brown, Gravelly, Silty, fine- to coarse-grained SAND; well graded, little porosity

③ RAINBOW GRANITE
Slightly weathered, moist, light brown to reddish brown, strong GRANITIC ROCK

TRENCH T 15

GEOCON
INCORPORATED
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159
PROJECT NO. 007511 - 32 - 01
FIGURE A-15
DATE

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 16 ELEV. (MSL.) _____ DATE COMPLETED 04-14-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**TOPSOIL** Loose, very moist, dark brown, Silty, fine- to medium-grained SAND			
2				SM				
4					**OLD ALLUVIUM** Medium dense to dense, damp, medium to light reddish brown, Silty, fine- to medium-grained SAND; massive, indurated, with little porosity			
6				SM				
8					-Angular clast of metasedimentary rock			
10								
					TRENCH TERMINATED AT 10½ FEET (Near refusal) No groundwater encountered			

Figure A-16,
Log of Trench T 16, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◣ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 17 ELEV. (MSL.) _____ DATE COMPLETED 04-14-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**COLLUVIUM** Loose, moist, medium to dark brown, Silty, medium-grained SAND; porous, with roots			
2								
4				SM	**OLD ALLUVIUM** Medium dense, moist, medium brown to reddish brown, Silty, fine- to coarse-grained SAND; massive, indurated and well-graded			
6								
8								
					TRENCH TERMINATED AT 9 FEET No groundwater encountered			

Figure A-17,
Log of Trench T 17, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

TRENCH T 18

ELEV. (MSL.) _____ DATE COMPLETED 04-14-2005

EQUIPMENT JD 510 24"

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				SM	**COLLUVIUM** Very loose, moist, dark brown, Silty, fine- to medium-grained SAND			
4				SC-CL	Loose to stiff, very moist, dark reddish brown, very Clayey, fine to coarse SAND to Sandy CLAY; porous, pinholes, roots			
6								
8				SM	**OLD ALLUVIUM** Medium dense, moist, medium reddish brown, Silty, fine to coarse SAND; massive, indurated and well-graded, trace clay			
10								
12					TRENCH TERMINATED AT 12 FEET No groundwater encountered			

Figure A-18,
Log of Trench T 18, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 19 ELEV. (MSL.) _____ DATE COMPLETED 04-14-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**OLD ALLUVIUM** Medium dense to dense, damp, medium reddish brown, Silty, fine- to coarse-grained SAND; massive, indurated and well-graded			
2	T19-1			SM			154.9	7.0
	T19-2							
4								
					TRENCH TERMINATED AT 5½ FEET No groundwater encountered			

Figure A-19,
Log of Trench T 19, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 20 ELEV. (MSL.) _____ DATE COMPLETED 04-14-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**COLLUVIUM** Loose, very moist, dark brown, Silty, fine to medium SAND			
2				SM				
4					-Becomes slightly clayey			
6					**OLD ALLUVIUM** Medium dense to dense, medium reddish brown, Silty, fine- to coarse-grained SAND; massive, indurated and well-graded, with grit-size sand			
8				SM				
10								
					TRENCH TERMINATED AT 11 FEET No groundwater encountered			

Figure A-20,
Log of Trench T 20, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 21 ELEV. (MSL.) _____ DATE COMPLETED 04-14-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SC	**OLD ALLUVIUM** Medium dense, damp, medium to light reddish brown, Clayey, fine to coarse SAND; weathered formation?			
2								
4				SM	Medium dense to dense, moist, medium reddish brown, Silty, fine to coarse SAND; trace clay, massive, indurated and well-graded			
6								
8								
10								
12								
					TRENCH TERMINATED AT 13 FEET No groundwater encountered			

Figure A-21,
Log of Trench T 21, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 22 ELEV. (MSL.) _____ DATE COMPLETED 04-14-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, humid, medium to dark gray-brown, Silty, fine to medium SAND; very porous, roots			
2				SM	**OLD ALLUVIUM** Medium dense, damp, medium reddish brown, Silty, fine- to coarse-grained SAND with some clay; weathered formation?			
4								
6				SM	Medium dense to dense, moist, medium reddish brown, Silty, fine to coarse-grained SAND; massive, indurated and well-graded			
8								
					TRENCH TERMINATED AT 9 FEET No groundwater encountered			

Figure A-22,
Log of Trench T 22, Page 1 of 1

07511-32-01 GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

TRENCH T 23

ELEV. (MSL.) _____ DATE COMPLETED **04-14-2005**

EQUIPMENT **JD 510 24"**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
				SM	**ALLUVIUM** Loose, damp to moist, dark brown, Gravelly, Silty, medium to coarse-grained SAND; porous, roots			
2								
4				SM				
6					**OLD ALLUVIUM** Medium dense to dense, moist, medium to dark reddish brown, Silty, fine- to coarse-grained SAND; indurated and well-graded			
					TRENCH TERMINATED AT 7½ FEET No groundwater encountered			

Figure A-23,
Log of Trench T 23, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 24 ELEV. (MSL.) _____ DATE COMPLETED 04-14-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**ALLUVIUM** Loose, damp, light yellow-brown, very Gravelly, Silty, coarse-grained SAND			
2								
4				SM-GM	-Lag gravel of granitic boulders (caving)			
6								
8					**OLD ALLUVIUM** Medium dense, very moist to wet, light reddish brown, Silty, coarse-grained, Gravelly SAND			
10				SM				
12					**WOODSON MT. GRANODIORITE** Weathered, very moist, light brown, moderately strong GRANITIC ROCK			
					TRENCH TERMINATED AT 12 FEET No groundwater encountered			

Figure A-24,
Log of Trench T 24, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 25 ELEV. (MSL.) _____ DATE COMPLETED 04-14-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, very moist, dark gray-brown, Silty, fine- to medium-grained SAND			
2								
4				SM	**OLD ALLUVIUM** Medium dense, moist, medium reddish brown, Silty, fine- to coarse-grained SAND			
6								
8			▼		-Seepage (possibly perched on bedrock or cemented (durapan) at depth)			
					TRENCH TERMINATED AT 8½ FEET Seepage at 8 feet			

Figure A-25,
Log of Trench T 25, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 26 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, very moist, dark gray-brown, Silty, fine- to medium-grained SAND			
2				SM	**OLD ALLUVIUM** Medium dense to dense, damp, medium reddish brown, Silty, fine to coarse SAND; massive, well-graded, indurated			
4					TRENCH TERMINATED AT 8½ FEET Groundwater encountered at 8 feet			

Figure A-26,
Log of Trench T 26, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 27 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, very moist, dark gray-brown, Silty, fine to medium SAND; porous, numerous roots			
2				SM	**OLD ALLUVIUM** Medium dense, moist, medium reddish brown, Silty, fine to coarse SAND			
4	T27-1			SM	Extremely dense, cemented, medium reddish brown, Silty, fine to coarse SANDSTONE; durapan over 12" thick (maybe marginally rippable)			
					TRENCH TERMINATED AT 5½ FEET (Refusal) No groundwater encountered			

Figure A-27,
Log of Trench T 27, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 28 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**ALLUVIUM** Loose, very moist, dark brown, Silty, fine to coarse SAND; porous, roots			
2				SM				
4					Loose, moist, light reddish brown, medium to coarse SAND; mostly massive, but with some thin lenticular interbedded silty sands			
6	T28-1							
8								
10				SW/SP				
12			▼		-Groundwater at 13 feet			
14								
					TRENCH TERMINATED AT 15 FEET (Caving badly) Groundwater encountered at 13 feet			

Figure A-28,
Log of Trench T 28, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◣ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 29 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**ALLUVIUM** Loose, moist, dark brown, Silty, fine to coarse SAND; porous, with roots, trace clay			
2								
4								
6				SM	**OLD ALLUVIUM** Medium dense, moist, medium to dark reddish brown, Silty SAND			
8								
10				SM	Extremely dense, moist, medium reddish brown, cemented, Silty, fine to coarse SAND			
					TRENCH TERMINATED AT 11 FEET (Near refusal) No groundwater encountered			

Figure A-29,
Log of Trench T 29, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 30 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SC	**TOPSOIL** Loose to soft, very moist, dark brown, Clayey to Silty, fine to medium SAND; porous, with roots			
2								
4				SM	**OLD ALLUVIUM** Medium dense, moist, medium reddish brown, Silty, fine- to coarse-grained SAND; indurated and well-graded			
6					**SAN MARCOS GABBRO** Very weathered, moist, medium brown-olive, moderately strong, biotite-hornblende GABBRO ROCK			
					TRENCH TERMINATED AT 7 FEET No groundwater encountered			

Figure A-30,
Log of Trench T 30, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 31 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**ALLUVIUM** Loose, moist, dark brown, Silty, fine to coarse SAND; very porous, roots, burrows			
2								
4				SW/SP	Loose, damp to moist, light yellow-brown to reddish brown, medium to coarse SAND; with thin silty lenticular layers, friable, noncohesive when disturbed			
6								
8								
10								
12			▼		-Groundwater at approx. 12 feet			
					TRENCH TERMINATED AT 13½ FEET (Caving badly) Groundwater encountered at 12 feet			

Figure A-31,
Log of Trench T 31, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◣ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

TRENCH T 32

ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005

EQUIPMENT JD 510 24"

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**ALLUVIUM**			
2				SM	Loose, moist, dark brown, Silty, fine to coarse SAND; very porous, with burrows, roots			
4								
6					Loose, moist to very moist, light yellow-brown, medium to coarse SAND; friable, non cohesive when disturbed			
8								
10				SP	-Caving			
12			▼		-Groundwater at 12 feet			
14								
					TRENCH TERMINATED AT 15 FEET (Caving badly) Groundwater encountered at 12 feet			

Figure A-32,
Log of Trench T 32, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

TRENCH T 33

ELEV. (MSL.) _____ DATE COMPLETED **04-15-2005**

EQUIPMENT **JD 510 24"**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**ALLUVIUM** Loose, moist, dark grayish brown, Silty, fine to medium SAND; porous, roots, burrows			
2				SM				
4								
6					-Cobble-size lag gravelly sand			
8				SC	**OLD ALLUVIUM** Medium dense, moist, medium to dark reddish brown, Clayey, fine to coarse SAND			
10	T33-1			SM	Medium dense to dense, moist, medium reddish brown, Silty, fine- to coarse-grained SAND; massive, well-graded, indurated, trace clay-cobble			
12								
14	T33-2			SM	Medium dense to dense, moist, olive-brown to brown, Silty, fine SAND; micaceous, with calcium carbonate, small concretionary inclusions			
					TRENCH TERMINATED AT 15 FEET No groundwater encountered			

Figure A-33,
Log of Trench T 33, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 34	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"			
					MATERIAL DESCRIPTION			
0				SM	**ALLUVIUM** Loose, humid, dark brown, Silty, fine SAND; porous, with roots			
2					Loose, damp, light gray-tan, fine to medium SAND; friable, noncohesive, when disturbed, laminated			
4								
6					-6" layer of rounded cobble (granitic)			
8				SP				
10								
12								
14			▼		-Becomes very moist to wet (possible seepage) with basal lag-gravel			
				SC	**OLD ALLUVIUM** Medium dense to dense, very moist, dark reddish brown, Clayey, fine- to coarse-grained SAND with some silt; massive, indurated			
					TRENCH TERMINATED AT 15 FEET Seepage at 14 feet			

Figure A-34,
Log of Trench T 34, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 35 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, dry, dark brown, Silty, fine to medium SAND; porous, roots			
2				SM	**OLD ALLUVIUM** Medium dense to dense, moist, medium reddish brown, Silty, fine to coarse SAND with some clay; massive, indurated, well-graded			
4								
					TRENCH TERMINATED AT 5 FEET No groundwater encountered			

Figure A-35,
Log of Trench T 35, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 36 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**ALLUVIUM** Loose, damp, dark gray-brown, very Silty, fine SAND to Sandy SILT; with abundant micaceous laminations			
2				SM-ML				
4								
6					Loose, moist, light brown, medium to coarse SAND; friable, noncohesive when disturbed			
8								
10				SW/SP				
12			▼		-Groundwater at 13 feet			
14					TRENCH TERMINATED AT 14 FEET (Caving badly) Groundwater encountered at 13 feet			

Figure A-36,
Log of Trench T 36, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◣ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 37 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**ALLUVIUM** Loose, moist, dark gray-brown, very Silty, fine SAND to Sandy SILT; very micaceous			
2								
4								
6				SM/ML				
8					-Becomes wet to saturated			
10			▼		-Seepage at 10 feet, and becomes more sandy			
12								
14					TRENCH TERMINATED AT 14 FEET (Caving badly) Seepage at 10 feet			

Figure A-37,
Log of Trench T 37, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

TRENCH T 38

ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005

EQUIPMENT JD 610 24"

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**ALLUVIUM** Loose, moist, dark gray-brown, very Silty, fine to coarse SAND; very porous, roots, very micaceous			
2				SM				
4								
6								
8			▼	SW/SP	Loose, wet to saturated, light yellow brown, medium- to very coarse-grained SAND; very friable, noncohesive, caving in -Groundwater encountered at 9 feet			
10					TRENCH TERMINATED AT 10 FEET (Caving badly) Groundwater encountered at 9 feet			

Figure A-38,
Log of Trench T 38, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 39 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**ALLUVIUM** Loose, damp to moist, dark brown, very Gravelly, Silty, medium SAND; porous, with numerous roots			
2				SM-GM				
4								
6					Medium dense to dense, veery moist, dark brown, Silty, very coarse GRAVEL; gabbro boulders to 2' diameter			
8			▼	GM				
10								
					TRENCH TERMINATED AT 11 FEET (Refusal on boulders) Groundwater encountered at 9 feet			

Figure A-39,
Log of Trench T 39, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◣ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 40 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**OLD ALLUVIUM** Medium dense, damp, light to medium reddish brown, Silty to Sandy coarse GRAVEL; subangular to subrounded granitics and metasediments in indurated matrix, represents and old alluvial fan or stream deposit			
2				GM				
4								
6					TRENCH TERMINATED AT 6 FEET (Near refusal) No groundwater encountered			

Figure A-40,
Log of Trench T 40, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◪ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 41 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				GC	**OLD ALLUVIUM** Dense, damp, medium reddish brown, Clayey to Sandy, angular GRAVEL with some silt; indurated, well-graded			
2					TRENCH TERMINATED AT 3 FEET (Refusal on gravel) No groundwater encountered			

