Jim Glomb

Geotechnical and Environmental Consulting, Inc.

152 Weeks Way • Sebastopol, CA 95472 • Phone/Fax 707/829-7258

March 8, 2005
Project 915

Mr. Neil Schafer
2800 Jefferson St., Ste. 3
Napa, CA 94558

RE: **Geotechnical Investigation Report**
Proposed 8-Lot Subdivision
Tucker Road
Napa County, California

Dear Mr. Schafer:

We are pleased to submit our geotechnical investigation report for the subject property on Tucker Road in Napa County, California. The proposed project consists of construction of eight new residences.

The purposes of our work have been to investigate the geologic and soil conditions at the property and to provide geotechnical recommendations, including foundation design criteria for the proposed residential construction.

SCOPE

The scope of our work consisted of:

1. Review of geologic and fault data pertaining to the site and vicinity, including stereo pairs of aerial photographs;
2. Geotechnical field reconnaissance of the site and vicinity;
3. Exploration of subsurface conditions by excavation and geologic logging of 8 test pits at the site;
4. Geotechnical analysis of research and field data .
5. Preparation of this report with our findings, conclusions and recommendations.

DEVELOPMENT PLAN

It our understanding from Mr. Neil Schafer that site development will consist of limited grading to accommodate a private street and driveways for the new residences.

Site grading and residence construction plans are not presently completed. When a tentative grading plan is prepared for the site and construction details are available they should be forwarded to this office for review.

SITE CONDITIONS

The site consists of a portion of a slope which descends northeasterly from Summit Drive and Tucker Road to Highway 29. The site appears to be in the natural condition as no indications of previous grading or building construction were observed except roadway grading along Summit Drive and Tucker Road.

GEOLOGIC SETTING

A regional geologic map of the subject site (Reference 1) reviewed in the office of Napa County Planning Department indicates that the site vicinity is underlain by pumicitic ash-flow tuff bedrock of the Sonoma Volcanic Group. No geologic structure data in the site vicinity are indicated on Reference 1.

Our site investigation included observation of existing cut slopes in the site vicinity and excavation and geologic logging of 8 test pits. The 8 test pits excavated exposed natural topsoil and bedrock of the Sonoma Volcanic Group. These materials are described briefly below and in the test pit logs, Plates 3.1 through 3.8. The test pit locations are identified on the Site Plan, Plate 1.

A mantle of natural soil varying in thickness from approximately 1 ½ to 5 ½ thick was encountered in the test pits. This soil has developed by weathering of the underlying bedrock materials. The soil consists chiefly of brown silty clay, clayey silt and sandy clay in a generally very moist, soft, porous condition. Soil encountered in some of the test pits contains abundant rock fragments. The soil is not considered suitable for support of structures in its present condition and is judged to be prone to downslope creep, which an imperceptibly slow soil movement downhill due to gravity.

Bedrock of the Sonoma Volcanic Group was encountered in all of the test pits excavated on the site. Regionally, the Sonoma Volcanic Group includes a wide variety of volcanic and sedimentary rock types. Our test pits on the site encountered tuff, rhyolite, pebbly and conglomeratic sandstone, siltstone and sandstone breccia, sandstone and clayey siltstone. This wide variety of rock types is typical of the Sonoma Volcanic Group.

Most of the bedrock encountered in the test pits did not exhibit bedding planes or other geologic structures. Where bedding planes were exposed in the test pits, they were generally indistinctly expressed by subtle alignments and orientations of pebbles. These generally indistinct bedding planes observed in the test pits dip towards the south and west. That geologic structure is favorable for geologic stability of the site.

The bedrock exposed in the test pits is considered suitable for support of the planned residences and may be excavated and used as compacted fill.

Indications of geologic instability were not observed on the site in the course of our field investigation, nor were they apparent on the referenced regional geologic map and aerial photographs.

Active faults, as defined by the Alquist-Priolo Earthquake Fault Zoning Act of 1972, are not present on the site. The site is, however, located in a seismically active region and is subject to seismically induced ground shaking from nearby and distant faults, which is characteristic of all of all Northern California. The closest active faults are the Maacama Fault, located 16 kilometers west of the site and the Rogers Creek Fault, located 21 kilometers southwest of the site. Neither the time, location, nor magnitude of earthquakes is accurately predictable with existing technology.

Seismically induced liquefaction is not anticipated at the site due to the shallow depth to bedrock at the site.

CONCLUSIONS

Based on our field work, literature review and analyses, we conclude that the subject site is geotechnically suitable for construction of the planned residences. The primary geotechnical concern is the weak, creep prone, natural soils which mantle the bedrock on the site. The underlying bedrock is considered adequate for structural support.

RECOMMENDATIONS

We recommend that the following measures be implemented:

Foundations

General

Foundations should be supported in bedrock, at estimated depths of 2 to 6 feet from the existing ground surface, by the use of spread footings or drilled piers.

Spread Footings

Spread footings should be embedded a minimum of 12 inches into competent bedrock. Foundations so established may be designed for maximum allowable soil contact pressure of 2000 pounds per square foot for dead and sustained live loads. An increase of 1/3 may be applied when considering load combinations, including wind or seismic forces.

An allowable passive equivalent fluid pressure of 350 pounds per cubic foot and a friction factor of 0.35 may be used to resist lateral forces and sliding. Passive resistance from the soil mantle should be neglected unless the soil is confined by slabs or pavements.

If unsatisfactory conditions are encountered in footing excavations, localized deepening will be required. Difficult excavation conditions may exist within the footing zones.

Pier Foundations

Drilled piers should be at least 18 inches in diameter and should be designed to acquire frictional bearing in competent bedrock only. The estimated thickness of the soil cover on the site varies up to 6 feet below existing grade. Locally thicker soils may be present on the site and this possibility must be considered in designing foundations and preparing materials (eg. pier reinforcing steel). We recommend that piers extend at least 8 feet into competent bedrock as determined by the engineering geologist in the field during drilling. Difficult drilling conditions due to hard rock are expected. The drilling contractor should be prepared to obtain the required pier depths regardless of rock hardness and drilling difficulty. It is the drilling contractor's responsibility to remove all loose material from the pier excavations before placing reinforcing steel and concrete.

Skin friction from the soil mantle should be ignored. Piers should be designed with maximum allowable skin friction in competent bedrock of 800 pounds per square foot for dead plus sustained live load, or 1200 pounds per square foot for total loads, including wind or seismic forces. The weight of the foundation concrete extending below grade may be disregarded.

Resistance to lateral displacement of individual piers will be generated primarily by passive earth pressures in bedrock acting against 2 pier diameters. Passive pressures should be assumed equivalent to a fluid weighing 400 pounds per cubic foot. Passive pressures should be disregarded for the portion of piers within soil. Piers should be designed and reinforced to resist creep forces generated within a zone extending from ground surface to an average depth of 5 feet. The resulting active pressure should be assumed equivalent to a fluid weighing 60 pounds per cubic foot acting against 2 pier diameters as well as the buried portions of grade beams.

