

Worlitz Associates



SITE AND LABORATORY REPORT  
VOLUME I-TEXT

MT. TAYLOR URANIUM MILL PROJECT  
EVAPORATION POND DAM  
MILL SITE CATCHMENT-DAM

GULF MINERAL RESOURCES CO.

ENCLOSURE

PDR

WM-126

Site and Laboratory Report  
Volume I - Text

MT. TAYLOR  
URANIUM MILL PROJECT

Evaporation Pond Dam  
Mill Site Catchment Dam

San Mateo, New Mexico

Gulf Mineral Resources Co.  
a Division of Gulf Oil Corporation

February 1980

Wahler Associates  
Geotechnical Engineers

Project GUL-105A

15735

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& ASSOCIATES

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February 1980  
Project GUL-105A

Gulf Mineral Resources Co.  
1720 South Bellaire Street  
Denver, Colorado 80222

Attention: Mr. Robert E. Bohm

Subject: Site and Laboratory Investigation  
Proposed Evaporation Pond Dam  
and Mill Site Catchment Dam

Gentlemen:

This report presents the results of our site and laboratory investigation for the proposed evaporation pond and dam in La Polvadera Canyon and for the mill site catchment dam off San Lucas Canyon.

The results of our investigations indicate that these sites are suitable for the intended purposes. Sufficient satisfactory borrow materials are available in the vicinity of these sites to construct the proposed embankments, except that filter-drain material will need to be obtained from commercial sources.

We appreciate the opportunity to have provided our services to Gulf Mineral Resources Co. on this study. If you have any questions, or if we can be of further service to you in any way, please do not hesitate to contact us.

Sincerely,

WAHLER ASSOCIATES

*Forrest W. Gifford*

Forrest W. Gifford  
Project Manager  
Professional Engineer No. 7165  
State of New Mexico

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## EXECUTIVE SUMMARY

This report presents the results of site and laboratory investigations for two elements of Gulf Mineral Resources Co.'s Mt. Taylor Project, near Grants, New Mexico. These elements are (1) the proposed evaporation pond that is an integral part of the tailings disposal facilities in La Polvadera Canyon and (2) a mill site catchment dam off San Lucas Canyon.

### La Polvadera Canyon Evaporation Pond

The proposed evaporation pond provides for the storage and evaporation of excess mill waste fluids. The facility will consist of a zoned earthfill dam across a drainage on the south portion of La Polvadera Canyon and a clay lined pond that will be partially excavated to remove alluvium and allow for reservoir shaping. The dam will have a maximum height of about 75 feet above streambed. The ultimate area of the pond will be about 205 acres.

Geologic conditions at La Polvadera Canyon are favorable for the construction of the evaporation pond. The subsurface geology is controlled by the San Mateo Dome, where the sedimentary bedrock units are relatively flat-lying. The abutments of the proposed dam will be founded on the competent interbedded sandstone, siltstone, and shale of the Dilco Coal Member. In the channel section, the Gallup Sandstone should also provide an adequate and competent foundation after excavation and removal of the overlying alluvium (which may reach depths of up to 30 feet). The downstream portion of the pond floor and the lower slopes of the pond will be underlain by Gallup Sandstone; most of the upper slopes will be underlain entirely by the Dilco Coal Member bedrock. Both these bedrock units should provide adequate foundation for the clay pond liner.

Foundation excavation for the dam and excavation for shaping of the pond should be relatively easy with modern heavy duty excavation equipment equipped with rippers. The same sandstones in the pond area may require some moderately difficult ripping which will likely cause some irregularities in the excavation surface.

The proposed pond area will yield earth construction materials satisfactory for the embankment. The quantities available are, for the most part, adequate. In the later stages of embankment construction, additional shell material will be obtained from excavation at the adjacent tailings burial site. Drain materials will have to be obtained from off-site or commercial sources.

No ground water was encountered in drill holes in La Polvadera Canyon.

It is not expected that the evaporation pond dam will be subject to heavy earthquake shaking. The Mt. Taylor project is located in an area of low seismic activity, no seismic events as great as maximum intensity VI (Modified Mercalli Scale) have been recorded for this area, and the greatest event that can reasonably be expected would have a maximum intensity of VII. Therefore, a conservative design criterion for earthquake-induced load on this structure would be a pseudostatic coefficient of 0.10 g.

#### San Lucas Canyon Mill Catchment Dam and Reservoir

The mill site catchment dam will intercept and retain run-off from the mill and will serve as an emergency storage reservoir for milling operations. It will have a maximum height of 42.5 feet and a crest length of about 600 feet.

At the dam site, interbedded sandstone, siltstone, and shale of the Menefee Formation should provide competent foundation material for the proposed dam. In the channel section, alluvium (up to 26 feet in depth) should be excavated and removed along the cutoff trench. During investigations, some perched ground water was noted in the alluvium and this may pose a problem during excavation. The trench should be excavated about 5 feet into bedrock to expose competent rock in the abutments and channel section and also should be extended laterally through a permeable terrace deposit in both abutments. In the left abutment, fracture permeability is indicated by high rates of water loss in drill holes to depths of 50 feet. Therefore, a grout curtain will be required along the cutoff trench, with primary grout holes to depths of 60 feet to provide a relatively impervious foundation.



The impoundment's spillway is suitably located, upstream of the left abutment, across a bedrock ridge that is controlled by a massive sandstone outcrop, which extends to the bottom of the spillway cut.

Excavation of the bedrock material should be possible with heavy-duty excavation machines equipped with rippers, although minor blasting may be required to shape the massive sandstone in the upper part of the abutments.

Adequate volumes of suitable quality borrow materials for impervious and shell zones can be obtained within the reservoir area upstream of the proposed catchment dam. Riprap can be obtained from the spillway excavation (into largely sandstone bedrock), and/or from the basalt talus deposit on the east slopes. Only drain material will have to be obtained from commercial sources.

A probable landslide mass that is extensive but shallow was mapped upstream of the right abutment. Because of the potential instability there, no borrow excavation should be done within the slide area nor should any facilities be located there without prior, detailed site investigations. Any renewed slide activity should not endanger the dam facilities but would contribute a significant amount of debris to the proposed pond.

For the mill site catchment dam, the design criterion for an earthquake-induced load would be a pseudostatic coefficient of 0.10 g, as for the evaporation pond dam.

This executive summary is presented for the reader's convenience only. For complete technical discussion and the rationale for conclusions and recommendations, the full text of this report should be consulted.

**INTRODUCTION**

POOR ORIGINAL

CHAPTER I  
INTRODUCTION

A. PROJECT DESCRIPTION

This report presents the results of Wahler Associates' geotechnical site investigation and of laboratory tests of foundation and construction materials for Gulf Mineral Resources Co.'s proposed evaporation pond and mill site catchment dam for the Mt. Taylor project. This report updates the April 1978 report titled "Site and Laboratory Investigations for Tailings Impoundment and Catchment Dams". The evaporation pond is to be located in La Polvadera Canyon, approximately 30 miles northeast of Grants, New Mexico (Figure 1-1). The mill site catchment dam is to be located about 4 miles southeast of the tailings impoundment site, across a small tributary off San Lucas Canyon.

The evaporation pond is an integral part of the Mt. Taylor Uranium Project. The major components of the project will include a deep underground mine, a mill whose presently planned ultimate production capacity will be approximately 1.5 million tons of ore per year and the tailings disposal facilities. The evaporation pond is part of the tailings disposal facilities and serves to provide storage and evaporation of excess mill waste liquids. The solid tailings are to be disposed of in a series of excavated trenches to be located in La Polvadera Canyon.

The evaporation pond dam will have a maximum height of about 75 feet above streambed and an ultimate pond size of approximately 205 acres. The mill site catchment dam will intercept and retain runoff from the mill and will serve as an emergency storage reservoir for the milling operations. The proposed catchment dam will have a maximum height of 42.5 feet and a crest length of about 600 feet.

B. AUTHORIZATION

The authorization for this work is set forth in an agreement with an effective date of December 28, 1978, signed by Gulf Mineral Resources Co. (GMRC) and Wahler Associates. Mr. R. E. Bohm of GMRC and Mr. F. W. Gifford of Wahler Associates served as project managers for the work.

C. SCOPE OF WORK

The work performed under this contract documented in this report included geotechnical site investigations of La Polvadera Canyon and mill site catchment dam areas in San Lucas Canyon and laboratory testing of potential borrow materials. The site investigations consisted of geologic mapping, an extensive drilling, trenching and sampling program, and field permeability testing conducted during three periods between 1977 and 1979.

This report presents the results of geotechnical site and laboratory investigations in La Polvadera Canyon and at the mill site catchment dam area. The results of the site investigation in San Lucas Canyon other than at the mill site catchment dam area are presented in Wahler Associates' report "Evaluation of Alternative Tailings Management Methods" November, 1979.

D. REPORT ORGANIZATION

This report describes regional and local seismic and geologic conditions in La Polvadera Canyon and at the catchment dam site off San Lucas Canyon, summarizes information and data obtained in site and laboratory investigations, and discusses factors influencing the evaporation pond dam and catchment dam designs.

The results of these investigations are capsulized in the Executive Summary. Chapter I introduces the project and defines the scope of work. Chapter II describes the regional geologic and seismic setting and Chapter III deals with local geologic conditions. Chapter IV describes the foundation

conditions at the evaporation pond and catchment dam sites. Chapter V describes borrow material sources for the proposed embankments.

The field investigation data are given in Appendix A (Volume II) and the results of the laboratory investigation are included in Appendix B. The results of Earth Sciences Associates' seismic refraction studies in La Polvadera Canyon are presented in Appendix C. Appendices B and C comprise Volume III of this report. Principal literature references are listed at the end of the main report text.

#### E. LIMITATIONS

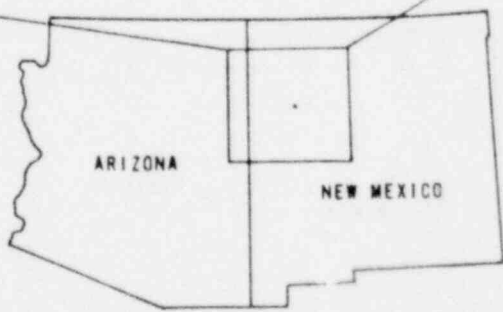
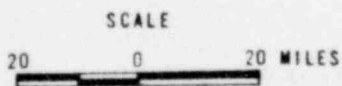
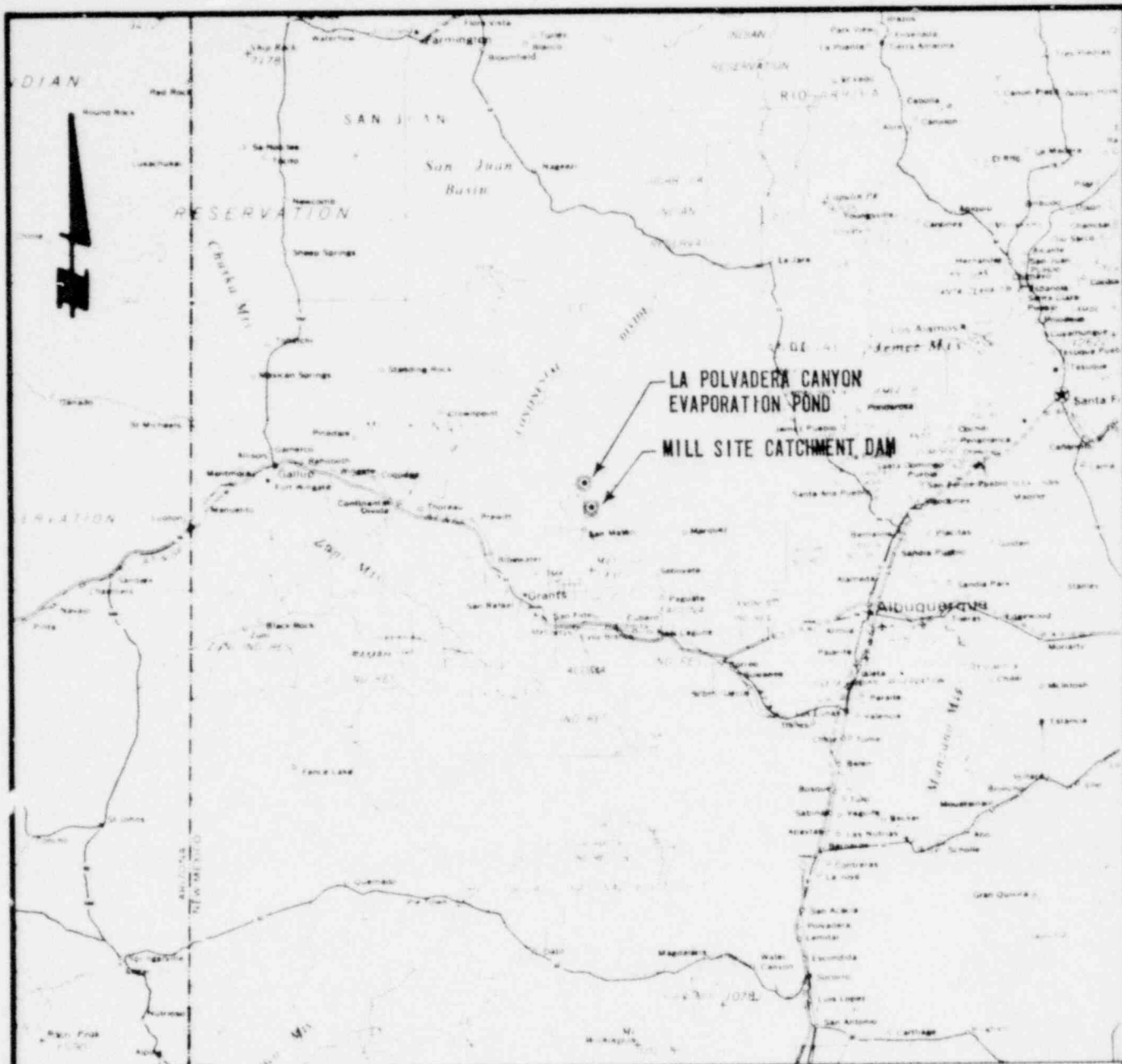
The data, information, interpretations, and recommendations in this report are presented solely as bases and guides to the design of the evaporation pond facility in La Polvadera Canyon and the mill site catchment dam off San Lucas Canyon. The conclusions and professional opinions presented herein were developed by Wahler Associates in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties, either express or implied.

These data, conclusions, and recommendations should be considered to relate only to the specific project and locations discussed herein. Wahler Associates is not responsible for any conclusions or recommendations that may be made by others.

This report has not been prepared for use by parties other than Gulf Mineral Resources Co. and the reviewers of the Mt. Taylor project. It may not contain sufficient information for the purpose of other parties for other uses. If any changes are made in the project as outlined in this report, the conclusions and recommendations contained herein shall not be considered valid unless the changes are reviewed by Wahler Associates and the conclusions and recommendations of this report are modified or approved in writing.

F. ACKNOWLEDGEMENTS

Wahler Associates acknowledges, with appreciation, the contributions of Earth Sciences Associates and Gulf Mineral Resources Co. in developing information for this report. The seismic refraction work at the proposed evaporation pond site was performed by Earth Sciences Associates.



BASE FROM UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY "THE NATIONAL ATLAS OF THE UNITED STATES OF AMERICA", WASHINGTON, D. C. 1970

POOR ORIGINAL

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT PALO ALTO • NEWPORT BEACH • CALIF.	LOCATION MAP		
		PROJECT NO. GUL-105A	DATE FEBRUARY 1980	FIGURE NO. 1

**REGIONAL SETTING**

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CHAPTER II  
REGIONAL SETTING

A. REGIONAL GEOLOGY

The Mt. Taylor project site lies in the eastern part of the Colorado Plateau geologic province near the southern boundary of the San Juan Basin. It is about 35 miles west of the San Ignacio faulted monocline that forms the boundary between the Colorado Plateau and the Rio Grande Depression.

The San Juan Basin sediments were gently folded in Jurassic time (about 155 million years before the present) and tilted northwestward, in the region of the Mt. Taylor site, at a low angle (2 to 5 degrees) toward the center of the basin. This tectonic activity subsided during Cretaceous time, but in early Tertiary time (50 to 60 million years ago), tectonic activity began again. This activity resulted in the formation of the present general configuration of the San Juan Basin. In late Tertiary time (10 to 20 million years ago) a regional east-west crustal extension resulted in the formation of the Rio Grande Depression and also created major folding that was accompanied by northeast-trending normal faulting east and northeast of the project area. During this same period, there was considerable volcanic activity centered in the Mt. Taylor volcanic field, east of the project area.

La Polvadera Canyon is at the northeast end of the San Mateo Dome, which is near the border of the Chaco Slope and the Acoma Sag elements of the San Juan Basin (Cooper and John, 1968). The San Mateo Dome, an elongated structure, trends northeasterly. The northeast flank of the dome coincides with the west side of the Mt. Taylor syncline. Contours drawn on the base of the Dakota Sandstone show that the San Mateo Dome retains its general structure at depths of 1,600 to 2,000 feet (Santos, 1966). The dome is cut by normal faults which can be traced for several miles and exhibit both horizontal and vertical displacement.

## B. REGIONAL SEISMICITY

### 1. Seismic History

Seismic evidence, both historical and instrumentally recorded, indicates that the Mt. Taylor project site is in an area of low seismic activity (Figure II-1). There is no reported historic record of earthquake damage in the area since 1887.

There are two zones of moderate seismicity in the region of the Mt. Taylor site; these zones are characterized as having a relatively large number of low to moderate seismic events, both historical and instrumentally recorded. Each zone corresponds to an area of known faulting. One seismic zone, about 170 miles from the project site at its closest distance, trends northwest and extends from the lower Rio Grande Valley near El Paso on the south through southwestern New Mexico into Arizona, terminating near Flagstaff. Several Modified Mercalli Intensity V to VI shocks have been recorded in the area--the largest earthquake, of intensity VII, occurred at Flagstaff in 1906. The second zone coincides approximately with the Rio Grande Rift Zone, about 50 miles east of the project site. This roughly north-south trending zone begins south of Socorro and parallels the Rio Grande Valley north to Colorado. The Rio Grande Rift Zone is believed to be a tensional feature in the earth's crust incorporating large, downdropped blocks of crustal material (grabens). This rift zone is bounded on the east and west by north-south trending faults. It is postulated that earthquakes with hypocenters located within the Rio Grande Rift Zone are the result of slight movements along these fault planes. Some of the smaller magnitude events, as well as a great deal of the microseismic activity within the rift zone, are believed to be associated with geothermal sources lying at moderate depths within the zone. Although most of the historical and instrumentally recorded earthquakes associated with the rift zone have been of low magnitude and intensity, a few larger magnitude events have been documented. The strongest recorded earthquake in New Mexico occurred in this zone, at Socorro, on July 16, 1906; it had a maximum intensity of VIII with a radius of perceptibility of 200 miles. This shock was

part of a prolonged earthquake swarm that began in July 1906 and continued into the early part of 1907. The Mt. Taylor project site, about 100 miles northwest of the epicentral area, probably experienced shaking effects with intensities of IV to V during the Socorro event. Another shock of intensity VII to VIII about 60 miles east of the project site occurred in Sandoval County, New Mexico on May 28, 1918, and probably subjected the project site to intensities similar to those of the Socorro shock. Although the effects of the earthquakes were very localized and the damage was relatively minor, these events within the rift zone demonstrate the potential of faults within the zone to generate moderate to moderately large earthquakes.

An earthquake swarm epicentered on the Colorado-New Mexico border about 100 miles northeast of the project area occurred in January 1966. The largest event in this swarm had a Richter magnitude of 5.5 and was felt over an area of about 15,000 square miles. Damage was reported in the small town of Dulce, New Mexico, near the epicentral area. This event was felt in Los Alamos but reportedly was not felt in Albuquerque; therefore, the event was probably not felt in the project area.

Another significant event that may have affected the Mt. Taylor project site was the Sonora, Mexico earthquake of May 3, 1887, which had an intensity of VIII to IX at the epicenter (estimated Richter magnitude 6.3 to 7.0). Its epicenter was probably about 20 miles south of the Arizona-New Mexico border, where faulting was reported on both sides of the Sierra Teras, a north-south range forming part of the Sierra Madre Occidental, which is continuous with ranges in southeastern Arizona. On the west side of the Sierra Teras the scarp followed a winding course over 35 miles, with a maximum throw of 26 feet. The shock was felt over a wide area and as far north as Albuquerque and Santa Fe. At Tucson, El Paso, and Albuquerque, 130 to 320 miles from the epicenter, "water tanks slopped over, cars were set in motion on tracks, chimneys toppled down," which indicates an intensity of V to VI (Heck and Eppley, 1958). The project site is about 320 miles northwest of the epicentral area, and therefore probably experienced the same intensity of shaking.

Only two known earthquake events have occurred within 50 miles of the project area, and both have occurred in recent years. The nearest earthquake to the project site was a magnitude 4.4 earthquake on December 23, 1973, with its epicenter near Grants, about 20 miles southwest of the site. The earthquake was felt in McKinley and Valencia counties and subjected Grants, where minor damage occurred, to a maximum intensity of VI. In San Mateo, near the site, the reported intensities ranged from I to IV. The most recent event was a magnitude 5.0 shock on January 5, 1976, with the epicenter located 45 miles northwest of the site. The epicentral area experienced an intensity of VI.

## 2. Earthquake Risk Evaluation

Available seismograph records for the project area are insufficient to permit statistical forecasting of the occurrences of large-magnitude earthquakes. Therefore, the evaluation of earthquake risk is based on historical records and on the assumption that the maximum earthquake of record is the worst likely to occur during a comparable period of time in the future. Both historical and instrumentally recorded data were used; therefore, there is some statistical bias with population density.

The seismic history of the area indicates that the largest tremors within 200 miles of the project site have been: (1) the 1906 Flagstaff earthquake (intensity VIII), 170 miles west of the site; (2) the 1906 Socorro, New Mexico earthquake (intensity VIII), 100 miles southwest of the site; and (3) the 1918 Sandoval County, New Mexico earthquake (intensity VII-VIII), about 60 miles east of the site. The largest shock in the region was the 1887 northern Mexico earthquake of intensity IX, 320 miles southwest of the site; this earthquake may have subjected the site to a shock of intensity V to VI. The most recent shocks, in 1973 and 1976, located 20 and 45 miles from the site, had reported maximum intensities of VI in the epicentral area and were probably felt at the project site with intensities of IV or less. The most significant earthquake that affected the area was the 1918 Sandoval County earthquake in the Rio Grande seismic belt. The maximum intensity of VIII was the highest

reported in the Rio Grande Rift Zone. It was probably felt at the project area with an intensity of VI, and would have been accompanied by a maximum ground acceleration of about 0.06g.

Based on the historical record, the analysis indicates that an earthquake of intensity VIII could occur at the Rio Grande Rift Zone about 60 miles to the east of the site. This earthquake would probably be felt at the project site with an intensity of about VI. In terms of the Mt. Taylor evaporation pond and mill catchment embankment stability, an earthquake with a maximum intensity greater than VII at the site cannot reasonably be expected. To generate such a shock would require an intensity IX to X earthquake along the Rio Grande seismic belt, and in view of the available historical data, this possibility should be considered remote.

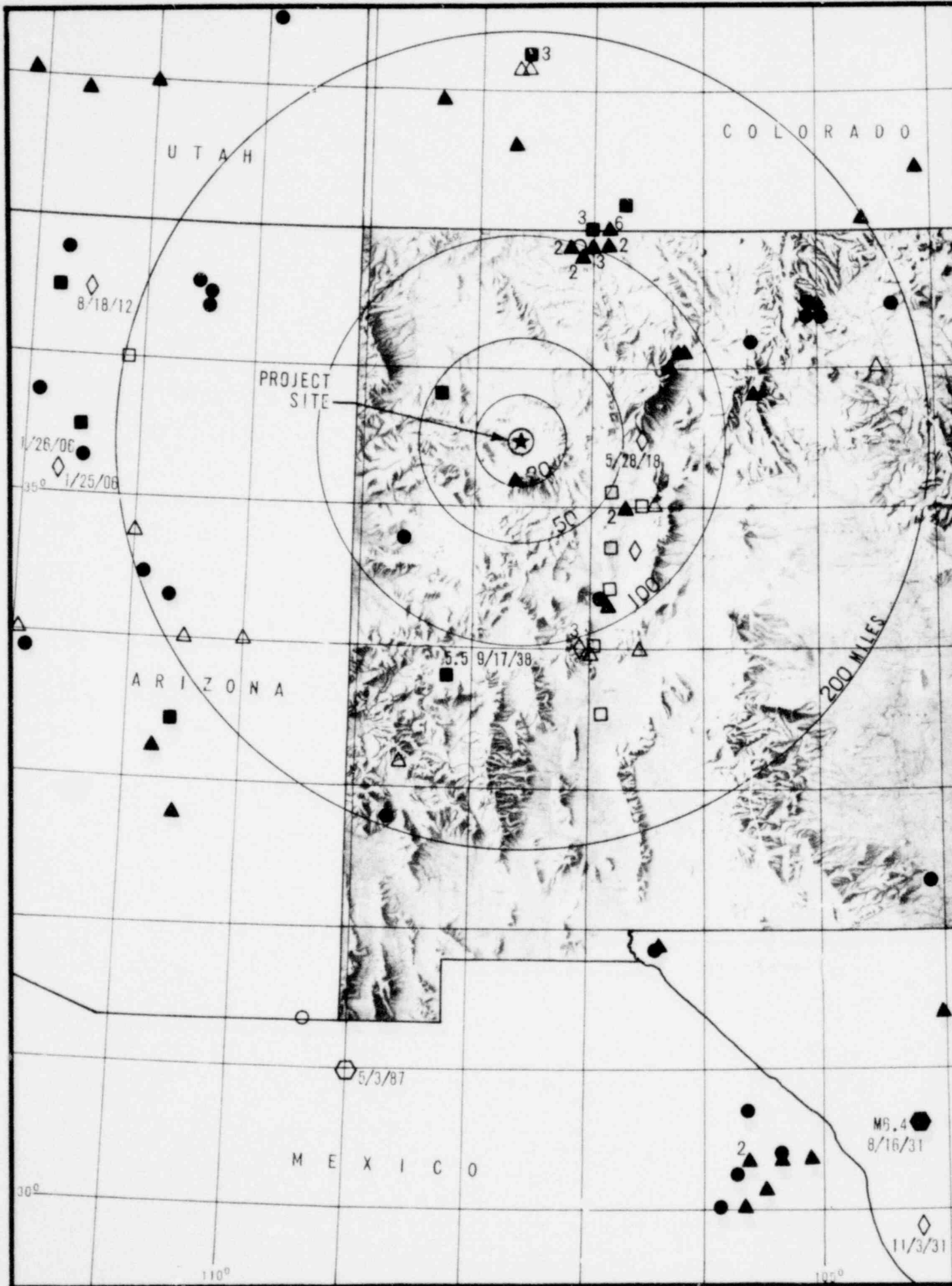
### 3. Seismic Design Criteria

The seismic coefficient applied in pseudostatic analysis is sometimes calculated from empirical formulas relating to intensity (determined according to the Modified Mercalli Intensity Scale and maximum ground acceleration). These formulas are not entirely mathematically correct because they treat intensity values as true numerical quantities, which they are not. One of these formulas has been presented by Richter (1958) as a "passable empirical relation":

$$\log a = I/3 - 1/2$$

where  $a$  is acceleration in  $\text{cm}/\text{sec}^2$  and  $I$  is the Modified Mercalli intensity. Applying this formula to an earthquake of intensity VII, an acceleration of  $68 \text{ cm}/\text{sec}^2$ , or about  $0.07g$ , is computed. This is consistent with the effective horizontal acceleration (pseudostatic seismic coefficient) of 8 percent of gravity shown in the preliminary map of horizontal acceleration for the United States prepared by the U.S. Geological Survey (1976).

On the basis of the foregoing calculations, an acceleration of 0.10g is recommended for use in a pseudostatic stability analysis of embankments. This will result in a conservative design criterion for earthquake-induced loads on the dam in La Polvadera Canyon and the mill catchment dam.



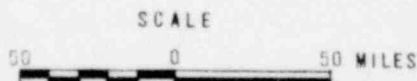
POOR ORIGINAL



EXPLANATION

SYMBOL	INTENSITY M.M.	SYMBOL	MAGNITUDE
○	I-IV	●	2.0-3.9
△	V	▲	4.0-4.9
□	VI	■	5.0-5.9
◇	VII-VIII	⬢	6.0 AND GREATER
⬡	IX-X	⊙	6 EPICENTERS

- NOTES: 1. EARTHQUAKES WITH KNOWN MAGNITUDES ARE INSTRUMENTALLY LOCATED.
2. DATA FROM THE EARTHQUAKE DATA FILE COMPUTER LISTING OF THE NATIONAL GEOPHYSICAL AND SOLAR TERRESTRIAL DATA CENTER 1887 TO FEBRUARY 1976. ADDITIONAL DATA FROM PUBLICATIONS OF NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION OF THE U.S. DEPARTMENT OF COMMERCE ON U.S. EARTHQUAKES.



POOR ORIGINAL

W. A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

SEISMICITY MAP OF NEW MEXICO

PROJECT NO

GUL-105A

DATE

FEBRUARY 1980

FIGURE NO.

11-1



**SITE GEOLOGY**

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CHAPTER III  
SITE GEOLOGY

A. GENERAL

The proposed evaporation dam and pond is located in La Polvadera Canyon. La Polvadera Canyon was the subject of previous extensive geologic surface and subsurface studies related to various alternative schemes for the disposal of mill waste. Wahler Associates conducted site selection studies as well as a definitive design investigation for a tailings impoundment in La Polvadera Canyon. The results of these investigations are contained in W. A. Wahler & Associates Phase I Site Selection Report for Tailings Impoundments (July 1977), and Phase II Site and Laboratory Investigations for Tailings Impoundment and Catchment Dams (April 1978). Subsequently, other disposal systems such as a multiple small-tailings pond scheme were also investigated. Several of these impoundment schemes appeared suitable. In response to the NRC position that burial is the prime option for disposal, a burial scheme is planned. This planned burial scheme will be located in the southern portion of La Polvadera Canyon. Part of this tailings burial scheme is an evaporation dam and pond in the south part of the canyon which is the subject of this report. The exploration map (Figure III-1) shows all the previous and recent subsurface drilling and trenching work in La Polvadera Canyon.

B. LA POLVADERA CANYON

The La Polvadera canyon area is a broad, rolling, bowl-shaped basin drained by several washes that converge and drain through a series of low hogback ridges into San Lucas Canyon. The hogbacks are formed by resistant sandstone beds that dip 20 to 30 degrees east, or downstream, at the canyon outlet. These dipping beds form the eastern flank of the San Mateo Dome; north of the canyon outlet they curve westward, forming

the northern flank of the dome and the northern rim of the La Polvadera drainage basin. The western and southern margins of the basin are formed by arms of the San Mateo Mesa. The axis of the dome bisects the central part of the canyon area; thus bedrock units (consisting primarily of a thick sequence of interbedded sandstone and shales) are generally flat-lying or gently dipping in the broader parts of the basin. It is in this area that the proposed evaporation pond is located.

#### 1. Bedrock Units

Bedrock outcrops in the canyon include Cretaceous sandstone, siltstone, and shales of the Menefee Formation, Point Lookout Sandstone, Crevasse Canyon Formation, Gallup Sandstone, and Mancos Shale. Bedrock is well exposed in the canyon and on surrounding mesas and hogbacks. These formations intertongue in a complex manner as a result of cyclic marine transgression and regression. The geology of La Polvadera Canyon is illustrated on Figure III-2 (in the pocket at the end of this volume). The explanation on the figure graphically represents the complex interbedding of the formations. The geologic formation outcropping in the proposed evaporation pond area consists of the Dilco Coal Member of the Crevasse Canyon Formation. The Gallup Sandstone lies buried beneath the alluvium in some areas of the pond. Surficial deposits of alluvial and eolian sand, silt, and clay blanket the bedrock along the valley bottom. A brief description of the bedrock units in La Polvadera Canyon in stratigraphic order from youngest to oldest is given in Table III-1. A geologic time scale is presented in Table III-2.

a. Mulatto Tongue Member of the Mancos Shale (Kmm) The Mulatto Tongue Member is the youngest bedrock type in the proposed evaporation pond area and occurs in conformable contact over the Dilco Coal Member. It outcrops in the broad ridges west of and outside the limits of the proposed evaporation pond.

The Mulatto Tongue consists of thinly bedded, light tan, sandy shale and siltstone with a few thin beds of sandstone and dark gray shale. Gypsum occurs as infilling of fracture and bedding planes.

b. Dilco Coal Member of Crevasse Canyon Formation (Kcdi) - The Dilco Coal Member underlies the Mulatto Tongue Member. The Dilco member comprises the major bedrock type in the project area and forms the broad ridges in the central portion of La Polvadera Canyon. To the north, the Dilco Coal Member is about 120 feet thick in full section and consists of interbedded, white to brown sandstone, brown to light gray siltstone, and gray to black and purple shale beds. Minor coal lenses up to 6 inches in maximum thickness were encountered in some drill holes. The sandstone is fine- to medium- grained and poorly cemented, and contains carbonaceous partings and some iron-oxide stain. The thickness of the sandstone beds ranges from 6 inches to 5 feet, although one massive sandstone bed on the upper part of the Dilco stratigraphic section attains a maximum aggregate thickness of 15 feet. The siltstone shows variegated colors from tan to yellow to gray and purple, with iron staining, and exhibits wavy bedding. The shale is gray to black, carbonaceous, fissile to flaky, and air-slakes readily. Most of the shale is found in the lower half of the stratigraphic section.

c. Gallup Sandstone (Kg) - The Gallup Sandstone underlies the Dilco Coal Member and, for the most part, occurs in the subsurface. The only outcrop occurrence is in the area of Michael Tank (Figure III-2). In the proposed evaporation pond site, the Gallup is not exposed and is buried beneath the alluvium. As indicated by drilling, the Gallup attains thicknesses ranging from 58 to 70 feet along the proposed evaporation pond dam axis. The Gallup Sandstone is a massive, cross-bedded, white, light yellow to light gray, fine- to medium-grained, poorly cemented sandstone. It contains few inclusions and thin streaks of carbonaceous material. Iron staining is common in the upper half of the section and persists to a lesser degree in the lower part of the

section. Joints, steeply dipping to vertical and spaced from 2 to 10 feet, were observed in outcrops. However, cores revealed very few joints or fractures.

d. Main Body of the Mancos Shale (Km) - The upper part of the main body of the Mancos Shale is of Late Cretaceous age and is a thick lithologic unit composed predominantly of dark gray, calcareous, fissile clay shale of marine origin. In La Polvadera Canyon, the Mancos Shale, as indicated by the well log of the Polvadera Well, is 905 feet thick (Cooper and John, 1968).

The Mancos Shale is not exposed in the project area but was encountered in deep drill holes along the proposed evaporation pond dam axis (Figures III-3 and III-4). In these drill holes (WPC-33 and WPC-34), the Mancos Shale was penetrated to depths ranging from 15 to 23 feet. The Mancos Shale encountered in core holes consists of interbedded, thinly bedded, tight, dark gray shale and siltstone with carbonaceous partings.

## 2. Surficial Deposits

Surficial deposits in the La Polvadera Canyon area consist of alluvial and eolian deposits, talus and slopewash deposits, and residual deposits. In the proposed evaporation pond area only the alluvial and eolian deposits exist. Minor slopewash deposits were noted. Extensive talus deposits found along the base of cliffs around the rim of La Polvadera Canyon consist of yellowish-brown to gray silt, sand, and gravel with numerous sandstone and siltstone blocks. Residual deposits of weathered bedrock in the canyon were mapped as saprolite by the USGS (Santos, 1966). These deposits contain siltstone and shale bedrock that has weathered in place to a plastic clay of various colors. In the pond area, residual deposits are almost always present as a thin cover over bedrock and not separated in the geologic map.

a. Alluvial and Eolian Deposits - Soil cover in the stream valleys consists of a complex of deposits of fine-grained alluvium and eolian material. There is no well-defined contact between the alluvial and eolian deposits in La Polvadera Canyon. These soil deposits range from a moderate brown to moderate yellow-brown, sandy clay to a silty sand, and occur as alternating layers. At depth and near the bedrock contact, the material is generally coarser and consists of gravelly sand with varying amounts of fines. Soils are generally loose to moderately dense near the surface but gradually become stiffer and denser at depth and near the bedrock contact. The shallower soils tend to be collapsible, as exhibited by the sink-type depressions that occur along stream bottoms.

Results of borehole exploration show that average soil thickness generally decreases upstream from the canyon mouth in both the north and south drainages. Average soil thickness ranges from more than 60 feet at the mouth of the canyon to 20 to 30 feet at a distance of 4,000 to 5,000 feet upstream of the north-south trending fault which bisects the canyon.

### 3. Structural Geology

The major structural feature in the project area is the San Mateo Dome. On the north and east flanks of the dome, the Point Lookout Sandstone and the upper two members of the Crevasse Canyon Formation form hogbacks that dip at an angle of 20 to 30 degrees. Bedding structure in the central part of La Polvadera Canyon, which is coincident with the crest of the dome, generally dips at an angle less than 5 degrees, except where local drag folds occur along normal faults. The proposed evaporation pond site is situated approximately on the eroded crest of San Mateo Dome, where the oldest rocks in the project area are exposed.

Joint patterns in sandstone beds in the Dilco are well developed; they are mostly vertical and are spaced 6 inches to 4 feet apart. Minor exposures of the massive Gallup Sandstone show widely spaced vertical

jointing. Very few steeply dipping to vertical joints were noted in cores in the Gallup, and the drill cores generally break along bedding or cross-bedding planes. The shale and siltstone are closely fractured but the fractures appear to be tight and sealed. Jointing in the Mulatto is closely spaced.

As shown on the geologic map, the east flank of the dome is complexly faulted. Lateral displacement along the faults at the hogbacks is very conspicuous in topographic maps and air photos. The beds at the mouth of La Polvadera Canyon are offset laterally approximately 1,000 to 1,500 feet by a north-northeast trending fault.

Another fault structure in the project area trends north-south and separates outcrops of the Mulatto Tongue Member of the Mancos Shale and Dilco Coal Member of the Crevasse Canyon Formation. This fault shows 150 to 200 feet of vertical displacement; it is located along the transitional boundary between steeply dipping rocks forming the eastern flank of the dome and the relatively flat-lying beds near the crest of the dome. Bedrock exposed east of this fault is the Mulatto Tongue Member. It is tilted 10 to 25 degrees from horizontal and is much more fractured than the corresponding rocks of the Dilco Coal Member on the west side of the fault. This north-south fault divides the canyon into two areas. East of the fault, the rocks are steeply dipping and complexly faulted. West of the fault, the beds are relatively flat-lying and the geologic structures are less complex. The proposed evaporation pond dam is located about 1800 feet west of this north-south fault.

In the upper reaches of the proposed evaporation pond a probable normal fault trending northeast was mapped by the USGS (Santos 1966). This probable fault is shown cutting the Mulatto Tongue Member. Our surface geologic mapping detected no evidence of the fault; furthermore our interpretation of subsurface geologic data indicates continuity in the subsurface stratigraphic profile (Figure III-4, Sec. C-C').

Faults in the La Polvadera Canyon comprise a system of normal faults which originated during the formation of the San Mateo Dome (SMD) during early Tertiary time. Examples of similar normal faulting patterns associated with anticlinal structures are well known, and they are expressions of relief of tensional stress in the upper parts of these structures. Most faults of the dome probably are not deepseated features and not continuous beyond its boundaries. The span of principal activity on these structures most likely was correlative with regional stress as during the Laramide orogeny: reactivation of some elements of the system may have occurred during middle Tertiary normal faulting.

Most of the fault structures in the area can be readily identified with late- or post-Pliocene erosional features in Cretaceous rocks. Faults exercise major control of erosion in resistant beds and have influenced topographic development. Fault-line scarps are apparent on some structures with escarpments formed on either the upthrown or downthrown sides, or on both sides along different segments of the same fault. Geomorphic expression of geologically young fault activity has not been identified in the area.

Present-day topography is apparently inherited with only slight modification from late- and post-Pliocene time. Over parts of the dome, post-Pliocene erosion has substantially exceeded 600 feet, leaving remnants of a pre-Pliocene erosion surface (San Mateo Mesa) standing high amid a much dissected topography. The principal drainages of this landscape are filled by alluvium, which currently is undergoing erosion by gullyng. Thick alluvium, extensive colluvial and landslide deposits on steeper slopes, and deep chemical weathering resulting in widespread saprolite formations are all characteristic of the area, but clearly are not compatible with the present day climatic regime, nor generally with that of the Holocene Epoch. They are instead consonant with the wetter climatic regime of the Pleistocene, and with an earlier episode of alluviation and canyon backfilling.



Faults in the area of the proposed evaporation pond and in the general area, are not known to transect these deposits.

The SMD fault system is apparently the northeastern most extension of the San Rafael fault zone, and the subparallel San Mateo fault zone. These zones converge in the SMD area in a plexus of faults, but to the southwest they consist of a relative few, long continuous breaks.

These fault zones are known mainly from subsurface relations since they are capped by Quaternary surficial deposits and without surface expressions over much of their mapped length. Individual breaks, within these systems transect some Pliocene volcanic rocks, but most members are pre-Pliocene in age. Moreover, in the vicinity of Grants, New Mexico the main members are overlain without displacement by basalt flows of Quaternary age.

In summary, there is no evidence that faults locally associated with the SMD could be younger than surficial deposits of probable Pleistocene age. They are probably much older as suggested by the following factors:

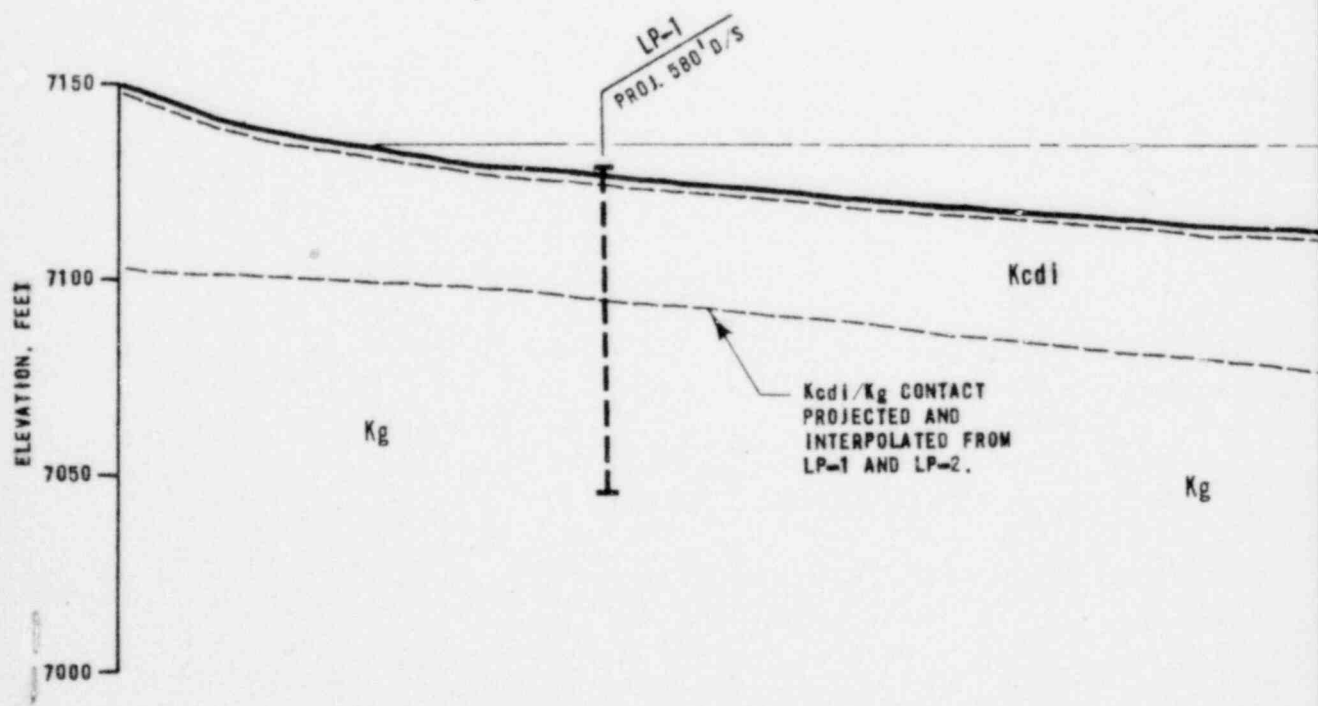
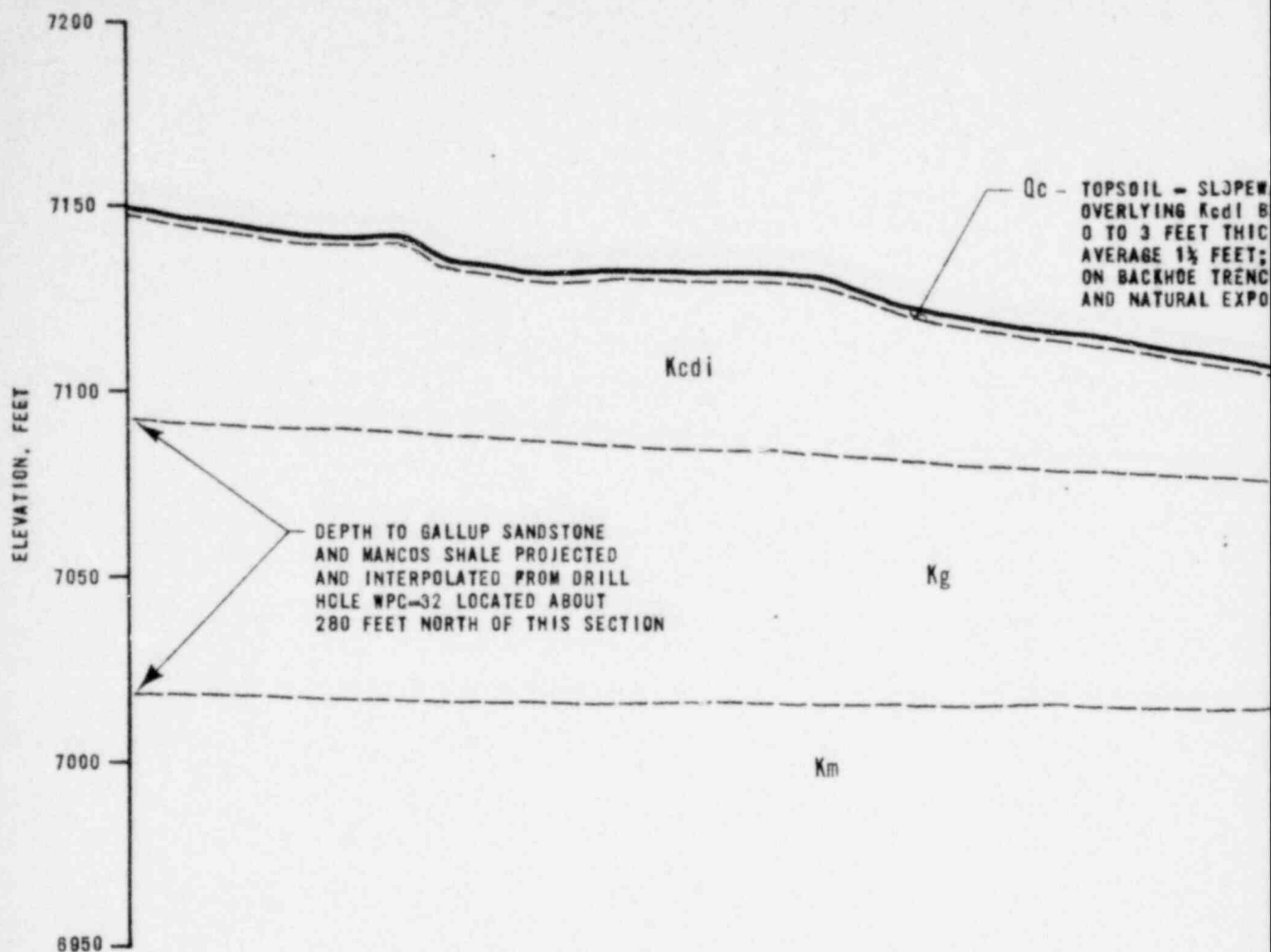
- The SMD fault system is apparently correlative in origin with long inactive stresses which produced folding in early Tertiary time.
- Other faults, possibly younger than the SMD fault system, but related spatially, are mostly no younger than Pliocene, and mapped relations suggest all are older than late-Pleistocene.
- A variety of erosional and depositional features are superposed on fault lines which, in part, control an ancient prealluviation landscape.

C. MILL CATCHMENT DAM SITE

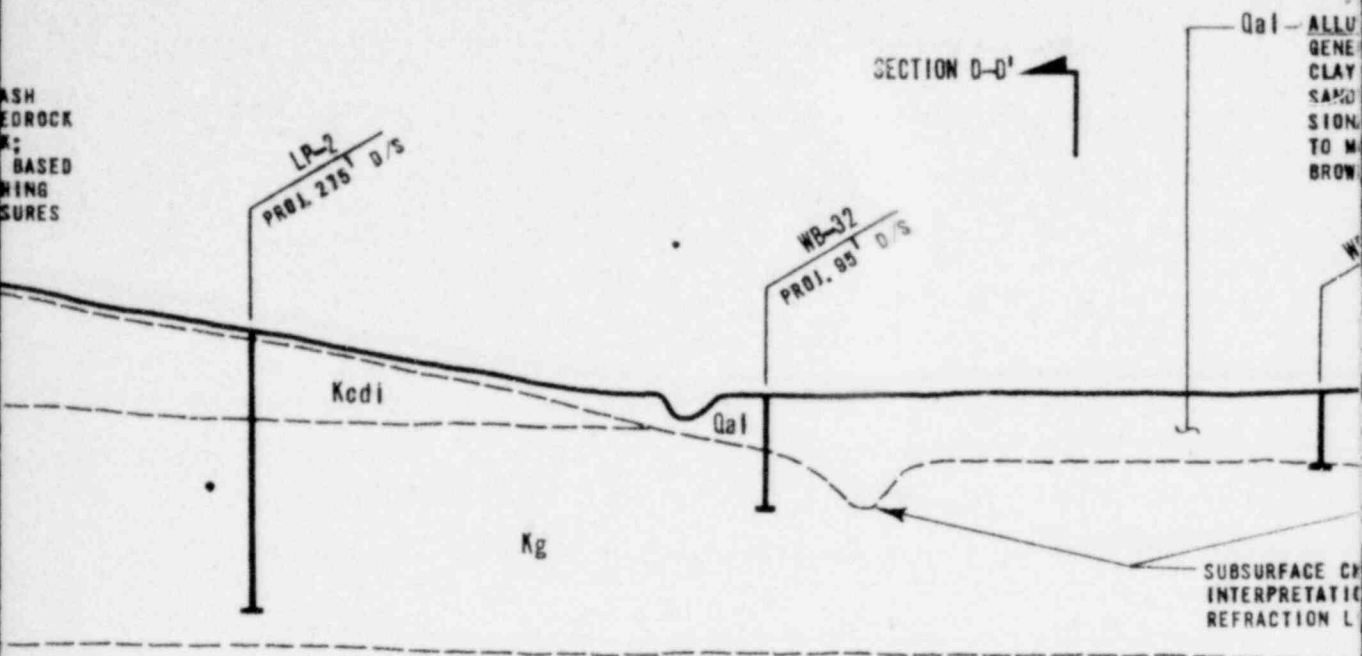
The proposed mill catchment dam site is in a small, northeast-trending tributary of San Lucas Canyon, about 4 miles south-southwest of the proposed La Polvadera Canyon tailings burial site and evaporation pond area. Figure III-5 is a surficial geologic map of the proposed dam and reservoir, and Figure III-6 shows geologic profiles along the dam axis and in the reservoir. The project site is on the southeastern flank of San Mateo Dome where the bedrock formation shows a northeast strike and low dips to the southeast. The Menefee Formation of Cretaceous age (Kmf) comprises the bedrock material underlying the entire site and is exposed on ridges and steep slopes. Elsewhere, the Menefee Formation is covered by talus, slopewash, terrace, and alluvial deposits. The Menefee Formation is interbedded, light brown to grayish-orange siltstone and sandstone with interbedded gray shale and minor coal seams.

The alluvial and eolian deposits in the channel consist of interlayered, light brown, sandy silt to silty sand and moderately brown, clayey sand to sandy clay. Ground water occurs in the stream alluvium and appears to be localized. Slopewash deposits consisting of mixed sand, silt, and clay, with some fragments of basalt and sandstone, overlie the bedrock on the lower slopes. A portion of this slopewash deposit, as evidenced by subdued hummocky topography and minor slumps at slopes high above the proposed reservoir to the east is comprised of fines and gravel- to boulder-sized basalt derived from the basalt caprock upslope and outside the mapped area. Minor terrace deposits overlie the bedrock on the broad ridgetop of both abutments.

The project site is on the southeastern flank of San Mateo Dome where the bedrock formation shows a northeast strike and low dips to the southeast. The Menefee Formation of Cretaceous age (Kmf) comprises the bedrock material underlying the entire site and is exposed on ridges and steep slopes.



ASH  
BEDROCK  
K;  
BASED  
NING  
SURES

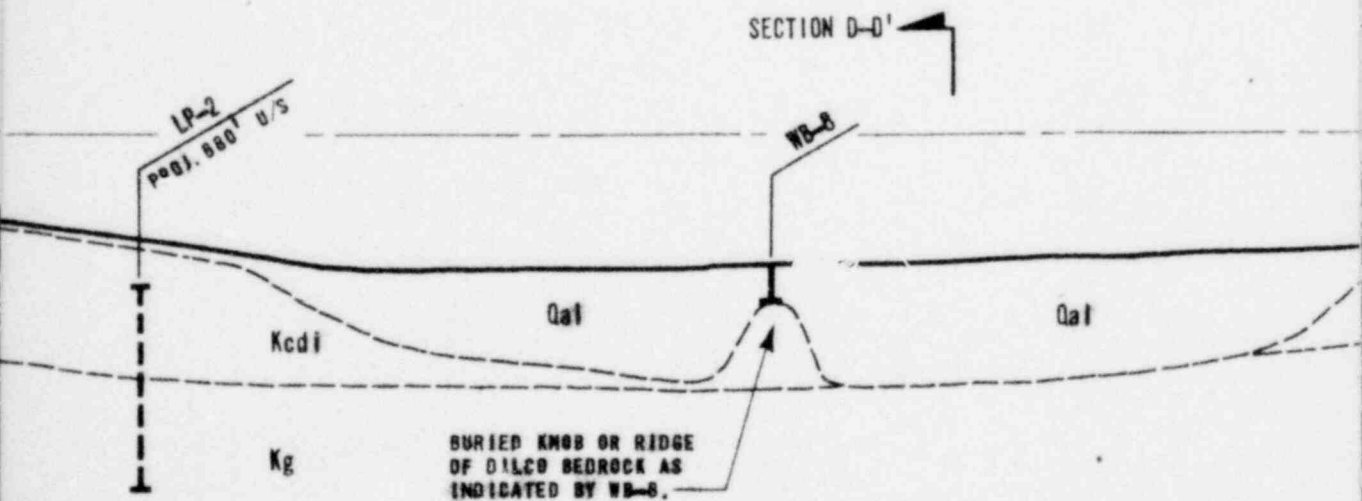


LONGITUDINAL SECTION A-A' - ALONG DAM AXIS

LOOKING DOWNSTREAM (EAST)

HORIZONTAL SCALE: 1" = 200'

VERTICAL SCALE: 1" = 50'



SECTION B-B' - POND AREA

LOOKING DOWNSTREAM (EAST)

HORIZONTAL SCALE: 1" = 200'

VERTICAL SCALE: 1" = 50'

VIIUM  
RALLY LEAN SANDY  
WITH SILTY SAND,  
SILT AND OCCA-  
SIONAL GRAVELS; BROWN  
MODERATE YELLOW  
N.

BEND IN SECTION

Kcdi - DILCO COAL MEMBER OF  
CREVASSE CANYON FORMATION;  
INTERBEDDED SANDSTONE,  
SILTSTONE, CARBONACEOUS  
SHALES AND MINOR COAL SEAMS.

Qc

Kg - GALLUP SANDSTONE  
LIGHT GRAY TO PINK TAN  
FINE TO MEDIUM GRAINED;  
POORLY GRADED; POORLY  
CEMENTED; MASSIVE; DENSE.

ANNALS BASED ON  
IN OF SEISMIC  
INES

Km - MAIN BODY OF MANCOS SHALE  
INTERBEDDED MEDIUM TO DARK  
GRAY SILTY SHALE AND LIGHT  
GRAY SANDY SHALE; THINLY  
LAMINATED WITH SOME CROSS  
BEDDING.

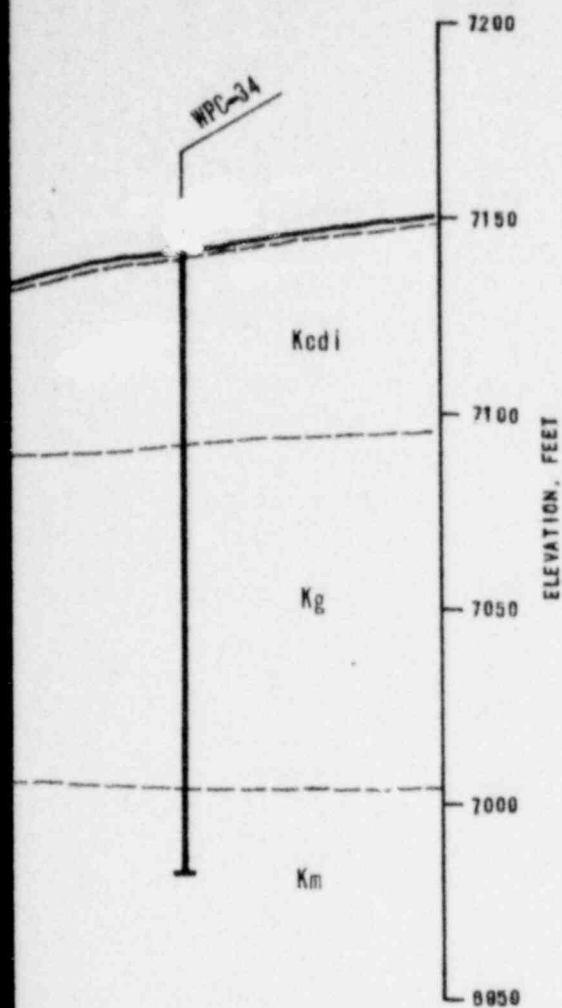
WPC-34  
PROJ. EDC

Kcdi

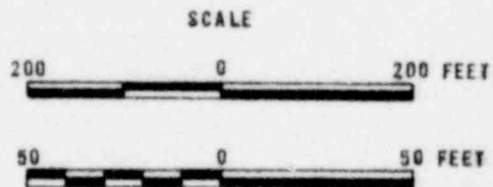
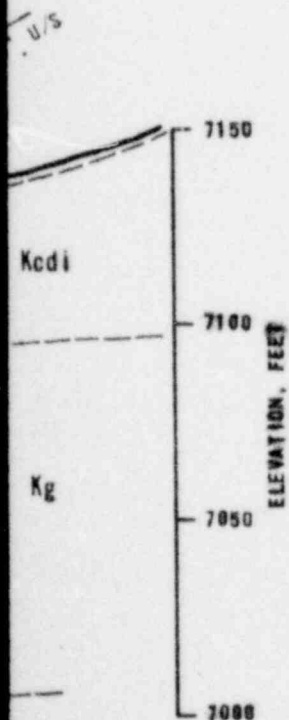
Kg

Km

W.A.  
& ASS



- NOTES:
1. DEPTH OF ALLUVIUM BASED ON INTERPRETATION AND INTERPOLATION OF DRILL HOLE DATA AND SEISMIC REFRACTION LINES.
  2. SEE FIGURES 111-1 AND 111-2 FOR LOCATION OF LINES OF SECTION.
  3. SEE SECTION A-A FOR DESCRIPTION OF GEOLOGIC UNITS.



WAHLER  
ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

GEOLOGIC SECTIONS  
EVAPORATION POND AND PROPOSED DAM

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.

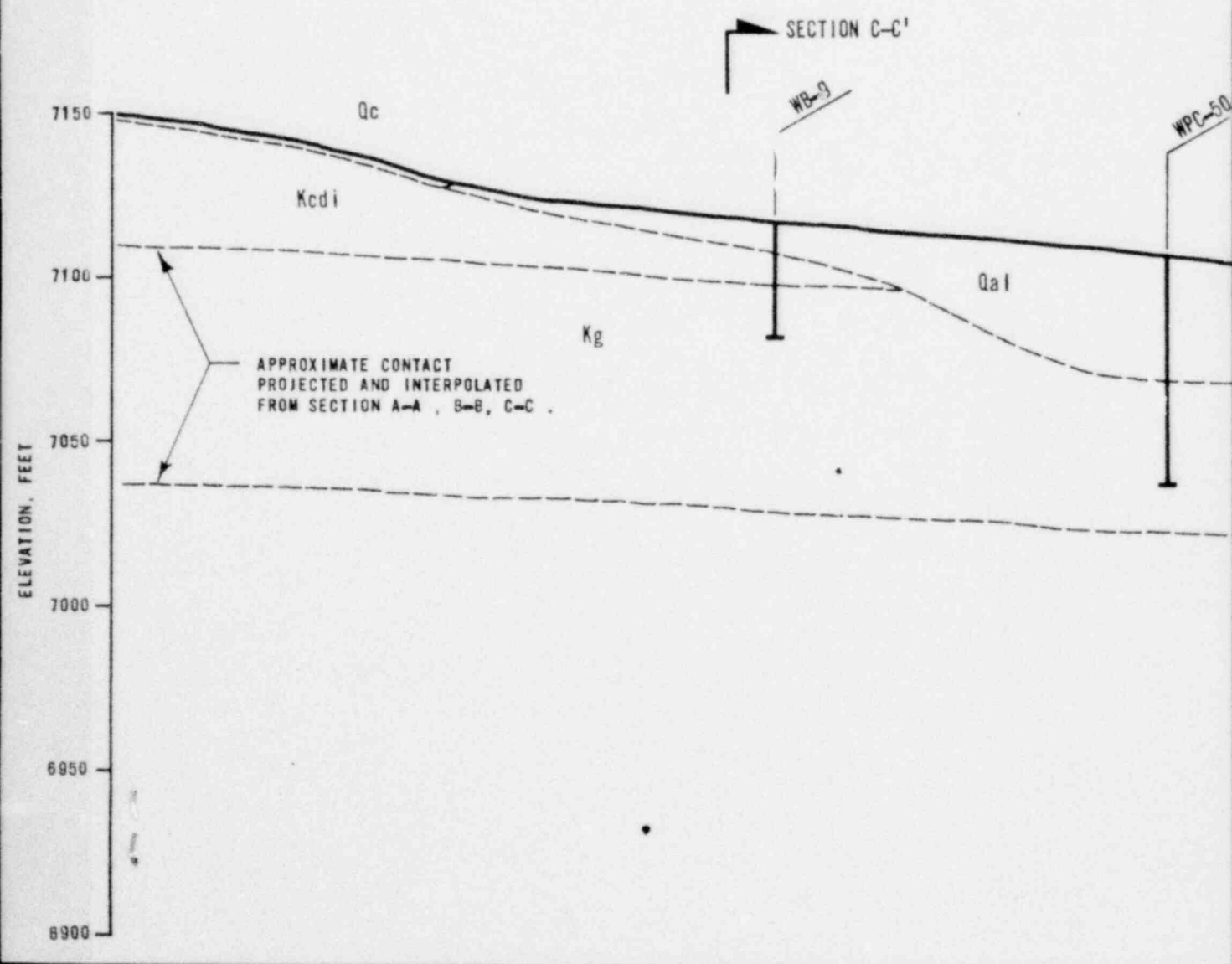
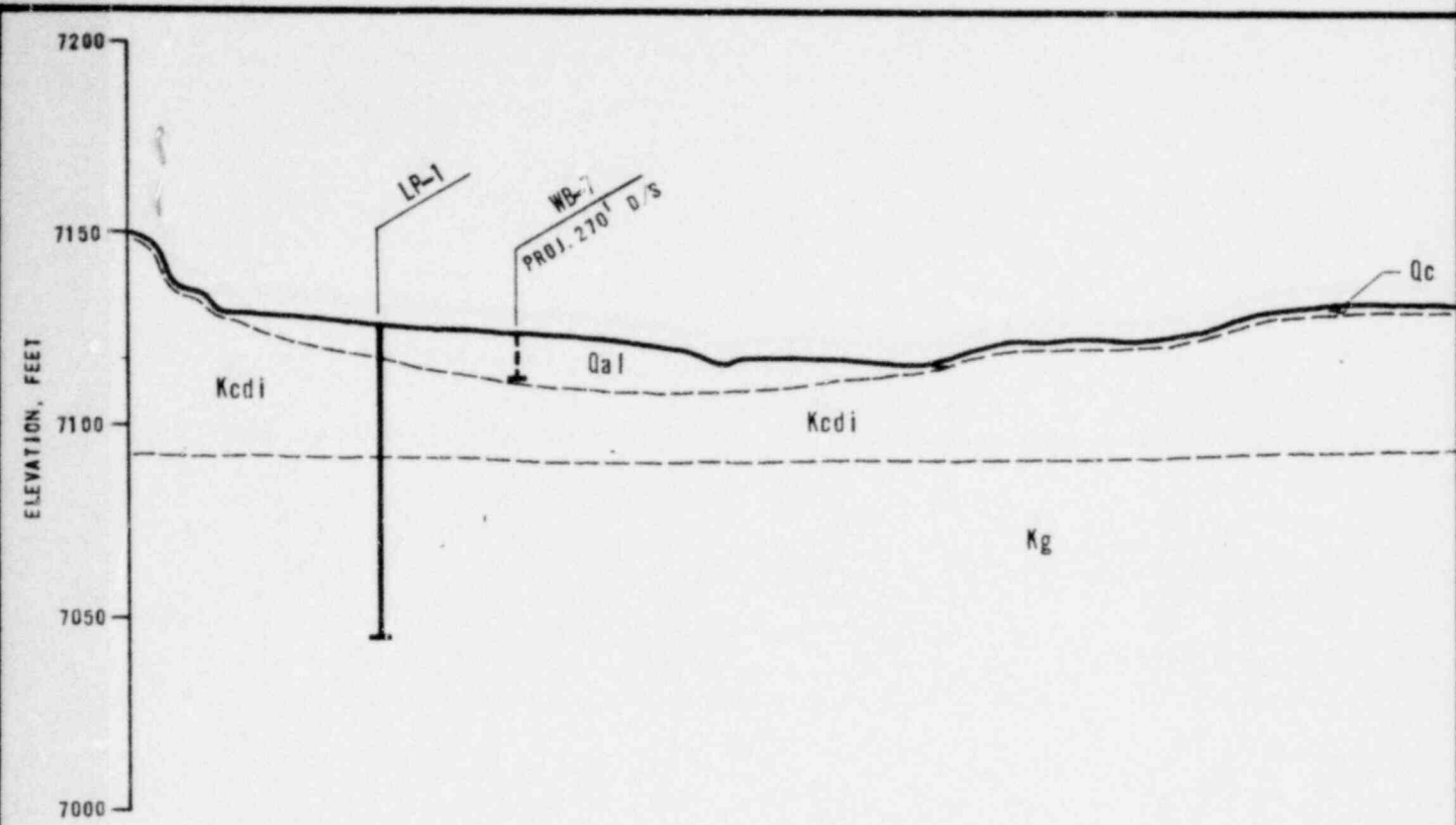
DATE

FIGURE NO.

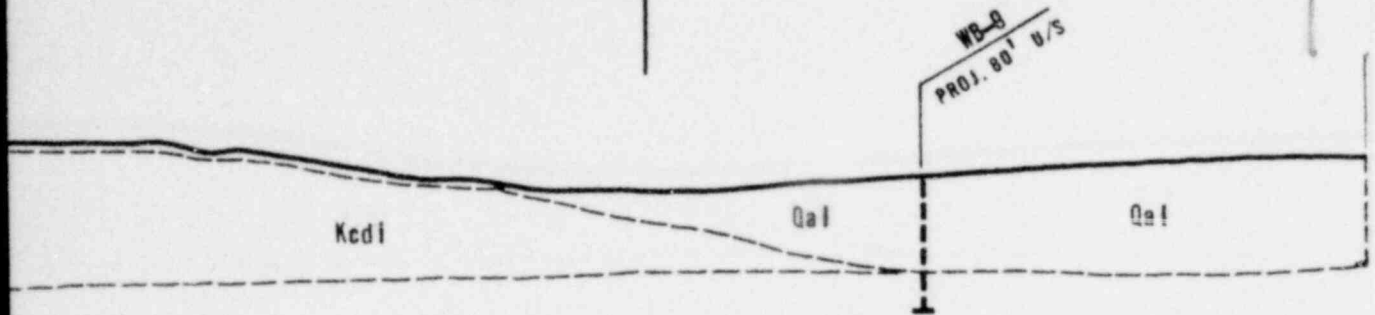
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111-3



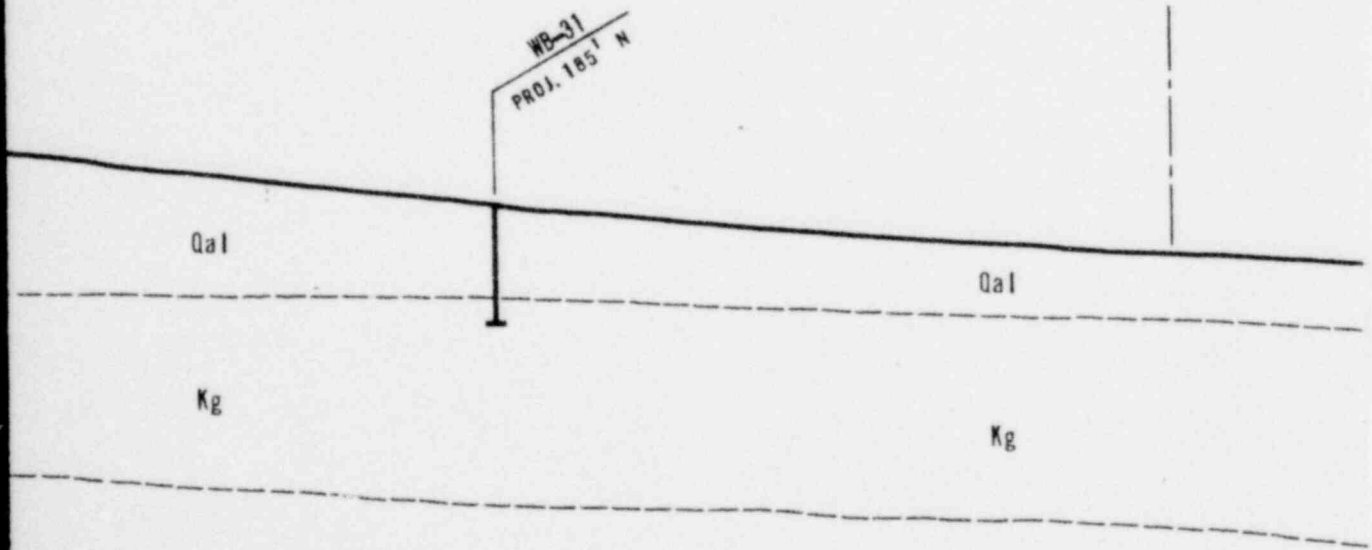
SECTION D-D'



SECTION C-C' - POND AREA  
LOOKING DOWNSTREAM (EAST)  
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VERTICAL SCALE: 1" = 50'

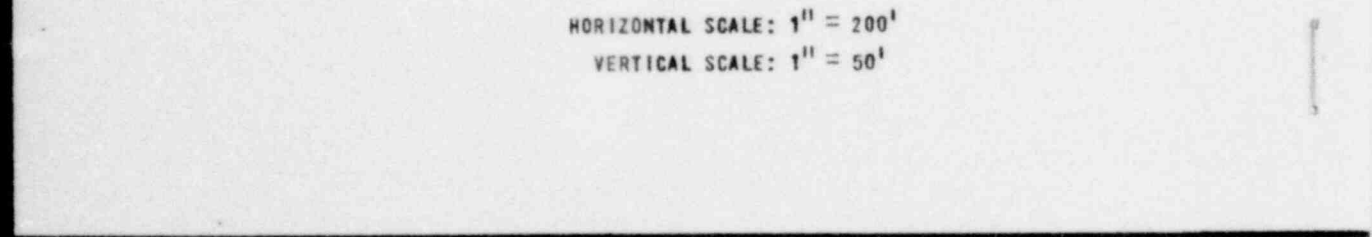
SECTION B-B'

SECTION A-A  
APPROXIMATE  
DAM CENT. LINE



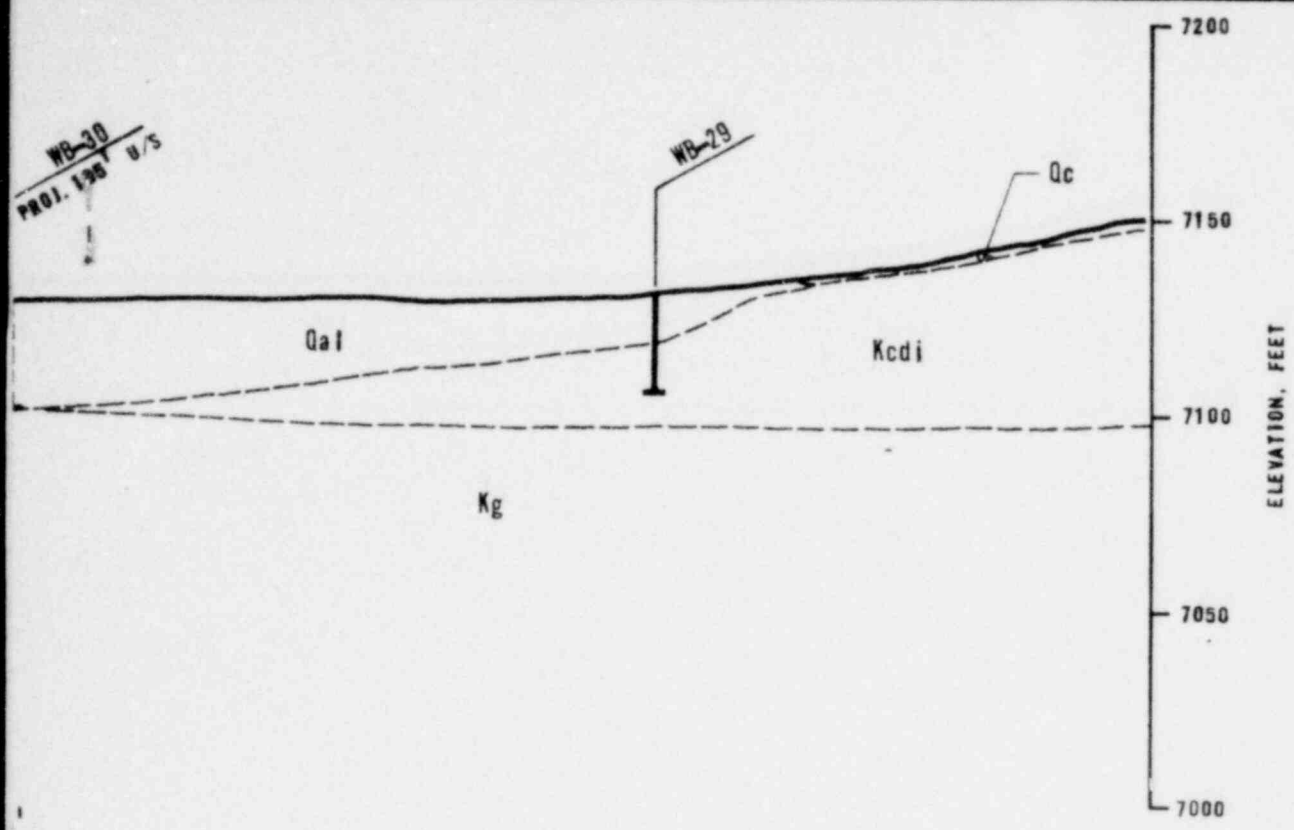
SECTION D-D' - DAM AND POND AREA  
LOOKING NORTH

HORIZONTAL SCALE: 1" = 200'  
VERTICAL SCALE: 1" = 50'

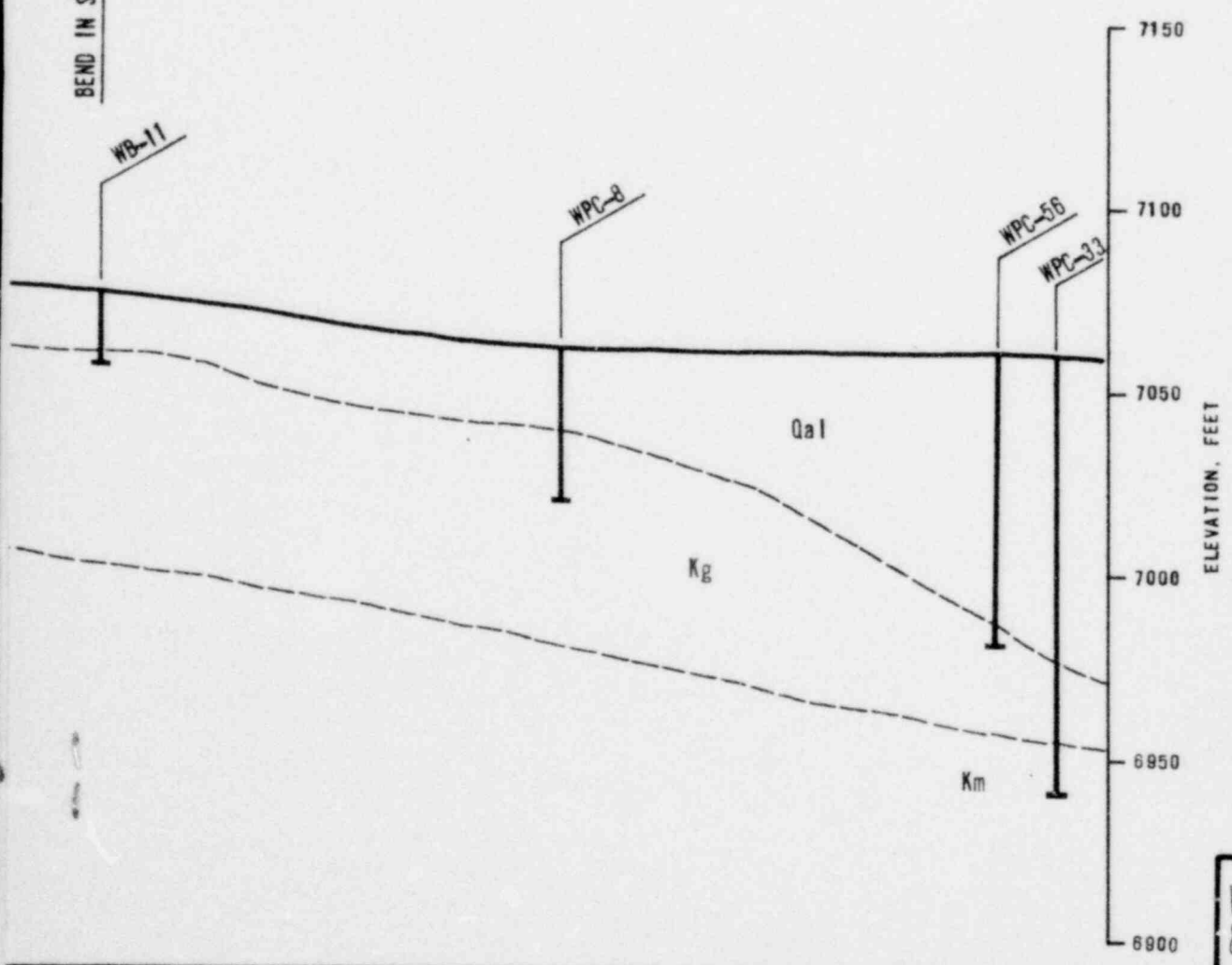




WB-30  
PROJ. 138 U/S



BEND IN SECTION



W.A.  
& A.S.

- NOTES:
1. DEPTH OF ALLUVIUM BASED ON INTERPRETATION AND INTERPOLATION OF DRILL HOLE DATA AND SEISMIC REFRACTION LINES.
  2. SEE FIGURES 111-1 AND 111-2 FOR LOCATION OF LINES OF SECTION.
  3. SEE SECTION A-A FOR DESCRIPTION OF GEOLOGIC UNITS.

SCALE



WAHLER  
SOCIATES

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PALO ALTO • NEWPORT BEACH • CALIF.

GEOLOGIC SECTIONS  
PROPOSED EVAPORATION POND

PROJECT NO.

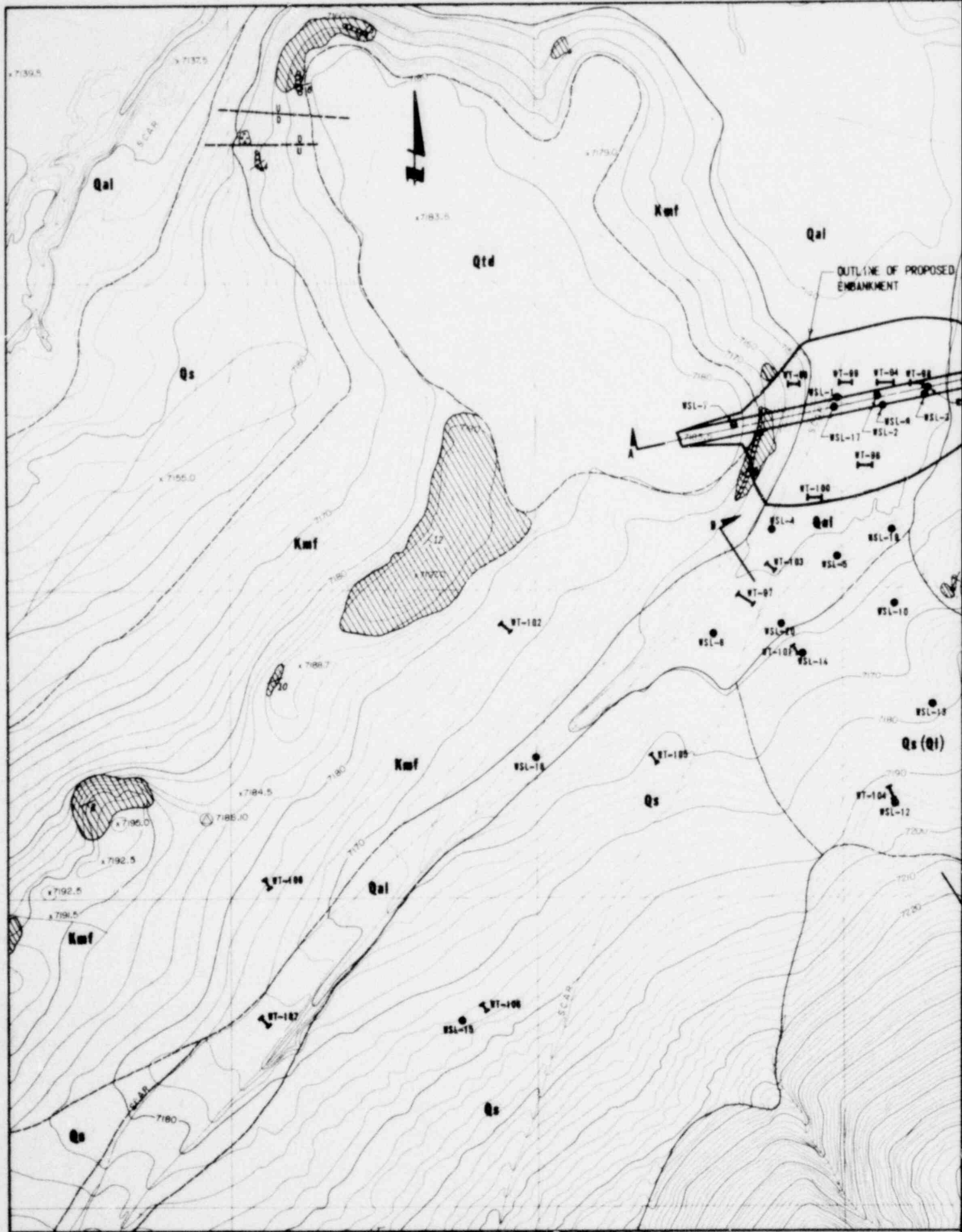
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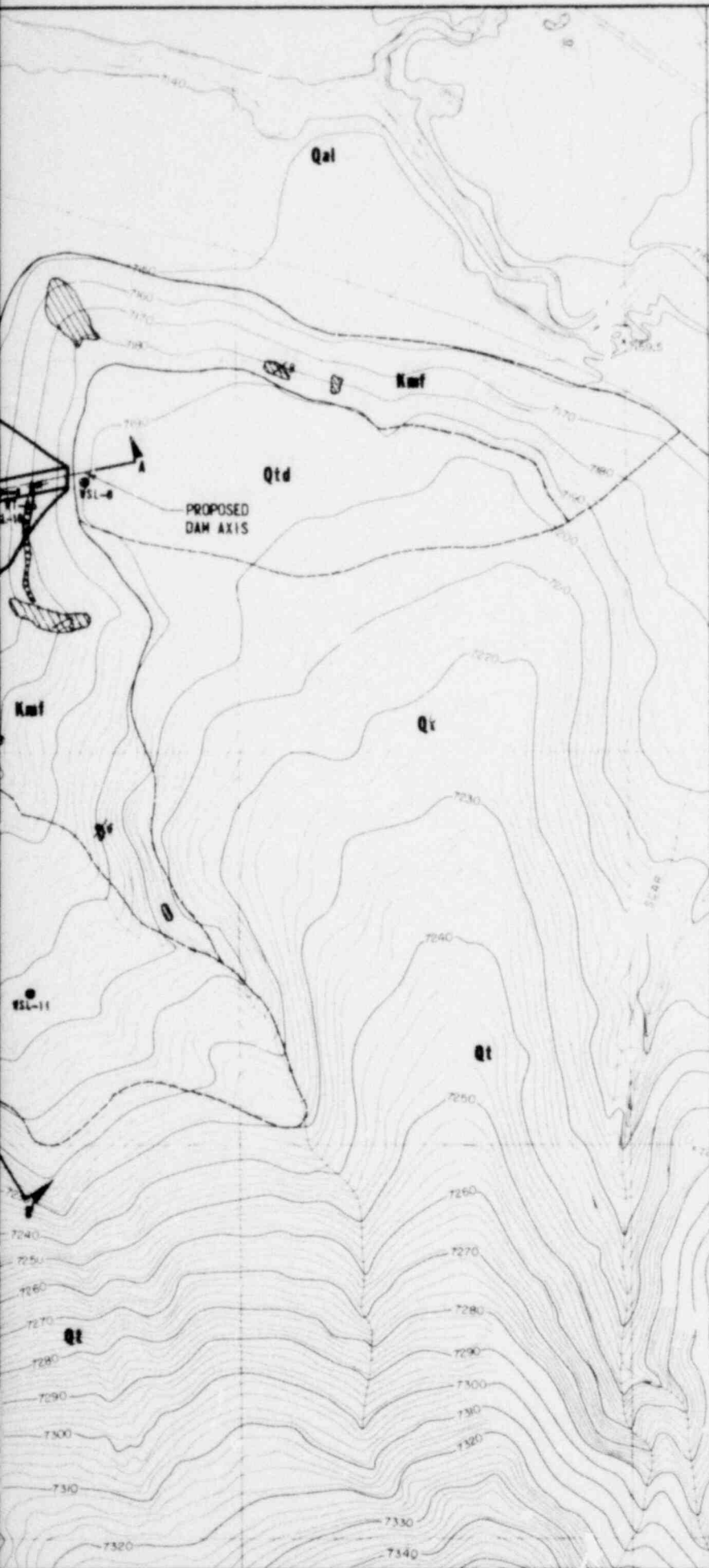
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FIGURE NO.

111-4





POOR ORIGINAL




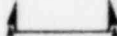
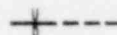




EXPLANATION  
GEOLOGIC UNITS  
QUATERNARY

- Qal** ALLUVIAL AND EOLIAN DEPOSITS: INTERBEDDED LIGHT BROWN SILTY SAND WITH MEDIUM BROWN CLAYEY SAND TO SANDY CLAY.
- Qs** SLOPES WASH DEPOSIT: LIGHT BROWN TO YELLOW BROWN SANDY CLAY TO SILTY SAND WITH GRAVEL TO COBBLES OF BASALT AND SANDSTONE.
- Qs(Ql)** POSSIBLE OLD LANDSLIDE DEPOSIT INVOLVING SLOPES WASH DEPOSIT.
- Qt** TALUS DEPOSIT: MOSTLY GRAVELS TO COBBLES OF BASALT MIXED WITH LIGHT BROWN TO YELLOW BROWN CLAYEY TO SILTY SAND; OCCURS AS AN EXTENSIVE DEPOSIT DOWNSLOPE OF BASALT-CAPPED MESA.
- Qtd** TERRACE DEPOSIT: MOSTLY GRAVEL TO COBBLES OF BASALT WITH SAND AND SILT. SOME ROUNDED AGATE PEBBLES; OCCURS AS CAPPING OVER BROAD RIDGES.

CRETACEOUS


- KmF** MENEFFEE FORMATION: LIGHT BROWN TO GRAYISH ORANGE SILT-STONE AND SANDSTONE WITH INTERBEDDED LIGHT GRAY SHALE; GENERALLY COVERED WITH 0 TO 5 FEET OF SLOPES WASH AND RESIDUAL SOIL.
-  KmF MAPPED OUTCROPS
-  KmF RESISTANT QUARTZ SANDSTONE BED; USED AS MARKER BED FOR CORRELATION.

SYMBOL

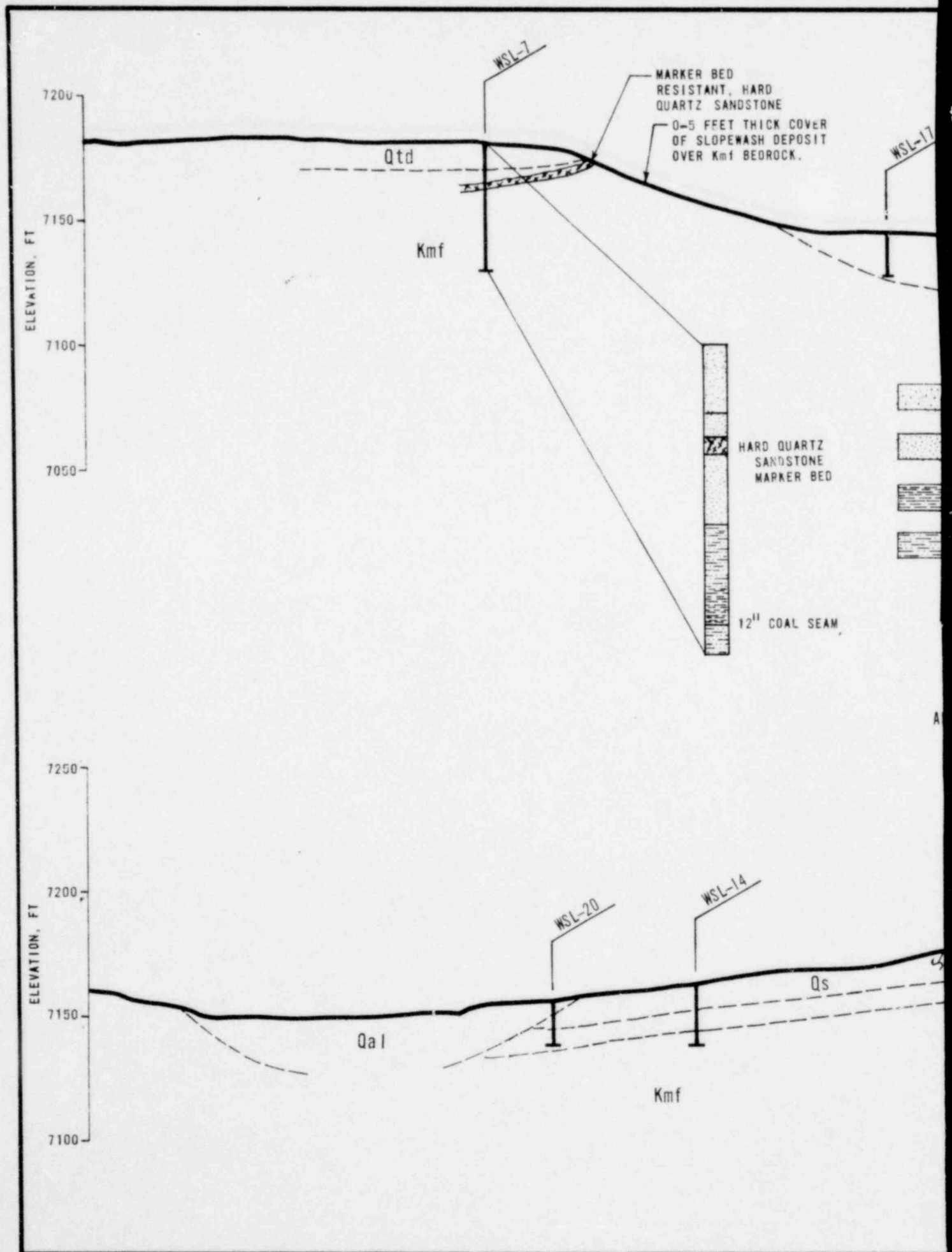
-  CONTACT, DASHED WHERE APPROXIMATELY LOCATED
-  LINE OF CROSS SECTION
-  FAULT; U, UPLIFTED SIDE; D, DOWNDROPPED SIDE, DASHED WHERE APPROXIMATELY LOCATED.
-  STRIKE AND DIP OF BEDS
-  VERTICAL JOINTS
-  WSL-18 EXPLORATION DRILL HOLE
-  WT-106 EXPLORATION TRENCH

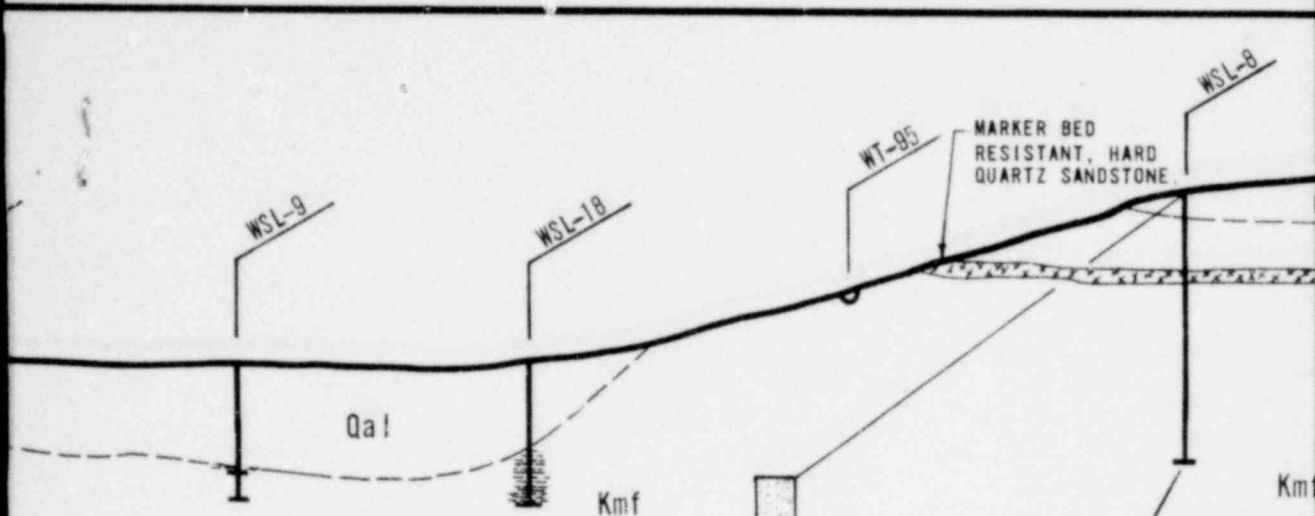


- NOTES: 1. SEE FIGURE III-6 FOR GEOLOGIC SECTION  
2. GEOLOGY MODIFIED FROM ELMER S. SANTOS, U.S. GEOLOGICAL SURVEY, "GEOLOGIC QUADRANGLE MAP, SAN LUCAS QUADRANGLE, NEW MEXICO" (60-516), 1966.

REV	DATE	DESCRIPTION	APPROVED
ISSUED FOR CONSTRUCTION		CUSTOMER APPROVAL	
DESIGNED	DRAWN	REVIEWED	APPROVED
 <b>Gulf Mineral Resources Co.</b> GULF AFE NO. 1599			
<b>W. A. WAHLER &amp; ASSOCIATES</b> PALO ALTO • NEWPORT BEACH • CALIF.			
<b>MT. TAYLOR URANIUM MILL PROJECT SAN LUCAS CANYON MILL SITE MILL CATCHMENT DAM GEOLOGY AND FIELD EXPLORATION MAP</b>			
SCALE 1" = 200'	PROJECT NUMBER GUL-105A	DRAWING NUMBER	REVISION
DATE FEB 1980			

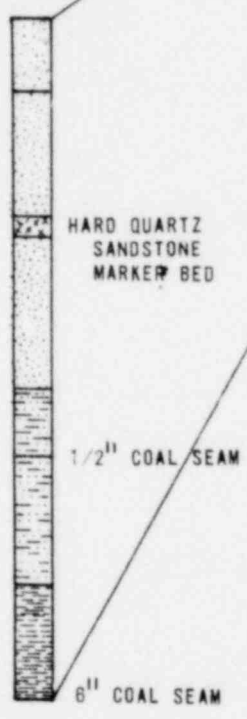
POOR ORIGINAL





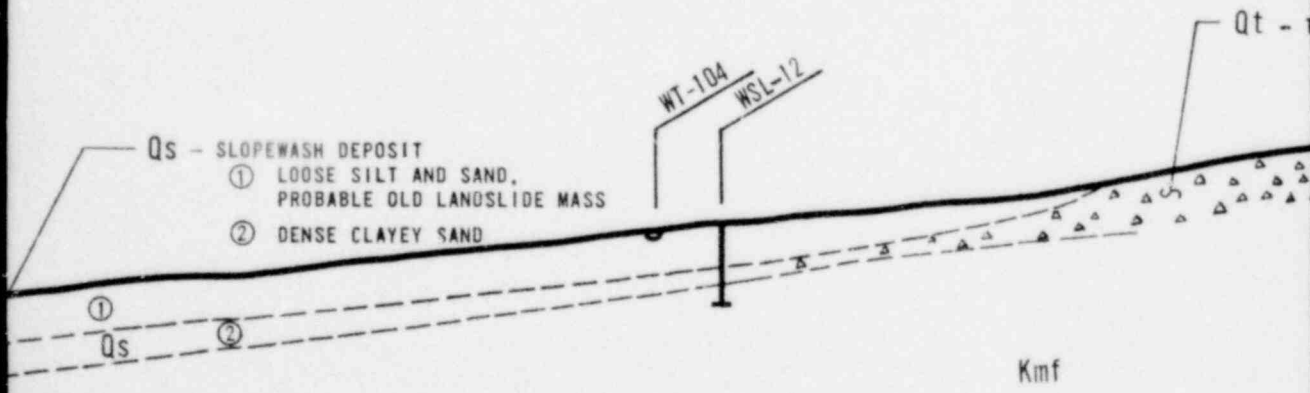
KEY TO GRAPHIC DIAGRAM

- TERRACE DEPOSIT
- SANDSTONE, MINOR SILTSTONE AND SHALE
- SHALE
- INTERBEDDED SHALEY SILTSTONE AND SANDSTONE



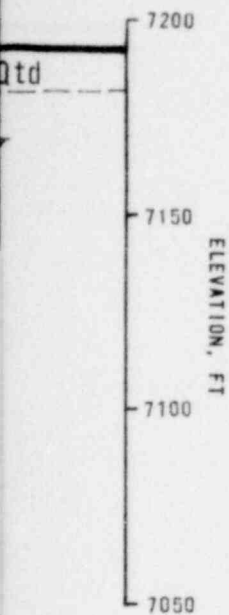
SECTION A-A'

LONG DAM AXIS LOOKING DOWNSTREAM



SECTION B-B'  
LOOKING DOWNSTREAM

W. A. WAHL  
& ASSOCIAT

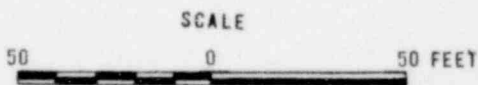
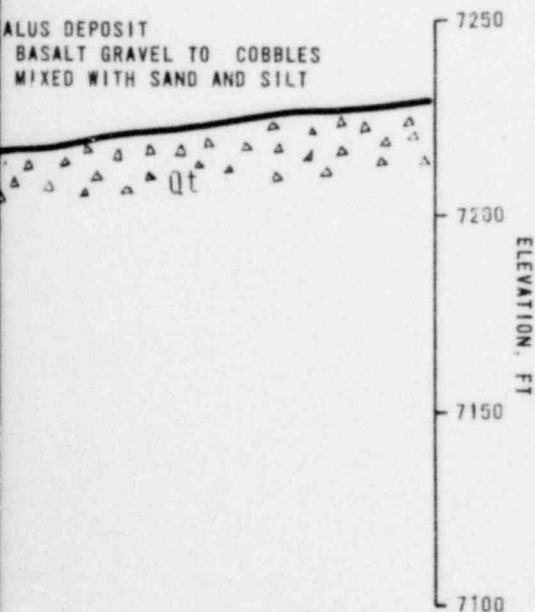


### EXPLANATION

- Qal ALLUVIUM; LIGHT BROWN TO YELLOWISH BROWN, SILTY SAND TO CLAYEY SAND.
- Qs SLOPEWASH DEPOSIT
- Qt TALUS DEPOSIT
- Qtd TERRACE DEPOSIT
- Kmf MENEFFEE FORMATION; INTERBEDDED SANDSTONE, SILTSTONE AND SHALE; SANDSTONE IS LIGHT YELLOW BROWN TO GRAY, MASSIVE BEDDING; SHALE AND SILTSTONE ARE THINLY BEDDED, LIGHT GRAY TO DARK GRAY WITH MINOR CARBONACEOUS SHALE AND COAL SEAMS.

NOTE: SEE FIGURE III-5 FOR LOCATION OF LINES OF SECTION.

TALUS DEPOSIT  
 BASALT GRAVEL TO COBBLES  
 MIXED WITH SAND AND SILT



R  
S

MT. TAYLOR URANIUM MILL PROJECT

GEOLOGIC SECTIONS  
 MILL SITE CATCHMENT DAM

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.  
 GUL-105A

DATE  
 FEBRUARY 1980

FIGURE NO.  
 III-8

TABLE III-1

STRATIGRAPHY - BEDROCK UNITS IN LA POLVADERA CANYON PROJECT AREA

<u>Geologic Formation</u>	<u>Description</u>
Menefee Formation (Kmf)	Yellow-brown siltstone and sandstone with interbedded gray sandstone, complete section not exposed.
Upper Part of Point Lookout Sandstone (Kpu)	Gray and red-brown sandstone, 60 to 80 feet thick.
Satan Tongue of Mancos Shale (Kms)	Yellow-brown sandstone and siltstone with dark gray shale, 0 to 140 feet thick, occurs only along northeastern rim of La Polvadera Canyon.
Hosta Tongue of Point Lookout Sandstone (Kph)	Gray and red-brown sandstone, 100 to 140 feet thick.
Gibson Coal Member of Crevasse Canyon Formation (Kcg)	Interbedded sandstone, siltstone, shale, and coal beds, 190 to 300 feet thick.
Dalton Sandstone Member of Crevasse Canyon Formation (Kcda)	Light gray sandstone, 60 to 120 feet thick.
Mulatto Tongue Member of Mancos Shale (Kmm)	Yellow-brown shale, dark gray shale, and massive yellow-brown sandstone, 350 to 400 feet thick.
Dilco Coal Member of Crevasse Canyon Formation (Kcdi)	Interbedded sandstone, siltstone, shale, and coal beds, 100 to 150 feet thick.
Gallup Sandstone (Kg)	Buff to light gray, massive cross-bedded sandstone, 80 to 120 feet thick.
Main Body of Mancos Shale (Km)	Medium to dark gray shales with some siltstone and minor sandstone, about 900 feet thick.
Dakota Sandstone (Kd)	Light colored fine to medium grained quartzose sandstone and dark gray to black carbonaceous shales, 100 to 170 feet thick.
Morrison Formation (Jm)	Variegated shales, claystones and discontinuous interbedded sandstones, about 200 to 600 feet thick.

Source: Modified from Santos, 1966 and Cooper and John, 1968



TABLE III-2  
GEOLOGICAL TIME SCALE

ERA	PERIOD	EPOCH	AGE of BEGINNING of PERIOD YEARS BEFORE PRESENT
Cenozoic	Quaternary	Holocene	11,000
		Pleistocene	2-3 Million
Cenozoic	Tertiary	Pliocene	6 Million
		Miocene	22 Million
		Oligocene	36 Million
		Eocene	58 Million
		Paleocene	63 Million
Mesozoic	Cretaceous	(Many)	145 Million
	Jurassic		210 Million
	Triassic		255 Million
Paleozoic	Permian	(Many)	280 Million
	Pennsylvanian		320 Million
	Mississippian		360 Million
	Devonian		415 Million
	Silurian		465 Million
	Ordovician		520 Million
	Cambrian		580 Million
Precambrian			

**FOUNDATION CONDITIONS**

POOR ORIGINAL

CHAPTER IV  
FOUNDATION CONDITIONS

A. LA POLVADERA CANYON EVAPORATION POND

1. General

The proposed evaporation pond will consist of a zoned earthfill dam and an excavated retention reservoir to provide storage and evaporation of excess mill waste liquids. The solid tailings are to be disposed in a series of trenches adjacent to the west of the evaporation pond. An upstream containment dike is also planned across the drainage on the northwest portion of the pond to prevent water from encroaching into the tailings burial site further upstream.

The stratigraphy beneath the proposed evaporation pond dam is shown in Figure III-3. The Dilco Coal Member underlies a major portion of the proposed dam and about two-thirds of the pond area. The Gallup Sandstone will comprise the foundation material along the channel section of the dam and the lower portions of the proposed pond after excavation and removal of the alluvium. These geologic units are conformable, that is, the beds lie upon one another in unbroken and parallel order. The evaporation pond area is on the crest of San Mateo Dome as reflected by nearly horizontal to gently dipping bedrock strata.

The dam and pond foundation conditions are based on our interpretation and interpolation of data from an extensive subsurface exploration program throughout the entire area, including a seismic refraction survey performed by Earth Sciences Associates (See Appendix C, Volume III). Since the stratigraphy is relatively simple and nearly horizontally bedded in the pond area, it is reasonable to project geologic data obtained in adjacent areas.

A major part of the exploration program was to obtain reliable field permeability data of the various bedrock units underlying the project site, which

comprised the basic data used in seepage analyses presently being performed by Earth Sciences Associates. All field permeability data are included in Appendix A of this report.

## 2. Abutments

The dam abutments follow broad, gently to moderately sloping ridges underlain entirely by the lower half of the Dilco Coal Member of the Crevasse Canyon Formation except near the channel section where the Gallup Sandstone lies buried beneath the alluvium.

The Dilco Coal Member along the dam axis consists of interbedded sandstone, siltstone, shale and minor thin coal seams. The basal portion of the Dilco Coal Member near its contact with the underlying Gallup Sandstone, consists mostly of fine grained moderately fractured sandstone with thin laminae of siltstone throughout, a few stringers of coal and/or interbedded siltstone and shale. This transition zone was encountered in drill holes WPC-49 (about 32 feet thick) in the upstream pond area and WPC-43 (about 25 feet thick) downstream of the proposed pond. Above the transition zone the Dilco Coal Member consists mostly of siltstone-shale with some sandstone beds. Individual sandstone beds attain a maximum thickness of 3 feet. On the surface, the relatively resistant sandstone beds control low topographic breaks or steps in the otherwise smooth slopes. Open cross-fractures are quite obvious on surface exposures of sandstone beds, but apparently become tighter at depth. These shallow open fractures probably can be attributed to stress relief. The interbedded shale and siltstone are generally thinly bedded, ranging from thin laminae to 8 inches thick. The shale is fissile, flaky, and air-flakes readily. Iron staining is common and is most prevalent near the surface. Some gypsum was noted along fractures and bedding planes. Near the surface, the shale and siltstone are weathered to a clay but are tight and firm about 2 to 3 feet below ground surface.

The Dilco Coal Member bedrock is overlain by up to 2 feet of topsoil or slope debris. Natural exposures and exploratory trenches excavated in the Dilco Coal Member show that the upper 3 to 5 feet are generally weathered,

fractured, iron stained but competent enough to support the proposed dam. Open fractures in the sandstone layers of the Dilco Coal Member may extend to depths of 2 to 4 feet; therefore any cut-off trench proposed for the impervious core should be excavated to depths on the order of 4 feet. Special treatment such as dental concrete may be necessary to seal open sandstone fractures in the remainder of the impervious core foundation.

### 3. Channel Section

In selecting the present location of the evaporation pond dam we have specifically avoided the deep incised buried channel located about 1,000 feet downstream and investigated as part of previous tailings disposal studies (W. A. Wahler & Associates, April 1978). This buried channel is incised into the Gallup Sandstone and is up to 84 feet deep measured from ground surface. Elsewhere to the north, a narrow, deep, buried incised channel was also investigated in detail. The discovery of these incised buried channels was the result of an extensive subsurface exploration program.

The channel section of the evaporation pond dam is along a channel cut entirely in Gallup Sandstone and buried by up to 30 feet of alluvium (as interpreted from drill hole and seismic refraction survey data). The channel is about 800 feet wide measured normal to the direction of drainage. The seismic refraction survey indicates the presence of two narrow subsurface channels incised into the weathered Gallup Sandstone along both sides of the channel. The approximate dimensions of these incised channels as suggested by the seismic refraction survey data are 100 feet in width and about 10 feet into rock. However, based on geologic information found elsewhere in the La Polvadera Canyon area discussed above, there is a possibility that narrow, incised buried channels may be present in the channel section of the dam and such eventuality should be considered in the design.

It is probable that the buried bedrock surface is irregular and that the sandstone, especially along the banks of buried channels is much more fractured at shallow depths because of stress relief. Open fractures in the

Gallup sandstone may require slush grouting beneath the impervious core zone of the proposed dam.

#### 4. Pond Area

The proposed evaporation pond will require excavation and removal of the alluvium, shaping of the reservoir, and a clay liner is presently proposed to control reservoir seepage. Two geologic units will be uncovered during excavation, namely the Gallup Sandstone on the downstream floor and lowermost slopes of the proposed pond and the Dilco Coal Member on the upper slopes (Figures III-3 and III-4). A subsurface bedrock contour map was developed by Earth Sciences Associates from seismic refraction lines, correlation with drill hole data and surface mapping by and is included as Figure IV-1. Both of these bedrock units are strong and should provide adequate foundation for the pond liner. The composition of the Dilco Coal Member and Gallup Sandstone have been previously discussed under foundation conditions beneath the dam.

Subsurface velocities obtained from seismic refraction survey indicate that the Dilco Coal Member is within the rippable range of modern, heavy duty excavation equipment such as a D9G-No. 9 Series B Ripper (Appendix C, Figure 18) to depths ranging from 50 to 100 feet. The siltstone-shale should shape readily and provide a relatively smooth surface. The sandstone should also shape readily although the excavation surface will probably be irregular.

The massive Gallup Sandstone is poorly cemented and generally weathered on its upper portion. The seismic refraction survey indicates medium velocity layers on the order of 3500 to 7500 feet per second that are correlatable to at least the upper 60 feet of the Gallup Sandstone. These velocities are well within the rippable range of modern heavy duty excavation equipment. It should shape readily although the excavation surface may be irregular in places.

An upstream containment dike across a small drainage on the northwest portion of the pond may be required. The approximate location of this dike

would be at the northern end of geologic section C-C' (Figure III-4). The bedrock foundation material is entirely in the Dilco Coal Member and should provide adequate support for the proposed dike. The alluvial cover along the channel section attains a maximum thickness on the order of 15 feet. It is recommended that the alluvium be excavated and removed as part of design considerations.

B. MILL CATCHMENT DAM SITE

1. Dam Foundation

The bedrock foundation material for the entire embankment area consists of the Menefee Formation (Figures III-5 and 6). On both abutments, bedrock is generally covered with a veneer of slopewash material ranging from 0 to 5 feet thick. In the channel area, it is overlain by alluvial deposits to a maximum depth of 26 feet, as indicated by drilling. Bedding strikes north-east, roughly parallels the drainage channel, and dips slightly (6 to 10 degrees) to the southeast and toward the right abutment. Drill core holes and backhoe trenches in the dam site area indicate that bedrock consists of interbedded sandstone, shale, and siltstone. The upper part of the abutments is in massive, crossbedded sandstone with minor interbedded shale and siltstone. Within this upper sandstone is a 2- to 3-foot-thick, hard, resistant quartz sandstone bed which was used as a marker bed in correlating the stratigraphic section on both abutments. The massive sandstone is light yellow to yellowish-brown, fine- to medium-grained, cross-bedded, and weakly to moderately cemented. Jointing is generally vertical, is spaced 1 to 3 feet, and is partly opened near the surface due to stress relief. The lower portion of the abutments and the channel section of the dam consists of interbedded shale and siltstone with occasional coal seams up to 6 inches thick. Individual beds vary in thickness from a few inches to 12 inches. The siltstone is light brown when weathered and gray when fresh. The shale is light gray to dark gray, air-slakes readily, and is highly plastic when wet. Iron staining was noted in the shale and siltstone in abutment core holes to depths of 45 feet.

A remnant of terrace deposit exists as capping over bedrock on the relatively flat abutment ridges and varies in thickness from 7.5 feet on the right abutment to 11 feet on the left abutment. The terrace deposit is a permeable, gravelly, silty sand, with basalt cobbles and boulders up to 2 feet in maximum dimensions. High blow counts with the standard penetration tests indicate the dense consistency of the terrace deposit. The maximum reservoir elevation of the proposed catchment dam is at 7,180 feet; this is a few feet above the terrace deposit-bedrock contact, so it will be necessary to extend the foundation cutoff trench through the permeable terrace deposit on the abutment ridges.

The channel section of the dam is about 250 feet wide and, as indicated by drilling other than pneumatic, is underlain by alluvium to depths of 26 feet. The alluvial deposits consist of interlayered, light brown to moderate brown, sandy silt, clayey sand, and silty sand. The upper 15 feet of the alluvium has a stiff to dense consistency and grades to medium-dense silty sand down to bedrock. Basalt boulders were also encountered at and near the bedrock contact in some drill holes in the channel section. In one hole (WSL-9), ground water was encountered in the alluvium at a depth of 14.5 feet but was not noted elsewhere in other holes in the alluvium except for moist, clayey sand at a depth of 15 feet in WSL-17 on the left side of the channel. The ground water appears to be a local perched water table in the alluvium and may pose a problem during foundation excavation.

The limited exploration and testing program did not indicate the presence of collapsible soils at the site. This may be due to the localized groundwater condition and variability of alluvial materials. However, collapsible soils have been discovered at other locations in the area. During foundation stripping and excavation these soils should be tested and evaluated and appropriate design revisions taken if necessary.

The cutoff trench should be extended into bedrock about 5 feet to expose competent rock. Excavation for the cutoff trench should be possible using heavy excavating equipment with rippers, although some minor blasting may be required in the massive sandstone to shape the upper part of the abutments.



Because of the possibility of shale slaking upon exposure, provisions to protect the final grade foundation should be incorporated in the specifications.

Drill hole data indicate high water losses in the bedrock to depths of about 50 feet in the left abutment; this can probably be attributed to fracture permeability. In order to provide a relatively impervious dam foundation, it will be necessary to construct a grout curtain along the cutoff trench. Grout takes should be low in the shale and moderate in siltstone and sandstone. As discussed above, the secondary grout curtain should be extended along the foundation cutoff on the abutment ridges overlain by the terrace deposit. A grout cap will be required in the siltstone-shale unit in the channel section and lower abutment areas, but may not be required in the sandstone unit in the upper portion of the abutments.

The remainder of the embankment foundation in the abutment areas should be stripped of slopewash and residual soil deposits, with depths being on the order of 1 to 5 feet. In the channel section, the alluvium could remain under the shell but should be stripped to an average depth of 12 inches to remove loose topsoil and organic material.

## 2. Spillway

The proposed spillway location is on a bedrock ridge upstream of the left abutment ridge. The centerline of the proposed spillway passes through the highest point of the ridge at Elevation 7,197 feet. The bottom of the proposed spillway is at Elevation 7,180, with a minimum bottom width of 100 feet, and will be unlined. The planned maximum depth of cut is approximately 17 feet.

An extensive outcrop of massive cross-bedded sandstone controls the spillway ridge. The sandstone strikes N40°E and dips 12 degrees south. Jointing is spaced from 2 to 5 feet and is predominantly vertical. The sandstone is yellowish-brown, iron-stained, fine- to medium-grained, and weakly to moderately cemented near the surface. The sandstone appears to extend for the

most part to the bottom of the proposed excavation, as indicated by projections of geologic data from the core hole on the left abutment and trenches in the immediate area. The sandstone should be competent, but if extensive areas of shale are exposed they may pose a problem because of the shale's erodibility and slaking characteristics.

It is planned to generate rock material from the spillway cut for protection of the embankment slopes. Excavation for the spillway will probably have to be done by blasting to produce riprap material. Sorting of the rock material will be required to produce riprap material.

### 3. Reservoir Conditions

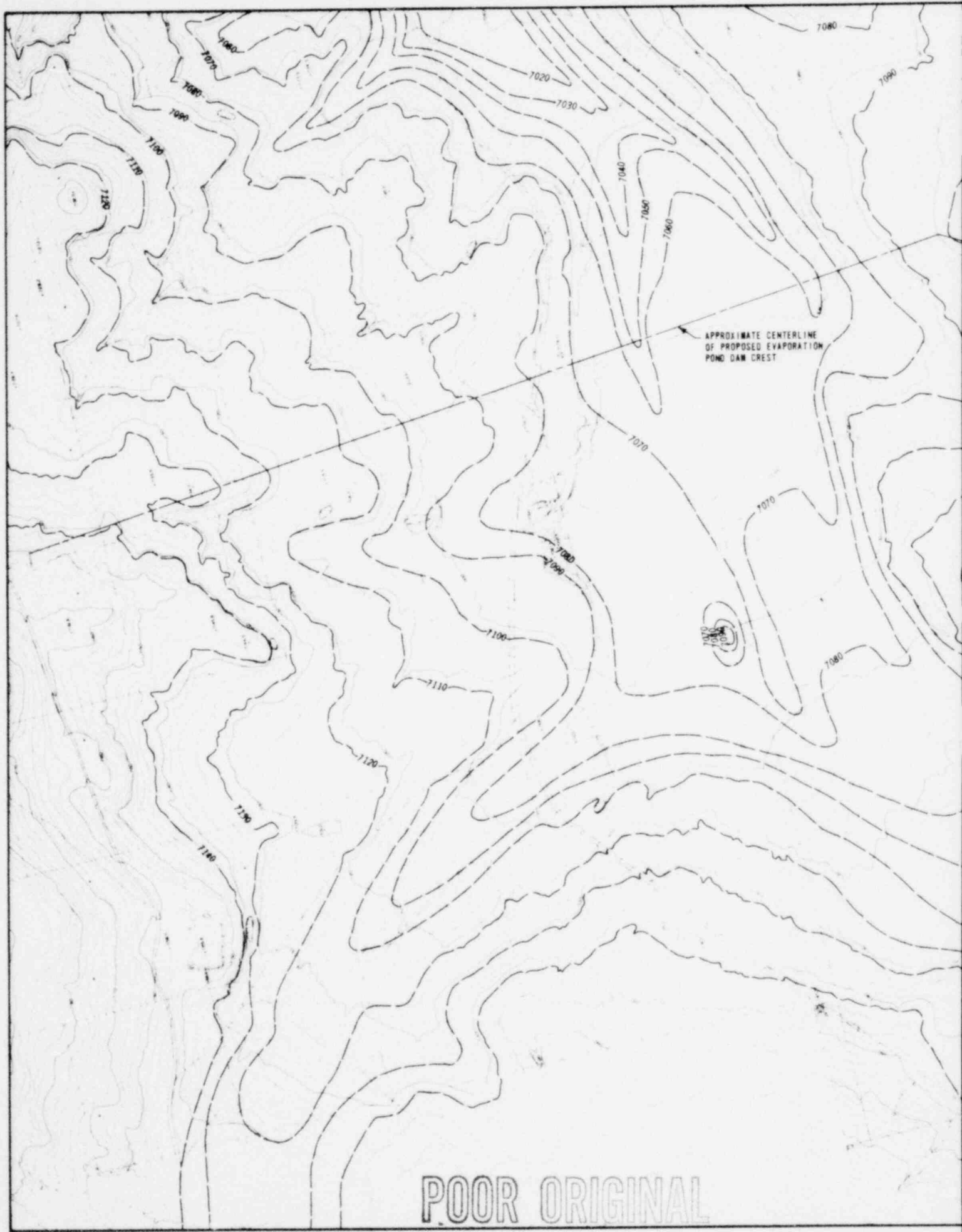
The existing slopes in the proposed reservoir area are generally gentle and are underlain by alluvial and slopewash deposits. It is planned to excavate alluvial, slopewash, and bedrock material in the upper part of the reservoir to provide embankment borrow materials. The proposed excavation will remove most of the surficial deposits and expose Menefee Formation bedrock.

There is a probable old landslide deposit in the reservoir area immediately upstream of the right abutment. Its slope ranges from 10 to 15 percent and it extends about 700 feet upslope and high above the proposed reservoir level (Figure III-6). Drill holes in this area indicate 14- to 20-foot-thick slopewash material overlying bedrock. The slopewash deposit consists of up to 10 feet of loose, silty sand overlying dense clayey sand, with basalt cobbles and boulders that are generally concentrated close to or at the bedrock surface.

No ground water seepage was observed in the holes drilled in the probable landslide area. Although the slope is relatively gentle and no evidence of recent mass instability was observed, the potential for instability is recognized. Therefore, it is planned to avoid borrow excavations in the channel or reservoir slope area on the downslope portion of the probable landslide. All borrow excavations will be located in the upstream part of

the proposed reservoir, away from that area. No facilities should be located in the probable landslide area unless the proposed facility location or alignment has first been investigated in detail.

The proposed dam is located downstream of the toe of the probable landslide. Any renewed landslide activity should not endanger the dam facilities, but would probably contribute a significant amount of debris to the pond.



APPROXIMATE CENTERLINE  
OF PROPOSED EVAPORATION  
POND DAM CREST

POOR ORIGINAL



EXPLANATION

----- SUBSURFACE BEDROCK CONTOURS

NOTE: BEDROCK CONTOURS WERE DEVELOPED BY EARTH SCIENCES ASSOCIATES. THEY ARE BASED ON INTERPRETATION AND INTERPOLATION OF SEISMIC REFRACTION SURVEY DATA AND DRILL HOLE DATA AND ARE THEREFORE APPROXIMATE.

SCALE  
 200 0 200 FEET  
 HALF REDUCTION


REV.	DATE	DESCRIPTION	APPROVED

**Gulf** **Gulf Mineral Resources Co.**  
 GULF AFE NO. 1599

**W. A. WAHLER & ASSOCIATES**  
 PALO ALTO • NEWPORT BEACH • CALIF.

**MT. TAYLOR URANIUM MILL PROJECT**  
**LA POLVADERA CANYON**  
**BEDROCK CONTOUR MAP**  
**EVAPORATION POND AREA**

SCALE 1" = 200'	PROJECT NUMBER GUL105A	DRAWING NUMBER	REVISION
DATE FEBRUARY 1980			

POOR ORIGINAL

FIGURE IV-1

**CONSTRUCTION MATERIALS**

POOR ORIGINAL

CHAPTER V  
CONSTRUCTION MATERIALS

A. LA FOLVADERA CANYON EVAPORATION POND

1. General

Four basic types of borrow material are required to construct the evaporation pond and dam. They are:

- a. clay for the core of the dam and pond liner
- b. random earth for the downstream shell zone of the dam
- c. sand for internal drainage systems associated with the dam
- d. rock slope protection for proposed dam face

2. Clay Fill Material

Adequate volumes of satisfactory quality clay fill for the proposed embankment core and pond liner will be obtained from the alluvium in the proposed pond area. Several auger holes were drilled to determine the lateral and vertical extent of the alluvium and to obtain samples for laboratory testing. The alluvium attains widths ranging from 800 to 1200 feet along the main channel and depths averaging about 20 feet (Figures III-3 and III-4). The alluvium consists of plastic sandy clay with interlayered silty sand and sandy silt. Near the contact with the underlying bedrock, the alluvium is generally coarser and gravelly in places, contains less fines and is therefore unsuitable for clay fill. No groundwater was observed in the borrow auger holes, although it is possible that local water table conditions could develop during the rainy months.

### 3. Shell Fill Material

The downstream shell zone of the proposed embankment will be constructed initially from the Dilco Coal Member bedrock and the coarser portions of the alluvium excavated from within the retention pond area. The excavation will be planned in conjunction with reservoir shaping and preparation for the clay pond liner. The Dilco Coal Member consists of interlayered sandstone, siltstone and shale distributed in approximately equal amounts with minor seams of coal. A predominantly sandstone transition zone occurs at the base of the Dilco near its contact with the Gallup Sandstone. The siltstone and shale are generally thinly bedded while the sandstone attains thickness up to 3 feet above the transition zone. The bedding planes range from a few inches to 12 inches apart and jointing is primarily vertical and is spaced a few inches to 2 1/2 feet apart.

The Dilco should be rippable using heavy-duty excavation equipment. The shale and siltstone should excavate to a gravelly, sandy clay. The sandstone should excavate initially into cobble to boulder sizes, but it should break down further during handling into relatively smaller fragments mixed with sand and silt fines. It may also be necessary to break the larger sandstone pieces generated during initial excavation by track-rolling with a sheepsfoot roller.

Shell material for subsequent stages of dam construction may be obtained from trench excavation in the proposed tailings burial site or from excavation of the proposed evaporation pond. The proposed tailings burial site is underlain by Mulatto Tongue Member, Dilco Coal Member and alluvium. Studies made by Pace Engineers indicate that the bedrock materials should excavate to a gravelly sand with some cobbles and fines.

### 4. Drain Material

A clean, well-graded, sand to fine gravel mixture will be needed for construction of the drain within the proposed dam embankment. A nonreactive aggregate is required for this purpose. No suitable materials are available



on the site or in the Grants area; therefore the drain material will have to be processed from basalt or imported from a commercial source.

#### 5. Slope Protection Material

Rock riprap material will be necessary to prevent erosion on both the upstream and downstream faces of the proposed evaporation pond. This material can be obtained from the basalt outcrops in San Lucas Canyon. Other alternative sources are the sandstone interbeds in the Dilco Coal Member and the Gallup Sandstone generated during shaping and excavation of the proposed evaporation pond and sandstone from bedrock excavation in the tailings disposal trenches.

#### B. MILL CATCHMENT DAM BORROW MATERIALS

A major portion of the borrow materials for the main embankment will be obtained from within the proposed reservoir and the cutoff trench excavation along the dam. There are three types of borrow material sources--alluvium, slopewash deposit, and Menefee Formation bedrock. The alluvium along the channel and slopewash deposits on the right side (east) of the reservoir consists of mixtures of sand, silt, and clay, and will provide the impervious core material for the embankment. As discussed previously, no borrow excavation will be performed in the probable landslide area on the downstream right slopes of the reservoir. The alluvium excavated in the cutoff trench will also be used as impervious core. Excavation of the alluvium and slopewash deposit should be fairly easy using conventional equipment. The interbedded sandstone, siltstone, and shale on the west side of the reservoir will provide the main source of shell fill material and can be supplemented with the coarser portion of the slopewash deposit, if required. The bedrock units should be rippable with a heavy-duty dozer with ripper. The most difficult excavation conditions are expected to be in the sandstone beds on the upper portion of the west side of the proposed reservoir.

Riprap material for embankment slope protection will be sandstone from the proposed spillway excavation. Another source of riprap material is the basalt talus deposit east of the proposed reservoir. This deposit consists mostly of basalt cobbles to boulders admixed with silt and clay; therefore working the talus deposit will require sorting the rock components.

As for the proposed evaporation pond dam, filter-drain material for the catchment dam will have to be imported from commercial sources.

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POOR ORIGINAL

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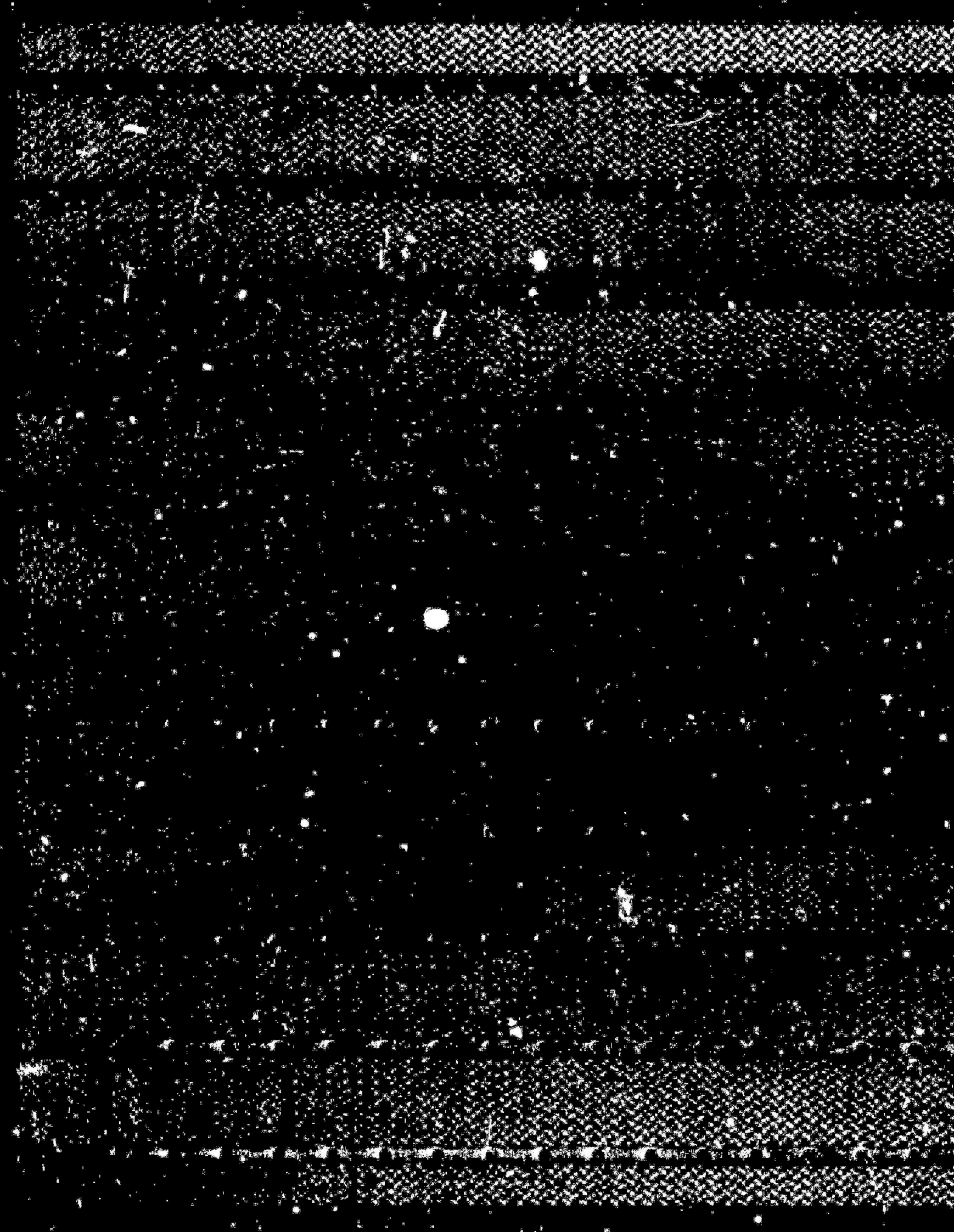
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**Wahler Associates**



**SITE AND LABORATORY REPORT  
VOLUME III - APPENDICES B AND C**

**MT. TAYLOR URANIUM MILL PROJECT  
EVAPORATION POND DAM  
MILL SITE CATCHMENT DAM**

**SLM MINERAL RESOURCES CO.**



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Site and Laboratory Report  
Volume III - Appendices B and C

MT. TAYLOR  
URANIUM MILL PROJECT

Evaporation Pond Dam  
Mill Site Catchment Dam

San Mateo, New Mexico

Gulf Mineral Resources Co.  
a Division of Gulf Oil Corporation

February 1980

Wahler Associates  
Geotechnical Engineers

Project GUL-105A

FEE EXEMPT

15735

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**APPENDIX B**

POOR ORIGINAL

APPENDIX B  
LABORATORY INVESTIGATION

A. INTRODUCTION

This appendix includes a discussion of test procedures and results of the laboratory investigation performed by Wahler Associates for the Mt. Taylor Uranium Mill Project. Test results from June 1977 until January 1980 are presented. The purpose of the investigation was to study the engineering characteristics of selected embankment and foundation soil, rock samples and tailings material. The laboratory investigation was carried out employing, whenever practical, currently accepted test procedures of the American Society of Testing and Materials (ASTM).

B. IDENTIFICATION OF SAMPLES

The soil was received into the laboratory as relatively undisturbed Shelby tube, Wahler ring and plastic bag bulk samples. They are identified by hole number, sample number (when available) and depth. The two large composite soil samples were made in the laboratory by combining a number of similar bag samples and are identified as "Combined". The composition of each combined sample is listed on the individual data sheet. The rock samples were received in the form of cores and are identified by hole number and depth. Four samples of tailings material were received over a period of two years and are identified as T-1, T-2, or total tailings. Some of the total tailings sample was washed on the #270 mesh sieve and is identified as "+ #270" and "- #270" tailings.

C. INDEX PROPERTIES TESTING

In the field of soil mechanics and earth dam design, it is advantageous to have a standard method of identifying soils and classifying them into categories or groups that have similar or distinct engineering properties. The method most commonly used is the Unified Soils Classification System (USCS),

as described by ASTM D2487-69. The USCS is based on a recognition of the various types and significant distribution of soil constituents, considering individual grain size, gradation characteristics, and plasticity of materials. The index properties tests discussed in this report include determinations of natural water content and in-place dry density, grain-size distribution, Atterberg limits, and specific gravity.

#### 1. Natural Water Content and Dry Density

Natural water content and dry density were determined, usually in conjunction with other tests, on selected undisturbed soil and rock core samples. The samples were trimmed to obtain a smooth flat face and accurately measured to obtain their volumes and wet weights. The samples were then dried (in accordance with ASTM D2216-71) for a period of 16 to 24 hours in an oven maintained at a temperature of 110°C. After the dry weight was determined, moisture content and dry density were calculated. In addition, water contents were determined on the ring, plastic bag and tailings samples tested. These results are summarized in Table B-1 and are also shown with the various other index and engineering properties test results. The natural water contents of some of the most recently tested samples are not reported because of the elapsed time period between sampling and testing.

#### 2. Grain-Size Distribution

The gradation characteristics of selected samples were determined in accordance with U.S. Bureau of Reclamation Test Designation E-6, except where modified as indicated below. Representative samples were soaked in water until individual soil particles were separated; the samples were then washed on the No. 200 mesh sieve in accordance with ASTM D1140-54. The portion of the material retained on the No. 200 mesh sieve was oven-dried and then mechanically sieved. The hydrometer analysis was performed on a representative portion of the minus No. 200 mesh material of the samples that had a significant amount of fines. The test was run in a constant-temperature hydrometer bath using sodium hexametaphosphate as a dispersing agent. The

grain-size distribution test results are presented on Figure B-1, Sheets 1 through 29.

### 3. Atterberg Limits

Liquid and plastic limits of selected samples were determined in accordance with ASTM Designations D423-66 and D424-59. Results of these Atterberg limits tests are summarized on Figure B-2, Sheets 1 through 17. They also appear on the gradation and compaction sheets, to aid in interpretation of those results.

### 4. Specific Gravity

Specific gravity determinations were made on selected samples in accordance with ASTM Designation D854-58. The results are shown on Table B-2 and also appear on the grain-size distribution test results.

## D. ENGINEERING PROPERTIES TESTING

Engineering properties testing included compaction, relative density, consolidation, swell, triaxial shear, permeability, field capacity, undrained and drained settlement density, drained consolidated density-permeability tests, raffinate reaction and evaporation tests.

### 1. Compaction

Compaction tests were performed to determine the moisture-density relationship of selected materials. The tests were performed in accordance with ASTM Designation D1557-78, modified to yield 20,000 foot-pounds per cubic foot ( $\text{ft-lb/ft}^3$ ) by reducing the number of layers to 3 and the number of blows per layer to 15. The compaction results, together with gradation characteristics of the materials tested, are presented on Figure B-3, Sheets 1 through 9.

## 2. Relative Density

A minimum and maximum density test was performed on one selected soil sample according to ASTM Designation D2049-69. The maximum density test utilized the wet method of preparation. The mold size for testing was 0.1 cubic foot.

The results appear on Figure B-4, Sheet 1. A minimum and maximum density test was performed on the "+ #270" tailings sample using a 0.02 cubic foot mold because of a shortage of material. The results appear in Table B-3.

## 3. Consolidation

One-dimensional consolidation tests were performed on selected, undisturbed, tube samples in accordance with ASTM D2435-70, except as modified below. The samples were loaded to 250, 500, and 1,000 psf. After they had consolidated under 1,000 psf, they were flooded with water and observed. The samples were then loaded to 2,000, 4,000, 8,000, and 16,000 psf and were allowed to consolidate for 24 hours under each load increment. Loads were applied to the samples by the use of air pressure regulators feeding into the consolidometer. Accuracy was maintained throughout the loading range by the use of sensitive oil and mercury manometers for the lower loads and psi gauges for the higher loads. Sample deformation was measured to 0.0001 inch. Rebounding was done at twice the rate of loading and the final specimen data were calculated at the last rebound increment. Results of the consolidation tests, in the form of percent consolidation versus log of pressure, are presented on Figure B-5, Sheets 1 through 4.

## 4. Swell

Swell tests were performed on selected samples fabricated to 95 percent compaction at optimum moisture content. The samples were loaded to 1 psi, allowed to consolidate, and then flooded with water. The ultimate swell is calculated as percent swell of sample height after consolidation and is presented on Figure B-6, Sheet 1.

## 5. Triaxial Shear

a. Sample Preparation - The triaxial testing was performed on samples fabricated in the laboratory to 95 percent compaction at approximately optimum plus 2 percent moisture content, and on one undisturbed, 2.875-inch, thin-wall tube sample.

Laboratory-Fabricated Samples - Samples were moisture-conditioned to a predetermined moisture content and allowed to cure for approximately 24 hours. The fabrication was performed in a 2.8-inch-diameter mold with a height-to-diameter ratio of 2:1, using the rounded end of a 1/2-inch-diameter tamper which was used to knead the sample until a given weight of soil occupied a known volume. The sample was compacted in five equal layers, with care being taken to scarify each compacted surface in order to preclude preferential bonding or the development of laminae between layers. Soft rock samples were mechanically broken down and scalped on a 3/8 inch diameter sieve prior to fabrication.

Undisturbed Samples - The sample was extruded from the tube using a hydraulically operated ram capable of exerting the minimum force necessary to free the sample from the tube. Specimens were then trimmed to an approximate 2:1 height-to-diameter ratio. Through the use of a special trimming device which completely supported the sample, the possibility of sample disturbance due to handling was significantly reduced.

After fabrication, the initial weight and volume measurements were made and each specimen was placed in a triaxial cell, encased in a rubber membrane, and sealed to the bottom pedestal and top cap with rubber "O" rings. After the triaxial chamber was secured, the cell was filled with water, fitted with a 1-inch-diameter stainless steel piston for load application, and transported to the saturation bay.

b. Sample Saturation and Consolidation - The laboratory is equipped with a panel of nine bays, with individual pressure control to each bay, so that nine triaxial samples can be simultaneously saturated and/or consolidated at



different pressures. Bleeding air regulators capable of delivering air pressure up to 180 psi are used to control the top, bottom, and chamber lines leading to the triaxial cells. Each saturation bay is also equipped with constant-diameter Pyrex sight tubes, each with a cross-sectional area of 0.075 square inch, which connect with the base of the triaxial cell and thus to the sample. The sight tubes are easily read to the nearest 0.01 cubic inch.

The samples were saturated using a combination vacuum/backpressure technique. A small vacuum was applied to increase the initial saturation without a change in void ratio. A backpressure of 50 psi was then applied to obtain a sufficient degree of saturation prior to the consolidation phase of the test. In order to determine whether the backpressure was causing complete saturation, Skempton's "B" parameter was measured for all samples. A value in excess of 0.95 was considered to represent a fully saturated condition. After complete saturation was achieved, the chamber pressure was increased above the backpressure to the designated consolidation pressure. The top and bottom drainage lines were then opened simultaneously, and the total volume of water expelled from the sample was monitored as a function of time. Except for the permeability specimens, strips of filter paper placed inside the membrane along the sides of the samples, and in some cases yarn wicks through the length of the samples, were employed to accelerate the consolidation process.

Unconsolidated-Undrained (UU) Tests - Samples tested under UU conditions were prepared as in (a) above. The samples were tested at set-up moisture content. The chamber pressure was increased to the desired confining pressure, but no drainage of the samples was allowed. The samples were failed in an undrained condition by compression loading, and axial load and sample strain were monitored throughout the test. Results of the UU triaxial tests are presented on Figure B-7, Sheets 1 through 5.

Isotropically Consolidated Undrained (ICU) Tests - The samples tested under ICU conditions were prepared as in (a) above, saturated and consolidated as in (b) above, and then failed in an undrained condition with pore pressure, axial load, and sample strain monitored during the test. Results of the ICU triaxial tests are presented on Figure B-8, Sheets 1 through 6.

Isotropically Consolidate Drained (ICD) Tests - Samples tested under ICD conditions were prepared as in (a) above, saturated and consolidated as in (b) above, and then failed at a slow rate of strain in a drained condition with axial load, sample volume change, and sample strain monitored throughout the test. Results of the ICD triaxial tests are presented on Figure B-9, Sheets 1 and 2.

c. Sample Failure - The triaxial specimens were failed by compression loading at a constant rate of strain while maintaining a constant minor principal stress. The rate of strain selected for sample failure was dependent upon the materials' consolidation and permeability characteristics. Load readings were recorded during the test at specified axial deformations using a BLH load cell (0 - 2,000 lbs). Pore pressure measurements were obtained using a Statham pore pressure transducer (0 - 200 psi). Sample volume change was monitored by recording the water level of the top and bottom sight tubes. The failure criterion used for the presentation of the Mohr circle of stress for the ICU and ICD triaxial tests was the point of maximum principal effective stress ratio, and for the CU tests it was the maximum deviator stress or 15 percent strain, whichever occurred first.

#### 6. Permeability Tests

Permeability coefficients were determined on selected undisturbed soil samples, soil samples fabricated in the laboratory and selected rock core samples. Tests were also performed on a selected soil sample with 1% and 2% commercial bentonite added to the samples. The samples were tested in triaxial cells after backpressure saturation and consolidation to 5 or 10 psi. The permeability was determined by applying a constant head hydraulic gradient and monitoring the flow of water from bottom to top of the sample

through calibrated constant-diameter sight tubes. The permeability test results of the soil samples, together with the gradation characteristics of the samples tested, are presented on Figure B-10, Sheets 1 through 6. The permeability test results of the rock core samples appear in Table B-4.

#### 7. Field Capacity Tests

After backpressure saturation in triaxial cells, selected rock core samples were weighed and placed in a sealed container. The inside of the container was moist but the samples were not in contact with free water. The samples were then allowed to drain by gravity until they reached a constant wet weight. The samples were then oven dried and the field capacity water content was calculated. These results appear in Table B-5.

#### 8. Undrained Settlement Density Testing on Tailings Material

a. Description of Samples - The tailings sample used for undrained settlement density test #1 was received as a gray, dry powder and was designated sample T-1. The fine tailings sample used for undrained density tests 2 through 6 and 8 were received in two plastic jugs in the form of dark-colored slurries. The jugs were marked "- #150" and were designated sample T-2. The pH of each was measured as 2. The contents of each of the two jugs seemed identical except that their water contents, determined by drying at 110°C, varied slightly. One had a water content of 376 percent (21 percent solids by weight) and was used for grain-size distribution, Atterberg limits, and settlement tests 2, 3, 4, and 5 until it was depleted. The other had a water content of 326 percent (23.5 percent solids by weight) and was used for settlement tests 3A, 6, and 8. The total tailings sample used for undrained settlement density tests 7, 9 and 10 was received in two plastic bags. After each of the two samples was tested for percent passing the No. 200 sieve, it was determined that they were the same and they were combined into one sample. The water content after drying at 110°C was 28.3 percent. The total tailings sample used for settlement test 11 was received in plastic jugs. The water content was 67.1 percent. The raffinate used for the settlement testing was received in a large glass jug and was labeled 4 g/l Cl<sup>-</sup> (4 grams of chloride per liter). The raffinate was light green in color

and had a pH less than 2. When 20 grams of hydrated lime were blended with 800 milliliters (ml) of the raffinate (2.5 percent) to neutralize the sample to a pH of 7, the dissolved salts precipitated out to 475 ml (60 percent by volume). The remaining 325 ml was a clear fluid. The precipitated salts were then oven-dried at 110°C to a constant weight of 65.3 grams. The dry density of the precipitate was then determined to be 8.6 pounds per cubic foot (pcf).

b. Testing Procedures

Settlement Test 1 - One hundred twenty-five grams of dry sample T-1 and 500 ml of distilled water were thoroughly mixed in a graduated cylinder to produce a slurry of 20 percent solids by weight. Clear water appeared at the top as the volume of the sample decreased with time until its ultimate undrained settlement dry density of 32.1 pcf was reached. A plot of settlement in the form of dry density versus time appears on Figure B-11, Sheet 1.

Settlement Test 2 - Four hundred seventy-six grams of wet sample T-2 was oven-dried at 110°C, broken down, and sieved to produce 100 grams of dry tailings powder. This was blended with 400 ml of clear fluid produced by neutralizing the raffinate as described in (a) above. The product was a slurry of 20 percent solids by weight. The pH dropped down to 2.2.

The slurry was mixed well and poured into a graduated cylinder. The tailings settled rapidly, with clear fluid appearing at the top and the volume of the sample decreasing with time, until its ultimate undrained settlement dry density of 27.5 pcf was reached. The sample was then allowed to drain by means of opening a valve at the bottom of the cylinder and attained its ultimate drained settlement dry density of 33.2 pcf. A plot of settlement in the form of dry density versus time appears on Figure B-11, Sheet 1.

This test was rejected for use in the analyses because of oven-drying and failure to effectively neutralize the tailings/raffinate mix.

Settlement Test 3 - A total of 476 grams of wet sample T-2 was blended with 24 ml of raffinate, and 5 grams of hydrated lime were added to bring the sample up to a pH of 7. The sample thickened considerably and the water content was determined to be 365 percent. Approximately 300 ml of raffinate and 5 grams of hydrated lime were then added incrementally to thin the sample and produce a slurry with a pH of 7. The slurry was mixed well and a portion was poured into a graduated cylinder. A small amount of clear fluid appeared at the top as the tailings settled slightly, until the ultimate undrained dry density of 9.8 pcf was reached. The water content was 549 percent. The dry weight of the entire slurry was not determined; only that portion used for the settlement test was dried to obtain the dry density. A plot of settlement in the form of dry density versus time appears on Figure B-11, Sheet 2.

Settlement Test 3A - Four hundred twenty-six grams of wet sample T-2 was blended with 144 ml of raffinate to form a slurry of 17.5 percent solids by weight. To this, 4 grams of hydrated lime were added to produce a thick slurry with a pH of 7. This was then blended with 400 ml of clear fluid produced by neutralizing the raffinate as described earlier. The slurry was mixed well and poured into a graduated cylinder. As the tailings settled, clear fluid appeared at the top and the volume of the sample decreased with time, until its ultimate undrained dry density of 9.8 pcf was reached. The water content was 565 percent and the final dry weight was 116 grams. A plot of settlement in the form of dry density versus time appears on Figure B-11, Sheet 2. The results of this test are almost identical to those of Test 3, but this test was accepted as best representing neutralized field conditions.

Settlement Test 4. - An amount of 476 grams of wet sample T-2 was blended with 400 ml of raffinate. The pH was less than 2. The slurry was mixed well and poured into a graduated cylinder. As the tailings settled, semi-clear fluid appeared at the top and the volume of the sample decreased with time, until its ultimate undrained dry density of 17.5 pcf was reached. The water content was 336 percent. A plot of settlement in the form of dry density versus time appears on Figure B-11, Sheet 2.

Settlement Test 5 - A total of 476 grams of wet sample T-2 was oven-dried at 110°C, broken down, and sieved to produce 100 grams of dry tailings powder. This was blended with 400 ml of raffinate to produce a slurry of 20 percent solids by weight with a pH less than 2. After mixing well, the slurry was poured into a graduated cylinder. The tailings settled rapidly, with semiclear fluid appearing at the top, and the volume of the sample decreased with time until its ultimate undrained dry density of 28.8 pcf was reached. A plot of settlement in the form of dry density versus time appears on Figure B-11, Sheet 1.

Settlement Test 6 - An amount of 426 grams of wet sample T-2 was oven-dried at 110°C, broken down, and sieved to produce 100 grams of dry tailings powder. This was blended with 600 ml of raffinate and 15 grams of hydrated lime to produce a slurry with a pH of 7. The slurry was mixed well before being poured into a graduated cylinder. As the tailings settled, clear liquid appeared at the top, and the volume of the sample decreased with time until its ultimate undrained dry density of 18.7 pcf was reached. The water content was 218 percent and the final dry weight was 138.7 grams. A plot of settlement in the form of dry density versus time appears on Figure B-11, Sheet 1.

Settlement Test 7 - One hundred twenty-eight grams of wet total tailings were blended with 372 ml of raffinate to produce a slurry of 20 percent solids by weight with a pH less than 2. The slurry was thoroughly mixed in a graduated cylinder. A small amount of raffinate was added to rinse the sides of the cylinder. The sand portion of the tailings settled to the bottom almost immediately. As the fine portion of the tailings settled, semiclear fluid appeared at the top as the volume of the sample decreased with time, until its ultimate undrained dry density of 39.5 pcf was reached. The water contents of the sand and fine portions were 31 and 572 percent, respectively. A plot of settlement in the form of dry density versus time appears on Figure B-11, Sheet 3.

Settlement Test 8 - An amount of 426 grams of wet sample T-2 was blended with 144 ml of raffinate to form a slurry of 17.5 percent solids by weight. To this, 2.5 grams of hydrated lime were added to increase the pH to 4. This was then blended with 400 ml of clear fluid produced by partial neutralization of the raffinate to pH 4. The slurry was mixed well and poured into a graduated cylinder.

As the tailings settled, clear fluid appeared at the top and the volume of the sample decreased with time until its ultimate undrained dry density of 11.8 pcf was reached. The final dry weight was 111.5 grams. A plot of settlement in the form of dry density versus time appears on Figure B-11, Sheet 2.

Settlement Test 9 - One hundred twenty-eight grams of wet total tailings were blended with 442 ml of raffinate to produce a slurry of 17.5 percent solids by weight. To this, 6.5 grams of hydrated lime were added to increase the pH to 4. The slurry was mixed well in a graduated cylinder, and 100 ml of clear fluid produced by partial neutralization of the raffinate to a pH of 4 were then added to rinse the sides of the cylinder. The sand portion of the tailings settled to the bottom almost immediately. As the fine portion of the tailings settled, clear fluid appeared at the top as the volume of the sample decreased with time until it reached an ultimate undrained dry density of 26.2 pcf. The water contents of the sand, lower fine, and upper fine portions were 39, 237, and 742 percent, respectively. The final total dry weight was 121.2 grams. A plot of settlement in the form of dry density versus time appears on Figure B-11, Sheet 3.

Settlement Test 10 - An amount of 128 grams of wet total tailings and 442 ml of raffinate were blended to produce a slurry of 17.5 percent solids by weight, and 10 grams of hydrated lime were added to the slurry to neutralize the sample to a pH of 7. The slurry was mixed well in a graduated cylinder, and then 100 ml of clear fluid produced by neutralizing the raffinate were added to rinse the sides of the cylinder. The sand portion of the tailings settled to the bottom almost immediately. Clear fluid appeared at the top as the fine tailings settled. The volume of the sample decreased with time

until its ultimate undrained dry density of 20.2 pcf was reached. The water contents of the sand, lower fine, and upper fine portions were 77, 272, and 784 percent, respectively. The final total dry weight was 128.7 grams. A plot of settlement in the form of dry density versus time appears on Figure B-11, Sheet 3.

Settlement Test 11 - An amount of 250 grams of total tailings and 180 ml of raffinate were blended to produce a slurry of 35 percent solids by weight. The slurry was poured into a graduated cylinder. As the tailings settled, semiclear fluid appeared at the top and the volume of the sample decreased with time until its ultimate dry density of 61.5 pcf was reached. A plot of settlement in the form of dry density versus time appears on Figure B-11 Sheet 4.

9. Drained Consolidated Density and Permeability Testing on Tailings Material

a. Description of Samples - The fine tailings sample used for drained consolidated density and permeability testing was the same as sample T-2 described in (6) above. The total tailings sample was the same as the one used in the undrained settlement density test #11 described above. A portion of the total tailings sample was washed on the #270 mesh sieve. The materials retained and passing the #270 sieve were separated for testing purposes. The synthetic raffinate used was manufactured to be the same as the raffinate described previously.

b. Testing Procedure - The tests utilized specially built 2.5-inch-diameter lucite cylinders that allowed drainage of the sample at top and bottom to facilitate one dimensional consolidation and falling head permeability testing with raffinate.

After initial settlement, the samples were fitted with filter papers and porous stones at top and bottom and placed in consolidometers with dial gauges to measure sample deformation. The samples were loaded incrementally



and deformation versus time was recorded. Successive loads were applied after primary consolidation was complete.

At selected intervals during consolidation, the samples were rebounded and positioned in permeameters for falling head permeability tests with raffinate.

After the tests, the samples were removed and oven dried. These results, in the form of dry density versus load and dry density versus permeability, appear on Figure B-12, Sheets 1 through 4.

10. Evaporation Test - Samples of 500 ml each of raffinate and distilled water were placed in an oven set at 100°F (38°C). The loss due to evaporation was determined daily until the distilled water totally evaporated and the raffinate crystallized after more than 92 percent evaporation. The wet weight of the crystallized sediment was 47.5 grams. A plot of evaporation versus time appears on Figure B-13, Sheet 1.

11. Raffinate Reaction Test - A sample from boring WPC-15 was tested to determine its reaction to a head of raffinate. A 3-inch-high sample was fabricated to 95 percent compaction at optimum plus 2 percent moisture content in a 12-inch-long, 2.5-inch-diameter, lucite cylinder. Raffinate was then poured into the cylinder to a head of 11 inches. The head of the raffinate remained constant for 9 days, although its color lightened slightly and the pH increased to 2.4. A plot of the sample height increase and observed penetration of raffinate into the soil versus time is presented on Figure B-14, Sheet 1.

TABLE B-1  
NATURAL WATER CONTENT AND DRY DENSITY DATA

<u>Hole No.</u>	<u>Sample No.</u>	<u>Depth (ft)</u>	<u>Water Content (%)</u>	<u>Dry Density (pcf)</u>
WB-1	B-1	0-13	9.2	---
WB-1	B-2	13-22	4.8	---
WB-2	B-1	0-9	6.6	---
WB-3	B-1	0-8	8.0	---
WB-3	B-2	9-13	6.8	---
WB-4	B-1	0-13	6.8	---
WB-5	B-1	0-17	5.5	---
WB-6	B-1	0-10	8.7	---
WB-7	B-1	0-5	9.3	---
WB-9	B-1	0-11	5.0	---
WB-9	B-2	11-21	6.4	---
WB-9	B-3	21-32	4.1	---
WB-10	B-1	0-11	3.5	---
WB-11	B-1	0-11	10.2	---
WB-11	B-2	11-16.5	5.6	---
WB-13	B-1	9-40	4.1	---
WB-14	B-3	5-39	4.9	---
WB-15	B-1	0-5	10.9	---
WB-15	B-2	5-44	5.8	---
WB-16	B-1	5-21	2.5	---
WB-16	B-2	25-44	11.8	---
WB-17	B-1	0-10	2.4	---
WB-17	B-2	10-18	4.7	---
WB-18	B-1	0-30	7.1	---
WB-43	---	15.5-16.5	9.7	---
WB-44	---	5.5-6.3	5.4	---
WB-44	---	13-15	7.9	---
WB-44	---	20.4-20.9	6.8	---

TABLE B-1 (Continued)

<u>Hole No.</u>	<u>Sample No.</u>	<u>Depth (ft)</u>	<u>Water Content (%)</u>	<u>Dry Density (pcf)</u>
WPC-1	W-3	52-52.5	2.9	---
WPC-2	G-1	0-5	7.2	---
WPC-2	S-1	5-7	6.0	88.2
WPC-2	S-1	5-7	5.6	80.8
WPC-2	G-3	16.9-22	7.1	---
WPC-2	S-4	30-31.3	5.3	86.9
WPC-2	S-4	30-31.3	13.9	88.5
WPC-2	W-1	38.5-40	11.8	---
WPC-2	W-3	52.5-53	12.8	---
WPC-3	G-2	8-13	5.0	---
WPC-3	G-4	23-28	8.0	---
WPC-3	W-1	29-29.5	9.8	---
WPC-3	W-3	44-44.5	4.1	---
WPC-4	G-1	0-5	8.7	---
WPC-4	G-2	8-13	7.2	---
WPC-5	S-1	5-6.7	8.6	79.8
WPC-5	S-1	5-6.7	8.3	77.6
WPC-6	W-1	5.75-6.25	5.5	---
WPC-6	W-5	20-20.5	5.0	---
WPC-6	W-9	35-35.5	15.2	---
WPC-7	S-1	5-6.5	1.3	95.9
WPC-7	W-1	20-20.5	2.9	---
WPC-7	W-3	27.5-28	3.4	---
WPC-7	W-5	35-35.5	3.1	---
WPC-7	W-7	42.5-43	4.2	---
WPC-7	G-7	45-50	4.8	---
WPC-7	W-11	57.5-58	3.2	---
WPC-8	G-1	0-5	8.7	---
WPC-10	G-1	0-5	7.6	---
WPC-10	G-3	16-20	8.5	---
WPC-15	G-1	0-5	9.2	---

TABLE B-1 (Continued)

<u>Hole No.</u>	<u>Sample No.</u>	<u>Depth (ft)</u>	<u>Water Content (%)</u>	<u>Dry Density (pcf)</u>
WPC-60	J-1	25-30	4.7	---
WPC-60	J-2	35-40	6.5	---
WPC-60	J-3	45-50	6.1	---
WPC-60	J-4	55-58.5	6.3	---
WSL-9	S-1	3-4	10.9	105.1
WSL-9	S-2	10-11.5	10.8	111.0
WSL-9	S-2	10-11.5	12.5	100.8
WSL-9	S-2	10-11.5	9.5	---
WSL-9	S-3	15-16.5	24.0	100.8
WSL-16	G-1	5-10	9.6	---
WT-81	---	1-2.5	10.7	---
WT-82	---	3.5-4.5	7.2	---
WT-98	S-1	4-5	10.1	92.9
WT-103	J-1	2-4.5	5.7	---
WT-105	J-1	3-5.5	3.6	---
WT-105	B-1	3-5.5	4.3	---
WT-107	J-1	1-3	6.2	---
WT-107	B-1	1-3	7.3	---
WT-109	J-1	3-6.5	6.5	---
WT-109	B-1	3-6.5	8.5	---
WT-110	J-1	4-6	9.2	---
WT-110	B-1	4-6	10.2	---
WT-111	J-1	5-7	4.9	---
WT-111	B-1	1-3	7.1	---
LP-15	---	10-13	5.8	---
LP-16	---	2-5	5.3	---
LP-17	---	14-18	3.3	---

TABLE B-1 (Continued)

<u>Hole No.</u>	<u>Sample No.</u>	<u>Depth (ft)</u>	<u>Water Content (%)</u>	<u>Dry Density (pcf)</u>
LP-1	---	64.1-64.3	---	121.3
LP-1	---	66.8-69.1	1.2	119.5
LP-2	---	33-33.5	3.2	115.1
LP-2	---	49.5-50	4.3	112.2
LP-3	---	53.3-53.7	6.2	137.6
LP-3	---	64.3-64.9	10.6	---
LP-3	---	147.1-147.5	---	145.5
LP-3	---	163-163.4	---	120.9
LP-4	---	28-28.2	6.1	140.3
LP-4	---	33.3-34	6.3	142.1
LP-4	---	36.1-36.6	3.9	137.3
LP-4	---	43.5-43.9	4.6	138.9
LP-5	---	112,8-113.3	---	122.8
LP-6	---	45.9-46.4	---	121.0
LP-7	---	171-171.4	---	111.0
LP-7	---	208.6-209	8.8	122.6
---	T-2	---	376	---
---	T-2	---	326	---
---	Total Tailings	---	28.3	---
---	Total Tailings	---	67.1	---

- Notes: 1. Drill hole LP-3 was drilled with foam and air at depths greater than 91.5 feet.
2. Drill holes LP-5, LP-6, and LP-7 used water as coring fluid.

TABLE B-2

SPECIFIC GRAVITY RESULTS

<u>Hole No.</u>	<u>Sample No.</u>	<u>Depth (ft)</u>	<u>Specific Gravity</u>
WB-5	B-1	0-17	2.64
WB-7	B-1	0.5	2.69
WB-9	B-3	21-32	2.69
WB-10	B-1	0-11	2.63
WB-11	B-1	0-11	2.64
WPC-2	S-1	5-7	2.64
WPC-12	S-2	13-14.7	2.63
WPC-15	G-1	0-5	2.64
WSL-9	S-2	10-11.5	2.68
WSL-16	G-1	5-10	2.69
WT-81	---	1-2.5	2.69
LP-17	---	14-18	2.63
---	Combined*	---	2.66
---	Combined**	---	2.68
---	T-1	---	2.54
---	Total Tailings	---	2.65
---	Total Tailings	---	2.73
---	"+ #270" Tailings	---	2.63
---	"- #270" Tailings	---	2.60

NOTE: The difference in specific gravity between the "total tailings" and the "+ #270" and "- #270" tailings is thought to be an effect of the washing process.

\* Combined of: WPC-8, S-2; WPC-9, G-1, S-1 and S-2; WPC-12, S-1 and S-2; LP-15

\*\* Combined of: LP-10, 20'-25' and LP-11, 9'-15'

TABLE B-3

RELATIVE DENSITY DATA

<u>Sample</u>	<u>Minimum Dry Density (pcf)</u>	<u>Maximum Dry Density (pcf)</u>
"+ #270" Tailings	94.0	108.5

TABLE B-4

PERMEABILITY TEST RESULTS

<u>Hole No.</u>	<u>Depth (ft)</u>	<u>As Tested</u>			<u>Coefficient of Permeability (cm/sec)</u>
		<u>Water Content (%)</u>	<u>Dry Density (pcf)</u>	<u>Void Ratio</u>	
LP-1	66.8-69.1	13.5	120.2	0.350	$1.4 \times 10^{-3}$
LP-2	33-33.5	15.3	116.0	0.399	$9.6 \times 10^{-4}$
LP-2	49.5-50	16.8	113.0	0.436	$1.0 \times 10^{-3}$
LP-6	45.9-46.4	12.8	121.7	0.333	$3.3 \times 10^{-4}$
LP-7	171-171.4	17.4	111.7	0.452	$1.1 \times 10^{-3}$

TABLE B-5

FIELD CAPACITY TEST RESULTS

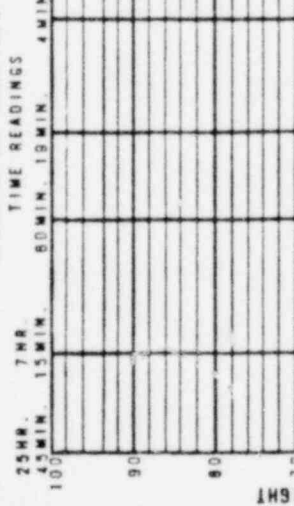
<u>Hole No.</u>	<u>Depth (ft)</u>	<u>Field Capacity Water Content, % By Weight</u>
LP-1	64.1-64.3	10.6
LP-1	66.8-69.1	11.0
LP-2	33-33.5	13.8
LP-2	49.5-50	15.8
LP-3	147-147.5	6.8
LP-3	163-163.4	11.8
LP-4	43.5-43.9	8.5
LP-5	112.8-113.3	11.4
LP-6	45.9-46.4	10.9
LP-7	171-171.4	13.8



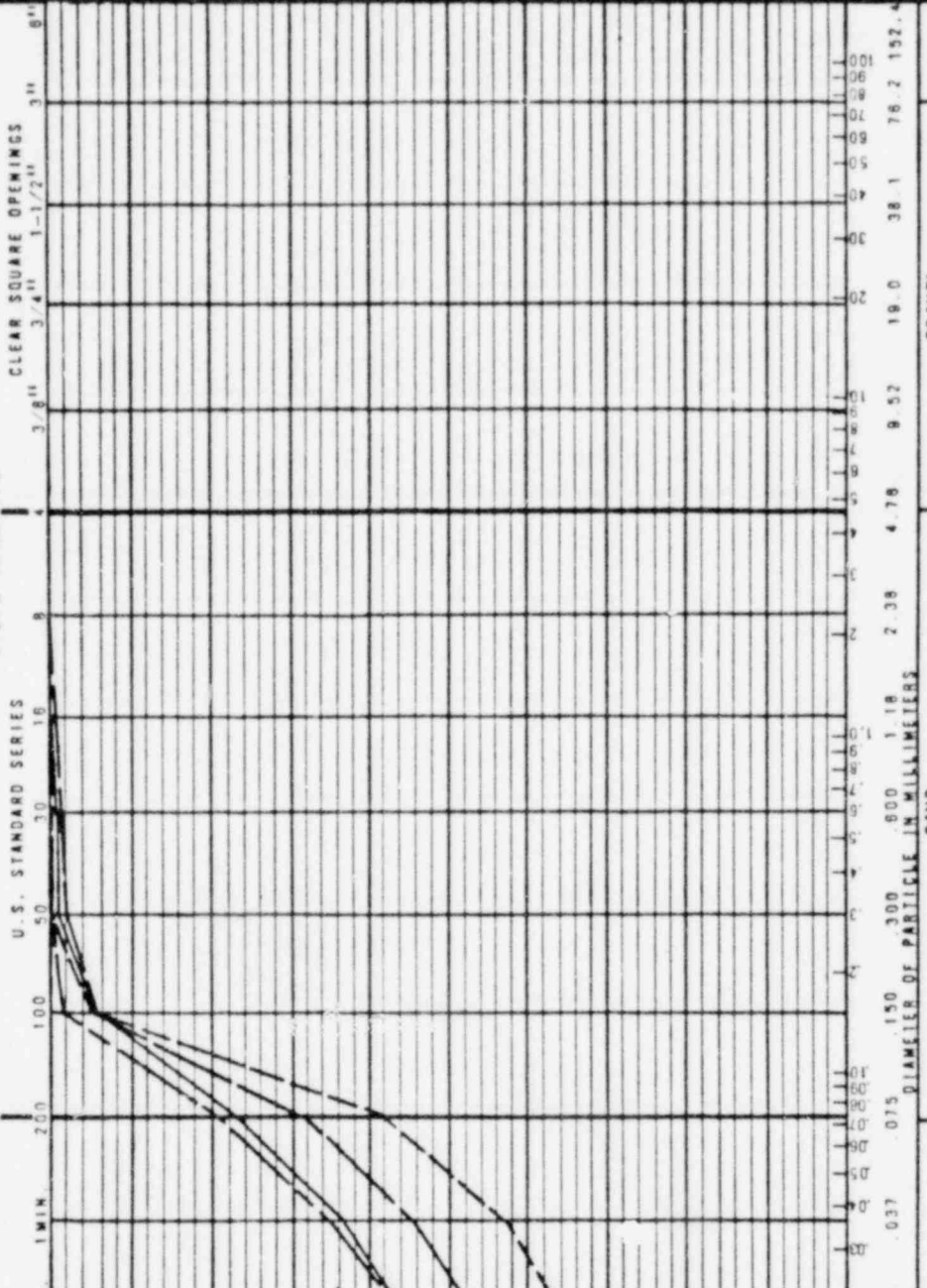
KEY:

LL	33	24	---	29		
PL	14	15	---	15		
PI	19	9	---	14		
NAT. W/C	9.2	4.8	6.6	8.0		
SPEC. GRAVITY	---	---	---	---		
CLASSIF. SYMB.	CL	CL	CL	CL		
SAMPLE NO.	B-1	B-1	B-1	B-1		
DEPTH, FT.	0-13	0-9	0-9	0-8		
HOLE NO.	WB-1	WB-1	WB-2	WB-3		

HYDROMETER ANALYSIS



SIEVE ANALYSIS



CLAY (PLASTIC) TO SILT (NON-PLASTIC) FINE MEDIUM SAND GRAVEL COARSE COBBLES

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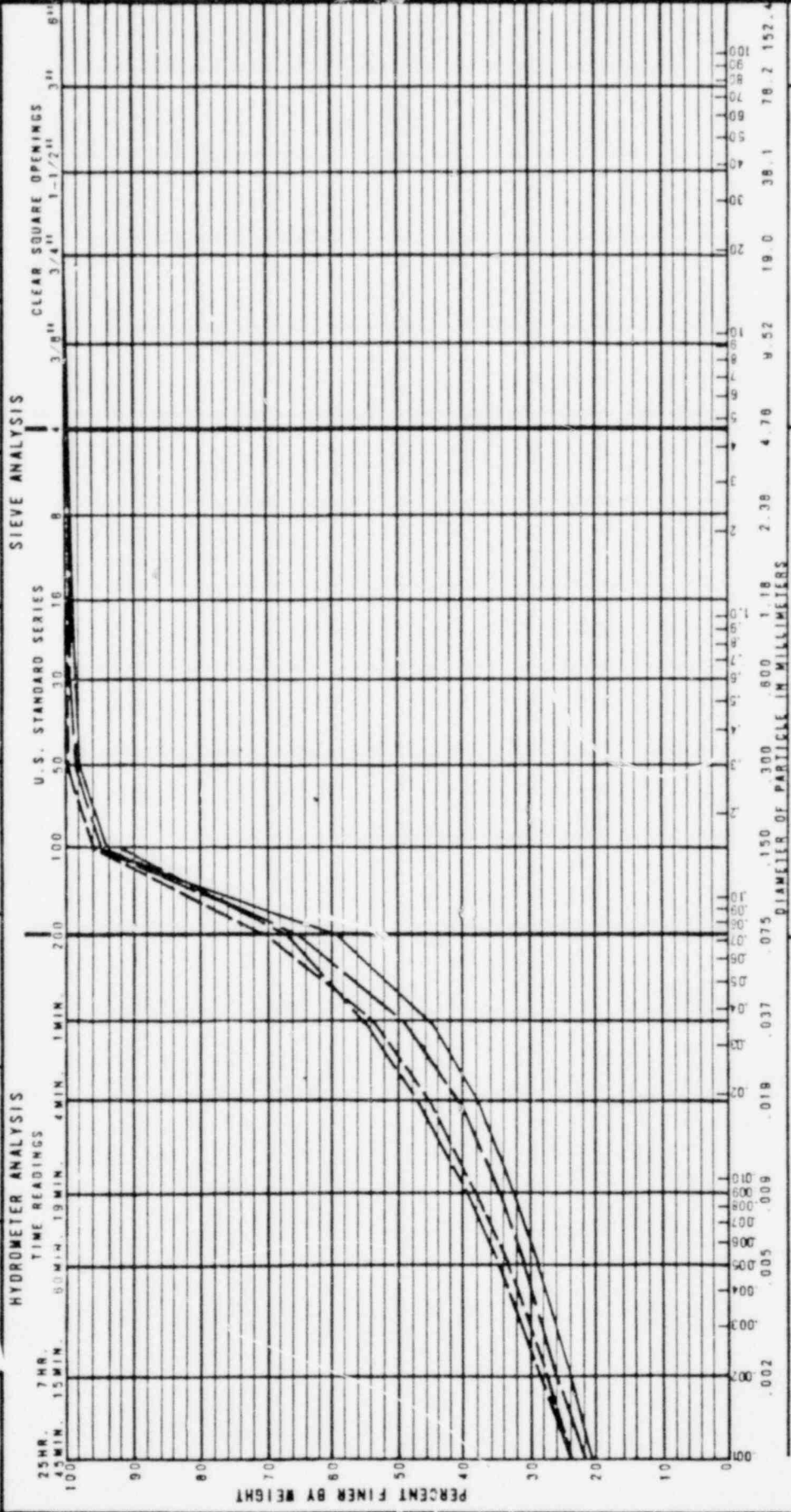
PALO ALTO • NEWPORT BEACH • CALIF.

GRADATION TEST RESULTS

PROJECT NO.	DATE	FIGURE NO.
GUL-101	AUGUST 1977	B-1

**KEY:**

LL	---	28	25	30
PL	---	13	15	14
P <sub>i</sub>	---	15	10	16
NAT. W/C	6.8	6.8	5.5	8.7
SPEC. GRAVITY	---	---	---	---
CLASSIF. SYMB.	CL	CL	CL	CL
SAMPLE NO.	B-2	B-1	B-1	B-1
DEPTH, FT.	9-13	0-13	0-17	0-10
HOLE NO.	WB-3	WB-4	WB-5	WB-6



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**GRADATION TEST RESULTS**

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.  
6UL-101

DATE  
AUGUST 1977

FIGURE NO.  
B-1

CLAY (PLASTIC) TO SILT (NON-PLASTIC)	FINE	MEDIUM	COARSE	FINE	COARSE	GRAVEL	COARSE	COBBLES
--------------------------------------	------	--------	--------	------	--------	--------	--------	---------

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PROJECT NO.

601-101

DATE

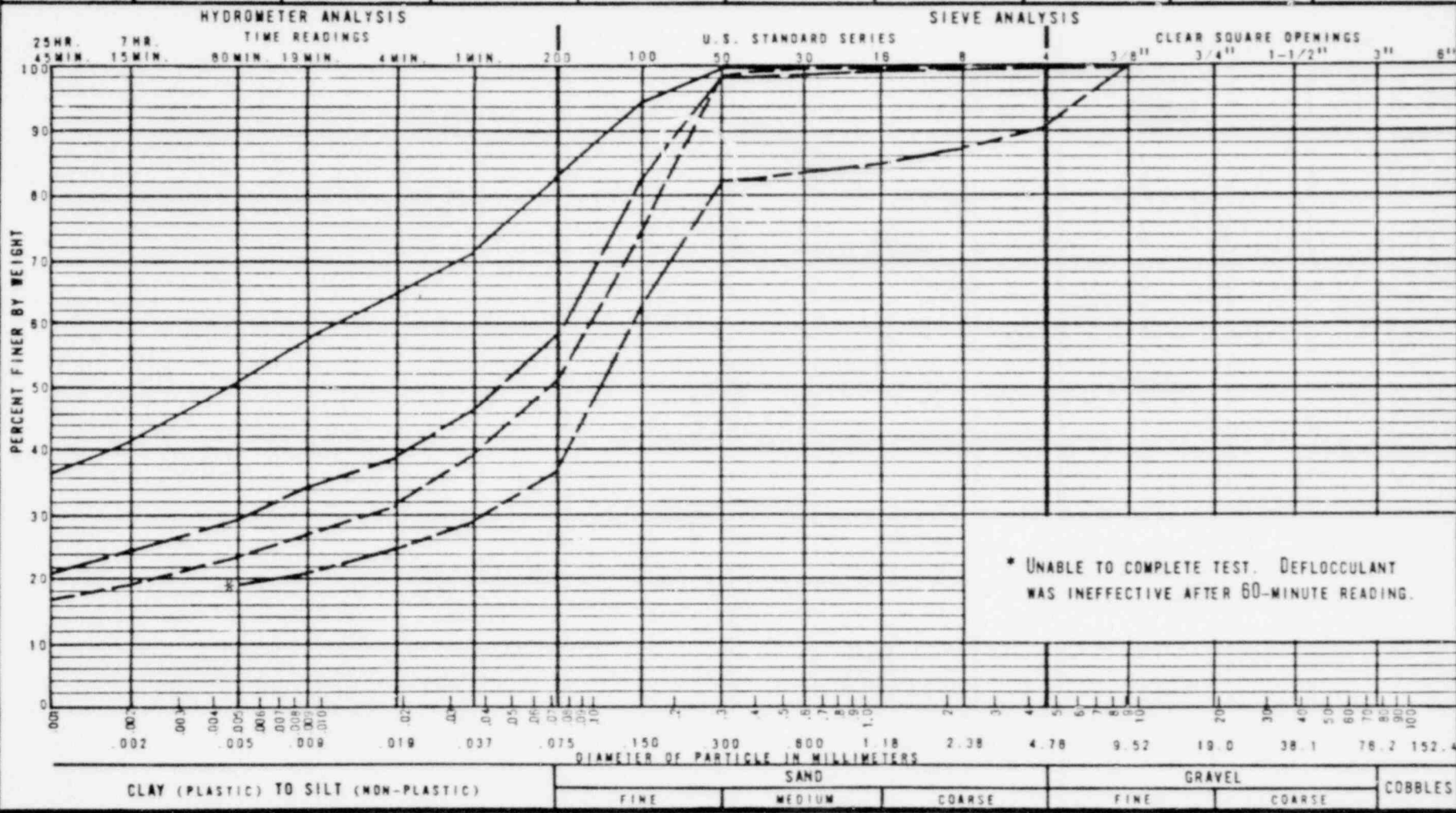
AUGUST 1977

FIGURE NO.

8

KEY:

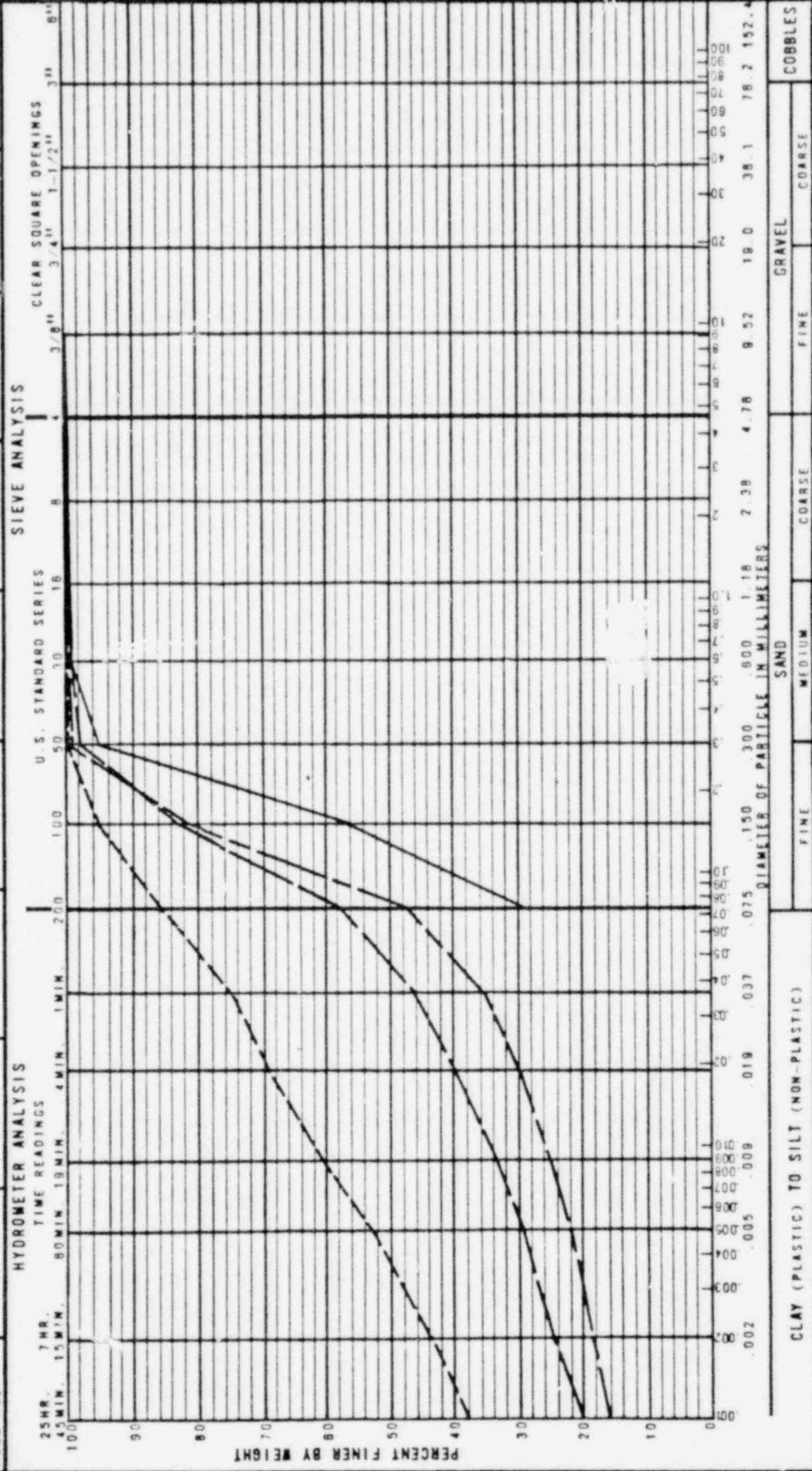
LL	43	23	27	----
PL	17	16	13	----
PI	26	7	14	----
NAT. W/C	9.3	5.0	6.4	4.1
SPEC. GRAVITY	----	----	----	----
CLASSIF. SYMB.	CL	CL-ML	CL	SM-SC
SAMPLE NO.	B-1	B-1	B-2	B-3
DEPTH, FT.	0-5	0-11	11-21	21-32
HOLE NO.	WB-7	WB-9	WB-9	WB-9



GRADATION TEST RESULTS

KEY:

LL	NP	44	24	---
PL	NP	17	14	---
PI	0	27	10	---
NAT. W/C	3.5	10.5	5.6	4.1
SPEC. GRAVITY	---	---	---	---
CLASSIF. SYMB.	SM	CL	CL	SC
SAMPLE NO.	B-1	B-1	B-2	B-1
DEPTH, FT.	0-11	0-11	11-16.5	9-40
HOLE NO.	WB-10	WB-11	WB-11	WB-13



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GRADATION TEST RESULTS

PROJECT NO.	DATE	FIGURE NO.
GUL-101	AUGUST 1977	8-1

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PROJECT NO.  
GUL-101

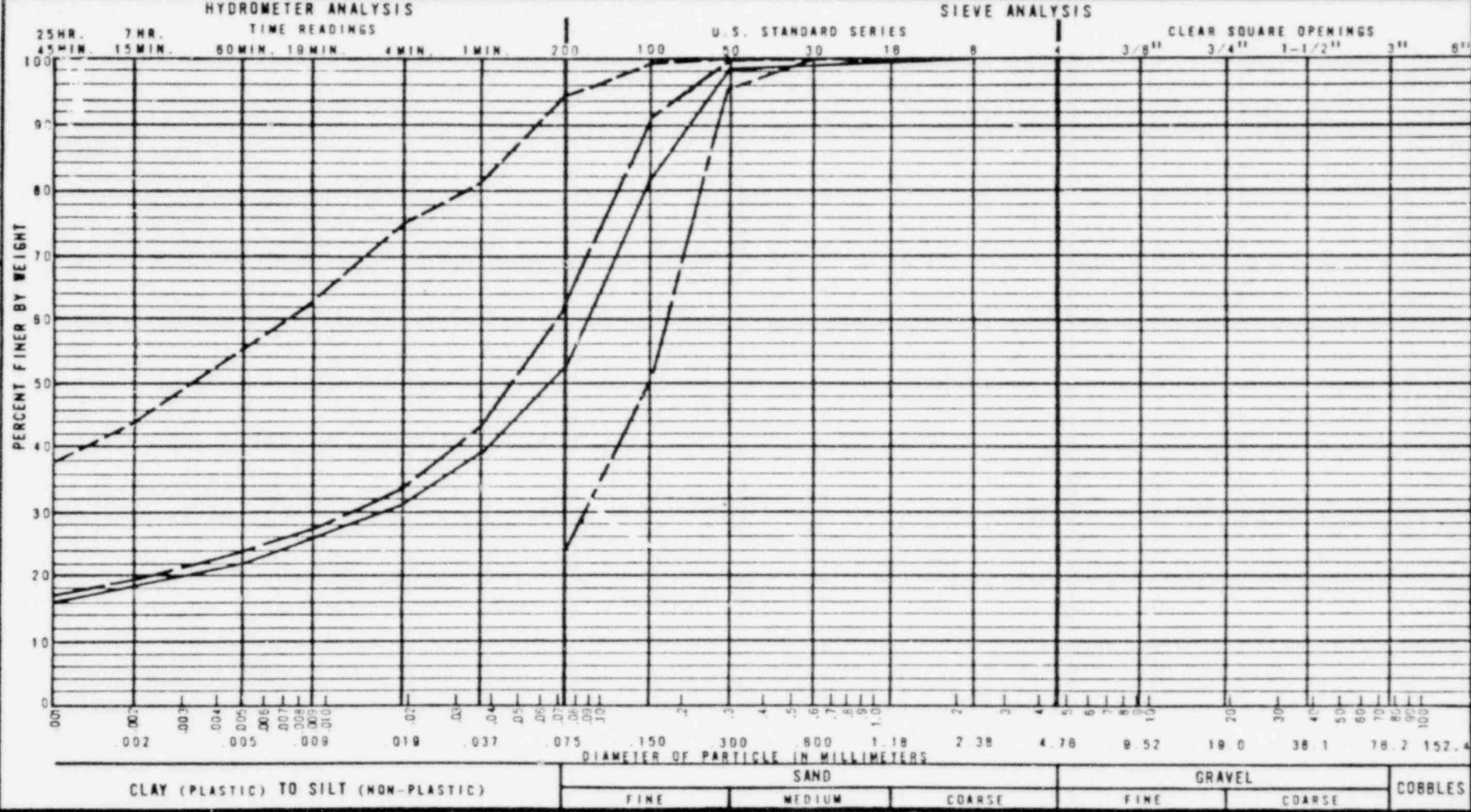
DATE  
AUGUST 1977

FIGURE NO.  
B-1

GRADATION TEST RESULTS

KEY:

LL	23	44	24	NP				
PL	17	19	16	NP				
PI	6	25	8	0				
NAT. W/C	4.9	10.9	5.8	2.5				
SPEC. GRAVITY	----	----	----	----				
CLASSIF. SYMB.	CL-ML	CL	CL	SM				
SAMPLE NO.	B-3	B-1	B-2	B-1				
DEPTH, FT.	5-39	0-5	5-44	5-21				
HOLE NO.	WB-14	WB-15	WB-15	WB-16				



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PROJECT NO.