Figure A-41,
Log of Trench T 41, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 42 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				CL	**TOPSOIL** Stiff, moist, dark brown, very Sandy CLAY			
2					**SAN MARCOS GABBRO** Very weathered, layered, olive to yellow-brown, ultrabasic GABBRO ROCK with calcium carbonate fracture linings			
4					TRENCH TERMINATED AT 5 FEET (Refusal on cemented rock) No groundwater encountered			

Figure A-42,
Log of Trench T 42, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 43 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**OLD ALLUVIUM** Very stiff, very moist, dark reddish brown, Gravelly CLAY; possible ancient slopewash or mudflow deposit of very weathered old alluvium (?)			
2				CL-GC				
4								
6					TRENCH TERMINATED AT 6 FEET (Refusal on boulders) No groundwater encountered			

Figure A-43,
Log of Trench T 43, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 44 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, moist, dark brown, Silty, fine to medium SAND; porous, roots			
2				SM	**OLD ALLUVIUM** Medium dense, damp, light reddish brown, Silty, fine to medium SAND			
4								
6					**SAN MARCOS GABBRO** Very weathered, damp to humid, olive-gray, strong biotite-hornblende GABBRO ROCK			
					TRENCH TERMINATED AT 6 FEET No groundwater encountered			

Figure A-44,
Log of Trench T 44, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◥ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 45 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**OLD ALLUVIUM** Dense, damp, light to medium reddish brown, Silty, fine to coarse, Gravelly SAND; angular clasts of granitic and metasedimentary rocks; possible isolated remnant of an old alluvial fan			
2				SM-GM				
4								
6					TRENCH TERMINATED AT 6 FEET (Cut slope) No groundwater encountered			

Figure A-45,
Log of Trench T 45, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 46 ELEV. (MSL.) ______ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24"	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0 2 4		+ + +			**WOODSON MT. GRANODIORITE** Very weathered, damp, light yellow-brown, strong GRANITIC ROCK; excavates to a clayey, coarse sand			
					TRENCH TERMINATED AT 6 FEET (Cut slope) No groundwater encountered			

Figure A-46,
Log of Trench T 46, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

LIST OF REFERENCES

1. California Department of Conservation, California Geological Survey, *Geologic Map of the Pala 7.5' Quadrangle, San Diego County, California*, A Digital Database Version 1, by Michael P. Kennedy, 2000.

2. *State of California Special Study Zones, Pala Quadrangle*, effective date January 1, 1980.

3. ------, *Landslide Hazards in the Northern Part of the San Diego County Metropolitan Area, San Diego County, California,* DMG Open-File Report 95-04, 1995.

4. ------, Probabilistic Seismic Hazard Assessment for the State of California, DMG Open-File Report, 96-08, 1996.

5. Larsen, E.S., *Batholith and Associated Rocks of Corona, Elsinore and San Luis Rey Quadrangles [15'],* Geological Society of America Memoir 29, 1948.

6. Jennings, C.W., *Fault Activity Map of California and Adjacent Areas,* California Geologic Survey (formerly California Division of Mines and Geology), 1994.

7. Miller, William J., *Geomorphology of the Southern Peninsular Range of California,* Bulletin Geological Society of America, Vol. 46, pp. 1535-1562, 1935.

8. Unpublished reports, aerial photographs, and maps on file with Geocon Incorporated.

APPENDIX G2

Geologic Reconnaissance – Warner Ranch

GEOCON
INCORPORATED
GEOTECHNICAL
CONSULTANTS

GEOLOGIC RECONNAISSANCE

WARNER RANCH
SAN DIEGO COUNTY, CALIFORNIA

PREPARED FOR

CAPSTONE PARTNERS, LLC
CARLSBAD, CALIFORNIA

MARCH 3, 2011
PROJECT NO. 07511-32-01

GEOCON
INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. 07511-32-01
March 3, 2011

Capstone Partners, LLC
1545 Faraday Avenue
Carlsbad, California 92008

Attention: Mr. Mark Hayden

Subject: WARNER RANCH
SAN DIEGO COUNTY, CALIFORNIA
GEOLOGIC RECONNAISSANCE

Dear Mr. Hayden:

In accordance with your authorization of our Proposal No. LG-11022, dated January 20, 2011, we have performed a geologic reconnaissance of the Warner Ranch property in San Diego County, California. Our study was performed in 2005 and the subsurface information contained herein has been presented informally in several transmittals during project planning. The accompanying report describes the site soil and geologic conditions, discusses the anticipated geotechnical considerations for site development and provides preliminary recommendations to assist in future geotechnical studies.

Should you have questions regarding this report, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Trevor E. Myers
RCE 63773

David B. Evans
CEG 1860

TEM:DBE:dmc

(6) Addressee
(email) Shapouri & Associates
Attention: Mr. Mike Shapouri

TABLE OF CONTENTS

GEOLOGIC RECONNAISSANCE

1. PURPOSE AND SCOPE

This report presents the results of a geologic reconnaissance for the Warner Ranch property located off of Highway 76, immediately north of Pala Casino in San Diego County, California (see Vicinity Map, Figure 1). The purpose of this study was to perform a reconnaissance of the soil and geologic conditions within the property boundaries and identify any known geologic hazards that may adversely impact the project as planned. This correspondence also discusses items that will require evaluation during future geotechnical studies.

The primary geotechnical considerations for this project will be the presence of hard rock, rock fall potential and potential compression (including liquefaction) where embankments are planned over saturated and unconsolidated alluvial sediments. Additional studies, including subsurface exploration, should be performed prior to construction to further characterize the geologic and geotechnical conditions.

The scope of our study included a review of readily available published geologic literature pertinent to the site (see List of References), performing a field reconnaissance consisting of geologic mapping in accessible locations, a field exploration program consisting of excavating 46 exploratory trenches across the site, reviewing stereoscopic aerial photographs of the property, and preparing this report summarizing our findings. The field portion of this study was performed in April 2005. The geologic information was used during project planning but was never submitted in a formal report. This correspondence presents the information from our study and addresses the geotechnical considerations for site development.

The exhibit used as a base map to depict the soil and geologic conditions consists of a reproducible copy of a compilation of digital information provided by Shapouri & Associates (Geologic Map, Figure 2). The plan depicts the overall site and development boundaries, existing topography and mapped geologic contacts, based on published information and our reconnaissance. The conclusions and recommendations presented herein are based on an analysis of the data reviewed as part of this study and our experience with similar soil and geologic conditions.

2. SITE AND PROJECT DESCRIPTION

The irregularly shaped property is situated north of State Route 76 in the Pala community of northern San Diego County, California. The Pala Casino and Resort is located immediately to the south of the property, south of SR-78. The overall site encompasses approximately 514 acres of essentially undeveloped natural hillside and valley terrain north of the San Luis Rey River. Several residential,

maintenance and agricultural-related structures and orange orchards exist along the southern portion of the property.

Topographically, the site consists of hillside and valley terrain. A relatively flat alluvial plain is located along the southern portion of the property with relatively moderate to steep hillside terrain to the north. Surface drainage is directed to the southerly trending alluvial valleys, which converge into a broad basin north of the San Luis Rey River. Elevations across the overall property vary from approximately 350 to 1,200 feet above Mean Sea Level (MSL). Elevations across the proposed development, excluding the water tank pads and access roads, generally range from approximately 350 feet to 545 feet above MSL. The water tank pads are located at an elevation of approximately 780 feet. An approximately 120 foot high, 1:1 (horizontal:vertical) cut slope and 30 foot high, 2:1 (H:V) fill slope are shown adjacent to the water tank pads.

Current plans propose construction of 780 residential units, including 556 single family detached and 224 multi-family and attached townhomes, approximately 11 acres of private parks, 6 acres of landscaped areas, an approximately 3-acre active public park, 344 acres of preserved open space, and two above ground water storage tanks with associated access roads. A 220,000-gallon per day (GPD) on-site packaged wastewater treatment plant and 10,000 sq. ft. fire station are also planned. Streets and other infrastructure, as well as underground utilities and water storage tanks will be constructed. The project will be accessed by a central roadway extending north of SR-76. Widening and traffic control improvements on SR-76 are also planned.

Cut slopes in the residential portion are proposed at a maximum inclination of 1.5:1 (horizontal:vertical) with a maximum height of approximately 90 feet. Fill slopes are proposed at maximum inclinations of 2:1 (horizontal:vertical) with maximum heights on the order of 50 feet. Cut and fill slopes for the tank site are proposed at 1:1 and 2:1, respectively, to a maximum cut slope height of 120 feet.

The above locations and descriptions are based on a site reconnaissance and review of the referenced tentative map. If development plans differ significantly from those described herein, Geocon Incorporated should be contacted for review and possible revisions to this report.

3. SOIL AND GEOLOGIC CONDITIONS

Based on our review of published geologic maps, previous geotechnical reports and observations during the site reconnaissance and field exploration, the geologic conditions exposed on the property consist of crystalline igneous rocks, (gabbro, granodiorite, and tonalite), metamorphic rocks, older and younger alluvial and colluvial deposits and topsoil. Although some of these units may not be encountered during grading, we have described them herein to characterize the general geologic

conditions that should be anticipated. The surficial soils and geologic formations are discussed below. The estimated extent of these units is shown on the Geologic Map, Figure 2.

3.1 Topsoil (Unmapped)

Topsoil consisting of loose, silty to clayey sand with occasional gravel was encountered in the exploratory trenches throughout the majority of the site. The topsoil is on the order of 1 to 2 feet thick and due to its porous nature is considered compressible and unsuitable for support of structural fill and the proposed improvements. These deposits will require remedial grading during project development.

3.2 Alluvium and Colluvium Deposits (Qal, Qcol)

Alluvial and colluvial soils were encountered during the field exploration and mapped during the field reconnaissance. The maximum thickness of these deposits was not determined in all areas due to the limited reach of the backhoe. The alluvium in the main drainages is in excess of 15 feet thick. These deposits consisted of loose, silty, fine to coarse sands and gravelly medium to coarse sands with little to no cohesion. In addition, groundwater was encountered in the majority of the trenches at a depth of approximately 12 feet below existing grades. Laboratory grain size testing on a sample collected below the water table suggests that the alluvium is liquefiable under seismic loading. The potential for this condition should be the focus of future studies. Due to the relatively unconsolidated nature of these deposits, remedial grading or ground improvement techniques will be necessary in structural development areas to mitigate the potential for compression related settlement and/or liquefaction.

3.3 Older Alluvium (Qoal)

Pleistocene or early Holocene-age older alluvial deposits were encountered during the field exploration and mapped during the field reconnaissance. These deposits are characterized as medium dense to very dense, indurated and well-graded silty, fine to coarse sand and clayey sand. These deposits typically have adequate strength to support fill soils or structural loads. However, future studies will be required in order to evaluate their suitability.

3.4 San Marcos Gabbro (Ksm)

Cretaceous-age San Marcos Gabbro was identified primarily along the western and eastern portions of the site. The gabbro is typically deeply weathered, but appears to contain *corestones* and *floater* boulders that will require special handling and/or breaking. In other areas, the gabbro forms solid *knobs*, ribs and *ledges* that are likely marginally rippable to non-rippable.

With the exception of highly weathered, or highly fractured portions, it is anticipated that blasting or the use of specialized equipment will be necessary to excavate within this formation. Additional studies are recommended that include seismic refraction traverses and subsurface investigation using a rotary air percussion drill in the gabbro to better define hardrock and difficult excavation zones.

3.5 Granitic Rock (Kwm, Kb)

Cretaceous-age granitic rock units consisting of granodiorite and tonalite compositions are present across the majority of the property and underlie the surficial and alluvial units at depth. The various granitic formations identified include the Woodson Mountain Granodiorite (Kwm), and Bonsall Tonalite.

The rock encountered during grading is anticipated to have a variable weathering pattern ranging from completely weathered decomposed granite to outcrops of fresh, extremely strong, hard rock that will require blasting to excavate. Future studies should evaluate these conditions using exploration techniques such as seismic refraction surveys and rotary air percussion borings (air track).

The granitic units generally exhibit adequate bearing and slope stability characteristics. Cut slopes excavated at an inclination of 1:1 (horizontal:vertical) within granitic rock should be grossly stable to the proposed heights if free of adversely oriented structural features (e.g. faults, joints, fractures). The soils derived from excavations within the decomposed granitic rock are anticipated to consist of low-expansive, silty, medium- to coarse-grained sands and should provide suitable foundation support in a properly compacted condition. In addition, it should be anticipated that excavations within the granitic rock will generate boulders and oversize materials (rocks greater than 12 inches in length) that will require special handling and possible exportation from the site.

3.6 Bedford Canyon (Trbc)

Metasedimentary rock of Triassic-age was encountered in two relatively small areas in the northern-central portion of the site development (see *Geologic Map*, Figure 2). The Bedford Canyon Formation consists of weathered, foliated and metamorphosed shales that comprise a pendant (or large remnant) of very old rock sandwiched between the two younger units of San Marcos Gabbro and Bonsall Tonalite. Because of the weathered, folded and fractured condition of the rock, clayseams and adversely-dipping structures could be exposed in localized sections of cut-slopes. An engineering geologist should be present if this unit is encountered to assess the potential for adverse conditions in cut-slopes.

4. GROUNDWATER

We encountered groundwater in the alluvial deposits ranging from approximately 11 to 14 feet below grade. Groundwater will be an important consideration during the development of the site with respect to settlement and liquefaction potential. Groundwater depths indicated are reflective of groundwater elevations we encountered during our investigation and may vary seasonally and should be ealuated during future studies. Wet alluvial removals may be encountered during grading operations, leading to difficult excavation, top loading, and compaction challenges.

It is not uncommon for groundwater or seepage conditions to develop where none previously existed. Groundwater elevations are dependent on seasonal precipitation, irrigation, and land use, among other factors, and vary as a result. Proper surface drainage will be important to future performance of the project.