If groundwater is encountered during pier shaft drilling, it should be removed by pumping, or the concrete may be placed by the tremie method. If pier shafts will not stand open, temporary casing may be necessary to support the sides of the pier shafts until concrete is placed.

Slabs on Grade

Floor slabs may be supported on competent bedrock or certified compacted fill (i.e., slabs must not span across a bedrock-fill transition). To retard moisture penetration, the slabs should be underlain by a capillary moisture break consisting of at least 4 inches of clean, free-draining crushed rock or gravel graded such that 100 percent will pass the 1-inch sieve and none will pass the No. 4 sieve. Further protection against slab moisture penetration can be provided by means of a moisture vapor membrane, placed between the drain rock and slab. The membrane should be covered with 2 inches of damp, clean sand to protect it during construction.

Although not anticipated, in the event that expansive soils are exposed in the slab subgrade, it is recommended that the material be removed and replaced to a depth of 1.5 feet with non-expansive soil to reduce the effects of the expansive material.

Retaining Walls

Retaining walls should be fully backdrained. The backdrains should consist of 4-inch diameter, rigid perforated pipe surrounded by a drainage blanket. The pipe should slope to drain by gravity to appropriate outlets. Accessible subdrain cleanouts should be provided and maintained on a routine basis. The drainage blanket should consist of clean, free-draining crushed rock or gravel, wrapped in a filter fabric such a Mirafi 140N. Alternatively, the drainage blanket could consist of Caltrans Class 2 "Permeable Material" or a prefabricated drainage structure such as Mirafi Miradrain. The top of the drain pipe should be at least 8 inches below lowest adjacent grade. The drainage blanket should be at least 1 foot in width and extend to within 1 foot of the surface. The uppermost 1 foot should be backfilled with compacted native soil to reduce the infiltration of surface water.

Assuming that the retaining walls will be supporting slopes no steeper than 4 (horizontal) to 1 (vertical), we recommend that the retaining walls be designed on the basis of an active earth pressure of 50 pounds per cubic foot (equivalent fluid weight). The above design pressure is applicable to cantilever walls which are free to rotate at least 0.005 radian. Walls not capable of this movement should be assumed rigid and designed for a higher at-rest pressure of 65 pcf.

Appropriate lateral surcharge loading should be applied if adjacent foundations, traffic loading or other surcharge loads will be present within a 1.5 (horizontal) to 1 (vertical) imaginary plane projected up from the lower rear corner of the wall. We can provide specific surcharge analysis if necessary once the surcharge loads (if any) have been identified.

The walls should also be designed for increased lateral loads that develop during a seismic event. The dynamic lateral loading can be assumed as a rectangularly distributed pressure with a magnitude of 15H pounds per square foot, where H is the height of the wall in feet.

Retaining walls should be supported on spread footings designed in accordance with the foundation recommendations presented above.

Wall backfill should consist of soil which is spread in level lifts not exceeding 8 inches in thickness. Each lift should be brought to at least the optimum moisture content and compacted to not less than 90 percent relative compaction, per ASTM test designation D-1557. Retaining walls will yield slightly during backfilling. Therefore, walls should be properly braced during the backfilling operations.

Site Preparation and Grading

General

Grading is most economically performed during the summer months when the on-site soils are driest. Delays should be anticipated in site grading performed during the rainy season due to excessive soil moisture. Special and comparatively expensive construction procedures should be anticipated if grading must be completed during the winter.

Clearing

Areas to be graded or receive improvements should be cleared of tree stumps, debris, or other deleterious material, and then stripped of the upper soils containing root growth and organic matter. We anticipate that the required depth of stripping will be a few inches. However, deeper stripping will be required to remove localized concentrations of tree roots and other organic matter. The cleared materials should be removed from the site; strippings may be stockpiled for reuse as topsoil in landscaping areas.

Overexcavation

Fill soil and weathered bedrock should be overexcavated in areas designated for placement of fill. Difficulty in achieving the recommended minimum degree of compaction described below should be used as a field criterion by the engineering geologist to identify areas of unstable soils that should be removed and replaced as properly moisture conditioned and compacted fill. The depth and extent of overexcavation should be approved in the field by the engineering geologist.

Subgrade Preparation

Exposed soils designated to receive engineered fill should be scarified to a minimum depth of 8 inches and compacted to at least 90 percent relative compaction in accordance with ASTM test designation D 1557. Improvements and fill may be placed directly on exposed competent bedrock.

Fill Placement on Slopes

All fill placed on slopes steeper than 5H:1V should be placed on level benches cut into the hillside. The benches should be excavated into competent bedrock a minimum depth of 2 feet. Internal subdrainage may be required to reduce the buildup of hydrostatic pressure behind the fill. The engineering geologist will provide recommendations in the field during grading if drainage is required behind fills.

General Engineered Fill

It is anticipated that on-site soils will be suitable for reuse as general engineered fill provided that rocks or lumps greater than 6 inches in largest dimension and roots/organic materials are removed. If encountered, expansive material should not be used as fill supporting structures. Fill material should be approved by the engineering geologist prior to use.

General engineered fill should be placed in level lifts not exceeding 8 inches in loose thickness. Each lift should be compacted to at least 90 percent relative compaction in accordance with ASTM test designation D 1557.

Temporary Slopes

Temporary slopes should be laid back or shored in conformance with OSHA standards. All temporary slopes and shoring design are the responsibility of the contractor.

Finished Slopes

In general, cut and fill slopes in soil should be constructed at an inclination not exceeding 2H:1V. Cut slopes in competent bedrock with maximum heights of 10 to 12 feet should not exceed an inclination of 1.5H:1V. Routine maintenance of slopes should be anticipated. The tops of cut slopes should be rounded and compacted to reduce the risk of erosion. Fill and cut slopes should be planted with vegetation to resist erosion and/or protected from erosion by other measures, upon completion of grading. Surface water runoff should be intercepted and diverted away from the tops and toes of cut and fill slopes by using berms or ditches.

Planters

Planters adjacent to the residences should be sealed or provided with subdrains.

Drainage

Existing natural surface drainage on the site consists of sheetflow towards the north and northwest. Site development should incorporate provisions for positive drainage away from building and yard areas. Roofs should be provided with gutters and downspouts that discharge into closed conduits that drain away from the foundations to appropriate discharge points. Energy dissipators, such as riprapped stilling basins, may be required to reduce erosion where subdrains or culverts discharge into natural, unlined drainage ways.

The potential for erosion, future landslides or slope instability can be significantly reduced by proper collection and disposal of surface water runoff. Surface drainage systems should not be connected to subsurface drainage systems.