GUL-101

DATE

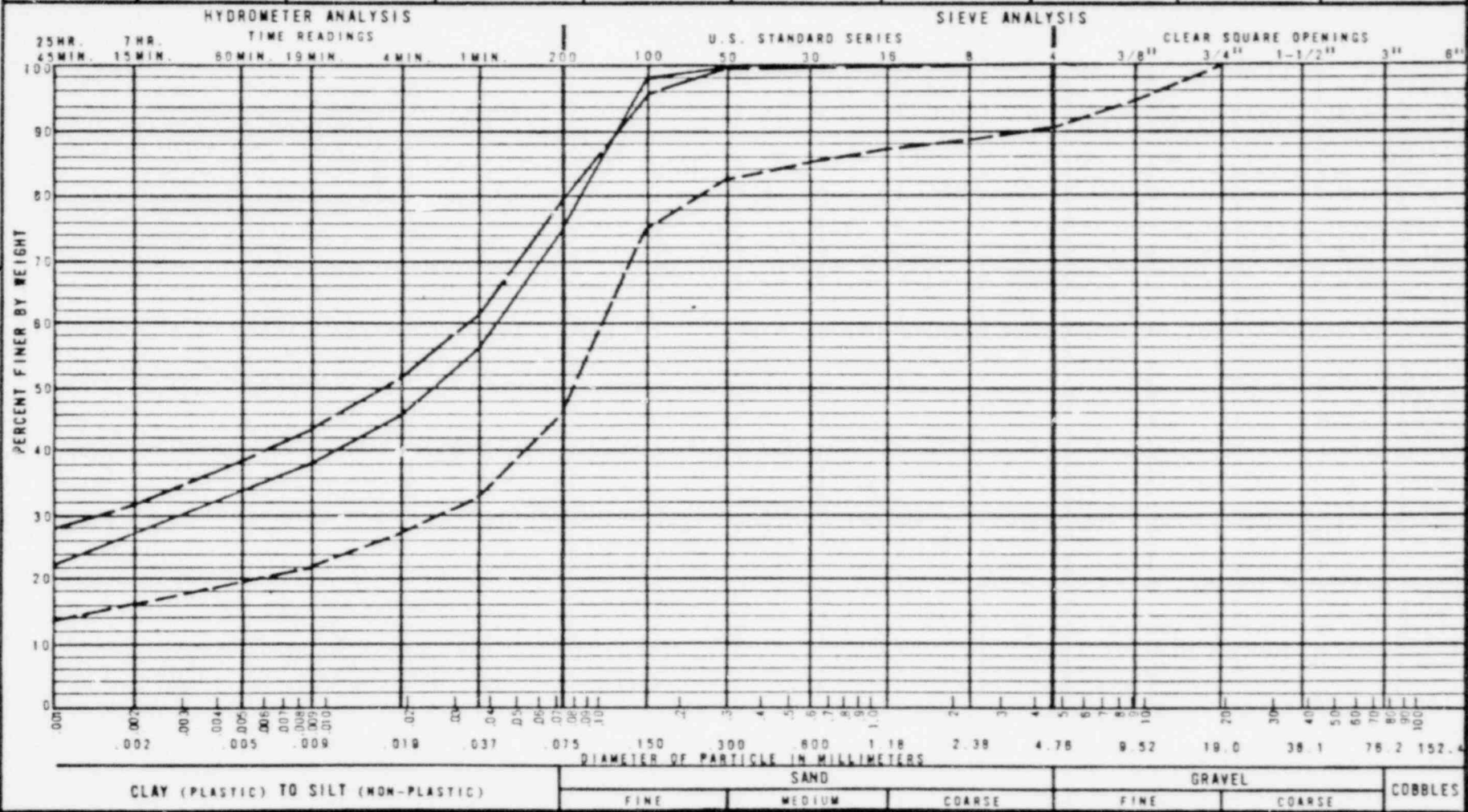
AUGUST 1977

FIGURE NO.

1

Sheet 6 of 29

KEY:			
LL	28	23	33
PL	14	19	14
PI	14	4	19
NAT. W/C	2.4	4.7	7.1
SPEC. GRAVITY	----	----	----
CLASSIF. SYMB.	CL	SM-SC	CL
SAMPLE NO.	B-1	B-2	B-1
DEPTH, FT.	0-10	10-18	0-30
HOLE NO.	WB-17	WB-17	WB-18

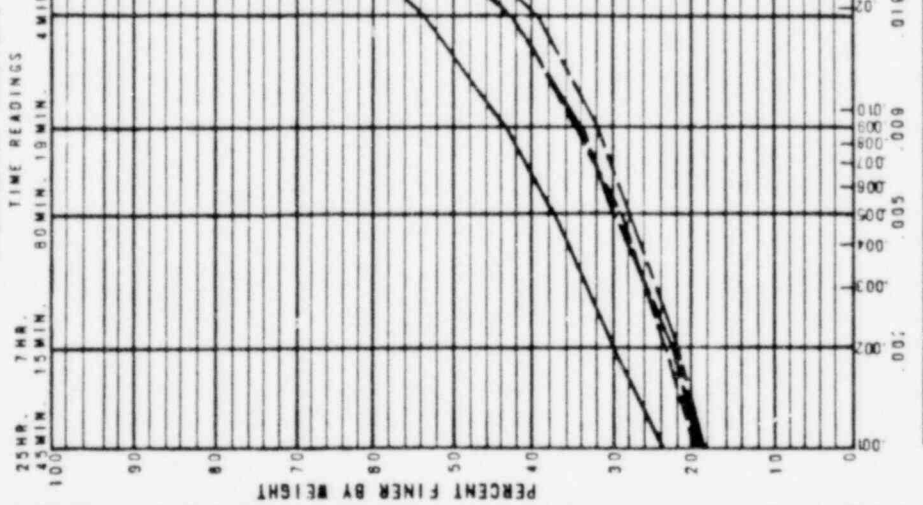


GRADATION TEST RESULTS

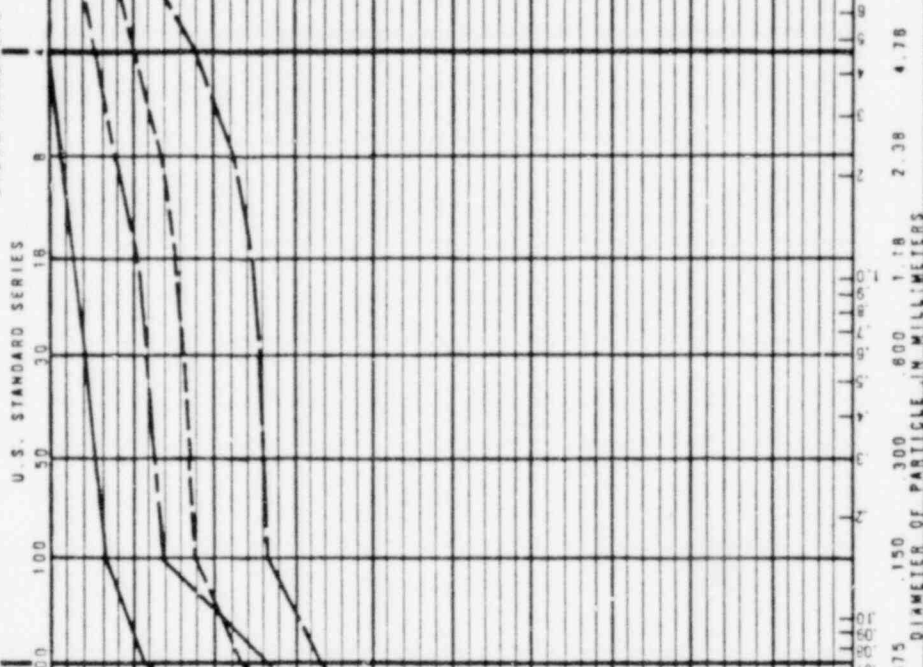
KEY:

LL	33	27	29	27
PL	14	19	14	16
PI	19	8	15	11
NAT. W/C	9.7	5.4	7.9	6.8
SPEC. GRAVITY	---	---	---	---
CLASSIF. SYMB.	CL	CL-ML	CL	CL
SAMPLE NO.	---	---	---	---
DEPTH, FT.	15.5-16.5	5.5-6.3	13.0-15.0	20.4-20.9
HOLE NO.	WB-43	WB-44	WB-44	WB-44

HYDROMETER ANALYSIS



SIEVE ANALYSIS



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GRADATION TEST RESULT

PROJECT NO.	DATE	FIGURE NO.
GUL-101	SEPTEMBER 1977	8

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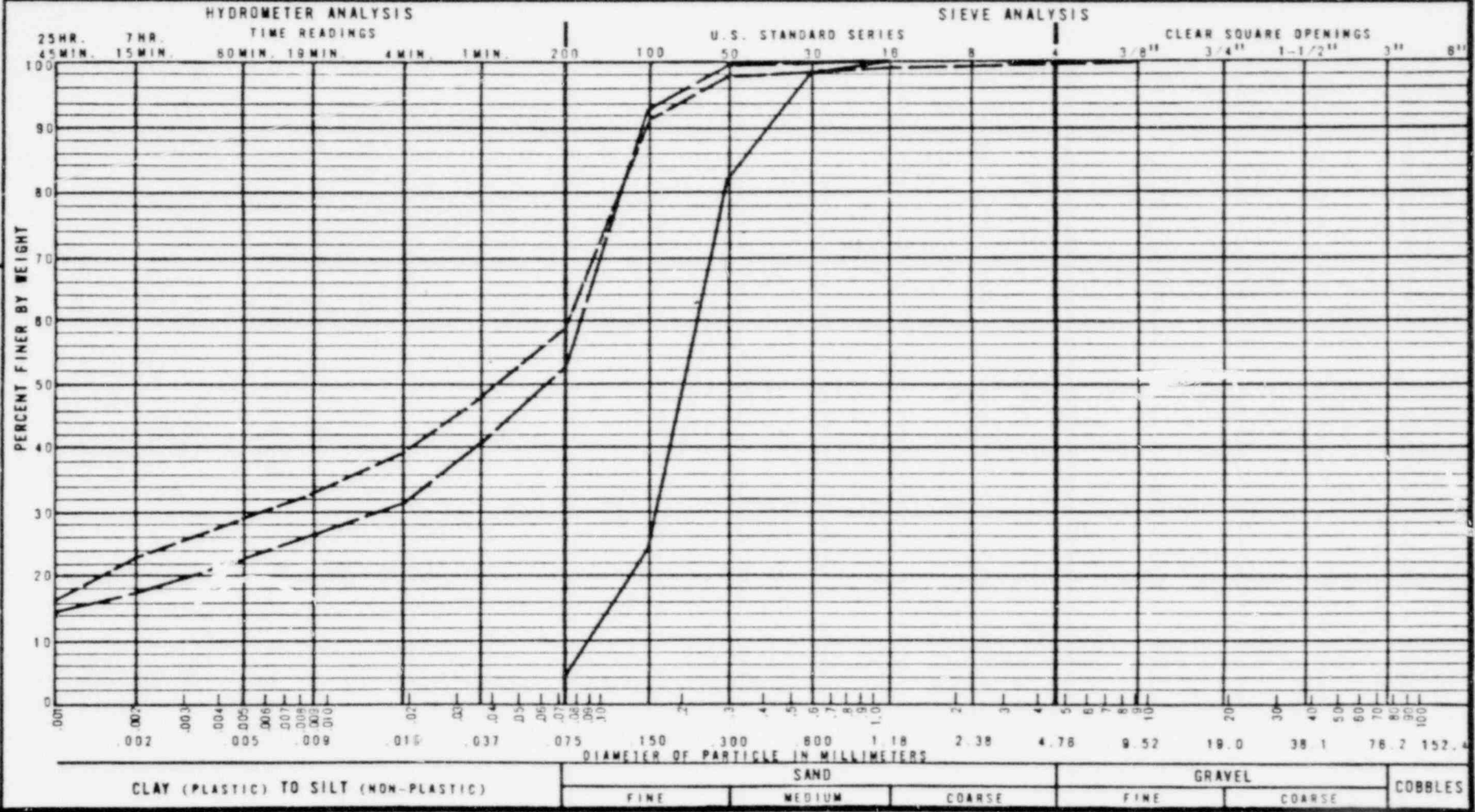
PROJECT NO. GUL-101

DATE JUNE 1977

FIGURE NO. 8

GRADATION TEST RESULTS

KEY:			
LL	----	29	24
PL	NP	16	NP
PI	0	13	0
NAT. W/C	2.9	7.2	6.0
SPEC. GRAVITY	----	----	2.64
CLASSIF. SYMB.	SP	CL	ML
SAMPLE NO.	W-3	G-1	S-1
DEPTH, FT.	52-52.5	G-5	5-7
HOLE NO.	WPC-1	WPC-2	WPC-2





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PROJECT NO.  
GUL-101

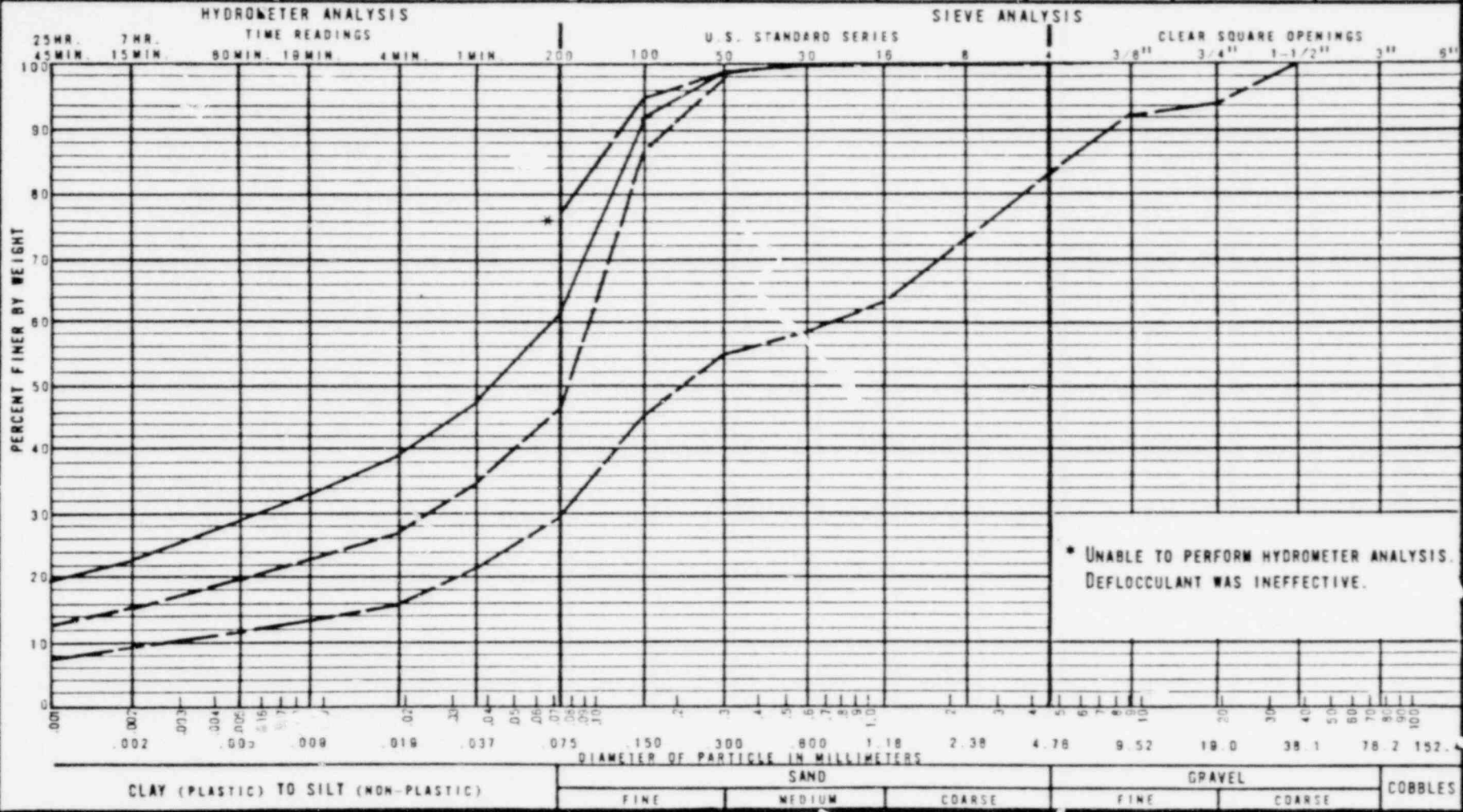
DATE  
JUNE 1977

FIGURE NO.  
8

GRADATION TEST RESULTS

KEY:

LL	----	20	32	23
PL	----	NP	20	NP
PI	----	0	12	0
NAT. W/C	7.1	5.3	11.8	12.8
SPEC. GRAVITY	----	----	----	----
CLASSIF. SYMB.	CL-ML	SM	CL	SM
SAMPLE NO.	G-3	S-4	W-1	W-3
DEPTH, FT.	16.9-22	30-31.3	38.5-40	52.5-53
HOLE NO.	WPC-2	WPC-2	WPC-2	WPC-2



**KEY:**

LL	26	32	34	21
PL	19	14	15	NP
PI	7	18	19	0
NAT. W/C	5.0	8.0	9.8	4.1
SPEC. GRAVITY	---	---	---	---
CLASSIF. SYMB.	CL-ML	CL	CL	GM
SAMPLE NO.	G-2	G-4	W-1	W-3
DEPTH, FT.	8-13	23-28	29-29.5	44-44.5
HOLE NO.	WPC-3	WPC-3	WPC-3	WPC-3

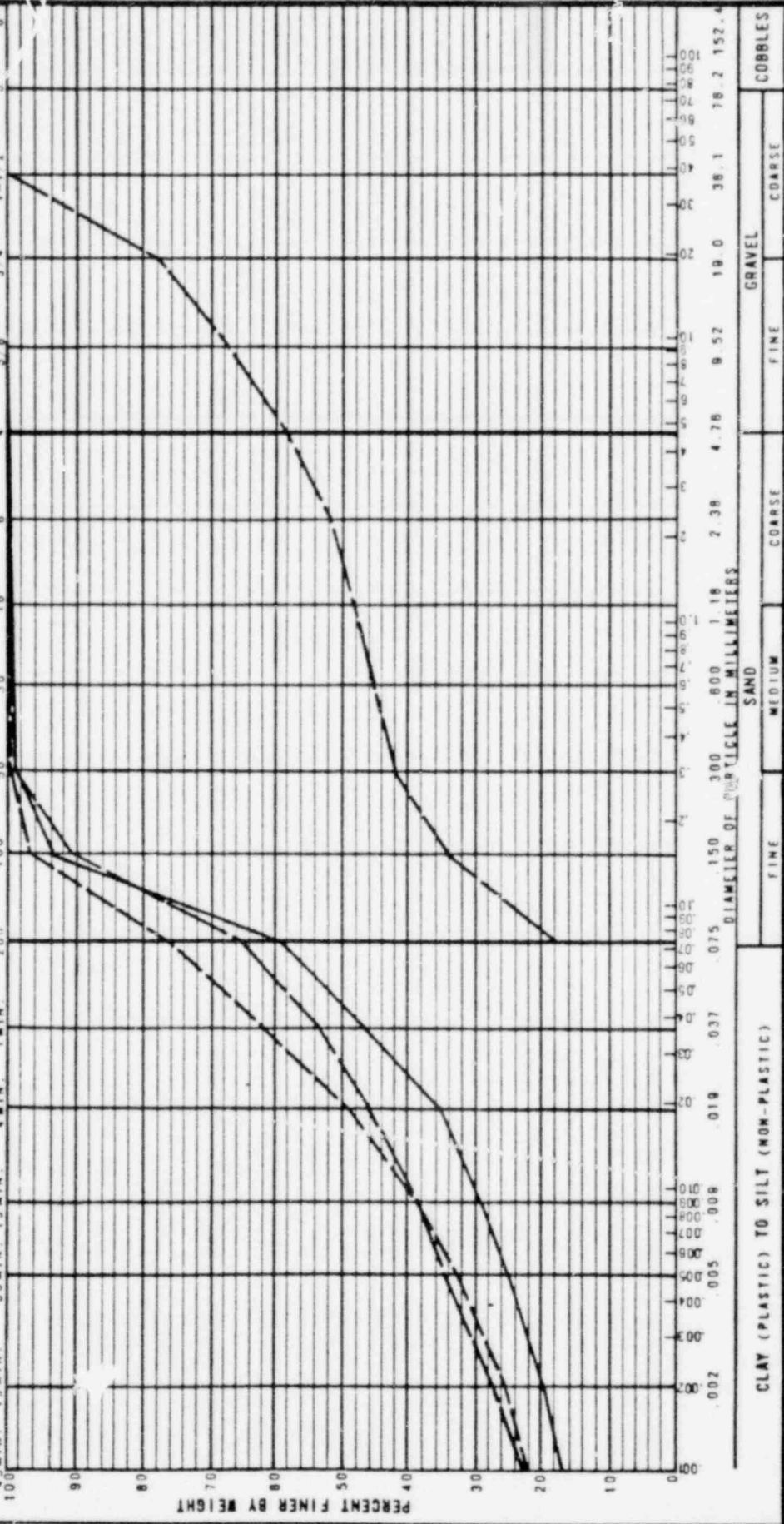
**HYDROMETER ANALYSIS**

25HR. 7HR. 45MIN. 15MIN. 80MIN. 19MIN. 4MIN. 1MIN.

**SIEVE ANALYSIS**

U.S. STANDARD SERIES

CLEAR SQUARE OPENINGS  
3/8" 3/4" 1-1/2" 3"



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**GRADATION TEST RESULTS**

PROJECT NO.	DATE	FIGURE NO.
6UL-101	JUNE 1977	8-1

PALO ALTO • NEWPORT BEACH • CALIF.

KEY:

LL	---	30
PL	---	13
PI	---	17
NAT. W/C	8.7	7.2 8.6
SPEC. GRAVITY	---	---
CLASSIF. SYMB.	CL	CL
SAMPLE NO.	G-1	S-1
DEPTH, FT.	0-5	5-6.7
HOLE NO.	WPC-4	WPC-5

HYDROMETER ANALYSIS

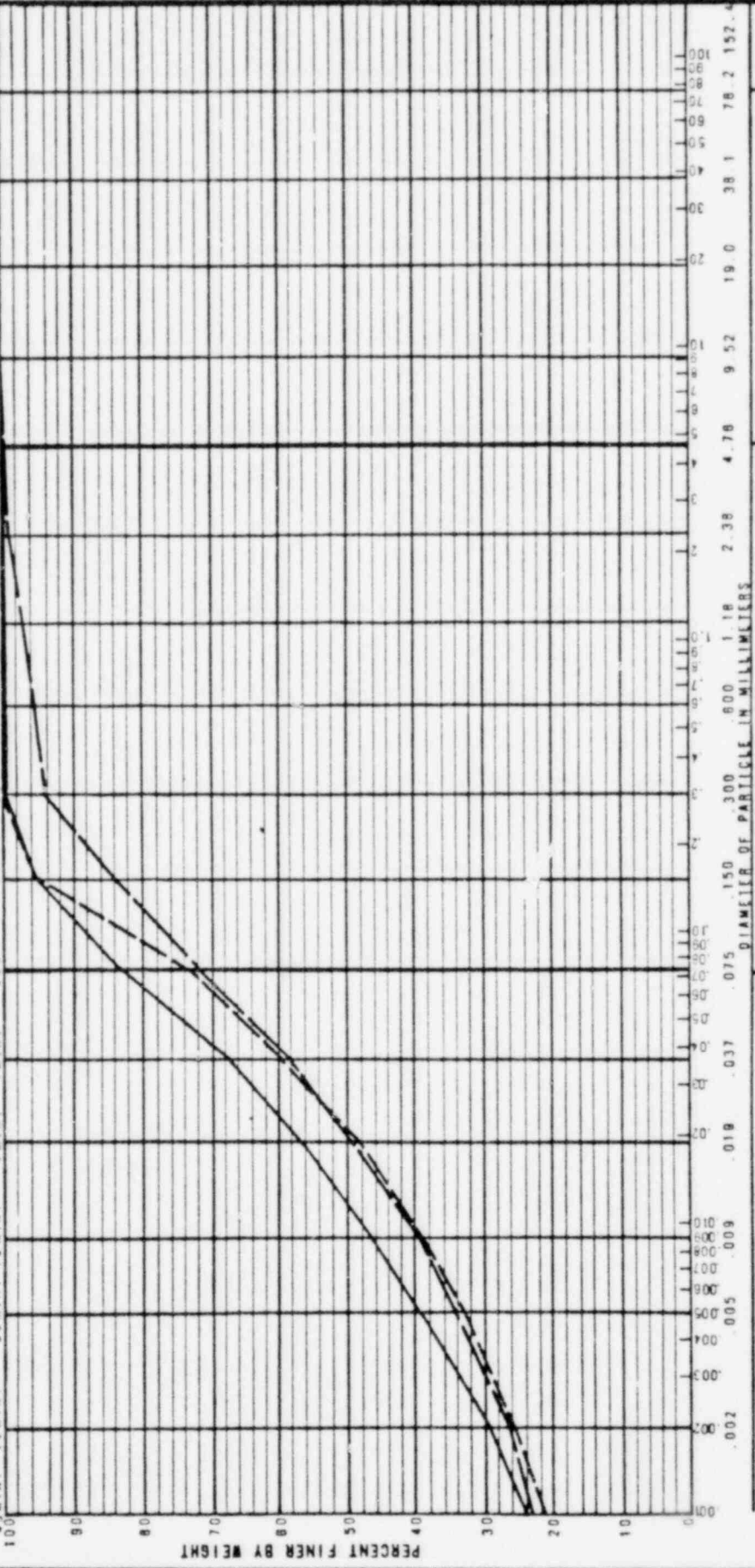
25HR.	THR.
45MIN.	15MIN.
100	100
80	80
60	60
40	40
20	20

U.S. STANDARD SERIES

50	100	200	400	800	1500	3000	6000	12000	25000	50000	100000
----	-----	-----	-----	-----	------	------	------	-------	-------	-------	--------

SIEVE ANALYSIS

3/8"	3/4"	1-1/2"	3"	6"
------	------	--------	----	----



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GRADATION TEST RESULTS

PROJECT NO.	DATE	FIGURE NO.
GUL-101	JUNE 1977	8

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PROJECT NO.

GU-101

DATE

JUNE 1977

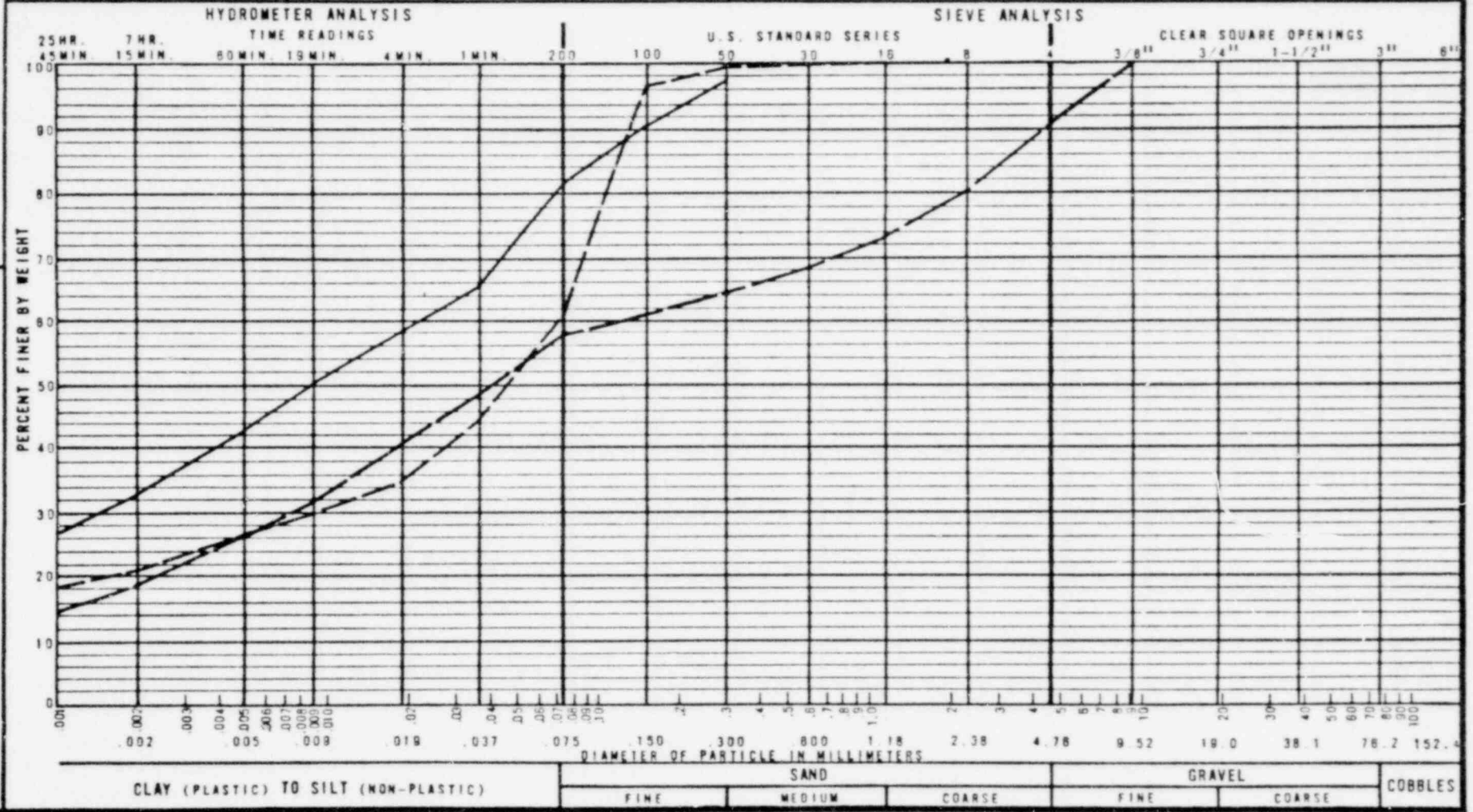
FIGURE NO.

8

GRADATION TEST RESULTS

KEY:

LL	28	----	----
PL	18	----	----
PI	8	----	----
NAT. W/C	5.5	5.0	15.2
SPEC. GRAVITY	----	----	----
CLASSIF. SYMB.	CL	CL-ML	CL-ML
SAMPLE NO.	W-1	W-5	W-9
DEPTH, FT.	5.75-6.25	20-20.5	35-35.5
HOLE NO.	WPC-6	WPC-6	WPC-6



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GRADATION TEST RESULTS

PROJECT NO.

GUL-101

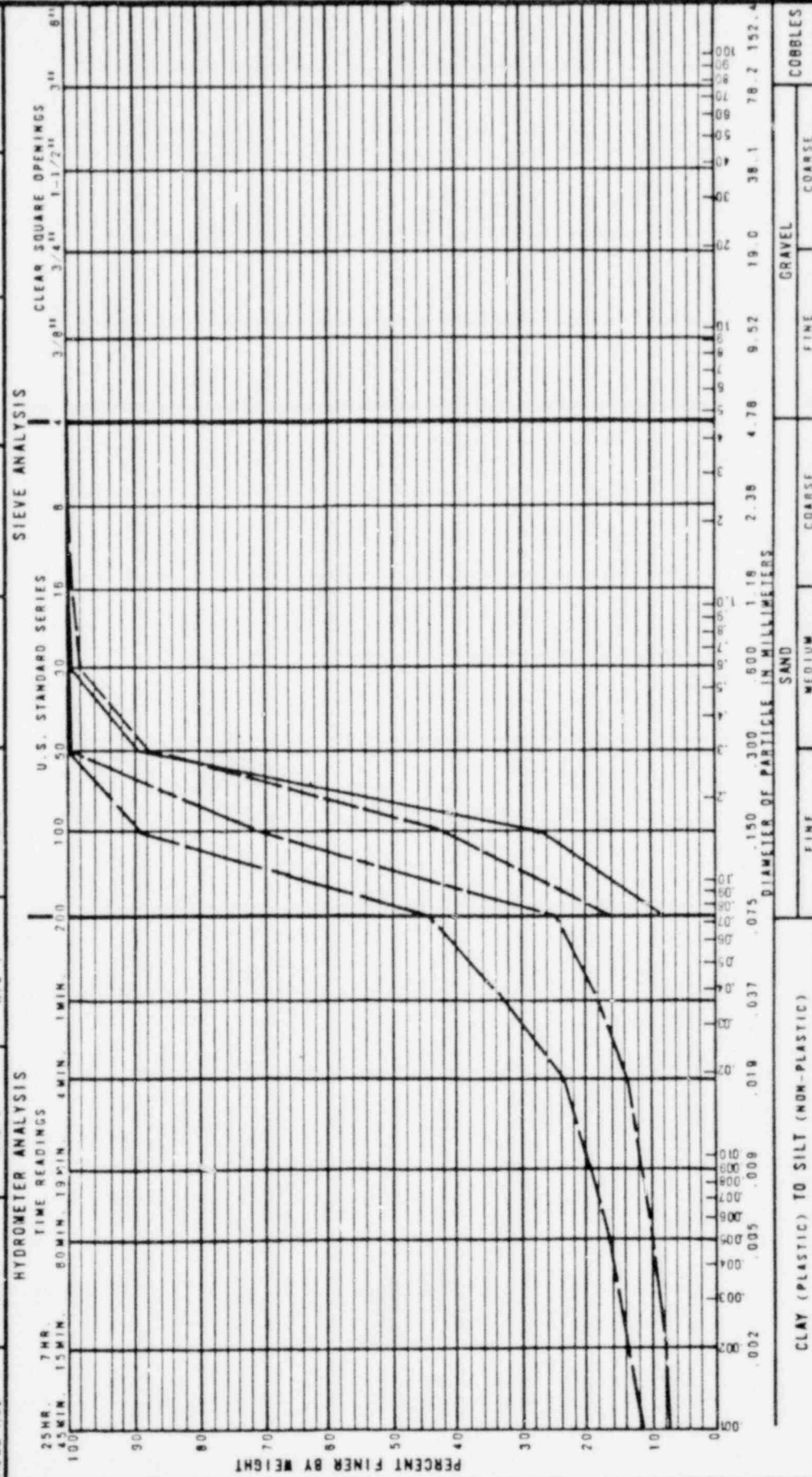
DATE

JUNE 1977

FIGURE NO

8-1

LL	---	---	---	---	---	---	---	---
PL	NP	NP	NP	NP	NP	NP	NP	NP
PI	0	0	0	0	0	0	0	0
NAT. W/C	1.3	2.9	3.4	3.1	3.1	3.1	3.1	3.1
SPEC. GRAVITY	---	---	---	---	---	---	---	---
CLASSIF. SYMB.	SP-SM	SM	SC-SM	SM	SM	SM	SM	SM
SAMPLE NO.	S-1	W-1	W-3	W-5	W-5	W-5	W-5	W-5
DEPTH, FT.	5-6.5	20-20.5	27.5-28	35-35.5	35-35.5	35-35.5	35-35.5	35-35.5
HOLE NO.	WPC-7	WPC-7	WPC-7	WPC-7	WPC-7	WPC-7	WPC-7	WPC-7



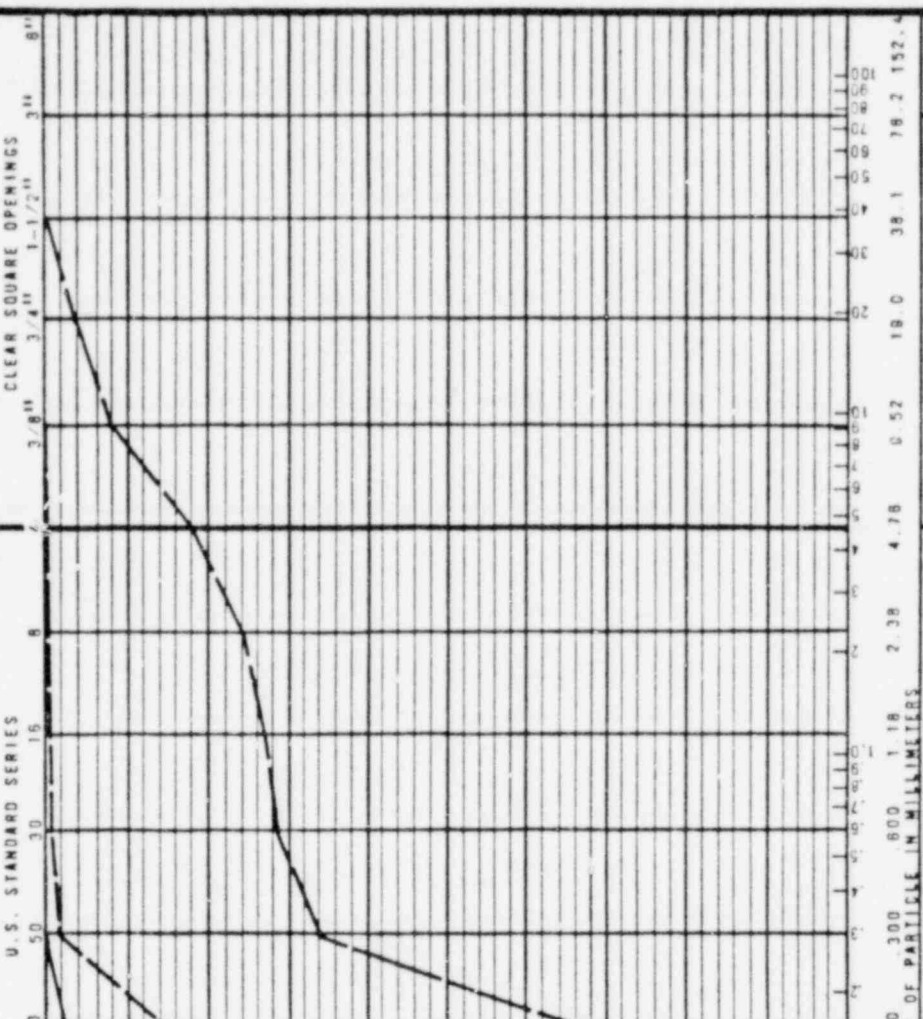
KEY:

LL	23	---	---
PL	NP	---	NP
PI	0	---	0
NAT. W/C	4.2	4.6	3.2
SPEC. GRAVITY	---	---	---
CLASSIF. SYMB.	ML	SC-SM	SM
SAMPLE NO.	W-7	G-7	W-11
DEPTH, FT.	42.5-43	45-50	57.5-58
HOLE NO.	WPC-7	WPC-7	WPC-7

HYDROMETER ANALYSIS

25HR.	7HR.	TIME READINGS	
45MIN.	15MIN.	30MIN.	19MIN.
100	80	4MIN.	1MIN.

SIEVE ANALYSIS



CLAY (PLASTIC) TO SILT (NON-PLASTIC)		SAND		GRAVEL		COBBLES	
FINE	COARSE	FINE	COARSE	FINE	COARSE		
0.002	0.005	0.008	0.018	0.037	0.075	0.150	0.300
0.005	0.008	0.018	0.037	0.075	0.150	0.300	0.600
0.008	0.018	0.037	0.075	0.150	0.300	0.600	1.18
0.018	0.037	0.075	0.150	0.300	0.600	1.18	2.36
0.037	0.075	0.150	0.300	0.600	1.18	2.36	4.75
0.075	0.150	0.300	0.600	1.18	2.36	4.75	7.5
0.150	0.300	0.600	1.18	2.36	4.75	7.5	15
0.300	0.600	1.18	2.36	4.75	7.5	15	30
0.600	1.18	2.36	4.75	7.5	15	30	60
1.18	2.36	4.75	7.5	15	30	60	120
2.36	4.75	7.5	15	30	60	120	250
4.75	7.5	15	30	60	120	250	500
7.5	15	30	60	120	250	500	1000
15	30	60	120	250	500	1000	2000
30	60	120	250	500	1000	2000	4000
60	120	250	500	1000	2000	4000	8000
120	250	500	1000	2000	4000	8000	
250	500	1000	2000	4000	8000		
500	1000	2000	4000	8000			
1000	2000	4000	8000				
2000	4000	8000					
4000	8000						
8000							

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GRADATION TEST RESULTS

PROJECT NO.	DATE	FIGURE NO.
GUL-101	JUNE 1977	8

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PROJECT NO.  
GUL-101

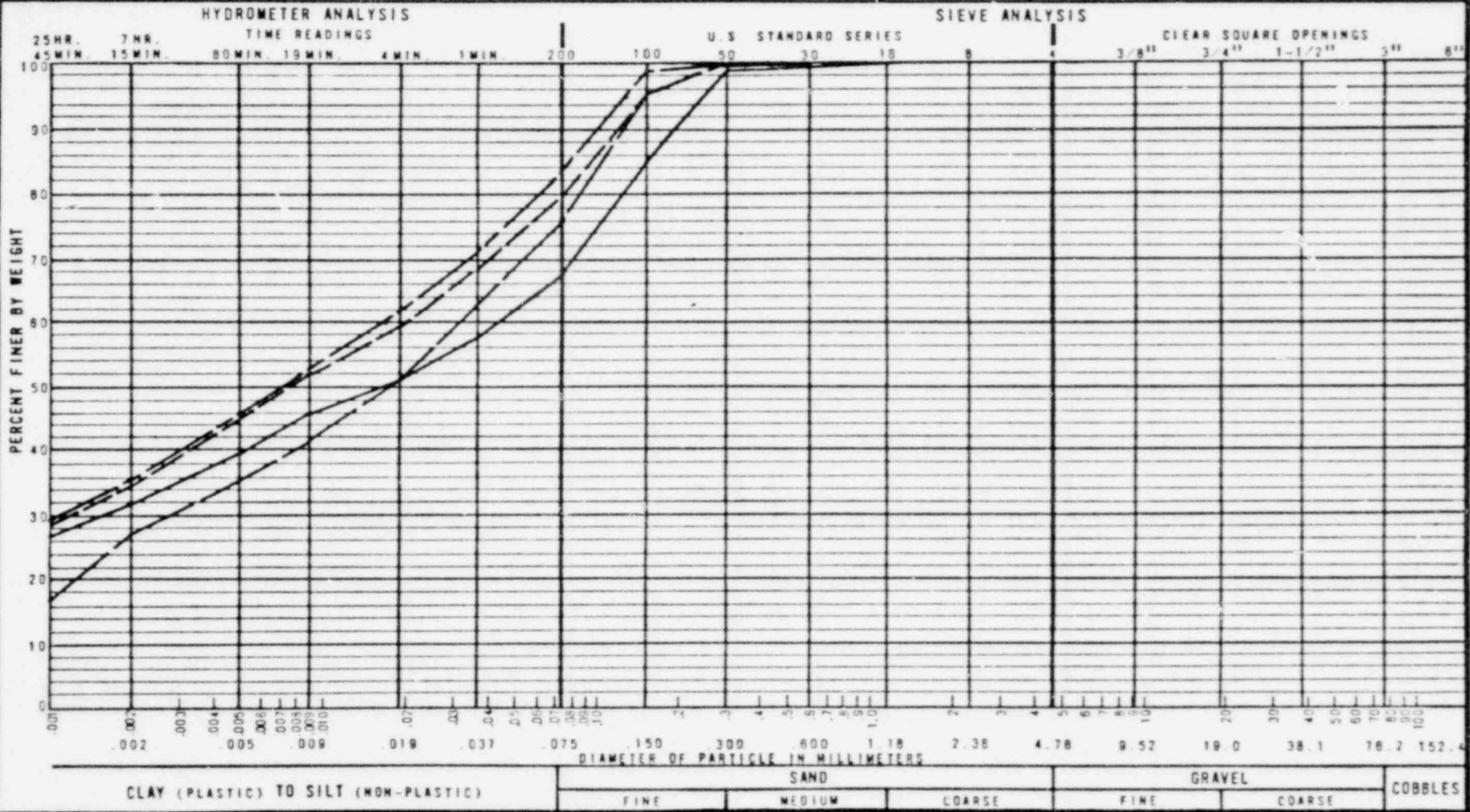
DATE  
JUNE 1977

FIGURE NO.  
1

GRADATION TEST RESULTS

KEY:

LL	35	40	35	36
PL	15	18	14	18
PI	20	24	21	20
NAT. W/C	8.7	7.8	8.5	9.2
SPEC. GRAVITY	----	----	----	2.64
CLASSIF. SYMB.	CL	CL	CL	CL
SAMPLE NO.	G-1	G-1	G-3	G-1
DEPTH, FT.	0-5	0-5	18-20	0-5
HOLE NO.	WPC-8	WPC-10	WPC-10	WPC-15



**KEY:**

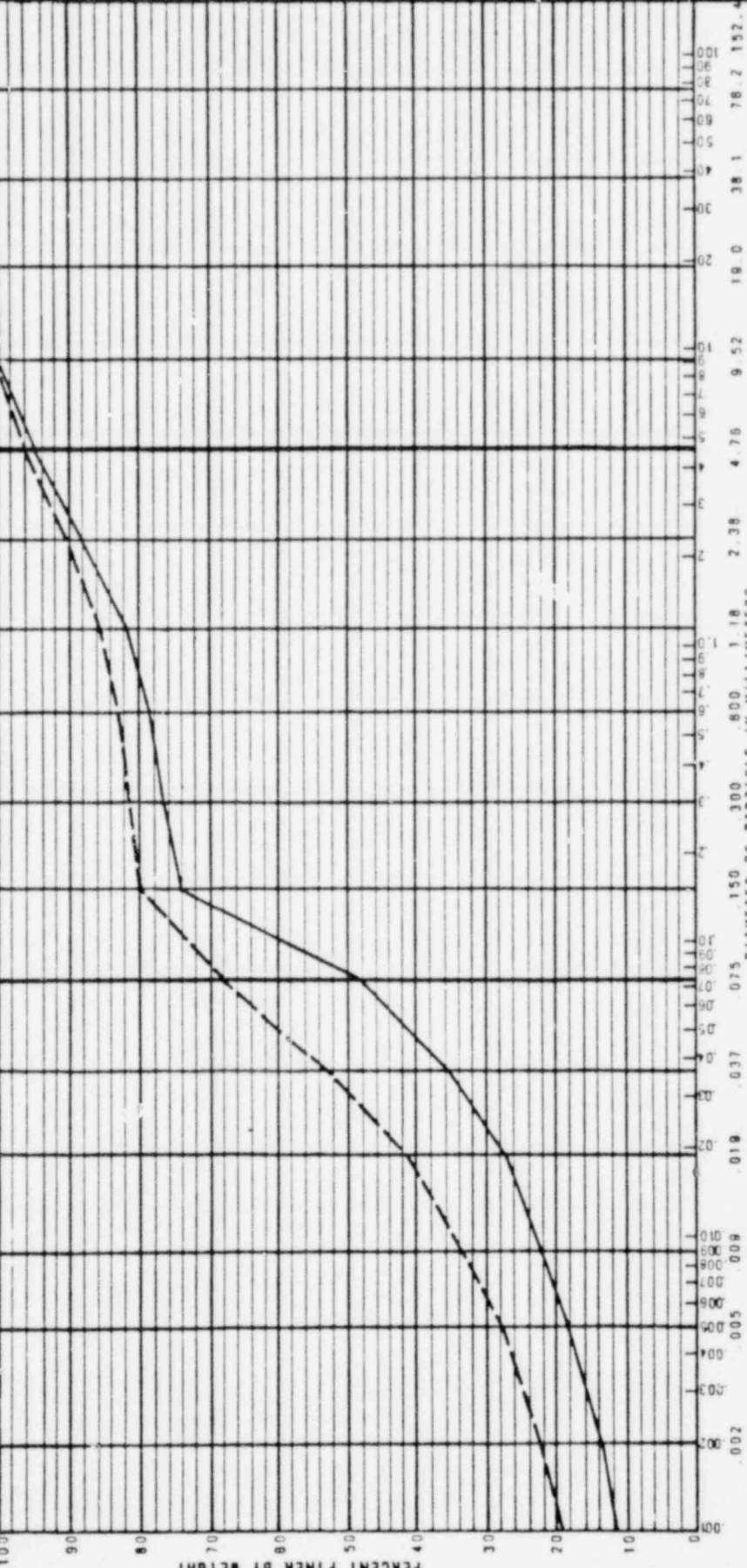
LL	22	27
PL	22	19
PI	0	8
NAT. W/C	4.7	6.5
SPEC. GRAVITY	----	----
CLASSIF. SYMB.	ML	CL
SAMPLE NO.	J-1	J-2
DEPTH, FT.	25-30	35-40
HOLE NO.	WPC-60	WPC-60

**HYDROMETER ANALYSIS**

25HR. THR.	15MIN.	30MIN.	1HR.	2HR.
100	90	80	70	60

**SIEVE ANALYSIS**

U.S. STANDARD SERIES	3.75"	4.75"	6.0"	7.5"	9.5"	12.5"	15.0"	19.0"	25.0"	30.0"	37.5"	47.5"	60"
CLEAR SQUARE OPENINGS	3/8"	3/4"	1-1/2"	2"	2 3/8"	3"	3 3/4"	4"	4 3/4"	5"	5 1/2"	6"	6 1/2"



CLAY (PLASTIC) TO SILT (NON-PLASTIC)	COBBLES
GRAVEL	COARSE
FINE	COARSE
MEDIUM	COARSE
FINE	COARSE
DIAMETER OF PARTICLE IN MILLIMETERS	38.1 76.2 152.4

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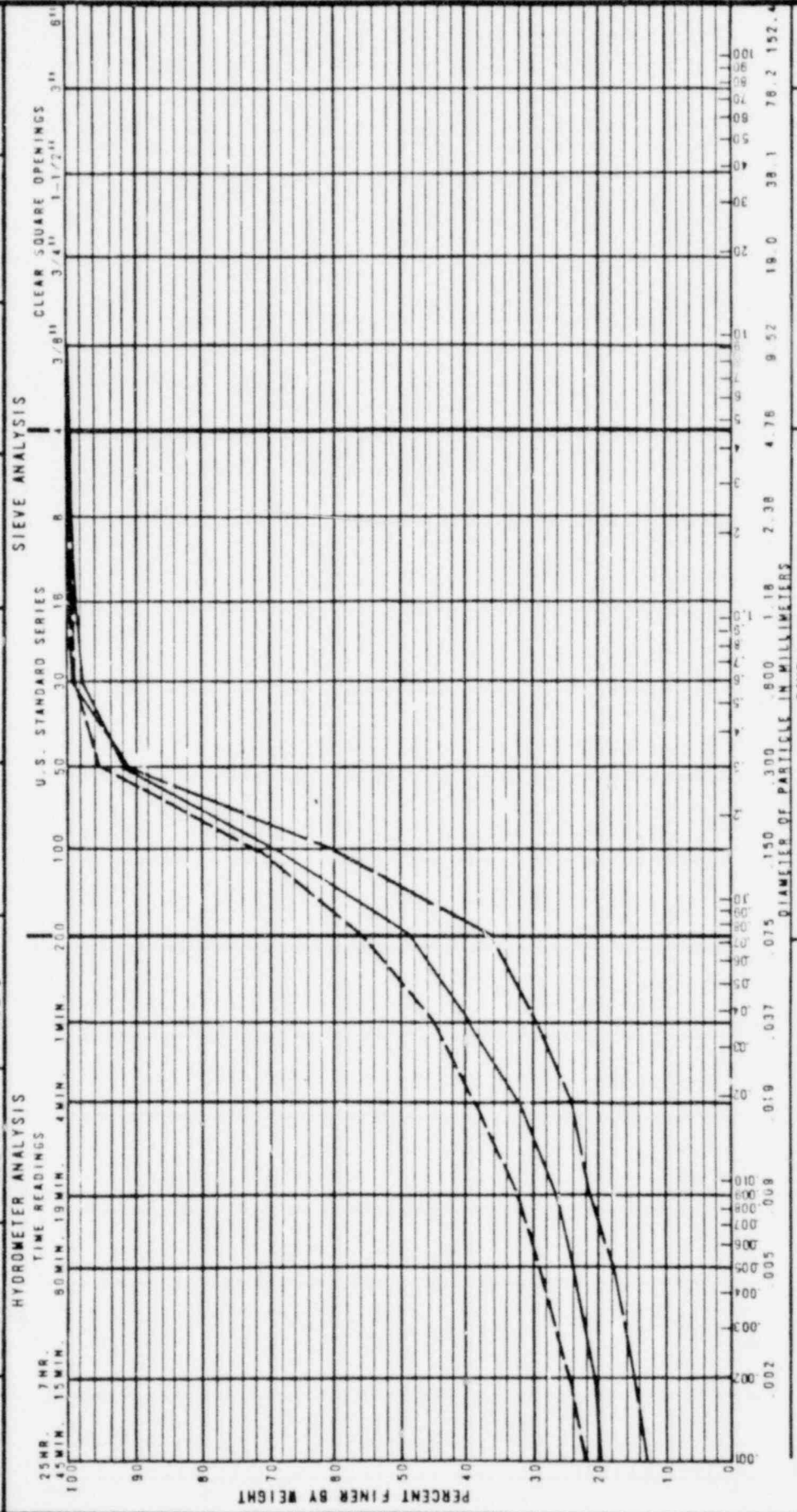
**GRADATION TEST RESULTS**

PROJECT NO.	DATE	FIGURE NO.
GUL-101	DECEMBER 1977	8



**K E Y:**

LL	26	34	34
PL	20	13	13
PI	6	21	21
NAT. W/C	10.9	9.5	10.8
SPEC. GRAVITY	----	2.68	2.68
CLASSIF. SYMB.	SC-SM	CL	SC
SAMPLE NO.	S-1	S-2	S-2
DEPTH, FT.	3-4	10-11.5	10-11.5
HOLE NO.	WSL-9	WSL-9	WSL-9



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**GRADATION TEST RESULTS**

PROJECT NO.

GUL-101

DATE

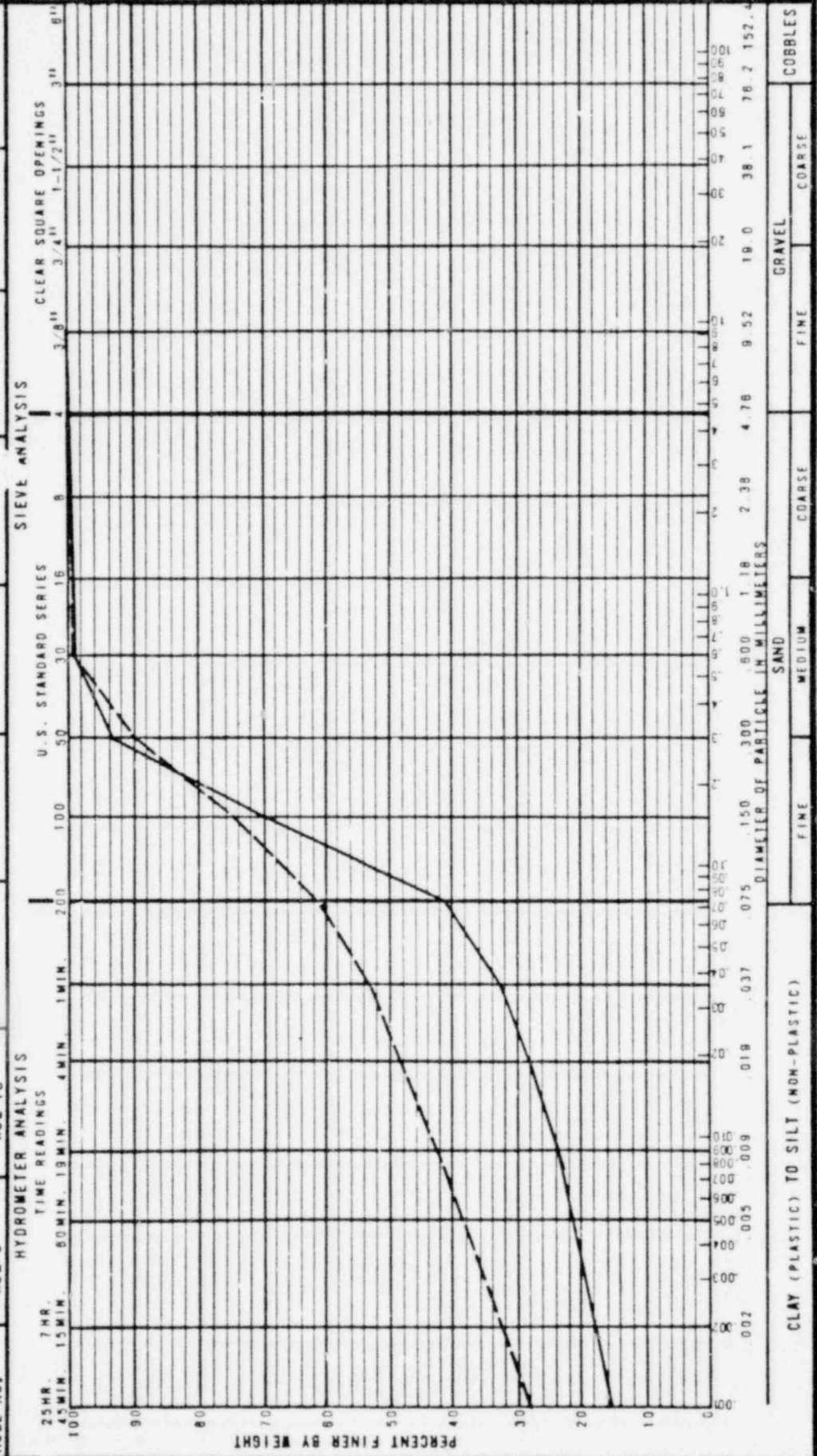
DECEMBER 1977

FIGURE NO.

8

KEY:

LL	23	35
PL	22	16
PI	1	19
NAT. W/C	24.0	9.6
SPEC. GRAVITY	-----	2.69
CLASSIF. SYMB.	SM	CL
SAMPLE NO.	S-3	G-1
DEPTH, FT.	15-16.5	5-10
HOLE NO.	MSL-9	MSL-16



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MT. TAYLOR URANIUM MILL PROJECT

GRADATION TEST RESULTS

PROJECT NO.	DATE	FIGURE NO.
GUL-101	DECEMBER 1977	B-1

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PAID AUTO. NEWPORT BEACH CALIF.

PROJECT NO.  
GUL-101

DATE  
SEPTEMBER 1977

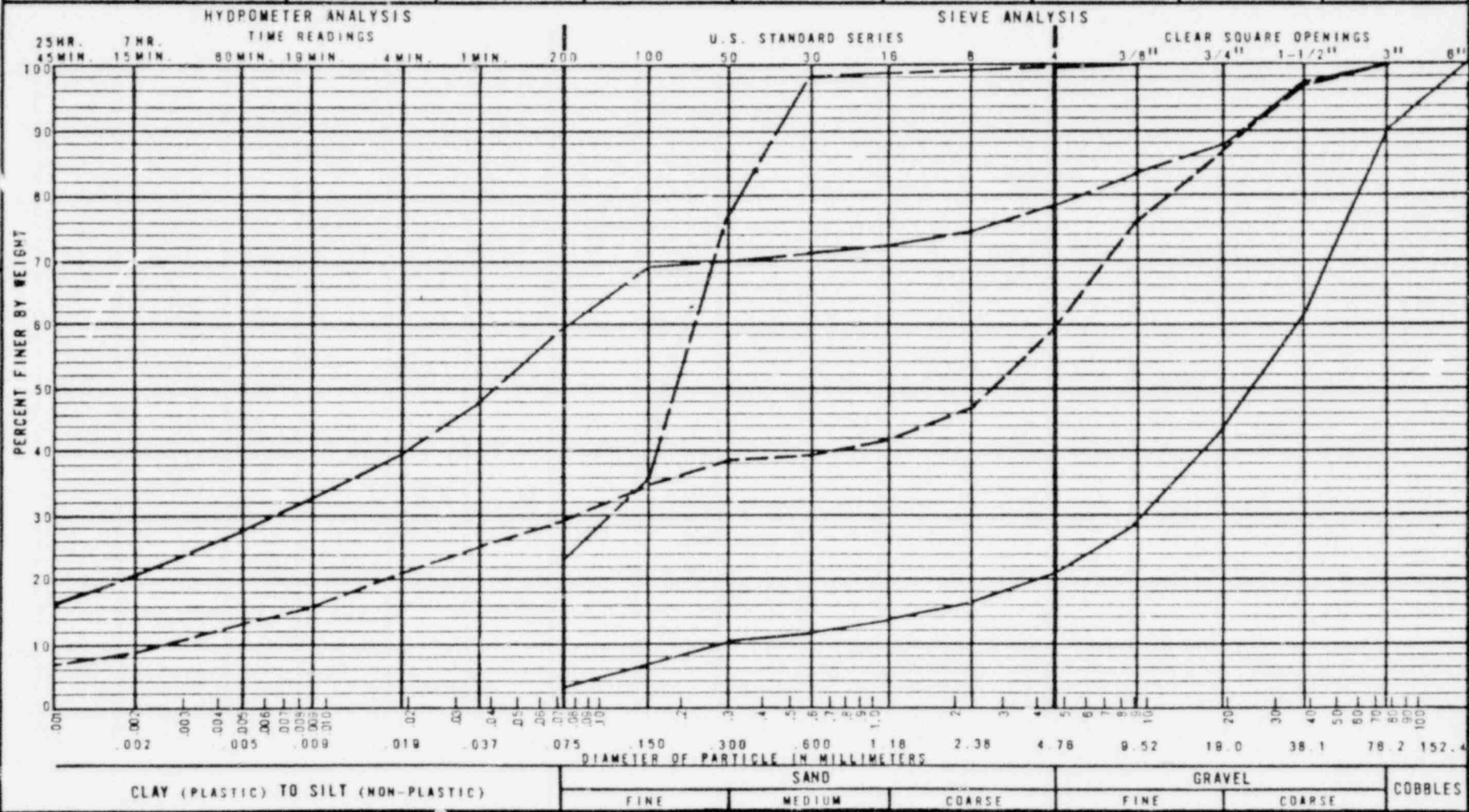
FIGURE NO.  
1

GRADATION TEST RESULTS

KEY:

LL	25	30	30	----
PL	25	15	16	----
PI	0	15	14	----
NAT. W/C	----	10.7	7.2	10.1
SPEC. GRAVITY	----	2.69	----	----
CLASSIF. SYMB.	GP	GC <sup>2</sup>	CL <sup>*</sup>	SM
SAMPLE NO.	----	----	----	----
DEPTH, FT.	1.0-3.0	1.0-2.5	3.5-4.5	4-5 <sup>1</sup>
HOLE NO.	WT-80	WT-81	WT-82	WT-98

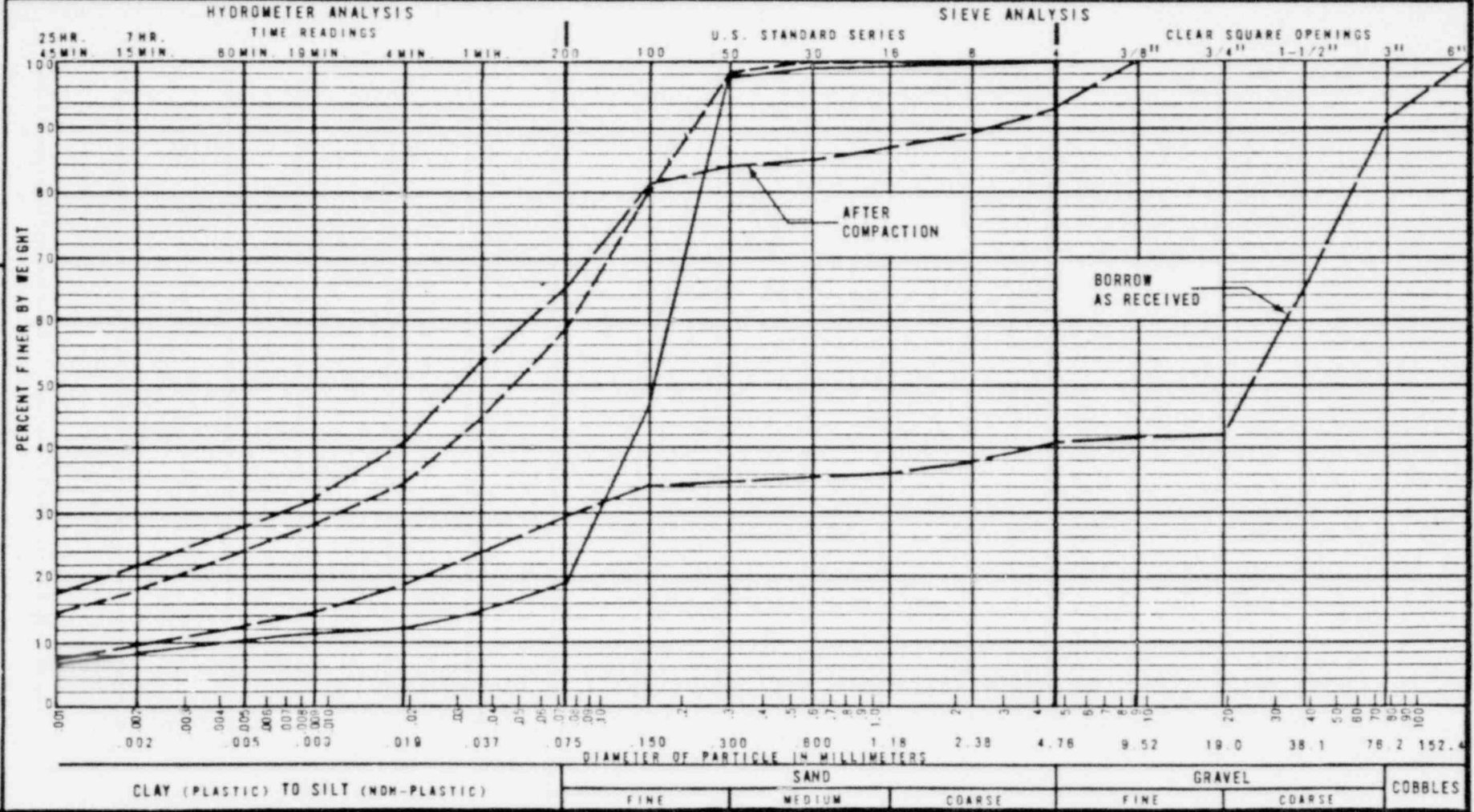
\* COARSE MATERIAL BREAKS DOWN  
WHEN COMPACTED.



BORROW AS RECEIVED AFTER COMPACTION

KEY:

LL	NP	----	26	26
PL	NP	----	20	20
PI	NP	----	6	6
NAT. W/C	4.3	7.3	8.5	8.5
SPEC. GRAVITY	----	----	----	----
CLASSIF. SYMB.	SM	CL	GC-GM	CL-ML
SAMPLE NO.	B-1	B-1	B-1	B-1
DEPTH, FT.	3-5.5	1-3	3-6.5	3-6.5
HOLE NO.	WT-105	WT-107	WT-109	WT-109



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WT. TAYLOR URANIUM MILL PROJECT

PAID AUTO. NEWPORT BEACH CALIF

GRADATION TEST RESULTS

PROJECT NO. GUL-101

DATE

DECEMBER 1977

FIGURE NO.

Sheet 20 of 29

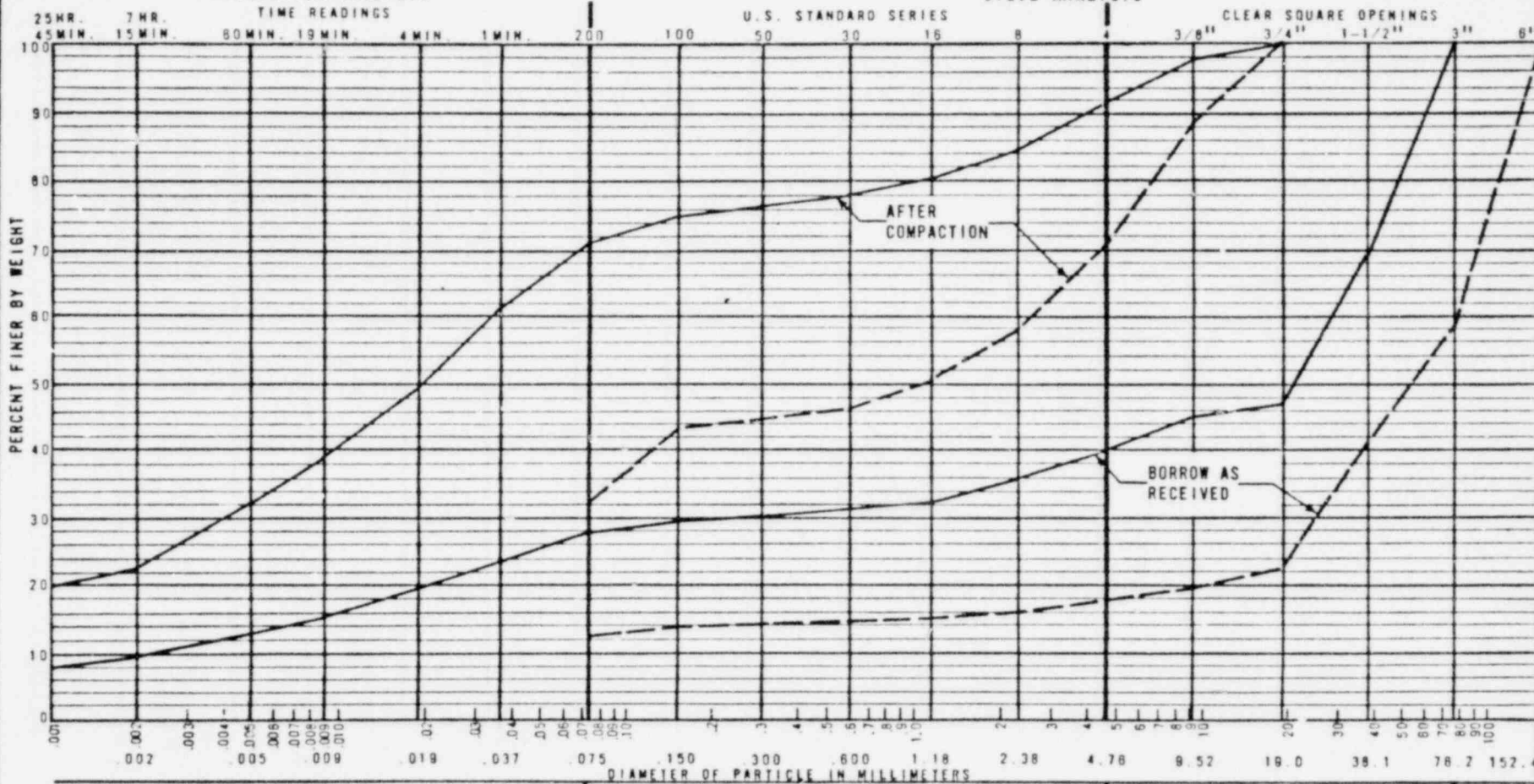
AS RECEIVED      AFTER COMPACTION      AS RECEIVED      AFTER COMPACTION

KEY:

LL	31	31	25	25
PL	17	17	20	20
PI	14	14	5	5
NAT. W/C	10.2	10.2	----	----
SPEC. GRAVITY	----	----	----	----
CLASSIF. SYMB.	GC	CL	GC-GM	SC-SM
SAMPLE NO.	B-1	B-1	B-1	B-1
DEPTH, FT.	4-6	4-6	1-3	1-3
HOLE NO.	WT-110	WT-110	WT-111	WT-111

HYDROMETER ANALYSIS

SIEVE ANALYSIS



W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PAID A.C.T.O. • MEMPHIS BEACH • CALIF.

GRADATION TEST RESULTS

PROJECT NO. GUL-101

DATE DECEMBER 1977

FIGURE NO. 1

W.A. WALKER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PAID AHEAD • NIROPOT BEACH • CALIF.

PROJECT NO.

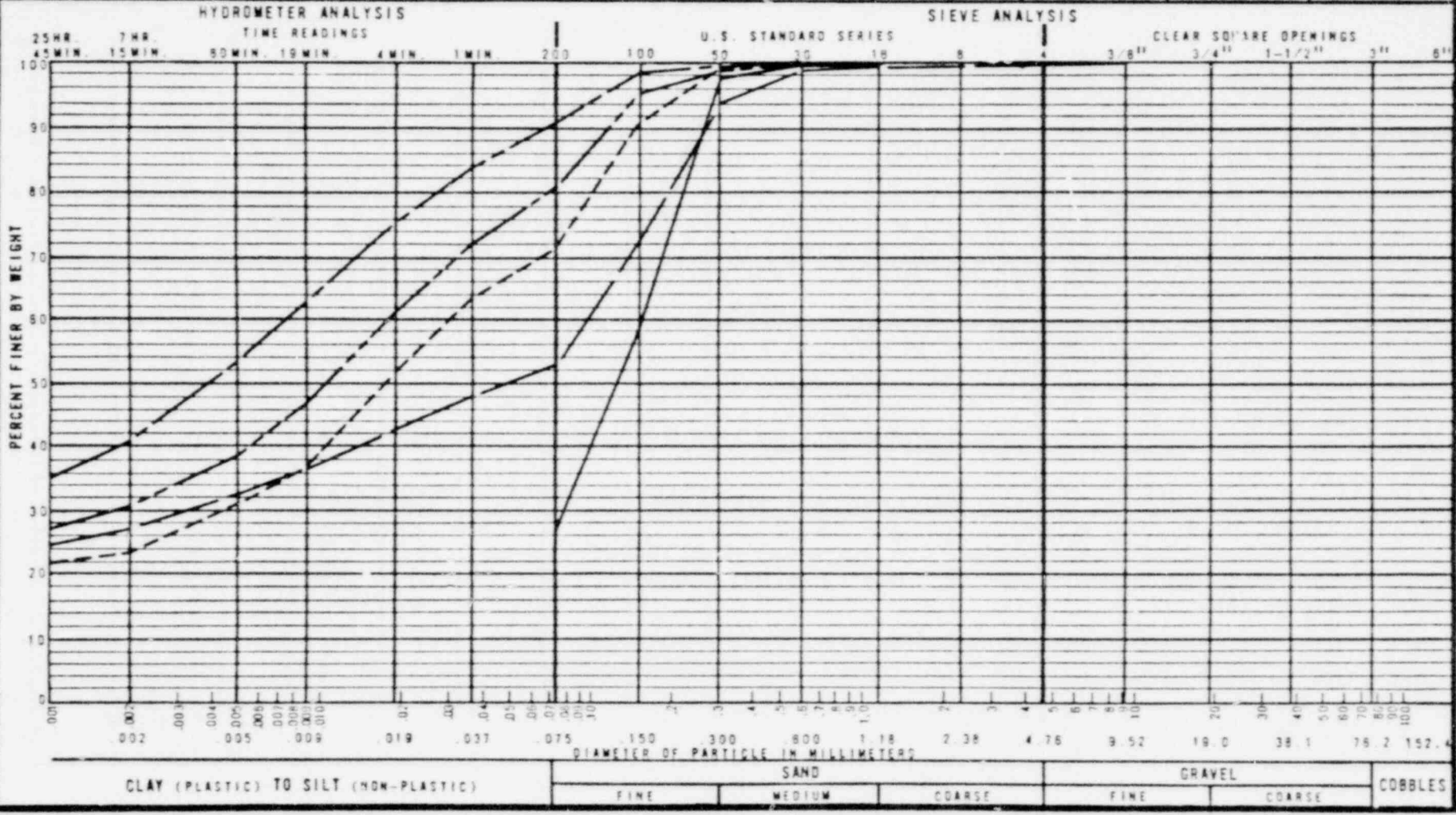
DATE

FIGURE NO.

GRADATION TEST RESULTS

KEY:

LL	----	----	26	43	34				
PL	----	----	11	17	16				
PI	----	----	15	26	18				
NAT. W/C	----	----	----	----	----				
SPEC. GRAVITY	----	----	----	----	----				
CLASSIF. SYMB.	SM	CL	CL	CL	CL				
SAMPLE NO.	S-1	S-2	G-1	S-1	S-2				
DEPTH, FT.	5.0-6.8	13.0-14.3	0-5.0	5.0-6.5	13.0-13.7				
HOLE NO.	WPC-8	WPC-8	WPC-9	WPC-9	WPC-9				



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& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

GRADATION TEST RESULTS

PAID ALTO • REPORT BEACH • CALIF.

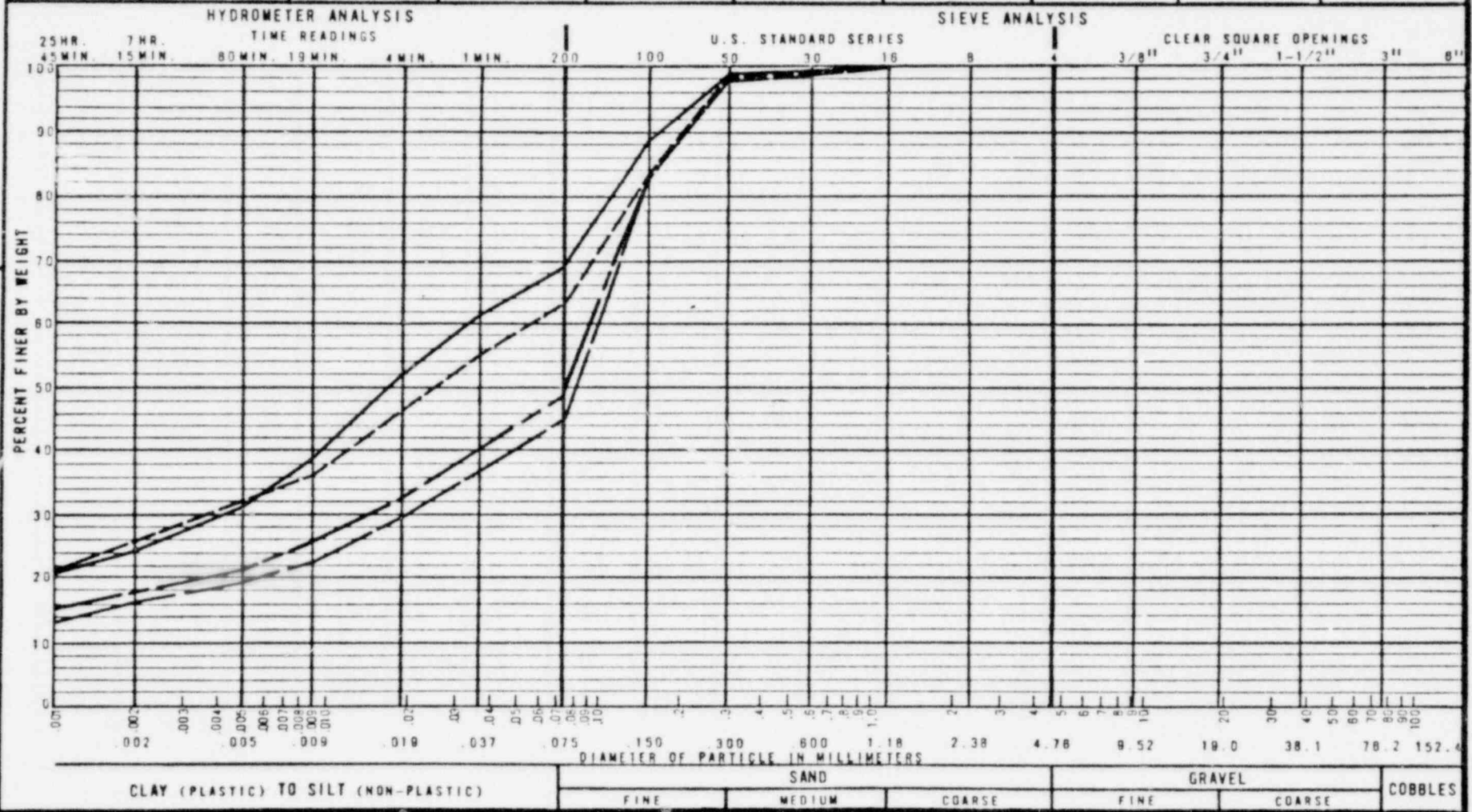
PROJECT NO.  
GUL-105A

DATE  
DECEMBER 1979

FIGURE NO.  
8-1

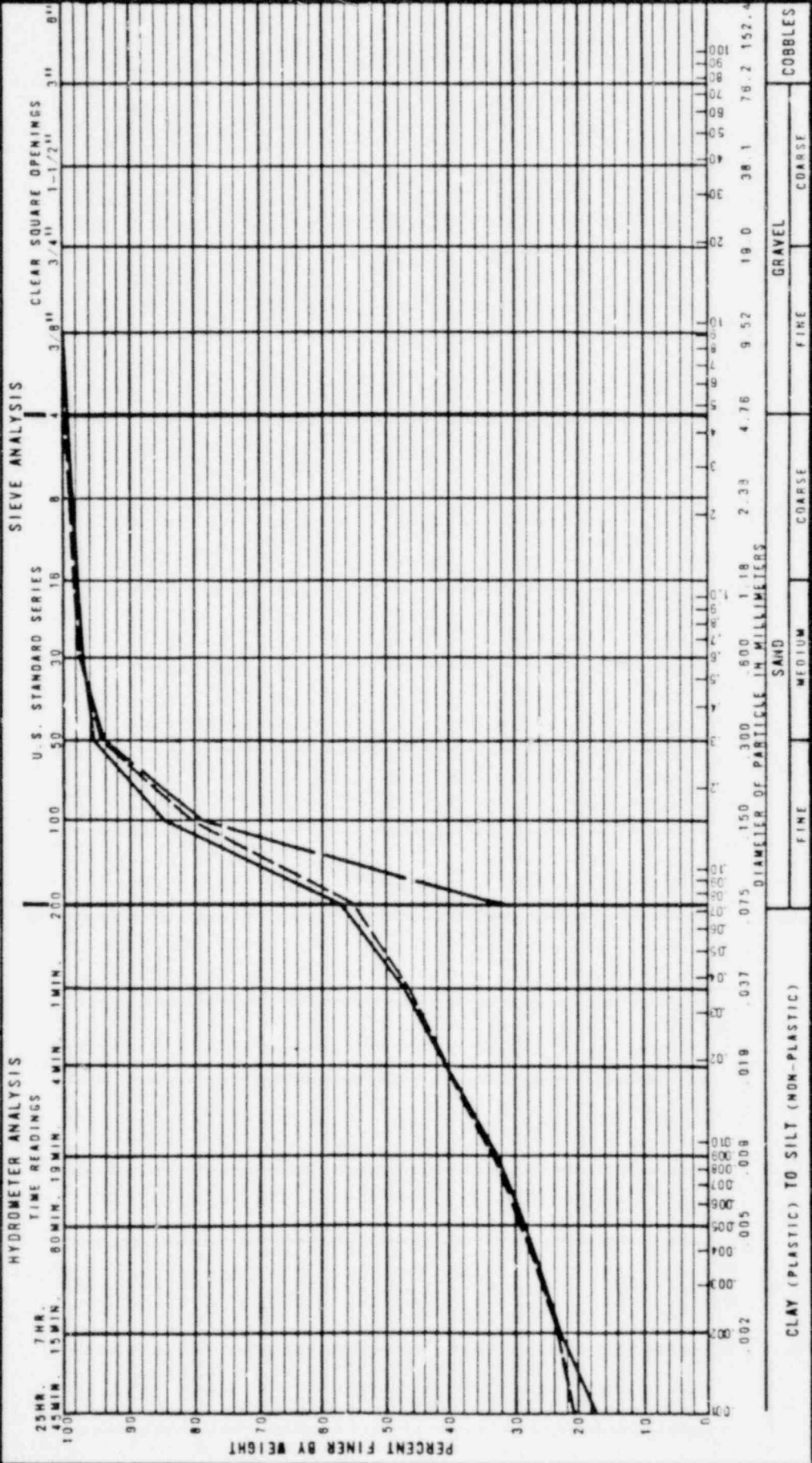
Sheet 23 of 29

KEY:				
LL	----	----	23	----
PL	----	----	20	----
PI	----	----	3	----
NAT. W/C	----	----	----	----
SPEC. GRAVITY	----	2.63	----	----
CLASSIF. SYMB.	CL	CL	SM	SM
SAMPLE NO.	S-1	S-2	S-3	S-4
DEPTH, FT.	5.0-6.75	13.0-14.7	35.0-36.3	55.0-56.4
HOLE NO.	WPC-12	WPC-12	WPC-33	WPC-33



KEY:

LL	25	28	21
PL	13	12	NP
PI	12	16	0
NAT. W/C	5.8	5.3	3.3
SPEC. GRAVITY	---	---	2.63
CLASSIF. SYMB.	CL	CL	SM
SAMPLE NO.	---	---	---
DEPTH, FT.	10.0-13.0	2.0-5.0	14.0-18.0
HOLE NO.	LP-15	LP-16	LP-17



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GRADATION TEST RESULTS

PROJECT NO.	DATE	FIGURE NO.
GUL-105A	DECEMBER 1979	8-1



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MT. TAYLOR URANIUM MILL PROJECT

PALD AUTO • NEWPORT BEACH • CALIF.

PROJECT NO. GUL-105A

DATE DECEMBER 19, 19

FIGURE NO. 8-1

GRADATION TEST RESULTS

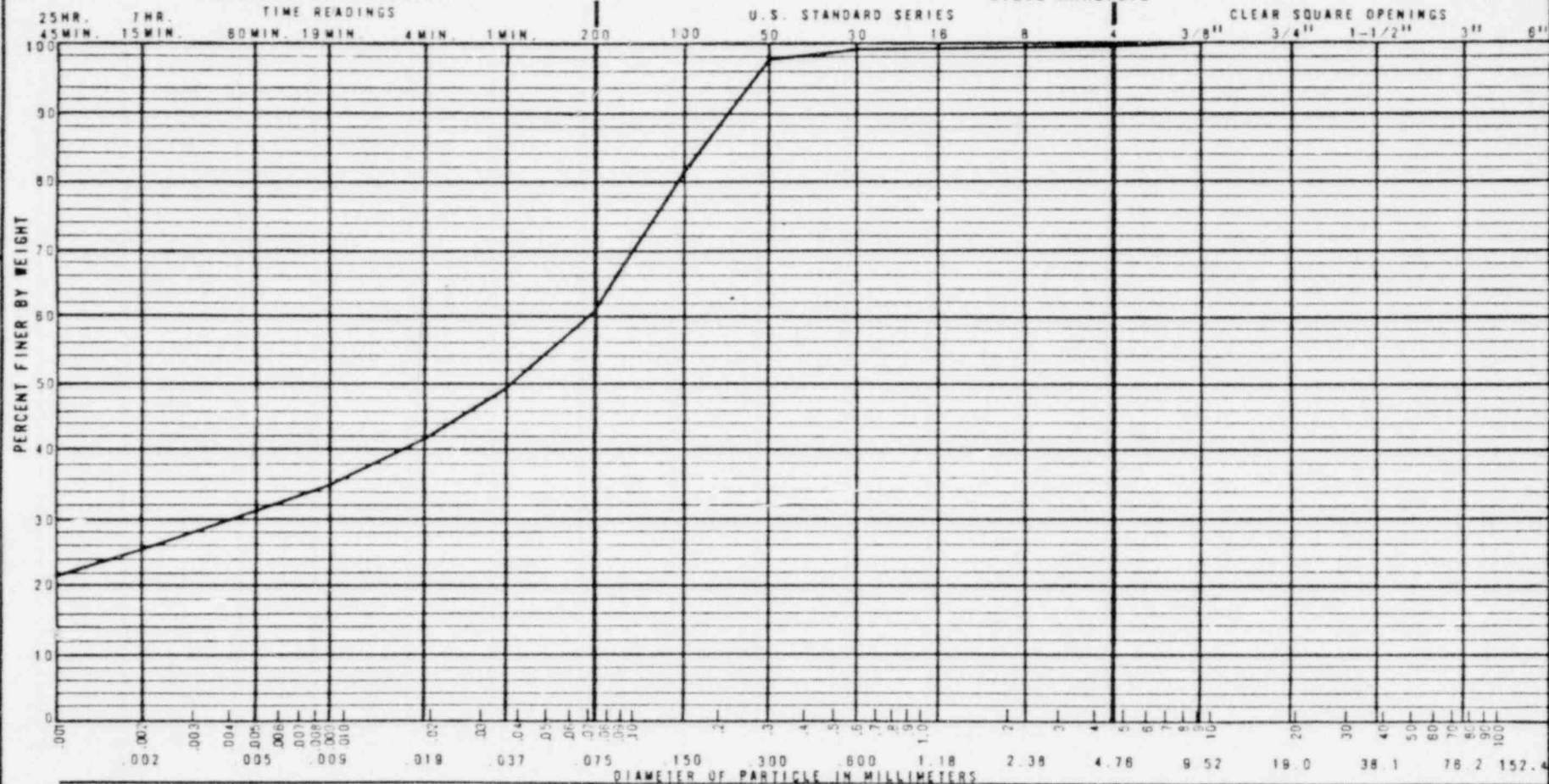
KEY:

LL	26																	
PL	13																	
PI	13																	
NAT. W/C	----																	
SPEC. GRAVITY	2.66																	
CLASSIF. SYMB.	CL																	
SAMPLE	COMBINED*																	
DEPTH, FT.	----																	
HOLE NO.	----																	

COMBINED\* OF: WPC-8, S-2;  
WPC-9, G-1, S-1 AND S-2;  
WPC-12, S-1 AND S-2; LP-15

HYDROMETER ANALYSIS  
TIME READINGS

SIEVE ANALYSIS



CLAY (PLASTIC) TO SILT (NON-PLASTIC)

SAND

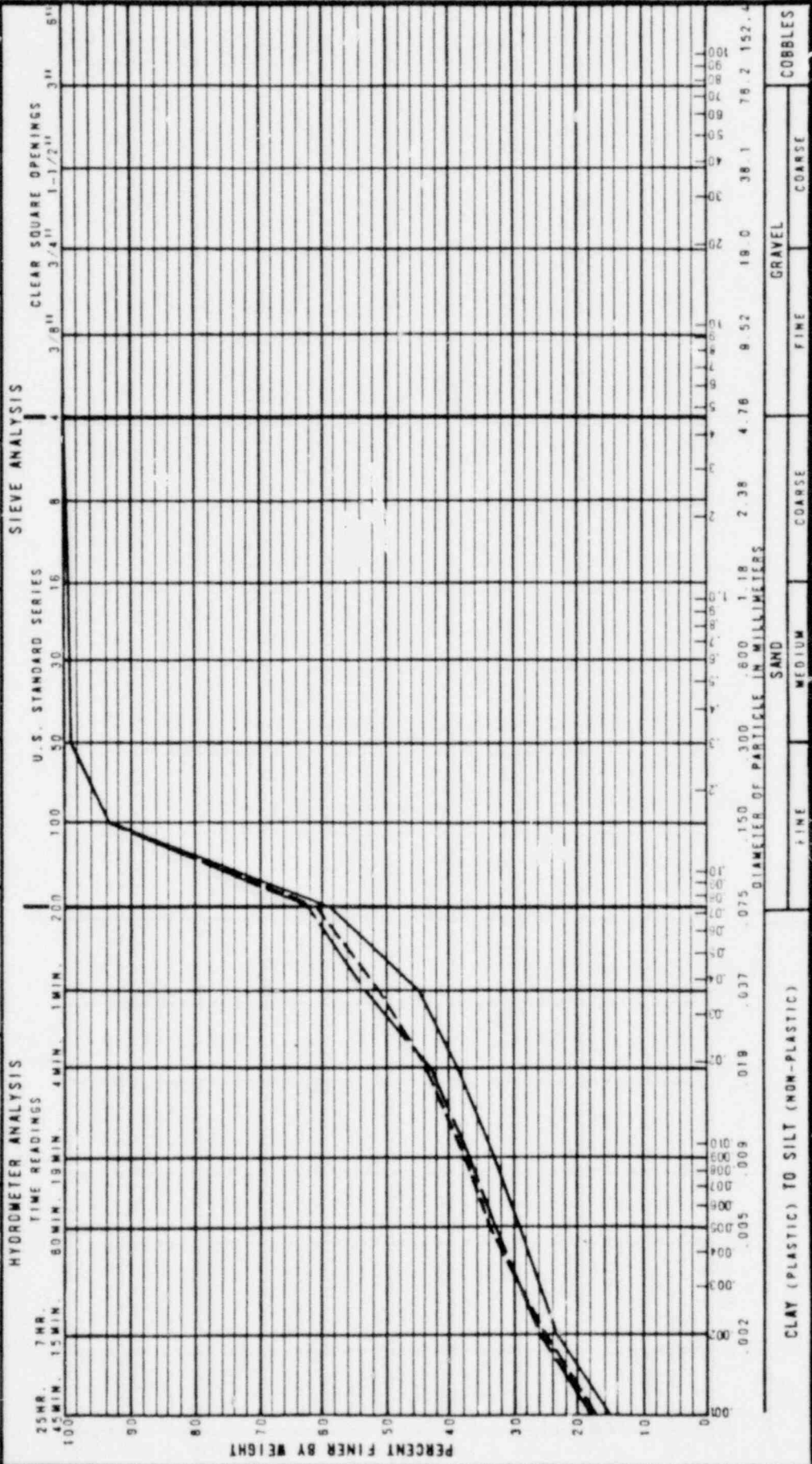
GRAVEL

COBBLES

KEY:

LL	26	26	28
PL	16	14	15
PI	10	12	13
NAT. W/C	5.5	5.7	5.8
SPEC. GRAVITY	2.68	---	---
CLASSIF. SYMB.	CL	CL	CL
SAMPLE	COMBINED*	COMBINED*	COMBINED*
	---	(1% BENTONITE)	(2% BENTONITE)
	---	---	---

\*COMBINED OF: LP-10, 20 0-25.0 FEET  
AND LP-11, 9.0-15.0 FEET.



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MT. TAYLOR URANIUM MILL PROJECT

GRADATION TEST RESULTS

PROJECT NO.	DATE	FIGURE NO.
GUL-105A	JANUARY 1980	8

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MT. TAYLOR URANIUM MILL PROJECT  
PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.  
GUL-101

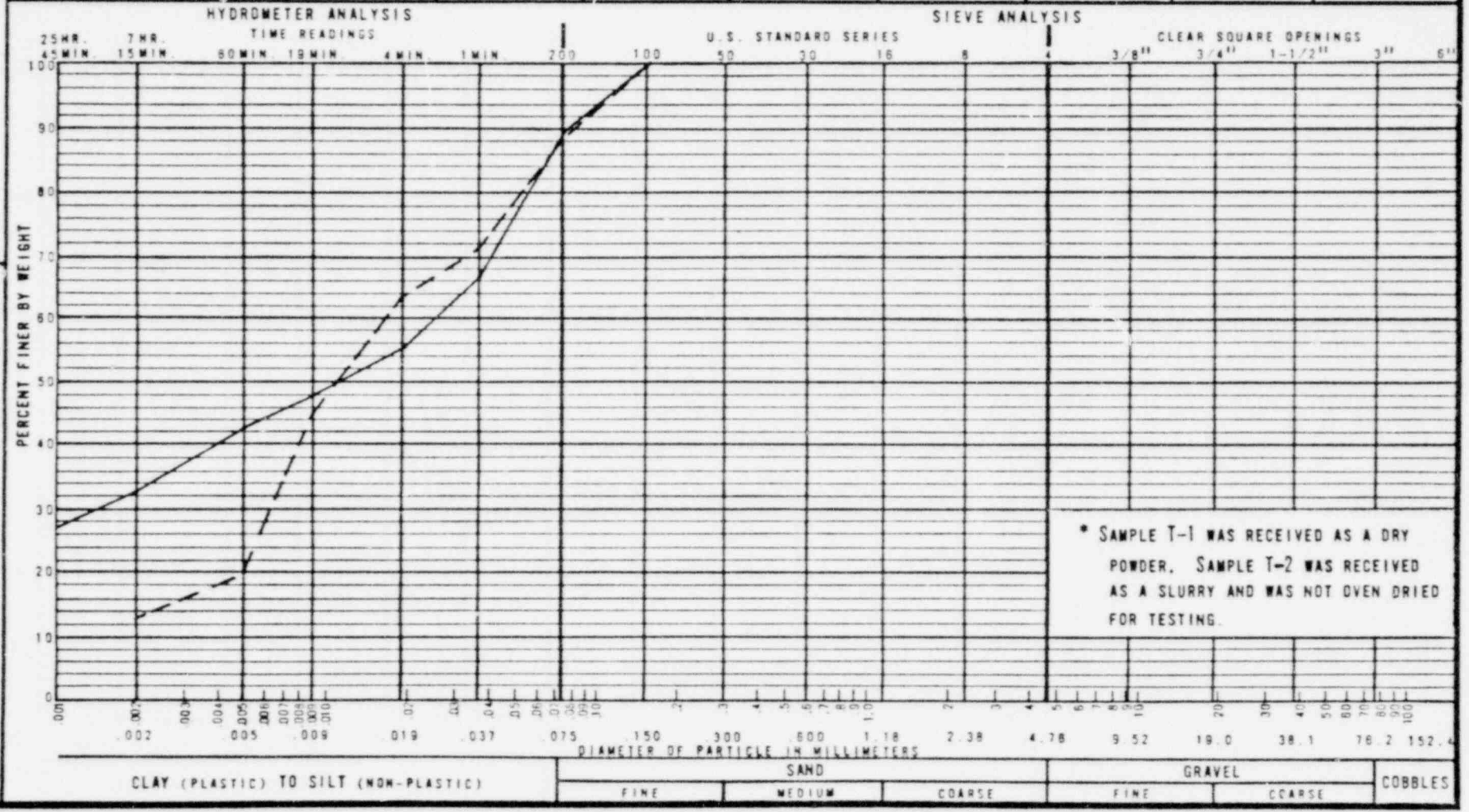
DATE  
JUNE 1977

FIGURE NO.  
B

GRADATION TEST RESULTS

KEY: \_\_\_\_\_

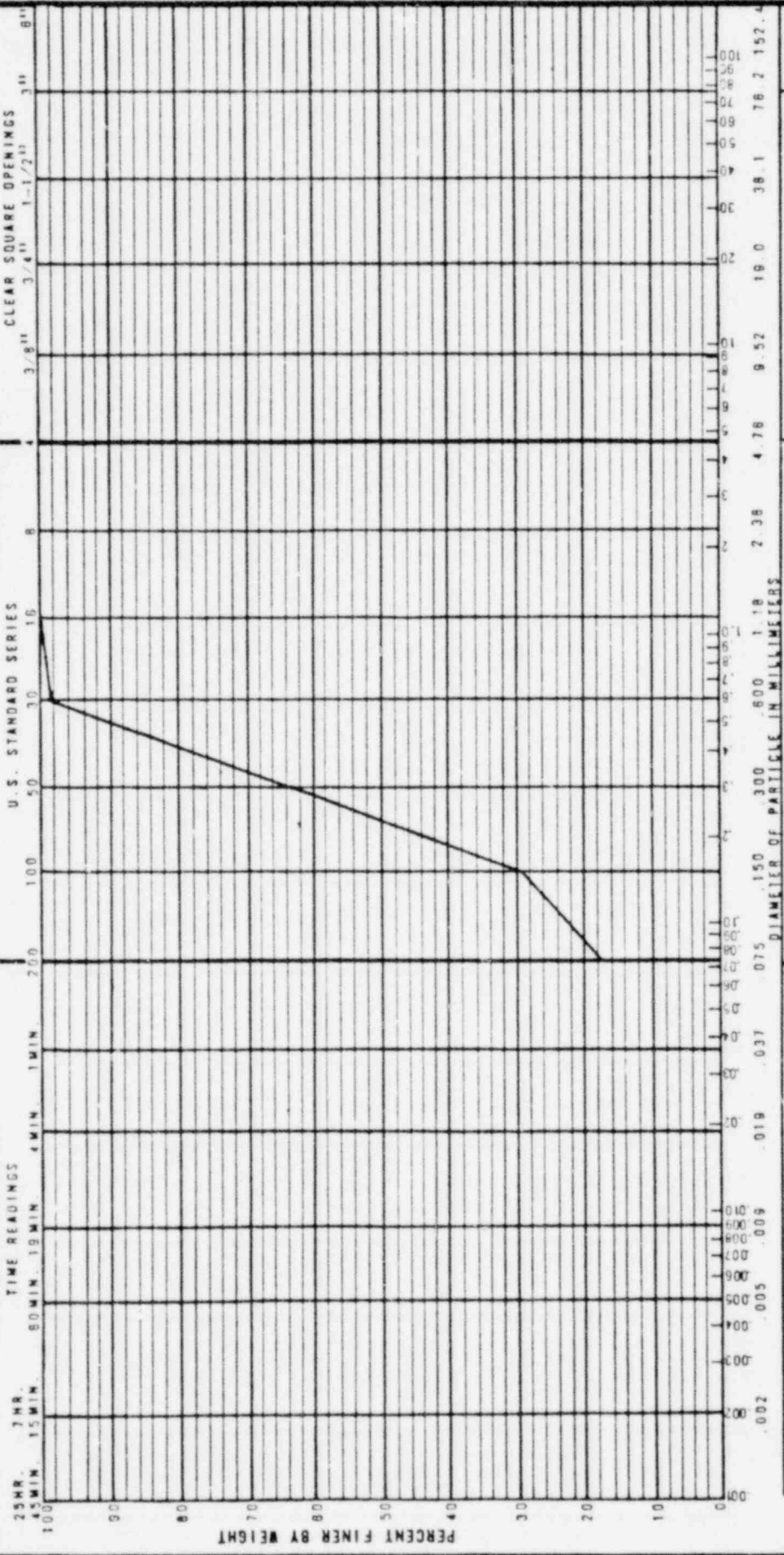
LL	56	110
PL	22	37
PI	34	73
NAT. W/C	3.4	376
SPEC. GRAVITY	2.54	----
CLASSIF. SYMB.	CH	CH
SAMPLE NO.	T-1*	T-2*
DEPTH, FT.	----	----
HOLE NO.	----	----



KEY:

LL	24
PL	NP
PI	0
NAT. W/C	28.3
SPEC. GRAVITY	2.65
CLASSIF. SYMB.	SM
SAMPLE	TOTAL TAILINGS
DEPTH, FT.	----
HOLE NO.	----

HYDROMETER ANALYSIS



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MT. TALYOR URANIUM MILL PROJECT

GRADATION TEST RESULTS

PROJECT NO. GUL-101	DATE OCTOBER 1977	FIGURE NO. B
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GRADATION TEST RESULTS

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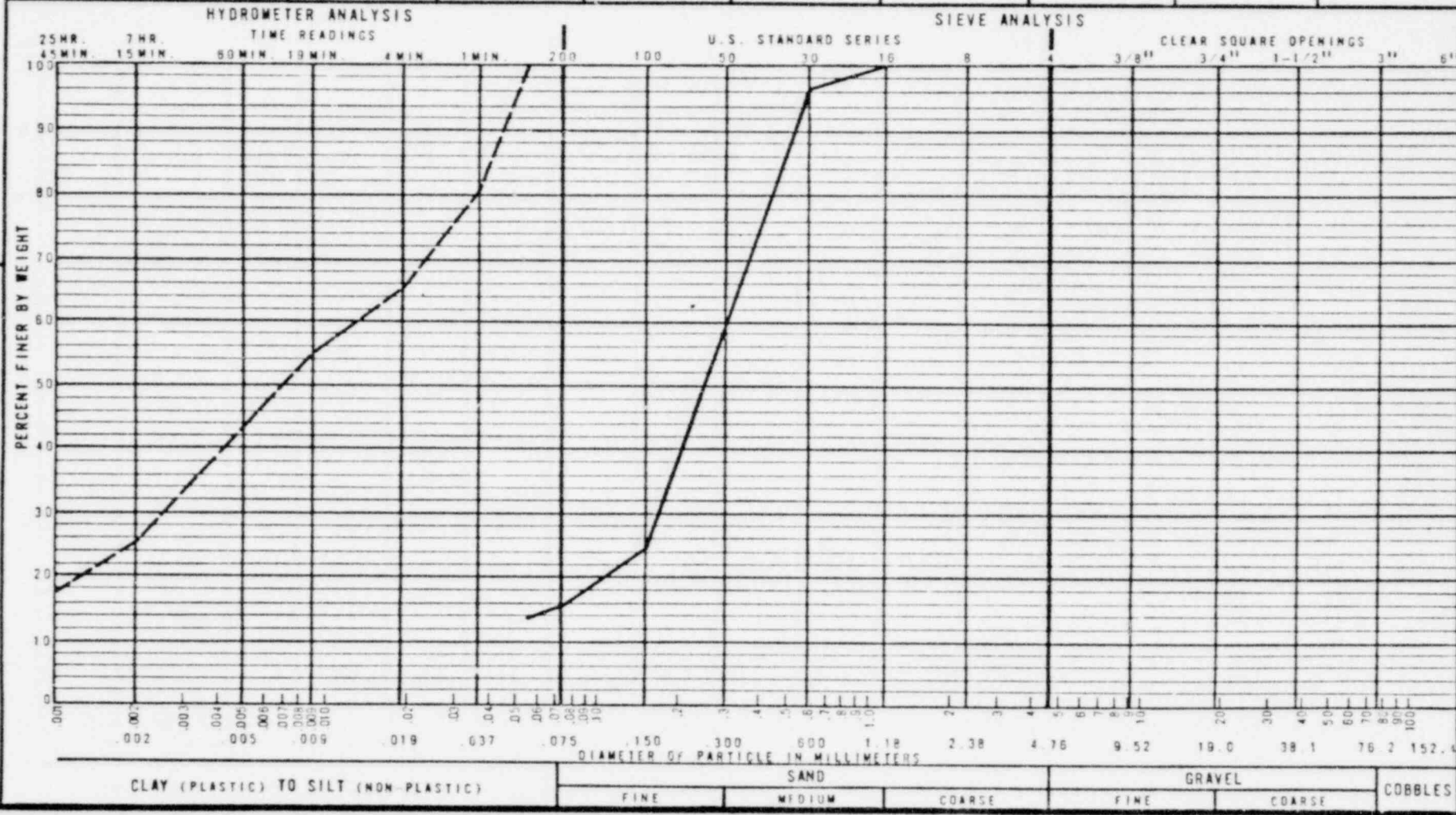
PROJECT NO.  
GUL-105A

DATE  
AUGUST 1979

FIGURE NO.  
1

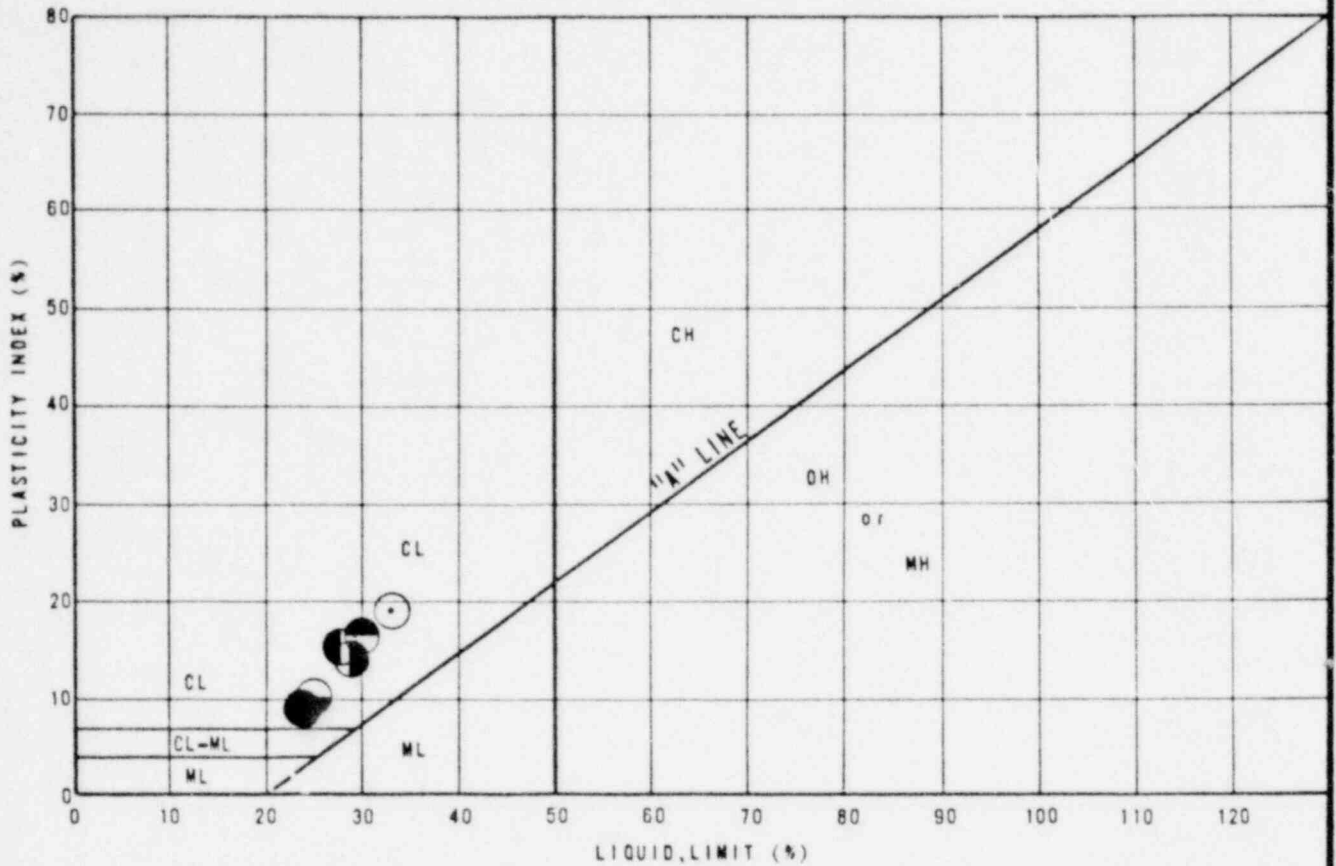
Sheet 29 of 29

KEY:		-----	
LL	NP	70	
PL	NP	40	
PI	0	30	
NAT. W/C	67.1	----	
SPEC. GRAVITY	2.76	2.63	
CLASSIF. SYMB.	SM	MH-OH	
SAMPLE	TOTAL TAILINGS	#270" TAILINGS	
DEPTH, FT.	----	----	
HOLE NO.	----	----	



CLAY (PLASTIC) TO SILT (NON-PLASTIC)	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	

### PLASTICITY CHART



### PLASTICITY DATA

KEY SYMBOL	HOLE NO., SAMPLE NO.	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $\frac{W - PL}{LL - PL}$	UNIFIED SOIL CLASSIFICATION SYMBOL
○	WB-1, B-1	0-13	9.2	14	33	19	----	CL
●	WB-1, B-2	13-22	4.8	15	24	9	----	CL
◐	WB-3, B-1	0-8	8.0	15	29	14	----	CL
◑	WB-4, B-1	0-13	6.8	13	28	15	----	CL
◒	WB-5, B-1	0-17	5.5	15	25	10	----	CL
◓	WB-6, B-1	0-10	8.7	14	30	16	----	CL

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MT. TAYLOR URANIUM MILL PROJECT

ATTERBERG LIMITS - PLASTICITY DATA

PROJECT NO.

DATE

FIGURE NO.

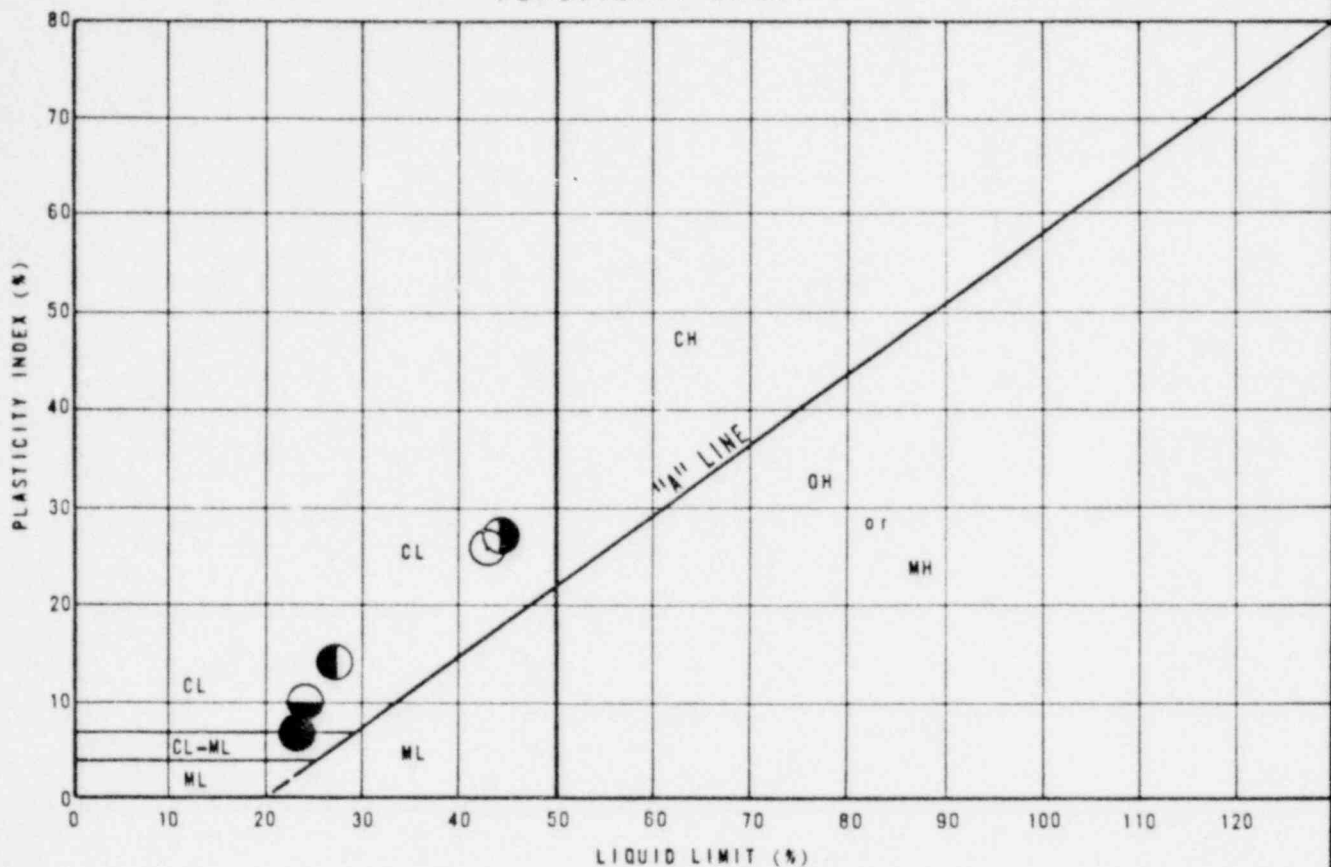
PALO ALTO • NEWPORT BEACH • CALIF.

GUL-101

AUGUST 1977

B-2

### PLASTICITY CHART



### PLASTICITY DATA

KEY SYMBOL	HOLE NO. SAMPLE NO.	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $(\frac{W - PL}{LL - PL})$	UNIFIED SOIL CLASSIFICATION SYMBOL
○	WB-7, B-1	0-5	9.3	17	43	26	----	CL
◐	WB-9, B-1	0-11	5.0	16	23	7	----	CL-ML
◑	WB-9, B-2	11-21	6.4	13	27	14	----	CL
◒	WB-11, B-1	0-11	10.2	17	44	27	----	CL
◓	WB-11, B-2	11-16.5	5.6	14	24	10	----	CL

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MT. TAYLOR URANIUM MILL PROJECT

ATTERBERG LIMITS - PLASTICITY DATA

PROJECT NO.

DATE

FIGURE NO.

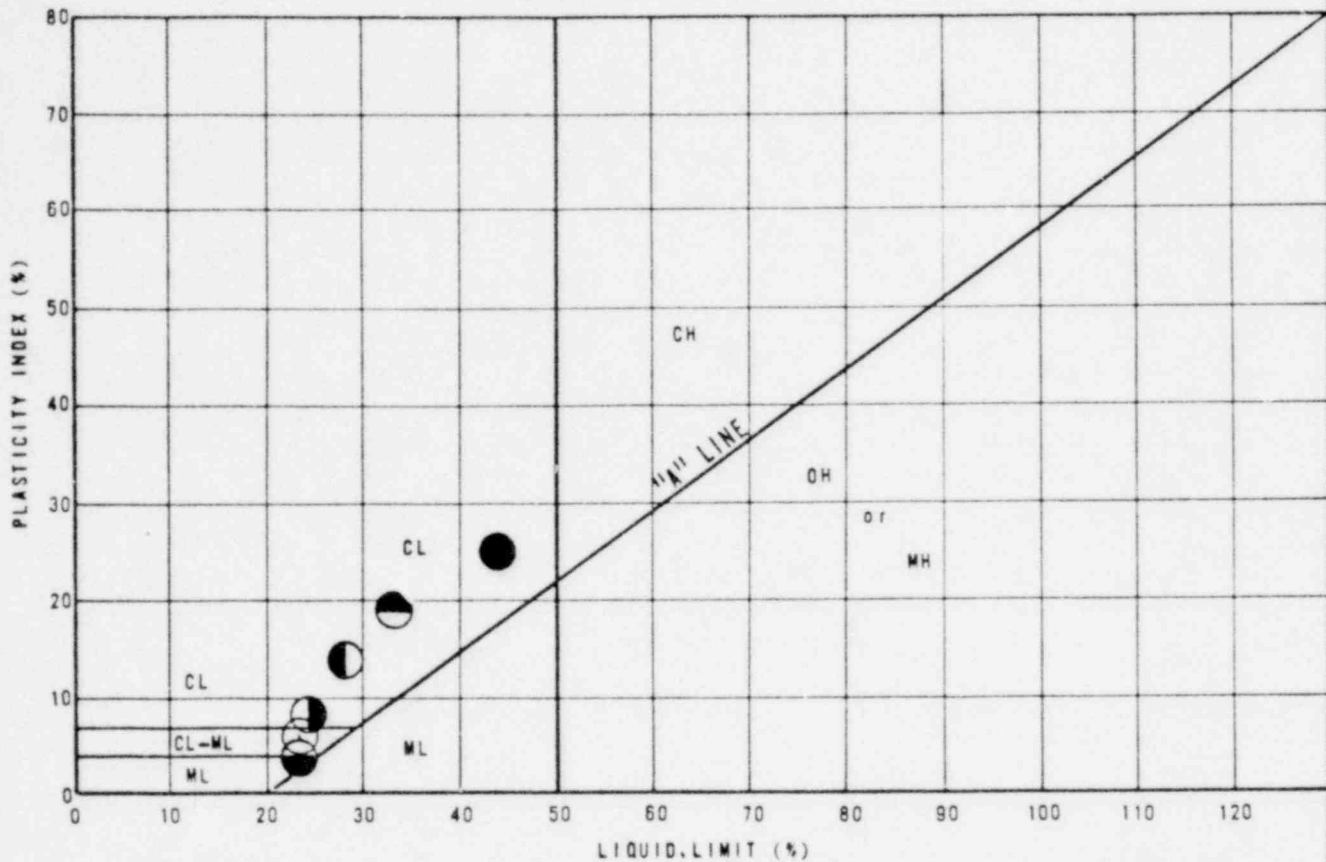
GUL-101

AUGUST 1977

B-2

PALO ALTO • NEWPORT BEACH • CALIF.

PLASTICITY CHART



PLASTICITY DATA

KEY SYMBOL	HOLE NO. SAMPLE NO.	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $(\frac{W - PL}{LL - PL})$	UNIFIED SOIL CLASSIFICATION SYMBOL
○	WB-14, B-3	5-39	4.9	17	23	6	----	CL-ML
●	WB-15, B-1	0-5	10.9	19	44	25	----	CL
◐	WB-15, B-2	5-44	5.8	16	24	8	----	CL
◑	WB-17, B-1	0-10	2.4	14	28	14	----	CL
◒	WB-17, B-2	10-18	4.7	19	23	4	----	SM-SC
◓	WB-18, B-1	0-30	7.1	14	33	19	----	CL

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MT. TAYLOR URANIUM MILL PROJECT

ATTERBERG LIMITS - PLASTICITY DATA

PROJECT NO.

DATE

FIGURE NO.

GUL-101

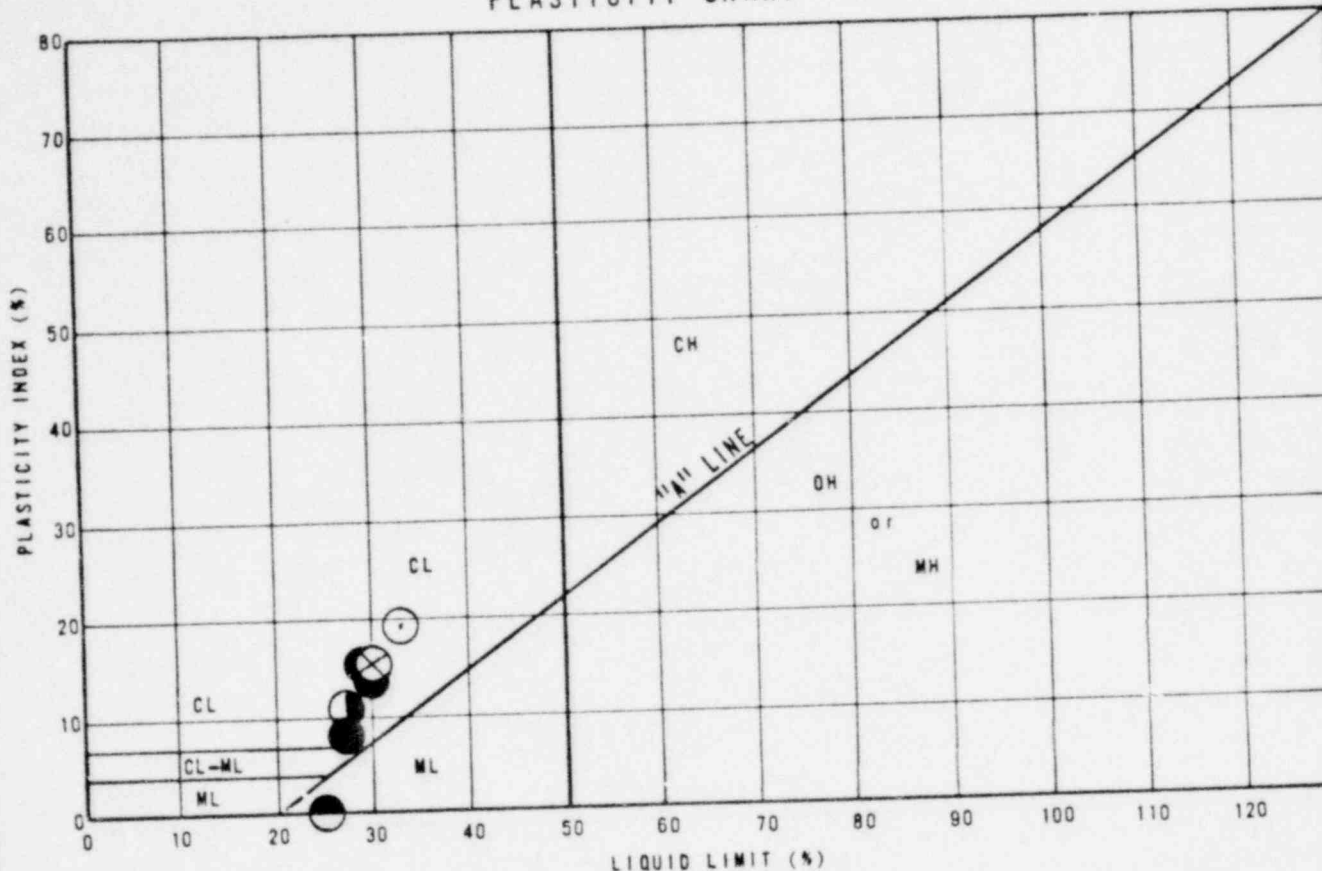
AUGUST 1977

B-2

PALM ALTO • NEWPORT BEACH • CALIF.



### PLASTICITY CHART



### PLASTICITY DATA

KEY SYMBOL	HOLE NUMBER	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $(\frac{W - PL}{LL - PL})$	UNIFIED SOIL CLASSIFICATION SYMBOL
○	WB-43	15.5-16.5	9.7	14	33	19	----	CL
●	WB-44	5.5-6.3	5.4	19	27	8	----	CL-ML
◐	WB-44	13.0-15.0	7.9	14	29	15	----	CL
◑	WB-44	20.4-20.9	6.8	16	27	11	----	CL
◒	WT-80	1.0-3.0	----	25	25	0	----	GP
⊗	WT-81	1.0-2.5	10.7	15	30	15	----	GC
◓	WT-82	3.5-4.5	7.2	16	30	14	----	CL

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**MT. TAYLOR URANIUM MILL PROJECT**

**ATTERBERG LIMITS - PLASTICITY DATA**

PROJECT NO.

DATE

FIGURE NO.

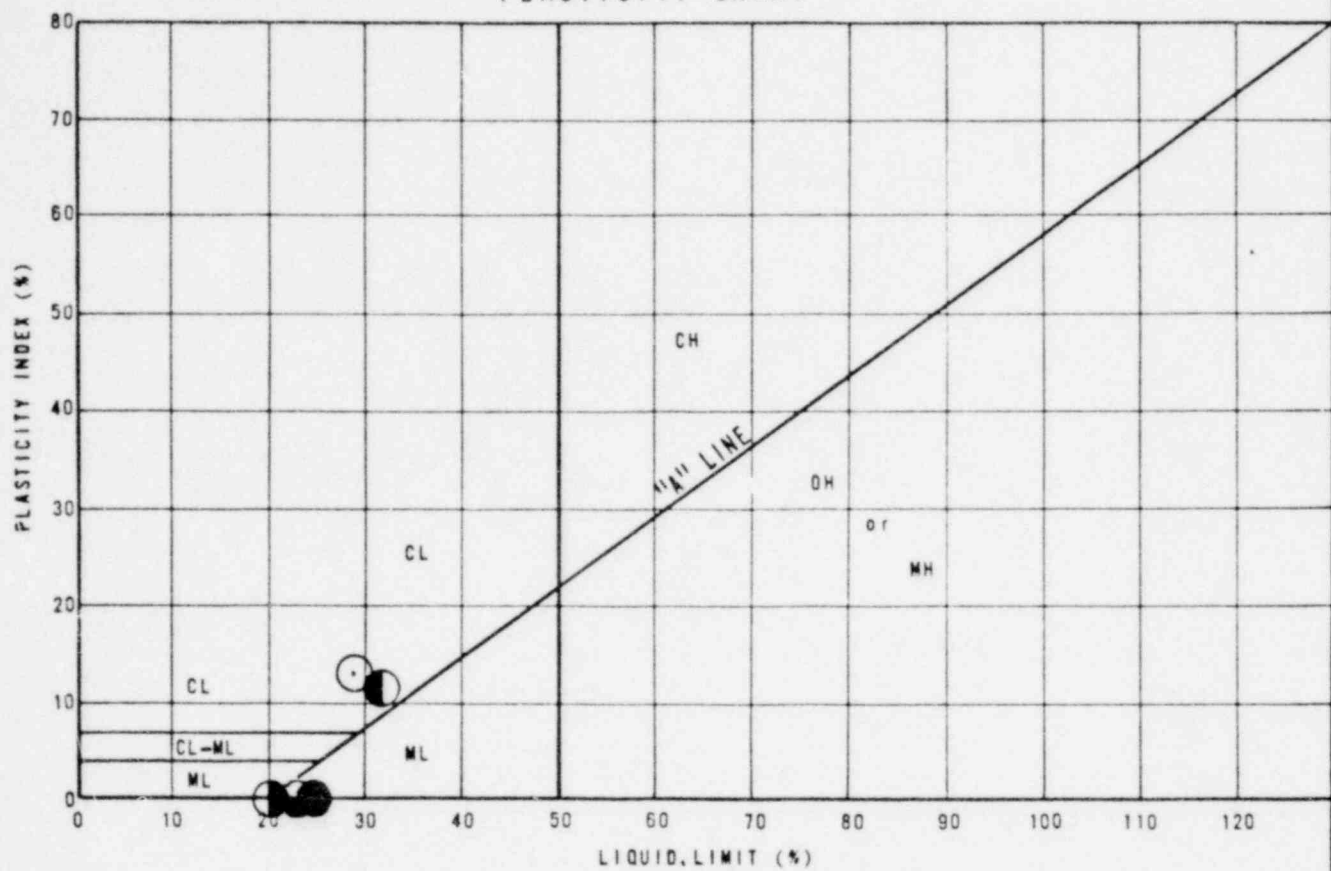
GUL-101

SEPTEMBER 1977

B-2

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### PLASTICITY CHART



### PLASTICITY DATA

KEY SYMBOL	HOLE NO. / SAMPLE NO.	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $(\frac{W - PL}{LL - PL})$	UNIFIED SOIL CLASSIFICATION SYMBOL
○	WPC-2, G-1	0-5	7.2	16	29	13	----	CL
●	WPC-2, S-1	5-7	6.0	NP	24	0	----	ML
◐	WPC-2, S-4	30-31.3	5.3	NP	20	0	----	SM
◑	WPC-2, W-1	38.5-40	11.8	20	32	12	----	CL
◒	WPC-2, W-3	52.5-53	12.8	NP	23	0	----	SM

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ATTERBERG LIMITS - PLASTICITY DATA

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.

DATE

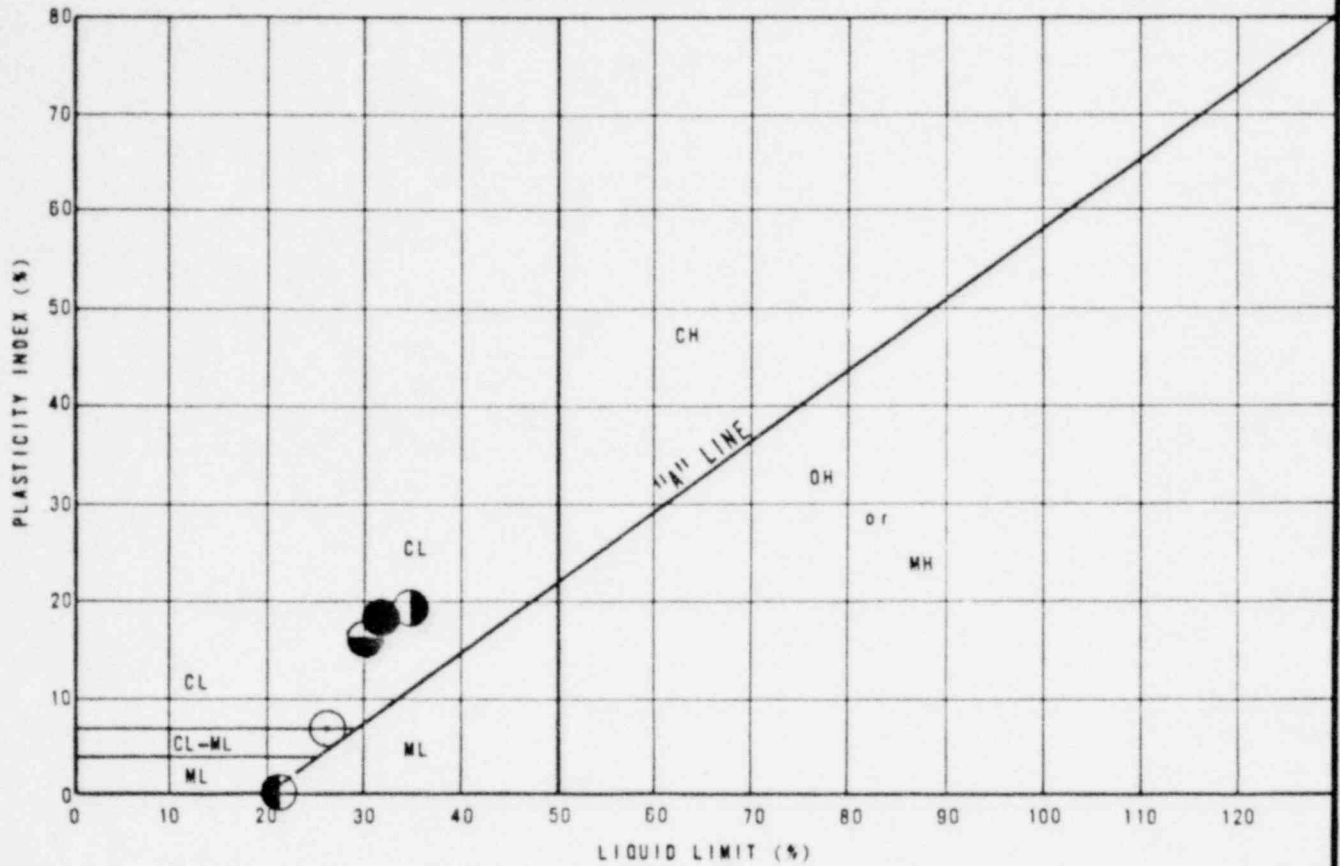
FIGURE NO.

GUL-101

JUNE 1977

B-2

### PLASTICITY CHART



### PLASTICITY DATA

KEY SYMBOL	HOLE NO., SAMPLE NO.	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $(\frac{W - PL}{LL - PL})$	UNIFIED SOIL CLASSIFICATION SYMBOL
○	WPC-3, G-2	8-13	5.0	19	26	7	----	CL-ML
●	WPC-3, G-4	23-28	8.0	14	32	18	----	CL
◐	WPC-3, W-1	29-29.5	9.8	15	34	19	----	CL
◑	WPC-3, W-3	44-44.5	4.1	NP	21	0	----	GM
◒	WPC-5, S-1	5-6.7	8.6	13	30	17	----	CL

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**MT. TAYLOR URANIUM MILL PROJECT**

**ATTERBERG LIMITS - PLASTICITY DATA**

PROJECT NO.

DATE

FIGURE NO.

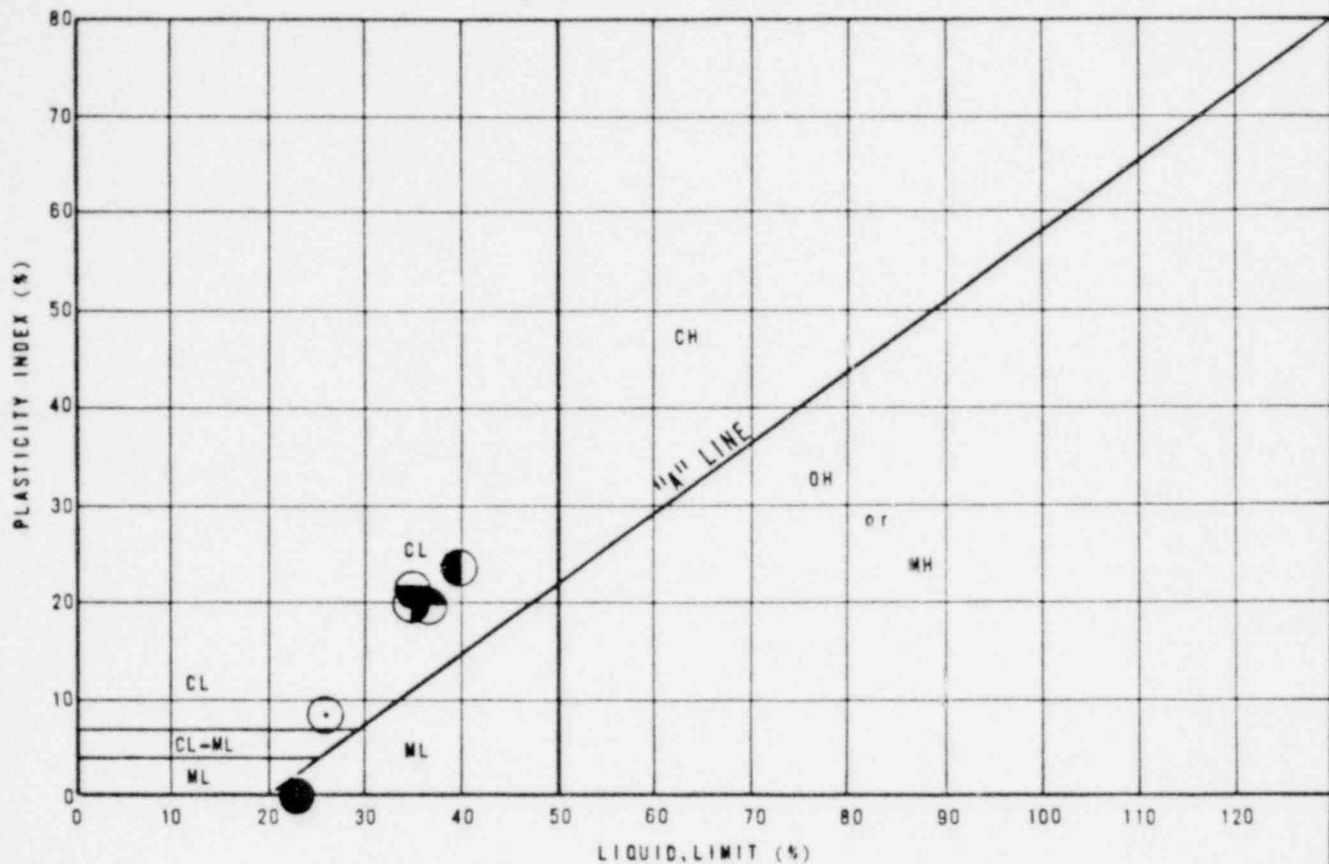
GUL-101

JUNE 1977

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PALO ALTO • NEWPORT BEACH • CALIF.

PLASTICITY CHART



PLASTICITY DATA

KEY SYMBOL	HOLE NO., SAMPLE NO.	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $(\frac{W-PL}{LL-PL})$	UNIFIED SOIL CLASSIFICATION SYMBOL
○	WPC-6, W-1	5.75-6.25	5.5	18	26	8	----	CL
●	WPC-7, W-7	42.5-43	4.2	NP	23	0	----	ML
◐	WPC-8, G-1	0-5	8.7	15	35	20	----	CL
◑	WPC-10, G-1	0-5	7.8	16	40	24	----	CL
◒	WPC-10, G-3	16-20	8.5	14	35	21	----	CL
◓	WPC-15, G-1	0-5	9.2	16	36	20	----	CL

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MT. TAYLOR URANIUM MILL PROJECT

ATTERBERG LIMITS - PLASTICITY DATA

PROJECT NO

DATE

FIGURE NO

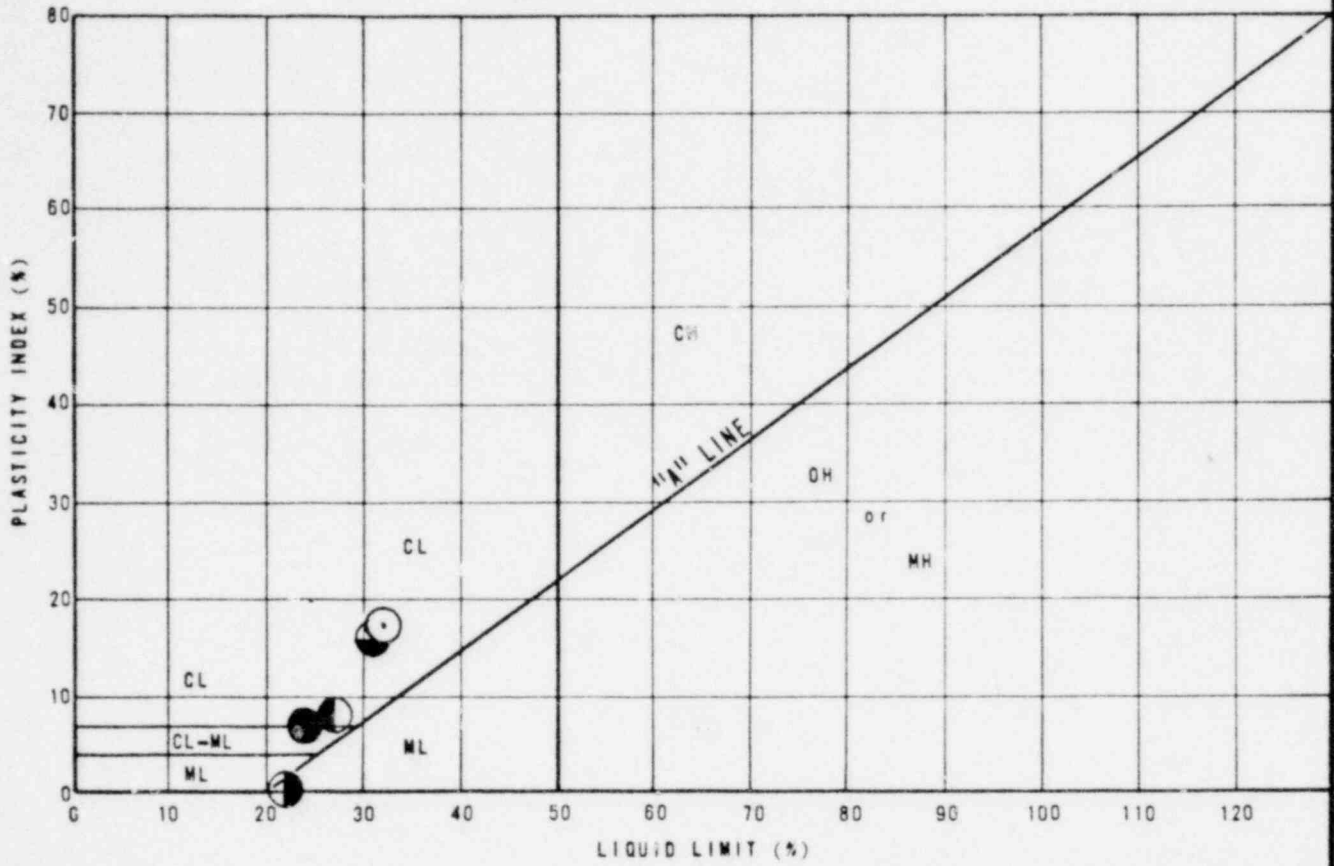
GUL-101

JUNE 1977

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PALO ALTO • NEWPORT BEACH • CALIF

### PLASTICITY CHART



### PLASTICITY DATA

KEY SYMBOL	HOLE NUMBER	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $(\frac{W - PL}{LL - PL})$	UNIFIED SOIL CLASSIFICATION SYMBOL
○	WPC-58, J-1	66.5	----	15	32	17	----	CL
●	WPC-59, J-1	72.0	----	17	24	7	----	CL-ML
◐	WPC-60, J-1	25-30	4.7	22	22	0	----	ML
◑	WPC-60, J-2	35-40	6.5	19	27	8	----	CL-ML
◒	WPC-60, J-3	45-50	6.1	15	31	16	----	CL

W. A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

ATTERBERG LIMITS - PLASTICITY DATA

PROJECT NO.

DATE

FIGURE NO.

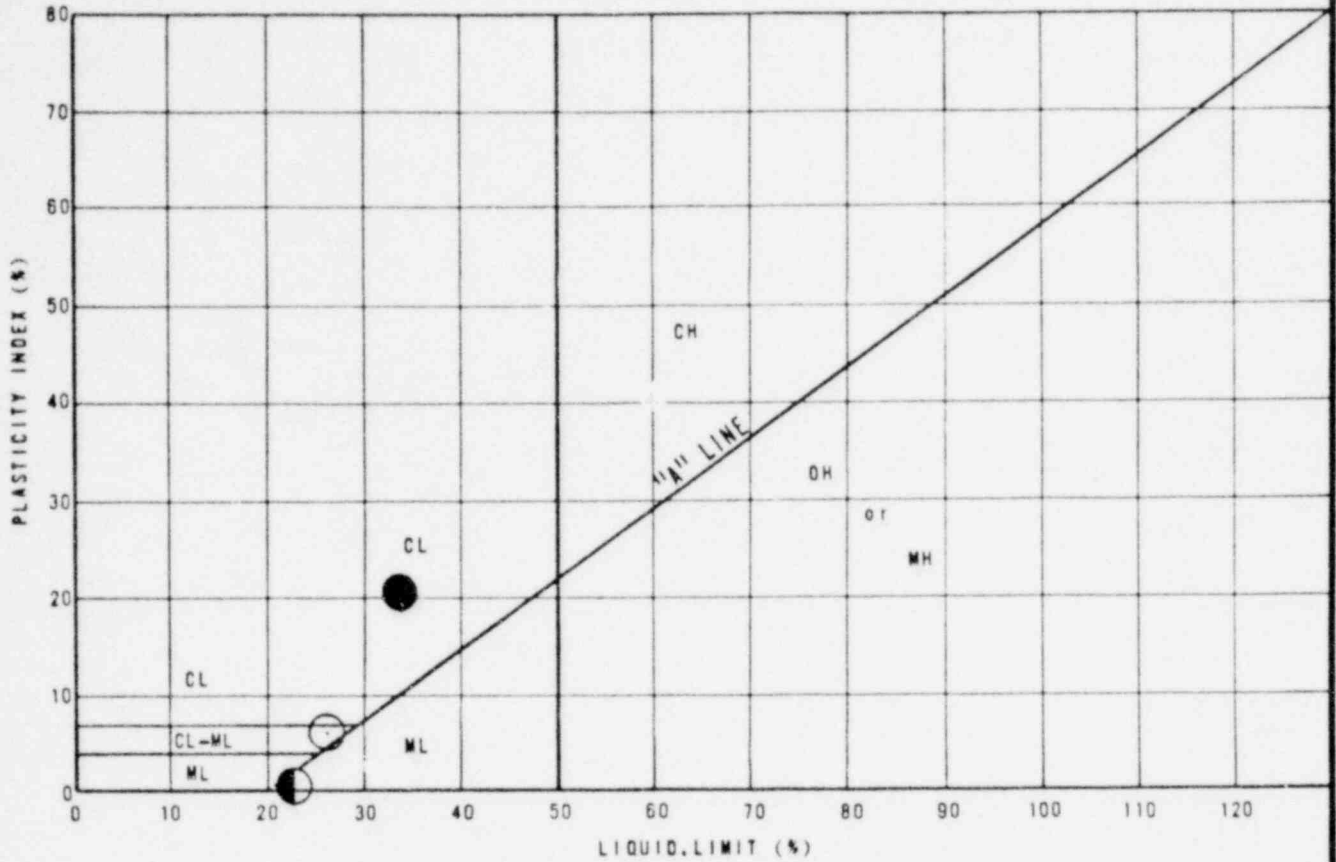
GUL-101

DECEMBER 1977

B-2

PALO ALTO • NEWPORT BEACH • CALIF.

### PLASTICITY CHART



### PLASTICITY DATA

KEY SYMBOL	HOLE NUMBER	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $\left(\frac{W - PL}{LL - PL}\right)$	UNIFIED SOIL CLASSIFICATION SYMBOL
○	WSL-9, S-1	3-4	10.9	20	26	6	----	SC-SM
●	WSL-9, S-2	10-11.5	9.5	13	34	21	----	CL
◐	WSL-9, S-3	15-16.5	24.0	22	23	1	----	SM

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**MT. TAYLOR URANIUM MILL PROJECT**

**ATTERBERG LIMITS - PLASTICITY DATA**

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO

DATE

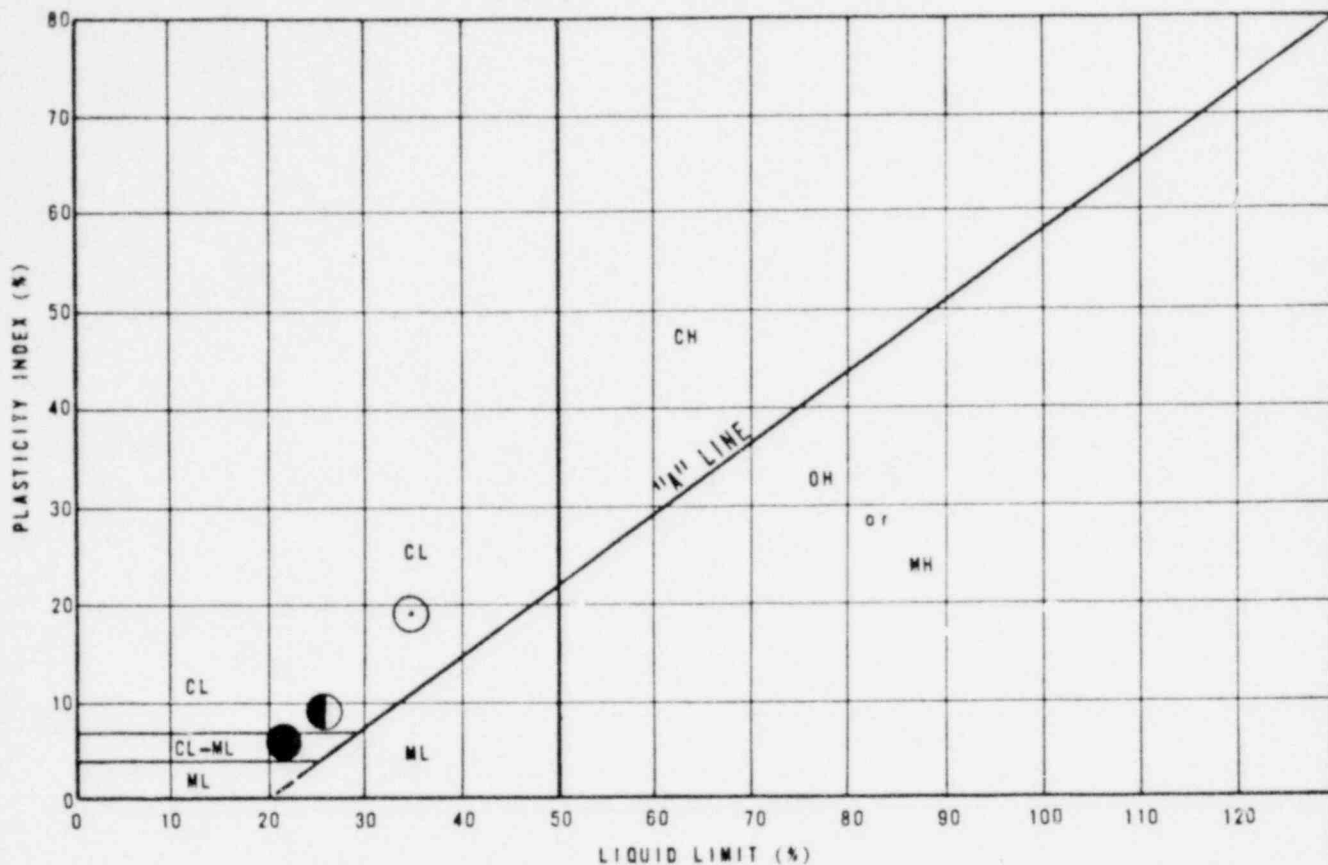
FIGURE NO.

GUL-101

DECEMBER 1977

B-2

### PLASTICITY CHART



### PLASTICITY DATA

KEY SYMBOL	HOLE NUMBER	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $(\frac{W - PL}{LL - PL})$	UNIFIED SOIL CLASSIFICATION SYMBOL
⊙	WSL-16, G-1	5-10	9.6	16	35	19	----	CL
●	WT-103, J-1	2-4.5	5.7	17	22	5	----	CL-ML
◐	WT-107, B-1	1-3	7.3	17	26	9	----	CL

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MT. TAYLOR URANIUM MILL PROJECT

ATTERBERG LIMITS - PLASTICITY DATA

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.

GUL-109

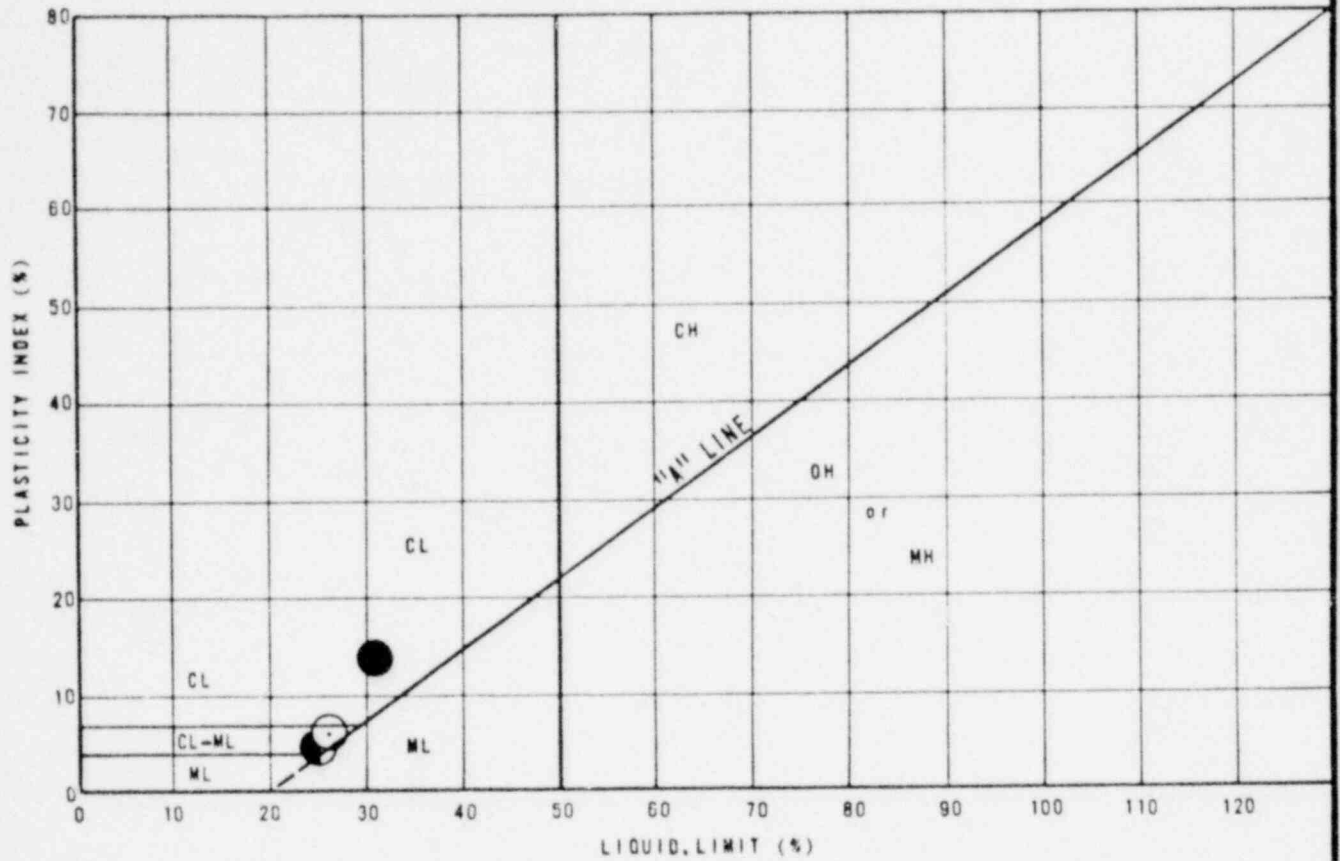
DATE

DECEMBER 1977

FIGURE NO.

B-2

### PLASTICITY CHART



### PLASTICITY DATA

KEY SYMBOL	HOLE NUMBER	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $(\frac{W - PL}{LL - PL})$	UNIFIED SOIL CLASSIFICATION SYMBOL
○	WT-109, B-1	3-6.5	8.5	20	26	6	----	CL-ML
●	WT-110, B-1	4-6	10.2	17	31	14	----	CL
◐	WT-111, B-1	1-3	7.1	20	25	5	----	SC-SM

**W. A. WAHLER & ASSOCIATES**

**WT. TAYLOR URANIUM MILL PROJECT**

**ATTERBERG LIMITS - PLASTICITY DATA**

PROJECT NO.

DATE

FIGURE NO.

GUL-101

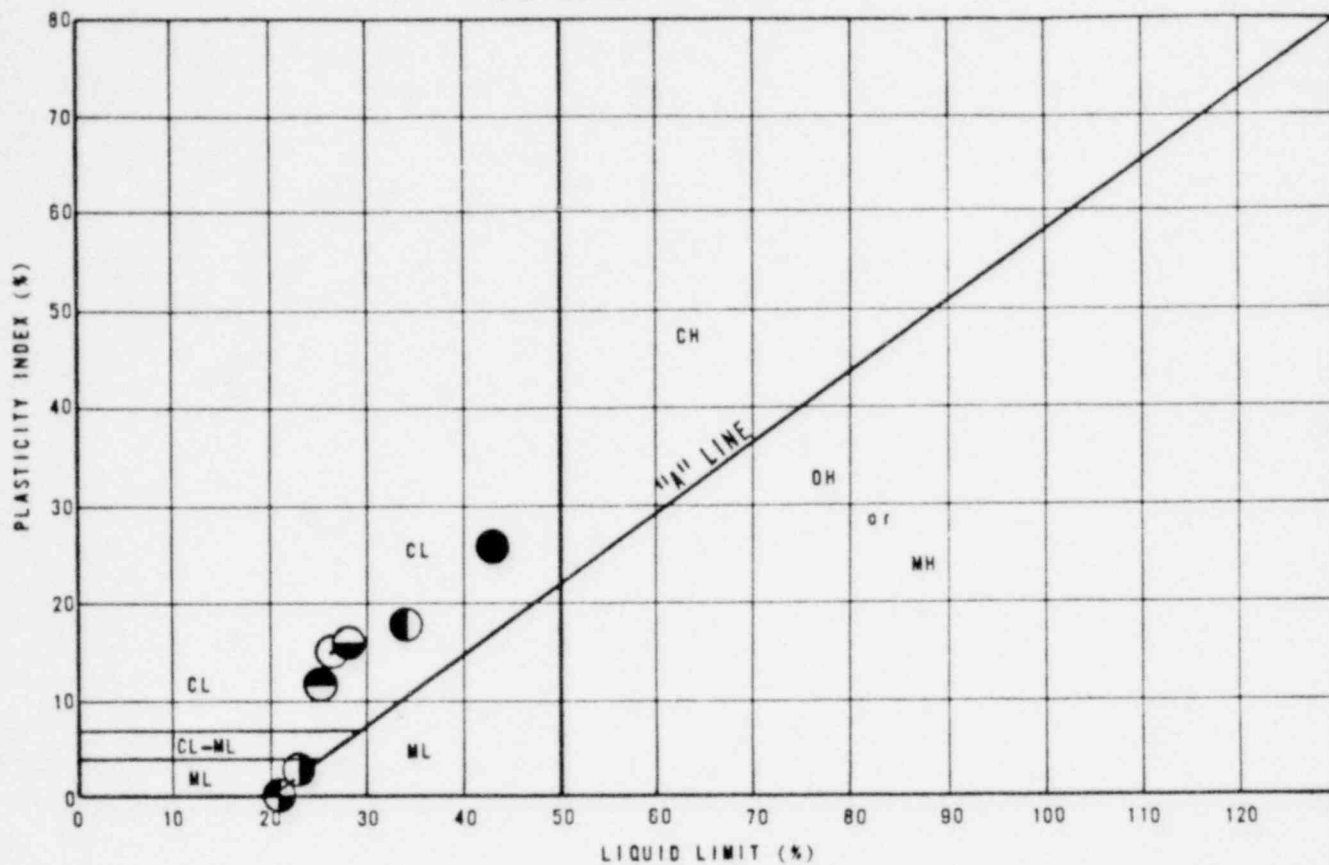
DECEMBER 1977

B-2

PALO ALTO • NEWPORT BEACH • CALIF.



### PLASTICITY CHART



### PLASTICITY DATA

KEY SYMBOL	HOLE NO. / SAMPLE NO.	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $(\frac{W - PL}{LL - PL})$	UNIFIED SOIL CLASSIFICATION SYMBOL
○	WPC-9, G-1	0-5.0	----	11	26	15	----	CL
●	WPC-9, S-1	5.0-6.5	----	17	43	26	----	CL
◐	WPC-9, S-2	13.0-13.7	----	16	34	18	----	CL
◑	WPC-33, S-3	35.0-36.3	----	20	23	3	----	SM
◒	LP-15	10.0-13.0	5.8	13	25	12	----	CL
◓	LP-16	2.0-5.0	5.3	12	28	16	----	CL
◔	LP-17	14.0-18.0	3.3	NP	21	0	----	SM

**W. A. WAHLER & ASSOCIATES**

MT. TAYLOR URANIUM MILL PROJECT

ATTERBERG LIMITS - PLASTICITY DATA

PROJECT NO.

DATE

FIGURE NO.

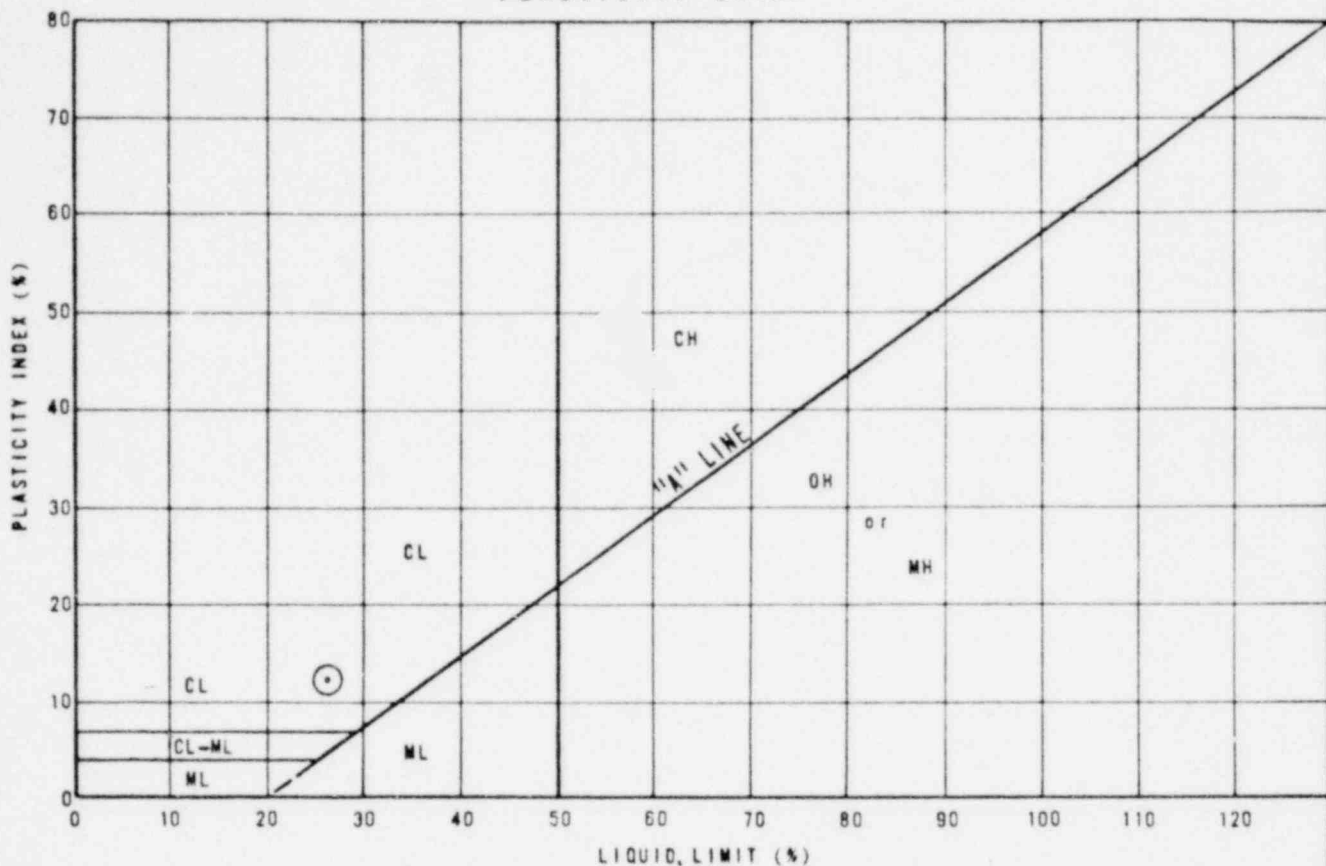
GUL-105A

DECEMBER 1979

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PALO ALTO • NEWPORT BEACH • CALIF

### PLASTICITY CHART



COMBINED\* OF: WPC-8, S-2;  
 WPC-9, G-1, S-1 AND S-2;  
 WPC-12, S-1 AND S-2; LP-15

### PLASTICITY DATA

KEY SYMBOL	SAMPLE	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $\left(\frac{W - PL}{LL - PL}\right)$	UNIFIED SOIL CLASSIFICATION SYMBOL
⊙	COMBINED*	----	----	13	26	13	----	CL

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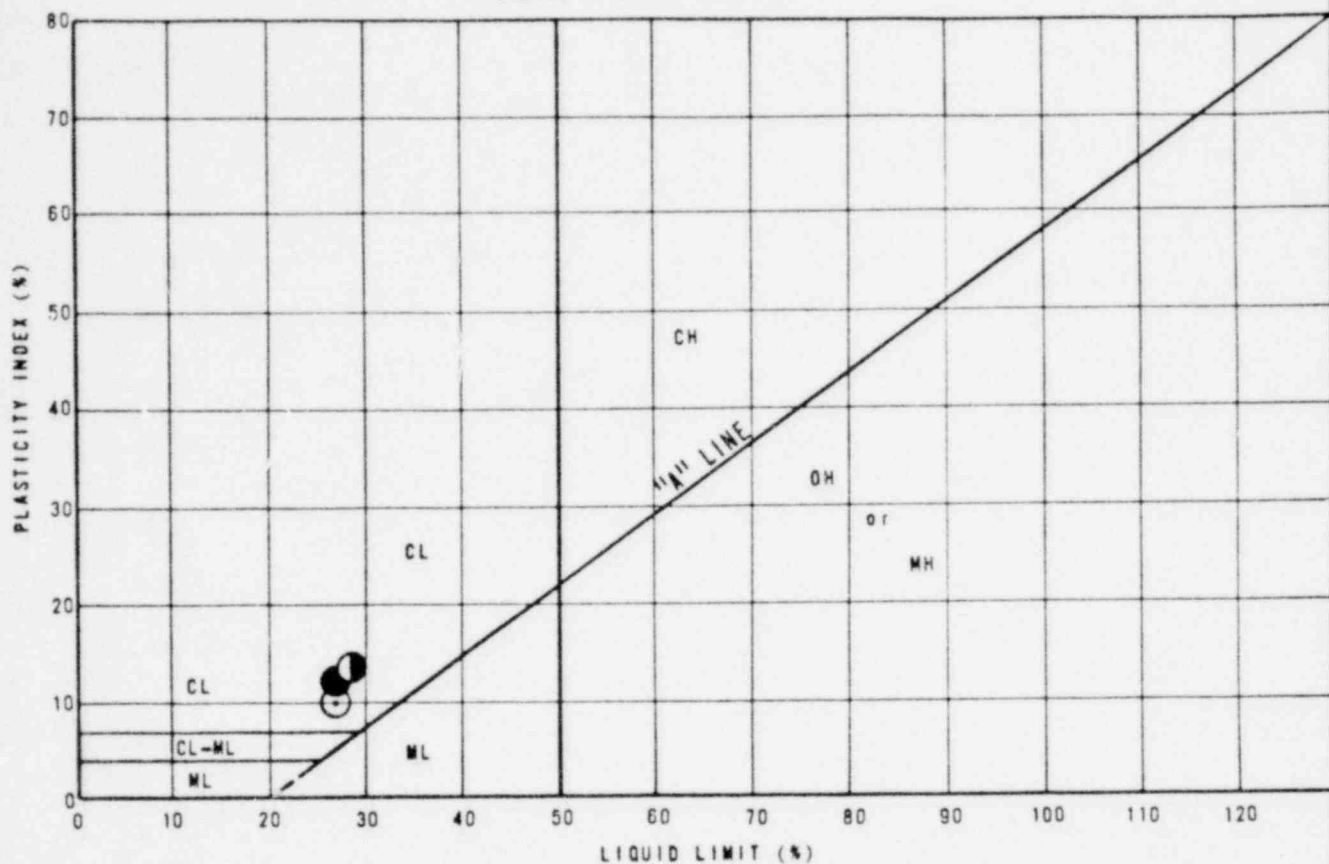
MT. TAYLOR URANIUM MILL PROJECT

ATTERBERG LIMITS - PLASTICITY DATA

PROJECT NO.	DATE	FIGURE NO.
GUL-105A	DECEMBER 1979	B-2

PALO ALTO • NEWPORT BEACH • CALIF.

### PLASTICITY CHART



\*COMBINED FO: LP-10, 20.0-25.0 FEET  
AND LP-11, 9.0-15.0 FEET

### PLASTICITY DATA

KEY SYMBOL	SAMPLE	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $(\frac{W-PL}{L-PL})$	UNIFIED SOIL CLASSIFICATION SYMBOL
○●	COMBINED*	----	----	16	26	10	----	CL
●	COMBINED* (1% BETONITE)	----	----	14	26	12	----	CL
○●	COMBINED* (2% BETONITE)	----	----	15	28	13	----	CL

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MT. TAYLOR URANIUM MILL PROJECT

ATTERBERG LIMITS - PLASTICITY DATA

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.

DATE

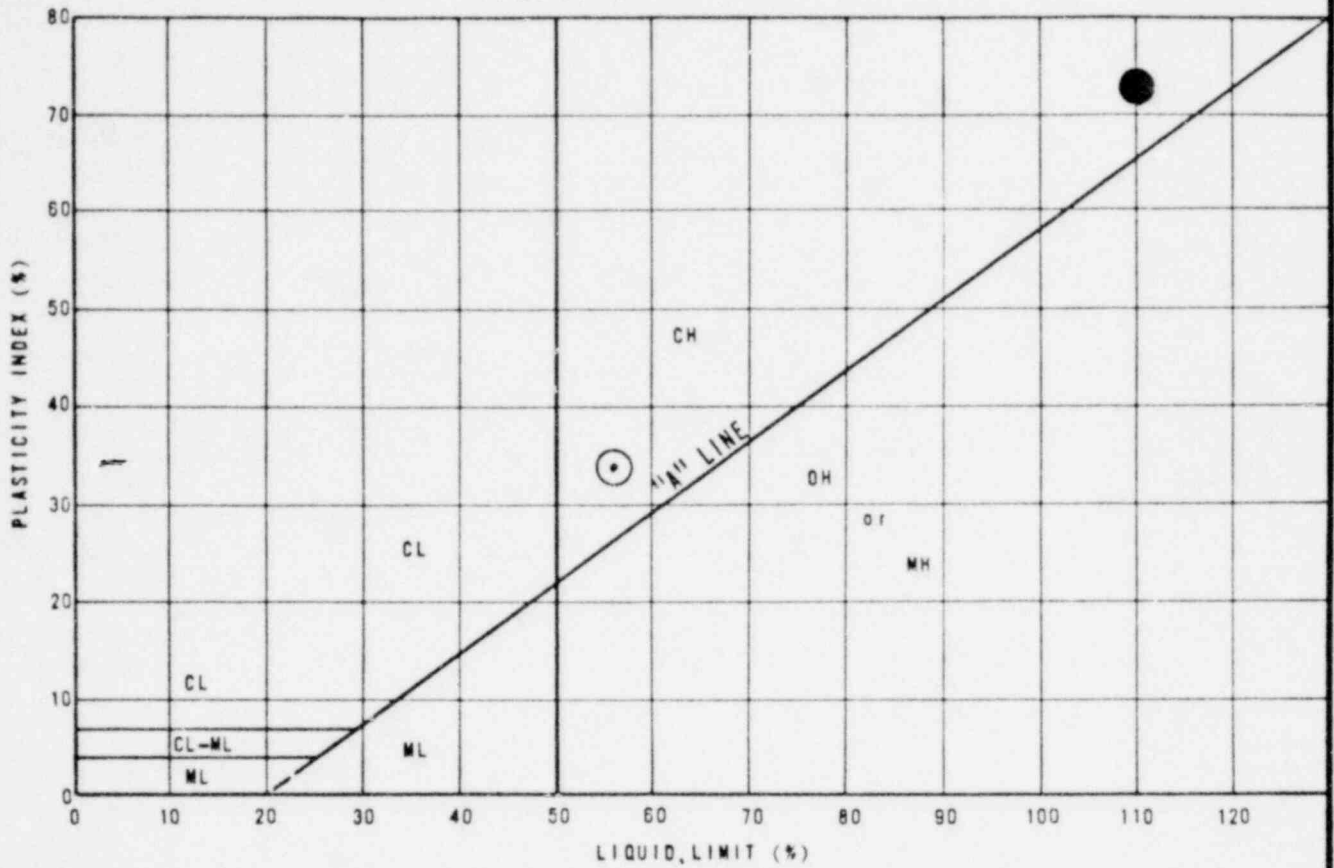
FIGURE NO.

GUL-105A

JANUARY 1980

B-2

PLASTICITY CHART



PLASTICITY DATA

KEY SYMBOL	SAMPLE NUMBER*	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $\left(\frac{W - PL}{LL - PL}\right)$	UNIFIED SOIL CLASSIFICATION SYMBOL
○	T-1	----	3.4	22	56	34	----	CH
●	T-2	----	376	37	110	73	----	CH

\* SAMPLE T-1 WAS RECEIVED AS A DRY POWDER AND WAS OVEN DRIED FOR 24 HOURS AT 110°C PRIOR TO TESTING. SAMPLE T-2 WAS RECEIVED AS SLURRY AND WAS AIR DRIED DOWN TO ITS LIQUID AND PLASTIC LIMITS.

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ATTERBERG LIMITS - PLASTICITY DATA

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO.

DATE

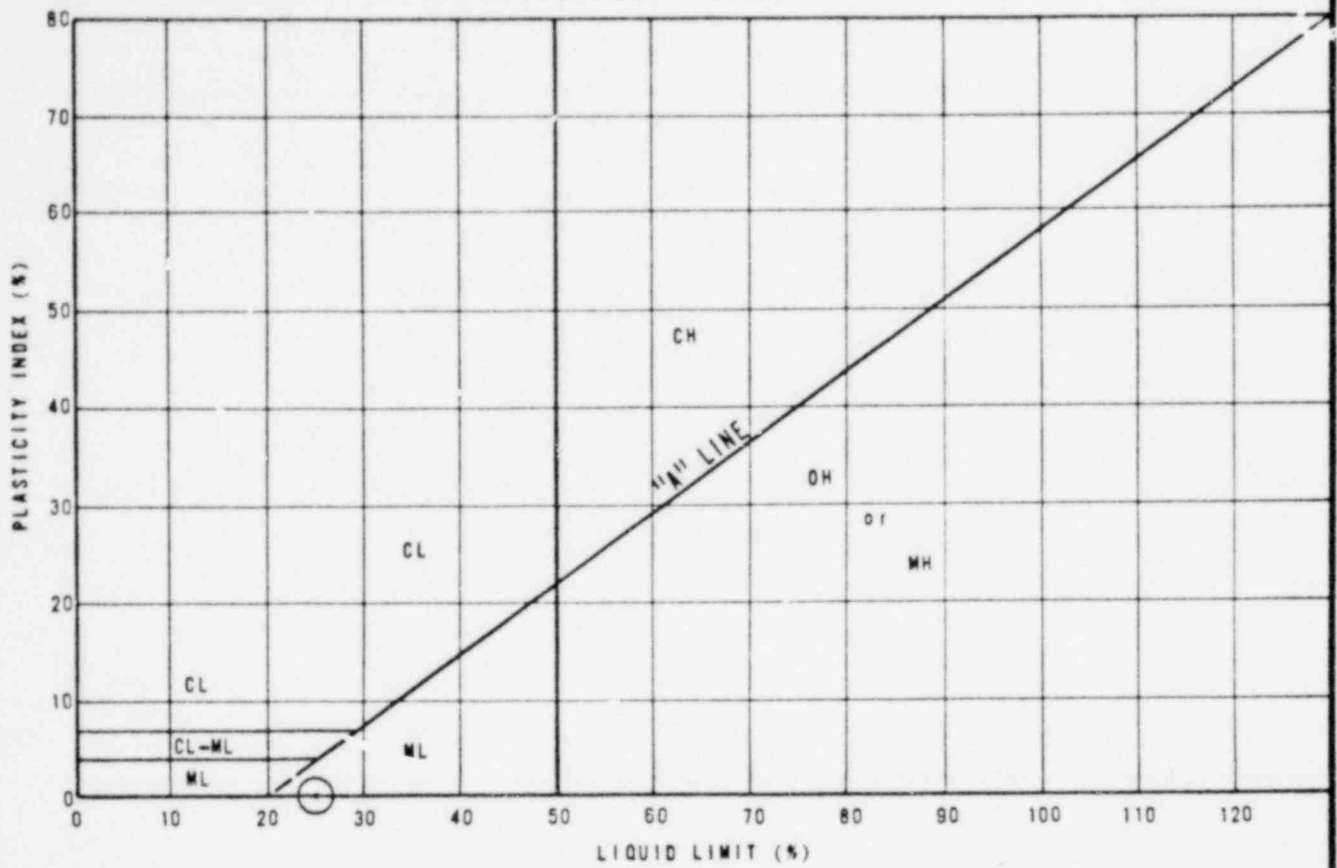
FIGURE NO.

GUL-101

JUNE 1977

B-2

### PLASTICITY CHART



### PLASTICITY DATA

KEY SYMBOL	SAMPLE	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $\left(\frac{W - PL}{LL - PL}\right)$	UNIFIED SOIL CLASSIFICATION SYMBOL
⊙	TOTAL TAILINGS	----	28.3	NP	24	0	----	SH

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MT. TAYLOR URANIUM MILL PROJECT

ATTERBERG LIMITS - PLASTICITY DATA

PROJECT NO.

DATE

FIGURE NO.

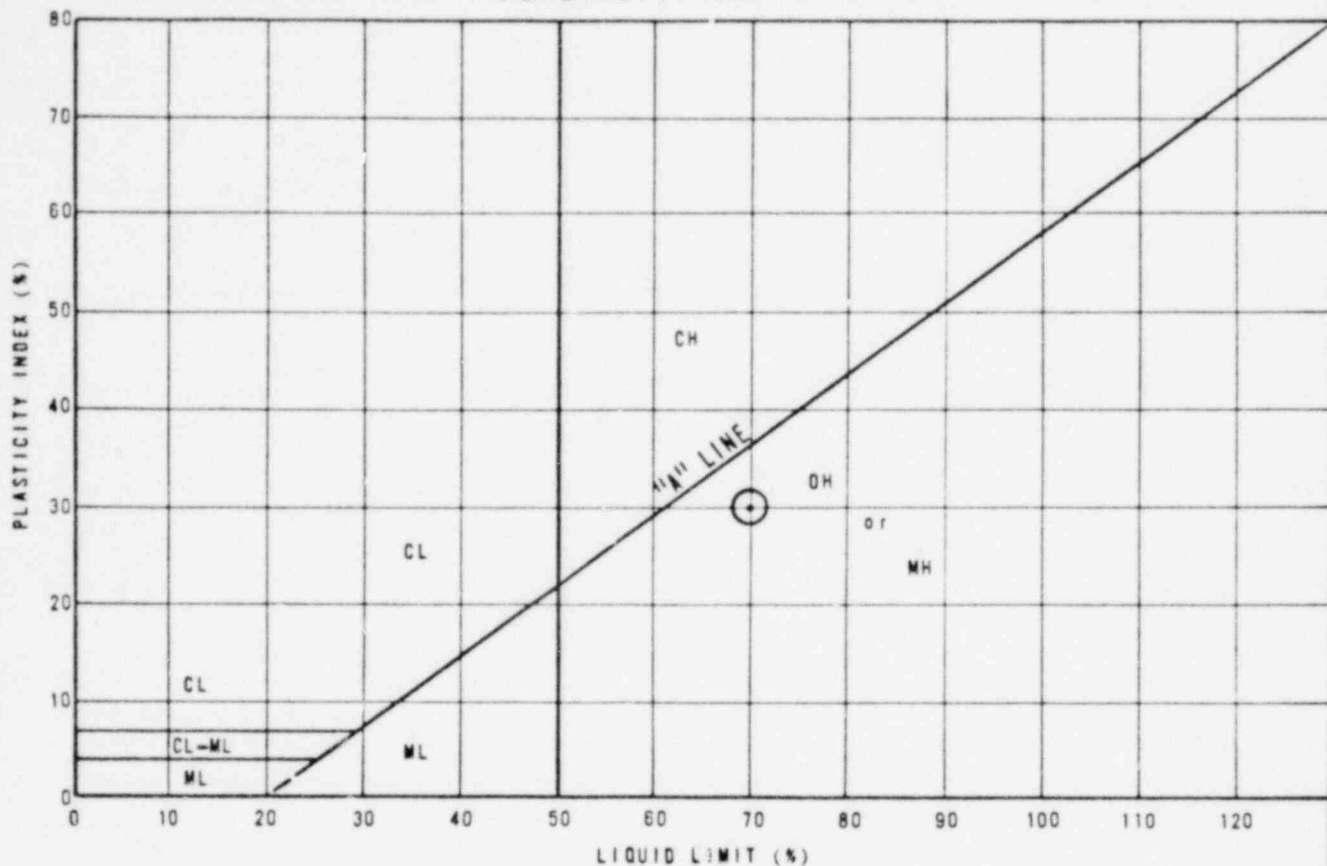
GUL-101

OCTOBER 1977

B-2

PALM ALTO • NEWPORT BEACH • CALIF.

### PLASTICITY CHART



### PLASTICITY DATA

KEY SYMBOL	SAMPLE	DEPTH (ft)	NATURAL WATER CONTENT W (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	LIQUIDITY INDEX $\frac{W - PL}{LL - PL}$	UNIFIED SOIL CLASSIFICATION SYMBOL
⊙	"-#270" TAILINGS	----	----	40	70	30	----	MH-OH

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MT. TAYLOR URANIUM MILL PROJECT

ATTERBERG LIMITS - PLASTICITY DATA

PROJECT NO.

DATE

FIGURE NO.

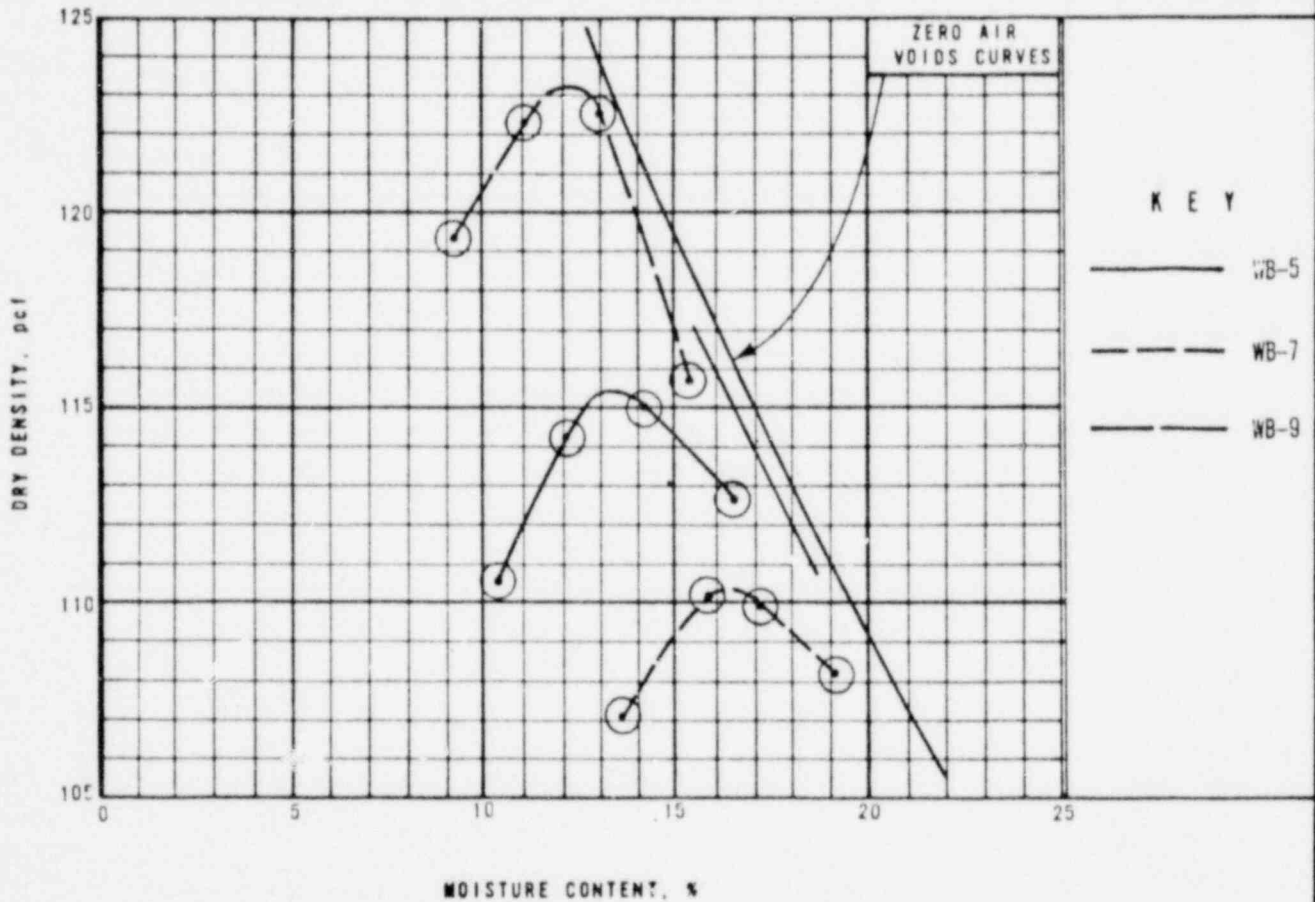
GUL-105A

AUGUST 1979

B-2

PALO ALTO • NEWPORT BEACH • CALIF.

HOLE NO.	SAMPLE NO.	DEPTH (ft)	SAMPLE DESCRIPTION	SPECIFIC GRAVITY	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PERCENT PASSING	
							NO. 50	NO. 200
WB-5	B-1	0-17	SILTY CLAY, BROWN, CL	2.64	25	15	95	64
WB-7	B-1	0-5	SANDY SILTY CLAY, BROWN, CL	2.69	43	17	99	83
WB-9	B-3	21-32	GRAVELLY CLAYEY SAND, BROWN, SM-SC	2.69	----	----	81	37



HOLE NO.	WB-5	WB-7	WB-9
NATURAL WATER CONTENT, %	5.5	9.3	4.1
OPTIMUM WATER CONTENT, %	13.3	16.3	12.1
MAXIMUM DRY DENSITY, pcf	115.3	110.3	123.2
TEST DESIGNATION	ASTM D1557-70 20,000	ASTM D1557-70 20,000	ASTM D1557-70 20,000

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PALO ALTO • NEWPORT BEACH • CALIF.

COMPACTION TEST RESULTS

PROJECT NO.

DATE

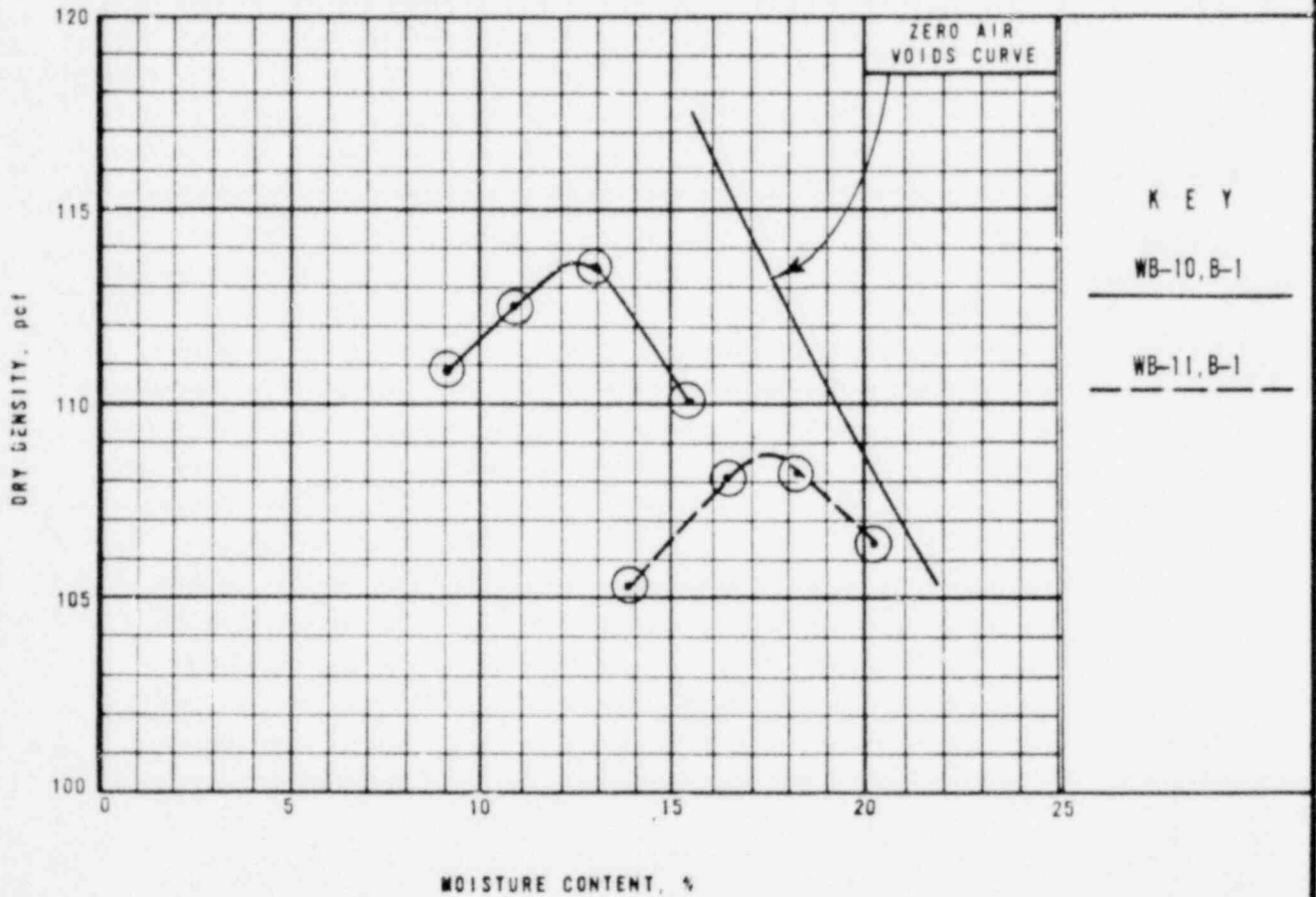
FIGURE NO.