5. GEOLOGIC HAZARDS

5.1 Faulting and Seismicity

A fault investigation was performed in April 2005 and consisted of excavating several exploratory trenches (T-1, T-2 and T-3) to determine the presence of a published mapped fault trace shown to extend across the proposed development area (Kennedy, 2000). The trenches indicated that the fault identified on the published geologic map (see List of References) does not exist. The continuous, 150-foot-long trench, in addition to several adjacent trenches, revealed a transitional igneous intrusive boundary between San Marcos Gabbro and Bonsall Tonalite, which evidently was interpreted as a fault-related contact. This type of contact was identified in the same area on a regional scale in a previous study (Larsen, 1948). This interface represents an ancient (Cretaceous-age) emplacement of magma against an even older rock type, resulting in an irregular welded contact zone from several feet to several yards wide (see Trench T-2, profile log). The bedrock formations encountered during the study are typically massive, but can have discontinuous joints and fractures.

A review of the referenced geologic materials and our knowledge of the general area indicate that the site is not underlain by active, potentially active, or inactive faults. An active fault is defined by the California Geological Survey (CGS) as a fault showing evidence for activity within the last 11,000 years. The site is not located within a State of California Earthquake Fault Zone.

According to the computer program *EZ-FRISK* (Version 7.51), 19 known active faults are located within a search radius of 50 miles from the property. The nearest known active fault is the Elsinore - Temecula Fault, located approximately 4 miles northeast of the site and is the dominant source of potential ground motion. Earthquakes that might occur on the Elsinore Fault Zone or other faults within the southern California and northern Baja California area are potential generators of

significant ground motion at the site. The estimated deterministic maximum earthquake magnitude and peak ground acceleration for the Elsinore-Temecula Fault are 6.8 and 0.4g, respectively. Table 5.1.1 lists the estimated maximum earthquake magnitude and peak ground acceleration for the most dominant faults in relationship to the site location. We calculated peak ground acceleration (PGA) using Boore-Atkinson (2008) NGA USGS2008, Campbell-Bozorgnia (2008) NGA USGS, and Chiou-Youngs (2008) NGA acceleration-attenuation relationships.

TABLE 5.1.1
DETERMINISTIC SEISMIC SITE PARAMETERS

Fault Name	Distance from Site (miles)	Maximum Earthquake Magnitude (Mw)	Peak Ground Acceleration		
			Boore-Atkinson 2008 (g)	Campbell-Bozorgnia 2008 (g)	Chiou-Youngs 2008 (g)
Elsinore-Temecula	4	6.8	0.31	0.36	0.40
Elsinore-Julian	4	7.1	0.30	0.33	0.40
Elsinore-Glen Ivy	24	6.8	0.11	0.08	0.08
Newport-Inglewood Offshore	25	7.1	0.12	0.09	0.10
Rose Canyon	26	7.2	0.12	0.09	0.10
San Jacinto-Anza	26	7.2	0.12	0.09	0.10
San Jacinto- San Jacinto Valley	28	6.9	0.10	0.08	0.07
Earthquake Valley	32	6.5	0.07	0.06	0.05
San Jacinto-Coyote Creek	34	6.8	0.08	0.06	0.05
San Joaquin Hills	37	6.6	0.06	0.07	0.05
Coronado Bank	42	7.6	0.09	0.07	0.08

We used the computer program *EZ-FRISK* to perform a probabilistic seismic hazard analysis. The computer program *EZ-FRISK* operates under the assumption that the occurrence rate of earthquakes on each mappable Quaternary fault is proportional to the faults slip rate. The program accounts for fault rupture length as a function of earthquake magnitude, and site acceleration estimates are made using the earthquake magnitude and distance from the site to the rupture zone. The program also accounts for uncertainty in each of following: (1) earthquake magnitude, (2) rupture length for a given magnitude, (3) location of the rupture zone, (4) maximum possible magnitude of a given earthquake, and (5) acceleration at the site from a given earthquake along each fault. By calculating the expected accelerations from considered earthquake sources, the program calculates the total average annual expected number of occurrences of site acceleration greater than a specified value. We utilized acceleration-attenuation relationships suggested by Boore-Atkinson (2008) NGA USGS, Campbell-Bozorgnia (2008) NGA USGS, and Chiou-Youngs (2008) in the analysis. Table 5.1.2 presents the site-specific probabilistic seismic hazard parameters including acceleration-attenuation relationships and the probability of exceedence.

TABLE 5.1.2
PROBABILISTIC SEISMIC HAZARD PARAMETERS

Probability of Exceedence	Peak Ground Acceleration		
	Boore-Atkinson, 2007 (g)	Campbell-Bozorgnia, 2008 (g)	Chiou-Youngs, 2008 (g)
2% in a 50 Year Period	0.78	0.80	0.97
5% in a 50 Year Period	0.58	0.62	0.74
10% in a 50 Year Period	0.45	0.49	0.57

The California Geologic Survey (CGS) has a program that calculates the ground motion for a 10 percent of probability of exceedence in 50 years based on an average of several attenuation relationships. Table 5.1.3 presents the calculated results from the *Probabilistic Seismic Hazards Mapping Ground Motion Page* from the CGS website.

TABLE 5.1.3
PROBABILISTIC SITE PARAMETERS FOR SELECTED FAULTS
CALIFORNIA GEOLOGIC SURVEY

Calculated Acceleration (g) Firm Rock	Calculated Acceleration (g) Soft Rock	Calculated Acceleration (g) Alluvium
0.57	0.57	0.57

While listing peak accelerations is useful for comparison of potential effects of fault activity in a region, other considerations are important in seismic design, including the frequency and duration of motion and the soil conditions underlying the site. Seismic design of the structures should be evaluated in accordance with the California Building Code (CBC) or other applicable code.

5.2 Liquefaction

Liquefaction typically occurs when a site is located in a zone with seismic activity, onsite soil is cohesionless, groundwater is encountered within 50 feet of the surface, and soil relative densities are less than about 70 percent. If all four previous criteria are met, a seismic event could result in a rapid pore-water pressure increase from the earthquake-generated ground accelerations. Based on our preliminary evaluation, the potential for liquefaction and seismically induced settlement to occur where the development is underlain by alluvial deposits appears to be moderate to high and will require evaluation during future subsurface studies.

5.3 Landslides

No landslides were encountered during our site reconnaissance, and none are known to exist on the property or at a location that would impact the proposed development.

5.4 Rock Fall Potential

We evaluated rock-fall hazard potential along the margins of the proposed development where excavations are planned into naturally sloping ground. Our evaluation consisted of observing the slopes above the proposed cuts and determining whether or not rock outcroppings were present and if so, were there spherical boulders or rock slabs that could be prone to movement down slope in the near-term during the natural erosion process or during a seismic event. Although this evaluation is primarily qualitative, factors such as steepness of slope, boulder size and shape, and embedment depth into the surrounding groundmass can be used to provide a relative risk level to assist in developing mitigation plans such as rock pinning, encatchment berms or rock fences.

Our reconnaissance revealed that nearly all of development perimeter is free of rock outcroppings. In the very limited areas where surface rock can be observed, the slabs are non-spherical and sufficiently embedded in the surrounding weathered matrix. Therefore, it is our opinion that the risk for rock fall hazards along the perimeter of the development is considered low. Further observations and confirmation of this opinion should be performed during clearing and grubbing, and site grading.

6. GEOTECHNICAL CONSIDERATIONS

6.1 Compressible Alluvial/Colluvial Deposits

Potentially compressible alluvial/colluvial deposits are present and will require remedial grading or ground improvement techniques where structural improvements are planned. The settlement potential of these deposits and the magnitude of geotechnical mitigation required should be the focus of future studies.

6.2 Shallow Groundwater

Shallow groundwater within the alluvial deposits may limit the extent of remedial grading using conventional techniques. De-watering and/or embankment surcharge methods may be necessary to induce compression related settlement prior to construction of structural improvements. Construction schedules can be impacted by surcharge techniques since construction of brittle improvements cannot commence until primary consolidation has occurred.

6.3 Liquefaction Potential

Based on our field exploration and limited laboratory testing, the saturated alluvial deposits underlying the site may be prone to liquefaction during an earthquake. In the event that future studies identify liquefiable layers, mitigation consisting of remedial grading and/or geotechnical ground improvement techniques may be necessary.

6.4 Shallow Hardrock

The presence of shallow hardrock in areas of planned excavation may necessitate blasting techniques to accomplish the grading. Future studies should focus on rock rippability using exploration techniques such as seismic refraction surveys and rotary air percussion drilling. A potential benefit associated with hardrock is that crushing of the oversize materials could produce aggregate materials for use as road base, pipe bedding and subdrain rock.

6.5 Rock Fall Potential

The risk for rock fall hazards along the perimeter of the development is considered low.

6.6 Slope Stability

The proposed excavations in the formational materials should be stable if free of adversely oriented structural features such as faults, fractures or joints. It is recommended that all cut slope excavations be observed during grading by an engineering geologist to check that soil and geologic conditions do not differ significantly from those anticipated. Fill slopes constructed from properly compacted soils should possess acceptable stability if inclined at 2:1 or flatter.

6.7 Corrosion

Laboratory tests were performed on a representative soil sample to evaluate the water-soluble sulfate content (California Test No. 417), pH and Resistivity (California Test Method 643), and water-soluble chloride content (AASHTO T 291) to generally evaluate the corrosion potential to structures in contact with soil. The results of the laboratory tests are summarized in Appendix B. The results should be considered for design of concrete, underground structures and metallic pipes.

We performed laboratory tests on samples of the site materials to evaluate the percentage of water-soluble sulfate content. Results from the laboratory water-soluble sulfate content tests are presented in Appendix B and indicate that the on-site materials at the locations tested possess "negligible" sulfate exposure to concrete structures as defined by 2010 CBC Section 1904.3 and ACI 318-08 Sections 4.2 and 4.3. The presence of water-soluble sulfates is not a visually discernible characteristic; therefore, other soil samples from the site could yield different concentrations.

Additionally, over time landscaping activities (i.e., addition of fertilizers and other soil nutrients) may affect the concentration.

Laboratory pH and resistivity and water soluble chloride content tests were performed to evaluate whether the soils are potentially corrosive to buried metal. The results are summarized in Appendix B. The corrosive nature of the soils should be considered in the design of buried metal pipes and underground structures.

Geocon Incorporated does not practice in the field of corrosion engineering; therefore, further evaluation by a corrosion engineer may be needed to incorporate the necessary precautions to avoid premature corrosion of underground pipes and buried metal in direct contact with the soils.

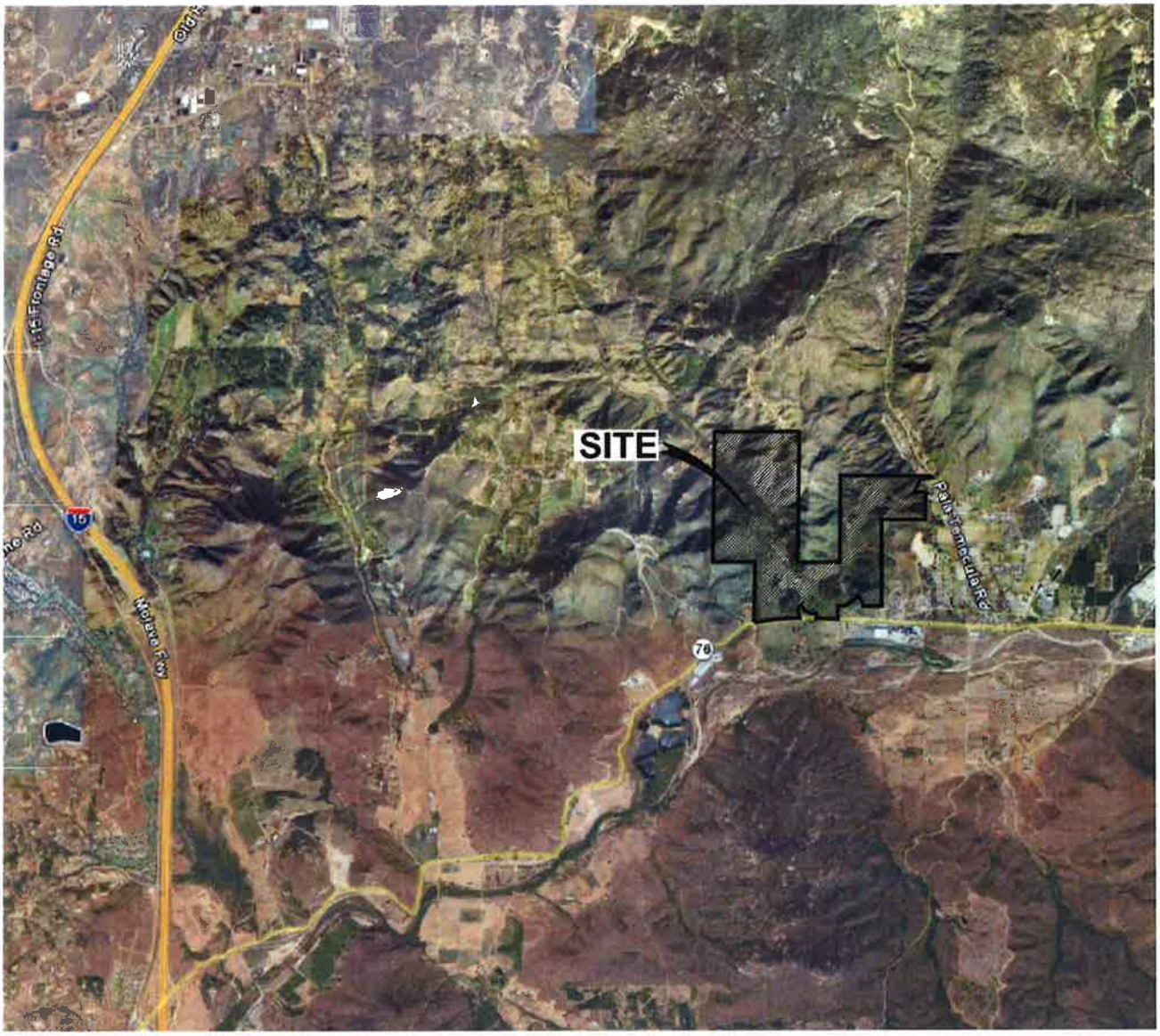
LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.

2. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon Incorporated should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon Incorporated.

3. This report is issued with the understanding that it is the responsibility of the owner or his representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

4. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.