Foundation Drains

In the case where the ground surface slopes toward the residence, foundation drains should be installed along the upslope and sideslope sides of the residences. The drains should consist of a minimum 12-inch wide trench, extending to the elevation of the bottom of the footing or 30 inches deep, whichever is less. A 4-inch diameter rigid perforated pipe, consisting of PVC Schedule 40, ABS SDR-35 or better, and sloped to drain to outlets, should be placed 3 inches from the bottom of the trench. The top of the pipe should be at least 8-inches below the level of the lowest adjacent interior grade. The trench should be backfilled with clean free-draining crushed rock, wrapped in a filter fabric such as Mirafi 140N. The top 6 inches of backfill should consist of compacted on-site soil.

Seismic Design

Based on the location of the Maacama fault (Type B) at 16 km from the site and the Rogers Creek Fault (Type A) at 21 kilometers from the site, we recommend that the following seismic design criteria be used in accordance with the 1997 Uniform Building Code:

Seismic Zone Factor (Z)	0.4
Seismic Source Type	"B"
Soil Profile Type	Sb
Near Source Factor (Na)	1.0
Near Source Factor (Nv)	1.0
Seismic Coefficient (Ca)	0.40
Seismic Coefficient (Cv)	0.40

Conformance to the above criteria for seismic excitation does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a maximum level earthquake occurs. The primary goal of seismic design is to protect life, and not to avoid all damage, since such design may be economically prohibitive. Following a major earthquake, a building may be damaged beyond repair, yet not collapse.

Maintenance

Periodic land maintenance will be required. Drains should be checked frequently, and cleaned and maintained as necessary. If signs of erosion or surficial soil instability occur, they should be promptly evaluated by the engineering geologist.

Supplemental Services

Jim Glomb Consulting recommends that we be retained to review the project plans and specifications to determine if they are consistent with our recommendations. Site grading and residence construction plans are not presently completed. When a tentative grading plan is prepared for the site it should be forwarded to this office for review and additional geotechnical studies, if indicated. In addition, we should be retained to observe geotechnical construction, particularly site grading and excavation of foundations, as well as to perform appropriate field observations.

If, during construction, subsurface conditions different from those described in this report are observed, or appear to be present beneath excavations, we should be advised at once so that these conditions may be reviewed and our recommendations reconsidered. The recommendations made in this report are contingent upon our notification and review of the changed conditions.

If more than 18 months have elapsed between the submission of this report and the start of work at the site, or if conditions have changed because of natural causes or construction operations at or adjacent to the site, the recommendations of this report may no longer be valid or appropriate. In such case, we recommend that we review this report to determine the applicability of the conclusions and recommendations considering the time elapsed or changed conditions. The recommendations made in this report are contingent upon such a review. These services are performed on an as-requested basis and are in addition to this geotechnical investigation. We cannot accept responsibility for conditions, situations or stages of construction that we are not notified to observe.

LIMITATIONS

This report has been prepared for the exclusive use of Mr. Neil Schafer and his consultants for the proposed project described in this report. Our services consist of professional opinions and conclusions developed in accordance with generally-accepted engineering geologic and geotechnical engineering principles and practices. We provide no other warranty, either expressed or implied. Our conclusions and recommendations are based upon the information provided us regarding the proposed construction and professional judgment. Verification of our conclusions and recommendations is subject to our review of the project plans and specifications, and our observation of construction.

Site conditions and cultural features described in the text of this report are those existing at the time of our field work and may not necessarily be the same or comparable at other times.

The scope of our services did not include an environmental assessment or an investigation of the presence or absence of hazardous, toxic or corrosive materials in the soil, surface water, groundwater or air, on or below, or around the site, nor did it include an evaluation or investigation of the presence or absence of wetlands.

We trust this provides the information you require at this time. If you have questions or wish to discuss this further, please call.

Yours very truly,

Jim Glomb Consulting, Inc.

Jim Glomb
Engineering Geologist, C.E.G. #1154

Patrick J. Conway
Geotechnical Engineer, G.E. #2303

Attachments: References
Plate 1 - Site Plan and Geologic Cross Section
Plate 2.1 through 2.8 - Logs of Test Pits

REFERENCES

1. California Division of Mines and Geology, 1986, State of California Special Studies Zones Fault Maps, Scale 1:24,000.

2. Dwyer, Michael J., 1976. Reconnaissance Photo-Interpretation Map of Landslides in 24 Selected 7.5' Quadrangles, OFM-76-74.

3. Fox Jr., K. F., 1973, Preliminary Geologic Map of Eastern Sonoma and Western Napa County, California, MFS Map – 483.

4. Jennings, C.W., 1975, Fault Map of California with Locations of Volcanoes, Thermal Springs and Thermal Wells: California Division of Mines and Geology, Geologic Data Map No. 1, Scale 1:750,000.

5. Lawson, A.C., 1908, The California Earthquake of April 18, 1906, Report of the State Earthquake Investigation Commission: Carnegie Institution of Washington, D.C., 1969.

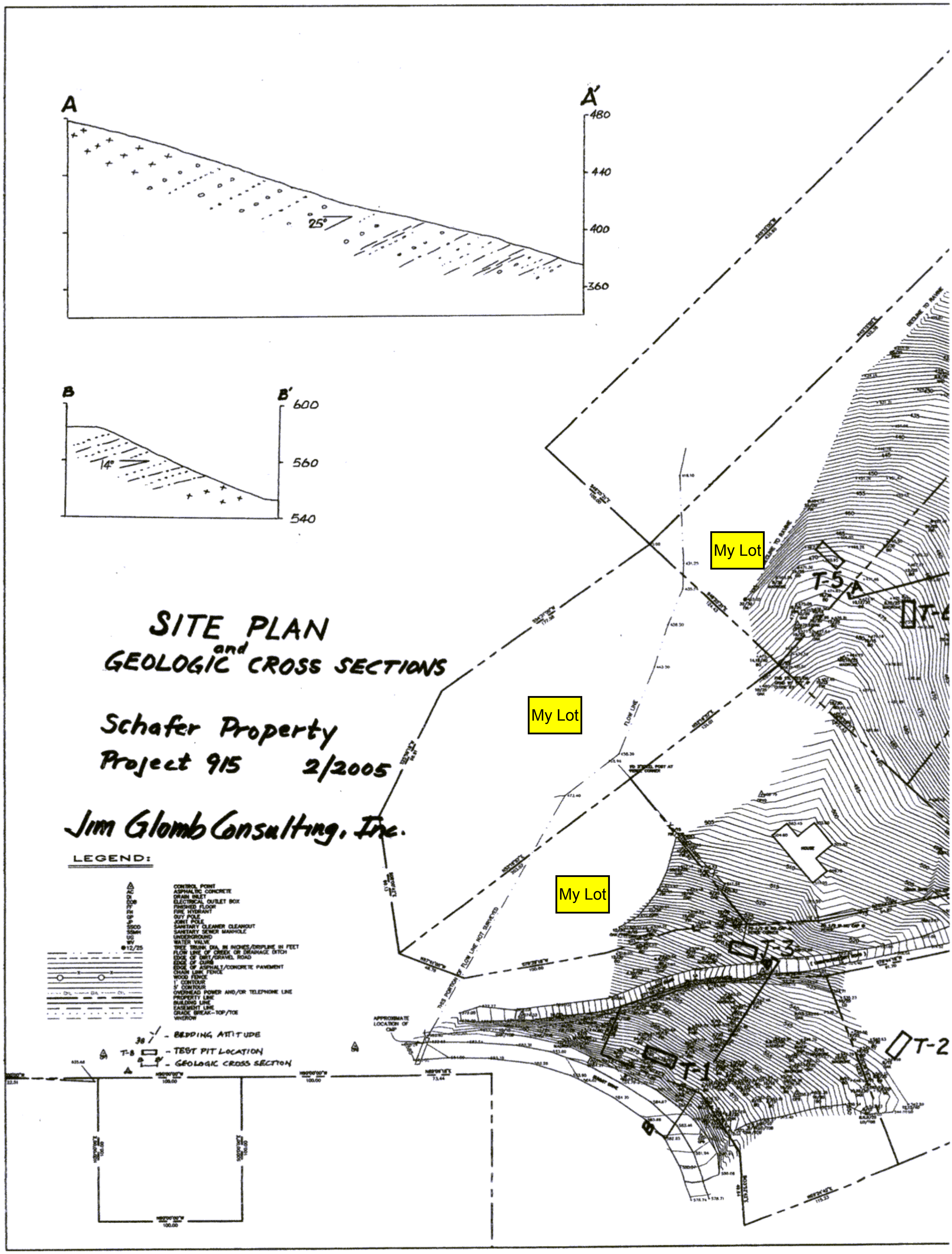
6. Napa County Environmental Resource Maps, Vol. 9, 1973.