GUL-101

SEPTEMBER 1977

B-3

HOLE NO.	SAMPLE NO.	DEPTH (ft)	SAMPLE DESCRIPTION	SPECIFIC GRAVITY	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PERCENT PASSING	
							NO. 50	NO. 200
WB-10	B-1	0-11	SILTY SAND, BROWN, SM	2.63	NP	NP	95	29
WB-11	B-1	0-11	SILTY CLAY, BROWN, CL	2.64	44	17	99	85



HOLE NO.	WB-10	WB-11
NATURAL WATER CONTENT, %	3.5	10.2
OPTIMUM WATER CONTENT, %	12.5	17.4
MAXIMUM DRY DENSITY, pcf	113.7	108.7
TEST DESIGNATION ASTM COMPACTIVE ENERGY ft. lb/ft <sup>3</sup>	D1557-70 20,000	D1557-70 20,000

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MT. TAYLOR URANIUM MILL PROJECT

COMPACTION TEST RESULTS

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.

DATE

FIGURE NO.

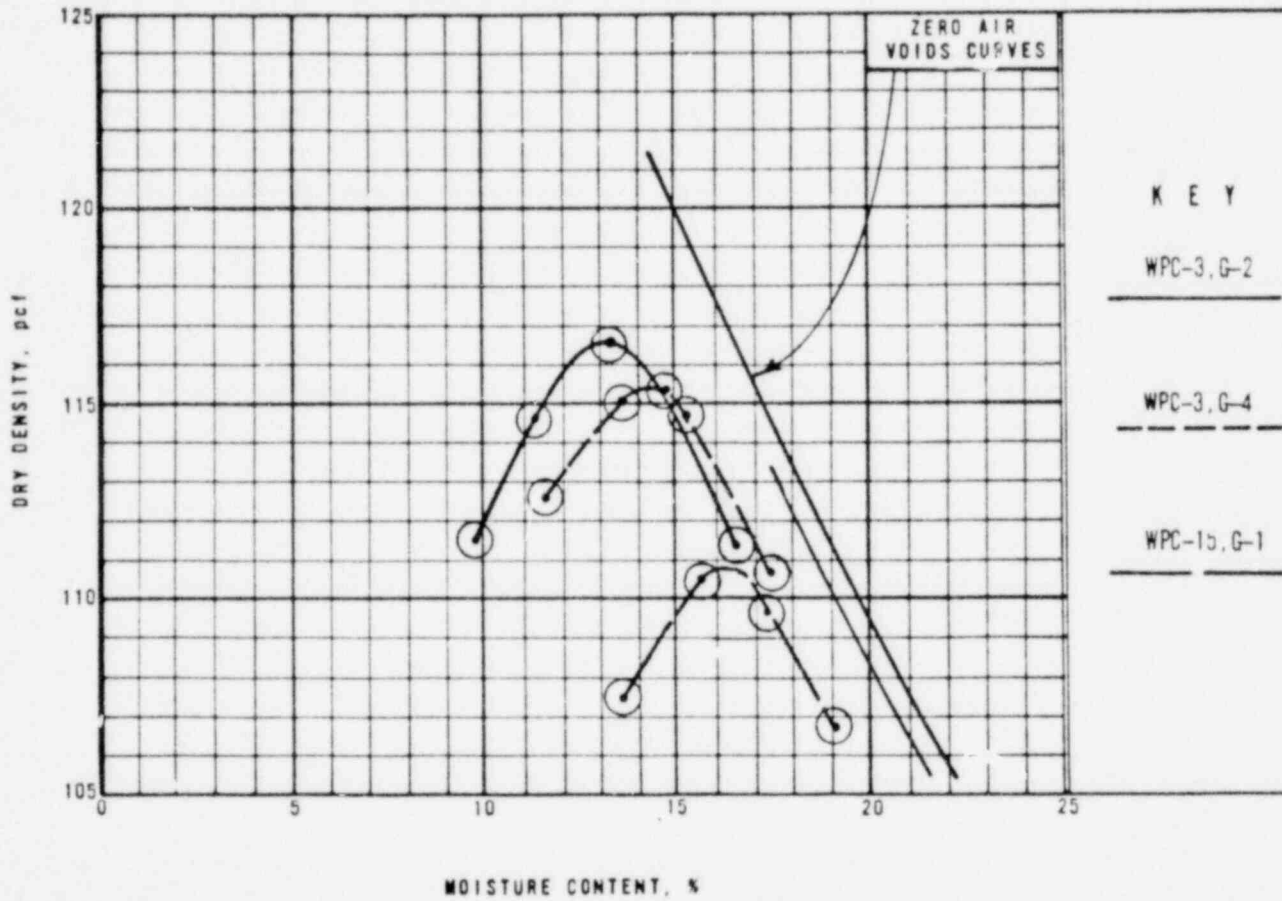
GUL-101

SEPTEMBER 1977

B-3



HOLE NO.	SAMPLE NO.	DEPTH (ft)	SAMPLE DESCRIPTION	SPECIFIC GRAVITY	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PERCENT PASSING	
							NO. 50	NO. 200
WPC-3	G-2	8-13	SANDY, CLAYEY SILT, LIGHT BROWN, CL-ML	2.7 (est.)	26	19	98.2	59.8
WPC-3	G-4	23-28	SANDY, SILTY CLAY, LIGHT BROWN, CL	2.7 (est.)	32	14	99.4	76.1
WPC-15	G-1	0-5	SANDY, SILTY CLAY, LIGHT BROWN, CL	2.64	36	16	99.7	82.8

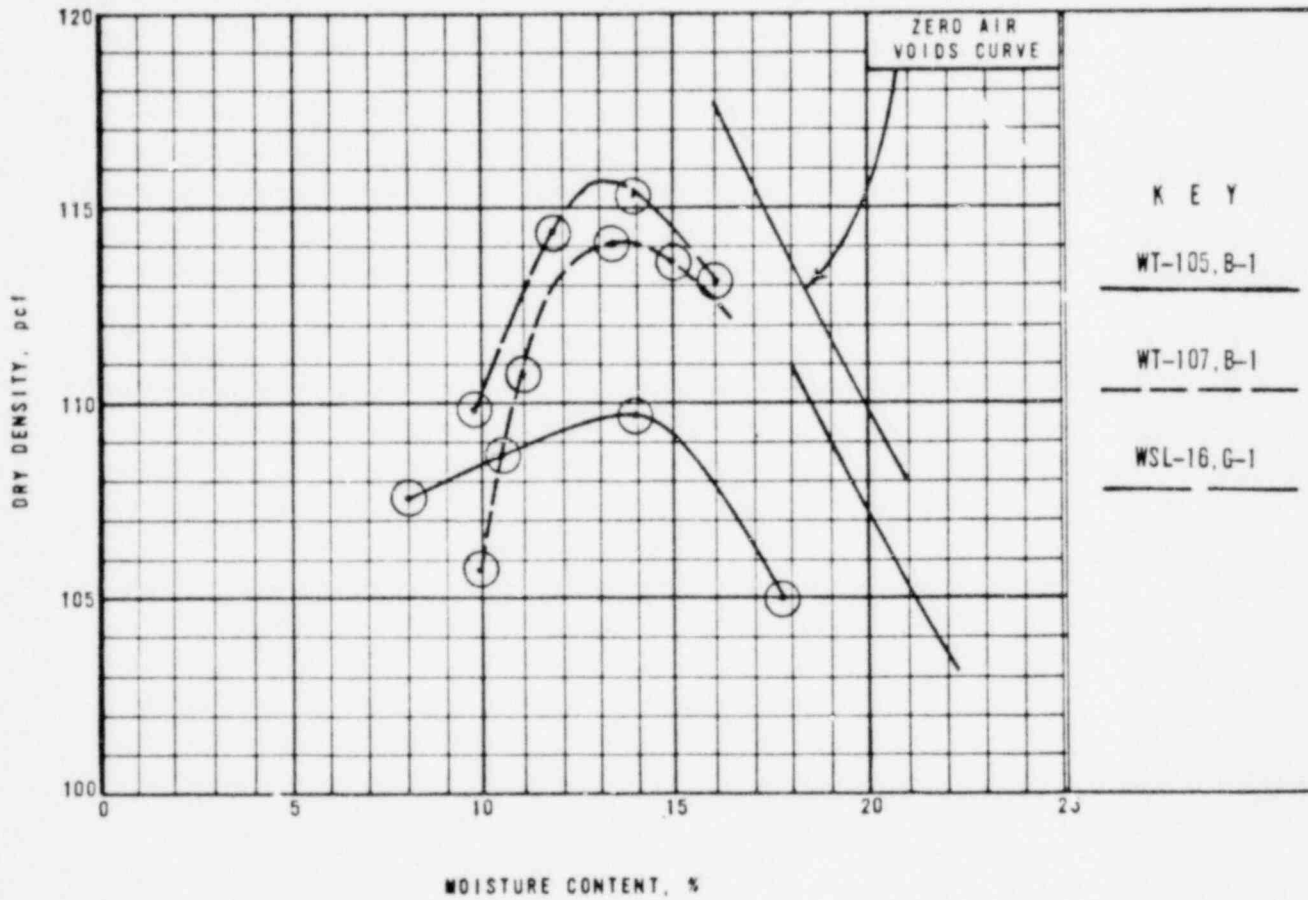


HOLE NO., SAMPLE NO.	WPC-3, G-2	WPC-3, G-4	WPC-15, G-1
NATURAL WATER CONTENT, %	5.0	8.0	9.2
OPTIMUM WATER CONTENT, %	13.1	14.3	16.2
MAXIMUM DRY DENSITY, pcf	116.6	115.3	110.8
TEST DESIGNATION ASTM COMPACTIVE ENERGY, ft. lb/ft <sup>3</sup>	D1557-70 20,000	D1557-70 20,000	D1557-70 20,000

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT PALO ALTO • HERBERT BEACH • CALIF.	COMPACTION TEST RESULTS		
		PROJECT NO.	DATE	FIGURE NO.
		GUL-101	JUNE 1977	B-3

L.3/77

HOLE NO.	SAMPLE NO.	DEPTH (ft)	SAMPLE DESCRIPTION	SPECIFIC GRAVITY	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PERCENT PASSING	
							NO. 50	NO. 200
WT-105	B-1	3-5.5	SILTY SAND, LIGHT BROWN, SM	2.60 est.	NP	NP	97.2	19.1
WT-107	B-1	1-3	SILTY CLAY, BROWN, CL	2.70 est.	26	17	98.3	57.7
WSL-16	G-1	5-10	SANDY CLAY, BROWN, CL	2.69	35	16	90.0	61.4



HOLE NO. SAMPLE NO.	WT-105, B-1	WT-107, B-1	WSL-16, G-1
NATURAL WATER CONTENT, %	4.3	7.3	9.6
OPTIMUM WATER CONTENT, %	14.0	13.5	13.0
MAXIMUM DRY DENSITY, pcf	109.8	114.2	115.8
TEST DESIGNATION	ASTM D1557-70 COMPACTIVE ENERGY ft. lb/ft <sup>3</sup> 20,000	ASTM D1557-70 20,000	ASTM D1557-70 20,000

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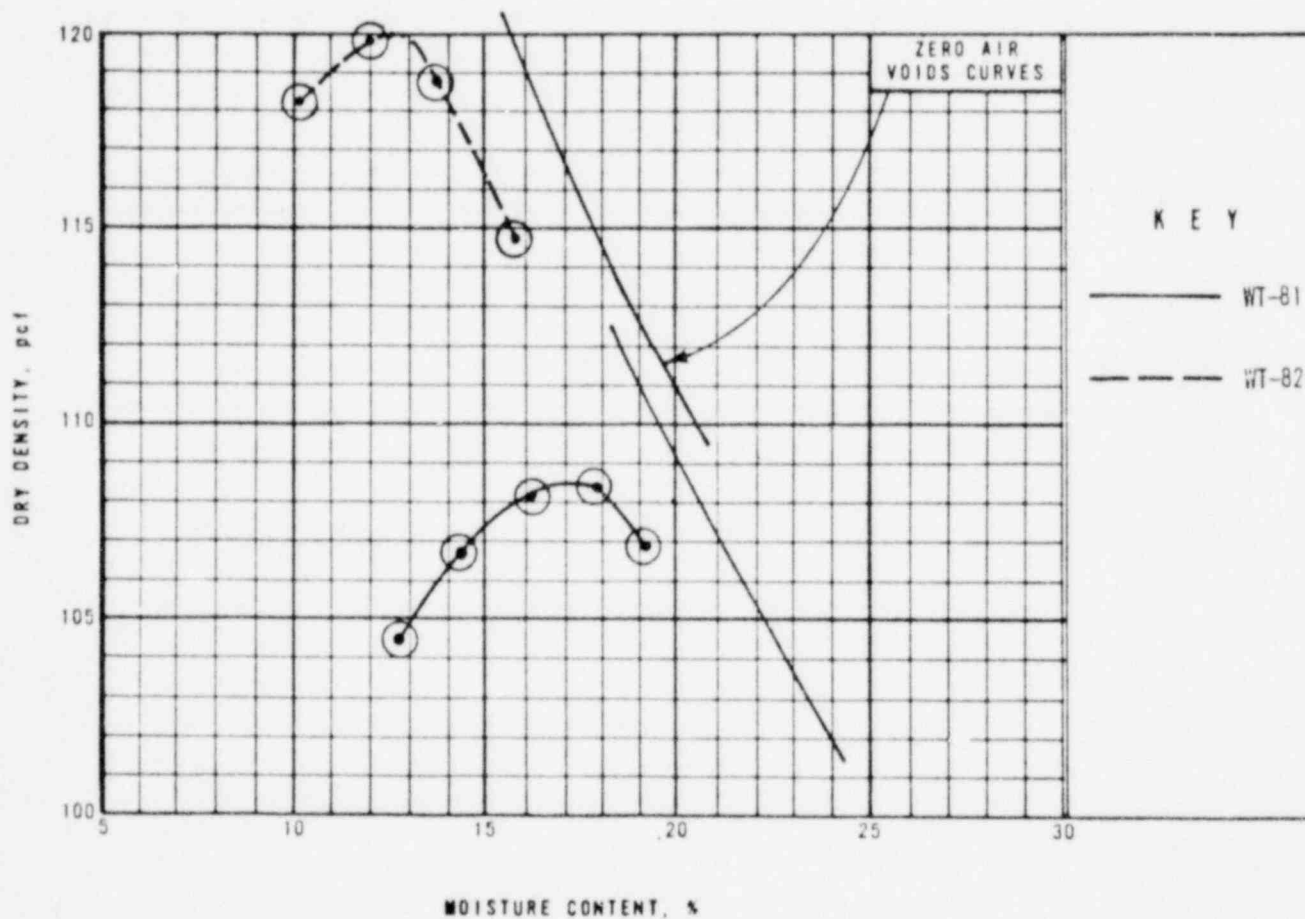
MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

COMPACTION TEST RESULTS

PROJECT NO.	DATE	FIGURE NO.
GUL-101	DECEMBER 1977	B-3

HOLE NO.	SAMPLE NO.	DEPTH (ft)	SAMPLE DESCRIPTION	SPECIFIC GRAVITY	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PERCENT PASSING	
							NO. 4	NO. 200
WT-81	----	1-2.5	SANDY CLAYEY GRAVEL, YELLOW BROWN, GC*	2.69	30	15	58.5	29.7
WT-82	----	3.5-4.5	GRAVELLY SANDY CLAY, BROWN, CL*	EST. 2.75	30	16	78.5	59.6



\*COARSE MATERIAL BREAKS DOWN WHEN COMPACTED

HOLE NO.	WT-81	WT-82	
NATURAL WATER CONTENT, %	10.7	7.2	
OPTIMUM WATER CONTENT, %	17.0	12.5	
MAXIMUM DRY DENSITY, pcf	108.5	120.0	
TEST DESIGNATION	ASTM D1557-70 20,000	D1557-70 20,000	
	COMPACTIVE ENERGY ft. lb/ft <sup>3</sup>		

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

COMPACTION TEST RESULTS

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.

DATE

FIGURE NO.

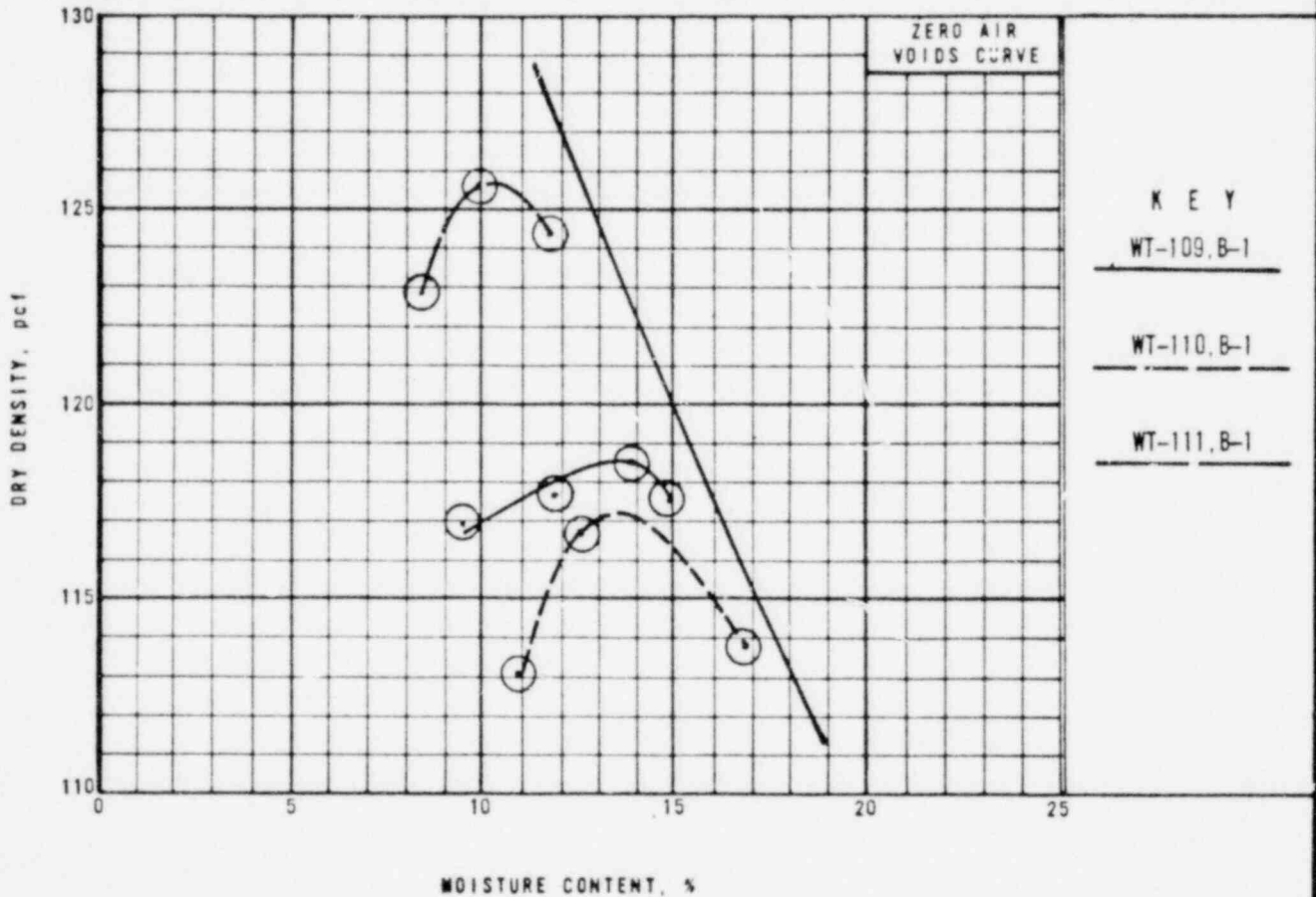
GUL-101

SEPTEMBER 1977

B-3

HOLE NO.	SAMPLE NO.	DEPTH (ft)	SAMPLE DESCRIPTION	SPECIFIC GRAVITY	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PERCENT PASSING*	
							NO. 50	NO. 200
WT-109	B-1	3-6.5	CLAYSTONE / SILTSTONE, BROWN, CL-ML	2.70 est.	26	20	83.7	64.6
WT-110	B-1	4-6	CLAYSTONE, BROWN, CL	2.70 est.	31	17	76.6	71.2
WT-111	B-1	1-3	CLAYSTONE / SILTSTONE, BROWN, SC-SM	2.70 est.	25	20	44.6	32.2

\* AFTER COMPACTION



HOLE NO. SAMPLE NO.	WT-109, B-1	WT-110, B-1	WT-111, B-1
NATURAL WATER CONTENT, %	8.5	10.2	7.1
OPTIMUM WATER CONTENT, %	13.5	13.5	10.5
MAXIMUM DRY DENSITY, pcf	118.8	117.2	125.7
TEST DESIGNATION	ASTM D1557-70 COMPACTIVE ENERGY ft. lb/ft <sup>3</sup> 20,000	D1557-70 20,000	D1557-70 20,000

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WT. TAYLOR URANIUM MILL PROJECT

COMPACTION TEST RESULTS

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.

DATE

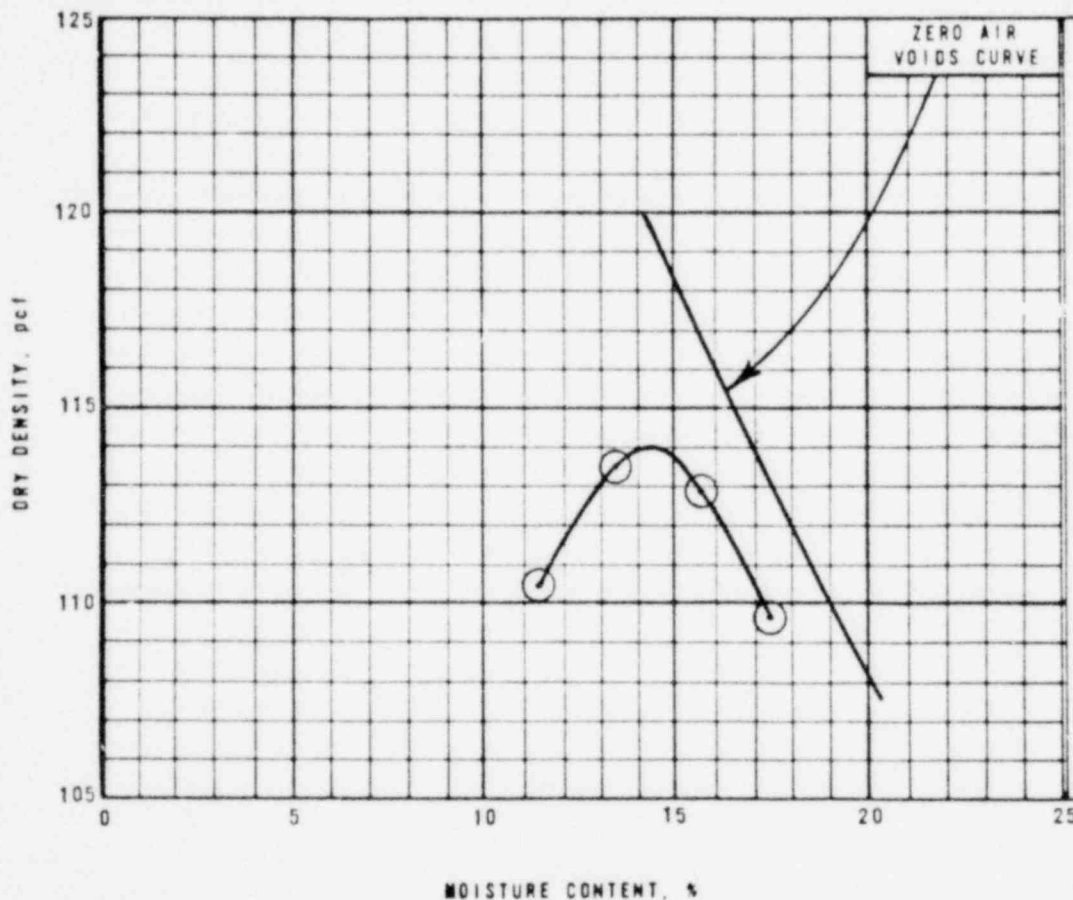
FIGURE NO.

GUL-101

DECEMBER 1977

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HOLE NO.	SAMPLE NO.	DEPTH (ft)	SAMPLE DESCRIPTION	SPECIFIC GRAVITY	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PERCENT PASSING	
							NO. 4	NO. 200
LP-17	----	14.0-18.0	SILTY SAND, YELLOW BROWN (SM)	2.63	21	NP	99.9	31.1



HOLE NO.	LP-17		
NATURAL WATER CONTENT, %	3.3		
OPTIMUM WATER CONTENT, %	14.3		
MAXIMUM DRY DENSITY, pcf	114.0		
TEST DESIGNATION	ASTM COMPACTIVE ENERGY ft. lb/ft <sup>3</sup>	D1557-78 20,000	

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MT. TAYLOR URANIUM MILL PROJECT

COMPACTION TEST RESULTS

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.

GUL-105A

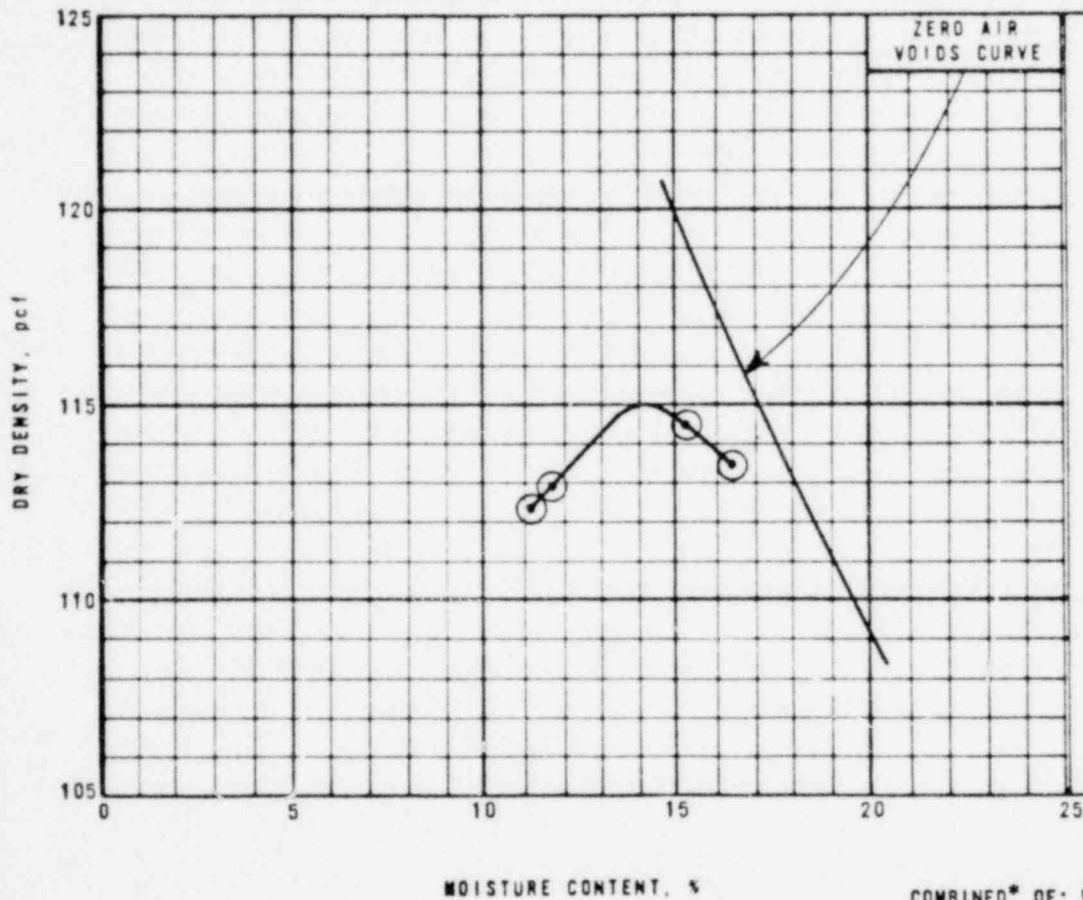
DATE

DECEMBER 1979

FIGURE NO.

B-3

SAMPLE	SAMPLE DESCRIPTION	SPECIFIC GRAVITY	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PERCENT PASSING	
					NO. 4	NO. 200
COMBINED*	SANDY CLAY, BROWN (CL)	2.66	26	13	99.6	61.1



COMBINED\* OF: WPC-8, S-2;  
WPC-9, G-1, S-1 AND S-2;  
WPC-12, S-1 AND S-2; LP-15

SAMPLE	COMBINED		
NATURAL WATER CONTENT, %	----		
OPTIMUM WATER CONTENT, %	14.0		
MAXIMUM DRY DENSITY, pcf	115.0		
TEST DESIGNATION	ASTM D1557-78		
	COMPACTIVE ENERGY ft. lb/ft <sup>3</sup> 20,000		

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MT. TAYLOR URANIUM MILL PROJECT

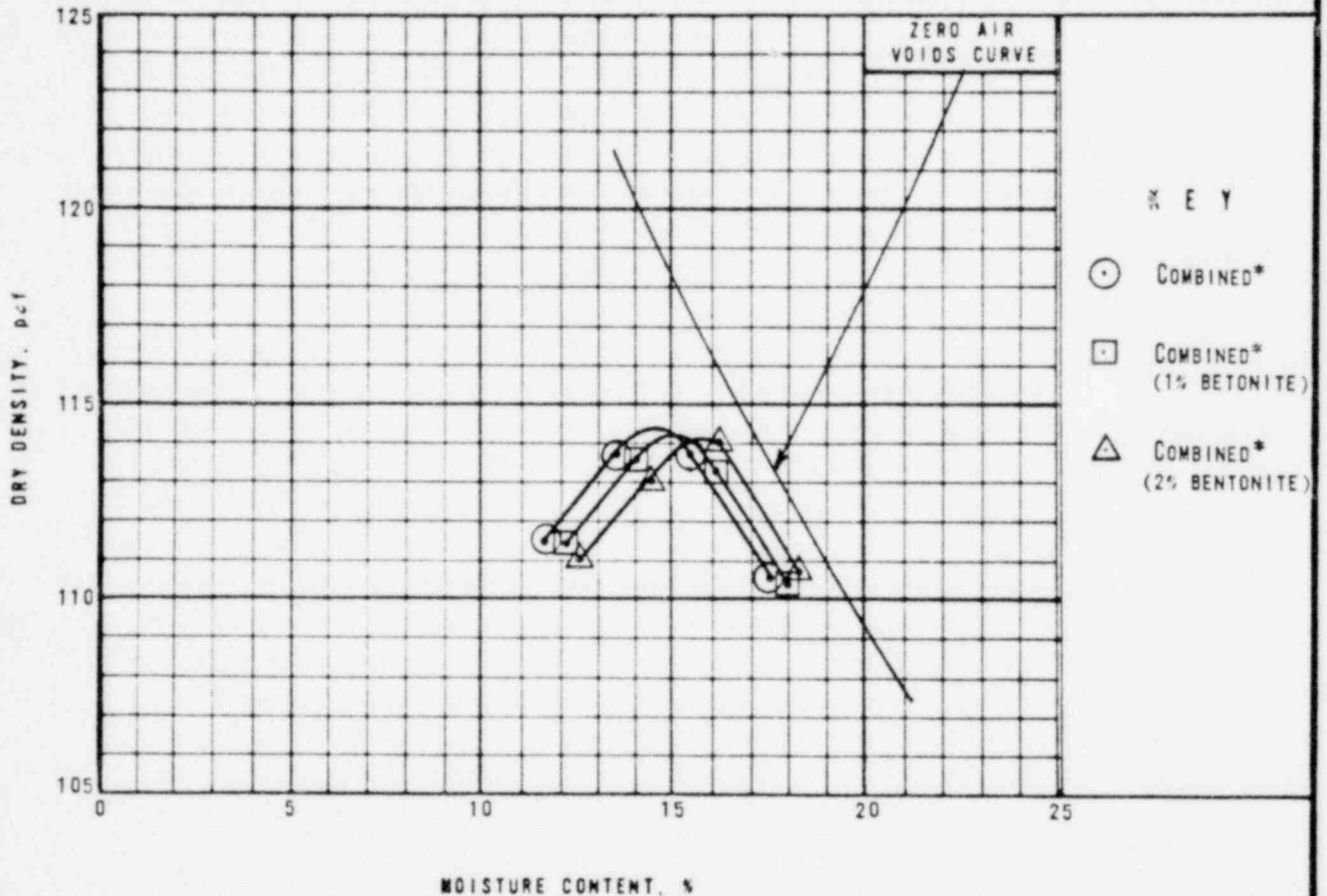
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COMPACTION TEST RESULTS

PROJECT NO.	DATE	FIGURE NO.
GUL-105A	DECEMBER 1979	B-3

SAMPLE	SAMPLE DESCRIPTION	SPECIFIC GRAVITY	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PERCENT PASSING	
					NO. 4	NO. 200
COMBINED*	SANDY CLAY, LIGHT BROWN	2.68	26	16	99.9	59.0
COMBINED* (1% BENTONITE)	SANDY CLAY, LIGHT BROWN	----	26	14	100	60.5
COMBINED (2% BENTONITE)	SANDY CLAY, LIGHT BROWN	----	28	15	100	62.1

\*COMBINED OF: LP-10, 20.0-25.0 FEET  
AND LP-11, 9.0-15.0 FEET.

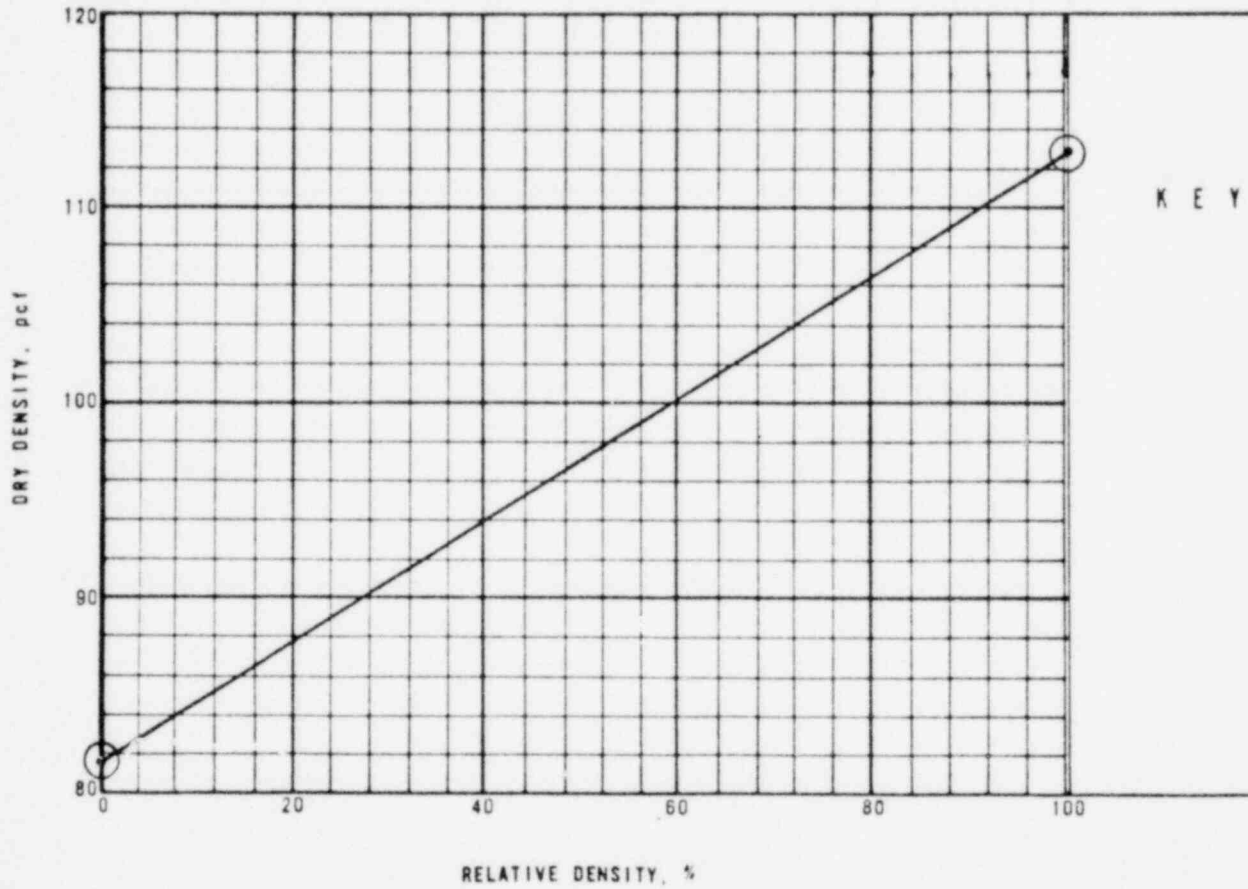


SAMPLE	COMBINED*	COMBINED* (1% BENTONITE)	COMBINED* (2% BENTONITE)
NATURAL WATER CONTENT, %	----	----	----
OPTIMUM WATER CONTENT, %	14.6	15.1	15.7
MAXIMUM DRY DENSITY, pcf	114.3	114.2	114.1
TEST DESIGNATION	ASTM D1557-78	D1557-78	D1557-78
	COMPACTIVE ENERGY ft. lb./ft <sup>3</sup> 20,000	20,000	20,000

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W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT PALO ALTO • HERBERT BEACH • CALIF.	COMPACTION TEST RESULTS		
		PROJECT NO.	DATE	FIGURE NO.
		GUL-105A	JANUARY 1980	B-3

HOLE NO.	SAMPLE NO.	DEPTH (ft)	SAMPLE DESCRIPTION	SPECIFIC GRAVITY	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	PERCENT PASSING	
							NO. 50	NO. 200
WPC-7	S-1	5-6.5	SAND, FINE, LIGHT BROWN SM-SP	----	----	NP	89.7	7.1

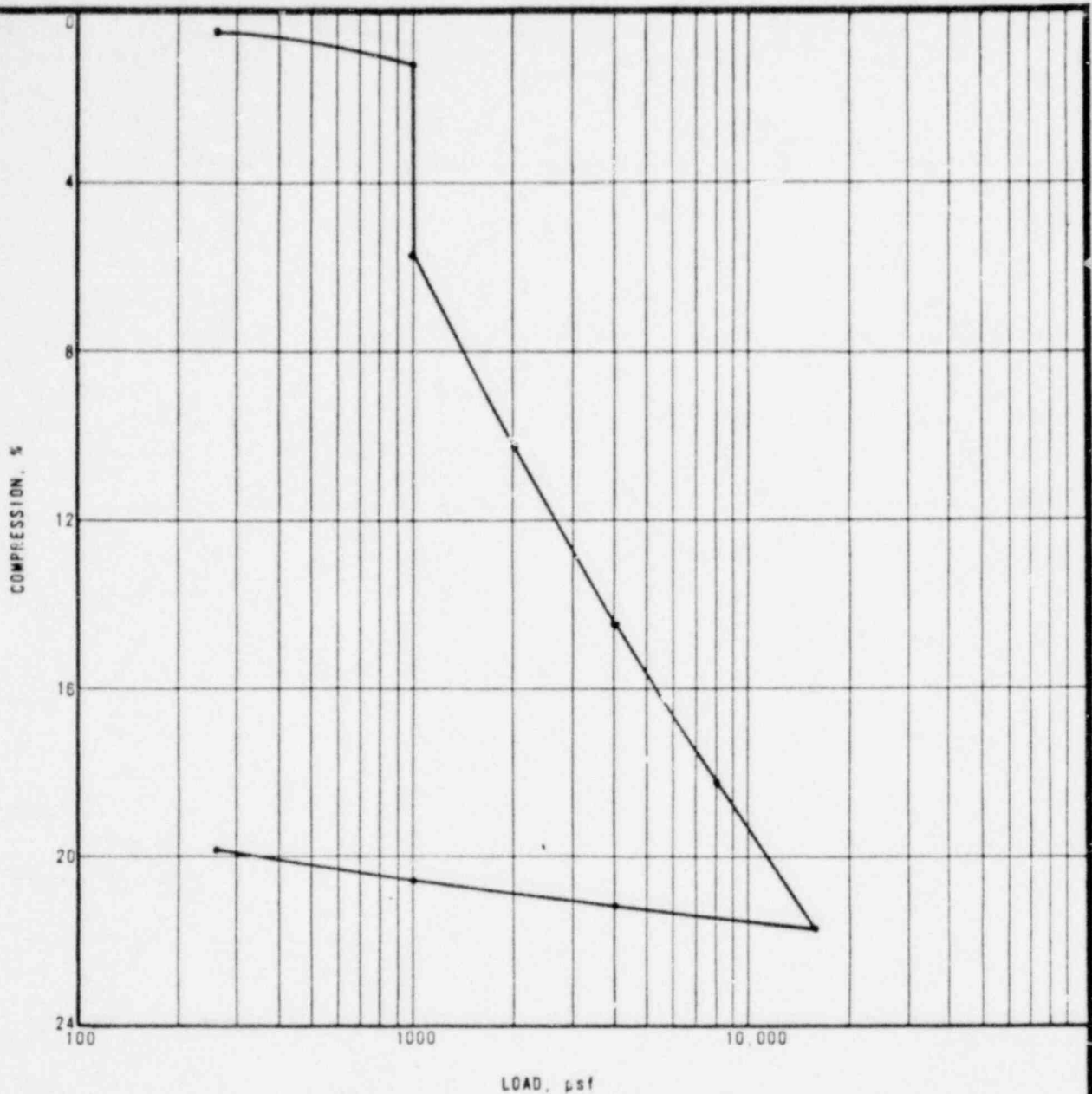


HOLE NO., SAMPLE NO.	WPC-7, S-1		
NATURAL WATER CONTENT, %	1.3		
MINIMUM DRY DENSITY, pcf	81.7		
MAXIMUM DRY DENSITY, pcf	112.7		
TEST DESIGNATION	ASTM	D2049-89	

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W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT PALO ALTO • NEWPORT BEACH • CALIF.	RELATIVE DENSITY RESULTS		
		PROJECT NO. GUL-101	DATE JUNE 1977	FIGURE NO. B-4





NOTE: SAMPLE WAS FLOODED WITH WATER AFTER CONSOLIDATING UNDER 1000 psf. FINAL SPECIMEN DATA WERE CALCULATED AT 250 psf REBOUND.

HOLE NO.	SAMPLE NO.	DEPTH (ft)	INITIAL SPECIMEN DATA			FINAL SPECIMEN DATA		
			DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO	DRY DENSITY (pcf)	WATER CONTENT (%)	DEGREE OF SATURATION (%)
WPC-2	S-1	5-7	80.8	5.6	1.039	100.8	24.0	100

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MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

CONSOLIDATION TEST

PROJECT NO.

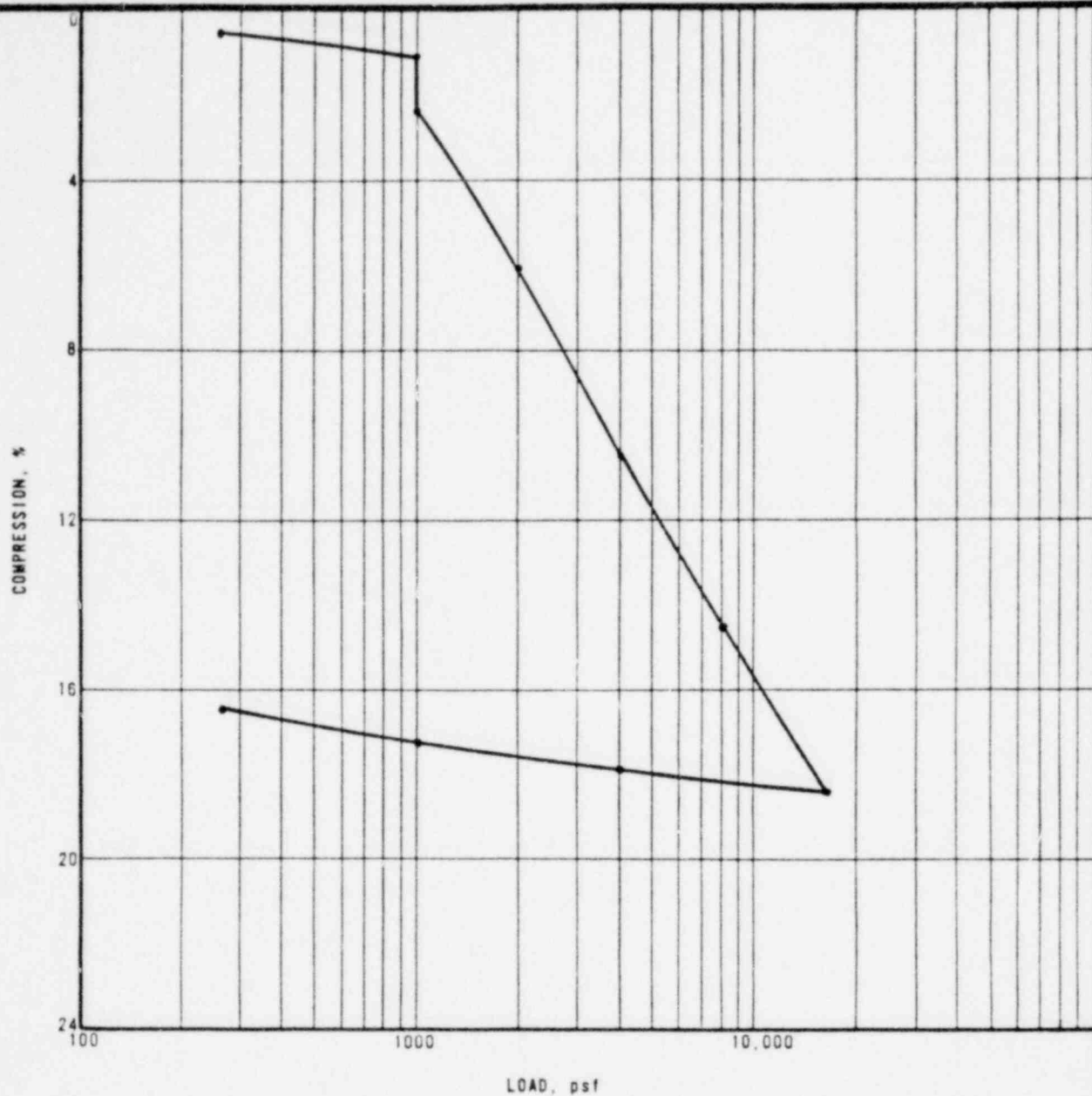
GUL-101

DATE

JUNE 1977

FIGURE NO.

8-5

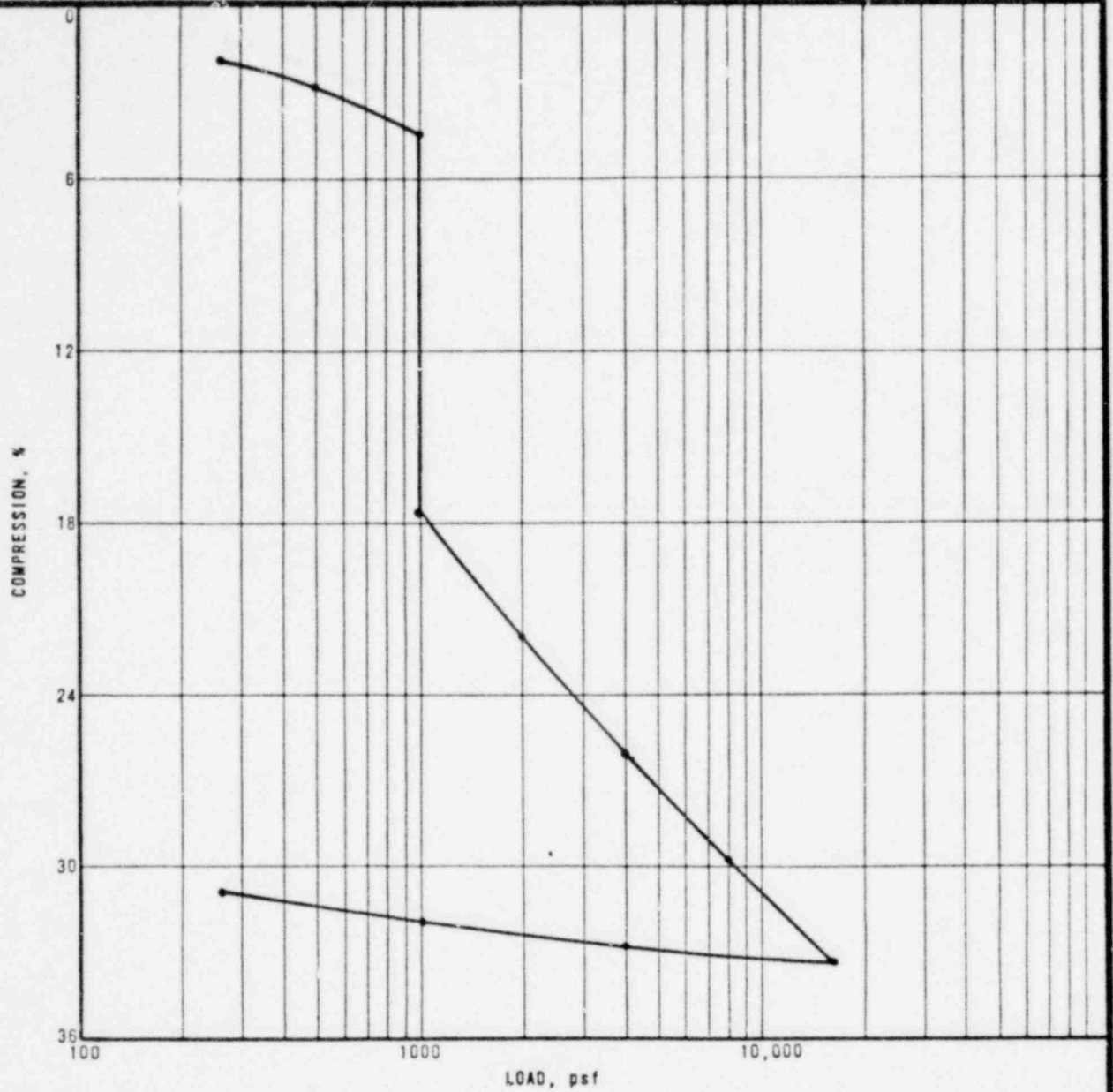


NOTE: SAMPLE WAS FLOODED WITH WATER AFTER CONSOLIDATING UNDER 1000 psf. FINAL SPECIMEN DATA WERE CALCULATED AT 250 psf REBOUND.

HOLE NO.	SAMPLE NO.	DEPTH (ft)	INITIAL SPECIMEN DATA			FINAL SPECIMEN DATA		
			DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO	DRY DENSITY (pcf)	WATER CONTENT (%)	DEGREE OF SATURATION (%)
WPC-2	S-4	30-31.3	88.5	13.9	0.868	106.0	21.1	100

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		CONSOLIDATION TEST		
	PROJECT NO.	DATE	FIGURE NO.		
	GUL-101	JUNE 1977	B-5		

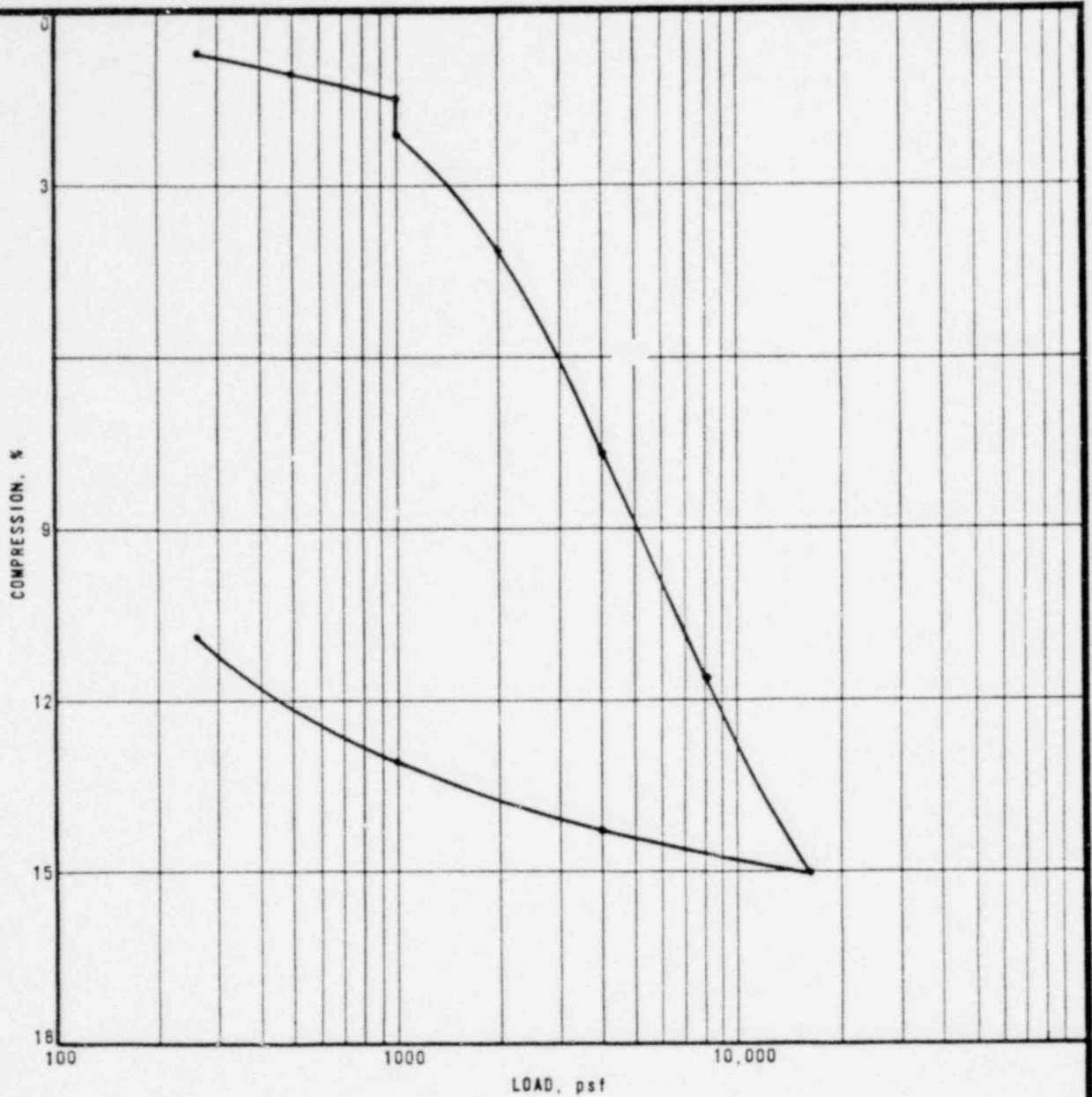
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NOTE: SAMPLE WAS FLOODED WITH WATER AFTER CONSOLIDATING UNDER 1000 psf. FINAL SPECIMEN DATA WERE CALCULATED AT 250 psf REBOUND.

HOLE NO.	SAMPLE NO.	DEPTH (ft)	INITIAL SPECIMEN DATA			FINAL SPECIMEN DATA		
			DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO	DRY DENSITY (pcf)	WATER CONTENT (%)	DEGREE OF SATURATION (%)
WPC-5	S-1	5-6.7	77.6	8.3	1.131	112.3	17.8	100

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		CONSOLIDATION TEST		
	PROJECT NO.	DATE	FIGURE NO.		
	GUL-101	JUNE 1977	8-5		



NOTE: SAMPLE WAS FLOODED WITH WATER AFTER CONSOLIDATING UNDER 1000 psf. FINAL SPECIMEN DATA WERE CALCULATED AT 250 psf REBOUND.

HOLE NO.	SAMPLE NO.	DEPTH (ft)	INITIAL SPECIMEN DATA			FINAL SPECIMEN DATA		
			DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO	DRY DENSITY (pcf)	WATER CONTENT (%)	DEGREE OF SATURATION (%)
WSL-9	S-2	10.0-11.5	100.8	12.5	0.659	113.0	17.9	100

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& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

CONSOLIDATION TEST

PROJECT NO.

GUL101

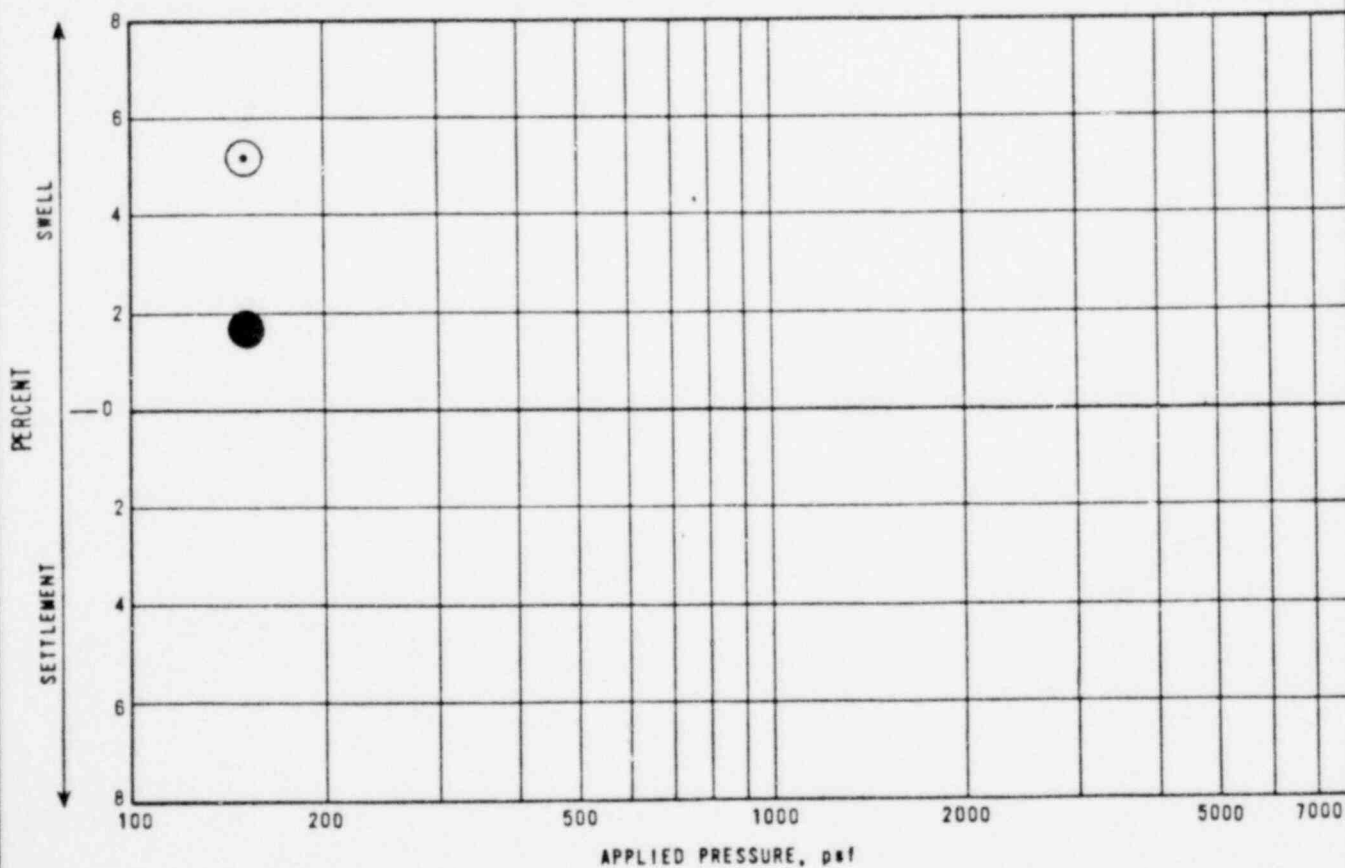
DATE

DECEMBER 1977

FIGURE NO.

B-5

HOLE NO.	DEPTH (ft)	SPEC NO.	INITIAL SPECIMEN DATA				FINAL SPECIMEN DATA			
			DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO (e)	DEGREE OF SATURATION (%)	DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO (e)	DEGREE OF SATURATION (%)
WB-11	0-11	1	103.5	18.3	0.592	81.7	99.3	25.0	0.659	100
WT-81	1-2.5	2	103.2	17.1	0.627	73.4	101.9	24.1	0.647	100



KEY

- SPECIMEN 1
- SPECIMEN 2

W. A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SWELL-COMPRESSION TEST

PROJECT NO

DATE

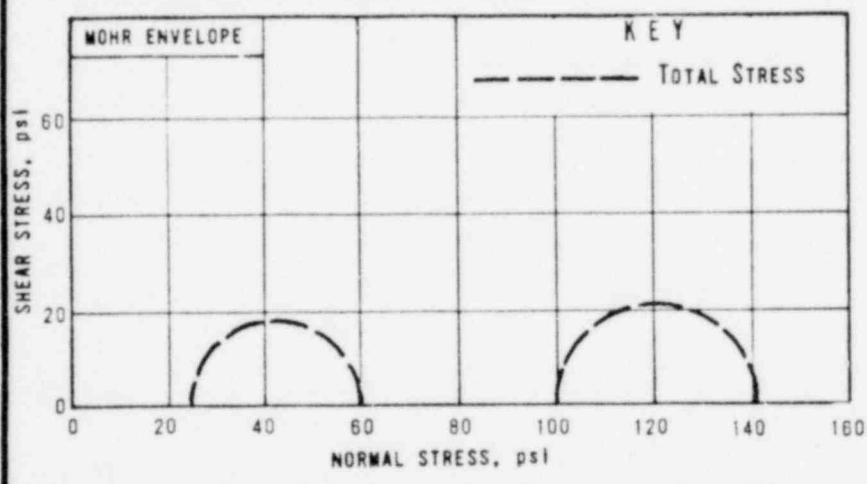
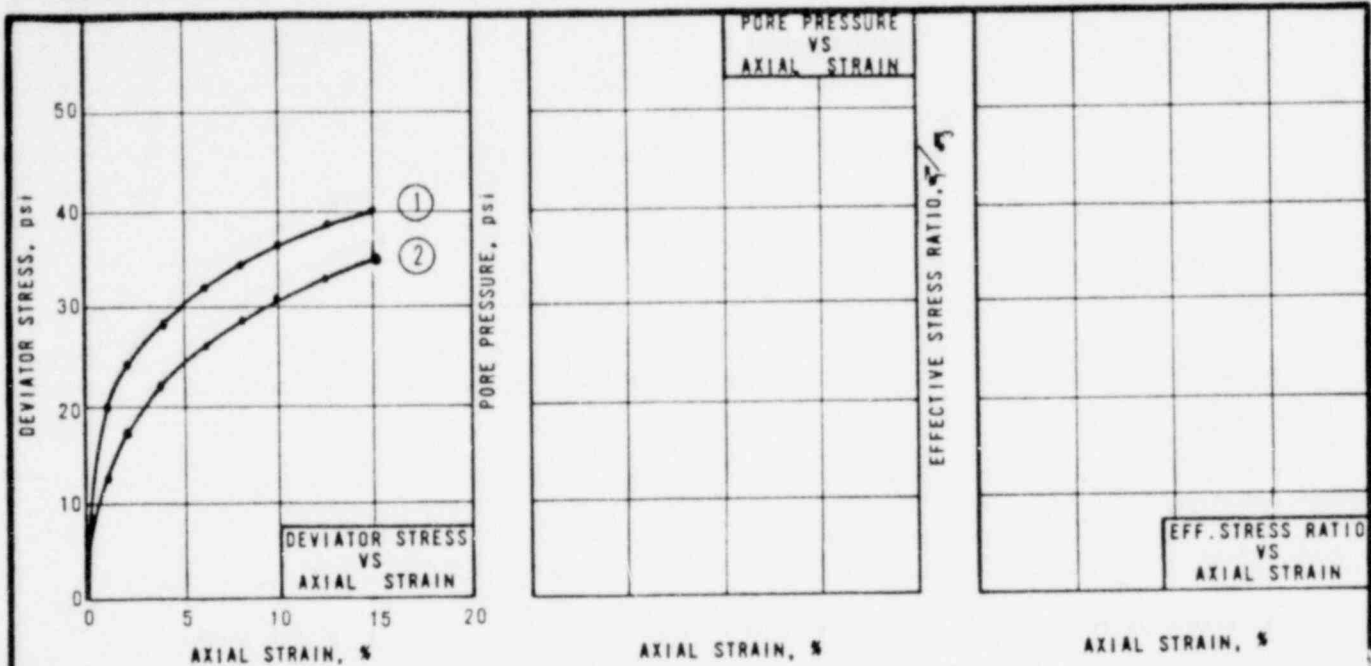
FIGURE NO.

GUL-101

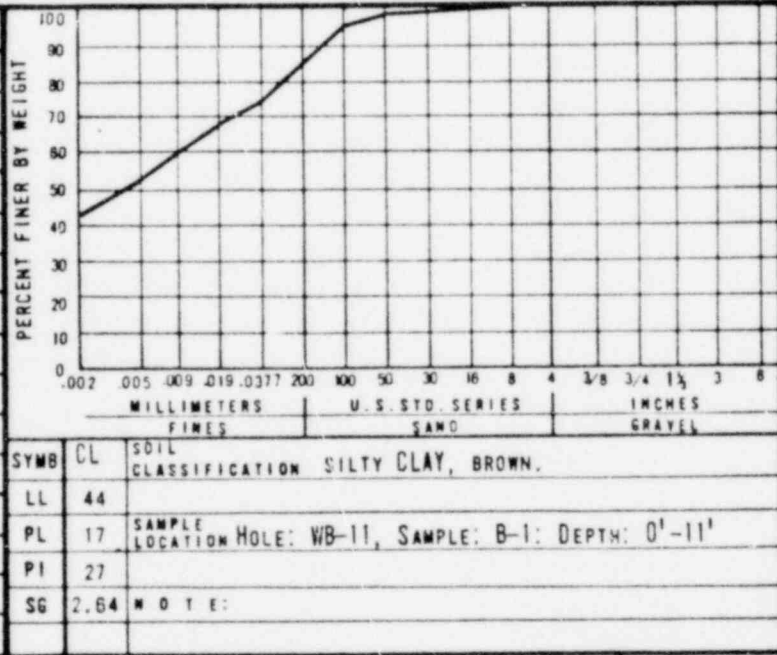
OCTOBER 1977

B-6

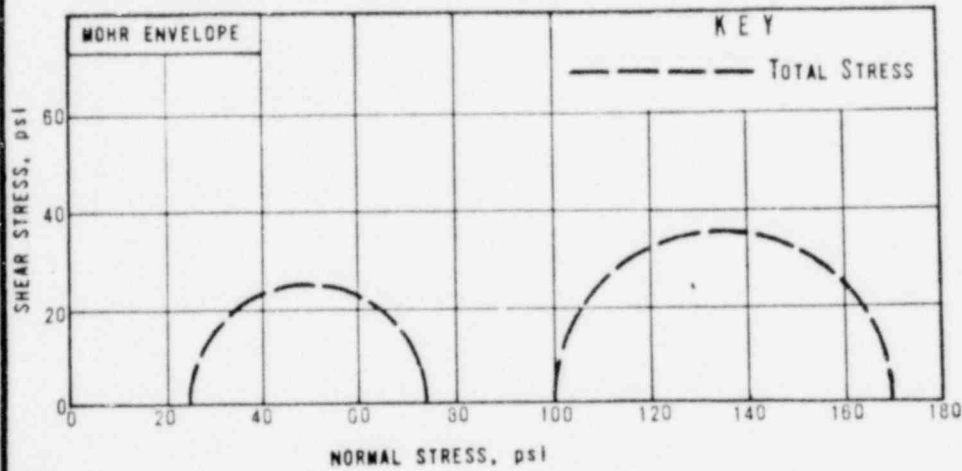
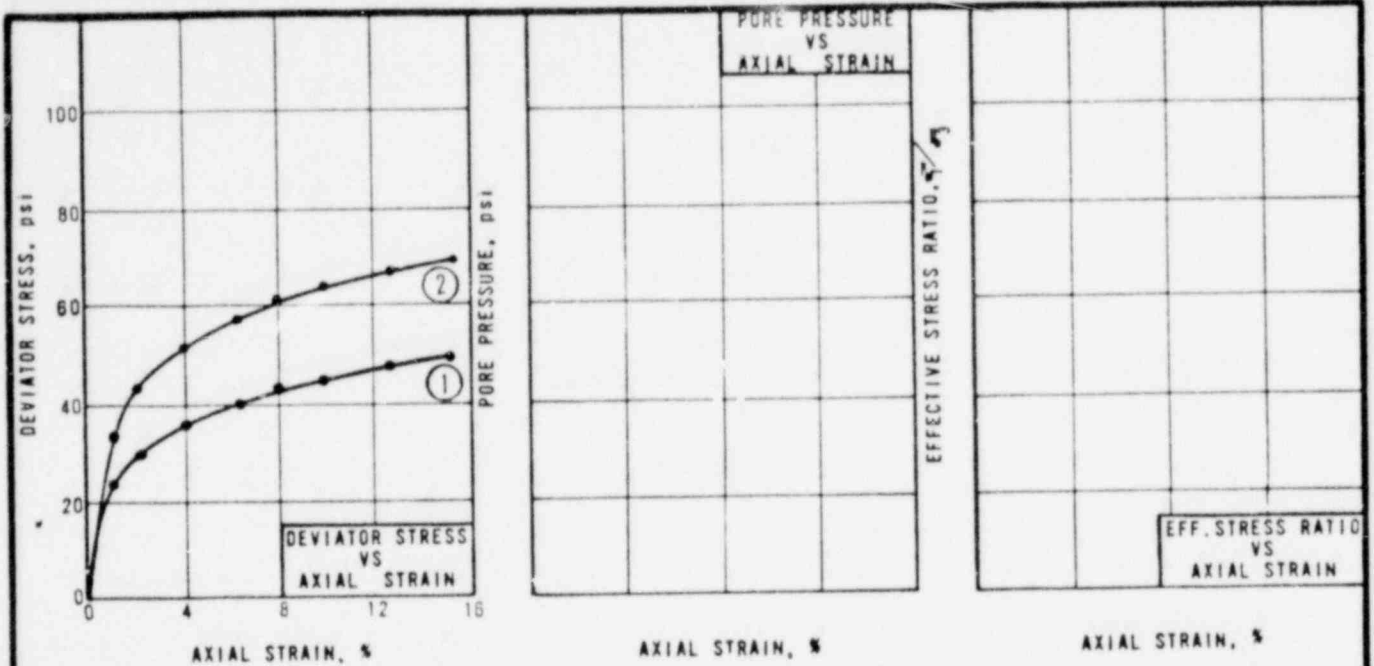
PALO ALTO • NEWPORT BEACH • CALIF.



SPECIMEN NO.		①	②
INITIAL CONDITION	Water Content, %	20.0	20.2
	Opt. Water Content, %	17.9	17.9
	Dry Density, pcf	103.6	103.4
	Max. Dry Density, pcf	108.7	108.7
	Void Ratio	0.591	0.594
	Saturation, %	79.4	89.8
FINAL CONDITION	Confin. Pressure, psi	25.0	100.0
	Water Content, %	----	----
	Dry Density, pcf	----	----
GENERAL	Void Ratio	----	----
	H <sub>g</sub> parameter	0.40	0.40
	Specimen Diameter, in	2.80	2.80
	Back Pressure, psi	0	0
	Test Time, hr	1.83	1.82
Rate of Strain, %/hr	8.28	8.36	



W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	TRIAxIAL TEST RESULTS			HOLE NO., SAMPLE NO.
		UNCONSOLIDATED UNDRAINED			
		PROJECT NO.	DATE	FIGURE NO.	
PALO ALTO NEWPORT BEACH CALIF.		GUL-101	SEPTEMBER 1977	B-7	WB-11, B-1



SPECIMEN NO.		①	②
INITIAL CONDITION	Water Content, %	17.8	17.7
	Opt. Water Content, %	16.2	16.2
	Dry Density, pcf	105.7	105.7
	Max. Dry Density, pcf	110.8	110.8
	Void Ratio	0.559	0.559
	Saturation, %	84.3	83.7
FINAL CONDITION	Confin. Pressure, psi	25.0	100.0
	Water Content, %	----	----
	Dry Density, pcf	----	----
GENERAL	Void Ratio	----	----
	$U_B$ Parameter	0.30	0.41
	Specimen Diameter, in	2.80	2.80
	Back Pressure, psi	0	0
	Test Time, hr	1.83	1.83
Rate of Strain, %/hr	8.28	8.28	

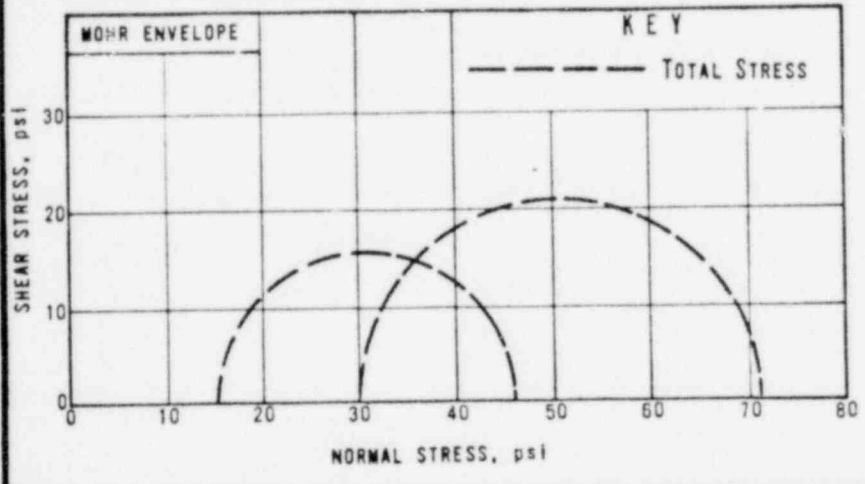
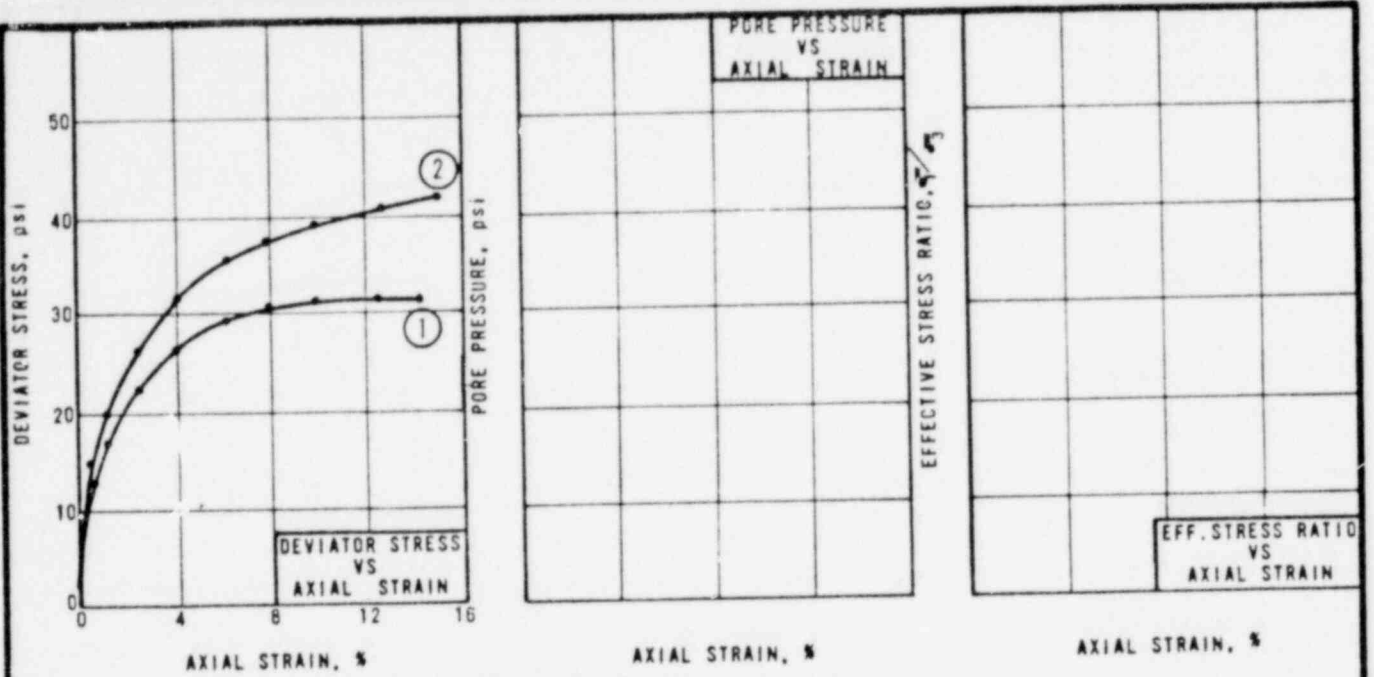
PERCENT FINER BY WEIGHT	MILLIMETERS			U.S. STD. SERIES			INCHES		
	75	60	42.5	NO. 20	NO. 40	NO. 60	NO. 10	NO. 20	NO. 40
100	100	100	100	100	100	100	100	100	100
90	95	90	85	90	85	80	90	85	80
80	85	80	75	80	75	70	80	75	70
70	75	70	65	70	65	60	70	65	60
60	65	60	55	60	55	50	60	55	50
50	55	50	45	50	45	40	50	45	40
40	45	40	35	40	35	30	40	35	30
30	35	30	25	30	25	20	30	25	20
20	25	20	15	20	15	10	20	15	10
10	15	10	5	10	5	0	10	5	0
0	5	0	0	0	0	0	0	0	0

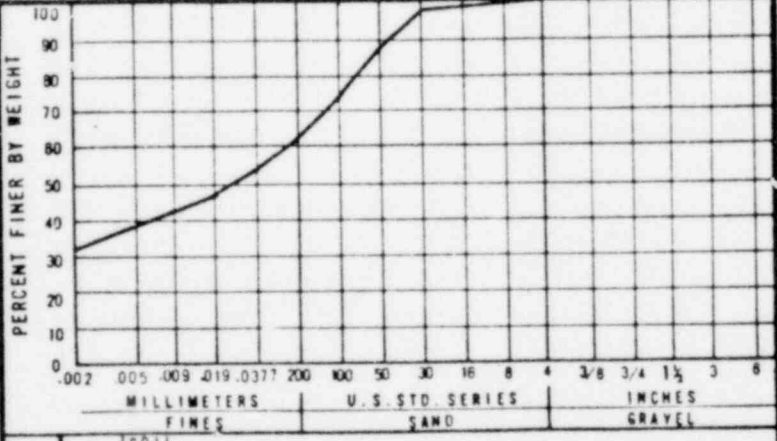
SYMB	CL	SOIL CLASSIFICATION SANDY CLAY, BROWN.
LL	36	
PL	18	SAMPLE LOCATION HOLE: WPC-15, SAMPLE: G-1, DEPTH: 0'-5'
PI	20	
SG	2.64	NOTE:

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	TRIAxIAL TEST RESULTS			HOLE NO., SAMPLE NO. WPC-15, G-1
		UNCONSOLIDATED UNDRAINED			
		PROJECT NO. GUL-101	DATE SEPTEMBER 1977	FIGURE NO. B-7	

PALO ALTO NEWPORT BEACH CALIF.



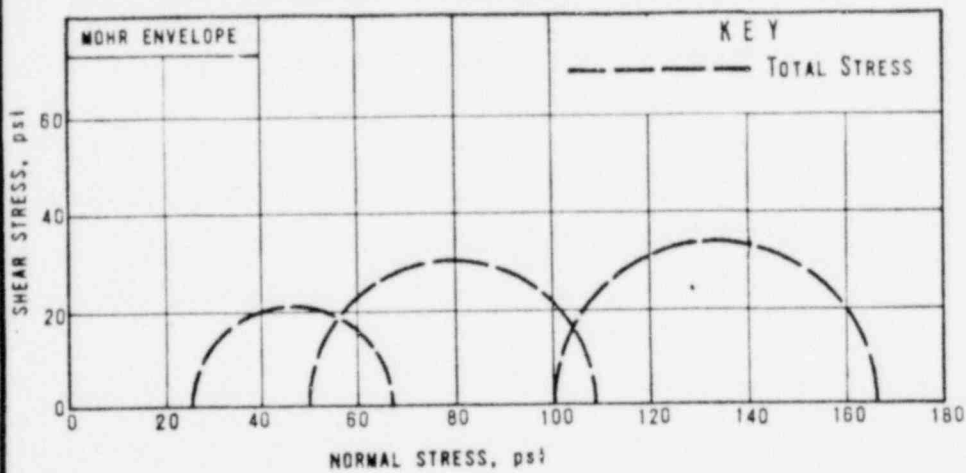
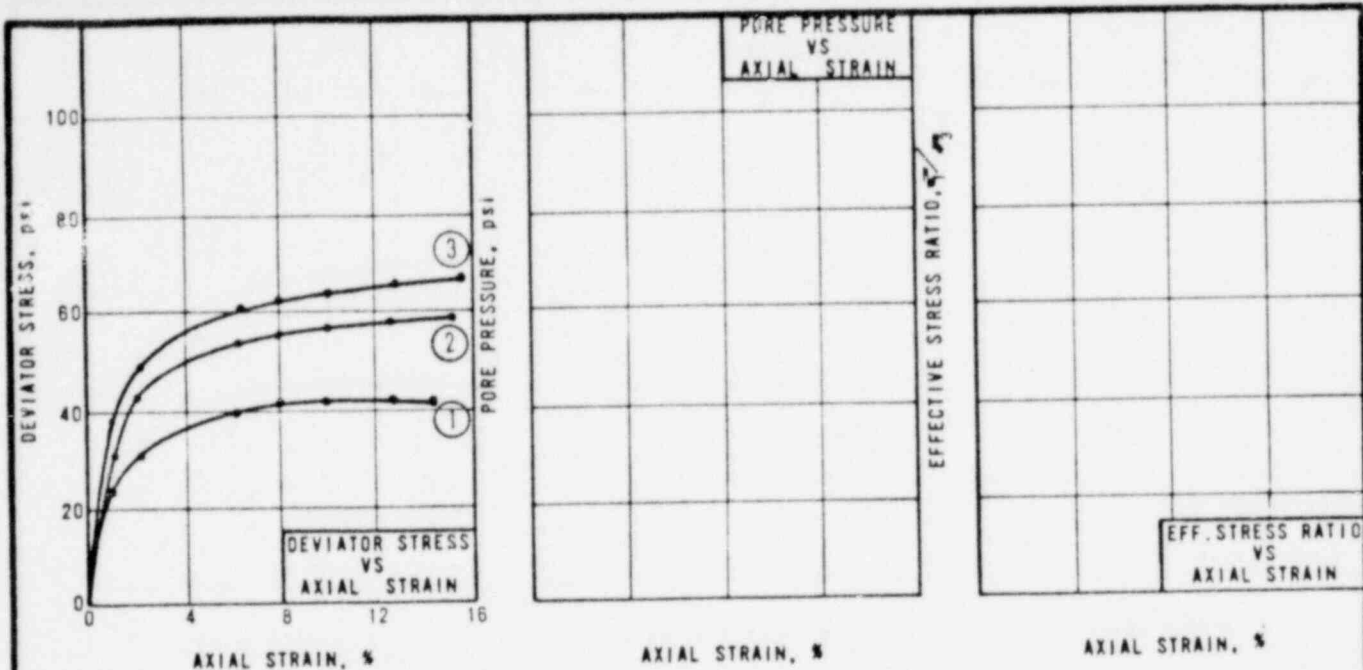
SPECIMEN NO.		①	②
INITIAL CONDITION	Water Content, %	15.8	15.7
	Opt. Water Content, %	13.0	13.0
	Dry Density, pcf	109.1	109.2
	Max. Dry Density, pcf	115.8	115.8
	Void Ratio	0.538	0.537
	Saturation, %	79.1	78.7
FINAL CONDITION	Confin. Pressure, psi	15.0	30.0
	Water Content, %	----	----
	Dry Density, pcf	----	----
	Void Ratio	----	----
GENERAL	"B" Parameter,	0.23	0.21
	Specimen Diameter, in	2.8	2.8
	Back Pressure, psi	0	0
	Test Time, hr	1.73	1.83
	Rate of Strain, %/hr	8.24	8.28



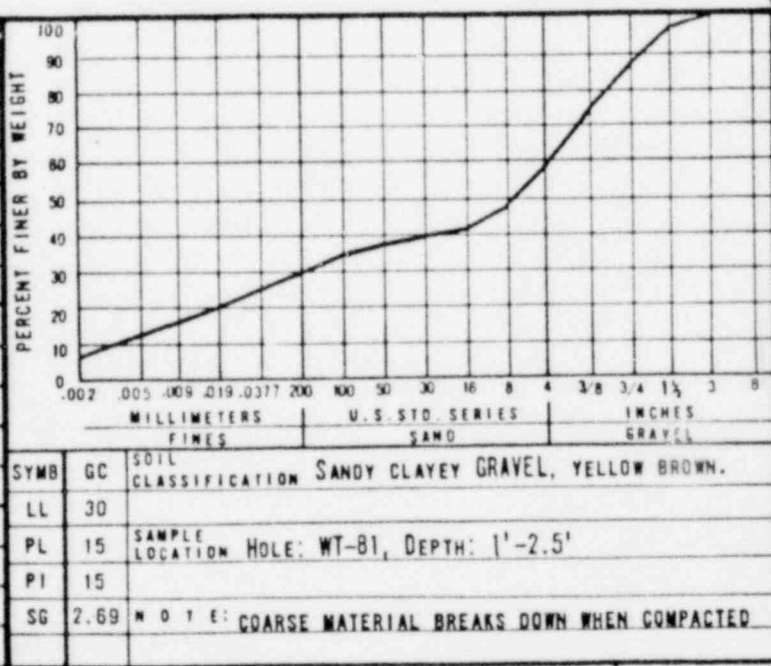
SYMB	CL	SOIL CLASSIFICATION	SANDY CLAY, BROWN
LL	35		
PL	16	SAMPLE LOCATION	HOLE: WSL-16; SAMPLE: G-1. DEPTH: 5'-10'
P1	18		
SG	2.69	NOTE:	

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	TRIAxIAL TEST RESULTS			HOLE NO., SAMPLE NO. WSL-16, G-1
		UNCONSOLIDATED UNDRAINED			
		PROJECT NO.	DATE	FIGURE NO.	
		GUL-101	DECEMBER 1977	B-7	



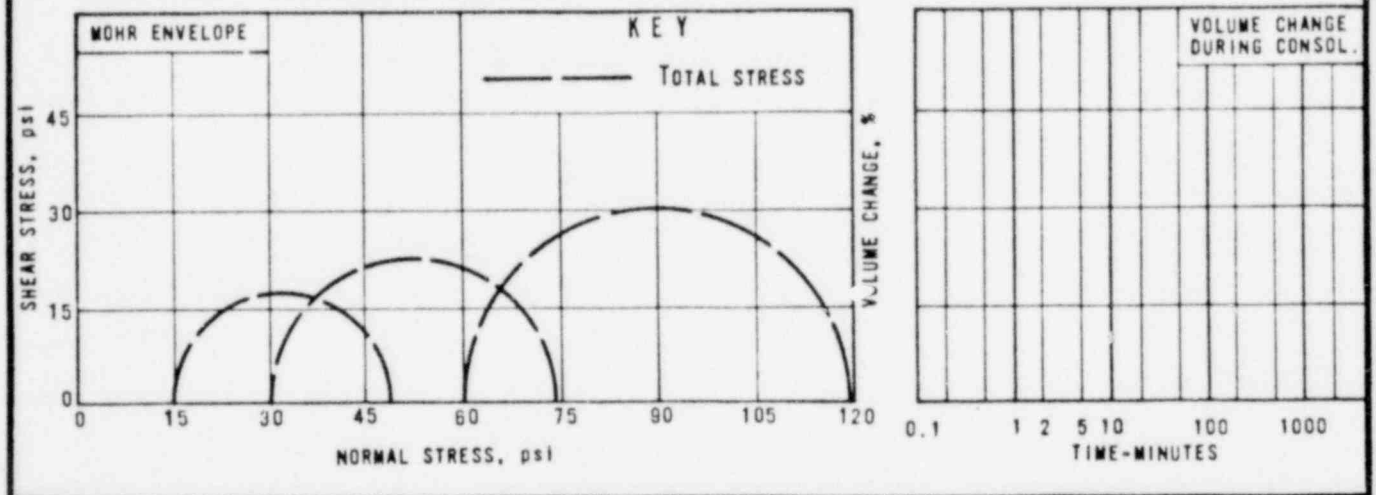
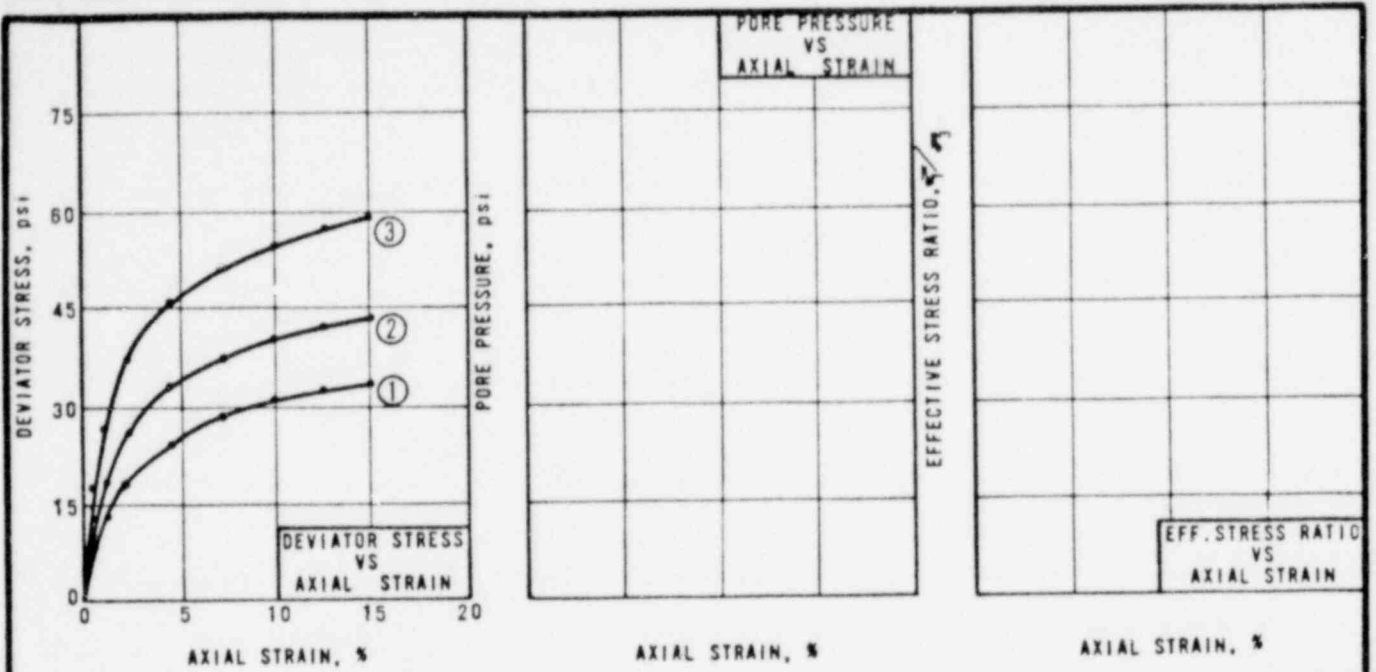


SPECIMEN NO.		①	②	③
INITIAL CONDITION	Water Content, %	18.5	18.6	19.1
	Opt Water Content, %	17.0	17.0	17.0
	Dry Density, pcf	103.5	103.5	102.9
	Max. Dry Density, pcf	108.5	108.5	108.5
	Void Ratio	0.622	0.623	0.631
	Saturation, %	79.8	80.5	81.7
FINAL CONDITION	Confin. Pressure, psi	25.0	50.0	100.0
	Water Content, %	----	----	----
	Dry Density, pcf	----	----	----
	Void Ratio	----	----	----
GENERAL	$11_{B''}$ Parameter	0.43	0.39	0.48
	Specimen Diameter, in	2.80	2.80	2.80
	Back Pressure, psi	0	0	0
	Test Time, hr	1.72	1.83	1.88
	Rate of Strain, %/hr	8.32	8.28	8.30

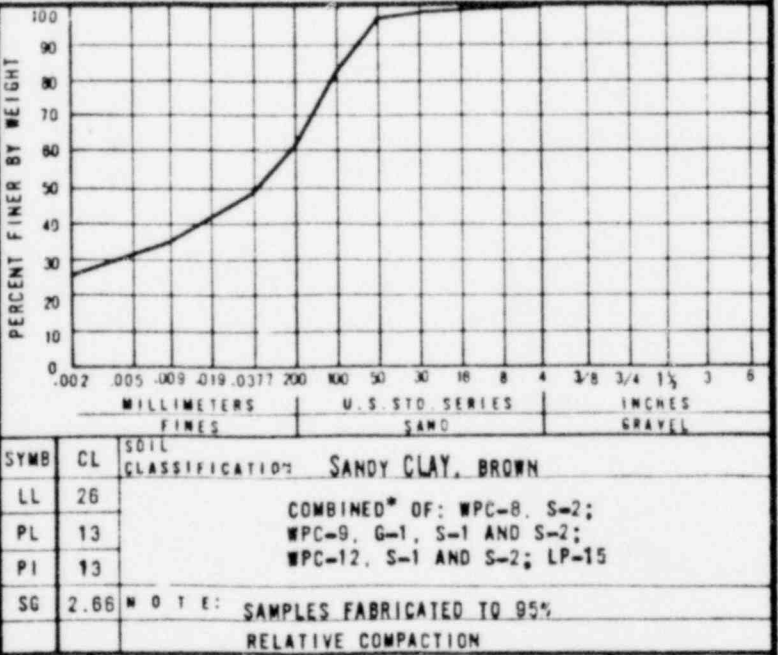


W.A. WAHLER & ASSOCIATES	WT. TAYLOR URANIUM MILL PROJECT	TRIAxIAL TEST RESULTS			HOLE NO. WT-81
		UNCONSOLIDATED UNDRAINED			
		PROJECT NO. GUL-101	DATE SEPTEMBER 1977	FIGURE NO. 8-7	

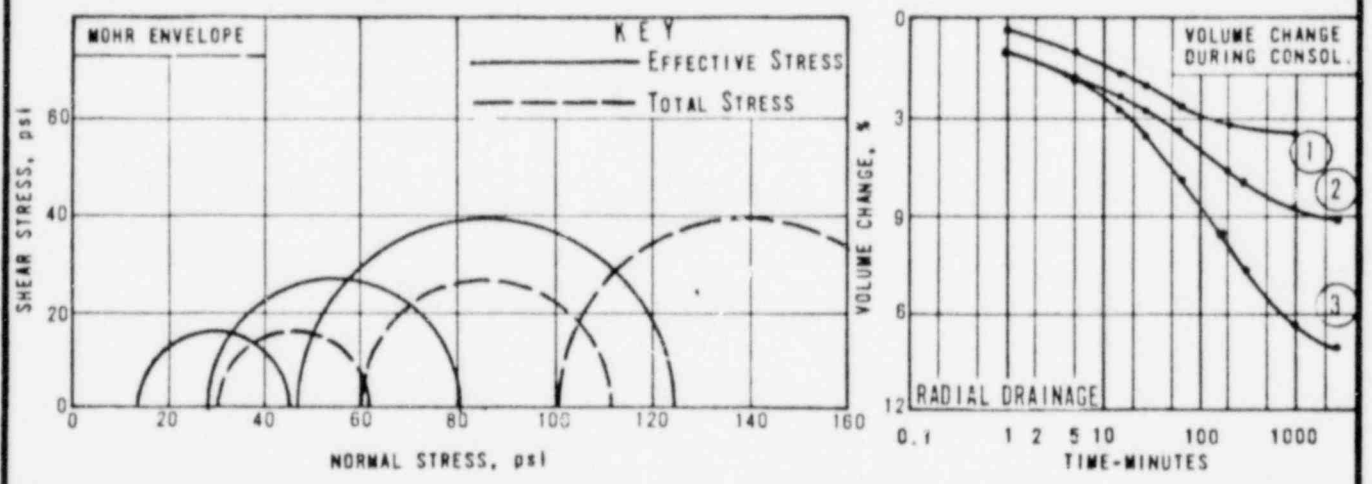
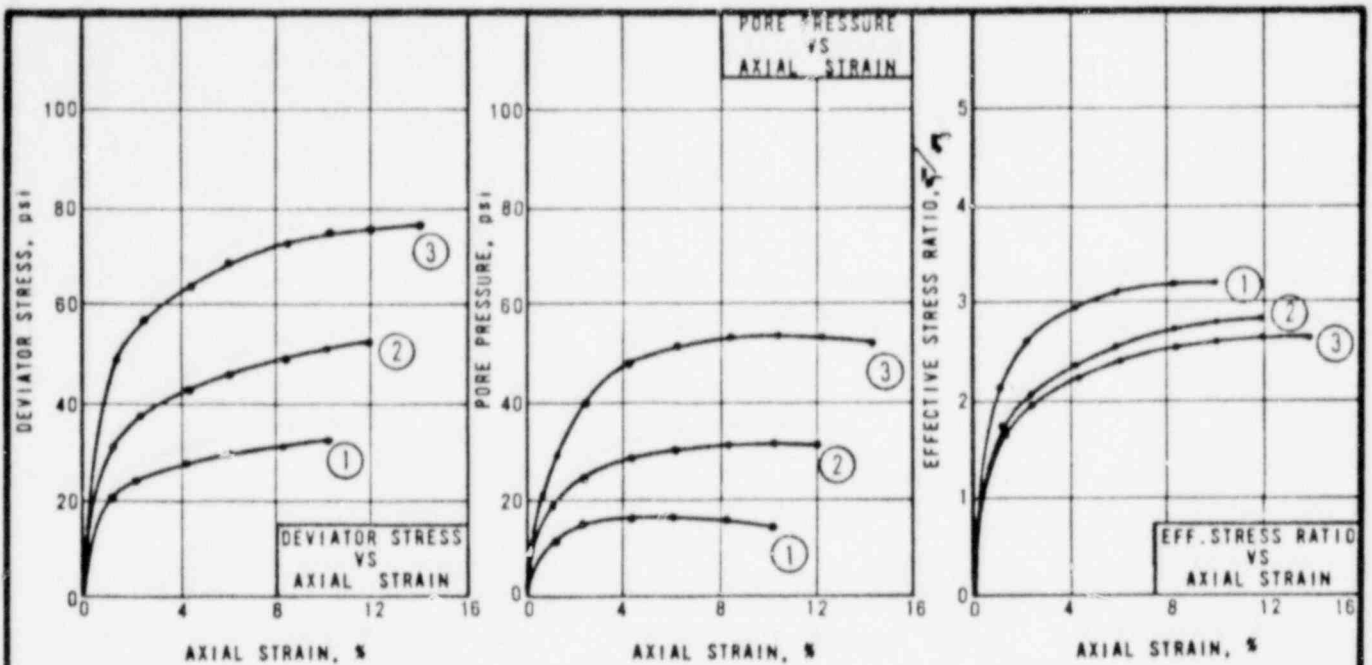
PALO ALTO NEWPORT BEACH CALIF.



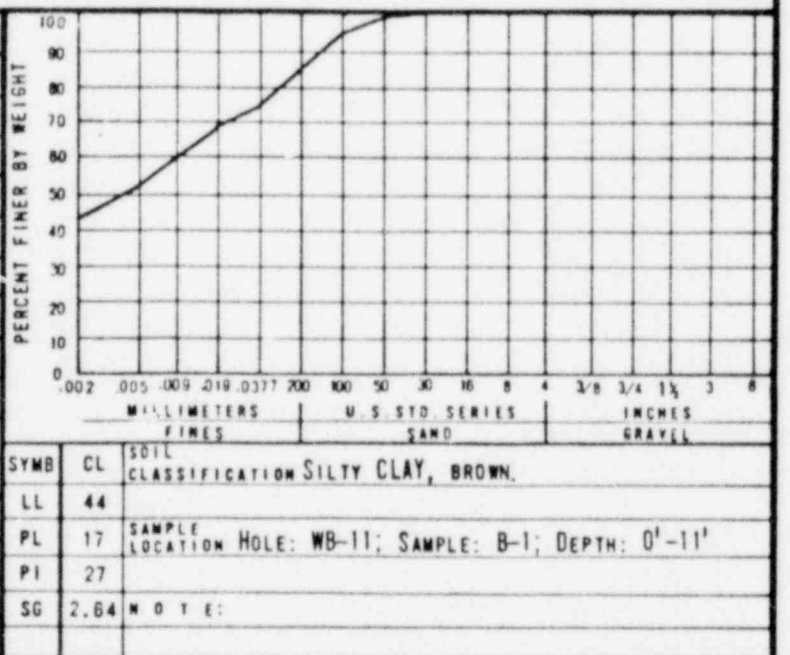
SPECIMEN NO.		①	②	③
INITIAL CONDITION	Water Content, %	16.1	15.9	16.1
	Opt. Water Content, %	14.0	14.0	14.0
	Dry Density, pcf	108.9	109.1	109.0
	Max. Dry Density, pcf	115.0	115.0	115.0
	Void Ratio	0.524	0.521	0.523
	Saturation, %	81.7	81.1	81.9
FINAL CONDITION	Confin. Pressure, psi	15.0	30.0	60.0
	Water Content, %	----	----	----
	Dry Density, pcf	----	----	----
	Void Ratio	----	----	----
GENERAL	"B" PARAMETER	0.15	0.12	0.10
	Specimen Diameter, in	2.80	2.80	2.80
	Back Pressure, psi	0	0	0
	Test Time, hr	1.82	1.82	1.82
	Rate of Strain, %/hr	8.25	8.25	8.25



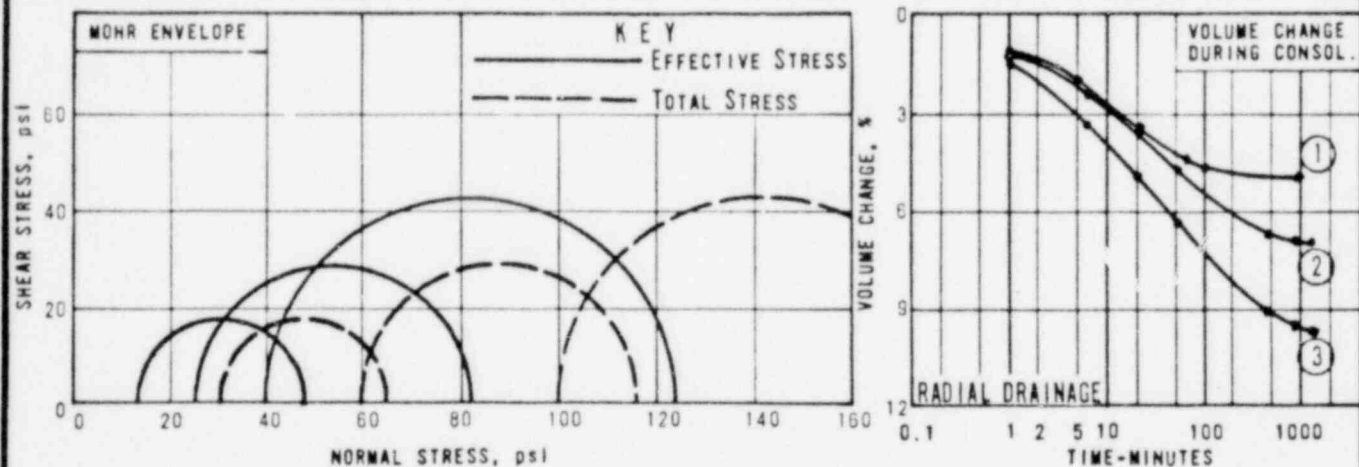
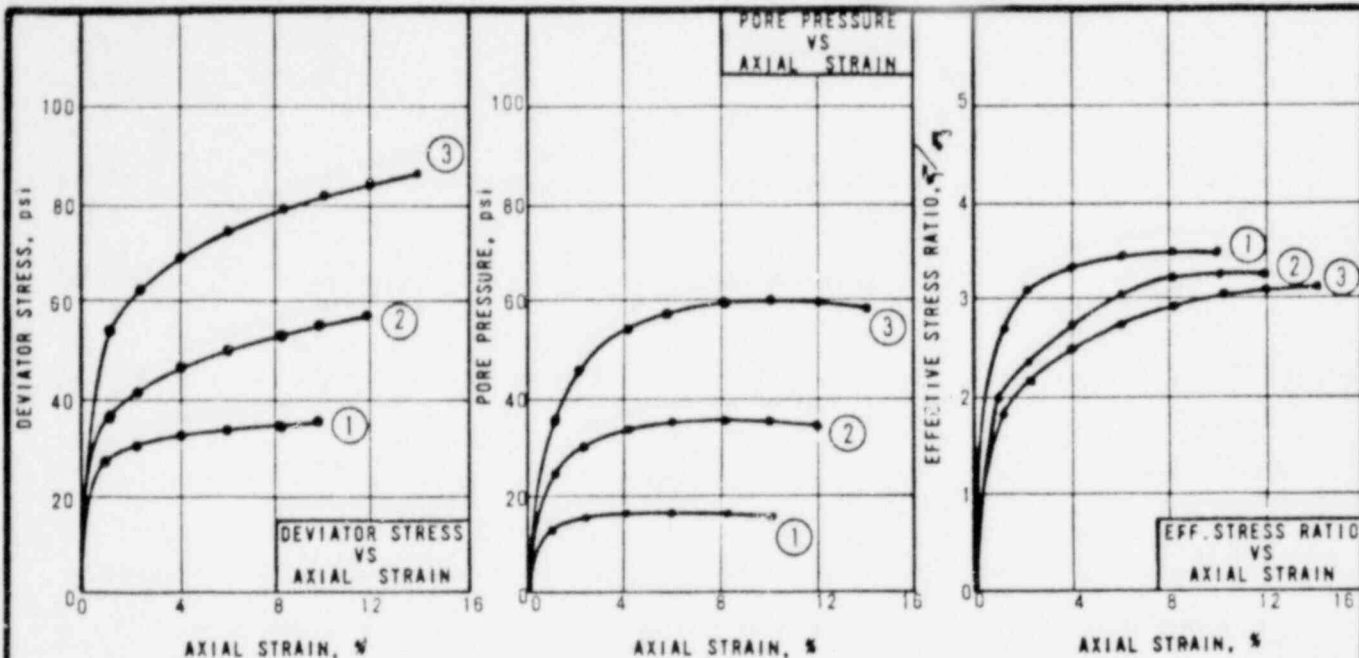
W.A. WAHLER & ASSOCIATES PALO ALTO NEWPORT BEACH CALIF.	MT. TAYLOR URANIUM MILL PROJECT		TRIAxIAL TEST RESULTS UNCONSOLIDATED UNDRAINED			SAMPLE COMBINED*
	PROJECT NO.	DATE	FIGURE NO.			
	GUL-105A	DECEMBER 1979	B-7			



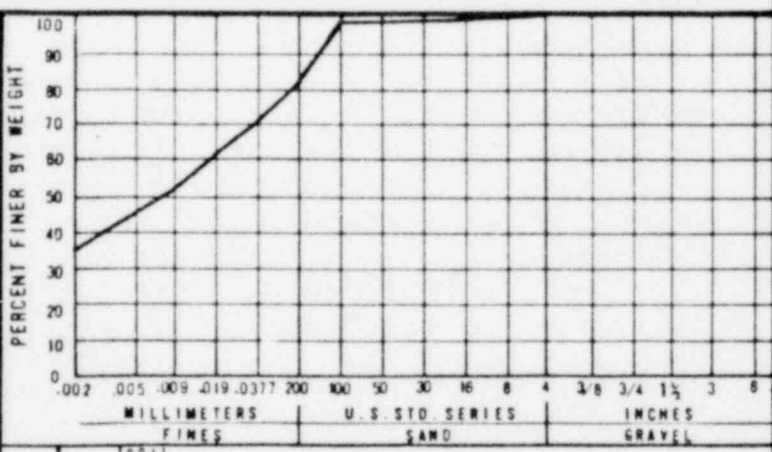
SPECIMEN NO.		①	②	③
INITIAL CONDITION	Water Content, %	20.3	20.2	20.1
	Opt. Water Content, %	17.4	17.4	17.4
	Dry Density, pcf	103.3	103.4	103.4
	Max. Dry Density, pcf	108.7	108.7	108.7
	Void Ratio	0.596	0.594	0.593
	Saturation, %	90.1	89.8	89.6
FINAL CONDITION	Consol. Pressure, psi	30.0	60.0	100.0
	Water Content, %	20.5	18.8	16.4
	Dry Density, pcf	106.9	110.1	114.9
	Void Ratio	0.542	0.497	0.434
Saturation, %		100.0	100.0	100.0
GENERAL	Specimen Diameter, in	2.80	2.80	2.80
	Back Pressure, psi	50.0	50.0	50.0
	Test Time, hr	2.33	2.75	3.18
	Rate of Strain, %/hr	4.28	4.35	4.43



W A WAHLER & ASSOCIATES PALO ALTO NEWPORT BEACH CALIF.	MT. TAYLOR URANIUM MILL PROJECT	TRIAxIAL TEST RESULTS CONSOLIDATED UNDRAINED			HOLE NO., SAMPLE NO. WB-11, B-1
		PROJECT NO.	DATE	FIGURE NO.	
		GUL-101	SEPTEMBER 1977	B-8	

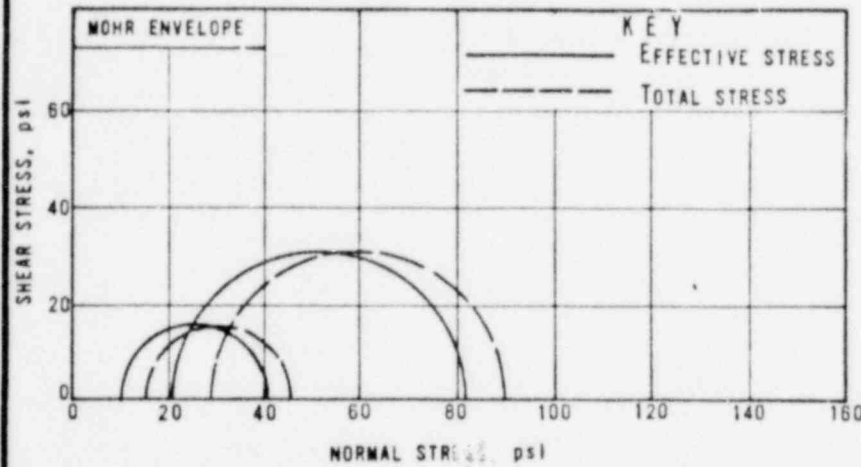
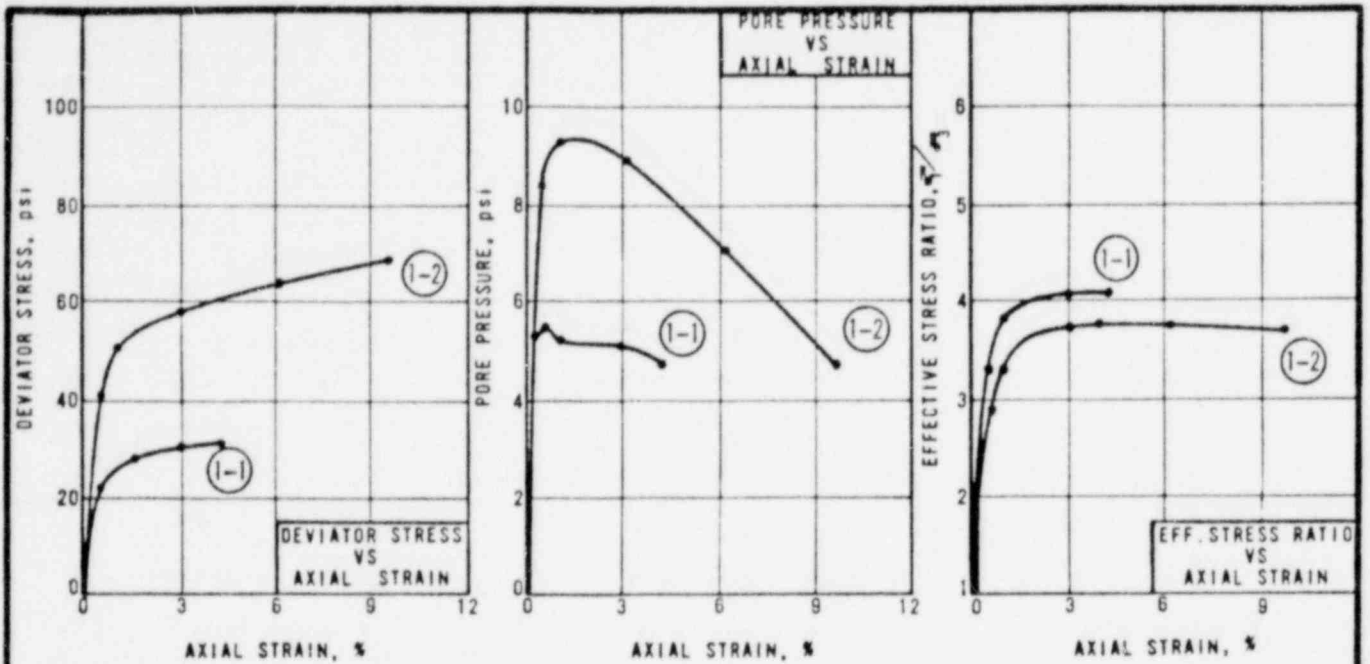


SPECIMEN NO.		①	②	③
INITIAL CONDITION	Water Content, %	18.3	17.6	17.7
	Opt. Water Content, %	16.2	16.2	16.2
	Dry Density, pcf	105.4	105.8	105.8
	Max. Dry Density, pcf	110.8	110.8	110.8
	Void Ratio	0.563	0.558	0.558
Saturation, %	86.0	83.6	84.0	
FINAL CONDITION	Consol. Pressure, psi	30.0	60.0	100.0
	Water Content, %	18.3	17.0	15.4
	Dry Density, pcf	111.0	113.7	117.1
	Void Ratio	0.484	0.449	0.407
Saturation, %	100.0	100.0	100.0	
GENERAL	Specimen Diameter, in.	2.80	2.80	2.80
	Back Pressure, psi	50.0	50.0	50.0
	Test Time, hr	2.33	2.77	3.15
	Rate of Strain, %/hr	4.32	4.35	4.47



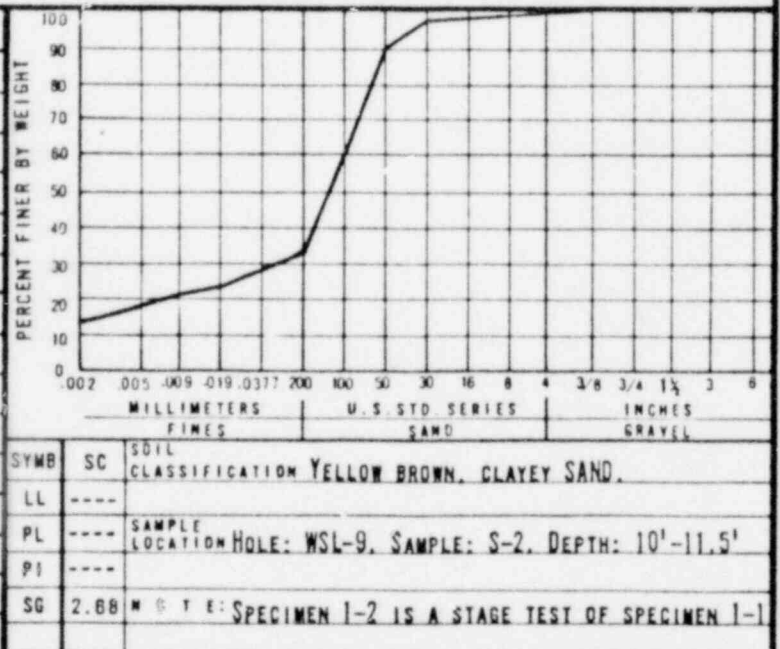
SYMB	CL	SOIL CLASSIFICATION SANDY CLAY, BROWN.
LL	36	
PL	16	SAMPLE LOCATION HOLE: WPC-15, SAMPLE: G-1, DEPTH: 0'-5'
PI	20	
SG	2.64	NOTE:

W. A. WAHLER & ASSOCIATES PALO ALTO NEWPORT BEACH CALIF.	MT. TAYLOR URANIUM MILL PROJECT			TRIAxIAL TEST RESULTS CONSOLIDATED UNDRAINED			HOLE NO., SAMPLE NO.
	PROJECT NO.	DATE	FIGURE NO.				
	GUL-101	SEPTEMBER 1977	8-8				WPC-15, G-1

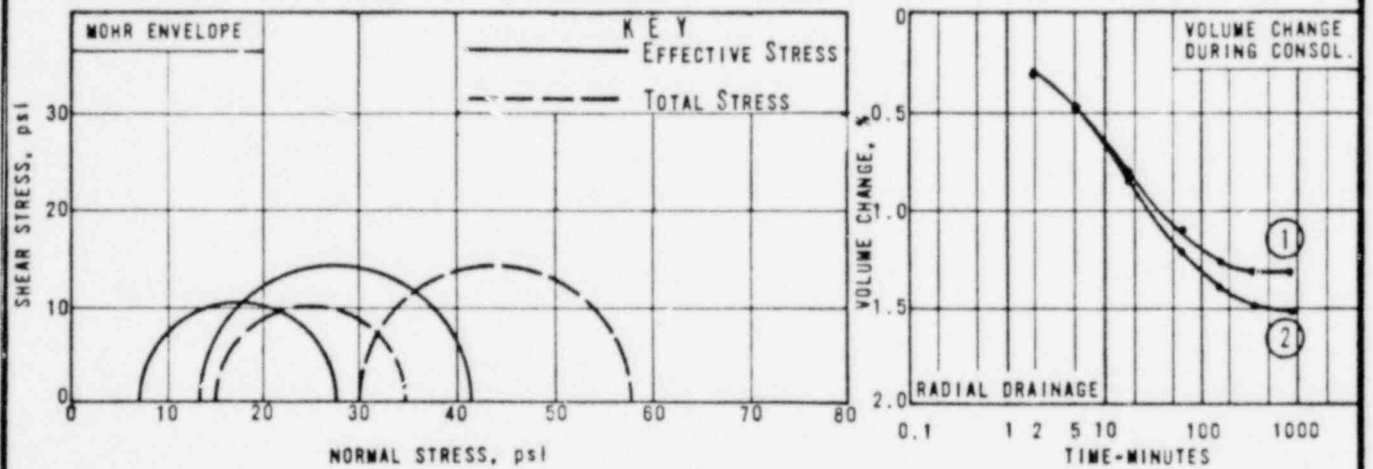
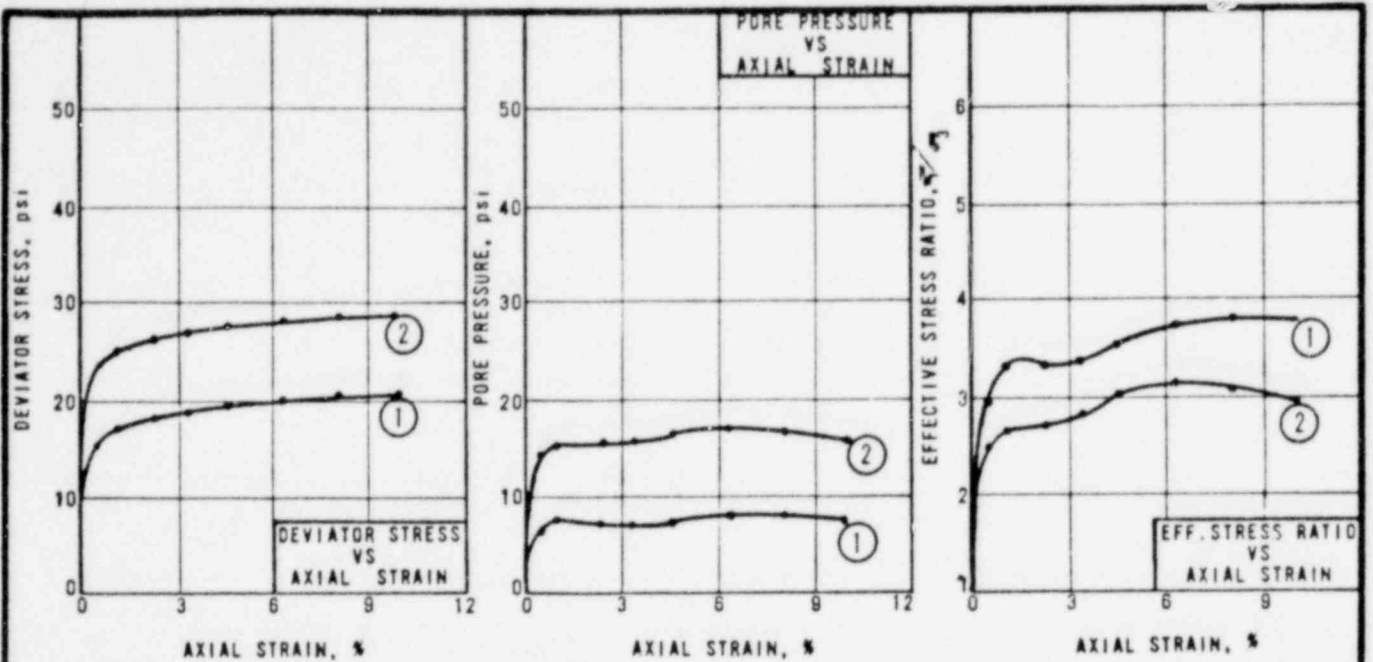


SPECIMEN NUMBER	VOLUME CHANGE PRIOR TO SHEAR, %
1-1	1.98
1-2	1.41

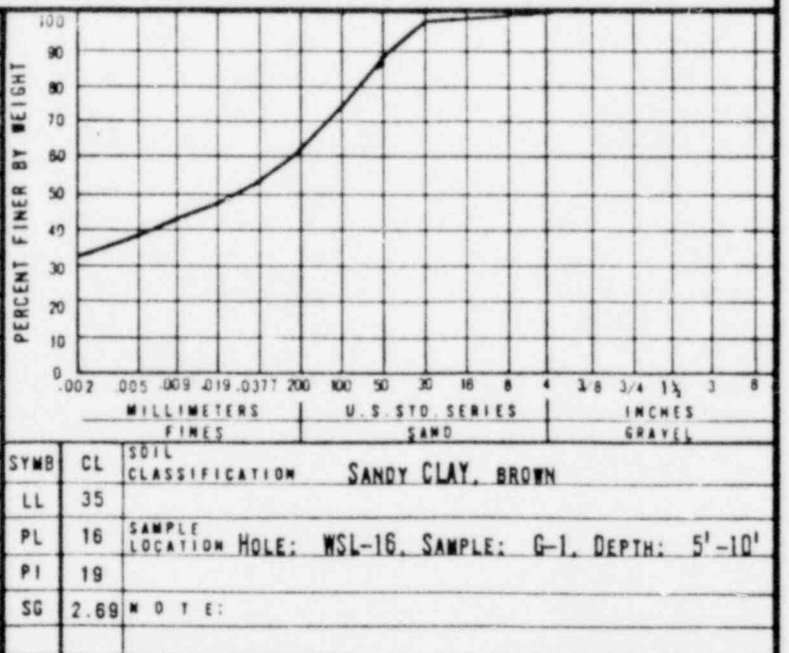
	(1-1)	(1-2)
<b>INITIAL CONDITION</b>		
Water Content, %	10.8	18.0
Opt Water Content, %	----	----
Dry Density, pcf	111.0	113.2
Max. Dry Density, pcf	----	----
Void Ratio	0.508	0.478
Saturation, %	57.1	100.0
<b>FINAL CONDITION</b>		
Consol. Pressure, psi	15.0	30.0
Water Content, %	17.8	17.1
Dry Density, pcf	113.2	114.8
Void Ratio	0.478	0.457
Saturation, %	100.0	100.0
<b>GENERAL</b>		
Specimen Diameter, in	2.875	2.914
Back Pressure, psi	50.0	50.0
Test Time, hr	1.07	2.33
Rate of Strain, %/hr	3.95	4.15



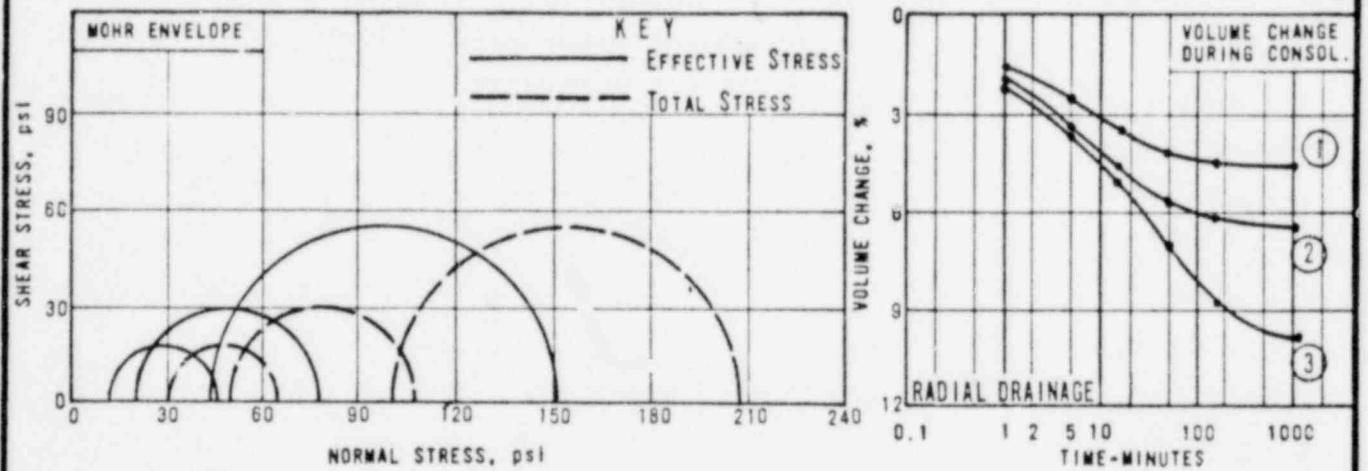
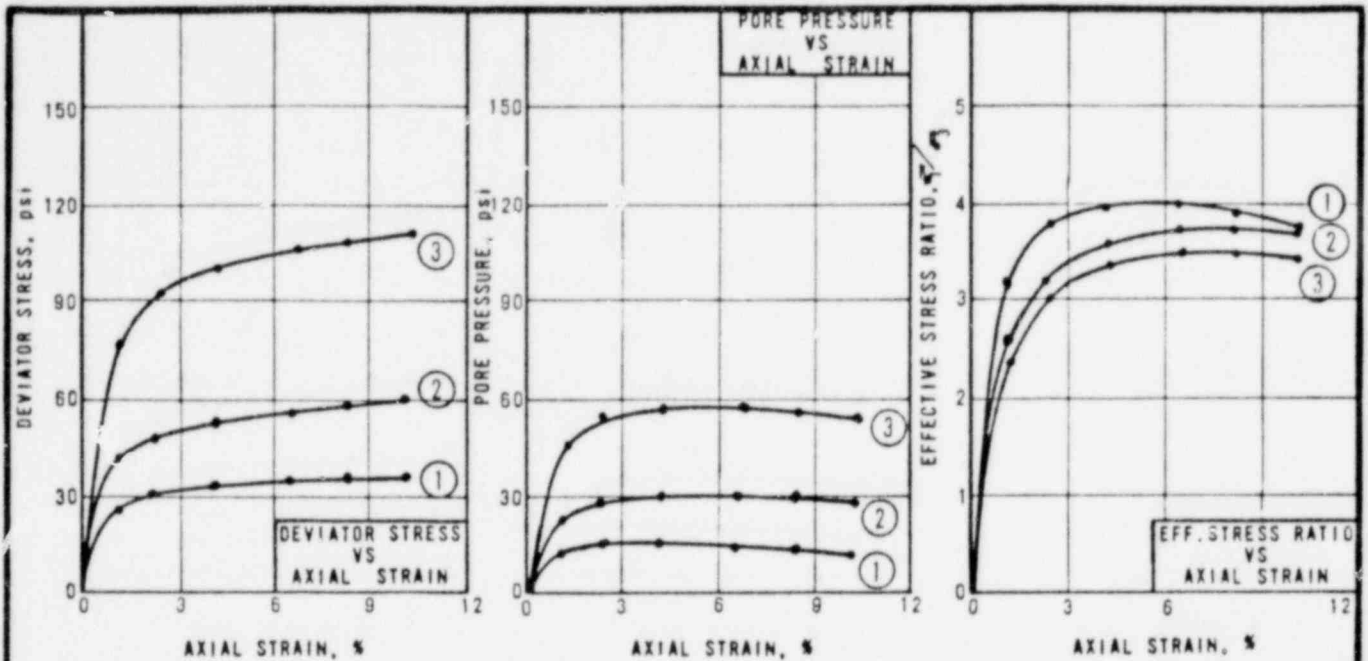
W.A. WAHLER & ASSOCIATES PALO ALTO NEWPORT BEACH CALIF.	MT. TAYLOR URANIUM MILL PROJECT			TRIAXIAL TEST RESULTS CONSOLIDATED UNDRAINED			HOLE NO., SAMPLE NO. WSL-9, S-2
	PROJECT NO.	DATE	FIGURE NO.	GUL-101	DECEMBER 1977	B-8	
	Symb SC SOIL CLASSIFICATION YELLOW BROWN, CLAYEY SAND. LL ---- PL ---- SAMPLE LOCATION HOLE: WSL-9, SAMPLE: S-2, DEPTH: 10'-11.5' PI ---- SG 2.88 NOTE: SPECIMEN 1-2 IS A STAGE TEST OF SPECIMEN 1-1						



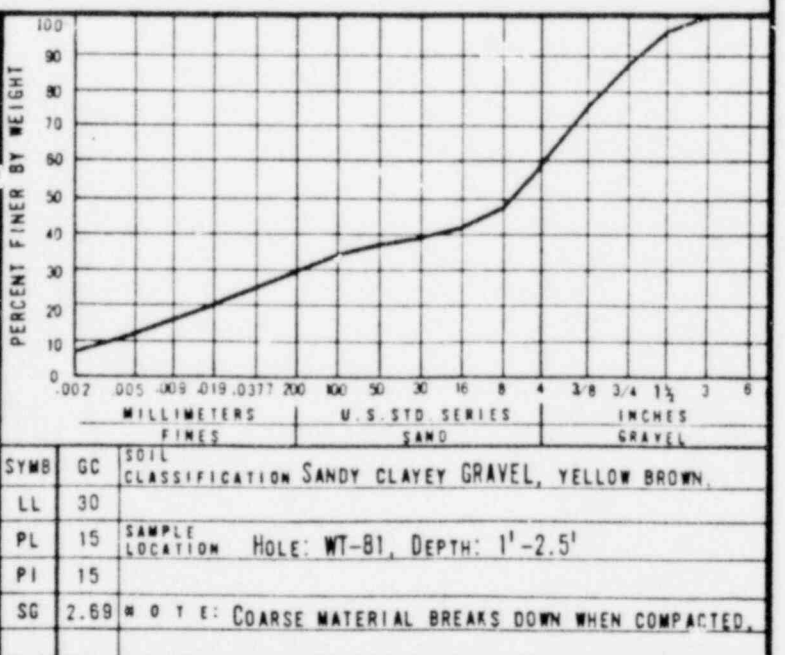
SPECIMEN NO.		①	②
INITIAL CONDITION	Water Content, %	15.5	15.3
	Opt Water Content, %	13.0	13.0
	Dry Density, pcf	109.4	109.6
	Max. Dry Density, pcf	115.8	115.8
	Void Ratio	0.535	0.531
	Saturation, %	78.2	77.4
FINAL CONDITION	Consol. Pressure, psi	15.0	30.0
	Water Content, %	19.1	18.9
	Dry Density, pcf	110.8	111.4
	Void Ratio	0.515	0.508
		100.0	100.0
GENERAL	Specimen Diameter, in	2.80	2.80
	Back Pressure, psi	50.0	50.0
	Test Time, hr	2.33	2.32
	Rate of Strain, %/hr	4.24	4.27



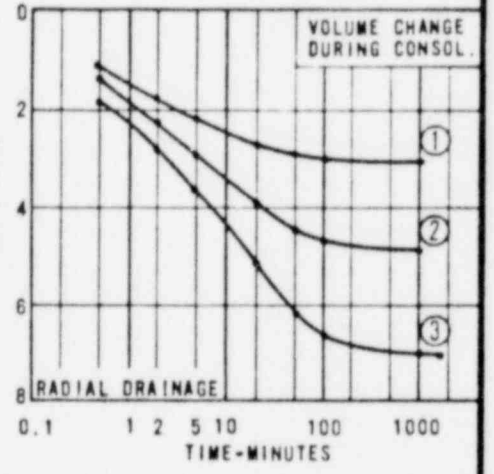
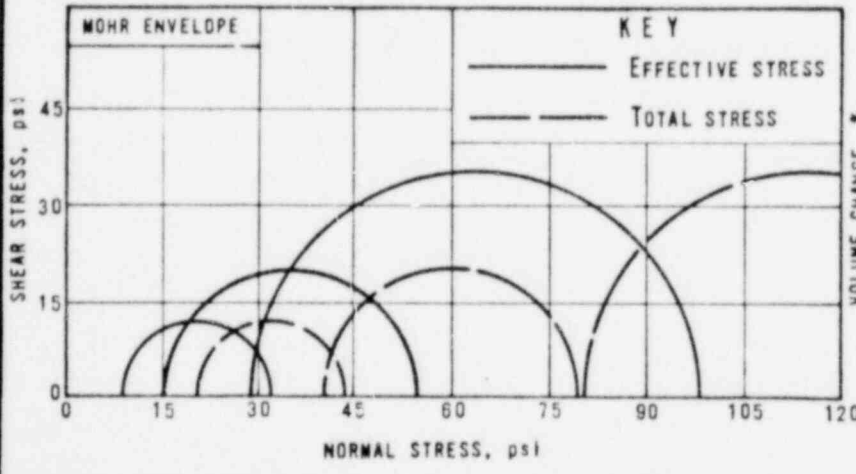
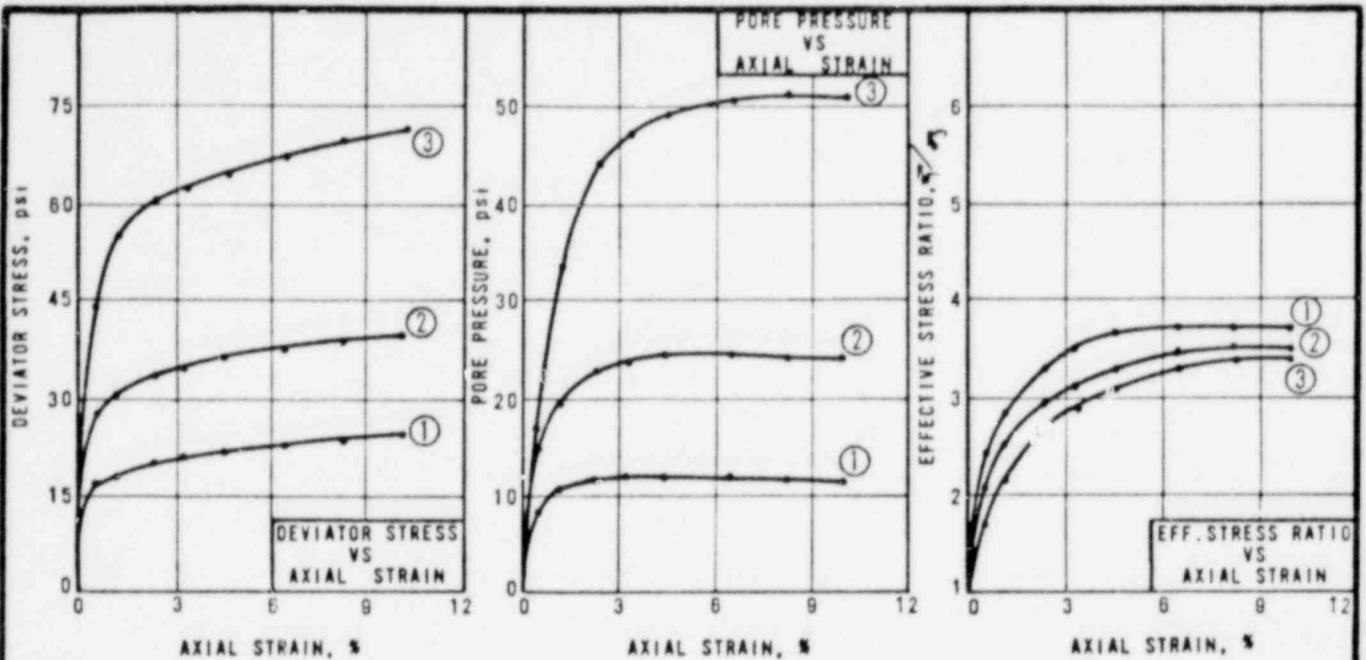
W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	TRIAXIAL TEST RESULTS			HOLE NO., SAMPLE NO. WSL-16 G-1
		CONSOLIDATED UNDRAINED			
		PROJECT NO. GUL-101	DATE DECEMBER 1977	FIGURE NO. B-8	



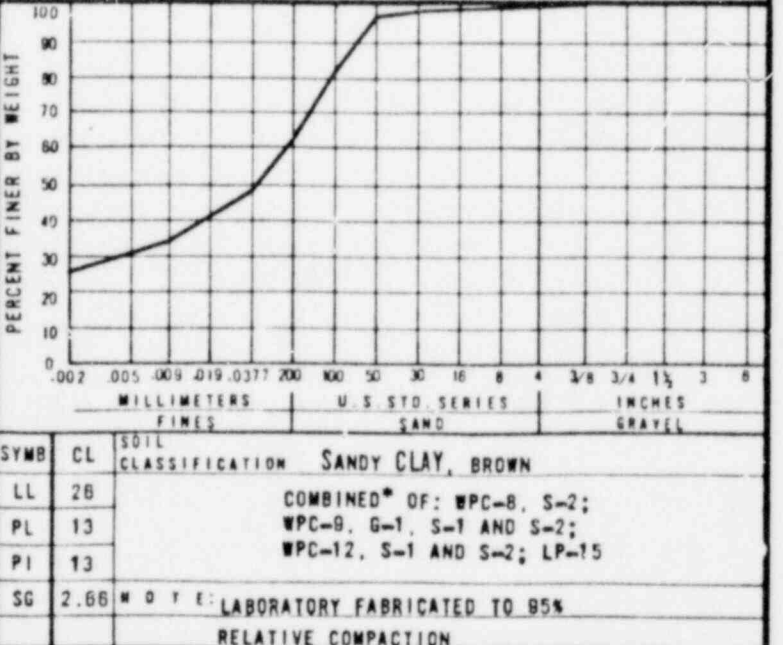
SPECIMEN NO.		①	②	③
INITIAL CONDITION	Water Content, %	18.7	18.5	18.8
	Opt Water Content, %	17.0	17.0	17.0
	Dry Density, pcf	103.4	103.5	103.2
	Max. Dry Density, pcf	108.5	108.5	108.5
	Void Ratio	0.624	0.622	0.627
	Saturation, %	80.8	80.1	81.0
FINAL CONDITION	Consol. Pressure, psi	25.0	50.0	100.0
	Water Content, %	20.4	19.2	17.4
	Dry Density, pcf	108.4	110.7	114.4
	Void Ratio	0.550	0.517	0.468
GENERAL	Saturation, %	100.0	100.0	100.0
	Specimen Diameter, in	2.80	2.80	2.80
	Back Pressure, psi	50.0	50.0	50.0
	Test Time, hr	2.33	2.33	2.33
	Rate of Strain, %/hr	4.31	4.35	4.43



W.A. WAHLER & ASSOCIATES PALO ALTO NEWPORT BEACH CALIF	MT. TAYLOR URANIUM MILL PROJECT			TRIAxIAL TEST RESULTS CONSOLIDATED UNDRAINED			HOLE NO. WT-81
	PROJECT NO.	DATE	FIGURE NO.	PROJECT NO.	DATE	FIGURE NO.	
	GUL-101	SEPTEMBER 1977	8-8	GUL-101	SEPTEMBER 1977	8-8	

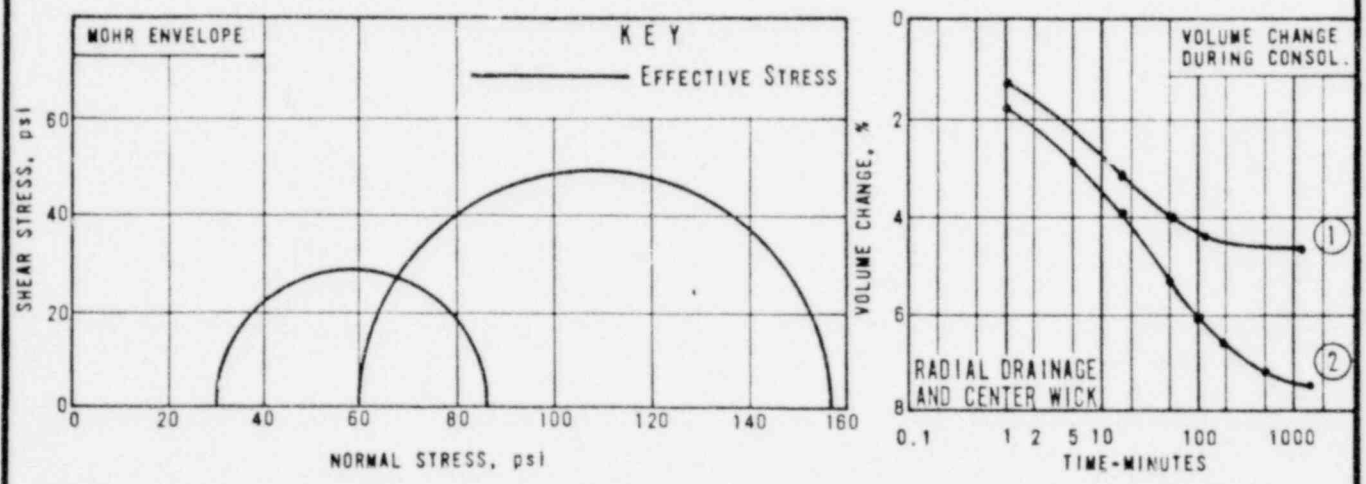
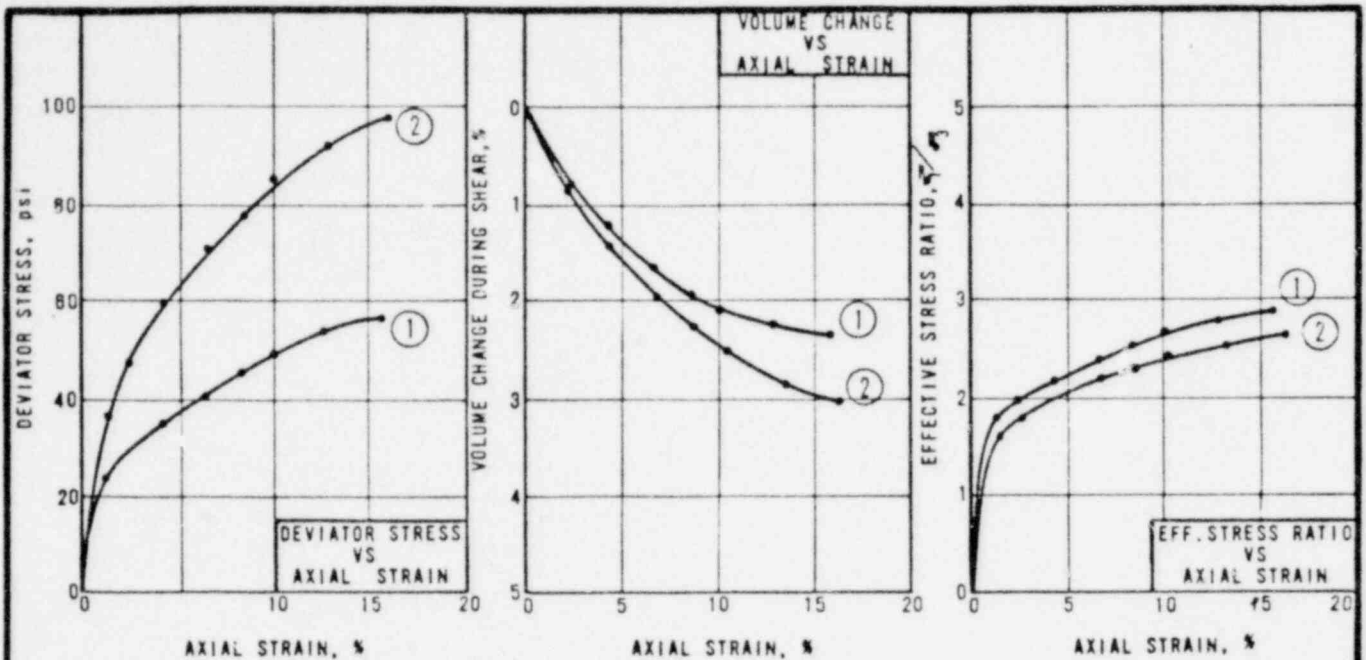


SPECIMEN NO.		①	②	③	
INITIAL CONDITION	Water Content, %	15.9	15.9	15.9	
	Opt Water Content, %	14.0	14.0	14.0	
	Dry Density, pcf	109.0	109.2	109.2	
	Max. Dry Density, pcf	115.0	115.0	115.0	
	Void Ratio	0.523	0.520	0.520	
	Saturation, %	80.9	81.3	81.3	
FINAL CONDITION	Consol. Pressure, psi	20.0	40.0	80.0	
	Water Content, %	17.9	16.9	15.6	
	Dry Density, pcf	112.4	114.5	117.4	
	Void Ratio	0.477	0.450	0.414	
		Saturation, %	100.0	100.0	100.0
GENERAL	Specimen Diameter, in	2.80	2.80	2.80	
	Back Pressure, psi	50.0	50.0	50.0	
	Test Time, hr	2.33	2.33	2.33	
	Rate of Strain, %/hr	4.28	4.31	4.37	
			SYMB	CL	SOIL CLASSIFICATION SANDY CLAY, BROWN
		LL	26	COMBINED* OF: WPC-8, S-2; WPC-9, G-1, S-1 AND S-2; WPC-12, S-1 AND S-2; LP-15	
		PL	13		
		PI	13		
		SG	2.66	*NOTE: LABORATORY FABRICATED TO 95% RELATIVE COMPACTION	

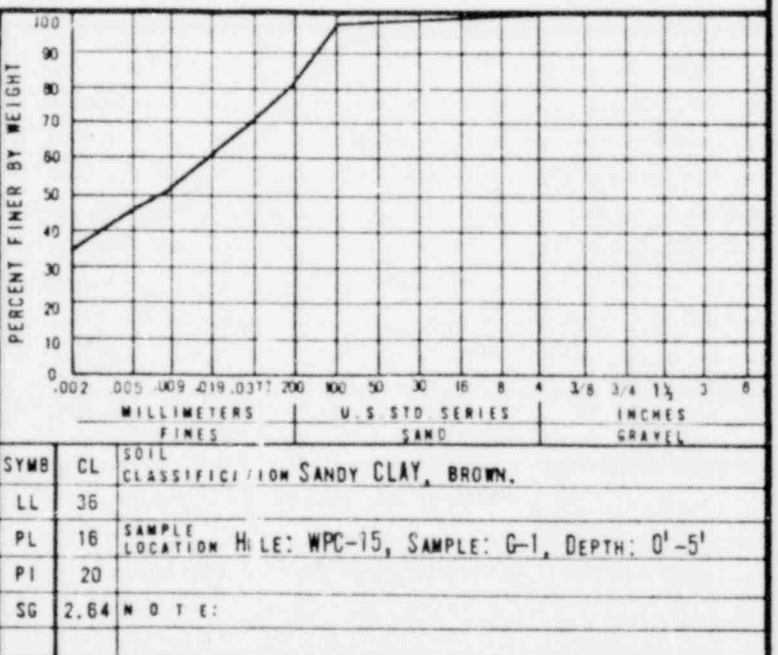


W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	TRIAXIAL TEST RESULTS			SAMPLE COMBINED*
		CONSOLIDATED UNDRAINED			
		PROJECT NO.	DATE	FIGURE NO.	
PALO ALTO NEWPORT BEACH CALIF.		GUL-105A	DECEMBER 1979	B-8	

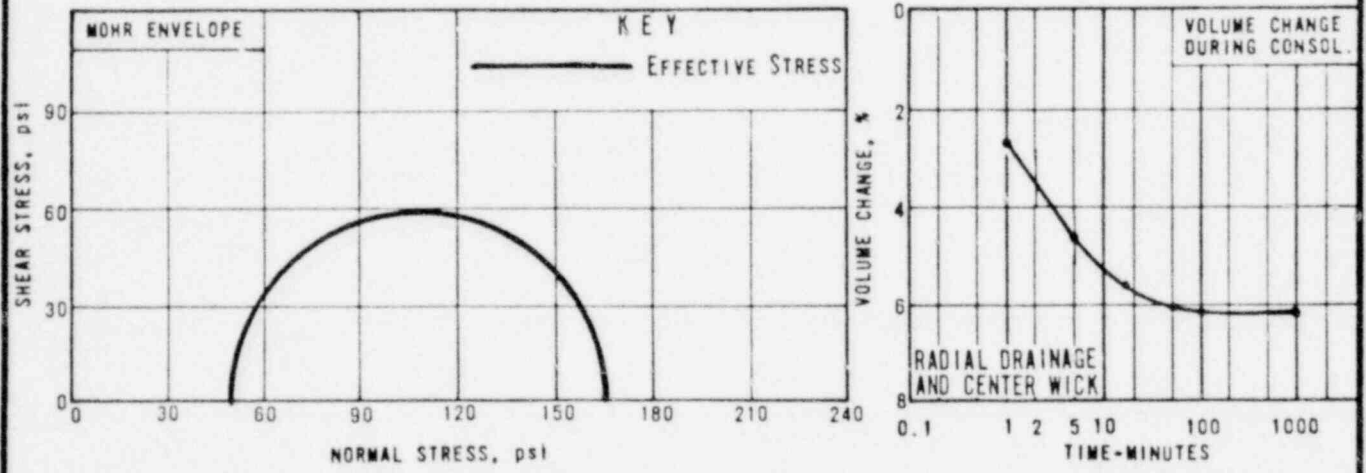
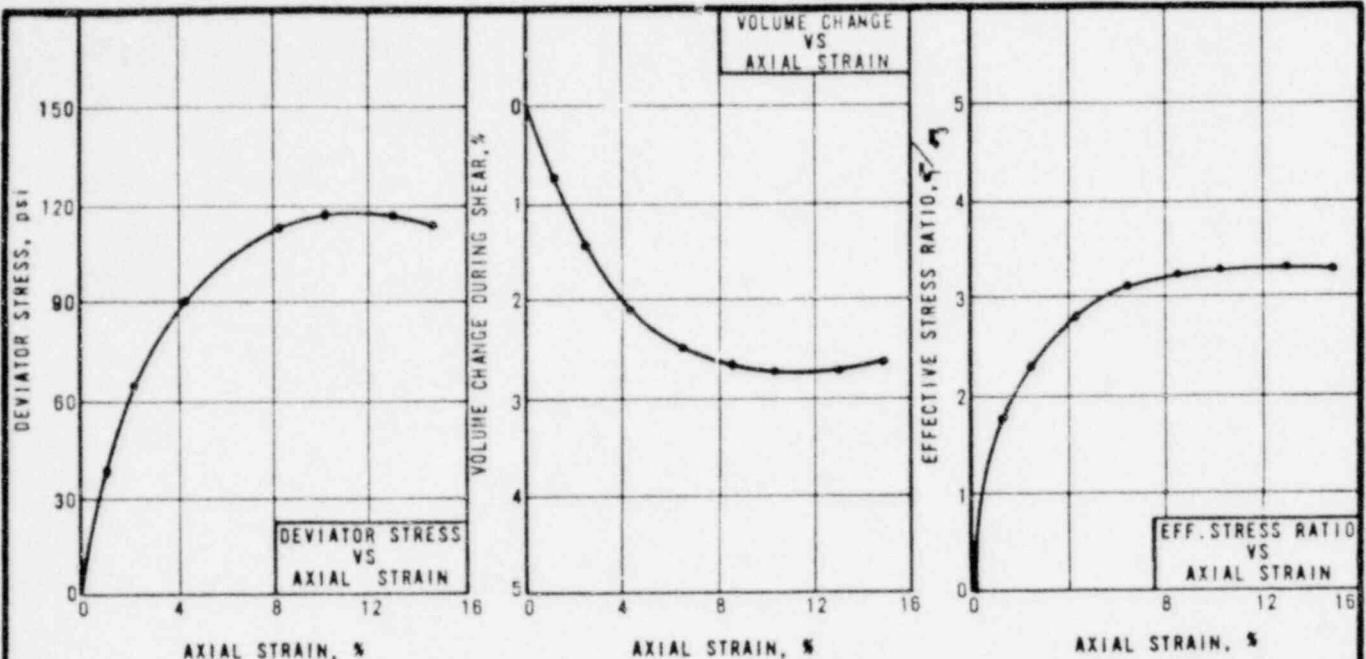




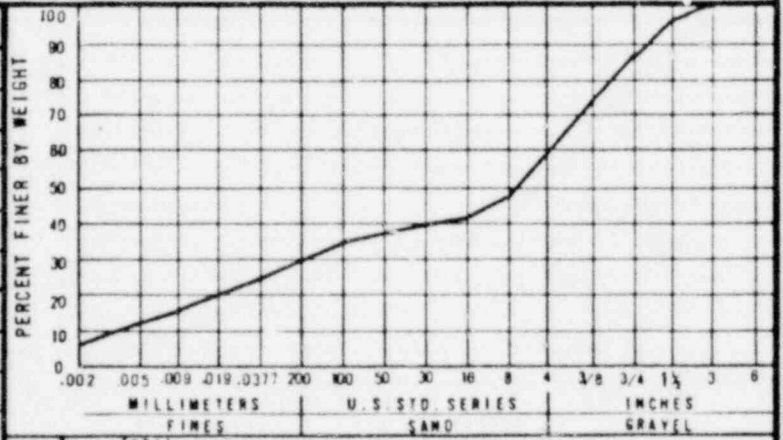
		①	②
INITIAL CONDITION	Specimen No.	①	②
	Water Content, %	18.1	17.8
	Opt. Water Content, %	16.2	16.2
	Dry Density, pcf	105.3	105.5
	Max. Dry Density, pcf	110.8	110.8
	Void Ratio	0.565	0.562
FINAL CONDITION	Consol. Pressure, psi	30.0	60.0
	Water Content, %	17.2	15.3
	Dry Density, pcf	113.2	117.4
	Void Ratio	0.365	0.404
GENERAL	Saturation, %	100.0	100.0
	Specimen Diameter, in.	2.0	2.80
	Back Pressure, psi	50.0	50.0
	Test Time, hr	15.05	15.27
	Rate of Strain, %/hr	1.05	1.08



W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	TRIAxIAL TEST RESULTS			HOLE NO., SAMPLE NO.
		CONSOLIDATED DRAINED			
		PROJECT NO. 60C-101	DATE SEPTEMBER 15/77	FIGURE NO. B-9	
PALO ALTO NEWPORT BEACH CALIF.					



SPECIMEN NO.		
INITIAL CONDITION	Water Content, %	19.1
	Opt. Water Content, %	17.0
	Dry Density, pcf	103.0
	Max. Dry Density, pcf	108.5
	Void Ratio	0.631
	Saturation, %	81.7
FINAL CONDITION	Consol. Pressure, psi	50.0
	Water Content, %	18.3
	Dry Density, pcf	112.5
	Void Ratio	0.493
GENERAL	Saturation, %	100.0
	Specimen Diameter, in	2.80
	Back Pressure, psi	50.0
	Test Time, hr	7.18
	Rate of Strain, %/hr	2.05



SYMB	GC	SOIL CLASSIFICATION SANDY CLAYEY GRAVEL, YELLOW BROWN.
LL	30	
PL	15	SAMPLE LOCATION HOLE: WT-81, DEPTH: 1'-2.5'
PI	15	
SG	2.69	NOTE: COARSE MATERIAL BREAKS DOWN WHEN COMPACTED

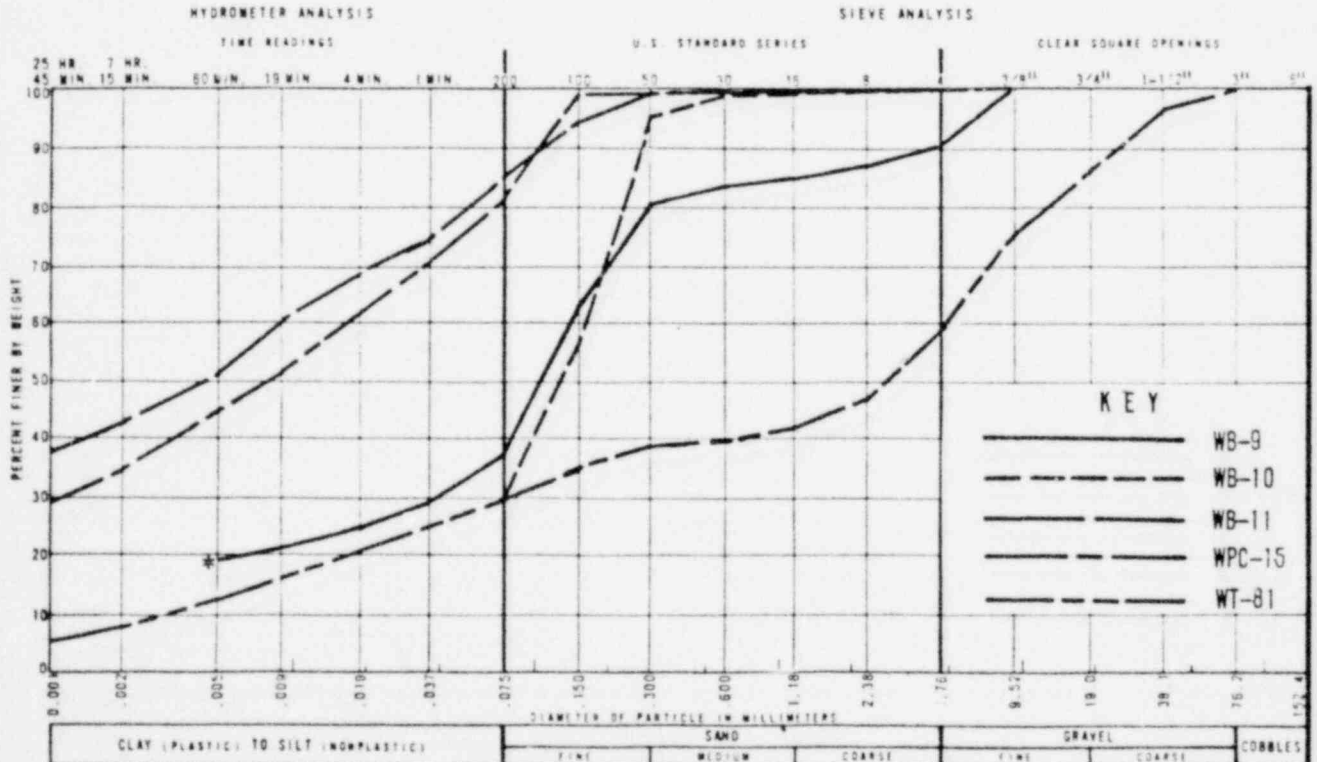
W A WAHLER & ASSOCIATES PALO ALTO NEWPORT BEACH CALIF.	WT. TAYLOR URANIUM MILL PROJECT			TRIAXIAL TEST RESULTS CONSOLIDATED DRAINED			HOLE NO.
	PROJECT NO.	DATE	FIGURE NO.				WT-81
	GUL-101	SEPTEMBER 1977	B-9				

SUMMARY OF PERMEABILITY TEST DATA

HOLE NO.	SAMPLE NO.	DEPTH (ft)	SOIL TYPE*	AS TESTED				COEFFICIENT OF PERMEABILITY (cm/sec)
				DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO (%)	SATURATION (%)	
WB-9	B-3	21-32	SM-SC	118.4	15.5	0.418	100	$1.4 \times 10^{-6}$
WB-10	B-1	0-11	SM	108.8	19.3	0.508	100	$1.9 \times 10^{-4}$
WB-11	B-1	0-11	CL	104.3	21.9	0.579	100	$4.9 \times 10^{-9}$
WPC-15	G-1	0-5	CL	105.5	21.3	0.561	100	$6.0 \times 10^{-9}$
WT-81	---	1-2.5	GC	105.3	22.1	0.594	100	$2.7 \times 10^{-7}$

\*Unified Soil Classification Symbol

GRAIN SIZE CURVES



L 3/77

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	PERMEABILITY-GRAIN SIZE SUMMARY		
		PROJECT NO. GUL-101	DATE SEPTEMBER 1977	FIGURE NO. B-10

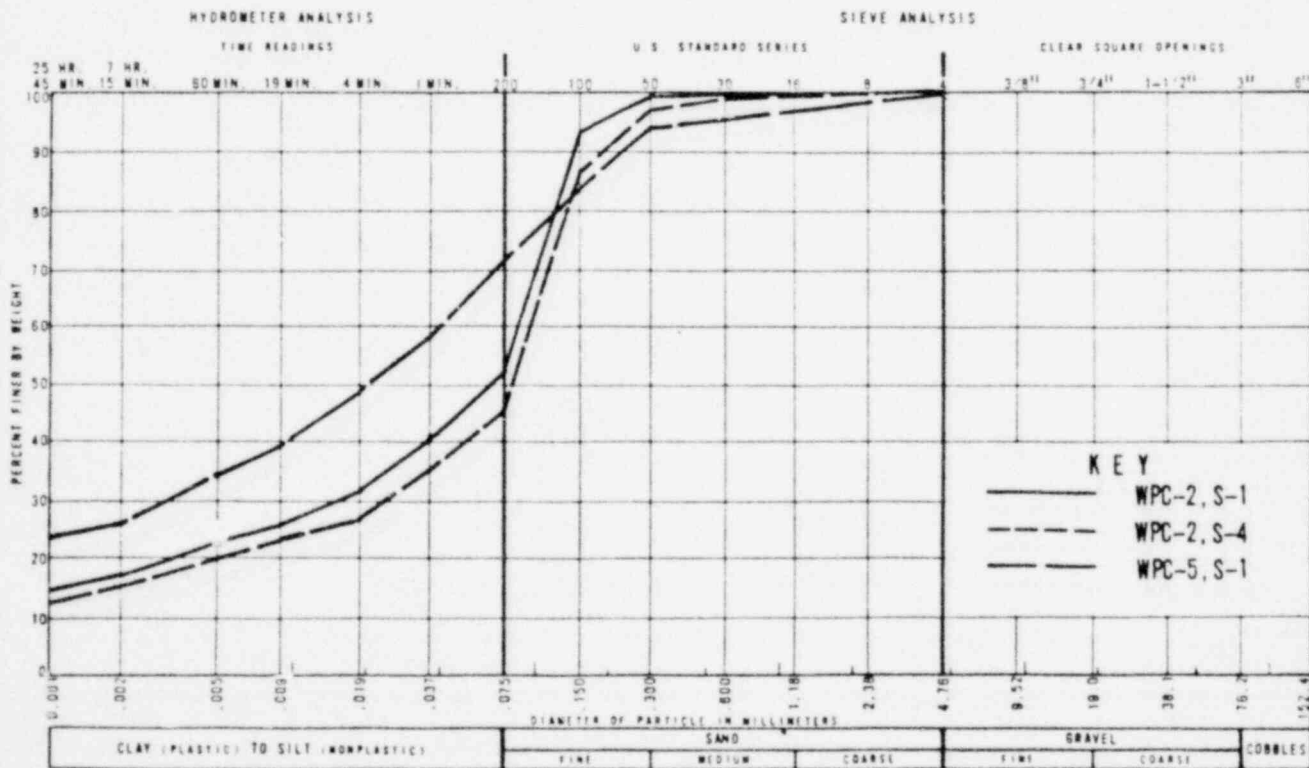
SUMMARY OF PERMEABILITY TEST DATA

HOLE NO.	SAMPLE NO.	DEPTH (ft)	SOIL TYPE*	AS TESTED				COEFFICIENT OF PERMEABILITY (cm/sec)
				DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO (%)	SATURATION (%)	
WPC-2	S-1	5-7	ML	89.3	32.0	0.845	100	$6.2 \times 10^{-4}$
WPC-2	S-4	30-31.3	SM	89.0	32.4	0.858	100	$9.4 \times 10^{-4}$
WPC-5	S-1	5-6.7	CL	95.4	27.7	0.733	100	$4.2 \times 10^{-6}$

\*Unified Soil Classification Symbol

NOTE: UNDISTURBED SAMPLES

GRAIN SIZE CURVES



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MT. TAYLOR URANIUM MILL PROJECT

PERMEABILITY-GRAIN SIZE SUMMARY

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO

DATE

FIGURE NO.

GUL-101

JUNE 1977

B-TU

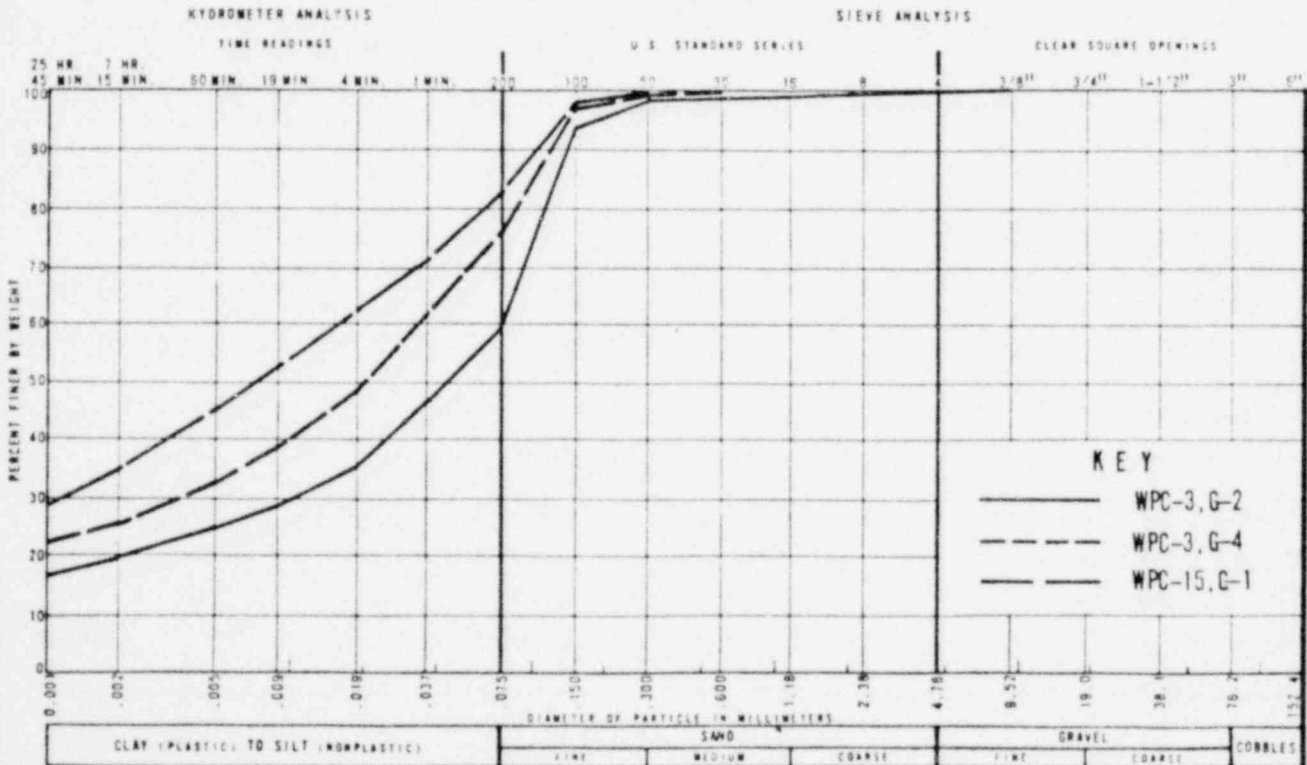
SUMMARY OF PERMEABILITY TEST DATA

HOLE NO.	SAMPLE NO.	DEPTH (ft)	SOIL TYPE*	AS TESTED				COEFFICIENT OF PERMEABILITY (cm/sec)
				DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO (%)	SATURATION (%)	
WPC-3	G-2	8-13	CL-ML	106.2	21.7	0.586	100	$1.3 \times 10^{-4}$
WPC-3	G-4	23-28	CL	105.2	22.3	0.802	100	$8.4 \times 10^{-6}$
WPC-15	G-1	0-5	CL	100.1	25.3	0.683	100	$1.3 \times 10^{-7}$

\*Unified Soil Classification Symbol

NOTE: LABORATORY FABRICATED TO 90% COMPACTION AT OPTIMUM MOISTURE CONTENT.

GRAIN SIZE CURVES



L 3/77

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MT. TAYLOR URANIUM MILL PROJECT

PERMEABILITY-GRAIN SIZE SUMMARY

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO

DATE

FIGURE NO.

GUL-101

JUNE 1977

8-10

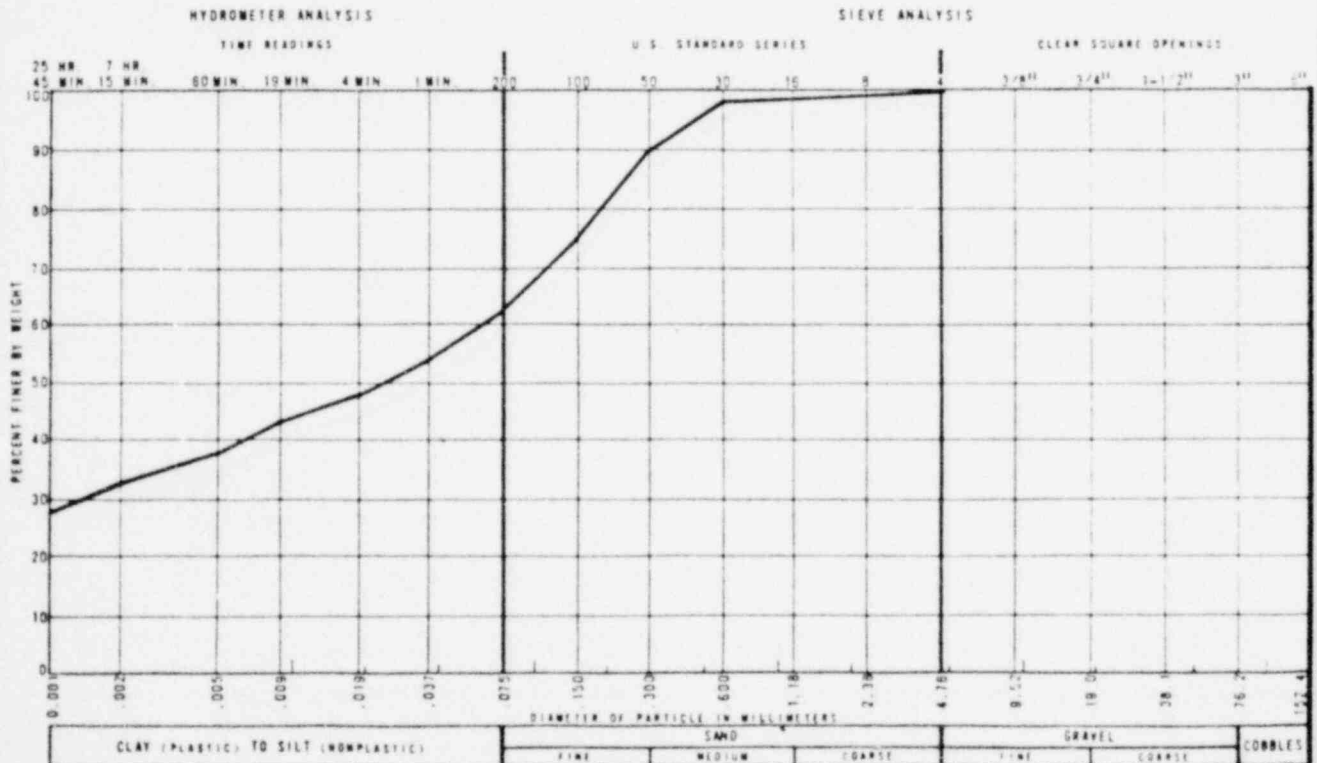
SUMMARY OF PERMEABILITY TEST DATA

HOLE NO.	SAMPLE NO.	DEPTH (ft)	SOIL TYPE*	AS TESTED				COEFFICIENT OF PERMEABILITY (cm/sec)
				DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO (%)	SATURATION (%)	
WSL-16	G-1	5-10	CL	110.4	19.3	0.520	100	$6.7 \times 10^{-9}$

\*Unified Soil Classification Symbol

NOTE: LABORATORY FABRICATED TO 95% COMPACTION AT OPTIMUM PLUS 2% MOISTURE CONTENT.

GRAIN SIZE CURVES



L 3/77

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MT. TAYLOR URANIUM MILL PROJECT

PERMEABILITY-GRAIN SIZE SUMMARY

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.

DATE

FIGURE NO.

GUL-101

DECEMBER 1977

B-10

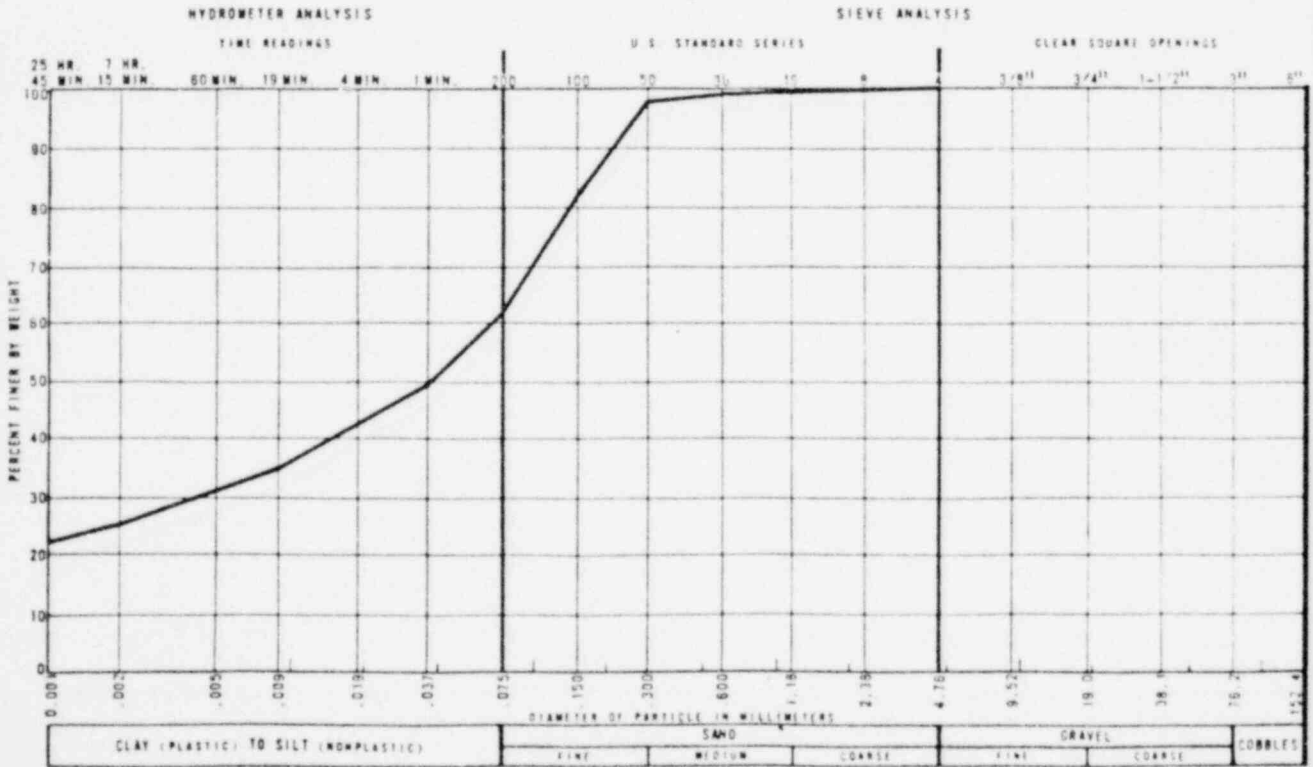
SUMMARY OF PERMEABILITY TEST DATA

HOLE NO.	SAMPLE	DEPTH (ft)	SOIL TYPE*	AS TESTED				COEFFICIENT OF PERMEABILITY (cm/sec)
				DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO (%)	SATURATION (%)	
----	COMBINED*	----	CL	112.4	17.9	0.477	100	$3.5 \times 10^{-7}$
----	COMBINED*	----	CL	117.4	15.6	0.414	100	$1.3 \times 10^{-8}$

\*Unified Soil Classification Symbol

COMBINED\* OF: WPC-8, S-2;  
WPC-9, G-1, S-1 AND S-2;  
WPC-12, S-1 AND S-2; LP-15

GRAIN SIZE CURVES



L 3/77

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT PALO ALTO • NEWPORT BEACH • CALIF	PERMEABILITY-GRAIN SIZE SUMMARY		
		PROJECT NO GUL-105A	DATE DECEMBER 1979	FIGURE NO B-10

SUMMARY OF PERMEABILITY TEST DATA

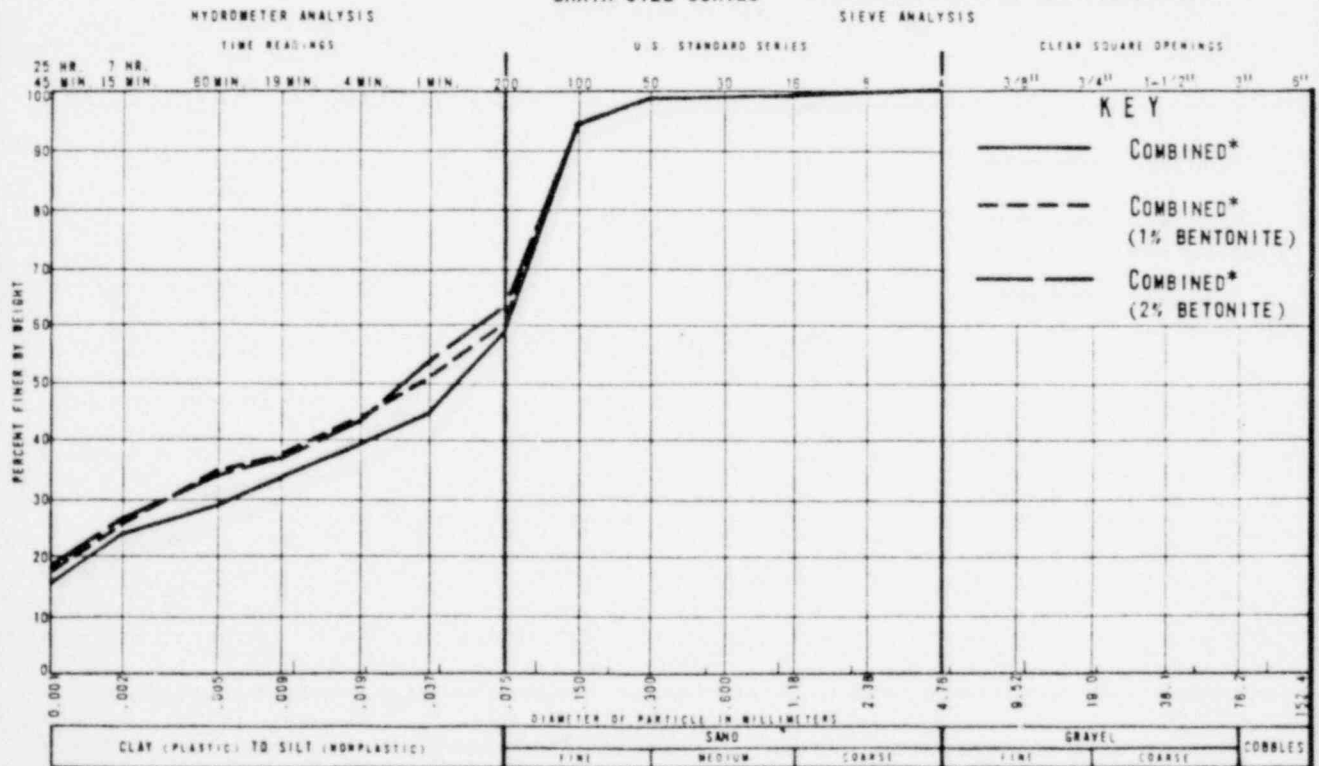
\*COMBINED OF: LP-10, 20.0-25.0 FEET AND LP-11, 9.0-15.0 FEET

SAMPLE	DEPTH (ft)	SOIL TYPE*	SET-UP	AS TESTED			COEFFICIENT OF PERMEABILITY (cm/sec)
			WATER CONTENT (%)	WATER CONTENT (%)	DRY DENSITY (pcf)	SATURATION (%)	
COMBINED*	----	CL	16.5	20.3	108.3	100	$3.5 \times 10^{-6}$
	----	CL	16.7	20.2	108.5	100	$8.5 \times 10^{-7}$
	----	CL	16.6	18.5	111.9	100	$3.6 \times 10^{-8}$
COMBINED* (1% BENTONITE)	----	CL	18.0	20.8	107.3	100	$7.1 \times 10^{-8}$
	----	CL	17.6	20.0	108.8	100	$6.7 \times 10^{-7}$
	----	CL	16.5	18.7	111.5	100	$1.7 \times 10^{-8}$
	----	CL	STAGE**	18.8	111.3	100	$3.7 \times 10^{-7}$
COMBINED* (2% BENTONITE)	----	CL	18.2	20.5	107.9	100	$1.4 \times 10^{-7}$
	----	CL	17.6	20.0	108.9	100	$1.2 \times 10^{-7}$
	----	CL	16.9	18.8	111.3	100	$4.0 \times 10^{-8}$
	----	CL	STAGE**	18.5	111.9	100	$7.7 \times 10^{-8}$

\*Unified Soil Classification Symbol

\*\*CONSOLIDATED FROM APPROXIMATELY 95% TO 98% COMPACTION. ALL OTHERS COMPACTED TO APPROXIMATELY 95% OR 98% COMPACTION.

GRAIN SIZE CURVES



L 3/77

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MT. TAYLOR URANIUM MILL PROJECT

PERMEABILITY-GRAIN SIZE SUMMARY

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO

GUL-105A

DATE

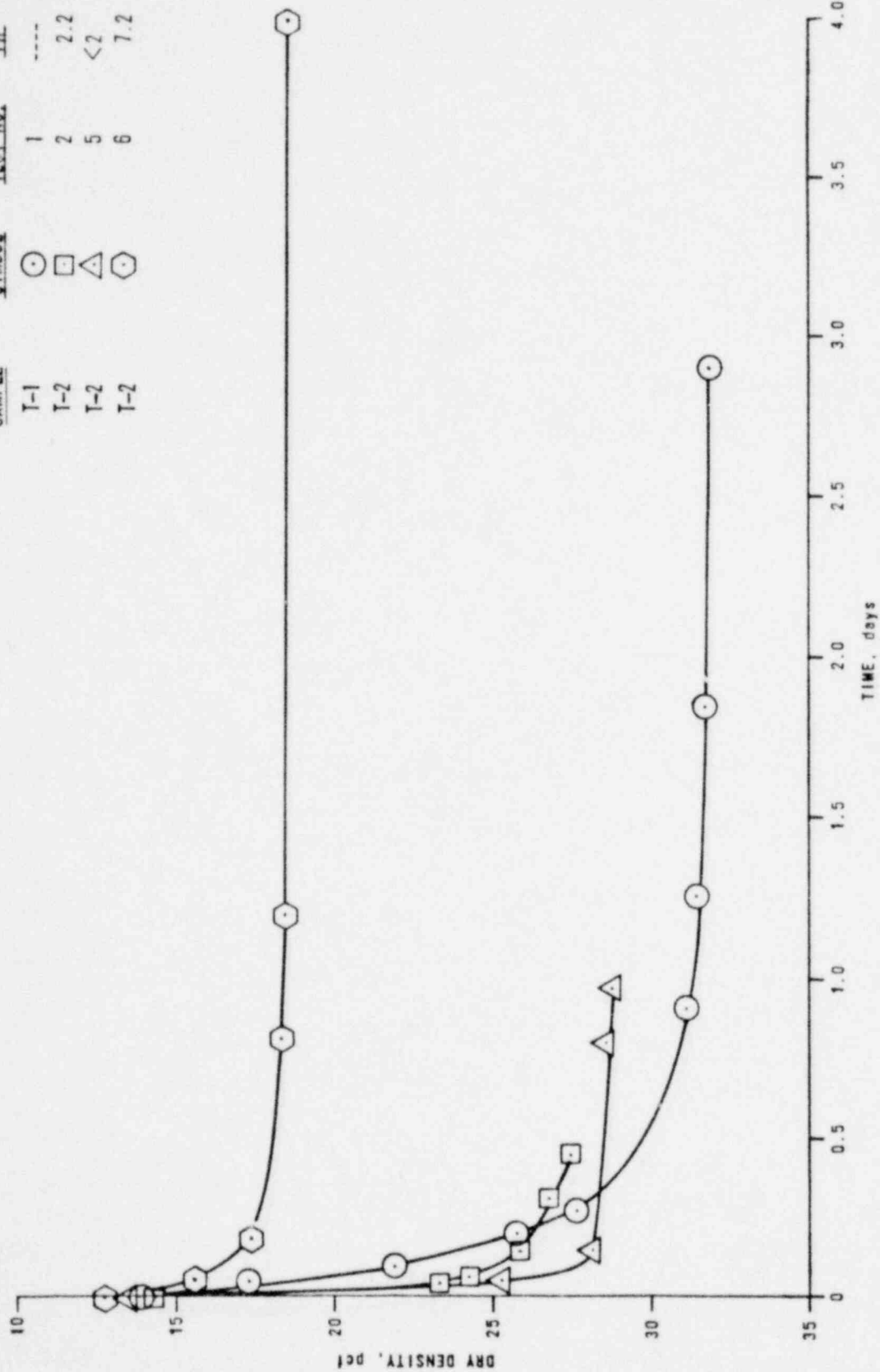
JANUARY 1980

FIGURE NO.