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NO SCALE

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PHONE 858 558-6900 - FAX 858 558-6159

TM / RA		DSK/GTYPD

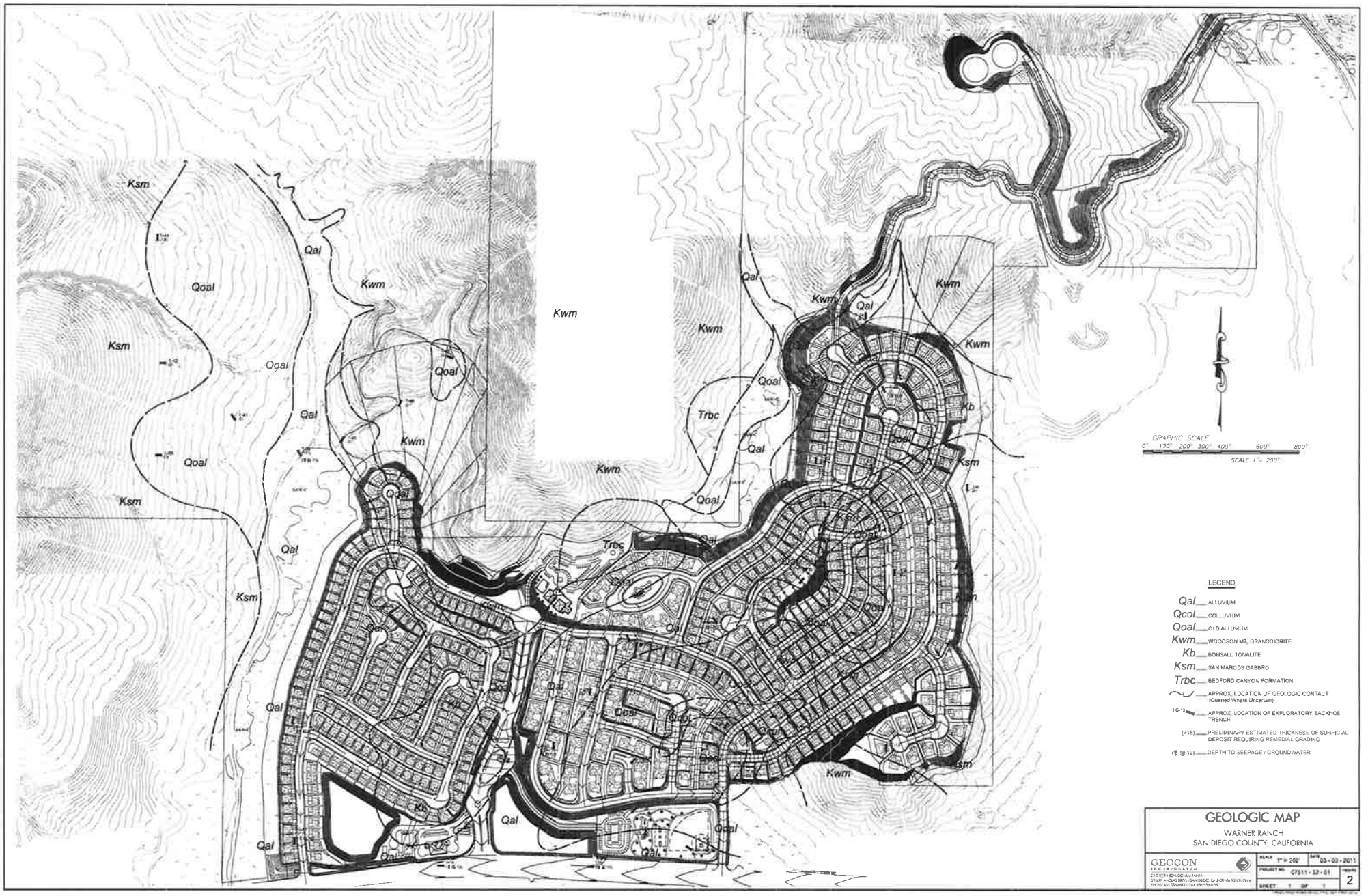
VICINITY MAP

WARNER RANCH
SAN DIEGO COUNTY, CALIFORNIA

DATE 03 - 03 - 2011	PROJECT NO. 07511 - 32 - 01	FIG. 1

Vicinity Map

Y:\PROJECTS\07511-32-01 WARNER RANCH\DETAILS\GVicinity Map.dwg



GEOLOGIC MAP

WARNER RANCH
SAN DIEGO COUNTY, CALIFORNIA

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INCORPORATED

SCALE	1" = 200'
DATE	03-03-2011
PROJECT NO.	07511-32-01
FIGURE	2
SHEET	1 OF 1

APPENDIX A

APPENDIX A

FIELD INVESTIGATION

Our field investigation was performed in April 2005 and consisted of a site reconnaissance and field mapping, and excavation of 46 exploratory backhoe trenches. Trenches were excavated using a John Deere 510 rubber-tired backhoe equipped with 24-inch wide bucket. During trenching, bulk samples were obtained.

Soil conditions encountered in trench excavations were visually examined, classified and logged in general accordance with the American Society for Testing and Materials (ASTM) practice for Description and Identification of Soils (Visual-Manual Procedure D2488). Logs of exploratory excavations are contained herein as Figures A-1 through A-46. The logs depict the soil and geologic conditions encountered and the depth at which samples were obtained. The approximate locations of the exploratory excavations are shown on the Geologic Map (Figure 2, map pocket).

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**TRENCH T 1** ELEV. (MSL.) _____ DATE COMPLETED **04-13-2005** EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**ALLUVIUM** Loose, damp, dark brown, Silty, fine to coarse SAND; very porous, massive, textave with few clean sand layers (well-graded)			
2								
4								
				SM				
6								
8					-Becomes moist			
10								
12		+ + + + + +			**BONSALL TONALITE** Very weathered, light to medium yellow-brown, moderately strong GRANITIC ROCK; excavates to a silty, very coarse sand			
					TRENCH TERMINATED AT 12½ FEET No groundwater encountered			

Figure A-1,
Log of Trench T 1, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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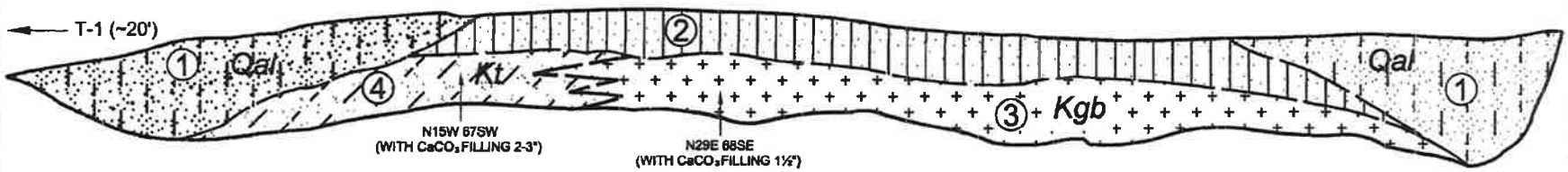
SAN DIEGO COUNTY, CALIFORNIA



IGNEOUS TRANSITION ~20'+ WITH
INCLUSIONS (XENOLITHS) OF GABBRO IN Kt

SCALE:
HORIZONTAL 1" ≅ 15'
VERTICAL 1" = 10'

① ALLUVIUM

② TOPSOIL / COLLUVIUM

③ SAN MARCOS GABBRO (Biotite-hornblende rich, medium to dark gray-brown, fine to medium crystalline texture

④ GREEN VALLEY TONALITE (Coarse crystalline texture, light to medium brown)

TRENCH T 2

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FIGURE A-2
DATE

X:/R14TEMP/1_GEOTECH/1_GEOTECH_MICAELA/2005/07511-32-01Warner Ranch

PROJECT NO. 07511-32-01

TRENCH T 3

ELEV. (MSL.) _____ DATE COMPLETED **04-13-2005**

EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**ALLUVIUM** Loose, damp, medium to dark gray-brown, Silty, fine to medium SAND; porous, roots, pinhole pores			
2								
4				SM				
6								
8					**OLD ALLUVIUM** Medium dense, damp to moist, medium reddish brown, Silty, fine to medium SAND with some clay; grit, well-graded and indurated			
10				SM				
12			▼		-Becomes very moist -Seepage at 12 feet			
	T3-1				**SAN MARCOS GABBRO** Weathered, damp, brownish gray, strong, biotite-hornblende GABBRO ROCK			
					TRENCH TERMINATED AT 13½ FEET Seepage at 12 feet			

Figure A-3,
Log of Trench T 3, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 4 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				SM	**ALLUVIUM** Loose, dry to damp, dark grayish brown, Silty, fine to medium SAND: very porous, roots			
4					**OLD ALLUVIUM** Medium dense, humid to damp, reddish brown, Silty, fine- to medium-grained SAND; trace clay, minor pinhole pores in upper 3-5 feet			
6								
8								
10				SM				
12					-Becomes moist, less porous, massive, well-graded, with silt-to-grit size sand, and well indurated			
14								
16								
18								
					TRENCH TERMINATED AT 19½ FEET No groundwater encountered			

Figure A-4,
Log of Trench T 4, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**TRENCH T 5** ELEV. (MSL.) _____ DATE COMPLETED **04-13-2005** EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, moist, dark brown, Silty, fine to medium SAND; porous			
2					**SAN MARCOS GABBRO** Very weathered, damp, brownish gray, strong biotite-hornblende GABBRO ROCK			
4								
					TRENCH TERMINATED AT 5 FEET No groundwater encountered			

Figure A-5,
Log of Trench T 5, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 6 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
				SM	**TOPSOIL** Loose, very moist, dark brown, Silty, fine SAND; porous			
2					**SAN MARCOS GABBRO** Weathered, damp, brownish gray, strong biotite-hornblende GABBRO ROCK; excavates to silty, medium to coarse sand			
4								
					TRENCH TERMINATED AT 5½ FEET No groundwater encountered			

Figure A-6,
Log of Trench T 6, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 7 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**TOPSOIL** Loose, very moist, dark brown, Silty, fine SAND; porous			
2			▼	SM	-Seepage			
4				SM	**OLD ALLUVIUM** Extremely dense, damp, reddish brown, cemented, Silty, coarse SAND; massive, well-graded			
					TRENCH TERMINATED AT 4½ FEET (Refusal) Seepage at 3 feet			

Figure A-7,
Log of Trench T 7, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 8 ELEV. (MSL.) ______ DATE COMPLETED **04-13-2005** EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0 2 4		+ +			**SAN MARCOS GABBRO** Weathered, damp, medium dark brownish gray, strong biotite-hornblende GABBRO ROCK			
					TRENCH TERMINATED AT 5 FEET No groundwater encountered			

Figure A-8,
Log of Trench T 8, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**TRENCH T 9** ELEV. (MSL.) _____ DATE COMPLETED **04-13-2005** EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SC	**TOPSOIL** Loose, very moist, dark brown, Clayey to Silty, fine to medium SAND; porous			
2		+ + + + + + + + + +			**SAN MARCOS GABBRO** Weathered, very moist, dark reddish brown to olive, moderately strong, biotite-hornblende GABBRO ROCK; with thin strong peg. dikes and selvages of metasedimentary (quartz)			
4					TRENCH TERMINATED AT 5 FEET (Refusal on dikes and siliceous metasedimentary selvages) No groundwater encountered			

Figure A-9,
Log of Trench T 9, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 10 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, moist, dark brown, Silty, fine to medium SAND			
2					**SAN MARCOS GABBRO** Weathered, humid, moderately strong, biotite-hornblende GABBRO ROCK			
					TRENCH TERMINATED AT 3½ FEET (Near refusal) No groundwater encountered			

Figure A-10,
Log of Trench T 10, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▩ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 11 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**TOPSOIL** Loose, very moist, dark brown, Silty, medium to coarse SAND; very porous, roots			
2				SM				
4					**SAN MARCOS GABBRO** Very weathered, moist, dark gray-olive, strong GABBRO ROCK; excavates to a silty, medium to coarse sand			
					TRENCH TERMINATED AT 5 FEET No groundwater encountered			

Figure A-11,
Log of Trench T 11, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 12 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, dry, medium brown, Gravelly, Silty, medium SAND; very porous, roots			
2					**SAN MARCOS GABBRO** Weathered, damp, grayish brown, moderately strong, biotite-hornblende GABBRO ROCK			
4								
6					TRENCH TERMINATED AT 6 FEET No groundwater encountered			

Figure A-12,
Log of Trench T 12, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 13 ELEV. (MSL.) _____ DATE COMPLETED 04-13-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, dry to humid, dark brown, Gravelly, Silty, fine to medium SAND			
2					**SAN MARCOS GABBRO** Very weathered, fractured, medium to light brownish gray, strong GABBRO ROCK; excavates to silty, medium to coarse sand			
4								
6								
					TRENCH TERMINATED AT 7 FEET No groundwater encountered			

Figure A-13,
Log of Trench T 13, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**TRENCH T 14** ELEV. (MSL.) _____ DATE COMPLETED **04-13-2005** EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, moist, dark brown, Silty, fine to medium SAND; porous			
2					**SAN MARCOS GABBRO** Very weathered, damp, medium gray-brown, moderately strong GABBRO ROCK; excavates to a coarse sand			
4								
					TRENCH TERMINATED AT 5 FEET No groundwater encountered			

Figure A-14,
Log of Trench T 14, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▩ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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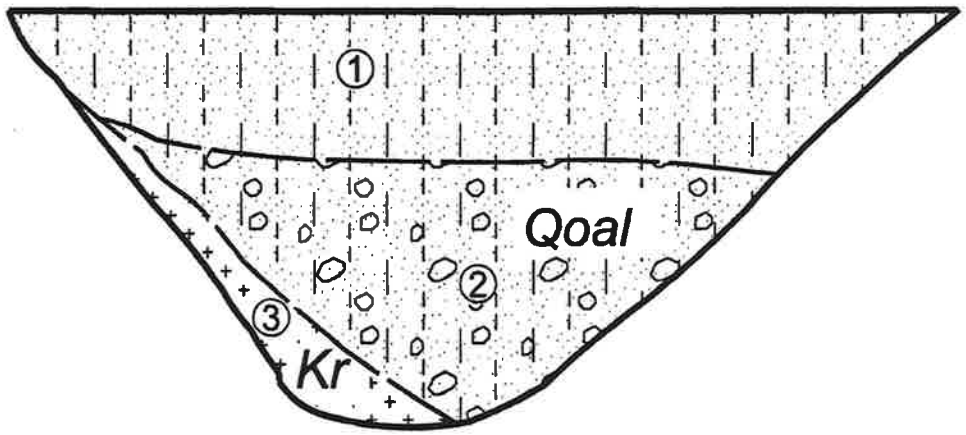
WARNER RANCH
SAN DIEGO COUNTY, CALIFORNIA