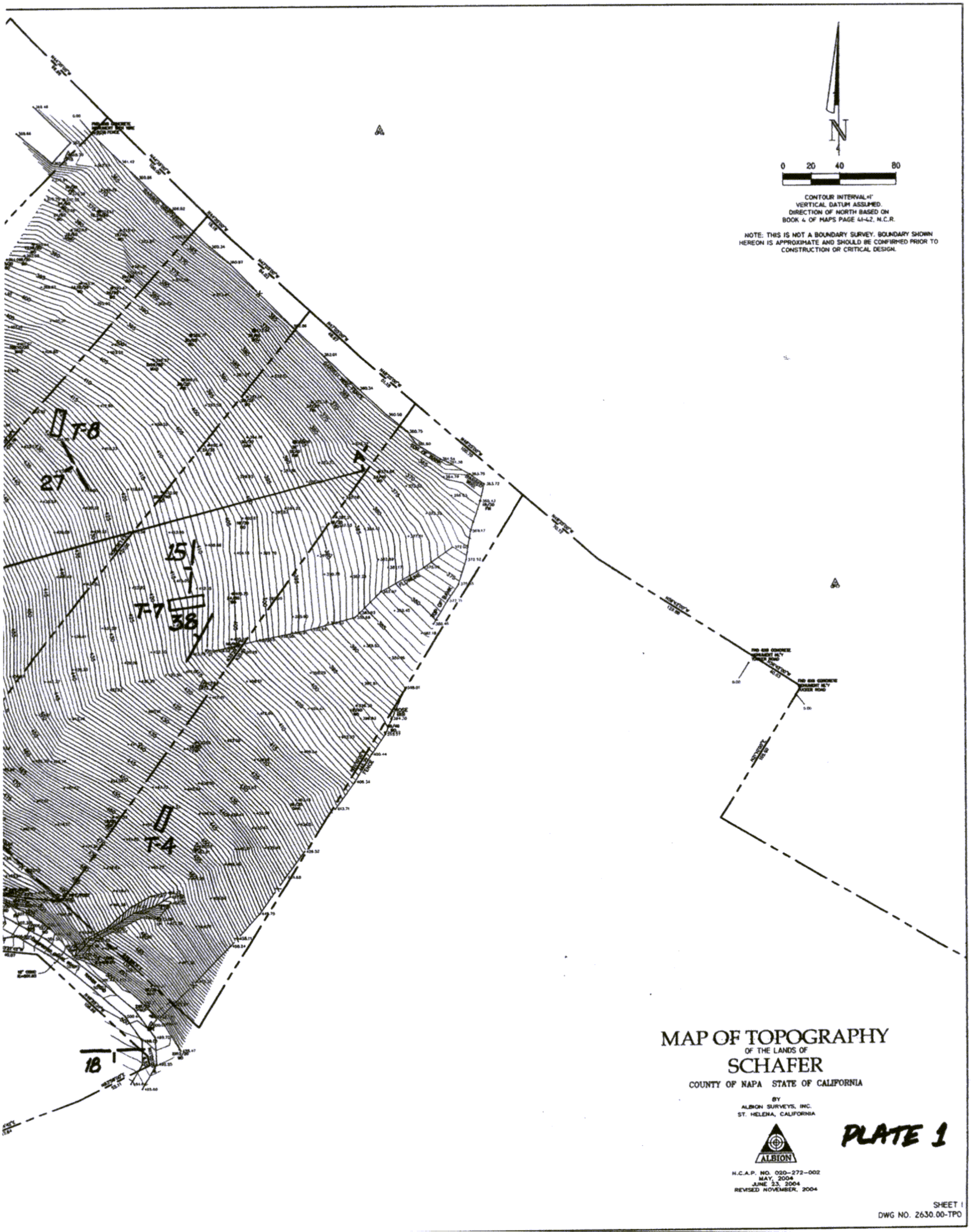
7. Aerial Photographs

Photo Numbers	Date Flown	Scale
AV 3566 12-11 & 12-12	5-18-89	1:28,800
3575-1 096 & 097	6-7-73	not indicated