B-10



SAMPLE	KEY	TEST NO.	PH.
T-1	○	1	---
T-2	□	2	2.2
T-2	△	5	<2
T-2	◇	6	7.2



NOTES: 1. DISTILLED WATER USED AS LIQUID MEDIUM IN TEST # 1.  
 2. RAFFINATE USED AS LIQUID MEDIUM IN TESTS 2, 5, AND 6.  
 3. RAFFINATE NEUTRALIZED WITH LIME IN TEST #6.

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PALO ALTO • NEWPORT BEACH • CALIF.

UNDRAINED SETTLEMENT DENSITY TEST  
 TIME-SETTLEMENT CURVE

PROJECT NO

GUL-101

DATE

DECEMBER 1977

FIGURE NO.

8-11

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& ASSOCIATES

PALO ALTO • NEWPORT BEACH • CALIF.

MT. TAYLOR URANIUM MILL PROJECT

UNDRAINED SETTLEMENT DENSITY TEST

PROJECT NO.

GUL-101

DATE

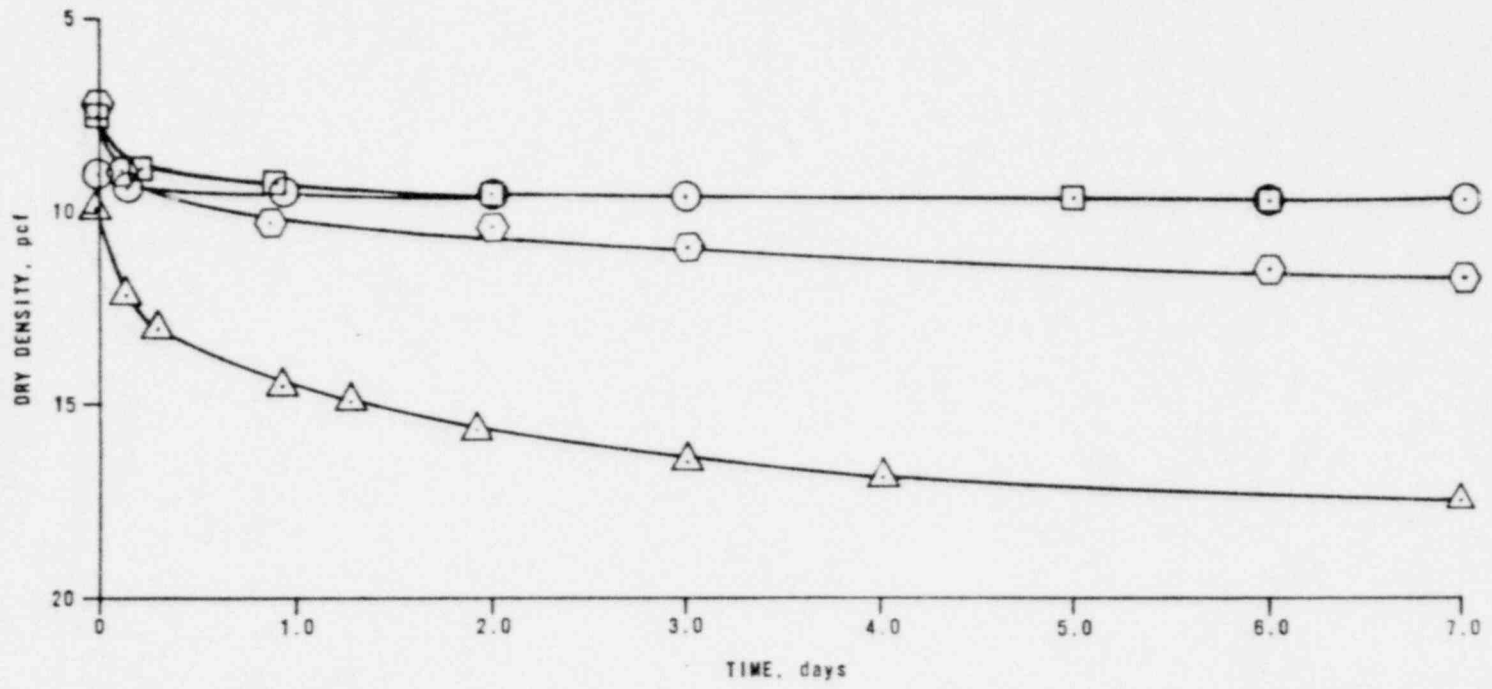
DECEMBER 1977

FIGURE NO.

B-11

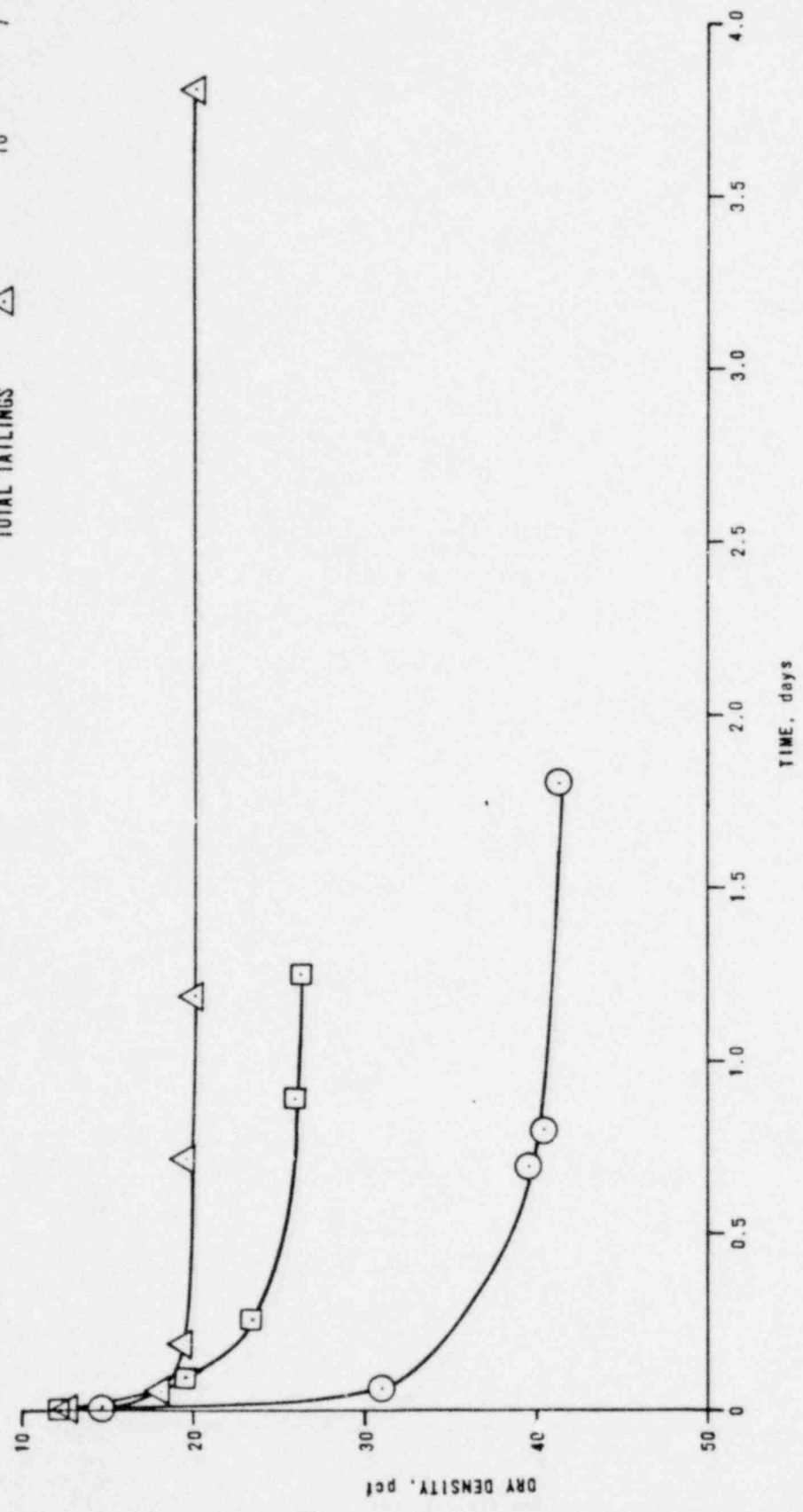
Sheet 2 of 4

SAMPLE	SYMBOL	KEY TEST NO.	PH
T-2	○	3	7
T-2	□	3A	7
T-2	△	4	< 2
T-2	◇	8	4



NOTES: 1. RAFFINATE WAS USED AS LIQUID MEDIUM.  
2. LIME WAS USED FOR NEUTRALIZATION.

SAMPLE      KEY      SYMBO      PH  
 TEST NO.      TEST NO.      PH  
 TOTAL TAILINGS      7      <2  
 TOTAL TAILINGS      9      4  
 TOTAL TAILINGS      10      7



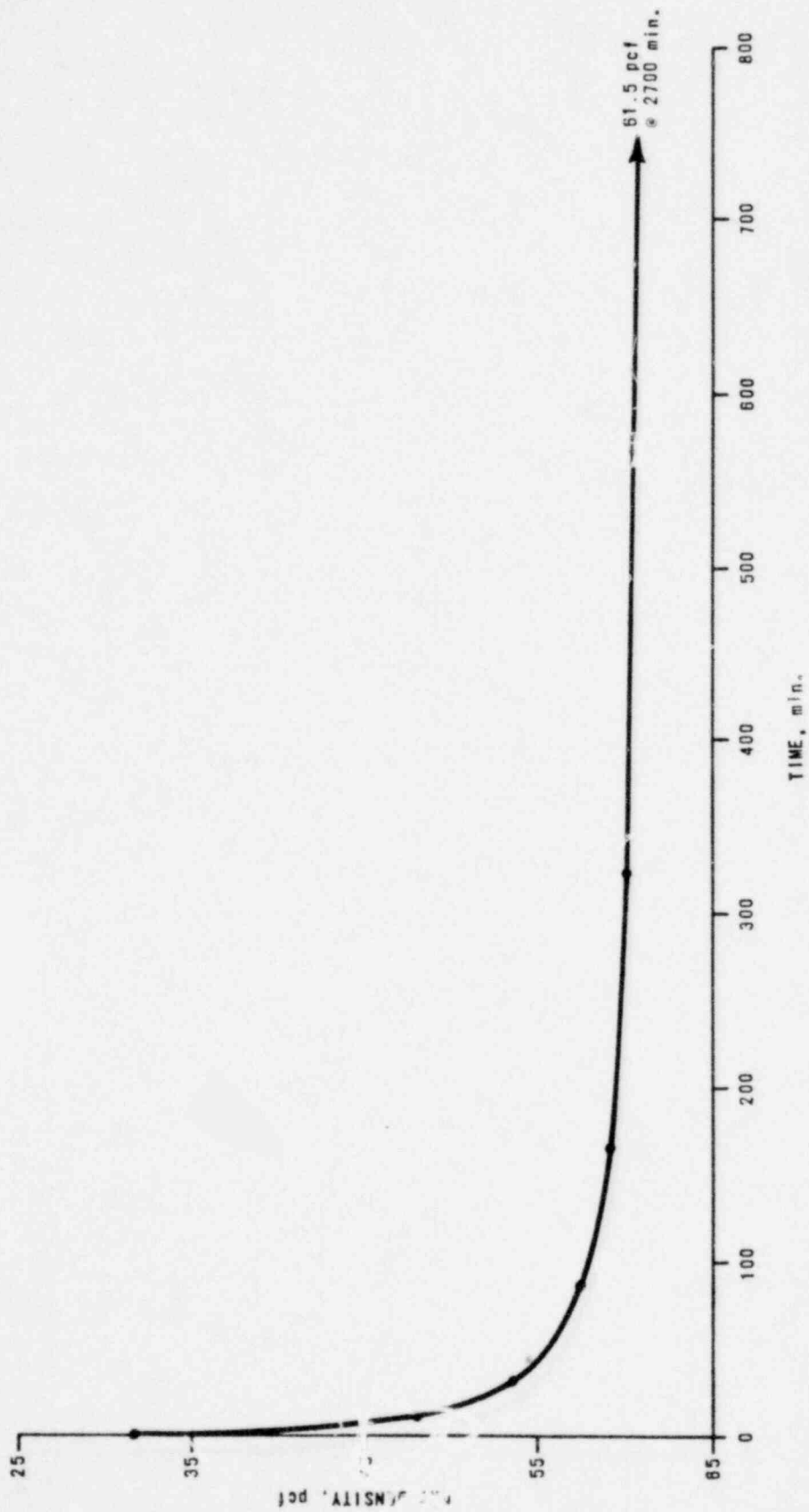
NOTES 1. RAFFINATE WAS USED AS LIQUID MEDIUM.  
 2. LIME WAS USED FOR NEUTRALIZATION.

W. A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT  
 PALO ALTO • NEWPORT BEACH • CALIF.

UNDRAINED SETTLEMENT DENSITY TEST TIME-SETTLEMENT CURVE		
PROJECT NO	DATE	FIGURE NO.
GUL-101	DECEMBER 1977	B-11

SAMPLE TEST NO.  
TOTAL TAILINGS 11



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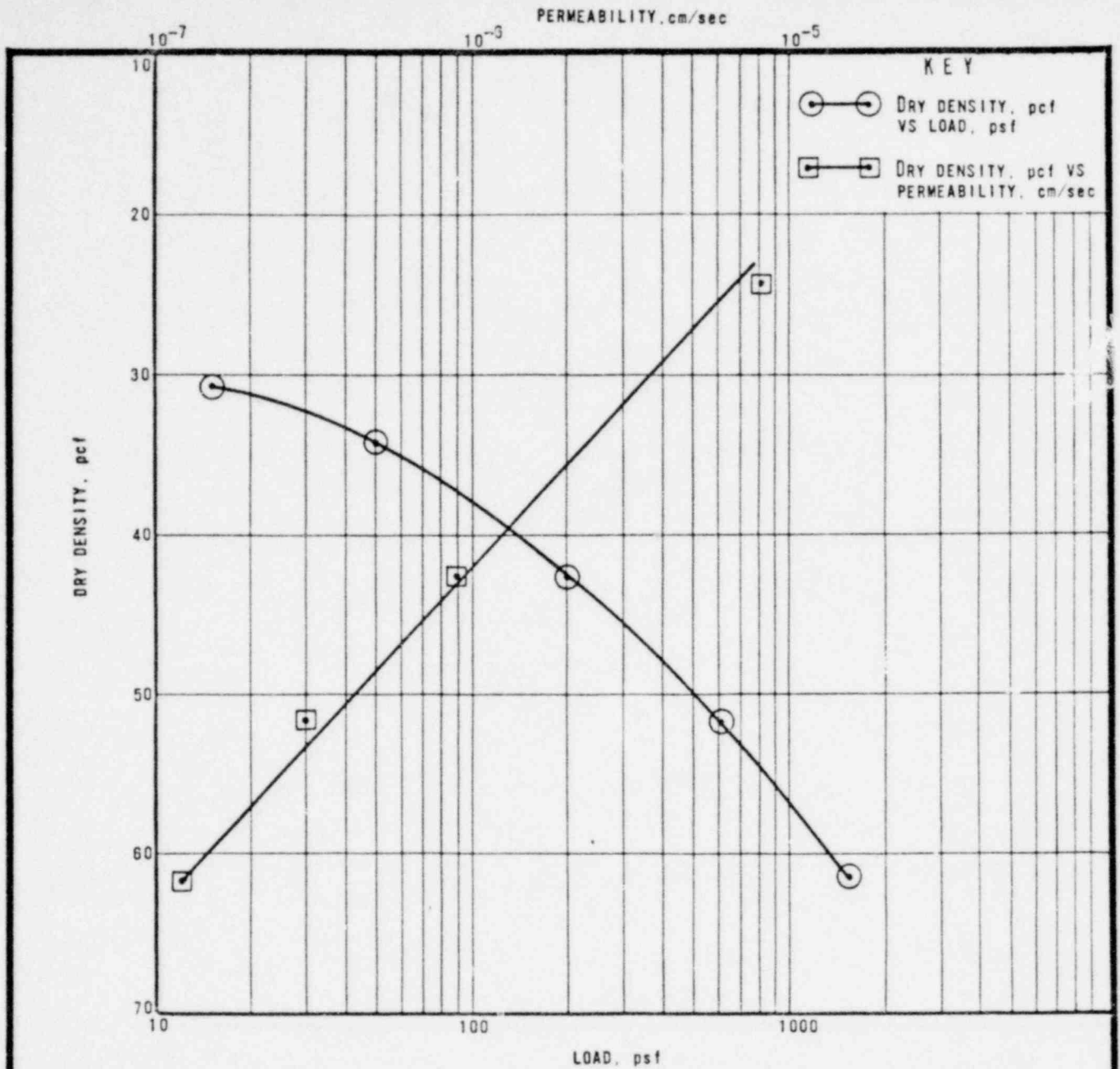
UNDRAINED SETTLEMENT DENSITY TEST  
TIME-SETTLEMENT CURVE

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.  
GUL-105A

DATE  
AUGUST 1978

FIGURE NO.  
B-11



HOLE NO.	DEPTH (ft)	SPECIMEN NO.	AFTER SETTLEMENT			AFTER LOADING		
			DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO	DRY DENSITY (pcf)	WATER CONTENT (%)	DEGREE OF SATURATION (%)
T-2	---	---	24.2	220.8	5.962	61.8	63.9	100

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CONSOLIDATION AND PERMEABILITY TEST

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.

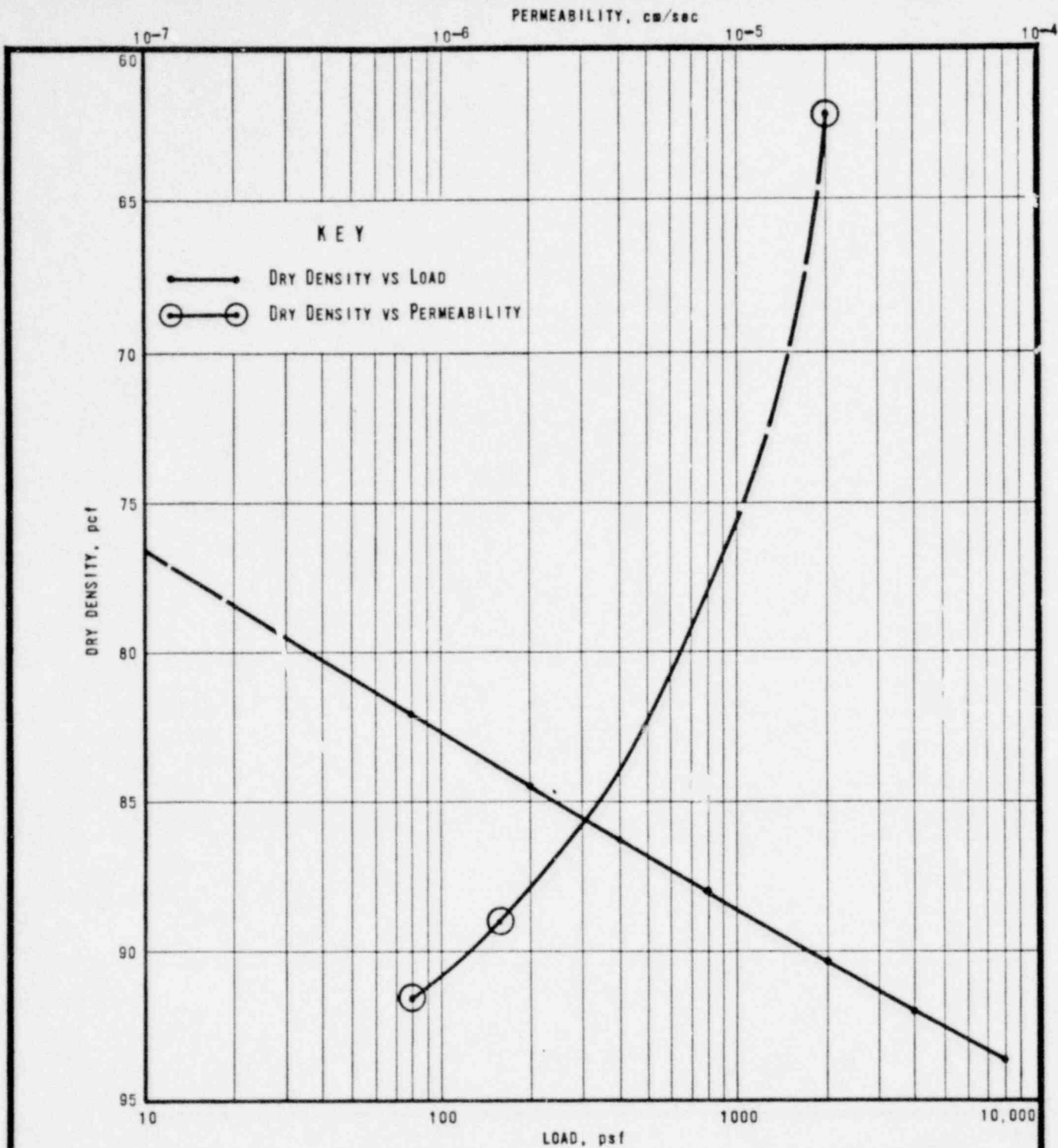
GUL-101

DATE

FEBRUARY 1978

FIGURE NO.

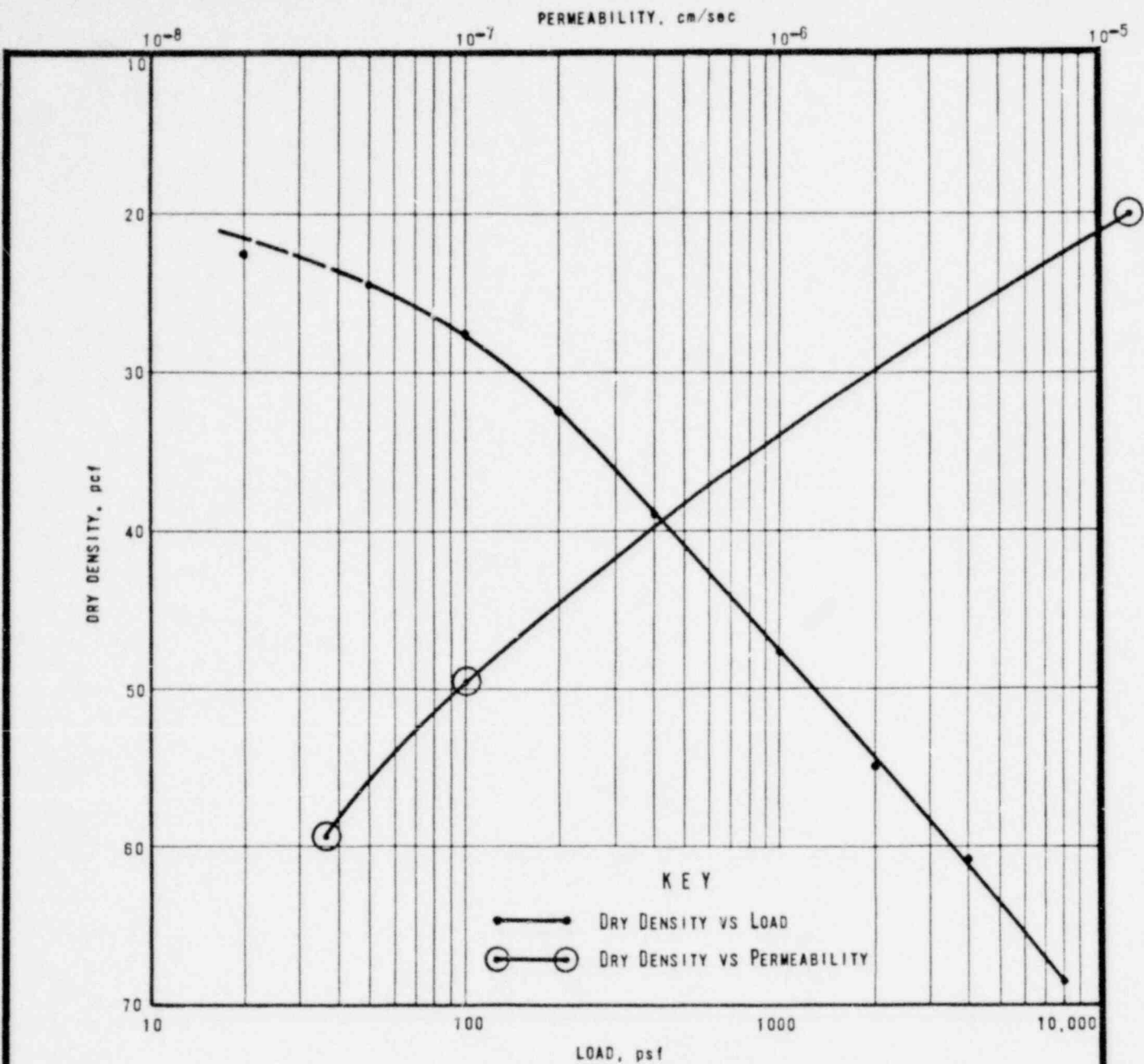
B-12



HOLE NO.	SAMPLE	SPECIMEN NO.	AFTER SETTLEMENT			FINAL SPECIMEN DATA		
			DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO	DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO
----	TOTAL TAILINGS	----	62.0	64.0	1.748	91.6	31.5	0.860

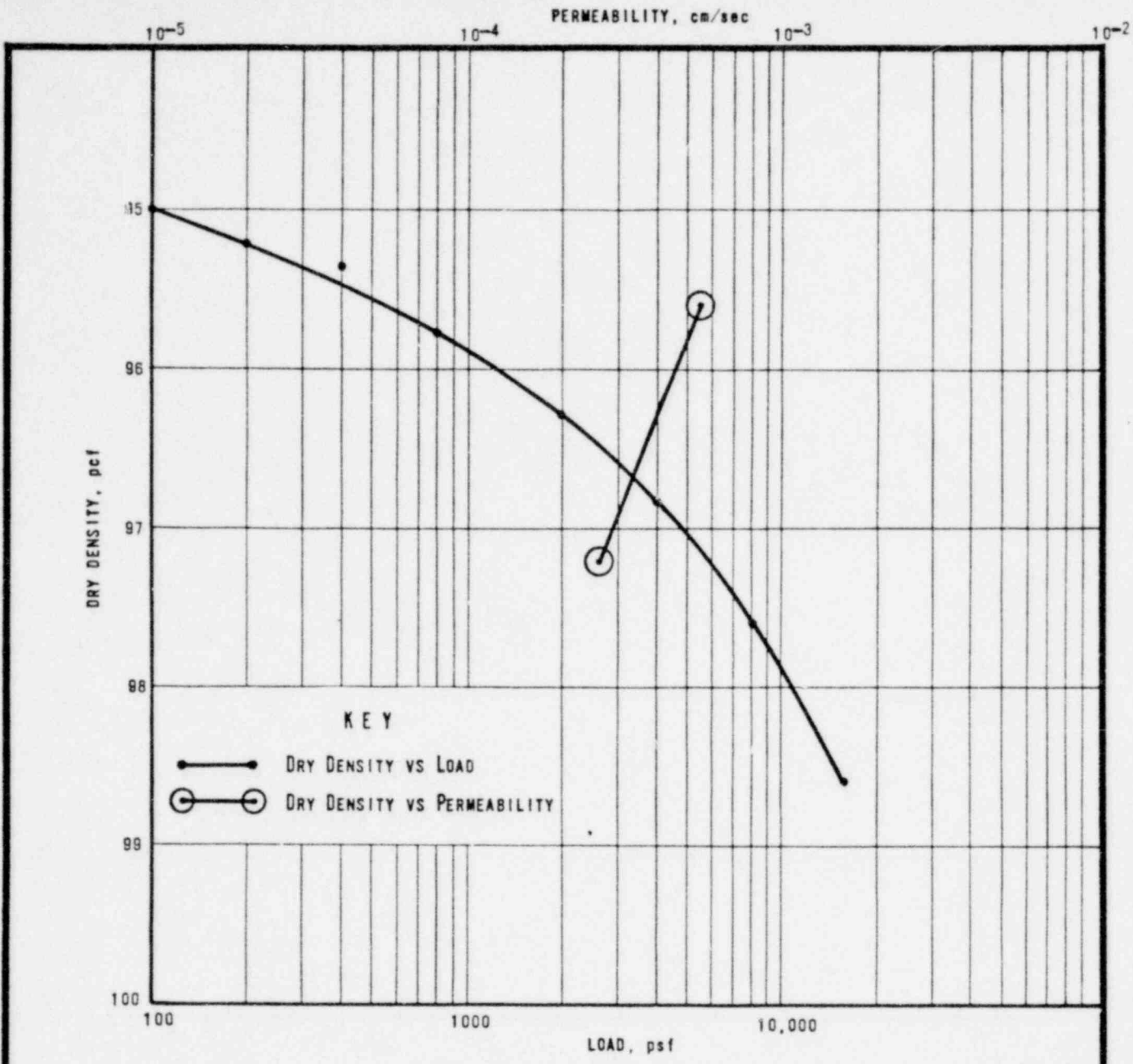
<b>W.A. WAHLER &amp; ASSOCIATES</b>	<b>MT. TAYLOR URANIUM MILL PROJECT</b>		<b>CONSOLIDATION AND PERMEABILITY TEST</b>		
	PROJECT NO.	DATE	FIGURE NO.		
	GUL-105A	AUGUST 1979	B-12		

PALO ALTO • NEWPORT BEACH • CALIF.



HOLE NO.	SAMPLE	SPECIMEN NO.	AFTER SETTLEMENT			FINAL SPECIMEN DATA		
			DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO	DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO
----	"- #270" TAILINGS	----	18.0	308.0	8.01	68.3	52.9	1.375

<b>W.A. WAHLER &amp; ASSOCIATES</b>	<b>MT. TAYLOR URANIUM MILL PROJECT</b>	<b>CONSOLIDATION AND PERMEABILITY TEST</b>		
		PROJECT NO.	DATE	FIGURE NO.
		PALO ALTO • NEWPORT BEACH • CALIF.	GUL-105A	AUGUST 1979



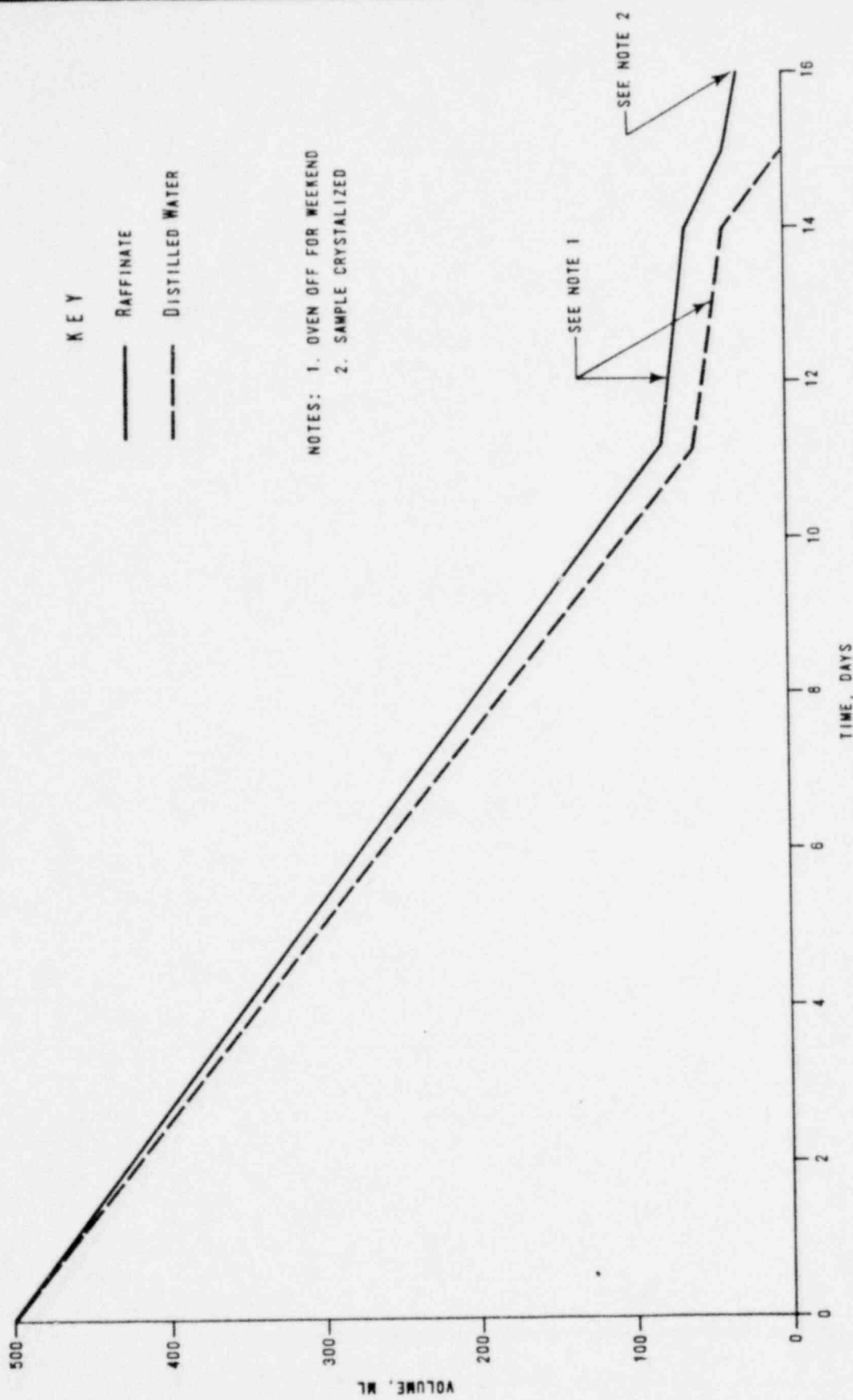
NOTE: EACH LOAD APPLIED TO SAMPLE FOR AT LEAST 24 HOURS.  
VOID RATIOS CALCULATED USING A SPECIFIC GRAVITY OF 2.63.

HOLE NO.	SAMPLE	SPECIMEN NO.	AFTER SETTLEMENT			FINAL SPECIMEN DATA		
			DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO	DRY DENSITY (pcf)	WATER CONTENT (%)	VOID RATIO
----	+ #270 TAILINGS	----	94.6	27.9	0.735	98.6	25.3	0.688

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		CONSOLIDATION AND PERMEABILITY TEST		
	PROJECT NO.	DATE	FIGURE NO.		
	GUL-105A	AUGUST 1979	8-12		

PALO ALTO • NEWPORT BEACH • CALIF.





**W. A. WAHLER & ASSOCIATES**

MT. TAYLOR URANIUM MILL PROJECT  
PALO ALTO • NEWPORT BEACH • CALIF.

**EVAPORATION TEST  
EVAPORATION VS TIME**

PROJECT NO.	DATE	FIGURE NO.
GUL-101	JANUARY 1977	B-13

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& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

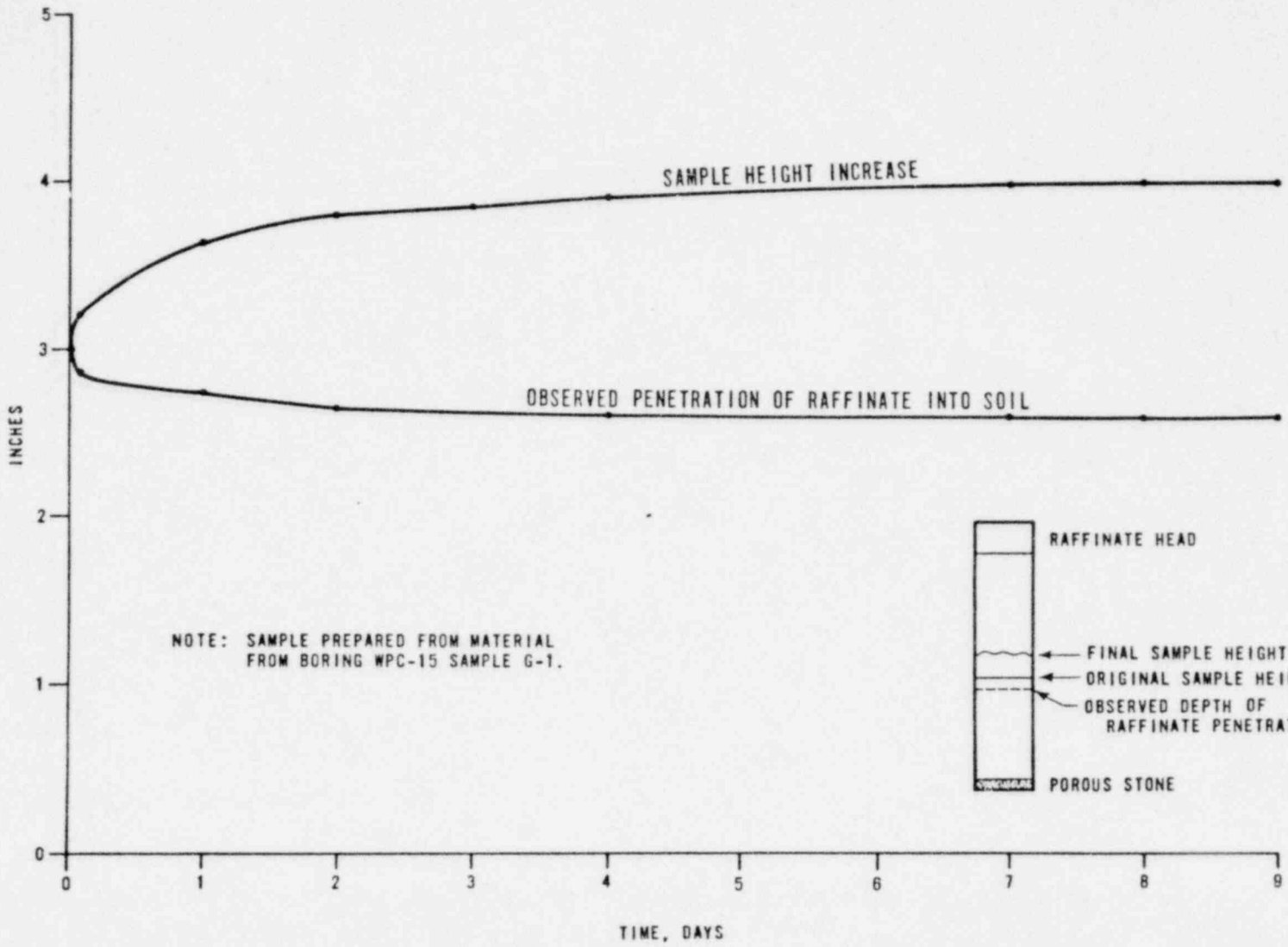
PALO ALTO • HERBERT BEACH • CALIF.

RAFFINATE REACTION TEST

PROJECT NO  
GUL-101

DATE  
JANUARY 1978

DRAWING NO  
B-14



**APPENDIX C**

POOR ORIGINAL

LA POLVADERA CANYON  
SEISMIC REFRACTION SURVEY  
MT. TAYLOR URANIUM MILL PROJECT

for

Gulf Mineral Resources Co.  
Denver, Colorado

by

Earth Sciences Associates  
701 Welch Road  
Palo Alto, California 94304

# LA POLVADERA CANYON SEISMIC REFRACTION SURVEY

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B. Tailings Disposal and Settling Pond Site	5
1. Broad Northern Ridge	5
III. Method and Equipment	7
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## FIGURES

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- 2 Data and Interpreted Subsurface Velocity Profile Lines S-4, S-5, S-6, S-7, and S-8
- 3 Data and Interpreted Subsurface Velocity Profile Lines S-1, S-2, S-3, and S-43
- 4 Data and Interpreted Subsurface Velocity Profile Lines S-9, S-17, S-18, and S-19
- 5 Data and Interpreted Subsurface Velocity Profile Lines S-10, S-11, S-12, S-13, S-14, S-15, and S-16
- 6 Data and Interpreted Subsurface Velocity Profile Lines S-20, S-21, and S-22
- 7 Data and Interpreted Subsurface Velocity Profile Lines S-23 and S-42
- 8 Data and Interpreted Subsurface Velocity Profile Line S-41
- 9 Data and Interpreted Subsurface Velocity Profile Line S-40
- 10 Data and Interpreted Subsurface Velocity Profile Lines S-44, S-45, and S-46
- 11 Data and Interpreted Subsurface Velocity Profile Lines S-24, S-25, and S-26
- 12 Data and Interpreted Subsurface Velocity Profile Lines S-27 and S-28
- 13 Data and Interpreted Subsurface Velocity Profile Lines S-29 and S-30
- 14 Data and Interpreted Subsurface Velocity Profile Lines S-31 and S-32
- 15 Data and Interpreted Subsurface Velocity Profile Lines S-33 and S-34
- 16 Data and Interpreted Subsurface Velocity Profile Lines S-35 and S-36
- 17 Data and Interpreted Subsurface Velocity Profile Lines S-37, S-38, and S-39
- 18 Ripper Performance as Related to Seismic Wave Velocities

## LA POLVADERA CANYON SEISMIC REFRACTION SURVEY

### I. Introduction and Summary

A total of 46 individual seismic refraction lines with a combined spread length of 11,675 feet\* were performed in La Polvadera Canyon for the proposed Mount Taylor Uranium Mill project in November, 1979. The purpose of these lines was to evaluate the depth to and characteristics of various subsurface materials and to supplement information from existing exploratory borings for design of evaporation pond, settling pond, and tailings disposal facilities.

Locations of the seismic refraction lines are shown on Figure 1 of this report. Cross sections showing subsurface velocity zones were constructed from interpretations of seismic refraction data, and are presented in Figures 2 through 17 of this report. Figure 18 presents a chart which may be used for relating seismic wave velocities to rippability of subsurface materials.

Interpreted results of the seismic refraction survey are discussed in Chapter II of this report on an areal basis, with areas broken down into the following categories:

- A. Evaporation Pond Site
  - 1. Dam Axis
    - a. Left Abutment
    - b. Channel
    - c. Right Abutment
  - 2. Pond Storage Area
    - a. Main Channel
    - b. Small Northern Channel
    - c. Central Southern Ridge
- B. Tailings Disposal and Settling Pond Site
  - 1. Broad Northern Ridge

Following the discussion of interpreted results is a description of the method and equipment used for this survey, a discussion of the limitations involved, and a brief discussion of one method for evaluating rippability of subsurface materials based on their seismic wave velocities.

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\* For the purposes of this report, a seismic refraction line consists of several geophones (usually 12) placed in a linear array, monitored simultaneously, with shot or impact points off both ends of each line. Spread length is that distance between the first and last geophone in the array.

## II. Interpreted Results

### A. Evaporation Pond Site

#### 1. Dam Axis

##### a. Left Abutment

Seismic refraction lines S-2 through S-8 were completed along the left abutment of the evaporation pond dam axis as shown on Figure 1. Data and interpreted subsurface velocity profiles are presented in Figures 2 and 3.

Interpretation of the data indicates that a thin layer of low velocity material (1150-1360 ft/sec) blankets the left abutment and extends to a depth of 2 to 6 feet beneath the ground surface. This surficial low velocity zone is underlain by a low to medium velocity zone (2660-3550 ft/sec) which extends down to a depth of 7 to 20 feet beneath the ground surface. Underlying the low to medium velocity zone is a third zone, consisting of medium velocity material (4520-5680 ft/sec) extending to at least 50 feet beneath the ground surface (which is the depth-limit of seismic refraction information obtained in this area).

Correlation with geologic information in the area of the left abutment suggests that the low velocity zone blanketing the area represents primarily residual soil and partially the highly weathered and fractured rock surface from which the residual soil was derived. The underlying low to medium velocity zone represents highly weathered sandstone and shale which becomes less weathered at depth, and hence increases in velocity, transforming into the medium velocity zone below.

##### b. Channel

Seismic refraction lines S-1, S-17, S-18, S-19, and S-43 were completed in the channel along the central portion of the evaporation pond dam axis as shown on Figure 1. Data and interpreted subsurface velocity profiles are presented in Figures 3 and 4.

Interpretation of the data indicates a thin surficial layer of low velocity material (1000-1370 ft/sec) extending to a depth of 3 to 7 feet, and typically 3 to 4 feet, beneath the ground surface. This low velocity zone is underlain by low to medium velocity material (1790-2350 ft/sec) which extends down to depths of 12 to 28 feet, and typically 12 to 17 feet, beneath the ground surface. Underlying the low to medium velocity zone is a medium velocity zone (3840-5710 ft/sec) which extends down to 65 to 95 feet beneath the ground surface where high velocity material (7630-8820 ft/sec) is encountered. This high velocity zone extends to



a depth of at least 200 feet (the depth-limit of seismic refraction information obtained in this area).

Geologic information from the channel area suggests that the low velocity zone represents low density alluvial deposits and the low to medium velocity zone represents higher density alluvial deposits. The medium velocity zone represents weathered sandstone beneath the alluvium and the high velocity zone at depth may represent a less weathered zone or possibly the transition from Gallup Sandstone into Mancos Shale.

Interpretation of the data in this area also suggests that there are two narrow subsurface channels incised into in the weathered rock beneath the existing broad channel surface as shown on Figure 4. The approximate dimensions of both of these channels are 100 feet in width and on the order of 10 feet in depth (into rock).

#### c. Right Abutment

Seismic refraction lines S-9, S-10, S-11, S-12, S-13, S-14, S-15, and S-16 were completed along the right abutment of the evaporation pond dam axis as shown on Figure 1. Data and interpreted subsurface velocity profiles are presented in Figures 4 and 5.

Interpretation of the data indicates that a thin layer of low velocity material (1140-1480 ft/sec) blankets the right abutment and extends to a depth of 2 to 10 feet, and typically 2 to 4 feet, beneath the ground surface. This surficial low velocity zone is underlain by a medium velocity zone (4710-6640 ft/sec) which extends to a depth of at least 50 feet beneath the ground surface (which is the depth-limit of seismic refraction information obtained in this area).

Existing geologic information suggests that the low velocity zone blanketing the right abutment represents primarily residual soil and partially the highly weathered and fractured rock surface from which the residual soil was derived. The underlying medium velocity zone represents weathered sandstone and shale.

## 2. Pond Storage Area

### a. Main Channel

Seismic refraction lines S-20, S-21, S-22, S-40, S-41, and S-42 were completed in the main channel within the evaporation pond storage area upstream from the dam axis in the locations shown on Figure 1. Data and interpreted subsurface velocity profiles are presented in Figures 6, 7, 8, and 9.

Interpretation of the data indicates that there is a surficial layer of low velocity material (1040-1320 ft/sec) extending to a depth of 4-8 feet beneath the ground surface. A low to medium velocity zone (1670-2220 ft/sec) underlies this low velocity zone and extends to depths of 8 to 38 feet, and typically 15 to 25 feet, beneath the ground surface. Beneath the low to medium velocity zone is a medium velocity zone (3490-5430 ft/sec) which extends to a depth of 83 to 175 feet beneath the ground surface where high velocity material (7960-10,080 ft/sec) is encountered. This high velocity zone extends to a depth of at least 200 feet (which is the depth-limit of seismic refraction information obtained here).

Correlation with geologic information in the area suggests that the low and low to medium velocity zones represent alluvial deposits with various densities. The medium velocity zone represents weathered sandstone and the deep, high velocity zone may represent a rigid zone within the underlying rock; possibly the transition into Mancos Shale from Gallup Sandstone.

Interpretation of the data also indicates two apparent subsurface channels in the upper reach of the main channel as shown on Figure 6. A subsurface channel on the order of 100 feet or more in width and 10 feet in depth (within the rock) apparently underlies the existing broad channel surface just north of the center of the broad channel. A smaller subsurface channel apparently underlies the broad channel surface towards its southern edge. There appears to be a shallow area of high velocity material beneath the southern edge of the channel.

b. Small Northern Channel

Seismic refraction line S-23 was completed across the small northern channel in the evaporation pond storage area in the location shown on Figure 1. Data and subsurface velocity profile are presented in Figure 7.

Interpretation suggests that a thin low velocity zone (1350 ft/sec) extends to a depth of 2 to 4 feet beneath the ground surface where low to medium velocity material (1790 ft/sec) is encountered. The low to medium velocity zone extends to 15 to 25 feet beneath the ground surface where medium velocity material (5000 ft/sec) is encountered. High velocity material (>10,000 ft/sec) at 90 to 95 feet extends to at least 100 feet (which is the depth-limit of seismic refraction information obtained in this area).

Geologic correlation suggests that both the low and low to medium velocity zones represent alluvial deposits. The medium velocity zone represents weathered

sandstone and shale and the high velocity zone is either created by a shallower occurrence of the medium velocity zone at each end of the seismic refraction line or may represent a rigid zone within the Gallup Sandstone or the transition into Mancos Shale from Gallup Sandstone.

Two, slight subsurface channels apparently lie beneath the existing small northern channel surface as shown on Figure 7.

c. Central Southern Ridge

Seismic refraction lines S-44, S-45, and S-46 were completed along the central southern ridge of the evaporation pond storage area as shown on Figure 1. Data and interpreted subsurface velocity profile are shown on Figure 10.

Interpretation of the data indicates that a thin zone of low velocity material (1390-1790 ft/sec) covers the slope and extends to a depth of 3 to 5 feet beneath the ground surface where low to medium velocity material (2770-3100 ft/sec) is encountered. The low to medium velocity zone is underlain by medium velocity material (5380-6550 ft/sec) at a depth of 15 to 21 feet. Medium velocity material extends on down to at least 100 feet in this area (which is the depth-limit of seismic refraction information obtained here).

Geologic information suggests that the low velocity zone represents residual soil and highly weathered and fractured sandstone and shale. The low to medium velocity zone represents weathered sandstone and shale which becomes less weathered at depth, resulting in an increase of seismic velocity to that of the medium velocity zone.

B. Tailings Disposal and Settling Pond Site

1. Broad Northern Ridge

Seismic refraction lines S-24 through S-39 were completed on the broad northern ridge of the tailings disposal and settling pond site as shown on Figure 1. Lines S-29, S-30, S-33, S-34, and S-35 were completed across the ridge and the remaining lines (S-24 through S-39) were completed down the length of the ridge. Data and interpreted subsurface velocity profiles are presented in Figures 11 through 17.

Interpretation of the data suggests that a surficial low velocity zone (1040-1670 ft/sec) covers the ridge and extends to depths of 4 to 9 feet beneath the ground surface. The low velocity zone is underlain by a low to medium velocity zone (2620-4760 ft/sec) which extends to depths of 11 to 50 feet. Beneath the

low to medium velocity zone is a medium velocity zone (4390-6420 ft/sec) that extends to depths of 50 to 100 feet where high velocity material (6950- >10,000 ft/sec) is encountered. The zone of high velocity material extends to at least 100 feet (which is the depth-limit of seismic refraction information obtained in the northern broad ridge area). The higher velocities (>10,000 ft/sec) were observed only near the depth-limit of detection and are therefore questionable.

Correlation with geologic information in the area of the broad northern ridge suggests that the low velocity zone covering the ridge is residual soil and highly weathered and fractured sandstone, siltstone, and shale rock in the process of becoming residual soil. The low to medium velocity zone and the medium velocity zone both represent sandstone, siltstone, and shale in varying degrees of weathering. The possible high velocity zone at depth represents either a rigid zone within the rock or the transition into Mancos Shale.

### III. Method and Equipment

Seismic refraction lines S-1 through S-16 were performed using a Bison Model 1570B Signal Enhancement Seismograph.

The seismic refraction survey procedure used for these lines consisted of placing two receiving geophones 150 feet apart and striking a 10-pound sledge hammer equipped with impact oscilloscope triggering switch on a flat metal plate positioned on the ground surface at 10 to 20-foot intervals along a line between the two geophones.

The oscilloscope triggering switch on the hammer initiated an oscilloscope trace on the seismograph upon impact. The seismic compression wave produced by the impact was refracted through the subsurface materials before arriving at and exciting the geophones. Repeated impacts with the hammer at each station produced enhanced wave forms on the oscilloscope and cancelled random background noise. Seismic wave arrival times were measured on the oscilloscope and recorded in the field following each series of hammer impacts.

Seismic refraction lines S-17 through S-46 were performed using a truck-mounted, 24-channel Texas Instruments 8000 Explorer seismic system in parallel with a Texas Instruments 25-channel photographic oscilloscope.

The seismic refraction survey procedure used for these lines consisted of placing 12, 4-Hz geophones in as straight a line as possible (in plan) spaced at 25-foot intervals and, for three lines (S-40, S-41, and S-42), at 50-foot intervals. Kinetics two-component explosives were detonated with Vibrodet blasting caps at 12.5 feet off both ends of each 12-geophone string (25 feet off both ends of lines S-40, S-41, and S-42) while monitoring the seismograph. As an alternate energy source, a 33-pound sledge hammer equipped with impact timing and camera drive switches was impacted off both ends of some of the geophone lines, and for three lines (lines S-40, S-41, and S-42), at the center of the geophone lines.

The instant of explosion or impact (time break) and the 12 geophones were monitored simultaneously as the shock wave produced by each shot or impact was refracted by the subsurface materials and traveled to and excited each individual geophone.

Background noise was filtered and seismic source wave arrivals were amplified by the seismograph and recorded on photographic paper. Photographic oscilloscope records were developed in a mobile photographic laboratory in the field and checked for accuracy following each shot or impact.

Records were reduced and analyzed in the office using computer programs and results were correlated with known geologic factors.

#### IV. Limitations

The subsurface velocity profiles shown on Figures 2 through 17 represent the most reasonable interpretation of seismic refraction survey data based on our knowledge of existing geologic conditions and the information found in exploratory boring logs from borings drilled in the area. The results are presented for design information only and are not intended to serve as information for determining construction procedures.

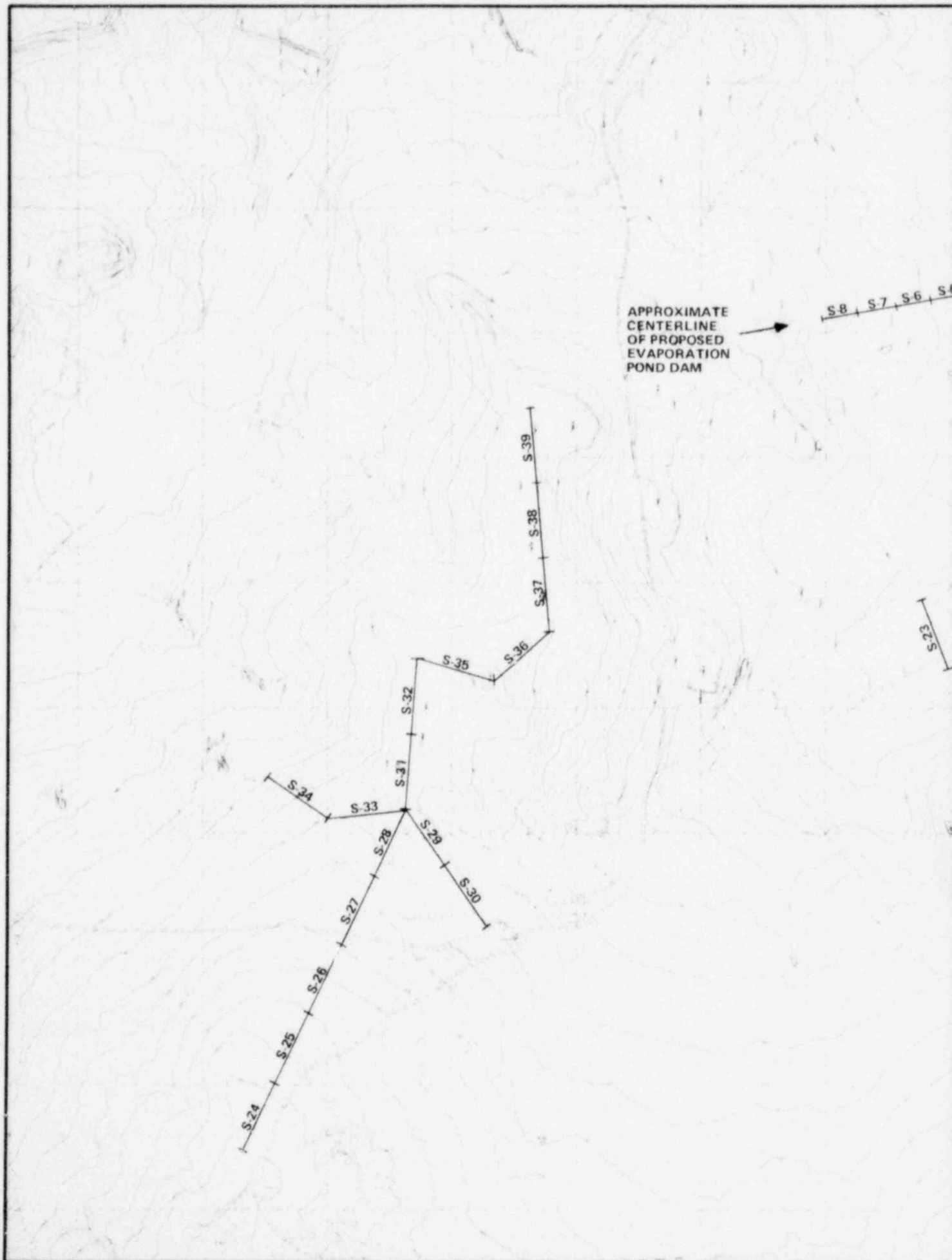
The reliability of seismic refraction data for this survey was limited by wind noise, some background noise from passing vehicles and airplanes, and slightly irregular terrain (corrections were necessary for topographic irregularities traversed by the lines). Although in general the seismic refraction data for this survey was good, the above factors produced some scatter in the recorded data, potentially limiting the accuracy of velocity zone depth determinations to on the order of  $\pm 2$  feet in the near surface (upper 20 feet),  $\pm 5$  feet in the mid-depth range (20-40 feet), and  $\pm 10$  feet at greater depths. The absence of exploratory borings directly along seismic refraction lines in many of the areas surveyed may also limit the reliability of interpretation, since correlation with borings is important in establishing accuracy.

The maximum depth of reliable seismic refraction information obtained during this survey can be assumed to be roughly one-third of the length of the individual lines. For example, a seismic refraction line 300 feet in length will typically yield reliable data on materials to a depth of about 100 feet.

## V. Rippability

In order to evaluate excavation characteristics, seismic wave velocities have been related to rippability. The seismic wave velocities of various geologic materials have been related to rippability as shown on Figure 18, which relates the performance of three dozer and ripper combinations to seismic wave velocities. The geologic materials present in the project area are mainly residual or alluvial soils overlying sedimentary rocks such as sandstones, siltstones, and shales.





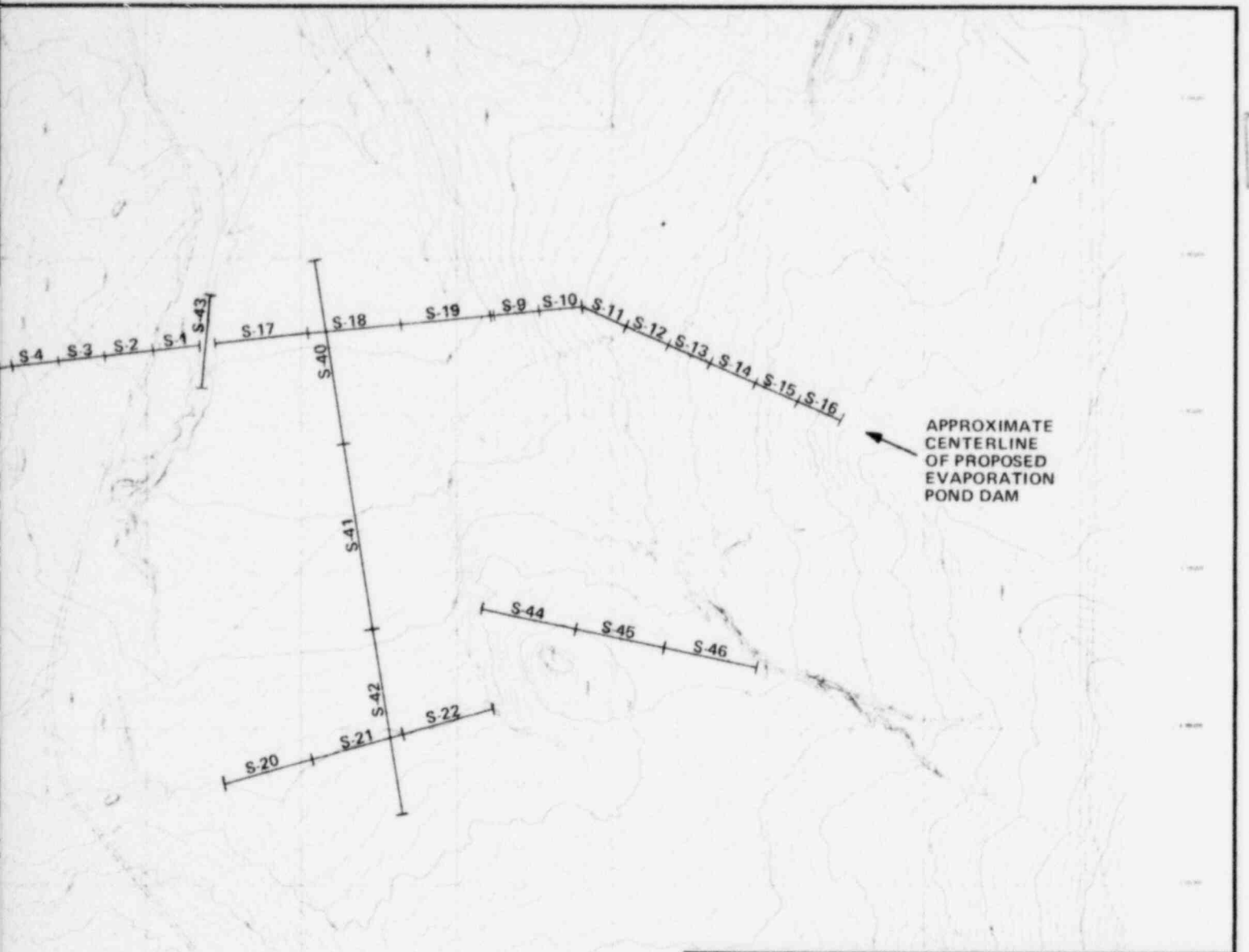
APPROXIMATE  
CENTERLINE  
OF PROPOSED  
EVAPORATION  
POND DAM

S-8 S-7 S-6 S-5

S-35

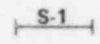


POOR ORIGINAL



SCALE: 1"=500'

EXPLANATION



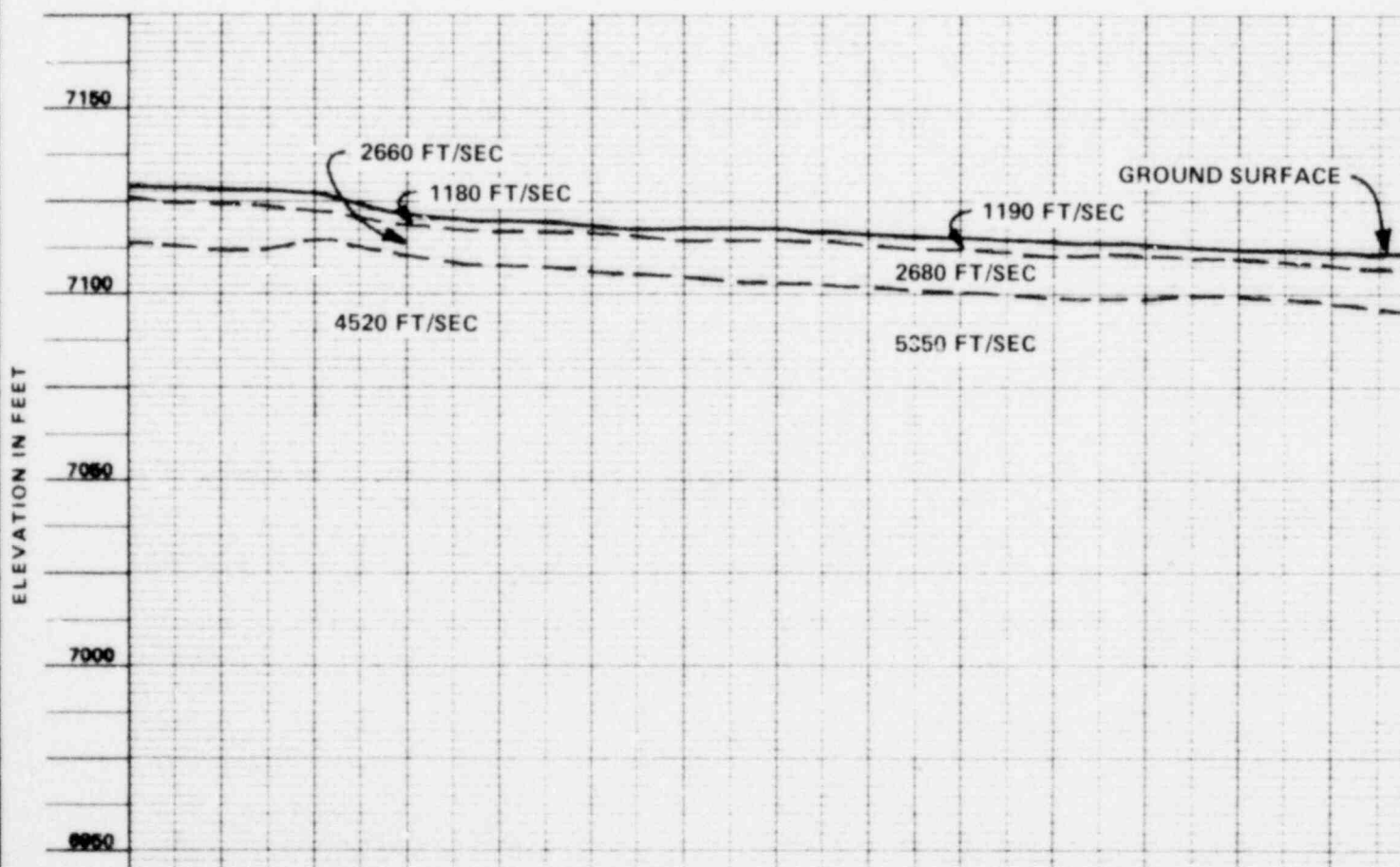
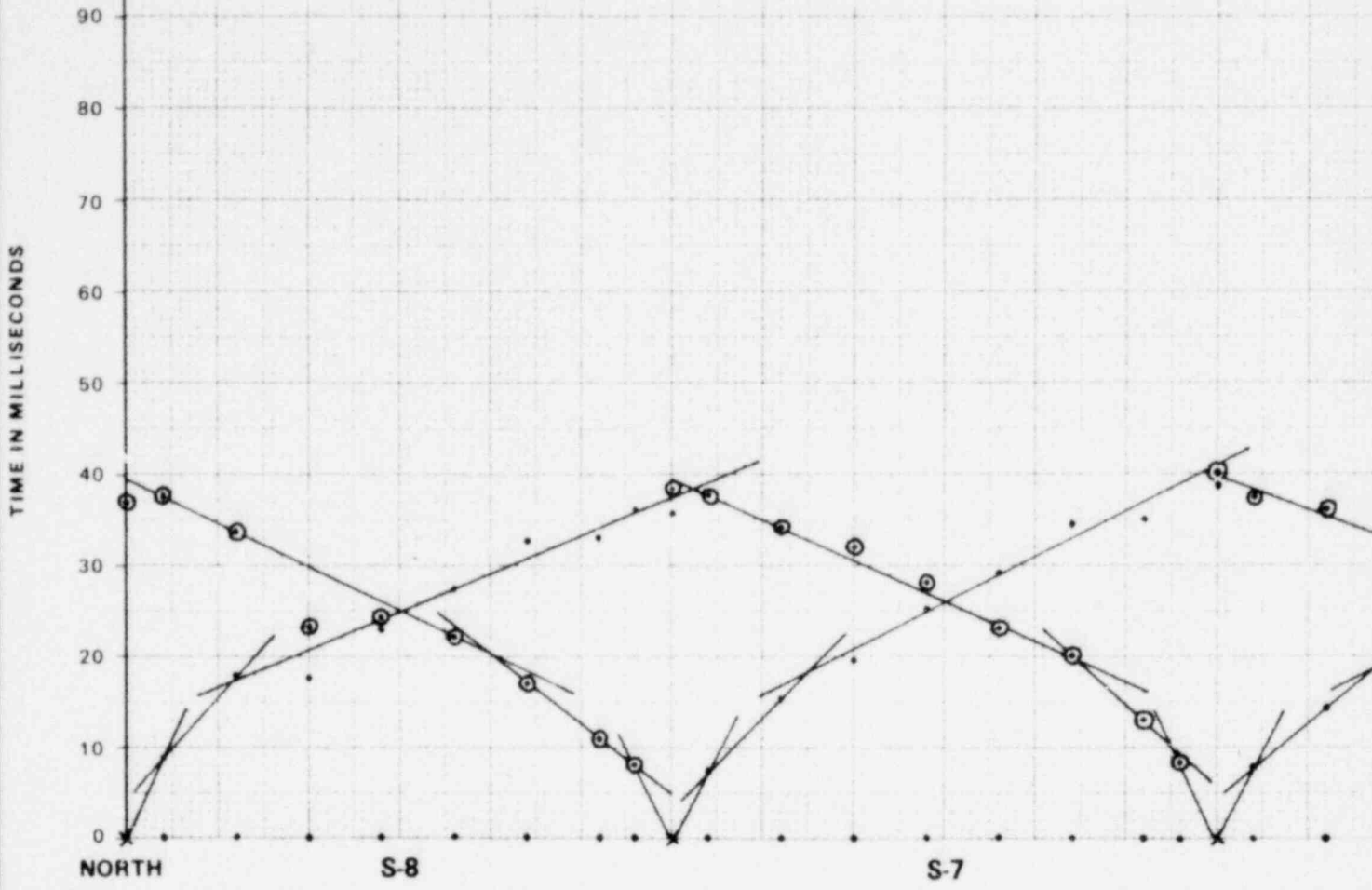
SEISMIC REFRACTION LINE

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 Palo Alto, California

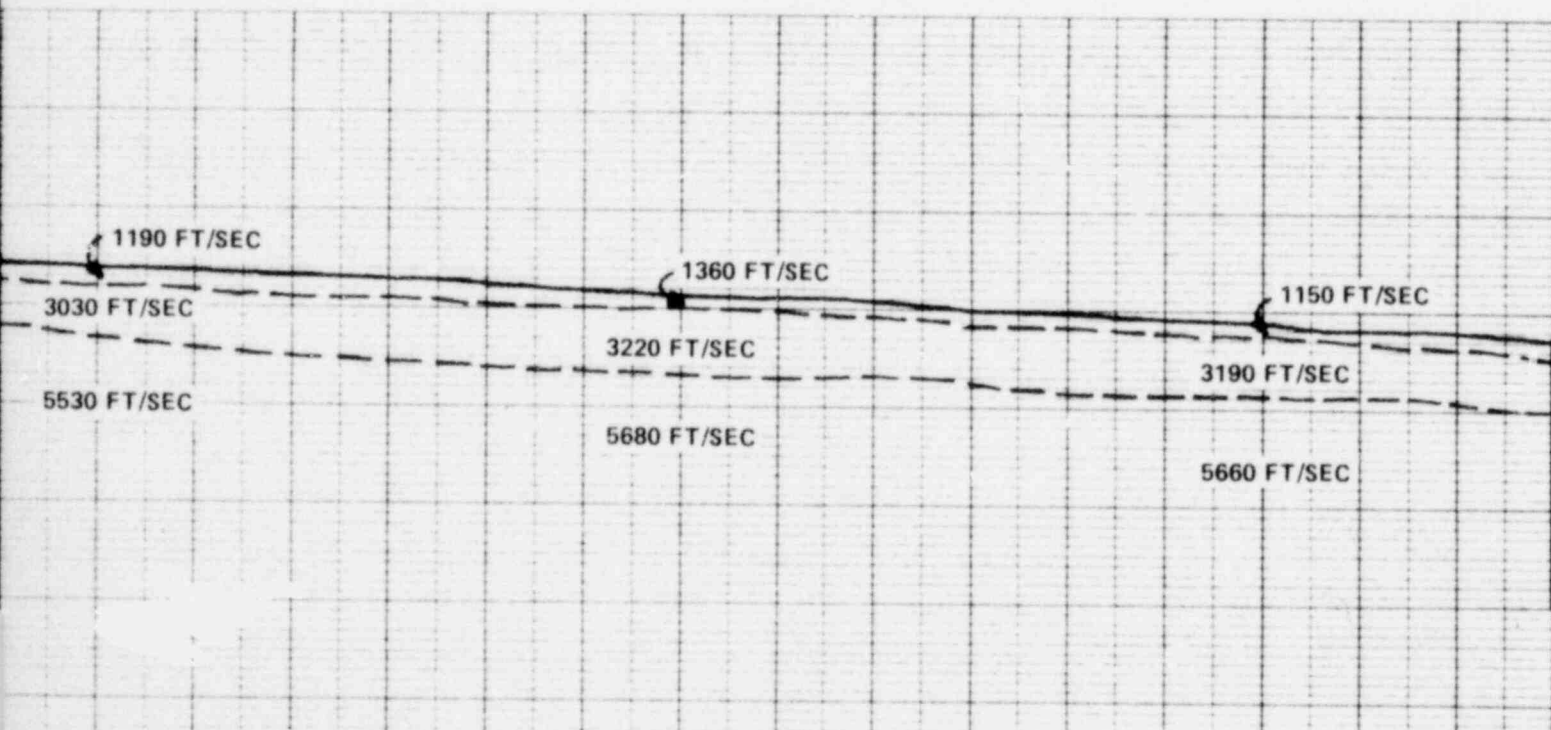
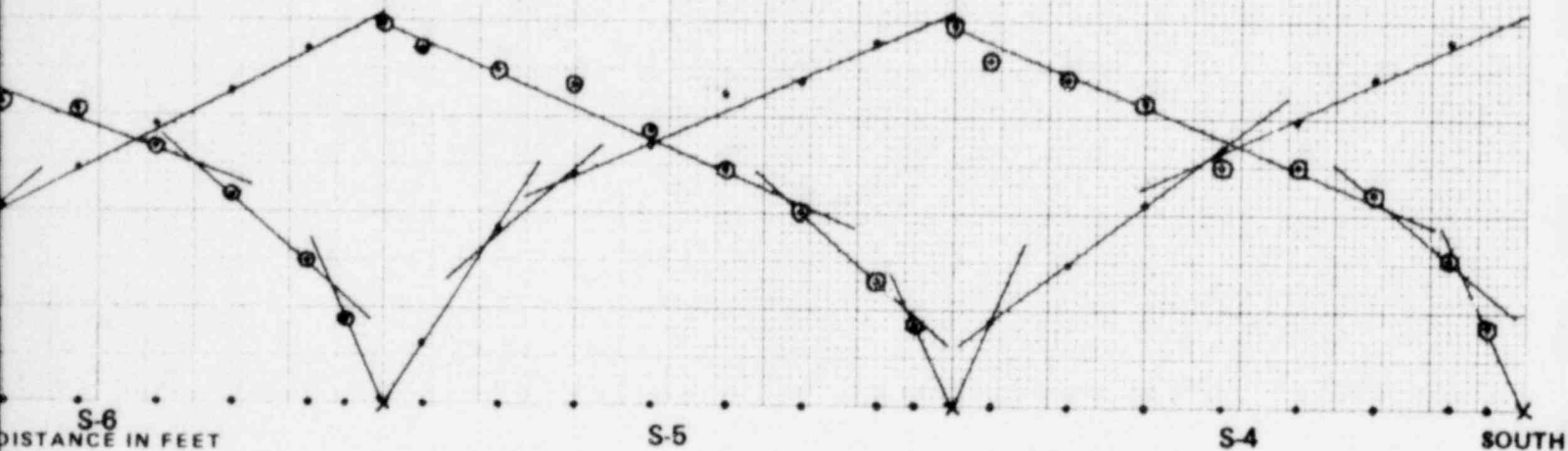
LA POLVADERA CANYON SEISMIC REFRACTION SURVEY  
 LOCATION MAP

Checked by	<i>POS</i>	Date	<i>12/31/79</i>	Project No.	Figure No.
Approved by	<i>WRH</i>	Date	<i>1/2/80</i>	2143	1

POOR ORIGINAL



LINES S-4 THROUGH S-8 LOCATED ON FIGURE 1



**NOTES**

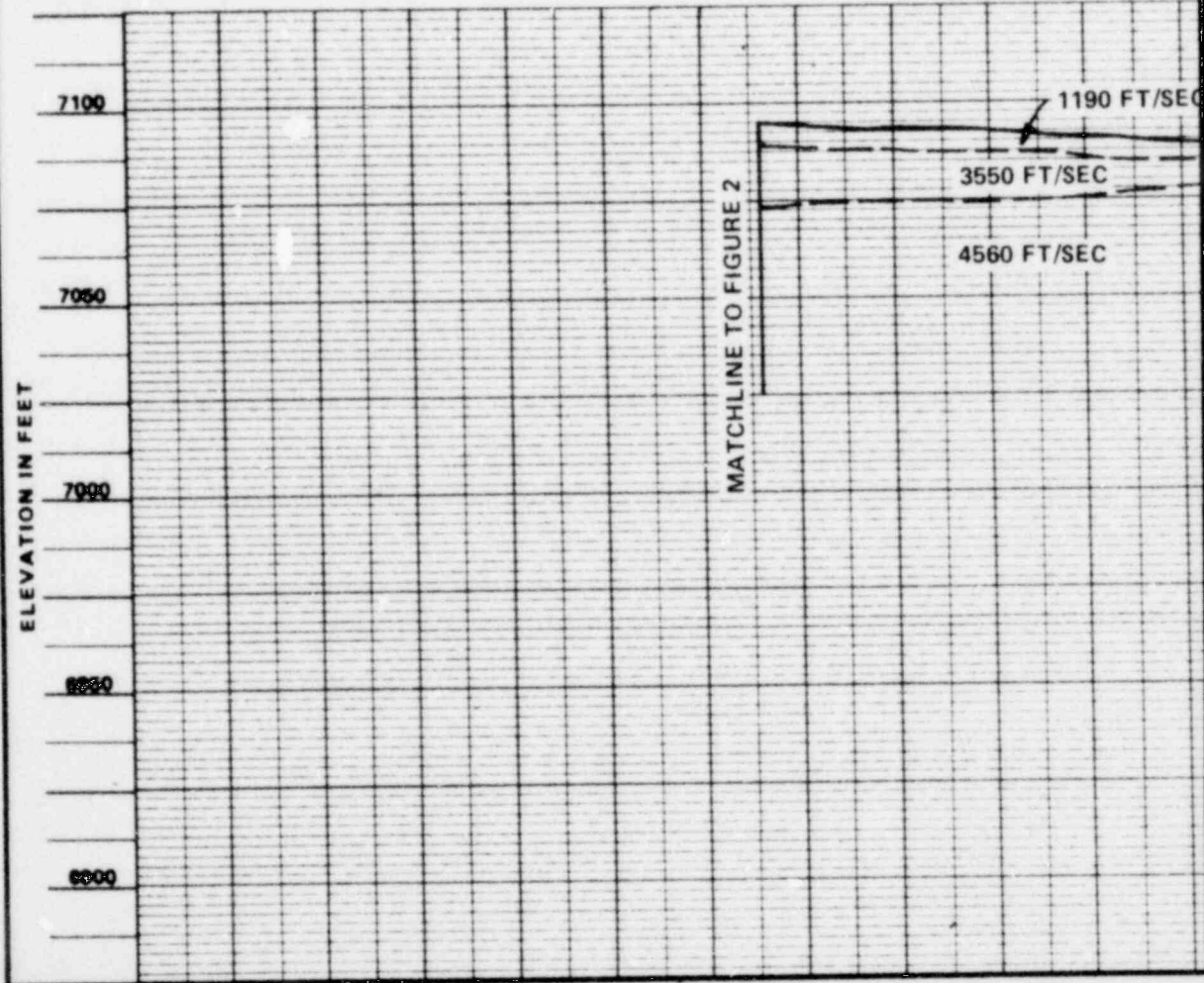
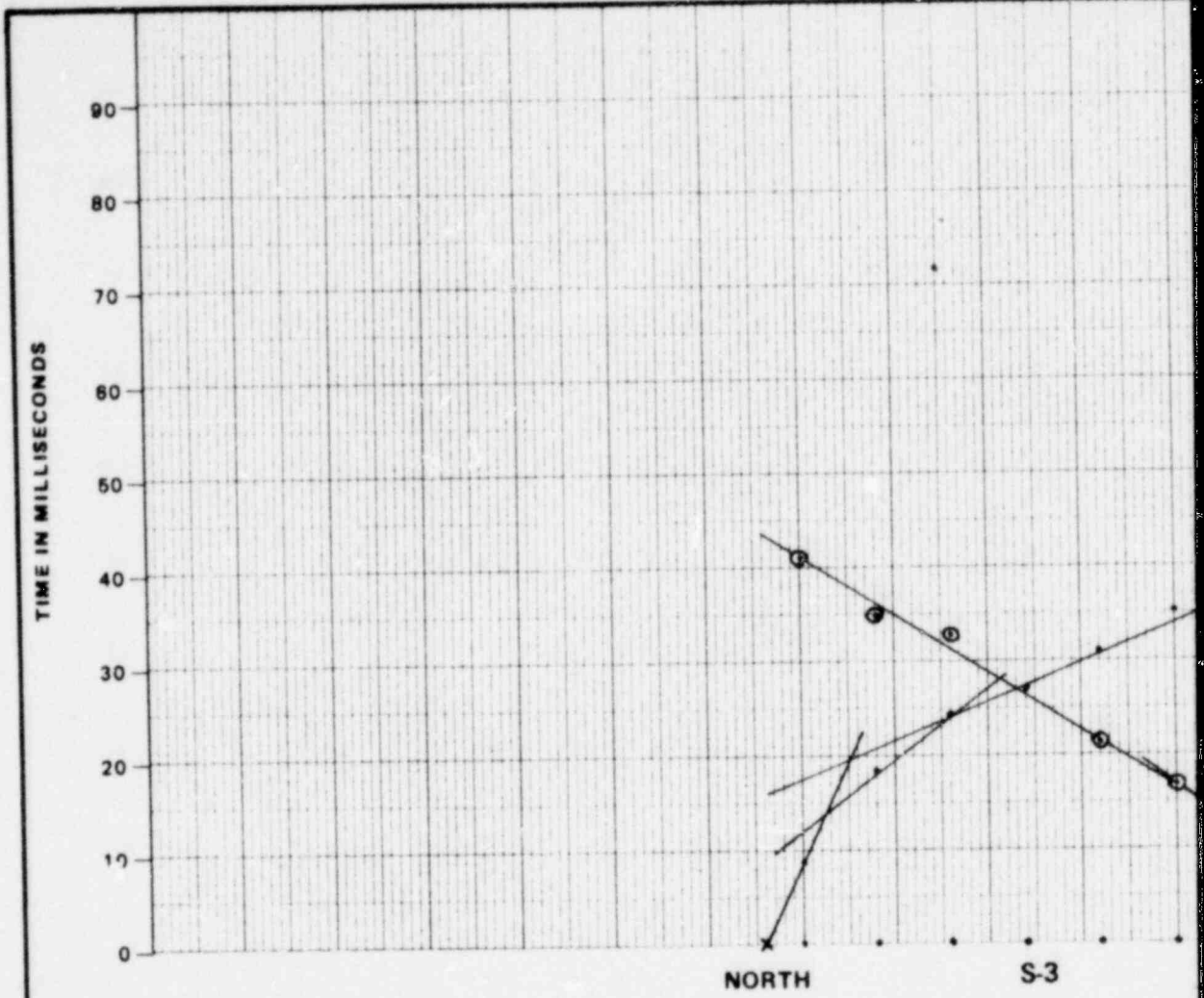
1. TIME-DISTANCE GRAPHS AT TOP OF FIGURE REPRESENT SEISMIC REFRACTION SURVEY DATA; DOTS ON BOTTOM LINE OF GRAPHS REPRESENT GEOPHONE LOCATIONS, X'S REPRESENT SHOT POINT LOCATIONS.  
HORIZONTAL SCALE: 1" = 50 FEET  
VERTICAL SCALE: 1" = 20 MILLISECONDS
2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.  
VERTICAL AND HORIZONTAL SCALE: 1" = 50 FEET

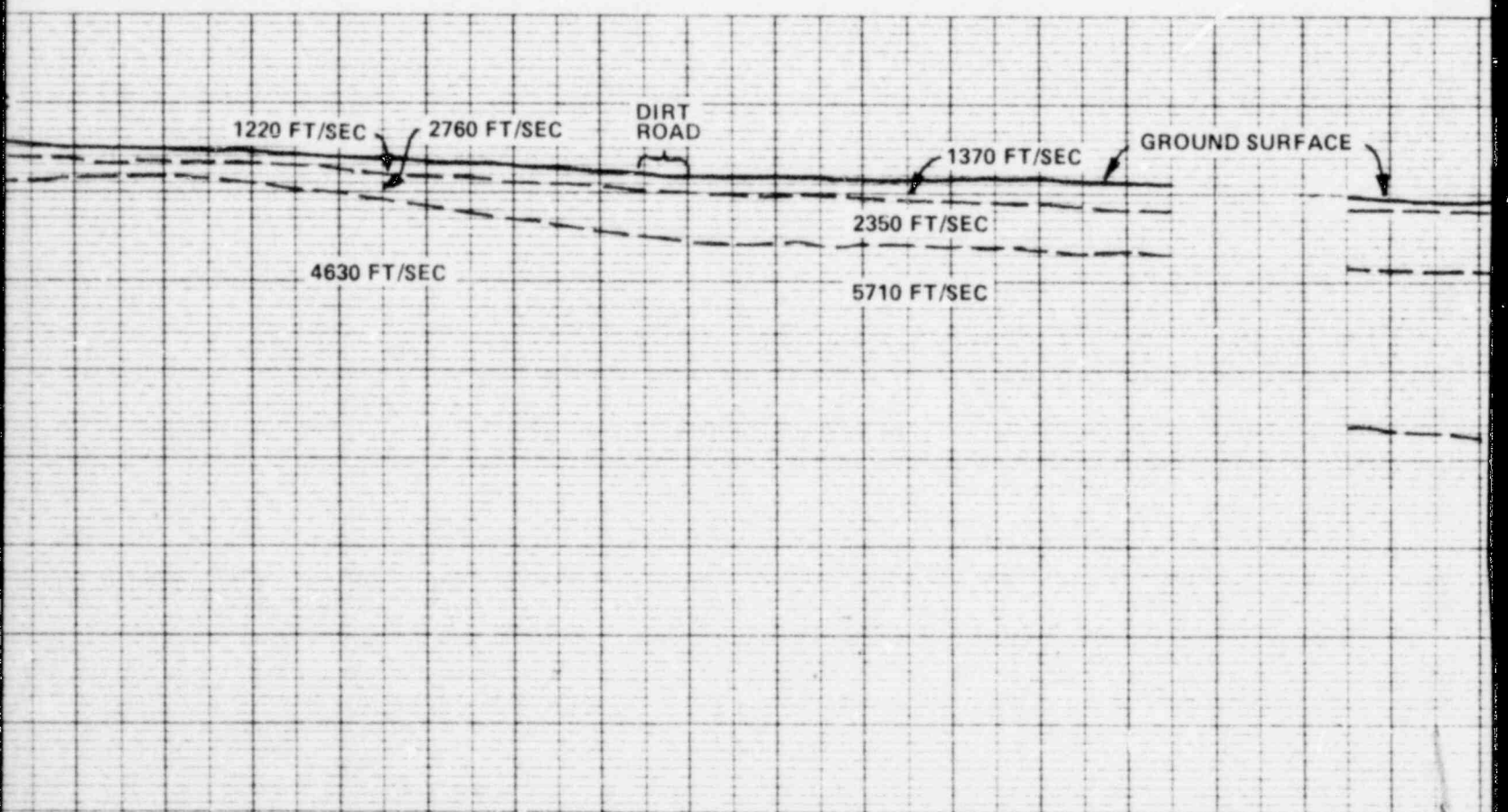
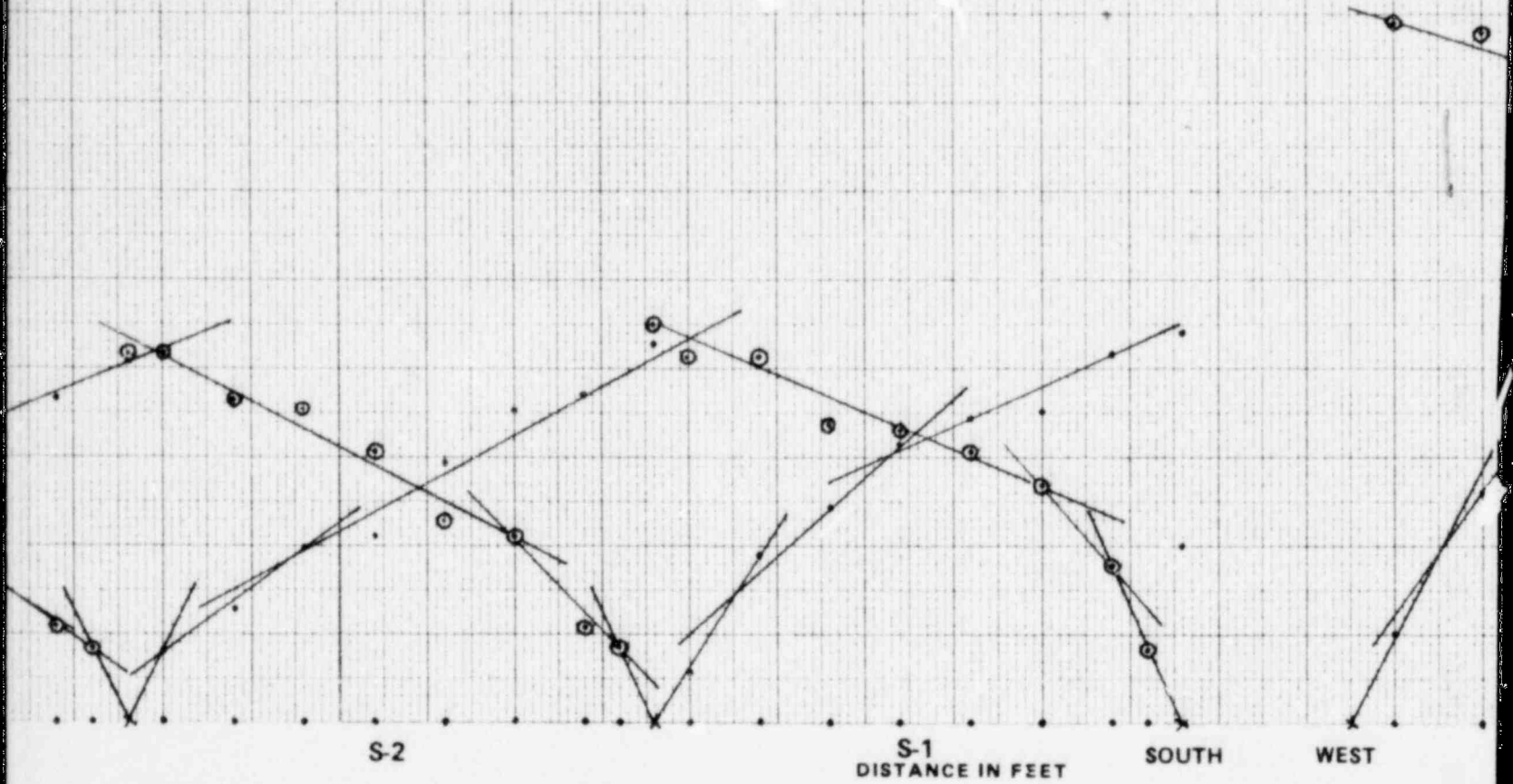
**Earth Sciences Associates**  
Palo Alto, California

**LA POLVADERA CANYON SEISMIC REFRACTION SURVEY  
DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE  
LINES S-4, S-5, S-6, S-7, AND S-8**

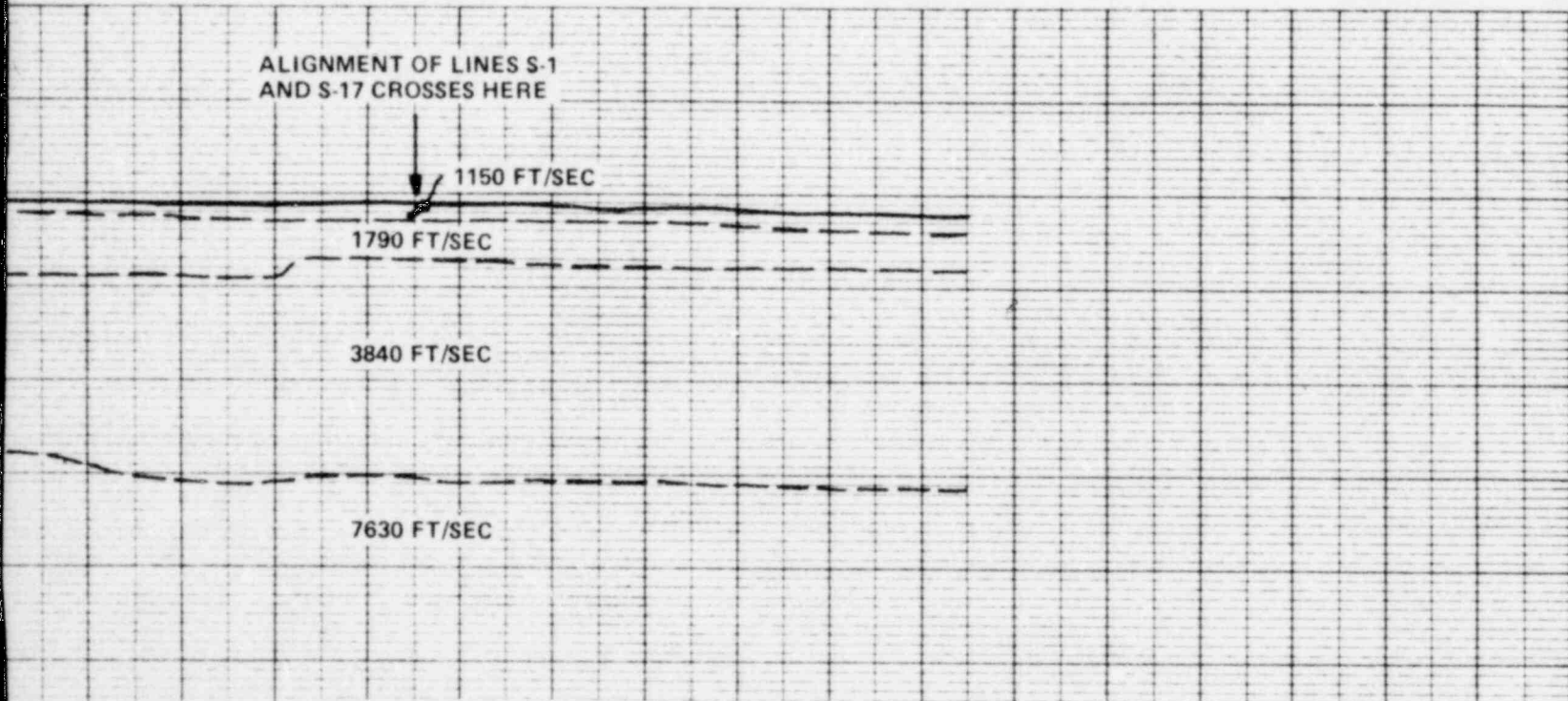
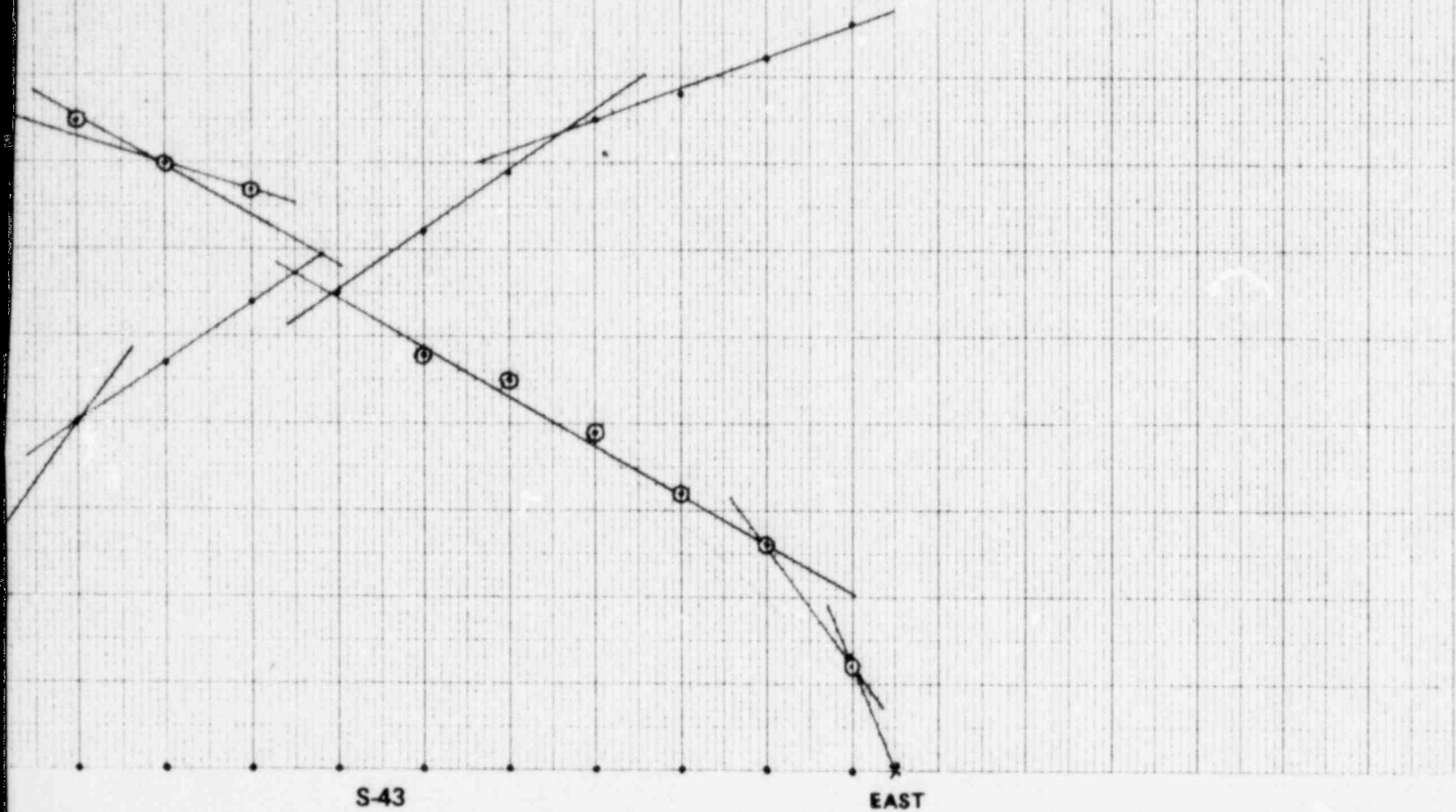
Checked by <i>POS</i>	Date <i>12/31/79</i>	Project No.	Figure No.
Approved by <i>WRH</i>	Date <i>1/2/80</i>	<b>2143</b>	<b>2</b>

MATCHLINE TO FIGURE 3





LINES S-1, S-2, S-3 AND S-43 LOCATED ON FIGURE 1



NOTES

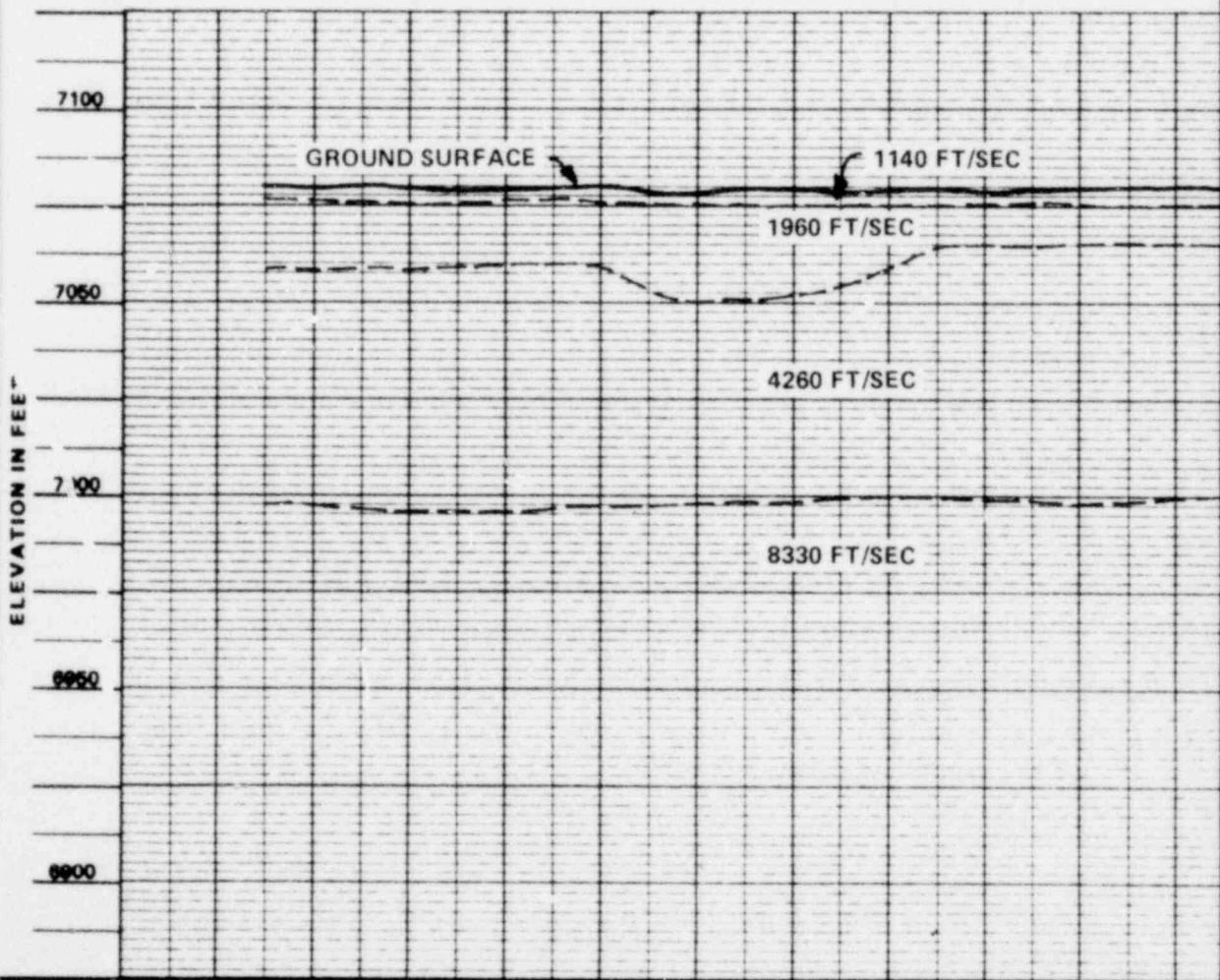
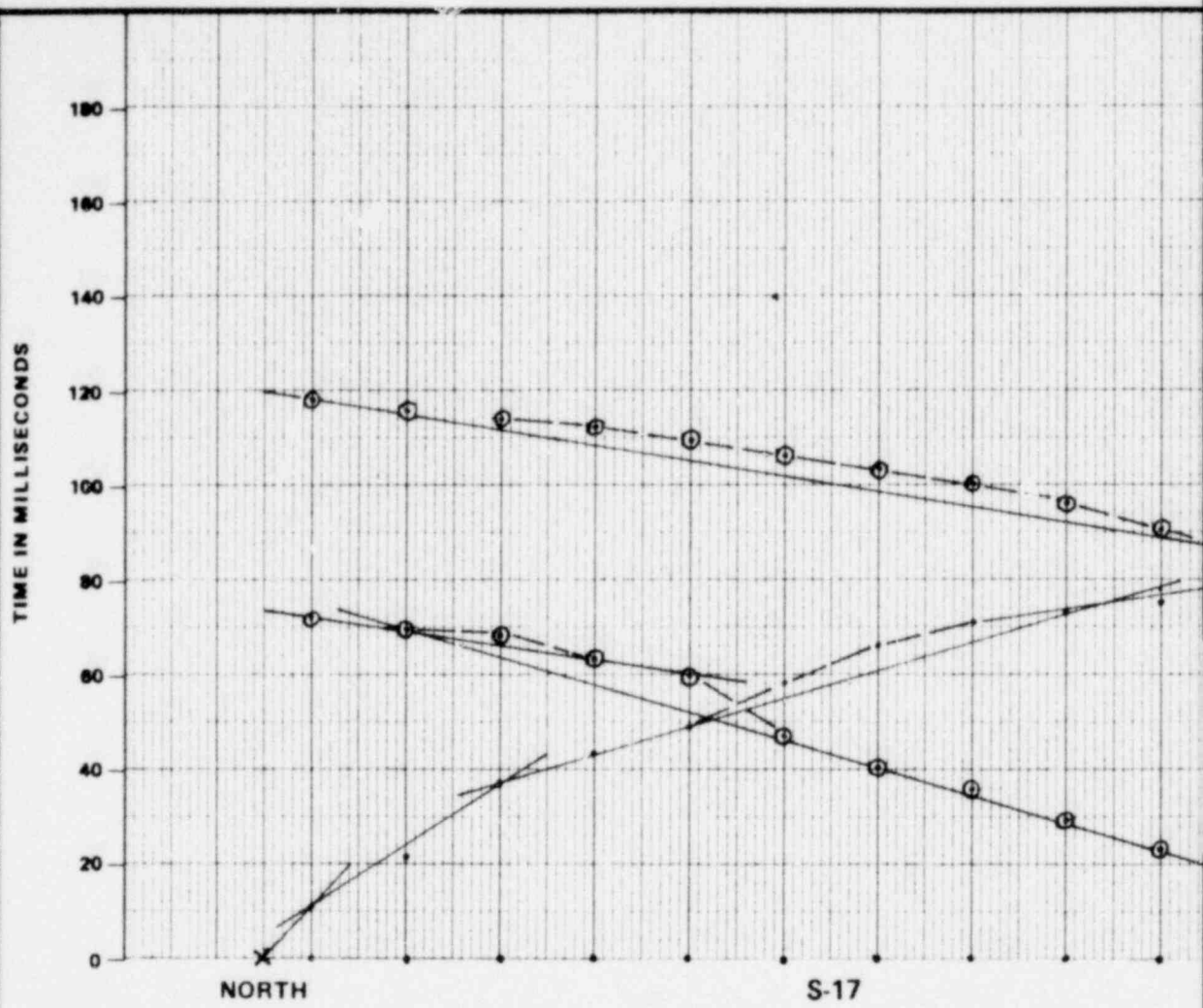
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HORIZONTAL SCALE: 1" = 50 FEET  
VERTICAL SCALE: 1" = 20 MILLISECONDS
2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.  
VERTICAL AND HORIZONTAL SCALE: 1" = 50 FEET

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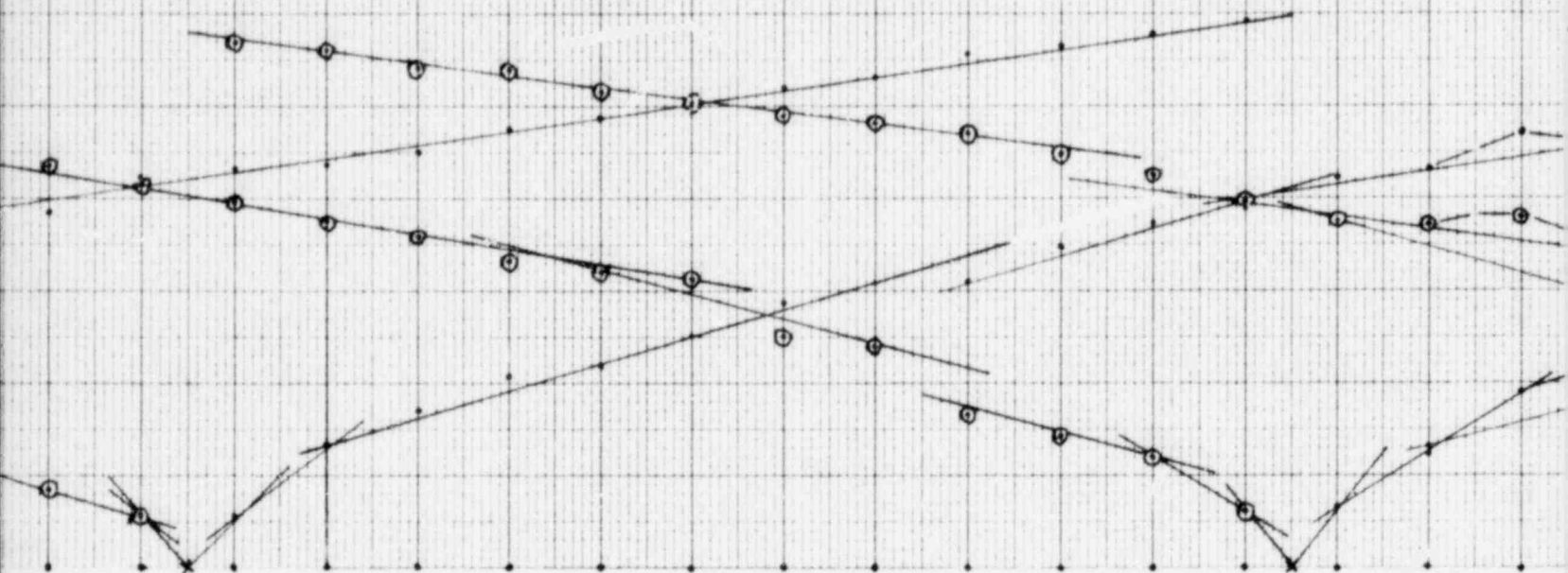
Palo Alto, California

LA POLVADERA CANYON SEISMIC REFRACTION SURVEY  
DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE  
LINES S-1, S-2, S-3, AND S-43

Checked by	POJ	Date	12/31/79	Project No.	Figure No.
Approved by	W/RH	Date	1/2/80	2143	3

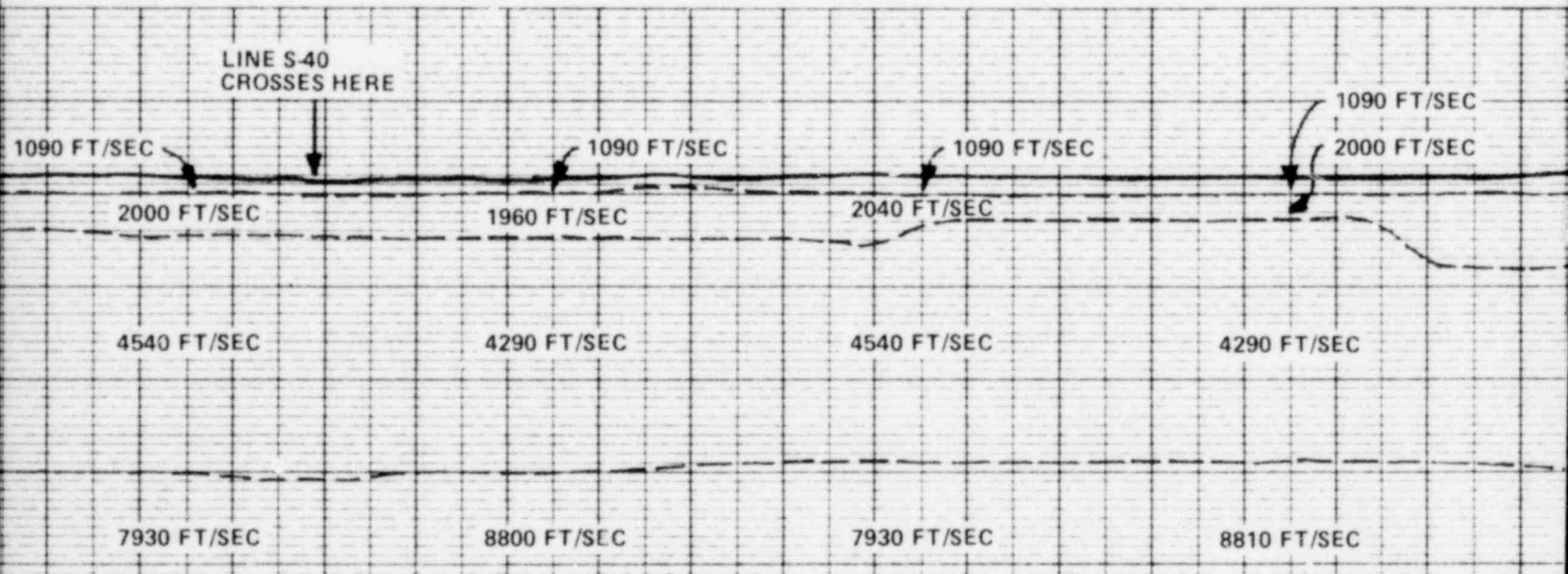






S-18

DISTANCE IN FEET



LINE S-40  
CROSSES HERE

1090 FT/SEC  
2000 FT/SEC

1090 FT/SEC

2000 FT/SEC

1090 FT/SEC

1960 FT/SEC

1090 FT/SEC

2040 FT/SEC

4540 FT/SEC

4290 FT/SEC

4540 FT/SEC

4290 FT/SEC

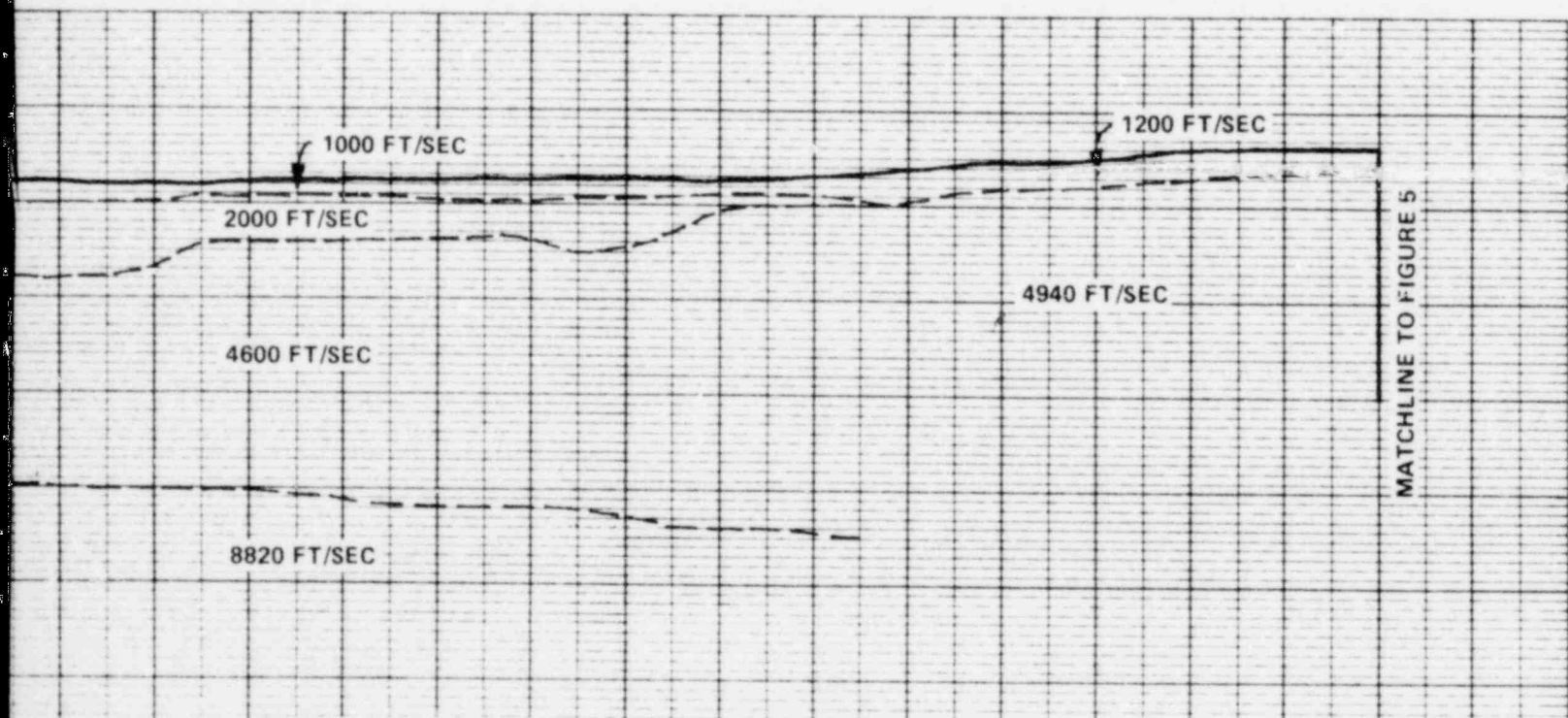
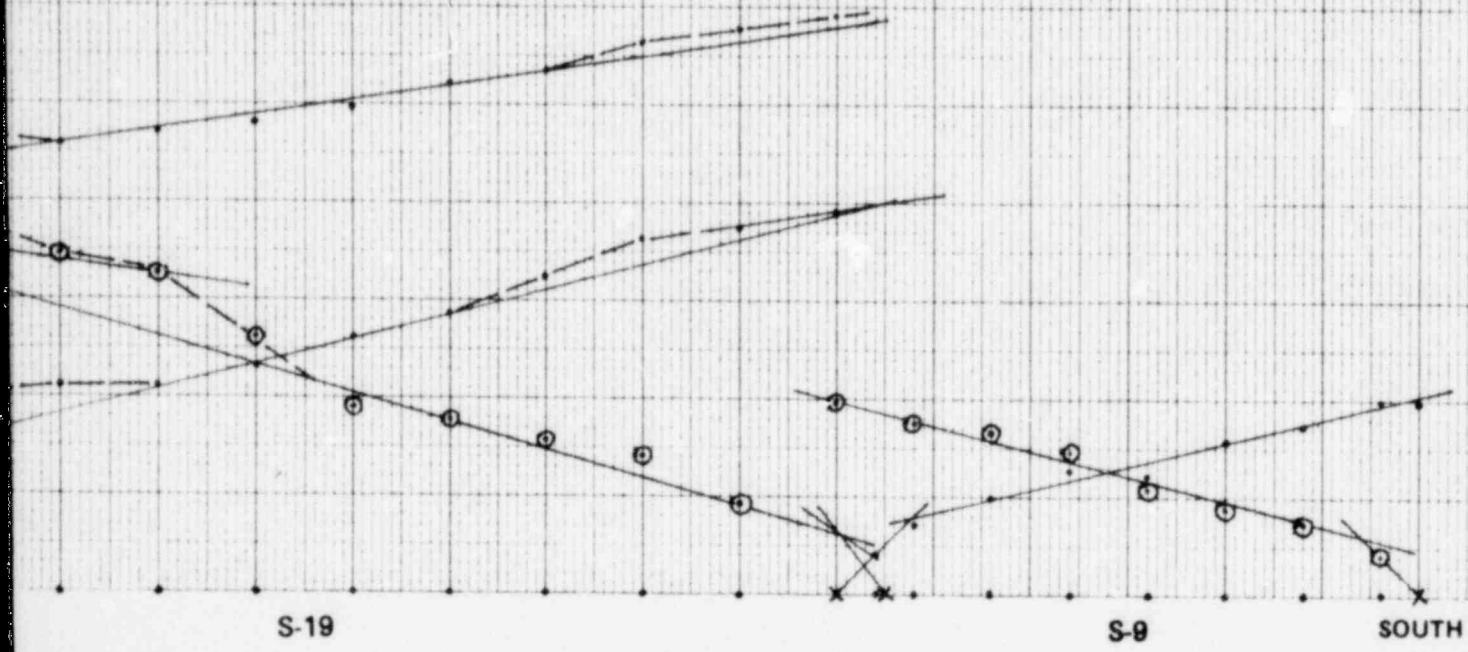
7930 FT/SEC

8800 FT/SEC

7930 FT/SEC

8810 FT/SEC

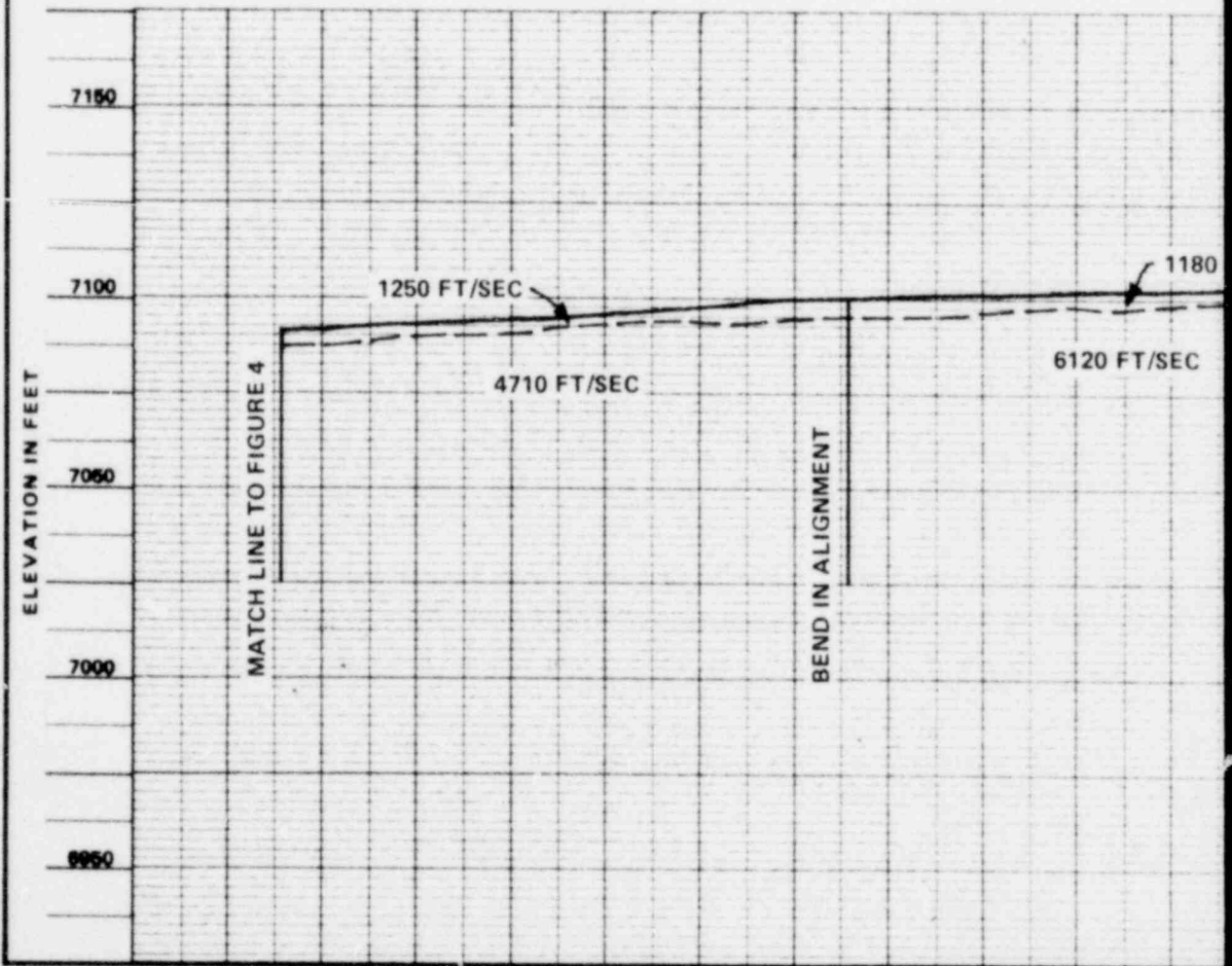
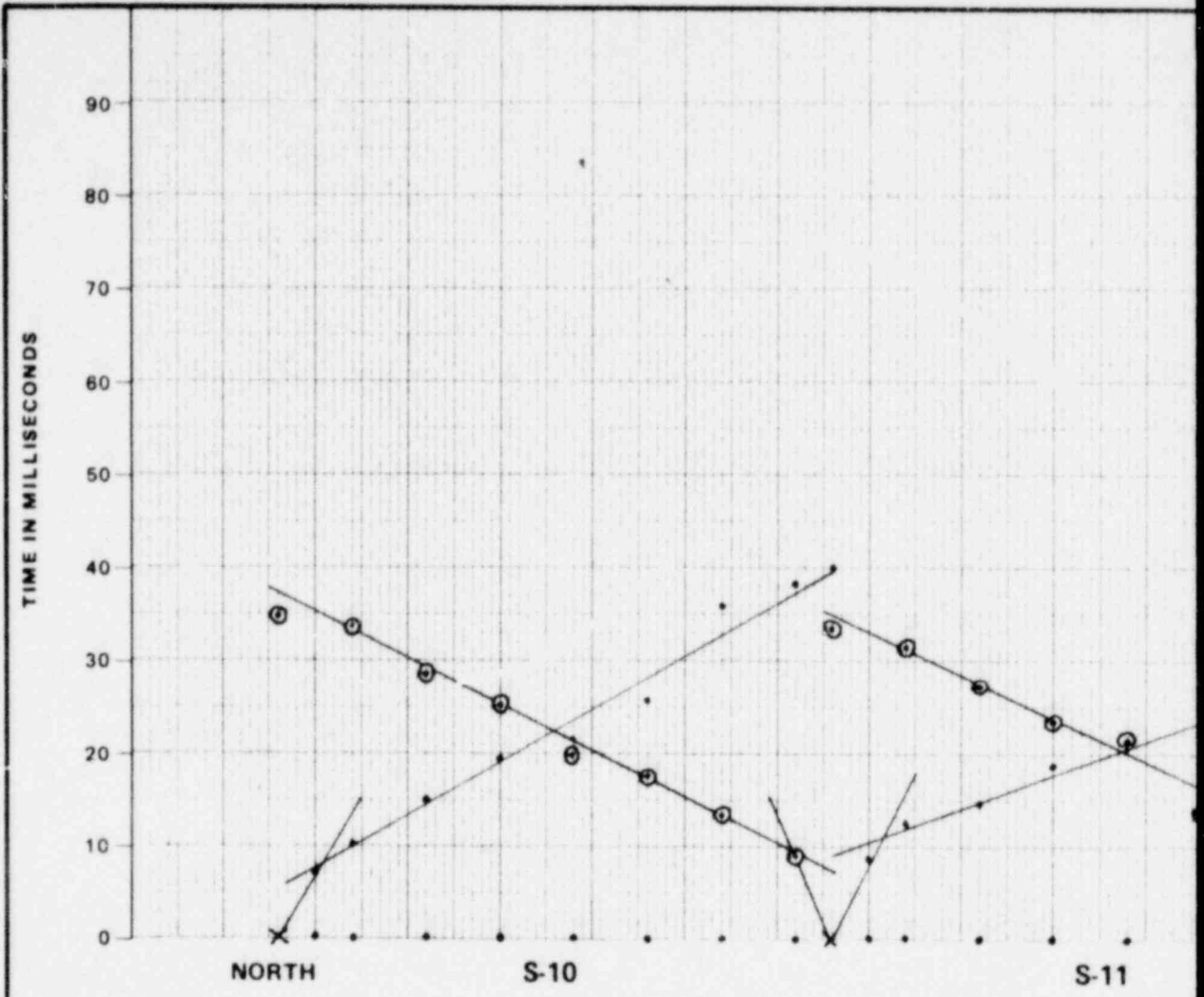
LINES S-17, S-18, S-19 & S-9 LOCATED ON FIGURE 1

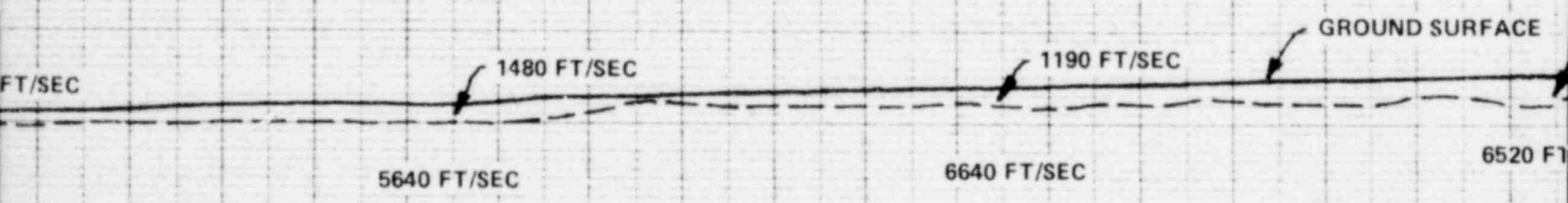
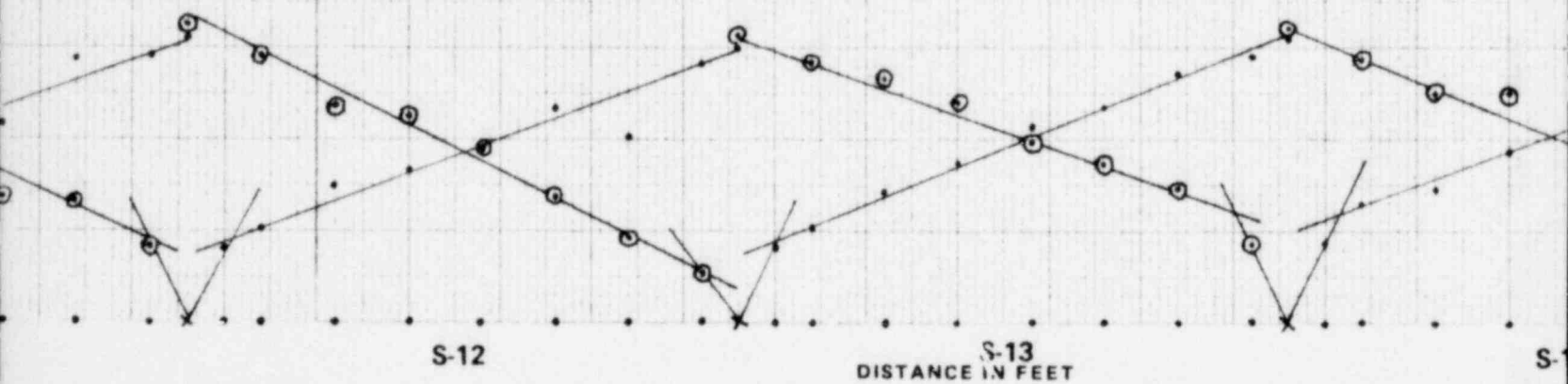


**NOTES**

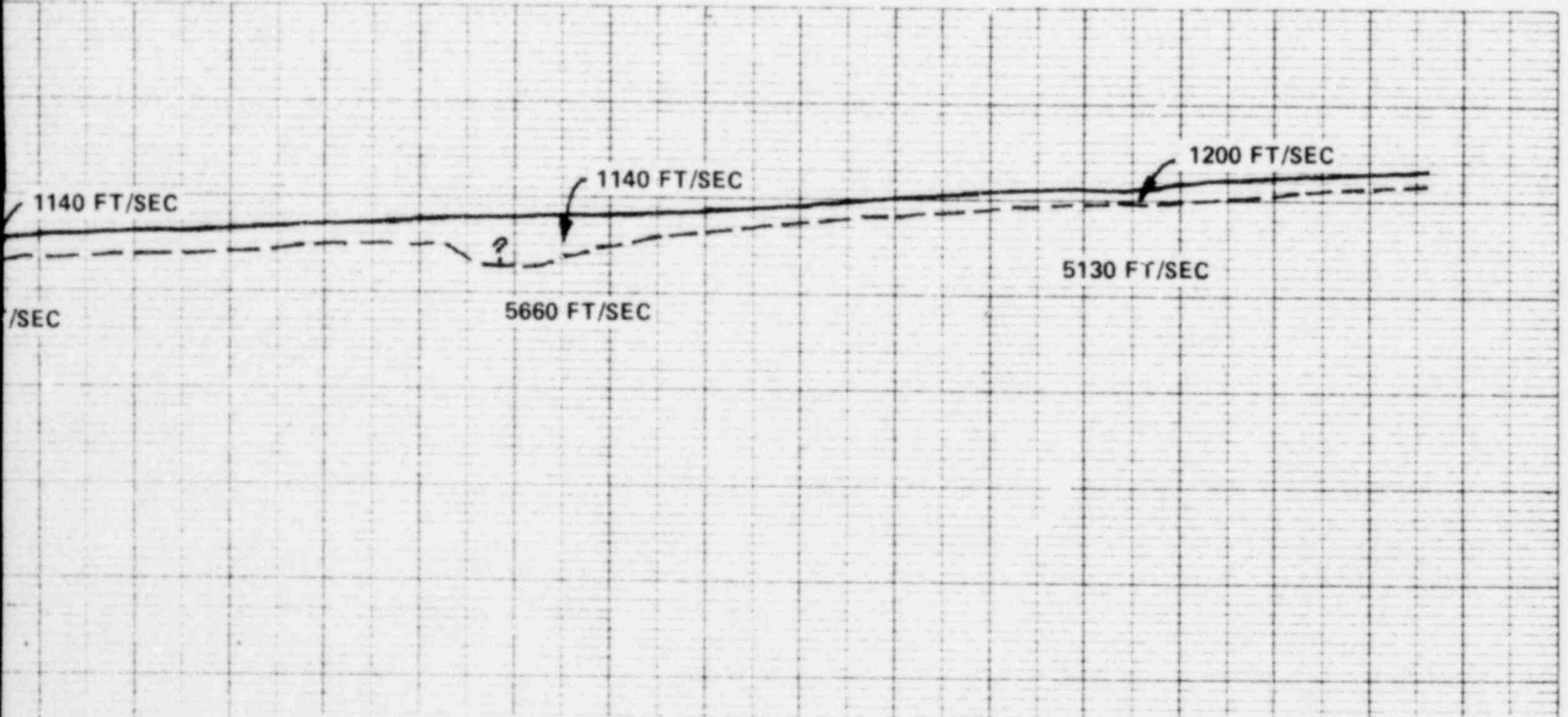
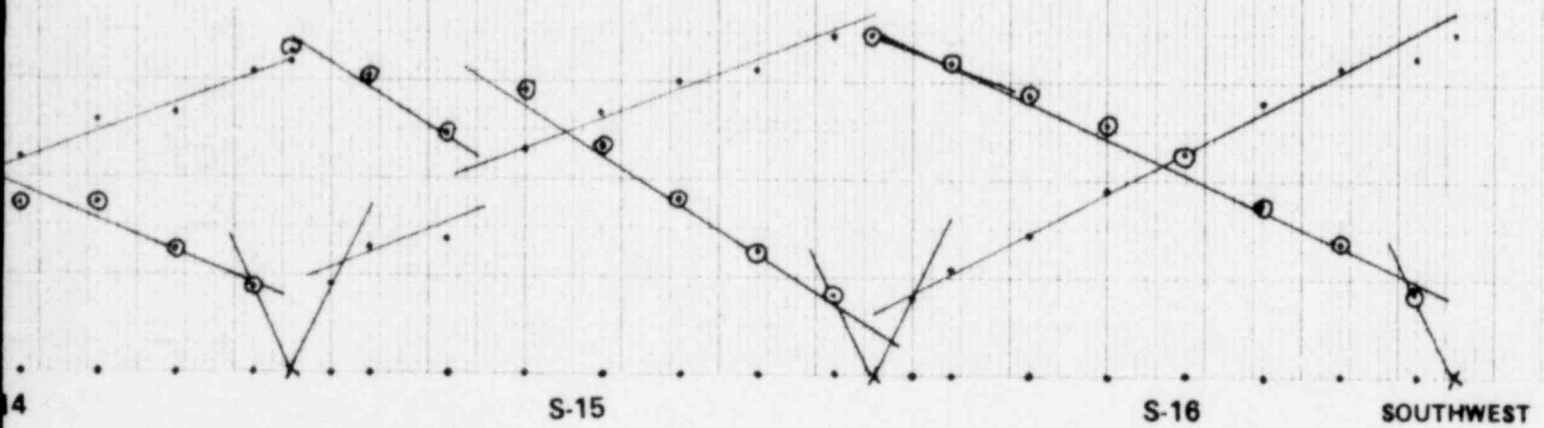
1. TIME-DISTANCE GRAPHS AT TOP OF FIGURE REPRESENT SEISMIC REFRACTION SURVEY DATA; DOTS ON BOTTOM LINE OF GRAPHS REPRESENT GEOPHONE LOCATIONS, X'S REPRESENT SHOT POINT LOCATIONS.  
HORIZONTAL SCALE: 1" = 50 FEET  
VERTICAL SCALE: 1" = 40 MILLISECONDS
2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.  
VERTICAL AND HORIZONTAL SCALE: 1" = 50 FEET

<b>Earth Sciences Associates</b> Palo Alto, California			
<b>LA POLVADERA CANYON SEISMIC REFRACTION SURVEY DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE LINES S-8, S-17, S-18, AND S-19</b>			
Checked by <u>POS</u>	Date <u>12/31/77</u>	Project No. <u>2143</u>	Figure No. <u>4</u>
Approved by <u>WRW</u>	Date <u>1/3/80</u>		





LINES S-10 THROUGH S-16 LOCATED ON FIGURE 1



**NOTES**

1. TIME-DISTANCE GRAPHS AT TOP OF FIGURE REPRESENT SEISMIC REFRACTION SURVEY DATA; DOTS ON BOTTOM LINE OF GRAPHS REPRESENT GEOPHONE LOCATIONS, X'S REPRESENT SHOT POINT LOCATIONS.

HORIZONTAL SCALE: 1" = 50 FEET  
 VERTICAL SCALE: 1" = 20 MILLISECONDS

2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.

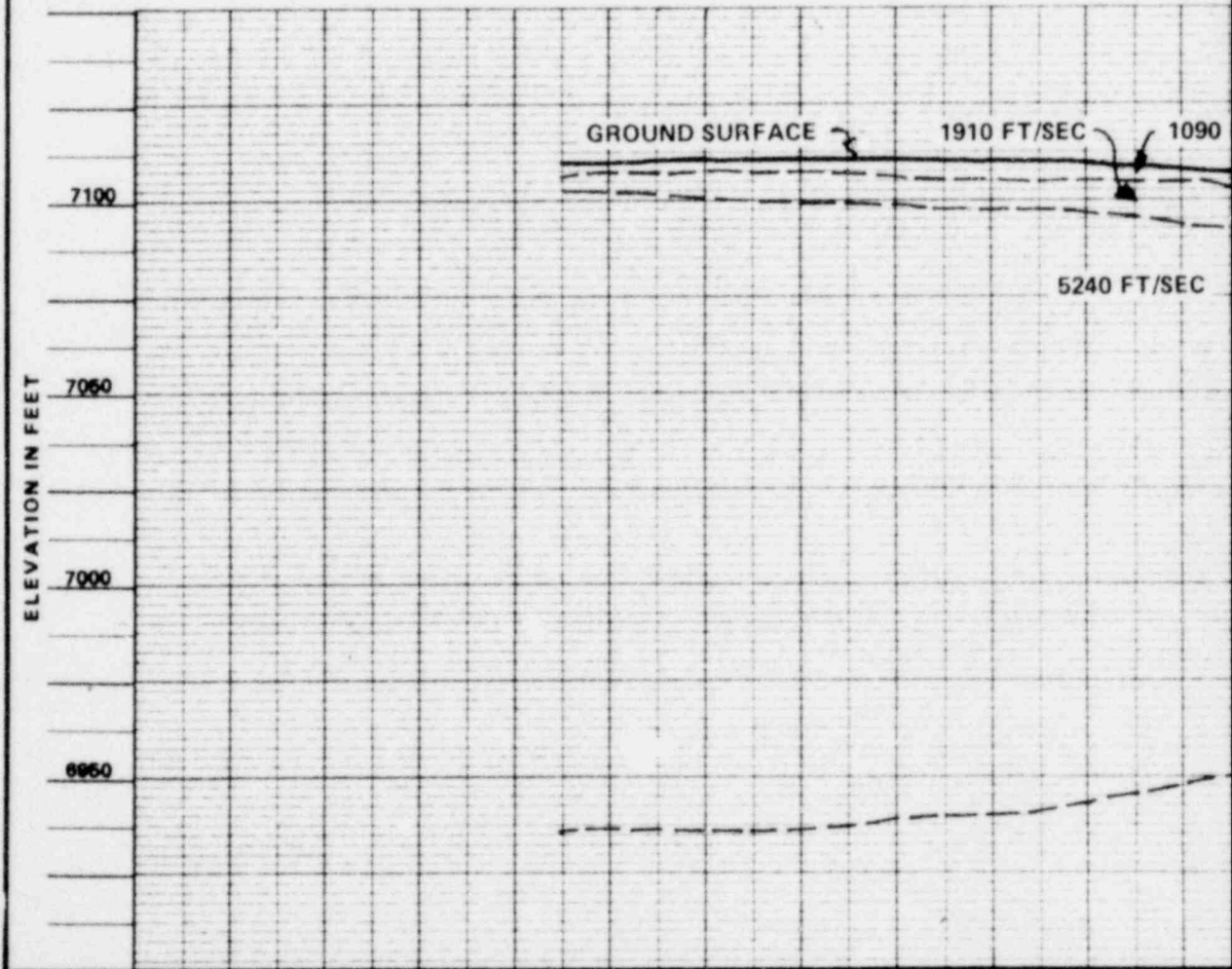
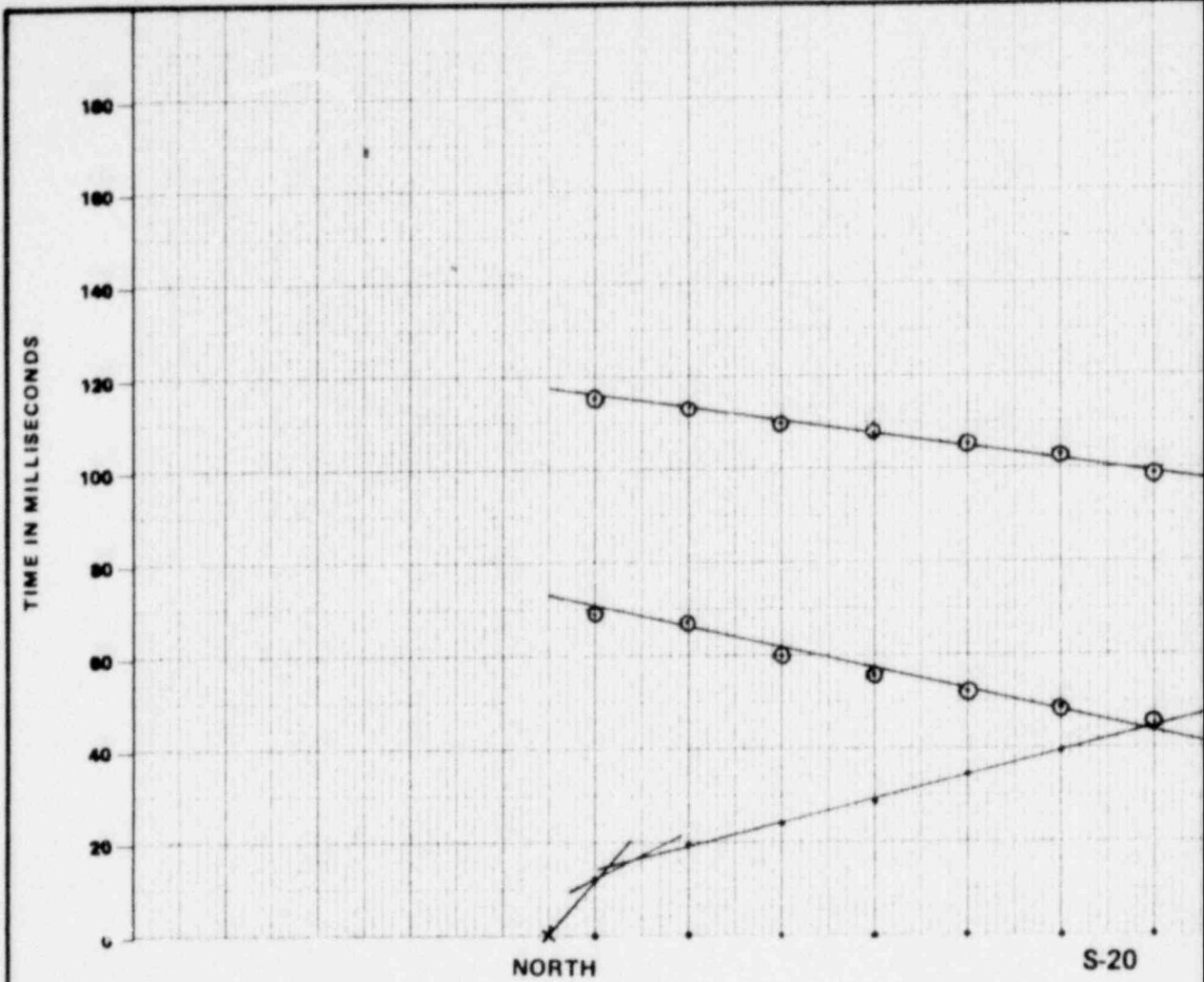
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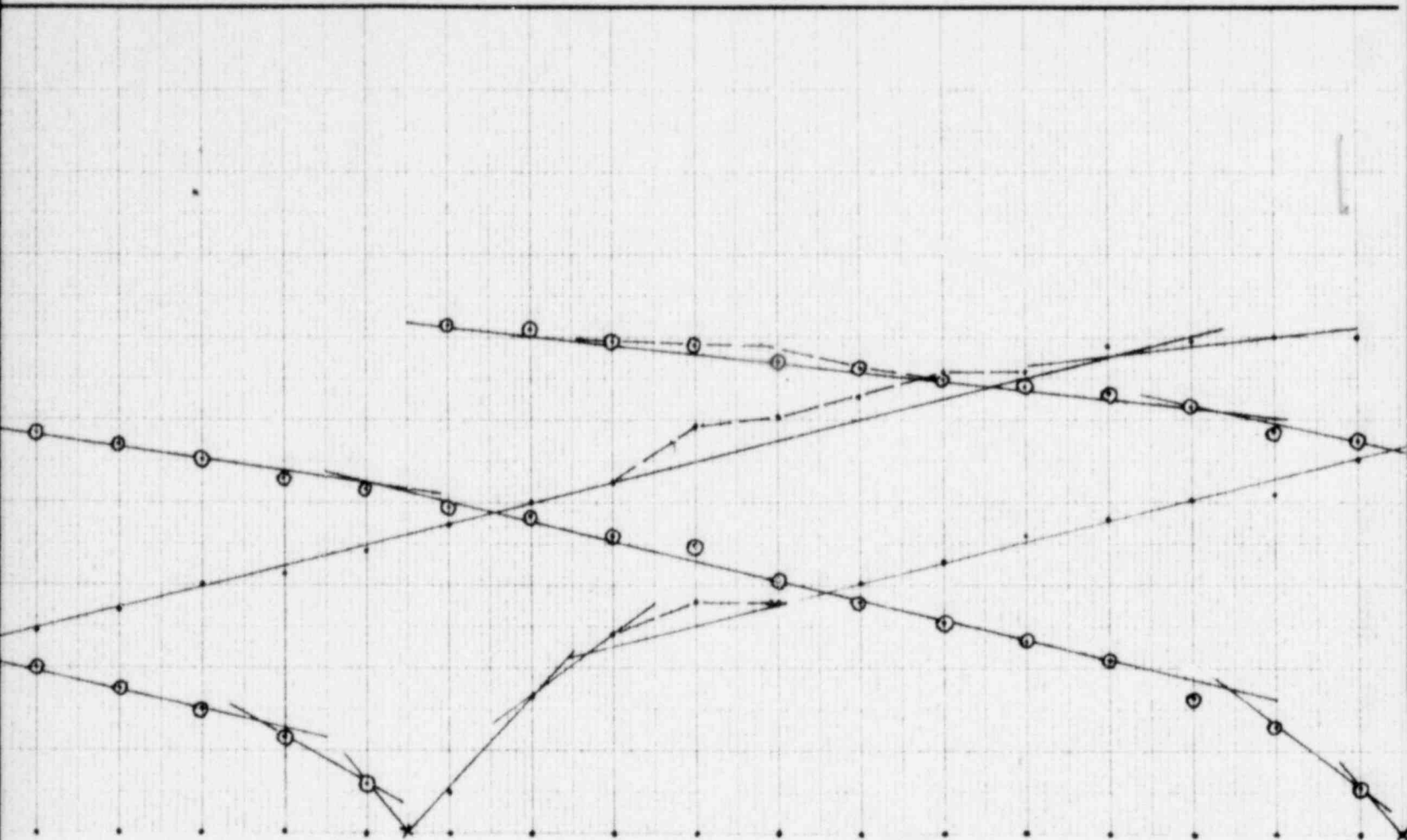
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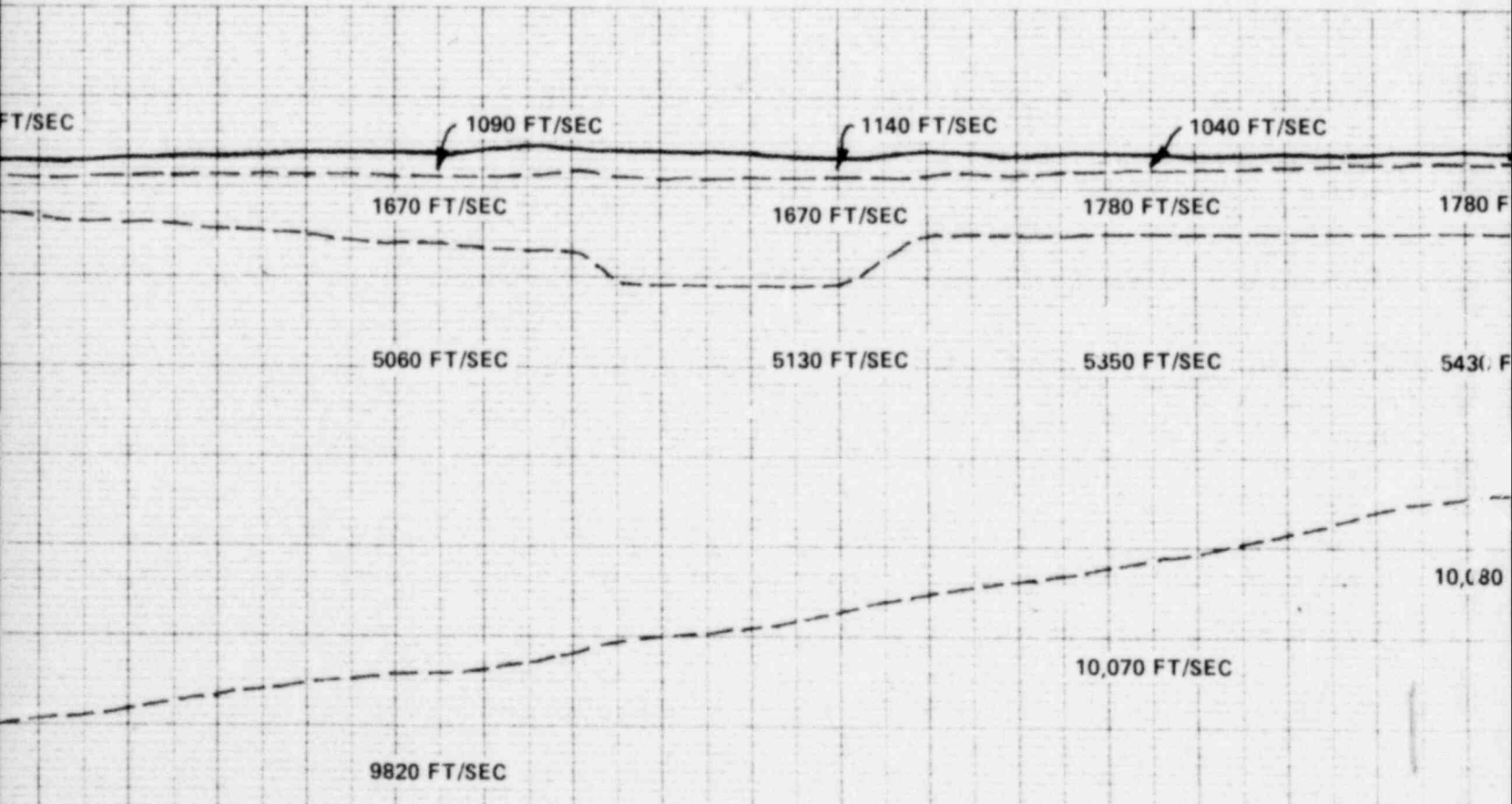
**LA POLVADERA CANYON SEISMIC REFRACTION SURVEY  
 DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE  
 LINES S-10, S-11, S-12, S-13, S-14, S-15, AND S-16**

Checked by <u>POS</u>	Date <u>12/31/79</u>	Project No. <u>2143</u>	Figure No. <u>5</u>
Approved by <u>WRH</u>	Date <u>1/2/80</u>		

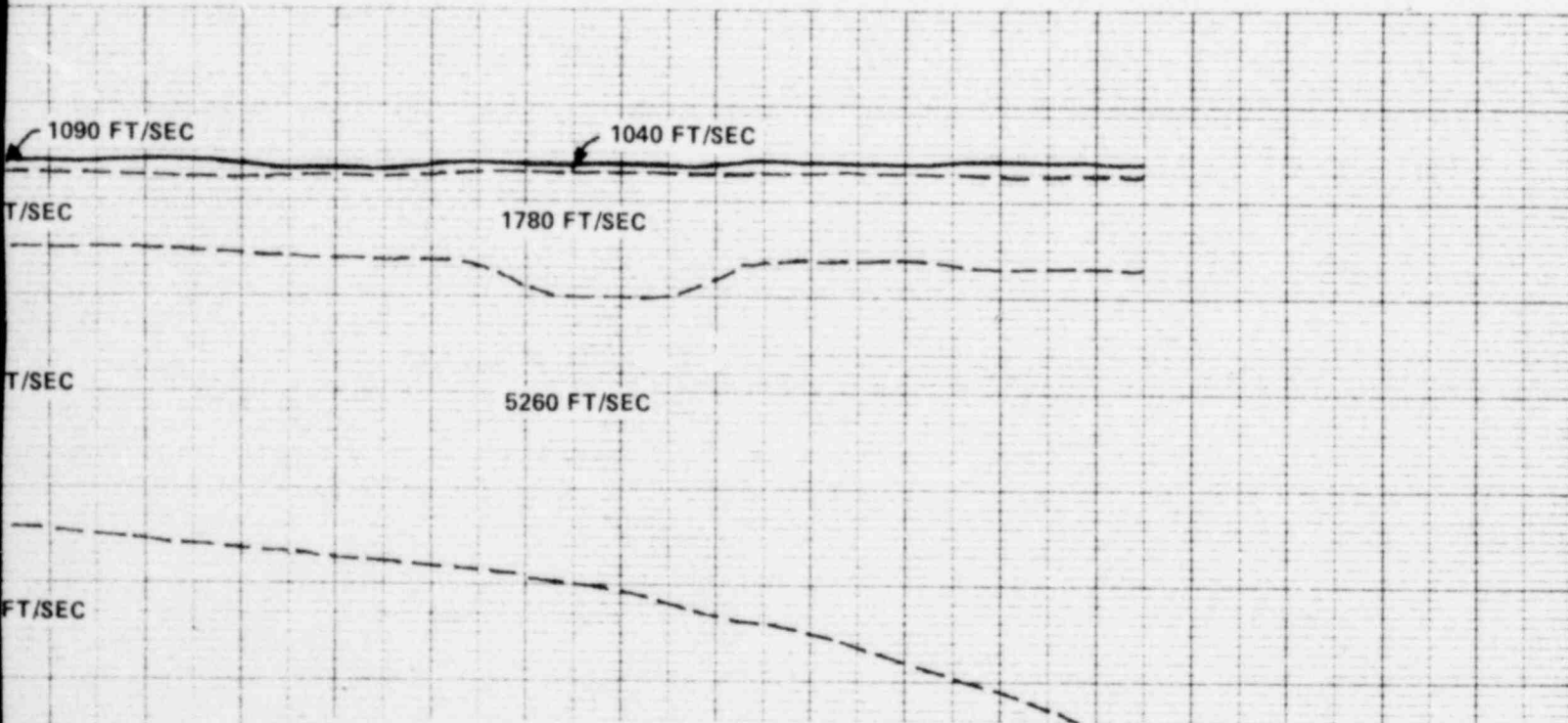
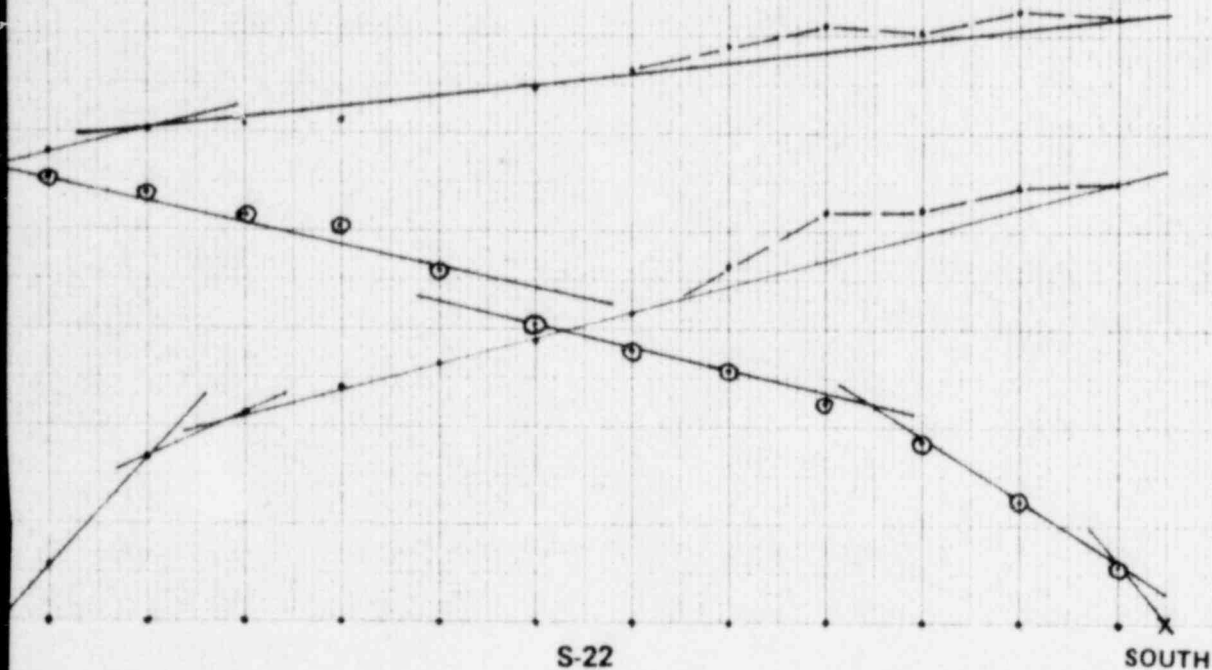




S-21  
DISTANCE IN FEET



LINES S-20, S-21 & S-22 LOCATED ON FIGURE 1



**NOTES**

1. TIME-DISTANCE GRAPHS AT TOP OF FIGURE REPRESENT SEISMIC REFRACTION SURVEY DATA; DOTS ON BOTTOM LINE OF GRAPHS REPRESENT GEOPHONE LOCATIONS, X'S REPRESENT SHOT POINT LOCATIONS.

HORIZONTAL SCALE: 1" = 50 FEET  
 VERTICAL SCALE: 1" = 40 MILLISECONDS

2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.