SW NE



SCALE: 1" ≅ 4'
HORIZONTAL = VERTICAL

① TOPSOIL / COLLUVIUM
Loose, very moist, dark brown, Silty, fine SAND: very porous, roots

② OLD ALLUVIUM
Medium dense, moist, light to medium brown to reddish brown, Gravelly, Silty, fine- to coarse-grained SAND; well graded, little porosity

③ RAINBOW GRANITE
Slightly weathered, moist, light brown to reddish brown, strong GRANITIC ROCK

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6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159
PROJECT NO. 007511 - 32 - 01
FIGURE A-15
DATE

TRENCH T 15

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 16 ELEV. (MSL.) _____ DATE COMPLETED 04-14-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, very moist, dark brown, Silty, fine- to medium-grained SAND			
2								
4				SM	**OLD ALLUVIUM** Medium dense to dense, damp, medium to light reddish brown, Silty, fine- to medium-grained SAND; massive, indurated, with little porosity			
6								
8					-Angular clast of metasedimentary rock			
10								
					TRENCH TERMINATED AT 10½ FEET (Near refusal) No groundwater encountered			

Figure A-16,
Log of Trench T 16, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**TRENCH T 17** ELEV. (MSL.) _____ DATE COMPLETED **04-14-2005** EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**COLLUVIUM** Loose, moist, medium to dark brown, Silty, medium-grained SAND; porous, with roots			
2								
4				SM	**OLD ALLUVIUM** Medium dense, moist, medium brown to reddish brown, Silty, fine- to coarse-grained SAND; massive, indurated and well-graded			
6								
8								
					TRENCH TERMINATED AT 9 FEET No groundwater encountered			

Figure A-17,
Log of Trench T 17, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

TRENCH T 18

ELEV. (MSL.) _____ DATE COMPLETED **04-14-2005**

EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**COLLUVIUM** Very loose, moist, dark brown, Silty, fine- to medium-grained SAND			
2				SM				
4				SC-CL	Loose to stiff, very moist, dark reddish brown, very Clayey, fine to coarse SAND to Sandy CLAY; porous, pinholes, roots			
6					**OLD ALLUVIUM** Medium dense, moist, medium reddish brown, Silty, fine to coarse SAND; massive, indurated and well-graded, trace clay			
8				SM				
10								
12					TRENCH TERMINATED AT 12 FEET No groundwater encountered			

Figure A-18,
Log of Trench T 18, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 19 ELEV. (MSL.) _____ DATE COMPLETED 04-14-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**OLD ALLUVIUM** Medium dense to dense, damp, medium reddish brown, Silty, fine- to coarse-grained SAND; massive, indurated and well-graded			
2	T19-1			SM			154.9	7.0
4	T19-2							
					TRENCH TERMINATED AT 5½ FEET No groundwater encountered			

Figure A-19,
Log of Trench T 19, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

TRENCH T 20

ELEV. (MSL.) _____ DATE COMPLETED **04-14-2005**

EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**COLLUVIUM** Loose, very moist, dark brown, Silty, fine to medium SAND			
2				SM				
4					-Becomes slightly clayey			
6					**OLD ALLUVIUM** Medium dense to dense, medium reddish brown, Silty, fine- to coarse-grained SAND; massive, indurated and well-graded, with grit-size sand			
8				SM				
10					TRENCH TERMINATED AT 11 FEET No groundwater encountered			

Figure A-20,
Log of Trench T 20, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 21 ELEV. (MSL.) _____ DATE COMPLETED 04-14-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**OLD ALLUVIUM** Medium dense, damp, medium to light reddish brown, Clayey, fine to coarse SAND; weathered formation?			
2				SC				
4					Medium dense to dense, moist, medium reddish brown, Silty, fine to coarse SAND; trace clay, massive, indurated and well-graded			
6								
8				SM				
10								
12								
					TRENCH TERMINATED AT 13 FEET No groundwater encountered			

Figure A-21,
Log of Trench T 21, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

TRENCH T 22

ELEV. (MSL.) _____ DATE COMPLETED **04-14-2005**

EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**TOPSOIL** Loose, humid, medium to dark gray-brown, Silty, fine to medium SAND; very porous, roots			
2				SM	**OLD ALLUVIUM** Medium dense, damp, medium reddish brown, Silty, fine- to coarse-grained SAND with some clay; weathered formation?			
4								
6				SM	Medium dense to dense, moist, medium reddish brown, Silty, fine to coarse-grained SAND; massive, indurated and well-graded			
8								
					TRENCH TERMINATED AT 9 FEET No groundwater encountered			

Figure A-22,
Log of Trench T 22, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 23 ELEV. (MSL.) _____ DATE COMPLETED 04-14-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**ALLUVIUM** Loose, damp to moist, dark brown, Gravelly, Silty, medium to coarse-grained SAND; porous, roots			
2				SM				
4				SM				
6					**OLD ALLUVIUM** Medium dense to dense, moist, medium to dark reddish brown, Silty, fine- to coarse-grained SAND; indurated and well-graded			
					TRENCH TERMINATED AT 7½ FEET No groundwater encountered			

Figure A-23,
Log of Trench T 23, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◹ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

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PROJECT NO. 07511-32-01

TRENCH T 24

ELEV. (MSL.) _____ DATE COMPLETED **04-14-2005**

EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**ALLUVIUM** Loose, damp, light yellow-brown, very Gravelly, Silty, coarse-grained SAND			
2								
4				SM-GM	-Lag gravel of granitic boulders (caving)			
6								
8					**OLD ALLUVIUM** Medium dense, very moist to wet, light reddish brown, Silty, coarse-grained, Gravelly SAND			
10				SM				
12					**WOODSON MT. GRANODIORITE** Weathered, very moist, light brown, moderately strong GRANITIC ROCK			
					TRENCH TERMINATED AT 12 FEET No groundwater encountered			

Figure A-24,
Log of Trench T 24, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 25 ELEV. (MSL.) _____ DATE COMPLETED 04-14-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**TOPSOIL** Loose, very moist, dark gray-brown, Silty, fine- to medium-grained SAND			
2				SM				
4					**OLD ALLUVIUM** Medium dense, moist, medium reddish brown, Silty, fine- to coarse-grained SAND			
6				SM				
8			▼		-Seepage (possibly perched on bedrock or cemented (durapan) at depth)			
					TRENCH TERMINATED AT 8½ FEET Seepage at 8 feet			

Figure A-25,
Log of Trench T 25, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

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PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 26 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, very moist, dark gray-brown, Silty, fine- to medium-grained SAND			
2								
4				SM	**OLD ALLUVIUM** Medium dense to dense, damp, medium reddish brown, Silty, fine to coarse SAND; massive, well-graded, indurated			
					TRENCH TERMINATED AT 8½ FEET Groundwater encountered at 8 feet			

Figure A-26,
Log of Trench T 26, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 27 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
				SM	**TOPSOIL** Loose, very moist, dark gray-brown, Silty, fine to medium SAND; porous, numerous roots			
2								
				SM	**OLD ALLUVIUM** Medium dense, moist, medium reddish brown, Silty, fine to coarse SAND			
4								
	T27-1			SM	Extremely dense, cemented, medium reddish brown, Silty, fine to coarse SANDSTONE; durapan over 12" thick (maybe marginally rippable)			
					TRENCH TERMINATED AT 5½ FEET (Refusal) No groundwater encountered			

Figure A-27,
Log of Trench T 27, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▩ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 28 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**ALLUVIUM**			
2				SM	Loose, very moist, dark brown, Silty, fine to coarse SAND; porous, roots			
4					Loose, moist, light reddish brown, medium to coarse SAND; mostly massive, but with some thin lenticular interbedded silty sands			
6	T28-1							
8								
10				SW/SP				
12								
14			▼		-Groundwater at 13 feet			
					TRENCH TERMINATED AT 15 FEET (Caving badly) Groundwater encountered at 13 feet			

Figure A-28,
Log of Trench T 28, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS			
	☐ ... SAMPLING UNSUCCESSFUL	◧ ... STANDARD PENETRATION TEST	■ ... DRIVE SAMPLE (UNDISTURBED)
	▨ ... DISTURBED OR BAG SAMPLE	◪ ... CHUNK SAMPLE	▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 29 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**ALLUVIUM** Loose, moist, dark brown, Silty, fine to coarse SAND; porous, with roots, trace clay			
2				SM				
4								
6					**OLD ALLUVIUM** Medium dense, moist, medium to dark reddish brown, Silty SAND			
8				SM				
10				SM	Extremely dense, moist, medium reddish brown, cemented, Silty, fine to coarse SAND			
					TRENCH TERMINATED AT 11 FEET (Near refusal) No groundwater encountered			

Figure A-29,
Log of Trench T 29, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

TRENCH T 30

ELEV. (MSL.) _____ DATE COMPLETED **04-15-2005**

EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
2				SC	**TOPSOIL** Loose to soft, very moist, dark brown, Clayey to Silty, fine to medium SAND; porous, with roots			
4				SM	**OLD ALLUVIUM** Medium dense, moist, medium reddish brown, Silty, fine- to coarse-grained SAND; indurated and well-graded			
6					**SAN MARCOS GABBRO** Very weathered, moist, medium brown-olive, moderately strong, biotite-hornblende GABBRO ROCK			
					TRENCH TERMINATED AT 7 FEET No groundwater encountered			

Figure A-30,
Log of Trench T 30, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 31 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**ALLUVIUM** Loose, moist, dark brown, Silty, fine to coarse SAND; very porous, roots, burrows			
2								
4				SW/SP	Loose, damp to moist, light yellow-brown to reddish brown, medium to coarse SAND; with thin silty lenticular layers, friable, noncohesive when disturbed			
6								
8								
10								
12			▼		-Groundwater at approx. 12 feet			
					TRENCH TERMINATED AT 13½ FEET (Caving badly) Groundwater encountered at 12 feet			

Figure A-31,
Log of Trench T 31, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◥ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 32 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**ALLUVIUM** Loose, moist, dark brown, Silty, fine to coarse SAND; very porous, with burrows, roots			
2				SM				
4								
6					Loose, moist to very moist, light yellow-brown, medium to coarse SAND; friable, non cohesive when disturbed			
8								
10				SP	-Caving			
12			▼		-Groundwater at 12 feet			
14								
					TRENCH TERMINATED AT 15 FEET (Caving badly) Groundwater encountered at 12 feet			

Figure A-32,
Log of Trench T 32, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 33 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**ALLUVIUM** Loose, moist, dark grayish brown, Silty, fine to medium SAND; porous, roots, burrows			
2				SM				
4								
6					-Cobble-size lag gravelly sand			
8				SC	**OLD ALLUVIUM** Medium dense, moist, medium to dark reddish brown, Clayey, fine to coarse SAND			
10	T33-1			SM	Medium dense to dense, moist, medium reddish brown, Silty, fine- to coarse-grained SAND; massive, well-graded, indurated, trace clay-cobble			
12								
14	T33-2			SM	Medium dense to dense, moist, olive-brown to brown, Silty, fine SAND; micaceous, with calcium carbonate, small concretionary inclusions			
					TRENCH TERMINATED AT 15 FEET No groundwater encountered			

Figure A-33,
Log of Trench T 33, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

TRENCH T 34

ELEV. (MSL.) _____ DATE COMPLETED **04-15-2005**

EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				SM	**ALLUVIUM** Loose, humid, dark brown, Silty, fine SAND; porous, with roots			
2					Loose, damp, light gray-tan, fine to medium SAND; friable, noncohesive, when disturbed, laminated			
4								
6					-6" layer of rounded cobble (granitic)			
8				SP				
10								
12								
14			▼		-Becomes very moist to wet (possible seepage) with basal lag-gravel			
				SC	**OLD ALLUVIUM** Medium dense to dense, very moist, dark reddish brown, Clayey, fine- to coarse-grained SAND with some silt; massive, indurated			
					TRENCH TERMINATED AT 15 FEET Seepage at 14 feet			

Figure A-34,
Log of Trench T 34, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▩ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**TRENCH T 35** ELEV. (MSL.) _____ DATE COMPLETED **04-15-2005** EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				SM	**TOPSOIL** Loose, dry, dark brown, Silty, fine to medium SAND; porous, roots			
2				SM	**OLD ALLUVIUM** Medium dense to dense, moist, medium reddish brown, Silty, fine to coarse SAND with some clay; massive, indurated, well-graded			
4								
					TRENCH TERMINATED AT 5 FEET No groundwater encountered			

Figure A-35,
Log of Trench T 35, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

TRENCH T 36

ELEV. (MSL.) _____ DATE COMPLETED **04-15-2005**

EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**ALLUVIUM** Loose, damp, dark gray-brown, very Silty, fine SAND to Sandy SILT; with abundant micaceous laminations			
2				SM-ML				
4								
6					Loose, moist, light brown, medium to coarse SAND; friable, noncohesive when disturbed			
8								
10				SW/SP				
12			▼		-Groundwater at 13 feet			
14					TRENCH TERMINATED AT 14 FEET (Caving badly) Groundwater encountered at 13 feet			

Figure A-36,
Log of Trench T 36, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

▩ ... DISTURBED OR BAG SAMPLE ◥ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 37 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**ALLUVIUM** Loose, moist, dark gray-brown, very Silty, fine SAND to Sandy SILT; very micaceous			
2								
4								
6				SM/ML				
8					-Becomes wet to saturated			
10			▼		-Seepage at 10 feet, and becomes more sandy			
12								
14					TRENCH TERMINATED AT 14 FEET (Caving badly) Seepage at 10 feet			

Figure A-37,
Log of Trench T 37, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 38 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0					**ALLUVIUM** Loose, moist, dark gray-brown, very Silty, fine to coarse SAND; very porous, roots, very micaceous			
2				SM				
4								
6								
8			▼	SW/SP	Loose, wet to saturated, light yellow brown, medium- to very coarse-grained SAND; very friable, noncohesive, caving in -Groundwater encountered at 9 feet			
10					TRENCH TERMINATED AT 10 FEET (Caving badly) Groundwater encountered at 9 feet			