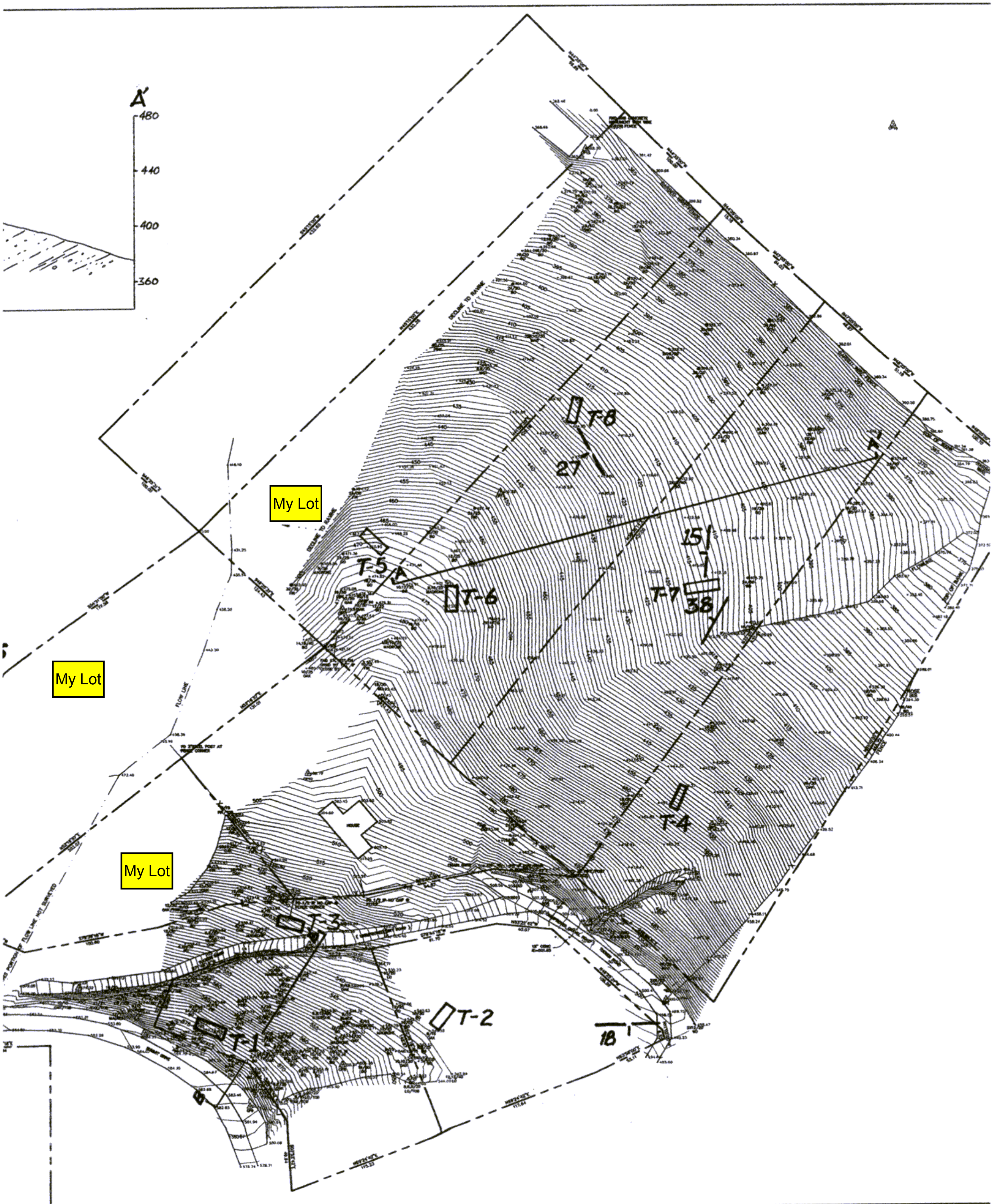
8. Sims, et. Al., 1973, Preliminary Geologic Map of Solano Co. and Parts of Napa, Contra Costa, Marin and Yolo Counties, CA (MF-484).

9. 1997 Uniform Building Code, ICBO.


A
A'
480
440
400
360
25°
B
B'
600
560
540
14°
SITE PLAN
and
GEOLOGIC CROSS SECTIONS
Schafer Property
Project 915 2/2005
Jim Glomb Consulting, Inc.
LEGEND:
BEDDING ATTITUDE
TEST PIT LOCATION
GEOLOGIC CROSS SECTION
My Lot
My Lot
My Lot
T-5
T-3
T-1
T-2
FLOW LINE
HOUSE



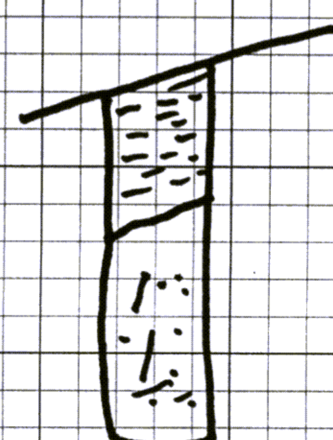
T-8
27
15
T-7
38
T-4
18
N
0 20 40 80
CONTOUR INTERVAL=1'
VERTICAL DATUM ASSUMED.
DIRECTION OF NORTH BASED ON
BOOK 4 OF MAPS PAGE 41-42, N.C.R.
NOTE: THIS IS NOT A BOUNDARY SURVEY. BOUNDARY SHOWN HEREON IS APPROXIMATE AND SHOULD BE CONFIRMED PRIOR TO CONSTRUCTION OR CRITICAL DESIGN.
MAP OF TOPOGRAPHY
OF THE LANDS OF
SCHAFER
COUNTY OF NAPA STATE OF CALIFORNIA
BY
ALBION SURVEYS, INC.
ST. HELENA, CALIFORNIA
PLATE 1
ALBION
N.C.A.P. NO. 020-272-002
MAY, 2004
JUNE 23, 2004
REVISED NOVEMBER, 2004
SHEET 1
DWG NO. 2630.00-TPO


A'
480
440
400
360
My Lot
My Lot
My Lot
T-1
T-2
T-3
T-4
T-5
T-6
T-7
T-8
27
15
38
18

LOG OF TEST PIT

Surface Elevation: 575' Pit Orientation: N60W Pit Dimensions: 2 x 4 x 7 Ground Water Depth: none enc.	Logged by: RW Date: February 10, 2005 Equipment: CAT BH30, 12" bucket	Test Pit Number T-1

Depth (ft).	Samples Bulk	Samples Tube	Pocket Pen (ft kips/ft.)	Field Moisture (% of dry weight)	Plastic Index	Dry Density (pcf)	Soil Type (USCS)	Geologic/Engineering Description and Remarks	Geologic Attitudes
								@ 0-1.5' Med. brown silty Clay: soft, very moist, abund. roots. TOPSOIL	
								@ 1.5-4' Tan silty fine Sandstone: moist, hard, unbedded. Refusal at 4' BEDROCK, SONOMA VOLCANICS	
5									
								Bottom of Test Pit at 4 feet.	
10									
15									



SURFACE GRADIENT: 16 degrees

SCALE: 1" = 2'