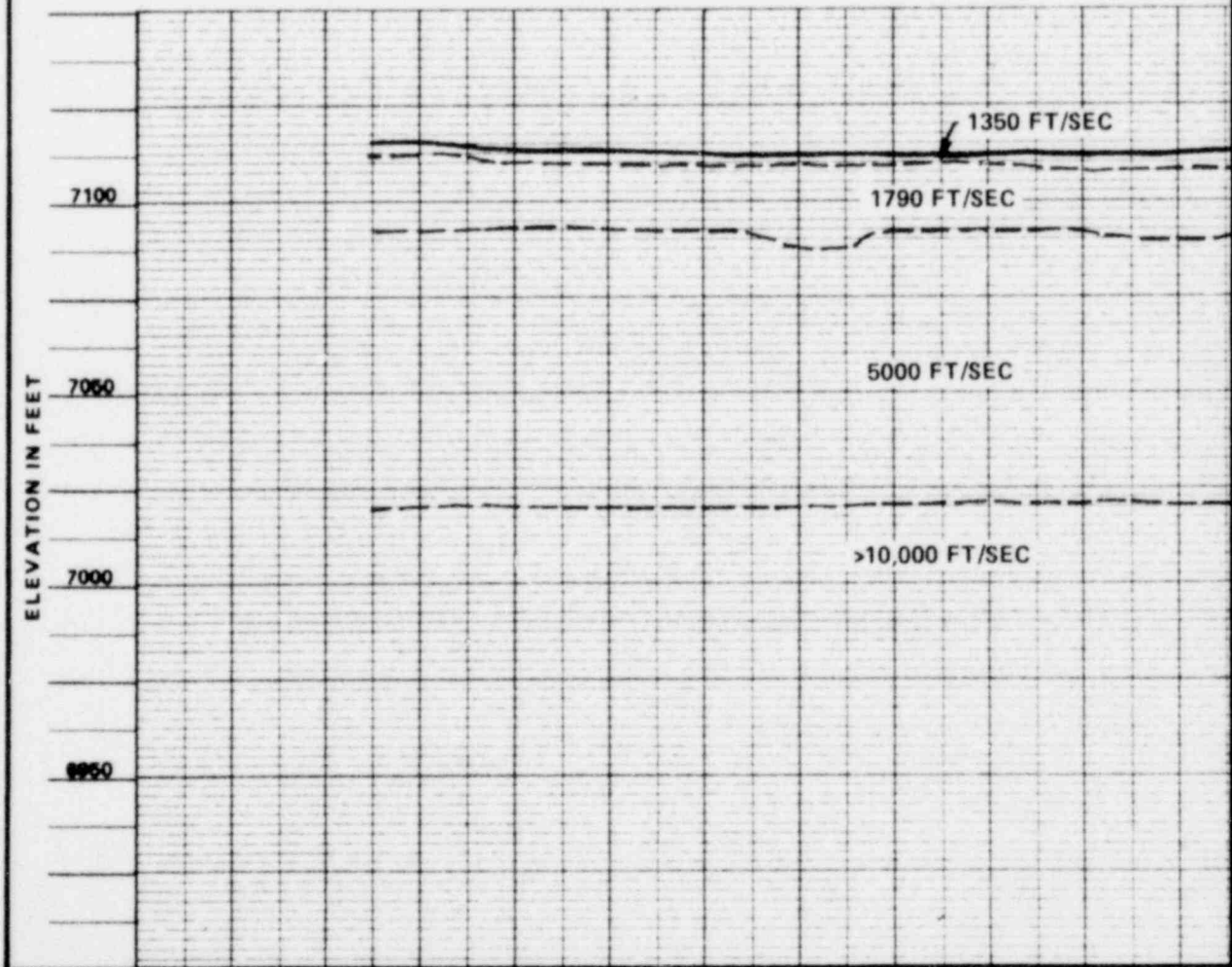
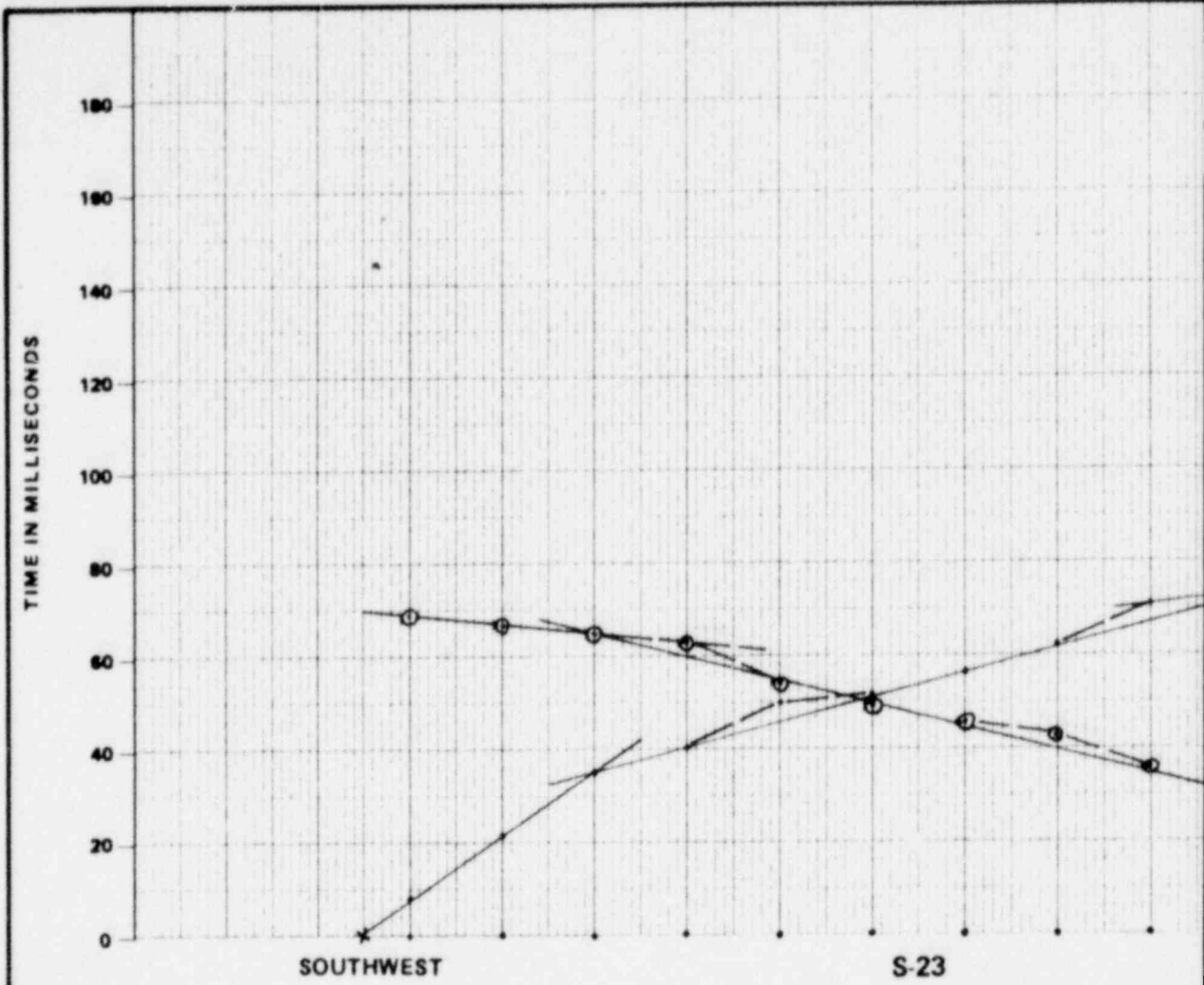
VERTICAL AND HORIZONTAL SCALE: 1" = 50 FEET

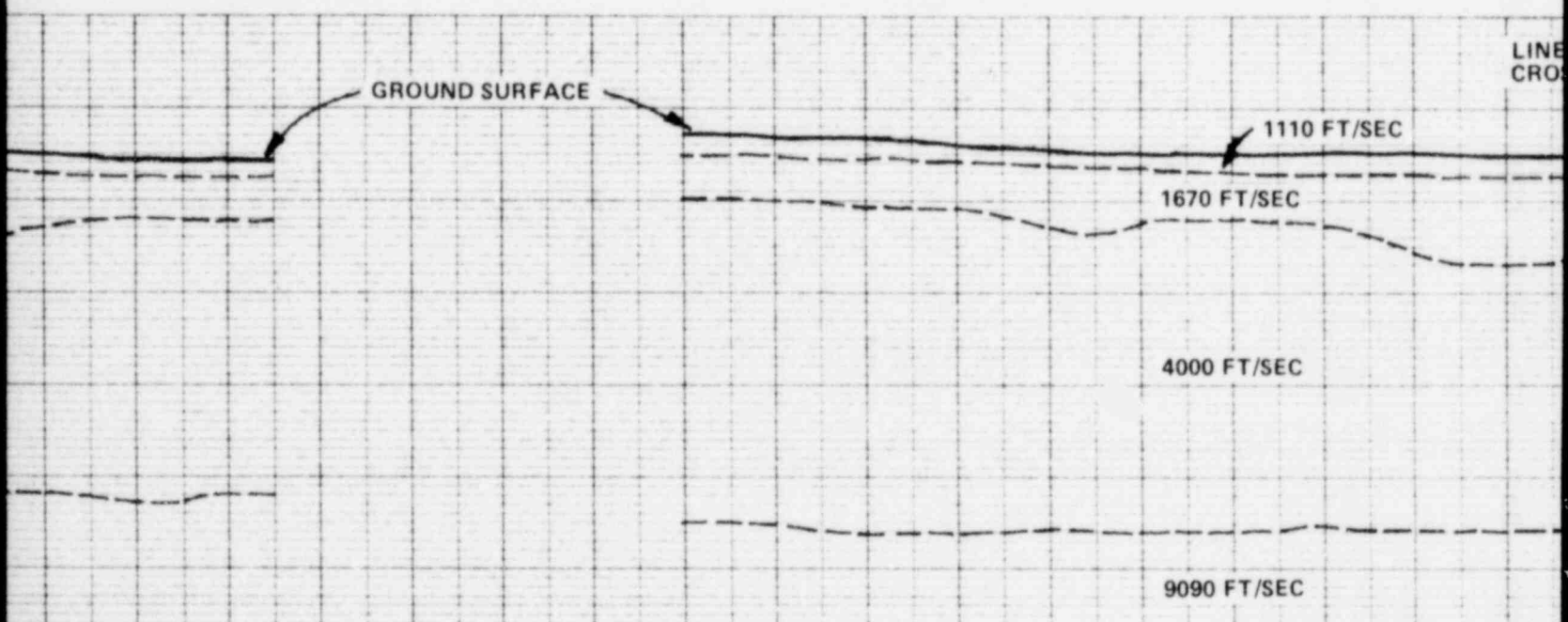
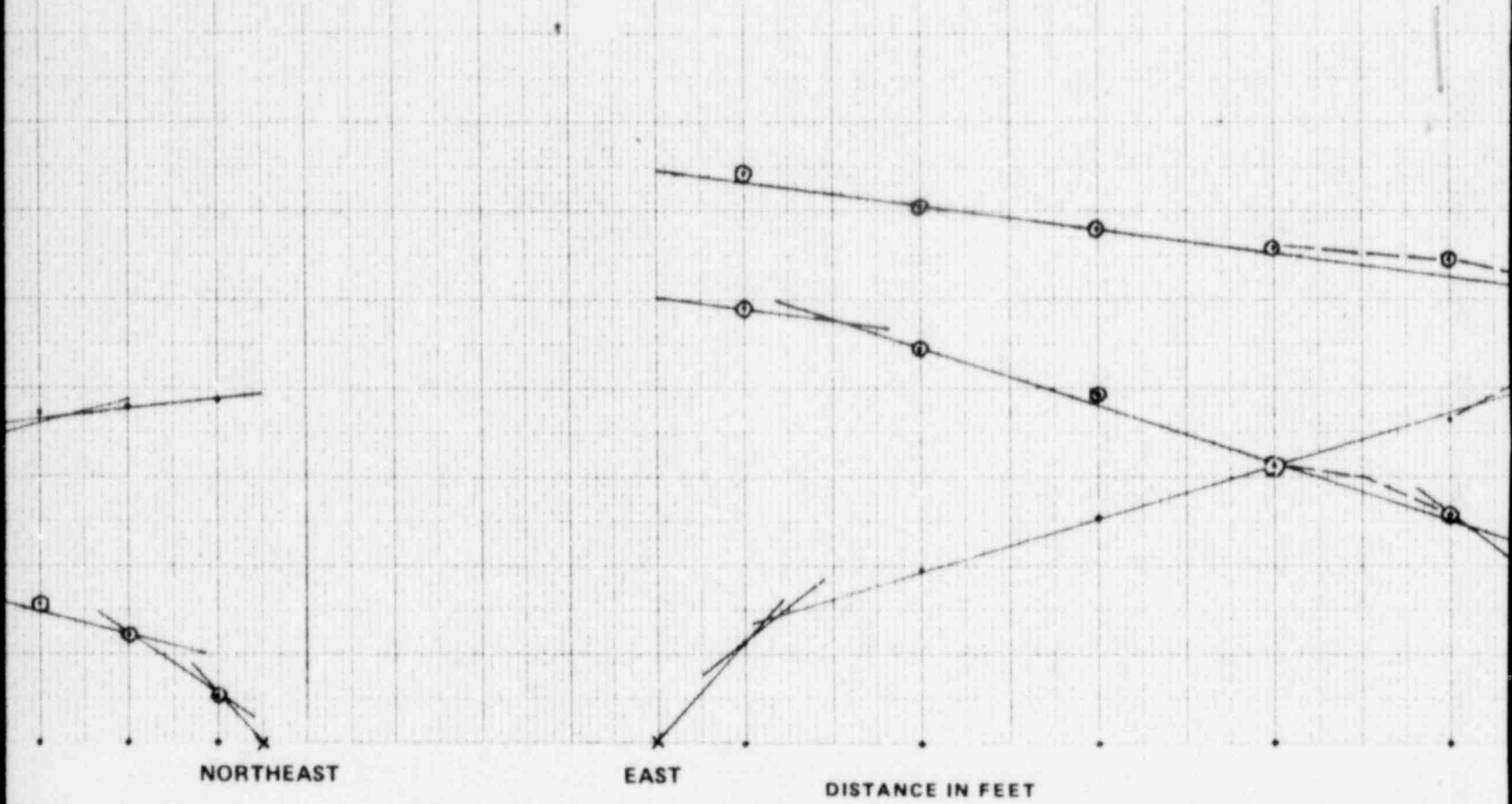
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**LA POLVADERA CANYON SEISMIC REFRACTION SURVEY  
 DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE  
 LINES S-20, S-21, AND S-22**

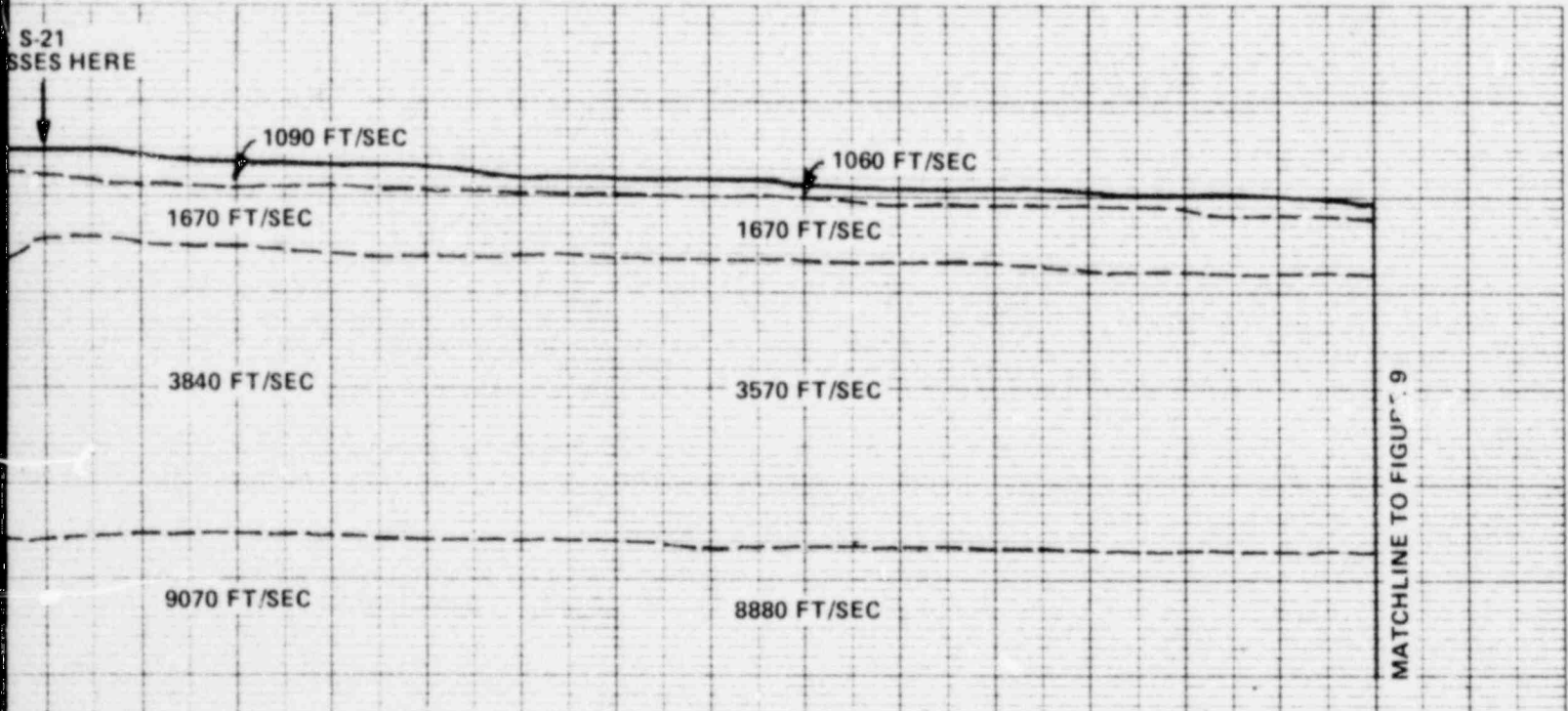
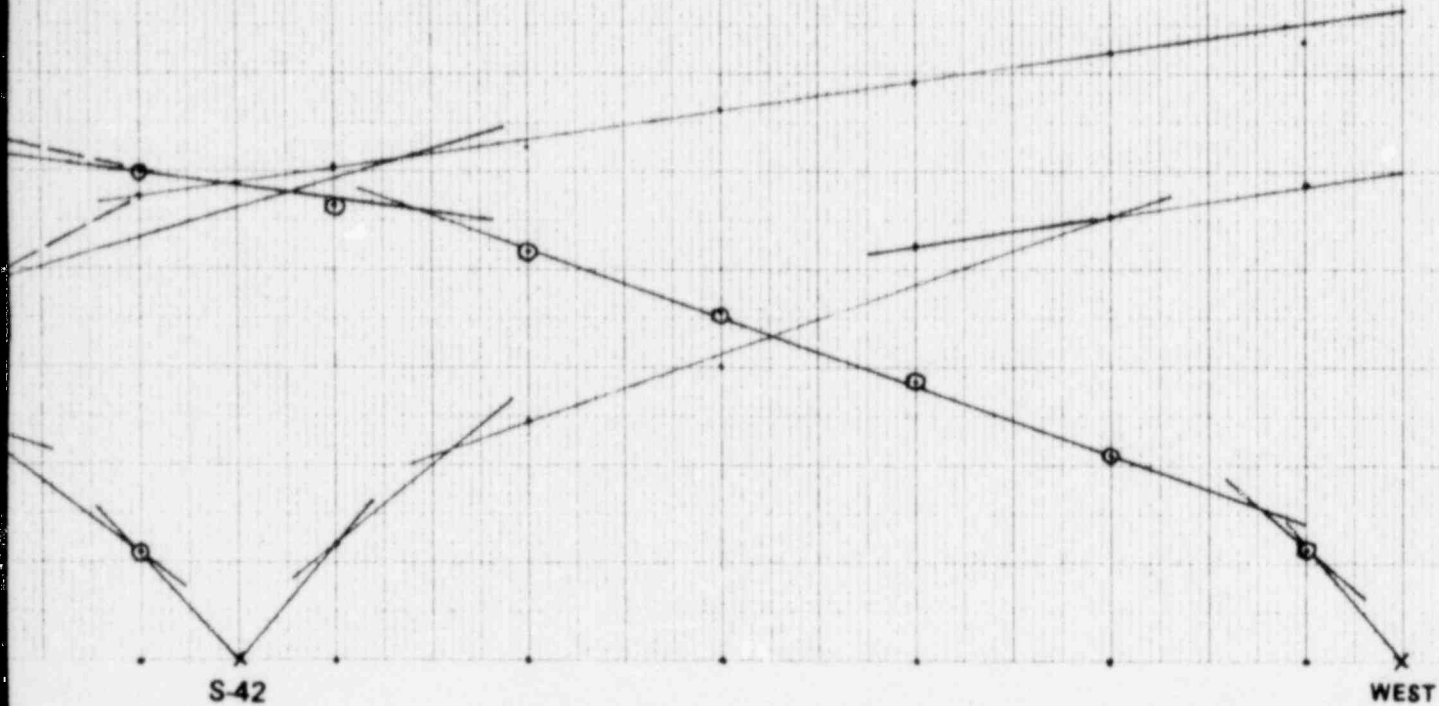
Checked by <u>POS</u>	Date <u>12/31/77</u>	Project No. <u>2143</u>	Figure No. <u>6</u>
Approved by <u>WRH</u>	Date <u>1/2/80</u>		







LINES S-23 & S-42 LOCATED ON FIGURE 1



**NOTES**

1. TIME-DISTANCE GRAPHS AT TOP OF FIGURE REPRESENT SEISMIC REFRACTION SURVEY DATA; DOTS ON BOTTOM LINE OF GRAPHS REPRESENT GEOPHONE LOCATIONS, X'S REPRESENT SHOT POINT LOCATIONS.  
 HORIZONTAL SCALE: 1" = 50 FEET  
 VERTICAL SCALE: 1" = 40 MILLISECONDS
2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.  
 VERTICAL AND HORIZONTAL SCALE: 1" = 50 FEET

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Palo Alto, California			
<b>LA POLVADERA CANYON SEISMIC REFRACTION SURVEY DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE LINES S-23 AND S-42</b>			
Checked by	<i>POS</i>	Date	<i>11/1/79</i>
Approved by	<i>WRH</i>	Date	<i>1/2/80</i>
Project No.	<b>2143</b>	Figure No.	<b>7</b>

TIME IN MILLISECONDS

180  
160  
140  
120  
100  
80  
60  
40  
20  
0

WEST

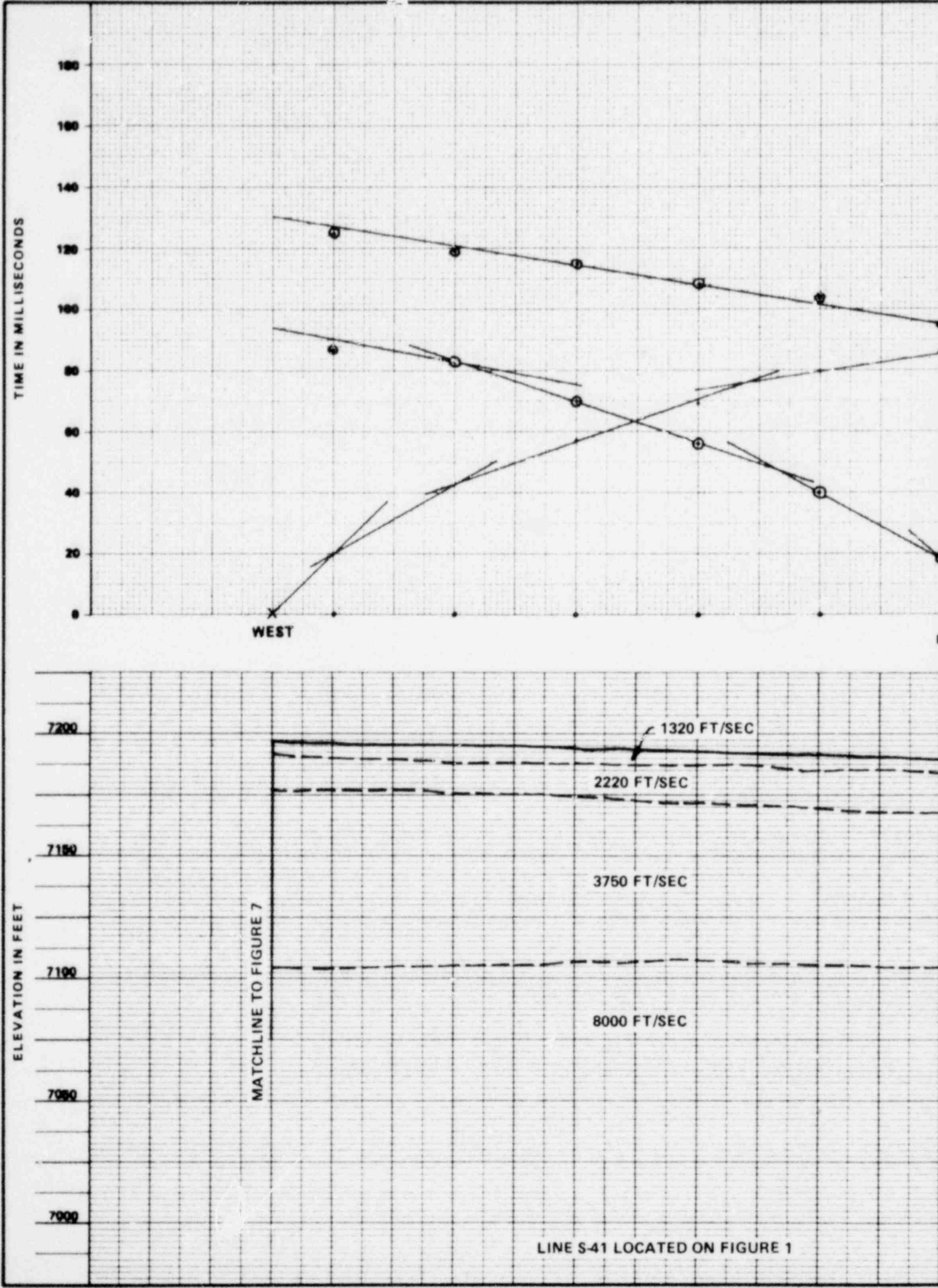
ELEVATION IN FEET

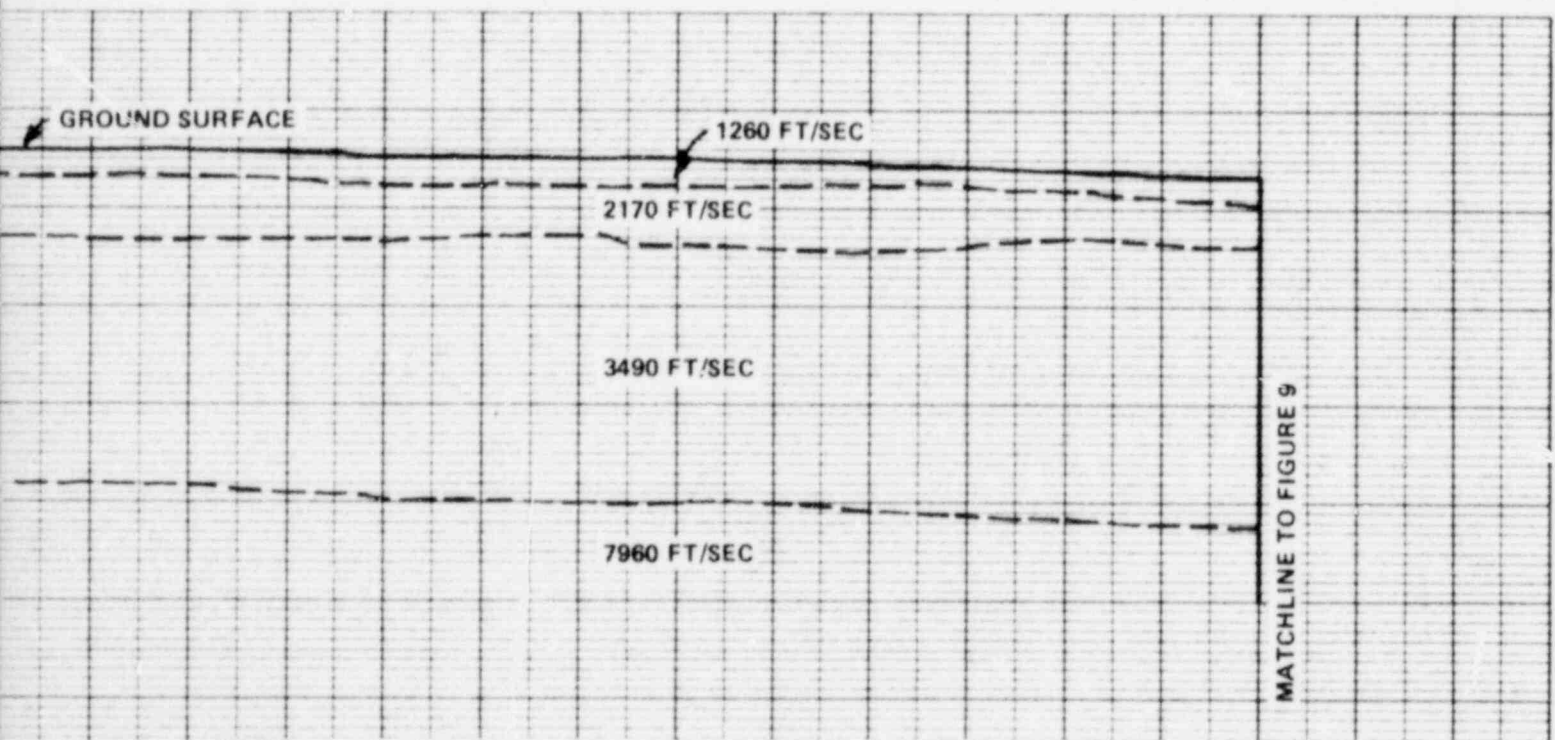
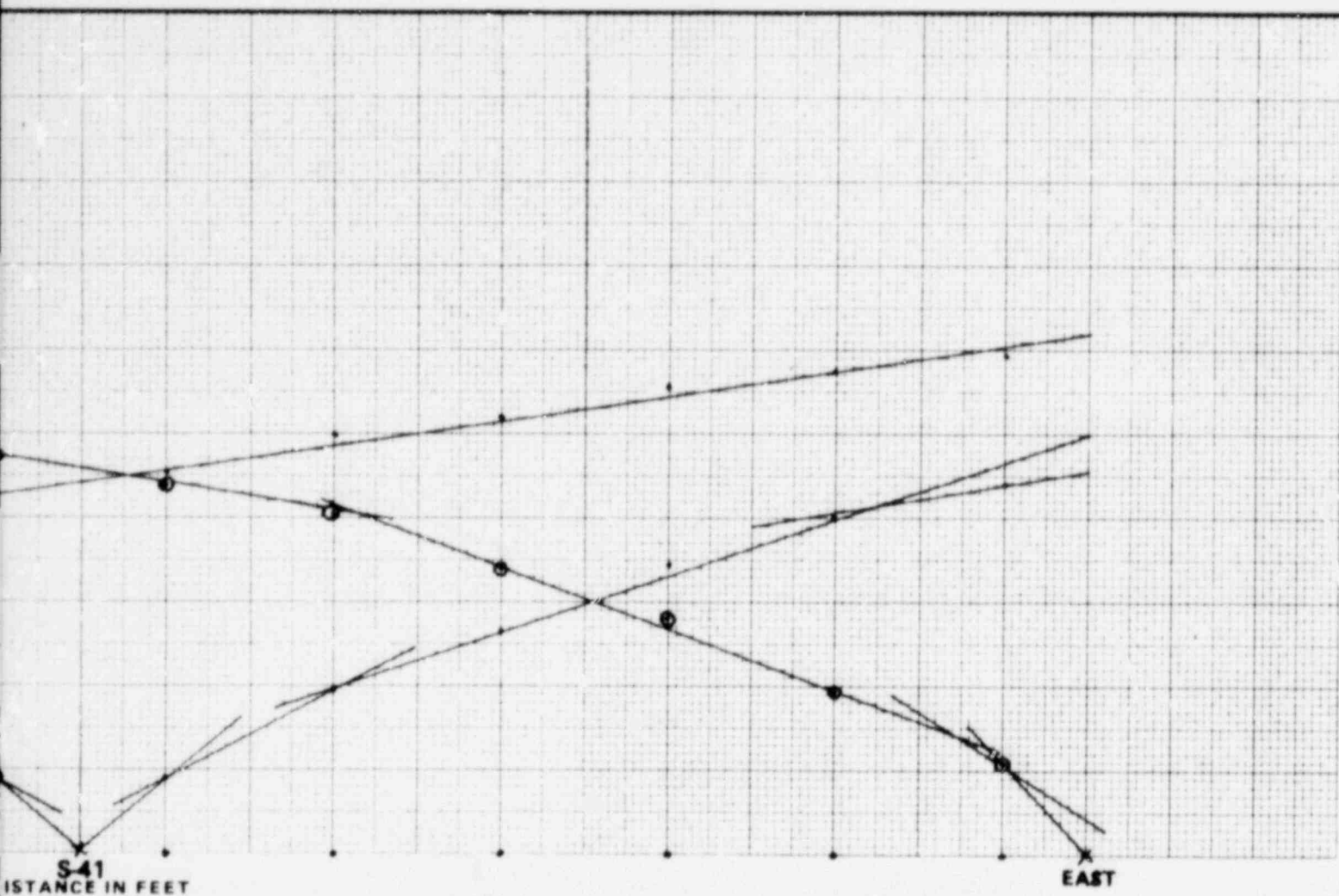
7200  
7180  
7160  
7140  
7120  
7100  
7080  
7060  
7040  
7020  
7000

MATCHLINE TO FIGURE 7

1320 FT/SEC  
2220 FT/SEC  
3750 FT/SEC  
8000 FT/SEC

LINE S-41 LOCATED ON FIGURE 1





**NOTES**

1. TIME-DISTANCE GRAPHS AT TOP OF FIGURE REPRESENT SEISMIC REFRACTION SURVEY DATA; DOTS ON BOTTOM LINE OF GRAPHS REPRESENT GEOPHONE LOCATIONS, X'S REPRESENT SHOT POINT LOCATIONS.  
 HORIZONTAL SCALE: 1" = 50 FEET  
 VERTICAL SCALE: 1" = 40 MILLISECONDS
2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.  
 VERTICAL AND HORIZONTAL SCALE: 1" = 50 FEET

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**LA POLVADERA CANYON SEISMIC REFRACTION SURVEY  
 DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE  
 LINE S-41**

Checked by <i>POJ</i>	Date <i>8/9/79</i>	Project No. <b>2143</b>
Approved by <i>W.R.H.</i>	Date <i>1/2/80</i>	Figure No. <b>8</b>

TIME IN MILLISECONDS

180  
160  
140  
120  
100  
80  
60  
40  
20  
0

WEST

ELEVATION IN FEET

7200  
7180  
7160  
7140  
7120  
7100  
7080  
7060  
7040  
7020  
7000

MATCHLINE TO FIGURE 8

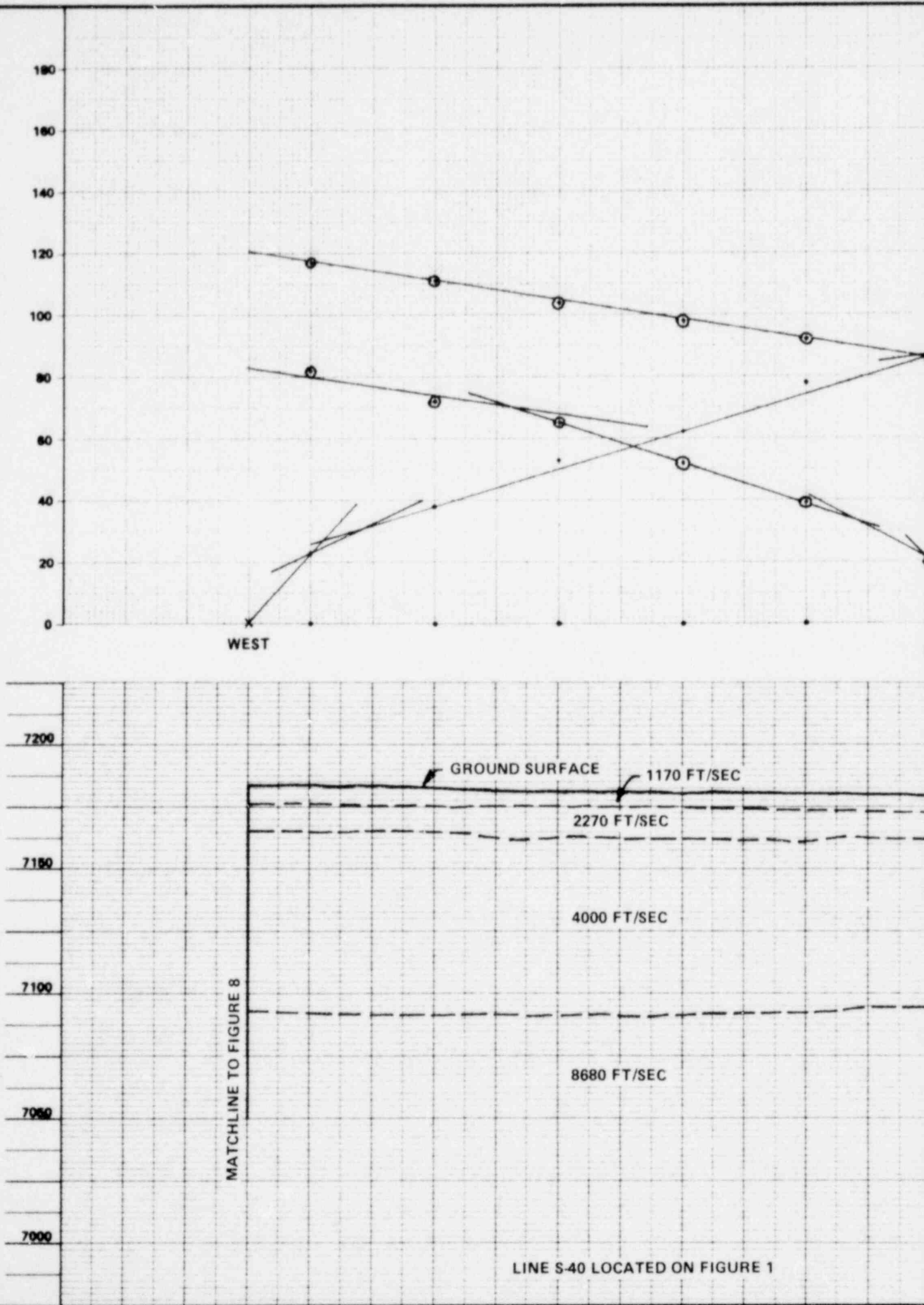
GROUND SURFACE 1170 FT/SEC

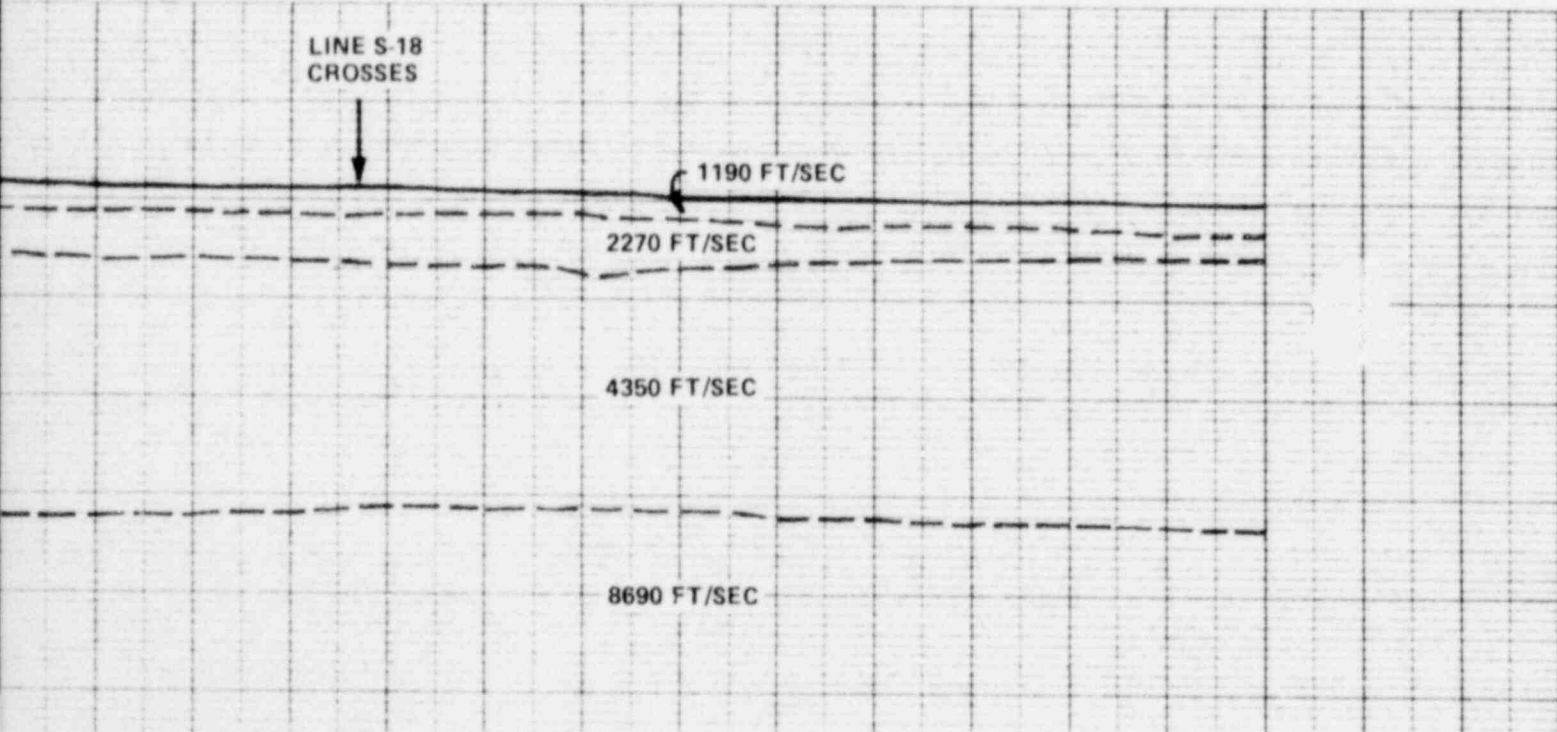
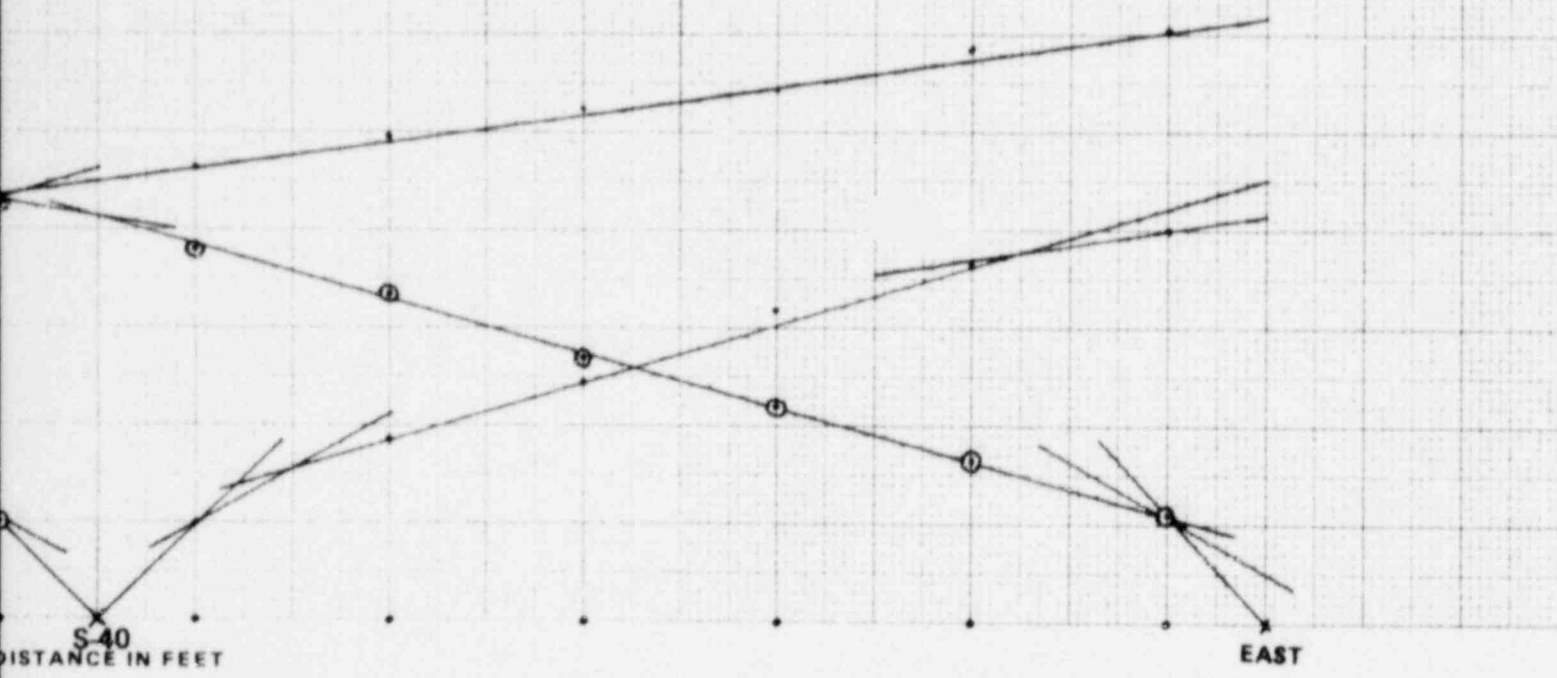
2270 FT/SEC

4000 FT/SEC

8680 FT/SEC

LINE S-40 LOCATED ON FIGURE 1





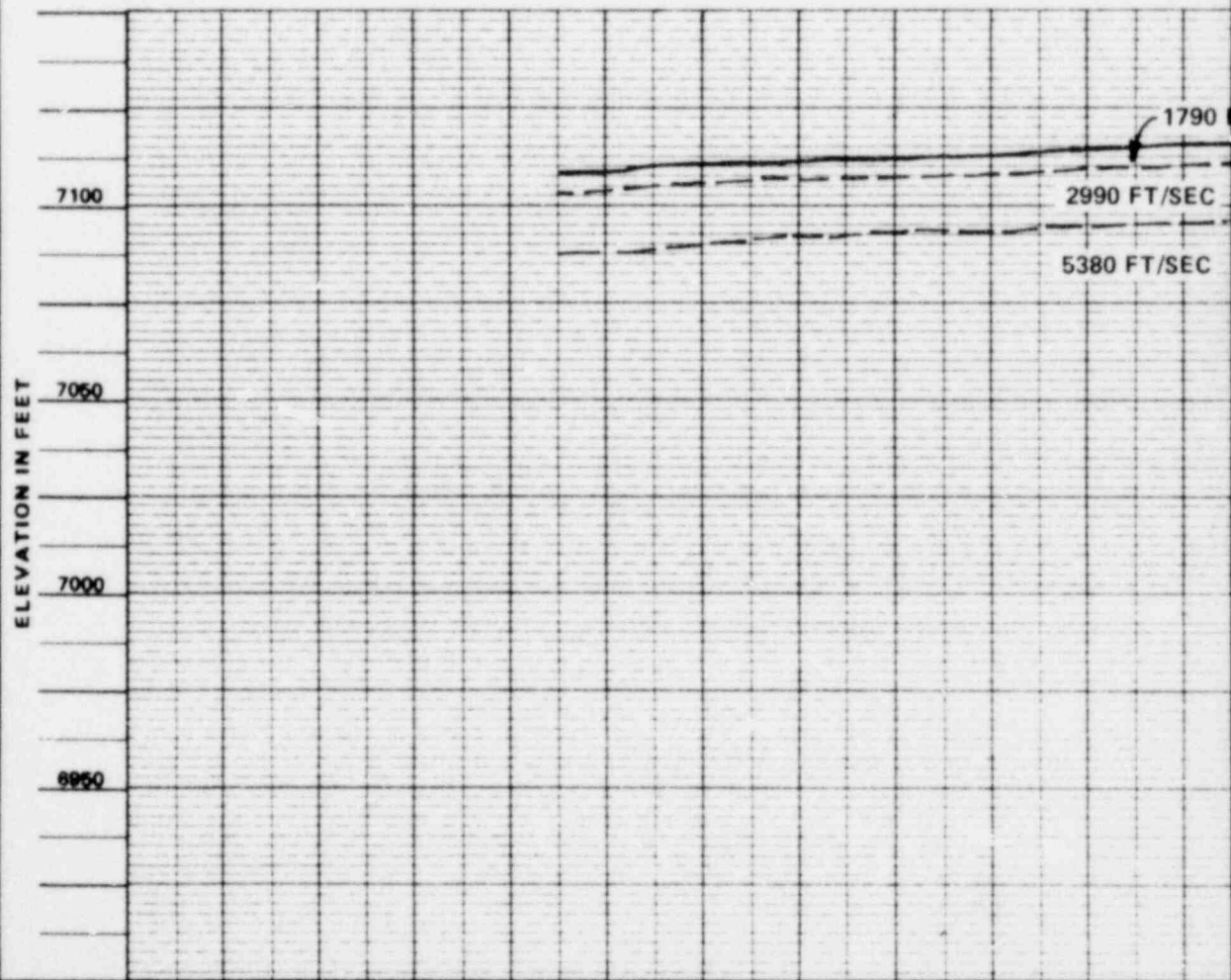
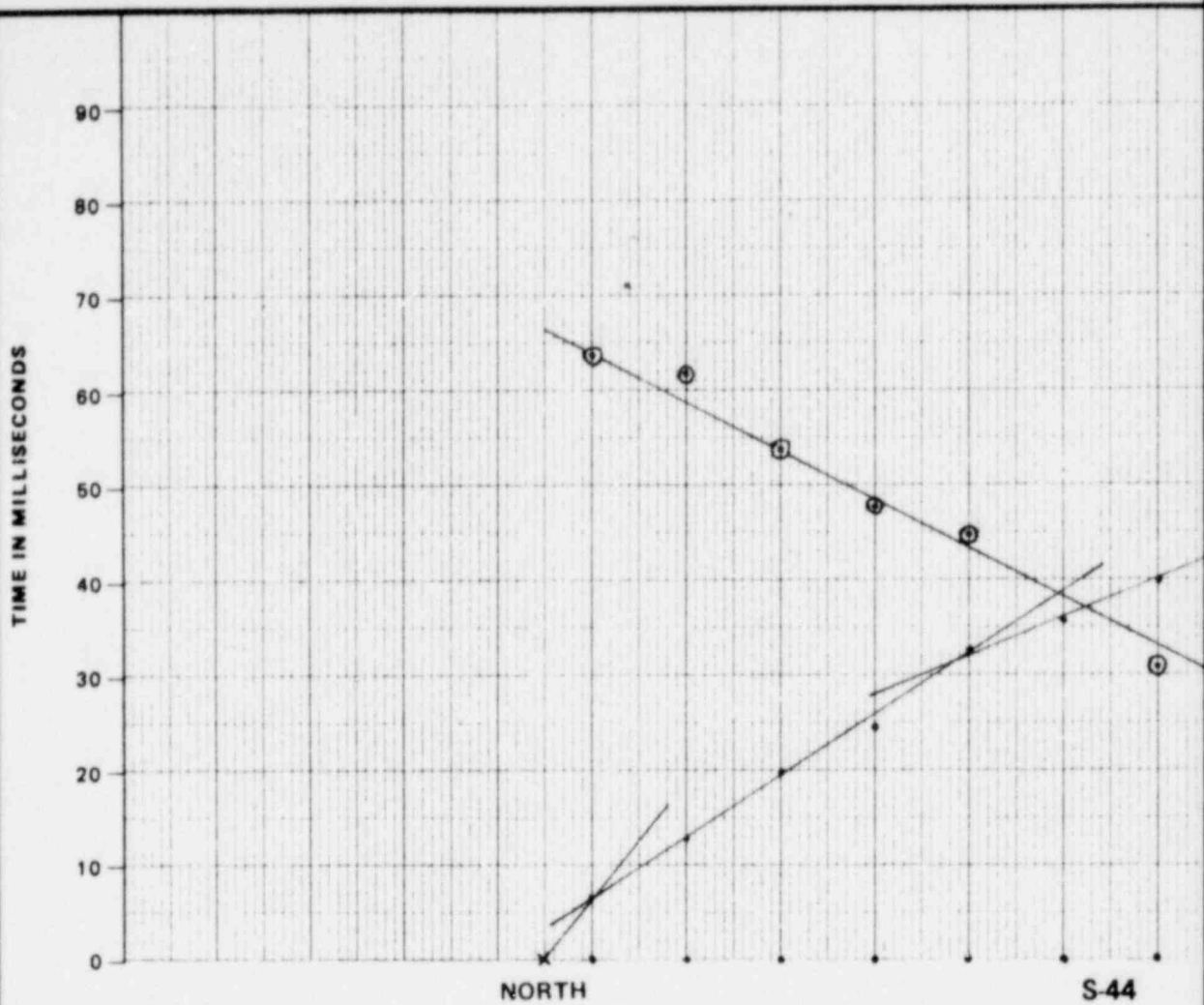
**NOTES**

1. TIME-DISTANCE GRAPHS AT TOP OF FIGURE REPRESENT SEISMIC REFRACTION SURVEY DATA, DOTS ON BOTTOM LINE OF GRAPHS REPRESENT GEOPHONE LOCATIONS, X'S REPRESENT SHOT POINT LOCATIONS.  
 HORIZONTAL SCALE: 1" = 50 FEET  
 VERTICAL SCALE: 1" = 40 MILLISECONDS
2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.  
 VERTICAL AND HORIZONTAL SCALE: 1" = 50 FEET

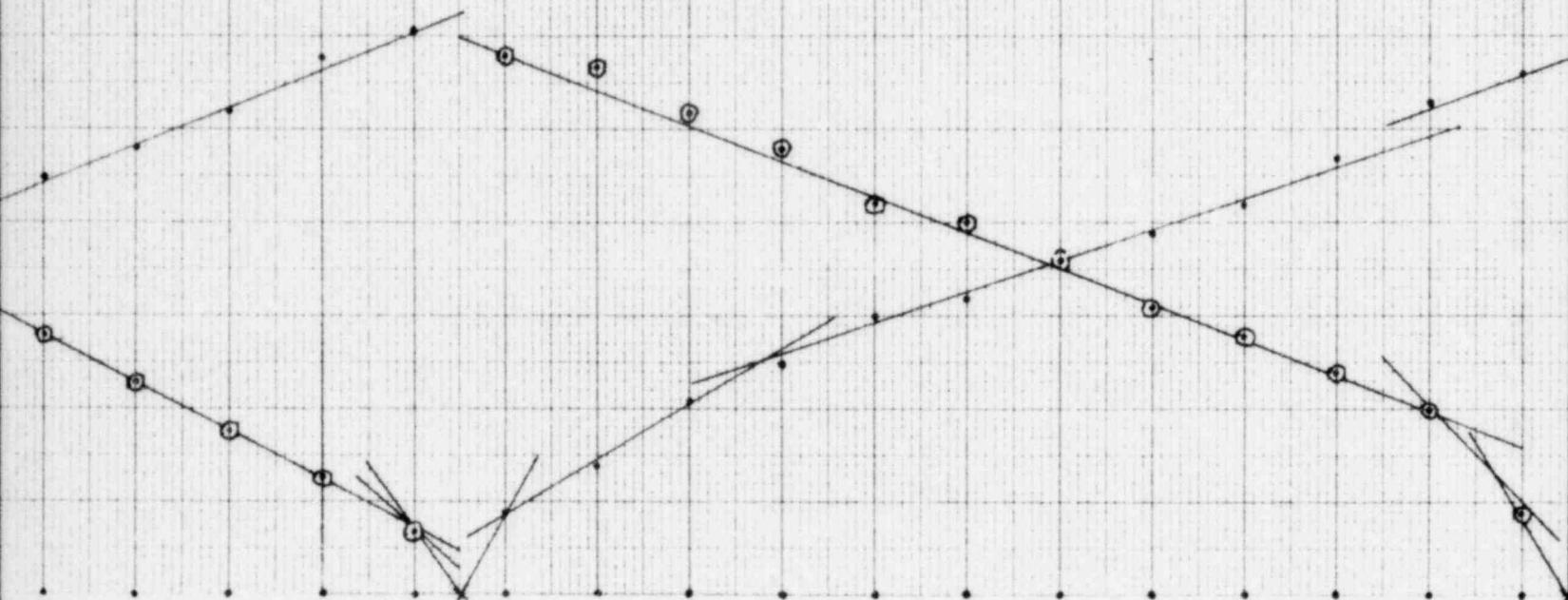
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**LA POLVADERA CANYON SEISMIC REFRACTION SURVEY  
 DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE  
 LINE S-40**

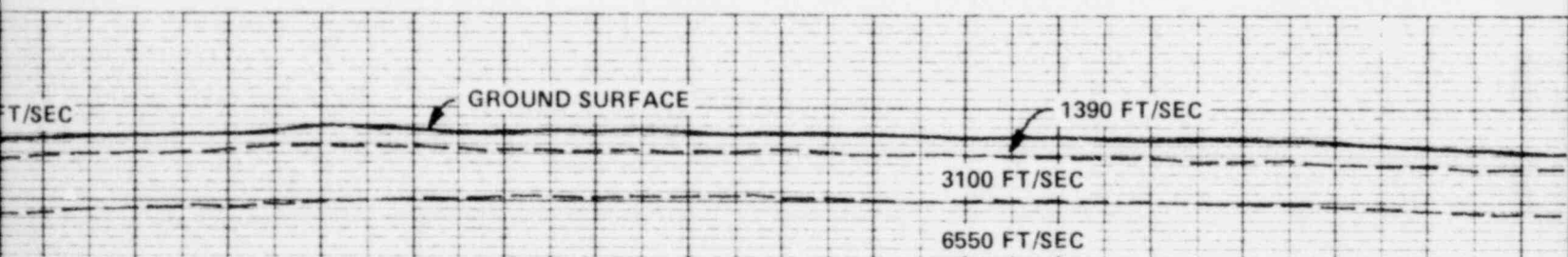
Checked by <i>POS</i>	Date <i>11/11/77</i>	Project No.	Figure No.
Approved by <i>WRH</i>	Date <i>1/2/80</i>	<b>2143</b>	<b>9</b>



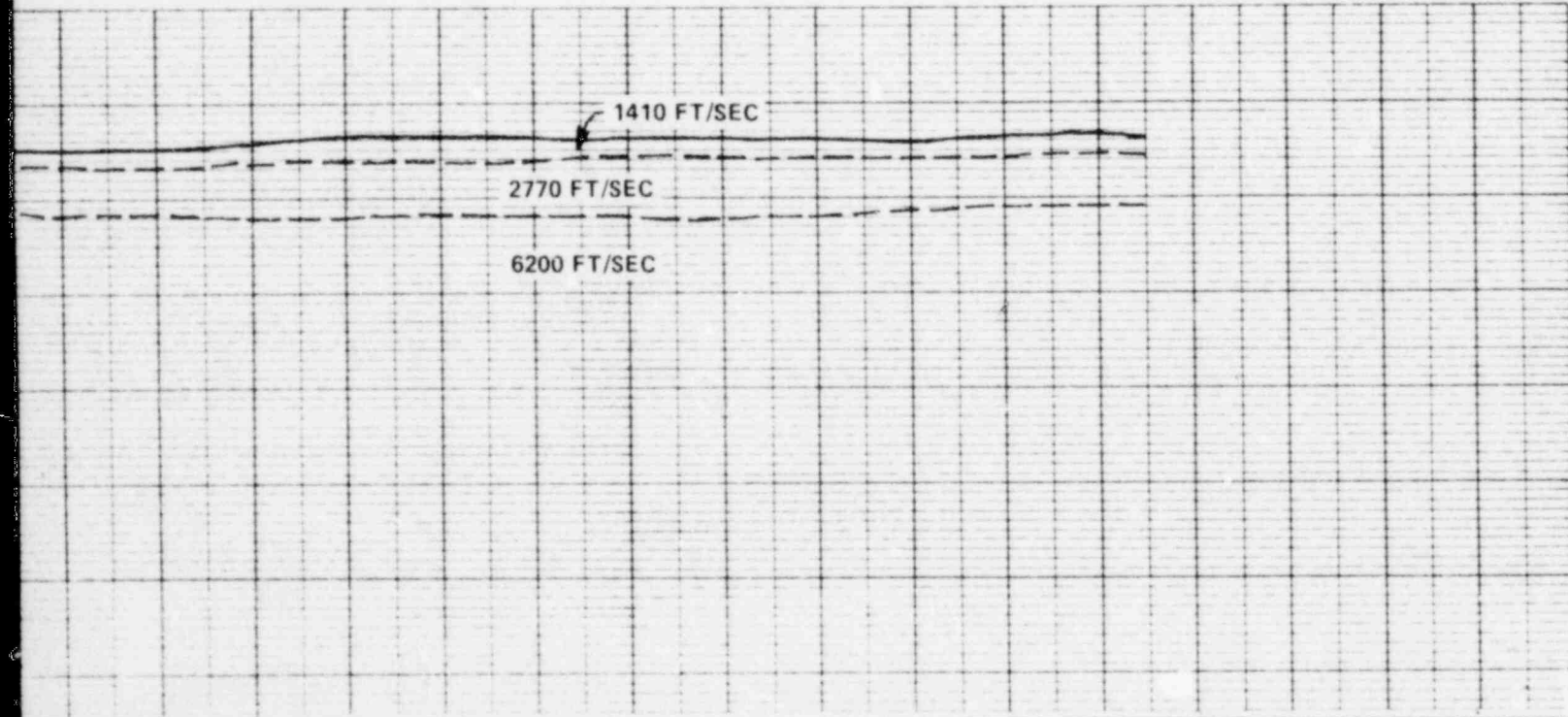
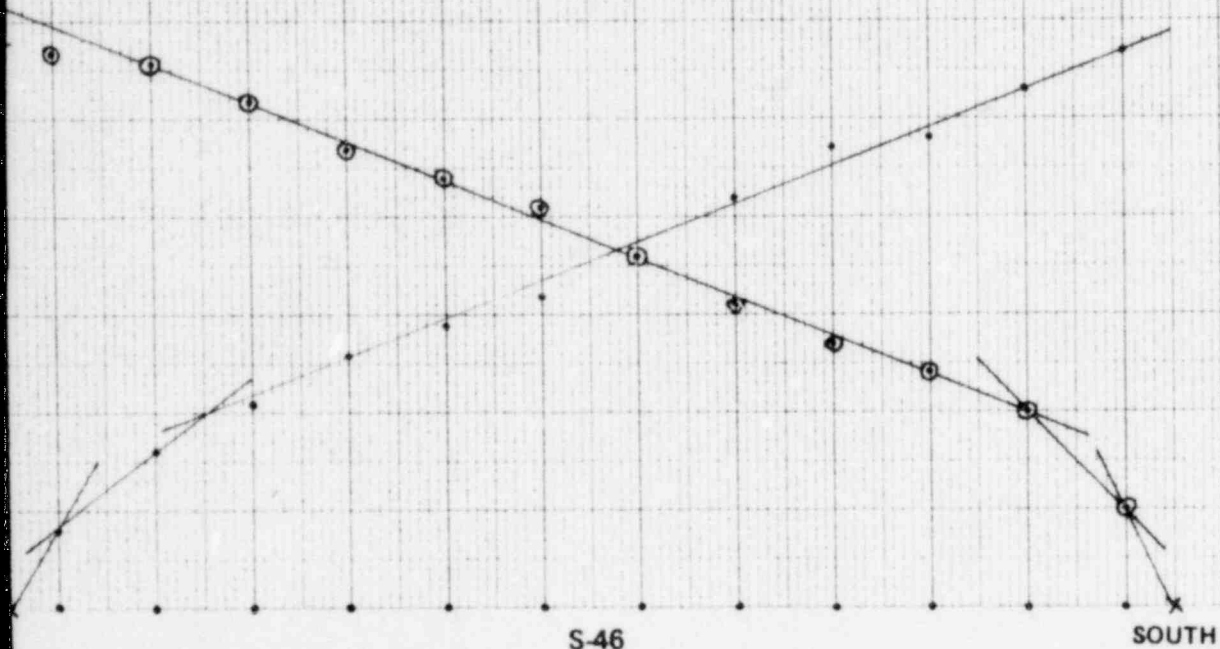




S-45  
DISTANCE IN FEET



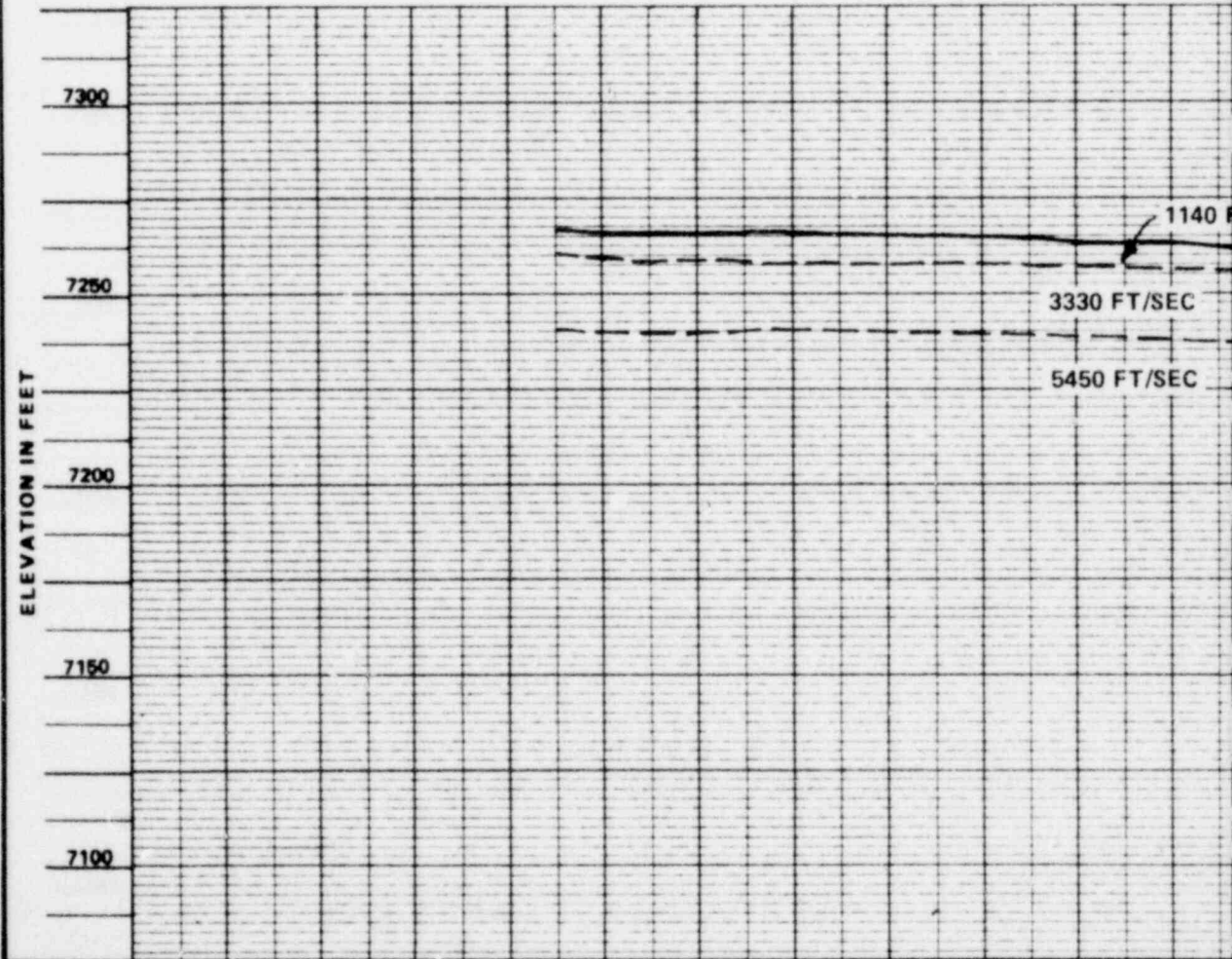
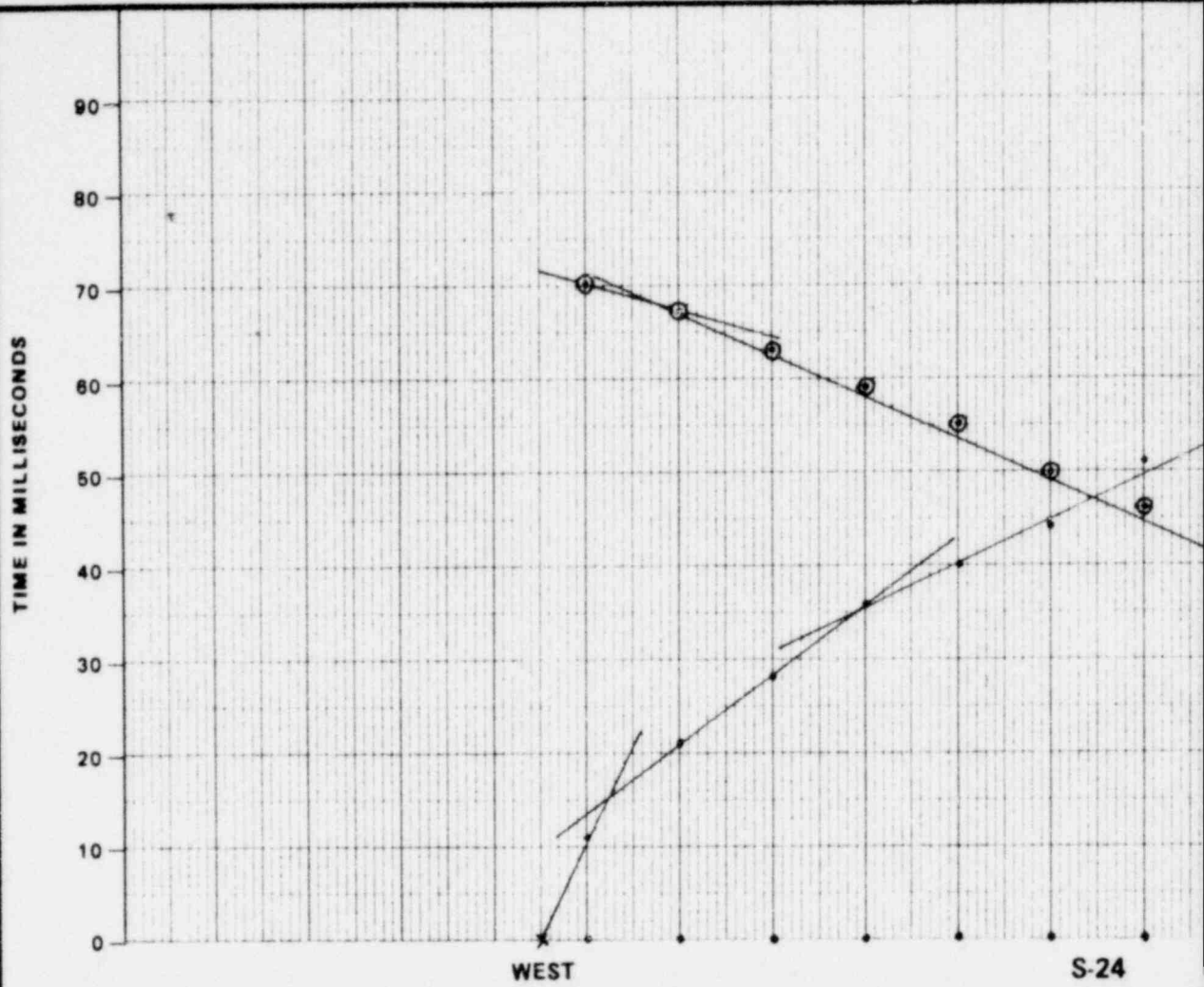
LINES S-44, S-45 & S-46 LOCATED ON FIGURE 1

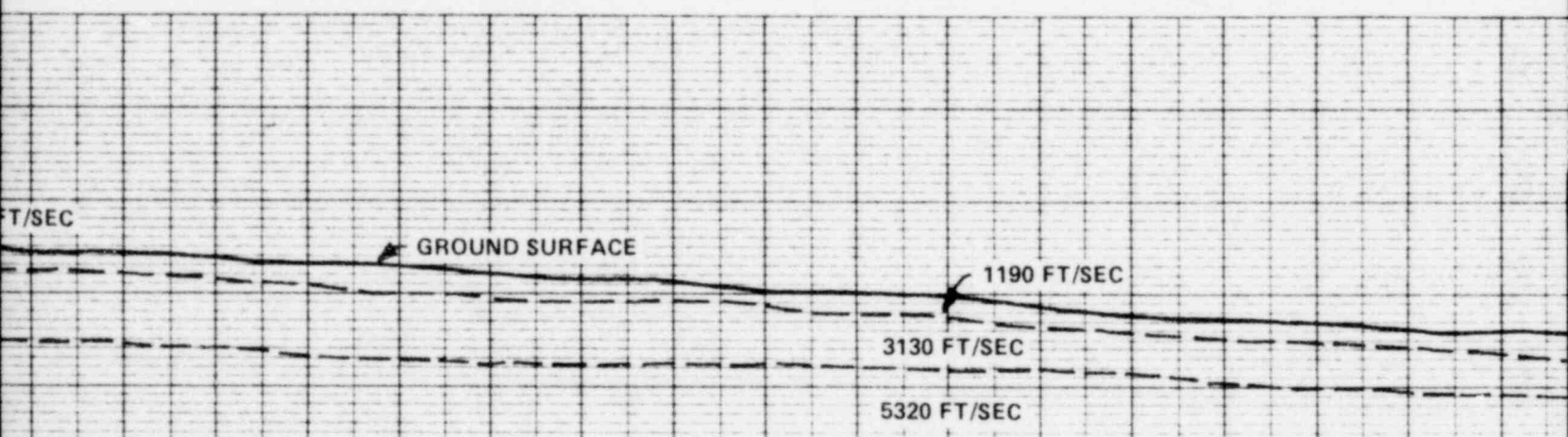
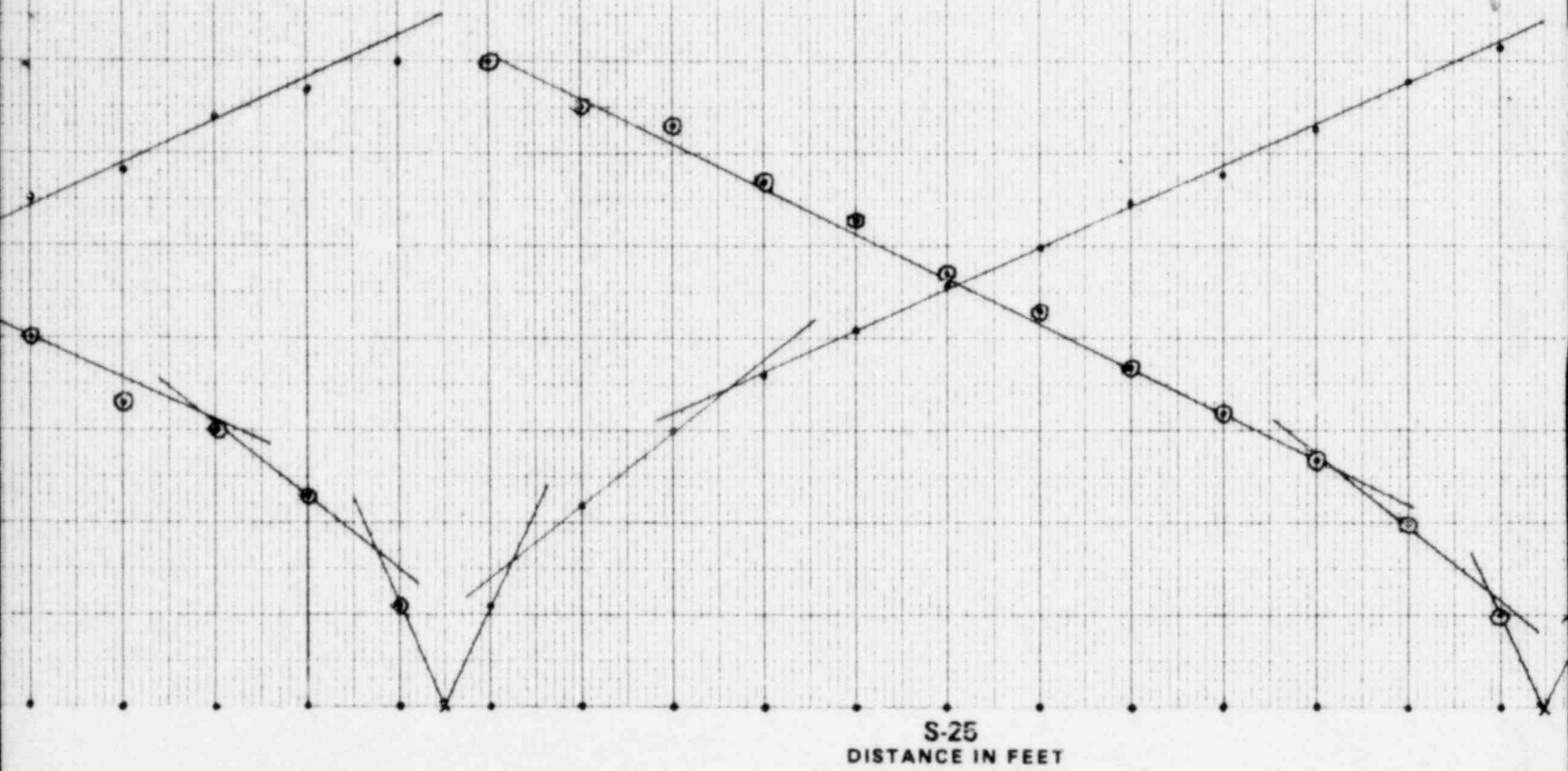


**NOTES**

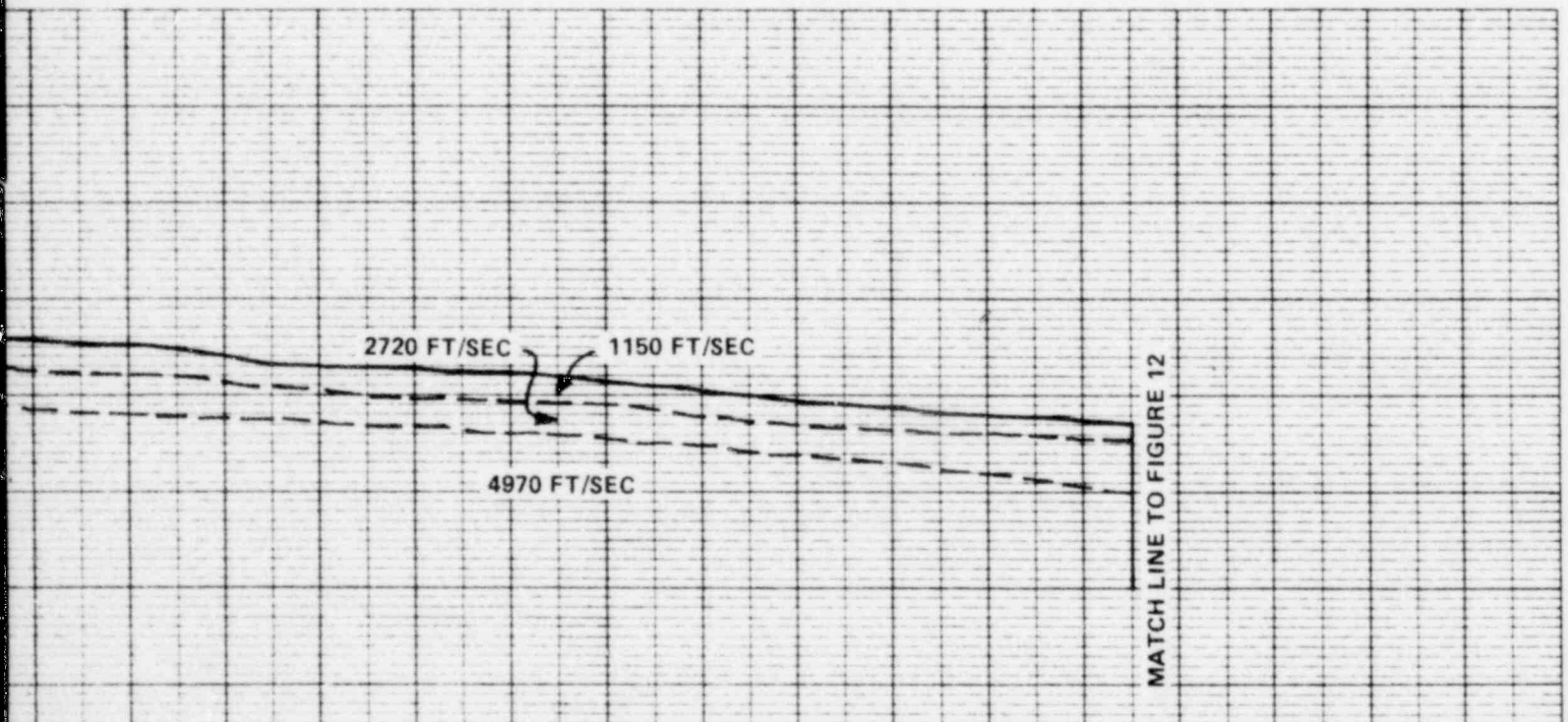
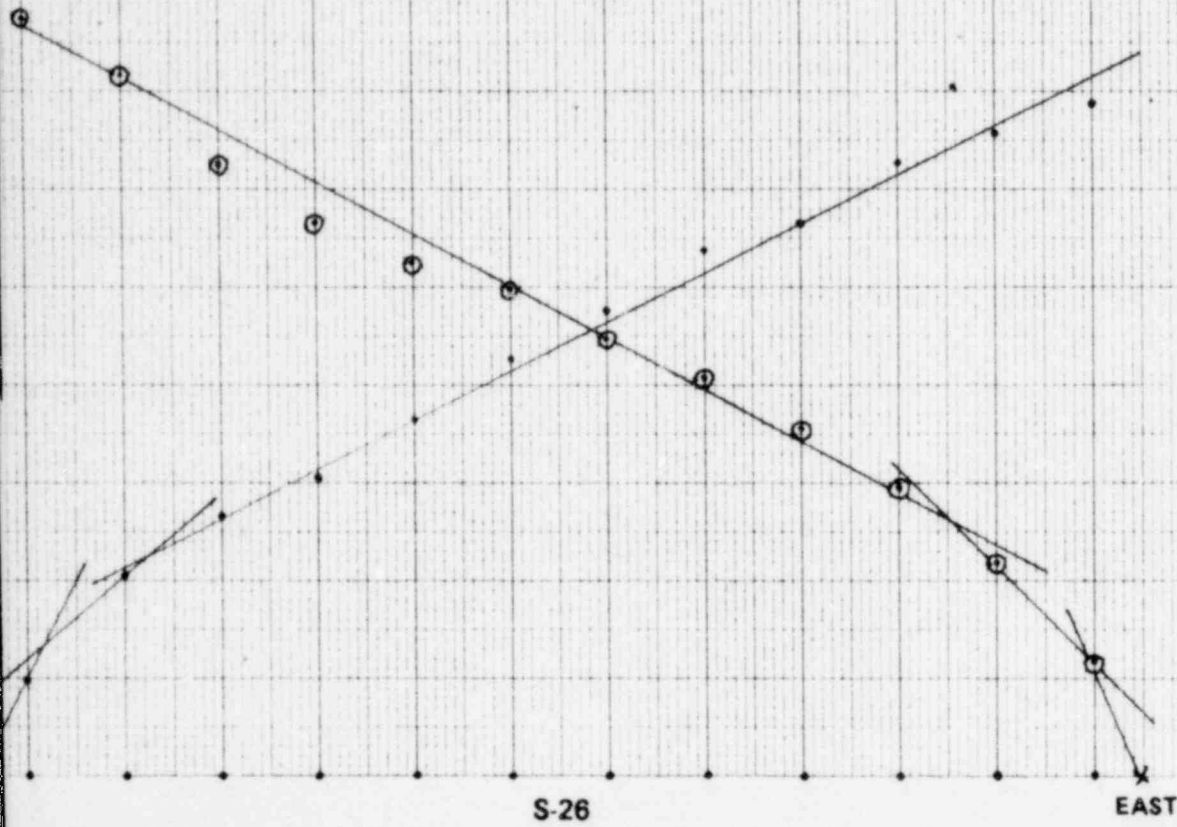
1. TIME-DISTANCE GRAPHS AT TOP OF FIGURE REPRESENT SEISMIC REFRACTION SURVEY DATA; DOTS ON BOTTOM LINE OF GRAPHS REPRESENT GEOPHONE LOCATIONS, X'S REPRESENT SHOT POINT LOCATIONS.  
 HORIZONTAL SCALE: 1" = 50 FEET  
 VERTICAL SCALE: 1" = 20 MILLISECONDS
2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.  
 VERTICAL AND HORIZONTAL SCALE: 1" = 50 FEET

<b>Earth Sciences Associates</b> Palo Alto, California			
<b>LA POLVADERA CANYON SEISMIC REFRACTION SURVEY DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE LINES S-44, S-45, AND S-46</b>			
Checked by	<i>POS</i>	Date	<i>12/31/79</i>
Approved by	<i>WRH</i>	Date	<i>1/2/80</i>
Project No.	<b>2143</b>	Figure No.	<b>10</b>





LINES S-24, S-25 & S 26 LOCATED ON FIGURE 1



NOTES

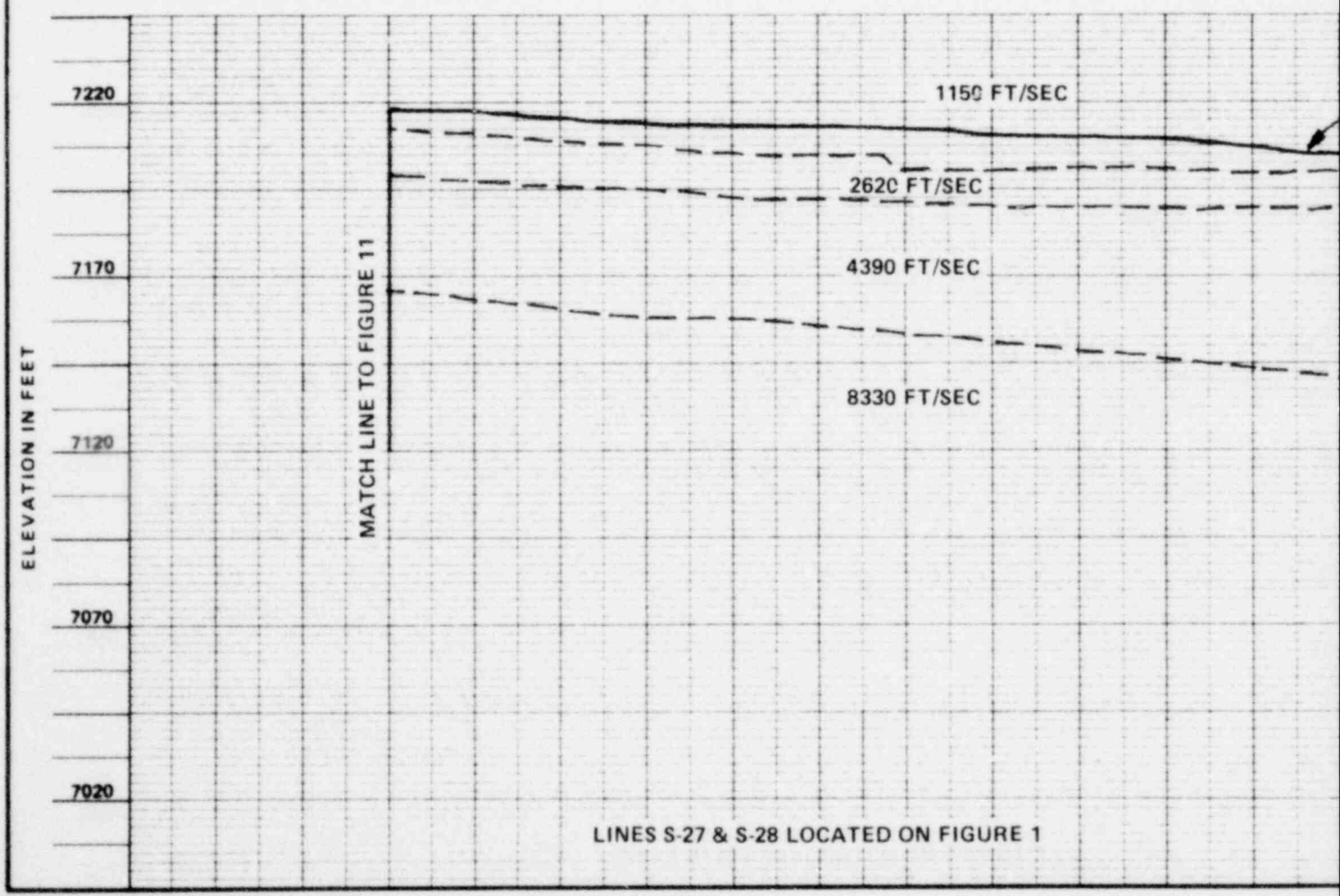
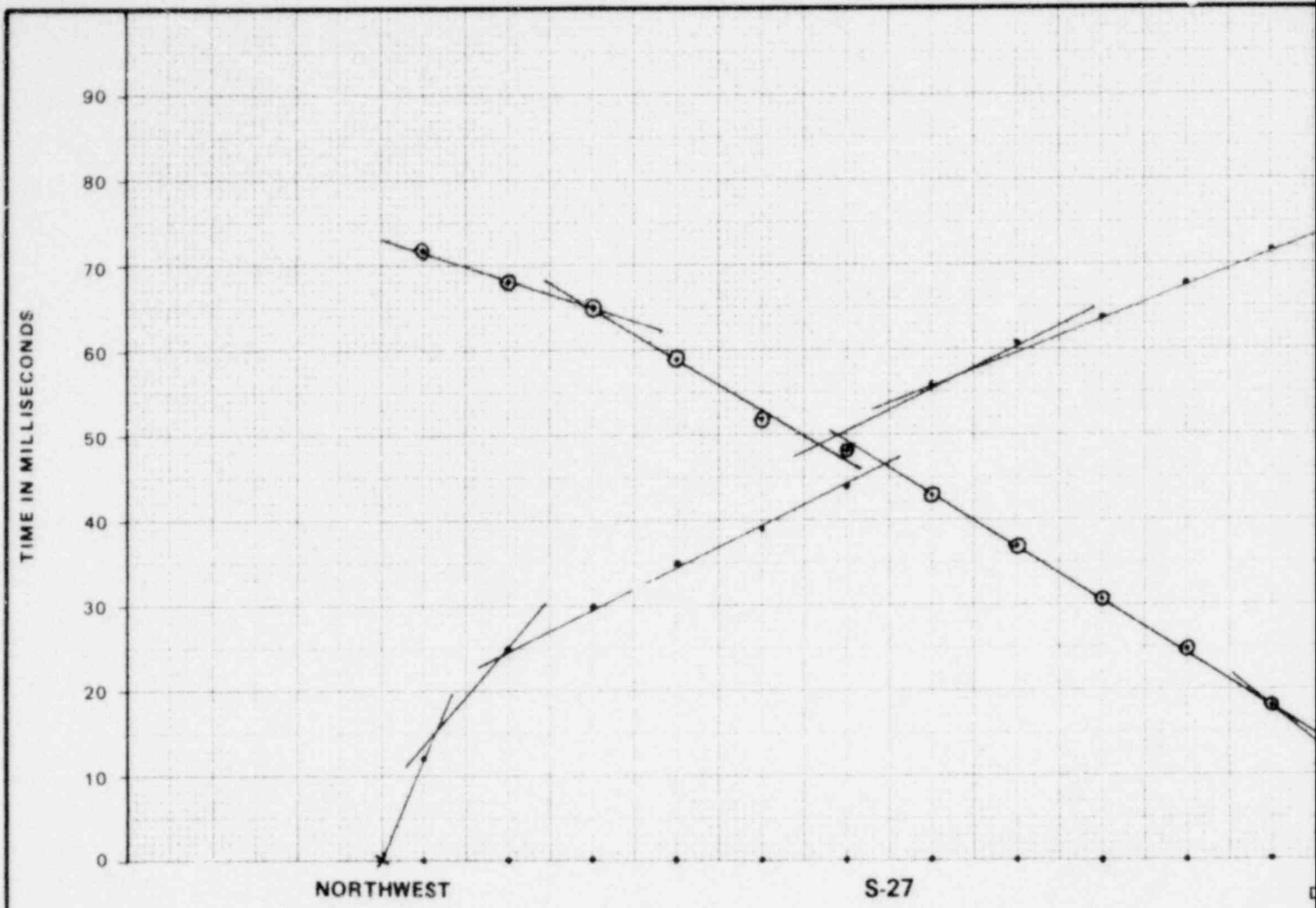
1. TIME-DISTANCE GRAPHS AT TOP OF FIGURE REPRESENT SEISMIC REFRACTION SURVEY DATA; DOTS ON BOTTOM LINE OF GRAPHS REPRESENT GEOPHONE LOCATIONS, X'S REPRESENT SHOT POINT LOCATIONS.  
HORIZONTAL SCALE: 1" = 50 FEET  
VERTICAL SCALE: 1" = 20 MILLISECONDS
2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.  
VERTICAL AND HORIZONTAL SCALE: 1" = 50 FEET

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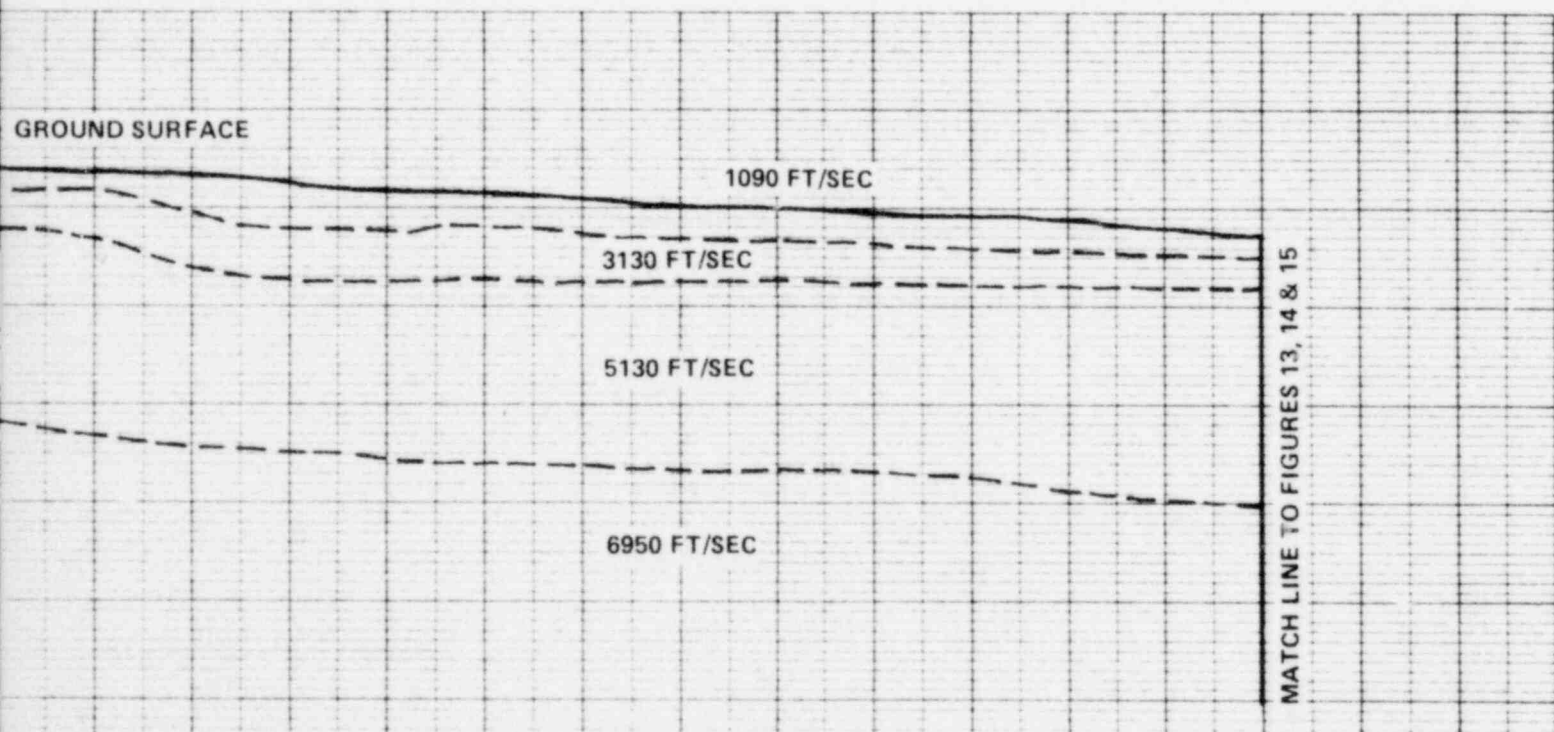
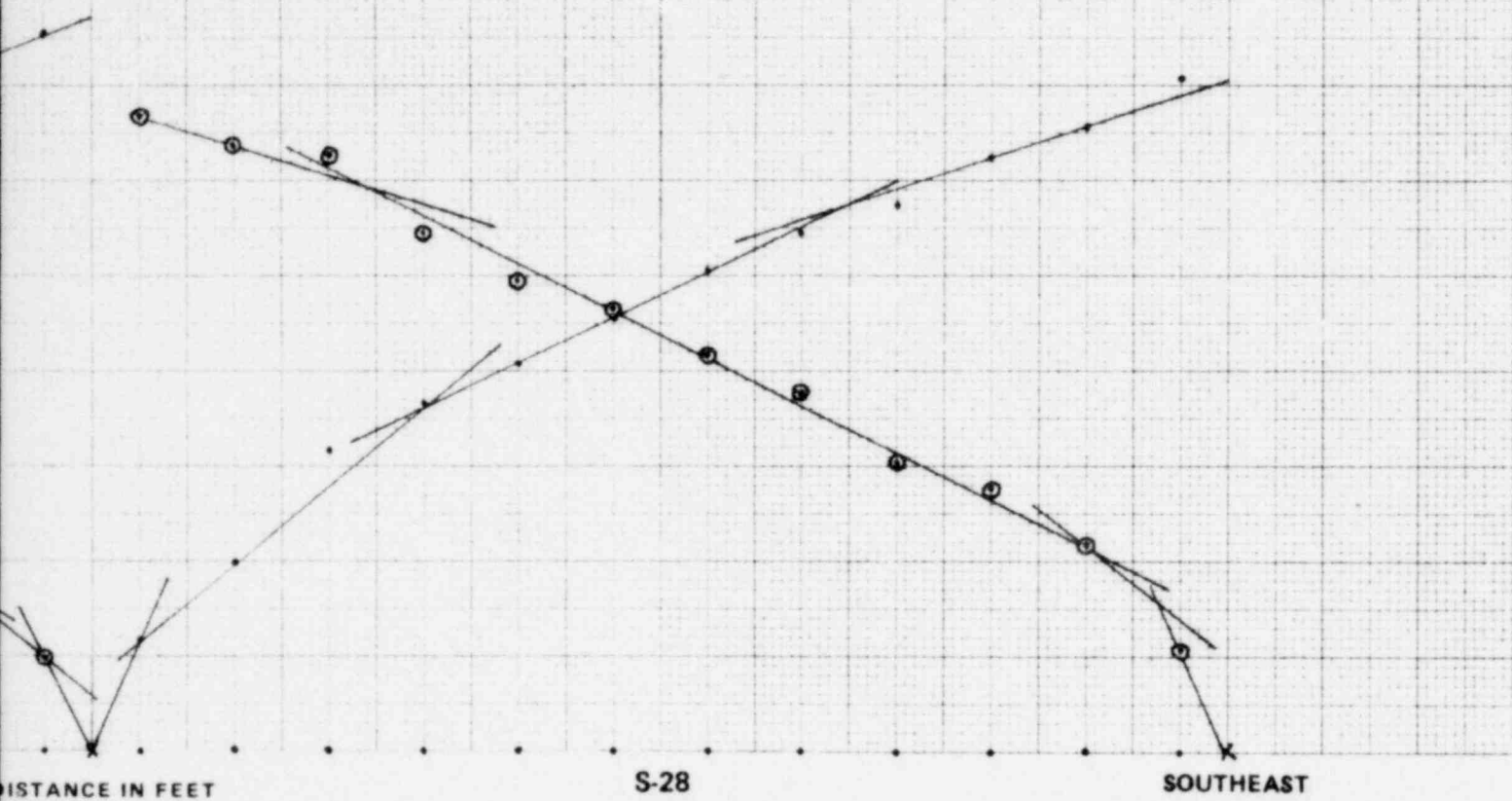
Palo Alto, California

LA POLVADERA CANYON SEISMIC REFRACTION SURVEY  
DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE  
LINES S-24, S-25, AND S-26

Checked by	POS	Date	12/31/79	Project No.	Figure No.
Approved by	WRH	Date	1/2/80	2143	11



LINES S-27 & S-28 LOCATED ON FIGURE 1



NOTES

1. TIME-DISTANCE GRAPHS AT TOP OF FIGURE REPRESENT SEISMIC REFRACTION SURVEY DATA; DOTS ON BOTTOM LINE OF GRAPHS REPRESENT GEOPHONE LOCATIONS, X'S REPRESENT SHOT POINT LOCATIONS.  
 HORIZONTAL SCALE: 1" = 50 FEET  
 VERTICAL SCALE: 1" = 20 MILLISECONDS
2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.  
 VERTICAL AND HORIZONTAL SCALE: 1" = 50 FEET

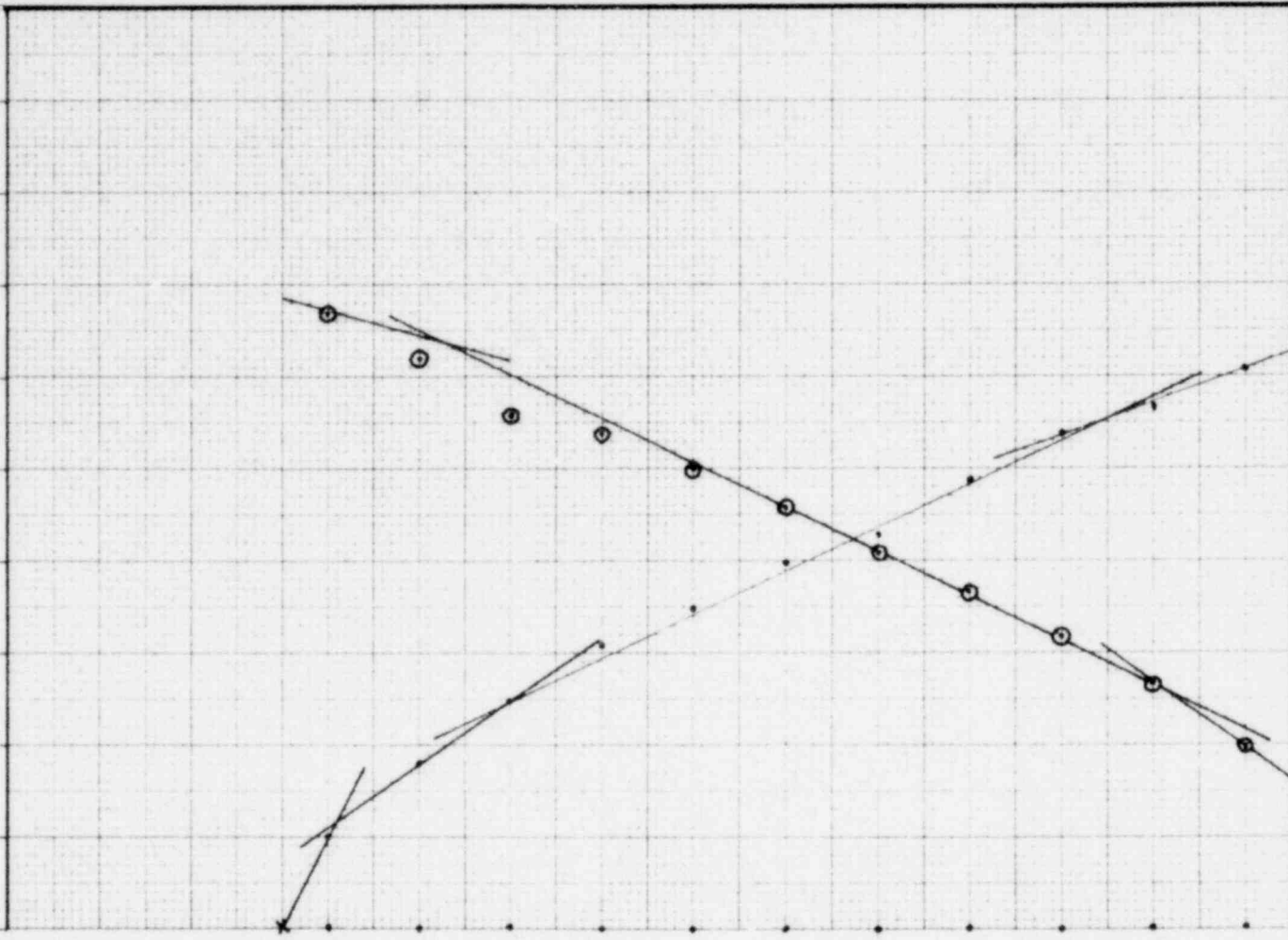
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**LA POLVADERA CANYON SEISMIC REFRACTION SURVEY  
 DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE  
 LINES S-27 AND S-28**

Checked by <u>POS</u>	Date <u>12/11/79</u>	Project No.	Figure No.
Approved by <u>WRH</u>	Date <u>1/2/80</u>	<b>2143</b>	<b>12</b>

TIME IN MILLISECONDS

90  
80  
70  
60  
50  
40  
30  
20  
10  
0

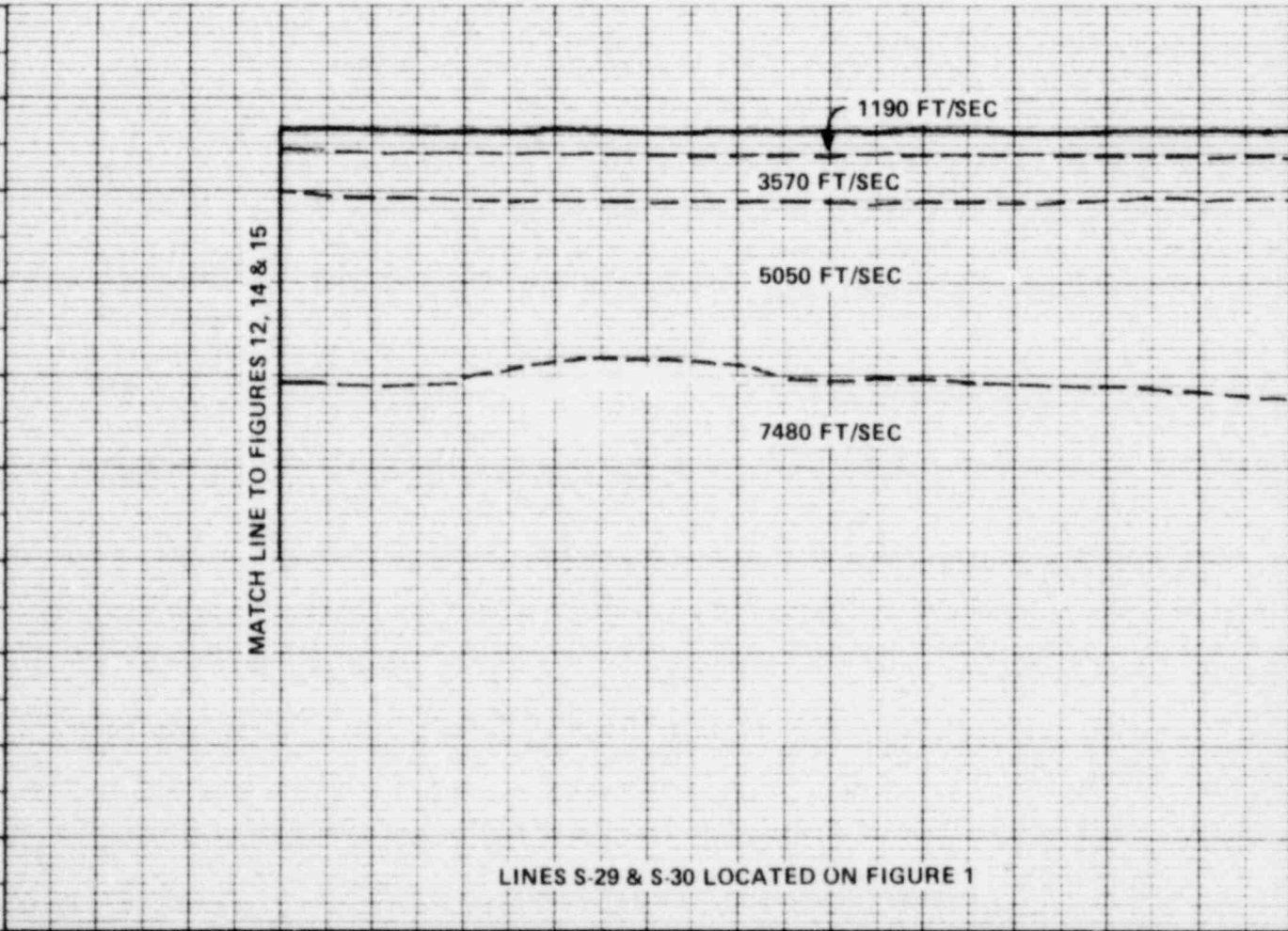


NORTHEAST

S-29

ELEVATION IN FEET

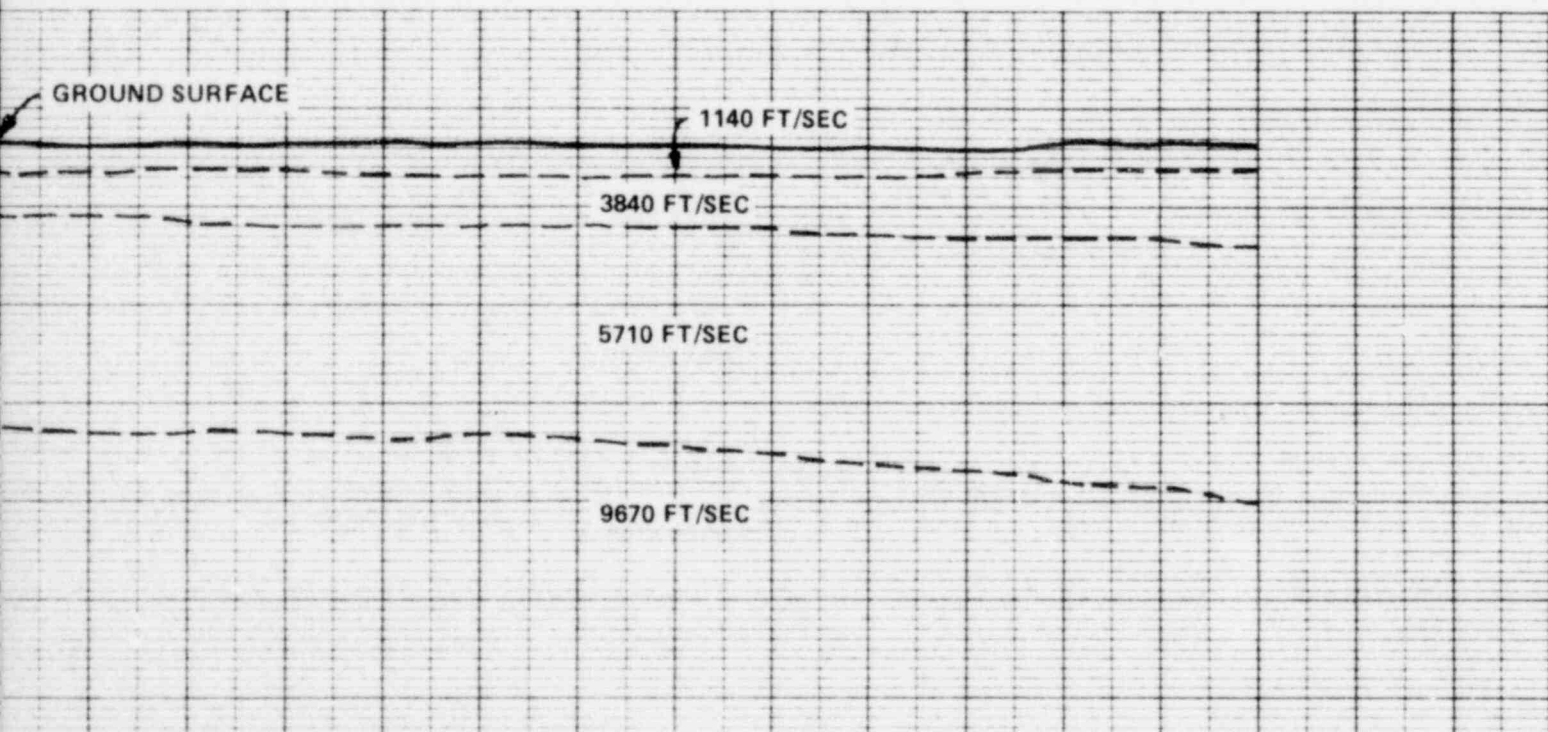
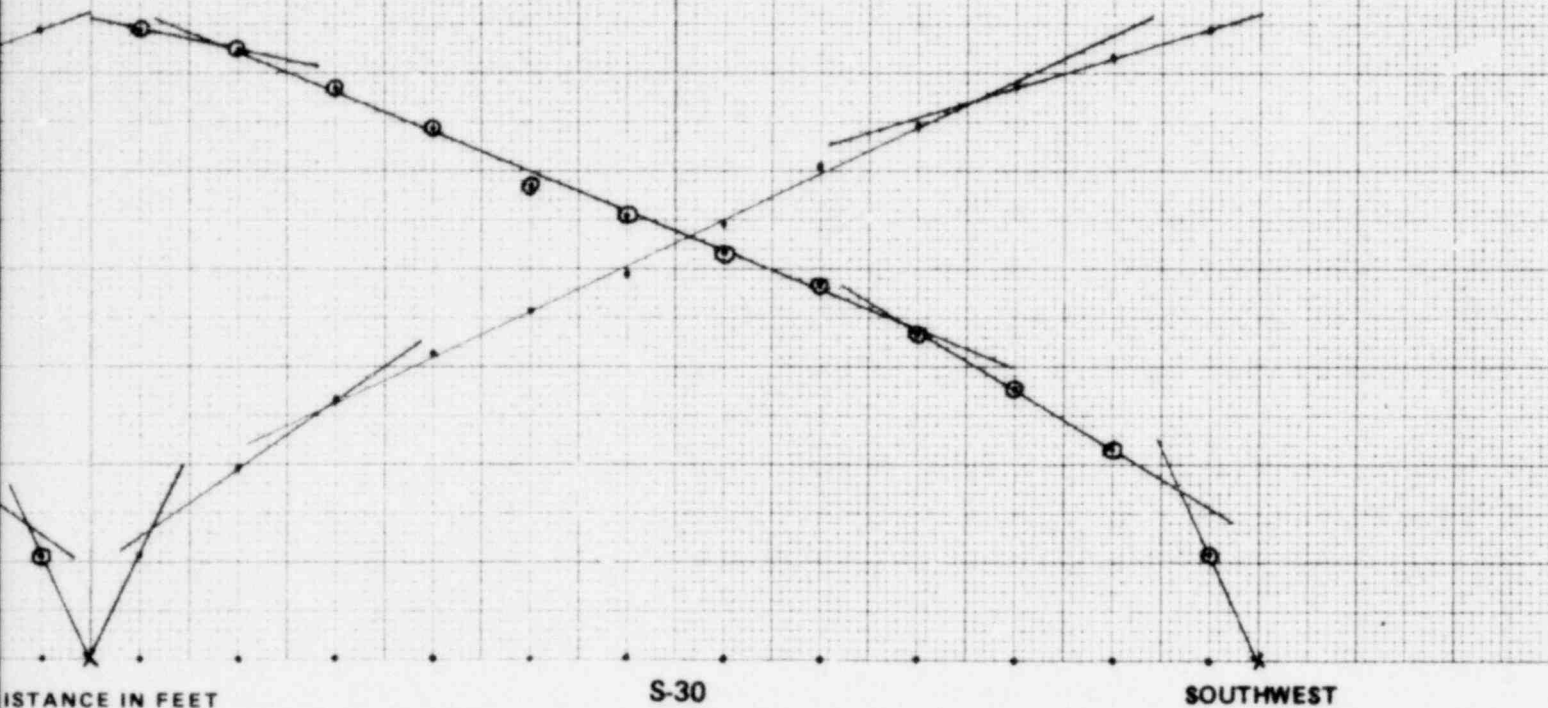
7200  
7180  
7160  
7140  
7120  
7100  
7080  
7060  
7040  
7020  
7000



MATCH LINE TO FIGURES 12, 14 & 15

LINES S-29 & S-30 LOCATED ON FIGURE 1

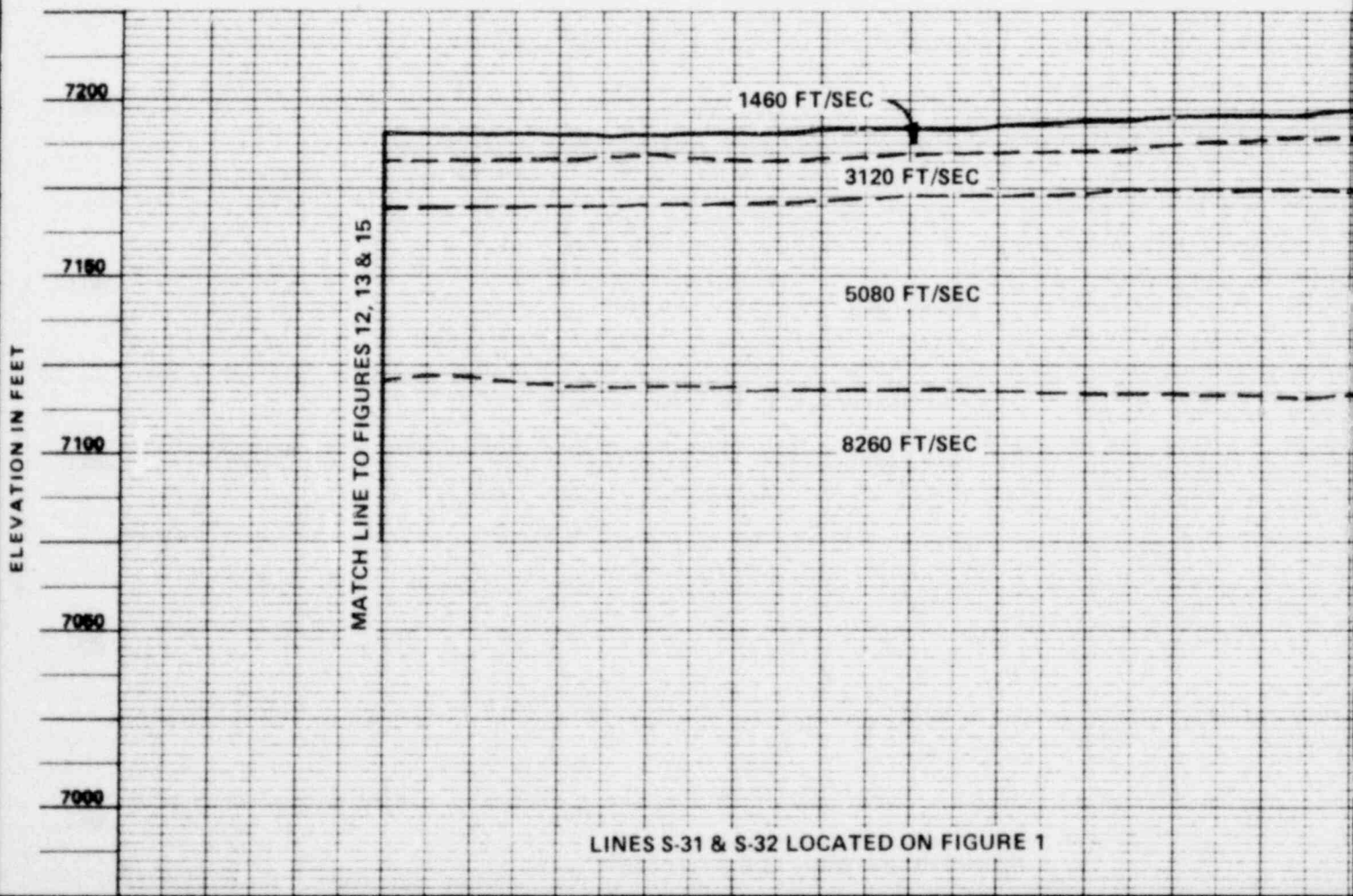
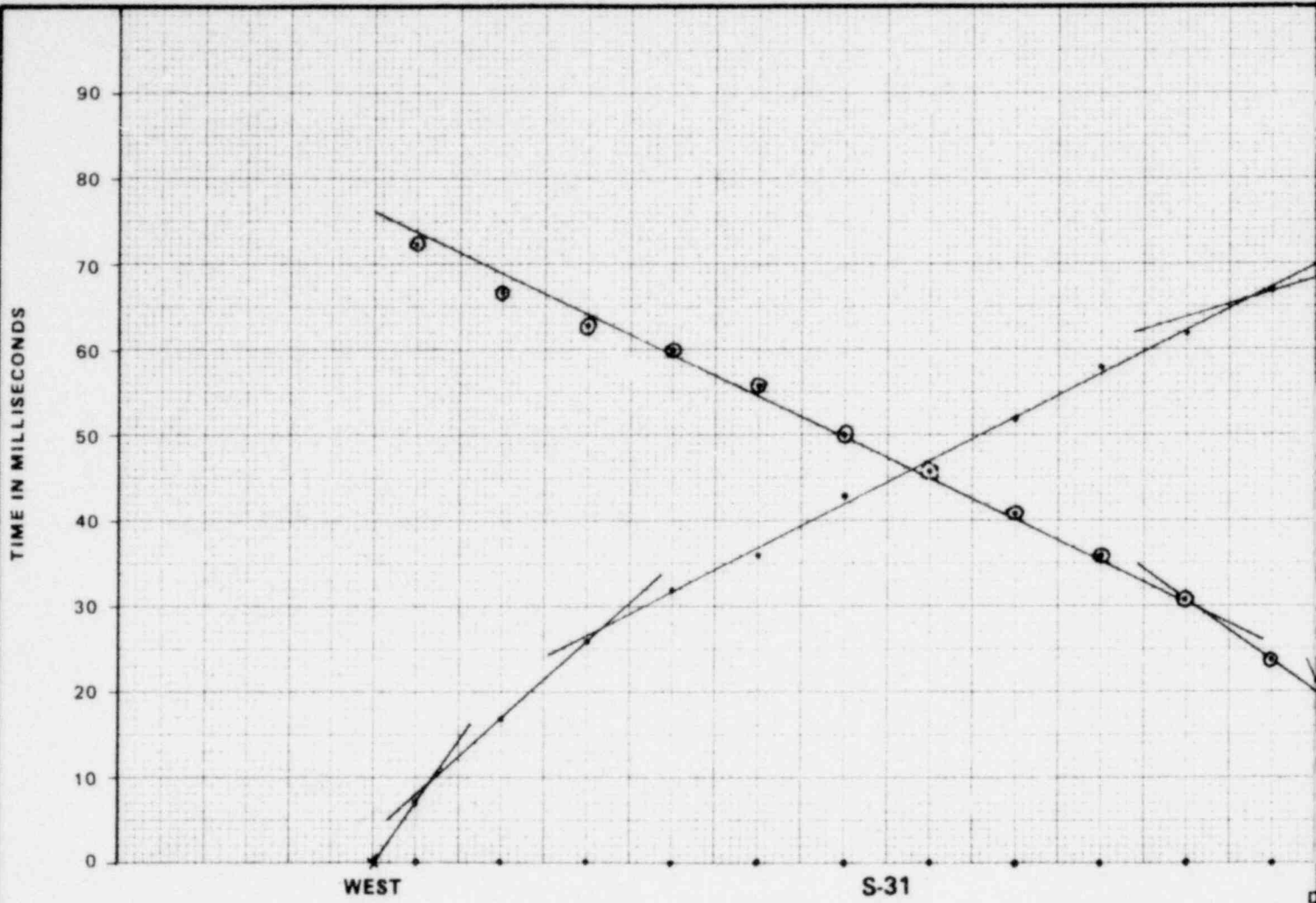


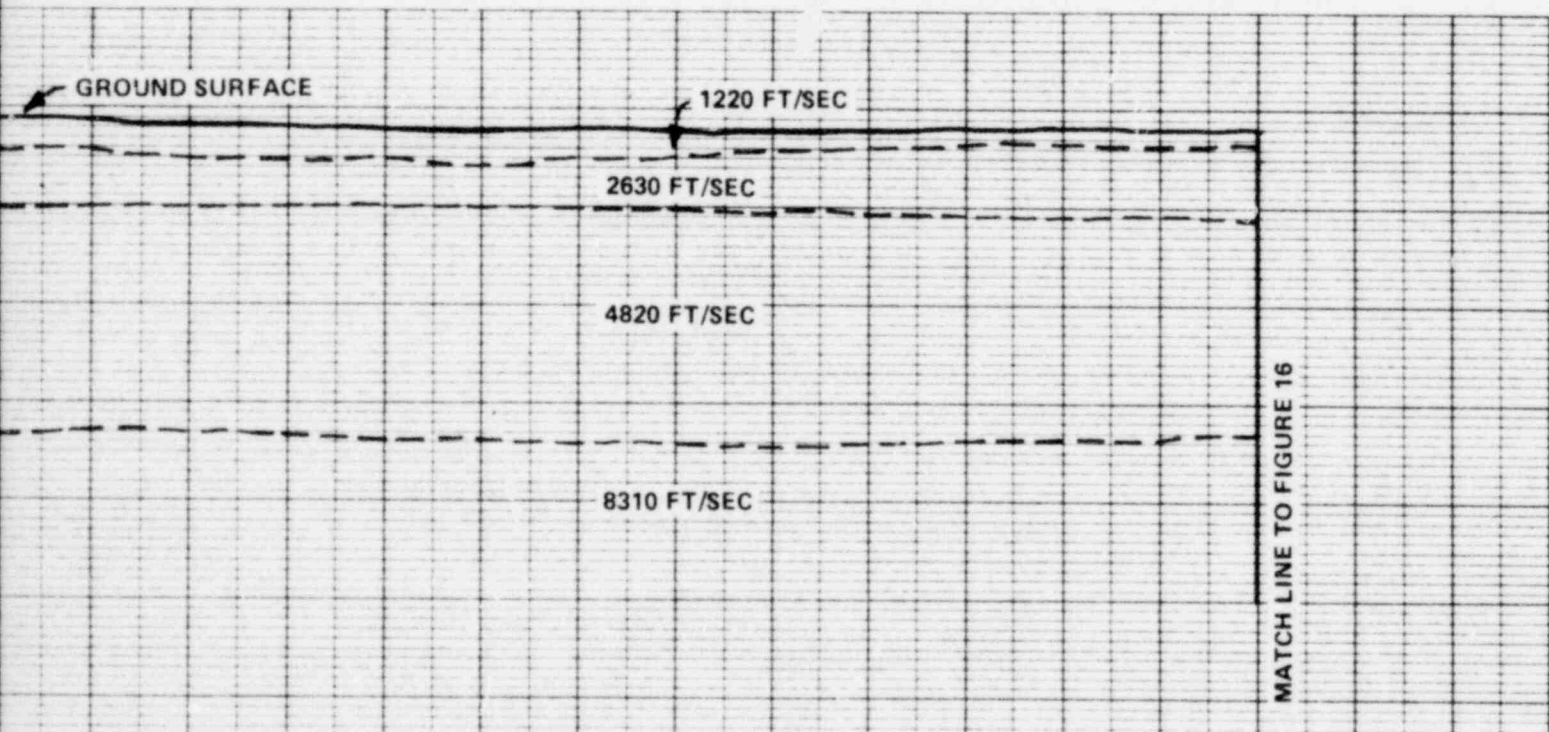
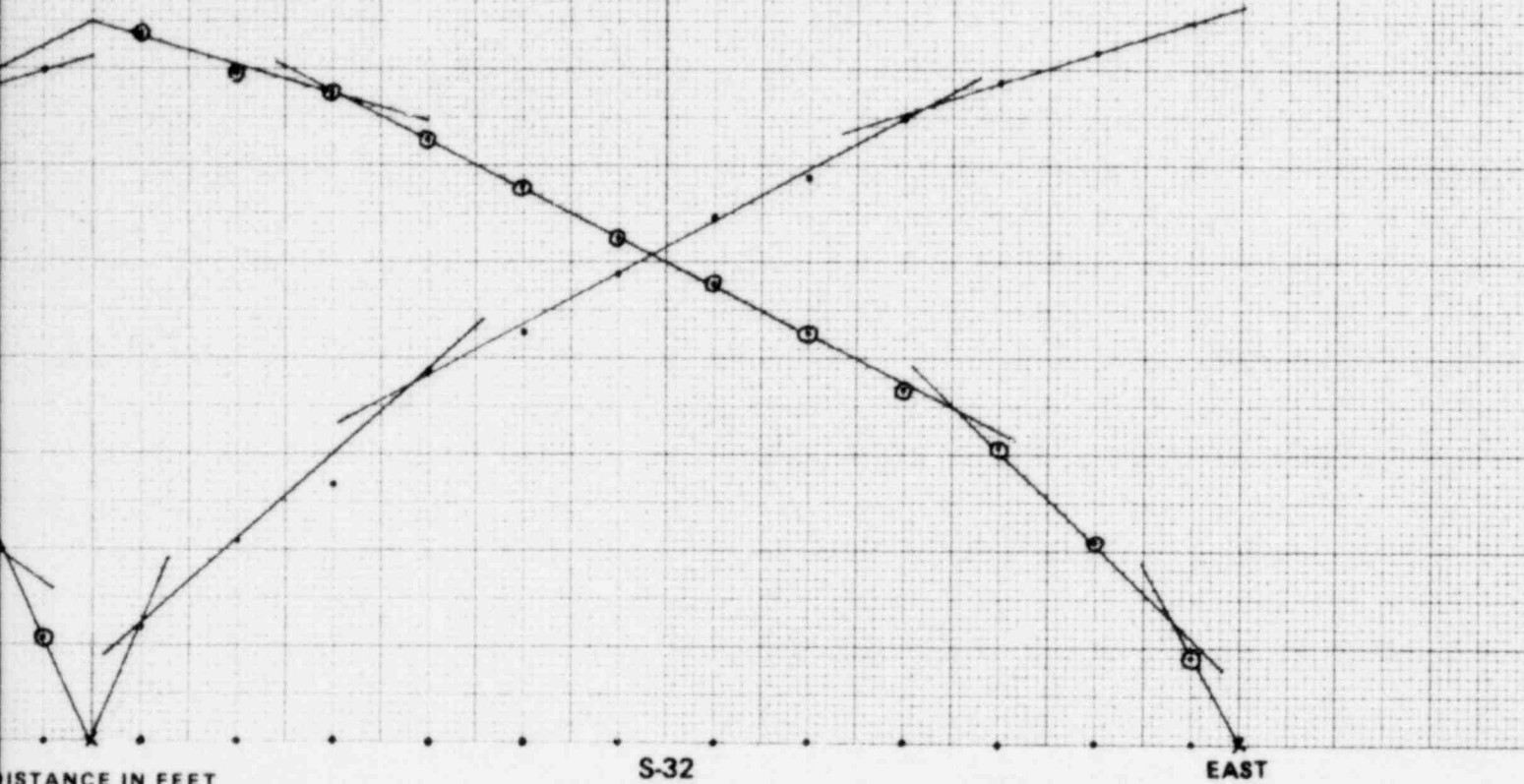


**NOTES**

1. TIME-DISTANCE GRAPHS AT TOP OF FIGURE REPRESENT SEISMIC REFRACTION SURVEY DATA; DOTS ON BOTTOM LINE OF GRAPHS REPRESENT GEOPHONE LOCATIONS, 'X'S REPRESENT SHOT POINT LOCATIONS.  
HORIZONTAL SCALE: 1" = 50 FEET  
VERTICAL SCALE: 1" = 20 MILLISECONDS
2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.  
VERTICAL AND HORIZONTAL SCALE: 1" = 50 FEET

<b>Earth Sciences Associates</b> Palo Alto, California			
<b>LA POLVADERA CANYON SEISMIC REFRACTION SURVEY DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE LINES S-29 AND S-30</b>			
Checked by	<i>POS</i>	Date	<i>11/31/79</i>
Approved by	<i>WRH</i>	Date	<i>1/2/80</i>
Project No.	<b>2143</b>	Figure No.	<b>13</b>





**NOTES**

1. TIME-DISTANCE GRAPHS AT TOP OF FIGURE REPRESENT SEISMIC REFRACTION SURVEY DATA; DOTS ON BOTTOM LINE OF GRAPHS REPRESENT GEOPHONE LOCATIONS, X'S REPRESENT SHOT POINT LOCATIONS.

HORIZONTAL SCALE: 1" = 50 FEET  
 VERTICAL SCALE: 1" = 20 MILLISECONDS

2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.

VERTICAL AND HORIZONTAL SCALE: 1" = 50 FEET

<b>Earth Sciences Associates</b> Palo Alto, California			
<b>LA POLVADERA CANYON SEISMIC REFRACTION SURVEY          DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE          LINES S-31 AND S-32</b>			
Checked by	<i>POS</i>	Date	<i>12/31/77</i>
Approved by	<i>NRH</i>	Date	<i>1/2/80</i>
Project No.	<b>2143</b>	Figure No.	<b>14</b>

TIME IN MILLISECONDS

90  
80  
70  
60  
50  
40  
30  
20  
10  
0

NORTHEAST

S-34

ELEVATION IN FEET

7200  
7150  
7100  
7050  
7000

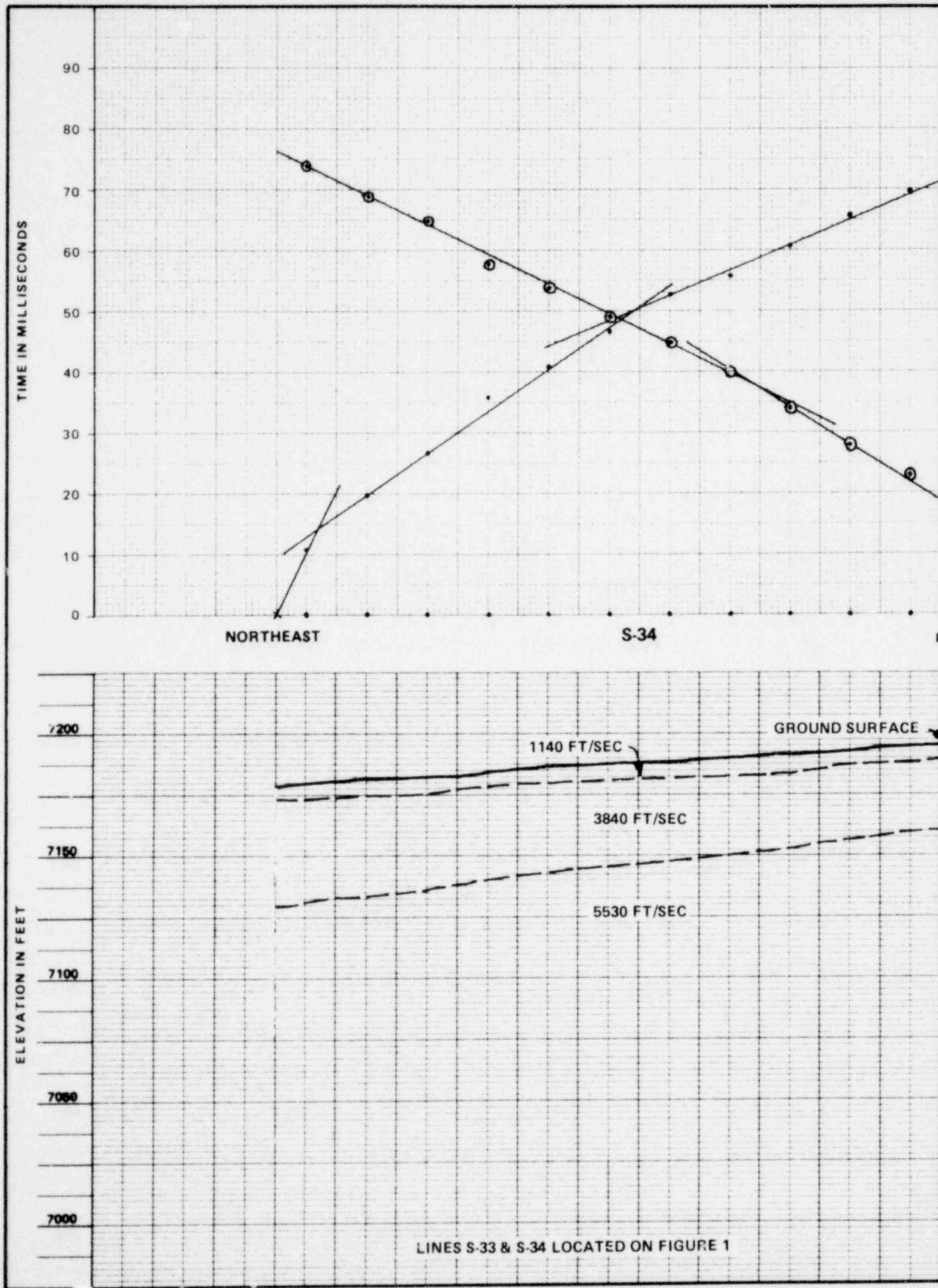
GROUND SURFACE

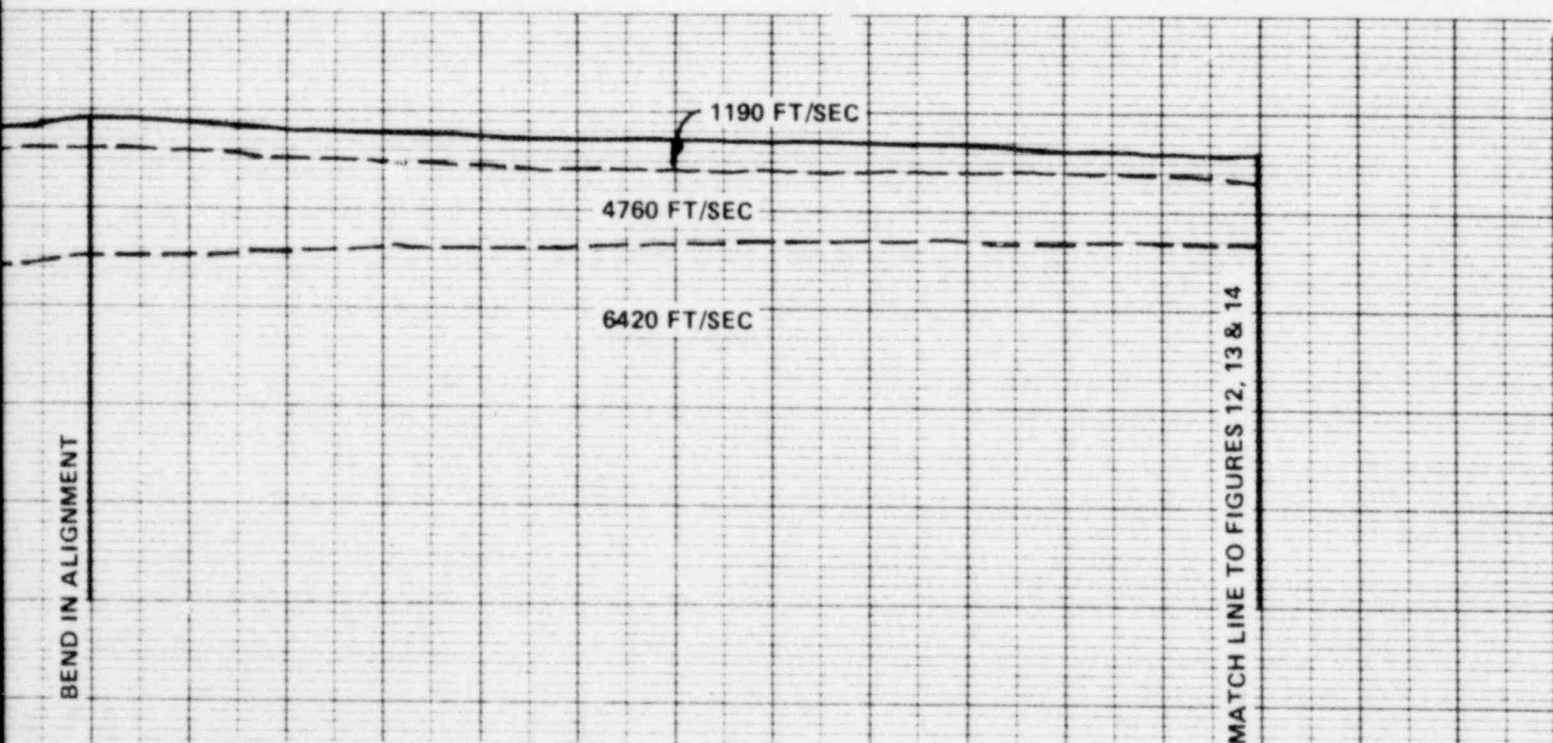
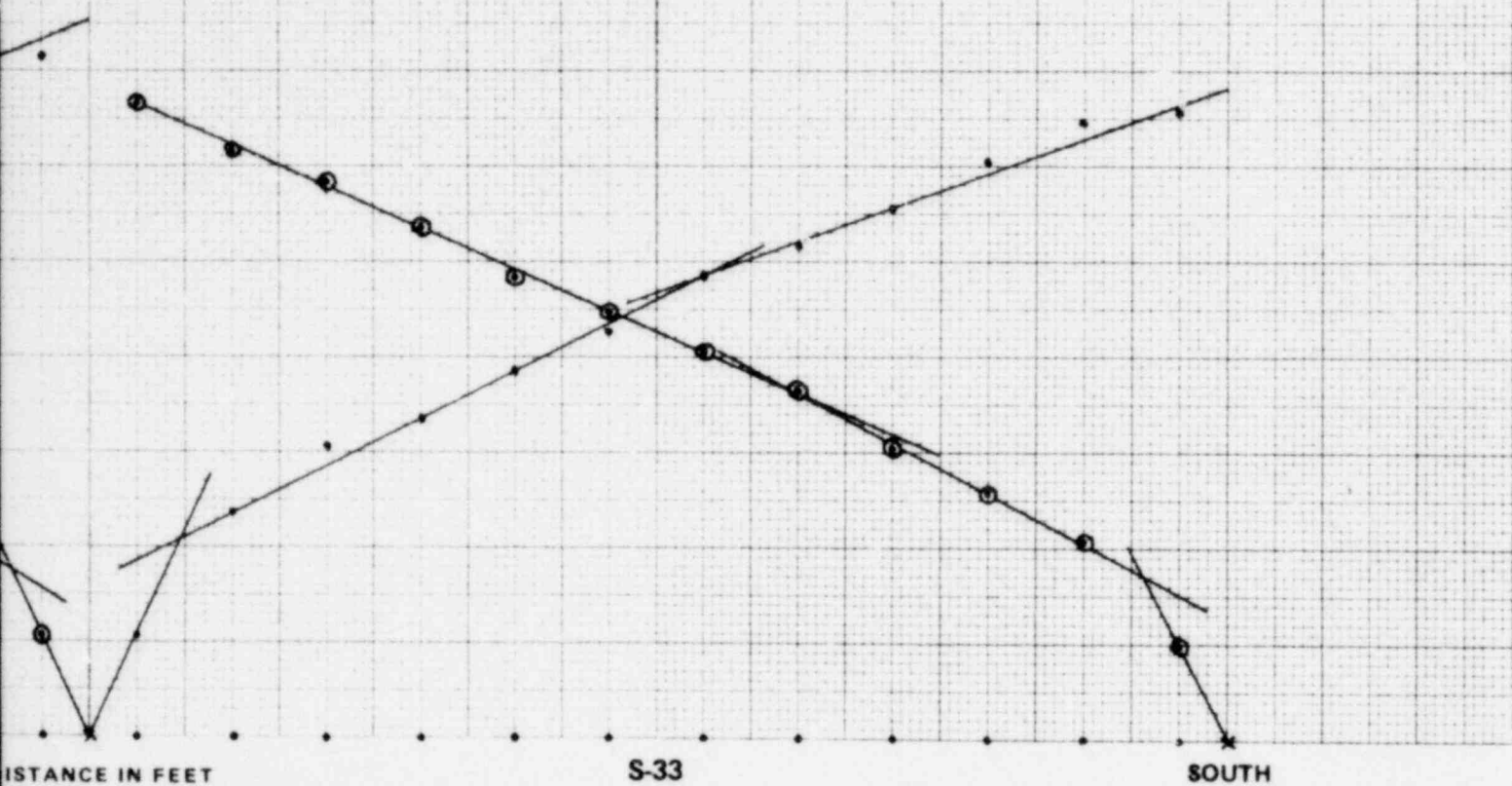
1140 FT/SEC

3840 FT/SEC

5530 FT/SEC

LINES S-33 & S-34 LOCATED ON FIGURE 1





**NOTES**

1. TIME-DISTANCE GRAPHS AT TOP OF FIGURE REPRESENT SEISMIC REFRACTION SURVEY DATA; DOTS ON BOTTOM LINE OF GRAPHS REPRESENT GEOPHONE LOCATIONS, 'X'S REPRESENT SHOT POINT LOCATIONS.

HORIZONTAL SCALE: 1" = 50 FEET  
 VERTICAL SCALE: 1" = 20 MILLISECONDS

2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.

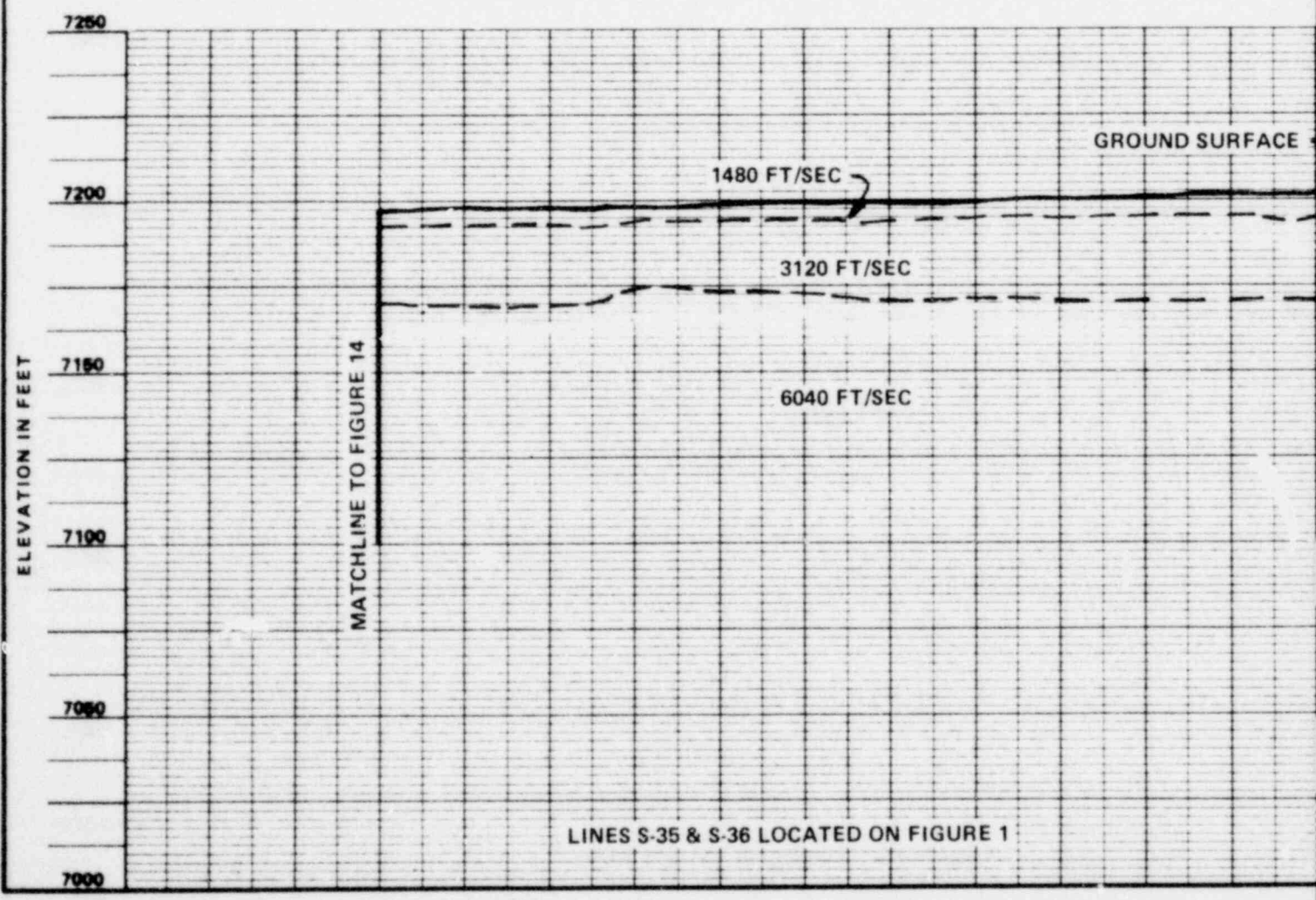
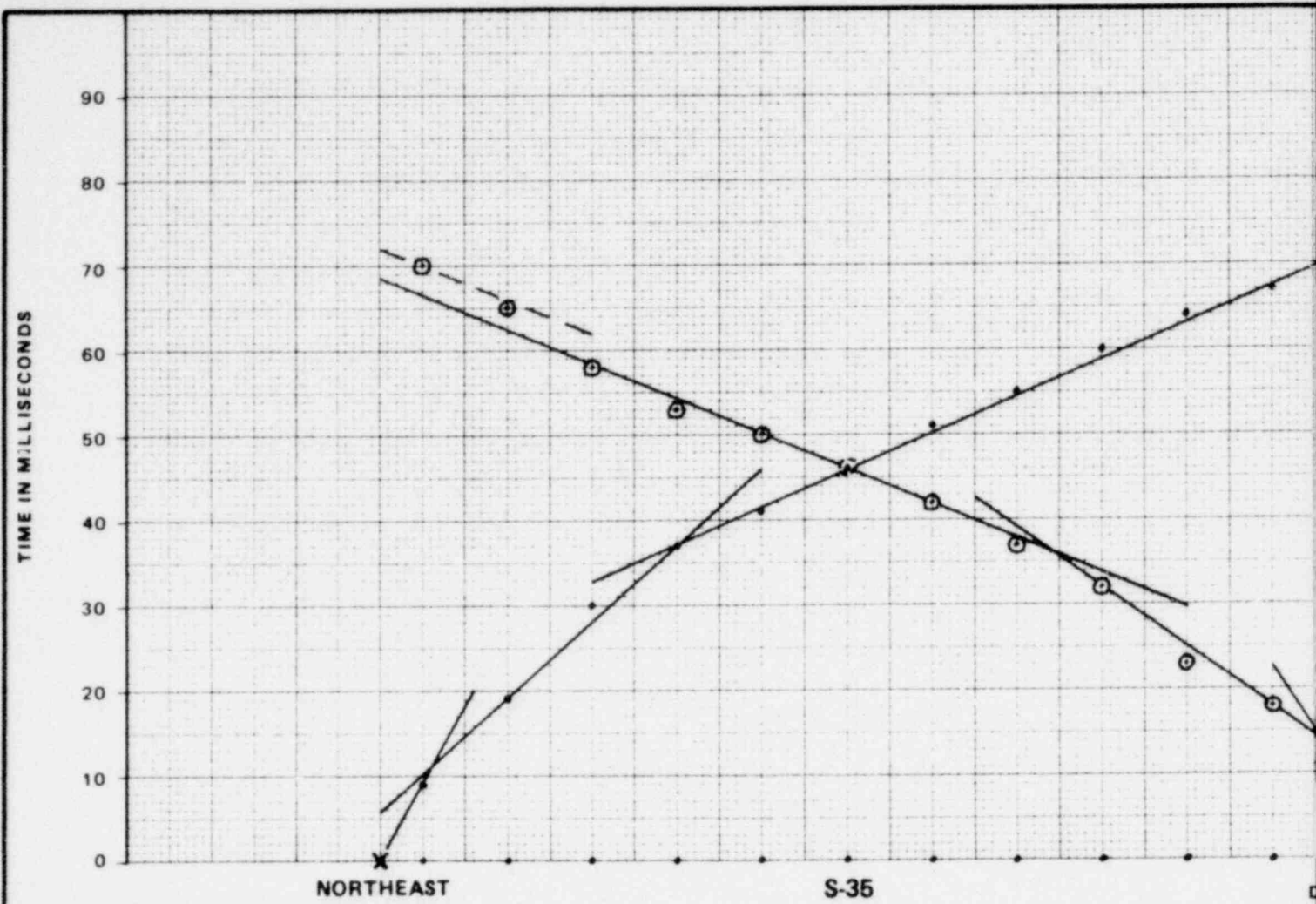
VERTICAL AND HORIZONTAL SCALE: 1" = 50 FEET

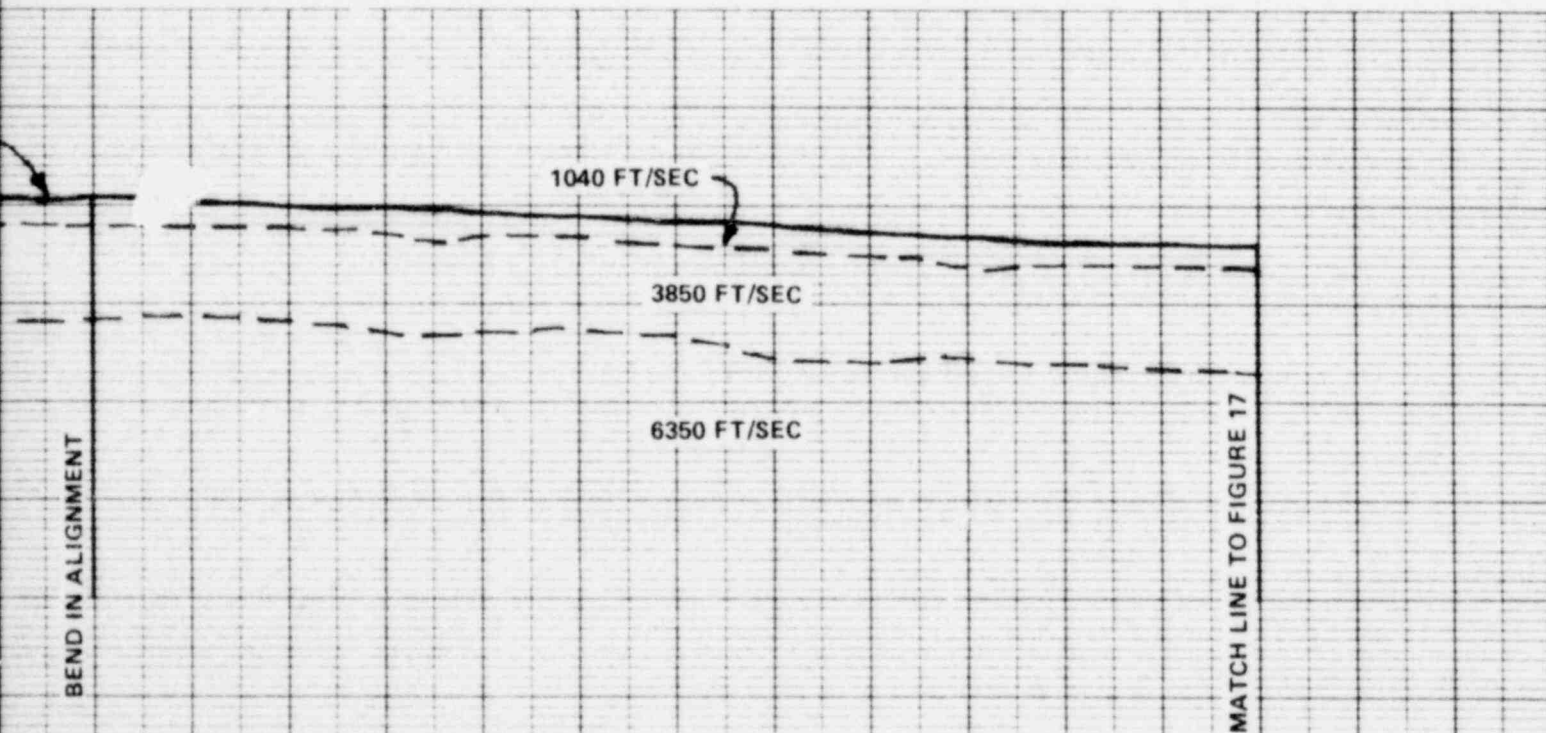
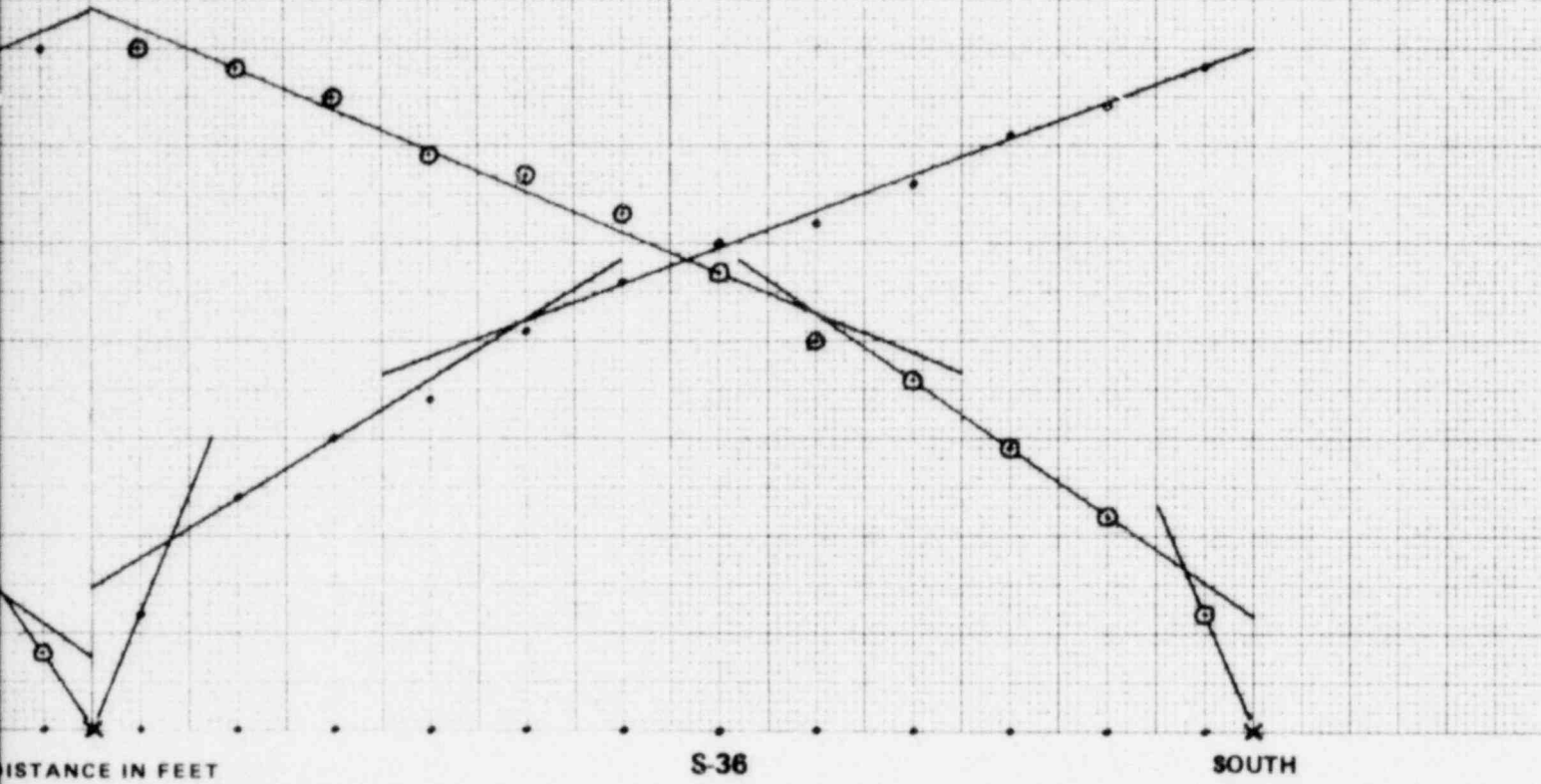
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**LA POLVADERA CANYON SEISMIC REFRACTION SURVEY DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE LINES S-33 AND S-34**

Checked by <u>POS</u>	Date <u>12/31/77</u>	Project No.	Figure No.
Approved by <u>WRH</u>	Date <u>1/2/80</u>	<b>2143</b>	<b>15</b>

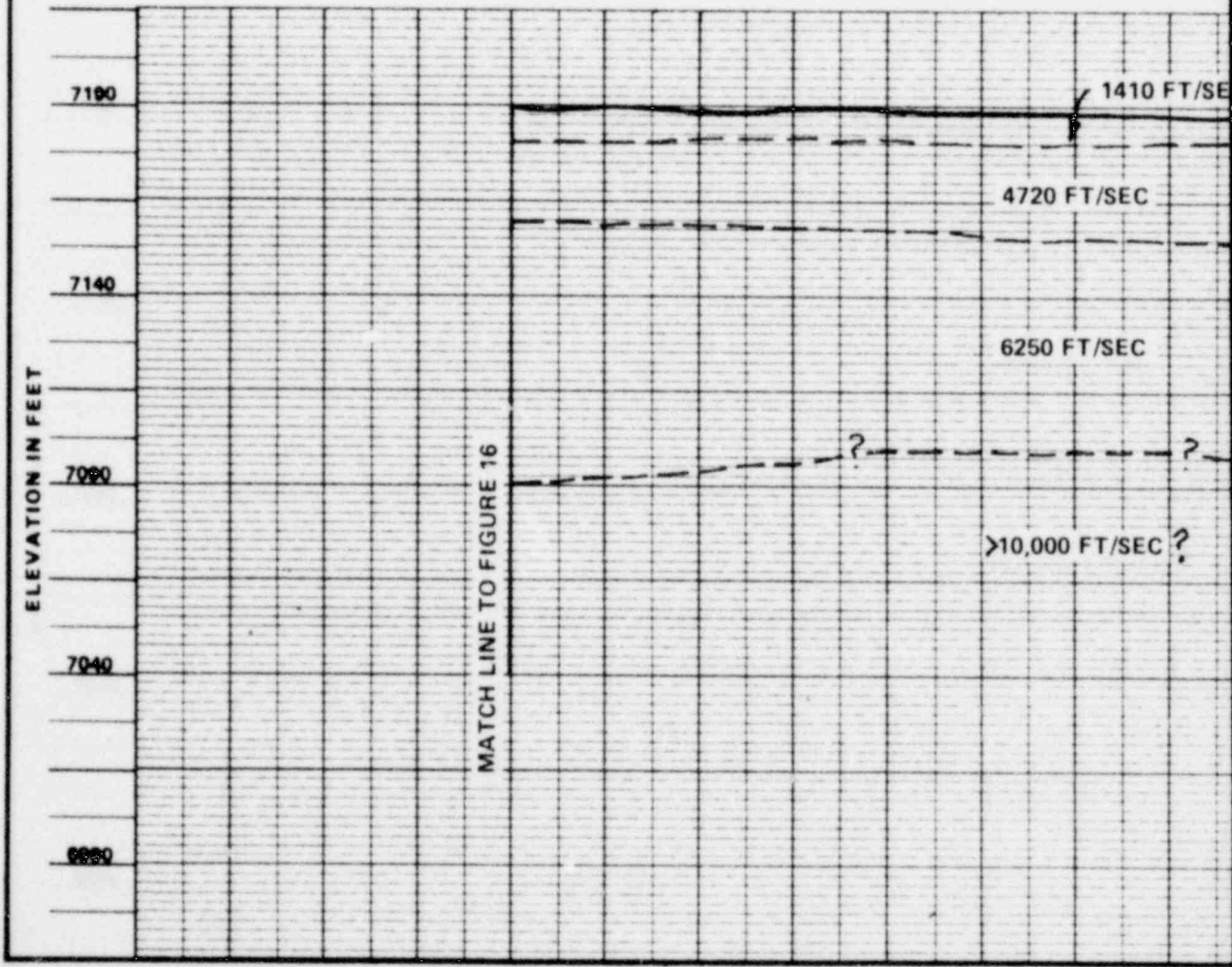
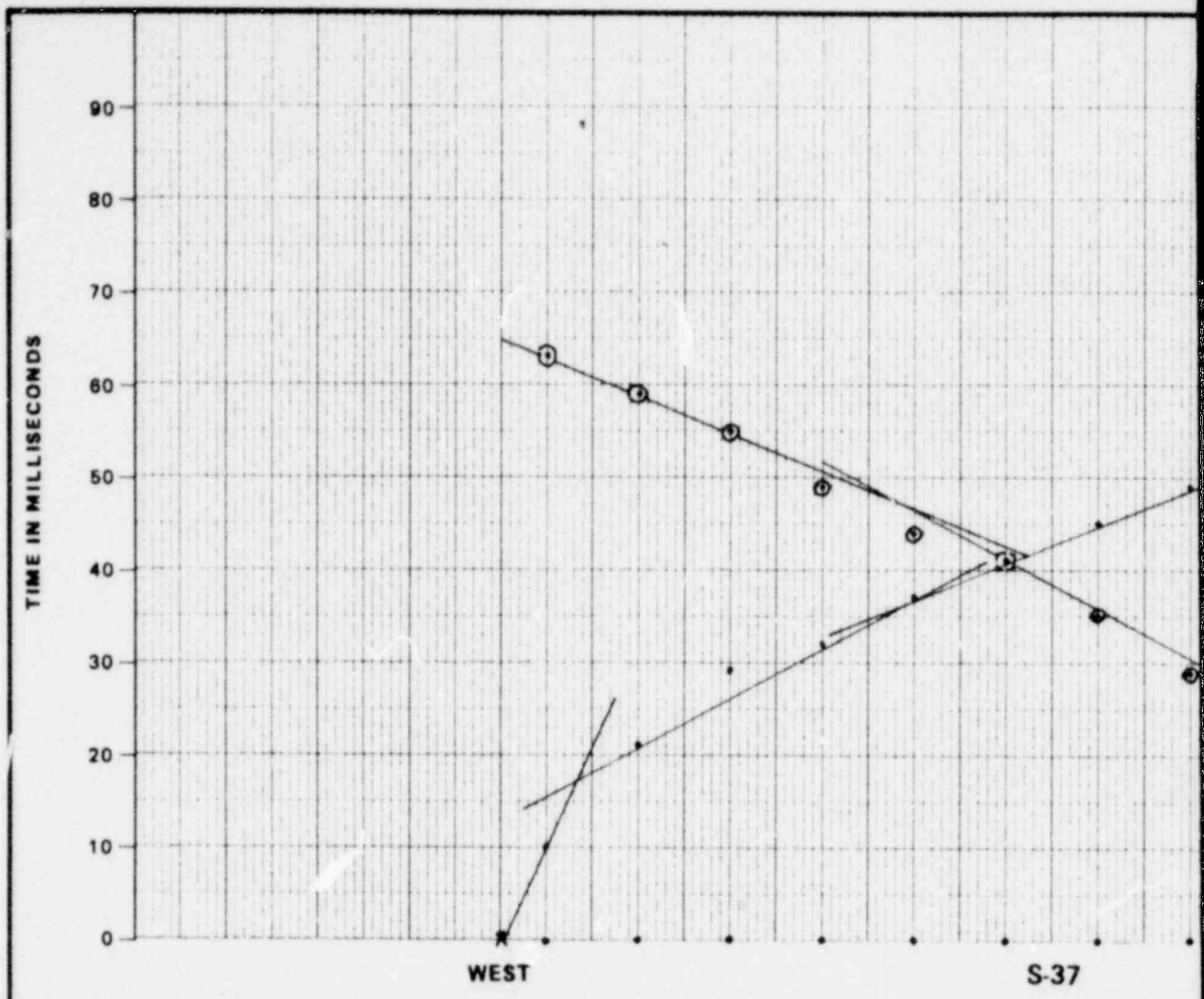




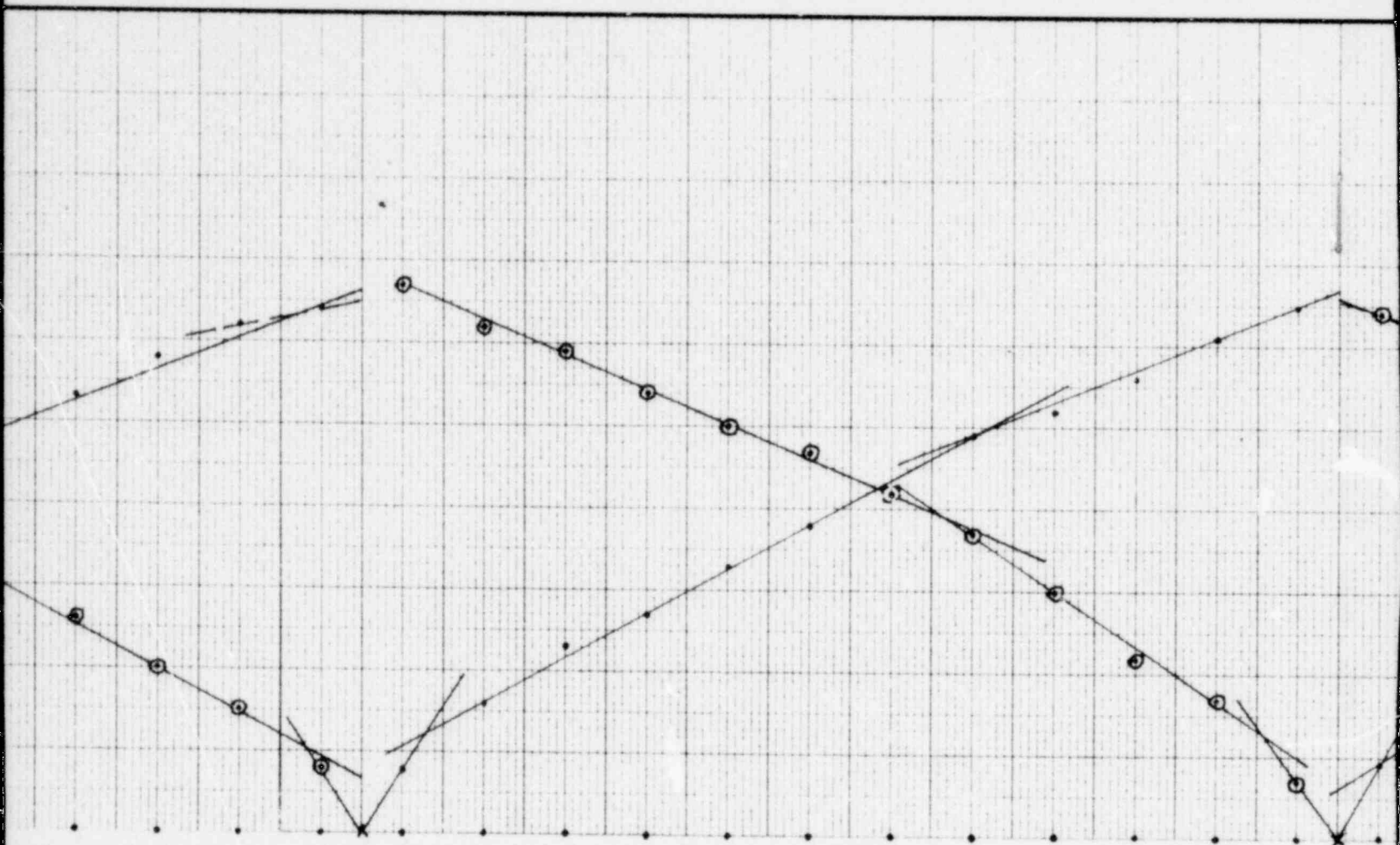
**NOTES**

1. TIME-DISTANCE GRAPHS AT TOP OF FIGURE REPRESENT SEISMIC REFRACTION SURVEY DATA; DOTS ON BOTTOM LINE OF GRAPHS REPRESENT GEOPHONE LOCATIONS, X'S REPRESENT SHOT POINT LOCATIONS.  
 HORIZONTAL SCALE: 1" = 50 FEET  
 VERTICAL SCALE: 1" = 20 MILLISECONDS
2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.  
 VERTICAL AND HORIZONTAL SCALE: 1" = 50 FEET

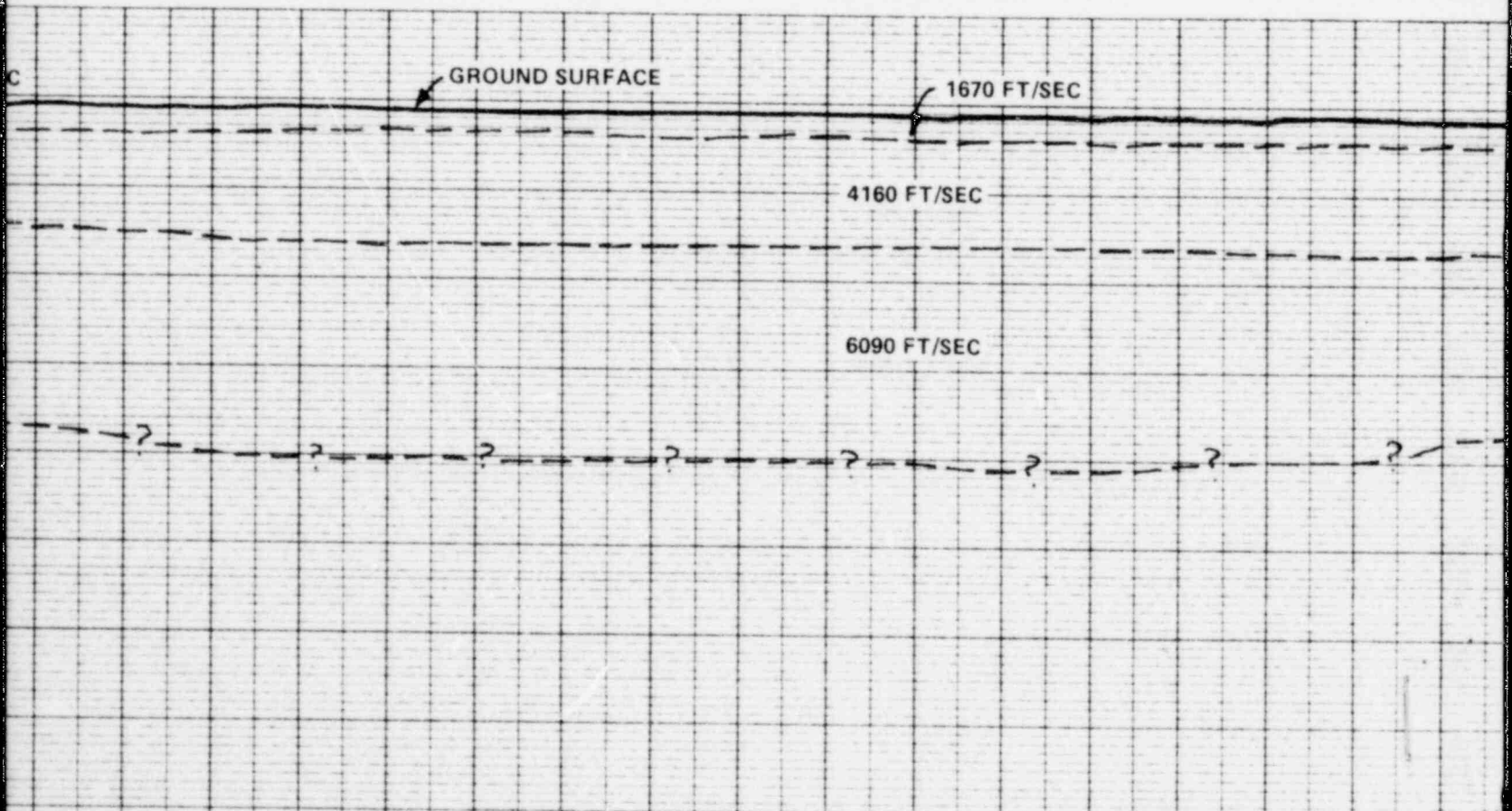
<b>Earth Sciences Associates</b>			
Palo Alto, California			
<b>LA POLVADERA CANYON SEISMIC REFRACTION SURVEY DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE LINES S-36 AND S-38</b>			
Checked by	POS	Date	12/31/79
Approved by	WRH	Date	1/2/80
Project No.	2143	Figure No.	16



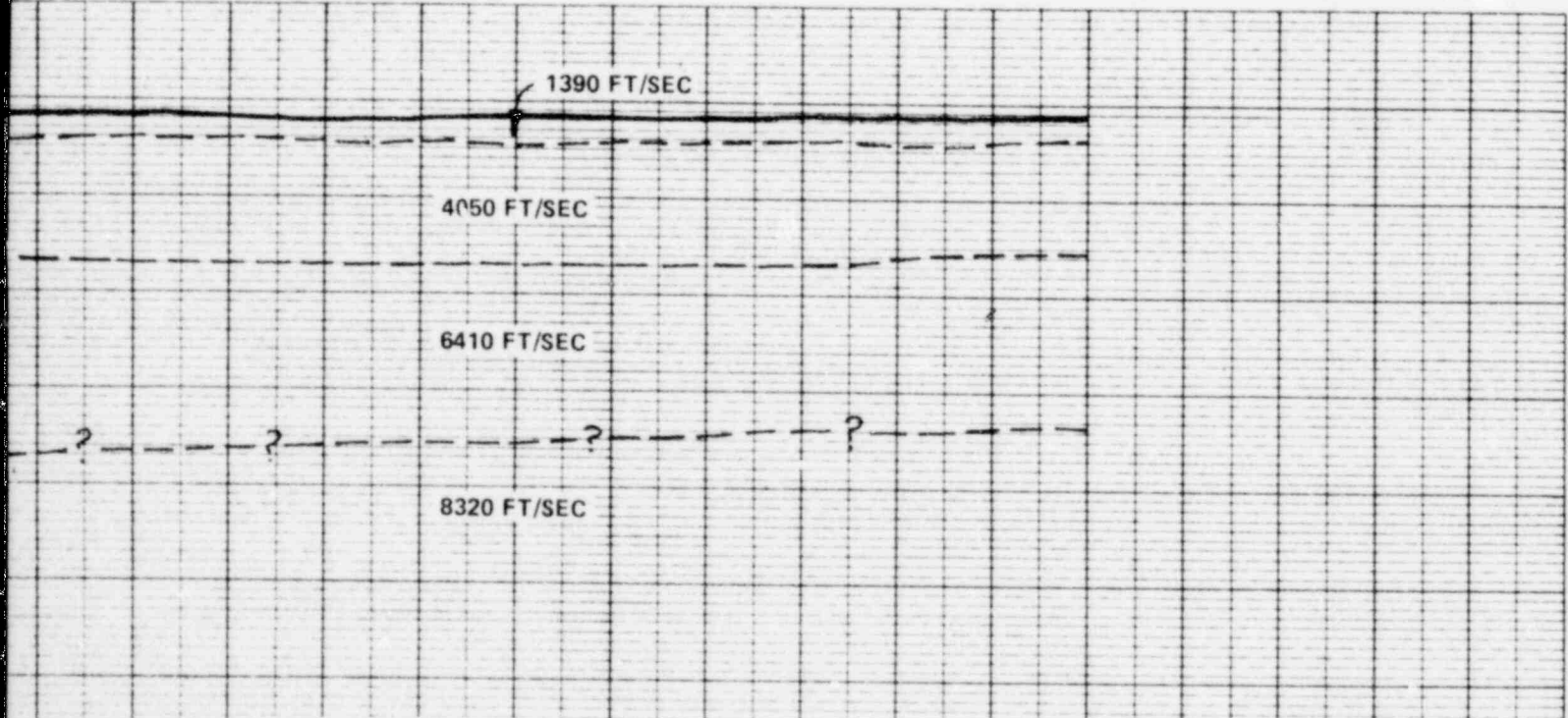
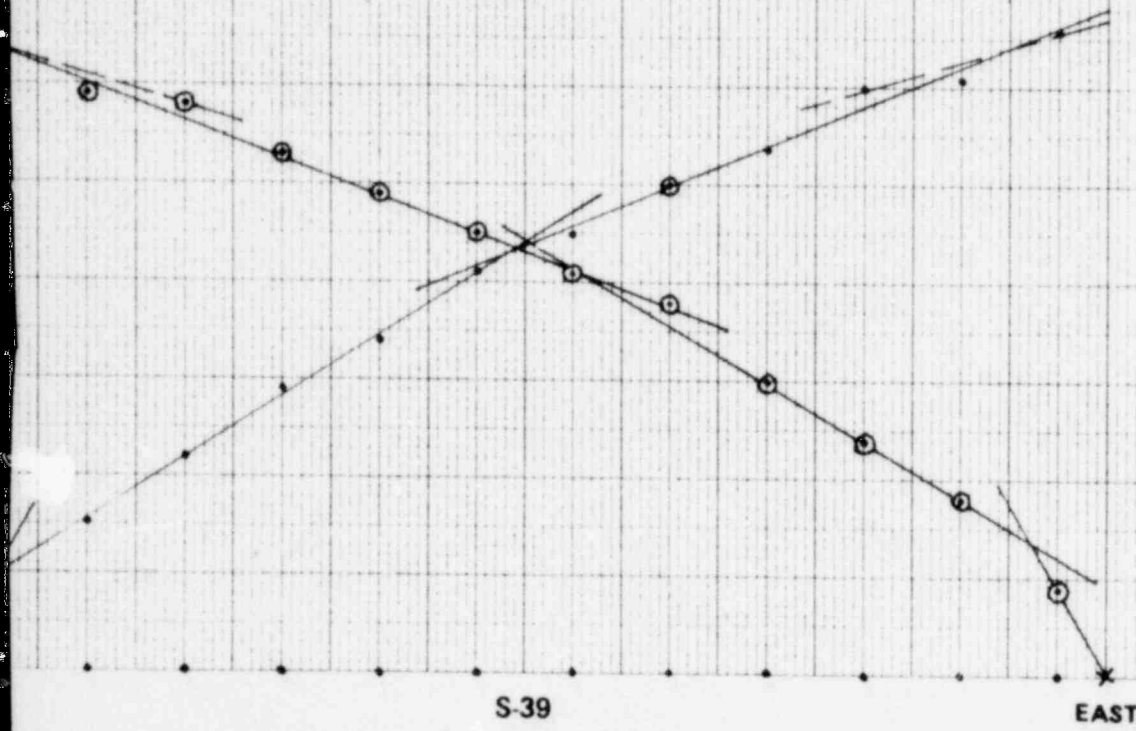




S-38  
DISTANCE IN FEET



LINES S-37, S-38 AND S-39 LOCATED ON FIGURE 1

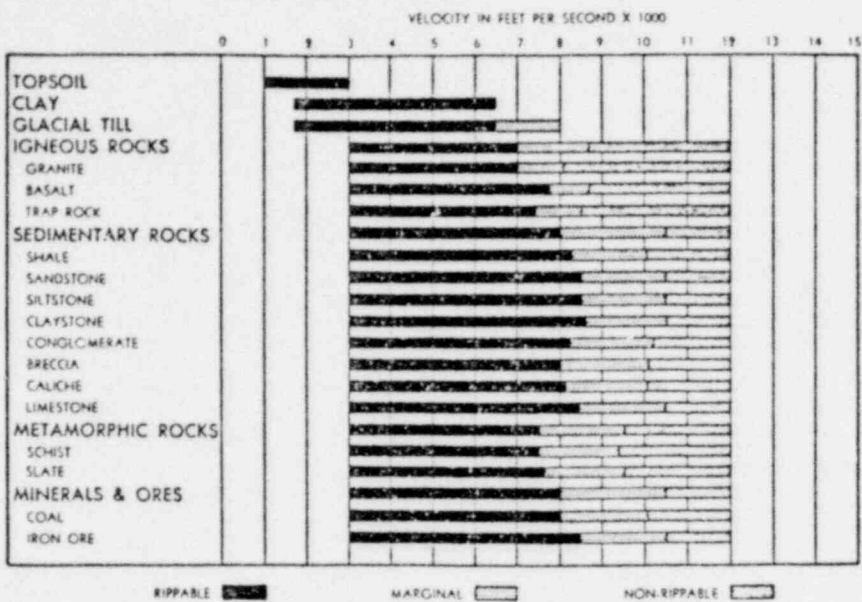


**NOTES**

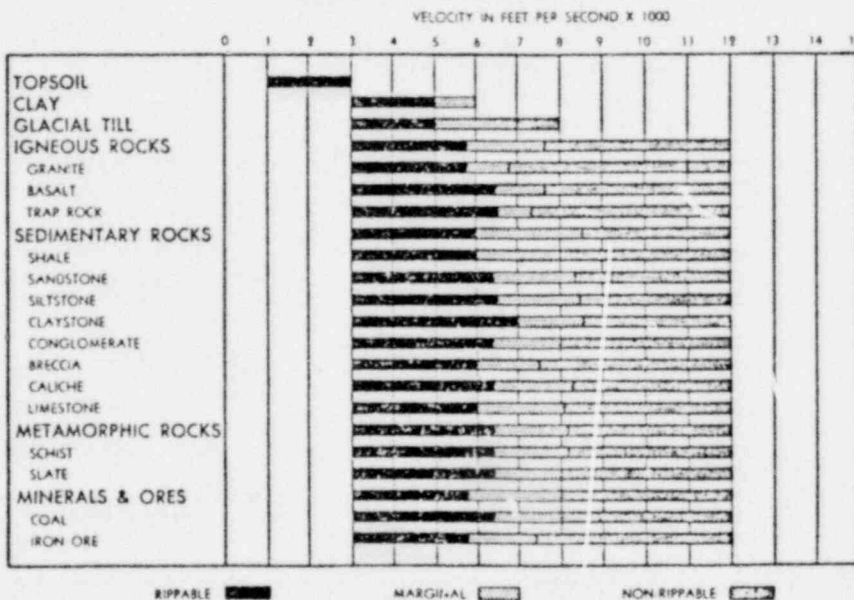
1. TIME-DISTANCE GRAPHS AT TOP OF FIGURE REPRESENT SEISMIC REFRACTION SURVEY DATA; DOTS ON BOTTOM LINE OF GRAPHS REPRESENT GEOPHONE LOCATIONS, X'S REPRESENT SHOT POINT LOCATIONS.  
 HORIZONTAL SCALE: 1" = 50 FEET  
 VERTICAL SCALE: 1" = 20 MILLISECONDS
2. SUBSURFACE VELOCITY PROFILES AT BOTTOM OF FIGURE REPRESENT INTERPRETATIONS OF SEISMIC REFRACTION DATA AND ARE INTENDED FOR DESIGN PURPOSES ONLY.  
 VERTICAL AND HORIZONTAL SCALE: 1" = 50 FEET

<b>Earth Sciences Associates</b>			
Palo Alto, California			
<b>LA POLVADERA CANYON SEISMIC REFRACTION SURVEY DATA AND INTERPRETED SUBSURFACE VELOCITY PROFILE LINES S-37, S-38, AND S-39</b>			
Checked by	<i>POS</i>	Date	<i>12/11/79</i>
Approved by	<i>WRH</i>	Date	<i>1/2/80</i>
Project No.	2143	Figure No.	17

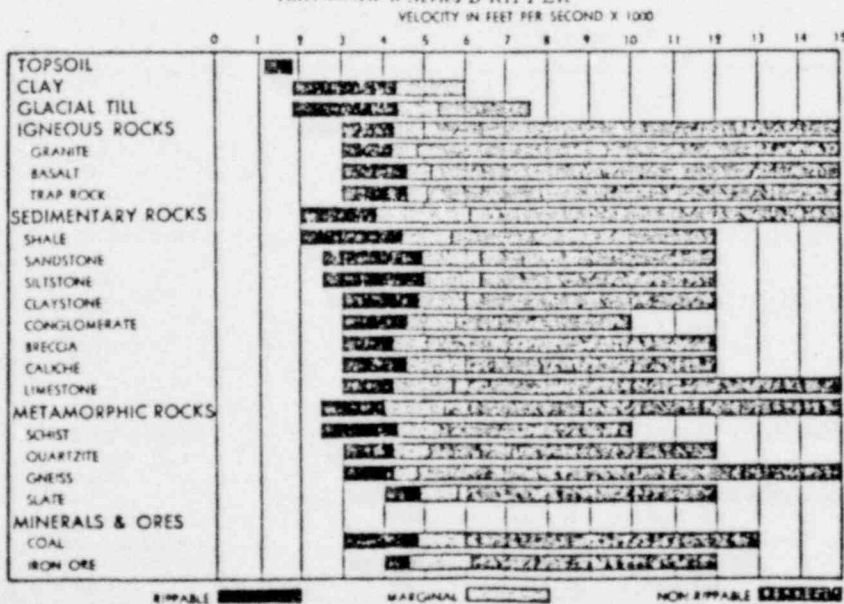
RIPPER PERFORMANCE AS RELATED TO SEISMIC WAVE VELOCITIES



D9G — No. 9 Series B RIPPER



D8H — No. 8 Series B RIPPER



D7E — No. 7 RIPPER

Figure 18

Wahler Associates



SITE AND LABORATORY REPORT  
VOLUME II - APPENDIX A

MT. TAYLOR URANIUM MILL PROJECT  
EVAPORATION POND DAM  
MILL SITE CATCHMENT DAM

GULF MINERAL RESOURCES CO.

PDR

WM - 26

11

Site and Laboratory Report  
Volume II - Appendix A

MT. TAYLOR  
URANIUM MILL PROJECT

Evaporation Pond Dam  
Mill Site Catchment Dam

San Mateo, New Mexico

Gulf Mineral Resources Co.  
a Division of Gulf Oil Corporation

February 1980

Wahler Associates  
Geotechnical Engineers

Project GUL-105A

15735

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VOLUME III - APPENDICES B AND C

**APPENDIX A**

POOR ORIGINAL

APPENDIX A  
FIELD INVESTIGATION

A. INTRODUCTION

As discussed previously, La Polvadera Canyon was the subject of previous extensive surface and subsurface exploration studies related to various alternative schemes for the disposal of mill waste. These previous investigations commenced with a Phase I site selection study and led to a Phase II Site and Laboratory Investigation program for two tailings pond sites in La Polvadera Canyon and the proposed mill site catchment dam off San Lucas Canyon. The Phase I field work was performed in May 1977 and the Phase II field work was conducted during the months of July through October 1977. The results of these investigations are contained in W. A. Wahler & Associates reports dated July 1977 and April 1978 (See References). Detailed discussions of the field investigation during these two phases is included in Appendix R of each report and is repeated here in brief form. However, all basic data developed during this previous investigation work, including auger holes, diamond core drilling, trench excavation, water injection and falling head tests in drill holes and permeameter tests in shallow borings, are included in this Appendix.

Subsequently, an alternative tailings disposal scheme consisting of multiple small tailings ponds was studied. A field exploration program was conducted from October to November 1970 and consisted of drilling, coring and water testing several drill holes. Transcriptions of drill hole logs and summaries of field permeability test results during this subsequent field investigation program are included in this Appendix.

In addition Earth Sciences Associates performed a seismic refraction survey in the proposed evaporation pond area. The results of this survey are included as Appendix C (Volume III) of this report.



## B. EXPLORATION ROTARY AND CORE HOLES

Sixty-three holes ranging from 8 feet to 190 feet were augered and/or cored in La Polvadera Canyon, as part of the Phase I and Phase II program. A total of 19 holes were cored during the investigation for multiple tailings pond sites and numbered LP-1 through LP-19.

In the mill catchment dam area below the proposed San Lucas Canyon mill site, 20 holes were drilled to evaluate dam foundation, borrow material sources, and a probable landslide area in the reservoir. The holes ranged in depth from 3 feet to 70 feet, for a total footage of 581 feet.

Coring was done with an NX (3-inch-diameter) core barrel, and augering was done with either a 6-inch continuous solid flight auger or an 8-inch hollow stem auger. Some holes were also drilled using a 3-inch-diameter tricone rock bit. The recovered cores were placed in core boxes and are stored at GMRC mine plant in San Mateo or were shipped to Wahler Associates' laboratory for testing.

Logs of exploration rotary and core holes, designated WPC and LP for holes in La Polvadera Canyon and WSL for holes at the mill catchment dam site, are included in this appendix. The locations of the La Polvadera Canyon drill holes are shown on Figure III-1 of this report (with the exception of WPC-18 which is located in San Lucas Canyon downstream of the mouth of La Polvadera Canyon). The mill catchment dam exploration holes are shown on Figure III-5.

## C. BORROW EXPLORATION AUGER HOLES

Exploration for borrow material sources in the alluvium and bedrock units within La Polvadera Canyon consisted of continuous flight and/or hollow stem auger drilling. The material was logged continuously by our engineering geologist using the Unified Soil Classification System. The holes ranged

from 6 inches to 8 inches in diameter and 9.5 feet to 75 feet in depth. Split spoon and bulk samples were obtained for classification and laboratory testing. Selected samples were shipped to Wahler Associates' laboratory in Palo Alto, California for testing.

Fourteen auger holes were drilled within the north drainage for a total footage of 435 feet, 15 auger holes in the south drainage for a total footage of 723 feet, and 5 auger holes in the downstream portion of La Polvadera Canyon for a total footage of 200 feet. Logs of the borrow auger holes (designated WB) are included in this appendix, and the hole locations are shown on Figure III-1 of the main text.

#### D. TRENCHES

Backhoe trenches were excavated in La Polvadera Canyon and the San Lucas Canyon mill catchment dam site, in order to expose subsurface materials and to provide sampling sites in both the foundation and borrow areas. Altogether, 113 trenches were excavated in La Polvadera Canyon. Sixteen trenches, numbered WT-93 through WT-108, were excavated at the mill catchment dam site. The trenches ranged in depth from 3 feet to 13 feet. Logs of trenches are included in this appendix and trench locations are shown on Figures III-1 and III-5.

#### E. WATER-INJECTION TESTS

Several water-injection tests using packers were performed at varying depths and pressures in a total of 19 rotary and core holes in La Polvadera Canyon during the Phase I and II investigations. During the multiple tailings dam investigation, 6 core holes were also water tested. Tests were performed in the various bedrock units, including the Dilco Coal Member of the Crevasse Canyon Formation and the Gallup Sandstone, underlying the proposed embankment and pond. Apparent field permeabilities were calculated using the formula:

$$K = C_p \times \frac{Q}{H}$$

where:

K is the apparent coefficient of permeability in feet/year

Q is the constant rate of flow into the hole

H is the effective water head in the test interval, and

C<sub>p</sub> is a constant dependent on the hole diameter and length of tested section

The test results are summarized later in this appendix. These data, together with the falling head test results, were used to develop apparent permeability information, which was one of the major factors used in evaluating seepage conditions in the La Polvadera Canyon area.

#### F. FALLING HEAD TESTS

Field permeability tests using the falling head method were performed in 17 of the core holes that were water-injection-tested. Those tests consisted of measuring drop in water level over selected time intervals, and were run up to periods of 24 hours or more. Permeabilities were calculated using the drop in head over time near the end of the test. These calculations used the following formula:

$$K = \frac{1}{c} \frac{Q}{rh}$$

$$Q = \pi r^2 \frac{\Delta H}{\Delta t}$$

and

Q is the flow in gallons per minute

c is the unsaturated conductivity coefficient for a particular head and hole radius

r is the radius of the hole

h is the mean head during the test, and

H is the change in head for a change in time  $\Delta t$

The results of the falling head tests are summarized later in this appendix.

G. FIELD PERMEAMETER TESTS

Eighteen in-place permeameter tests were performed in bedrock foundation materials in the La Polvadera Canyon area in order to evaluate near-surface permeability. In these tests, we used the USBR E-19 test procedure (U.S. Bureau of Reclamation, 1974). The summary of the permeameter tests is included in this Appendix. The permeameter test locations are shown on Figure III-1.

ROTARY AND CORE  
HOLE LOGS  
LA POLVADERA  
CANYON

POOR ORIGINAL

DRILL RIG	CME	HOLE ELEVATION	6,991'	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	MAY 4, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-6.0' SANDY SILT; light brown; dry.			
5			S-1	P	
	SM	6.0-24.0' SILTY SAND; light brown; loose to medium dense.	STP	D	4/2/3-1.5'
10			G-1	HSA	Contains caliche stain, 6.0-24.0'.
			S-2	P	
15			STP	D	4/9/6-1.5'
			G-2	HSA	
20			S-3	P	Pushed -4-5,000 psi
			STP	D	13/18/18-1.5'
25	CL	24.0-30.5' SANDY CLAY; brown; very stiff.	G-3	HSA	
			S-4	P	Pushed -7,500 psi
30	SM	30.5-45.5' SILTY SAND; light brown; medium dense.	STP	D	10/8/9-1.5'
			G-4	HSA	Contains carbonaceous material and caliche stain, 30.5-53.0'.
35			W-1	D	21-6"
			STP	D	13/12/11-1.5'
40			G-5		
45	SP	45.5-53.0' SAND; light brown; medium dense.	W-2	D	
			STP	D	8/10/10-1.5'
50			G-6	HSA	

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO	DATE	SHEET NO
GUL-101	JUNE 1977	1 OF 2

HOLE NO.  
WPC-1

DRILL RIG	CME	HOLE ELEVATION	6,991'	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	MAY 4, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
50	SP	SAND (continued)	G-6	HSA	
			W-3	D	10/19-1.0'
			W-4	D	7/8/10-1.5'
			STP	D	
55	SP-GP	53.0-67.0' MEDIUM SAND with SANDSTONE GRAVEL (up to 50%), medium brown, dense.			
			G-7	HSA	Sandstone fragments are subangular.
			W-5	D	30/43-1.0'
			W-6	D	26/20/23-1.5'
			STP	D	
60					
			G-8	HSA	
65	LITH.	BEDROCK CONTACT			50 blows-1/2" (refusal)
		67.0-87.3' FINE TO MEDIUM QUARTZ SANDSTONE with interbedded CARBONACEOUS SHALE.	Run No.	Recov. Adv.	Augered through bedrock; 67.0-69.0'. Started coring at 69.0'.
70				9.7 13.0	
		SANDSTONE - white to gray to red-brown banded color. SHALE - gray to black, plastic.	1	(75%)	Core segments ranged from 1/2" to 6" long.
75					
		All beds dip 25°-35° from horizontal, fractures along bedding planes.	2	2.5' 5.3' (49%)	Hole took ~10 gpm during coring.
80					
		TOTAL DEPTH = 87.3 FEET			
85		NOTE: Bedrock is Mulatto Tongue Member of Mancos Shale (?).			
90		<small>DATA ON THIS LOG IS APPROXIMATE UNLESS THE INFO WITHIN HAS BEEN OBTAINED FROM DIRECT MEASUREMENTS AND POSSIBLY DETERMINED SAMPLING INDICATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND TO CORRECT FOR ADVANCING HOLES.</small>			
95		<small>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</small>			
		<small>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO POSSIBLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</small>			
		<small>SOIL CLASSIFICATION SHOWN ON LOG AND FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</small>			
		<small>THE DETERMINATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			
100					

DRILL RIG	CME	HOLE ELEVATION	7,020'	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	MAY 5, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL to ML	0.0-15.3' SANDY, CLAYEY SILT to SANDY, SILTY CLAY; light brown; loose.	G-1	HSA	
5			S-1	P	Pushed ~2,000 psi.
			STP	D	5/3/5-1.5'
10	CL to ML	15.3-22.0' SANDY, CLAYEY SILT to SANDY, SILTY CLAY; light brown; plastic; very stiff.	G-2	HSA	
15			S-2	P	Pushed ~3,000 psi.
			STP	D	12/13/16-1.5' (down hole hammer)
20	ML	22.0-36.0' SANDY SILT with gravel; light to medium brown; medium dense.	G-3	HSA	
25			S-3	P	
			STP	D	17/12/12-1.5' (down hole hammer)
30	ML	22.0-36.0' SANDY SILT with gravel; light to medium brown; medium dense.	G-4	HSA	
35			S-4	P	
			STP	D	16/17/20-1.5' (down hole hammer)
40	CL	36.0-46.0' SILTY, SANDY CLAY; medium brown; damp; plastic; hard.	S-5	P	Pushed ~6,000 psi.
			W-1	D	50-6"
			STP	D	38/39/41-1.5'
45	ML	46.0-53.5' CLAYEY, SANDY SILT; red-brown; damp; slightly plastic; hard.	G-5	HSA	Contains caliche mottles 36.0-53.5'.
			G-6	HSA	
			W-2	D	50-6"
50	ML	46.0-53.5' CLAYEY, SANDY SILT; red-brown; damp; slightly plastic; hard.	STP	D	34/50-1.0' (down hole hammer)
			G-7	HSA	

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& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.

DATE

SHEET NO.

GUL-101

JUNE 1977

1 OF 2

HOLE  
NO.

WPC-2



DRILL RIG GROUNDWATER DEPTH (BELOW GROUND SURFACE)	CME DRY HOLE	HOLE ELEVATION 7,020' HOLE DIAMETER 7-3/4" NX	LOGGED BY MPF DATE DRILLED MAY 5, 1977
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NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
50	ML	CLAYEY, SANDY SILT (continued)	G-7	HSA	
	LITH.	BEDROCK CONTACT	W-3	D	50-6"
55		53.5-60.0' WEATHERED QUARTZ SANDSTONE; white to tan to red; medium to fine-grained sand; contains gypsum flakes.	STP	D	36/50-6"/3" (refusal)
			G-8	HSA	Augered through weathered bedrock; 53.5-60.0'.
60		60.0-78.2' SANDY, SILTY SHALE with interbedded CLAY-SHALE; gray-black-tan banded color; contains carbonaceous material and thin sandstone stringers; beds dip 10° from horizontal; fractures along bedding and at approximately 45°; contains gypsum crystals in fractures and along bedding.	Run No.	Recov. Adv.	Started coring at 60.0'.
			1	2.5' 2.9' (86%)	
65			2	4.4' 4.4' (100%)	Core segments ranged from 1/4" to 22" long.
70			3	9.3' 10.9' (85%)	
80		TOTAL DEPTH = 78.2 FEET NOTE: Bedrock is the Mulatto Tongue Member of the Mancos Shale.			
85		<small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM SUBJECT LOGGERS AND POSSIBLY DISTURBED SAMPLES. RECONSTITUTED BY USE OF SMALL DIAMETER HOLES. ROTARY AND PUMP BORING HOLES HAVE FURTHER COMPLICATING BY THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES. THIS LOG INDICATES CONDITIONS IN THE HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION. MML CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			
66					
68					
70					

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MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE NO.  
WPC-2

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO. GUL-101	DATE JUNE 1977	SHEET NO. 2 OF 2
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DRILL RIG	CME	HOLE ELEVATION	7,031'	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	MAY 7, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL to ML	0.0-~22.0' SILTY CLAY to SANDY, CLAYEY SILT; light brown; very stiff to medium dense.	G-1	HSA	
5			S-1	P	Pushed ~3,000 psi
			STP	D	4/7/7-1.5'
10			G-2	HSA	Contains caliche mottling, 0.0- -22.0'.
			S-2	P	
15			STP	D	9/11/12-1.5'
			G-3	HSA	
20			S-3	P	
	CL	-22.0-37.3' SILTY CLAY; light to medium brown; plastic; hard.	STP	D	12/15/18-1.5'
25			G-4	HSA	
			S-4	P	Pushed ~5,000 psi
30			W-1	D	16/58-1.0'
			STP	D	20/21/40-1.5'
			G-5	HSA	Contains carbonaceous material; 31.0-37.3'.
35					
	SM	37.3-45.0' CLAYEY, SILTY SAND; light brown; dense; contains subangular sand- stone fragments.	W-2	D	50-6"
40			STP	D	31/30/20-1.5'
			G-6	HSA	Contains caliche mottling; 37.3- 45.0'.
45			W-3	D	50-6"
			STP	D	50-6" (Refusal)
		Continued on next page			
		BEDROCK CONTACT			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE  
NO.

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO

DATE

SHEET NO

GUL-101

JUNE 1977

1 OF 2

WPC-3

DRILL RIG	CME	HOLE ELEVATION	7,031'	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	MAY 7, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS. LITH.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
45		45.0-49.0' WEATHERED SAND- STONE; light brown to medium red.			Augered through bed- rock; 45.0-49.0'. Contains fragments up to 1" diameter.
50		49.0-55.5' SILTY SANDSTONE with shale beds up to 3" thick; tan-white-gray banded; wavy bedding; con- tains gypsum along bedding planes.	1	9.5' 9.5' (100%)	Started coring at 49.0'. Core segments ranged from 1" to 12" long.
55		55.5-58.5' SANDY SHALE; tan and gray banded color; wavy bedding.			
60		58.5-66.5' SHALEY SILTSTONE; light to dark gray banded color; wavy bedding; beds range from 1/2" to 1" thick.	2	8.0' 8.0' (100%)	
65		TOTAL DEPTH = 66.5 FEET			
70		NOTE: Bedrock is Mulatto Tongue Member of the Mancos Shale.			
		<p>DATE ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE ONLY WATER WAS OBTAINED FROM SHALLOW TEST COLUMNS AND POSSIBLY UNTIMED SAMPLES. UNLIMITED BY USE OF SMALL DIAMETER HOLES. SOIL AND SAND BORING HOLES HAVE FURTHER COMPLE- CATING IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN PART AT LEAST TO PROVIDE PROVISIONAL DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNSATURATED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIGRAPHIC UNITS REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-3
		PROJECT NO. GUL-101	DATE JUNE 1977	SHEET NO. 2 of 2	
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DRILL RIG		CME	HOLE ELEVATION	7,053'	LOGGED BY	JMB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)		DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED MAY 8, 1977	
NOTE: Drilled by Engineering Testing Laboratories.						
ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS	
0	CL	0.0-16.1' CLAY; yellow-brown; very stiff; horizontal bedding; slightly calcareous.	G-1	HSA	Contains organic material; 0.0-13.0'.	
5			S-1	P		
			STP	D	7/10/11-1.5'	
10			G-2	HSA	Contains sand; 13.0-16.1'.	
			S-2	P		
15	LITH.	BEDROCK CONTACT	STP	D	8/13/53-1.5' (Refusal)	
		16.1-40.1' SANDSTONE; light gray; fine grain; poorly cemented; slightly calcareous; bedding dips approximately 10°; contains few shale beds 1-4" thick.	G-3	HSA	Augered through bedrock; 16.1-20.0'.	
20			Run No.	Recov. Adv.	Started coring at 20.0'.	
25			1	8.9' 10.0' (89%)	Core segments range from 2" to 6" long.	
30					No recovery; 30.0-40.1'; water pressure washed sand away.	
35			2			
40		TOTAL DEPTH = 40.1 FEET				
45		NOTE: Bedrock is Gallup Sandstone.				
W.A. WAHLER & ASSOCIATES		MT. TAYLOR URANIUM MILL PROJECT		SOIL EXPLORATION DRILL HOLE LOG		HOLE NO. WPC-4
PALO ALTO • NEWPORT BEACH • CALIF.		PROJECT NO.	DATE	SHEET NO.		
		GUL-101	JUNE 1977	1 OF 1		

DRILL RIG	CME	HOLE ELEVATION	7,068'	LOGGED BY	JMB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	MAY 8, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-13.0' CLAY; orange to brown; very stiff; slightly calcareous.	G-1	HSA	Contains shale and sandstone fragments; 0.0-13.0'.
5			S-1	P	Pushed ~5,000 psi
			STP	D	10/9/9-1.5'
10			G-2	HSA	
					20+blows-1.5" (Refusal) (Ring Sampler)
	LITH.	BEDROCK CONTACT			
15		13.0-37.4' SANDSTONE; white; fine grain; poorly cemented	G-3 Run No.	HSA Recov Adv.	Started coring at 15.0'. No recovery; driller put in new core retainer spring.
			1		
20			2	4.5' 5.4' (83%)	
25					
					Coring rate = 1 min/ft. from 25.8-37.4'.
30			3	7.9' 11.6' (68%)	Core segments ranged from 1/4" to 3" long
35					
40		TOTAL DEPTH = 37.4 FEET  NOTE: Bedrock is Gallup Sandstone.  <small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM SUBJECT OBSERVERS AND POSSIBLY DIFFERED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES. THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND NOT NECESSARILY CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO FURNISH PROVED DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION. HOLE CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED HOLE CLASSIFICATION SYSTEM. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN HOLE TYPES AND THE CLASSIFICATION MAY BE USUAL.</small>			

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	JUNE 1977	1 of 1

HOLE NO.  
WPC-5

DRILL RIG	CME	HOLE ELEVATION	7,050'	LOGGED BY	JMB
GROUNDWATER DEPTH (REL. TO GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	MAY 9, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL to SC	0.0-35.3' SANDY CLAY to CLAYEY SAND; light brown; very stiff; calcareous; shows horizontal bedding.	G-1	HSA	
5			S-1	P	
			W-1	D	9/23-1.0'
			W-2	D	6/12/13-1.5'
			STP	D	
10			G-2	HSA	
			W-3	D	12/17-1.0'
			W-4	D	4/12/10-1.5'
			STP	D	(upper 6" is slough)
15			G-3	HSA	
			W-5	D	10/23-1.0'
			W-6	D	11/11/13-1.5'
			STP	D	
20			G-4	HSA	
			W-7	D	15/23/1.0'
			W-8	D	13/17/13-1.5'
			STP	D	
25			G-5	HSA	
			W-9	D	23/30-6"/3";
			W-10	D	29/47-1.0 (Refusal)
	STP	D	(Bedrock was not cored)		
30					
35					
40					

DATA ON THIS LOG IS APPROXIMATE ONLY. BECAUSE THE SOIL  
MATRIX WAS OBTAINED FROM INCREASING DIAMETERS AND POSSIBLY  
DISTURBED SAMPLING, NECESSITATED BY USE OF SMALL DIAMETER  
HOLES. ROTARY AND PUMP DOWN HOLES HAVE FURTHER COMPLICATED  
CUTTING IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING  
FLUID AND IN CASES OF ADVANCED HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE  
DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER  
LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE  
DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES  
OF SPECIFIC CONTRACTORS.

SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS  
BASED ON IMPROVED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY  
BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BEDROCK CONTACT

35.3-36.25' INTERBEDDED  
SANDSTONE, SILTSTONE, and  
SHALE (1/4" to 1" thick);  
dark to light brown;  
fractures contain gypsum.

TOTAL DEPTH = 36.25 FEET

NOTE: Bedrock is Mulatto  
Tongue Member of  
Mancos Shale.

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-6
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	JUNE 1977	1 of 1	

DRILL RIG	CME	HOLE ELEVATION	7,034'	LOGGED BY	JMB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	MAY 9, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SM to SC	0.0-34.0' <u>SILTY SAND</u> to <u>CLAYEY SAND</u> ; light brown; medium dense.	G-1	HSA	Contains organic matter and sandstone fragments; 0.0-5.5'.
5			S-1	P	
			STP	D	6/5/6-1.5'
10			G-2	HSA	
			S-2	P	
15			STP	D	6/7/7-1.5'
			G-3	HSA	Contains gravel; 21.8-22.5'.
20			W-1	D	6/10-1.0'
			W-2	D	3/7/10-1.5'
			STP	D	
25	ML	34.0-58.0' <u>SANDY SILT</u> to <u>CLAYEY SILT</u> ; light brown; medium dense.	G-4	HSA	Calcareous; 22.5- 34.0'.
			W-3	D	11/16-1.0'
			W-4	D	5/12/9-1.5'
30			STP	D	
			G-5	HSA	
35			W-5	D	15/10-1.0'
			W-6	D	17/10/15-1.5'
			STP	D	
40			G-6	HSA	Slightly calcareous 34.0-38.0'.
			W-7	D	17/19-1.0'
	W-8	D	19/15/13-1.5'		
45	STP	D			
50	G-7	HSA	Contains gypsum; 38.0-58.0'.		

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.

GUL-101

DATE

JUNE 1977

SHEET NO.

1 OF 2

HOLE  
NO  
WPC-7

DRILL RIG	CME	HOLE ELEVATION	7,034'	LOGGED BY	JMB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	MAY 9, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
50	ML	SANDY SILT to CLAYEY SILT (continued)	W-9	D	14/18-1.0'
			W-10	D	15/15/15-1.5'
			STP	D	
55			G-8	HSA	
60	GC	58.0-65.5' GRAVEL, SAND, and CLAY; white with orange mottles; gravel is rounded to angular.	W-11	D	24/30-1.0'
			W-12	D	40/30/30-1.5'
			STP	D	
			G-9	HSA	Contains gypsum and calcite; 58.0-65.5'.
65	LITH.	BEDROCK CONTACT			
70	LITH.	65.5-75.5' WEATHERED SAND- STONE and SHALE (weathered to clay); yellow-brown with Fe stain; hard.	W-13	D	34/16-6"/1"
			STP	D	30/31/34-1.5'
			G-10	HSA	Augered through weathered bedrock; 65.5-75.5'.
			STP	D	32/27/34-1.5' (Saved sample)
75	LITH.	75.5-90.0' INTERBEDDED SILT- STONE, SANDSTONE, and SHALE; tan-yellow, brown- gray banded color; cross- bedded; contains gypsum along fractures and bedding planes.	W-14	D	50 blows-5" (Refusal)
			Run No.	Recov. Adv.	4.5'
			1	4.5' (100%)	
80					
85			2		9.5' 10.0' (95%)
90		TOTAL DEPTH = 90.0 FEET			
95		NOTE: Bedrock is Mulatto Tongue Member of Mancos Shale.			
		SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNFROZEN SOIL CLASSIFICATION SYSTEM. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-7
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	JUNE 1977	2 of 2	



DRILL RIG	CME	HOLE ELEVATION	7,060'	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	MAY 16, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-~6.0' <u>SANDY, SILTY CLAY</u> ; light brown; fluffy.	G-1	HSA	
5			S-1	P	Pushed -3,000 psi
	SM	~6.0-21.0' <u>SILTY SAND</u> ; light brown; medium dense; contains carbonaceous material and caliche mottles.	STP	D	6/5/5-1.5'
10			G-2	HSA	
			S-2	P	Pushed -6,000 psi
15			STP	D	4/5/7-1.5'
20	LITH.	BEDROCK CONTACT	G-3	HSA	
			W-1	D	50 blows-4" (Refusal)
25			Run No.	Recov. Adv.	Started coring at 24.5'.
		21.0-40.0' <u>SILTY SANDSTONE</u> ; white to tan; poorly cemented; fine to medium grain; contains wavy shale partings.	1	5.5' 5.5' (100%)	Sandstone contains Fe and Mg circular concretions 1/4" to 1" diameter.
30			2	5.5' 10.0' (55%)	Core segments ranged from 1" to 6" long.
35					No recovery; 35.5- 45.0'; rock washed away in drill water
40			3		
45		TOTAL DEPTH = 45.0 FEET			
		NOTE: Bedrock is Gallup Sandstone.			

DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO  
OBTAINED WAS OBTAINED FROM DIRECT OBSERVATION AND POSSIBLY  
OBTAINED SAMPLES RECORDED BY USE OF SMALL DIAMETER  
HOLES. ROTARY AND RAM BORING HOLES HAVE FURTHER COMPLEX  
FACTORS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING  
FLUID AND OR CASING IN ADVANCED HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE  
DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER  
LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROBABLY PROVIDE  
DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES  
OF SPECIFIC CONSTRUCTORS.

SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS  
BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY  
BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-8
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	JUNE 1977	1 OF 1	

DRILL RIG	CME	HOLE ELEVATION	7,086'	LOGGED BY	JMB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	MAY 11, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL to SC	0.0-20.0' SANDY CLAY to CLAYEY SAND; light brown; slightly plastic to plastic; very stiff to medium dense.	G-1	HSA	Contains gypsum and weathered sandstone fragments; 0.0- 10.0'.
5			S-1	P	Pushed ~6,000 psi
			STP	D	16/24/26-1.5'
10			G-2	HSA	
			G-3		Slightly calcareous 10.0-20.0'.
			S-2	P	Pushed 6,000 psi
15			STP	D	4/7/7-1.5'
			G-4	HSA	
20		BEDROCK CONTACT			
		20.0-20.5' SHALE; black; weathered; contains gypsum and sandstone lenses.	W-1	D	50 blows-4" (Refusal) (Bedrock was not cored)
25		TOTAL DEPTH = 20.5 FEET			
		NOTE: Bedrock is Dilco Coal Member of Crevasse Canyon Formation.			
		<small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT INDICATORS AND POSSIBLY OBTAINED SAMPLES NECESSITATED BY USE OF SMALL DIAMETER HOLES. BITTET AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</small>			
		<small>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</small>			
		<small>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROBABLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</small>			
		<small>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</small>			
		<small>THE STRATIFICATION LINES DEPICTED ON THIS LOG REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			
40					

DRILL RIG	CME	HOLE ELEVATION	7,095'	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	MAY 17, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-28.0' SANDY CLAY to SILTY CLAY; light brown; plastic; stiff to very stiff; contains caliche mottles.	G-1	HSA	
5			S-1	P	
			STP	D	7/7/8-1.5'
10			G-2	HSA	
15			S-2	P	
			STP	D	7/8/8-1.5'
20			G-3	HSA	
			S-3	P	
			STP	D	8/8/10-1.5'
25			G-4	HSA	
30	GP	28.0-40.7' SANDSTONE GRAVEL; weathered; light brown; fine to medium grain.	W-1	D	18/17-1.0'
			W-2	D	
			STP	D	8/12/13-1.5'
35					Sandstone fragments recovered ranged from 1/8" to 1/4" diameter.
		<small>DATA ON THIS LOG IS APPROXIMATE ONLY SINCE THE SOIL METER WAS OBTAINED FROM DIRECTLY UNDERGROUND AND POSSIBLY DISTURBED SAMPLES. UNLESS STATED BY ONE OF SMALL DIAMETER HOLES, SOILS AND SAND BORING HOLES HAVE FURTHER COMPLICATIONS IN THE REWARD SECTION OF THE HOLE TO USE DRILLING FLUID AND IN CASES OF ADVANCED HOLES.</small> <small>THE LOG INDICATES CONDITIONS IN THE HOLE ONLY IN THE CASES INDICATED AND NOT ANY REPRESENTATION OF OTHER LOCATIONS AND IN OTHER STATES.</small> <small>THE HOLE WAS LOGGED IN SUCH A MANNER TO PROBABLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</small> <small>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON LIMITED SOIL CLASSIFICATION TESTS.</small> <small>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>	G-5	HSA	
40		BEDROCK CONTACT	STP	D	14/50-6"/2" (Refusal) (Bedrock was not cored.)
		40.7-42.0' SANDSTONE.			
		TOTAL DEPTH = 42.0 FEET			
45		NOTE: Bedrock is Dilco Coal Member of Crevasse Canyon Formation.			



DRILL RIG	CME	HOLE ELEVATION	7,132'	LOGGED BY	MPF-DS
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	MAY 18, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SM	0.0-15.3' <u>SILTY SAND</u> ; light brown; medium dense.	G-1	HSA	
5			S-1	P	Pushed -2,500 psi
			STP	D	7/8/8-1.5'
10			G-2	HSA	Contains plastic clay; 6.0-7.0'.
			S-2	P	Pushed 3,000 psi
15	CL	15.3-21.0' <u>SANDY CLAY</u> ; red-brown; plastic; hard.	STP	D	8/14/17-1.5'
			G-3	HSA	
20	LITH.	BEDROCK CONTACT	W-1	D	33/17-6"/1"
			STP	D	50 Blows-6" (Refusal)
25		21.0-30.0' <u>WEATHERED, SILTY SANDSTONE</u> ; light brown to red to white; recovered as subrounded fragments.	G-4	HSA	Augered through weathered bedrock; 21.0-30.0'.
30			Run No.	Recov. Adv.	Started coring at 30.0'.
		30.0-47.6' <u>INTERBEDDED SHALE, SANDSTONE, AND SANDY SHALE</u> ; black-gray-white banded color; horizontal bedding; contains 6" coal bed (33.0-33.5').	1	1.3' 1.3' (100%)	
35			2	8.2' 8.8' (93%)	
40		<small>DATA ON THIS LOG IS APPROPRIATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM DIRECTLY OBSERVABLE AND POSSIBLY OBTAINED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND PAUL BUREAU HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUIDS AND TO CLING TO ADVANCING HOLES.</small>			
		<small>THIS LOG INDICATES CONDITIONS IN THE HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER PLACES OR ON OTHER DATES.</small>			
		<small>THIS LOG WAS LOGGED BY SUCH A WAY AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF THE CONTRACTOR.</small>			
		<small>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNPAID SOIL CLASSIFICATION SYSTEM.</small>			
		<small>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			
45		NOTE: Bedrock is Dilco Coal Member of Crevasse Canyon Formation.	3	7.6' 7.6' (100%)	
50		TOTAL DEPTH = 47.6 FEET			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WPC-12
		DRILL HOLE LOG			
		PROJECT NO.	DATE	SHEET NO.	
PALO ALTO • NEWPORT BEACH • CALIF.		GUL-101	JUNE 1977	1 OF 1	

DRILL RIG	CME	HOLE ELEVATION	7,132'	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	MAY 19, 1977

NOTES: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	GM	0.0-4.0' <u>SILTY SAND</u> with <u>SANDSTONE AND SILTSTONE</u> <u>ROCK FRAGMENTS</u> up to 1/2" diameter.	G-1 Run No.	HSA Recov. Adv.	(Probably weathered bedrock residuum; 0.0-4.0'). Started coring at 4.0'.
5	LITH	4.0-27.5' <u>INTERBEDDED SANDSTONE AND SANDY SILTSTONE</u> with <u>THIN SHALE</u> partings; tan-yellow-gray-black banded color; wavy bedding; shale partings up to 1/4" thick-plastic; fractures along shale partings.	1	9.2' 10.5' (88%)	Core segments range from 1/2" to 2.0" long.
15					Thin black shale bed; 15.4-19.0'.
20			2	10.2' 10.2' (100%)	
25					
30		27.5-45.0' <u>SANDSTONE</u> with <u>CARBONACEOUS SHALE</u> partings; white to tan; wavy bedding; fine to medium grain; poorly cemented; fractures along shale partings.	3	10.2' 10.2' (100%)	Core segments range from 1" to 1.7' long
35					
40		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE WATER SAMPLES OBTAINED FROM BENEATH DISCONTINUES AND POSSIBLY UNFINISHED SAMPLING INDICATED BY USE OF SMALL DIAMETER HOLES. NOTARY AND WASH BOREING HOLES HAVE FURTHER CONFIRMATION IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND TO CARE IN ADVANCEING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNFINISHED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIGRAPHIC LITHO REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>	4	10.2' 10.2' (100%)	Fractures show Fe stain; 27.5-45.0'.
45		TOTAL DEPTH = 45.0 FEET NOTE: Bedrock is Dilco Coal Member of Crevasse Canyon Formation.			
50					

DRILL RIG	CME	HOLE ELEVATION	7,110'	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	MAY 19, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-8.0' <u>CLAYEY SAND</u> ; tan; loose to medium dense; contains caliche mottling.	G-1	HSA	
5			S-1	P	
	LITH.	BEDROCK CONTACT	STP	D	5/5/6-1.5'
10		8.0-35.0' <u>SANDSTONE</u> ; white to light gray; massive bedding; poorly cemented; fine to medium grain; fractures along horizontal planes, some fractures contain clay.	G-2	HSA	Augered through bed- rock; 8.0-14.0'.
15			Run No.	Recov. Adv.	Started coring at 14.0'.
20			1	6.0' 10.7' (56%)	Core segments range from 1" to 7" long.
25					
30			2	9.5' 10.3' (92%)	
35		TOTAL DEPTH = 35.0 FEET			
40		NOTE: Bedrock is Gallup Sandstone.			
		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SPORADIC NATION HAS OBTAINED FROM INDISCREET DISCONTINUOUS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. SOFT AND FIRM BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE BALLS FILLED AND OR CLASS IN ADVANCE HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PRESERVE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.

GUL-101

DATE

JUNE 1977

SHEET NO.

1 OF 1

HOLE  
NO.

WPC-14

DRILL RIG	CME	HOLE ELEVATION	7,140'	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	MAY 20, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-12.0' CLAY; light to medium brown; very plastic; stiff to very stiff.	G-1	HSA	
5			W-1	D	50-6"
			STP	D	21/15/13-1.5'
10	ML	12.0-22.5' SANDY, CLAYEY SILT; light brown; slightly sticky; medium dense; contains caliche mottles.	G-2	HSA	
15			W-2	D	9/15-1.0'
			W-3	D	7/8/7-1.5'
			STP	D	
20	LITH.	BEDROCK CONTACT	G-3	HSA	
			W-4	D	9/12-1.0'
			W-5	D	4/4/23-1.5'
			STP	D	
25	LITH.	22.5-50.0' SANDSTONE; white to tan; fine to medium grain; poorly cemented; massive bedding; breaks along horizontal planes and at 45°.	G-4	HSA	Augered through bedrock; 22.5-30.0'.
30			Run No.	Recov. Adv.	Started coring at 30.0'.
				4.3'	
				10.0'	
				(43%)	
35			1		Core segments range from 1" to 11" long.
40					
45			2		Shows Fe stain in bottom 3.0'.
			7.8'		
			10.0'		
			(78%)		
50					

DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SAMPLES WERE OBTAINED FROM DIRECT OBSERVATION AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OF CASING IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PERMANENTLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.

SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

NOTE: Bedrock is Gallup Sandstone.

TOTAL DEPTH = 50.0 FEET

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	JUNE 1977	1 of 1

HOLE NO.  
WPC-15



DRILL RIG	CME	HOLE ELEVATION	7,120'	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	MAY 20, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML LITH	0.0-2.0' CLAYEY, SANDY SILT; light brown; slightly plastic.	G-1	HSA	Contains siltstone fragments up to 2" diameter.
5		BEDROCK CONTACT 2.0-54.0' INTERBEDDED SANDY SILTSTONE AND WEATHERED SHALES;	G-2	HSA	Augered through weathered bedrock; 2.0-9.0'.
10			W-1 W-2	D D	86 blows-1.0' (Refusal)
15		SANDY SILTSTONE - orange- tan-yellow banded color; wavy bedding; beds dip -10°-20° east; contains gypsum along bedding fractures.	Run No. 1	Recov. Adv. 6.0' 9.0' (67%)	Started coring at 9.0'.
20		WEATHERED SHALE - dark brown to gray; plastic; beds are less than 6" thick; contains gypsum in fractures.	2	7.3' 9.0' (81%)	Core segments range from small broken pieces to 6" long.
25					
30			3	6.8' 7.1' (96%)	Coring required -300 gallons for 10.0' run.
35					
40			4	6.1' 7.7' (79%)	
45		NOTE: Shale beds are very weathered and come out of hole as clay slake coating on more com- petent siltstone core. Bedrock is Mulatto Tongue Member of Mancos Shale.	5	3.3' 6.2' (53%)	
50			6	5.8' 5.9'	

W A WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE  
NO.  
WPC-16

PAID ALTO • NEWPORT BEACH • CALIF

PROJECT NO  
GUL-101

DATE  
JUNE 1977

SHEET NO  
1 of 2

DRILL RIG	CME	HOLE ELEVATION	7,120'	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	MAY 20, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
50		INTERBEDDED SANDY SILTSTONE AND WEATHERED SHALE-- (continued)	6	5.8' 5.9' (98%)	
55		TOTAL DEPTH = 54.0 FEET  <small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SAMPLE MATERIAL WAS OBTAINED FROM DIRECTLY UNDERGROUND AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND HAND BORING HOLES GIVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.  THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.  THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.  NCE CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.  THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			

DRILL RIG	CME	HOLE ELEVATION	7,050'	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	MAY 22, 1977

NOTE: Drilled by Engineering Testing Laboratories.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SM	0.0-13.0' <u>SILTY SAND</u> ; light brown; dense to very dense.	G-1	HSA	
5			W-1	D	32/18-6"/2"
			W-2	D	
			STP	D	40/50-1.0'
10			G-2	HSA	
	LITH.	BEDROCK CONTACT			Contains weathered siltstone fragments; 1/8" to 1/2" diameter; 10.0-13.0'. Augered 2.0' of bedrock. Started coring at 15.0'.
15		13.0-49.1' <u>INTERBEDDED SANDY SILTSTONE AND WEATHERED SHALE</u> ;	Run No.	Recov. Adv.	
20		<u>SANDY SILTSTONE</u> - orange tan-yellow banded color; wavy bedding; beds dip -10°-20° east; contains gypsum along bedding fractures.	1	6.8' 7.0' (97%)	
25		<u>WEATHERED SHALE</u> - dark brown to gray; plastic; contains gypsum in fractures.	2	6.2' 8.9' (70%)	Core segments range from small broken pieces to 6" long.
30					
35			3	8.8' 10.1' (87%)	Coring required ~300 gallons for 10.0' run.
40					
45			4	6.6' 8.2' (80%)	
50		TOTAL DEPTH = 49.1 FEET			

DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDICENT AND POSSIBLY UNIFORMED SAMPLING INDICATED BY USE OF SMALL DIAMETER HOLES. BOREHOLE AND PUMP BOREHOLE HOLES HAVE FURTHER COMPLICATING IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.

SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

NOTE: Bedrock is Mulatto Tongue Member of Mancos Shale

W A WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

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SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.

DATE

SHEET NO.

GUL-101

JUNE 1977

1 OF 1

HOLE NO.

WPC-17

DRILL RIG	CME	HOLE ELEVATION	7,100'	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	MAY 22, 1977

NOTE: Drilled by Engineering Testing Laboratories. Hole located in San Lucas Canyon.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS	
0	ML to SM	0.0-16.0' SANDY SILT TO SILTY SAND; light to medium brown; slightly sticky; medium dense; fine to medium grain.	G-1	HSA	Large bag samples taken; 0.0-10.0', 10.0-20.0', 20.0-30.0'.  6/7/8-1.5'	
5			STP	D		
			G-1 (continued)	HSA		
10			STP	D		6/6/10-1.5'
			G-2	HSA		
15	ML to GC	16.0-30.0' STRATIFIED SANDY SILT ALLUVIUM with basalt float; yellow-brown; partially weathered to clay; slightly plastic; horizontal bedding; dense to very dense.	STP	D	14/19/18-1.5'	
			G-2 (continued)	HSA		
20			STP	D	14/32/50-1.5'	
			G-3	HSA		
25			STP	D	9/14/20-1.5'	
30		TOTAL DEPTH = 30.0 FEET	G-3 (continued)	HSA		
35						

DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE WATER SAMPLES OBTAINED FROM SUCH SMALL DIAMETER HOLES (ROTARY AND WASH BOREHOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUIDS AND OR CASING IN ADVANCED HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

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THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,082' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED JULY 11-15, 1977

NOTE: Hole located in center of channel, channel leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-2.0' <u>CLAYEY SILT</u> ; gray brown; slightly plastic.		HSA	
2	ML	2.0-5.0' <u>SANDY SILT</u> ; light brown; loose; contains fine sand.			
6	SM	5.0-20.0' <u>SILTY SAND</u> ; fine sand; light brown; loose.			
15.0-60.0'		Damp from 15.0-60.0'.			

W A WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-19
		PROJECT NO. GUL-101	DATE SEPT. 1977	SHEET NO. 1 of 6	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,082' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED JULY 11-15, 1977

NOTE: Hole located in center of channel, channel leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20	SM- ML	20.0-36.0' <u>C.LAYEY, SILTY SAND</u> ; brown; slightly plastic; damp.		HSA	
22					
24					
26					
28					
30					
32					
34					
36					
38					
40					
	SM	36.0-45.0' <u>SILTY SAND</u> ; gravelly; brown; slightly sticky; contains sub-angular gravel consisting of sandstone and quartz.			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

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SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO	DATE	SHEET NO
GUL-101	SEPT, 1977	2 of 6

HOLE  
NO.

WPC-19

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,082' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 11-15, 1977

NOTE: Hole located in center of channel, channel leg, dam axis 6A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40	SM	36.0-45.0' SILTY SAND-- (continued)		HSA	
42					
44					
46	SM- SC	45.0-52.0' CLAYEY, SILTY SAND; gravelly; gray- brown; slightly plastic.	STP	D	4/5/7 - 1.5'
48					
50					
52	SC- CL	52.0-60.0' CLAYEY SAND to SANDY CLAY; light brown with Fe-stain; plastic; contains sandstone gravel up to 1" diameter.			Drilling became more difficult at -52.0'.
54			STP	D	5/10/11 - 1.5'
56					
58					
60					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,082' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 11-15, 1977

NOTE: Hole located in center of channel, channel leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60		BEDROCK CONTACT	STP	D	50 - 1.5' (Refusal)
62		60.0-64.7' WEATHERED SAND- STONE; light gray with Fe-stain; poorly cemented; contains fine to medium grained sand.			
64			Run No.	Recev Adv.	Drilled hollow stem auger to 64.0'. Started NX coring at 64.7'.
66		64.7-67.7' SANDSTONE; gray with yellow mottles and Fe-stain along bedding; weakly cemented; massive to poorly bedded; recovered solid core ranging from 2-10" long; probably Gallup Sandstone boulder or ledge in buried channel.	1	3.0 3.0 (100%)	No water return from 64.7-67.7'. Took approximately 400 gallons.
68		67.7-78.0' SANDSTONE (cuttings); yellow to tan sand re- covered in slurry form; bottom 0.5' weakly cemented gray sandstone; probably severely weathered Gallup Sandstone or alluvium.		3.5 10.3 (34%)	Complete water loss from 67.7-72.0'. Regain partial water return at 72'.
72			2		
74					
76					
78					
80		78.0-97.8' MAIN BODY OF MANCOS SHALE; SHALE- SILTSTONE; interbedded; dark gray; thin bedded; fissile; cuttings are very plastic.	3		Return flow turned gray -80.0'.

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& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

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SOIL EXPLORATION

DRILL HOLE LOG

PROJECT NO

GUL-101

DATE

SEPT. 1977

SHEET NO

4 of 6

HOLE  
NO.

WPC-19



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,082' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 11-15, 1977

NOTE: Hole located in center of channel, channel leg, dam axis 6A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
80		78.0-97.8' SHALE-SILTSTONE-- (continued)			
82		78.0-85.0' Recovered solid core from 1/2-12" long; siltstone with gray shale partings (up to 1/4" thick); medium gray; horizontal bedding; fractures along bedding; shale inter- beds are plastic; con- tains 1/4" thick coal seam at bottom.	3	6.5 7.0 (93%)	
84					Pulled out core barrel after Run No. 4 to run falling head and WPT test.
86		85.0-86.0' Recovered solid core consisting of interbedded, dark gray, clayey shale, and fine, silty sandstone; some carbonaceous partings.	4	1.0 1.0 (100%) RD	Water level after WPT at 64'.
88					Advanced hollow stem auger to 79.0' to seal off section of water loss. Cleaned out hole with 3" rock bit to 86.5'.
90		86.5-97.8' Recovered solid core; consisting of gray siltstone-shale sandstone up to 3" long.	5	3.0 3.5 (86%)	No water return during clean out, but regained water return at 86.5'.
92					No water return from 90.0-92.0', nearly full return 92.0- 95.8'.
94					No water return from 95.8-97.8'.
96					
98		97.8-118.9' SILTSTONE-SHALE; interbedded as indicated by cuttings of fine to medium sand and gray shale fragments.	6	5.8 5.8 (100%)	
100					Core bit plugged off at 97.8'. Drilled with 3" tri- cone rock bit from 97.8-118.9' because core bit was plugging in shale.

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-19
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	5 of 6	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,082' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 11-15, 1977

NOTE: Hole located in center of channel, channel leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
100		97.0-118.9' SILTSTONE-SHALE-- (continued)		RD	Cutting recovery is fine to medium quartz sand and gray shale fragments.
102					Took ~125 gallons for 22.0' run with rotary bit.
104					
106					
108					
110					
112					
114					
116		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SPICER MATHS WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			
118		TOTAL DEPTH = 118.9 FEET			Performed falling head test after drilling and WPT from 88.9-118.9'.
120					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-19
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	6 OF 6	

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DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,091' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 11, 1977

NOTE: Drilled 15' downstream of WT-21, channel leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SM	0.0-8.0' SILTY SAND; fine to very fine grained; brown; dry.		HSA	Drilled with hollow stem auger from 0-9.0'.
2					
4					
6					
8	LITH.	BEDROCK CONTACT			
8		8.0-28.5' GALLUP SANDSTONE; SANDSTONE; fine grained; massive; white to light gray with minor iron staining and carbonaceous partings; weakly to moderately cemented.	Run No.	HSA Recov. Adv.	Augered through sandstone from 8.0-9.0'.
10				3.1 9.5 (33%)	Core drilling with NQ wireline starting at 9.0'; 50 to 100 psi applied pressure.
12		9.0-18.5' Recovered several solid cores 2" to 8" long.			
14			1		100% water return; white, fine sand cuttings.
16					
18		18.5-28.5' Recovered small pieces of sandstone and 2" to 3" long solid core.	2	1.5 10.0 (15%)	
20					

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MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE  
NO.  
WPC-20

PAID ALTO • NEWPORT BEACH • CALIF

PROJECT NO.  
GUL-101

DATE  
AUGUST 1977

SHEET NO.  
1 OF 2

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,091' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER 7-3/4" NX	DATE DRILLED	JULY 11, 1977

NOTE: Drilled 15' downstream of WT-21, channel leg, dam axis 6A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		8.0-28.5' SANDSTONE-- (continued)		2 (continued)	Easy coring; no water loss; cuttings of fine, light gray sand.
22					Poor recovery; most of core apparently ground up and washed out as fine, sand cuttings.
24					
26					
28					
30		TOTAL DEPTH = 28.5 FEET  NOTE: Abandoned hole because of stuck drill rods and core barrel.  <small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED; SAMPLING INDICATED BY USE OF SMALL DIAMETER HOLES. SOFT AND FIRM BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES. THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION. SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

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SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.  
GUL-101

DATE  
AUGUST 1977

SHEET NO.  
2 of 2

HOLE NO.  
WPC-20

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,084' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (FEET TO GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	JULY 11, 1977

NOTE: Hole located near Michael Tank, channel leg, dam axis 6A.

ELEVATION (DEPTH)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-0.5' SANDY SILT.		AD	Easy drilling with 6" flight auger.
2		0.5-4.0' CLAYEY, SANDY SILT; fine sand; moderate brown; slightly plastic; soft; dry.			
4	LITH.	BEDROCK CONTACT			
		4.0-8.5' GALLUP SANDSTONE; SANDSTONE; as indicated by white, silty sand cuttings; dense; dry.			
10		TOTAL DEPTH = 8.5 FEET  <small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE DRILL- MATION WAS OBTAINED FROM INDICATED LOG CUTTINGS AND POSSIBLY DIFFERENT SAMPLES REPRESENTED BY ONE OR SMALL DIAMETER HOLE. HOWEVER, THIS BOREHOLE HAS BEEN FURTHER CON- FIRMED IN THE FIELD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CARDS IN AVOIDING HOLES.  THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.  THIS HOLE WAS LOGGED IN ACCORDANCE TO PRESENT PROVEN DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS.  HOLE CLASSIFICATION SHOWN ON LOG USE FIELD CLASSIFICATION BASED ON UNIFIED HOLE CLASSIFICATION SYSTEM.  THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN HOLE TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO  
GUL-101

DATE  
AUGUST 1977

SHEET NO  
1 of 1

HOLE  
NO  
WPC-21

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,083' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (PELO * GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	JULY 13, 1977

NOTE: Hole located near Michael Tank, channel leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SM- ML	0.0-8.5' <u>SILTY SAND TO SANDY SILT</u> ; fine sand; yellow brown; soft.		AD	Easy drilling with 6" flight auger.
2					
4					
6					
8					
10	SM	8.5-16.0' <u>SILTY SAND</u> ; very little fines, less than 5%; fine sand; soft; dry.			
12					
14					
16	SM	16.0-27.5' <u>SILTY SAND</u> ; slightly clayey; gravelly; gravel consists of angular fragments of buff colored, fine-grained sandstone and iron-stained shale; yellowish brown; medium dense; dry.			
18					
20					

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,083' (TOPO)	LOGGED BY ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 6"	DATE DRILLED JULY 13, 1977

NOTE: Hole located near Michael Tank, channel leg, dam axis 6A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20	SM	16.0-27.5' SILTY SAND-- (continued)			
22					
24					
26					
28	LITH.	BEDROCK CONTACT 27.5-33.5' GALLUP SANDSTONE; SANDSTONE; as indicated by light gray to light yellowish brown; silty sand; dense; dry.			
30					
32					
34		TOTAL DEPTH = 33.5 FEET  <small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SPORADIC WATER WAS OBTAINED FROM INDICENT UNCONFINED AND POSSIBLY UNSTABILIZED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. BITARY AND HAND BORING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CARE IN ADVANCING HOLES.</small> <small>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY OF THE DATA INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</small> <small>THIS HOLE WAS LOGGED BY SUCH A WAY AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</small> <small>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</small> <small>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7.083' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	JULY 13, 1977

NOTE: Hole located near Michael Tank, channel leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS					
0	ML	0.0-15.0' <u>SANDY, CLAYEY SILT</u> ; grading to <u>CLAYEY, SANDY SILT</u> ; fine sand; yellowish brown; slight to moderate plasticity; soft to dry.		AD	Easy drilling with 6" flight auger.					
2										
4										
6										
8										
10										
12										
14										
16										
18										
20										
15.0						SM	15.0-28.5' <u>SILTY SAND</u> ; fine sand; slightly clayey; yellowish brown; medium dense; dry.			
16										
18										
20										



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,083' (TOPO)	LOGGED BY	ASB	
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	JULY 13, 1977

NOTE: Hole located near Michael Tank, channel leg, dam axis 6A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20	SM	15.0-28.5' SILTY SAND-- (continued)		AD	
22					
24					
26					
28					
30	SM	28.5-35.5' SILTY SAND; slight- ly gravelly; fine grained; yellowish brown; medium dense; dry.			
32		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO NATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND PAW BOREING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNDRILLED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			
34	LITH.	BEDROCK CONTACT			
36		35.5-38.5' GALLUP SANDSTONE; SANDSTONE; white to light gray.			
38					
40		TOTAL DEPTH = 38.5 FEET			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	AUGUST 1977	2 of 2

HOLE  
NO  
WPC-23

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,082.5'(TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	JULY 13, 1977

NOTE: Located on channel leg, dam axis 6A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-3.5' <u>CLAYEY, SANDY SILT</u> ; yellowish brown; soft; dry.		AD	Easy drilling from 0-26.0'.
2					
4	ML	3.5-26.0' <u>SANDY SILT</u> ; slight- ly clayey; yellow brown; soft to firm; dry.			
6					
8					
10					
12					
14					
16					
18					
20					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,082.5(TOPO)	LOGGED BY	ASB	
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	JULY 13, 1977

NOTE: Located on channel leg, dam axis 6A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20	ML	3.5-26.0' SANDY SILT-- (continued)			
22					
24					
26	CL	26.0-40.0' SANDY, SILTY CLAY; light yellowish brown; moderate plasticity.			Stiffer drilling from 26.0'.
28					
30					
32					
34					
36					
38					
40					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO WPC-24
		DRILL HOLE LOG			
		PROJECT NO	DATE	SHEET NO	
PALO ALTO • NEWPORT BEACH • CALIF		GUL-101	AUGUST 1977	2 of 3	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,082.5' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	JULY 13, 1977

NOTE: Located on channel leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40	SM	40.0-56.5' <u>SILTY SAND</u> ; gravelly; slightly clayey; yellow brown.		AD	
42					
44					
46					
48					
50					
52					
54		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SAMPLE MATRIX WAS OBTAINED FROM SPHERICAL AND POSSIBLY DISTURBED SAMPLES RECORDED BY USE OF SMALL DIAMETER HOLES. SOFT AND FINE BORING HOLES GAVE FURTHER COMPLICATIONS IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THE HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED BY SUCH A RATE AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			Attempted Shelby tube at 54' to check material; unsuccessful because of slough.
56	LITH.	<u>BEDROCK CONTACT</u>			Rough drilling starting at 56.5' in bedrock.
58		56.5-58.5' <u>GALLUP SANDSTONE</u> ; <u>SANDSTONE</u> ; drills to white, silty sand with yellowish brown and iron staining.			
60		TOTAL DEPTH = 58.5 FEET			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-24
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	AUGUST 1977	3 of 3	

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,093' (TOPO)	LOGGED BY ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER 7-3/4" NX
		DATE DRILLED JULY 18, 1977

NOTE: Dam axis 6A, channel leg, upstream of Michael Tank.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-7.0' SANDY SILT; yellow brown.		HSA	Drilled with hollow stem auger to 9.0'. Set up for coring.
2					
4					
6					
7.0	LITH.	BEDROCK CONTACT			
8		7.0-16.0' TRANSITION ZONE; SANDSTONE; weathered; yellow orange to white.	Run No.	HSA Recov. Adv.	
9.0		9.0-19.0' Recovered solid pieces of core; 2.0-12.0'; 1/8" cavity at 17'.			NX coring at 9-19'. Soft from 9-16', washed out cuttings.
10				3.0 10.0 (30%)	
12			1		
14					
16		16.0-39.0' GALLUP SANDSTONE; SANDSTONE; fine to medium grained; light gray; poorly cemented; massive; cross-bedded.			Relatively hard from 16-19'. Cuttings of white sandstone.
18		19.0-29.0' Recovered solid pieces of core; up to 18" long; cross-bedded; steeply dipping fracture at 25'.	2	10.0 10.0 (100%)	19.0-29.0' Easy coring. Took 10 minutes; partial water loss. 200 to 300 psi applied pressure.
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WPC-25
		DRILL HOLE LOG			
		PROJECT NO. GUL-101	DATE AUGUST 1977	SHEET NO. 1 OF 2	

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,093' (TOPO)	LOGGED BY ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 7-3/4" NX	DATE DRILLED JULY 18, 1977

NOTE: Dam axis 6A, channel leg, upstream of Michael Tank.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		16.0-39.9' SANDSTONE-- (continued)	2 (continued)		Core broken during laying out in core box.
22					
24					
26					
28					
30		29.0-39.0' Recovered several short pieces of sandstone core; light gray; yellow staining.			29.0-39.0' Easy coring. 300 psi applied pressure. Took 6' in 4 minutes, complete water return. Slough in hole after pulling NX rods; washed out slough before WPT.
32				7.0 10.0 (70%)	WPT 28-39'.
34			3		
36		<small>DATA OF THIS LOG IS APPROXIMATE ONLY BECAUSE THE IMPROVEMENTS OBTAINED FROM IMPROVED DRILLING AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND RAM BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND TO CLASSIFY IN ADVANCE. THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION. SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNSATURATED SOIL CLASSIFICATION SYSTEM. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			Lowered 2" PCV pipe to 16' deep for falling head test.
40		TOTAL DEPTH = 39.0 FEET			

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION DRILL HOLE LOG

HOLE NO.

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO. GUL-101

DATE AUGUST 1977

SHEET NO. 2 of 2

WPC-25

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,107' (TOPO)	LOGGED BY ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 7-3/4" NX	DATE DRILLED JULY 18-19, 1977

NOTE: Dam axis 6A, channel leg.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	LITH.	0.0-1.0' <u>SLOPE DEBRIS.</u>		HSA	Drilled with hollow stem auger.
2		1.0-21.0' <u>DILCO COAL MEMBER, CREVASSE CANYON FORMATION; SANDSTONE-SILTSTONE-SHALE;</u> weathered; interbedded; thinly bedded shale and siltstone; shale is dark gray to buff; iron staining.			Hard dilling in sandstone. Cuttings of yellow orange, silty sand; brown-gray, silty sand.
4					
6					
8					
10			Run No.	Recov. Adv.	NX coring starting at 9.0'.
12			1	4.5 5.5 (82%)	Relatively soft coring. No water loss.
14		14.5-16.0' Purple-gray shale; wavy bedding.			Blocked at 14.5'. Recovered several pieces of solid core to 4" long.
16		16.0-19.0' Sandstone; light gray to yellow orange; carbonaceous partings.	2	4.5 4.5 (100%)	Relatively slow coring. 250 psi applied pressure. No water loss. 15 minute coring.
18			3		Recovered several pieces solid core to 9" long.
20					

W A WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALM ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	AUGUST 1977	1 OF 2

HOLE NO  
WPC-26

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,107' (TOPO)	LOGGED BY ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 7-3/4" NX	DATE DRILLED JULY 18-19, 1977

NOTE: Dam axis 6A, channel leg.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		SANDSTONE-SILTSTONE-SHALE-- (continued)			Brownish gray cuttings at 20.0-21.0'. Partial water loss from 21.0-24.0' at contact of shale and sandstone. Took 15 minutes to core.
22		21.0-27.5' TRANSITION ZONE; SANDSTONE; light gray; with iron staining; numerous wavy carbonaceous shale partings; core breaks along thicker (up to 1/4" thick) gray shale seams.	3 (continued)	10.0 10.0 (100%)	Recovered several pieces solid core up to 18" long.
28		27.5-39.0' GALLUP SANDSTONE; SANDSTONE; fine to medium grained; poorly cemented; white to light gray; minor carbonaceous partings and iron staining; very dense.			Partial water loss; took 10 minutes coring at 250 psi. Recovered several pieces solid core, most were broken during pulling out from inner core barrel.
34			4	10.0 10.0 (100%)	
36		<small>           DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE UPPER SECTION WAS OBTAINED FROM INDIRECT LOG CUTTINGS AND POSSIBLY OBTAINED SAMPLES RECOVERED BY USE OF SMALL DIAMETER HOLES. ROTARY AND RAM BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.            THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.            THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.            SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.            THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.         </small>			
40		TOTAL DEPTH AT 39.0 FEET			

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MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE NO.

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO  
GUL-101

DATE  
AUGUST 1977

SHEET NO  
2 OF 2

WPC-26



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,120' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	NOT ENCOUNTERED	HOLE DIAMETER	7-3/4" NX	DRILLED	JULY 20, 1977

NOTE: Dam axis 6A, channel leg.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-2.0' <u>SLOPE DEBRIS.</u>		HSA	Drilled with hollow stem auger in interbedded sandstone and siltstone.
2	LITH.	BEDROCK CONTACT			Cuttings of yellowish orange to white, silty sand.
2		2.0-22.5' <u>DILCO COAL MEMBER, CREVASSE CANYON FORMATION; SHALE-SILTSTONE-SANDSTONE;</u> interbedded; thinly-bedded; purple and tan siltstone and gray to black shale; 2" to 6" beds; crumbly; wavy bedding; shale is carbonaceous.			
8			Run No.	Recov. Adv.	Start coring at 8.5'. 250 psi applied pressure. Complete water return. Took 30 minutes to core.
10			1	7.5 10.0 (75%)	1/4" to 4" long core segments.
16					
18			2	10.0 10.0 (100%)	No water loss. 35 minutes coring.

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,120' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	NOT ENCOUNTERED	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 20, 1977

NOTE: Dam axis 6A, channel leg.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		2.0-22.5' SHALE-SILTSTONE-SANDSTONE--(continued)			
22					
24		22.5-31.5' <u>TRANSITION ZONE</u> ; SANDSTONE; with interbedded carbonaceous shale; light gray with yellowish orange staining; carbonaceous shale partings spaced 2-24" apart; massive; steeply dipping fracture at 24.5'; shale is dark gray with wavy bedding.	2	10.0 10.0 (100%)	Recovered several pieces solid core.
26					
28					Partial water loss. Took 15 minutes to core.
30					
32		31.5-58.5' <u>GALLUP SANDSTONE</u> ; SANDSTONE; massive; fine to medium grained; light gray with yellow staining; poorly cemented; minor carbonaceous partings.	3	10.0 10.0 (100%)	Recovered several pieces solid sandstone core.
34					
36					
38					
40		Crumbly from 39-42'; could be broken with the finger.			

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	AUGUST 1977	2 of 3

HOLE NO.  
WPC-27

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,120' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	NOT ENCOUNTERED	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 20, 1977

NOTE: Dam axis 6A, channel leg.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		31.5-58.5' SANDSTONE-- (continued)		4.5 10.0	Took 10 minutes coring. Little water loss. 2.5' of cuttings in hole, apparently washed out crumbly portions of sandstone.
42					
44		Sandstone; brittle; light gray.	4		Recovered several pieces broken core; most breaks along bedding plane.
46					
48					
50		Sandstone; massive; light gray with yellow staining.			Easy coring; little water loss. Recovered several solid cores up to 3' long.
52					
54			5	10.0 10.0 (100%)	
56		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM SUBJECT DISCONTINUOUS AND POSSIBLY DISTURBED SAMPLES. RECORDED BY USE OF SMALL DIAMETER HOLES. ROTARY AND RAIN BORING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THE HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER TO PERMANENTLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNSATURATED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			
58		TOTAL DEPTH = 58.5 FEET			
60					

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	AUGUST 1977	3 of 3

HOLE NO.

WPC-27

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,092' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	JULY 25, 1977

NOTE: Dam axis 6A, channel leg.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-5.0' <u>CLAY</u> ; light brown; plastic.		AD	
2					
4					
6	ML	5.0-17.0' <u>SANDY SILT</u> ; yellow- brown.			5.0-17.0' Weathered bedrock transition zone of Dilco Coal Member of Crevasse Canyon Formation above Gallup Sandstone.
8					
10					
12					
14					
16					
18	LITH.	BEDROCK CONTACT			
18		17.0-18.5' <u>GALLUP SANDSTONE</u> ; white to gray; fine to medium grained; silty.			
20		TOTAL DEPTH = 18.5 FEET			

DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SAMPLES  
WAS OBTAINED FROM DIRECT USE OF THE LOG AND POSSIBLY  
OBTAINED SAMPLES RECORDED BY USE OF SMALL DIAMETER  
HOLES ROTARY AND HAND BORING HOLES HAVE FURTHER COMPLI-  
CATIONS IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING  
FLUID AND OR CARDS IN ADVANCING HOLE.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE  
DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER  
LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN EXC-4 RATE AS TO PRESENTLY PROVIDE  
DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES  
OF SPECIFIC CONTRACTORS.

SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION  
BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY  
BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALM ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO	DATE	SHEET NO
GUL-101	AUGUST 1977	1 of 1

HOLE  
NO  
WPC-28

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,088' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	JULY 25, 1977

NOTE: Dam axis 6A, channel leg.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-5.0' <u>CLAY</u> ; light brown; plastic.		AD	
2					
4					
6	ML	5.0-10.0' <u>SANDY SILT</u> ; yellow- brown.			5.0-10.0' Weathered bedrock transition zone of Dilco Coal Member of Crevasse Canyon Formation above Gallup Sand- stone.
8					
10	LITH.	BEDROCK CONTACT			
12		10.0-13.5' <u>GALLUP SANDSTONE</u> ; white to gray; fine to medium grained; silty.			
14		TOTAL DEPTH = 13.5 FEET			
16		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE DRIFT MATERIAL WAS OBTAINED FROM SHORTEST LOG LENGTHS AND POSSIBLY DISTURBED SAMPLING INTERRUPTED BY LOGS OF SMALL DIAMETER HOLES. SOILS AND SAND BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUIDS AND TO CARE IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNPULVED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			
18					
20					

W A WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-29
		PROJECT NO. GUL-101	DATE AUGUST 1977	SHEET NO. 1 of 1	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,123' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 26-27, 1977

NOTE: Dam axis 6A, north leg.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML-SM	0.0-13.0' SANDY SILT TO SILTY SAND; reddish brown to yellowish orange, silty sand.		HSA	Drilled with hollow stem auger.
2					
4					
6					
8					
10		Yellowish orange, silty sand in split spoon.	SP-1 Run No.	DR Recov. Adv.	SPT 20/.5, 21/.5
12					Started NX wireline coring at 10.0'. Washed out alluvium 10.0-13.0'; coring in shale at 13.0-19.0'. 250 psi applied pressure. Took 30 minutes to core.
13.0	LITH.	BEDROCK CONTACT			
14		13.0-49.0' DILCO COAL MEMBER, CREVASSE CANYON FORMATION.	1		
15		13.0-20.5' SHALE; dary gray; carbonaceous; iron staining; thinly bedded; friable; air slakes; plastic.		3.0 9.0 (33%)	
16					Recovered 3' of broken, weathered shale core. 2.5' of slough in hole. 250 psi applied pressure. Took 40 minutes to core. No water loss.
18					
20					

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	AUGUST 1977	1 OF 3

HOLE NO.  
WPC-30

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,123' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 26-27, 1977

NOTE: Dam axis 6A, north leg.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		13.0-20.5' SHALE--(continued)			
		20.5-21.0' SANDSTONE; medium grained; buff; mostly broken core.			
22		21.0-29.0' SHALE-SILTSTONE; interbedded; laminated to thinly bedded; dark gray with white thin layers; some soft, dark gray, clayey shale from 24.5-29.0'.	2	10.0 10.0 (100%)	Recovered broken core and solid core up to 1' 7" long.
26					
28					Resumed 8:30 7/27/77 No water loss. Took 35 minutes coring.
30		29.0-31.5' SANDSTONE; yellowish brown with thin coal inclusions and carbonaceous partings.			
32		31.5-36.0' SANDSTONE; yellowish brown; iron staining; fine to medium grained; massive.	3	10.0 10.0 (100%)	Recovered several pieces solid core up to 18" long.
34					
36		36.0-38.5' SILTSTONE with carbonaceous partings; dark gray to white.			
		38.5-38.8' 4" fractured coal seam.			
38		38.8-39.0' CLAYEY SHALE			
		39.0-45.0' SANDSTONE with INTERBEDDED SILTSTONE and CARBONACEOUS SHALE PARTINGS; gray to brownish gray.			No water loss; 30 minutes coring.
40					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WPC-30
		DRILL HOLE LOG			
		PROJECT NO. GUL-101	DATE AUGUST 1977	SHEET NO. 2 of 3	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,123' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 26-27, 1977

NOTE: Dam axis 6A, north leg.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		39.0-45.0' SANDSTONE with INTERBEDDED SILTSTONE and CARBONACEOUS SHALE PARTINGS- (continued)	4	10.0 10.0 (100%)	Fractured, broken core; solid case to 8" long.
42					
44					
46		45.0-49.0' SANDSTONE; light gray to gray; medium grained; poorly cemented; weathered and soft in- places; wavy carbonaceous partings.	5	10.0 10.0 (100%)	30 minutes coring. No water loss.  Recovered several pieces solid core.  Flushed hole with clear water before WPT.
48					
50		49.0-57.5' TRANSITION ZONE; SANDSTONE; gray; fine to medium grained; some wavy, carbonaceous shale laminae.			
52					
54		57.5-59.0' GALLUP SANDSTONE; SANDSTONE; light gray with yellow orange stains; massive; fine to medium grained; poorly cemented.			
56					
58					
60		TOTAL DEPTH = 59.0 FEET			

DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SPUR  
MAYOR HAS OBTAINED FROM SUBJECT DRILLING AND POSSIBLY  
OBTAINED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER  
HOLES. ROYAL AND WASH BORING HOLES HAVE FURTHER COMPLI-  
CATIONS IN THE REGARD BECAUSE OF THE NEED TO USE COLLAR  
PILES AND OR CASING IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE  
DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER  
LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PRESENT PROVEN  
DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES  
OF SPECIFIC CONSTRUCTORS.

SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS  
BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY  
BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

W. A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL TAILINGS

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE  
NO.

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.

DATE

SHEET NO.

GUL-101

AUGUST 1977

3 of 3

WPC-30



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,148' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 27, 1977

NOTE: North leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-4.0' Slope debris and weathered rock.		AD	Drilled with hollow stem auger 0.0-9.0'.
2					
4	LITH.	BEDROCK CONTACT			
4		4.0-86.3' <u>DILCO COAL MEMBER OF CREVASSE CANYON FORMATION</u>			
6		4.0-9.0' <u>SANDSTONE</u> ; weathered yellowish brown to reddish brown; dense.			
8					
10		9.0-12.5' <u>SANDSTONE</u> ; buff; fine to medium grained.	Run No.	Recov. Adv.	NX coring at 9.0'. Took 30 minutes at 300 psi applied pressure. No water loss.
12					
14		12.5-15.5' <u>SANDSTONE</u> ; well weathered crumbles to clayey, silty sand; yellow orange; iron staining.	1	7.0 10.0 (70%)	
16		15.5-19.0' <u>SANDSTONE</u> ; buff; fine to medium grained; poorly cemented; massive; minor carbonaceous partings.			
18		19.0-22.0' <u>INTERBEDDED SILT-STONE AND SHALE</u> ; purple with Fe-stain and yellow silt along bedding; segments up to 4" long; very fractured.			Took 150-200 gallons; water from 19.0-29.0'.
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WPC-31
		DRILL HOLE LOG			
		PROJECT NO. GUL-101	DATE SEPT. 1977	SHEET NO. 1 OF 10	

DRILL RIG		CME 75 (ETL)		HOLE ELEVATION 7,148' (TOPO)		LOGGED BY ASB		
GROUNDWATER DEPTH (BELOW GROUND SURFACE)		DRY HOLE		HOLE DIAMETER 7-3/4" NX		DATE DRILLED JULY 27, 1977		
NOTE: North leg, dam axis 6A.								
ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS			
20		19.0-22.0' INTERBEDDED SILT- STONE AND SHALE--(continued)						
22		22.0-26.0' INTERBEDDED SILT- STONE AND SANDSTONE with BLACK SHALE PARTINGS; white to tan; 1-5" segments; con- tains gypsum along bedding; 1/2" coal seam at 22'.	2	9.2 10.0 (92%)				
24								
26		26.0-31.5' SHALE; dark gray; plastic; friable; wavy bedding; segments up to 3" long; contains yellow silt and Fe-stain along bedding.						
28					Lost drill water 29.0-33.0'.			
30			3	2.5 4.0 (63%)	Packer tested and augered with hollow stem to depth of 33.0' to seal off water loss zone.			
32		31.5-35.0' SANDSTONE; tan with Mg-stain; fine grained; wavy bedding; 45° gypsum filled fracture at 33.5'.			20-30 gallons water lost; 33.0-40.0'.			
34								
36		35.0-37.5' SILTSTONE with GRAY SHALE PARTINGS; gray with Fe-stain; wavy bedding.	4	6.8 7.0 (97%)				
38		37.5-47.0' SHALE; black; thin laminated, flaky, horizontal to wavy bedding; plastic; core segments ranged from 2-24".						
40								
W.A. WAHLER & ASSOCIATES		MT. TAYLOR URANIUM MILL PROJECT		SOIL EXPLORATION DRILL HOLE LOG				HOLE NO. WPC-31
				PROJECT NO.	DATE	SHEET NO.		
				GUL-101	SEPT. 1977	2 of 10		
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DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,148' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 27, 1977

NOTE: North leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40	[Stratigraphic column with horizontal lines]	37.5-47.0' SHALE--(continued)	5	10.0 10.0 (100%)	40-50'
42					10.0' in one hour.
44					
46					
48		47.0-50.0' SILTSTONE with GRAY SHALE PARTINGS; gray to tan; horizontal bedding.			
50	[Stratigraphic column with horizontal lines]	50.0-55.3' SHALE; dark gray; wavy bedding; flaky; brittle; fractures along bedding; grades into silt- stone at 54.3-55.3'.	6	10.0 10.0 (100%)	50-60'
52					10.0' in one hour.
54					Core segments ranged from 1-12".
56					
58		55.3-58.5' SANDY SILTSTONE; gray; wavy bedding; brittle fractures along bedding.			
60		58.5-62.0' SANDSTONE; tan with Fe-stain; poorly cemented; contains Mg-stain along bedding; horizontal bedding.			

W A WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO WPC-31
		PROJECT NO	DATE	SHEET NO	
		GUL-101	SEPT. 1977	3 of 10	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,148' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELG. GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 27, 1977

NOTE: North leg, dam axis 6A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS	
60		58.5-62.0' SANDSTONE-- (continued)			7	Took 10-20 gallons; 60-70'. 10.0' in 45 minutes.
62		62.0-64.7' SILTSTONE; dark gray; hard; massive; wavy bedding.				Core segments ranged from 1/2-15". Intervals 58.5-60.0' and 68.0-69.0'; shows clean vertical fractures.
64				10.0		
		64.7-65.2' Coal Seam; black; brittle; shows vertical cleats.		10.0		
66		65.2-69.0' SILTY SANDSTONE with GRAY SHALE PARTINGS; gray to tan; horizontal bedding.		(100%)		
68						
70		69.0-71.5' CLAYSTONE; light gray; very poorly cemented; crumbly.			8	Took 10-15 gallons; 70.0-80.0'. 10.0' in 45 minutes.
72		71.5-75.5' SILTY SANDSTONE; gray; wavy bedding; massive; contains grains of Fe-pyrite; fractures along bedding.				Core segments ranged from 1-15".
74				10.0		
		75.5-76.3' SHALE; black; flaky; plastic.		10.0		
76		76.3-78.5' SANDY SILTSTONE; gray; wavy bedding. shows vertical fractures.		(100%)		
78						
80		78.5-86.0' TRANSITION Z NE 78.5-80.0' SANDSTONE; gray to tan with Fe-stain; hor- zontal bedding.				

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,148' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 27, 1977

NOTE: North leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
80		80.0-86.3' SANDSTONE; purple-tan-yellow banded color; wavy bedding; fine to medium grained; contains few gray shale beds up to 1" thick.	9	9.1 10.0 (91%)	80.0-90.0'. Took 10-15 gallons; 10.0' in 30 minutes. Core segments ranged from 1-8" long.
82					
84		86.3-170.0' GALLUP SANDSTONE 86.3-90.0' SANDSTONE; yellow to gray with some Fe-stain along bedding; bedding fairly horizontal; fine to medium grained.			
86					
88		90.0-100.0' SANDSTONE; yellow to gray; massive bedding; fine to medium grained; contains few inclusions of carbonaceous material.	10	10.0 10.0 (100%)	90.0-100.0'. Took 1-15 gallons; 10.0' in 20 minutes. Contains few weathered clay zones 1-2" thick. Core segments ranged from 2" to 2.0' long.
90					
92					
94					
96					
98					
100					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,148' (TOPO)	LOGGED BY	MPF	
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 27, 1977

NOTE: North leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS		
100		100.0-105.5' SANDSTONE with INTERBEDDED, DARK GRAY SHALE from 2-6" thick; yellow-tan banded color with Fe-stain; bedding dips 10-40°; shale is friable.	11	$\frac{8.7}{10.0}$ (87%)	Took 15-20 gallons; 100.0-110.0'.  Core segments ranged from broken crumbs to 8" long.		
102							
104							
106		105.5-110.0' SANDSTONE; gray with Fe-stain along bedding; massive bedding; shows vertical fractures from 108.0-110.0'.					
108							
110		110.0-120.0' SANDSTONE; yellow to gray with Fe-stain mottles; cross-bedded; shows some Mn-stain along bedding.	12	$\frac{10.0}{10.0}$ (100%)	  Core segments ranged from 2-10" long.		
112							
114							
116							
118							
120							

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE NO.  
WPC-31

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO.  
GUL-101

DATE  
SEPT. 1977

SHEET NO.  
6 of 10

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,148' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 27, 1977

NOTE: North leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
120		120.0-159.0' SANDSTONE; light gray with dark gray mottling; Fe-stains and widely spaced, yellowish zones are visible to approximately 135'.	13	10.0 10.0 (100%)	
122					
124					
126		128.0-153.6' Massive; moderately strong.			
128					
130		137.0' Mostly free of Fe-staining; dark gray mottling becomes intermittent.	14	10.0 10.0 (100%)	130.0-160.0' Smooth coring. Approximately 20 minutes per core run.
132					400 gallons of water used between 130-160'.
134					
136					
138					
140					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,148' (TOPO)	LOGGED BY	LAR	
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 27, 1977

NOTE: North leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
140		120.0-159.0' SANDSTONE-- (continued)			
142					
144			15	10.0 10.0 (100%)	
146					
148					
150					
152					
154		153.6-155.0' Weak, closely fractured zone. 155.0-165.0' Moderate to little fractured.	16	9.2 10.0 (92%)	
156					
158		Grades into: 159.0-170.0' SILTSTONE and FINE SANDSTONE interbedded and crossbedded; medium light gray to dark gray.			
160					

W A WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO WPC-31
		PROJECT NO	DATE	SHEET NO	
		GUL-101	SEPT. 1977	8 of 10	
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DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,148' (TOPO)	LOGGED BY	LAR/MPF	
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 27, 1977

NOTE: North leg, dam axis 6A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
160		159.0-170.0' SILTSTONE AND FINE SANDSTONE--(continued)	17	9.5 10.0 (95%)	Coring is slower below 163'. 160.0-170.0' Coring time 35 minutes.
162		162.9-164.0' 1" clay seams.			
164		165.0' Contains thin, shaley laminations.			
166		170.0-190.0' MAIN BODY OF MANCOS SHALE; SHALE; dark gray; plastic; thin laminations; beds dip 10-15°; slakes; friable; contains fossil shells; shows few vertical fractures 3-8" long; badly fractured 188.0-190.0'.	18	9.0 10.0 (90%)	170.0-180.0' Coring time 1-1/2 hours. Core segments range from 1/2-15" long.
168					
170					
172					
174					
176					
178					
180					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,148' (TOPO)	LOGGED BY	LAR/MPF	
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	JULY 27, 1977

NOTE: North leg, dam axis 6A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
180		170.0-190.0' SHALE-- (continued)	19	10.0 10.0 (100%)	180.0-190.0' Coring time 3 hours.
182					182.0-183.0' Took 800-1,000 gallons for 10' run.
184					
186					
188					
190					
192					
		TOTAL DEPTH = 190.0 FEET			
		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SAMPLE WATER WAS OBTAINED FROM DIRECTLY UNDER THE CASE AND POSSIBLY OBTAINED SAMPLES REPRESENTED BY USE OF SMALL DIAMETER HOLES. SOFT AND FINE SANDS, HOLES MAY FURTHER COMPLY LAYING IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLE.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED BY SUCH A RATE AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE  
NO.

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO.	DATE	SHEET NO.
GUL-101	SEPT. 1977	10 of 10

WPC-31


DRILL RIG	CME 75	HOLE ELEVATION 7,168' (TOPO)	LOGGED BY LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER 6" NX	DATE DRILLED AUGUST 4-8, 1977

NOTE: Hole located at intersection of Dam 8A (north leg) and Dam 6A (channel leg).

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SM	0.0-5.0' <u>COLLUVIUM</u> ; <u>SILTY SAND</u> ; pale yellow brown; very fine-grained; approximately 40% nonplastic fines		HSA	Drilled with 6" diameter hollow stem auger from 0.0-54.0'
2					Water pressure tests run at:
					56.5- 68.0'
					71.5-103.0'
					106.5-138.0'
					136.5-148.0'
					149.5-160.5'
	LITH.	5.0-66.0' <u>DILCO COAL MEMBER OF CREVASSE CANYON FORMATION</u>			5.0-52.0' Drilling through alternating firm and soft layers
6		5.0-12.0' <u>SANDSTONE</u> ; grayish-orange; very fine grained; deeply weathered.			
8					
10					
12		12.0-52.0' <u>SHALE</u> ; medium dark gray; alternates between firm, silty shale and softer clayey zones in 3-5' intervals.			
14					
16					
18					
20					

DRILL RIG	CME 75	HOLE ELEVATION	7,168' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6" NX	DATE DRILLED	AUGUST 4-8, 1977

NOTE: Hole located at intersection of Dam 8A (north leg) and Dam 6A (channel leg).

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS	
20		12.0-52.0' SHALE--(continued)				
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
						32.0-34.0' Augering is very hard.
						34.0' Becomes softer.

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WPC-32
		DRILL HOLE LOG			
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	2 OF 8	

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DRILL RIG	CME 75	HOLE ELEVATION	7,168' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6" NX	DATE DRILLED	AUGUST 4-8, 1977

NOTE: Hole located at intersection of Dam 8A (north leg) and Dam 6A (channel leg).

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		12.0-52.0' SHALE--(continued)			
42					
44				HSA	
46					
48					
50		52.0-57.5' SANDSTONE AND SHALE; interbedded and thinly laminated; beds are 0.1-0.6'; sandstone is light olive-gray; fine grained; weak; stained light-brown; shale is medium			
52		dark gray with very thin partings and a few horizontal gypsum seams to 0.05" thick; intensely fractured along horizontal planes to 58.0'.			52.0' Augering becomes slow. 52.0' Coring with NX core barrel.
54		57.5-65.0' SANDSTONE; light olive gray; fine grained; contains scattered carbonaceous fragments and laminations to 0.1"; weak.			
56		GALLUP TRANSITION ZONE			6' Run in 50 minutes; used 75 gallons of water.
58		58.0-65.0' Closely fractured along bedding planes.	1	6.0 6.0 (100%)	58.0-114.0' Closely fractured.
60					

W A WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT PALO ALTO • NEWPORT BEACH • CALIF	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-32
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	3 of 8	

DRILL RIG	CME 75	HOLE ELEVATION	7,168' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6" NX	DATE DRILLED	AUGUST 4-8, 1977

NOTE: Hole located at intersection of Dam 8A (north leg) and Dam 6A (channel leg).

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60		57.0-65.0' SANDSTONE-- (continued)	1 (continued)		
62					61.0-71.0' 10' run in 40 minutes.
64		64.0-65.0' Light brown staining			
66		65.0-66.0' SILTSTONE AND CLAYEY SHALE; medium dark gray			
68		66.0-144.8' GALLUP SANDSTONE; pinkish-gray to yellow gray; fine to medium grained. SANDSTONE; poorly cemented; weak to moderately strong. Closely fractured along bedding planes.	2	9.7 10.0 (97%)	
70					
72					71.0-81.0' 10' run in 30 minutes.
74					
76			3	9.7 10.0 (97%)	
78					
80					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-32
		PROJECT NO.	DATE	SHEET NO.	
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DRILL RIG CME 75	HOLE ELEVATION 7,168' (TOPO)	LOGGED BY LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 6" NX	DATE DRILLED AUGUST 4-8, 1977

NOTE: Hole located at intersection of Dam 8A (north leg) and Dam 6A (channel leg).

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
80		66.0-144.8' GALLUP SANDSTONE- (continued)	3 (continued)		
82					81.0-91.0' 10' run in 30 minutes.
84					Water loss is approxi- mately 75 gallons per run.
86			4	$\frac{9.7}{10.0}$ (97%)	
88					
90					
92		93.0' 0.5' iron stained zone.			91.0-101.0' 10' run in 35 minues; 150 gallons of water loss.
94					92.0-93.0' Dark gray, clayey fragments in cuttings.
96			5	$\frac{9.0}{10.0}$ (90%)	
98					
100		99.0- 0.8' zone of crossbedding at 20°.			

DRILL RIG	CME 75	HOLE ELEVATION	7,168 (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6" NX	DATE DRILLED	AUGUST 4-8, 1977

NOTE: Hole located at intersection of Dam 8A (north leg) and Dam 6A (channel leg).

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MOUE	REMARKS
100		66.0-144.8' GALLUP SANDSTONE (continued)	5 (continued)		
102					101.0-111.0' 10' run in 45 minutes.
104		103' Becomes grayish- orange with much stain- ing along horizontal bedding fractures.			
106			6	8.8 10.0 (88%)	
108					
110					
112					111.0-121.0' 10' run in 30 minutes; 200 gallons of water loss.
114		114.0' Becomes moderate- ly fractured.			
116		115.5-120.0' Color is pale reddish-brown.	7	8.6 10.0 (86%)	
118					
120					

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MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION

DRILL HOLE LOG

HOLE  
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DRILL RIG CME 75	HOLE ELEVATION 7,168 (TOPO)	LOGGED BY LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 6" NX	DATE DRILLED AUGUST 4-8, 1977

NOTE: Hole located at intersection of Dam 8A (north leg) and Dam 6A (channel leg)

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
120		66.0-144.8' GALLUP SANDSTONE (continued)	7 (continued)	/ / / / /	
122					121.0-131.0' 10' run in 30 minutes.
124		121.9-122.3' Fracture 50° from horizontal.			
126			8	8.6 10.0 (86%)	
128		127.0-131.5' Moderately strong; moderately to little fractured.			
130				/ / / / /	
132		131.5-138.1' Light gray with dark yellow-orange horizontal stains and dark gray mottling; closely fractured at 131.5-135.0'.			131.0-141.0' 10' run in 25 minutes.
134			9	10.0 10.0 (100%)	
136					
138		138.1' Color changes to medium gray with dark gray streaks and mottles; little frac- tured; strong.			
140					

DRILL RIG CME 75	HOLE ELEVATION 7,168' (TOPO)	LOGGED BY LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 6" NX	DATE DRILLED AUGUST 4-8, 1977

NOTE: Hole located at intersection of Dam 8A (north leg) and Dam 6A (channel leg)

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
140		66.0-144.8' GALLUP SANDSTONE— (continued)	9 (continued)		
		141.6' 3" shale layer.	10		
142			11	0.4 0.4	141.6' Core Blocked; lost circulation.
			12	1.0 1.0	142.1' Core blocked; no circulation; pumped water into hole at 10 gpm for 30 minutes, no re- turn; end of drill- ing 8/5/77.
144			13	1.2 1.2	
			14	0.4 0.4	
146		144.8-160.5' <u>MANCOS SHALE</u> ; Alternating medium dark gray, silty shale and light gray, sandy shale; thinly laminated with some cross- bedding; breaks along hori- zontal partings; contains scattered small mollusk fossils. Physical condition: Little fractured to massive; mod- erately hard; moderately strong.	15	1.7 1.7	142.1-143.1' 1' run; core blocked; water take is 10 gpm with no return.
148			16	4.4 4.6 (96%)	144.3' Core blocked. 144.7' Core blocked 146.4' Core blocked 146.4-151.0' Out of water; run stopped; end of drilling 8/6/77.
150					
152		152.5-152.7' Clayey zone	17	1.5 1.5	152.5' Core blocked.
154		<small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFOR- MATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. NOTARY AND PUMP BURNING HOLES MAY HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLE.</small> <small>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</small> <small>THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROBABLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</small> <small>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNPAID SOIL CLASSIFICATION SYSTEM.</small> <small>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>	18	2.5 2.5	
156			19	0.5 0.5	155.0' Core blocked; water take 16 gpm.
158		158.0-160.5' Mostly dark gray silty to clayey shale.	20	2.3 2.3	155.7' Core run end- ded out of water; end of drilling 8/7/77.
		160.0'; 45° joint.	21	0.7/0.7	155.7-158.0' Run end- ed; out of water.
160		TOTAL DEPTH = 160.5' and CEMENTED TO 45'	22	1.8 1.8	

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MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE  
NO.

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO.  
GUL-101

DATE  
SEPT. 1977

SHEET NO.  
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WPC-32

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,060' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 10, 1977

NOTE: Hole located on channel leg, dam axis 8A

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-7.5' SANDY, CLAYEY SILT; light brown; slightly plastic; contains fine sand; fluffy.		HSA	
2					
4					
6			S-1	P	Pushed 5-8 ksi. Tube buckled, threw away.
8	CL	7.5-13.0' SANDY CLAY; gray- brown; very plastic; hard.	STP	D	20/25/30 - 1.5'
10				HSA	
12					
14	ML	13.0--15.0' SANDY, CLAYEY SILT; light brown; slightly plastic.	S-2	P	Pushed ~5 ksi.
16	SM	~15.0-22.0' SILTY, FINE SAND; yellow brown; slightly plastic.	STP	D	4/8/11 - 1.5'
18				HSA	
20					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,060' (TOPO)	LOGGED BY	MPF	
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 10, 1977

NOTE: Hole located on channel leg, dam axis 8A

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20	SM	15.0-22.0' SILTY, FINE SAND-- (continued)		HSA	
22	CL	22.0-37.5' SANDY CLAY; light brown; plastic.			
24					
26					
28					
30					
32					
34					
36			S-3	P	
38	SC to CL	37.5-57.0' CLAYEY SAND TO SANDY CLAY; tan; very plastic; sticky; shows some caliche stain; con- tains some carbonaceous material.	STP	D	9/11/13 - 1.5'
40					

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MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.

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DATE

AUGUST 1977

SHEET NO.

2 OF 6

HOLE  
NO.

WPC-33

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,060' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 10, 1977

NOTE: Hole located on channel leg, dam axis 8A

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40	SC to CL	37.5-57.0' CLAYEY SAND TO SANDY CLAY--(continued)			
42					
44					
46			STP	D	12/16/20 - 1.5'
48				HSA	
50					
52					
54					
56			S-4	P	Pushed - 5 ksi.
58	SM	57.0-66.0' SILTY SAND AND GRAVEL; tan with Fe-stain, gravel composed of sub- rounded to subangular sandstone and siltstone fragments 1/4" to 1" diameter.	STP	D	14/19/17 - 1.5'
60					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-33
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	AUGUST 1977	3 of 6	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,060' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 10, 1977

NOTE: Hole located on channel leg, dam axis 8A

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60	SM	57.0-66.0' SILTY SAND AND GRAVEL--(continued)		HSA	
62					
64					
66	CL	66.0-84.0' SANDY CLAY; medium brown with Fe-stain; stiff; moist; contains thin gypsum seams up to 1/8" thick.			
68					
70			STP	D	13/14/21 - 1.5'
72				HSA	
74					
76			STP	D	10/12/21 - 1.5'
78				HSA	
80					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-33
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	AUGUST 1977	4 of 6	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,060' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 11, 1977

NOTE: Hole located on channel leg, dam axis 8A

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
80	CL	66.0-84.0' SANDY CLAY-- (continued)			
82					
84	LITH.	BEDROCK CONTACT			50 - 2.0" (refusal)
		84.0-94.5' GALLUP SANDSTONE; SANDSTONE; light gray to yellow with Fe-stain; fine to medium grained; weakly cemented; core segments ranged from 2" to 8" long.	STP Run No.  1	D Recov. Adv.  5.6 6.0 (93%)	Started coring at 84.0'. Took 20 to 30 gallons, 84.0-90.0'.
86					
88					
90					
92					
94					
		94.5-105.0' SILTSTONE with INTERBEDDED, BLACK SHALE BEDS (up to 3" thick); dark gray; wavy bedding; resistant-hard; breaks along shale beds; core segments ranged from 2" to 18" long.	2	10.0 10.0 (100%)	Took 30 to 40 gallons, 90.0-110.0'.
96					
98					
100					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,060' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 11, 1977

NOTE: Hole located on channel leg, dam axis 8A

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
100		94.5-105.0' SILTSTONE with INTERBEDDED, BLACK SHALE BEDS--(continued)			
102					
104			3	10.0 10.0 (100%)	
106		105.0-120.0' MANCOS SHALE; SHALE with FEW SILTSTONE BEDS (up to 2" thick); dark gray to black; brittle; plastic; shows vertical fractures; fractures along bedding when dry; core segments ranged from broken crumbs to 3" long.			
108					
110					
112					
114			4	10.0 10.0 (100%)	Took 30 to 40 gallons, 110-120'.
116					
118					
120		TOTAL DEPTH = 120.0 FEET			

DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY OBTAINED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. SOFT AND HARD BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCED HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.

SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LOGS REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.



DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,142' (TOPO)	LOGGED BY LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 6" & 2-15/16"	DATE DRILLED AUGUST 11-15, 1977

NOTE: Hole located on south leg, dam axis 8A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SC	0.0-2.0' SOIL COVER; CLAYEY SAND; light brown; very fine grained; 40-50% medium plastic fines.		HSA	
2	LITH.	BEDROCK CONTACT			
2.0-49.0'		DILCO MEMBER OF CREVASSE FORMATION; INTERBEDDED SANDSTONE, SILTSTONE, AND SHALE; SANDSTONES are grayish orange; very fine grained; SILTSTONES and SHALES are medium dark to dark gray.			
15.0'					Tight, hard augering at 15.0'.

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WPC-34
		DRILL HOLE LOG			
PALM ALTO • NEWPORT BEACH • CALIF		PROJECT NO. GUL-101	DATE AUGUST 1977	SHEET NO. 1 of 8	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,142' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER 6" & 2-15/16"	DATE DRILLED AUGUST 11-15, 1977	

NOTE: Hole located on south leg, dam axis 8A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		2.0-49.0' INTERBEDDED SAND- STONE, SILTSTONE, AND SHALE--(continued)		HSA	
22					
24					
26					
28					
29.0		29.0' Light olive gray, siltstone.			
30					30.0' Augering slows.
32					
33.0				RD	33.0' Drilling with 2-3/4" diameter tricone bit using clear water.
34					
36					
38					
40					

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE  
NO

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO

DATE

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WPC-34

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,142' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER 6" & 2-15/16"	DATE DRILLED	AUGUST 11-15, 1977

NOTE: Hole located on south leg, dam axis 8A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		2.0-49.0' INTERBEDDED SAND- STONE, SILTSTONE, AND SHALE--(continued)		RD	
42					
44					
46					
48					
50		49.0-137.0' <u>GALLUP SANDSTONE</u> ; drilling yields uniform, fine, light olive green gray; occasionally grayish orange sand.			45.0' End of drilling 8/11/77; no drilling 8/12/77.
52					49.0-140.0' Very fine, light olive gray sand in cuttings.
54					
56					
58					
60					

W A WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-34
		PROJECT NO	DATE	SHEET NO	
		GUL-101	AUGUST 1977	3 OF 8	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,142' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER 6" & 2-15/16"	DATE DRILLED AUGUST 11-15, 1977	

NOTE: Hole located on south leg, dam axis 8A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60		49.0-137.0' GALLUP SANDSTONE-- (continued)			
62					
64					
66					
68					
70					70.0' Bit sanded in; end of drilling 8/13/77.
72					
74					
76					
78					
80					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,142' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER 6" & 2-15/16"	DATE DRILLED AUGUST 11-15, 1977	

NOTE: Hole located on south leg, dam axis 8A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
80		49.0-137.0' GALLUP SANDSTONE-- (continued)		RD	
82					
84					Drilling at approxi- mately 10' per hour.
86					Water loss is minimal.
88					
90					
92		92.0' Color of cuttings changes to grayish orange.			
94					
96					
98					
100					

W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-34
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	AUGUST 1977	5 of 8	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,142' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER 6" & 2-15/16"	DATE DRILLED AUGUST 11-15, 1977	

NOTE: Hole located on south leg, dam axis 8A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
100		49.0-137.0' GALLUP SANDSTONE-- (continued)			
102					
104					
106					
108					
110					
112		111.0-114.5' Cuttings are pale red.			
114					
116					
118					
120					

W A WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-34
		PROJECT NO GUL-101	DATE AUGUST 1977	SHEET NO 6 of 8	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,142' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER 6" & 2-15/16"	DATE DRILLED	AUGUST 11-15, 1977

NOTE: Hole located on south leg, dam axis 8A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
120		49.0-137.0' GALLUP SANDSTONE-- (continued)		RD	
122					
124					
126					
128					
130		130.0' Olive gray shale fragments in cuttings.			
132					
134					Hole flushed with clean water and pressure tested at 134.0-160.0'.
136					
138		137.0-160.0' <u>MANCOS SHALE</u> ; drilling yields light olive gray, clayey frag- ments in cuttings and black, oily residue in return water; little sand below 140.0'.			137.0' Drilling be- comes softer.
140					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-34
		PROJECT NO	DATE	SHEET NO	
		GUL-101	AUGUST 1977	7 of 8	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,142' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6" & 2-15/16"	DATE DRILLED	AUGUST 11-15, 1977

NOTE: Hole located on south leg, dam axis 8A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS	
140		137.0-160.0' MANCOS SHALE-- (continued)			140.0' End of drilling 8/14/77.	
142						
144						
146						
148						
150						
152						
154						
156						
158						
160						
			<p>DATA IN THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM SUBJECT INDENTURES AND POSSIBLY DIFFERENT SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. SPLIT AND PACH BORING HOLES MAY FURTHER COMPLICATE THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO FURNISH PROVEN DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTIONS.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			
			TOTAL DEPTH = 160.0 FEET			



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,102' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 9, 1977

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-6.0' <u>SILTY CLAY</u> ; light brown; fluffy; plastic; sticky.	G-1	HSA	
2					
4	ML	6.0-12.0' <u>CLAYEY SILT</u> ; yellow brown; sticky; slightly plastic; contains fine sand.	G-2	HSA	
6					
8	SM to ML	12.0-18.0' <u>SILTY SAND</u> to <u>SANDY, CLAYEY SILT</u> ; light brown; sticky; nonplastic; contains carbonaceous material.	W-1	D	46-1.0'
10			STP	D	7/8/7 - 1.5'
12	SM	18.0-23.5' <u>SILTY SAND</u> ; light brown; fine grained.	G-3	HSA	
14					
16	SM	18.0-23.5' <u>SILTY SAND</u> ; light brown; fine grained.	G-4	HSA	
18					
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-35
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	AUGUST 1977	1 of 2	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,102' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 9, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		SILTY SAND--(continued)	G-4	HSA	
22			W-2	D	11/18 - 1.0'
24	SM	23.5-30.0' SILTY SAND with GRAVEL; tan with Fe-mottles; contains angular sandstone-siltstone gravel.	STP	D	13/12/23 - 1.5'
26			G-5	HSA	
28					
30	LITH.	BEDROCK CONTACT			
32		30.0-40.0' GALLUP SANDSTONE; white to gray; fine to medium grained; slightly calcareous.			
34					
36					
38					
40					

DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SPICE  
METER WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY  
DEFLECTED SAMPLES RECORDED BY USE OF SMALL DIAMETER  
HOLES. SURFACE AND FAULT SURFACE HOLES HAVE FURTHER COMPLI-  
CATION IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING  
FLUID AND TO CARE IN ADVANCE HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE  
DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER  
LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE  
DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES  
OF SPECIFIC CONSTRUCTION.

1. ALL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS  
AS USED IN (UNFINISHED) HOLE CLASSIFICATION SYSTEM.

2. STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY  
BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

NOTE: Took 1-6"  
ring sample each  
10.0'.

TOTAL DEPTH = 40.0 FEET

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,102' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 9, 1977

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-9.0' <u>CLAY</u> ; light brown; sticky; plastic; contains some fine sand.			
2			G-1	HSA	
4					
6					
8					
	LITH.	BEDROCK CONTACT			
10		9.0-11.0' <u>GALLUP SANDSTONE</u> ; white to gray; fine to medium grained; contains some carbonate cement; effervesces slightly.	W-1	D	27/50 - 1.0'
12		TOTAL DEPTH = 11.0 FEET  <small>DATA ON THIS LOG IS APPROPRIATE ONLY BECAUSE THE ONLY WATER WAS OBTAINED FROM DIRECTLY UNDERGROUND AND POSSIBLY OBTAINED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.  THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.  THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO FURNISH PROVEN DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTIONS.  SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.  THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,102' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 9, 1977

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-10.0' SANDY CLAY; light brown; plastic; fluffy; contains fine sand.	G-1	HSA	
2					
4					
6			G-2	HSA	
8					
10	SM	10.0-13.0' SILTY SAND with SUBROUNDED SANDSTONE FRAGMENTS; tan with Fe-mottles.	W-1	D	24/20 - 1.0'
12			STP	D	18/19/15 - 1.5'
	LITH.	BEDROCK CONTACT			
14		13.0-15.0' GALLUP SANDSTONE; white to gray; fine to medium grained; calcareous; effervesces slightly.			
16		TOTAL DEPTH = 15.0 FEET			
		<p>DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DIFFERENT SAMPLING METHODS BY USE OF SMALL-DIAMETER HOLES. SOFT AND HARD BORING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD OF THE USE OF THE DRILLING FLUID AND/OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON USGS SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-37
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	AUGUST 1977	1 of 1	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,108' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 9, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-10.5' SANDY CLAY; light brown to yellow brown; very plastic; contains fine sand.	G-1	HSA	
2					
4			G-2	HSA	
6					
8	SM	10.5-12.5' SILTY SAND; light brown; fine grained.	STP	D	8/9/10 - 1.5'
10					
12	ML	12.5-16.0' CLAYEY SILT; light brown; slightly plastic.	G-3	HSA	
14					
16	CL	16.0-20.0' SANDY CLAY; light brown; slightly plastic.	G-4	HSA	
18					
20					

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

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SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	AUGUST 1977	1 of 2

HOLE  
NO  
WPC-38

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,108' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 9, 1977

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20	SM	20.0-25.0' <u>SILTY SAND</u> with <u>GRAVEL</u> ; tan with Fe-stain; contains subangular sand- stone-siltstone fragments up to 1/2 diameter.	W-1	D	24/29 - 1.0'
22			G-5	HSA	
24	LITH.	BEDROCK CONTACT			
26		25.0-30.0' <u>GALLUP SANDSTONE</u> ; white to gray; fine to medium grained.			
30		TOTAL DEPTH = 30.0 FEET			
32		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO- MATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING. NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR LUBRIC IN ARTIFICIAL HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE. ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED BY SUCH A RATE AS TO FURNISH PROPER DATA FOR DESIGN PLS. IT IS AND NOT NECESSARILY THE PURPOSE OF SPECIFIC CONTRACTS.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNHISTORIC SOIL CLASSIFICATION SYSTEMS.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,086' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 2, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-10.1' SILT; dark yellow orange; dry; slow dilatency; contains approximately 10% very fine sand.		HSA	Drilling with 6" diameter hollow stem auger.
2					
4					
6				D	5.0-6.5' Drove standard split spoon. 7/6/7 - 1.5'
8				HSA	
10	LITH.	BEDROCK CONTACT			
10.1		10.1-15.0' GALLUP SANDSTONE; SANDSTONE; yellow gray; very fine grained.		D	10.0-10.3' Drove standard split spoon.
12		<small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO WAS OBTAINED FROM INDIRECT OBSERVATION AND POSSIBLY DIFFERENT SAMPLING TECHNIQUES BY USE OF SMALL DIAMETER HOLES. SOFT AND FIRM BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CLAMS IN ADVANCING HOLES.</small> <small>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</small> <small>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO FURNISH PROPER DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS.</small> <small>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</small> <small>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>		HSA	60-.3' Refusal. Sandstone contact in campler.
14					
16		TOTAL DEPTH = 15.0 FEET NOTE: Moved 25' south to look for possible channel.			
18					
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-39
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	AUGUST 1977	1 of 1	





DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,084' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	AUGUST 2, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-25.0' SILT--(continued)		D	20.0-21.5' Drove standard split spoon. 12/12/16 - 1.5'
22				HSA	
24		Grades into:			
26	CL	25.0-36.0' SANDY CLAY; moderate yellow brown; lean; approximately 25% very fine sand; slightly damp.		D	25.0-26.5' Drove standard split spoon. 11/13/15 - 1.5'
28				HSA	
30		Contains angular and rounded, deeply weathered siltstone and sandstone fragments below 31.0'.		D	30.0-31.5' Drove standard split spoon. 12/17/20 - 1.5'
32				HSA	
34					
36	SC-GC	36.0-57.0' CLAYEY SAND AND GRAVEL; 10-15% low plasticity fines; 30-40% fine to coarse, subangular to subrounded gravel; remainder is fine to coarse sand. Contains scattered, silty sand lenses.		D	35.0-36.5' Drove standard split spoon. 18/18/27 - 1.5'
38				HSA	
40					

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,084' (TOPO)	LOGGED BY LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 6"	DATE DRILLED AUGUST 2, 1977

NOTE: Pond 6A, north leg dam axis.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40	SC-GC	36.0-57.0' CLAYEY SAND AND GRAVEL--(continued)		D	40.0-41.5' Drove standard split spoon. 15/14/11 - 1.5'
42				HSA	
44				HSA	
46	SM	45.5' Zone of silty sand; very fine grained; 25% nonplastic fines.		D	45.0-46.5' Drove standard split spoon. 9/8/9 - 1.5'
48				HSA	
50	SC-GC			D	50.0-51.5' Drove standard split spoon. 11/9/8 - 1.5'
52				HSA	
54				HSA	
56	SM	55.0-55.5' Lense of silty sand.		D	55.0-56.5' Drove standard split spoon. 6/7/7 - 1.5'
		56.0' Gravels are deeply weathered and stained.			
		57.0' Drilling slows.			
	LITH	BEDROCK CONTACT			
58		57.0-65.0' GALLUP SANDSTONE; very light gray; very fine to fine grained; slightly weathered to fresh.		HSA	
60					

W A WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.

GUL-101

DATE

AUGUST 1977

SHEET NO.

3 of 4

HOLE NO.

WPC-40

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,084' (TOPO)	LOGGED BY	LAR	
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	AUGUST 2, 1977

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60		57.0-65.0' GALLUP SANDSTONE-- (continued)		D	60.0-60.2' Drove standard split spoon. 60-.2' Refusal.
62				AD	
64					
66		TOTAL DEPTH = 65.0 FEET  <small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SOIL          WATER WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY          DISTURBED SAMPLES. INDENTATIONS BY USE OF SMALL DIAMETER          HOLES. ROTARY AND SHIM HOLES SHOULD HAVE FURTHER COMPLE          CLAYTONS IN THIS REGARD. BECAUSE OF THE NEED TO USE DRILLING          FLUID AND OR LUBING IN ADVANCING HOLE.          THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE          DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER          LOCATIONS AND ON OTHER DATES.          THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO FURNISH PROVEN          DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES          OF SPECIFIC CONSTRUCTION.          SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION          BASED ON UNPREDRILLED HOLE CLASSIFICATION SYSTEM.          THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES          BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,088' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 14, 1977

NOTE: Hole located on south leg, dam axis 8A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	RECOVERED	REMARKS
0	GC	0.0-4.0' SANDY CLAY to CLAYEY SAND with SUBROUNDED SANDSTONE and SILTSTONE GRAVEL; light brown; plastic.		HSA	
2					
4	LITH.	BEDROCK CONTACT			
4		4.0-25.5' DILCO COAL MEMBER OF CREVASSE CANYON FORMATION			Return cuttings contain clayey, sandy silt with angular rock fragments up to 3/4" diameter.
6		4.0-9.0' INTERBEDDED SANDSTONE AND SILTSTONE; tan to purple with Fe-stain.			
8					
10		9.0-11.5' SANDSTONE with GRAY SHALE PARTINGS; tan to light gray with Fe-stain and Mn-stain; wavy bedding; fractures along shale partings.	Run No.	Recov. Adv.	Started coring at 9.0'. Coring time was 30 minutes, 9.0-19.0'. Core shows discontinuous, vertical fractures 9.0-19.0'. Less than 5 gallons water take for 10.0' run. Coring segments ranged from 1-10" long, 9.0-19.0'.
12		11.5-14.5 INTERBEDDED SILTSTONE AND SHALE; purple with Fe-stain along bedding; wavy bedding; shale is plastic and crumbly.	1	9.5 10.0 (95%)	
14		14.5-19.0' SANDSTONE; light gray with yellow and Fe-mottles; fine to medium grained; wavy bedding; contains 6" shaley coal seam at 18.5-19.0'.			
16		19.0-25.5' INTERBEDDED SILTSTONE AND SHALE; purple-tan banded color with Fe-stain; wavy bedding; fractures along shale beds; 1/8" thick horizontal gypsum seam at 21.5', shale is brittle.			Coring time ≈ 30 minutes, 19.0-29.0'. Core segments ranged from 2-5".
18					
20					

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE NO.

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO

DATE

SHEET NO

GUL-101

AUGUST 1977

1 OF 5

WCP-41

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,088' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED AUGUST 14, 1977

NOTE: Hole located on south leg, dam axis 8A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		19.0-25.5' INTERBEDDED SILT- STONE AND SHALE--(continued)			20-30 gallons water take for 10.0' run.
22					
24			2	9.6 10.0 (96%)	
26		25.5-100.0' GALLUP SANDSTONE 25.5-33.0' SANDSTONE with GRAY SHALE PARTINGS; tan to light gray with Fe-stain; fine to medium grained; weakly cemented; fractures along shale partings.			
28					
30					Coring time =30 minutes, 29.0-39.0'. 25-35 gallons water take for 10.0' run. Core segments ranged from 1" to 8" long.
32					
34		33.0-100.0' SANDSTONE; light brown to light gray with some minor Fe-stain; weakly cemented; crossbedded.	3	9.7 10.0 (97%)	
36					
38					
40					

W A WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-41
		PROJECT NO. GUL-101	DATE AUGUST 1977	SHEET NO. 2 of 5	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,088' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER 7-3/4" NX	DATE DRILLED	AUGUST 14, 1977

NOTE: Hole located on south leg, dam axis 8A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		33.0-100.0' SANDSTONE-- (continued)			Driller using 500 psi down pressure and crushing rock while coring. ~20 gallons for 10.0' run.
42				6.0 10.0 (60%)	Coring time ≈20-30 minutes, 39.0-49.0'.
44			4		
46					
48					
49.0-49.5'		Contains gray shale partings.			
50					~20-25 gallons for 10.0' run. Coring time ≈20 minutes, 49.0-59.0'.
52					Driller reduced down pressure to 300 psi at 49.0'.
54			5	10.0 10.0 (100%)	
56					
58					
59.0-60.0'		Shows circular shape Fe-stains 1/2"- 1" diameter.			
60					

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.

DATE

SHEET NO.

GUL-101

AUGUST 1977



3 of 5

HOLE  
NO.

WPC-41

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,088' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER 7-3/4" NX	DATE DRILLED	AUGUST 14, 1977

NOTE: Hole located on south leg, dam axis 8A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60		33.0-100.0' SANDSTONE-- (continued)			
62				5.0 10.0 (50%)	
64			6		
66					
68					
70		Exhibits complex frac- ture system oriented 60-80° from horizontal.			Coring time =20 minutes, 69.0-79.0'. ~20 gallons for 10.0' run. Core segments ranged from broken crumbs to 3" long, 69.0- 79.0'.
72					
74			6	8.0 10.0 (80%)	
76					
78					
80					

W A WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO WPC-41
		PROJECT NO GUL-101	DATE AUGUST 1977	SHEET NO 4 of 5	

PALO ALTO • NEWPORT BEACH • CALIF

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,088' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	DATE DRILLED AUGUST 15, 1977
HOLE DIAMETER 7-3/4" NX		

NOTE: Hole located on south leg, dam axis 8A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
80		33.0-100.0' SANDSTONE-- (continued)			Coring time = 20 minutes, 79.0-89.0'.
82					-300 gallons water take for 10.0' run.
84		84.0-97.0' Shows purple to pink stain and mottling.	7	10.0 10.0 (100%)	Core segments ranged from 3-12" long, 79.0-89.0'.
86					
88					
90					Coring time = 30 minutes, 89.0-99.0'.
92					~50-75 gallons water take for 10.0' run.
94		DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SAMPLE BATCH WAS OBTAINED FROM SUBJECT DRILLER AND POSSIBLY OBTAINED SAMPLES. RECORDED BY USE OF SMALL DIAMETER HOLES. BITERS AND BUSH BORING SCALES HAVE FURTHER COMPLICATED CATCHES IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLE.	8	9.7 10.0 (97%)	Core segments ranged from 8-30" long, 89.0-99.0'.
96		THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.			
98		THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.			
100		SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.			
		THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.			
		97.0-100.0' Shows Fe- stain and yellow mottles.			
			9	100%	
		TOTAL DEPTH = 100.0 FEET			

W A WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE  
NO.

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO.  
GUL-101

DATE  
AUGUST 1977

SHEET NO.  
5 OF 5

WPC-41



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,127' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 16, 1977

NOTE: Hole located on north leg, dam axis 8A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SC	0.0-2.0' <u>CLAYEY SAND</u> with <u>SANDSTONE-SILTSTONE ROCK FRAGMENTS</u> (up to 2" diameter); light brown; slightly plastic.		HSA	
2	LITH.	BEDROCK CONTACT			Bedrock contact at 2.0'.
2.0		2.0-9.0' <u>DILCO COAL MEMBER OF CREVASSE CANYON FORMATION</u> ; <u>INTERBEDDED SANDSTONE, SILTSTONE, AND SHALE</u> ; tan to purple with Fe-stain.			
4					
6					
8					
9.0		9.0-19.0' <u>SHALE</u> ; purple to gray with Fe-stain and yellow-stain along bedding; very weathered; plastic; shows discontinuous vertical fractures (up to 3" long) in upper 5.0'.	Run No.	Recov. Adv.	Started coring at 9.0'. Core segments ranged from broken crumbs to 3" long. 75-100 gallons water take for 10.0' run. One hour 15 minutes coring time; 9.0-19.0'.
10					
12					
14			1	6.5 10.0 (65%)	
16					
18		19.0-22.0' <u>SHALE</u> ; dark gray to black; brittle; wavy bedding; contains 2" thick flaky, carbonaceous shale beds at 19.5' and 21.5'.			
20					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,127' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER 7-3/4" NX	DATE DRILLED	AUGUST 16, 1977

NOTE: Hole located on north leg, dam axis 8A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		19.0-22.0' SHALE--(continued)			One hour coring time; 19.0-29.0'.
22		22.0-31.0' <u>SILTY SANDSTONE</u> with <u>BLACK CARBONACEOUS</u> <u>SHALE PARTINGS</u> ; medium to dark gray; wavy bedding; fine to medium grained; shows vertical fractures 28.0-29.0'.	2	10.0 10.0 (100%)	~100 gallons water take for 10.0' run. Core segments ranged from small fragments to 10" long.
24					
26					
28		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY UNFINISHED SAMPLING. NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CARDS IN A WASHING HOLE.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATION SHOWN IN LOG ARE FIELD CLASSIFICATIONS BASED ON UNFINISHED HOLE CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			45 minutes coring time; 29.0-39.0'.
30		31.0-31.3' Coal Seam; black.			~100 gallons water take for 10.0' run.
32		31.3-34.5' <u>SILTY SANDSTONE</u> with <u>GRAY SHALE PARTINGS</u> ; light gray; wavy bedding; fine to medium grained.			Core segments ranged from 1-1/2-24" long.
34		34.5-36.0' <u>SANDY SILTSTONE</u> with <u>GRAY SHALE PARTINGS</u> ; light gray.	3	10.0 10.0 (100%)	
36		36.0-38.0' <u>SHALE</u> ; medium gray; wavy bedding.			
38		38.0-39.0' <u>SILTY SANDSTONE</u> ; medium gray.			
40		TOTAL DEPTH = 39.0 FEET			

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,085 (TOPO)	LOGGED BY MPF - LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 6" NX	DATE DRILLED August 16, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	LITH.	0.0-49.5' <u>DILCO COAL MEMBER OF CREVASSE CANYON FORMATION</u>			
2		0.5-4.0' <u>INTERBEDDED SILTSTONE, SANDSTONE, AND SHALE</u> ; purple, tan, gray banded color with Fe-stain along bedding.		AD	
4		4.0-6.0' <u>SANDSTONE</u> with purple shale partings; tan; fine to medium grained.		Recov. Adv.	4.0' Started coring. 4.0-10.0' Coring time = 1/2 hour.
6		6.0-9.0' <u>SILTSTONE</u> with purple to gray shale partings; tan to gray with Fe-stain; shale partially weathered to clay; contains discontinuous vertical fractures.	1	6.0 6.0 (100%)	20-30 gallons of water taken for 6.0' run. Core segments ranged from 1-3" long.
10		9.0-17.0' <u>SHALE</u> ; dark gray to black with Fe- and yellow-stain along bedding; brittle; partially weathered to plastic clay; contains black coal seam 9.7' to 10.0'.			
14		17.0-19.0' <u>SANDSTONE</u> ; yellow brown; fine grained; little fractured along horizontal bedding; weak to moderately strong.	2	8.5 10.0 (85%)	
18		19.0-24.6' <u>SANDY SHALE AND SILTSTONE</u> ; medium light gray with dark gray mottling; contains weak, 1-2" thick clayey zones at approximately 1' intervals.			
20					

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,085 (TOPO)	LOGGED BY MPF-LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 6" NX	DATE DRILLED August 16, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		19.0-24.6' SANDY SHALE AND SILTSTONE--(continued)			20.0' Coring rate below 4 min/ft.
22					Water loss is below 5 gallons per core run.
24			3	10.0 10.0 (100%)	
26		24.6-49.5' SANDSTONE; yellow brown with dark yellow-orange staining; contains carbonaceous laminations and fragments; medium gray below 28.0'. Physical condition: Moderately fractured; mostly horizontal; moderately strong.			
28					
30					
32					
34		33.7-34.0' Coal seam.			
36			4	10.0 10.0 (100%)	
38		36.5-40.0' Thinly laminated with medium-dark gray clayey shale.			
40					

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,085 (TOPO)	LOGGED BY MPF-LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 6" NX	DATE DRILLED August 16, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		24.6-49.5' SANDSTONE-- (continued)			
42					
44		43.5-44.1' Layer of dark gray, expansive clayey shale.	5	10.0	
46		44.6-49.5' Laminated and mottled with dark gray siltstone.		10.0 (100%)	
48					
50		49.5-70.0' GALLUP SANDSTONE; light olive gray; fine to medium grained quartz sandstone. Physical condition: Moderately to slightly fractured; fractures are mostly 20° to horizontal; weak to moderately strong; fresh.			5.0' Coring rate increases to 2 min/ft.
52					
54					
56			6	10.0	
58				10.0 (100%)	
60					

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,085 (TOPO)	LOGGED BY LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 6" NX	DATE DRILLED August 16, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60		49.5-70.0' GALLUP SANDSTONE-- (continued)			
62					
64		63.6-63.9' Layer of crushed, clayey shale.			
		64.5' 45° joint.	7	10.0 10.0 (100%)	
66					
		67.5' 60° joint.			
68					
		69.5' 60-70° joint.			
70		TOTAL DEPTH = 70.0 FEET			
72		NOTE:  <small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</small> <small>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</small> <small>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</small> <small>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</small> <small>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			

DRILL RIG	CME 75	HOLE ELEVATION	7,199' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6" NX	DATE DRILLED	AUGUST 17-18, 1977

NOTE: Hole located on north leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SM	0.0-1.0' COLLUVIUM; silty sand; very fine grained; grayish-orange.		HSA	Drilling with 6" diameter hollow stem auger.
2	LITH.	1.0-29.5' MULATTO TONGUE, MANCOS FORMATION; INTER-BEDDED SANDSTONE, SILTSTONE, AND SHALE; thinly bedded; weak; deeply weathered.			
4		SANDSTONE AND SILTSTONE are moderately yellow brown; intensely to closely fractured; weak.			
6		SHALE is mostly weathered to clay and is lost when cored.			
8				Recov. Adv.	
10		10.2-10.5' Crushed shale zone with gypsum seams to 0.30".	Run No.		9.0' Coring with NX core barrel and clear water.
12				5.5 10.0 (55%)	Coring rate: 4-1/2 min/ft. Water loss is less than 5-10 gallons per run above 23.0'
14			1		
16					
18		18.2-18.5' Vertically fractured in sandstone.			
20		18.8-20.1' Clay; dark yellow-brown with gypsum veinlets.			

W A WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT PALO ALTO • NEWPORT BEACH • CALIF.	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-44
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 of 2	

DRILL RIG	CME 75	HOLE ELEVATION	7,199' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6" NX	DATE DRILLED	AUGUST 17-18, 1977

NOTE: Hole located on north leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		1.0-29.5' INTERBEDDED SAND- STONE, SILTSTONE, AND SHALE (continued)			
22		21.3-21.5' Clay seam.			
24		22.3-29.0' Crushed to intensely fractured sandstone and siltstone; much is lost in core run.		6.0 10.0 (60%)	23.0' Water loss in- creases; total loss for hole is 300 gallons.
26		<small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE DRIFT WATER WAS OBTAINED FROM DEEPER THAN OUTCROPS AND POSSIBLY DIFFERENT SAMPLES. THE SAMPLES WERE OBTAINED BY USE OF SMALL DIAMETER BOREHOLE AND SMALL BOREHOLE LOGS HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CARBON DIOXIDE IN THE BOREHOLE. THE LOG INDICATES QUANTITIES IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROVIDE PROVEN DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS. SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM. THE STRATIFIED LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>	2		
28					
30		29.5-39.0' DILCO COAL MEMBER 29.5-30.1' Fresh, light gray sandstone; strong; unfractured.			29.0' End of drill- ing 8/17/77. Hole is dry in morning.
32		30.1-37.3' weak; closely fractured sandstone and siltstone; horizontal bedding fractures with several thin clay layers containing gypsum.		8.2 10.0 (82%)	
34			3		
36					
38		37.3-39.0' Several 45° clay filled fractures			
40		TOTAL DEPTH = 39.0 FEET			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	SEPT. 1977	2 OF 2

HOLE  
NO.

WPC-44



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,199' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6" NX	DATE DRILLED	AUGUST 18, 1977

NOTE: Hole located on north leg, fault zone, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-2.0' COLLUVIUM; SANDY CLAY; yellow brown; lean.		HSA	Drilling with 6" diameter hollow stem auger.
2	LITH.	BEDROCK CONTACT			
2		2.0-32.5' MULLATO TONGUE MEMBER OF THE MANCOS SHALE; SILTSTONE; yellow brown; irregular and contorted bedding; many gypsum fillings to 0.1" in fractures and partings; deeply weathered to 12.0'.			
12		12.0-32.5' Moderately weathered; closely fractured along horizontal to 20° bedding.			12.0' Augering becomes firm.
14			Run No.	Recov. Adv.	14.0' Coring with NX core barrel and clear water; coring rate is approximately 4 minute/feet.
15.5-16.0'		Clayey zone.	1	9.6 10.0 (100%)	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,199' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6" NX	DATE DRILLED	AUGUST 18, 1977

NOTE: Hole located on north leg, fault zone, dam axis 6A.

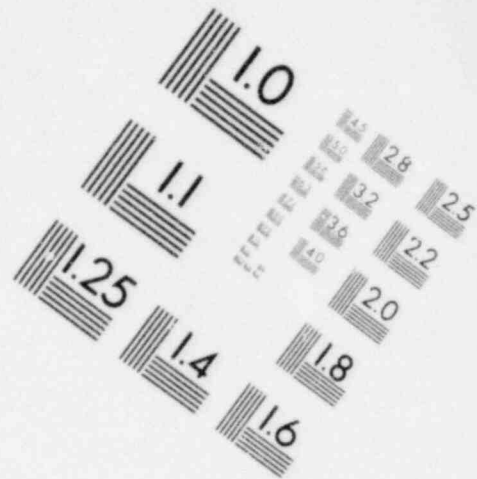
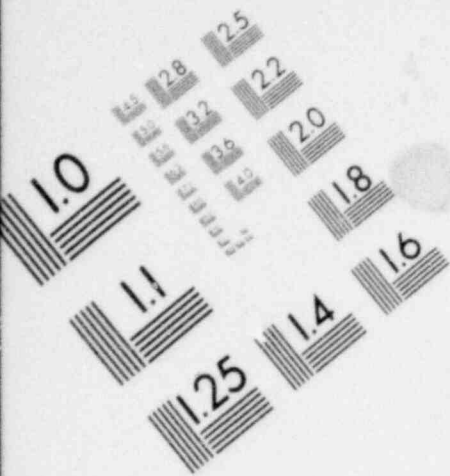
ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		2.0-32.5' SILTSTONE-- (continued)			
22		21.5-27.5' Siltstone is interbedded with shale that has weath- ered to clay and con- tains granular gypsum deposits on partings at approximately 1" intervals.	2	9.6 10.0 (96%)	Taking small amount of water below 24'.
24					
26					
28					
30					
32					
34		32.5-79.0' <u>DILCO MEMBER OF THE CREVASSE CANYON FORMATION.</u>	3	10.0 10.0 (100%)	Taking approximately 50 gallons per 10' run.
36		32.5-59.5' <u>SANDSTONE</u> ; grayish orange with medium dark gray, carbonaceous mottles; bedding is indistinct and irregular; moderately fractured with gypsum on surfaces.			
38		34.5' 60° joint healed with gypsum. 35.3-35.8' Clayey zone with gypsum. 36.5-36.8' Crushed zone; light olive color.			
40					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-45
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	AUGUST 1977	2 of 4	

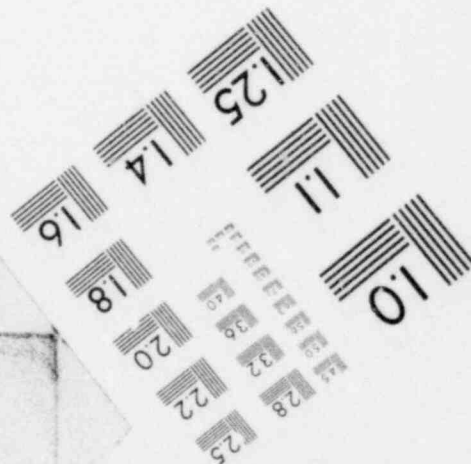
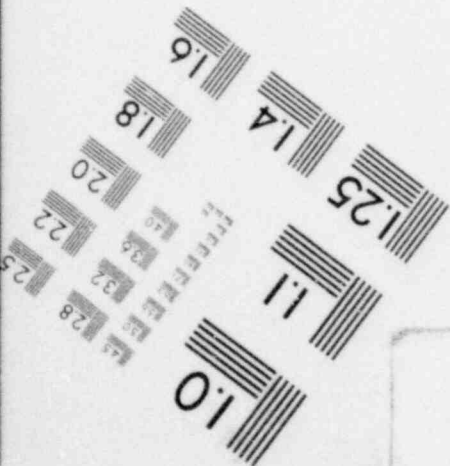
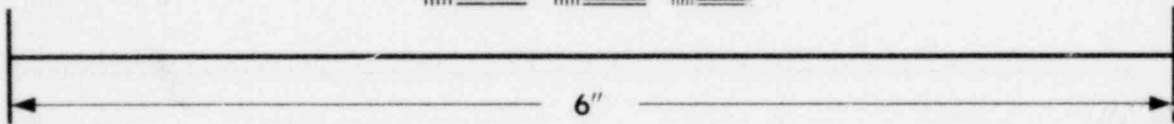
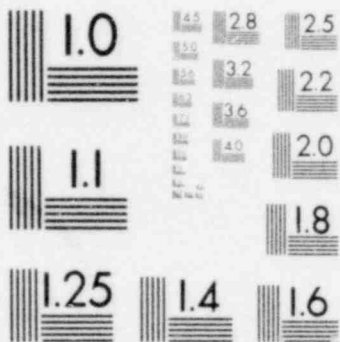
DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,199' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6" NX	DATE DRILLED	AUGUST 18, 1977

NOTE: Hole located on north leg, fault zone, dam axis 6A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		32.5-59.5' SANDSTONE-- (continued)			Coring rate continues at 4 minute/feet.
42		40.0' Becomes medium light gray; little fractured.			
44		41.0-41.8' Vertical frac- ture healed with gypsum. 42.2' 30° gypsum. 43.3-47.0' Many fine, healed fractures and several clayey shale seams to 3".	4	9.0 10.0 (90%)	
46					
48		48.5' 45° fracture.			
50					
52		52.0-52.2' Clay seam.			
54		53.3-54.0' 45° fractures.	5	9.8 10.0 (98%)	
56		56.1-57.2' Coal seam.			56.0' Oily residue in return water; water loss remains at 50 gallons per 10' run.
58		57.4-57.9' 75° fracture. 59.5-79.0' SILTSTONE; medium gray; thinly banded with light gray sandstone; most banding is 20-30° from horizontal; moderately strong; moderate to little fractured.			
60					



**IMAGE EVALUATION  
TEST TARGET (MT-3)**



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,199' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6" NX	DATE DRILLED	AUGUST 18, 1977

NOTE: Hole located on north leg, fault zone, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60		59.5-79.0' SILSTONE-- (continued)			
62		62.4-62.6' Clay zones.			
64		63.8-64.2' Clay zones.			
		65.0-65.7' Carbonaceous.	6	10.0 10.0 (100%)	
66					
68					
70		69.6-70.7' Crushed to intensely fractured and very clayey.			
		70.7-77.0' Light gray; very fine grained sand- stone with dark gray siltstone bands; moder- ately fractured along 10-20° laminations.			
72					
74			7	10.0 10.0 (100%)	
76		<small>           DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM SHORTLY DISCONTINUED AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.             THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.             THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PREPARELY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS.             SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.             THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.         </small>			
78					
80		TOTAL DEPTH = 79.0 FEET			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT  
PALO ALTO • NEWPORT BEACH • CALIF

SOIL EXPLORATION DRILL HOLE LOG		
PROJECT NO.	DATE	SHEET NO.
GUL-101	AUGUST 1977	4 OF 4

HOLE  
NO.  
WPC-45

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,230' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6" NX	DATE DRILLED	AUGUST 19, 1977

NOTE: Located on north end of north leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-2.0' <u>SOIL COVER</u> ; <u>SANDY SILT</u> ; moderate yellow brown.		HSA	Drilling with 6" diameter hollow stem auger.
2	LITH.	2.0-50.0' <u>MULLATO TONGUE MEMBER OF THE MANCOS SHALE</u>			
4		2.0-23.0' <u>SANDSTONE</u> ; very fine grained; grayish orange; weak; closely fractured along horizontal to 30° bedding planes; deeply weathered to 9.0'.			
6					
8					
10			Run No.	Recov. Adv.	9.0' Augering becomes firm.
11.3		11.3-12.0' Strong to very strong.			10.0' Coring with NX core barrel using clear water; water loss is 100-150 gallons per 10' run.
12					
14					
16			1	9.6 10.0 (96%)	
18					
20					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,230' (TOPO)	LOGGED BY	LAR	
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6" NX	DATE DRILLED	AUGUST 19, 1977

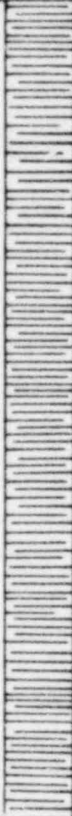
NOTE: Located on north end of north leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		2.0-23.0' SANDSTONE-- (continued)			
22		Grades into:		5.0 10.0 (50%)	
24		23.0-32.5' SILTSTONE; grayish orange; intensely fractured to crushed below 29.0'.	2		
26					
28					
30					
32		32.5-50.0' SHALE; varies from clayey to sandy; thinly laminated; mostly weak to friable; clayey zones are crushed with scattered gypsum fillings.	3	5.1 10.0 (51%)	
34					
36					
38					
40					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-46
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	2 of 3	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,230' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6" NX	DATE DRILLED	AUGUST 1, 1977

NOTE: Located on north end of north leg, dam axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		32.5-50.0' SHALE--(continued)	4	7.5 10.0 (75%)	
42					
44					
46					
48					
50					
52					
		TOTAL DEPTH = 50.0 FEET			
		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO OBTAINED WAS OBTAINED FROM INDICALLY DRILL OPERATIONS AND POSSIBLY DIFFERENT SAMPLING TECHNIQUES BY USE OF SMALL DIAMETER HOLES. ROTARY AND SHIP BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRESENTLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT  
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SOIL EXPLORATION DRILL HOLE LOG		
PROJECT NO.	DATE	SHEET NO.
GUL-101	SEPT. 1977	3 OF 3

HOLE  
NO.  
WPC-46



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,151' (TOPO)	LOGGED BY	LAR/BEE
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 19-21, 1977

NOTE: Located in Pond 6A reservoir area.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-22.0' SANDY CLAY; moderate yellow brown; lean; contains 10-15% very fine sand.		HSA	Drilling with 6" diameter hollow stem auger.
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WPC-47
		DRILL HOLE LOG			
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 OF 3	

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,151' (TOPO)	LOGGED BY LAR/BEE
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 7-3/4' NX	DATE DRILLED AUGUST 19-21, 1977

NOTE: Located in Pond 6A reservoir area.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20	CL	0.0-22.0' SANDY CLAY-- (continued)			
22	LITH.	BEDROCK CONTACT			Drilling becomes firm at 22.0'.
22		22.0-30.0' <u>DILCO COAL MEMBER</u> ; probably weathered bedrock.			
24					
26					
28					
30			Run No.	Recov Adv.	
30		30.0-31.7' <u>SILTSTONE AND SANDSTONE</u> ; very fine grained; laminated yellow orange, tan, and gray; cross- bedded; weathered, readily breaks down to sand sized fragments; thin interbeds of gray brown shale (clay)			30.0' Coring with NX core barrel using clear water; end of drilling 8/19/77. Resume drilling 8/21/77 at 3:00 p.m. Water loss 50-70 gallons for 10' run.
32					
34		31.7-34.1' <u>SHALE</u> ; dark gray brown; weathered (clay).			
34		34.1-54.7' <u>SANDSTONE</u> ; fine grained; dark gray and very light gray; crossbedded; thin laminae of dark, gray brown shale throughout sandstone; also 1/4-3/4" shale beds. Shale beds contain gravel sized sand- stone fragments. Few near vertical open fractures.	1	10.0 10.0 (100%)	
36					
38					
40					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,151' (TOPO)	LOGGED BY	LAR/BEE
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE P.C. = AUGUST 19-21, 1977

NOTE: Located in Pond 6A reservoir area.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		34.1-54.7' SANDSTONE-- (continued)			
42					
44					
46			2	10.0 10.0 (100%)	
48					
50					
52					
54			3	10.0 10.0 (100%)	
56		54.7-60.0' SANDSTONE; fine grained; gray; quartose; well sorted; friable.			
58		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDICENT DISCONTINUOUS AND POSSIBLY DISTURBED SAMPLING INCREASINGLY BY USE OF SMALL DIAMETER HOLES. ROTARY AND RAM BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE SMALLER FILLS AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO FURNISH PROVED DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			
60		TOTAL DEPTH = 60.0 FEET			Hole terminated at 60.0', 8/21/77 6 p.m.

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-47
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	3 of 3	
PALO ALTO • NEWPORT BEACH • CALIF.					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,202' (TOPO)	LOGGED BY	BEE
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 22, 1977

NOTE: Located in Pond 6A, reservoir area.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SM	0.0-3.0' COLLUVIUM; SLIGHTLY SILTY SAND; light yellow brown; very fine grained; loose; dry.		HSA	0-9.0' Drilling with 6" diameter hollow stem auger.
2					
	LITH.	BEDROCK CONTACT			
3		3.0-31.5' MULATTO TONGUE, MARLS SHALE			
4		3.0-9.0' SHALE-SILTSTONE; weathered.			
6					
8					
			Run No.	Recov.	
9		9.0-31.5' SILTSTONE; yellow brown to gray brown; thinly bedded; moderate to severely weathered. Fractured along bedding planes, 1-3" spacing, also near vertical. Many are open, others filled with clay and gypsum. Some manganese staining in open fractures. Thin laminae and interbeds of very fine grained sandstone.	1	Adv.	9.0' Coring with NX core barrel using clean water. Water loss -75 gallons for 10' core.
10					
12					
14				8.8	
16				10.0	
18				(88%)	
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO WPC-48
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 of 3	
PALO ALTO • NEWPORT BEACH • CALIF					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,202' (TOPO)	LOGGED BY	BEE
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 22, 1977

NOTE: Located in Pond 6A, reservoir area.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		9.0-31.5' SILTSTONE-- (continued)			Water loss ~75 gallons for 10' core.
22					
24			2	6.9 10.0 (69%)	
26		25.0-31.5' Severely fractured, gravel sized angular fragments.			
28					
30					Water loss ~12.5' gallons for 10' core.
32		Grades into <u>DILCO COAL MEMBER</u> 31.5-47.4' <u>SANDSTONE</u> ; very fine grained; light yellow brown; quartzose and mottled light brown, yellow brown, and dark gray brown; crossbedded; thin laminae of dark gray brown shale.	3	9.1 10.0 (91%)	
34					
36					
38					
40					

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& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.

GUL-101

DATE

SEPT. 1977

SHEET NO.

2 of 3

HOLE  
NO

WPC-48

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,202' (TOPO)	LOGGED BY	BEE
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 22, 1977

NOTE: Located in Pond 6A, reservoir area.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		31.5-47.4' SANDSTONE-- (continued)			
42					
44			4	10.0 10.0 (100%)	
46					
48		47.4-49.0' SANDSTONE; very fine grained; dark gray and light gray; cross- bedded.			
50		TOTAL DEPTH = 49.0 FEET  <small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SOIL          SECTION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY          DISTURBED SAMPLES. INDICATIONS BY USE OF SMALL DIAMETER          HOLES. BUTT AND FIRM BORING HOLES HAVE FURTHER COMPLI-          CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING          FLUID AND OR CASING IN ADVANCED HOLES.          THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE          DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER          LOCATIONS AND ON OTHER DATES.          THIS HOLE WAS LOGGED BY SUCH A WAY AS TO PROVIDE PROVEN          DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES          OF SPECIFIC CONSTRUCTIONS.          SOIL CLASSIFICATION SHOWN ON LOG USE FIELD CLASSIFICATION          BASED ON UNPULVED SOIL CLASSIFICATION SYSTEM.          THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY          BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,166' (TOPO)	LOGGED BY BEE
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 7-3/4" NX	DATE DRILLED AUGUST 22-23, 1977

Location: Pond 6A near Polvadera Well

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-37.0' <u>ALLUVIUM</u> 0.0-10.0' <u>CLAYEY SILT</u> ; Moderate brown to grayish-brown; dry		HSA	Drilled with hollow stem auger.
2					
4					
6					
8					
10	ML	10.0-37.0' <u>SANDY SILT</u> ; very fine grained; moderately brown; dry.			
12					
14					
16					
18					
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WPC-49
		DRILL HOLE LOG			
		PROJECT NO. GUL-101	DATE SEPT. 1977	SHEET NO. 1 of 5	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,166' (TOPO)	LOGGED BY	BEE
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 22-23, 1977

Location: Pond 6A near Polvadera Well

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		10.0-37.0' SANDY SILT-- (continued)			
22					
24					
26					
28					
30					
32					
34					
36					
38	CL	37.0-39.0' GRAVELLY CLAY; dark brown (chocolate); dry; possibly bedrock.			
	LITH.	BEDROCK CONTACT			
40		39.0-76.8' DILCO COAL MEMBER OF CREVASSE CANYON FORMATION			

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MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.

GUL-101

DATE

SEPT. 1977

SHEET NO.

2 of 5

HOLE  
NO.

WPC-49



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,166' (TOPO)	LOGGED BY	BEE
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 22-23, 1977

Location: Pond 6A near Polvadera Well

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		39.0-76.8' DILCO COAL MEMBER OF CREVASSE CANYON FORMATION--(continued)			
42					
44					
46		45.0-62.3' SANDSTONE; fine grained; light gray with thin string- ers of dark gray-brown; quartzose; crossbedded; thin laminae of dark gray-brown micaceous siltstone throughout.	Run No.	Recov. Adv.	45.0' Coring with NX core barrel using clear water. End drilling 8/22/77.
48	1		5.0 5.0 (100%)		
50					Water loss ~100 gal- lons for 10' core.
52				5.0 10.0 (50%)	
54			2		
56					
58					
60					

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE  
NO.

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PROJECT NO  
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3 of 5

WPC-49

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,166' (TOPO)	LOGGED BY BEE
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 7-3/4" NX	DATE DRILLED AUGUST 22-23, 1977

Location: Pond 6A near Polvadera Well

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MOJGE	REMARKS
60		39.0-76.8' DILCO COAL MEMBER OF CREVASSE CANYON FORMATION--(continued)			Water loss ~100 gallons for 10' core.
62					
64		62.3-66.2' SILTSTONE-SHALE; dark gray-brown; micaceous; moderately to severely weathered; few stringers of coal.	3	10.0 10.0 (100%)	
66					
68		66.2-74.1' SANDSTONE; fine grained; light gray with thin stringers of dark, gray-brown; quartzose; crossbedded; few stringers of coal.			
70					Water loss ~100 gallons for 10' run.
72					
74					
76		74.1-76.8' SANDSTONE; fine-grained; light gray; quartzose; well sorted; few stringers of coal.	4	10.0 10.0 (100%)	
78		76.8-100.0' <u>GALLUP SANDSTONE</u> ; SANDSTONE; fine to very fine grained; light brown to light gray; quartzose; well sorted; friable.			
80					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,166' (TOPO)	LOGGED BY	BEE
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 22-23, 1977

Location: Pond 6A near Polvadera Well

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
80		76.8-100.0 SANDSTONE-- (continued)			Water loss ~100 gallons for 10' run.
82					
84					
86			5	10.0 10.0 (100%)	
88					
90					Water loss ~250 gal- lons for 10' run.
92					
94					
96		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO- MATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING INDICATED BY USE OF SMALL DIAMETER TOOLS. ROTARY AND PAIR BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED BY ROCK &amp; RAY AS TO PROBABLY PROVED DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNDRILLED HOLE CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>	6	8.5 10.0 (85%)	96.0' loss of circu- lation.
98					
100		TOTAL DEPTH = 100.0 FEET			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	SEPT. 1977	5 of 5

HOLE  
NO.

WPC-49

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,110' (TOPO)	LOGGED BY	BEE
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 23, 1977

Location: Pond 6A

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SM	0.0-38.0' ALLUVIUM; SILTY SAND; moderately brown; fine to very fine grained; some gravel near surface; dense.		HSA	Drilling with hollow stem auger.
2					
4					
6					
8					
10					
12		SILTY CLAY; moderately brown to gray-brown; slightly sandy; dry.			
14					
16					
18					
20					

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,100' (TOPO)	LOGGED BY BEE
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER 7-3/4" NX
		DATE DRILLED AUGUST 23, 1977

Location: Pond 6A

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-38.0' SILTY SAND-- (continued)			
22		Increase in % sand.			
24					
26					
28					
30					
32		CLAYEY SAND; light to moderately brown; fine to very fine grained; dry.			
34		33.0' Gravel? SAND; light to moderately brown; clayey; fine to very fine grained.			
		BEDROCK CONTACT			
36		38.0-70.0' GALLUP SANDSTONE; SANDSTONE; clean; very light brown, some slightly reddish brown and light yellow; fine to very fine grained; well sorted; friable to locally hard; minor thin laminae of dark brown shale in upper 5'; few open or partially filled horizontal fractures (40-50); local circular iron staining.			
38	LITH.				
40					

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.

GUL-101

DATE

SEPT. 1977

SHEET NO.

2 of 4

HOLE NO.

WPC-50

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,110' (TOPO)	LOGGED BY	BEE
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" NX	DATE DRILLED	AUGUST 23, 1977

Location: Pond 6A

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		38.0-70.0' SANDSTONE-- (continued)			Core drilling with NX core barrel using clear water.
42					
44			1	10.0	Water loss ~100 gallons for 10' run.
				10.0 (100%)	
46					
48					
50					Water loss ~100 gal- lons for 10' run.
52					
54					
56			2	10.0	
				10.0 (100%)	
58					
60					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-50
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	3 of 4	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,110' (TOPO)	LOGGED BY BEE
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER 7-3/4" NX	DATE DRILLED AUGUST 23, 1977

Location: Pond 6A

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60		38.0-70.0' SANDSTONE-- (continued)		0.5/10.0	Water loss ~200 gallons for 10' run.
62					
64			3		65.0' Lost circula- tion.
66					
68					
70		TOTAL DEPTH = 70.0 FEET			
		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFOR- MATION WAS OBTAINED FROM SUBJECT DRILLING OPERATIONS AND POSSIBLY OBTAINED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROYAL AND WASH BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLE.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON IMPROVED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO	DATE	SHEET NO
GUL-101	SEPT. 1977	4 OF 4

HOLE  
NO

WPC-50

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,001' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	AUGUST 25, 1977

LOCATION: Catchment down at mouth of Polvadero Canyon.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-16.0' <u>ALLUVIUM</u> ; CLAY; moderate yellow brown; low plasticity.		AD	Drilled with 6" diameter continuous flight auger.
2					
4					
6					
8					
10					
12					
14					
16	LITH.	16.0-20.0' <u>SANDSTONE</u> ; light brown; becomes pale orange at 20.0'.			
18		NOTE: Bedrock is Point Lookout Sandstone(?).			
20		TOTAL DEPTH = 20.0 FEET			

DATA ON THIS LOG IS APPROPRIATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM SUBJECT DISCONTINUOUS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES - ROTARY AND PAIR BORING HOLES - AND FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO FURNISH PROPER DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS.

SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	6,993' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	AUGUST 25, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-40.0' ALLUVIUM; CLAY; moderate yellow brown; low to medium plasticity; dry; contains 5-10% very fine sand below 20.0'.		AD	Drilled with 6" diameter continuous flight auger.
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WPC-52
		DRILL HOLE LOG			
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 of 4	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	6,993' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	AUGUST 25, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-40.0' CLAY--(continued)			
22					
24					
26					
28					
30					
32					
34					
36		35.0' Slightly damp.			
38					
40					



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	6,993' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	AUGUST 25, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60		58.0-70.0' SANDSTONE-- (continued)			
62					
64					
66					
68					
70		TOTAL DEPTH = 70.0 FEET			
72		NOTE: Bedrock is Mulatto Tongue Member of Mancos Shale (?).			
		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SOIL WATER WAS OBTAINED FROM SHALLOW DEPTHS AND POSSIBLY DISTURBED SAMPLING. RESTRICTIONS BY USE OF SMALL DIAMETER SOIL ROTARY AND FLUX BORING SOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING SOLE.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED BY "LICK &amp; RAY" AS TO PRESENTLY PROVIDED DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC COUNTY CODES.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	6,988' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	AUGUST 25, 1977

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-25.0' <u>ALLUVIUM</u> ; <u>CLAY</u> ; moderate yellow brown; low plast.city.		AD	Drilling with 6" diameter continuous flight auger.
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	6,988' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	AUGUST 25, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MOE	REMARKS
20		0.0-25.0' CLAY--(continued)			
22					
24					
26	SC	Grades into: 25.0-68.0' <u>CLAYEY SAND</u> ; very fine grained; approximately 40% low plasticity fines.			
28					
30					
32					
34					
36					
38					
40					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WPC-53
		DRILL HOLE LOG			
		PROJECT NO	DATE	SHEET NO	
		GUL-101	SEPT. 1977	2 of 4	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	6.988' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	AUGUST 25, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		25.0-68.0' CLAYEY SAND-- (continued)			
42					
44					
46					
48					
50					
52					
54					
56					
57.0		Fines become very lean to silty.			
58					
60					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	6,988' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	AUGUST 25, 1977

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60		25.0-68.0' CLAYEY SAND-- (continued)		AD	
62		62.0' Becomes gravelly.			
64					
66					
68	LITH.	68.0-75.0' SANDSTONE; very fine grained; deeply weathered.			
70					
72					
74					
76		TOTAL DEPTH = 75.0 FEET NOTE: Bedrock is Mulatto Tongue Member of Mancos Shale (?).  <small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO OBTAINED WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. SOFTER AND FIRM BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCED HOLES.  THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.  THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.  SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.  THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			

W.A. WAHLER & ASSOCIATES	T. TAYLOR URANIUM MILL PROJECT PALO ALTO • REDPORT BEACH • CALIF	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-53
		PROJECT NO	DATE	SHEET NO	
		GUL-101	SEPT. 1977	4 of 4	



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,058' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 25, 1977

LOCATION: Channel leg, dam axis 8A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-12.0' CLAY; light brown; plastic; sticky; contains fine sand.			
2					
4					
6					
8					
10					
12	CL	12.0-15.0' SANDY CLAY; light brown; slightly plastic; contains fine sand; dense.			
14			S-1	P	Pushed ~8" at 800 psi.
16	ML	15.0-17.0' SANDY SILT with rock fragments up to 1/4" diameter.		AD	
17.0	LITH.	BEDROCK CONTACT			
18		17.0-19.0' GALLUP SANDSTONE; SANDSTONE; tan to light gray; fine to medium grained.			
19.0		TOTAL DEPTH = 19.0 FEET			

DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT MEASUREMENTS AND POSSIBLY DIFFERENT SAMPLING TECHNIQUES BY USE OF SMALL DIAMETER HOLES. SOFART AND SOFT SOILING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.

SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,060' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (FIELD GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 25, 1977

LOCATION: Channel leg, dam axis 8A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-8.0' SANDY CLAY; light brown; plastic; contains fine sand.		HSA	
2					
4					
6					
8	LITH.	BEDROCK CONTACT			
8.0-11.0'		GALLUP SANDSTONE; WEATHERED SANDSTONE AND SILTSTONE; light brown; contains caliche along weathered bedding planes.	STP	DR	15/22/24 - 1.5'
11.0-14.0'		SANDSTONE; light brown to red brown; silty.		HSA	
14		TOTAL DEPTH = 14.0 FEET			
16		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND RAM DRILLING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE COLLARS FILLED AND OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE PROVEN DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSE OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,060' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 25, 1977

LOCATION: Channel leg, cam axis 8A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-13.0' SANDY CLAY; light brown; plastic contains fine sand.		PSA	
2					
4					
6					
8					
10					
12					
14					
16					
18					
13.0	ML to SM	13.0-67.0' SANDY SILT TO SILTY FINE SAND; light brown; nonplastic; medium dense.		HSA	
14					
16					
18					
20					
10					
10					
10					
10					
10					
10			S-1	P	Pushed ~600 psi.
20			S-2	P	Pushed 600-800 psi.

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,060' (TOPO)	LOGGED BY	LAR	
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 25, 1977

LOCATION: Channel leg, dam axis 8A.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		13.0-67.0' SANDY SILT TO SILTY FINE SAND-- (continued)		HSA	
22					
24					
26					
28					
30					Slightly damp below 30.0'.
32					
34					
36					
38					
40					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-56
		PROJECT NO. GUL-101	DATE SEPT. 1977	SHEET NO. 2 OF 4	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,060' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 25, 1977

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		13.0-67.0' SANDY SILT TO SILTY FINE SAND-- (continued)			
42					
44					
46					
48					
50			S-3	P	Pushed ~500 psi.
52				HSA	
54					
56					
58					
60					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,060' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 25, 1977

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60		13.0-67.0' SANDY SILT TO SILTY FINE SAND-- (continued)			
62					
64					
66					
68	GM	67.0-75.0' SILTY SAND with SANDSTONE ROCK FRAGMENTS up to 1/4" diameter; light to medium brown.			
70		<small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SAMPLE MATERIAL WAS OBTAINED FROM SHORTLY DRIFTED HOLES AND POSSIBLY DISTURBED SAMPLES OBTAINED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATING FACTORS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</small>			
72		<small>THIS LOG INDICATES CONDITIONS IN THE HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</small>			
74		<small>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTIONS.</small>			
76	LITH.	75.0-80.0' WEATHERED SHALE AND SILTSTONE BEDROCK; medium brown to red brown; contains manganese stained fragments.			
78		<small>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</small>			
80		<small>THE STRATIGRAPHIC LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			
		NOTE: Bedrock is probably Gallup Sandstone.			
		TOTAL DEPTH = 80.0 FEET			

Becomes denser at  
65.0'.

DRILL RIG		CME 75 (ETL)	HOLE ELEVATION 7,060' (TOPO)		LOGGED BY	MPF	
GROUNDWATER DEPTH (BELOW GROUND SURFACE)		DRY HOLE	HOLE DIAMETER		7-3/4" DATE DRILLED AUGUST 25, 1977		
LOCATION: Channel leg, dam axis 8A.							
ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS		
0	CL	0.0-22.0' SANDY CLAY; light brown; plastic; contains fine sand.		HSA			
2							
4							
6							
8							
10							
12							
14							
16							
18							
20							
W.A. WAHLER & ASSOCIATES		MT. TAYLOR URANIUM MILL PROJECT		SOIL EXPLORATION			HOLE NO. WPC-57
				DRILL HOLE LOG			
				PROJECT NO	DATE	SHEET NO	
		PALO ALTO • NEWPORT BEACH • CALIF		GUL-101	SEPT. 1977	1 of 4	

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,060' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 7-3/4"	DATE DRILLED AUGUST 25, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-22.0' SANDY CLAY-- (continued)			
22	SC	22.0-53.0' CLAYEY SAND; light brown; slightly plastic.			
24			S-1	P	
26				HSA	
28					
30					
32					
34					
36					
38					
40					



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,060' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 25, 1977

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		22.0-53.0' CLAYEY SAND-- (continued)			
42					
44					
46					
48					
50					
52					
54	GC	53.0-67.0' CLAYEY SAND with SANDSTONE FRAGMENTS up to 1/4" diameter; light brown; slightly plastic.			
56					
58					
60					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-57
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	3 OF 4	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,060' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4" DATE DRILLED AUGUST 25, 1977	

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS	
60		53.0-67.0' CLAYEY SAND with SANDSTONE FRAGMENTS-- (continued)				
62						
64						
66						
68			TOTAL DEPTH = 67.0 FEET NOTE: Probably Gallup Sandstone Bedrock.			
			<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY OBTAINED SAMPLING INDICATED BY USE OF SMALL DIAMETER HOLES. SOFT AND FIRM BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLED FLUID AND OR CARE IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO POSSIBLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT PALO ALTO • NEWPORT BEACH • CALIF	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-57
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	4 of 4	

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,305'± (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 7" NX	DATE DRILLED OCTOBER 29-NOVEMBER 3, 1977

NOTE: Located borrow reclamation area.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	LITH.	0.0-1.5' <u>SILTY CLAY WITH SILTSTONE AND SHALE FRAGMENTS</u> up to 3" across; very light brown; plastic.		HSA	Drilled with hollow stem auger to 19.0'.
2		BEDROCK CONTACT			
		1.5-74.5' <u>MULATTO TONGUE MEMBER OF MANCOS SHALE</u>			
4		1.5-19.0' <u>INTERBEDDED SILTSTONE AND SHALE WITH THIN 2-3" SANDSTONE BEDS</u> ; tan to dark brown; contains gypsum between beds; 1-4" bedding; sandstone beds are difficult to auger.			
16		19.0-30.0' <u>SILTSTONE WITH THIN INTERBEDDED GRAY SHALE PARTINGS</u> (up to 1/4" thick); tan with Fe-stain along bedding; fractures along bedding; contains gypsum crystals between bedding (up to 1/8" thick); wavy bedding.			
19.0			Run No. 1	Recov. Adv.	Started NX coring at 19.0' using water.

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE NO.

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO  
GUL-101

DATE  
NOV. 1977

SHEET NO  
1 of 4

WPC-58

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,305'± (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 7" NX	DATE DRILLED OCTOBER 29- NOVEMBER 3, 1977

NOTE: Located borrow reclamation area.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS	
20	[Stratigraphic Column]	19.0-30.0' SILTSTONE WITH THIN INTERBEDDED GRAY SHALE PARTINGS--(continued)	1	4.0 6.0 (67%)	19.0-25.0' 20 minute core run; about 10 gallons of water loss; recovered core segments 1/2-3" long.	
22						
24						
26					25.0-34.5' 45 minute core run; 15 gallons of water loss; 25.0-30.0' poor recovery; shale probably washed out.	
28				4.5 9.5 (47%)		
30		30.0-40.0' SHALE WITH INTERBEDDED TAN SILTSTONE BEDS up to 4" thick; medium-brown; sticky; plastic; contains calcite crystals between bedding; contains shaley limestone concretions from 30.0-35.0'; shale recovered as broken fragments; siltstone recovered 1/4-3" discs.	2		Water loss at 30.0'; 30 gallons per 1' run. Lost circulation. Used drill mud at 30.0'.	
32						
34						Lost circulation at 34.0'.
36						Regained circulation using jet-flake. NOTE: Weathered-fractured. 1.0-2.0' Shaley limestone concretions with caliche filled fractures out-crop 30.0-35.0' below drill site.
38			3	4.0 8.0 (50%)		
40						

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MT. TAYLOR URANIUM MILL PROJECT

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SOIL EXPLORATION  
DRILL HOLE LOG

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HOLE NO  
WPC-58



DRILL RIG MOBILE DRILL: B-61 HOLE ELEVATION 7,305'+(TOPO) LOGGED BY MPF  
 GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED HOLE DIAMETER 7" NX DATE DRILLED OCTOBER 29-NOVEMBER 3, 1977

NOTE: Located borrow reclamation area.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60		42.5-65.0' SHALE--(continued)			
62					
64					
65.0		65.0-74.5' SANDY SILTSTONE; medium gray; wavy bedding; hard; fractures along bedding with few discontinuous vertical joints less than 2" long.			65.0-74.5' Resumed NX core drilling at 65.0'. Took 1 hour core run.
68					
70			4	9.5 9.5 (100%)	Core segments ranged from 1-8" long.
72					
74		TOTAL DEPTH = 74.5 FEET			Lost circulation at 73.5' (took 75-100 gallons in bottom 1.0').
76		<p>DATA ON THE LOG IS APPROXIMATE ONLY BECAUSE THE MPOB WATER WAS OBTAINED FROM REMOTELY LOCATED WELLS AND POSSIBLY INCLUDED SAMPLES RECOVERED BY USE OF SMALL DIAMETER WELLS. SOFART AND FAN BORING WELLS HAVE FURTHER COMPLICATIONS IN THE SQUARE BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCED WELLS.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS WELL ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS WELL WAS LOGGED IN ACCORDANCE WITH A RATE TO PROVIDE PRIMARY DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>NOI CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON LIMITED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,330'± (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 6" NX	DATE DRILLED NOVEMBER 3-10, 1977

NOTE: Located borrow reclamation area.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-2.5' SILTY CLAY WITH SILTSTONE ROCK FRAGMENTS up to 3" diameter; tan; plastic.		AD	Drilled with 6" continuous flight auger to 7.5'; set casing.
2		BEDROCK CONTACT			
4		2.5-100.0' MULATTO TONGUE MEMBER OF MANCOS SHALE; 2.5-7.5' INTERBEDDED SILTSTONE AND SHALE WITH THIN QUARTZ SANDSTONE BEDS 3-6" thick; tan; 1-6" bedding.			
8		7.5-55.0' WEATHERED SHALEY SILTSTONE WITH INTERBEDDED, WHITE, SILTY SANDSTONE LENSES 1-3" thick; tan to yellow-brown; weathered to near soil consistence; sandstone is calcareous; contains 5-10% sandstone.	Run No.	Recov. Adv.	Started NX coring at 7.5' using air. 7.5-5.0' 15 minute coring time.
10				1.0 7.5 (13%)	
12		NOTE: From 7.5-45.0' pulverized rock cuttings retrieved to surface as very light brown, clayey silt; slightly plastic.	1		Core segments ranged from broken crumbs to 1-1/2" discs. Poor recovery due to weathered nature of shale. Most core apparently blown out as cuttings.
14					
16				1.0 10.0 (10%)	
18			2		
20					

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MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE NO  
WPC-59

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DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,330'± (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 6" NX	DATE DRILLED NOVEMBER 3-10, 1977

NOTE: Located borrow reclamation area.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		7.5-55.0' WEATHERED SILTY SILTSTONE WITH INTERBEDDED, WHITE, SILTY SANDSTONE LENSES--(continued)	4		
42					
44					
46					Switched to coring with water at 45.0'. Plugged at 45.5'. About 200 gallons of water take in 3/4 hour.
48					High initial water loss at 45.0-45.5', possibly caused by saturating previously dry hole, hole swelled after wetting.
50					Used tricone rock bit and jet-flake starting at 45.5'.
52					45.5-55.0' 15 minute drilling time.
54					About 4-5 gallons per foot water take from 45.5-70.0'.
56		55.0-65.0' WEATHERED SHALE; medium gray; plastic; sticky; grades into gray, shaley siltstone at lower contact.			55.0-65.0' ~2 minutes per foot drilling time.
58					
60					

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MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE NO.

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO.

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WPC-59

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,330'± (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 6" NX	DATE DRILLED NOVEMBER 3-10, 1977

NOTE: Located borrow reclamation area.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60		55.0-65.0' WEATHERED SHALE-- (continued)		RD	
62					
64					
66		65.0-70.0' SHALEY SILTSTONE; medium gray; slightly plastic.			Relatively harder drilling at 65.0'. 65.0-70.0' ~20 minute drilling time.
68					
70		70.0-78.5 SANDY SILTSTONE; medium dark gray; wavy bedding; medium hard.			Resumed NX coring at 70.0'. 70.0-78.5' 1 hour core run. 10-20 gallons of water loss. Core bit plugged at 78.5' in gray shale.
72					
74			6	8.5 8.5 (100%)	
76					
78		78.5-100.0' INTERBEDDED GR'Y SHALE AND MEDIUM BROWN, SANDY SILTSTONE; shale is weathered; sticky; plastic; siltstone is slightly clayey.		RD	Switched to tricone rock bit from 78.5-100.0'.
80					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WPC-59
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	NOV. 1977	4 of 5	
PALM ALTO • NEWPORT BEACH • CALIF.					



DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,290'±(TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 7"	DATE DRILLED NOVEMBER 10-11, 1977

NOTE: Located borrow reclamation area.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-3.0' <u>CLAYEY, SANDY, SILT WITH SILTSTONE FRAGMENTS</u> up to 1/2" across; very light yellow-brown; slightly plastic.		HSA	Drill with hollow stem auger.
2					
	LITH.	BEDROCK CONTACT			
4		3.0-58.5' <u>MULATTO TONGUE MEMBER OF MANCOS SHALE</u>			
		3.0-7.5' <u>SHALE</u> ; medium brown; contains Fe-stain and gypsum crystals between bedding; slightly damp; parts along bedding; contains few grains of carbonaceous material.	SPT	DR	Standard penetration test. 16/42/50 - 1.5'
8		7.5-8.5' <u>SILTY SANDSTONE LENS</u> 1.0' thick; white; hard.			
		8.5-33.0' <u>SILTSTONE</u> ; light brown; contains sand size gypsum crystals; maximum cutting fragments size is 1/2" diameter; dry.	SPT	DR	Standard penetration test. 50-2" (Refusal)
10					
12					
14					
		Shows some Mn-stain along bedding at 15.0'.	SPT	DR	Standard penetration test. 50-4"
16					
18					
20					

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,290'±(TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE): NOT ENCOUNTERED	HOLE DIAMETER 7"	DATE DRILLED NOVEMBER 10-11, 1977

NOTE: Located borrow reclamation area.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		8.5-33.0' SILTSTONE-- (continued) Contains 1/8" thick gypsum sheets at 20.0'.  Contains 3" thick hard sandstone lens at 22.5'.	SPT	DR	50-3" Standard penetration test.
22					
24		Contains 1/4" thick gypsum sheet at 25.0'.	SPT	DR	50-5" Standard penetration test.
26					
28			J-1 (cuttings)		Standard penetration test.
30			SPT	DR	50-3" Standard penetration test.
32					
34		33.0-43.5' SILTY SHALE; medium dark brown; platy; slightly damp.			Augered easily from 33.0-41.5'.
36				SPT	DR
38			J-2 (cuttings)		
40					

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MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE NO.

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.

DATE

SHEET NO.

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DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,290'+ (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 7"	DATE DRILLED NOVEMBER 10-11, 1977

NOTE: Located borrow reclamation area.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		33.0-43.5' SILTY SHALE-- (continued) Contains fine-grained caliche at 40.0'. 2.0' thick; hard; light gray; quartz sandstone lens from 41.5-43.5'.	SPT	DR	33/50 - 6"/2"
42					
44		43.5-48.0' SANDY SILTSTONE; medium dark gray; hard; wavy bedding.	SPT	DR	Standard penetration test. 50-4"
46			J-3 (cuttings)		
48		48.0-58.5' SILTY SHALE; medium dark gray; friable; parts along bedding.	SPT	DR	Standard penetration test. 16/50 - 6"/2"
50					
52					
54			SPT	DR	Standard penetration test. 50-3"
56			J-4 (cuttings)		Drilling very hard below 56.0'; possibly due to loss of one-tooth on auger head.
58					Refusal at 58.5'.
60		TOTAL DEPTH = 58.5 FEET			

DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING NECESSITATED USE OF SMALL-DIAMETER HOLES. ROTARY AND WASH BORING IS A SAFE FURTHER COMPLICATION IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND TO CARE IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTION.

SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,095'± (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 6"	DATE DRILLED NOVEMBER 29, 1977

NOTE: Located cutoff key trench; axis 6A.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-11.5' <u>CLAYEY SILT</u> ; light yellow brown; plastic; fluffy.		AD	Drilled with 6" flight auger.
2					
4					
6					
8					
10					
12		11.5-15.0' <u>GALLUP SANDSTONE</u> ; light gray; silty fine sandstone.			
14					
16		TOTAL DEPTH = 15.0 FEET			
		<p>DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY INTERFERED SAMPLING NECESSITATED BY USE OF SMALL-DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONTRACTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

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SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	NOV. 1977	1 of 1

HOLE NO.  
WPC-61

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,090'± (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 6"	DATE DRILLED NOVEMBER 29, 1977

NOTE: Located along cutoff key trench, dam axis.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-13.0' CLAYEY SILT; light yellow-brown; plastic; fluffy.		AD	Drilled with 6" flight auger.
2					
4					
6					
8					
10					
12					
	LITH.	BEDROCK CONTACT			
14		13.0-15.0' GALLUP SANDSTONE; light gray; silty fine sandstone.			
16		TOTAL DEPTH = 15.0 FEET			
		<p>DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM DIRECT OBSERVATION AND POSSIBLY DISTURBED SAMPLES NECESSITATED BY USE OF SMALL-DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATES INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTIONS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			





HOLE LOCATION La Polvadera Canyon	HOLE ELEVATION Topo 7128	ANGLE Vert.	BEARING
DRILL RIG Gardner-Denver 14W	CORE SIZE NX	LOGGED BY WQ	DATE DRILLED 10/3-4/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
Drilled with 9-7/8" tricone bit, and installed 8.5' of 7" I.D. steel casing.	0			0.0-8.5 SANDY SILT (ML): fine grained, some clay, yellow-brown.
	5			
	10			DILCO CO' MEMBER 8.5-34.0 INTERBEDDED SHALE AND SILTSTONE: silty, friable in part, moderately hard, gray shale; thin-bedded, moderately hard, with 1/16" to 1/8" beds, tan-brown siltstone.
	15			
20.0-81.5 Coring with NX core barrel 2-1/8" I.D., 3-7/8" O.D., diamond bit and air.	20			21.0-22.4 SANDSTONE: fine to medium; well cemented; tan-brown.
20.0-26.0'	25			25.0-25.4 Carbonaceous shale.
5.6 93% R 6.0				
26.0-33.0'	30			31.6-34.0 SILTSTONE: carbonaceous in part; dark gray.
4.4 63% R 7.0				
33.0-40.0'	35			34.0-39.1 SANDSTONE: silty, fine grained; scattered thin 1/16" carbonaceous partings; moderately hard; scattered shale partings 1/16" to 1/8"; gray.
6.0 86% R 7.0				
40.0-43.0'	40			39.1-47.0 SILTSTONE: with scattered shale interbeds 1/16" to 1/8"; moderately hard; light gray.
2.6 87% R 3.0				
43.0-49.0'	45			47.0-49.4 SANDSTONE: silty, fine grained; moderately hard to hard; scattered carbonaceous partings; light gray.
6.0 100% R 6.0				
	50			

510 (Rev.)

W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO LP-1
	PROJECT NO	DATE	SHEET NO			
	GUL-105A	FEB. 1980	1 of 2			
PALO ALTO • NEWPORT BEACH • CALIF.						

HOLE LOCATION La Polvadera Canyon HOLE ELEVATION Topo 7128 ANGLE Vert. BEARING

DRILL RIG Gardner-Denver 14W CORE SIZE NX LOGGED BY WQ DATE DRILLED 10/3-4/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
49.0-57.2 5.0 8.2 61% R	50			<u>DILCO COAL MEMBER (continued)</u> 49.4-53.5 <u>SILTSTONE</u> : with numerous carbonaceous shale partings 1/16" thick; moderately hard; gray.
57.2-62.7 4.0 5.5 73% R	55			<u>GALLUP SANDSTONE</u> 53.5-81.5 <u>SANDSTONE</u> : fine to medium grained; moderately hard; friable in part; light gray.
62.7-72.7 9.5 10.0 100% R	60			
72.7-81.5 7.0 8.8 80% R	65			73.5-81.5 Poorly cemented, very friable.

Reamed hole with 5" bit to 81.5 feet. TOTAL DEPTH 81.5

510 (Rev.)

DATA ON THIS LOG ARE APPROXIMATE ONLY BE CAUSE THE SAMPLE MATERIALS OBTAINED FROM DIRECT DISCONTINUOUS AND POSSIBLY DISTURBED SAMPLING ARE LIMITED TO LOG OF SMALL-DIAMETER HOLES. ROTARY AND PUMP JACKING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCALITIES AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTORS.

ROCK CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO. LP-1
	PALO ALTO • NEWPORT BEACH • CALIF.		PROJECT NO.	DATE	SHEET NO.	
			GUL-105A	FEB. 1980	2 OF 2	

HOLE LOCATION La Polvadera Canyon HOLE ELEVATION Topo 7096 ANGLE Vert. BEARING

DRILL RIG Gardner-Denver 14W CORE SIZE NX LOGGED BY WQ DATE DRILLED 10/5-6/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
Drilled with 9-7/8" tricone bit and installed 9.5' of 7" I.D. steel casing.	0			0.0-6.9 SANDY SILT (ML): clayey; scattered angular rock fragments 1/8" to 3/4"; brown.
9.5-20.0' Drilled with 5" tricone bit using air.	5			<u>DILCO COAL MEMBER</u> 6.9-22.5 INTERBEDDED SHALE AND SILTSTONE: silty, friable, moderately hard, gray shale weathered in upper 5'; thin-bedded, moderately hard, iron stained with yellow streaks, tan-brown siltstone.
20.0-72.0' Cored with NX core barrel, 2-1/8" I.D., 3-7/8" O.D., diamond bit and air.	10			18.5-21.0 Scattered carbonaceous partings 1/16"
20.0-25.0'	15			21.5-22.5 Iron stained, orange and yellow.
2.9 58% R 5.0	20			<u>GALLUP SANDSTONE</u> 22.5-51.5 SANDSTONE: fine to medium grained; moderately hard; friable in part; iron stained 22.5'-24.0'; light pink-tan, rounded grains.
25.0-30.0'	25			32.5 Color changing to light tan-white, sandstone is friable, clean.
4.5 90% R 5.0	30			41.5-45.0 Slightly iron stained.
30.0-40.0'	35			
4.5 45% R 10.0	40			
42.0-52.0'	45			
10.0 100% R 10.0	50			

510 (Rev.)

W. A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

ROCK EXPLORATION CORE HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-105A	FEB. 1980	1 of 2

HOLE NO.

LP-2

HOLE LOCATION	La Polvaradera Canyon	HOLE ELEVATION	Topo 7096	ANGLE	Vert.	BEARING	
DRILL RIG	Gardner-Denver 14W	CORE SIZE	NX	LOGGED BY	WQ	DATE DRILLED	10/5-6/79

COMMENTS	DEPTH RECOVERY LOG	DESCRIPTION
52.0-62.0' $\frac{4.0}{10.0}$ 40% R  62.0-72.0' $\frac{3.5}{10.0}$ 35% R		GALLUP SANDSTONE (continued) 51.5-72.0 SANDSTONE: fine to medium grained; rounded; very poorly cemented; very friable; iron stained in part, light tan to cream color.
Reamed hole with 5" bit to 72.0 feet.		TOTAL DEPTH 72.0'

DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM SUBJECT DISCONTINUOUS AND POSSIBLY DISTURBED SAMPLING. NECESSITATED BY USE OF SMALL-DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCED HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SIX" A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTORS.

SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

510 (REV.)

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT PALO ALTO • NEWPORT BEACH • CALIF.	ROCK EXPLORATION CORE HOLE LOG			HOLE NO. LP-2
		PROJECT NO	DATE	SHEET NO	
		GUL-105A	FEB. 1980	2 of 2	

HOLE LOCATION La Polvadera Canyon		HOLE ELEVATION Topo 7206		ANGLE Vert.	BEARING
DRILL RIG Gardner-Denver 14W		CORE SIZE NX	LOGGED BY WQ	DATE DRILLED 10/8-10/79	
COMMENTS	DEPTH RECOVERY	LOG	DESCRIPTION		
Drilling with 9-7/8" tricone bit, set 22' of 7" I.D. steel casing.  Drilling with air.	0 5 10	B-1	0.0-13.0 <u>SANDY CLAY (CL)</u> : fine grained, tan.		
	15		<u>MULATTO TONGUE</u> 13.0-33.0 <u>SILTSTONE AND SHALE INTERBEDDED</u> : fine, sandy, moderately hard, tan siltstone; fissile, moderately hard, scattered gypsum, tan-brown shale.		
22.0-171.5' Cored with NX core barrel; 2-1/8" I.D., 3-7/8" O.D. x 20' with air and diamond bit.	20				
22.0-27.0' 1.0 / 5.0 20% R	25		27.5-33.0 Occasional thin, fine grained, sandstone stringers, scattered gypsum veins 1/16" to 1/8" thick.		
27.0-31.5' 1.9 / 4.5 42% R	30				
31.5-36.5' 5.0 / 5.0 100% R	35		<u>DILCO MEMBER</u> 33.0-40.0 <u>SANDSTONE</u> : fine grained, silty, moderately hard, scattered shale stringers, tan-white. Scattered carbonaceous material.		
36.5-41.5' 4.6 / 5.0 92% R	40		39.1-40.0 <u>COAL</u> : brittle, black.		
41.5-50.5' 7.3 / 9.0 81% R	45		40.0-48.5 <u>SANDSTONE</u> : fine grained; moderately hard; scattered shale partings; scattered carbonaceous material; light gray.		
	50		48.5-50.5 <u>SHALE</u> : silty, moderately hard, gray.		

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W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO. LP-3
	PALO ALTO • NEWPORT BEACH • CALIF.		PROJECT NO.	DATE	SHEET NO.	
			GUL-105A	FEB. 1980	1 of 4	

HOLE LOCATION La Polvadera Canyon		HOLE ELEVATION Topo 7206		ANGLE Vert. BEARING	
DRILL RIG Gardner-Denver 14W		CORE SIZE NX		LOGGED BY WQ	
DATE DRILLED 10/8-10/79					
COMMENTS	DEPTH RECOVERY LOG	DESCRIPTION			
50.5-61.5' <u>10.0</u> 11.0 91% R	50 55 60	DILCO MEMBER (continued) 50.5-72.0 <u>INTERBEDDED SANDSTONE AND SHALE</u> : fine to medium grained, scattered thin 1/16" carbonaceous partings, moderately hard, friable in part, light gray sandstone; blocky, silty, moderately hard, carbonaceous, gray to dark gray shale.			
61.5-71.5' <u>9.6</u> 10.0 96% R	65 70	72.0-83.0 <u>SANDSTONE</u> : fine grained; rounded; moderately hard; occasional carbonaceous fragments and partings; light gray.			
71.5-81.5' <u>8.8</u> 10.0 88% R	75 80	83.0-92.5 <u>INTERBEDDED SANDSTONE AND SHALE</u> : fine grained, silty, moderately hard, light gray sandstone; blocky, thin bedded, carbonaceous, dark gray shale.			
81.5-91.5' <u>4.6</u> 10.0 46% R	85 90	92.5-94.5 <u>COAL</u> : brittle, shaly in part, black.			
Started coring with air/foam 91.5-101.5' <u>10.0</u> 10.0 100% R	95 100	94.5-103.0 <u>SANDSTONE</u> : fine to medium grained, numerous shale partings; moderately hard; scattered carbonaceous partings; gray.			

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MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

ROCK EXPLORATION CORE HOLE LOG

PROJECT NO	DATE	SHEET NO
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HOLE NO. LP-3

HOLE LOCATION	La Polvadera Canyon	HOLE ELEVATION	Topo 7206	ANGLE	Vert.	BEARING
DRILL RIG	Gardner-Denver 14W	CORE SIZE	NX	LOGGED BY	WQ	DATE DRILLED

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
101.5-111.5'	100			DILCO MEMBER (continued)
$\frac{1.0}{10.0}$ 10% R				94.5-103.0 SANDSTONE: (continued)
	105			103.0-115.0 SILTSTONE: shaly partings; scattered sandstone partings; moderately hard; carbonaceous partings; gray.
111.5-121.5'	110			
$\frac{8.5}{10.0}$ 85% R				115.0-129.0 SILTSTONE: shaly; carbonaceous; moderately hard to hard; dark gray.
121.5-131.5'	115			
$\frac{1.3}{10.0}$ 13% R	120			129.0-154.5 SANDSTONE: fine to medium grained; rounded; moderately hard; friable in part; occasional carbonaceous partings; gray.
131.5-141.5'	125			
$\frac{10.0}{10.0}$ 100% R	130			138.5-140.5 Numerous carbonaceous partings.
141.5-151.5'	135			140.5-141.0 COAL: brittle, black.
$\frac{4.5}{10.0}$ 4-% R	140			141.0-154.5 Scattered shaly interbeds.
	145			
	150			

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W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO LP-3
	PROJECT NO	DATE	SHEET NO			
	GUL0105A	FEB. 1980	3 of 4			
PALO ALTO • NEWPORT BEACH • CALIF.						



HOLE LOCATION		La Polvadera Canyon		HOLE ELEVATION		Topo 7206		ANGLE		Vert. BEARING	
DRILL RIG		Gardner-Denver 14W		CORE SIZE		NX		LOGGED BY		WQ	
DATE DRILLED		10/8-10/79									
COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION							
151.5-161.5'	150			DILCO MEMBER (continued)							
10.0				129.0-154.5 SANDSTONE: (continued)							
10.0 100% R											
	155			GALLUP SANDSTONE							
				154.5-171.5 SANDSTONE: fine to medium grained; rounded; moderately hard; fissile; slight to moderate cementation, porous; light brown.							
161.5-171.5;	160										
10.0											
10.0 100% R											
	165										
	170										
Reamed hole with 5" bit to 171.5 feet.				TOTAL DEPTH 171.5'							
	175										
<small>           DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY SUPPLEMENTED SAMPLING NECESSITATED BY USE OF SMALL-DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.            THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.            THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PREFERABLE FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTION.            THE CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNITED STATES CLASSIFICATION SYSTEM.            THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.         </small>											
<b>W.A. WAHLER &amp; ASSOCIATES</b> MT. TAYLOR URANIUM MILL PROJECT PALO ALTO • NEWPORT BEACH • CALIF.				ROCK EXPLORATION <b>CORE HOLE LOG</b>				<b>HOLE NO</b> LP-3			
				PROJECT NO.		DATE		SHEET NO.			
GUL-105A		FEB. 1980		4 of 4							

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HOLE LOCATION La Polvadera Canyon		HOLE ELEVATION Topo 7228		ANGLE Vert. BEARING	
DRILL RIG Gardner-Denver 14W		CORE SIZE NX		LOGGED BY WQ DATE DRILLED 10/12/79	
COMMENTS	DEPTH RECOVERY	LOG	DESCRIPTION		
Drilled with 9-7/8" tricone bit. Set 22' of 7" I.D. steel casing. Drilling with air only.	0		0.0-5.5 <u>SANDY SILT (ML)</u> : fine grained, some clay; dry; tan.		
	5	B-1	5.5-11.0 <u>SANDY CLAY (CL)</u> : fine sand; tan.		
22.0-62.0' Cored with NX diamond bit and air. 22.0-27.0' 4.8 / 5.0 96% R	10		<u>MULATTO TONGUE</u> 11.0-32.5 <u>SILTSTONE AND SHALE</u> : fine sandy, moderately hard, tan siltstone; fissile, moderately hard, numerous gypsum fragments, tan-brown shale.		
	25		25.0-26.0 <u>SANDSTONE</u> : hard, light gray.		
27.0-32.5' 5.5 / 5.5 100% R	30				
	35		<u>DILCO COAL MEMBER</u> 32.5-39.0 <u>SANDSTONE</u> : silty; fine grained; moderately hard; numerous 1/16" wavy horizontal carbonaceous streaks; occasional shale partings; light gray with black streaks.		
32.5-37.0' 4.5 / 4.5 100% R	40		39.0-62.0 <u>INTERBEDDED SANDSTONE AND SHALE</u> : fine grained, moderately hard, silty, light gray sandstone; blocky, moderately hard, carbonaceous, gray shale.		
	45				
37.0-42.0' 5.0 / 5.0 100% R	50				
42.0-52.0' 10.0 / 10.0 100% R					

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**W. A. WAHLER & ASSOCIATES**

MT. TAYLOR  
URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

ROCK EXPLORATION  
CORE HOLE LOG

PROJECT NO	DATE	SHEET NO
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HOLE NO  
LP-4

HOLE LOCATION La Polvadera Canyon		HOLE ELEVATION Topo 7228		ANGLE Vert. BEARING		
DRILL RIG Gardner-Denver 14W		CORE SIZE NX		LOGGED BY WQ DATE DRILLED 10/12/79		
COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION		
52.0-62.0' 9.5 10.0 95% R	50 55 60			DILCO COAL MEMBER (continued) 39.0-62.0 INTERBEDDED SANDSTONE AND SHALE: (continued). 53.0-53.5 COAL: brittle, hard, black.		
Reamed hole with 5" bit to 62.0 feet.	65			TOTAL DEPTH 62.0'		
<small>           DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING. INCORPORATED BY USE OF SMALL-QUANTITY TOOLS. ROTARY AND HAND BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.            THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.            THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTIONS.            THE CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.            THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.         </small>						
W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT FALD ALTO • NEWPORT BEACH • CALIF.		ROCK EXPLORATION CORE HOLE LOG			HOLE NO LP-4
			PROJECT NO GUL-105A	DATE FEB. 1980	SHEET NO 2 of 2	

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HOLE LOCATION La Polvadera Canyon		HOLE ELEVATION Topo 7186		ANGLE Vert. BEARING	
DRILL RIG Gardner-Denver 14W		CORE SIZE NX		LOGGED BY WQ DATE DRILLED 10/16-19/79	
COMMENTS	DEPTH RECOVERY	LOG	DESCRIPTION		
Drilled with 9-7/8" tricone bit. Drilling with air. Set 22' of 7" I.D. steel casing.	0		<u>ALLUVIUM</u>		
	0-4.0		SANDY SILT (ML): clayey, dry, brown.		
	4.0-18.6		SANDY CLAY (CL): fine sand, tan.		
		B-1			
	20		<u>DILCO COAL MEMBER</u>		
22.0-160.0' Coring with NX diamond bit and clear water.	22.0-34.5'		18.6-41.5 SILTSTONE: shaly, moderately hard; thin wavy horizontal laminae of carbonaceous material; weathered in part; tan-brown and light gray, variegated color.		
2.6 12.5 21% R	25		18.6-31.5 Severely weathered and soft.		
Lost 200 gal. water	30				
34.5-37.0'	35		37.0 Scattered near vertical fractures, iron stained, very shaly, gray.		
1.7 2.5 68% R			40.5-41.0 COAL: hard, brittle, black.		
37.0-42.0'	40		41.5-77.0 INTERBEDDED SANDSTONE AND SHALE: fine grained, moderately hard with numerous thin carbonaceous partings, light gray sandstone; silty, moderately hard, carbonaceous, dark gray shale.		
4.5 5.0 90% R					
42.0-52.0'	45				
8.8 10.0 88% R					
Lost 200 gpm water.	50				

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W. A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

ROCK EXPLORATION CORE HOLE LOG

PROJECT NO	DATE	SHEET NO
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HOLE NO LP-5

HOLE LOCATION La Polvadera Canyon	HOLE ELEVATION Topo 7186	ANGLE Vert. BEARING
DRILL RIG Gardner-Denver 14W	CORE SIZE NX	LOGGED BY WQ
		DATE DRILLED 10/16-19/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
52.0-62.0' $\frac{10.0}{10.0}$ 100% R	50			41.5-77.0 <u>DILCO COAL MEMBER (continued)</u> <u>INTERBEDDED SANDSTONE AND SHALE:</u> (continued)
Lost 150 gal. water.	55			
62.0-72.0' $\frac{9.5}{10.0}$ 95% R	60			63.5-64.0 Carbonaceous shale, gray-black Note: Sandstone beds are moderately hard to hard.
Lost 200 gal. water.	65			
72.0-82.0' $\frac{9.7}{10.0}$ 97% R	70			69.0-72.0 Scattered clay shale beds 1" to 2" thick.
Lost 150 gal. water.	75			
82.0-92.0' $\frac{6.5}{10.0}$ 65% R	80			77.0-96.0 <u>SANDSTONE:</u> fine grained; rounded; moderately hard; carbonaceous partings 1/16" thick, occasional shale partings; medium gray; friable in part.
Lost 200 gal. water.	85			
92.0-102.0' $\frac{8.5}{10.0}$ 85% R	90			88.0 1/4" coal seam, black.
Lost 200 gal. water.	95			
	100			96.0-102.0 CLAY SHALE: silty; moderately soft; dark gray.

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HOLE LOCATION La Polvadera Canyon		HOLE ELEVATION Topo 7186		ANGLE Vert. BEARING	
DRILL RIG Gardner-Denver 14W		CORE SIZE NX	LOGGED BY WQ	DATE DRILLED 10/16-19/79	
COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION	
102.0-112.0'				DILCO COAL MEMBER (continued)	
8.9 10.0 89% R				102.0-105.0 INTERBEDDED SANDSTONE AND SHALE: thin partings, carbonaceous, dark gray.	
t 50 gal. water.				105.0-119.0 TRANSITION ZONE/SANDSTONE: fine grained, rounded; silty, moderately hard, occasional carbonaceous partings 1/16" thick ±, medium gray.	
112.0-122.0'				115.0-119.0 Occasional shaly beds, 1" to 2" thick, carbonaceous	
7.8 10.0 78% R				GALLUP SANDSTONE	
Lost 25 gal. water.				119.0-162.0 SANDSTONE: fine to medium grained, rounded; porous; poorly cemented, friable; moderately hard; quartzose; medium gray.	
122.0-132.0'				133.1-135.0 45° slickenside in 1/2" carbonaceous shale bed.	
9.5 10.0 95% R				135.0 Grades to medium grained sandstone.	
Lost 150 gal. water				148.0 Medium grained, clean, porous, friable.	
132.0-142.0'					
8.1 10.0 81% R					
Lost 150 gal. water.					
142.0-152.0'					
9.1 10.0 91% R					
Drilling with water lost circulation					
Note: Lost circulation zone 147' to T.D.					

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W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO. LP-5
	PALO ALTO • NEWPORT BEACH • CALIF.		PROJECT NO	DATE	SHEET NO	
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HOLE LOCATION La Polvadera Canyon	HOLE ELEVATION Topo 7186	ANGLE Vert. BEARING
DRILL RIG Gardner-Denver 14W	CORE SIZE NX	LOGGED BY WQ DATE DRILLED 10/16-19/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
152.0-160.0' 7.5 8.0 94% R	150 155			119.0-162.0 <u>GALLUP SANDSTONE (continued)</u> <u>SANDSTONE: (continued)</u>
152.0-160.0' Lost circulation.  Reamed hole with 5" bit to 160.0 feet	160 165			TOTAL DEPTH 160.0'

DATA ON THE LOG ARE APPROXIMATE ONLY BECAUSE THE ONLY SAMPLES OBTAINED FROM DIRECTLY DOWNDROCKS AND POSSIBLY UNREPRESENTATIVE SAMPLING NECESSITATED BY USE OF SMALL-DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCED HOLES.

THE LOG INDICATES CONDITIONS IN THE HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTORS.

NO. CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON USNR 800 SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

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<b>W. A. WAHLER &amp; ASSOCIATES</b>	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO LP-5
			PROJECT NO	DATE	SHEET NO.	
	PALO ALTO • NEWPORT BEACH • CALIF.		GUL-105A	FEB. 1980	4 of 4	

HOLE LOCATION La Polvadera Canyon	HOLE ELEVATION Topo 7134	ANGLE Vert.	BEARING
DRILL RIG Gardner-Denver 14W	CORE SIZE NX	LOGGED BY WQ	DATE DRILLED 10/22-23/79

COMMENTS	DEPTH RECOVERY	LOG	DESCRIPTION
Drilled with 9-1/8" tricone bit to 31.5', set 31.5' of 7" I.D. steel casing.	0		<u>ALLUVIUM</u>
	5		0.0-4.5 <u>SANDY SILT (ML)</u> : fine, some clay, brown.
	10		4.5-30.5 <u>CLAYEY SAND (SC)</u> : fine to very fine, yellow-brown.
	15	B-1	
	20		
	25		
31.5-72.0' Cored with NX diamond bit.	30		
Cored with water.			<u>DILCO COAL MEMBER</u>
31.5-36.5'			30.5-44.0 <u>INTERBEDDED SANDSTONE AND SHALE</u> : fine grained, rounded, moderately hard, gray sandstone; silty, fissile in part, carbonaceous in part, dark gray shale; unit is weathered with spotted iron staining from 31.5 to 41.2'
$\frac{0.9}{5.0}$ 18% R	35		
Lost 300 gal. water			
36.5-42.0'			
$\frac{4.4}{5.5}$ 88% R	40		
Lost 50 gal. water.			
42.0-52.0'			43.1-43.3 <u>COAL</u> : brittle, black.
$\frac{9.0}{10.0}$ 90% R	45		44.0-48.5 <u>SANDSTONE</u> : fine to medium grained; moderately hard, friable in part; iron stained, tan-brown.
	50		

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W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO. LP-6
	PALO ALTO • NEWPORT BEACH • CALIF.		PROJECT NO.	DATE	SHEET NO.	
			GUL-105A	FEB. 1980	1 of 2	



HOLE LOCATION La Polvadera Canyon	HOLE ELEVATION Topo 7184	ANGLE Vert.	BEARING
DRILL RIG Gardner-Denver 14W	CORE SIZE NX	LOGGED BY WQ	DATE DRILLED 10/22-23/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
52.0-62.0' 9.6 10.0 96% R	50			DILCO COAL MEMBER (continued) 48.5-70.5 INTERBEDDED SHALE AND SANDSTONE: silty, carbonaceous, fissile in part, dark gray shale; fine grained, moderately hard, carbonaceous partings 1/16" ± thick, scattered thin coal partings, dark gray sandstone.  53.6-54.0 COAL: brittle, black.
62.0-72.0' 8.2 10.0 82% R	60			66.5-70.5 Occasional interbeds of soft clay shale, dark gray.
	70			
	75			HOLE ABANDONED AT 72.0' due to casing problem. Moved rig 15 feet east to drill Hole No. 6A

DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY CONTAMINATED SAMPLES. MISCELLANEOUS INFORMATION IS NOT INCLUDED. BUT FIRST AND SECOND BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUIDS AND OR CASING IN ADJACENT HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRACTICALLY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTORS.

ROCK CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE PRODUCTS BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

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HOLE LOCATION La Polvadera Canyon	HOLE ELEVATION Topo 7184	ANGLE Vert.	BEARING
DRILL RIG Gardner-Denver 14K	CORE SIZE NX	LOGGED BY WQ	DATE DRILLED 10/24-26/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
<p>Drilled with 9-7/8" tricone bit. set 41' of 7" I.D. steel casing.</p> <p>Drilled with 5" tricone and water from 41.0' to 72.0'.</p>				<p>NOTE: Boring No. 6A is located 15 feet east of Boring No. 6.</p> <p>0.0-72.0 See Log of Boring No. 6 for description of material</p>
<p>72.0-182.0' Cored with water and NX diamond core bit 3-7/8" O.D., 2-1/8" I.D. X 20.0'.</p> <p>72.0-82.0'</p> <p>9.1 / 10.0 91% R</p>	70			<p style="text-align:center;"><u>DILCO COAL MEMBER</u></p> <p>70.5-82.5 <u>INTERBEDDED SHALE AND SILTSTONE</u>: silty, moderately hard, carbonaceous in part, fissile in part, dark gray shale; sandy, carbonaceous partings medium gray siltstone.</p>
<p>82.0-92.0'</p> <p>9.2 / 10.0 92% R</p>	80			<p>82.5-129.0 <u>INTERBEDDED SANDSTONE AND SHALE</u>: fine grained, silty, moderately hard, medium gray sandstone; silty, fissile in part, carbonaceous in part, dark gray shale.</p>
<p>92.0-102.0'</p> <p>8.9 / 10.0 89% R</p>	90			<p>90.7-90.9 COAL: brittle, black.</p> <p>92.0-93.4 COAL: brittle, black.</p> <p>93.4-95.5 Highly carbonaceous shale and sandstone.</p> <p>95.5-101.0 Scattered thin 1/16" carbonaceous partings in sandstone.</p>
	95			<p>98.8 45° slickenside.</p>
	100			
	105			

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<b>W. A. WAHLER &amp; ASSOCIATES</b>	MT. TAYLOR URANIUM MILL PROJECT	ROCK EXPLORATION CORE HOLE LOG			HOLE NO. LP-6A
	PALO ALTO • NEWPORT BEACH • CALIF.	PROJECT NO. GUL-105A	DATE FEB. 1980	SHEET NO. 1 of 3	

HOLE LOCATION La Polvadera Canyon		HOLE ELEVATION Topo 7184		ANGLE Vert. BEARING	
DRILL RIG Gardner-Denver 14W		CORE SIZE NX		LOGGED BY WQ	DATE DRILLED 10/24-26/79
COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION	
102.0-112.0' $\frac{9.7}{10.0}$ 97% R	105			DILCO COAL MEMBER (continued) 82.5-129.0 INTERBEDDED SANDSTONE AND SHALE: (continued)	
112.0-122.0' $\frac{9.5}{10.0}$ 95% R	110			114.0-119.0 SILTSTONE: fine sandy, blocky, moderately hard to hard, dark gray.	
122.0-132.0' $\frac{10.0}{10.0}$ 100% R	120			124.0-125.0 Slickensides (45° to 60°).	
132.0-142.0' $\frac{10.0}{10.0}$ 100% R	130			129.0-142.2 SANDSTONE: fine to medium grained; moderately hard; occasional shale (thin) partings, scattered carbonaceous partings 1/16" thick; silty; medium gray-brown.	
142.0-150.0' $\frac{10.0}{10.0}$ 100% R	140			142.2-166.6 INTERBEDDED SANDSTONE AND SHALE: fine to medium grained, moderately hard, silty, light gray sandstone; fissile in part, silty, carbonaceous, dark gray shale; numerous 1/16" carbonaceous partings.	
	150				
	155				

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MT. TAYLOR  
URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

ROCK EXPLORATION  
CORE HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-105A	FEB. 1980	2 OF 3

HOLE NO

LP-6A

HOLE LOCATION La Polvadera Canyon	HOLE ELEVATION Topo 7184	ANGLE Vert.	BEARING
DRILL RIG Gardner-Denver 14W	CORE SIZE NX	LOGGED BY WQ	DATE DRILLED 10/24-26/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
152.0-162.0' $\frac{10.0}{10.0}$ 100% R	152			<u>DILCO COAL MEMBER (continued)</u> 142.2-166.6 <u>INTERBEDDED SANDSTONE AND SHALE:</u> (continued) 157.1 Slickenside (70°) 158.7 Slickenside (45°)
162.0-172.0' $\frac{10.0}{10.0}$ 100% R	162			
172.0-182.0' $\frac{6.8}{10.0}$ 68% R	172			<u>GALLUP SANDSTONE</u> 166.6-182.0 <u>SANDSTONE:</u> fine to medium grained; rounded; friable; moderately hard; poorly cemented in part; porous; medium tan-gray.
Reamed hole with 5" bit to 182.0 feet.	182			TOTAL DEPTH 182.0'

DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE SAMPLES WERE OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING. UNLESS STATED BY USE OF SMALL-DIAMETER HOLES. ROTARY AND PNEUMATIC HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND TO CARE IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCAL TRENDS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTION.

ROCK CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNPREPARED SOLE CLASSIFICATION SYSTEMS.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN AGE TYPES AND THE TRANSITION MAY BE GRADUAL.

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<b>W. A. WAHLER &amp; ASSOCIATES</b>	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO LP-6A
			PROJECT NO	DATE	SHEET NO	
	PALO ALTO • NEWPORT BEACH • CALIF.		GUL-105A	FEB. 1980	3 of 3	

HOLE LOCATION		La Polvadera Canyon		HOLE ELEVATION		Topo 7205		ANGLE Vert.		BEARING	
DRILL RIG		Gardner-Denver 14W		CORE SIZE		NX		LOGGED BY		WQ	
				DATE DRILLED		10/29-				11/1/79	
COMMENTS		DEPTH	RECOVERY	LOG	DESCRIPTION						
Drilled with 9-7/8" tricone bit, set 19' of 7" I.D. steel casing.		0			0.0-6.0 <u>CLAYEY SILT (ML)</u> : fine sandy; tan-brown.						
17.0-22.0' Lost 300 gal. water.		5			<u>MULATTO TONGUE</u> 6.0-20.5 <u>INTERBEDDED SILTSTONE AND SHALE</u> : fine sandy; moderately hard, light gray-brown shale; silty, fissile in part with scattered gypsum fragments, gray-brown shale;						
19.0-22.0' Drilled with 5" tricone bit and water.		10									
22.0-272.0' Cored with NX diamond bit.		15			<u>DILCO COAL MEMBER</u> 20.5-37.5 <u>SILTSTONE</u> : fine sandy; moderately hard; shaly in part; medium brown.  27.5-37.5 core fractured and broken; fault zone.						
22.0-27.0' Lost 300 gal. water.		20									
4.3 5.0 86% R		25			37.5-57.0 <u>INTERBEDDED SANDSTONE AND SHALE</u> : very fine grained, fractured and broken, moderately hard but friable in part, medium brown sandstone; thin bedded, fissile in part, medium gray-brown shale.						
27.0-32.0' Lost 400 gal. water		30									
4.5 5.0 90% R		35									
32.0-42.0' Drilled with 5" tricone bit. Switched to air and foam due to large water loss.		40									
42.0-52.0'		45									
6.0 10.0 60% R		50									
Coring with air and foam.											

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MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

ROCK EXPLORATION CORE HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-105A	FEB. 1980	1 OF 6

HOLE NO.  
LP-7

HOLE LOCATION		HOLE ELEVATION		ANGLE	BEARING	
DRILL RIG		CORE SIZE	LOGGED BY	DATE DRILLED		
COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION		
52.0-62.0' Drilled with 5" tricone bit using air and foam.	50			DILCO COAL MEMBER (continued)		
	55			37.5-57.0 <u>INTERBEDDED SANDSTONE AND SHALE:</u> (continued)		
	60			57.0-131.0 <u>INTERBEDDED SANDSTONE AND SHALE:</u> fine grained, moderately hard, carbonaceous in part, medium gray sandstone; silty, carbonaceous, slightly fissile, dark gray shale.		
62.0-72.0' 9.4 10.0 94% R Coring with air and foam.	65			68.0-71.5 CLAY SHALE: moderately soft, dark gray.		
	70					
72.0-82.0' Drilled with 5" tricone bit using air and foam.	75					
	80					
82.0-92.0' 9.6 10.0 96% R Coring with air and foam.	85			82.0-127.0 Thin 1/16" carbonaceous partings, wavy.		
	90					
92.0-102.0' Drilled with 5" tricone bit using air and foam.	95					
	100					
W. A. WAHLER & ASSOCIATES PALO ALTO • NEWPORT BEACH • CALIF.	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO LP-7
	PROJECT NO	DATE	SHEET NO.			
	GUL-105A	FEB. 1980	2 of 6			

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HOLE LOCATION La Polvadera Canyon HOLE ELEVATION Topo 7205 ANGLE Vert. BEARING

DRILL RIG Gardner-Denver 14W CORE SIZE NX LOGGED BY WQ DATE DRILLED 10/29-11/1/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
102.0-112.0' 10.0 100% R 10.0 Coring with air and foam.	100			DILCO COAL MEMBER (continued) 57.0-131.0 INTERBEDDED SANDSTONE AND SHALE: (continued).  108.0 Numerous thin 1/16" wavy, carbonaceous partings.
112.0-122.0' Drilled with 5" tricone bit using air and foam.	110			
122.0-132.0' 10.0 100% R 10.0 Coring with air and foam.	120			127.0-131.0 Increase in sandstone.
132.0-142.0' Drilled with 5" tricone bit using air and foam.	130			131.0-137.5 SANDSTONE: fine to medium grained; rounded grains; moderately hard; friable; light gray.
142.0-152.0' 10.0 100% R 10.0 Coring with air and foam.	140			137.5-166.3 INTERBEDDED SANDSTONE AND SHALE: fine to medium grained, silty, moderately hard, light gray sandstone; silty, blocky, moderately hard, gray shale; numerous 1/16" wavy, carbonaceous partings.
	150			

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W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO. 1P-7
	PROJECT NO.	DATE	SHEET NO.			
	GUL-105A	FEB. 1980	3 of 6			
PALO ALTO • NEWPORT BEACH • CALIF.						

HOLE LOCATION La Polvadera Canyon	HOLE ELEVATION Topo 7205	ANGLE Vert.	BEARING
DRILL RIG Gardner-Denver 14W	CORE SIZE NX	LOGGED BY WQ	DATE DRILLED 10/31-11/1/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
152.0-162.0' Drilled with 5" tricone bit using air and foam.	150			DILCO COAL MEMBER (continued)
	155			137.5-166.3 INTERBEDDED SANDSTONE AND SHALE: (continued).
162.0-172.0' 10.0 100% R 10.0 Coring with air and foam.	160			
	165			GALLUP SANDSTONE
	170			166.3-217.5 SANDSTONE: fine to medium grained; rounded grains; poorly cemented; porous; friable; light gray.
172.0-182.0' Drilled with 5" tricone bit using air and foam.	175			
	180			
182.0-192.0' 6.8 68% R 10.0 Coring with air and foam.	185			183.0-217.5 Very poorly cemented; some core washed away while drilling.
	190			
192.0-202.0' Drilled with 5" tricone bit using air and foam.	195			
	200			

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W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO LP-7
	PROJECT NO.	DATE	SHEET NO.			
	GUL-105A	FEB. 1980	4 OF 6			
PALO ALTO • NEWPORT BEACH • CALIF.						



HOLE LOCATION La Polvadera Canyon	HOLE ELEVATION Topo 7205	ANGLE Vert. BEARING
DRILL RIG Gardner-Denver 14W	CORE SIZE NX	LOGGED BY WQ DATE DRILLED 10/31-11/1/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
202.0-212.0' 8.0 10.0 80% R Coring with air and foam.	200			GALLUP SANDSTONE (continued) 166.3-217.5 SANDSTONE: (continued).
212.0-222.0' Drilled with 5" tricone bit using air and foam.	210			
222.0-232.0' 10.0 10.0 100% R Coring with air and foam.	220			200-237.5 SANDSTONE: fine to medium grained; rounded; moderately hard; friable in part; occasional thin 1/16" carbonaceous veins; silty; medium gray.
232.0-242.0' Drilled with 5" tricone bit using air and foam.	230			
242.0-252.0' 10.0 10.0 100% R Coring with air and foam.	240			MANCOS SHALE 237.5-272.0 SHALE: silty; blocky; moderately hard; dark gray.
	250			

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<b>W. A. WAHLER &amp; ASSOCIATES</b>	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO. LP-7
	PROJECT NO.	DATE	SHEET NO.			
	GUL-105A	FEB. 1980	5 of 6			

HOLE LOCATION La Polvadera Canyon HOLE ELEVATION Topo 7205 ANGLE Vert. BEARING

DRILL RIG Gardner-Denver 14W CORE SIZE NX LOGGED BY WQ DATE DRILLED 10/31-11/1/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
252.0-262.0' Drilled with 5" tricone bit with air and foam.	250			MANCOS SHALE (continued)
	255			237.5-272.0 SHALE: (continued)
	260			
262.0-272.0' 10.0 10.0 100% R Coring with air and foam.	265			
	270			269.0-272.0 Scattered siltstone lenses 1/8" to 3/8".

Reamed hole with 5" bit to 272.0 feet.	275			TOTAL DEPTH 272.0'
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DATA ON THE LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLES. RECORDED BY USE OF SMALL-DIAMETER HOLES. BITSET AND PAID SURFING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCED HOLES.

THIS LOG INDICATES CONDITIONS IN THE HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTION.

SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

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W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO LP-7
	PROJECT NO	DATE	SHEET NO			
	GUL-105A	FEB. 1980	6 OF 6			

PALO ALTO • NEWPORT BEACH • CALIF.

HOLE LOCATION La Polvadera Canyon	HOLE ELEVATION Topo	ANGLE Vert.	BEARING
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DRILL RIG Gardner-Denver 14W	CORE SIZE 5"	LOGGED BY WQ	DATE DRILLED 11/5/79
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COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
Drilled with 5" tri-cone bit and air only.	0			0.0-4.5 <u>SANDY SILT (ML)</u> : fine sandy, some clay; tan.
	5		B-1	4.5-30.5 <u>SANDY SILTY CLAY (CL)</u> : tan.
	10			
	15		B-2	
	20			
	25			
	30			
	35			<u>DILCO COAL MEMBER</u>
				30.5-33.5 <u>SHALE</u> : weathered; fissile; moderately hard; silty; tan-brown.
				TOTAL DEPTH 33.5'

DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM DIRECT OBSERVATION, AND POSSIBLE DISTURBED SAMPLES INDICATED BY USE OF SMALL-DIAMETER HOLES. ROTARY AND PAW-BURRING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTION.

SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

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<b>W. A. WAHLER &amp; ASSOCIATES</b>	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO. LP-8
	PROJECT NO.	DATE	SHEET NO.			
	GUL-105A	FEB. 1980	1 of 1			

PALO ALTO • NEWPORT BEACH • CALIF.

HOLE LOCATION La Polvadera Canyon		HOLE ELEVATION		ANGLE Vert.	BEARING	
DRILL RIG Gardner-Denver 14W		CORE SIZE 5"	LOGGED BY WQ	DATE DRILLED 11/5/79		
COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION		
Drilled with 5" tricone bit and air only.	0		B-1	0.0-4.5 <u>SANDY CLAY</u> : fine sand; red-brown.		
	5			4.5-12.8 <u>SANDY CLAY</u> : fine sand, scattered small pebbles; tan.		
	10		B-2			
	15			<u>DILCO COAL MEMBER</u> 12.8-22.0 <u>INTERBEDDED SHALE AND SILTSTONE</u> : moderately hard, tan-brown.		
	20					
	25			TOTAL DEPTH 22.0'		
<small> DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT DISCONTINUOUS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL-DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.  THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.  THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTORS.  SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.  THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. </small>						
W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT PALO ALTO • NEWPORT BEACH • CALIF.		ROCK EXPLORATION CORE HOLE LOG			HOLE NO. LP-9
			PROJECT NO. GUL-105A	DATE FEB. 1980	SHEET NO. 1 of 1	

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HOLE LOCATION	La Polvadera Canyon	HOLE ELEVATION	ANGLE	Vert.	BEARING
DRILL RIG	Gardner-Denver 14W	CORE SIZE	5"	LOGGED BY	WQ
				DATE DRILLED	11/5/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
Drilled with 5" tricone bit and air.	0			0.0-5.0 <u>SILTY SAND (SM)</u> : very fine; clay; tan.
	5		B-1	5.0-32.7 <u>SANDY CLAY (CL)</u> : fine; tan.
	10			
	15		B-2	
	20		B-3	
	25			
	30			
	35			<u>DILCO COAL MEMBER</u> 32.7-40.5 <u>INTERBEDDED SHALE AND SILTSTONE</u> : moderately hard; carbonaceous; dark gray.
	40			TOTAL DEPTH 40.5'

DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDICENT DISCONTINUOUS AND POSSIBLY UNREPRESENTATIVE SAMPLES. INDICENTATED BY USE OF SMALL-DIAMETER HOLES. ROTARY AND RASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THE HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCALITIES AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTION.

THE CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

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W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO LP-10
	PALM ALTO • NEWPORT BEACH • CALIF.	PROJECT NO	DATE	SHEET NO		
		GUL-105A	FEB. 1980	1 of 1		

HOLE LOCATION La Polvadera Canyon		HOLE ELEVATION		ANGLE Vert. BEARING	
DRILL RIG Gardner-Denver 14W		CORE SIZE 5"		LOGGED BY WQ DATE DRILLED 11/5/79	
COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION	
Drilled with 5" tricone bit and air only.	0			0.0-16.0 <u>SANDY CLAY (CL)</u> : fine sandy; tan.	
			B-1		
	5				
			B-2		
	10				
			B-3		
	15			16.0-29.6 <u>SILTY SAND (SM)</u> : fine, yellow-brown.	
			B-3		
	20				
	25				
	30			<u>DILCO COAL MEMBER</u> 29.6-37.0 <u>INTERBEDDED SANDSTONE AND SHALE</u> : moderately hard; gray-brown.	
	35				
	40			TOTAL DEPTH 37.0'	
<small>           DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLE MISTAKES; SAMPLING UNASSISTED BY USE OF SMALL-DIAMETER HOLES. ROTARY AND WASH-BUILDING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCED HOLES.            THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.            THIS HOLE WAS LOGGED IN SIX 4' BATS AS TO PROVEN DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTIONS.            SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.            THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE IRREGULAR.         </small>					
<b>W. A. WAHLER &amp; ASSOCIATES</b>		MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG	
PALO ALTO • NEWPORT BEACH • CALIF.		PROJECT NO. GUL-105A	DATE FEB. 1980	SHEET NO. 1 of 1	
				HOLE NO. LP-11	

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HOLE LOCATION La Polvadera Canyon		HOLE ELEVATION		ANGLE Vert.	BEARING								
DRILL RIG Gardner-Denver 14W		CORE SIZE 5"		LOGGED BY WQ	DATE DRILLED 11/5/79								
COMMENTS	DEPTH RECOVERY	LOG	DESCRIPTION										
			<p>0.0-4.0 <u>SANDY CLAY (CL)</u>: scattered small pebbles, red-brown.</p> <p>4.0-10.8 <u>SILTY SAND (SM)</u>: some clay; tan.</p> <p>10.8-22.0 <u>DILCO COAL MEMBER INTERBEDDED SANDSTONE AND SHALE</u>: moderately hard; tan-brown.</p> <p>TOTAL DEPTH 22.0'</p>										
<p>DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL-DIAMETER HOLES. SOFT AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>													
<p>W. A. WAHLER &amp; ASSOCIATES</p>		<p>MT. TAYLOR URANIUM MILL PROJECT</p> <p>PALO ALTO • NEWPORT BEACH • CALIF.</p>		<p>ROCK EXPLORATION CORE HOLE LOG</p> <table border="1"> <tr> <td>PROJECT NO.</td> <td>DATE</td> <td>SHEET NO.</td> </tr> <tr> <td>GUL-105A</td> <td>FEB. 1980</td> <td>1 of 1</td> </tr> </table>		PROJECT NO.	DATE	SHEET NO.	GUL-105A	FEB. 1980	1 of 1	<p>HOLE NO LP-12</p>	
PROJECT NO.	DATE	SHEET NO.											
GUL-105A	FEB. 1980	1 of 1											

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HOLE LOCATION La Polvadera Canyon		HOLE ELEVATION		ANGLE Vert. BEARING	
DRILL RIG Gardner-Denver 14W		CORE SIZE 5"		LOGGED BY WQ	DATE DRILLED 11/6/79
COMMENTS	DEPTH RECOVERY LOG	DESCRIPTION			
		<p>0.0-7.0 <u>SANDY CLAY (CL)</u>: fine sandy, brown.</p> <p>7.0-17.3 <u>SANDY SILT (ML)</u>: very fine, some clay.</p> <p style="text-align: center;">DILCO COAL MEMBER</p> <p>17.3-27.0 <u>INTERBEDDED SHALE AND SILTSTONE</u>: weathered; tan-brown.</p> <p>TOTAL DEPTH 27.0'</p>			
<p>DATA ON THE LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM DIRECT OBSERVATION AND POSSIBLY INFERRED. LOGS OBTAINED BY USE OF SMALL-DIAMETER HOLES (1/2" AND 3/8" BORE HOLES) HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THE HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>					

510 (Rev.)