Figure A-38,
Log of Trench T 38, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▩ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 39 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**ALLUVIUM** Loose, damp to moist, dark brown, very Gravelly, Silty, medium SAND; porous, with numerous roots			
2				SM-GM				
4								
6					Medium dense to dense, veery moist, dark brown, Silty, very coarse GRAVEL; gabbro boulders to 2' diameter			
8			▼	GM				
10								
					TRENCH TERMINATED AT 11 FEET (Refusal on boulders) Groundwater encountered at 9 feet			

Figure A-39,
Log of Trench T 39, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ▨ ... DISTURBED OR BAG SAMPLE
- ◧ ... STANDARD PENETRATION TEST
- ◹ ... CHUNK SAMPLE
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 40 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**OLD ALLUVIUM** Medium dense, damp, light to medium reddish brown, Silty to Sandy coarse GRAVEL; subangular to subrounded granitics and metasediments in indurated matrix, represents and old alluvial fan or stream deposit			
2				GM				
4								
6					TRENCH TERMINATED AT 6 FEET (Near refusal) No groundwater encountered			

Figure A-40,
Log of Trench T 40, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 41 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**OLD ALLUVIUM**			
2				GC	Dense, damp, medium reddish brown, Clayey to Sandy, angular GRAVEL with some silt; indurated, well-graded			
					TRENCH TERMINATED AT 3 FEET (Refusal on gravel) No groundwater encountered			

Figure A-41,
Log of Trench T 41, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 42 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0				CL	**TOPSOIL** Stiff, moist, dark brown, very Sandy CLAY			
2					**SAN MARCOS GABBRO** Very weathered, layered, olive to yellow-brown, ultrabasic GABBRO ROCK with calcium carbonate fracture linings			
4					TRENCH TERMINATED AT 5 FEET (Refusal on cemented rock) No groundwater encountered			

Figure A-42,
Log of Trench T 42, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ... SAMPLING UNSUCCESSFUL
- ... STANDARD PENETRATION TEST
- ... DRIVE SAMPLE (UNDISTURBED)
- ... DISTURBED OR BAG SAMPLE
- ... CHUNK SAMPLE
- ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	**TRENCH T 43** ELEV. (MSL.) _____ DATE COMPLETED **04-15-2005** EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**OLD ALLUVIUM** Very stiff, very moist, dark reddish brown, Gravelly CLAY; possible ancient slopewash or mudflow deposit of very weathered old alluvium (?)			
2				CL-GC				
4								
6					TRENCH TERMINATED AT 6 FEET (Refusal on boulders) No groundwater encountered			

Figure A-43,
Log of Trench T 43, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS			
	... SAMPLING UNSUCCESSFUL	... STANDARD PENETRATION TEST	... DRIVE SAMPLE (UNDISTURBED)
	... DISTURBED OR BAG SAMPLE	... CHUNK SAMPLE	... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

TRENCH T 44

ELEV. (MSL.) _____ DATE COMPLETED **04-15-2005**

EQUIPMENT **JD 510 24"** BY: **G. COPENHAVER**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0								
				SM	**TOPSOIL** Loose, moist, dark brown, Silty, fine to medium SAND; porous, roots			
2				SM	**OLD ALLUVIUM** Medium dense, damp, light reddish brown, Silty, fine to medium SAND			
4								
					SAN MARCOS GABBRO Very weathered, damp to humid, olive-gray, strong biotite-hornblende GABBRO ROCK			
6					TRENCH TERMINATED AT 6 FEET No groundwater encountered			

Figure A-44,
Log of Trench T 44, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS

- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▨ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 45 ELEV. (MSL.) _____ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0					**OLD ALLUVIUM** Dense, damp, light to medium reddish brown, Silty, fine to coarse, Gravelly SAND; angular clasts of granitic and metasedimentary rocks; possible isolated remnant of an old alluvial fan			
2				SM-GM				
4								
6					TRENCH TERMINATED AT 6 FEET (Cut slope) No groundwater encountered			

Figure A-45,
Log of Trench T 45, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS	☐ ... SAMPLING UNSUCCESSFUL	◧ ... STANDARD PENETRATION TEST	■ ... DRIVE SAMPLE (UNDISTURBED)
	▨ ... DISTURBED OR BAG SAMPLE	◪ ... CHUNK SAMPLE	▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

PROJECT NO. 07511-32-01

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	TRENCH T 46 ELEV. (MSL.) ______ DATE COMPLETED 04-15-2005 EQUIPMENT JD 510 24" BY: G. COPENHAVER	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
					MATERIAL DESCRIPTION			
0 2 4		+ + +			**WOODSON MT. GRANODIORITE** Very weathered, damp, light yellow-brown, strong GRANITIC ROCK; excavates to a clayey, coarse sand			
					TRENCH TERMINATED AT 6 FEET (Cut slope) No groundwater encountered			

Figure A-46,
Log of Trench T 46, Page 1 of 1

07511-32-01.GPJ

SAMPLE SYMBOLS			
SAMPLE SYMBOLS	☐ ... SAMPLING UNSUCCESSFUL	◧ ... STANDARD PENETRATION TEST	■ ... DRIVE SAMPLE (UNDISTURBED)
	⊠ ... DISTURBED OR BAG SAMPLE	◪ ... CHUNK SAMPLE	▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

GEOCON

APPENDIX B

APPENDIX B

LABORATORY TESTING

Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures. Selected samples were tested for pH/resistivity, soluble sulfate content, chloride content and gradation characteristics. The results of the laboratory tests are shown on Tables B-I through B-III and Figure B-1.

TABLE B-I
SUMMARY OF LABORATORY POTENTIAL OF HYDROGEN (pH) AND RESISTIVITY TEST RESULTS
CALIFORNIA TEST NO. 643

Sample No.	pH	Resistivity (ohm centimeters)
T3-1	6.7	4,800
T19-2	7.2	2,907
T28-1	7.1	18,252

TABLE B-II
SUMMARY OF LABORATORY WATER-SOLUBLE SULFATE TEST RESULTS
CALIFORNIA TEST NO. 417

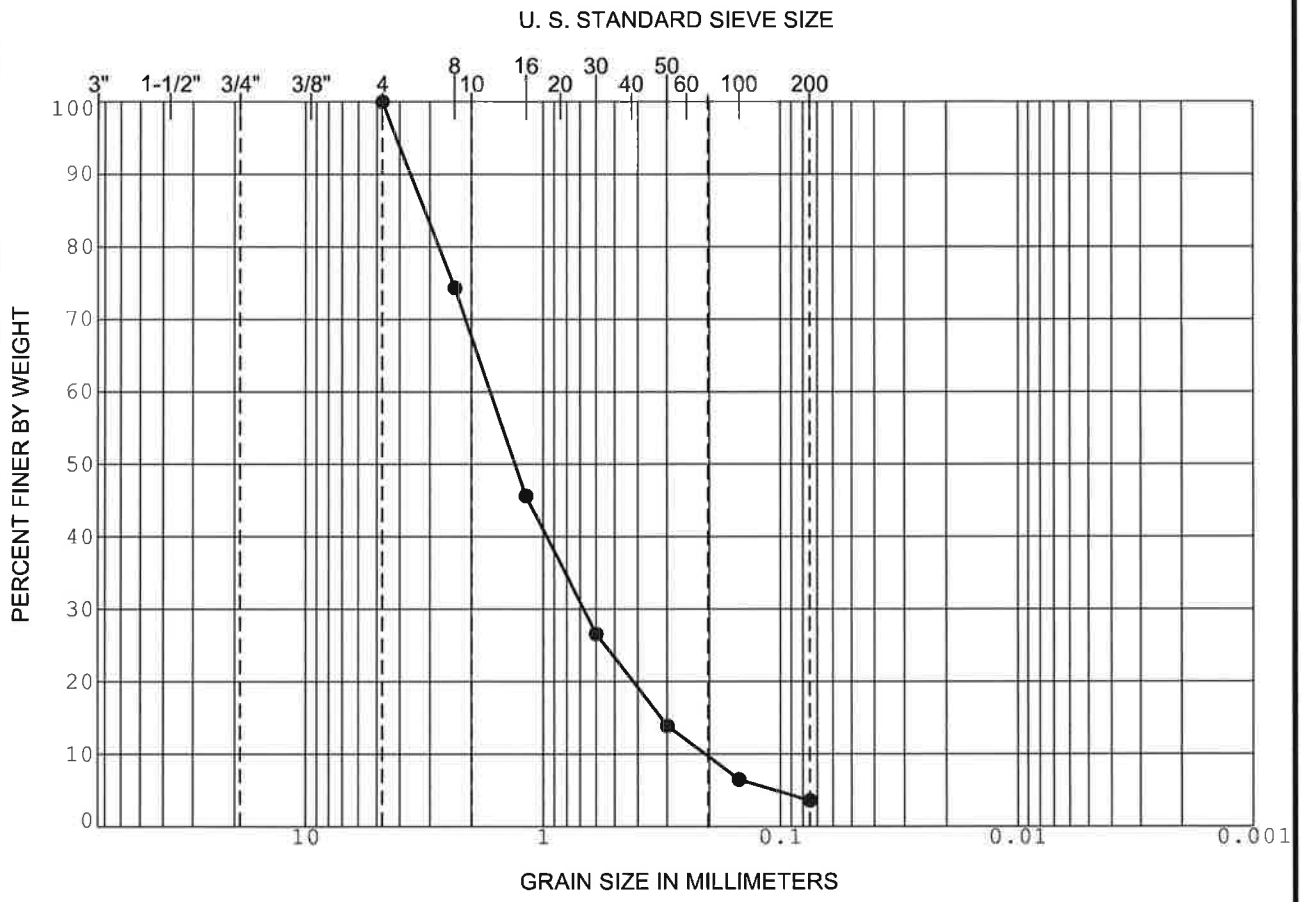
Sample No.	Water-Soluble Sulfate	Sulfate Exposure
T3-1	0.005	Negligible
T19-2	0.006	Negligible
T28-1	0.002	Negligible

TABLE III
SUMMARY OF LABORATORY WATER-SOLUBLE CHLORIDE (Cl) TEST RESULTS
AASHTO T 291

Sample No.	Description	Cl (%)
T19-1	Old Alluvium	0.006
T28-1	Alluvium	0.007

PROJECT NO. 07511-32-01

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	



	SAMPLE	DEPTH (ft)	CLASSIFICATION	NAT WC	LL	PL	PI
●	T28-1	6.0	SW				
■							
▲							

GRADATION CURVE

WARNER RANCH

SAN DIEGO COUNTY, CALIFORNIA

07511-32-01.GPJ

Figure B-1

GEOCON

LIST OF REFERENCES

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2. Brain S. J. Chiou and Robert R. Youngs, *A NGA Model for the Average Horizontal Component of Peak Ground Motion and Response Spectra,* preprint for article to be published in NGA Special Edition for Earthquake Spectra, Spring 2008.

3. California Department of Conservation, Division of Mines and Geology, *Probabilistic Seismic Hazard Assessment for the State of California,* Open File Report 96-08, 1996.

4. California Geological Survey, *Seismic Shaking Hazards in California,* Based on the USGS/CGS Probabilistic Seismic Hazards Assessment (PSHA) Model, 2002 (revised April 2003). 10% probability of being exceeded in 50 years. http://redirect.conservation.ca.gov/cgs/rghm/pshamap/pshamain.html

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7. *Geotechnical Investigation for Fenton-Pala Sand Mining Plant, Flood Diversion Embankment, San Diego County, California*, prepared by Geocon Incorporated, dated September 20, 1993 (Project No. 05152-42-01).

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12. Risk Engineering, *EZ-FRISK*, 2008.

13. Tan, S. S., *Geologic Map of the Bonsall 7.5' Quadrangle San Diego County, California, A Digital Database,* California Division of Mines and Geology, 2000.

14. *Transmittal of Preliminary Geotechnical Information, Warner Ranch, San Diego County, California*, prepared by Geocon Incorporated, dated May 5, 2005 (Project No. 07511-32-01).

15. *Soil and Geologic Reconnaissance, Yuima-Pala Pipeline Northern Route, San Diego County, California,* prepared by Geocon Incorporated, dated January 5, 2007 (Project No. 07749-42-01).

16. *State of California Special Study Zones, Pala Quadrangle*, effective date January 1, 1980.

17. ------, *Landslide Hazards in the Northern Part of the San Diego County Metropolitan Area, San Diego County, California,* DMG Open-File Report 95-04, 1995.

18. Unpublished reports, aerial photographs, and maps on file with Geocon Incorporated.

19. *Update Geotechnical Investigation Meadowood (Pankey Ranch), San Diego County, California*, prepared by Geocon Incorporated, dated November 20, 2006 (Project No. 06931-42-01).

20. *Update Geotechnical Investigation Pala Substation Peaker Plant, SR 76 and Pala Del Norte Road, San Diego County, California*, prepared by Geocon Incorporated, dated June 26, 2007 (Project No. 07839-22-01).

21. USGS computer program, *2002 Interactive Deaggregation,* http://eqint.cr.usgs.gov/deaggint/2002/index.php.

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APPENDIX G3

Plan Review – Warner Ranch

GEOCON
INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. 07511-32-02
April 2, 2012

Capstone Partners, LLC
1545 Faraday Avenue
Carlsbad, California 92008

Attention: Mr. Mark Hayden

Subject: PLAN REVIEW
WARNER RANCH
SAN DIEGO COUNTY, CALIFORNIA

References:
1. *Geologic Reconnaissance, Warner Ranch, San Diego County, California,* prepared by Geocon Incorporated, dated March 3, 2011.
2. *County of San Diego Preliminary Grading Plan, Warner Ranch, Tract No. 5508 rp14*, Sheets 1 through 11, prepared by Shapouri & Associates, dated March 27, 2012.

Gentlemen:

In accordance with the request of Mr. Mike Shapouri of Shapouri & Associates, we have reviewed the referenced plan and geotechnical information to determine if the information provided in the report is applicable to the new project configuration. Based upon our review, the geotechnical evaluation and considerations presented in Reference No. 1 remain applicable with respect to the Reference No. 2.

Should you have any questions regarding this correspondence, or if we may be of further service, please do not hesitate to contact the undersigned at you convenience.