JIM GLOMB CONSULTING, INC.
Sebastopol, California

NEIL SCHAFER

Date: February, 2005

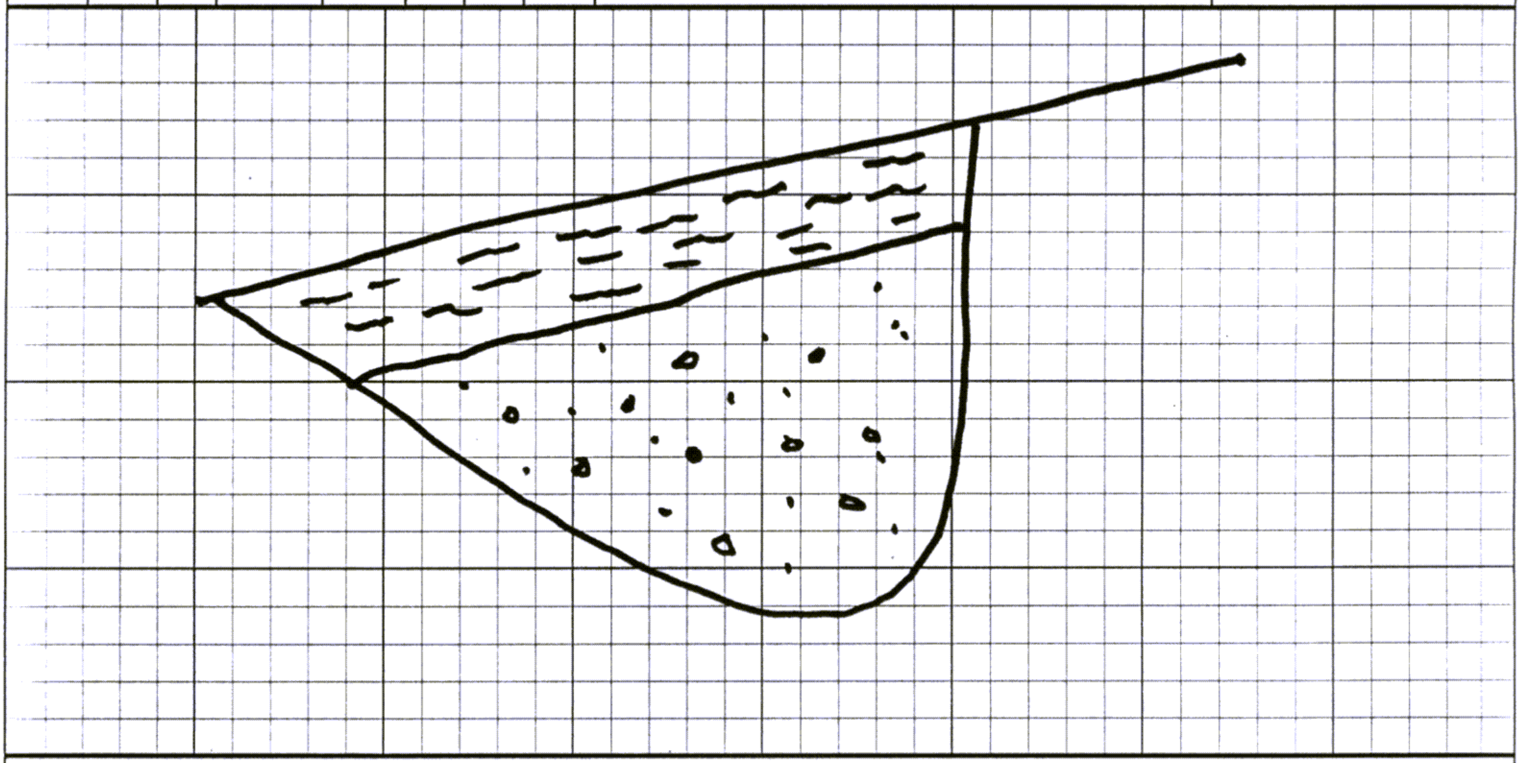
Project No: 915

Plate 2.1

LOG OF TEST PIT

Surface Elevation: 540' Pit Orientation: N45E Pit Dimensions: 2 x 5 x 8 Ground Water Depth: none enc.	Logged by: RW Date: February 10, 2005 Equipment: CAT BH30, 12" bucket	Test Pit Number T-2

Depth (ft).	Samples Bulk	Samples Tube	Pocket Pen (ft kips/ft.)	Field Moisture (% of dry weight)	Plastic Index	Dry Density (pcf)	Soil Type (USCS)	Geologic/Engineering Description and Remarks	Geologic Attitudes
								@ 0-1.5' Dark brown clayey sandy Silt: very moist, soft and abundant roots. TOPSOIL	
								@ 1.5-3' Med. brown weathered Tuff: soft to mod. hard, sl. porous, unbedded.	
5								@ 3-5' Yellowish tan Tuff: moist, mod. hard, unbedded. BEDROCK, SONOMA VOLCANICS	
								Bottom of Test Pit at 5 feet.	
10									
15									



SURFACE GRADIENT: 13 degrees

SCALE: 1" = 2'

JIM GLOMB CONSULTING, INC.
Sebastopol, California

NEIL SCHAFER

Date: February, 2005

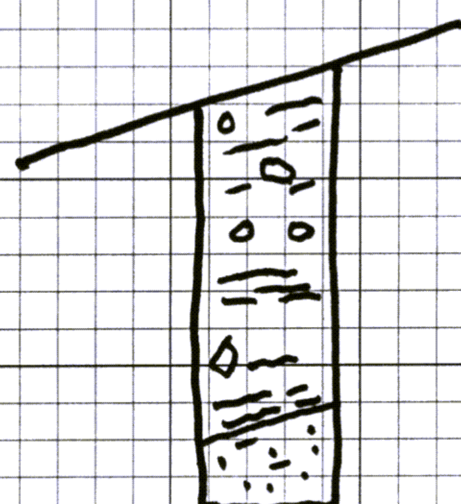
Project No: 915

Plate 2.2

LOG OF TEST PIT

Surface Elevation: 535' Pit Orientation: N80W Pit Dimensions: 1 x 7 x 9 Ground Water Depth: none enc.	Logged by: RW Date: February 10, 2005 Equipment: CAT BH30, 12" bucket	Test Pit Number T-3

Depth (ft).	Samples Bulk	Samples Tube	Pocket Pen (ft kips/ft.)	Field Moisture (% of dry weight)	Plastic Index	Dry Density (pcf)	Soil Type (USCS)	Geologic/Engineering Description and Remarks	Geologic Attitudes
								@ 0-5.5' Med. brown sandy Clay: soft, very moist, abund. roots, with rock fragments. SLOPEWASH	
5								@ 5.5-7' Gray Rhyolite: slightly moist, very hard, unbedded. BEDROCK, SONOMA VOLCANICS	
10								Bottom of Test Pit at 7 feet.	
15									



SURFACE GRADIENT: 16 degrees

SCALE: 1" = 3'