<b>W. A. WAHLER &amp; ASSOCIATES</b>	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO LP-13
	PROJECT NO	DATE	SHEET NO			
	GUL-105A	FEB. 1980	1 of 1			
PALO ALTO • NEWPORT BEACH • CALIF.						



HOLE LOCATION La Polvadera Canyon		HOLE ELEVATION		ANGLE Vert.	BEARING	
DRILL RIG Gardner-Denver		CORE SIZE 5"	LOGGED BY WQ	DATE DRILLED 11/6/79		
COMMENTS	DEPTH RECOVERY	LOG	DESCRIPTION			
			0	0.0-7.2 <u>SILTY SAND (SM)</u> : some clay, tan.		
			5	7.2-11.5 <u>SANDY SILT (ML)</u> : very fine sand; some clay; red-brown.		
			15	<u>MULATTO TONGUE</u> 11.5-19.6 <u>SHALE AND SANDSTONE</u> : moderately hard, tan-brown.		
			20	<u>DILCO COAL MEMBER</u> 19.6-22.0 <u>SHALE</u> : carbonaceous; brown.		
	25		TOTAL DEPTH 22.0'			
<p>DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DIFFERENT SAMPLING TECHNIQUES. USE OF SMALL-DIAMETER HOLES, SURFACE AND BOREHOLE HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTIONS.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG AND FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>						
W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO. LP-14
	PALO ALTO • NEWPORT BEACH • CALIF.		PROJECT NO.	DATE	SHEET NO.	
			GUL-105A	FEB. 1980	1 of 1	

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HOLE LOCATION <b>La Polvadera Canyon</b>	HOLE ELEVATION	ANGLE <b>Vert.</b>	BEARING
DRILL RIG <b>Gardner-Denver 14W</b>	CORE SIZE <b>5"</b>	LOGGED BY <b>WQ</b>	DATE DRILLED <b>11/6/79</b>

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
Drilled with 5" tricone bit and air only.	0			0.0-8.0 <u>CLAYEY SAND (SC)</u> : scattered rock fragments to 1/2" size, yellow-brown.
	5		B-1	
	10		B-2	8.0-16.2 <u>SANDY SILTY CLAY (CL)</u> : fine sand; yellow-brown.
	15			
	20			<u>MULATTO TONGUE</u> 16.2-32.0 <u>SILTSTONE AND SHALE INTERBEDDED</u> : moderately hard, tan-brown.
	25			
	30			
	35			TOTAL DEPTH 32.0'
<small>           DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT DISCONTINUOUS AND POSSIBLY DISTURBED SAMPLING. RECOVERY OF SMALL-DIAMETER CORES BY AIR AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.            THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.            THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PREFERABLY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTORS.            SOIL CLASSIFICATIONS SHOWN ON LOG AND FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.            THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.         </small>				

510 (Rev.)

<b>W. A. WAHLER &amp; ASSOCIATES</b>	MT. TAYLOR URANIUM MILL PROJECT	ROCK EXPLORATION CORE HOLE LOG			HOLE NO.  LP-15
	PALO ALTO • NEWPORT BEACH • CALIF.	PROJECT NO GUL-105A	DATE FEB. 1980	SHEET NO. 1 of 1	

HOLE LOCATION	La Polvadera Canyon	HOLE ELEVATION	ANGLE	Vert.	BEARING
DRILL RIG	Gardner-Denver 14W	CORE SIZE	5"	LOGGED BY	WQ
				DATE DRILLED	11/6/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
Drilled with 5" tricone bit using air only.	0		B-1	0.0-5.5 <u>SANDY CLAY (CL)</u> : fine sandy; occasional pebbles; yellow-brown.
	5			5.5-16.5 <u>SANDY SILT (ML)</u> : some clay; tan-brown.
	10			
	15			16.5-18.0 <u>GRAVEL</u> : 1/2" to 3/4" size, rounded.
	20			<u>MULATTO TONGUE</u> 18.0-22.0 <u>SHALE</u> : silty; moderately hard; tan-brown.
	25			TOTAL DEPTH 22.0'

DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY LIMITED SAMPLING. RECONSTITUTION BY USE OF SMALL-DIAMETER BITTERS, ROTARY AND RASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTORS.

THE CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

510 (REV.)

W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO. LP-16
	PROJECT NO.	DATE	SHEET NO.			
	GUL-105A	FEB. 1980	1 of 1			

PALO ALTO • NEWPORT BEACH • CALIF.

HOLE LOCATION	La Polvadera Canyon	HOLE ELEVATION	ANGLE Vert.	BEARING
DRILL RIG	Gardner-Denver 14W	CORE SIZE	5"	LOGGED BY WQ
				DATE DRILLED 11/6/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
Drilled with 5" tricone bit using air only.	0			0.0-12.0 <u>CLAYEY SAND (SC)</u> : gravel 1/4" to 1/2" size; yellow-brown.
	5		B-1	
	10			
	15		B-2	12.0-27.3 <u>CLAYEY SAND (SC)</u> : fine grained; scattered small pebbles; yellow-brown.
	20			
	25			
	30			<u>MULATTO TONGUE</u> 27.3-35.0 <u>SHALE</u> : silty; moderately hard.
	35			TOTAL DEPTH 35.0'
<small>           DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM DIRECT OBSERVATION AND POSSIBLE SUPPLEMENTED SAMPLING. RECORDED BY USE OF SMALL-DIAMETER HOLES. ROYAL AND RAIN BORING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD OF BEARING OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.            THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCALITIES AND ON OTHER DATES.            THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTORS.            CORE CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON USGS CORE LOG CLASSIFICATION SYSTEM.            THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.         </small>				

510 (Rev.)

W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO. LP-17
	PROJECT NO.	DATE	SHEET NO.			
	GUL-105A	FEB. 1980	1 of 1			
PALO ALTO • NEWPORT BEACH • CALIF.						

HOLE LOCATION La Polvadera Canyon HOLE ELEVATION ANGLE Vert. BEARING

DRILL RIG Gardner-Denver 14W CORE SIZE 5" LOGGED BY WQ DATE DRILLED 11/6/79

COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION
Drilled with 5" tricone bit using air only	0		B-1	0.0-4.5 SANDY CLAY (CL): fine sandy; red-brown.
	5			MULATTO TONGUE 4.5-22.0 SHALE AND SILTSTONE INTERBEDDED: moderately hard; numerous gypsum fragments; tan-brown.

	10			
	15			
	20			
	25			TOTAL DEPTH 22.0'

DATA ON THE LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM DIRECTLY DISCONTINUOUS AND POSSIBLY SPINDLED SAMPLES. NECESSITATED BY USE OF SMALL-DIAMETER HOLES. ROTARY AND REAM BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTORS.

THE CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICAL UNITS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

510 (Rev.)

W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO. LP-18
			PROJECT NO. GUL-105A	DATE FEB. 1980	SHEET NO. 1 of 1	
	PALO ALTO • NEWPORT BEACH • CALIF.					

HOLE LOCATION La Polvadera Canyon		HOLE ELEVATION		ANGLE Vert. BEARING	
DRILL RIG Gardner-Denver		CORE SIZE 5"		LOGGED BY WQ	DATE DRILLED 11/6/79
COMMENTS	DEPTH	RECOVERY	LOG	DESCRIPTION	
Drilled with 5" tricone bit using air only.	0		B-1	0.0-4.0 SANDY CLAY (CL): silty; red-brown.	
	5			DILCO COAL MEMBER 4.0-15.0 INTERBEDDED SHALE AND SILTSTONE: moderately hard; tan-brown.	
	10				
	15			TOTAL DEPTH 15.0'	
<p>DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY RETURNED SAMPLES ACQUIRED BY USE OF SMALL-DIAMETER BITTLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD RE: USE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCE DRILLING.</p> <p>THIS LOG INDICATES CONDITIONS IN THE HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>					

510 (REV.)

W. A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT		ROCK EXPLORATION CORE HOLE LOG			HOLE NO. LP-19
	PROJECT NO.	DATE	SHEET NO.			
	GUL-105A	FEB. 1980	1 OF 1			
PALO ALTO • NEWPORT BEACH • CALIF.						

ROTARY AND CORE HOLE LOGS  
MILL CATCHMENT DAM SITE

POOR ORIGINAL

DRILL RIG PNEUMATIC-(INGERSOLL-RAND)	HOLE ELEVATION 7,144' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 3"	DATE DRILLED SEPT. 3, 1977

NOTE: Hole located at proposed catchment dam axis, mill site.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
00	SM	0.0-5.0' <u>SILTY SAND</u> ; light brown; loose (cuttings blew out as dust).		RD	Drilled with pneumatic rotary drill rig.
2					
4					
6	CL-SC	5.0-17.0' <u>SANDY CLAY to CLAYEY SAND</u> ; medium brown; medium dense (cuttings recovered as small chips and balls 1/4" long).			
8					
10					
12					
14					
16					Lost air circulation from 16.0-17.0'.
	LITH.	BEDROCK CONTACT			
18		17.0-22.0' <u>MENEFEE FORMATION; INTERBEDDED FINE SANDSTONE AND SILTSTONE</u> ; tan to light gray.			
20					



DRILL RIG PNEUMATIC-(INGERSOLL-RAND)	HOLE ELEVATION 7,144' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 3"	DATE DRILLED SEPT. 3, 1977

NOTE: Hole located at proposed catchment dam axis, mill site.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		17.0-22.0' INTERBEDDED FINE SANDSTONE AND SILTSTONE-- (continued)			
22		TOTAL DEPTH = 22.0 FEET			
24		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM SUBJECT LOG CUTTINGS AND POSSIBLY OBTAINED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. NOTARY AND BATHY HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLE.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

DRILL RIG PNEUMATIC- (INGERSOLL-RAND)	HOLE ELEVATION 7,144' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) ~18.0'	HOLE DIAMETER 3"	DATE DRILLED SEPT. 3, 1977

NOTE: Hole located at proposed catchment dam axis, mill site.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SC- CL	0.0-18.0' CLAYEY SAND to SANDY CLAY; medium brown; damp; medium grained.		RD	Drilled with pneumatic rotary drill rig.
2					
4					
6					
8					
10					
12					
14					
16					
18	SM	18.0-45.0' SILTY SAND; light brown; medium grained; wet.			Water table at ~18.0'.
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WSL-2
		PROJECT NO	DATE	SHEET NO	
		GUL-101	SEPT. 1977	1 of 3	

DRILL RIG PNEUMATIC-(INGERSOLL-RAND)	HOLE ELEVATION 7,144' (TOPO)	LOGGED -3Y	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) -18.0'	HOLE DIAMETER 3"	DATE DRILLED SEPT. 3-4, 1977	

NOTE: Hole located at proposed catchment dam axis, mill site.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODF	REMARKS
20		18.0-45.0' SILTY SAND-- (continued)			Lost air circulation from 20.0-27.0'.  Completed hole with 3" bit.
22					
24					
26					
28					
30					
32					
34					
36					
38					
40					

W A WAHLER & ASSOCIATES	MI TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO WSL-2
		PROJECT NO	DATE	SHEET NO	
		GUL-101	SEPT. 1977	2 OF 3	

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DRILL RIG PNEUMATIC--(INGERSOLL-RAND)	HOLE ELEVATION 4,144' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) ~18.0'	HOLE DIAMETER 3"	DATE DRILLED SEPT. 3-4, 1977

NOTE: Hole located at proposed catchment dam axis, mill site.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		18.0-45.0' SILTY SAND-- (continued)			
42					
44					
46	CL	45.0-49.0' SANDY CLAY (?); medium brown; dense.  Weathered shale; bedrock contact probably above 45'.			Encountered very dense material at 45.0'.
48					
50		TOTAL DEPTH = 49.0 FEET  <small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO WATER WAS OBTAINED FROM SHORTLY ONE FOOT OR LESS POSSIBLY DISTURBED SAMPLING RECONSTITUTED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCED HOLES.  THE LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.  THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROBABLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSULTANTS.  SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNSATURATED SOIL CLASSIFICATION SYSTEM.  THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

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SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.

DATE

SHEET NO

GUL-101

SEPT. 1977

3 OF 3

HOLE  
NO.  
WSL-2

DRILL RIG PNEUMATIC-(INGERSOLL-RAND)	HOLE ELEVATION 7,145' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 3"	DATE DRILLED SEPT. 3, 1977

NOTE: Hole located at proposed catchment dam axis, mill site.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-23.0' SILTY SAND; light brown; loose.		RD	Drilled with pneumatic rotary drill rig.
2					
4					
6					
8					Contains basalt fragments; 8.0-10.0'.
10					
12					
14					
16					
18					
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WSL-3
		DRILL HOLE LOG			
		PROJECT NO. GUL-101	DATE SEPT. 1977	SHEET NO. 1 of 2	

DRILL RIG PNEUMATIC--(INGERSOLL-RAND)	HOLE ELEVATION 4,145' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 3"	DATE DRILLED SEPT. 3, 1977

NOTE: Hole located at proposed catchment dam axis, mill site.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-23.0' SILTY SAND-- (continued)			
22					
24	LITH.	BEDROCK CONTACT			
24		23.0-26.0' MENELEE FORMATION; WEATHERED SILTSTONE; light brown; soft.			
26		26.0-34.0' SHALE; light gray; fissile.			
28					
30					
32					
34		TOTAL DEPTH = 34.0 FEET			
36		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SAMPLES WERE OBTAINED FROM SHORTLY DISCONTINUOUS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND PAW BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

DRILL RIG PNEUMATIC-(INGERSOLL-RAND)	HOLE ELEVATION 7,149' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 3"	DATE DRILLED SEPT. 3, 1977

NOTE: Hole located at proposed retention pond, catchment dam, mill site.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SC	0.0-12.0' <u>CLAYEY SAND</u> ; medium brown.		RD	Drilled with pneumatic rotary drill rig.
2					
4					
6					
8					
10					
12	SM	12.0-22.0' <u>SILTY SAND</u> ; red-brown; loose; damp.			
14					
16					
18					
20					

DRILL RIG PNEUMATIC- (INGERSOLL-RAND)	HOLE ELEVATION 7,149' (TOP)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 3"	DATE DRILLED SEPT. 3, 1977

NOTE: Hole located at proposed retention pond, catchment dam, mill site.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		12.0-22.0' SILTY SAND-- (continued)			
22	LITH.	BEDROCK CONTACT			
22		22.0-24.0' MENELEE FORMATION; SHALE; medium gray; very weathered; damp.			Material denser from 22.0-24.0'.
24		24.0-32.0' SILTSTONE; light gray to tan; contains some fine sand.			
26					
28					
30					
32		TOTAL DEPTH = 32.0 FEET			
34		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLES. NECESSITATED BY USE OF SMALL DIAMETER HOLES ROTARY AND PAW BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED BY JACK A. BAY AS TO PRELIMINARY PROVIDED DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

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SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	SEPT. 1977	2 OF 2

HOLE NO.  
WSL-4



DRILL RIG PNEUMATIC-(INGERSOLL-RAND)	HOLE ELEVATION 7,153'(TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 3"	DATE DRILLED SEPT. 3-4, 1977

NOTE: Hole located at proposed retention pond, catchment dam, mill site.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-9.0' <u>CLAYEY SAND</u> ; medium brown; damp.		RD	Drilled with pneumatic rotary drill rig.
2					
4					
6					
8					
10					
12					
14					
16					
18	SM	9.0-27.0' <u>SAND</u> ; tan to medium brown; medium grained; slightly silty.			
20					

DRILL RIG PNEUMATIC-(INGERSOLL-RAND)	HOLE ELEVATION 7,153' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 3"	DATE DRILLED SEPT. 3-4, 1977

LOCATION: Hole located at proposed retention pond, catchment dam, mill site.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		9.0-27.0' SAND--(continued)			Lost air circulation 20.0-27.0'; no return cuttings.
22					
24					
26					
28	CL	27.0-41.0' SANDY CLAY; dark brown; damp (possibly weathered bedrock).			Lost air circulation from 35.0-39.0'.
30					
32					
34					
36					
38					
40					

DRILL RIG PNEUMATIC-(INGERSOLL-RAND)	HOLE ELEVATION 7,153'(TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 3"	DATE DRILLED SEPT. 4, 1977

NOTE: Hole located at proposed retention pond, catchment dam, mill site.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40	LITH.	27.0-41.0' SANDY CLAY--			Material very hard at 41.0-55.0'.
42		41.0-55.0' MENEFFEE FORMATION; INTERBEDDED GRAY SHALE AND TAN SILTSTONE; hard; fissile.			
44					
46					
48					
50					
52					
54					
56		TOTAL DEPTH = 55.0 FEET			
		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO RETURNED WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DEFERRED SAMPLING. REPRESENTED BY USE OF SMALL DIAMETER HOLES. ROTARY AND PILE BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED BY SUCH A WAY AS TO FURNISH PROVEN DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE HYDRATE/LAYER LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WSL-5
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	3 of 3	

DRILL RIG PNEUMATIC- (INGERSOLL-RAND)	HOLE ELEVATION 7,154' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 3"	DATE DRILLED SEPT. 3, 1977

NOTE: Hole located at proposed retention pond, catchment dam, mill site.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SM- CL	0.0-8.0' <u>CLAYEY, SILTY SAND</u> ; medium brown; slight y plastic; damp.		RD	Drilled with pneumatic rotary drill rig.
2					
4					
6					
8	SM	8.0-21.0' <u>SILTY SAND</u> with <u>BASALT FRAGMENTS</u> (up to 1/4" diameter); yellow brown; loose; damp.			
10					
12					
14					
16					
18					
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WSL-6
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 OF 2	

DRILL RIG PNEUMATIC- (INGERSOLL-RAND)	HOLE ELEVATION 7,156' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 3"	DATE DRILLED SEPT. 3, 1977

NOTE: Hole located at proposed retention pond, catchment dam, mill site.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20	CL	8.0-21.0' SILTY SAND with BASALT FRAGMENTS-- (continued)			Material denser from 21.0-27.0'.
22		21.0-27.0' SANDY CLAY; medium brown; plastic; damp; very dense.  Probably weathered shale			
24					
26					
28		TOTAL DEPTH = 27.0 FEET  <small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SAMPLE MATERIAL WAS OBTAINED FROM DIRECTLY OBSERVABLE AND POSSIBLY OBTAINED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND PNEUMATIC HOLES HAVE FURTHER COMPA- CATED IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUIDS AND TO MAINTAIN ADVANCING HOLES.  THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY IN THE DEPTH INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND OR OTHER DATES.  THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.  SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON USDEC'S SOIL CLASSIFICATION SYSTEM.  "V" ALTERNATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>		Refusal at 27.0' probably in bedrock.	

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WSL-6
		PROJECT NO. GUL-101	DATE SEPT. 1977	SHEET NO. 2 of 2	

DRILL RIG	MOBILE DRILL: B-61	HOLE ELEVATION	7,182' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	NOT ENCOUNTERED	HOLE DIAMETER	6" NX	DATE DRILLED	OCTOBER 18, 1977

NOTE: Located on left abutment.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-11.0' TERRACE DEPOSIT; SILTY SAND WITH BASALT GRAVEL AND COBBLES up to 8" diameter; very light brown; medium dense; dry; contains red to brown rounded agate pebbles.		HSA	Drilled with hollow stem auger to 20.0'.
2					20-30% Basalt
4					
6					Slightly damp at 6.0'.
8					
10					
	LITH.	BEDROCK CONTACT			
12		11.0-20.0' MENELEE FORMATION; SANDSTONE; silty; light yellow to gray; interbedded shale and siltstone.			Contains low re- sistance layers up to 6" thick; probably shale and siltstone.
14		Light gray, Quarts Sand- stone cuttings recovered from 14.5-17.0'.			Relatively harder drilling from 14.5- 17.0'.
16					
18					
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WSL-7
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	NOV. 1977	1 of 3	

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,182' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 6" NX	DATE DRILLED OCTOBER 18, 1977

NOTE: Located on left abutment.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		20.0-29.0' <u>SILTY SANDSTONE</u> ; light brown; massive bedding; poorly cemented.	Run No.	Recov.	Started NX coring at 20.0'.
22				Adv.	20.0-30.0' 1 hour core run; 25-30 gallons of water loss.
24			1	10.0 10.0 (100%)	Recovered solid core from 1-6" long.
26					
28		Contains black carbonaceous fragments 28.0-29.0'.			
30		29.0-40.0' <u>SILTSTONE WITH INTERBEDDED, GRAY SHALE</u> 6-12" thick; light brown with Fe-stain; contains discontinuous joints 2-6" long, 45° to near vertical; shale beds very plastic.			30.0-40.0' 1-1/2 hour run; took ~200 gallons from 30.0-32.0'.
32					Took ~300 gallons from 32.0-40.0' (probably through joints).
34			2	6.0 10.0 (60%)	Core bit plugging; 32.0-40.0'.
36		Shale completely crumbled and remolded in core barrel.			Core recovery: sandstone segments 2-8" long.
38					
40					

DRILL RIG	MOBILE DRILL: B-61	HOLE ELEVATION	7,182' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	NOT ENCOUNTERED	HOLE DIAMETER	6" NX	DATE DRILLED	OCTOBER 18, 1977

NOTE: Located on left abutment.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		40.0-45.0' SHALE; gray with Fe-stain; very sticky and plastic; shows vertical fracture 41.0-41.5'.	3	3.0 5.0 (60%)	40.0-45.0' 20 minute core run. Took ~150 gallons. Recovered core segments 2-8" long.
42					
44		45.0-50.0' INTERBEDDED SILT-STONE AND SHALE BEDS 6-12" thick; medium gray; contains black shale partings; 1.0" thick; black carbonaceous shale bed at 45.0'; 1.0' thick; tan claystone bed at 47.5'; shows discontinuous vertical joints 2-4" long; shale deforms plasticity.	4	4.0 5.0 (80%)	45.0-50.0' 30 minute run. Took 200-250 gallons. Recovered core segments, ranged from broken fragments to 6" long.
46					
48					
50		TOTAL DEPTH = 50.0 FEET			
52		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SAMPLES WERE OBTAINED FROM SHALLOW CORES AND POSSIBLY DISTURBED. SAMPLES OBTAINED BY USE OF SMALL DIAMETER HOLES, ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUIDS AND/OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE NO.

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO.  
GUL-101

DATE  
NOV. 1977

SHEET NO.  
3 of 3

WSL-7



DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,188' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE): NOT ENCOUNTERED	HOLE DIAMETER 6" NX	DATE DRILLED OCTOBER 20, 1977

NOTE: Located on right abutment.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-7.5' TERRACE DEPOSIT; GRAVELLY, SILTY SAND; basalt gravel and cobbles to 8" diameter; light brown; hard to penetrate using drive sample; contains 20-30% basalt.		A	Drill with hollow stem auger to 8'. NOTE: Water truck leaking 1-2 gpm at ground surface; all water percolating into ground.
2			SPT	DR	
4					
6				A	
8	LITH.	BEDROCK CONTACT		Recov. Adv.	
8		7.5-38.0' MENELEE FORMATION; SILTY SANDSTONE; light yellow brown; massive bedding; breaks along bedding planes.	Run No.		Started NX coring at 8.0'. 8.0-15.0' 20 minute run. Took 10-15 gallons. Recovered core segments 1-8" long.
10			1	6.0 7.0 (86%)	
12					
14				15.0-25.0' 20 minute run. Took -10 gallons. Recovered core segments 1-6" long.	
16			2	9.0 10.0 (90%)	
18					
20					

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE  
NO

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO.  
GUL-101

DATE  
NOV. 1977

SHEET NO  
1 of 4

WSL-8

DRILL RIG	MOBILE DRILL: B-61	HOLE ELEVATION	7,188' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	NOT ENCOUNTERED	HOLE DIAMETER	6" NX	DATE DRILLED	OCTOBER 20, 1977

NOTE: Located on right abutment.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		20.5-22.5' Quartz sandstone bed; resistant; recovered a 2' long solid core.			
22			2	9.0 10.0 (90%)	
24					25.0-35.0' 20 minute run. Took -15 gallons. Core segments 1-3" long.
26					
28			3	5.0 10.0 (50%)	
30					
32					
34		35.0-36.0' Fe-stain.			
36			4	2.0 4.5 (44%)	35.0-39.5' 1/2 hour coring. Took -10 gallons. Core segments 1-2" long.
38		38.0-58.0' SHALE WITH THIN INTERBEDDED YELLOW-BROWN SILTSTONE BEDS less than 6" thick; light brown; poorly cemented; becomes plastic when wetted.			Coring hard at 38.0' and bit plugging.
40			5		

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE NO.  
WSL-8

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO.	DATE	SHEET NO.
GUL-101	NOV. 1977	2 OF 4

DRILL RIG	MOBILE DRILL: B-61	HOLE ELEVATION	7,188' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	NOT ENCOUNTERED	HOLE DIAMETER	6" NX	DATE DRILLED	OCTOBER 20, 1977

NOTE: Located on right abutment.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		38.0-58.0' <u>SHALE</u> --(continued)			39.5-50.0' 1-1/2 hour coring. Took ~100 gallons. Hard at 45.0'.
42					
44					NOTE: Core plugged in barrel; had to be forced down hole and out of barrel using hydraulic down pressure.
46		1/2" Thick carbonaceous shale seam at 45.0'.	5	10.0 10.0 (100%)	
48					
50					No recovery; probably washed out core during coring. Drilled with 3" rock bit from 50.0-70.0'.
52					
54					
56					
58		Coal bed at 58.0'; about 6" thick; water take increased.			Coal bed at 58.0'. Lost ~30 gallons from 58.0-60.0'.
60		58.5-70.0' <u>SHALE</u> ; gray; weathered to consistence of wet clay; very plastic; sticky.	6	RD	

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,188' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 6" NX	DATE DRILLED OCTOBER 20, 1977

NOTE: Located on right abutment.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60	—	58.5-70.0' SHALE--(continued)			Very soft drilling from 60.0-70.0'; little water loss. Drilling rate ~1' per minute. Cuttings of gray clay.
62	—				
64	—				
66	—	Sandy shale 65.0-67.0'.			
68	—				
70		TOTAL DEPTH = 70.0 FEET			Run constant head test; tested section 8.0-70.0'. Coring - 8'. Water level - 1' above ground surface. Took 2 gallons in 40 minutes or about 0.05 gpm.
72		<small>           DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SECTION WATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND HAND BORING HOLES HAVE FURTHER COMPLICATED THIS SITUATION BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CARDS IN ADVANCED HOLES.            THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED - IT MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AT OTHER DATES.            THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.            SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.            THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.         </small>			

DRILL RIG MOBILE DRILL: B-61 HOLE ELEVATION 7,144' (TOPO) LOGGED BY MPF  
 GROUNDWATER DEPTH (BELOW GROUND SURFACE) 14.5' (PERCHED GROUNDWATER) HOLE DIAMETER 6" NX DATE DRILLED OCTOBER 26, 1977

NOTE: Located on channel section; dam site.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-4.0' <u>ALLUVIUM</u> ; <u>SANDY SILT</u> ; medium brown; slightly plastic; contains organic material.		HSA	Drilled with hollow stem auger.
2			S-1	P	Pushed Shelby tube.
4		4.0-11.0' <u>CLAYEY SAND</u> ; medium brown; dense; plastic; slightly damp; shows some caliche stain.	SPT	DR	Standard penetration test. 13/19/21 - 1.5'
6					
8			B-1	HSA	Bulk sample 5-10'.
10			S-2	P	Shelby
12		11.0-14.0' <u>SILTY SAND</u> ; light brown; medium dense; damp; slightly plastic.	SPT	DR	Standard penetration test. 5/7/10 - 1.5'
14					
14	▽	14.0-15.0' <u>CLAYEY SAND</u> ; medium brown; wet; plastic.		HSA	Soil wet at 14.0'.
16		15.0-26.0' <u>SILTY SAND</u> ; light brown; saturated; low plasticity; medium dense.	S-3	P	Shelby
18			SPT	DR	Standard penetration test. 4/6/5 - 1.5'
20				HSA	

DRILL RIG	MOBILE DRILL: B-61	HOLE ELEVATION 7,144' (TOPO)	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	14.5' (PERCHED GROUNDWATER)	HOLE DIAMETER 6" NX	DATE DRILLED	OCTOBER 26, 1977

NOTE: Located on channel section; dam site.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		15.0-26.0' SILTY SAND-- (continued)			Hit hard boulder at 20.0'; could not push Shelby tube; made metallic grinding sound when augering.
22					
24					
26	LITH.	BEDROCK CONTACT	SPT	DR	Standard penetration test.
26		26.0-28.0' MENELEE FORMATION; CARBONACEOUS SHALE; gray with Fe-stain; plastic; contains carbonaceous particles (laminations) up to 1/2" diameter.	Run No.	Recov. Adv.	12/42/50 - 6"/6"/3" (Refusal)
28		28.0-30.0' SILTY SANDSTONE with carbonaceous laminations; tan with Fe-stain.			Started NX coring at 26.3'. 26.3-35.0' 30 minute coring; took 10-20 gallons; core segments 1-1/2-18" long.
30		30.0-35.0' SILTY SANDSTONE; medium gray; poorly cemented; crossbedded; breaks along bedding; contains few thin carbonaceous partings; recovered in 6-8" segments.	1	8.7 8.7 (100%)	Installed 1" pvc pipe to monitor ground level. Water Level Readings:
32					<u>Date</u> <u>Water Level</u>
32					10/27/77      14.2
32					10/31/77      14.5
32					11/2/77      14.5
32					11/13/77      14.5
34					
36		TOTAL DEPTH = 35.0 FEET			
		<small>           DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO            WATER WAS OBTAINED FROM DIRECTLY DISCHARGES AND POSSIBLY            DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER            HOLES. SOFT AND FIRM BORING HOLES SAVE FURTHER COMPLI-            CATIONS IN THE FUTURE BECAUSE OF THE NEED TO USE DRILLING            FLUID AND OR CARDS IN ADVANCING HOLES.            THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE            DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER            LOCATIONS AND ON OTHER DATES.            THIS HOLE WAS LOGGED IN ACCORDANCE WITH FEDERAL PROVISIONS            DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSE            OF SPECIFIC CONSTRUCTORS.            SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS            BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.            THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY            BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.         </small>			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	NOV. 1977	2 of 2

HOLE NO.  
WSL-9

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,166' (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE D' METER 7"	DATE DRILLED OCTOBER 26, 1977

NOTE: Located upstream right abutment slope.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-4.0' SANDY SILT; light brown; nonplastic; soft.		HSA	Drilled with hollow stem auger.
2					
4	LITH.	BEDROCK CONTACT			
		4.0-5.0 MENELEE FORMATION; RESISTANT SANDSTONE LENS; light yellow; silty; hard to auger.			
6		5.0-10.5' SILTY SANDSTONE; light yellow; weathered; crossbedded; loose to dense; cuttings contain loose sand to sandstone fragments 1" across.	SPT	DR	Standard penetration test. 37/25/10 - 1.5'
8					
10			SPT	DR	Standard penetration test. 50/.5
12		TOTAL DEPTH = 10.5 FEET			
		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE DEPTH WITHIN WAS OBTAINED FROM SENSITIVE INDICATORS AND POSSIBLY DEFINED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. SOFT AND HARD BORING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OF CARING IN ADVANCE HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO POSSIBLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON LIMITED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.

GUL-101

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HOLE NO.

WSL-10

DRILL RIG	MOBILE DRILL: B-61	HOLE ELEVATION	7,198'	LOGGED BY	MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	NOT ENCOUNTERED	HOLE DIAMETER	7"	DATE DRILLED	OCTOBER 26, 1977

NOTE: Located upstream right abutment slope.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-3.0' SANDY SILT; medium brown; soft; contains basalt fragments up to 3" across.			
2					(Refusal) Hit basalt boulder at 2.5'; moved rig 3.0' to new hole.
4		TOTAL DEPTH = 3.0 FEET NOTE: At 3.0' black basalt boulders 6"-3' diameter; could not penetrate.			(Refusal at 3.0' at second hole.)
		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM VISUAL OBSERVATIONS AND POSSIBLY INTERRUPTED SAMPLING. NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND SHANK BORING HOLES HAVE FURTHER COMPLICATING IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT  
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SOIL EXPLORATION DRILL HOLE LOG		
PROJECT NO	DATE	SHEET NO
GUL-101	NOV. 1977	1 of 1

HOLE NO.  
WSL-11



DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,196'± (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE): NOT ENCOUNTERED	HOLE DIAMETER 7"	DATE DRILLED OCTOBER 27, 1977

NOTE: Located upstream right abutment slope.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-4.0' <u>SANDY SILT</u> ; medium brown; nonplastic; soft.		HSA	Chert, sandstone, and basalt cobbles exposed at surface, up to 3" diameter.
2					
4		4.0-5.5' <u>CLAYEY, SANDY SILT</u> ; dark brown; slightly plastic; fluffy; soft.			
6		5.5-10.0' <u>SILTY SAND</u> ; medium red-brown; loose; very slightly clayey.	SPT	DR	Standard penetration test. 8/5/3 - 1.5'
8				HSA	Contains basalt cobbles 2" across at 8.0'.
10		10.0-14.0' <u>SILTY CLAY WITH BASALT GRAVEL LENSES</u> ; yellow to brown with caliche stain along fractures; hard; plastic.	SPT	DR	Standard penetration test. 14/22/28 - 1.5'
12				HSA	Basalt gravel from 12.0-13.0'.
14	LITH.	BEDROCK CONTACT			Hard at 14.0',
14.0-20.0'		<u>MENELEE FORMATION; SANDY SILTSTONE</u> ; medium yellow-brown.	SPT	DR	Standard penetration test. 50-3" (Refusal)
16					
18				HSA	
20					

DATA ON THIS LOG IS APPROPRIATE ONLY BECAUSE THE BEFORE DATA HAS OBTAINED FROM SHALLOW, UNCONTROLLED AND POSSIBLY UNSTANDARD SAMPLING PROCEDURES BY USE OF SMALL DIAMETER HOLES. SOFT AND FIRM BORING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CARDS IN ADVANCED HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED BY SUCH A DATA TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.

SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFIED FROM BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LABELS REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

TOTAL DEPTH = 20.0 FEET

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,178 <sup>+</sup> (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 7"	DATE DRILLED OCTOBER 27, 1977

NOTE: Located upstream right abutment slope.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-8.0' SANDY SILT; dark brown; nonplastic; fluffy; firm grading to very stiff at depth.		HSA	Sandstone and basalt cobbles exposed at surface.
2					
4					
6		Contains basalt gravel-cobble lens 6.5-7.0'.	SPT	DR	Standard penetration test. 9/12/18 - 1.5'
8	LITH.	BEDROCK CONTACT			
10		8.0-13.0' <u>MENELEE FORMATION</u> ; SANDY SILTSTONE; light yellow.		HSA	
12					
14		TOTAL DEPTH = 13.0 FEET  <small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT DISCOVERY AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.            THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.            THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.            SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.            THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,164'±(TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 7"	DATE DRILLED OCTOBER 27, 1977

NOTE: Located upstream right abutment slope.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-13.0' <u>SILTY SAND</u> ; light red-brown; fluffy; very loose from 0.0-10.0'; very slightly clayey from 4.0-7.0'; shows slight caliche mottling.		HSA	NOTE: Old trees on this ridge are uprooted and tilt upslope.
2					
4					
6			SPT	DR	Standard penetration test. 5/2/3 - 1.5'
8					Basalt gravel lens at 7.5'.
10		Dense at 10.0' to 13.0'.			
12			SPT	DR	Standard penetration test. 20/34/33 - 1.5'
14		13.0-18.5' <u>CLAYEY SAND</u> ; light brown; slightly plastic; dense.			
16		<small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM BOREHOLE DISCONTINUOUS AND POSSIBLY INTERRUPTED SAMPLING INDICATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND PNEUMATIC HOLES MAY FURTHER COMPLICATE MATTERS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES. THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS. SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			
18	LITH.	BEDROCK CONTACT	SPT	DR	Standard penetration test. 50 - 2" (Refusal)
20		18.5-25.0' <u>MENELEE FORMATION</u> ; <u>VERY SILTY SANDSTONE</u> ; light yellow. TOTAL DEPTH = 25.0 FEET			

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,186'±(TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 7"	DATE DRILLED OCTOBER 27, 1977

NOTE: Located upper reservoir area - east side.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-5.5' SANDY SILT; light brown; fluffy; firm.			
2				HSA	
4					
6		5.5-7.5' ORGANIC, CLAYEY SILT; dark brown; slightly plastic.	SPT	DR	Standard penetration test. 9/8/11 - 1.5'
8		7.5-13.5' SILTY SAND; light red-brown; damp; dense; shows caliche mottles.		HSA	
10			SPT	DR	Standard penetration test. 6/21/26
12				HSA	
14		13.5-24.0' CLAYEY SAND TO SANDY CLAY; light red-brown; dense; contains caliche stain along bedding.	SPT	DR	Standard penetration test. 10/10/14 - 1.5'
16					
18				HSA	
20					



DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,162'±(TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 7"	DATE DRILLED OCTOBER 27, 1977

NOTE: Located upstream reservoir area.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-3.0' <u>SANDY SILT</u> ; medium brown; soft; nonplastic; slightly damp.		HSA	
2					
4		3.0-11.0' <u>SANDY CLAY</u> ; yellow-brown; plastic; contains caliche along fractures; stiff.			
6			SPT	DR	Standard penetration test. 8/12/11 - 1.5'
8		<small>DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING. INDICATED BY USE OF SMALL-DIAMETER HOLES. SOFTEN AND HARD BOLDING HOLES HAVE FURTHER COMPLICATIONS IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES. THIS LOG INDICATES CONDITIONS IN THE HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTORS. SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>	B-1	HSA	(Took large bag sample; 5.0-10.0'.
10			SPT	DR	Standard penetration test. 8/16/24 - 1.5'
12		11.0-15.0' <u>SANDY CLAY</u> ; gray-brown with Fe-stain along bedding; plastic; shows caliche mottles; cross-bedded.			
14					
16		15.0-17.0' <u>SILTY SAND</u> ; light brown; dense; shows caliche mottles; contains basalt gravel lens 16.0-16.5'.	SPT	DR	Standard penetration test. 8/22/41 - 1.5'
18	LITH.	17.0-18.5' <u>SANDY CLAY WITH BASALT GRAVEL</u> up to 2" diameter; yellow-brown; plastic. BEDROCK CONTACT			Hard, slow augering from 18.5-20.0'.
20		18.5-20.0' <u>MENELEE FORMATION; SILTY SANDSTONE</u> ; red-brown. TOTAL DEPTH = 20.0 FEET			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO WSL-16
		PROJECT NO. GUL-101	DATE NOV. 1977	SHEET NO. 1 of 1	

DRILL RIG	MOBILE DRILL: B-61	HOLE ELEVATION 7,144'±(TOPO)	LOGGED BY	MPF	
GROUNDWATER DEPTH (BELOW GROUND SURFACE):	NOT ENCOUNTERED	HOLE DIAMETER	7"	DATE DRILLED	OCTOBER 27, 1977

NOTE: Located channel section; dam axis.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-5.5' <u>SILTY SAND</u> ; light brown; loose.		HSA	
2					
4					
6		5.5-11.0' <u>CLAYEY SAND</u> ; dark brown; very dense; slightly plastic.	SPT	DR	Standard penetration test. 7/26/39 - 1.5
8		<small>DATA ON THIS LOG ARE APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT DISCONTINUOUS AND POSSIBLY DIFFERENT SAMPLING METHODS. THE USE OF SMALL-DIAMETER HOLES, ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLED FLUID AND/OR CASING IN ADVANCED HOLES.</small> <small>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</small> <small>THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONSTRUCTIONS.</small> <small>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</small> <small>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			
10		11.0-13.0' <u>SILTY SAND</u> ; medium brown; dense; shows caliche mottles.	SPT	DR	Standard penetration test. 9/14/18 - 1.5'
12					
14		13.0-15.0' <u>SANDY CLAY</u> ; very dark brown; damp; sticky; plastic.			
16		15.0-18.0' <u>CLAYEY SAND WITH BASALT GRAVEL</u> up to 1" across; light brown with yellow and Fe-stain mottles; slightly plastic; stiff; moist.	SPT	DR	Standard penetration test. 2/6/6 - 1.5'
18		TOTAL DEPTH = 18.0 FEET			Refusal at 18.0' in basalt cobble lens (1-3" diameter); could not penetrate using auger.
20					

W A WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO.  WSL-17
		DRILL HOLE LOG			
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	NOV. 1977	1 of 1	

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,144' ± (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 6"	DATE DRILLED OCTOBER 28, 1977

NOTE: Located channel section; dam axis.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-8.0' <u>SILTY SAND</u> ; medium brown; loose.		AD	Drilled with 6" continuous flight auger.
2					
4					
6		Damp at 6.0'.  Contains basalt gravels from 7.0-8.0'.			
8		8.0-11.0' <u>SANDSTONE BLOCK</u> ; yellow-brown.			
10					
12		11.0-23.0' <u>CLAYEY SAND</u> ; medium brown (yellow-brown when wet); plastic; sticky.			
14					
16					
18					
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WSL-18
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	NOV. 1977	1 of 2	



DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,144'± (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 6"	DATE DRILLED OCTOBER 28, 1977

NOTE: Located channel section; dam axis.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		11.0-23.0' CLAYEY SAND-- (continued)		AD	
22					
	LITH.	BEDROCK CONTACT			
24		23.0-33.0' MENEFEE FORMATION; WEATHERED SANDY SHALE; medium yellow-brown; sticky, plastic; damp.			
26					
28					
30					
32					
34		33.0-37.0' SHALE; dark gray; hard to auger through. <small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SPECIMEN WAS OBTAINED FROM INDIRECT DISCONTINUOUS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND SAMP BOREING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.  THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.  THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.  SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.  THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			
36					
38		TOTAL DEPTH = 37.0 FEET			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

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SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.

GUL-101

DATE

NOV. 1977

SHEET NO.

2 of 2

HOLE  
NO.

WSL-18

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,155'±(TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 7"	DATE DRILLED OCTOBER 27, 1977

NOTE: Located reservoir area, proposed mill catchment dam.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-8.0' <u>SILTY, FINE SAND</u> ; medium brown; loose; shows caliche streaks.			NOTE: Upper 1.0' contains sand- stone and basalt cobbles and boulders up to 8" diameter.
2		<small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO DATA WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BOREHOLE HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES. THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROBABLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS. SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNPAID SOIL CLASSIFICATION SYSTEM. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			
4		Damp below 5.5'.			
6			SPT	DR	Standard penetration test. 5/5/6 - 1.5' Sample contains carbonaceous parti- cles up to 1/4" across.
8		8.0-14.0' <u>CLAYEY, SILTY SAND</u> ; light red-brown; dense.			
10			SPT	DR	Standard penetration test. 12/16/18 - 1.5'
12		Contains some fine basalt gravel from 12.0-14.0'.			
14		14.0-17.5' <u>SILTY SAND</u> ; light brown; dense.			
16			SPT	DR	Standard penetration test. 12/18/23 - 1.5'
18		Basalt boulder at 17.5'. TOTAL DEPTH = 17.5 FEET			Hit basalt boulder; could not penetrate using auger.
20					

DRILL RIG MOBILE DRILL: B-61	HOLE ELEVATION 7,157'+ (TOPO)	LOGGED BY MPF
GROUNDWATER DEPTH (BELOW GROUND SURFACE) NOT ENCOUNTERED	HOLE DIAMETER 7"	DATE DRILLED OCTOBER 28, 1977

NOTE: Located reservoir area, proposed mill site catchment dam.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0		0.0-13.0' <u>SILTY SAND</u> ; light red-brown to yellow-brown; dense; shows slight caliche mottling.		HSA	
2					
4					
6			SPT	DR	Standard penetration test. 9/14/18 - 1.5'
8		Damp and slightly clayey 7.0'.		HSA	
10		<small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DIFFERENT SAMPLING PROCEDURES BY USE OF SMALL DIAMETER WELLS. SURFACE AND BATHYMETRIC DATA HAVE FURTHER COMPA- RATIONS IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUIDS AND OR CASING IN ADJACENT WELLS. THIS LOG INDICATES CONDITIONS IN THIS WELL. ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. THIS WELLS WAS LOGGED IN SUCH A WAY AS TO POSSIBLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION. WELL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED WELLS CLASSIFICATION SYSTEM. THE SEPARATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN WELL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>	SPT	DR	Standard penetration test. 10/18/31 - 1.5'
12					Sample contains Fe- stain mottles and basalt gravel.
14		13.0-17.0' <u>SILTY SAND</u> ; light gray-brown; very dense; shows some Fe-stain mottling.		HSA	Difficult to auger at 13.0'.
16			SPT	DR	Standard penetration test. 23/50 - 1.0' (Refusal)
18		17.0-19.0' <u>BASALT GRAVEL LENS</u>			
20		TOTAL DEPTH = 19.0 FEET			Could not penetrate with auger below 19.0'.

BORROW AUGER HOLE LOGS

POOR ORIGINAL

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,105' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	JULY 12, 1977

NOTE: Pond 6A, upstream of Michael Tank.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-2.0' CLAYEY SILT; brown; sandy; dry.	B-1	AD	Easy drilling with 6" flight auger.
5	CL	2.0-9.5' SANDY, SILTY CLAY; brown; moderate plasticity; dry.			
10	ML	9.5-13.0' SANDY, CLAYEY SILT; yellow brown; fine sand; slightly plastic; dry.	B-2		
15	SM to ML	13.0-22.5' SILTY SAND to SANDY SILT; yellow brown; fine grained; dry.			
20	LITH.	BEDROCK CONTACT			Another hole drilled 3' west to obtain more samples. Encountered bedrock at 21.0'.
25		22.5-23.5' GALLUP SANDSTONE; SANDSTONE; white; fine grained. TOTAL DEPTH = 23.5 FEET			
<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLES. RECORDED BY USE OF SMALL DIAMETER HOLES. SOFT AND FIRM BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR LASHES IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO FURNISH PROPER DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>					

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT  
PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	AUGUST 1977	1 of 1

HOLE NO.  
WB-1

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,119' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	JULY 14, 1977

NOTE: Pond 6A, north wash.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML to CL	0.0-9.0' SANDY, CLAYEY SILT; light brown grading to light reddish brown from 7.0-9.0'; fine sand.		AD	Drilled with 6" continuous flight auger.
5			B-1		
	LITH.	BEDROCK CONTACT			
10		9.0-48.5' DILCO COAL MEMBER, CREVASSE CANYON FORMATION; SANDSTONE, SHALE, AND SILT- STONE; interbedded; weath- ered; material logged as drilled.			Drilled another hole 3' away to verify bedrock contact by taking drive samples.
15		9.0-15.0' SANDY, SILTY CLAY; reddish brown; moderate plasticity.			9.0-10.5' SPT 8/8/16 - 1.5' Purple shale with horizontal beds.
20		15.0-23.0' SILTY SAND; yellowish brown to yellowish orange; fine grained; slightly clayey; very dense.			15.0-15.3' SPT 60 - .3' Fine; dense; yellow- ish brown sandstone.
25		23.0-29.0' CLAYEY, SILTY SAND; slightly gravelly; yellowish orange.			
30		29.0-30.0' GRAY, SILTY CLAY; probably shale.			
35		30.0-38.5' SILTY SAND; gravelly; slightly clayey; fine to medium grained; gray to light gray.			
40		38.5-48.5' SILTY SAND; light gray brown; fine grained.			
45		<small>DATA OF LOG IS APPROXIMATE ONLY BECAUSE THE WPTOR WATER SAMPLES WERE TAKEN FROM THE OFFSHORE AND POSSIBLY DIFFERENT SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES ROTARY AND PUMP DOWNING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES. THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION. SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM. THE STRATIGRAPHIC LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			
50		TOTAL DEPTH = 48.5 FEET			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT  
PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION DRILL HOLE LOG		
PROJECT NO.	DATE	SHEET NO.
GUL-101	AUGUST 1977	1 OF 1

HOLE  
NO.  
WB-2

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,159' (TOPO)	LOGGED BY	ASB	
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	JULY 14, 1977

NOTE: Pond 6A, north wash.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML to CL	0.0-8.0' SANDY, CLAYEY SILT; yellow brown; fine sand; low to moderate plasticity; dry.	B-1	HSA	
5					
10	SM	8.0-13.0' SILTY SAND; yellow brown.	B-2 SP-1 B-2 (continued)	DR HSA	5/5/6 - 1.5'
	LITH.	BEDROCK CONTACT			
15		13.0-19.0' DILCO COAL MEMBER; SHALE AND SANDSTONE; gray shale; yellowish brown sand- stone; drills to a clayey, silty sand; horizontal bedding observed in split spoon; very dense.		DR HSA	60 - .3'
20		TOTAL DEPTH = 19.0 FEET			
		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SOIL WATER WAS OBTAINED FROM BENEATH THE SURFACE AND POSSIBLY IMPROVED SAMPLING TECHNIQUES BY USE OF SMALL DIAMETER SOILS - ROTARY AND PUMP WORKING SOILS. HAVE FURTHER COMPLE- TION IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND IN CASES IN ADVANCED SOILS.</p> <p>THIS LOG INDICATES CONDITIONS IN THE HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE PROVEN DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIGRAPHIC LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT  
PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	AUGUST 1977	1 of 1

HOLE  
NO.  
WB-3

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,135' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	JULY 14, 1977

NOTE: 6A, borrow material, main wash.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-13.0' SANDY, CLAYEY SILT; yellow brown; low to moderate plasticity.		HSA	
5		7.0-9.0' Reddish brown.	B-1		
10			SP-1	DR	11/19/10 - 1.5
				HSA	
15		13.0-17.0' CLAYEY, SANDY SILT; yellow brown; stiff.	SP-2	DR	20/20/21 - 1.5
		BEDROCK CONTACT		HSA	
	LITH.	17.0-19.4' DILCO COAL MEMBER; SANDSTONE, SHALE, AND SILT- STONE; interbedded; yellow- ish brown to yellowish orange; iron stained; gray shale; weathered; very dense.		DR	60 - .4'
20		TOTAL DEPTH = 19.4 FEET			
		<small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SOIL SECTION WAS OBTAINED FROM DIRECTLY OBSERVATIONS AND POSSIBLY OBTAINED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OF CASING IN ADVANCING HOLE.</small> <small>THIS LOG REPRESENTS CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</small> <small>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTIONS.</small> <small>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</small> <small>THE STRATIFICATION LEVELS REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO.  
GUL-101

DATE  
AUGUST 1977

SHEET NO.  
1 of 1

HOLE  
NO.  
WB-4



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,164' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	JULY 14, 1977

NOTE: Pond 6A, borrow material, main wash.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML to CL	0.0-17.0' CLAYEY, SANDY SILT; yellow brown; fine silt; low to moderate plasticity; dry.	B-1	HSA	Drilled with hollow stem auger.
17.0	LITH.	BEDROCK CONTACT			
17.0-20.0		17.0-20.0' DILCO COAL MEMBER; SHALE AND SILTSTONE inter- bedded; gray shale; yellow- ish brown to buff iron stained siltstone and sand- stone; drills to a sandy clay with fragments of weathered shale; horizontal bedding indicated by split spoon.	SP-1	DR	30/60 - 1.0'
TOTAL DEPTH = 20.0 FEET					
<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT DISCONTINUOUS AND POSSIBLY DISTURBED SAMPLING UNDERTAKEN BY USE OF SMALL DIAMETER HOLES. ROTARY AND SHIM BORING HOLES HAVE FURTHER COMPLICATIONS IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUIDS AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER TO PERMANENTLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTIONS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>					

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE  
NO.  
WB-5

PROJECT NO.	DATE	SHEET NO.
GUL-101	AUGUST 1977	1 OF 1

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,160' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	JULY 14, 1977

NOTE: 6A, borrow material, main wash.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML to CL	0.0-12.0' CLAYEY, SANDY SILT; yellowish brown; low to moderate plasticity; dry.	B-1	HSA	Drilled with hollow stem auger.
12.0	ML	12.0-14.0' SANDY, CLAYEY SILT; light yellow brown; moder- ately plastic; stiff.			
14.0	ML to CL	14.0-19.0' CLAYEY, SANDY SILT; light yellow brown; slight- ly gravelly at 18.5'; firm to stiff; dry; same material as B-1.			
20.0		BEDROCK CONTACT			
19.0		19.0-25.0' DILCO COAL MEMBER; SHALE AND SILTSTONE; buff; weathered; split spoon in- dicates horizontal bedding; very dense.	SP-1	DR	30/60 - 1.0'
TOTAL DEPTH = 25.0 FEET					
<small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO- MATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DIFFERENT SAMPLING TECHNIQUES. USE OF SMALL DIAMETER HOLES, BITTERS AND RAIN BORING TOOLS HAVE FURTHER COM- PLICATED IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.</small>					
<small>THIS LOG INDICATES CONDITIONS IN THE HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</small>					
<small>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSULTANTS.</small>					
<small>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</small>					
<small>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>					

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE  
NO.  
WB-6

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO.	DATE	SHEET NO.
GUL-101	AUGUST 1977	1 of 1

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,130' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	JULY 15, 1977

NOTE: Pond 8A, borrow material.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-5.0' SANDY, SILTY CLAY; brown; fine sand; moderately plastic; dry.	B-1	HSA	
5	SM	5.0-9.5' SILTY SAND; yellowish brown; slightly clayey.			
		BEDROCK CONTACT			
10		9.5-10.5' DILCO COAL MEMBER; SANDSTONE; yellowish brown; fine grained; weathered; drills to yellow brown, silty sand.	SP-1	DR	8/16/40 - 1.5'
-5		<p>TOTAL DEPTH = 10.5 FEET</p> <p>DATA ON THIS LOG IS APPROPRIATE ONLY BECAUSE THE INFO WATER WAS OBTAINED FROM DIRECT DISCHARGES AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER TO PRESENT PROVED DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-7
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	AUGUST 1977	1 OF 1	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,100' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	JULY 15, 1977

NOTE: Pond 8A, borrow material.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SM	0.0-1.0' SILTY SAND		HSA	Drilled with hollow stem auger
	SM	1.0-4.0' SILTY, GRAVELLY SAND; yellowish brown; fine to medium grained; slightly clayey.	B-1		
5	ML to CL	4.0-7.0' CLAYEY, SANDY SILT; yellow brown; low plasticity	B-2		
		BEDROCK CONTACT			
10	LITH.	7.0-9.5' DILCO COAL MEMBER; SANDSTONE; buff to yellow orange with brown iron staining; weathered; very dense.	SP-1	DR	55 - .5'
<p>TOTAL DEPTH = 9.5 FEET</p> <p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT DISCONTINUOUS AND POSSIBLY DEPLETED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROYAL AND RASH BORING HOLES HAVE FURTHER COMPLICATIONS BY THE REQUIREMENT OF THE NEED TO USE DRILLING FLUID AND DE-CASING BY ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,122' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	JULY 15, 1977

NOTE: 8A, main wash.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-2.0' CLAYEY, SANDY SILT		HSA	Drilled with hollow stem auger.
	SM	2.0-5.0' SILTY SAND; fine grained; slightly clayey.			
5	ML to CL	5.0-11.0' CLAYEY, SANDY SILT; brown; low plasticity; dry.	B-1		
10					
	ML to CL	11.0-21.0' SANDY, CLAYEY SILT; yellow brown; moderately plastic; alternating layers of silty sand and sandy clay; stiff.	B-2		
15			SP-1	DR	12/14/12 - 1.5'
			B-2 (continued)		
20					
	SM	21.0-32.0' SILTY, GRAVELLY SAND; light yellow brown; angular to subrounded fragments of sandstone, siltstone, and shale; very dense; dry.	B-3		
25			SP-2	DR	30/29/31 - 1.5'
			B-3 (continued)	HSA	
30					
	LITH.	BEDROCK CONTACT			
		32.0-34.5' GALLUP SANDSTONE; SANDSTONE; buff to yellowish orange as indicated by split spoon; weathered; drills to a silty sand.		DR	50 - 1.5'
35					

TOTAL DEPTH = 34.5 FEET

DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM DIRECTLY OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING. RECOMMENDED BY USE OF SMALL DIAMETER HOLES. SOYART AND RAIN BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS.

SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,142' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	JULY 15, 1977

NOTE: Pond 8A, main wash.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SM	0.0-4.0' <u>SILTY SAND</u> ; yellow brown; fine grained; dry.		HSA	Drilled with hollow stem auger.
5	SM to SC	4.0-11.0' <u>CLAY Y, SILTY SAND</u> ; yellow brown; low plasticity; dry.	B-1		
10					
15	ML to CL	11.0-20.0' <u>SANDY, CLAYEY SILT</u> ; brown; moderately plastic.	B-2		
20					
25	ML to SM	20.0-27.5' <u>SANDY SILT to SILTY SAND</u> ; yellow brown; low plasticity.			
			SP-1	DR	13/18/20 - 1.5'
30	SM	27.5-34.0' <u>SILTY, GRAVELLY SAND</u> ; slightly clayey; angular fragments of iron-stained buff and yellowish orange sandstone and siltstone.			
35		TOTAL DEPTH = 34.0 FEET		HSA	
		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO          RATION WAS OBTAINED FROM SUBJECT DRILLING AND POSSIBLY          DISTURBED SAMPLING INITIATED BY USE OF SMALL DIAMETER          HOLES. ROTARY AND PNEUMATIC HOLES WERE FURTHER CON-          CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING          FLUID AND OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE          DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER          LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROVIDE          DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES          OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS          BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY          BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-10
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	AUGUST 1977	1 of 1	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,076' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	JULY 16, 1977

NOTE: Pond 8A, main wash.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML to CL	0.0-7.0' SANDY, CLAYEY SILT; light brown; moderately plastic; dry.		HSA	Drilled with hollow stem auger.
5					
10	ML	7.0-11.0' CLAYEY, SANDY SILT; yellow brown; fine sand; low to moderate plasticity.			
15	SM	11.0-16.5' SILTY SAND; light brown with white caliche mottling; slightly clayey; dense; dry.	B-2 SP-1	DR	18/18/18 - 1.5'
	LITH.	BEDROCK CONTACT	B-2 (cont.)	HSA	
20		16.5-19.2' GALLUP SANDSTONE; SANDSTONE; drill to white, silty sand; medium grained; poorly cemented; brittle; very dense.		DR	50 - .2'
TOTAL DEPTH = 19.2 FEET					
<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SOIL MATERIALS OBTAINED FROM SHALLOW, UNCONTROLLED AND POSSIBLY DISTURBED SAMPLING REQUISITED BY USE OF SMALL DIAMETER HOLES. SURFACE AND TAPING SURFACES HAVE FURTHER COMPLICATED FACTORS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUIDS AND OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG USES FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE VARIATION MAY BE MINIMAL.</p>					

W.A. WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

SOIL EXPLORATION  
DRILL HOLE LOG

HOLE  
NO.  
WB-11

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO.	DATE	SHEET NO.
GUL-101	AUGUST 1977	1 of 1

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,060' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	JULY 16, 1977

NOTE: Pond 8A, channel leg of axis; near WT-58.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML to CL	0.0-5.0' <u>SANDY, CLAYEY SILT</u> ; brown; moderately plastic; dry.		HSA	Drilled with hollow stem auger.
5	ML	5.0-9.0' <u>SANDY SILT</u> ; brown; slightly clayey; porous.			
10	SM to ML	9.0-15.0' <u>SILTY SAND</u> to <u>SANDY SILT</u> ; yellow brown; very fine to fine sand; porous; dry.			
15	SM to ML	15.0-27.0' <u>SAND</u> ; yellow brown; fine grained; slightly silty; medium dense; dry.	SP-1	DR	4/7/4 - 1.5' Interbedded sandy silt and sand in split spoon.
20		<small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE DRIF MATERIAL OBTAINED FROM INDIRECT INDICATORS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND SHIM BORING HOLES HAVE FURTHER CONFI CATING IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CARDS IN ADVANCING HOLES. THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTIONS. SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON LIMITED SOIL CLASSIFICATION SYSTEM. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			
25			SP-2	DR	6/6/7 - 1.5'
30	SP to SM	27.0-33.0' <u>GRAVELLY SAND</u> ; silty to fine sand; gravel consists of subangular sandstone fragments; medium dense.		HSA	Rough drilling at 27'.
35	SM	33.0-40.0' <u>SILTY SAND</u> ; brown; fine grained; gravelly; medium dense; dry.	SP-3	DR	9/11/12 - 1.5'
40	LITH.	BEDROCK CONTACT			Slow drilling at 40.0'
45		40.0-44.2' <u>GALLUP SANDSTONE</u> ; <u>SANDSTONE</u> ; tan to light gray; fine to medium grained; poorly cemented; weathered; very dense.		DR	50 - .2'
		TOTAL DEPTH = 44.2 FEET			



DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,060' (TOPO)	LOGGED BY ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 7-3/4", 6"	DATE DRILLED JULY 15, 1977

NOTE: Pond 8A, channel leg of dam axis, near WT-S7.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-9.0' SANDY, CLAYEY SILT; medium brown; moderately plastic; firm; dry.		HSA	Drilled with hollow stem auger.
5					
10	SM	9.0-55.5' SILTY SAND; medium yellow brown; fine grained; alternating with layers of clayey sand and clean sand.			Silty sand cuttings from 9' to 44'.
15					
20					
25			B-1		
30					
35					
40					
45		44.0-45.0' Drive sample; SILTY SAND; medium brown with white caliche mottlings; slightly porous; dense; dry.	SP-1	DR	20/20/23 - 1.5'
				AD	Drilled nearby hole with 6" auger to go below 44'.
50					

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	AUGUST 1977	1 of 2

HOLE NO.  
WB-13

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,060'(TOPO)	LOGGED BY ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 7-3/4", 6"	DATE DRILLED JULY 15, 1977

NOTE: Pond 8A, channel leg of dam axis near WT-57.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
50		9.0-55.0' SILTY SAND-- (continued)		AD	
55		TOTAL DEPTH = 55.5 FEET	SP-2	DR	16/18/30 - 1.5'
60		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SOIL SAMPLES WERE OBTAINED FROM DIRECTLY UNDER THE HOLE AND POSSIBLY DISTURBED SAMPLES. THE SAMPLES WERE OBTAINED BY USE OF SMALL DIAMETER HOLES. SPLIT AND PASS SAMPLES WOULD HAVE FURTHER COMPLICATED THE LOG BECAUSE OF THE NEED TO USE SWELLING FLUIDS AND OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROVIDE SUFFICIENT DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF OTHER CONSTRUCTORS.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG AND FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,030' (TOPO)	LOGGED BY ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 7-3/4"	DATE DRILLED JULY 17, 1977

NOTE: Catchment Pond Area, south side.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML to CL	0.0-5.0' <u>SANDY, CLAYEY SILT</u> ; brown; moderately plastic.	B-1	HSA	Drilled with hollow stem auger.
5	ML to SM	5.0-11.0' <u>SANDY SILT to CLAYEY, SILTY SAND</u> ; light yellow brown; porous.	B-2		
11.0	ML to SM	11.0-39.0' <u>SANDY SILT to SILTY SAND</u> ; interlayered with clayey, silty sand and sand; low plasticity; medium dense; same material as B-1, Drill Hole WB-13.	B-3		
39.0	TOTAL DEPTH = 39.0 FEET				
<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM DIRECT OBSERVATIONS AND POSSIBLY IMPROVED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. SHALLOWS AND FAIR BOREHOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE SWELLING FLUIDS AND/OR CARE IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THE HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS LOG WAS LOGGED BY SUCH A WAY AS TO FURNISH PROVEN DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG AND FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>					

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALO ALTO • NEWPORT BEACH • CALIF

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	AUGUST 1977	1 of 1

HOLE NO.  
WB-14

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,010' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	JULY 17, 1977

NOTE: Catchment Pond Area, south side.

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML to CL	0.0-5.0' SANDY, CLAYEY SILT; light brown; moderately plastic; dry.	B-1	HSA	Drilled with hollow stem auger.
5		5.0-45.5' SANDY SILT; yellow brown; alternating layers of sandy silt, silty sand, clayey, silty sand, and clayey sand; sand is fine grained; firm to stiff; dry.			
10		9.0-14.0' CLAYEY, SANDY SILT			
15		14.0-19.0' SANDY, CLAYEY SILT	B-2		
20		19.0-24' CLAYEY, SILTY SAND			
25					
30		29.0-30.5' Drive sample is interlayerd CLAYEY, SANDY SILT and SAND.	SP-1	DR	6/10/12 - 1.5'
35		<small>DATA ON THIS LOG IS APPROPRIATE ONLY BECAUSE THE INFO WAS OBTAINED FROM DIRECT INDENTURE AND FINALLY OBTAINED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES ROTARY AND WASH BORING HOLES HAVE OTHER COMPLI- CATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES  THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES  THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS  SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNSATURATED SOIL CLASSIFICATION SYSTEM  THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL</small>	B-2 (continued)		
40					
45		44.0-45.5' Drive sample is SANDY SILT.	SP-2	DR	10/14/16 - 1.5'
50		TOTAL DEPTH = 45.5 FEET			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-15
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	AUGUST 1977	1 OF 1	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,000' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	JULY 17, 1977

NOTE: Catchment Pond Area

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML to CL	0.0-5.0' SANDY, CLAYEY SILT; brown; moderately plastic; same as B-1, Drill Hole WB-15.		HSA	Drilled with hollow stem auger.
5	SM to SP	5.0-21.0' SAND; yellowish brown; fine to medium grained; slightly silty; medium dense; dry.	B-1		
21.0	SM to SP	21.0-25.0' GRAVELLY SAND; yellow brown; slightly silty; contains sandstone and siltstone fragments; medium dense.			Relatively tough drilling at 21.0'.
25.0	CL	25.0-45.5' SILTY CLAY; brown with gray and white caliche mottlings; slightly sandy and gravelly; very stiff; moderately to highly plastic; slightly damp.	B-2		Cuttings of brown, sandy, silty clay at 25.0'.
30.0			SP-1	DR	21/45 - 1.0'
35.0			B-2 (continued)	HSA	
40.0			SP-2	DR	16/20/20 - 1.5'
45.0			B-2 (continued)	HSA	
45.5			SP-3	DR	17/26/36 - 1.5'
		TOTAL DEPTH = 45.5 FEET			

DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SPONGE-SAMPLER WAS OBTAINED FROM HOLES WHICH WERE NOT NEARLY CONTINUED AND POSSIBLY DIFFERENT SAMPLING TECHNIQUES BY USE OF SMALL DIAMETER HOLES. ROTARY AND RAM-BORING HOLES HAVE FURTHER COMPLICATIONS IN THE RECORD BECAUSE OF THE NEED TO USE MUDFLOW FLUID AND/OR CASING IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO FURNISH PROPER DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS.

SOIL CLASSIFICATION SHOWN ON LOG AND FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,008' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	JULY 17, 1977

NOTE: Catchment Pond Area; north side.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML to CL	0.0-10.0' SANDY, CLAYEY SILT; brown; fine sand; moderately plastic; dry.	B-1	HSA	Drilled with hollow stem auger.
10	SM	10.0-18.0' SILTY SAND; yellow brown; gravelly; slightly clayey; medium dense; dry.	B-2		
18.0	ML	18.0-30.0' SANDY, CLAYEY SILT; yellow brown; moderately plastic; stiff; dry.			
30.0	SM	30.0-33.0' SILTY, GRAVELLY SAND; yellowish brown.			Rough drilling at 30'.
33.0	SC	33.0-40.0' CLAYEY SAND; yellowish orange; gravelly; very dense.			
40.0		TOTAL DEPTH = 40.0 FEET	SP-1	DR	25/35 - 1.0'
45		<p>DATA ON THIS LOG IS APPROPRIATE ONLY BECAUSE THE INFO- RATION WAS OBTAINED FROM DIRECTLY DISCONTINUOUS AND POSSIBLY DIFFERENT SAMPLING NECESSITY BY USE OF SMALL DIAMETER HOLES. SOFAR AND LASH BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THE REGARD RELATIVE OF THE NEED TO USE DRILLING FLUIDS AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY OF THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,030' (TOPO)	LOGGED BY	ASB
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	6"	DATE DRILLED	JULY 17, 1977

NOTE: Catchment Pond Area; located about 200'N of WPC-3.

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-3.0' SANDY SILT; yellow brown; contains fine sand.		AD	Drilled with 6" auger.
5	CL to ML	3.0-30.0' SILTY CLAY to CLAYEY, SANDY SILT; brown; sandy; moderately plastic.			Slow drilling from 10' to 30' in stiff, silty clay.
10					
15			B-1		
20					
25					
30		TOTAL DEPTH = 30.0 FEET			
35		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE BEFORE MENTIONED DATA WAS OBTAINED FROM INDIRECT MEASUREMENTS AND POSSIBLY DIFFERENT SAMPLING PROCEDURES BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED BY SUCH A RATE AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,181' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-32.0' <u>ALLUVIUM</u> ; <u>CLAY</u> ; moderate yellow brown; low plasticity; trace of very fine sand; dry.		AD	Drilling with 5-1/2" diameter continuous flight auger.
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					



DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,181' (TOPO)	LOGGED BY LAR
GROUNDWATER DEPTH (BELOW *ROUND SURFACE) DRY HOLE	HOLE DIAMETER 5-1/2"	DATE DRILLED AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-32.0' CLAY--(continued)			
22		23.0-32.0' Contains 5% fine siltstone gravel.			
24					
26					
28					
30					
32	LITH.	BEDROCK CONTACT			32.0' Drilling becomes firmer.
34		32.0-40.0' <u>DILCO COAL MEMBER; SANDSTONE</u> ; very fine grained.			
36		<small>DATA ON THIS LOG IS APPROXIMATE ONLY SINCE THE INFO  WAS OBTAINED FROM VISUAL OBSERVATIONS AND POSSIBLY  UNSYSTEMATIC SAMPLING. INVESTIGATED BY USE OF SMALL DIAMETER  HOLES. SOYAL AND RAIN SOILING HOLES HAVE FURTHER COMPLI-  CATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING  FLUID AND TO CARE IN ADVANCING HOLES.</small> <small>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE  DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER  LOCATIONS AND ON OTHER DATES.</small> <small>THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE  DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES  OF SPECIFIC CONSTRUCTION.</small> <small>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS  BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</small> <small>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY  BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			37.0-40.0' Slow drilling.
38					
40		TOTAL DEPTH = 40.0 FEET			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WB-19
		DRILL HOLE LOG			
PALO ALTO • NEWPORT BEACH • CALIF		PROJECT NO. GUL-101	DATE SEPT. 1977	SHEET NO. 2 OF 2	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,147'(TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-25.0' <u>ALLUVIUM</u> ; <u>CLAY</u> ; moderate yellow brown; low plasticity; contains 5-10% very fine sand below 10.0'; dry.		AD	Drilling with 5-1/2" diameter continuous flight auger.
2					
4					
6					
8					
10					
12					
14					
16		15.0-20.0' Contains 10-15% fine gravel.			
18					
20		20.0' Drilling becomes firmer.			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-20
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 of 2	

DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,147' (TOPO)	LOGGED BY LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 5-1/2"	DATE DRILLED AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-25.0' CLAY--(continued)			
22					
24					
26	LITH.	25.0' Sandstone and shale fragments in cuttings.			
28		25.0-35.0' DILCO COAL MEMBER; SANDSTONE, SILTSTONE, AND SHALE; deeply weathered; slightly damp.			
30					
32		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SPFC MATRIX WAS OBTAINED FROM INDIRECT MEASUREMENTS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. SOUTHERN AND WASH. BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN AVOIDING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THE HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			32.0' Drilling slows.
34					
36		TOTAL DEPTH = 35.0 FEET			

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PALM ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO	DATE	SHEET NO
GUL-101	SEPT. 1977	2 of 2

HOLE NO.  
WB-20

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,185' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-27.0' <u>ALLUVIUM</u> ; <u>CLAY</u> ; moderate yellow brown; low plasticity; less than 5% very fine sand; dry.		AD	Drilling with 5-1/2" diameter continuous flight auger.
2					
4					
6					
8					
10					
12					
14					
16					
18	CL- SC	18.0-27.0' Contains siltstone and sandstone gravels.			
20					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,185' (TOPO)	LOGGED BY	LAR	
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-27.0' CLAY--(continued)			
22					
24					
26		25.0' Drilling becomes firmer.			
28	LITH.	BEDROCK CONTACT			
30		27.0-35.0' <u>DILCO COAL MEMBER</u> ; <u>SILTSTONE</u> ; deeply weathered; slightly damp.			
32		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY SUPERFICIAL SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. SOFT AND PAW BORING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN ACCORDANCE WITH A BAY AREA TO PRELIMINARY PROVEN DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			32.0' Drilling slows.
34					
36		TOTAL DEPTH = 35.0 FEET NOTE:			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WB-21
		D. L. L. HOLE LOG			
		PROJECT NO. GUL-101	DATE SEPT. 1977	SHEET NO. 2 OF 2	
PALO ALTO • NEWPORT BEACH • CALIF					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,145' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-21.0' ALLUVIUM; CLAY; moderate yellow brown; low plasticity; 5-10% very fine sand; dry.		AD	Drilling with 5-1/2" continuous flight auger.
2					
4					
6		6.0' Becomes 5-10% fine gravel.			
8					
10					
12					
14	CL- SC	13.0' Sand content increases to 40-50%.			
16					
18					
20					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,145' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-21.0' CLAY--(continued)			
	LITH.	BEDROCK CONTACT			
22		21.0-24.0' DILCO COAL MEMBER; SANDSTONE; dark yellow orange; very fine grained; slightly damp.			
24		24.0-25.0' SHALE; carbona- ceous; grayish brown.			
26		TOTAL DEPTH = 25.0 FEET			
<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SAMPLES OBTAINED FROM SHALLOW DEPTHS AND POSSIBLY DIFFERENT SAMPLING TECHNIQUES BY USE OF SMALL DIAMETER HOLES. SOFT AND HARD BORING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CARBON IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON LIMITED SOIL CLASSIFICATION SYSTEMS.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-22
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	2 OF 2	

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DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,135' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-11.0' <u>ALLUVIUM</u> ; <u>CLAY</u> ; moderate yellow brown; low plasticity; little sand; dry.		AD	Drilling with 5-1/2" diameter continuous flight auger.
2					
4					
6					
8					
10					
11.0	LITH.	BEDROCK CONTACT			11.0' Drilling slows.
12		11.0-25.0' <u>DILCO COAL MEMBER</u> ; <u>SANDSTONE AND SHALE</u> ; light brown with dark yellow brown; deeply weathered; gypsum fragments in cuttings			
14					
16					
18					
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO WB-24
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 of 2	
PALO ALTO • NEWPORT BEACH • CALIF.					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,135' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		11.0-25.0' SANDSTONE AND SHALE--(continued)			21.0' Very firm drilling.
22					
24					
26					
		TOTAL DEPTH = 25.0 FEET			
		<p>DATA ON THIS LOG IS APPROPRIATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. SOILS AND ROCKS IN THESE HOLES MAY HAVE FURTHER COMPLICATIONS IN THE FUTURE BECAUSE OF THE NEED TO USE DRILLING FLUIDS AND OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PERMANENTLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-24
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	2 OF 2	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,152' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	GATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-30.0' <u>ALLUVIUM; CLAY;</u> moderate yellow brown; low plasticity; dry.  7.0-9.0' 5-10% fine gravel.		AD	Drilling with 5-1/2" diameter continuous flight auger.
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-25
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 of 2	

PALO ALTO • NEWPORT BEACH • CALIF

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,152' (TOPO)	LOGGED BY LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER 5-1/2"	DATE DRILLED AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-30.0' CLAY--(continued)			
22					
24					
26					
28					
30	LITH.	BEDROCK CONTACT			
32		30.0-39.0' DILCO COAL MEMBER; SHALE AND SILTSTONE; dark yellow brown; deeply weathered to 37.0'. 30.0' Shale fragments in cuttings.			
34					
36					
38					
40		TOTAL DEPTH = 39.0 FEET			

27.0' Drilling be-  
comes firm.

37.0' Drilling slows.

DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SPACING BETWEEN SAMPLES OBTAINED FROM BENEATH DISCONTINUITIES AND POSSIBLY UNREPRESENTATIVE SAMPLING INDICATED BY USE OF SMALL DIAMETER HOLES. SOILS AND SAND BORING HOLES HAVE FURTHER COMPLICATIONS IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCED HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED BY SICK & PARTNERS FOR THE PURPOSE OF OBTAINING DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.

SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON LIMITED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

**W.A. WAHLER & ASSOCIATES**

MT. TAYLOR URANIUM MILL PROJECT  
PALO ALTO • NEWPORT BEACH • CALIF.

SOIL EXPLORATION  
**DRILL HOLE LOG**

PROJECT NO.	DATE	SHEET NO.
GUL-101	SEPT. 1977	2 of 2

HOLE NO.  
WB-25

DRILL RIG		CME 75 (ETL)	HOLE ELEVATION		7,110' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)		DRY HOLE	HOLE DIAMETER		5-1/2"	DATE DRILLED AUGUST 23, 1977	
ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS		
0	CL	0.0-21.0' <u>ALLUVIUM</u> ; <u>CLAY</u> ; moderate yellow brown; low plasticity; dry.		AD	Drilling with 5-1/2" diameter continuous flight auger.		
2							
4							
6							
8							
10							
12							
14							
16		15.0' Becomes 5-10% fine gravel.					
18							
20					20.0' Drilling slows.		
W.A. WAHLER & ASSOCIATES		MT. TAYLOR URANIUM MILL PROJECT		SOIL EXPLORATION			HOLE NO. WB-26
				DRILL HOLE LOG			
				PROJECT NO.	DATE	SHEET NO.	
		PALO ALTO • NEWPORT BEACH • CALIF		GUL-101	SEPT. 1977	1 OF 2	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,110' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-21.0' CLAY--(continued)			
	LITH.	BEDROCK CONTACT			
22		21.0-25.0' <u>DILCO COAL MEMBER;</u> SANDSTONE AND CLAYEY SHALE; alternating layers; shale contains gypsum fragments; dark yellow orange and grayish brown.			
24					24.0' Hard drilling.
26		TOTAL DEPTH = 25.0 FEET			
		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM DIRECTLY OBSERVATIONS AND POSSIBLY OBTAINED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. SOYART AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND IN CASING IN ADVANCING HOLE.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-26
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	2 of 2	
PALO ALTO • NEWPORT BEACH • CALIF					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,147' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-15.0' <u>ALLUVIUM; CLAY;</u> moderate yellow brown; low to medium plastic; dry.		AD	Drilling with 5-1/2" diameter continuous flight auger.
2					
4					
6					
8					
10					
11.0		11.0' Approximately 5% fine gravel.			
12					
14					
15.0	LITH.	BEDROCK CONTACT			15.0' Drilling slows.
15.0-21.0		15.0-25.0' <u>DILCO COAL MEMBER;</u> <u>SILTSTONE;</u> dark yellow brown; deeply weathered to 21.0'.			
16					
18					
20					





DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,149' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-32.0' <u>ALLUVIUM</u> 0.0-22.0' <u>CLAY</u> ; moderate yellow brown; low to medium plastic; dry.		AD	Drilling with 5-1/2" diameter continuous flight auger.
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					

W A WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WB-28
		DRILL HOLE LOG			
		PROJECT NO. GUL-101	DATE AUG. 1977	SHEET NO. 1 of 2	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,149' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-22.0--(continued)			
22	SC- CL	22.0-32.0' CLAYEY SAND; pale yellow brown; very fine grained; approximately 40-50% low plasticity fines.			
24					
26					
28					
30					
32	LITH.	BEDROCK CONTACT			
34		32.0-40.0' DILCO COAL MEMBER; SILTSTONE; dark yellow brown; deeply weathered to 37.0'.			
36					
38					
40		TOTAL DEPTH = 40.0 FEET			37.0' Drilling slows.

DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE BEFORE MENTIONED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES SOFAST AND EARLY BORING HOLES HAVE FURTHER COMPLICATIONS IN THE FIELD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES

THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO FURNISH PROPER DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION

SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-28
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	2 of 2	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,131' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-12.0' <u>ALLUVIUM; SANDY CLAY</u> ; moderate yellow brown; lean; 30-40% very fine sand; dry.		AD	Drilling with 5-1/2" diameter continuous flight auger.
2					
4					
6					
8					
10					
		11.0' Contains siltstone gravel.			
12	LITH.	BEDROCK CONTACT			12.0' Firm drilling.
		12.0-25.0' <u>DILCO COAL MEMBER; SILTSTONE</u> ; deeply weathered to 20.0'.			
14					
16					
18					
20					20.0' Slow drilling

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WB-29
		DRILL HOLE LOG			
		PROJECT NO.	DATE	SHEET NO.	
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DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,131' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		12.0-25.0' SILTSTONE-- (continued)			
22					
24					
26		TOTAL DEPTH = 25.0 FEET			
		<p>DATA IN THIS LOG IS APPROXIMATE ONLY BECAUSE THE SOIL DATA WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY BY LIMITED SAMPLING. NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THE DEGREE BECAUSE OF THE NEED TO USE DRILLING FLUID OR LUBRICANT IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS LOG WAS LOGGED BY RICH A. WAHLER, POWER DATA FIELD DESIGN PERSONNEL AND NOT NECESSARILY THE PURPOSE OF SPECIFIC CONTRIBUTIONS.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON LIMITED SOIL CLASSIFICATION TESTS.</p> <p>THE STRATIGRAPHIC LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-29
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	2 of 2	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,124' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-23.0' <u>ALLUVIUM; SANDY CLAY</u> ; moderate yellow brown; low plasticity; 30-40% very fine sand; dry.		AD	Drilling with 5-1/2" diameter continuous flight auger.
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-30
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 of 2	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,124' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-23.0' SANDY CLAY-- (continued)			
22	LITH.	BEDROCK CONTACT			
24		23.0-25.0' GALLUP SANDSTONE; SANDSTONE; little weath- ering.			
26		TOTAL DEPTH = 25.0 FEET			
<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFOR- MATION WAS OBTAINED FROM INDICATIVE DISCREETIONS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. SOYART AND WASH BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,095' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS					
0	CL	0.0-24.0' <u>ALLUVIUM</u> 0.0-18.0' <u>CLAY</u> ; moderate yellow brown; medium plastic; dry.		AD	Drilling with 5-1/2" diameter continuous flight auger.					
2										
4										
6										
8										
10										
12										
14										
16										
18										
20										
18						SC	18.0-24.0' <u>CLAYEY SAND</u> ; medium yellow brown; very fine grained; 20-30% clayey fines.			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,095' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		18.0-24.0' CLAYEY SAND-- (continued)			
22					
24	LITH.	BEDROCK CONTACT			
26		24.0-30.0' <u>GALLUP SANDSTONE;</u> <u>SANDSTONE AND SILTSTONE;</u> deeply weathered.			
28					
30		TOTAL DEPTH = 30.0 FEET			
32					
		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE DEPTH MEASUREMENT WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. HOWEVER, SOME BORING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY IN THE SPOTS INDICATED AND NOT NECESSARILY REPRESENTS CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROBABLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			27.0' Drilling slows.



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,081' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-19.0' ALLUVIUM; CLAY; moderate yellow brown; medium plastic; dry.		AD	Drilling with 5-1/2" diameter continuous flight auger.
2					
4					
6					
8					
10					
12					
14					
16		16.0' Becomes 15-20% fine sand with gravel and cobbles.			
18		BEDROCK CONTACT			
	LITH.	19.0-30.0' GALLUP SANDSTONE; SANDSTONE AND SILTSTONE; deeply weathered to 27.0'; slightly damp.			19.0' Drilling slows.
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WB-32
		DRILL HOLE LOG			
		PROJECT NO.	DATE	SHEET NO.	
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DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,081' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		19.0-30.0' SANDSTONE AND SILT- STONE--(continued)			
22					
24					
26					
28					
30		TOTAL DEPTH = 30.0 FEET			
32		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SOIL WATER WAS OBTAINED FROM HORIZONTAL DISCONTINUOUS AND POSSIBLY DISTURBED SAMPLES OBTAINED BY USE OF SMALL DIAMETER HOLES. ROTARY AND PNEUMATIC HOLES MAY FURTHER COMPLIC- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCED SOILS.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER TO PROVIDE PROPER DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			27.0' Very slow drilling.

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,086' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-10.0' ALLUVIUM; CLAY; moderate yellow brown; medium plastic; dry.			Drilling with 5-1/2" diameter continuous flight auger.
2					
4					
6		6.0' Contains some gravel.			
8					
10	LITH.	BEDROCK CONTACT			
		10.0-13.0' GALLUP SANDSTONE; SILTSTONE; little weathered.			
12					
		TOTAL DEPTH = 13.0 FEET			
14					
		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SAMPLE RETURN WAS OBTAINED FROM DIRECTLY DISCONTINUED AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES SOFAR AND RARE BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLE.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>		Refusal at 13.0'.	

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-33
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 of 1	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,078' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-10.0' <u>ALLUVIUM; CLAY;</u> moderate yellow brown; low to medium plastic; dry.		AD	Drilling with 5-1/2" continuous flight auger.
2					
4					
6		6.0' Becomes 15-20% fine sand.			
8					
10	LITH.	BEDROCK CONTACT			10.0' Drilling slows.
		10.0-20.0' <u>GALLUP SANDSTONE;</u> <u>SANDSTONE AND SILTSTONE;</u> alternating hard and soft layers.			
12					
14					
16		<small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO- RATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING. NECESSITATED BY USE OF SMALL DIAMETER BOREHOLE BITTERS AND FIRM BOREHOLE WAYS FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING BORE. THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. THIS HOLE WAS LOGGED IN SUCH A WAY AS TO FURNISH PROVEN DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION. SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON IMPROVED SOIL CLASSIFICATION SYSTEM. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			
18					
20		TOTAL DEPTH = 20.0 FEET			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT PALO ALTO • NEWPORT BEACH • CALIF	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-34
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 of 1	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,192' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 25, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS					
0	CL	0.0-20.0' <u>ALLUVIUM; CLAY;</u> moderate yellow brown; low to medium plastic.		AD	Drilling with 5-1 2" diameter continuous flight auger.					
2										
4										
6										
8										
10										
12										
14										
16										
18										
20										
						SC	18.0' 30-40% very fine sand.			
							BEDROCK CONTACT			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,192' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 25, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		20.0-25.0' DILCO COAL MEMBER; <u>SANDSTONE</u> ; dark yellow orange; very fine grained; deeply weathered.			23.0' Drilling slows.
22					
24					
26		TOTAL DEPTH = 25.0 FEET			
28		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO WATER WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY OBTAINED SAMPLES NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND SHIM HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY IN THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRESENT PROVEN DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSULTANTS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,077' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	62.0' (PERCHED)	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS					
0	CL	0.0-11.0' <u>ALLUVIUM</u> ; <u>CLAY</u> ; moderate yellow brown; low plasticity; slightly damp.		AD	Drilling with 5-1/2" continuous flight auger.					
2										
4										
6										
8										
10										
11						SC	11.0-58.0' <u>CLAYEY SAND</u> ; very fine grained; 20-30% clayey fines; lenses of 10% fine gravel.			
12										
14										
16										
18										
20										

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,077' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH <small>(BELOW GROUND SURFACE)</small>	62.0' (PERCHED)	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		11.0-58.0' CLAYEY SAND-- (continued)			
22					
24					
26					
28					
30					
32					
34		33.0-45.0' 15% gravel with layers of sandy clay; damp.			
36					
38					
40					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-36
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 19 <sup>77</sup>	2 of 4	

PALO ALTO • NEWPORT BEACH • CALIF




DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,077' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	62.0' (PERCHED)	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		11.0-58.0' CLAYEY SAND-- (continued)			
42					
44					
46					
48					
50					
52					
54					
56					
58	LITH.	BEDROCK CONTACT			
60		58.0-75.0' <u>GALLUP SANDSTONE</u> , SANDSTONE; dark yellow orange to yellow gray; fine grained; deeply weathered; wet at 62.0'.			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-36
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	3 of 4	
PALO ALTO • NEWPORT BEACH • CALIF					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,077' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	62.0' (PERCHED)	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
60 62 64 66 68 70 72 74 76		58.0-75.0' SANDSTONE-- (continued)			70.0' Drilling be- comes very slow.
		DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFO- MATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY OBTAINED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND IN CASES OF ADVANCED HOLES.  THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.  THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRESENTLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSULTANTS.  SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.  THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.			
		TOTAL DEPTH = 75.0 FEET Water at 62' in hole after drilling.			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,184'	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS					
0	SC	0.0-18.0' <u>ALLUVIUM; CLAYEY SAND</u> ; moderate yellow brown; dry; fine grained; approximately 10% clayey fines; contains a few cobbles.		AD	Drilling with 5-1/2" continuous flight auger.					
2										
4										
6										
8										
10										
12										
14										
16										
18										
20										
18						LITH.	BEDROCK CONTACT			
18							18.0-25.0' <u>DILCO COAL MEMBER; SANDSTONE</u> ; yellow gray; very fine grained; deeply weathered.			
20										

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-37
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 of 2	

PALO ALTO • NEWPORT BEACH • CALIF

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,184'
LOGGED BY	LAR	GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE
HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 23, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		18.0-25.0' SANDSTONE-- (continued)			
22					
24					
26		TOTAL DEPTH = 25.0 FEET			
		<p style="font-size: small; margin: 0;">DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE BEFORE MATION WAS OBTAINED FROM DIRECTLY DISCONTINUOUS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. SOFT AND FIRM BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.</p> <p style="font-size: small; margin: 0;">THIS LOG INDICATES CONDITIONS IN THIS SOIL ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p style="font-size: small; margin: 0;">THIS SOIL WAS LOOKED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p style="font-size: small; margin: 0;">SOIL CLASSIFICATION SHOWN ON LOG AND FIELD CLASSIFICATION BASED ON LIMITED SOIL CLASSIFICATION TYPES.</p> <p style="font-size: small; margin: 0;">THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,166'	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-23.0' <u>ALLUVIUM</u> ; <u>SANDY CLAY</u> ; moderate yellow brown; low plasticity; approximately 25% very fine sand; dry.		AD	Drilling with 5-1/2" diameter continuous flight auger.
2					
4					
6					
8					
10					
12					
14					
16					
18					
20					

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WB-38
		DRILL HOLE LOG			
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 of 2	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,166'	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-23.0' SANDY CLAY-- (continued)			
22					
	LITH.	BEDROCK CONTACT			
24		23.0-35.0' <u>DILCO COAL MEMBER;</u> <u>SILTSTONE AND VERY FINE</u> <u>GRAINED SANDSTONE;</u> deeply weathered; drilling yields sandy silt.			
26					
28					
30					
32					
34					
36		TOTAL DEPTH = 35.0 FEET			
		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. SOFT AND FIRM BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PERMANENTLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-38
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	2 of 2	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,164'	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS					
0	CL	0.0-23.0' ALLUVIUM; CLAY; moderate yellow brown; low plasticity; dry.		AD	Drilling with 5-1/2" diameter continuous flight auger.					
2										
4										
6										
8										
10										
12										
14										
16										
18										
20										
							15.0' Contains dark brown siltstone frag- ments; slightly damp.			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT PALO ALTO • NEWPORT BEACH • CALIF	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-39
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 OF 2	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,164'	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-23.0' ALLUVIUM--(continued)			
22					
	LITH.	BEDROCK CONTACT			
24		23.0-30.0' <u>DILCO COAL MEMBER</u> ; SILTSTONE AND SHALE; dark yellow brown; deeply weathered; contains gypsum.			
26					26.0' Drilling slows.
28					
30		TOTAL DEPTH = 30.0 FEET			
32		<p>DATA OF THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT OBSERVATIONS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. SOFT AND FIRM BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCED HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO FURNISH PROVEN DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			



DRILL RIG CME 75 (ETL)	HOLE ELEVATION 7,094' (TOPO)	LOGGED BY LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE) DRY HOLE	HOLE DIAMETER 5-1/2"	DATE DRILLED AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-2.0' CLAY; moderate yellow brown; low plasticity; dry.		AD	Drilling with 5-1/2" diameter continuous flight auger.
2	LITH.	BEDROCK CONTACT			
2		2.0-10.0' GALLUP SANDSTONE; SANDSTONE; yellow gray; deeply weathered.			
4					
6					
8					
8					8.0' Slow drilling.
10		TOTAL DEPTH = 10.0 FEET			
10		NOTE:			
12		<small>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM ROUGHLY DISCONTINUOUS AND POSSIBLY DISTURBED SAMPLES. NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND PAW DRILLING HOLES HAVE FURTHER COMPLICATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</small>			
14		<small>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</small>			
14		<small>THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRIBUTORS.</small>			
16		<small>SOIL CLASSIFICATIONS SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</small>			
16		<small>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</small>			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,063' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	SM	0.0-32.0' <u>ALLUVIUM</u> ; <u>SILTY SAND</u> ; moderate yellow brown; very fine grained approximately 20% non-plastic fines.		AD	Drilled with 5-1/2" diameter continuous flight auger.
2					
4					
6					
8					
10					
12					
14					
16					
18					
20		20.0' Fine increase to 30-40%.			

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-41
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 of 3	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,063' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		0.0-32.0' SILTY SAND-- (continued)			
22					
24					
26					
28					
30					
32	LITH.	BEDROCK CONTACT			
34		32.0-50.0' GALLUP SANDSTONE; SANDSTONE; grayish orange; deeply weathered; augers easily; drills to a very fine, silty sand.			
36					
38					
40					

W A WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION			HOLE NO. WB-41
		DRILL HOLE LOG			
		PROJECT NO	DATE	SHEET NO	
		GUL-101	SEPT. 1977	2 OF 3	

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DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,063' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2" DATE DRILLED AUGUST 24, 1977	

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		32.0-50.0' SANDSTONE-- (continued)			
42					
44					
46					
48					
50		TOTAL DEPTH = 50.0 FEET			
52		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SOIL SECTION WAS OBTAINED FROM SELECT DEPTH INTERVALS AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLI- CATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROBABLY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTORS.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION 7,054' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS					
0	CL	0.0-18.0' <u>ALLUVIUM; CLAY</u> ; moderate yellow brown; low to medium plastic; dry.		AD	Drilled with 5-1/2" diameter continuous flight auger.					
2										
4										
6										
8										
10										
12										
14										
16										
18										
20										
18						SM	18.0-43.0' <u>SILTY SAND</u> ; very fine grained; 30-40% non- plastic fines.			
20										

W.A. WAHLER & ASSOCIATES	MT. TAYLOR URANIUM MILL PROJECT	SOIL EXPLORATION DRILL HOLE LOG			HOLE NO. WB-42
		PROJECT NO.	DATE	SHEET NO.	
		GUL-101	SEPT. 1977	1 of 3	

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,054' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS.	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		18.0-43.0' SILTY SAND-- (continued)			
22					
24					
26					
28					
30					
32					
34					
36					
38					
40					

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,054' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	5-1/2"	DATE DRILLED	AUGUST 24, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
40		18.0-43.0' SILTY SAND-- (continued)			
42	LITH.	42.0' Contains sandstone gravels. BEDROCK CONTACT			
44		43.0-50.0' GALLUP SANDSTONE; <u>SILTSTONE AND VERY FINE GRAINED SANDSTONE</u> ; deeply weathered; augers easily.			
46					
48					
50		TOTAL DEPTH = 50.0 FEET  NOTE:  DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE SAMPLE MATCH WAS OBTAINED FROM SHORTEST DRIFT LOGS AND POSSIBLY DIFFERENT SAMPLING TECHNIQUES BY USE OF SMALL DIAMETER WELLS. ROTARY AND WASH BORING WELLS HAVE FURTHER COMPLI- CATIONS IN THE REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND IN CASES OF ADVANCING WELLS.  THIS LOG INDICATES CONDITIONS IN THIS WELL. ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.  THIS WELL WAS LOGGED IN SUCH A MANNER AS TO FURNISH PROVED DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSULTANTS.  SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.  THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.			
52					

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& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

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SOIL EXPLORATION  
DRILL HOLE LOG

PROJECT NO.	DATE	SHEET NO.
GUL-101	SEPT. 1977	3 of 3

HOLE  
NO.

WB-42

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,223' (TOPO)	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 25, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	ML	0.0-1.0' SOIL COVER: SANDY SILT; moderate yellow brown; 30-40% very fine sand. BEDROCK CONTACT		AD	Drilling with 7-3/4" diameter hollow stem auger.
2	LITH.	1.0-17.5' MULATTO TONGUE; SILTSTONE; moderate yellow brown; contains interbeds of very fine grained sandstone and thin horizontal seams of granular gypsum.			Very slow drilling below 3.0'.
15.0-16.3'			SP-1	DR	15.0-16.3' - 13/.5; 23/.5; 32/.3 (refusal)
18		TOTAL DEPTH = 17.5 FEET			

DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM SUBJECT'S OWN OBSERVATIONS AND POSSIBLY DIFFERENT SAMPLING INCORPORATED BY USE OF SMALL DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OF CHANGE IN ADVANCING RATE.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.

THIS HOLE WAS LOGGED IN SUCH A MANNER AS TO PRIMARILY PROVIDE DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONTRACTORS.

SOIL CLASSIFICATION SHOWN ON LOG AND FIELD CLASSIFICATION BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.



DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,263'	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 25, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
0	CL	0.0-1.0' SOIL COVER; SANDY CLAY; moderate yellow brown; low plasticity; 10% very fine sand. BEDROCK CONTACT		AD	Drilling with 7-3/4" diameter hollow stem auger.
2	LITH.	1.0-25.5' MULATTO TONGUE; SILTSTONE AND SANDSTONE; closely interbedded; sandstone is very fine grained; drilling is firm.			
6			SP-1	DR	
14			B-1	AD	
18					Very slow drilling below 18.0'.
20		20.0' Gypsum veinlets in sample.			

DRILL RIG	CME 75 (ETL)	HOLE ELEVATION	7,263'	LOGGED BY	LAR
GROUNDWATER DEPTH (BELOW GROUND SURFACE)	DRY HOLE	HOLE DIAMETER	7-3/4"	DATE DRILLED	AUGUST 25, 1977

ELEVATION (Depth)	CLASS	DESCRIPTION FIELD IDENTIFICATION	SAMPLE NUMBER	MODE	REMARKS
20		1.0-25.5' SILTSTONE AND SANDSTONE--(continued)	SP-2	DR	
22					
24					
26		TOTAL DEPTH = 25.5 FEET			
		<p>DATA ON THIS LOG IS APPROXIMATE ONLY BECAUSE THE INFORMATION WAS OBTAINED FROM BRUSHED LOGGERS' RECORDS AND POSSIBLY IMPROVED SAMPLES NECESSITATED BY USE OF SMALL DIAMETER HOLES. REPORT AND SAMPLE HOLES MAY, FURTHER COMPLICATIONS IN THE RECORD BECAUSE OF THE NEED TO USE DRILLING FLUID AND OR CARBON IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES.</p> <p>THIS HOLE WAS LOGGED BY BUCK &amp; PAT AS TO PRESENTLY KNOWN DATA FOR DESIGN PURPOSES AND NOT NECESSARILY THE PURPOSES OF SPECIFIC CONSTRUCTION.</p> <p>SOIL CLASSIFICATION SHOWN ON LOG ARE FIELD CLASSIFICATIONS BASED ON UNIFIED SOIL CLASSIFICATION SYSTEM.</p> <p>THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.</p>			

# UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

MAJOR DIVISIONS		GROUP SYMBOLS	TYPICAL NAMES	
<b>COARSE-GRAINED SOILS</b> MORE THAN 50% RETAINED ON NO. 200 SIEVE*	<b>GRAVELS</b> 50% OR MORE OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS	GW WELL-GRADED GRAVELS AND GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.	
		GRAVEL WITH FINES	GP POORLY GRADED GRAVELS AND GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.	
		<b>SANDS</b> MORE THAN 50% OF COARSE FRACTION PASSES NO. 4 SIEVE	CLEAN SANDS	GM SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES.
			SANDS WITH FINES	GC CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES.
	<b>FINE-GRAINED SOILS</b> 50% OR MORE PASSES NO. 200 SIEVE*	<b>SILTS &amp; CLAYS</b> LIQUID LIMIT 50% OR LESS	CLEAN SANDS	SP WELL-GRADED SANDS AND GRAVELLY SANDS, LITTLE OR NO FINES.
			SANDS WITH FINES	SM POORLY GRADED SANDS AND GRAVELLY SANDS, LITTLE OR NO FINES.
			SANDS WITH FINES	SC SILTY SANDS, SAND-SILT MIXTURES.
			SANDS WITH FINES	SC CLAYEY SANDS, SAND-CLAY MIXTURES.
<b>SILTS &amp; CLAYS</b> LIQUID LIMIT GREATER THAN 50%		CLEAN SANDS	ML INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS.	
		SANDS WITH FINES	CL INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS.	
		SANDS WITH FINES	OL ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY.	
		SANDS WITH FINES	MH INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDS OR SILTS, ELASTIC SILTS.	
HIGHLY ORGANIC SOILS	SANDS WITH FINES	CH INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.		
	SANDS WITH FINES	OH ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY.		
		PT	PT PEAT, MUCK AND OTHER HIGHLY ORGANIC SOILS.	

\*BASED ON THE MATERIAL PASSING THE 3-IN. (75-MM) SIEVE.

## DEFINITION OF TERMS

U.S. STANDARD SERIES SIEVES

200	50	16	4	3/4"	3"	12"
-----	----	----	---	------	----	-----

SILTS & CLAYS DISTINGUISHED ON BASIS OF PLASTICITY	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

MOISTURE CONDITION (INCREASING MOISTURE →)					SANDS & GRAVELS		
DRY	SLIGHTLY DAMP	DAMP	MOIST (PL)	VERY MOIST	WET (SATURATED) (LL)	RELATIVE DENSITY	BLOWS/FOOT*

SAMPLE NUMBER COLUMN	MODE COLUMN	REMARKS COLUMN		
TYPE OF SAMPLE CONTAINER:  GRAB BAG ..... G JAR ..... J SHELBY TUBE ..... S LINER (TUBE) ..... L WRAPPED CORE ..... WC BOX ..... X PITCHER TUBE ..... PB WAHLER RING ..... W	METHOD OF ADVANCING HOLE: DRILL FLIGHT AUGER ..... AD BUCKET AUGER ..... BA SPIN AUGER ..... SD ROTARY DRILL ..... RD CABLE TOOL ..... CT HOLLOW AUGER ..... HSA  SAMPLER DRIVE ..... DR PITCHER BARREL ..... PB CORE ..... C PUSH ..... P  RECOVERY RATIO INDICATED BY A FRACTION: $1.2 = \frac{\text{FOOTAGE RECOVERED}}{\text{FOOTAGE SAMPLED}}$ $1.5 = \frac{\text{FOOTAGE RECOVERED}}{\text{FOOTAGE SAMPLED}}$	NUMBER OF BLOWS* REQUIRED TO DRIVE SAMPLER IS SHOWN FOR EACH 0.5 FT. OF PENETRATION AS FOLLOWS: 17/.5    22/.5    29/.5 N = BLOW COUNT FOR LAST 1.0 FOOT.  TERMINATED HOLE: SUFFICIENT INFORMATION OBTAINED.  REFUSAL: STOPPED BY MATERIAL TOO HARD FOR EQUIPMENT.  ABANDONED HOLE: STOPPED BECAUSE OF DIFFICULTIES AS EXPLAINED ON LOG.	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE  CLAYS & SILTS CONSISTENCY    BLOWS/FOOT*    STRENGTH** VERY SOFT    0-2    0-1/4 SOFT    2-4    1/4-1/2 FIRM    4-8    1/2-1 STIFF    8-16    1-2 VERY STIFF    16-32    2-4 HARD    OVER 32    OVER 4	

\* NUMBER OF BLOWS OF 140-POUND HAMMER FALLING 30 INCHES TO DRIVE A 2-INCH O.D. (1-3/8 INCH I.D.) SPLIT SPOON (SPT).  
 \*\* UNCONFINED COMPRESSIVE STRENGTH IN TONS/SQ. FT.

**W.A. WAHLER & ASSOCIATES**

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KEY FOR EXPLORATION LOGS

TRENCH LOGS

POOR ORIGINAL

F. 3/77

W.A. WAHLER  
& ASSOCIATES

TRENCH NO. WT-1

LOCATION: BETWEEN Kph AND Kcda, HOGBACKS N. OF ENTRANCE TO CANYON

Sheet 1 of 2

NOTES: UNIT 3 PROBABLY WEATHERED IN PLACE, SAMPLE TAKEN OF UNIT 2

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
BED THICKNESSES  VARY	①	SLOPEWASH AND AEOLIAN DEPOSITS: SAND AND SANDY CLAY (SC), CONTAINS SMALL ANGULAR FRAGMENTS OF SANDSTONE AND SHALE, ROOTS IN UPPER 1.5 - 2.0 FEET, QUITE POROUS, MEDIUM DENSE, GRAY BROWN TO BROWN, HORIZONTAL LAYERS, DRY.				
	②	CLAY (CL), GRAY, VERY STIFF CALCAREOUS DEPOSITS, ALSO SMALL ANGULAR FRAGMENTS, STRUCTURE NOT APPARENT, SLIGHTLY SANDY, CONTAINS ROOTLETS. WEATHERED IN PLACE FROM CREVASSE CANYON FORMATION GIBSON COAL MEMBER.				

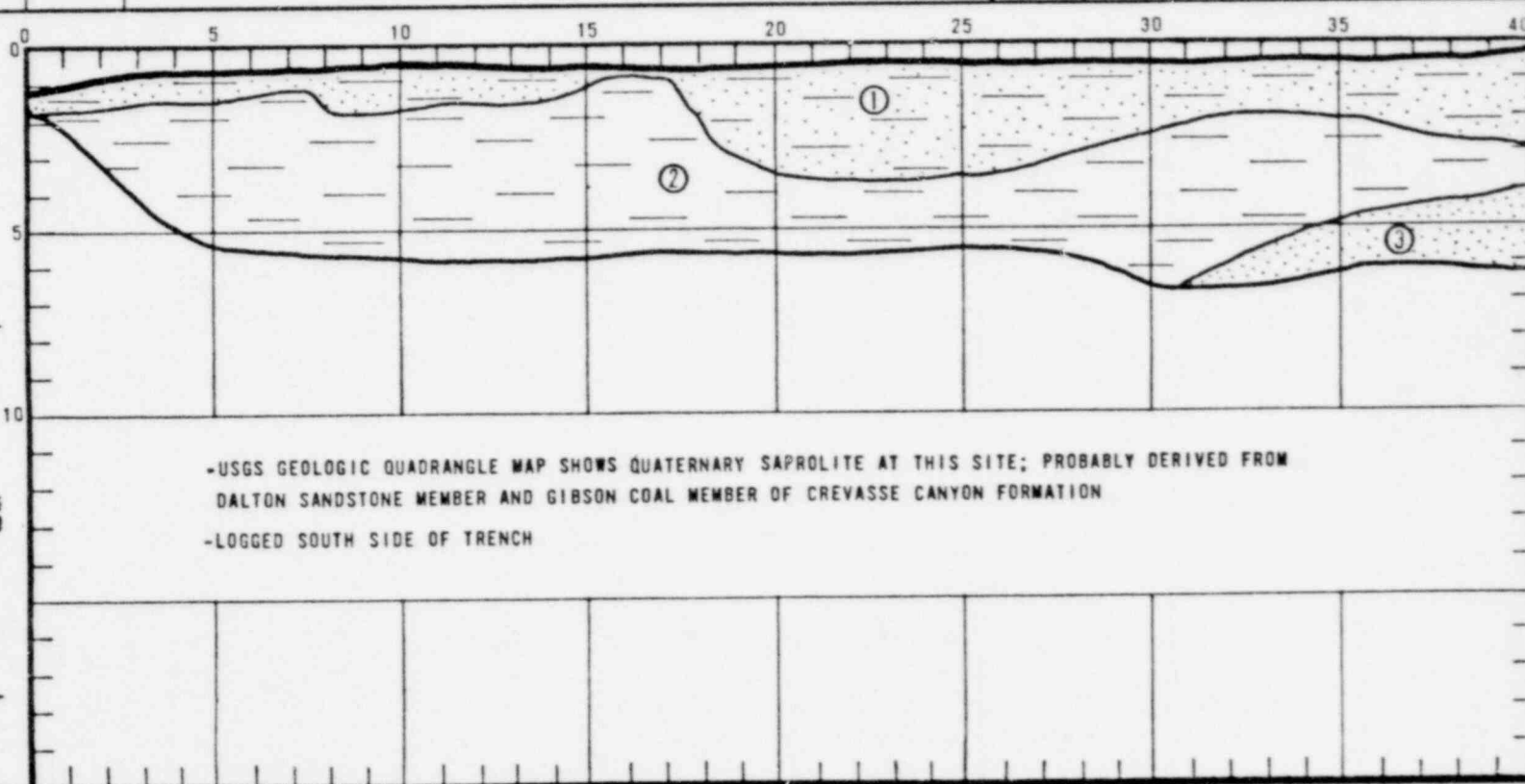
EL./DEPTH: 7080

5/11/77  
DATE

J.B. WF  
LOGGED BY

0 5  
SCALE, FT.

DUE WEST  
BEARING →



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MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO

DATE  
JUNE 1977

DRAWING NO

FIELD TRENCH LOG

W A WAHLER  
& ASSOCIATES

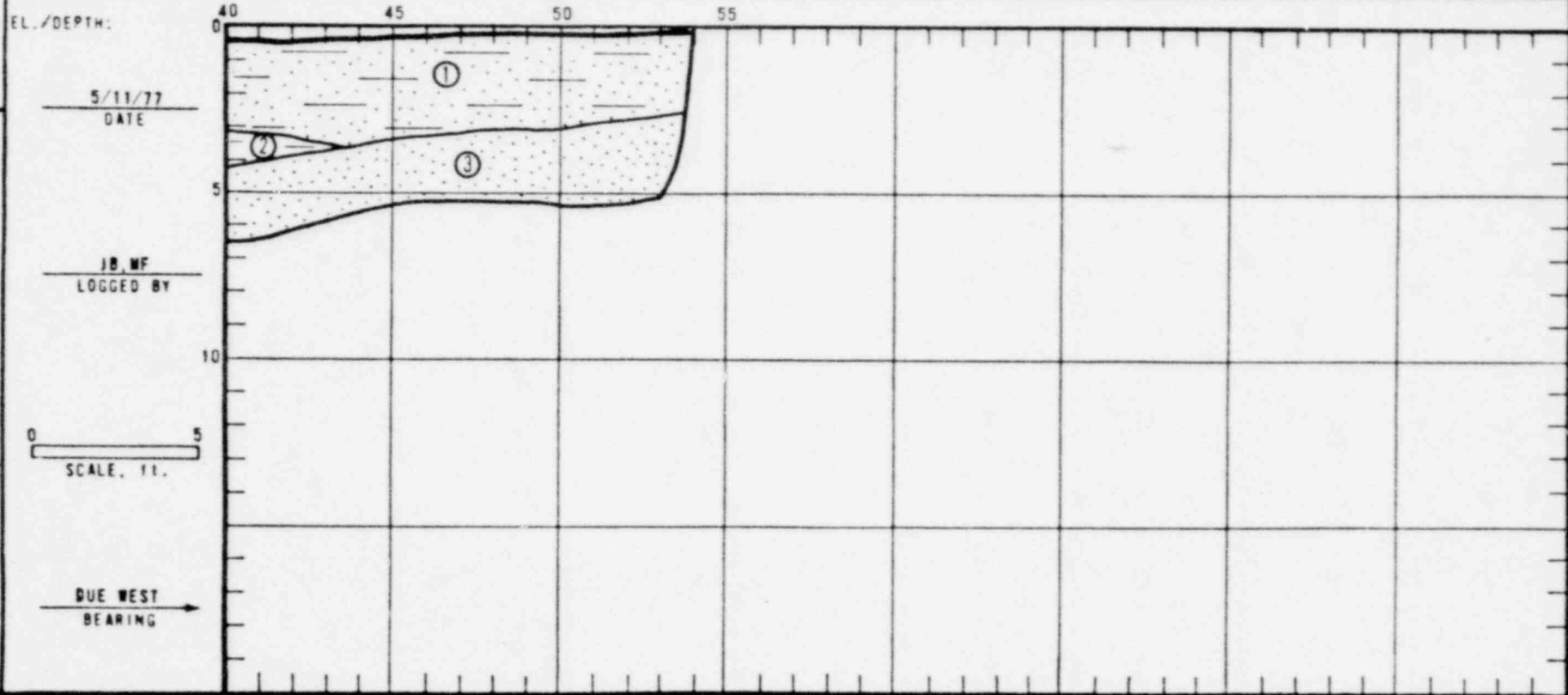
TRENCH NO. WT-1

LOCATION: BETWEEN TWO HOGBACKS NORTH OF CANYON ENTRANCE

Sheet 2 of 2

NOTES: \_\_\_\_\_

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	③	SAND (SP), LIGHT ORANGE-BROWN, FINE GRAINED, VERY LITTLE FINES, DENSE, PROBABLY DERIVED FROM WEATHERED SANDSTONE. NO RELIC STRUCTURE. WEATHERED IN PLACE FROM CREVASSE CANYON FORMATION.				



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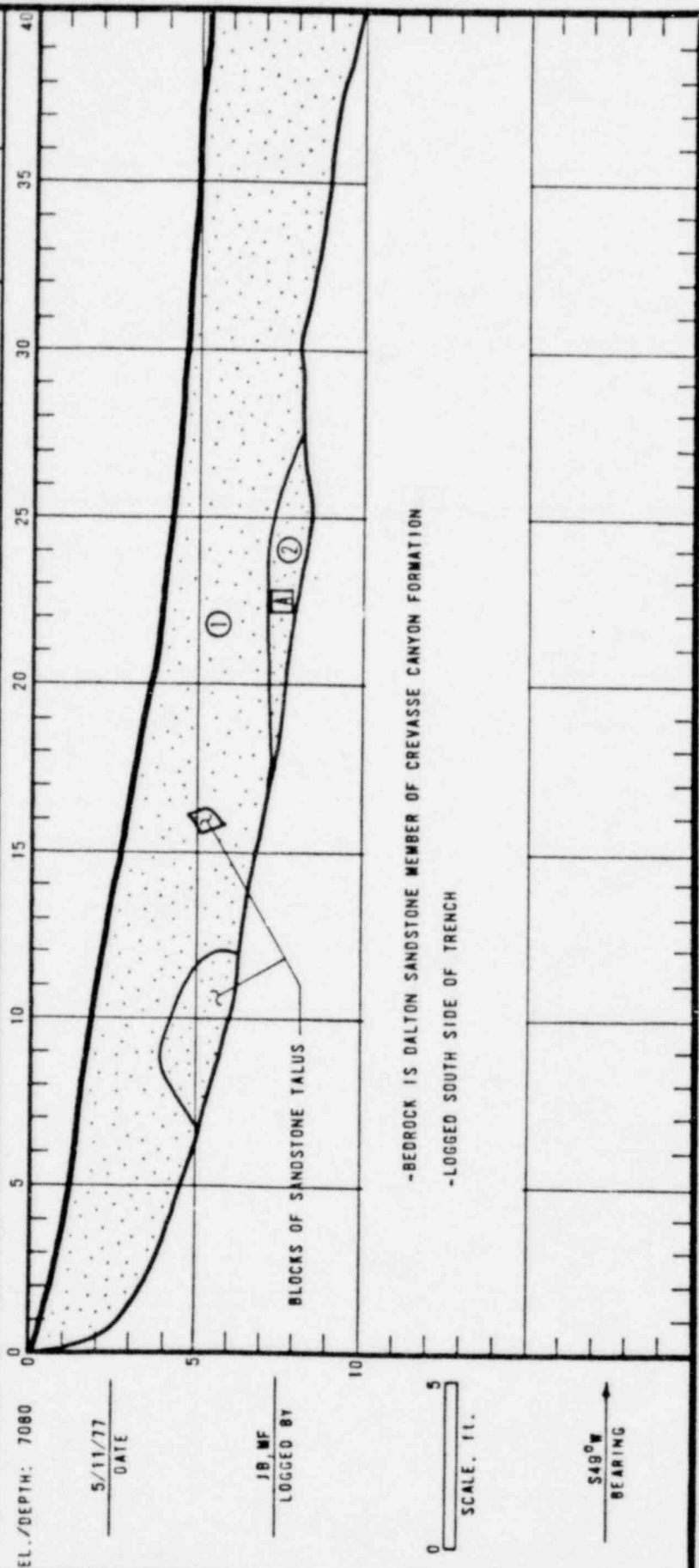
TRENCH NO. WT-2

Sheet 1 of 2

LOCATION: AT BASE OF KCDG HOGBACK, NE SIDE OF CANYON, N. OF BOREHOLE WPC-17

NOTES: PURPOSE: DETERMINE TYPE OF TALUS BENEATH HOGBACK

DEPTH		NO.	DESCRIPTION	STRUCTURE			
				NO.	STRIKE	DIP	TYPE
0' - 5.0'	①		SILTY SAND (SM), LIGHT BROWN, FINE GRAINED, ABOUT 20% SILT, LOOSE; ABUNDANT SMALL ROOTS IN UPPER FOOT; ALSO SLIGHTLY STRATIFIED IN UPPER FOOT AT TOP OF TRENCH; ANGULAR FRAGMENTS OF SANDSTONE - ABUNDANCE INCREASES WITH DEPTH, DRY TO SLIGHTLY DAMP, SLIGHTLY CALCAREOUS.	A	N35°W	~10°E	BEDDING
BELOW ~3.5'	②		SANDSTONE, TAN, MODERATELY WEATHERED, SILTY SANDSTONE, SOFT, WEAK, MASSIVE, CALCITE ON BEDDING PLANES.				



-BEDROCK IS DALTON SANDSTONE MEMBER OF CREVASSE CANYON FORMATION  
 -LOGGED SOUTH SIDE OF TRENCH

5/11/77  
DATE

JB, MF  
LOGGED BY

0 5  
SCALE, FT.

S49°W  
BEARING

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FIELD TRENCH LOG

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GUL101

DATE  
JUNE 1977

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F. 3/77

TRENCH NO. WT-2

Sheet 2 of 2

LOCATION: AT BASE OF KCDG HOGBACK, NE SIDE OF CANYON, N. OF BOREHOLE WPC-17

NOTES: \_\_\_\_\_

UNITS		DESCRIPTION	STRUCTURE			
DEPTH	NO.		NO.	STRIKE	DIP	TYPE
		SEE PREVIOUS PAGE				

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FIELD TRENCH LOG

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DATE  
JUNE 1977

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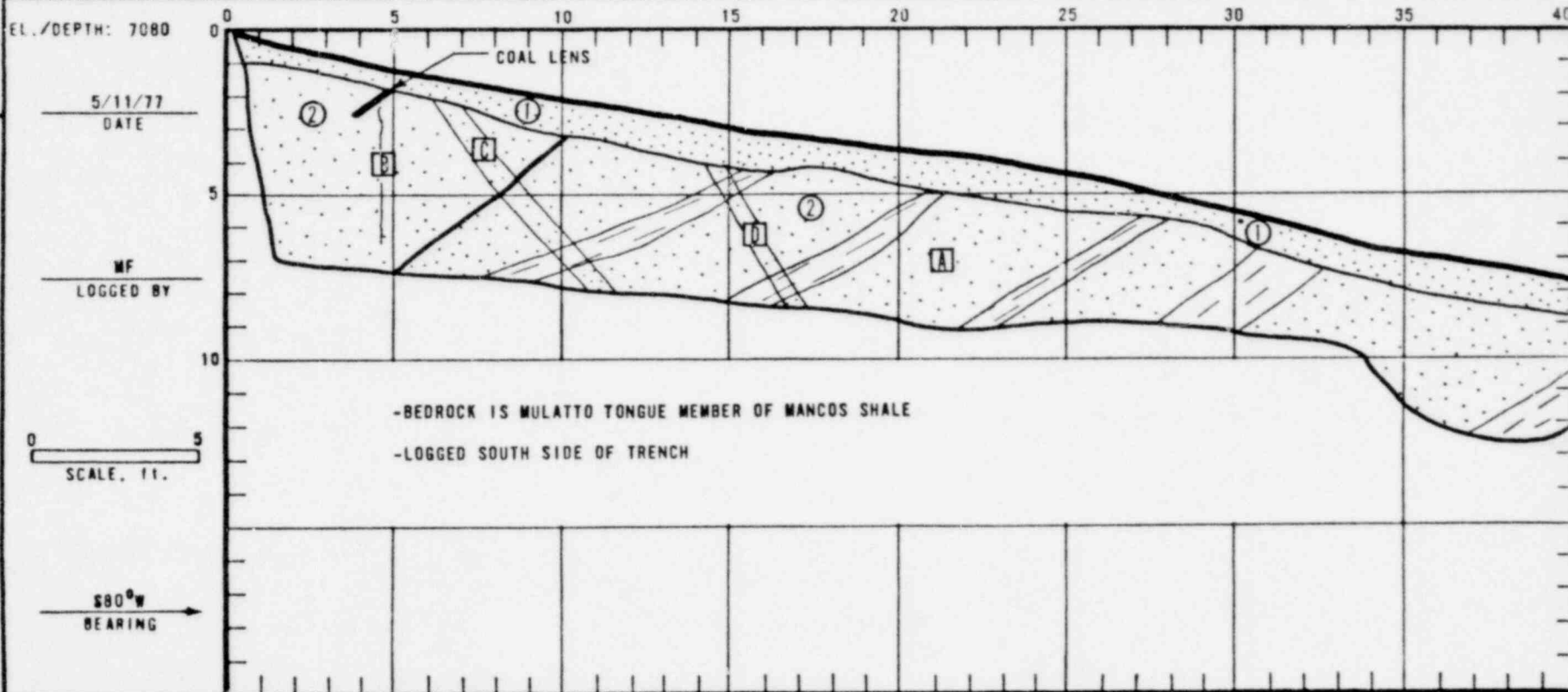
TRENCH NO. WT-3

LOCATION: AT BASE OF KODA HOGBACK, NE SIDE OF CANYON, N. OF TRENCH WT-2

Sheet 1 of 2

NOTES: PURPOSE: DETERMINE TYPE OF TALUS BENEATH HOGBACK

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
02 - 1.5'	①	SILTY SAND, YELLOW BROWN, LOOSE, CONTAINS ROOTS AND FRAGMENTS OF SANDSTONE, SILTSTONE, AND SHALE, SLIGHTLY CALCAREOUS.	A	N23°E	34°E	BEDDING
BELOW ~1.5'	○	INTERBEDDED SANDSTONE, SILTSTONE, AND SHALE: SANDSTONE - WHITE TO TAN, FINE GRAINED, 3-8 FEET THICK SILTSTONE - LIGHT BROWN, SOFT, 1-2 FEET THICK SHALE - DARK BROWN, 6" TO 2' THICK -BEDS STRIKE APPROX. DUE N.; DIP 34°E.	B	----	90°	FRACTURE
			C	N21°E	55°W	FRACTURE
			D	N31°W	45°W	FRACTURE
			-BEDROCK CONTAINS GYPSUM IN FRACTURES AND ALONG BEDDING PLANES			



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WA. WAHLER  
8 ASSOCIATES

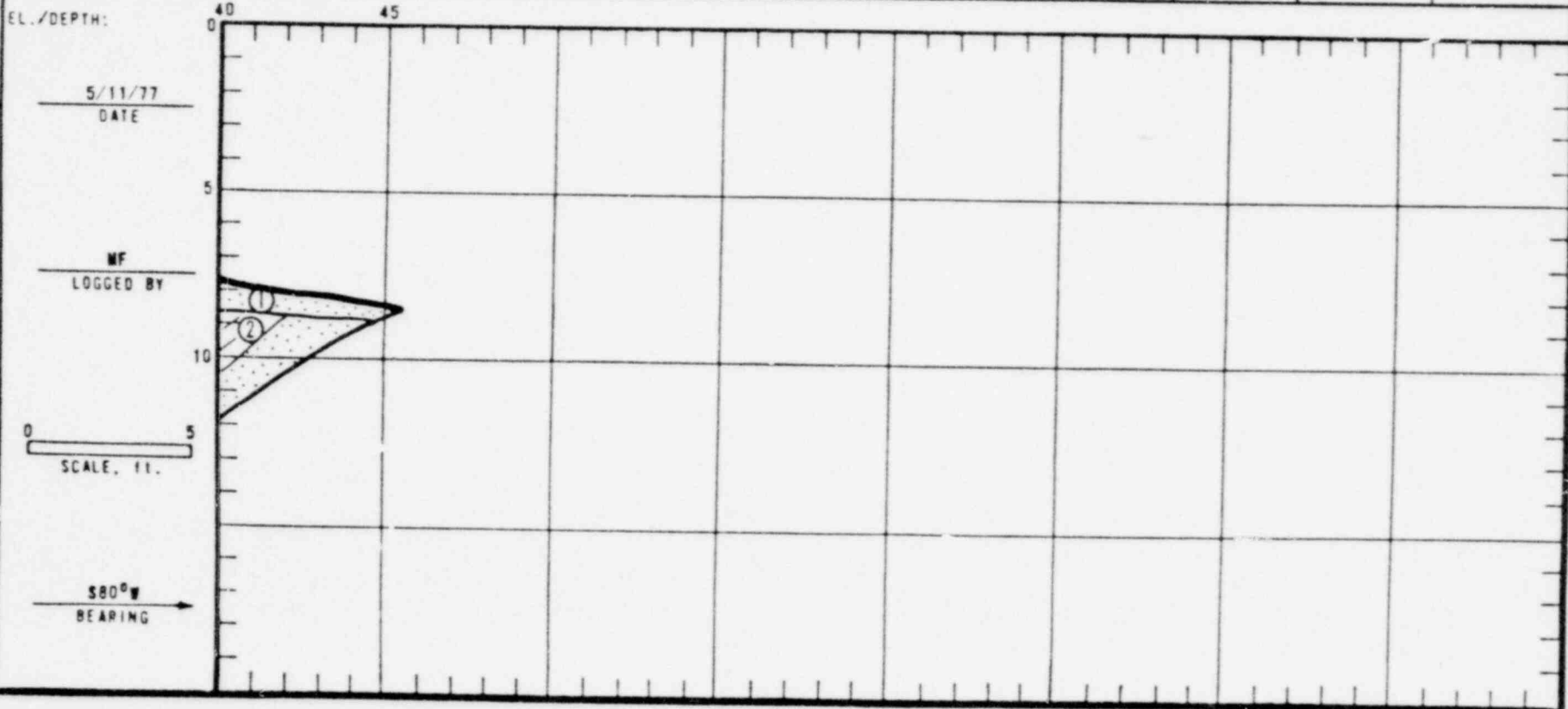
TRENCH NO. WT-3

Sheet 2 of 2

LOCATION: At base of Koda hogback, NE side of canyon, N. of trench WT-2

NOTES:

DEPTH		NO.	UNITS	DESCRIPTION	STRUCTURE			
					NO.	STRIKE	DIP	TYPE
SEE PREVIOUS PAGE								



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PROJECT NO. \_\_\_\_\_  
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FIELD TRENCH LOG

F. 3/77

TRENCH NO. WT-4

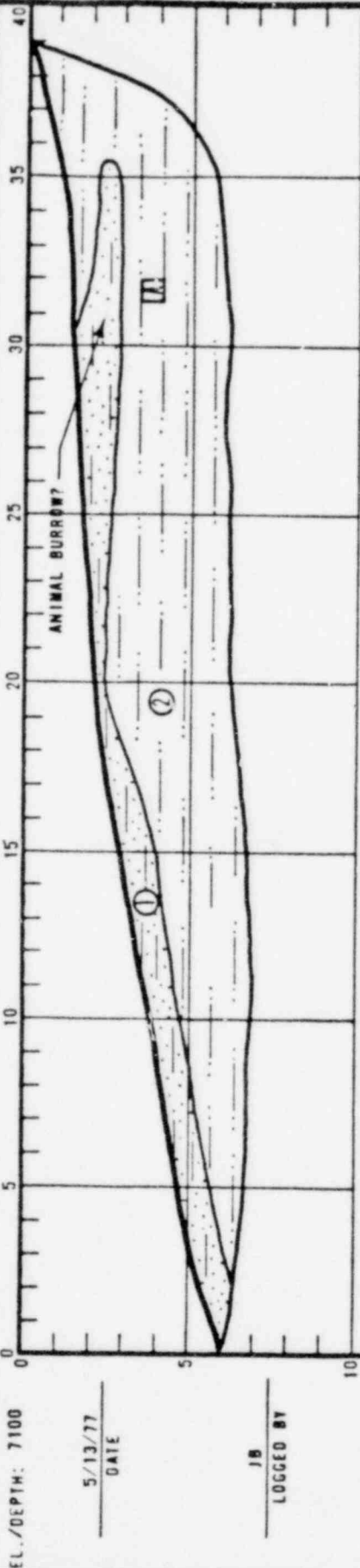
Sheet 1 of 1

LOCATION: N. SIDE OF KNOB, EAST OF CANYON CENTER

NOTES: PURPOSE: DETERMINE SUITABILITY OF ROCK FOR DAM FOUNDATION

UNITS

DEPTH	NO.	DESCRIPTION	STRUCTURE		
			NO.	STRIKE	DIP
0' - 1.5'	①	TOPSOIL: CLAYEY SAND, CONTAINS FRAGMENTS OF SILTSTONE AND SHALE AND ORGANIC MATERIAL, ROOTS IN UPPER 10 INCHES, LOOSE, DRY. THINLY INTERBEDDED SILTSTONE AND SHALE, YELLOW BROWN TO GRAY, SEVERELY WEATHERED, INTENSELY FRACTURED, WEAK, SOFT, CROSSBEDDED, ATTITUDE VARIES ACROSS TRENCH.	1	N65°E	15°E
BELOW 1.5'	②				



-BEDROCK IS MULATTO TONGUE MEMBER OF MANCOS SHALE

-LOGGED EAST SIDE OF TRENCH

0 5  
SCALE, FT.

S0°E  
BEARING

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FIELD TRENCH LOG

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO

DATE

DRAWING NO

GUL101

JUNE 1977

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DATE

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W A WAHLER & ASSOCIATES

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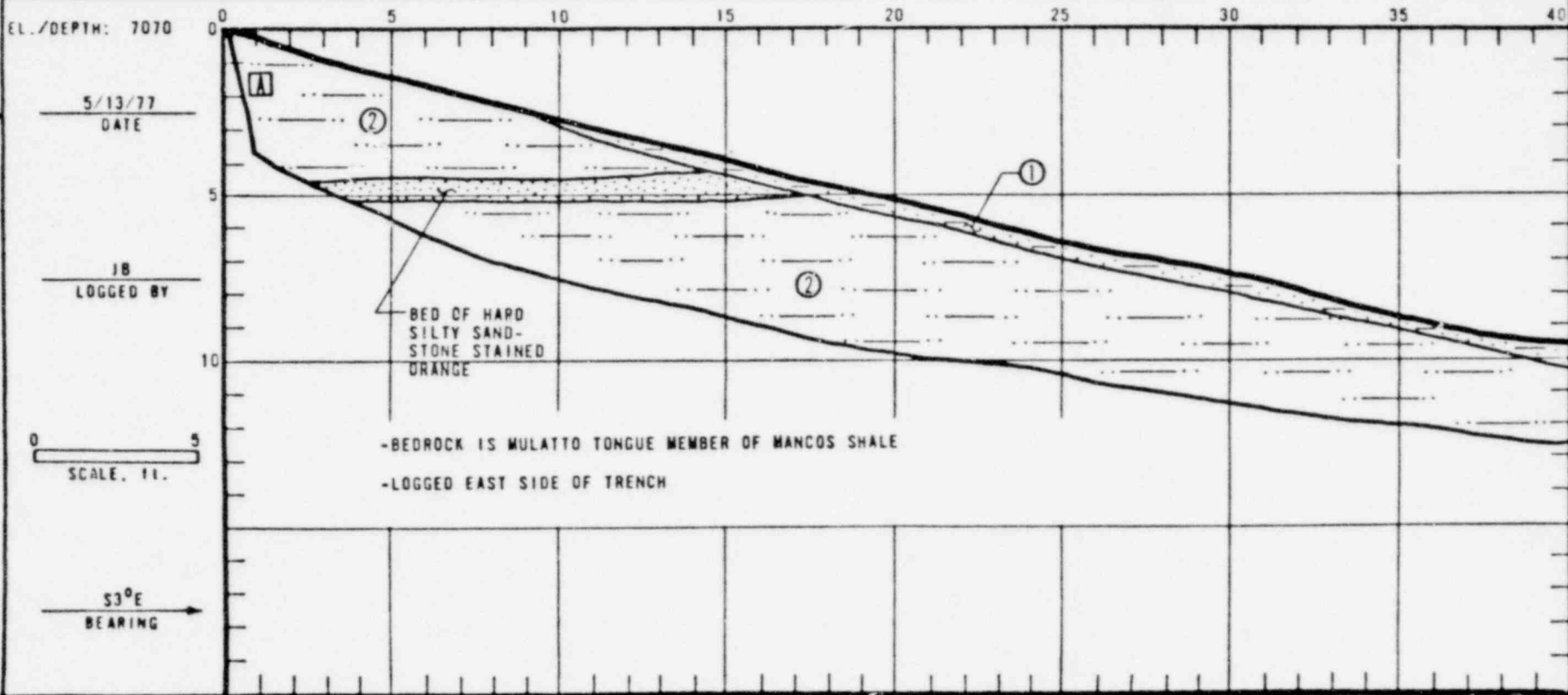
TRENCH NO. WT-5

LOCATION: S. SIDE OF KNOB, EAST OF CANYON CENTER

Sheet 1 of 2

NOTES: PURPOSE: DETERMINE SUITABILITY OF ROCK FOR DAM FOUNDATION

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
0' - 1.0'	①	RESIDUAL SOIL: SANDY CLAY, GRAY, DERIVED FROM MANCOS SHALE, ROOTS IN UPPER FOOT, LEACHED, CONTAINS GYPSUM. SOFT, DRY.	A	N15°E	10°E	BEDDING
BELOW 1.0'	②	INTERBEDDED SHALE AND SILTSTONE WITH A FEW BEDS OF HARD, SILTY SANDSTONE, GRAY TO YELLOW BROWN, ABUNDANT GYPSUM ON FRACTURE SURFACES AND BEDDING PLANES, MODERATELY WEATHERED, MODERATELY STRONG, SOFT, VISIBLE THIN CROSS-BEDDING, CLOSELY FRACTURED.				



FIELD TRENCH LOG

F. 3/77

TRENCH NO. MT-5

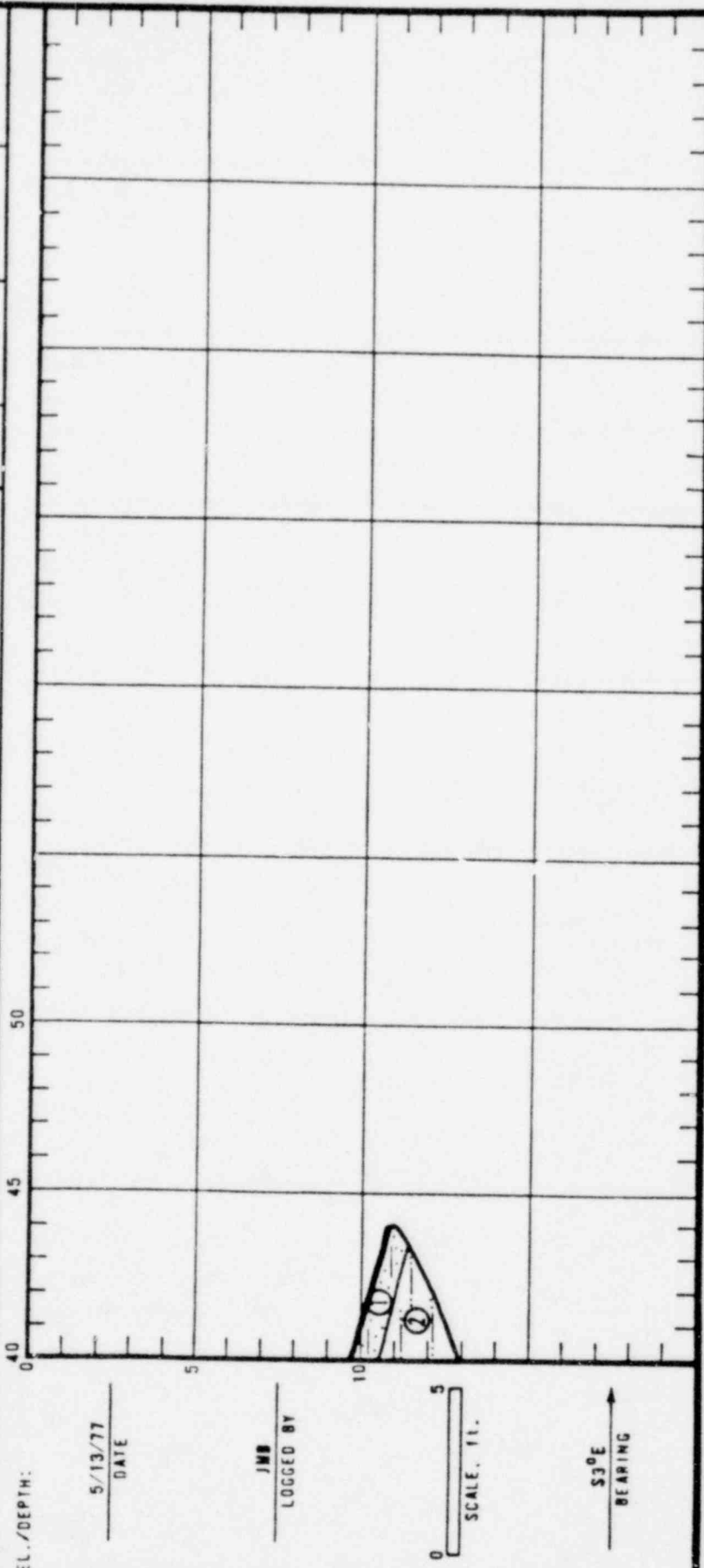
Sheet 2 of 2

LOCATION: S. SIDE OF KNOB, EAST OF CANYON CENTER

NOTES:

UNITS

DEPTH	NO.	DESCRIPTION	STRUCTURE		
			NO.	STRIKE	DIP
		SEE PREVIOUS PAGE			



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FIELD TRENCH LOG

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DATE  
JUNE 1977

DRAWING NO

F. 3/77

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8 ASSOCIATES

TRENCH NO. WT-6

Sheet 1 of 3

LOCATION: SADDLE NORTH OF WPC-4, N.E. OF MICHAEL TANK

NOTES: PURPOSE: DETERMINE CHARACTERISTICS OF FAULT ZONE

DEPTH	NO.	UNITS DESCRIPTION	STRUCTURE			
			NO.	STRIKE	DIP	TYPE
0' - 2.5'	①	CLAYEY SAND, YELLOW BROWN TO BROWN, FINE GRAINED, LOOSE, DRY, CONTAINS FRAGMENTS OF SILTSTONE, SANDSTONE, AND SHALE, ROOTS IN UPPER FOOT, ALSO CONTAINS SOME ORGANIC MATERIAL, DERIVED FROM MANCOS FORMATION AND CREVASSE CANYON FORMATION.	[B]	N7°W	72°E	FAULT
			[C]	N80°E	10-15°W	BEDDING
BELOW 2.5'	②	MANCOS SHALE, MULATTO TONGUE, INTERBEDDED SILTSTONES AND SHALE, YELLOW BROWN TO LIGHT GRAY, CLOSELY FRACTURED, MODERATELY TO SEVERELY WEATHERED, GYPSUM ON FRACTURE SURFACES AND BETWEEN BEDDING PLANES, SOFT, WEAK TO MODERATELY STRONG.				

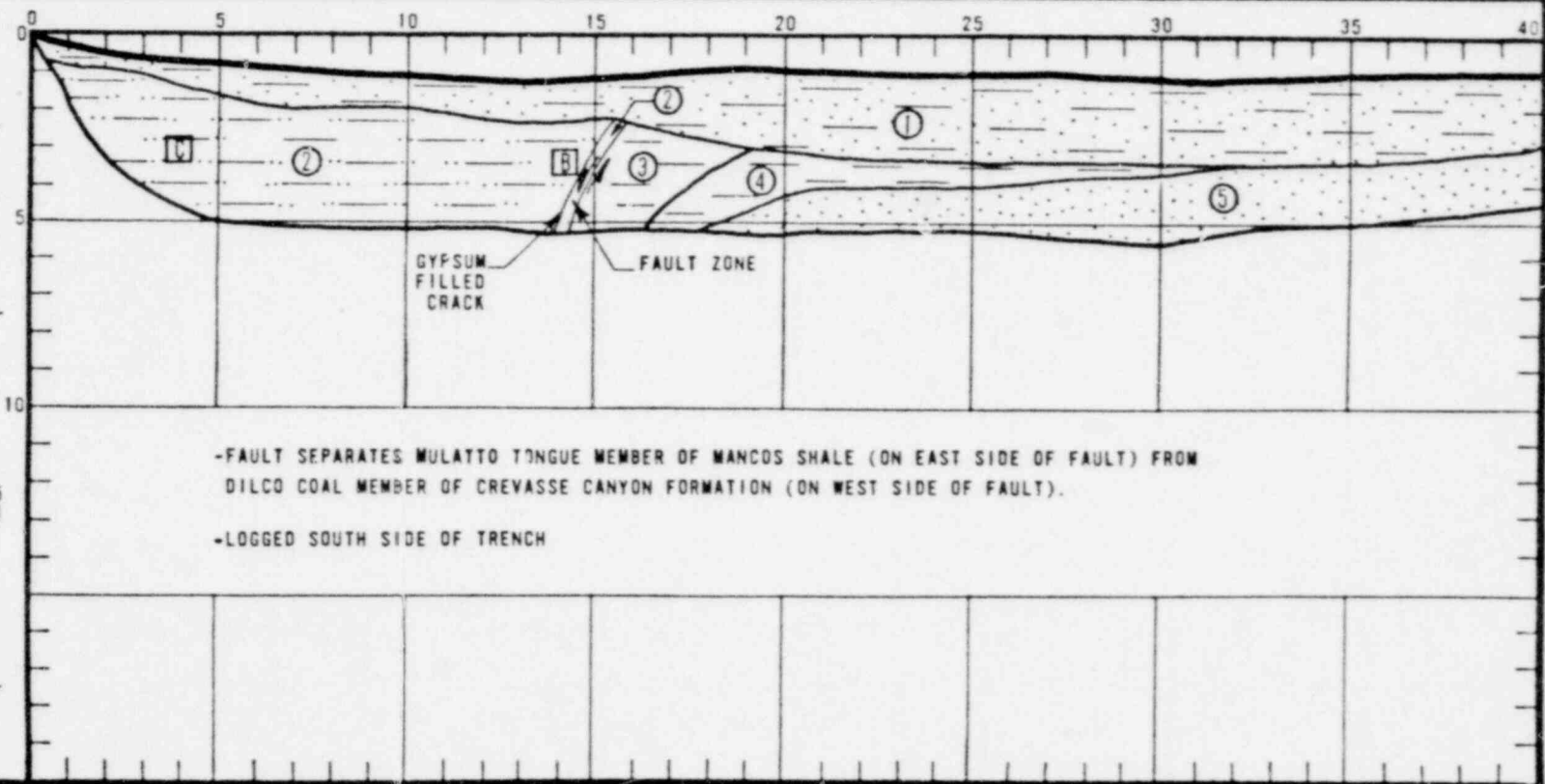
EL./DEPTH: 7120

5/13/77  
DATE

JB  
LOGGED BY

0 5  
SCALE, FT.

N65°W  
BEARING



PAID ATUO • NIPORT NENCH • CALIF

MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO

GUL101

DATE

JUNE 1977

FIELD TRENCH LOG

DRAWING NO

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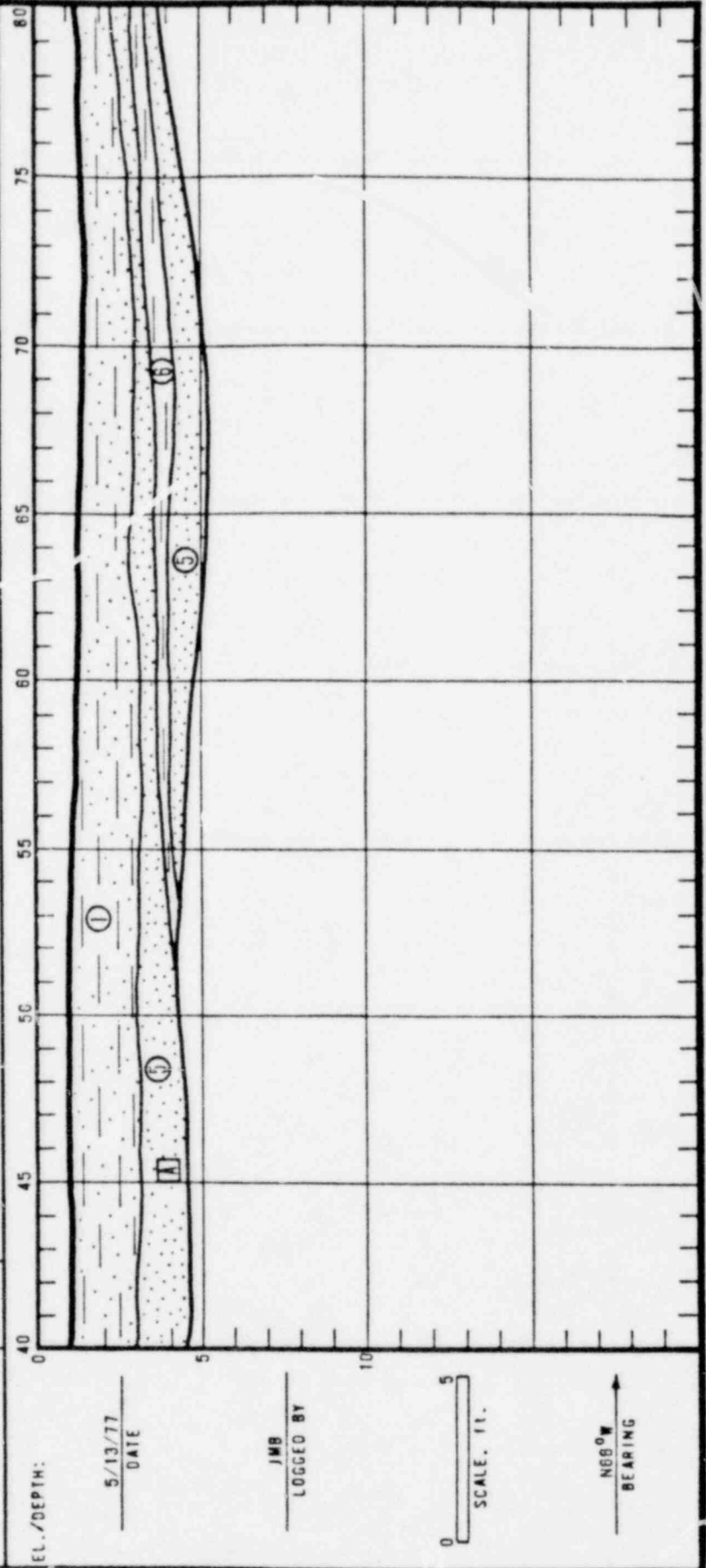
TRENCH NO. WT-6

Sheet 2 of 3

LOCATION: SADDLE N. OF WPC-4, N.E. OF MICHAEL TANK

NOTES:

DEPTH		UNITS		STRUCTURE		
NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE	
③	CREVASSE CANYON FORMATION, DILCO COAL MEMBER SHALE, SHEARED AND INTENSELY FRACTURED. DARK GRAY, CONTORTED BEDDING. SOFT, WEAK, MODERATELY TO SEVERELY WEATHERED, CONTAINS GYPSUM ON FRACTURE SURFACES.	A	N30E	80°E	JOINT SET	
④	SHALE, INTENSELY FRACTURED. MODERATELY WEATHERED, SOFT, WEAK TO MODERATELY STRONG, REGULAR BEDDING.					
⑤	SANDSTONE, WHITE TO ORANGE, CLOSELY TO MODERATELY FRACTURED MODERATELY WEATHERED, MODERATELY STRONG, MODERATELY HARD, STAINED ORANGE ALONG JOINTS.					



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MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PROJECT NO GUL101	DATE JUNE 1977	DRAWING NO
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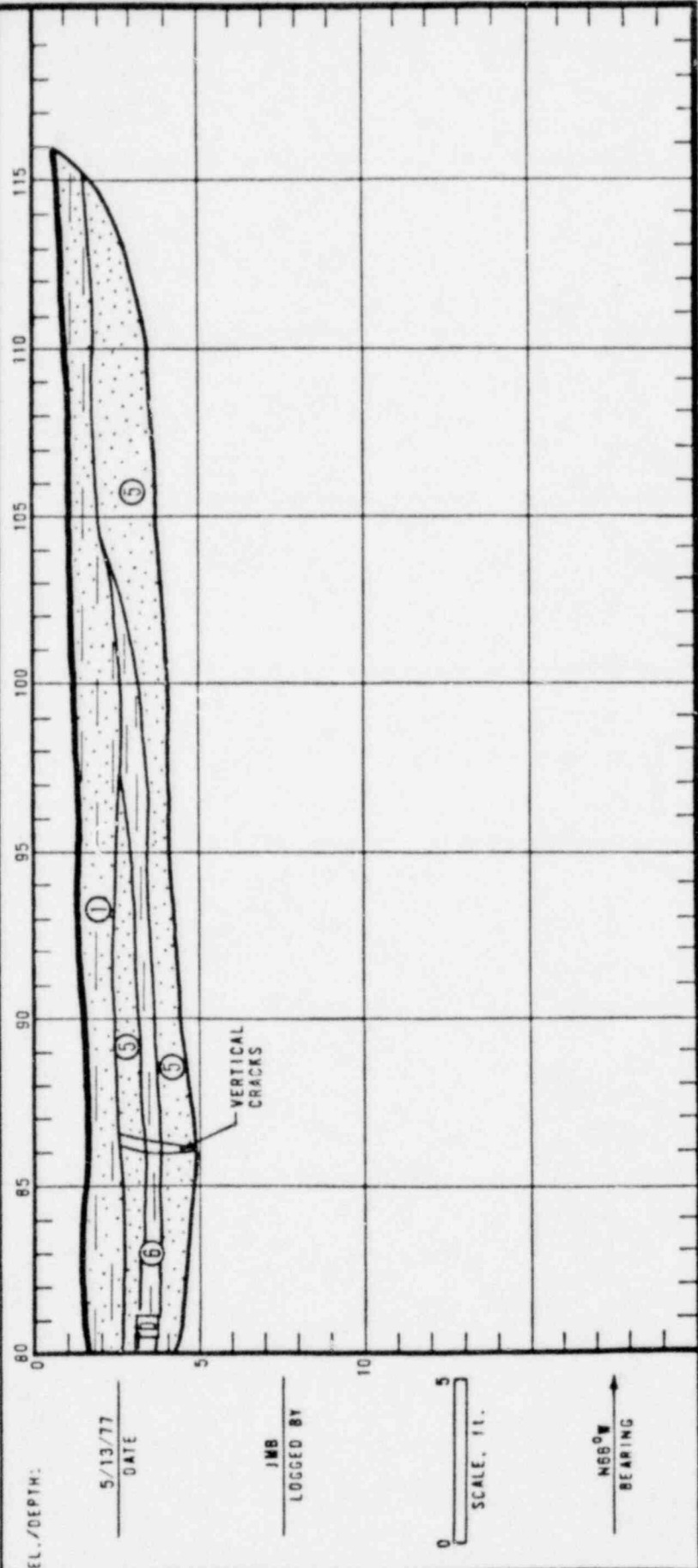
F. 3/77

TRENCH NO. WT-6  
 Sheet 3 of 3

LOCATION: SADDLE N. OF WPC-4, N.E. OF MICHAEL TANK

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	⑤	SHALE WITH INTERBEDDED SILTSTONE, THIN BEDDED, LIGHT GRAY, MODERATELY WEATHERED, WEAK, SOFT, CROSSBEDDING.	①	N35°W	10-20°NE	BEDDING IN CREVASSE CANYON FORMATION



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GUL101 JUNE 1977

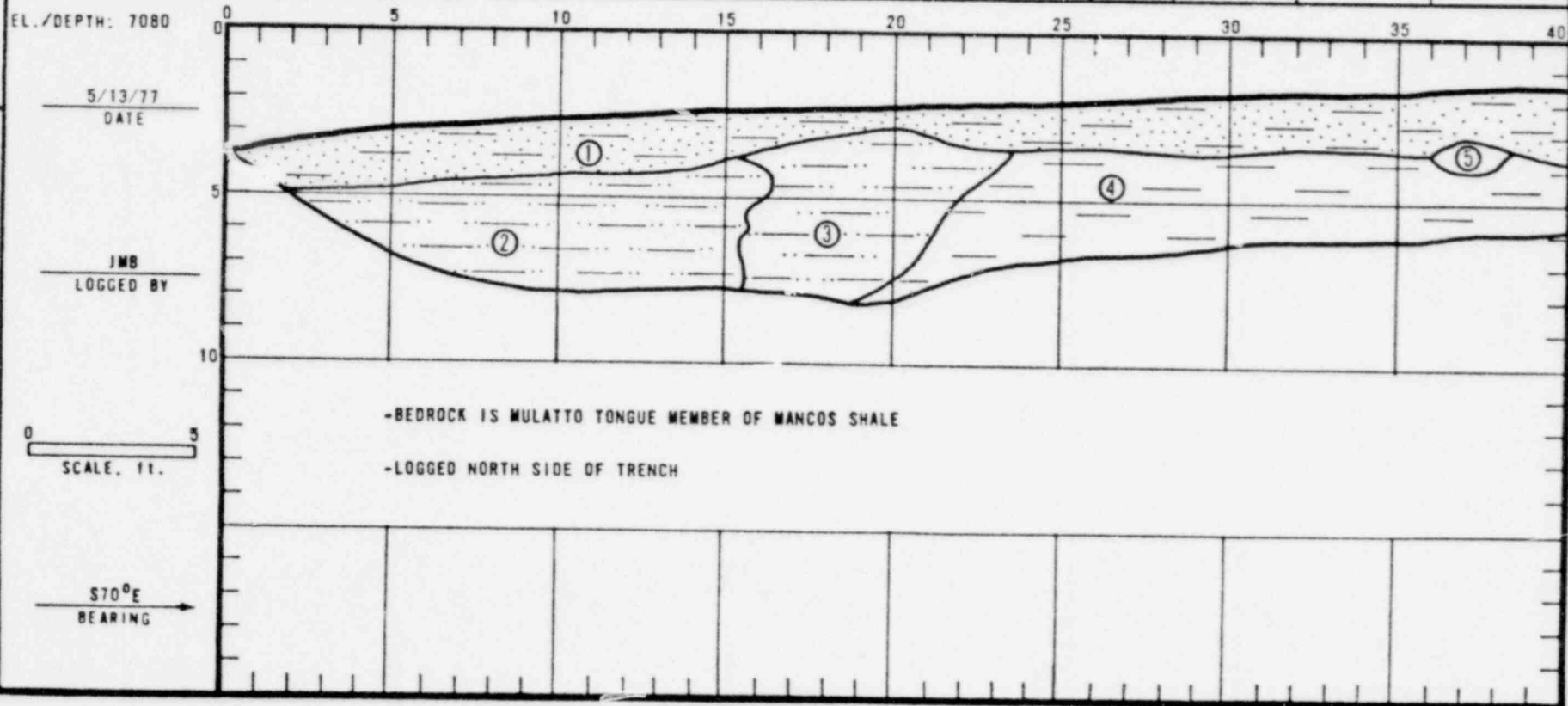
TRENCH NO. WT-7

LOCATION: N. OF SADDLE BETWEEN TWO RIDGES, CENTER OF CANYON, SECTION 14

Sheet 1 of 2

NOTES: PURPOSE: LOCATE AND DESCRIBE FAULT ZONE

DEPTH	NO.	UNITS DESCRIPTION	STRUCTURE			
			NO.	STRIKE	DIP	TYPE
0' - 2.0'	①	TOPSOIL: SANDY CLAY, YELLOW TO REDDISH BROWN, CONTAINS ORGANIC MATERIAL AND FRAGMENTS OF SHALE.				
SEE DIAGRAM	②	SANDY SILT, ORANGE-GRAY, CONTAINS DISSEMINATED CALCITE, DRY, FIRM.				
"	③	SANDY SILT, ORANGE-BROWN, MEDIUM DENSE, SLIGHTLY CALCAREOUS.				
"	④	SHALE, SEVERELY WEATHERED, INTENSELY FRACTURED.				
"	⑤	CALCITE FILLED BRECCIA.				



FIELD TRENCH LOG

F. 3/77

TRENCH NO. WT-7

Sheet 2 of 2

LOCATION:

NOTES:

UNITS		STRUCTURE	
DEPTH	NO.	NO.	DIP
DESCRIPTION		STRIKE	TYPE
SEE PREVIOUS PAGE			

EL./DEPTH:	40	45	50	55	60	65	70	75
	0	5	10					

5/13/77  
DATE

JMB  
LOGGED BY

0 5  
SCALE, FT.

↑  
STRIKE  
BEARING

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FIELD TRENCH LOG

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PROJECT NO  
GUL101

DATE  
JUNE 1977

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TRENCH NO. WT-10

Sheet 1 of 1

LOCATION: ALONG Km outcrop at SE rim of canyon

NOTES: PURPOSE: DETERMINE SUITABILITY OF ROCK FOR DAM FOUNDATION

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
0' - 3.0'	①	TOPSOIL, BROWN SANDY CLAY	[A]	N20°E	8°E	BEDDING
VARIABLE	②	WHITE CALCAREOUS CLAY, POSSIBLY SAPROLITE				
BELOW ~2.5'	③	SILTSTONE, SHALE, AND SANDSTONE, GRAY TO BROWN, SOME ORANGE STAINING, THINLY INTERBEDDED, CROSS LAMINATIONS, SEVERELY WEATHERED, CLOSELY FRACTURED, MODERATELY HARD, WEAR, SOME LENSES OF HARD, MASSIVE, FINE GRAINED SANDSTONE, SLIGHTLY CALCAREOUS.				

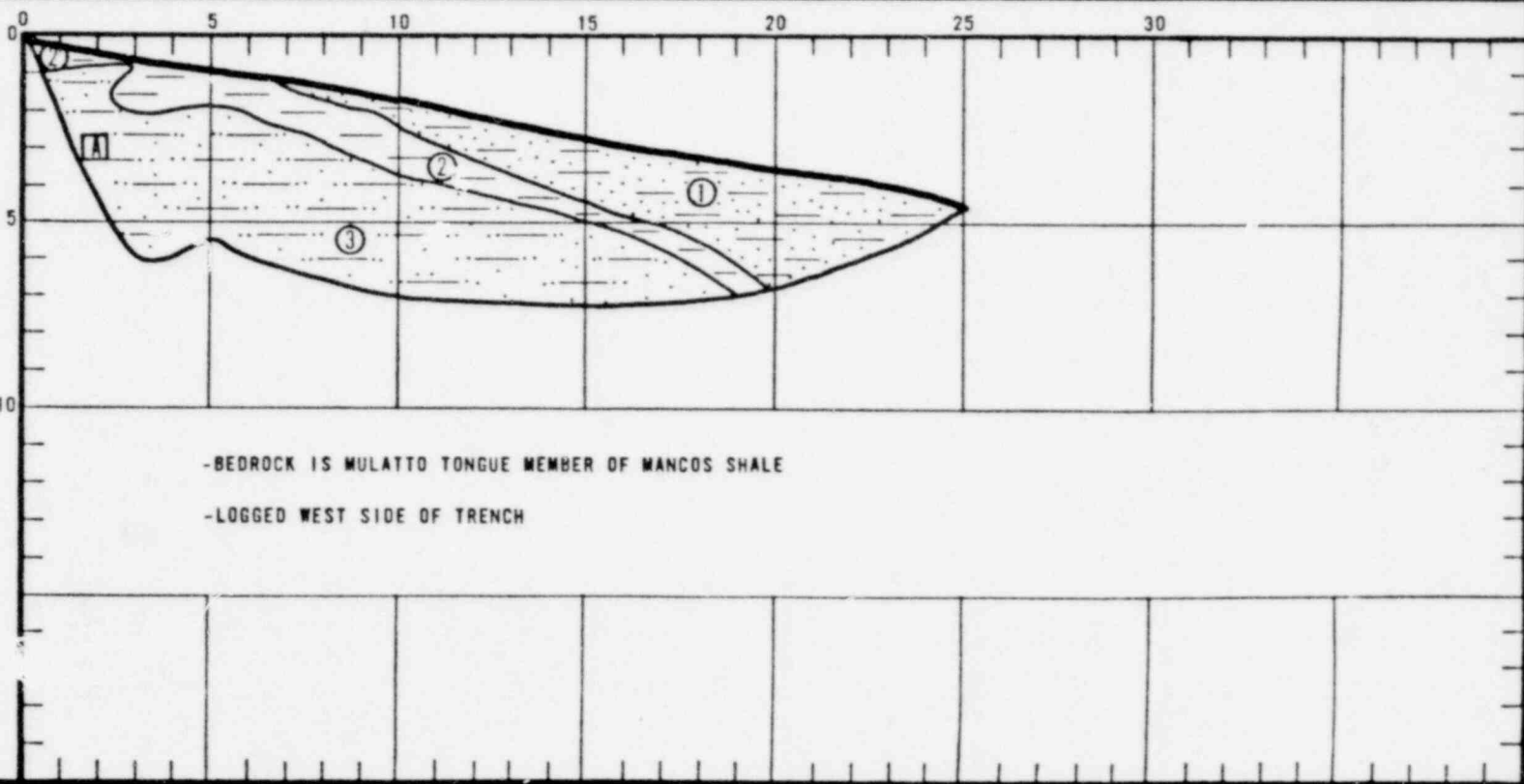
EL./DEPTH: 7090

5/13/77  
DATE

JMB  
LOGGED BY

0 5  
SCALE, FT.

DUE N  
BEARING



-BEDROCK IS MULATTO TONGUE MEMBER OF MANCOS SHALE

-LOGGED WEST SIDE OF TRENCH

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DATE JUNE 1977  
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FIELD TRENCH LOG

F.3/77

TRENCH NO. WT-12

Sheet 1 of 1

LOCATION: SAPROLITE OUTCROP, SOUTH POLVADERA CANYON, SECTION 23

NOTES: PURPOSE: INSPECT SAPROLITE MATERIAL

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FIELD TRENCH LOG

UNITS

DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	STRUCTURE TYPE
0' - 0.5'	①	SANDY CLAY, REDDISH BROWN.				ALL BEDS NEARLY HORIZONTAL
0.5' - 3.5'	②	VER. FINE SANDSTONE, YELLOW TO BROWN, MODERATELY TO SEVERELY WEATHERED.				
BELOW 3.5'	③	SHALE, PURPLE TO YELLOW TO TAN, ALTERED TO MH OR CH. MALLEABLE. Fe-STAINED (SAPROLITE).				

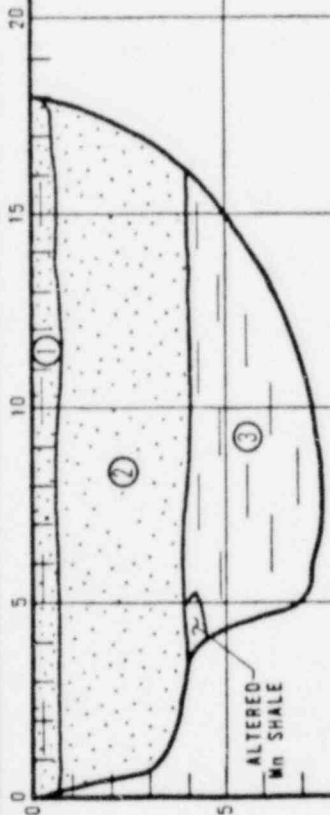
EL./DEPTH: 7140

5/16/77  
DATE

DPS  
LOGGED BY

0 5  
SCALE, FT.

~N45°E  
BEARING



-BEDROCK IS DILCO COAL MEMBER OF CREVASSE CANYON FORMATION  
-LOGGED NORTH SIDE OF TRENCH

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TRENCH NO. MT-13

Sheet 1 of 1

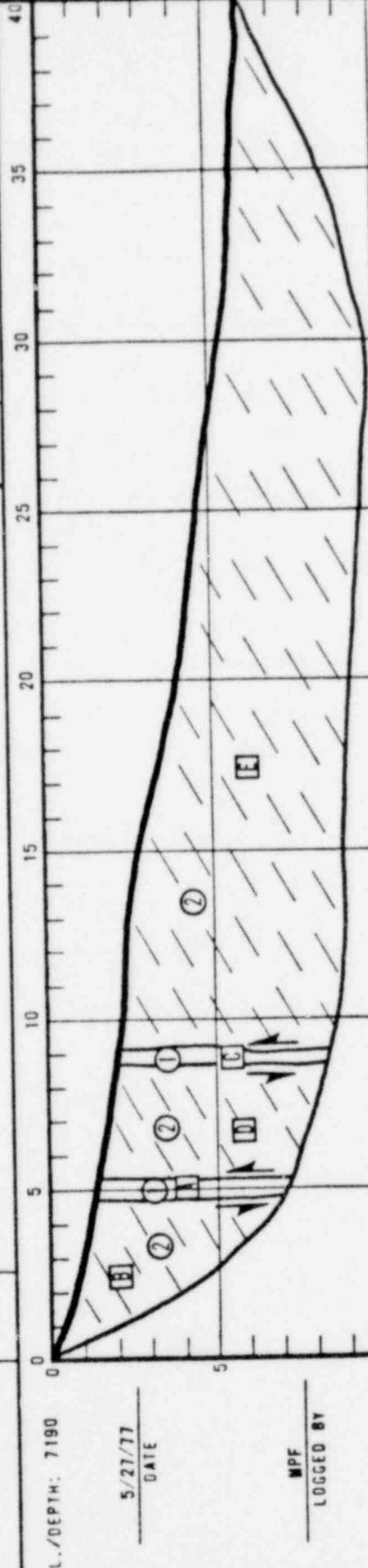
LOCATION: SECTION 11, AT TIP OF HOGBACK RIDGE, NEAR NE TRENDING FAULT

NOTES: PURPOSE: DETERMINE SUITABILITY OF ROCK FOR DAM FOUNDATION

UNITS

NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
①	FAULT GOUGE, SHALE WEATHERED TO CLAY, DARK BROWN, PLASTIC ZONE 4" TO 8" WIDE. CONTAINS SOME GYPSUM CRYSTALS ALONG VERTICAL PLANE.	A	N78°E	90°	FAULT ZONE
②	INTERBEDDED SHALE AND SILTY SANDSTONE: SHALE - MEDIUM BROWN, PLASTIC, BEDS 1/4" TO 2" THICK, CONTAINS GYPSUM CRYSTALS ALONG BEDDING AND JOINTS. SILTY SANDSTONE-TAN. CONTAINS FINE SAND, BEDS 3" TO 8" THICK.	B	N70°E	55°N	BEDDING
		C	N75°E	90°	FAULT ZONE
		D	N80°E	30°N	BEDDING
		E	N80°E	10-15°N	BEDDING

DEPTH -----  
BELOW G. L.



-BEDROCK IS MUALATTO TONGUE MEMBER OF MANCOS SHALE  
-LOGGED WEST SIDE OF TRENCH  
-THIN VENEER (0-0.5') OF SOIL COVER AT SURFACE; CLAYEY SILT WITH GYPSUM AND SILTSTONE FRAGMENTS 1/4" TO 2" IN DIAMETER.

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FIELD TRENCH LOG

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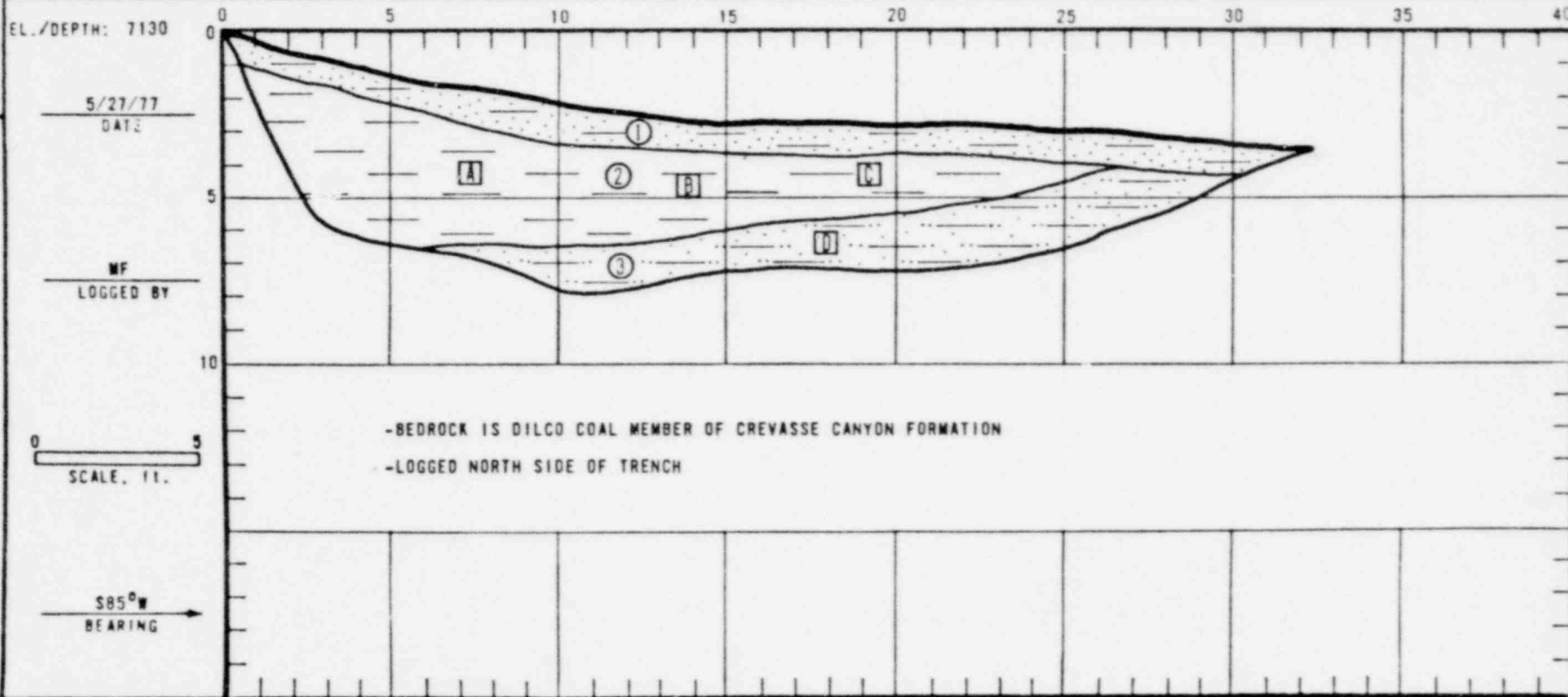
TRENCH NO. WT-14

Sheet 1 of 1

LOCATION: SECTION 14, ALONG STREAM TO NORTH OF MICHAEL TANK

NOTES: PURPOSE: DETERMINE SUITABILITY OF ROCK FOR DAM FOUNDATION

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
0' - 1.0'	①	SANDY CLAY, LIGHT BROWN, PLASTIC, CONTAINS FINE SAND AND SANDSTONE FRAGMENTS 1/4" TO 2" IN DIAMETER.	A	N40°W	10°E	LOADING
1.0' - 3.0'	②	SHALE, BLUE-GRAY, THIN BEDDED (LESS THAN 1/8" TO 1" THICK), BRITTLE, SHOWS SOME Fe STAIN, BEDDING IS WAVY AND IRREGULAR, YELLOW SILT FOUND IN SOME BEDDING PLANES.	B	N30°E	90°	PRIMARY JOINTS
			C	N60°W	90°	SECONDARY JOINTS
BELOW 3.0'	③	SILTY SANDSTONE, TAN, BEDDING 1" TO 8" THICK, Fe STAINED, CONTAINS SOME Fe CONCRETIONS, HARD, EXHIBITS PRIMARY AND SECONDARY JOINTS.	D	N40°W	0 - 10°E	BEDDING



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MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO.

DATE

DRAWING NO.

TRENCH NO. WT-15

Sheet 1 of 1

LOCATION: SECTION 14, NEAR WPC-13, NORTH OF Kcdi RIDGE OUTCROP

NOTES: TRENCH LOCATED ON HILLSIDE - POTENTIAL DAM ABUTMENT

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
0' - 1.5'	①	CLAYEY SILT, LIGHT BROWN, STICKY, SLIGHTLY PLASTIC, CONTAINS REMNANT-STRUCTURE OF SILTSTONE BEDROCK.	[A]	N45°E	0-8°S	BEDDING
1.5' - 4.0'	②	WEATHERED SILTSTONE, WHITE, CRUMBLY, DISSOLVES WHEN WET, CONTAINS Fe STAIN ALONG SOME BEDDING PLANES, UPPER 1.0' WEATHERED TO RESIDUAL SOIL COVER, BEDDING UP TO 1/2" THICK, CONTAINS SANDY SILTSTONE LENS WITH BEDS FROM 3" TO 6" THICK, LOWER CONTACT GRADATIONAL.	[B]	N45°E	0-8°S	BEDDING
BELOW 4.0'	③	SHALE, GRAY-PURPLE, BRITTLE, BEDS UP TO 1/2", CONTAINS YELLOW SILT AND Fe STAIN ALONG BEDDING.				

EL./DEPTH: 7160

5/27/77  
DATE

MF  
LOGGED BY

SANDSTONE LENS

0 5  
SCALE, FT.

-BEDROCK IS DILCO COAL MEMBER OF CREVASSE CANYON FORMATION  
-LOGGED WEST SIDE OF TRENCH

S5°E  
BEARING

FIELD TRENCH LOG

F. 3/77

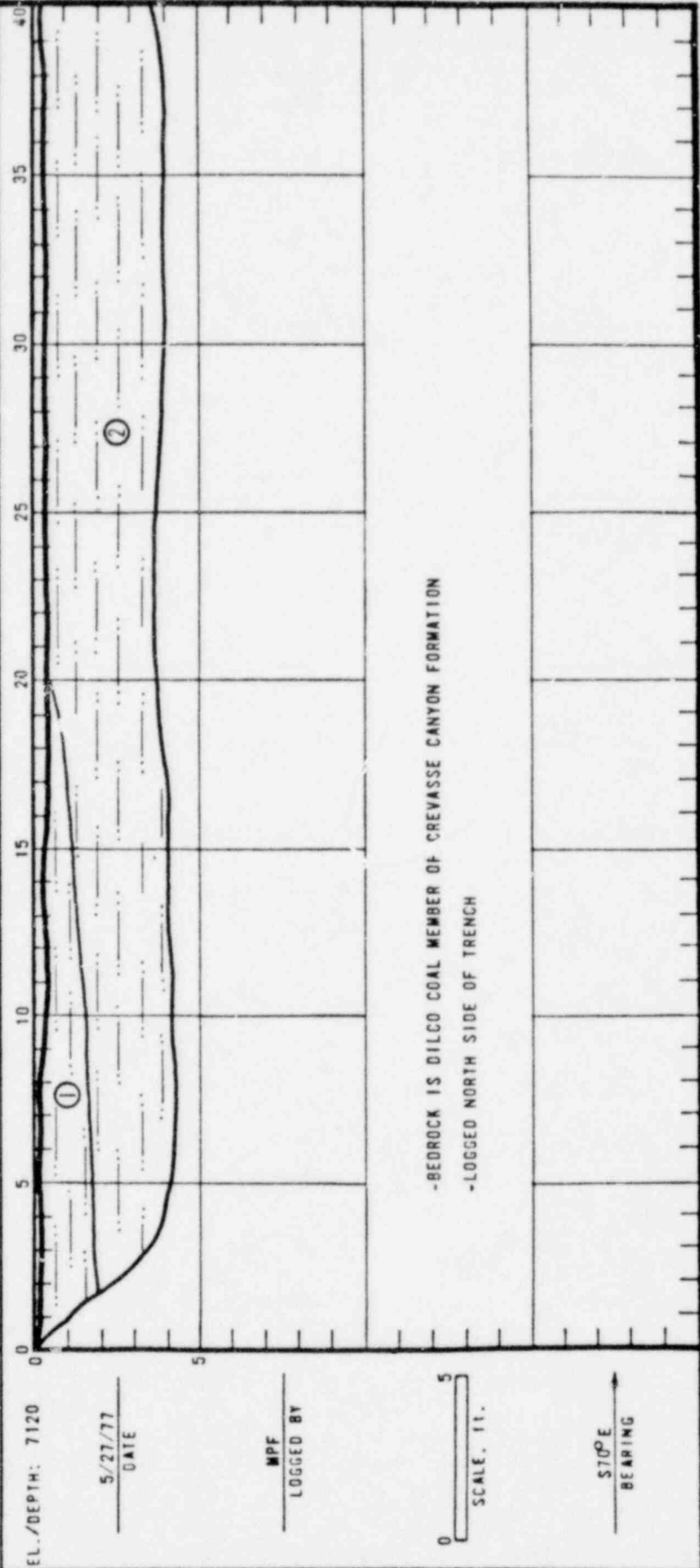
TRENCH NO. WT-1B

LOCATION: SOUTH-CENTRAL SECTION 14, ALONG SOUTH ROAD, SOUTH POLVADERA CANYON

Sheet 1 of 3

NOTES: PURPOSE: DETERMINE BEDROCK CONDITIONS -Kcd

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
0' ~ 1.5'	①	SANDY CLAYEY SILT, MEDIUM BROWN, SLIGHTLY PLASTIC, FINE GRAIN SAND. CONTAINS ALTERED Mn; FRAGMENTS 1/4" DIAMETER.				
~0' - 4.0'	②	SILTSTONE, PURPLE, THIN BEDDED (1/8"-1"), F <sub>0</sub> STAINED, CONTAINS LIMONITE BETWEEN BEDDING, BRITTLE.				
3.0' - 4.0'	③	SILTSTONE, PURPLE, MEDIUM BEDDING (4"-8"), WEATHERS TO PLASTIC CLAY AFTER 1 WEEK EXPOSURE.				



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FIELD TRENCH LOG

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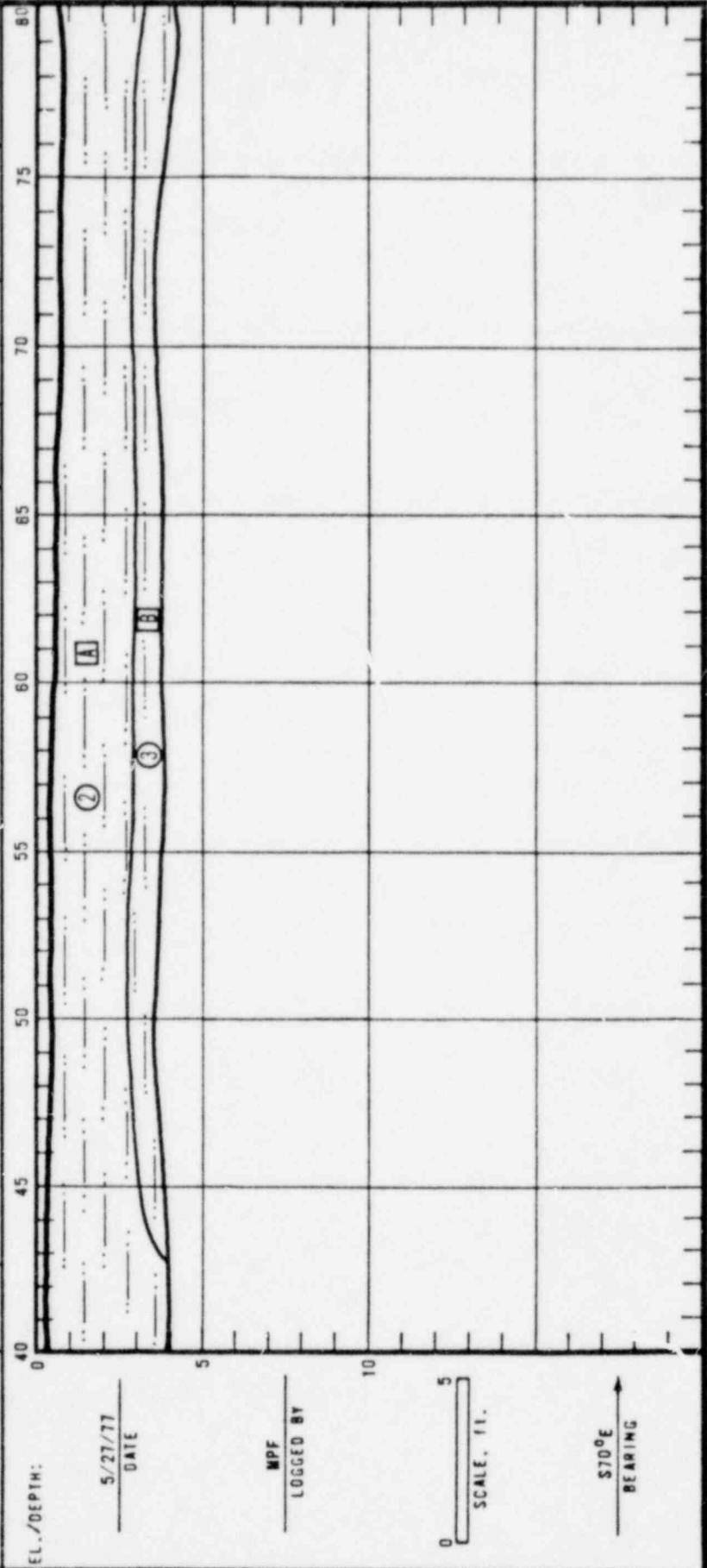
TRENCH NO. WT-16

LOCATION: SOUTH-CENTRAL SECTION 14, ALONG SOUTH ROAD, SOUTH POLVADERA CANYON

Sheet 2 of 3

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
		SEE PREVIOUS PAGE	A	N70°W	3-6°N	BEDDING
			B	N70°W	3-6°N	BEDDING



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FIELD TRENCH LOG

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DATE

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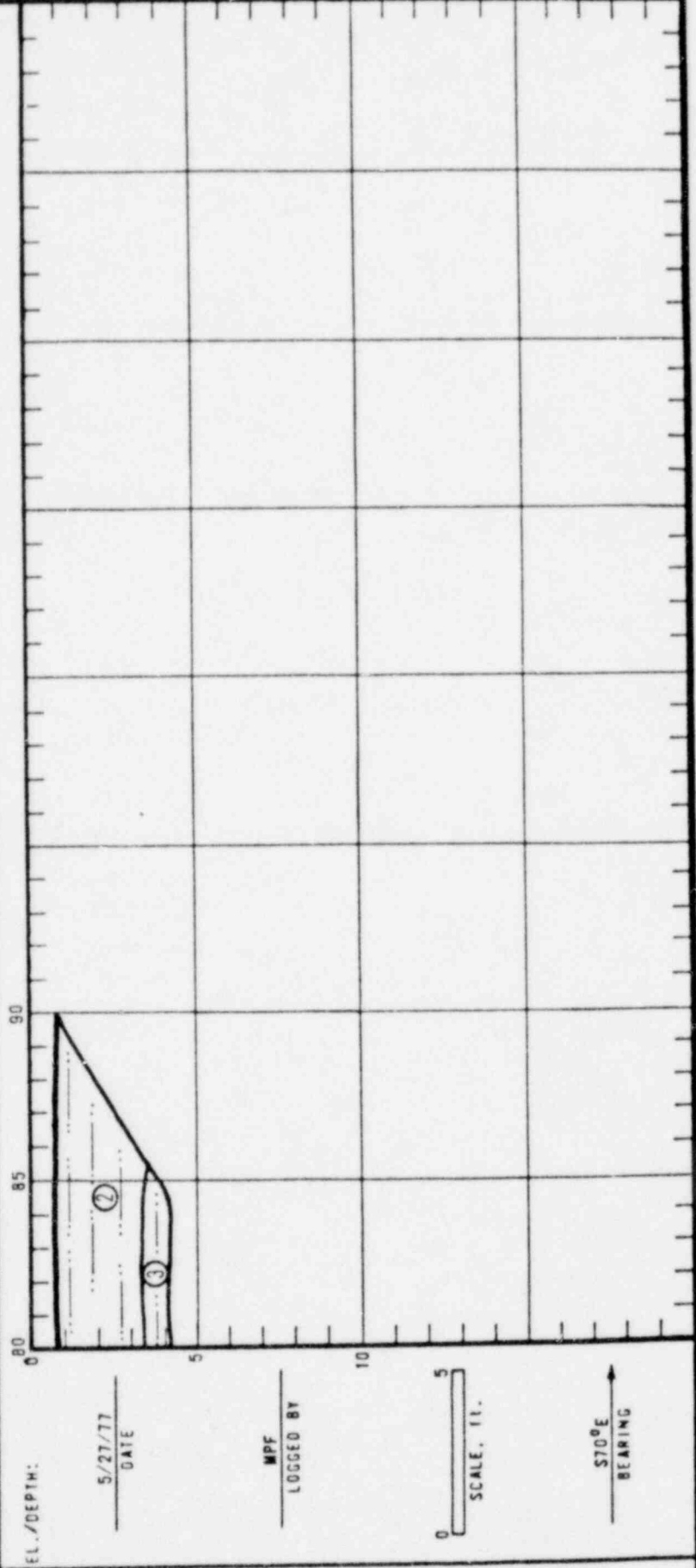
TRENCH NO. WT-18

Sheet 3 of 3

LOCATION: SOUTH-CENTRAL SECTION 14, ALONG SOUTH ROAD, SOUTH POLYADERA CANYON

NOTES:

DEPTH	NO.	DESCRIPTION	STRUCTURE		
			NO.	STRIKE	DIP
SEE PREVIOUS PAGES					



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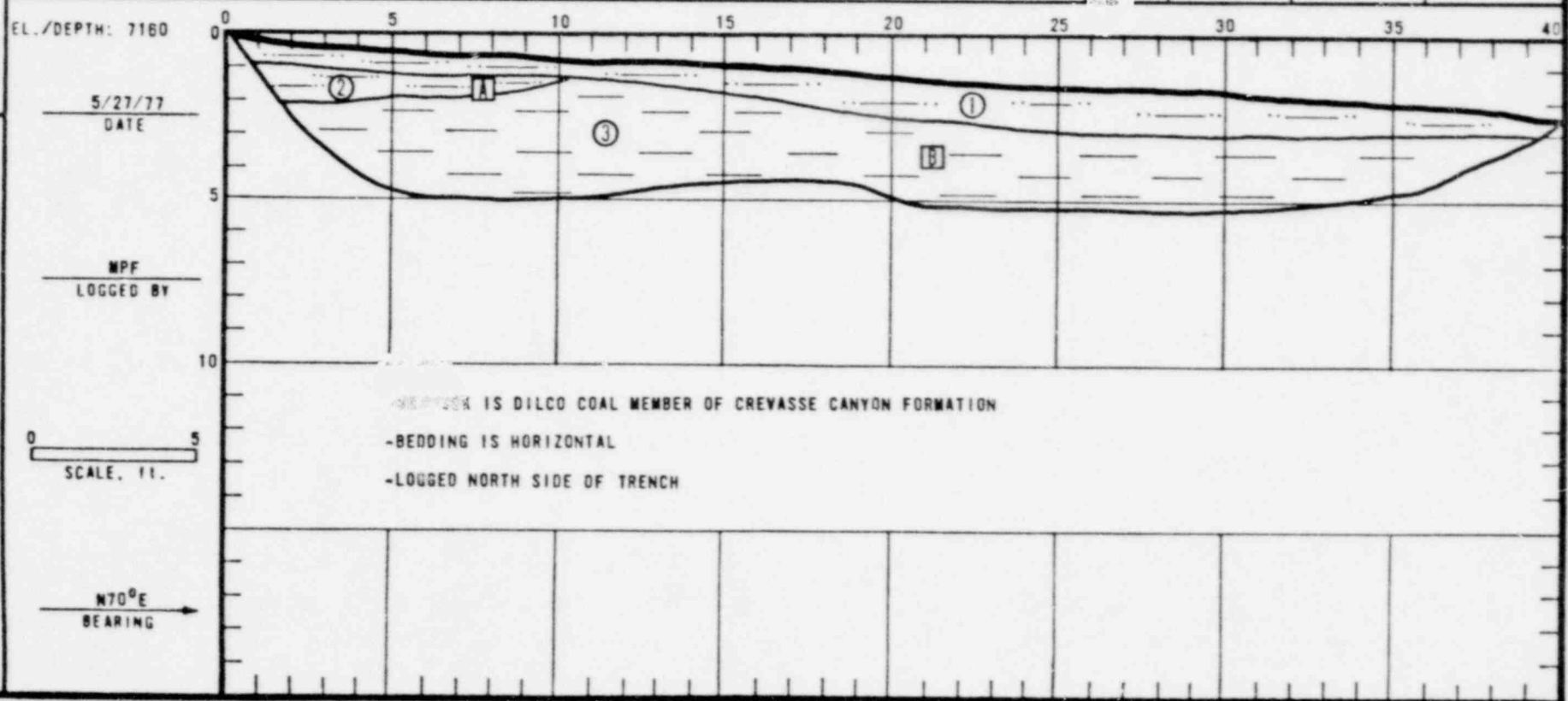
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PROJECT NO. GULLIODI  
DATE JUNE 1977  
DRAWING NO.