Very truly yours,

GEOCON INCORPORATED

Trevor E. Myers
RCE 63773

David B. Evans
CEG 1860

TEM:DBE:

(2) Addressee

APPENDIX G4

Supplemental Geotechnical Recommendations – Warner Ranch

GEOCON
INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. 07511-32-02
November 27, 2012

Capstone Partners, LLC
1545 Faraday Avenue
Carlsbad, California 92008

Attention: Mr. Mark Hayden

Subject: SUPPLEMENTAL GEOTECHNICAL RECOMMENDATIONS
WARNER RANCH
SAN DIEGO COUNTY, CALIFORNIA

References:
1. *Geologic Reconnaissance, Warner Ranch, San Diego County, California,* prepared by Geocon Incorporated, dated March 3, 2011.
2. *County of San Diego Preliminary Grading Plan, Warner Ranch, Tract No. 5508 rp14*, Sheets 1 through 10, prepared by Shapouri & Associates, dated November 30, 2012.

Dear Mr. Hayden:

We have prepared this correspondence to document our recent discussions with Mr. Mike Shapouri of Shapouri and Associates regarding the proposed water quality basins at the subject site. Based on the soil and geologic conditions, groundwater elevations, and close proximity to structures, we recommend the water quality basins incorporate an impermeable liner in the design which will prevent water infiltration into the underlying soils. The strength and thickness of the membrane, and construction method should be adequate to assure that the liner will not be compromised throughout the life of the system. In addition, civil engineering provisions should be implemented to assure that the capacity of the system is never exceeded resulting in over topping of the liner or basin.

Should you have any questions regarding this correspondence, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Trevor E. Myers
RCE 63773

REGISTERED PROFESSIONAL ENGINEER
TREVOR E. MYERS
No. RCE63773
CIVIL
STATE OF CALIFORNIA

David B. Evans
CEG 1860

PROFESSIONAL GEOLOGIST
DAVID B. EVANS
No. 1860
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

(e-mail) Addressee
(e-mail) Shapouri & Associates
Attention: Mr. Mike Shapouri

APPENDIX G5

Grading Plan/Major SWMP/Hydromodification Report Review – Warner Ranch

GEOCON
INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. 07511-32-02
March 6, 2013

Capstone Partners, LLC
1545 Faraday Avenue
Carlsbad, California 92008

Attention: Mr. Mark Hayden

Subject: GRADING PLAN / MAJOR SWMP / HYDROMODIFICATION REPORT REVIEW
WARNER RANCH
SAN DIEGO COUNTY, CALIFORNIA

References:
1. *Geologic Reconnaissance, Warner Ranch, San Diego County, California,* prepared by Geocon Incorporated, dated March 3, 2011.
2. *Supplemental Geotechnical Recommendations, Warner Ranch, San Diego County, California*, prepared by Geocon Incorporated, dated November 27, 2012.
3. *County of San Diego Preliminary Grading Plan, Warner Ranch, Tract No. 5508 rp14*, Sheets 1 through 13, prepared by Shapouri & Associates, dated February 28, 2013.
4. *Major Stormwater Management Plan (Major SWMP) For Warner Ranch (SP06-002, GPA06-009, R06-011, P06-016, TM5508),* prepared by Shapouri & Associates, dated February 27, 2013.
5. *Preliminary Hydromodification Management Study for Warner Ranch (Tract No. 5508 rpl4),* prepared by Shapouri & Associates, dated February 27, 2013.

Dear Mr. Hayden:

In accordance with the request of Mr. Mike Shapouri of Shapouri & Associates, we have reviewed Reference Nos. 3 through 5 to check if the plans and stormwater management reports have been prepared in substantial conformance with the recommendations presented in our referenced geotechnical reports (References 1 and 2). In accordance with Reference No. 2, we understand that all stormwater BMP's will incorporate an impermeable liner in the design to prevent stormwater infiltration from adversely impacting the adjacent structural improvements.

Based upon our review of the referenced plans, stormwater management reports, and the information contained within the referenced geotechnical reports, it is the opinion of Geocon Incorporated that the grading plans and stormwater management reports have been prepared in general conformance with recommendations presented in the geotechnical reports.

It should be understood that our review was limited to geotechnical aspects of project development and did not include the review of other details on the referenced plans. Geocon Incorporated has no opinion regarding other details found on the referenced plans, civil or otherwise, that do not directly pertain to geotechnical aspects of site development.

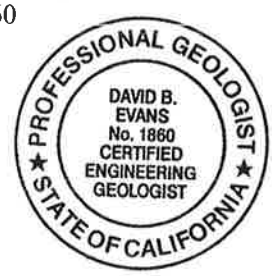
Should you have any questions regarding this correspondence, or if we may be of further service, please do not hesitate to contact the undersigned at you convenience.

Very truly yours,

GEOCON INCORPORATED

Trevor E. Myers
RCE 63773

David B. Evans
CEG 1860



TEM:DBE:dmc

(2) Addressee
(2) Shapouri & Associates
Attention: Mr. Mike Shapouri

APPENDIX G6

Geologic Reconnaissance – Warner Ranch Off-Site Improvements

GEOLOGIC RECONNAISSANCE

WARNER RANCH
OFF-SITE IMPROVEMENTS
SAN DIEGO COUNTY, CALIFORNIA

GEOCON
INCORPORATED

GEOTECHNICAL
ENVIRONMENTAL
MATERIALS

PREPARED FOR

CAPSTONE PARTNERS LLC
CARLSBAD, CALIFORNIA

OCTOBER 6, 2014
PROJECT NO. 07511-32-02

GEOCON
INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. 07511-32-02
October 6, 2014

Capstone Partners LLC
1545 Faraday Avenue
Carlsbad, California 92008

Attention: Mr. Mark Hayden

Subject: GEOLOGIC RECONNAISSANCE
WARNER RANCH
OFF-SITE IMPROVEMENTS
SAN DIEGO COUNTY, CALIFORNIA

Dear Mr. Hayden:

In accordance with your authorization on September 24, 2014, we have performed a geologic reconnaissance for the off-site improvements associated with the proposed Warner Ranch project. The accompanying report describes the soil and geologic conditions along the alignment and provides geotechnical considerations related to future design and construction.

If you have any questions regarding this study, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Troy K. Reist
CEG 2408

Trevor Myers
RCE 63773

David B. Evans
CEG 1860

TKR:TEM:DBE:dmc

(2) Addressee
(4) Shapouri & Associates
Attention: Mr. Mike Shapouri

TABLE OF CONTENTS

GEOLOGIC RECONNAISSANCE

1. PURPOSE AND SCOPE

This report presents the results of a limited geologic reconnaissance for the proposed off-site improvements for the Warner Ranch residential development located in San Diego County, California (see *Vicinity Map*, Figure 1). The purpose of this study was to perform a reconnaissance of the geologic conditions along the alignment and identify any known geologic hazards that may adversely impact the construction of improvements as planned.

The scope of our study included a review of readily available published geologic literature and our previous geotechnical reports and plans pertinent to the proposed improvements (see *List of References*), performing a limited field reconnaissance, reviewing stereoscopic aerial photographs of the alignment, and preparing this report summarizing our findings.

The exhibit used as a base map to depict the soil and geologic conditions consists of a reproducible copy of a compilation of digital information provided by Shapouri & Associates (*Geologic Map*, Figure 2). The plan depicts the proposed alignment of the off-site improvements, existing topography, and mapped geologic contacts based on published information and our reconnaissance. The conclusions and considerations presented herein are based on an analysis of the data reviewed as part of this study and our experience with similar soil and geologic conditions.

2. SITE AND PROJECT DESCRIPTION

The proposed off-site improvements will extend from the western margin of Warner Ranch, westward approximately 4.4 miles along Highway 76 to Pankey Road located near Interstate 15. The majority of the alignment will be within Highway 76, which consists of a two-lane windy road with unimproved shoulders that crosses approximately seventeen drainage culverts, a bridge, tunnel and the San Diego Aqueduct which bisects the highway at Station 148+40 to 150+40.

It is our understanding that the proposed off-site improvements include a 6-inch diameter sewer force main and gas line that will be constructed within the right-of-way of Highway 76 with a minimum of 4-foot of cover. The sewer and gas lines will extend approximately 4.4 and 1.2 miles, respectively to the west of the development. In addition, a sewer pump station will be constructed on-site adjacent to the western entrance of the development. A second sewer pump station is planned by others at the western end of the alignment near Pankey Road.

Locations and descriptions of the project and conditions along the alignment are based on review of published geologic literature, in-house geotechnical reports pertinent to the general geographic area of the roadway and our general understanding of the project as presently proposed. If the proposed

improvement details vary significantly from those described, Geocon Incorporated should be retained to update and/or modify this report accordingly.

3. PREVIOUS GEOTECHNICAL STUDIES

Several geotechnical studies have been performed by Geocon Incorporated in the general vicinity of the proposed alignment (see *List of References*). The subsurface information from these studies, which include exploratory borings, trenches, seismic traverses and air rotary percussion borings have been reviewed to provide general information regarding the soil and geologic conditions anticipated along the study area.

4. SOIL AND GEOLOGIC CONDITIONS

Based on a review of published geologic maps, previous geotechnical reports and observations during our site reconnaissance, the geology in the general vicinity of the proposed alignment consists of crystalline igneous rocks, (gabbro, granodiorite, monzogranite and tonalite), metamorphic rocks, old alluvial fan and flood plain deposits, young alluvial flood plain and colluvial deposits, wash deposits, topsoil, and undocumented fill. Although some of these units may not be encountered during pipeline construction, we have described them herein to characterize the general geologic conditions that should be anticipated along the project corridor. The surficial soils and geologic formations are discussed below. The estimated extent of these units is shown on the *Geologic Map*, Figure 2, with the exception of topsoil and undocumented fill.

4.1 Undocumented Fill (Not Mapped)

Undocumented fill deposits were observed along the majority of the alignment and consist of embankments for the existing highway. Depending on the condition of the fills encountered, remedial excavations beneath the proposed pipe zones may be required.

4.2 Topsoil (Not Mapped)

Topsoil generally blankets the formational units identified along the project corridor and typically consists of loose, unconsolidated, clayey sands and sandy clays. In general, the topsoil is not expected to exceed a thickness of two or three feet.

4.3 Alluvial Flood Plain Deposits & Wash Deposits (Qa, Qw)

Alluvial flood plain deposits and wash deposits are mapped in several areas along Highway 76. These deposits are typically characterized as unconsolidated, gravels, sands, silts and clays that can be potentially liquefiable during a seismic event if several conditions such as shallow groundwater and

uniform grain size characteristics exist. Previous exploratory borings performed in one area adjacent to the alignment (Station 184+50) encountered groundwater as shallow as one foot below the ground surface. Depending on the condition and characteristics of these deposits, remedial procedures may be required during pipeline construction.

4.4 Young Colluvial Deposits (Qyc)

Young colluvial deposits have been mapped along the alignment adjacent to the Warner Ranch development. Previous exploratory trenches performed within the development described these deposits as loose, silty, fine to coarse sands with little to no cohesion to clayey sands and sandy clays. In addition, groundwater was encountered in the majority of the trenches as shallow as 9 feet. Due to the relatively unconsolidated nature of these deposits, remedial procedures may be necessary during pipeline construction.

4.5 Old Alluvial Fan and Flood Plain Deposits (Qof_2, Qoa)

Late to middle Pleistocene-age alluvial fan and flood plain deposits are mapped along or adjacent to the proposed alignment. These deposits are characterized as moderately consolidated, gravelly sands, silts and clays. Previous exploratory borings and trenches performed within this deposit describe these units as medium dense to very dense, silty sands and clayey sands with varying amounts of gravel, cobble, and boulders. In addition, previous borings in this unit encountered refusal at shallow depths due to oversize material.

4.6 Igneous Crystalline Rock (Kt, Kgb, Kmm, Ki, Kcc)

Igneous crystalline rock units consisting of granodiorite, tonalite, monzogranite and gabbro compositions are present across the majority of the study area and underlie the surficial units at depth. The various formations identified include the Tonalite Undivided (Kt), Gabbro Undivided (Kgb), Monzogranite of Merriam Mountain (Kmm), Granodiorite of Indian Mountain (Ki), and Tonalite of Couser Canyon (Kcc).

The igneous rocks that occur along the alignment are anticipated to have a variable weathering pattern ranging from completely weathered decomposed granite to potentially fresh, extremely strong, hard rock that may require blasting to excavate. The excavations will likely generate boulders and oversize materials (rocks greater than 12 inches in length) that will require exportation from the alignment. A future study should be performed to evaluate whether or not these units will be encountered during pipeline construction.

4.7 Metamorphic Rock (Mzu)

Mezosoic-age metasedimentary and metavolcanic rock has been mapped in isolated areas adjacent to Highway 76. These formations typically consist of weakly metamorphosed volcanic and sedimentary rocks. Although they are different in composition and genesis, the bearing, stability and excavation characteristics of this formation should be similar to those of the igneous crystalline units described above. However, based on the current proposed improvements and geologic mapping, metamorphic rocks should not be encountered.

5. GROUNDWATER

Depending on the depth of the pipelines, shallow groundwater may be encountered where the project crosses or is adjacent to active washes (San Luis Rey River and Gomez Creek) and lowing lying areas of the project. During seasonal periods, mostly in winter months, these drainages have some surface flow. Also, nearby alluvial deposits are capable of shallow perched groundwater conditions during periods of rainfall, or shallow seepage from farms. Perched groundwater levels in drainages could affect excavation for the improvements. Localized dewatering may be necessary in order to facilitate pipeline construction. Previous borings and trenches performed adjacent to the proposed project encountered groundwater at a depth as shallow as one foot below the ground surface.

6. GEOLOGIC HAZARDS

6.1 Faulting and Seismicity

Based on our reconnaissance and a review of published geologic maps and reports, the site is not located on any known "active," "potentially active" or "inactive" fault traces as defined by the California Geological Survey (CGS).

Two discontinuous in-active faults have been mapped to the north of the alignment (Reference Nos. 11 and 12). The eastern most feature was trenched during a previous study and found to be a geologic contact (Reference No. 8). Some possible minor faulting/fracturing was also observed in some of the roadcuts during our reconnaissance. However, these features are relatively minor and not expected to impact pipeline construction.