JIM GLOMB CONSULTING, INC.
Sebastopol, California

NEIL SCHAFER

Date: February, 2005

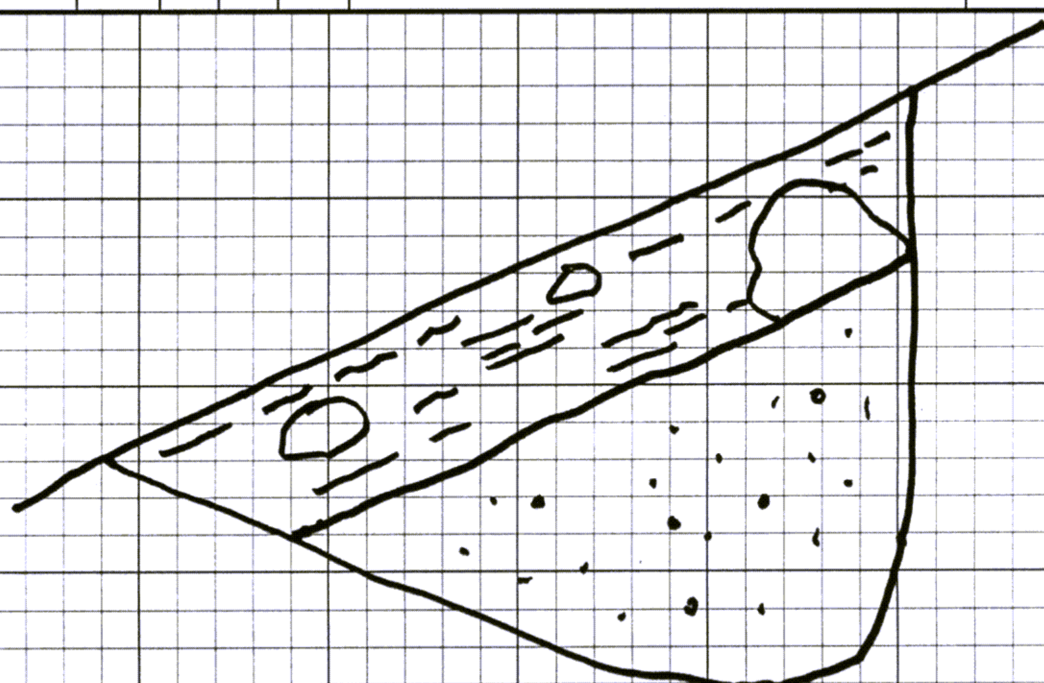
Project No: 915

Plate 2.3

LOG OF TEST PIT

Surface Elevation: 455' Pit Orientation: N30E Pit Dimensions: 2 x 6 x 9 Ground Water Depth: none enc.	Logged by: RW Date: February 10, 2005 Equipment: CAT BH30, 12" bucket	Test Pit Number T-4

Depth (ft).	Samples: Bulk	Samples: Tube	Pocket Pen (ft kips/ft.)	Field Moisture (% of dry weight)	Plastic Index	Dry Density (pcf)	Soil Type (USCS)	Geologic/Engineering Description and Remarks	Geologic Attitudes
								@ 0-2' Dark brown clayey sandy Silt: with rock fragments and boulders to 2-foot diameter, moist, porous, abund. roots. TOPSOIL	
5								@ 2-6' Light tan Sandstone: with scarce pebbles, moist, hard, unbedded. BEDROCK	
								Bottom of Test Pit at 6 feet.	
10									
15									



SURFACE GRADIENT: 25 degrees

SCALE: 1" = 2'

JIM GLOMB CONSULTING, INC.
Sebastopol, California

NEIL SCHAFER

Date: February, 2005

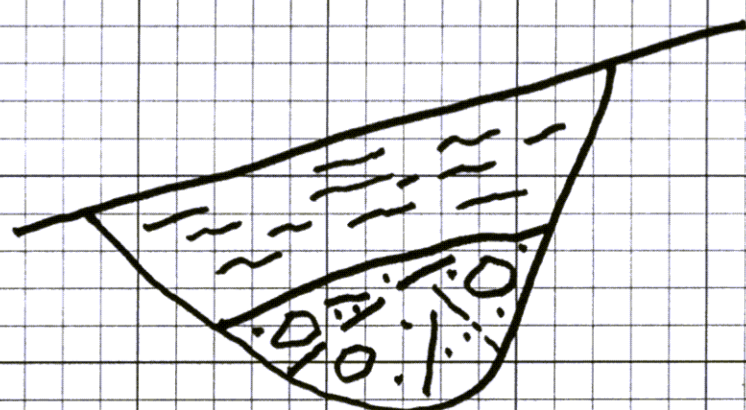
Project No: 915

Plate 2.4

LOG OF TEST PIT

Surface Elevation: 470' Pit Orientation: N70W Pit Dimensions:.1.5 x 3.5 x 6 Ground Water Depth: none enc.	Logged by: RW Date: February 10, 2005 Equipment: CAT BH30, 12" bucket	Test Pit Number T-5

Depth (ft).	Samples Bulk	Samples Tube	Pocket Pen (ft kips/ft.)	Field Moisture (% of dry weight)	Plastic Index	Dry Density (pcf)	Soil Type (USCS)	Geologic/Engineering Description and Remarks	Geologic Attitudes
								@ 0-1.5' Dark brown clayey Silt: soft, very moist, abund. roots. TOPSOIL	
5								@ 1.5-3.5' Tan Siltstone-Sandstone: moist, very hard, unbedded. breccia with abundant subrounded clasts to 6-inch diameter. BEDROCK, SONOMA VOLCANICS	
10								Bottom of Test Pit at 3.5 feet.	
15									



SURFACE GRADIENT: 16 degrees

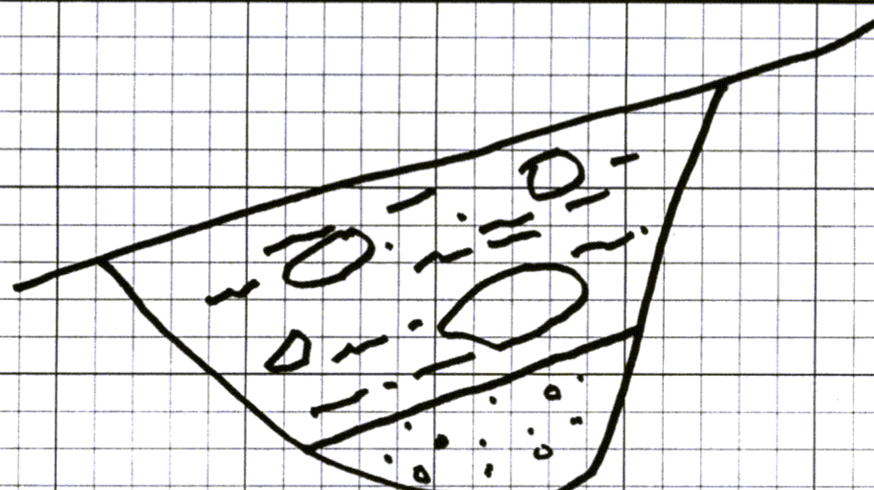
SCALE: 1" = 2'

JIM GLOMB CONSULTING, INC. Sebastopol, California	NEIL SCHAFER Date: February, 2005	
	Project No: 915	Plate 2.5

LOG OF TEST PIT

Surface Elevation: 472' Pit Orientation: N30E Pit Dimensions: 2 x 4 x 6.5 Ground Water Depth: none enc.	Logged by: RW Date: February 10, 2005 Equipment: CAT BH30, 12" bucket	Test Pit Number T-6

Depth (ft).	Samples Bulk	Samples Tube	Pocket Pen (ft kips/ft.)	Field Moisture (% of dry weight)	Plastic Index	Dry Density (pcf)	Soil Type (USCS)	Geologic/Engineering Description and Remarks	Geologic Attitudes
								@ 0-2.5' Dark brown clayey sandy Silt: soft, very moist, with abund. roots & rock frags to 12-inch dia. TOPSOIL	
5								@ 2.5-4' Gray Rhyolite: with abund. rust-brown oxidized surfaces slightly moist, very hard, structureless. Refusal at 4'. BEDROCK, SONOMA VOLCANICS	
10								Bottom of Test Pit at 4 feet.	
15									



SURFACE GRADIENT: 15 degrees

SCALE: 1" = 2'

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Sebastopol, California

NEIL SCHAFER

Date: February, 2005

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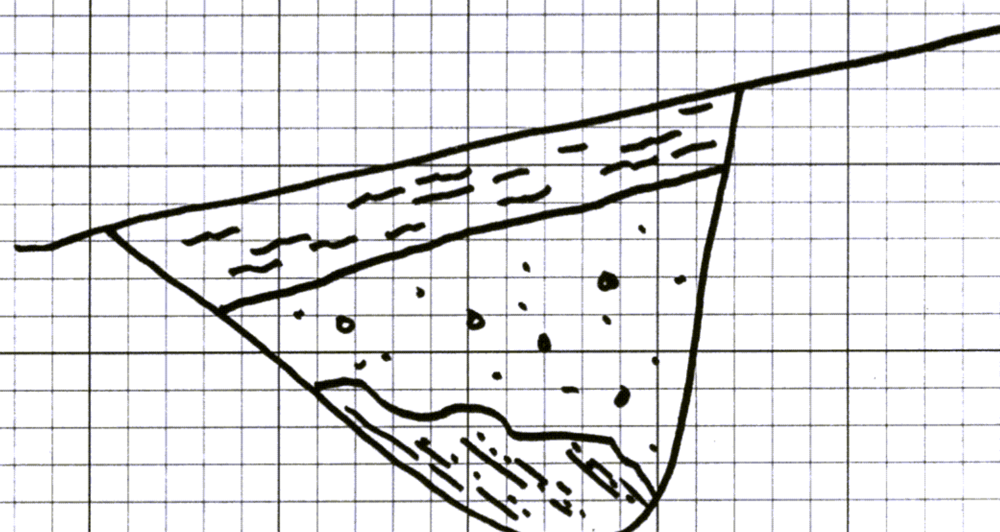
Plate 2.6

LOG OF TEST PIT

Surface Elevation: 475' Pit Orientation: N70E Pit Dimensions: 2 x 4.5 x 7 Ground Water Depth: none enc.	Logged by: RW Date: February 10, 2005 Equipment: CAT BH30, 12" bucket	Test Pit Number T-7

Depth (ft).	Samples: Bulk	Samples: Tube	Pocket Pen (ft kips/ft.)	Field Moisture (% of dry weight)	Plastic Index	Dry Density (pcf)	Soil Type (USCS)	Geologic/Engineering Description and Remarks	Geologic Attitudes
								@ 0-1' Dark brown silty Clay: v. soft, v. moist, abund. roots. TOPSOIL	
								@ 1-3' Tan conglomeratic Sandstone: moist, hard, unbedded.	@ 3' (irregular contact) N5E, 15W
5								@ 3-4.5' Tan silty fine Sandstone and clayey Siltstone: moist, hard. BEDROCK, SONOMA VOLCANICS	@ 4' bdg.: N30E, 38NW
								Bottom of Test Pit at 4.5 feet.	
10									
15									



SURFACE GRADIENT: 13 degrees

SCALE: 1" = 2'

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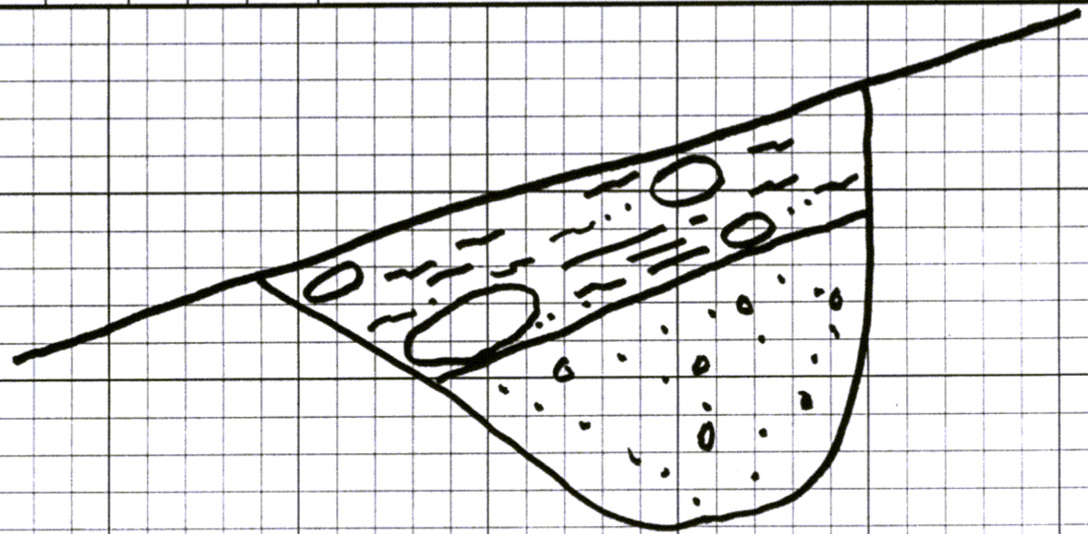
LOG OF TEST PIT

Surface Elevation: 422' Pit Orientation: N52E Pit Dimensions: 2 x 4.5 x 7 Ground Water Depth: none enc.	Logged by: RW Date: February 10, 2005 Equipment: CAT BH30, 12" bucket	Test Pit Number T-8

Depth (ft).	Samples Bulk	Samples Tube	Pocket Pen (ft kips/ft.)	Field Moisture (% of dry weight)	Plastic Index	Dry Density (pcf)	Soil Type (USCS)	Geologic/Engineering Description and Remarks	Geologic Attitudes
								@ 0-1.5' Dark brown clayey sandy Silt: with abund. roots and rock fragments to 12-inch diameter, very moist, soft. TOPSOIL	@ 3.5' bdg.: N30W, 27SW (very indistinct)
5								@ 1.5-4.5' Tan conglomeratic fine to coarse Sandstone: moist, hard, bedding very indistinct. BEDROCK, SONOMA VOLCANICS	
10								Bottom of Test Pit at 4.5 feet.	
15					-				



SURFACE GRADIENT: 18 degrees

SCALE: 1" = 2'

JIM GLOMB CONSULTING, INC.
Sebastopol, California

NEIL SCHAFER

Date: February, 2005

Project No: 915

Plate 2.8