The Elsinore Fault, located approximately 5 miles east of the site, is the closest known active fault. The CGS considers a fault seismically active when evidence suggests seismic activity within roughly the last 11,000 years. The CGS has included portions of the Elsinore Fault within an Alquist-Priolo Earthquake Fault Zone.

According to the computer program *EZ-FRISK* (Version 7.62), 11 known active faults are located within a search radius of 50 miles from the property. The nearest known active fault is the Elsinore

Fault, located approximately 5 miles east of the site and is the dominant sources of potential ground motion. Earthquakes that might occur on the Elsinore Fault or other faults within the southern California and northern Baja California area are potential generators of significant ground motion at the site. The estimated deterministic maximum earthquake magnitude and peak ground acceleration for the Elsinore Fault are 7.85 and 0.41g, respectively. Table 6.1.1 lists the estimated maximum earthquake magnitude and peak ground acceleration for the most dominant faults in relationship to the site location. We calculated peak ground acceleration (PGA) using Boore-Atkinson (2008) NGA USGS2008, Campbell-Bozorgnia (2008) NGA USGS, and Chiou-Youngs (2008) NGA acceleration-attenuation relationships.

TABLE 6.1.1
DETERMINISTIC SPECTRA SITE PARAMETERS

Fault Name	Distance from Site (miles)	Maximum Earthquake Magnitude (Mw)	Peak Ground Acceleration		
			Boore-Atkinson 2008 (g)	Campbell-Bozorgnia 2008 (g)	Chiou-Youngs 2008 (g)
Elsinore	5	7.85	0.34	0.30	0.41
Newport-Inglewood	23	7.5	0.18	0.13	0.15
Rose Canyon	24	6.9	0.15	0.10	0.10
San Jacinto	28	7.88	0.18	0.12	0.16
Earthquake Valley	33	6.8	0.11	0.08	0.07
San Joaquin Hills	37	7.1	0.12	0.10	0.09
Coronado Bank	40	7.4	0.12	0.08	0.09
Palos Verdes Connected	40	7.7	0.14	0.09	0.11
Chino	42	6.8	0.09	0.06	0.05
San Gorgornio	44	7.6	0.12	0.08	0.12
Southern San Andreas	45	8.2	0.15	0.10	0.14
Palos Verdes	47	7.3	0.10	0.07	0.07

We used the computer program *EZ-FRISK* to perform a probabilistic seismic hazard analysis. The computer program *EZ-FRISK* operates under the assumption that the occurrence rate of earthquakes on each mappable Quaternary fault is proportional to the faults slip rate. The program accounts for fault rupture length as a function of earthquake magnitude, and site acceleration estimates are made using the earthquake magnitude and distance from the site to the rupture zone. The program also accounts for uncertainty in each of following: (1) earthquake magnitude, (2) rupture length for a given magnitude, (3) location of the rupture zone, (4) maximum possible magnitude of a given earthquake, and (5) acceleration at the site from a given earthquake along each fault. By calculating the expected accelerations from considered earthquake sources, the program calculates the total

average annual expected number of occurrences of site acceleration greater than a specified value. We utilized acceleration-attenuation relationships suggested by Boore-Atkinson (2008) NGA USGS, Campbell-Bozorgnia (2008) NGA USGS, and Chiou-Youngs (2008) in the analysis. Table 6.1.2 presents the site-specific probabilistic seismic hazard parameters including acceleration-attenuation relationships and the probability of exceedence.

TABLE 6.1.2
PROBABILISTIC SEISMIC HAZARD PARAMETERS

Probability of Exceedence	Peak Ground Acceleration		
	Boore-Atkinson, 2007 (g)	Campbell-Bozorgnia, 2008 (g)	Chiou-Youngs, 2008 (g)
2% in a 50 Year Period	0.61	0.51	0.64
5% in a 50 Year Period	0.47	0.39	0.47
10% in a 50 Year Period	0.37	0.30	0.35

The California Geologic Survey (CGS) has a program that calculates the ground motion for a 10 percent of probability of exceedence in 50 years based on an average of several attenuation relationships. Table 6.1.3 presents the calculated results from the *Probabilistic Seismic Hazards Mapping Ground Motion* Page from the CGS website.

TABLE 6.1.3
PROBABILISTIC SITE PARAMETERS FOR SELECTED FAULTS
CALIFORNIA GEOLOGIC SURVEY

Calculated Acceleration (g) Firm Rock	Calculated Acceleration (g) Soft Rock	Calculated Acceleration (g) Alluvium
0.48	0.48	0.49

While listing peak accelerations is useful for comparison of potential effects of fault activity in a region, other considerations are important in seismic design, including the frequency and duration of motion and the soil conditions underlying the site. Seismic design of the structures should be evaluated in accordance with the California Building Code (CBC) guidelines currently adopted by the County of San Diego.

The site could be subjected to moderate to severe ground shaking in the event of a major earthquake on any of the referenced faults or other faults in Southern California. With respect to seismic shaking, the site is considered comparable to the surrounding developed area.

6.2 Liquefaction

Liquefaction typically occurs when a site is located in a zone with seismic activity, on-site soil is cohesionless, groundwater is encountered within 50 feet of the surface, and soil relative densities are less than about 70 percent. If all four previous criteria are met, a seismic event could result in a rapid pore-water pressure increase from the earthquake-generated ground accelerations. The potential for liquefaction and seismically induced settlement to occur along the alignment should be evaluated during a future subsurface study. The alluvial flood plain deposits and wash deposits may be prone to liquefaction.

6.3 Landslides

Our limited site reconnaissance, examination of aerial photographs in our files and review of available geotechnical reports for the roadway vicinity did not reveal evidence of landslides.

7. CONCLUSIONS AND CONSIDERATIONS

7.1 General

7.1.1 No soil or geologic conditions were encountered during our reconnaissance or literature review that would preclude construction of the improvements as presently planned.

7.1.2 A future geotechnical study that includes a subsurface investigation should be performed to evaluate the underlying geologic conditions along the alignment and to provide specific geotechnical recommendations for the project.

7.1.3 The presence of hard rock near or at the surface along the roadway alignment will require special consideration during site pipeline construction. It is anticipated that a significant portion of the pipeline excavations will encounter hard rock conditions and may require blasting or special excavation techniques.

7.1.4 It is anticipated that the excavations within the rock units shown on the *Geologic Map* will generate oversize materials that are not suitable for backfill and require exportation. Therefore, suitable backfill material may need to be imported to meet the agencies requirements.

7.1.5 Due to the unconsolidated nature of some of the mapped deposits, remedial procedures may be required beneath the pipe zone to provide a suitable subgrade for the proposed improvements.

7.1.6 The alluvial flood plain and wash deposits may be prone to liquefaction. The potential for liquefaction and seismically induced settlement should be evaluated during future geotechnical studies.

7.1.7 Portions of the alignment may encounter shallow groundwater that may require dewatering to facilitate pipeline construction, especially in the low lying areas adjacent to the San Luis Rey River and Gomez Creek.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The firm that performed the geotechnical investigation for the project should be retained to provide testing and observation services during construction to provide continuity of geotechnical interpretation and to check that the recommendations presented for geotechnical aspects of site development are incorporated during site grading, construction of improvements, and excavation of foundations. If another geotechnical firm is selected to perform the testing and observation services during construction operations, that firm should prepare a letter indicating their intent to assume the responsibilities of project geotechnical engineer of record. A copy of the letter should be provided to the regulatory agency for their records. In addition, that firm should provide revised recommendations concerning the geotechnical aspects of the proposed development, or a written acknowledgement of their concurrence with the recommendations presented in our report. They should also perform additional analyses deemed necessary to assume the role of Geotechnical Engineer of Record.

2. The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that anticipated herein, Geocon Incorporated should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous or corrosive materials was not part of the scope of services provided by Geocon Incorporated.

3. This report is issued with the understanding that it is the responsibility of the owner or his representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project and incorporated into the plans, and the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

4. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.

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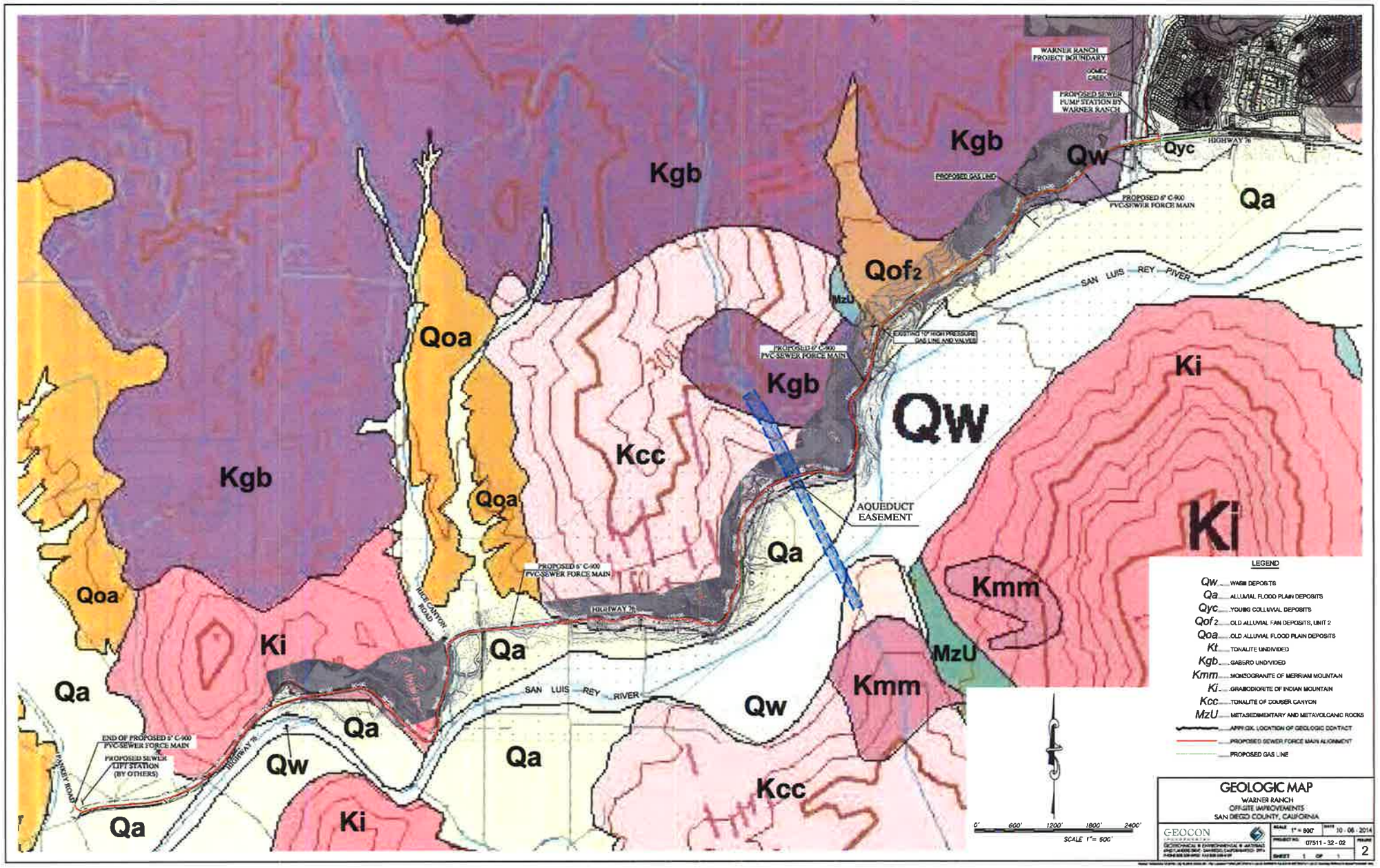
VICINITY MAP

WARNER RANCH
OFF-SITE IMPROVEMENTS
SAN DIEGO COUNTY, CALIFORNIA

DATE 10 - 06 - 2014	PROJECT NO. 07511 - 32 - 02	FIG. 1

Plotted:10/06/2014 8:34AM | By:RUBEN AGUILAR | File Location:Y:\PROJECTS\07511-32-02 WARNER RANCH\DETAILS\07511-32-02 VicinityMap-Hwy76.dwg


WARNER RANCH PROJECT BOUNDARY
GOMEZ CREEK
PROPOSED SEWER PUMP STATION BY WARNER RANCH
Kt
Kgb
Qyc
Qw
HIGHWAY 76
PROPOSED GAS LINE
PROPOSED 8" C-900 PVC SEWER FORCE MAIN
Qa
Qof2
SAN LUIS REY RIVER
MzU
EXISTING 10" HIGH PRESSURE GAS LINE AND VALVE
PROPOSED 8" C-900 PVC SEWER FORCE MAIN
Qoa
Kcc
Ki
AQUEDUCT EASEMENT
PROPOSED 8" C-900 PVC SEWER FORCE MAIN
BLUE CANYON ROAD
Kmm
END OF PROPOSED 8" C-900 PVC SEWER FORCE MAIN
PROPOSED SEWER LIFT STATION (BY OTHERS)
HIDDEN ROAD
LEGEND
Qw ..... WASH DEPOSITS
Qa ..... ALLUVIAL FLOOD PLAIN DEPOSITS
Qyc ..... YOUNG COLLUVIAL DEPOSITS
Qof2 ..... OLD ALLUVIAL FAN DEPOSITS, UNIT 2
Qoa ..... OLD ALLUVIAL FLOOD PLAIN DEPOSITS
Kt ..... TONALITE UNDIVIDED
Kgb ..... GABBRO UNDIVIDED
Kmm ..... MONZOGRANITE OF MERRIAM MOUNTAIN
Ki ..... GRANODIORITE OF INDIAN MOUNTAIN
Kcc ..... TONALITE OF DOUSER CANYON
MzU ..... METASEDIMENTARY AND METAVOLCANIC ROCKS
APPROX. LOCATION OF GEOLOGIC CONTACT
PROPOSED SEWER FORCE MAIN ALIGNMENT
PROPOSED GAS LINE
0' 600' 1200' 1800' 2400'
SCALE 1"= 500'
GEOLOGIC MAP
WARNER RANCH
OFFSITE IMPROVEMENTS
SAN DIEGO COUNTY, CALIFORNIA
GEOCON
SCALE 1" = 800'
DATE 10 - 06 - 2014
PROJECT NO. 07511 - 32 - 02
FIGURE 2
SHEET 1 OF 1

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