TRENCH NO. WT-17  
Sheet 1 of 1

LOCATION: SW CORNER - SECTION 14, ALONG SOUTH ROAD, SOUTH POLVADERA CANYON  
NOTES: PURPOSE: ATTEMPT TO LOCATE FAULT - UNSUCCESSFUL

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
0' - ~1.5'	①	SANDY CLAYEY SILT, LIGHT BROWN, SLIGHTLY PLASTIC, CONTAINS SILTSTONE FRAGMENTS 1/2" TO 2" DIAMETER.	[A]	N40°E	90° (SPACING 6" - 1')	JOINT
1.0' - 2.0'	②	SANDY SILTSTONE WITH INTERBEDDED GRAY SHALE BEDS 1" TO 2" THICK, TAN TO WHITE, BEDS 2" TO 5" THICK, SOME Fe STAIN, SEVERELY WEATHERED AT SURFACE, LOWER CONTACT GRADATIONAL.	[B]	E-W	90° (SPACING 1' - 4')	JOINT AND SLICKENSIDES
1.5' - 4.0'	③	SHALE, GRAY, BEDDING LESS THAN 1/8" TO 2" THICK, CONTAINS SOME Fe STAIN. LOCAL FAULTING AND FOLDING ALONG SLICKENSIDES AND JOINTS.				



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SEPTEMBER 1977

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TRENCH NO. WT-18

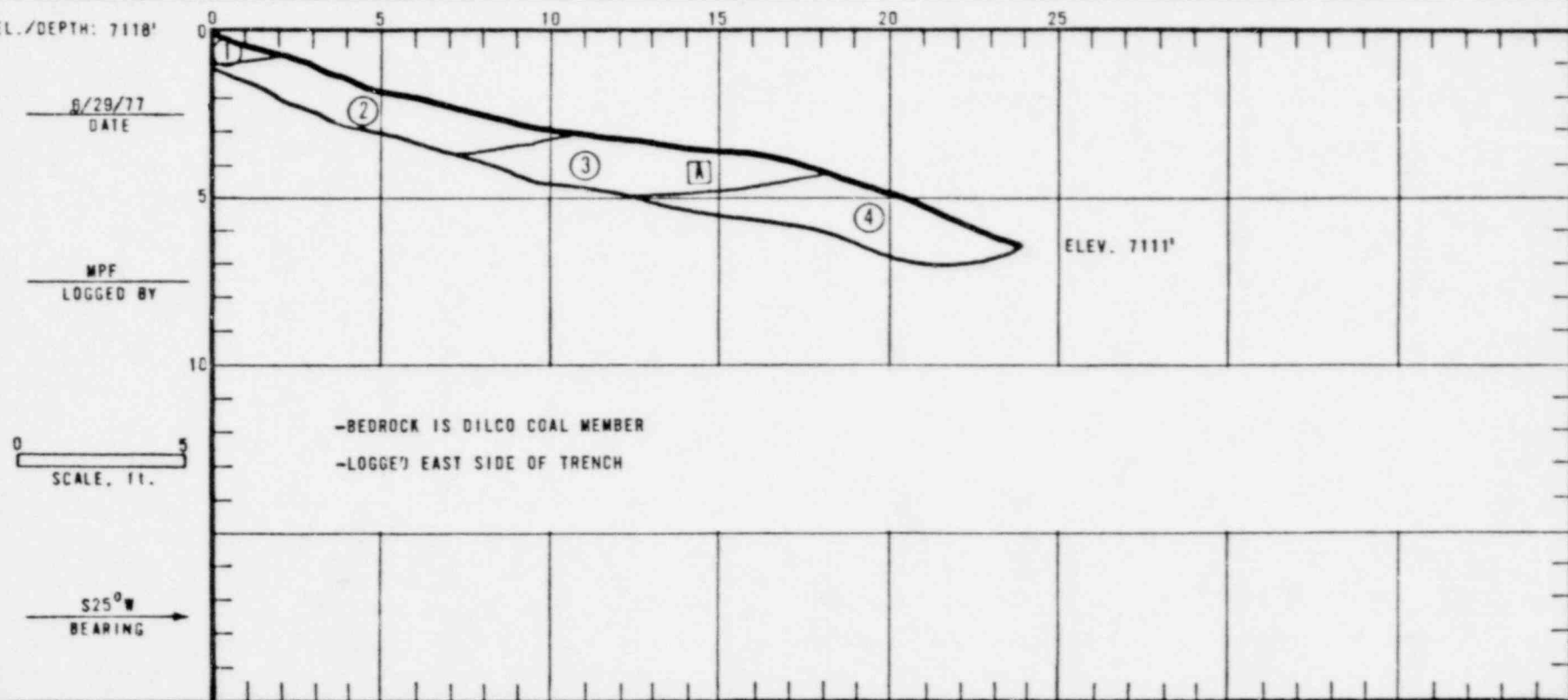
Sheet 1 of 1

LOCATION: BELOW SANDSTONE CLIFF, NORTH OF MICHAEL TANK, ON CHANNEL LEG OF DAM AXIS 6A

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SHALE; GRAY-BLACK, THIN BEDDED (UP TO 1"), FISSLE.	[A]	N60°W	6°N	BEDDING
	②	SANDSTONE; TAN, FINE GRAINED, MASSIVE, HARD.				
	③	SILTSTONE; YELLOW-TAN-ORANGE BANDED COLOR, THIN BEDDED (1"-4"), Fe-STAIN ALONG BEDDING, CONTAINS BLACK SHALE PARTINGS.				
	④	SHALE; GRAY-PURPLE, THIN BEDDED (1/4"-2"), BRITTLE.				

EL./DEPTH: 7118'



FIELD TRENCH LOG

F. 3/77

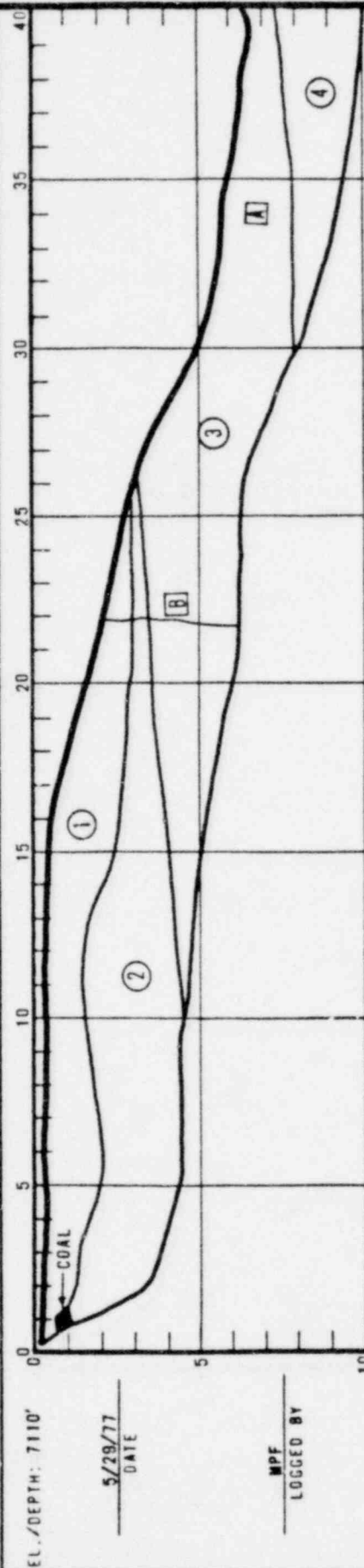
TRENCH NO. MT-19

Sheet 1 of 2

LOCATION: BELOW SANDSTONE CLIFF, NORTH OF MICHAEL TANK, ON CHANNEL LEG OF DAM AXIS 6A

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	FILL MATERIAL; BROWN SANDY SILT WITH SANDSTONE, SHALE, AND SILTSTONE FRAGMENTS.	A	DUE E	20°N	BEDDING
	②	SHALE; GRAY TO PURPLE, THIN BEDDED (1/4"-2"), BRITTLE, CONTAINS LIMONITE AND Fe STAIN ALONG JOINTS AND BEDDING, CONTAINS 6" LOOSE COAL SEAM.	B	N25°E	90°	JOINT
	③	SILTY SANDSTONE; TAN, FINE TO MEDIUM GRAINED, MEDIUM BEDDING (2"-1'), CONTAINS VERTICAL JOINTS.				
	④	INTERBEDDED SILTSTONE AND SHALE; GRAY TO PURPLE, THIN BEDDED (1/4"-2"), BRITTLE, CONTAINS VERTICAL JOINTS, Fe STAIN AND LIMONITE ALONG JOINTS AND BEDDING.				



EL./DEPTH: 7110'

5/29/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, FT.

S35°W  
BEARING

-BEDROCK IS DILCO COAL MEMBER  
-LOGGED EAST SIDE OF TRENCH

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FIELD TRENCH LOG

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SEPTEMBER 1977

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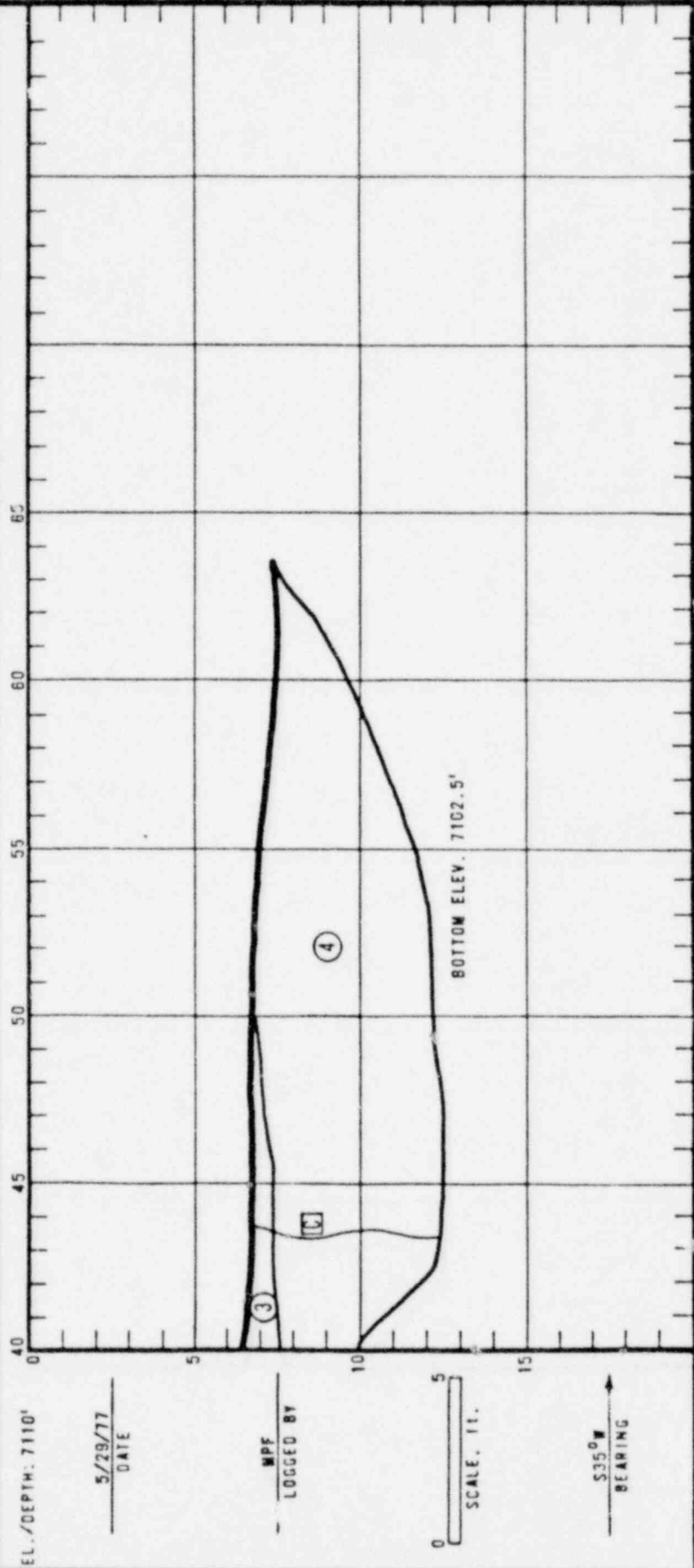
TRENCH NO. MT-19

Sheet 2 of 2

LOCATION: BELOW SANDSTONE CLIFF, NORTH OF MICHAEL TANK, ON CHANNEL LEG OF DAM AXIS 6A

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
			<u>C</u>	<u>N25°E</u>	<u>90°</u>	<u>JOINT</u>



EL./DEPTH: 7110'

5/29/77  
DATE

MPF  
LOGGED BY

0 5 10  
SCALE, FT.

S35°W  
BEARING

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GUL-101

DATE  
SEPTEMBER 1977

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TRENCH NO. WT-20

LOCATION: NORTH OF MICHAEL TANKS, ON CHANNEL LEG OF DAM AXIS 8A

Sheet 1 of 2

NOTES:

DEPTH	NO.	UNITS DESCRIPTION	STRUCTURE			
			NO.	STRIKE	DIP	TYPE
	①	SILTSTONE; PURPLE-GRAY-YELLOW BANDED COLOR, THIN BEDDED (UP TO 1"), SAME AS BOTTOM OF WT-19.	[A]	N20°E	90°	JOINTS (1' SPACING). BEDDING
	②	SANDSTONE; TAN WITH Fe STAIN, FINE TO MEDIUM GRAINED, BEDDING 3"-8" THICK, CONTAINS VERTICAL JOINTS WITH LIMONITE.	[B]	N15°W	3°E	
	③	SILTSTONE; PURPLE TO GRAY, BEDDING 1/4"-3" THICK, BRITTLE.				
	④	SHALE; BLACK, CARBONACEOUS, WITH COAL PARTICLES AND LIMONITE ALONG BEDDING, THIN LAMINATED, BRITTLE.				

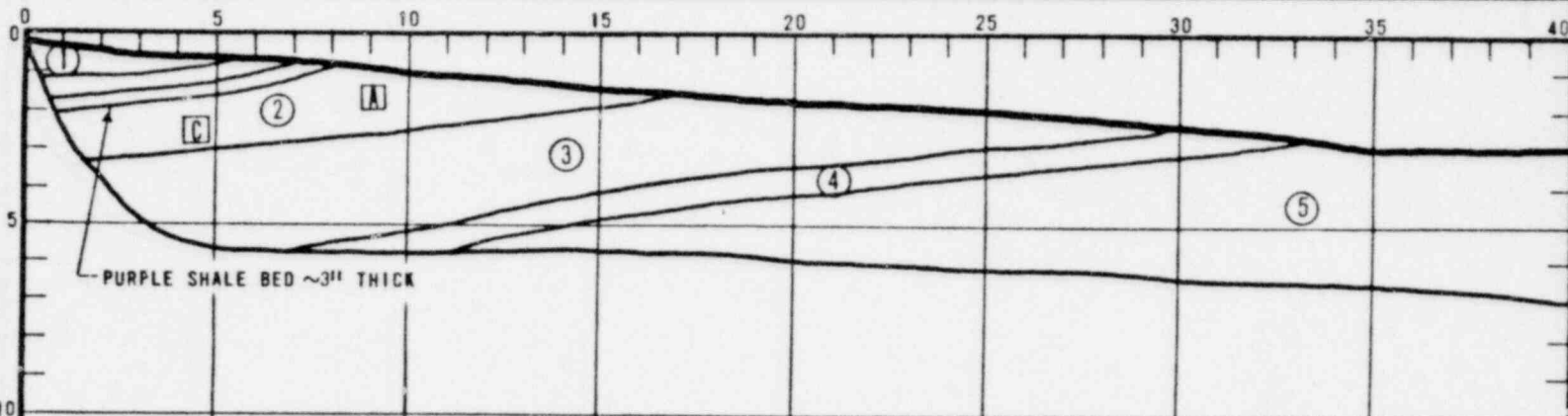
EL./DEPTH: 7104'

5/29/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, FT.

S40°W  
BEARING



-UPPER 8" OF SILTSTONE-SHALE IS REPEATED AT WT-19  
-BEDROCK IS DILCO COAL MEMBER  
-LOGGED EAST SIDE OF TRENCH

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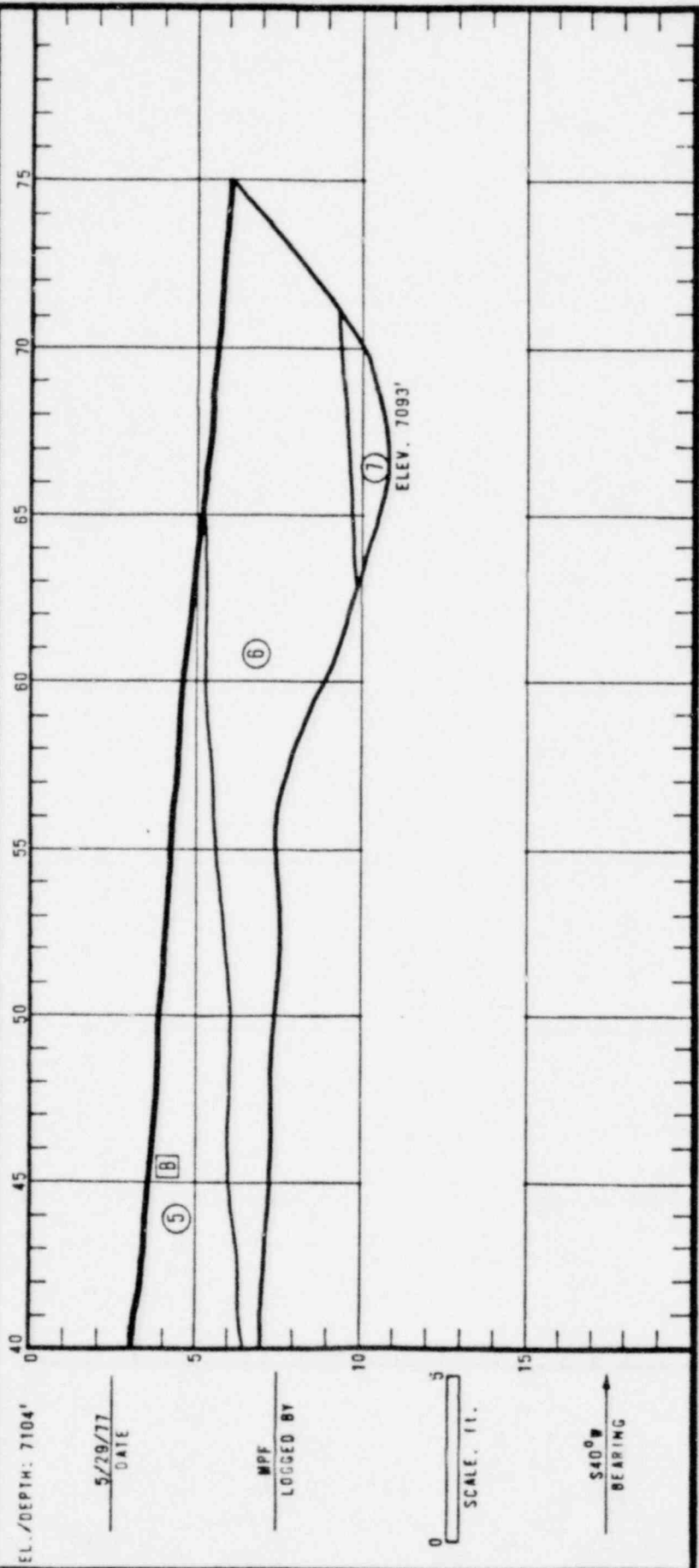
FIELD TRENCH LOG

F. 3/77

TRENCH NO. WT-20  
 Sheet 2 of 2

LOCATION: NORTH OF MICHAEL YANKS, ON CHANNEL LEG OF DAM AXIS 6A  
 NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	⑤	SANDSTONE; TAN WITH Fe STAIN, FINE TO MEDIUM GRAINED, BEDDING 3"-1" THICK, CONTAINS PURPLE SILTSTONE STRINGERS 1/4"-2" THICK, CONTAINS VERTICAL JOINTS.	⑧	N15°	90°	JOINTS (1' SPACING)
	⑥	INTERBEDDED SHALE AND SILTSTONE; PURPLE AND GRAY, THIN BEDDED (1/4"-2"), CONTAINS FAINT VERTICAL JOINTS.				
	⑦	SANDSTONE; YELLOW WITH Fe STAIN, FINE TO MEDIUM GRAINED.				



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FIELD TRENCH LOG

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6UL-101

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SEPTEMBER 1977

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TRENCH NO. WT-20a

LOCATION: DOWNSLOPE OF WT-20, ON CHANNEL LEG OF DAM AXIS 6A

Sheet 1 of 1

NOTES:

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SILT AND CLAYEY SILT; LIGHT BROWN, FIRM. SHOWS NO STRUCTURE OR STRATIFICATION; ALLUVIUM.				
	②	SANDSTONE BEDROCK; RED, SILTY, UNCONSOLIDATED, WEATHERED.				
	③	SANDSTONE; WHITE, FINE TO MEDIUM GRAINED, MASSIVE.				

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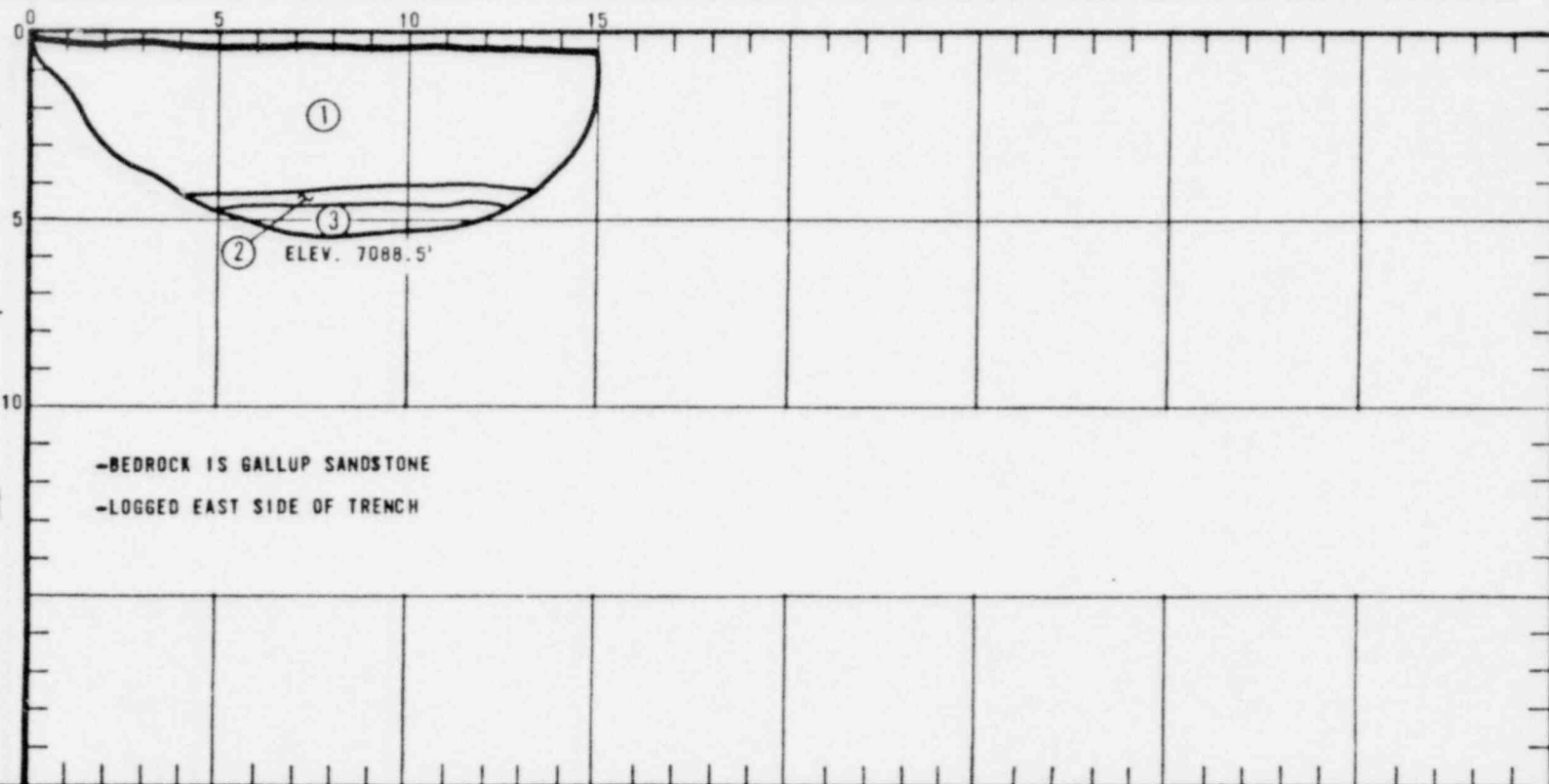
EL./DEPTH: 7094'

8/30/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, FT.

S38°W  
BEARING



-BEDROCK IS GALLUP SANDSTONE

-LOGGED EAST SIDE OF TRENCH

PROJECT NO. GUL-101  
DATE SEPTEMBER 1977  
DRAWING NO.

FIELD TRENCH LOG

F. 3/77

TRENCH NO. MT-21

Sheet 1 of 1

LOCATION: DOWNSLOPE OF MT-20g, ON CHANNEL LEG OF DAM AXIS 6A

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SANDY SILT; LIGHT BROWN, LOOSE, WITH DISCONTINUOUS SANDSTONE FRAGMENT LENSES 1"-3" THICK; ALLUVIUM. SANDSTONE; WHITE TO GRAY, FINE TO MEDIUM GRAINED, MASSIVE.				
	②					

EL./DEPTH: 7092'	0	5	10	15	20	25	30
6/30/77							
MPF	LOGGED BY						
0	5 SCALE, ft.						
	S40°W BEARING						

W A WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PALO ALTO • HIRSHPORT BEACH • CALIF

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

F. 3/77

WA WAHLER  
& ASSOCIATES

TRENCH NO. WT-22

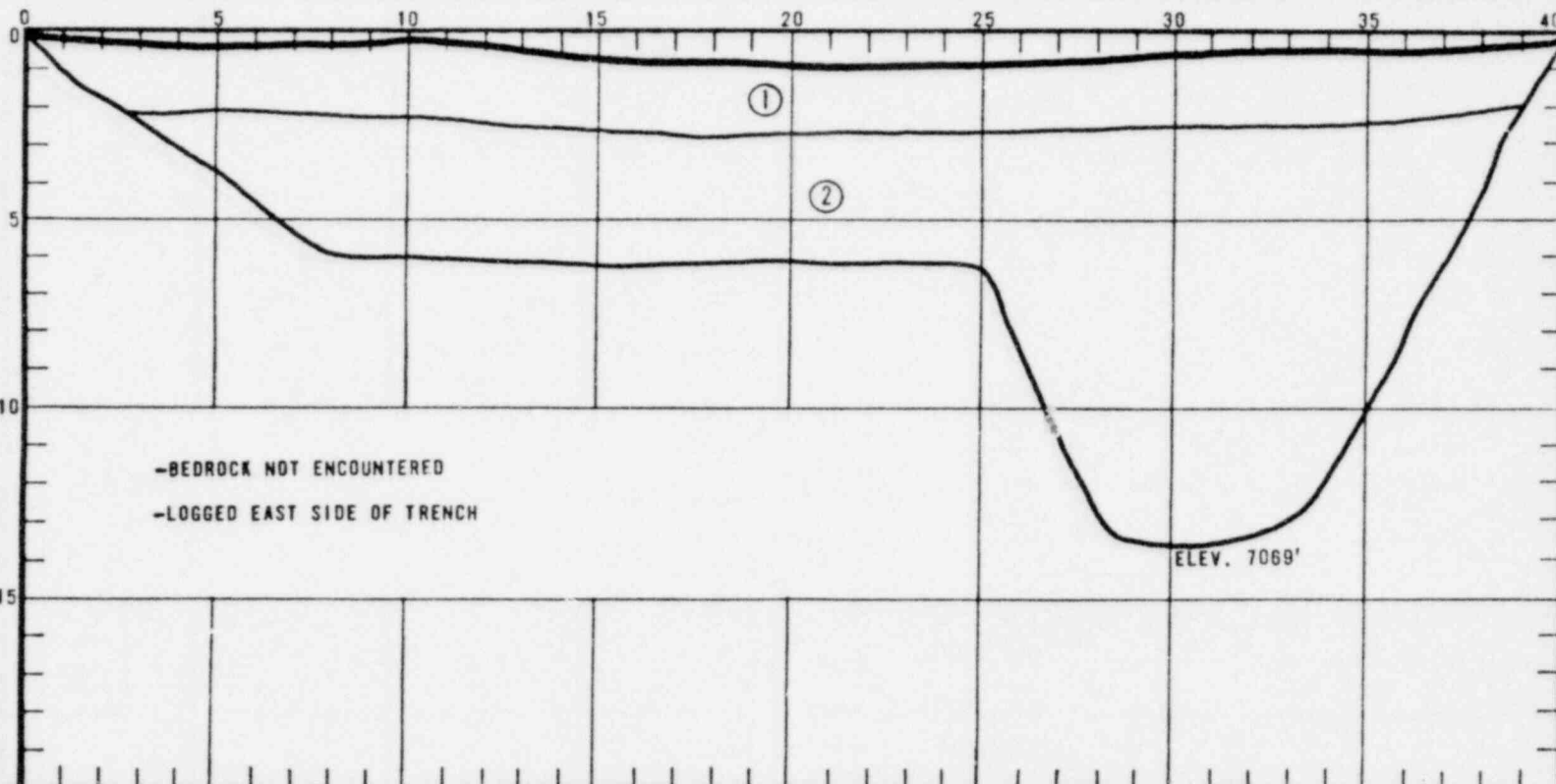
LOCATION: IN STREAM BED UPSTREAM OF MICHAEL TANK, ON CHANNEL LEG OF DAM AXIS 6A

Sheet 1 of 1

NOTES: \_\_\_\_\_

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAY; MEDIUM BROWN, STIFF, VERY PLASTIC, SHOWS BLOCKY STRUCTURE.				
	②	SILT; LIGHT BROWN, SLIGHTLY STIFF, CONTAINS SOME FINE GRAINED SAND; ALLUVIUM.				

EL./DEPTH: 7082'



6/30/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, FT.

S16°W  
BEARING

-BEDROCK NOT ENCOUNTERED  
-LOGGED EAST SIDE OF TRENCH

ELEV. 7069'

PAID ATTY • REPORT REVEN • CALIF  
MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO. 601-101  
DATE SEPTEMBER 1977  
DRAWING NO.

FIELD TRENCH LOG

W A WAHLER  
& ASSOCIATES

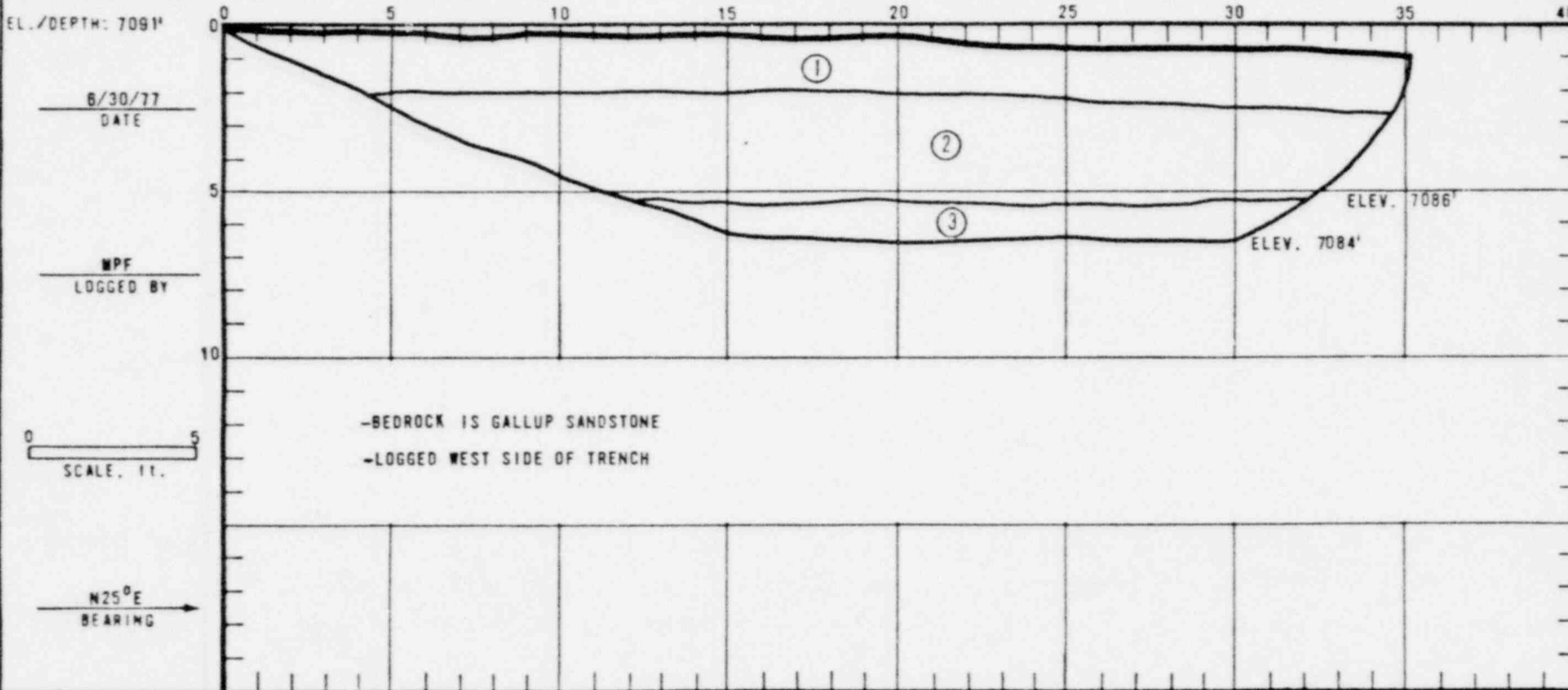
TRENCH NO. WT-23

LOCATION: SOUTH OF STREAM BED, UPSTREAM OF MICHAEL TANK, ON CHANNEL LEG OF DAM AXIS 6A

Sheet 1 of 1

NOTES: \_\_\_\_\_

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAY; MEDIUM BROWN, VERY PLASTIC, HARD, SHOWS BLOCKY STRUCTURE.				
	②	SILTY SAND TO SANDY SILT; LIGHT BROWN, STIFF, CONTAINS FINE TO MEDIUM QUARTZ AND Fe-STONE SAND.				
	③	SANDSTONE; TAN TO YELLOW, FINE TO MEDIUM GRAINED, MASSIVE, CONTAINS 3" WEATHERED GRAY SHALE AT SOIL CONTACT.				



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PROJECT NO. GUL-109  
DATE SEPTEMBER 1977  
DRAWING NO.

FIELD TRENCH LOG

F. 3/77

TRENCH NO. WT-24

Sheet 1 of 1

LOCATION: UPSLOPE OF WT-23, ON CHANNEL LEG OF DAM AXIS 6A

NOTES:

UNITS

DEPTH

NO.

DESCRIPTION

NO.

STRIKE

DIP

TYPE

①

CLAYEY SILT; WITH SANDSTONE FRAGMENTS (UP TO 1/2" DIAMETER). MEDIUM BROWN, SLIGHTLY STIFF.

②

SILTY SAND; WITH SANDSTONE FRAGMENTS (UP TO 2" DIAMETER), LIGHT BROWN, NOT STRATIFIED, APPARENTLY WEATHERED SLOPE WASH.

③

SANDSTONE; YELLOW TO GRAY WITH Fe STAIN, FINE TO MEDIUM GRAINED, BEDDING 6"-10" THICK, WEATHERED TO FRAGMENTS IN UPPER 1'.

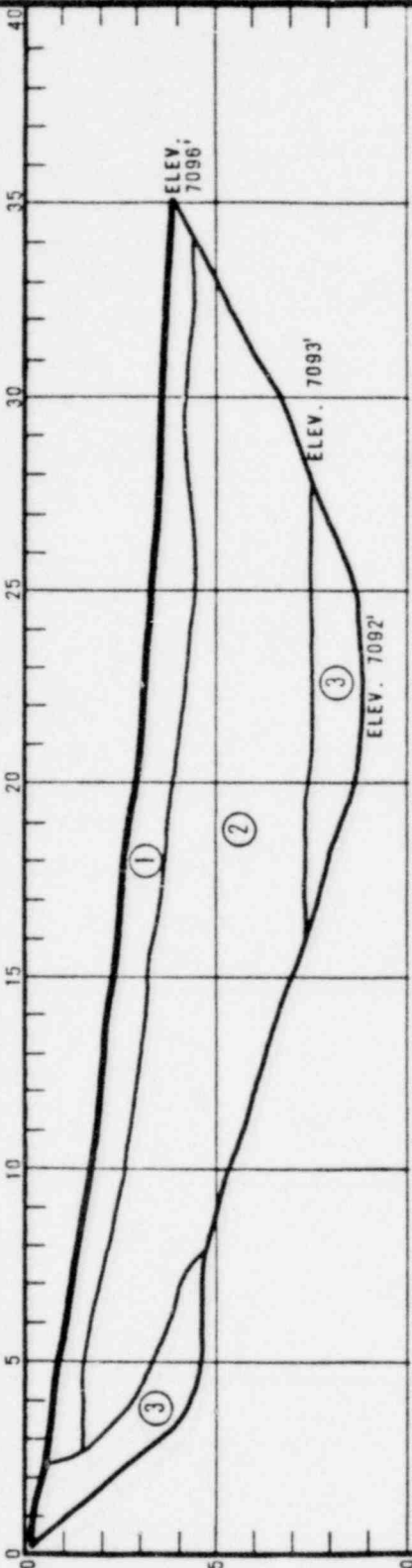
EL./DEPTH: 7100'

8/30/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, FT.

↑  
N170E  
BEARING



-BEDROCK IS DILCO COAL MEMBER

-LOGGED WEST SIDE OF TRENCH

W A WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

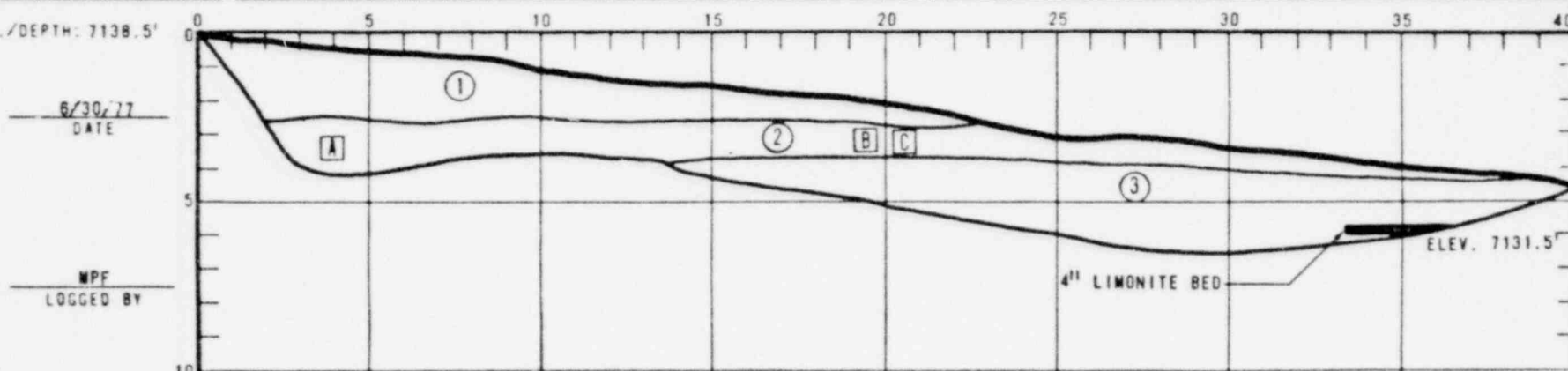
WA WAHLER  
& ASSOCIATES

TRENCH NO. WT-25  
Sheet 1 of 1

LOCATION: TIP OF TOPOGRAPHIC RIDGE, UPSLOPE OF WPC-13 ON CHANNEL LEG OF DAM AXIS 6A  
NOTES: \_\_\_\_\_

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SILTSTONE; TAN WITH Fe STAIN, THIN BEDDED (1/8" - 2"), BRITTLE, CONTAINS BROWN SHALE PARTINGS.	A	DUE E	3°N	BEDDING
	②	SHALE; GRAY TO BLACK, THIN BEDDED (UP TO 1"), BRITTLE, CONTAINS TWO SETS OF VERTICAL JOINTS.	B	DUE E	90°	PRIMARY JOINTS (6" - 1' SPACING).
	③	SILTSTONE; GRAY TO PURPLE, 1" - 3" BEDDING, SLIGHTLY SANDY, SHOWS Fe STAIN ALONG BEDDING.	C	N23°E	90°	SECONDARY JOINTS (1' - 2' SPACING).

EL./DEPTH: 7138.5'



6/30/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, 11.

-BEDROCK IS DILCO COAL MEMBER  
-LOGGED WEST SIDE OF TRENCH

N52°E  
BEARING

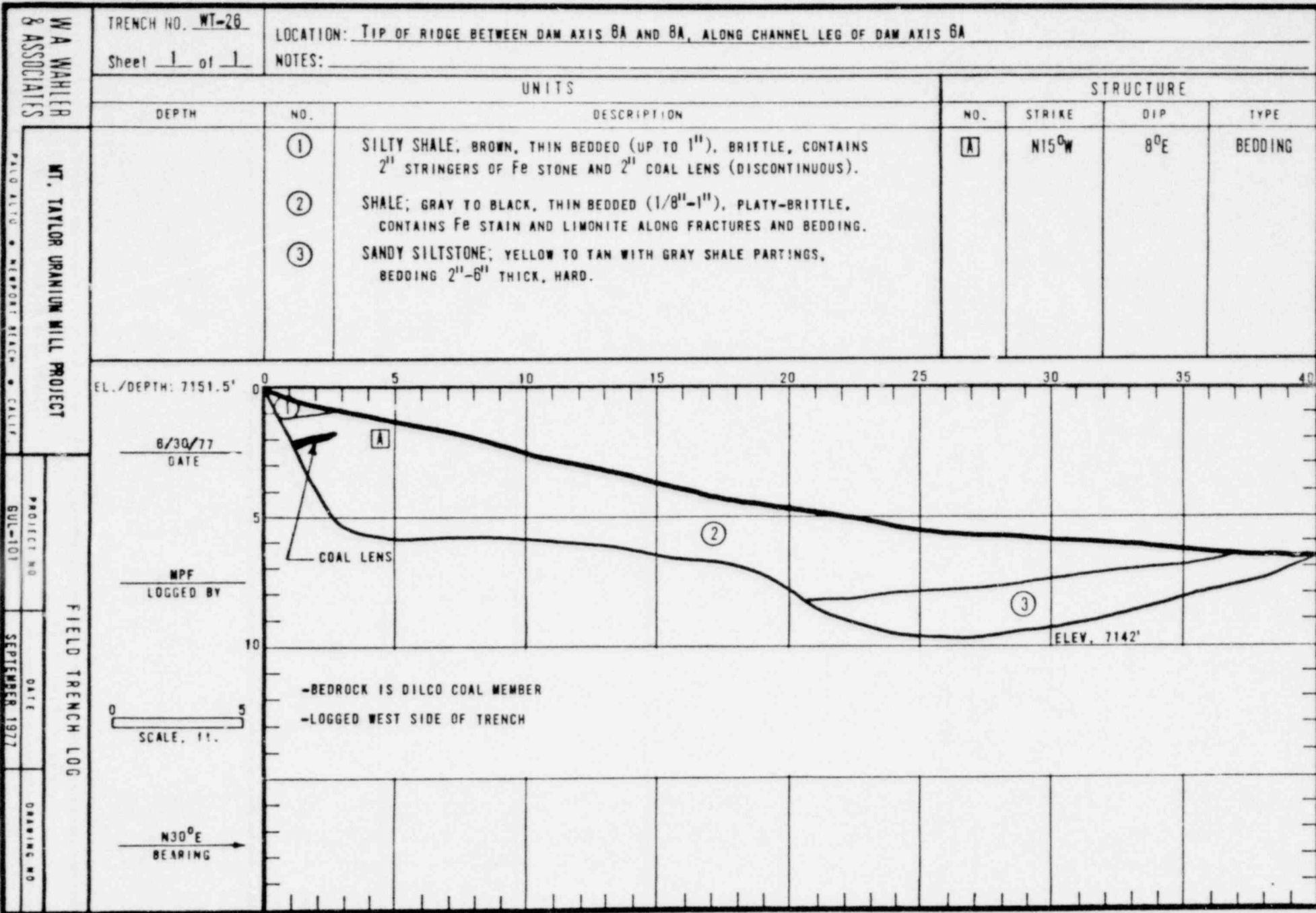
MT. TAYLOR URANIUM MILL PROJECT  
PAID ACTU. • REPORT GRACE • CALL

PROJECT NO.  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO.

FIELD TRENCH LOG



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PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

F. 3/77

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PAID ATTD • REPORT STICK • CALIF

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

TRENCH NO. WT-27

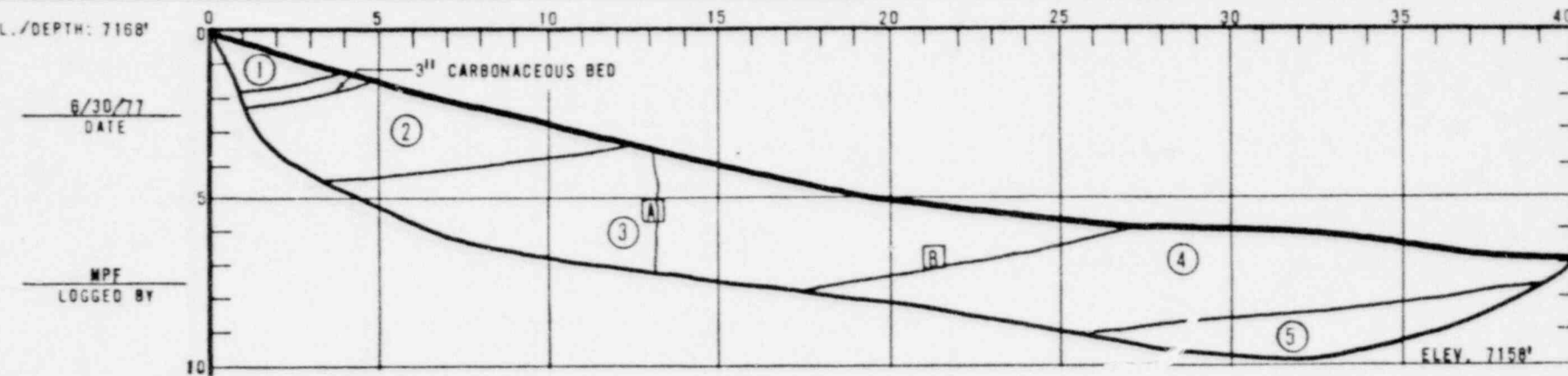
Sheet 1 of 1

LOCATION: CREST OF RIDGE BETWEEN DAM AXIS 6A AND 6A, ALONG CHANNEL LEG OF DAM AXIS 6A

NOTES: \_\_\_\_\_

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SILTSTONE; GRAY WITH Fe STAIN, THIN BEDDED (1/4"-1"). BRITTLE, CONTAINS Fe ALONG BEDDING.	[A]	S20°W	90°	JOINT
	②	SHALE; GRAY TO BLACK, THIN BEDDED (UP TO 1/2"). FISSILE, CONTAINS CARBONACEOUS BED WITH LIMONITE STAIN.	[B]	N54°W	6°S	BEDDING
	③	SANDY SILTSTONE; WHITE TO TAN, FINE TO MEDIUM SAND, 2"-8" BEDS.				
	④	SHALE; WITH THIN (3") SILTSTONE BEDS, LIGHT TO DARK GRAY, THIN BEDDED (UP TO 1/2"), CONTAINS Fe STAIN ALONG BEDDING, FISSILE, (TONGUE SHAPED BED).				
	⑤	SILTY SANDSTONE; YELLOW TO TAN WITH Fe STAIN, MASSIVE, HARD.				

EL./DEPTH: 7168'



6/30/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, FT.

-BEDROCK IS DILCO COAL MEMBER  
-LOGGED WEST SIDE OF TRENCH

N28°W  
BEARING

FIELD TRENCH LOG



W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

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PROJECT NO. GUL-101

DATE SEPTEMBER 1977

DRAWING NO.

TRENCH NO. WT-2B

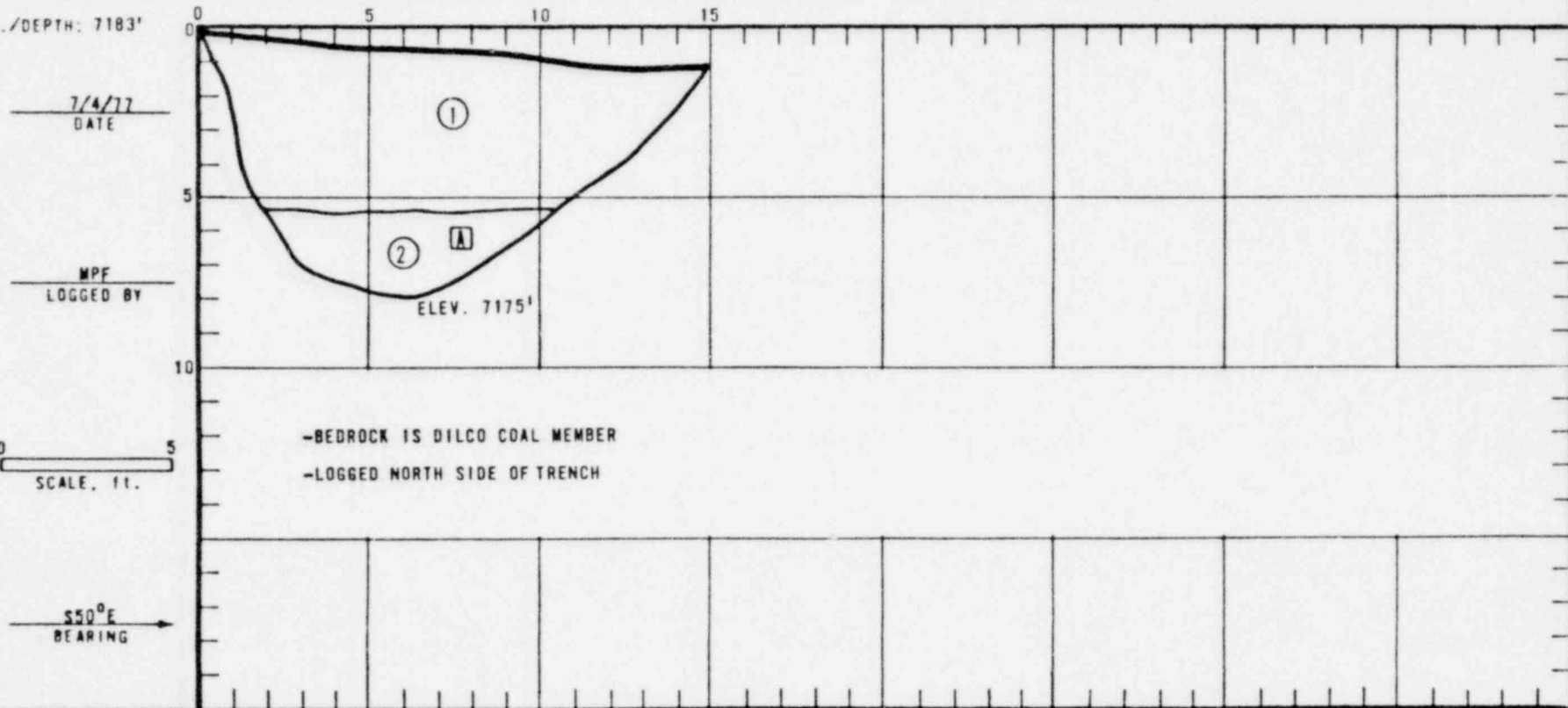
LOCATION: WEST LEG OF DAM AXIS 6A

Sheet 1 of 1

NOTES:

		UNITS		STRUCTURE			
DEPTH	NO.	DESCRIPTION		NO.	STRIKE	DIP	TYPE
	①	SILTY SAND; LIGHT BROWN, LOOSE, CONTAINS LENSES OF SILTSTONE FRAGMENTS UP TO 1/2" DIAMETER, APPARENTLY WEATHERED SLOPEWASH.		A	N20°W	3°E	BEDDING
	②	SILTY SANDSTONE; YELLOW-TAN-WHITE BANDED COLOR, POORLY CEMENTED, 1/2"-2" BEDDING, CROSS BEDDED, UPPER 6" SEVERELY WEATHERED.					

EL./DEPTH: 7183'



-BEDROCK IS DILCO COAL MEMBER  
-LOGGED NORTH SIDE OF TRENCH

0 5  
SCALE, ft.

S50°E  
BEARING

7/4/77  
DATE

MPF  
LOGGED BY

FIELD TRENCH LOG

F. 3/77

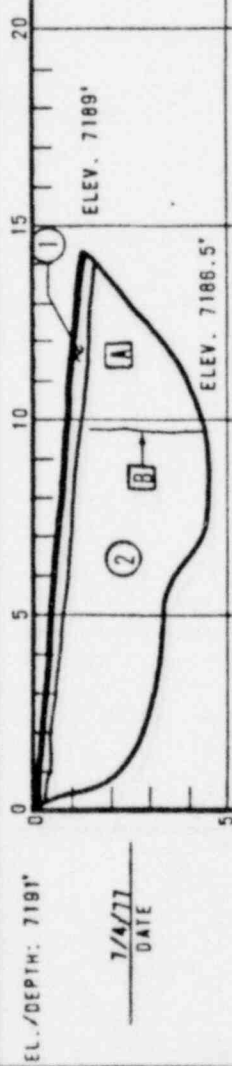
TRENCH NO. MT-29

Sheet 1 of 1

LOCATION: WEST LEG OF DAM AXIS 6A.

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAYEY SILT WITH SILTSTONE AND FB-STONE FLOAT FRAGMENTS UP TO 2" DIAMETER, LIGHT BROWN, SLIGHTLY PLASTIC, LOOSE, 6" THICK. INTERBEDDED SANDY SILTSTONE AND SHALE; PURPLE-TAN-YELLOW BANDED COLOR, THIN BEDDED (1/4"-1-1/2"), WAVY BEDDING, BRITTLE. CONTAINS FB-STAIN AND YELLOW SILT ALONG BEDDING.	A	N55°W	8°N	BEDDING
	②		B	N28°E N78°E	90° ---	PRIMARY SECONDARY



-BEDROCK IS DILCO COAL MEMBER  
-LOGGED EAST SIDE OF TRENCH

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FIELD TRENCH LOG

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PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

F. 3/77

TRENCH NO. <u>WT-30</u>		LOCATION: <u>WEST LEG OF DAM AXIS 6A</u>	
Sheet <u>1</u> of <u>1</u>		NOTES:	
DEPTH		UNITS	
NO.	DESCRIPTION	NO.	STRUCTURE
		STRIKE	DIP
			TYPE
①	CLAYEY SILTY SAND; LIGHT BROWN, STIFF TO HARD, SLIGHTLY PLASTIC. SHOWS CALICHE MOTTLES BELOW 2' DEPTH.		
②	WEATHERED SILTY SANDSTONE; YELLOW-TAN-WHITE BANDED COLOR, BEDDING NOT VISIBLE. UPPER 6" EXTREMELY WEATHERED.		

EL./DEPTH: 7194'

7/4/77  
DATE

MPF  
LOGGED BY

0 5 10  
SCALE, FT.

588° E  
BEARING

-BEDROCK IS DILCO COAL MEMBER  
-LOGGED NORTH SIDE OF TRENCH

W A WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PROJECT NO GUL-109	DATE SEPTEMBER 1977	DRAWING NO
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TRENCH NO. WT-31

LOCATION: WEST END OF DAM AXIS GA

Sheet 1 of 1

NOTES:

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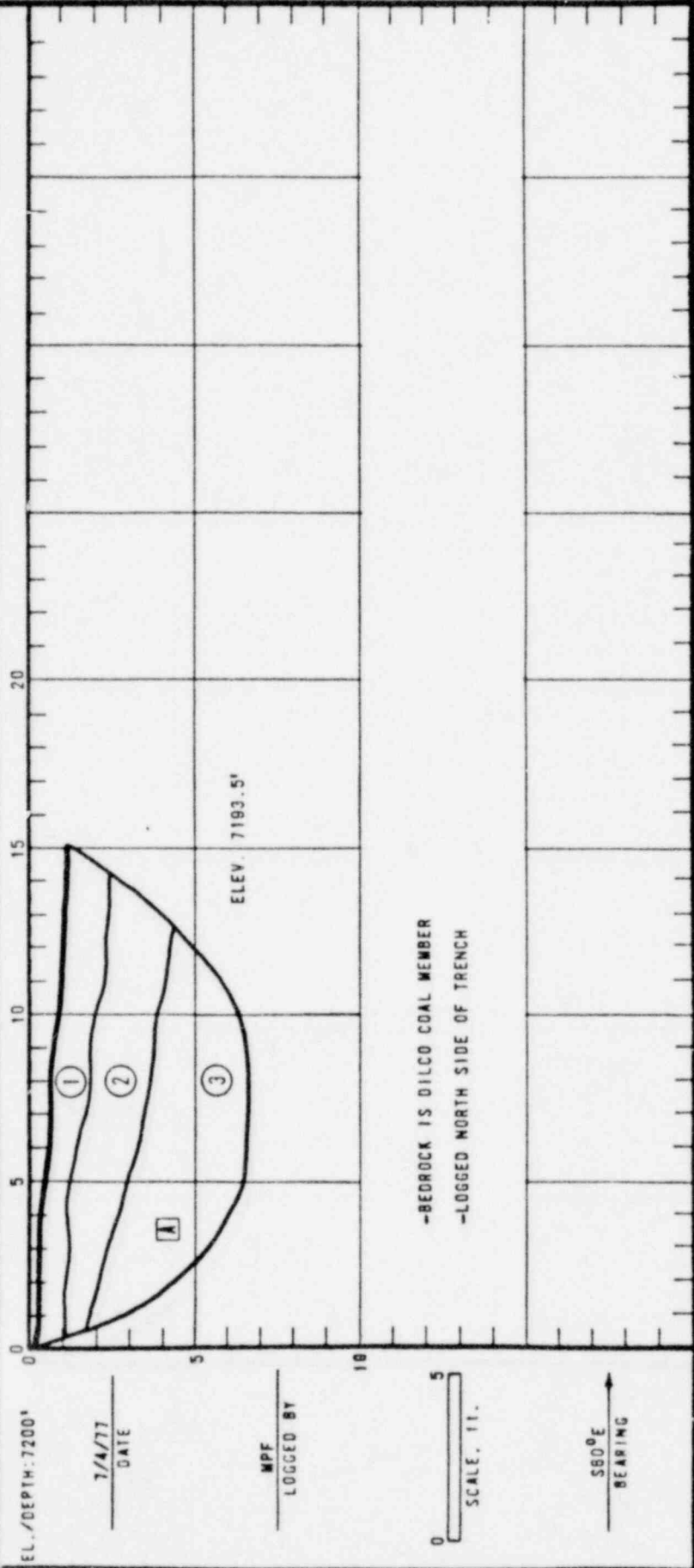
MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO GUL-101	DATE SEPTEMBER 1977	DRAWING NO
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DEPTH	UNITS			STRUCTURE		
	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAYEY SANDY SILT; LIGHT BROWN, DENSE TO STIFF, SHOWS CALICHE STAIN.	1	N38°E	10°E	BEDDING
	②	CLAY; MEDIUM BROWN TO GRAY, PLASTIC, STRATIFIED, SHOWS CALICHE STAIN, PROBABLY WEATHERED BEDROCK.				
	③	INTERBEDDED SHALE AND SANDY SILTSTONE; SHALE, GRAY TO PURPLE, BRITTLE, LAYERS UP TO 6" THICK, THIN BEDDED, CONTAINS SAND-SIZE GYPSUM CRYSTALS ALONG BEDDING; SANDY SILTSTONE, TAN TO YELLOW, BEDS 2"-6" THICK.				



F. 3/77

W. A. WAHLER & ASSOCIATES

TRENCH NO. WT-32

LOCATION: NORTH LEG OF DAM AXIS 6A

Sheet 1 of 1

NOTES: \_\_\_\_\_

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
0-8.5	①	SILTY SAND TO SANDY SILT; VERY LITTLE FINES, FIRM, SLIGHTLY POROUS, DRY FROM 0-5.5', DAMP TO WET FROM 5.5'-8.5'.				
6.5-8.5	②	SHALE; WELL WEATHERED, GRAY WITH Fe STAINING, CARBONACEOUS, THINLY BEDDED, LOW DIPPING, DAMP.				
8.5-10.0	③	SANDSTONE; WEATHERED, FRACTURED, BUFF, Fe-STAINED.				

PAID BY: MT. TAYLOR URANIUM MILL PROJECT

EL./DEPTH:

0 5 10 15

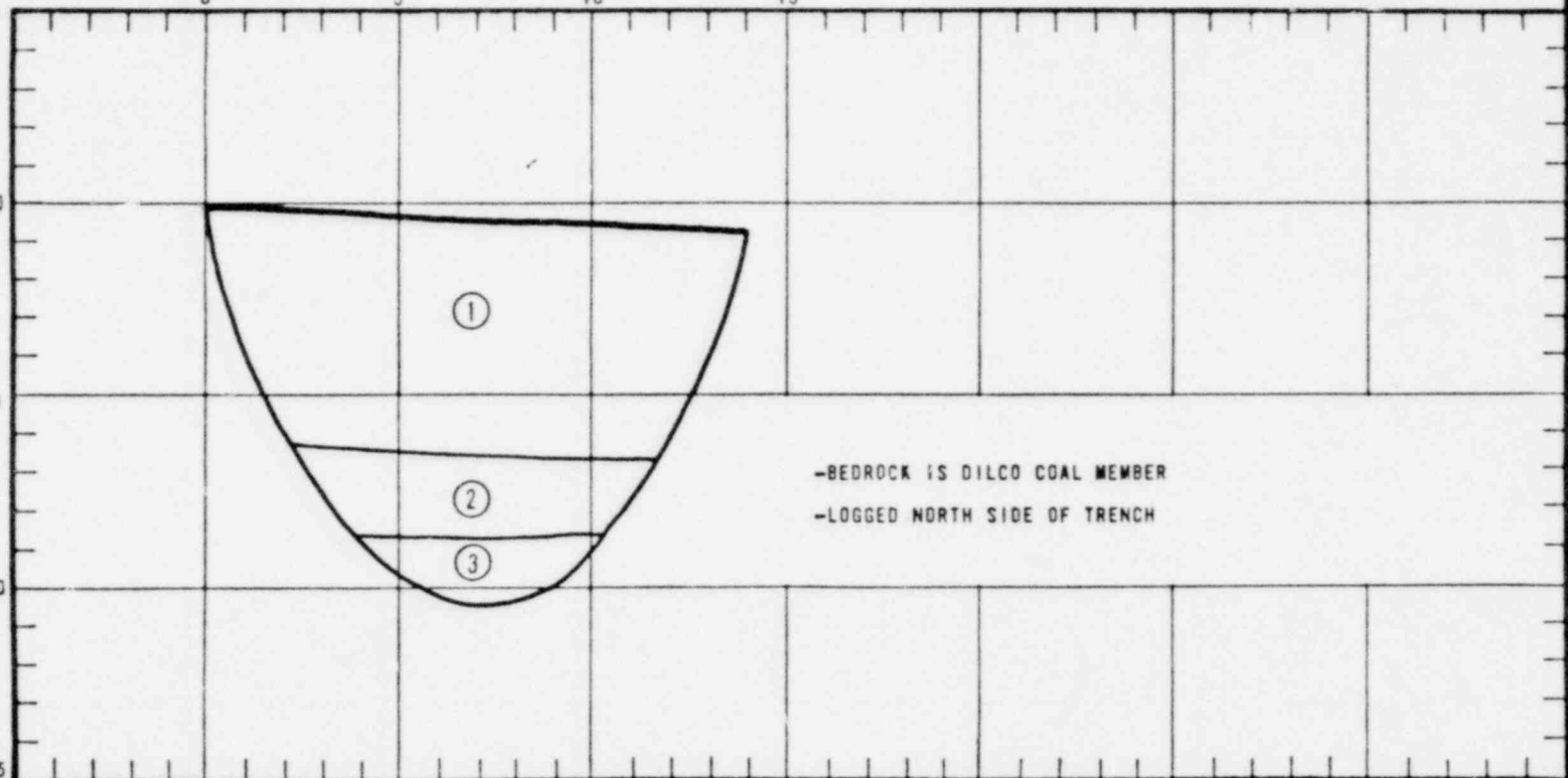
8/29/77  
DATE

7128' 0

ASB  
LOGGED BY

0 5  
SCALE, FT.

N85°E  
BEARING



-BEDROCK IS DILCO COAL MEMBER  
-LOGGED NORTH SIDE OF TRENCH

PROJECT NO. GUL-108 DATE SEPTEMBER 1977 DRAWING NO.

FIELD TRENCH LOG

F. 3/77

W A WAHLER  
& ASSOCIATES

TRENCH NO. WT-33

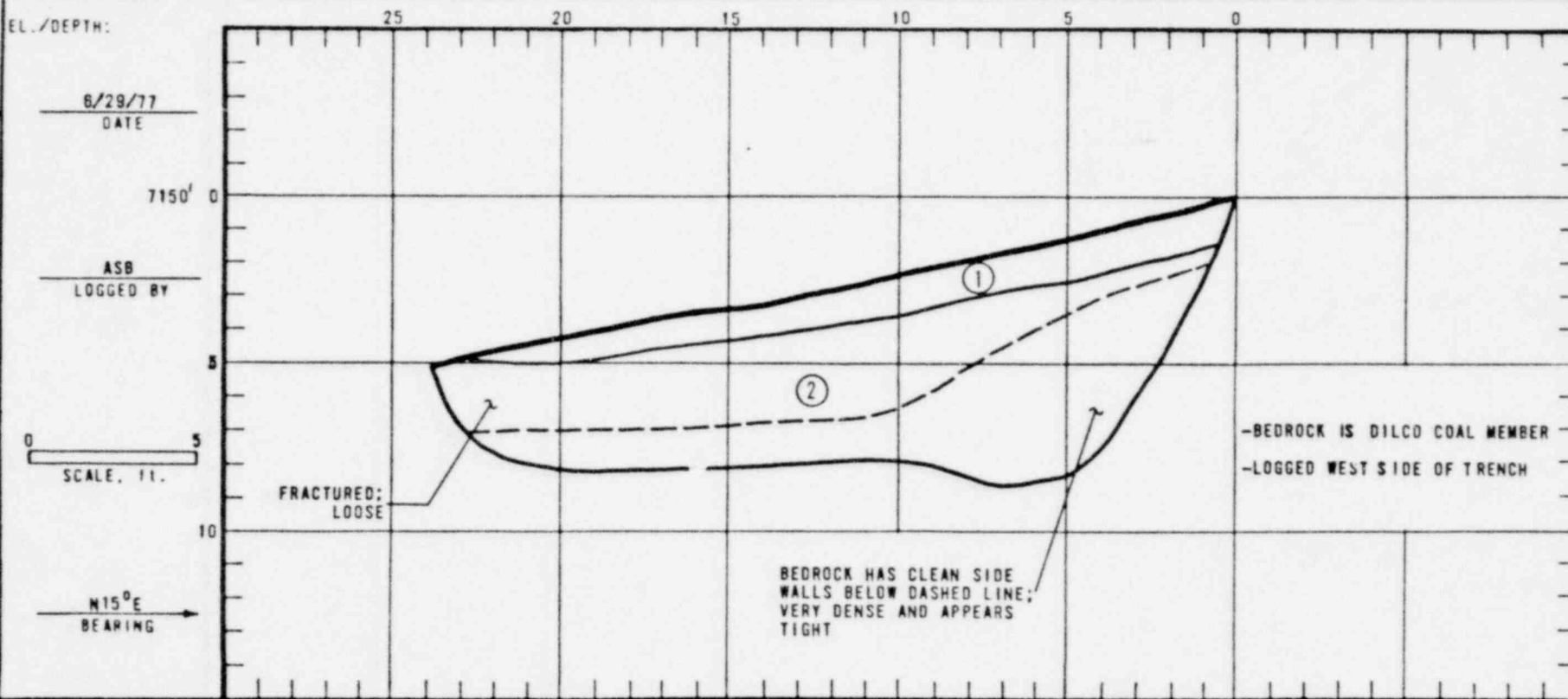
LOCATION: POND 6A, NORTH LEG

Sheet 1 of 1

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SLOPE DEBRIS; SANDY GRAVEL.				
	②	SHALE, SILTSTONE AND FINE SANDSTONE; THINLY BEDDED, INTERBEDDED, BROWNISH GRAY, CARBONACEOUS PARTING, Fe STAINING, FRACTURED AND LOOSE TO DEPTH OF 5'.  FRACTURED: LOOSE	A	N30°W	4°NE	BEDDING

EL./DEPTH:



PROJECT NO. GUL-101

DATE

SEPTEMBER 1977

DRAWING NO.

WT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

W A WAHLER  
8 ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO. GUL-101  
DATE SEPTEMBER 1977  
DRAWING NO.

FIELD TRENCH LOG

TRENCH NO. WT-34

LOCATION: NORTH LEG OF DAM AXIS 6A

Sheet 1 of 1

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
0-1.5	①	SILTSTONE; GRAY, THINLY BEDDED, YELLOW SULFER (?) AND CARBONACEOUS PARTINGS, Fe STAINING, FRACTURED, HORIZONTAL BEDDING.				
1.5	②	COAL SEAM; 8"-10" THICK, FRIABLE.				
	③	SANDSTONE; MASSIVE, BUFF, HARD, Fe STAINED, HARD EXCAVATION, DILCO COAL MEMBER.				

EL./DEPTH:

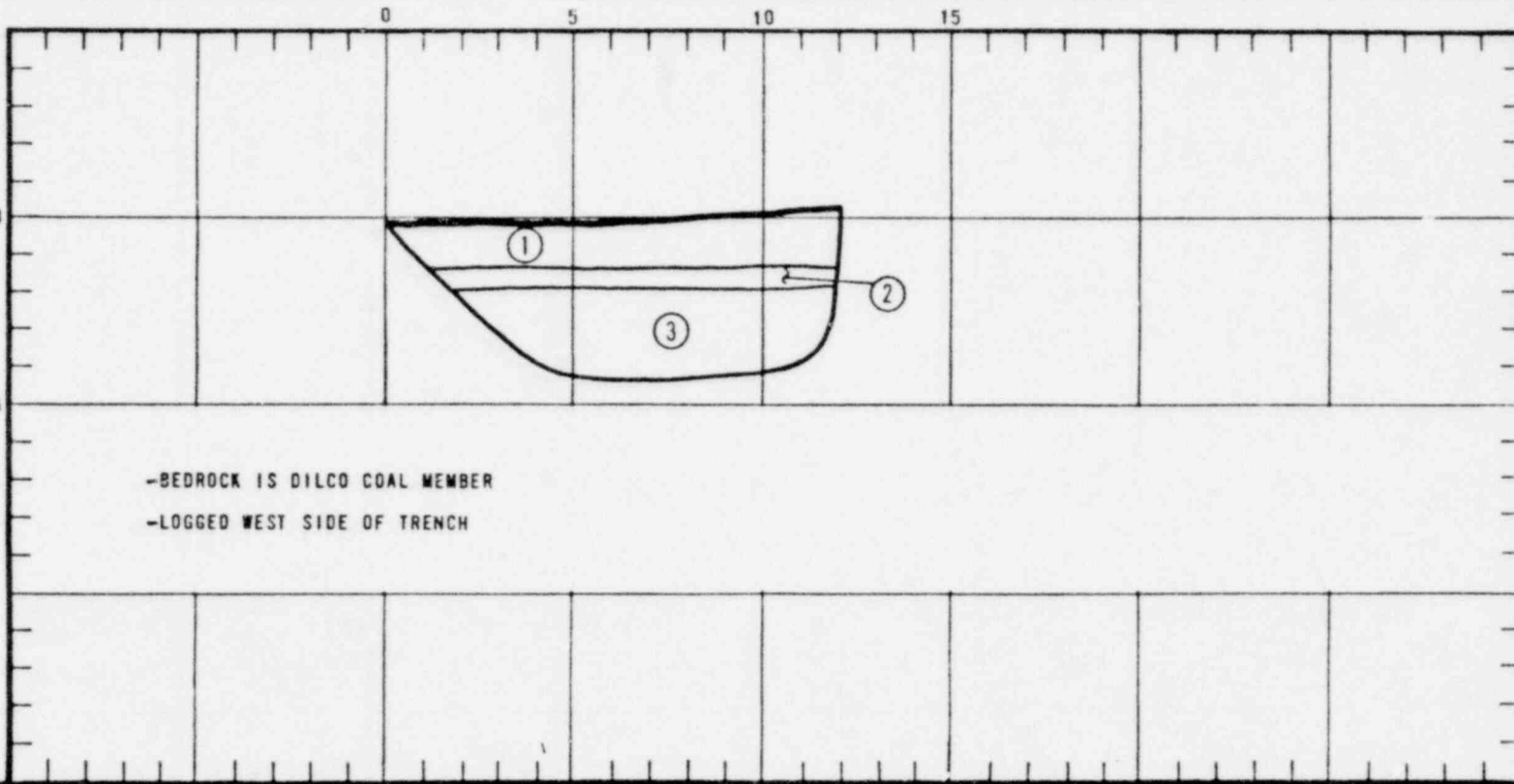
8/29/77  
DATE

7165'

ASB  
LOGGED BY

0 5  
SCALE, FT.

N5°E  
BEARING



-BEDROCK IS DILCO COAL MEMBER

-LOGGED WEST SIDE OF TRENCH

F. 3/77

TRENCH NO. WT-35

Sheet 1 of 1

LOCATION: NORTH LEG OF DAM AXIS 6A

NOTES:

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MT. TAYLOR URANIUM MILL PROJECT

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FIELD TRENCH LOG

PROJECT NO

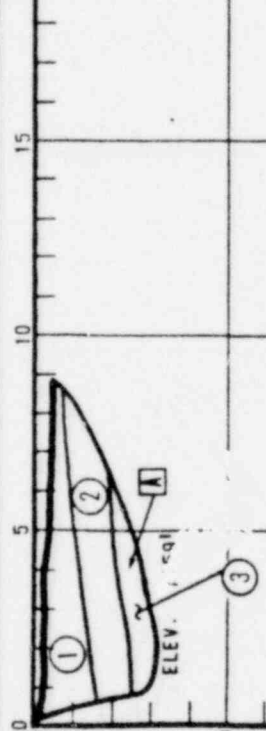
GUL-101

DATE

SEPTEMBER 1977

DRAWING NO

DEPTH	UNITS		DESCRIPTION	STRUCTURE			
	NO.	STRIKE		DIP	NO.	TYPE	
	①		CLAY ; BROWN TO GRAY, PLASTIC, SHOWS BLOCKY STRUCTURE MEDIUM STIFF (POSSIBLY WEATHERED BEDROCK ). SANDY SILTSTONE; GRAY-TAN WITH FE MOTTLES, THIN BEDDED (1/4"-1"), VERY WEATHERED AT SOIL CONTACT. SILTY SANDSTONE; TAN, MEDIUM TO FINE GRAIN, 2" TO 4" BEDDING, CONTAINS BLACK (CARBONACEOUS) PARTICLES.	A	N40°W	5°N	BEDDING
	②						
	③						



-BEDROCK IS DILCO COAL MEMBER  
-LOGGED EAST SIDE OF TRENCH

7/2/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, FT.

S12°W  
BEARING



F. 3/77

WA WAHLER  
& ASSOCIATES

TRENCH NO. WT-36

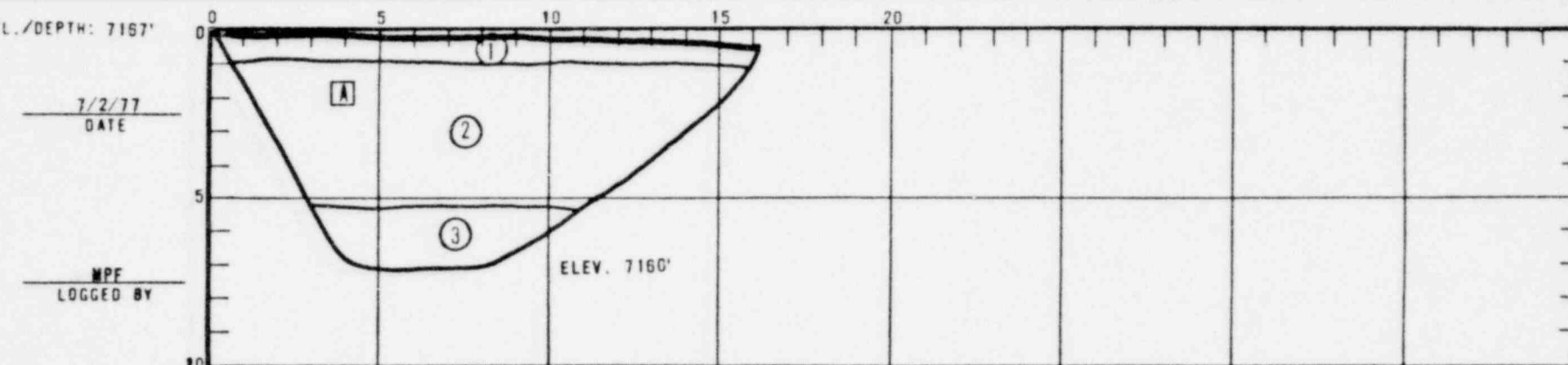
LOCATION: NORTH LEG OF DAM AXIS 6A

Sheet 1 of 1

NOTES:

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SANDY SILT; LIGHT BROWN, CONTAINS SILTSTONE AND Fe-STONE FRAGMENTS (1/8"-3/4" DIAMETER).	A	N11°E	2°S	BEDDING
	②	SANDY SILT; PURPLE-TAN WITH Fe STAIN, THIN BEDDED (1/4"-1"), WAVY BEDDING, CONTAINS GYPSUM CRYTALS AND Fe STAIN ALONG BEDDING.				
	③	SHALE; PURPLE TO GRAY, THIN BEDDED (1/8"-1"), BRITTLE, CONTAINS YELLOW SILT ALONG BEDDING.				

EL./DEPTH: 7167'



7/2/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, FT.

-BEDROCK IS DILCO COAL MEMBER

-LOGGED EAST SIDE OF TRENCH

S7°W  
BEARING

PAID ALSO • REPORT BEACH • CALIF  
MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO. GUL-101  
DATE SEPTEMBER 1977  
DRAWING NO.

FIELD TRENCH LOG

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& ASSOCIATES

TRENCH NO. WT-37

LOCATION: NORTH LEG OF DAM AXIS 6A

Sheet 1 of 1

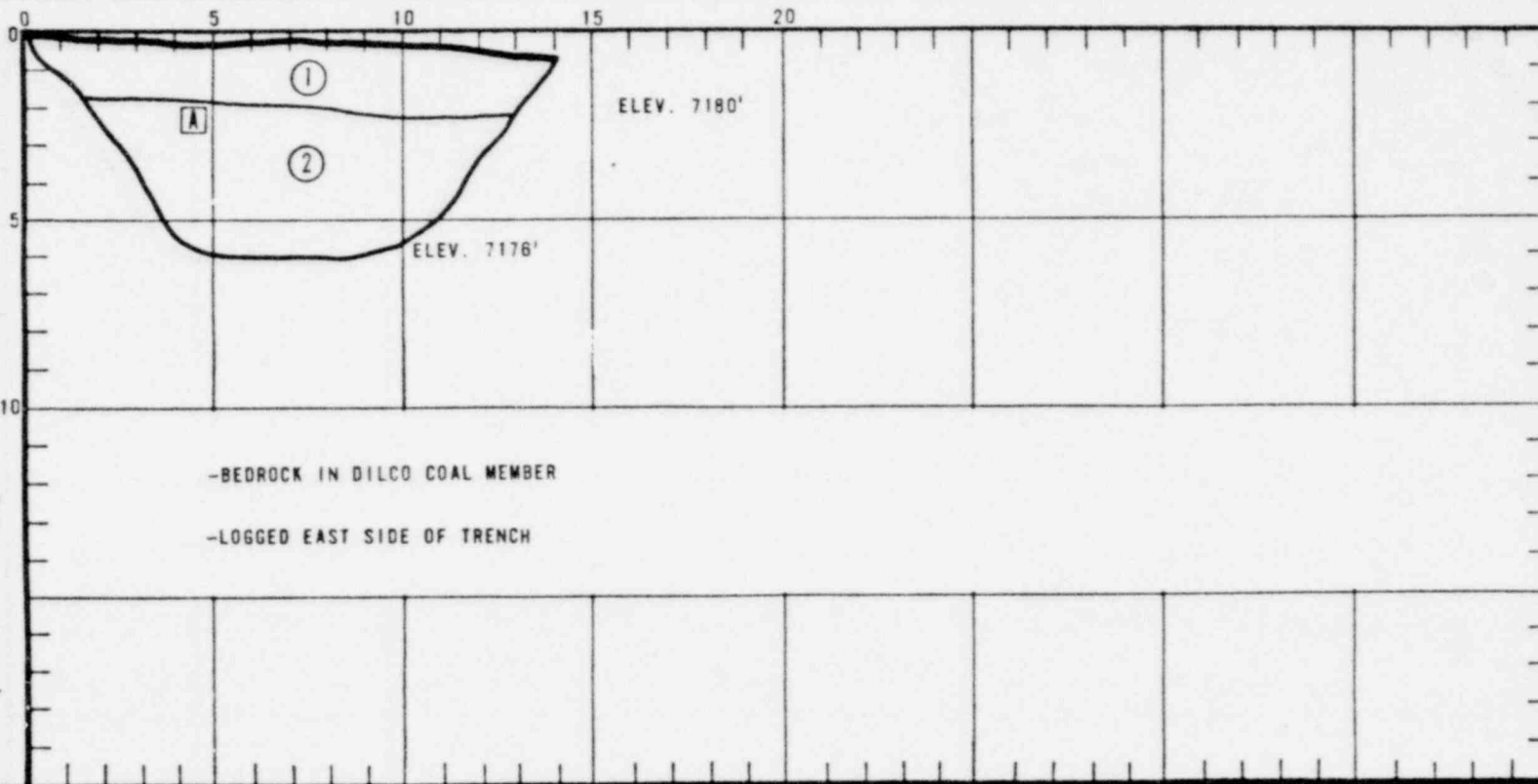
NOTES:

UNITS

STRUCTURE

DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAYEY SILT; LIGHT BROWN, SLIGHTLY PLASTIC DENSE, CONTAINS LIGHT BROWN SILTSTONE FRAGMENTS (UP TO 1/2" DIAMETER).	A	N33°E	2°S	BEDDING
	②	SANDY SILTSTONE WITH THIN INTERBEDDED SHALE; PURPLE-TAN-YELLOW BANDED COLOR, THIN BEDDED (1/8"-2"), WAVY BEDDING, CONTAINS YELLOW SILT AND Fe STAIN ALONG BEDDING.				

EL./DEPTH: 7182'



7/3/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, FT.

S3°E  
BEARING

-BEDROCK IN DILCO COAL MEMBER

-LOGGED EAST SIDE OF TRENCH

MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PAID \$110 • REPORT \$100 • \$100

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

F. 3/77

TRENCH NO. WI-33

LOCATION: NORTH LEG OF DAM AXIS 6 A

Sheet 1 of 1

NOTES:

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MT. TAYLOR URANIUM MILL PROJECT

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FIELD TRENCH LOG

PROJECT NO

GUL-101

DATE

SEPTEMBER 1977

DRAWING NO

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SILT; LIGHT BROWN, SLIGHTLY PLASTIC, CONTAINS SILTSTONE FRAGMENTS UP TO 3" DIAMETER (WEATHERED MULATTO TONGUE).	A	N40°W	6°N	BEDDING
	②	SILTSTONE; WITH THIN INTERBEDDED WEATHERED SHALE, TAN WITH FB STAIN ALONG FRACTURES, BADLY FRACTURED ROCK, 1/4"-3" BEDDING, ABUNDANT GYPSUM CRYSTALS.				

EL./DEPTH: 7202'

10

5

0

0 5 10 15 20

① ELEV. 7200'

②

A

ELEV. 7195'

-BEDROCK IS MULATTO TONGUE

-LOGGED EAST SIDE OF TRENCH

0 5 10

SCALE, FT.

DATE 7/3/77

MPE LOGGED BY

0 5 10

SCALE, FT.

BEARING

F. 3/77

W A WAHLER  
8 ASSOCIATES

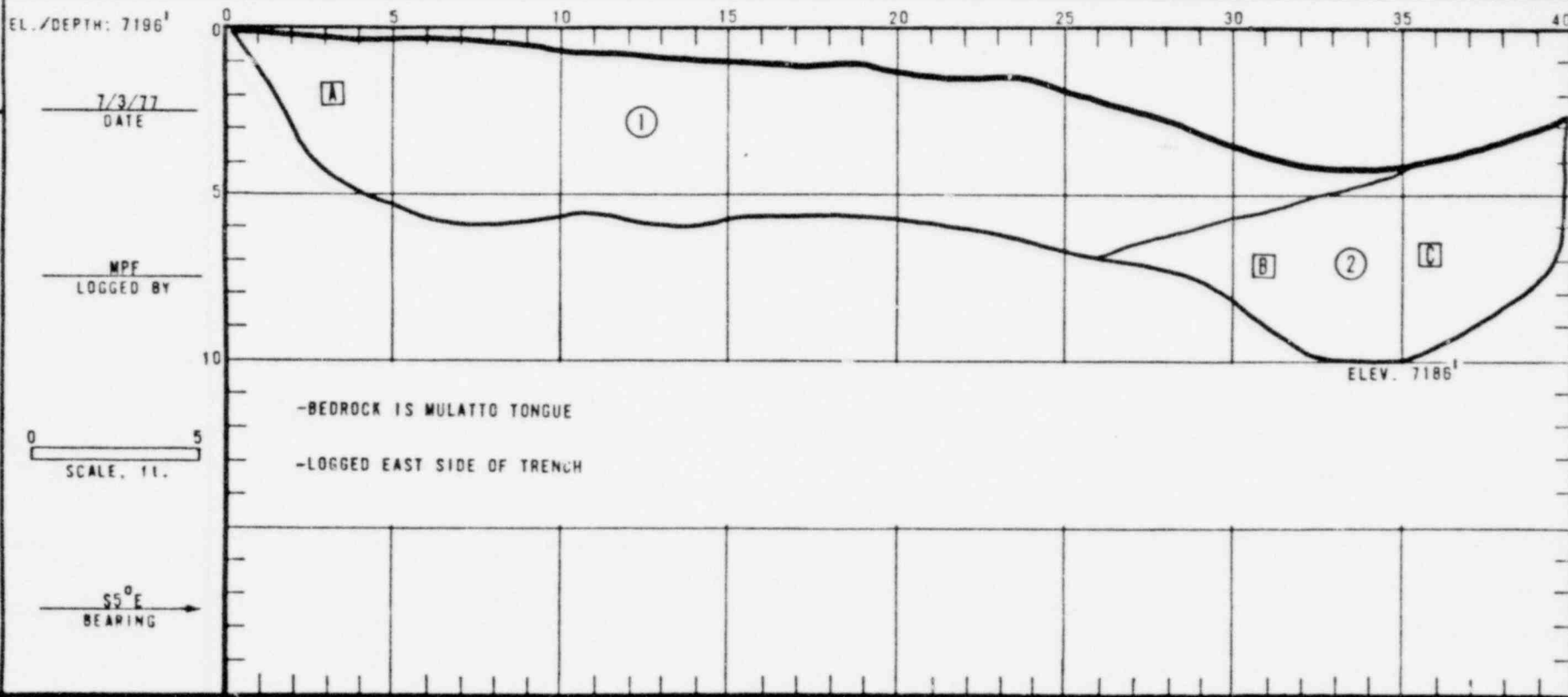
TRENCH NO. WT-39

LOCATION: WEST OF NORTH END OF DAM AXIS 6A, ALONG FAULT ZONE

Sheet 1 of 1

NOTES: \_\_\_\_\_

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SILTSTONE; WITH THIN (UP TO 1/2") INTERBEDDED WEATHERED SHALE BEDS AND GYPSUM CRYSTALS, TAN WITH Fe STAIN ALONG FRACTURES, 1/4"-3" BEDDING, BADLY FRACTURED.	A	N81°W	20°W	BEDDING
	②	SANDY SILTSTONE; WITH GYPSUM CRYSTALS (SHEETS) ALONG BEDDING, TAN, HARD, 1"-5" BEDDING, CONTAINS MICRO-FAULTS WITH GYPSUM SHEETS.	B	N81°W	21°N	BEDDING
			C	N35°-55°E	25°-30°S	MICRO-FAULT (~1/4" DIS- PLACEMENT)



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WT. TAYLOR URANIUM MILL PROJECT

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

FIELD TRENCH LOG

F. 3/77

TRENCH NO. WT-40  
 Sheet 1 of 1

LOCATION: NORTH LEG OF DAM AXIS BA  
 NOTES:

WA WAHLER & ASSOCIATES

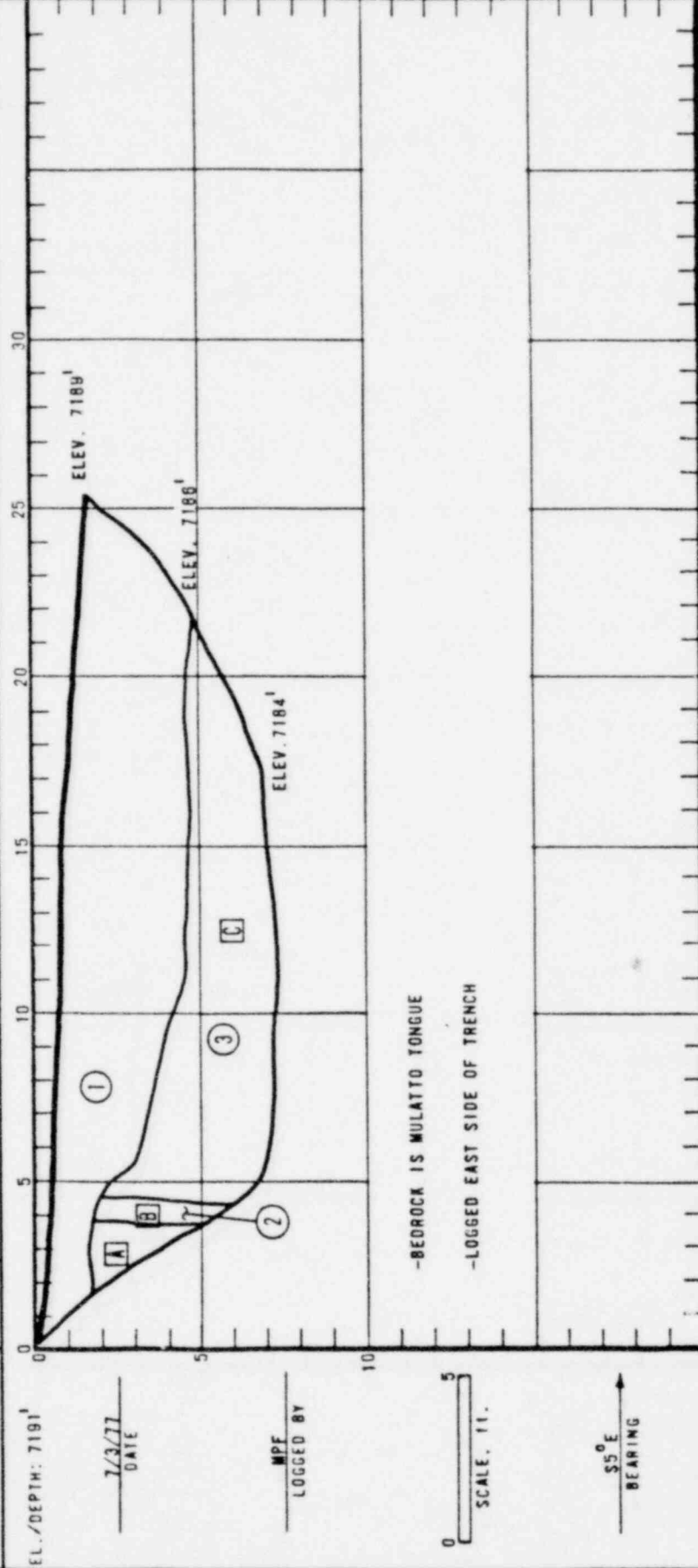
MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PAID ALTU • NEWPORT BEACH • CALIF.

PROJECT NO	DATE	DRAWING NO
6U1-101	SEPTEMBER 1977	

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SILT; LIGHT BROWN, SLIGHTLY PLASTIC. CONTAINS SILTSTONE FRAGMENTS (1/4"-1/2" DIAMETER), (WEATHERED MULATTO TONGUE).	A	N60°E	53°N	BEDDING
	②	COARSE CALCITE CRYSTALS; GRAY. DEPOSITED ALONG VERTICAL FRACTURE. CLOUDY LUSTER. VEIN 6"-12" WIDE.	B	N62°E	90°	VEIN
	③	SILTSTONE; WITH WEATHERED SHALE BEDS (UP TO 1/2" THICK), TAN. 1"-4" BEDDING. VERY FRACTURED WITH FINE GYPSUM CRYSTALS ALONG BEDDING.	C	N65°E	45°N	BEDDING



-BEDROCK IS MULATTO TONGUE  
 -LOGGED EAST SIDE OF TRENCH

F. 3/77

W.A. WAHLER  
& ASSOCIATES

TRENCH NO. WT-41

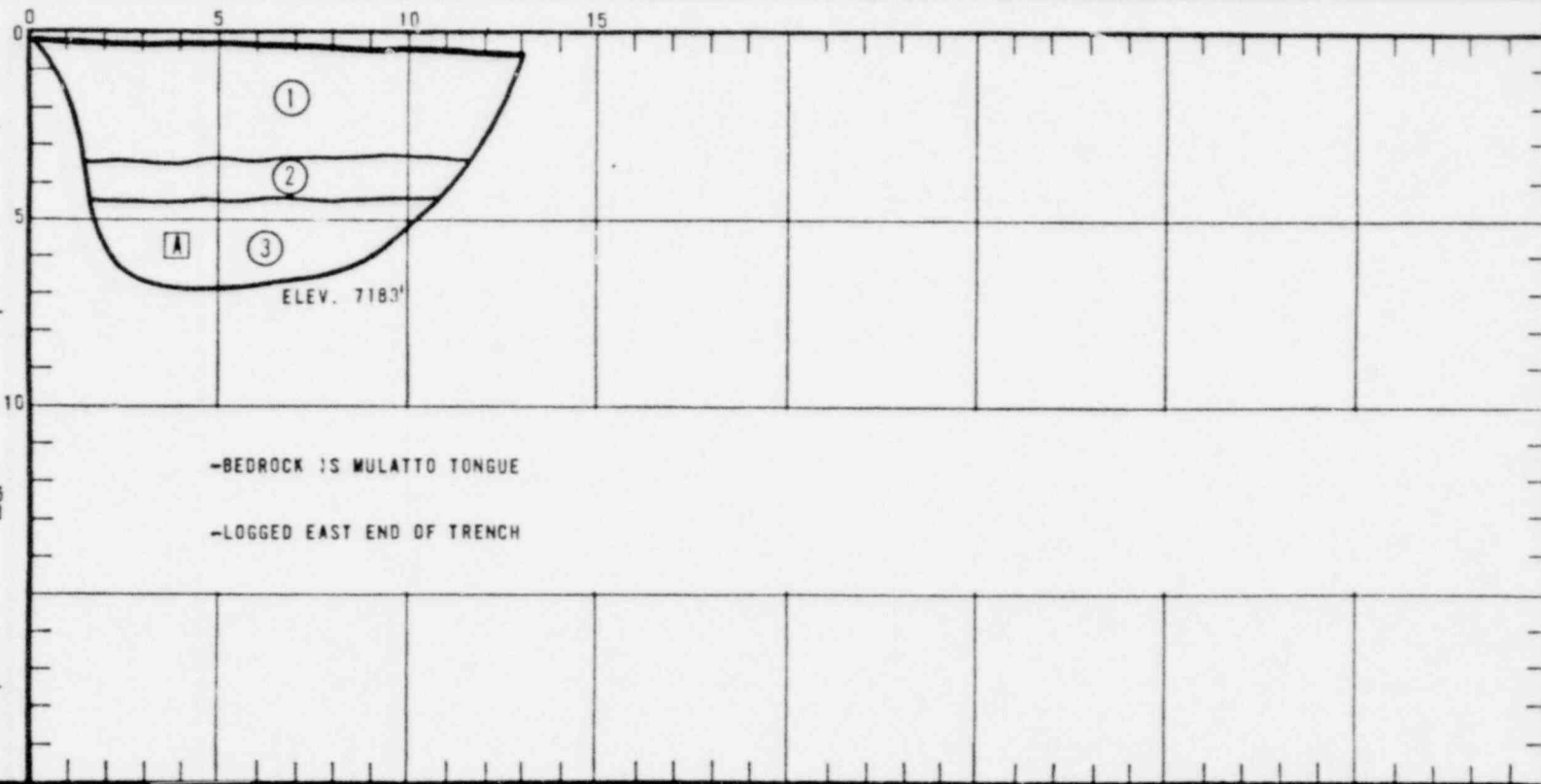
LOCATION: DOWNSLOPE OF WT-40, ON NORTH LEG OF DAM AXIS 6A.

Sheet 1 of 1

NOTES: \_\_\_\_\_

DEPTH	NO.	UNITS DESCRIPTION	STRUCTURE			
			NO.	STRIKE	DIP	TYPE
	①	SANDY SILT; LIGHT BROWN, DENSE, SLIGHTLY PLASTIC, CONTAINS FINE SAND, NOT STRATIFIED.	A	N67°E	3°N	BEDDING
	②	SILTSTONE; TAN, STIFF, CONTAINS SILTSTONE FRAGMENTS UP TO 1" DIAMETER. WEATHERED.				
	③	SILTSTONE; TAN, THIN BEDDED (1/4"-1" THICK), FRACTURED AND WEATHERED; CONTAINS SILT AND SAND SIZE GYPSUM CRYSTALS ALONG BEDDING.				

EL./DEPTH: 7190'



7/3/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, 11.

S3°E  
BEARING

PAULO ALTO • HERBERT BEACH • CALIF.

MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO

GUL-101

DATE

SEPTEMBER 1977

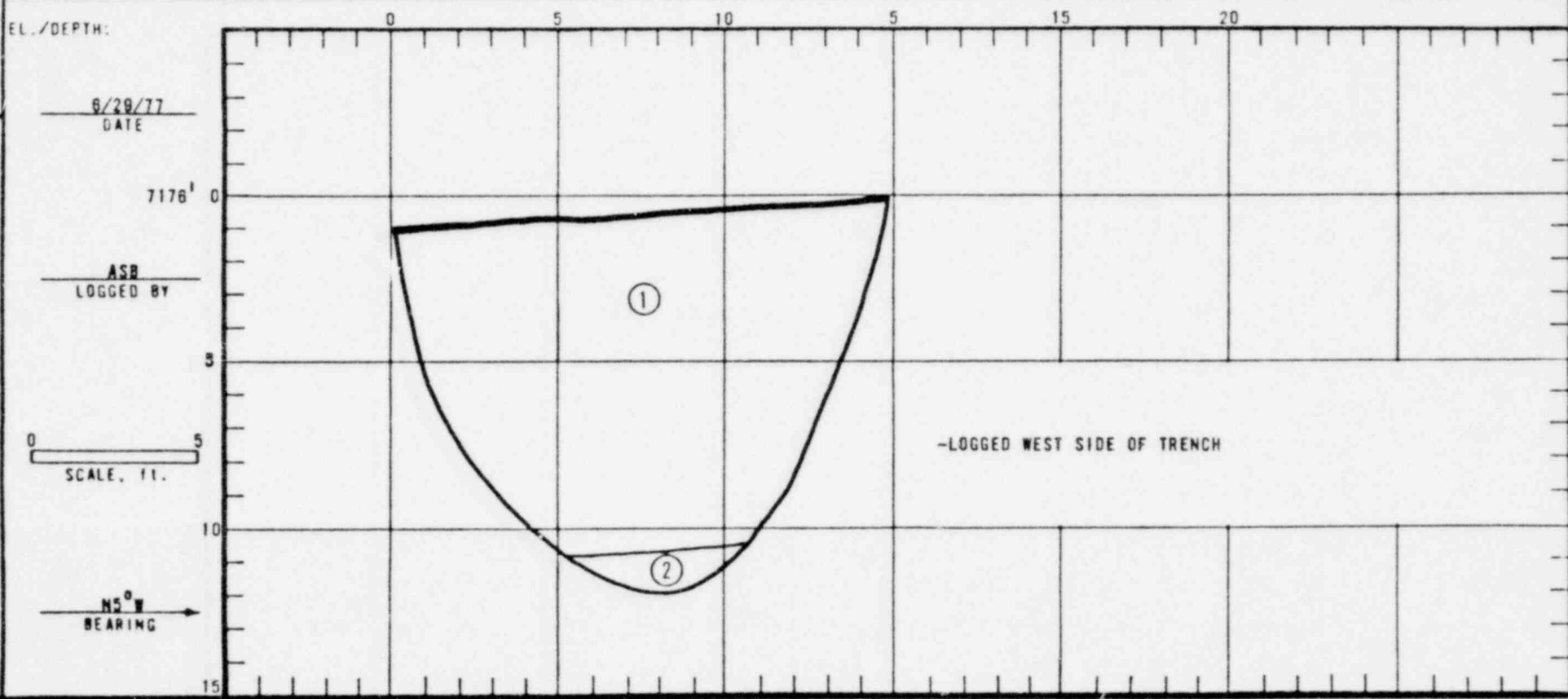
DRAWING NO

FIELD TRENCH LOG

F. 3/77

W.A. WAHLER & ASSOCIATES  
 MT. TAYLOR URANIUM MILL PROJECT  
 PALO ALTO • HERBERT BEACH • CLIFF  
 PROJECT NO. GU-101  
 DATE SEPTEMBER 1977  
 DRAWING NO.

TRENCH NO. <u>WT-42</u>		LOCATION: <u>NORTH LEG OF DAM AXIS 6A</u>				
Sheet <u>1</u> of <u>1</u>		NOTES:				
UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SILTY SAND; FINE SAND, ABOUT 5% CLAY, MODERATE BROWN, FIRM, DRY.				
	②	SANDY SILT; FINE SAND, MODERATE REDDISH BROWN, SLIGHTLY POROUS, FIRM, DAMP.				



F. 3/77

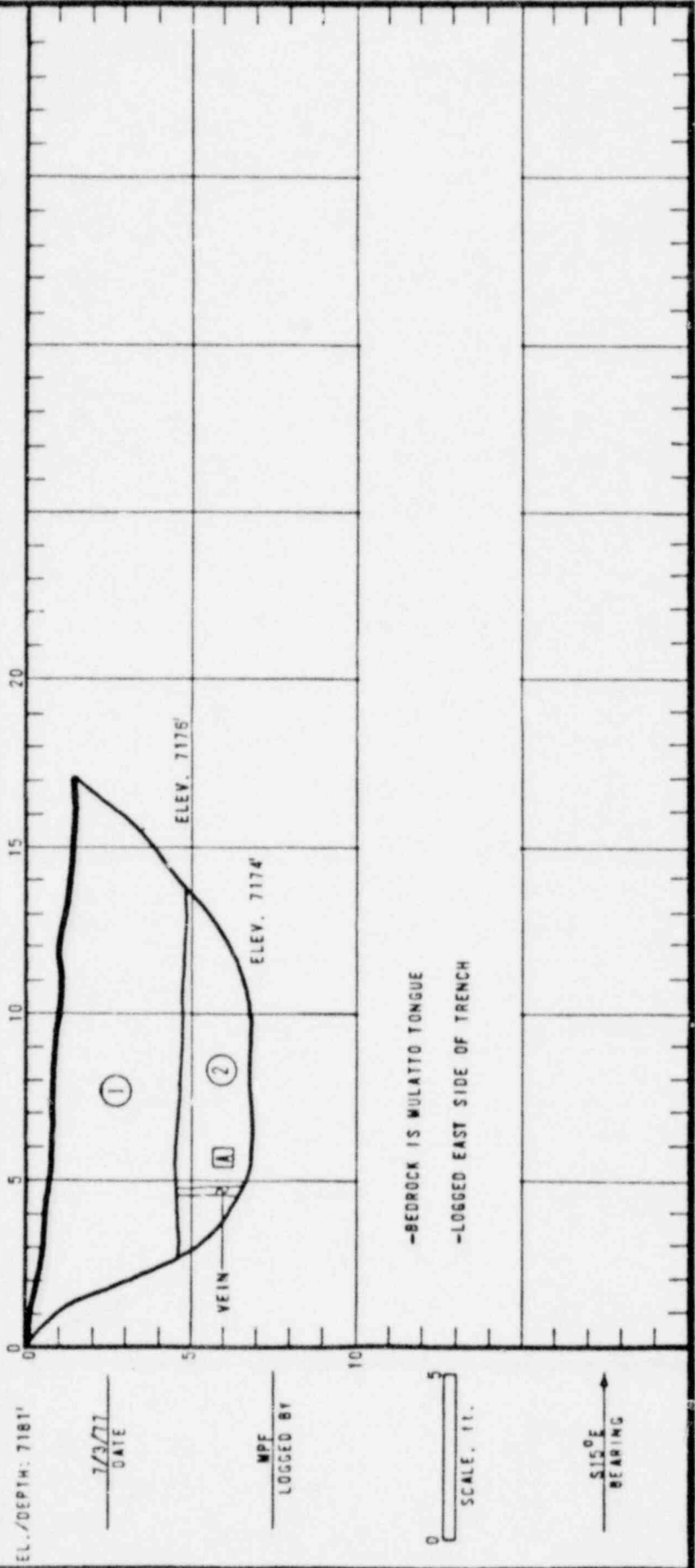
TRENCH NO. WT-43

Sheet 1 of 1

LOCATION: WEST SIDE OF NORTH LEG OF DAM AXIS 6A.

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAYEY SILT; LIGHT BROWN, SLIGHTLY PLASTIC, CONTAINS SILTSTONE FRAGMENTS UP TO 1" DIAMETER. SANDY SILTSTONE; TAN, CANNOT DISTINGUISH BEDDING, WEAK AND FRIABLE, WEATHERED, CONTAINS VEIN 6" WIDE.	①	DUE E	90°	VEIN
	②					



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FIELD TRENCH LOG

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PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO



F. 3/77

TRENCH NO. MT-44

Sheet 1 of 1

LOCATION: WEST SIDE OF NORTH LEG OF DAM AXIS 6A

NOTES:

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PALO ALTO • NEWPORT BEACH • CALIF

FIELD TRENCH LOG

PROJECT NO

6UL-101

DATE

SEPTEMBER 1977

DRAWING NO

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SILTY SAND; MODERATE BROWN, FINE SAND.				
	②	SAPROLITE; WEATHERED SANDSTONE AND SILTSTONE FRAGMENTS IN LIGHT YELLOWISH BROWN SILTY SAND.				
	③	CLAYSTONE; YELLOWISH BROWN, GYPSUM PARTINGS ALONG BEDDING AND FRACTURE PLANES, THINLY BEDDED. SIDES OF TRENCH SMOOTH. APPEARS LIGHT. DIPS TO N ABOUT 30°.				

EL./DEPTH: 7194'

8/29/77  
DATE

ASB  
LOGGED BY

0 5 10  
SCALE, FT.

S15°E  
BEARING

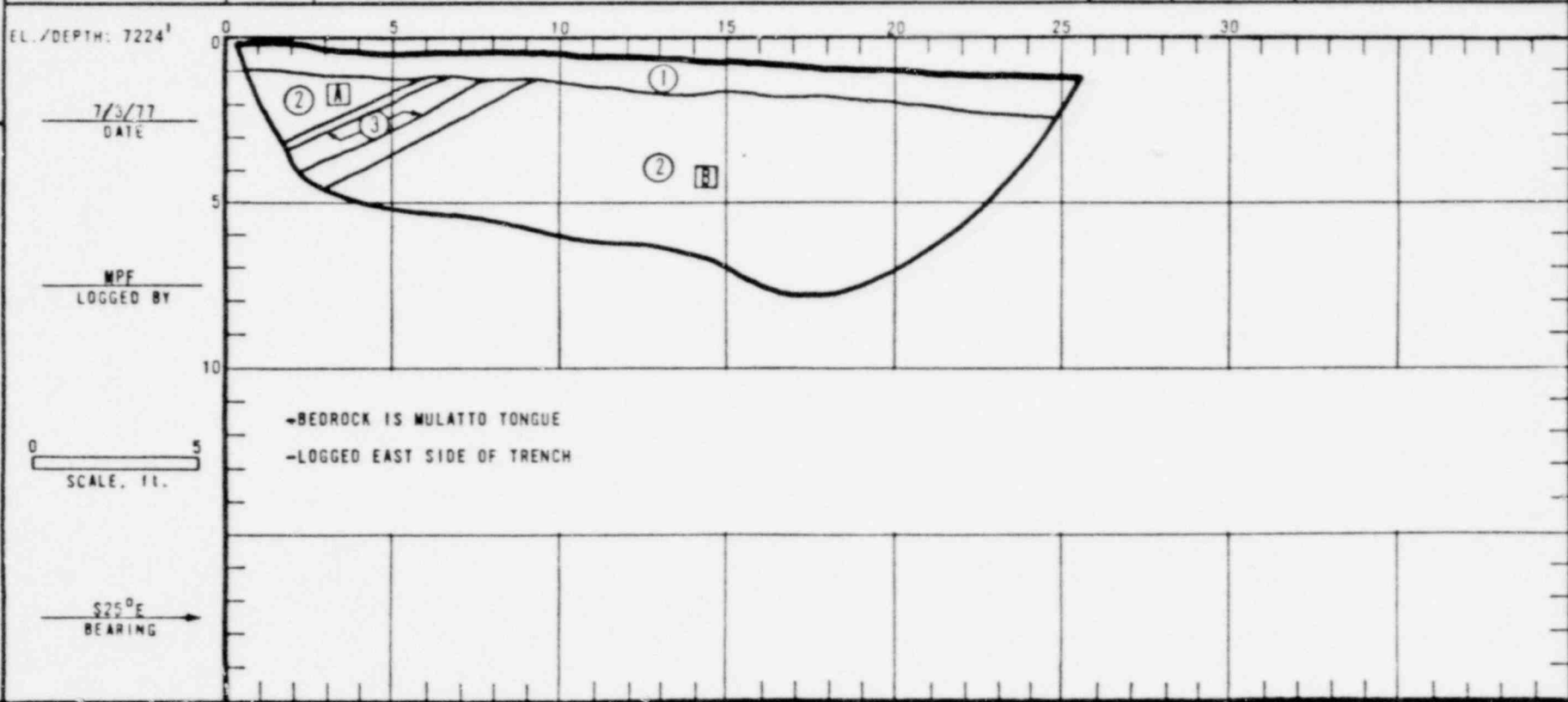
-BEDROCK PROBABLY IS MULATTO TONGUE  
-LOGGED EAST SIDE OF TRENCH

F. 3/77

W A WAHLER & ASSOCIATES  
 TRENCH NO. WT-45 LOCATION: WEST OF NORTH LEG OF AXIS 6A  
 Sheet 1 of 1 NOTES: \_\_\_\_\_

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAYEY SILT; LIGHT BROWN, SLIGHTLY STICKY, CONTAINS SILTSTONE FRAGMENTS UP TO 2" DIAMETER, (WEATHERED Kmm).	A	N85°E	80°N	BEDDING
	②	SANDY SILTSTONE WITH INTERBEDDED WEATHERED SHALE AND GYPSUM CRYSTALS; TAN TO MEDIUM BROWN WITH SOME Fe STAIN, VERY FRACTURED, CONTAINS CLOSELY SPACED JOINTS (3"-8" SPACING)	B	N75°E	55°S	JOINTS
	③	GYPSUM-STONE BEDS; LIGHT PURPLE, COMPOSED OF SAND SIZE GYPSUM CRYSTALS CEMENTED, HARD.				

MT. TAYLOR URANIUM MILL PROJECT  
 PROJECT NO. GUL-103  
 DATE: SEPTEMBER 1977  
 DRAWING NO.



F. 3/77

TRENCH NO. WI-46

LOCATION: RIDGE WEST OF NORTH LEG OF DAM AXIS 6A

Sheet 1 of 1

NOTES:

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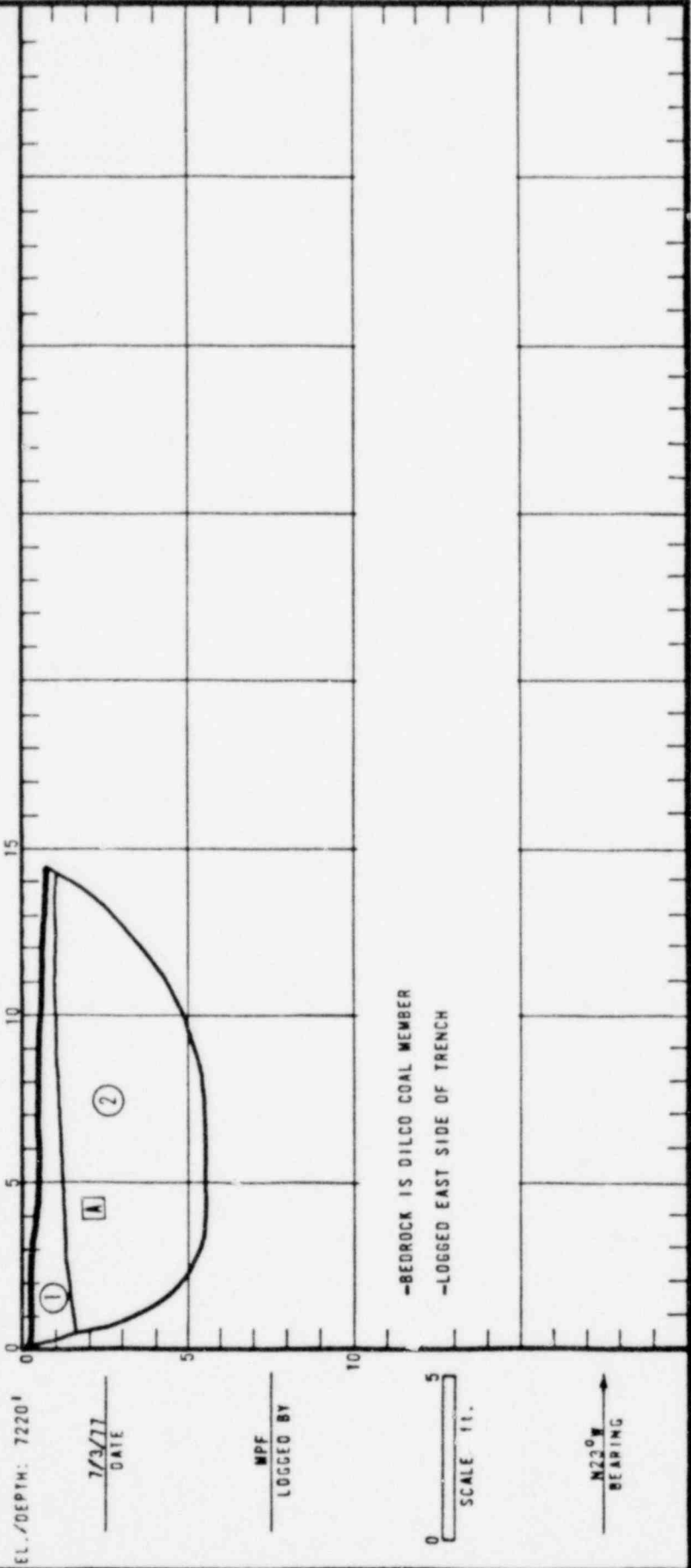
FIELD TRENCH LOG

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAYEY SILT; LIGHT BROWN, SLIGHTLY PLASTIC, DENSE, CONTAINS SILTSTONE FRAGMENTS UP TO 1" DIAMETER.	[A]	N-S	60W	BEDDING
	②	INTERBEDDED GRAY AND BROWN SILTSTONE AND GRAY SHALE; THIN BEDDED (UP TO 2"), WAVY BEDDING, BRITTLE, CONTAINS Fe STAIN AND YELLOW SILT ALONG BEDDING.				



F. 3/77

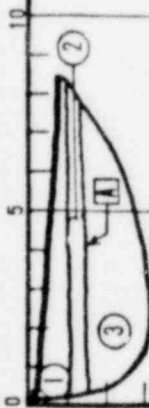
TRENCH NO. MT-47

Sheet 1 of 1

LOCATION: RIDGE WEST OF NORTH LEG OF DAM AXIS 6A

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SANDY SILT; MEDIUM BROWN, CONTAINS FINE SAND AND SILTSTONE FRAGMENTS 1/4"-1/2" DIAMETER.	1	N67°W	3°N	BEDDING
	②	COAL; BLACK, POWDERY, BURNED, UPPER 3" GRAY POWDERY ASH.				
	③	INTERBEDDED SILTSTONE AND SHALE; SHALE; PURPLE, BRITTLE, 1/8"-1/2" BEDDING, SHOWS Fe STAINS ALONG BEDDING. SILTSTONE; TAN, 3"-8" BEDDING.				



EL./DEPTH: 7206'  
0  
5

7/3/77  
DATE

MPE  
LOGGED BY

0 5  
SCALE, FT.

S80°W  
BEARING

-BEDROCK IS DILCO COAL MEMBER  
-LOGGED NORTH SIDE OF TRENCH

W A WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO  
GUL-109

DATE  
SEPTEMBER 1977

DRAWING NO

F. 3/77

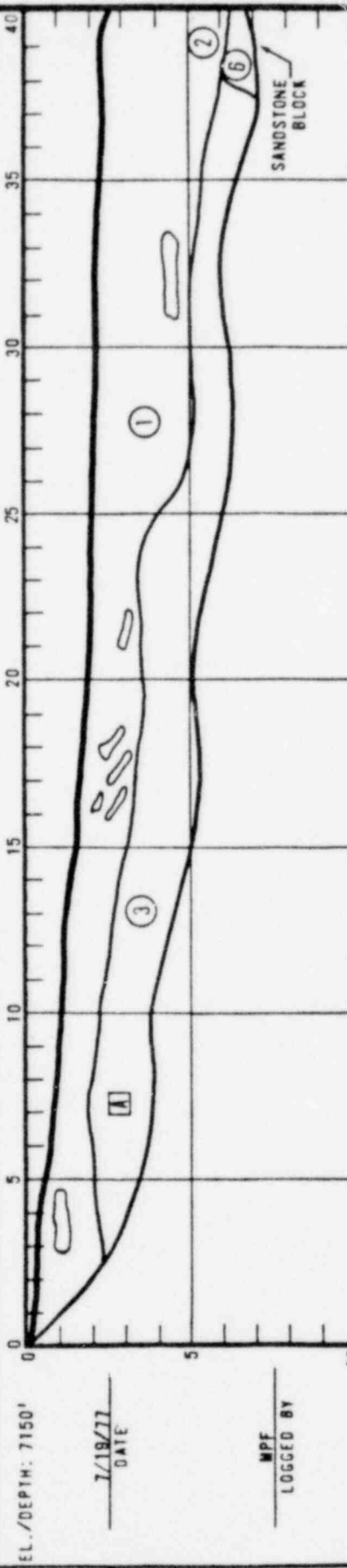
TRENCH NO. MT-48

Sheet 1 of 3

LOCATION: BETWEEN RIDGES WEST OF NORTH LEG OF LAM AXIS 6A

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SANDY SILT; MEDIUM BROWN, MEDIUM DENSE, NOT STRATIFIED, CONTAINS SANDSTONE FRAGMENTS FROM GRAVEL SIZE TO BLOCKS 1' THICK.	[A]	N70°E	30°N	BEDDING
	②	SANDY CLAYEY SILT; RED-BROWN, SLIGHTLY STICKY, CONTAINS SANDSTONE FRAGMENTS FROM GRAVEL SIZE TO BLOCKS 1' THICK.				
	③	SILTSTONE; WHITE TO GRAY WITH Fe STAIN ALONG BEDDING, HARD, 1"-6" WAVY BEDDING. CONTAINS FISSILE GRAY SHALE PARTINGS UP TO 1/2" THICK. UPPER 6" SEVERELY WEATHERED.				



-BEDROCK IS DILCO COAL MEMBER  
-LOGGED NORTH SIDE OF TRENCH

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FIELD TRENCH LOG

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PROJECT NO  
GUL-901

DATE  
SEPTEMBER 1977

DRAWING NO

F. 3/77

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TRENCH NO. WT-48

LOCATION: BETWEEN RIDGES WEST OF NORTH LEG OF DAM AXIS 6A

Sheet 2 of 3

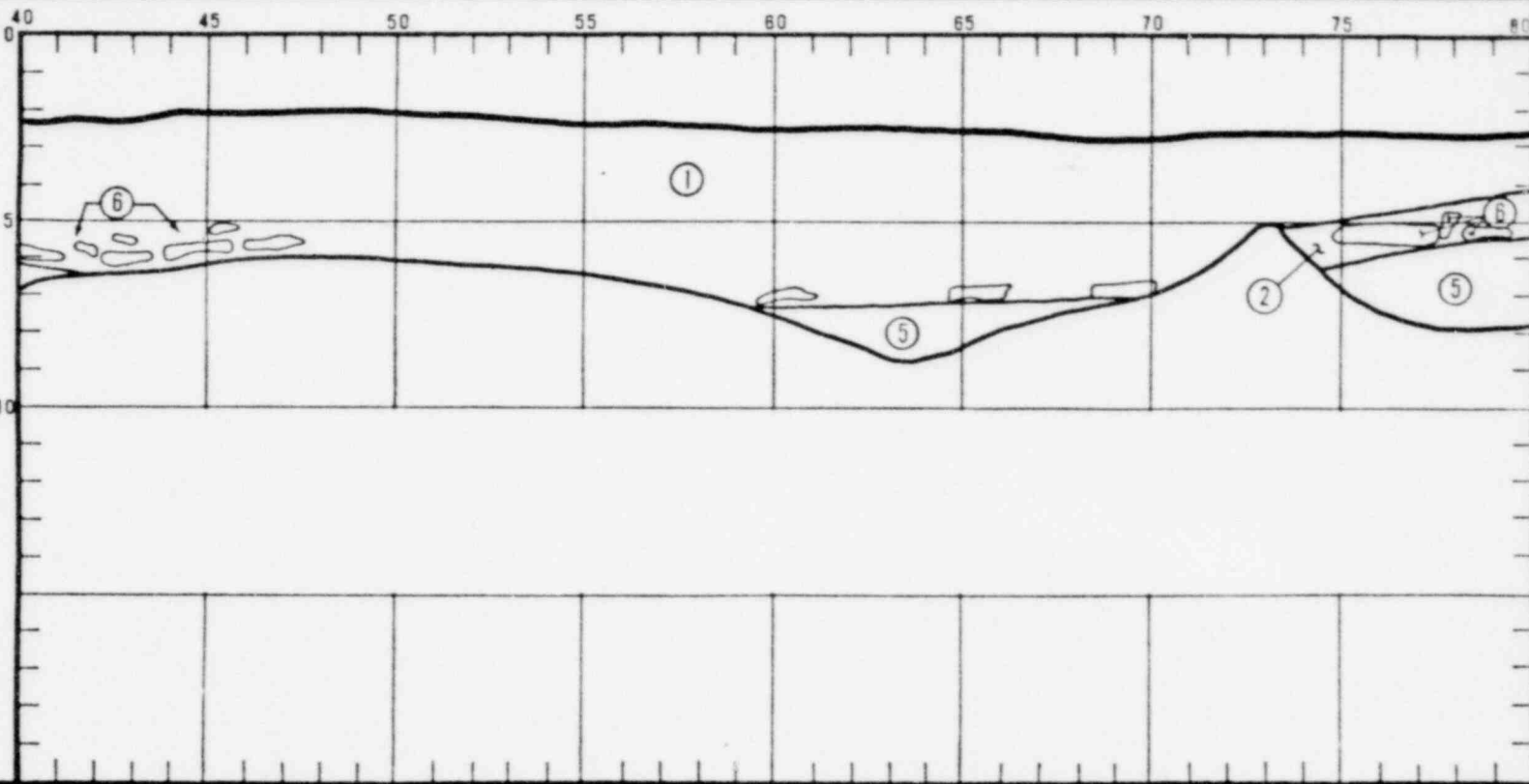
NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	④	INTERBEDDED LIGHT GRAY SILTSTONE AND DARK SHALE; BRITTLE. SILTSTONE BEDS UP TO 1' THICK, SHALE BEDS UP TO 4" THICK, SEVERELY WEATHERED IN UPPER 6", WEATHERED TO CLAY (MATERIAL NO. ⑤).				
	⑤	CLAY; GRAY PLATY STRUCTURE, PLASTIC, SHOWS SLICKENSIDES AND LOCAL SHRINK-SWELL CHARACTERISTICS, DERIVED FROM SHALE WEATHERED IN PLACE.				
	⑥	SILTY SANDSTONE BLOCKS; TAN WITH Fe STAIN, HARD, RESISTANT UP TO 1' THICK, RESIDUAL AND SLOPEWASH MATERIAL.				

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WT. TAYLOR URANIUM MILL PROJECT

EL./DEPTH: 7150'



7/19/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, FT.

S71°E  
BEARING

PROJECT NO  
GUL-108

DATE  
SEPTEMBER 1977

DRAWING NO

FIELD TRENCH LOG

F. 3/77

TRENCH NO. <u>WT-48</u>		LOCATION: <u>BETWEEN RIDGES WEST OF NORTH LEG OF DAM AXIS 6A</u>			
Sheet <u>3</u> of <u>3</u>		NOTES:			
DEPTH	NO.	DESCRIPTION	STRUCTURE		
			NO.	STRIKE	DIP
			[B]	N77°E	3°N
			[C]	APPROXIMATE CONTACT BETWEEN SHALE-SILTSTONE BEDROCK AND WEATHERED CLAY ZONE.	

EL./DEPTH: 7150'	7/19/77	DATE	MPE	LOGGED BY	SCALE, FT.	STRIKE BEARING
0					0	
5					5	
10					10	
80						
85						
90						
95						
100						

WA WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

F. 3/77

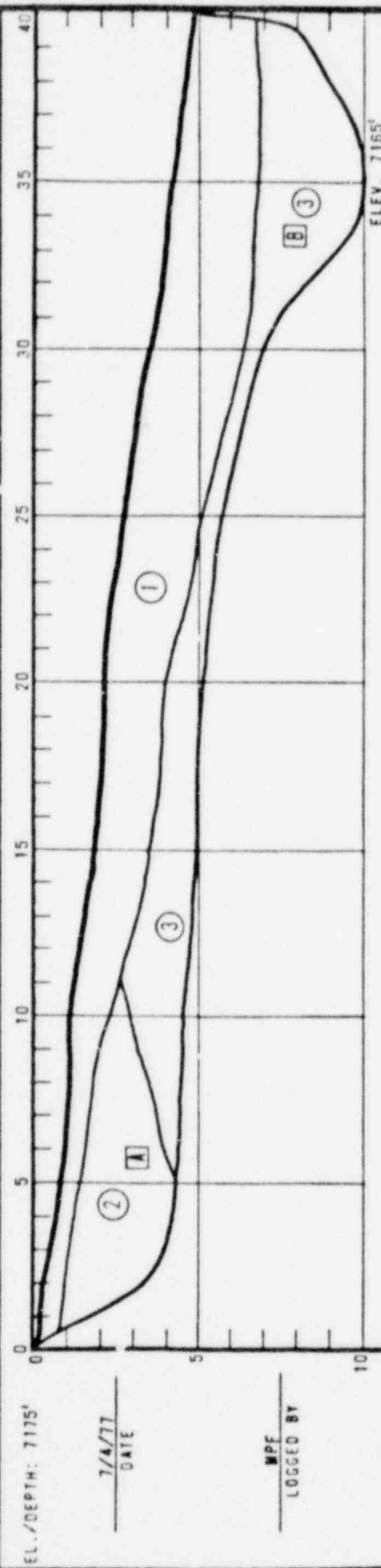
TRENCH NO. MT-49

Sheet 1 of 1

LOCATION: INTERSECTION OF DAM AXIS 6A AND AXIS 8A

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SILTY SAND; LIGHT BROWN. LOOSE, CONTAINS SILTSTONE FRAGMENTS UP TO 6" DIAMETER.	[A]	N25°W	6°W	BEDDING
	②	SANDY SILTSTONE; WHITE TO GRAY, MASSIVE. 4"-10" BEDS. HARD, SHOWS FB STAIN ALONG BEDS.	[B]	N82°E	3°W	BEDDING
	③	SHALE; GRAY, THIN BEDDED (UP TO 1" THICK), BRITTLE, CONTAINS FB STAIN ALONG BEDDING AND FRACTURES. WEATHERED TO CLAY IN UPPER 1".				



-BEDROCK IS DILCO COAL MEMBER  
-LOGGED NORTH SIDE OF TRENCH

EL./DEPTH: 7175'

7/4/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, FT.

STO°E  
BEARING

WA WAHLER & ASSOCIATES

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FIELD TRENCH LOG

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO



F. 3/77

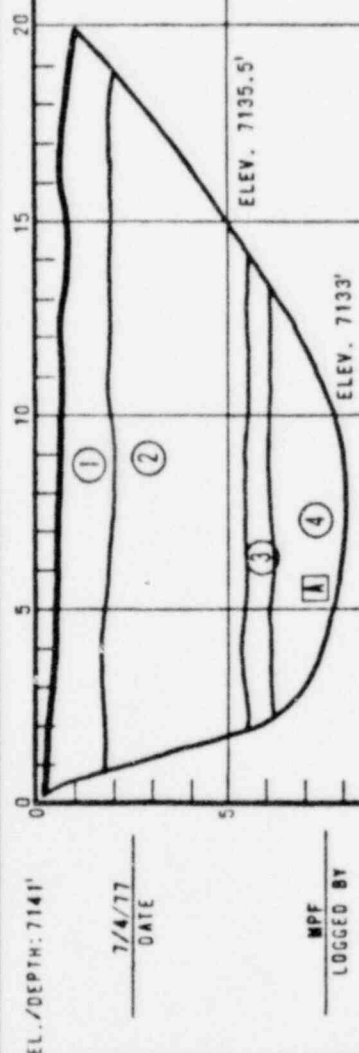
TRENCH NO. MT-50

LOCATION: DOWNSLOPE OF MT-19, ON NORTH LEG OF DAM AXIS BA

Sheet 1 of 1

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAYEY SILT; MEDIUM BROWN, SLIGHTLY PLASTIC, HARD.	A	N25°E	6°E	BEDDING
	②	SANDY SILT; LIGHT BROWN, HARD, SHOWS CALICHE STAIN, NOT STRATIFIED, POSSIBLY WEATHERED BEDROCK.				
	③	SILTY SANDSTONE; YELLOW TO TAN, WEATHERED.				
	④	SHALE; DARK GRAY, THIN BEDDED (UP TO 1"), BRITTLE, CONTAINS WHITE SILT ALONG BEDDING PLANES.				



-BEDROCK IS DILCO COAL MEMBER  
-LOGGED NORTH SIDE OF TRENCH

7/4/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, FT.

S61°E  
BEARING

W A WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PROJECT NO GUL-101	DATE SEPTEMBER 1977	DRAWING NO
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F. 3/77

TRENCH NO. MT-51L

Sheet 1 of 1

LOCATION: DOWNSLOPE OF MT-50, ON NORTH LEG OF DAM AXIS 8A

NOTES:

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MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO  
GUL-109

DATE  
SEPTEMBER 1977

DRAWING NO

DEPTH	UNITS		DESCRIPTION	STRUCTURE			
	NO.	STRIKE		DIP	NO.	STRIKE	DIP
	①		SILTY CLAY; MEDIUM BROWN, PLASTIC, STIFF, CONTAINS SILTSTONE FRAGMENTS UP TO 2" DIAMET. R.	A	N18°W	40°E	BEDDING
	②		INTERBEDDED SANDY SILTSTONE AND SILTY SANDSTONE; TAN-GRAY-YELLOW BANDING, 1/4"-2" BEDDING, CONTAINS BLACK Mn STAIN ALONG BEDDING AND FRACTURES, CONTAINS 5" DISCONTINUOUS Fe-STONE LENS.				

EL./DEPTH: 7128'

7/4/77  
DATE

MPF  
LOGGED BY

0 5 10  
SCALE, FT.

55°E  
BEARING

-BEDROCK IS DILCO COAL MEMBER

-LOGGED NORTH SIDE OF TRENCH

F. 3/77

W.A. WAHLER  
& ASSOCIATES

TRENCH NO. WT-52

LOCATION: EDGE OF KNOLL ON NORTH LEG OF DAM AXIS 0A

Sheet 1 of 1

NOTES:

UNITS

STRUCTURE

DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SHALE; PURPLE-GRAY, UP TO 2" BEDDING, BRITTLE, BADLY FRACTURED, CONTAINS Fe STAIN AND YELLOW SILT ALONG BEDDING AND FRACTURES.	A	N73°E	6°S	BEDDING
	②	COAL SEAM; (4"), BRITTLE BURNED COAL, BLACK-RED BROWN, DUSTY, SHOWS PRIMARY AND SECONDARY CLEAT PLANES.	B	N73°E	90°	PRIMARY CLEAT.
	③	CARBONACEOUS SHALE; PURPLE WITH CARBONACEOUS PARTICLES, FLAKY.	C	N22°W	90°	SECONDARY CLEAT.
	④	SANDY SILTSTONE; YELLOW-GRAY BANDING, 2" TO 5" BEDDING, Fe STAINED ALONG BEDDING.				

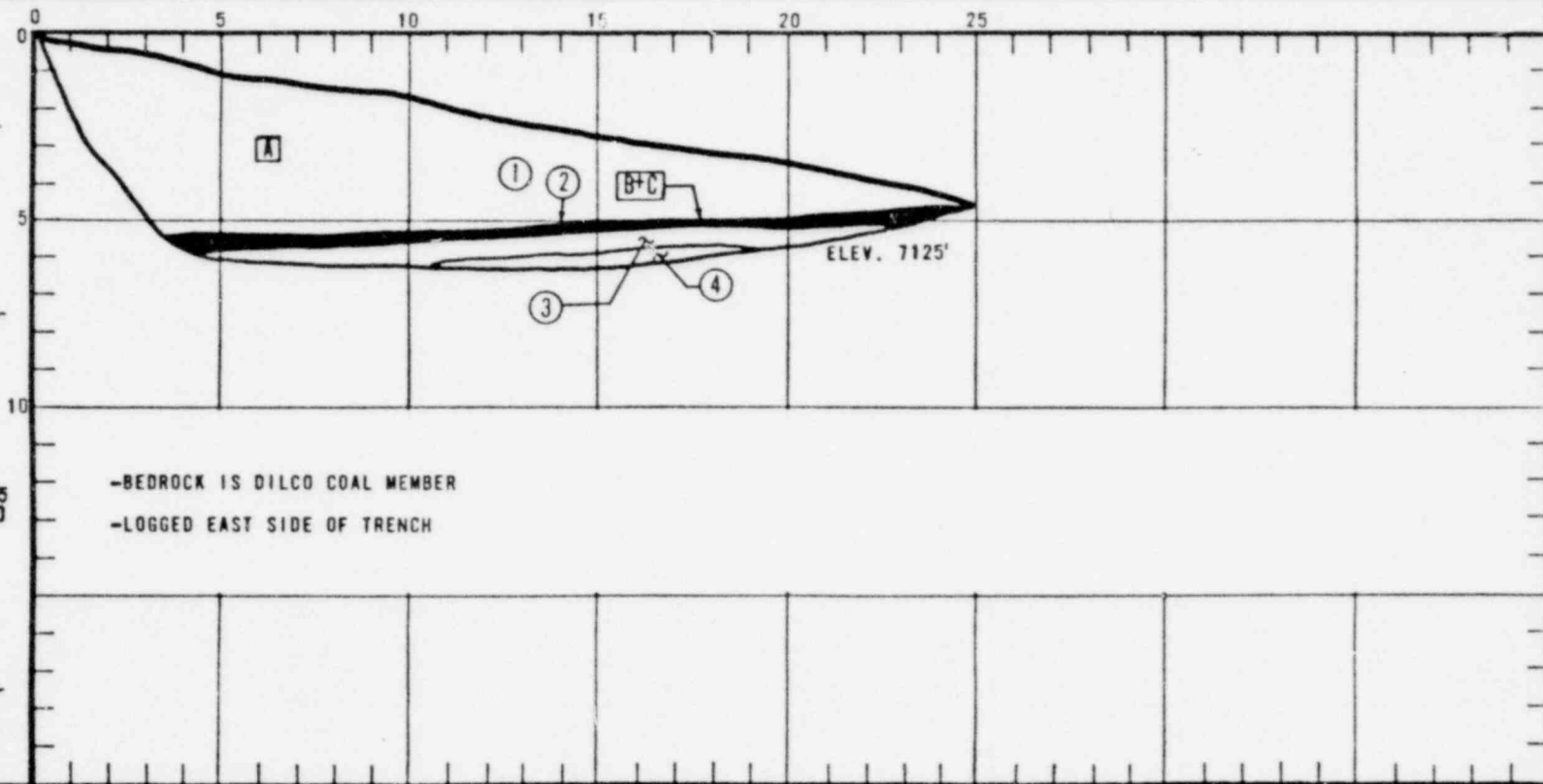
EL./DEPTH: 7131'

7/4/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, FT.

S41°W  
BEARING



-BEDROCK IS DILCO COAL MEMBER

-LOGGED EAST SIDE OF TRENCH

PAID BY: MERRITT BACH • CALIF.

MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO  
SUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

FIELD TRENCH LOG

F. 3/77

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& ASSOCIATES

TRENCH NO. WT-53

LOCATION: DOWNSLOPE OF WT-52, ON NORTH LEG OF DAM AXIS 8A

Sheet 1 of 1

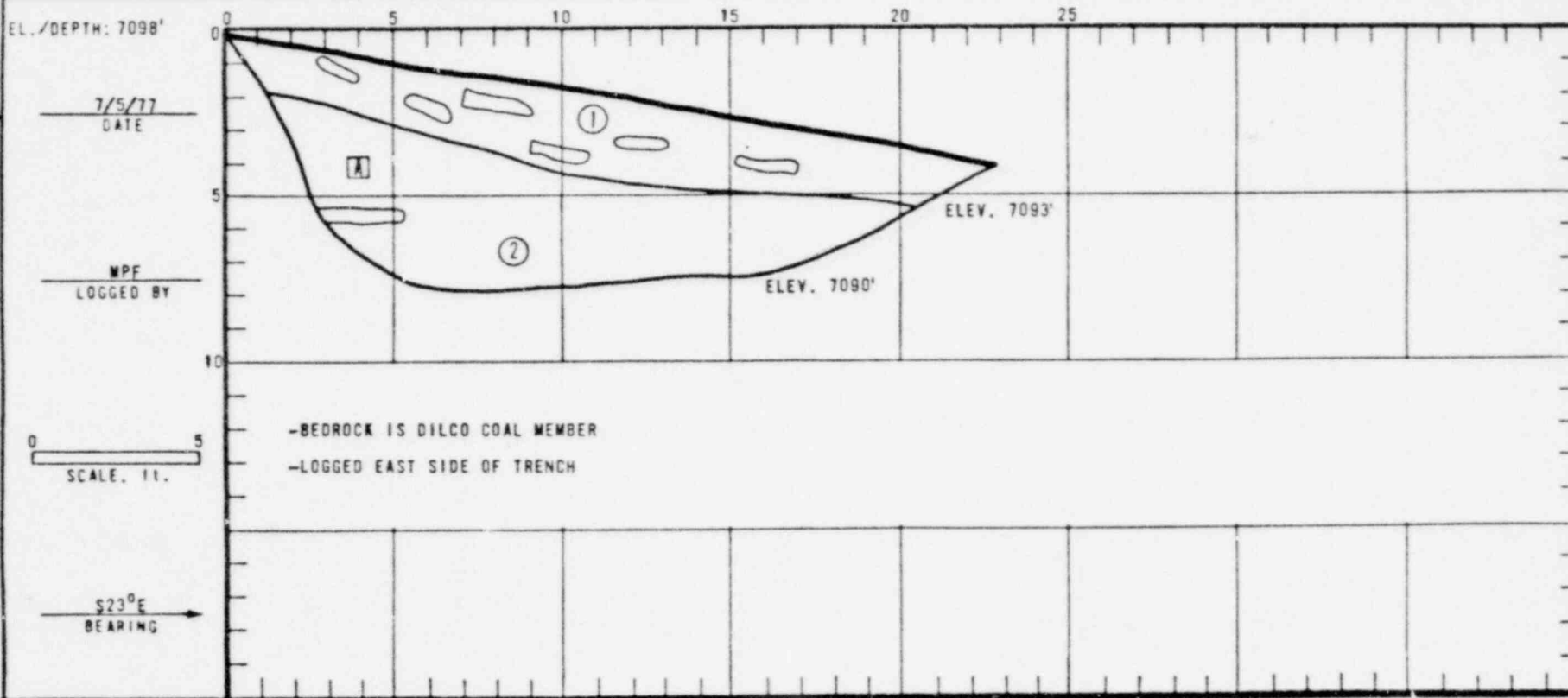
NOTES:

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAYEY SANDY SILT; WITH SANDSTONE GRAVEL, SLIGHTLY PLASTIC, MEDIUM BROWN.	[A]	N23°E	2°N	BEDDING
	②	INTERBEDDED TAN SILTSTONE AND GRAY SHALE; 1/8"-1-1/2" BEDDING. BRITTLE, SHOWS Fe STAIN ALONG BEDDING AND FRACTURES, CONTAINS SILT AND FINE GYPSUM CRYSTALS BETWEEN SHALE BEDS.				

W. TAYLOR URANIUM MILL PROJECT  
PAID BY: NEWPORT BRANCH - CALIF.

PROJECT NO. GUL-101  
DATE: SEPTEMBER 1977  
DRAWING NO.

FIELD TRENCH LOG



F. 3/77

W A WAHLER  
& ASSOCIATES

TRENCH NO. WT-54

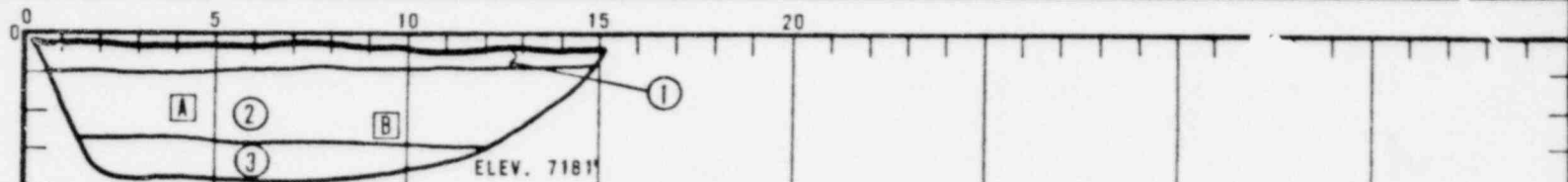
LOCATION: DOWNSLOPE OF WT-53 AT INTERSECTION OF CHANNEL AND NORTH LEG OF DAM AXIS BA

Sheet 1 of 1

NOTES: \_\_\_\_\_

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAYEY SILT; RED BROWN, SLIGHTLY STICKY, CONTAINS RED SILTSTONE FRAGMENTS UP TO 1" DIAMETER.	A	N23°W	2°E	BEDDING FRACTURE PLANE.
	②	SILTSTONE; WITH THIN INTERBEDDED GRAY SHALE, LIGHT GRAY Fe STAIN, 1/8"-1" BEDDING, WEATHERED TO CLAYEY SILT IN UPPER 6", CONTAINS Fe STAIN ALONG BEDDING.	B	N20°W	90°	
	③	SILTY SANDSTONE; TAN WITH Fe-STAIN, 1/2"-2" BEDDING, SHOWS BLACK Mn COATING ALONG BEDDING AND FRACTURES.				

EL./DEPTH: 7185'



7/5/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, FT.

-BEDROCK IS DILCO COAL MEMBER

-LOGGED EAST SIDE OF TRENCH

S20°W  
BEARING

PAID ALSO • NIMROTT BEACH • CALIF.  
MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO. GUL-101  
DATE SEPTEMBER 1977  
DRAWING NO.  
FIELD TRENCH LOG

W A WAHLER  
& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

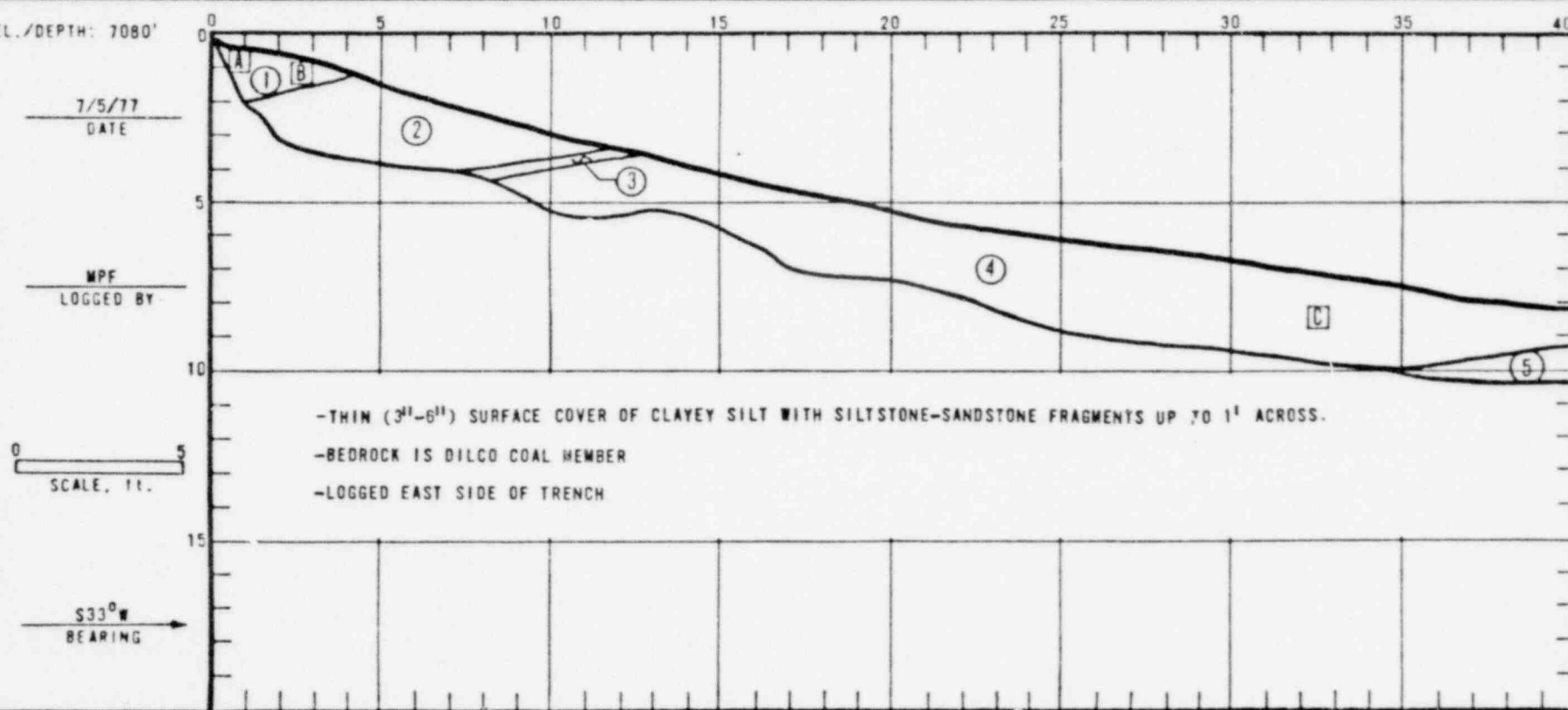
DRAWING NO

TRENCH NO. WT-55  
Sheet 1 of 2

LOCATION: DOWNSLOPE OF WT-54, ON CHANNEL LEG OF DAM AXIS BA  
NOTES: \_\_\_\_\_

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SILTY SANDSTONE; TAN WITH Fe STAIN, 1/4"-3" BEDDING, HARD, CONTAINS BROWN SHALE PARTINGS AND VERTICAL JOINTS.	[A]	N20°W	2°E	BEDDING
	②	INTERBEDDED GRAY SHALE AND TAN SILTSTONE; 1/4"-1" BEDDING, BRITTLE, CONTAINS Fe STAIN AND YELLOW SILT ALONG BEDDING.	[B]	N16°E	90°	JOINT (2' SPACING)
	③	CARBONACEOUS SHALE; PURPLE WITH BLACK CARBONACEOUS PARTICLES, FLAKY, 5" THICK.	[C]	N20°W	1-1/2°E	BEDDING
	④	INTERBEDDED GRAY SHALE AND TAN SILTSTONE; 1/4"-2" BEDDING, BRITTLE, CONTAINS Fe STAIN AND YELLOW SILT ALONG BEDDING.				

EL./DEPTH: 7080'



FIELD TRENCH LOG

F. 3/77

TRENCH NO. WT-55

Sheet 2 of 2

LOCATION: DOWNSLOPE OF WT-54, ON CHANNEL LEG OF DAM AXIS BA

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	(5)	SANDY SILTSTONE; WHITE-YELLOW-TAN BANDING. 2"-6" BEDDING. HARD. CONTAINS Fe STAIN ALONG BEDDING AND GRAY SHALE PARTINGS.				

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FIELD TRENCH LOG

PAID ALTU • NEWPORT BEACH • CALIF

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

F. 3/77

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TRENCH NO. WT-58

LOCATION: CHANNEL LEG OF DAM AXIS BA

Sheet 1 of 1

NOTES:

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
0-4.0	①	ALLUVIUM SILTY SAND TO SANDY SILT; LIGHT BROWN, DRY, FIRM.				
4.0-6.0	②	SILTY SAND TO SANDY SILT; FINE SAND, MODERATE BROWN, POROUS, HIGH DRY STRENGTH, DRY.				
6.0-9.0	③	SANDY SILT; CLAYEY, MODERATE BROWN, WHITE CALICHE OR GYPSUM, SLIGHTLY DAMP, STIFF.				
9.0-13.0	④	SILTY SAND TO SAND; FINE SAND, MEDIUM YELLOW BROWN, WITH BLACK AND WHITE SPECKS, SLIGHTLY DAMP.				

EL./DEPTH: 7058'

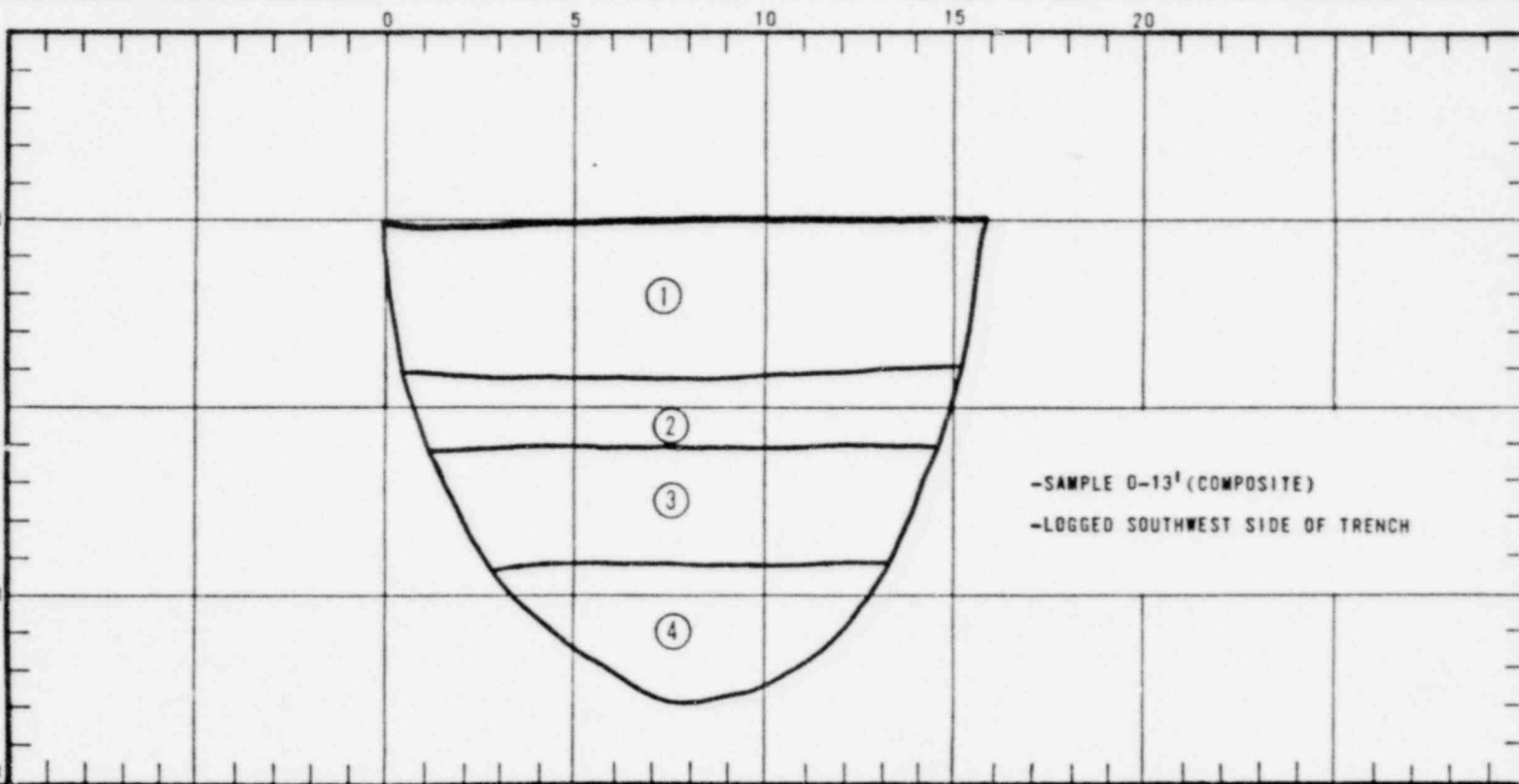
6/30/77  
DATE

ELEV. 7058'

ASB  
LOGGED BY

0 5 5  
SCALE, FT.

N50°W  
BEARING



-SAMPLE 0-13' (COMPOSITE)

-LOGGED SOUTHWEST SIDE OF TRENCH

FIELD LOG

MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO.  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO.

FIELD TRENCH LOG



F. 3/77

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8 ASSOCIATES

TRENCH NO. 57-57

LOCATION: CHANNEL LEG OF DAM AXIS BA

Sheet 1 of 1

NOTES: \_\_\_\_\_

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
0-4.0	①	SANDY SILT; CLAYEY, MEDIUM POROUS, FIRM, DRY.				
4.0-8.0	②	SANDY SILT; MODERATE BROWN, POROUS, FIRM DRY.				
8.0-11.0	③	SAND TO SILTY SAND; FINE SAND, MODERATE YELLOWISH BROWN, MEDIUM DENSE, DRY.				

EL./DEPTH: 7058'

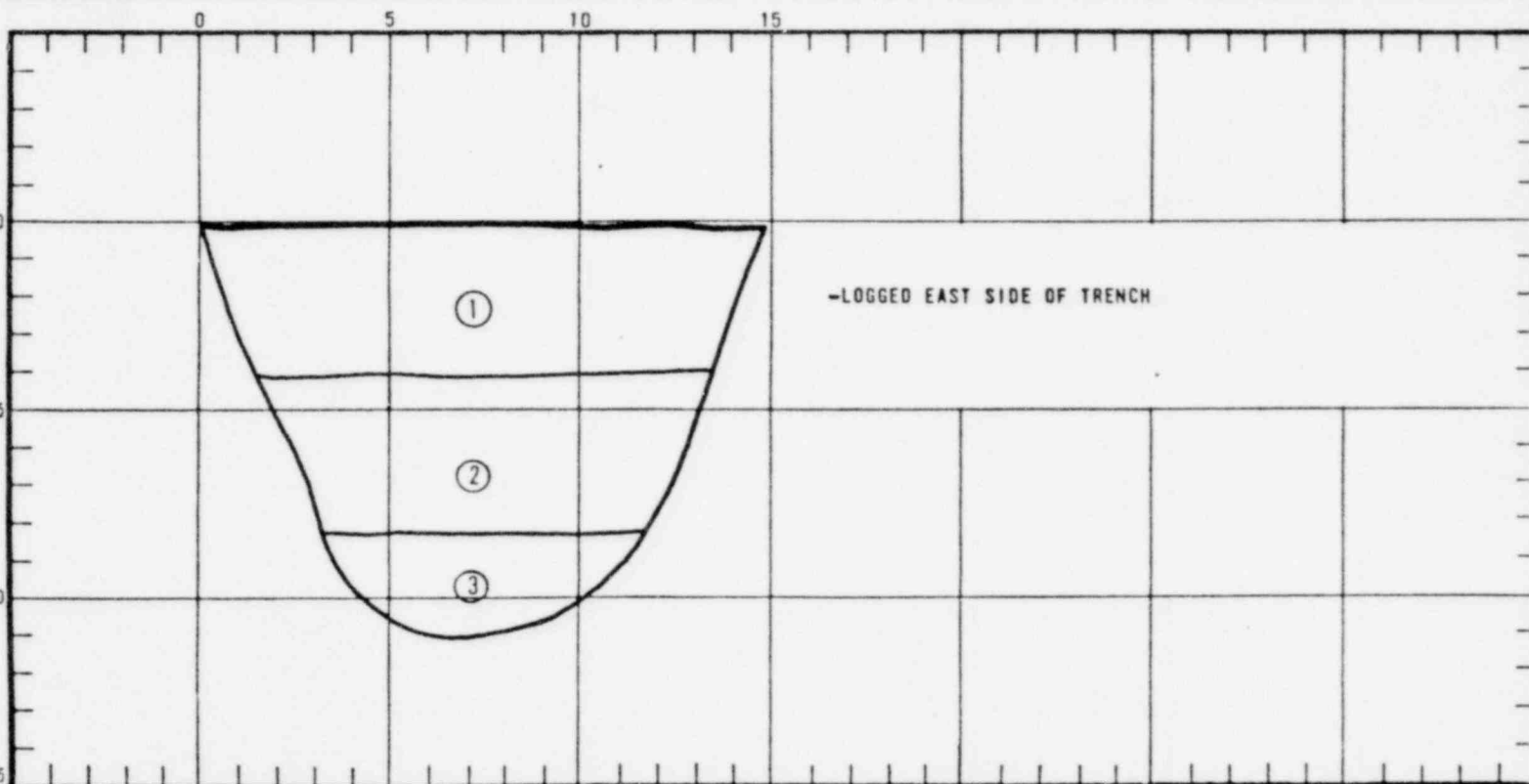
8/30/77  
DATE

ELEV. 7058'

ASB  
LOGGED BY

0 5  
SCALE, FT.

→ TRUE NORTH  
BEARING



PAID ALTID. • NIPROPT BRACK • CALIF.

MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

FIELD TRENCH LOG

F. 3/77

W A WAHLER  
8 ASSOCIATES

TRENCH NO. WT-58

LOCATION: CHANNEL LEG OF DAM AXIS BA

Sheet 1 of 1

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
0-1.0	①	SANDY CLAYEY SILT; MEDIUM BROWN, SOME WHITE CALICHE, FIRM, DRY.				
1.0-4.0	②	SILTY SAND; MEDIUM BROWN, POROUS, HIGH DRY STRENGTH, DRY.				
4.0-8.5	③	SAND; SLIGHTLY SILTY, FINE SAND, MODERATE YELLOW BROWN, DRY.				

EL./DEPTH: 7080'

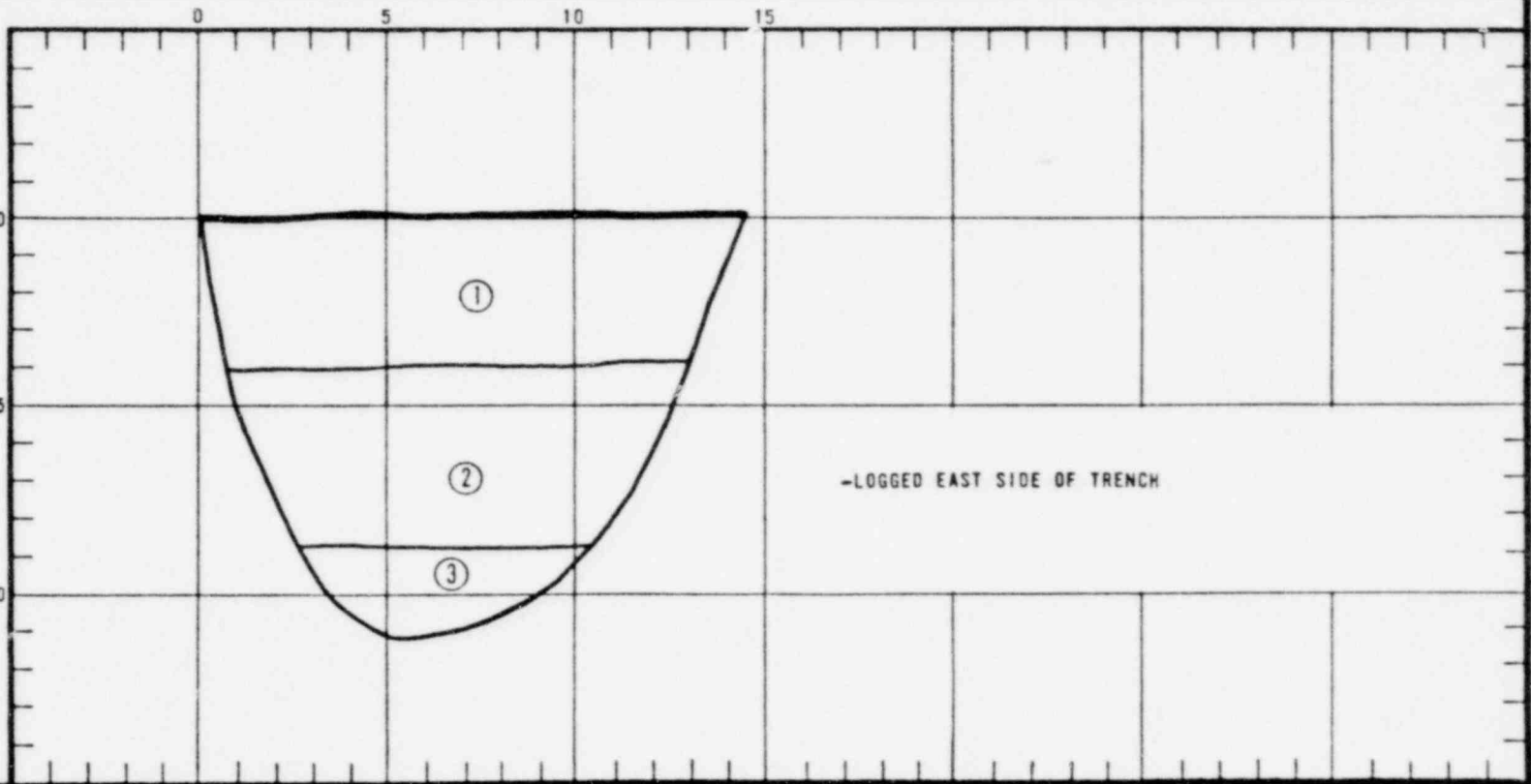
6/30/77  
DATE

ELEV. 7080'

ASB  
LOGGED BY

0 5  
SCALE, FT.

N5°W  
BEARING



PAID BY: MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO. SUL-101

DATE: SEPTEMBER 1977

DRAWING NO.

FIELD TRENCH LOG

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MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

TRENCH NO. WT-59

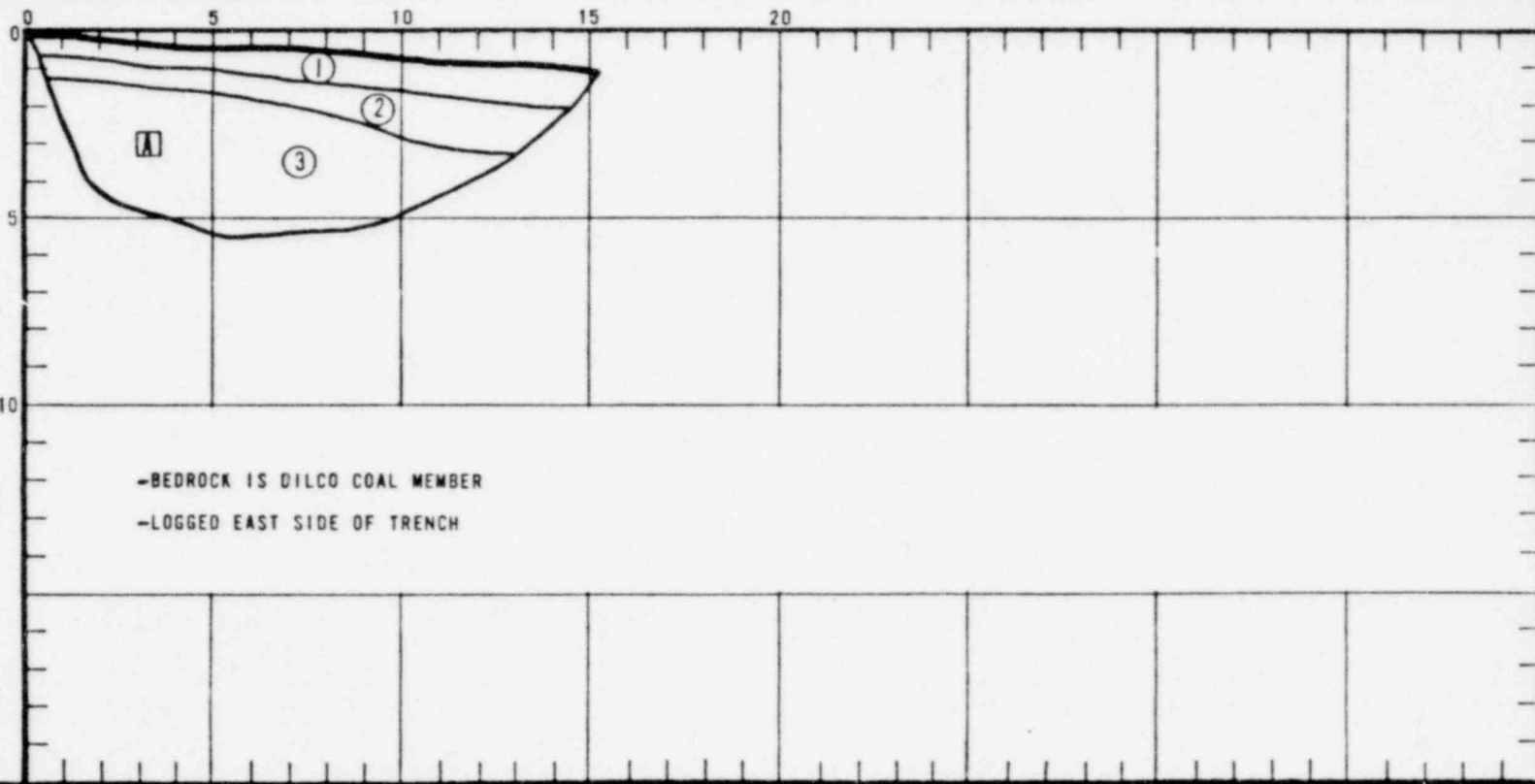
Sheet 1 of 1

LOCATION: INTERSECTION OF CHANNEL AND SOUTH LEG OF DAM AXIS 9A

NOTES:

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SANDY CLAYEY SILT; MEDIUM BROWN, SLIGHTLY PLASTIC, CONTAINS SANDSTONE FRAGMENTS UP TO 6" DIAMETER.	[A]	N56°W	3°SW	BEDDING
	②	SHALE AND SILTSTONE; WEATHERED IN SITU WITH WHITE CALCAREOUS POWDER THROUGHOUT.				
	③	INTERBEDDED GRAY SHALE AND TAN SILTSTONE; THIN BEDDED (UP TO 1"), BRITTLE, CONTAINS Fe STAIN AND YELLOW AND WHITE (CALCAREOUS) SILT ALONG BEDDING.				

EL./DEPTH: 7080'



7/5/77  
DATE

MPF  
LOGGED BY

0 5  
SCALE, FT.

N28°W  
BEARING

FIELD TRENCH LOG

F. 3/77

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& ASSOCIATES

TRENCH NO. WT-60  
Sheet 1 of 1

LOCATION: UPSLOPE OF WT-59 ALONG SOUTH LEG OF DAM AXIS 8A  
NOTES: \_\_\_\_\_

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SANDY SILTSTONE; GRAY-PURPLE-TAN BANDING, HARD, 1"-3" BEDDING, CONTAINS BROWN SHALE PARTINGS, SHOWS FE STAIN ALONG BEDDING, CONTAINS VERTICAL JOINTS WITH 2'-3' SPACING.	A	N65°W	1°E	BEDDING
			B	N5°E TO N13°W	90°	JOINT

EL./DEPTH: 7085'

0 5 10 15 20

7/5/77  
DATE

WHITE  
POWDERY  
CALCITE  
LENS

MPF  
LOGGED BY

-THIN (3"-8") SURFACE COVER OF SANDY CLAYEY SILT WITH SILTSTONE FRAGMENTS UP TO 4" DIAMETER.

-BEDROCK IS DILCO COAL MEMBER

-LOGGED NORTH SIDE OF TRENCH

0 5  
SCALE, FT.

N28°E  
BEARING

MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

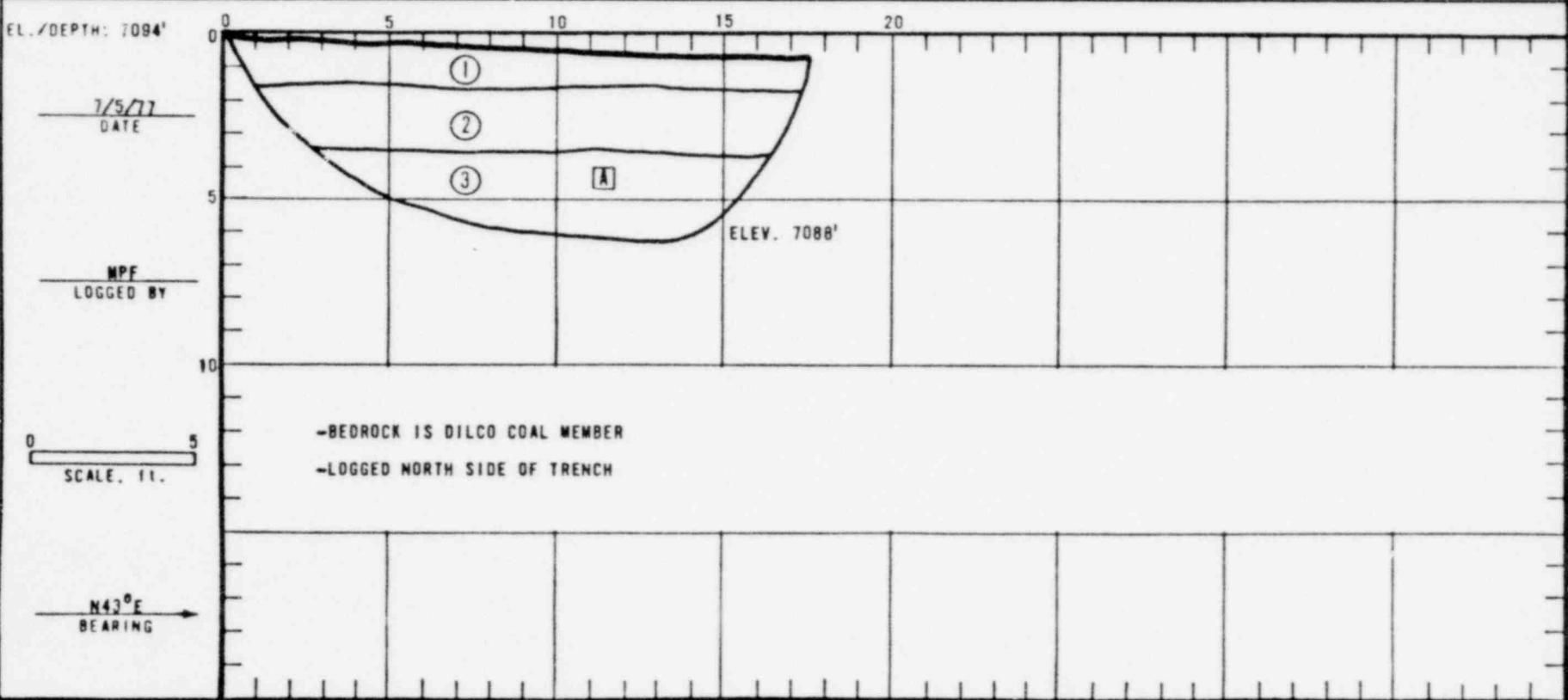
FIELD TRENCH LOG

F. 3/77

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 PROJECT NO. GUL-101  
 DATE SEPTEMBER 1977  
 DRAWING NO.

TRENCH NO. WT-81 LOCATION: UPSLOPE OF WT-80, ON SOUTH LEG OF DAM AXIS 8A  
 Sheet 1 of 1 NOTES: \_\_\_\_\_

DEPTH		UNITS		STRUCTURE			
NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE		
①	CLAY; RED-BROWN, PLASTIC, HARD, CONTAINS Fe STAIN FRAGMENTS UP TO 1/2" DIAMETER (SAPROLITE).	[A]	S88°N	3°N	BEDDING		
②	SILTSTONE; SANDY SILT WITH SILTSTONE FRAGMENTS AND Fe STONE UP TO 1/2" DIAMETER. CONTAINS CALICHE MOTTLES, MEDIUM DENSE, EXTREMELY WEATHERED.						
③	SANDY SILTSTONE; WITH INTERBEDDED GYPSUM CRYSTALS AND CALCITE POWDER (UP TO 1/2" BEDS), GRAY-TAN BANDING, 1/2"-2" BEDS, WAVY BEDDING, SHOWS Fe STAIN ALONG BEDDING.						



F. 3/77

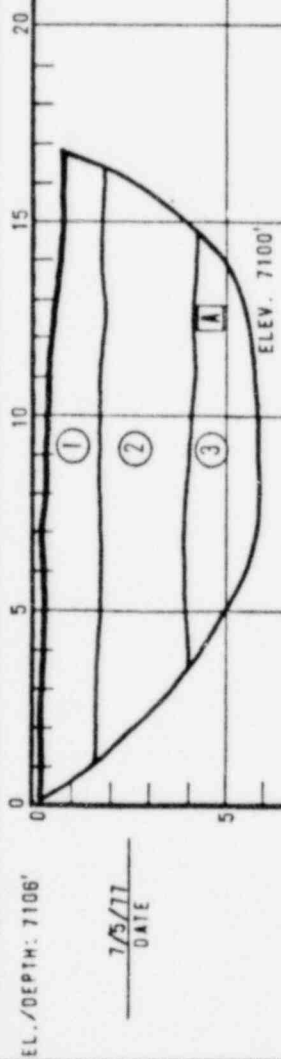
TRENCH NO. WT-82

LOCATION: UPSLOPE OF WT-61, ON SOUTH LEG OF DAM AXIS BA

Sheet 1 of 1

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAY; RED-BROWN, PLASTIC, HARD, CONTAINS Fe STONE FRAGMENTS UP TO 1/2" DIAMETER (SAPROLITE).	A	N80°W	3°N	BEDDING
	②	SILTSTONE; SANDY SILT WITH SILTSTONE FRAGMENTS AND Fe STONE UP TO 1/2" DIAMETER, CONTAINS CALICHE MOTTLES, MEDIUM DENSE, EXTREMELY WEATHERED.				
	③	SANDY SILTSTONE; WITH INTERBEDDED GYPSUM CRYSTALS AND CALCITE POWDER (UP TO 1/2" BEDS), GRAY-TAN BANDING, 1/2"-2" BEDS, WAVY BEDDING, SHOWS Fe STAIN ALONG BEDDING.				



--BEDROCK IS DILCO COAL MEMBER  
--LOGGED NORTH SIDE OF TRENCH

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FIELD TRENCH LOG

PROJECT NO GUL-101	DATE SEPTEMBER 1977	DRAWING NO
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TRENCH NO. WT-83

Sheet 1 of 1

LOCATION: SOUTH LEG OF DAM AXIS BA, UPSLOPE OF WT-62

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SANDY CLAY, RED BROWN, PLASTIC, CONTAINS SILTSTONE AND Fe-STONE FRAGMENTS UP TO 1" DIAMETER.	A	N45°E	4°S	BEDDING
	②	SILTSTONE, GRAY-TAN BANDING, 1/2"-2" WAVY BEDDING, CONTAINS GRAY SHALE PARTINGS, YELLOW SILT, AND Fe STAIN ALONG BEDDING. SHOWS SINGLE VERTICAL JOINT (FRACTURE).	B	N70°E	90°	SINGLE JOINT

EL./DEPTH: 7142'

7/5/77  
DATE

MPF  
LOGGED BY

0 5 10  
SCALE, FT.

N40°W  
BEARING

-BEDROCK IS DILCO COAL MEMBER

WA WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PROJECT NO	DATE	DRAWING NO
GUL-101	SEPTEMBER 1977	

F. 3/77

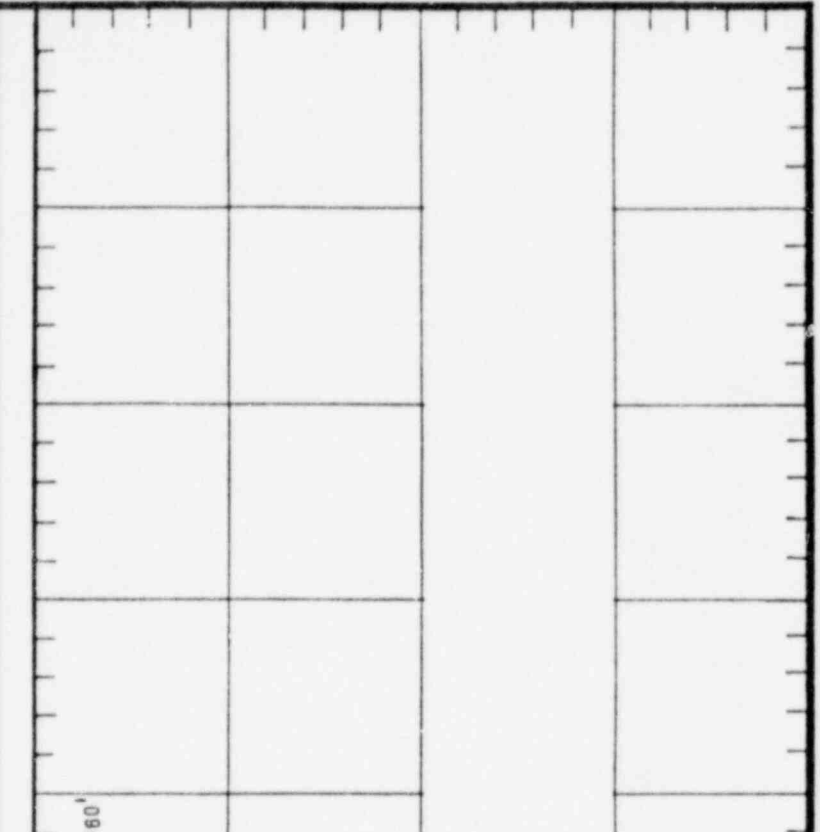
TRENCH NO. MT-63a

Sheet 1 of 1

LOCATION: SOUTH LEG OF DAM AXIS BA

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAYEY SILT; LIGHT BROWN, DENSE, CONTAINS SILTSTONE AND Fe STONE FRAGMENTS UP TO 1/2" DIAMETER.	1	N80°E	6°S	BEDDING
	②	SILTSTONE; WITH THIN GRAY SHALE BEDS (UP TO 1" THICK), WHITE-GRAY-TAN, FRACTURED AND FRIABLE, 1/2"-2" BEDDING, CONTAINS BROWN SHALE PARTINGS AND Fe STAIN ALONG BEDDING, WEATHERED TO CLAY IN UPPER 6".				



-BEDROCK IS DILCO COAL MEMBER  
 -LOGGED NORTH SIDE OF TRENCH

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FIELD TRENCH LOG

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PROJECT NO GUL-101	DATE SEPTEMBER 1977	DRAWING NO
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PAID RFDU • MEMPHIS GRACE • CALIF  
MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO  
GUL-101

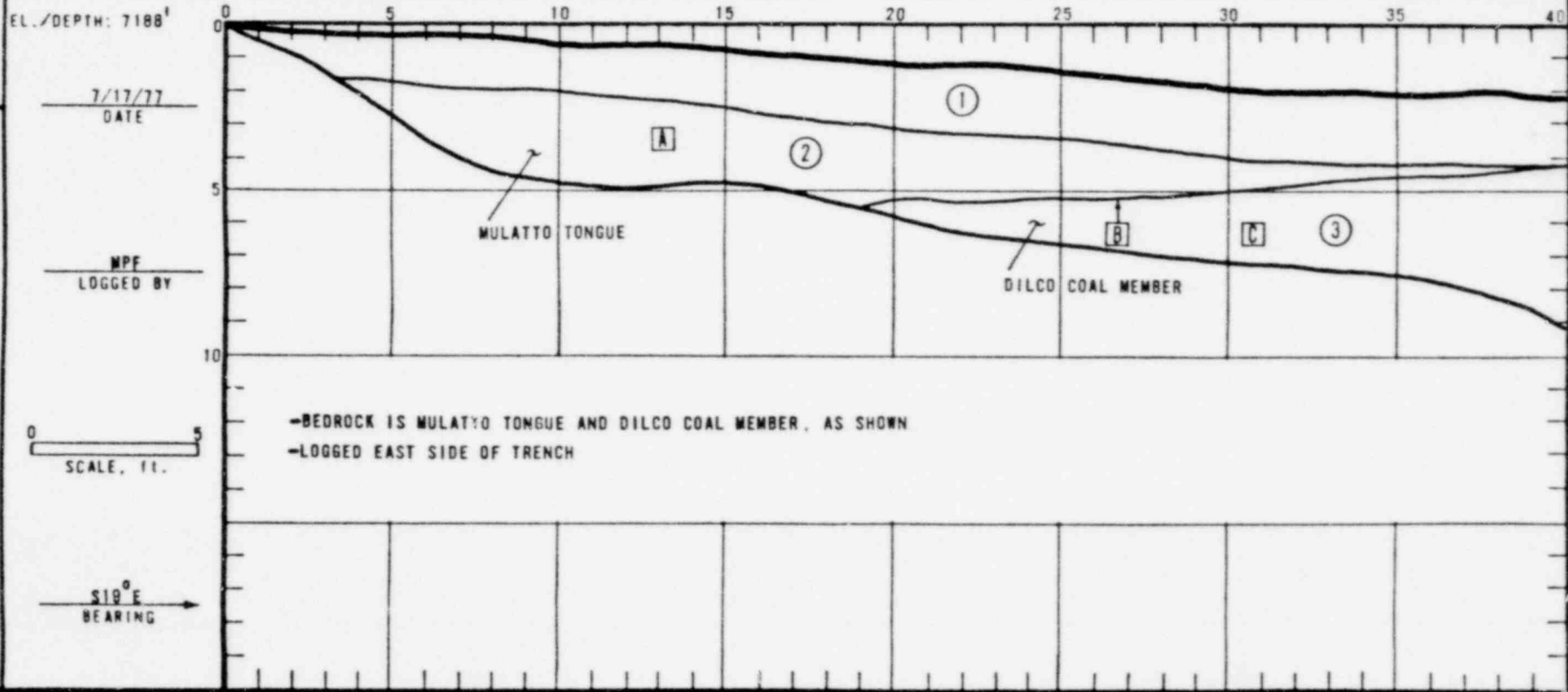
FIELD TRENCH LOG

DATE  
SEPTEMBER 1977  
DRAWING NO

TRENCH NO. WT-64  
Sheet 1 of 2

LOCATION: NORTH LEG OF DAM AXIS 6A  
NOTES:

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SILTY SANDY CLAY; YELLOW-BROWN, VERY PLASTIC, NOT STRATIFIED, CONTAINS SILTSTONE ROCK FRAGMENTS UP TO 1/4" DIAMETER.	A	N76°E	7°-9°N	BEDDING
	②	SILTSTONE; TAN WITH Fe STAIN, THIN BEDDED (1/8"-1/2"), BRITTLE, WEATHERED TO SILT ALONG BEDDING, UPPER B" WEATHERED TO CLAYEY SILT WITH SILTSTONE FRAGMENTS AND CALICHE STAIN, CONTAINS Mn STAIN ALONG BEDDING, CONTACT WITH DILCO COAL MEMBER MARKED BY GYPSUM CRYSTALS ALONG BEDDING PLANE.	B	N76°E	9°N	GEOLOGIC CONTACT
	③	SILTSTONE; GRAY AND YELLOW WITH Fe STAIN ALONG BEDDING, THIN WAVY BEDDING (1/8"-1"), BRITTLE, CONTAINS SILT AND SAND, SIZE GYPSUM DEPOSITS ALONG BEDDING.	C	N76°E	5°-9°N	BEDDING



F. 3/77

TRENCH NO. WT-64

Sheet 2 of 2

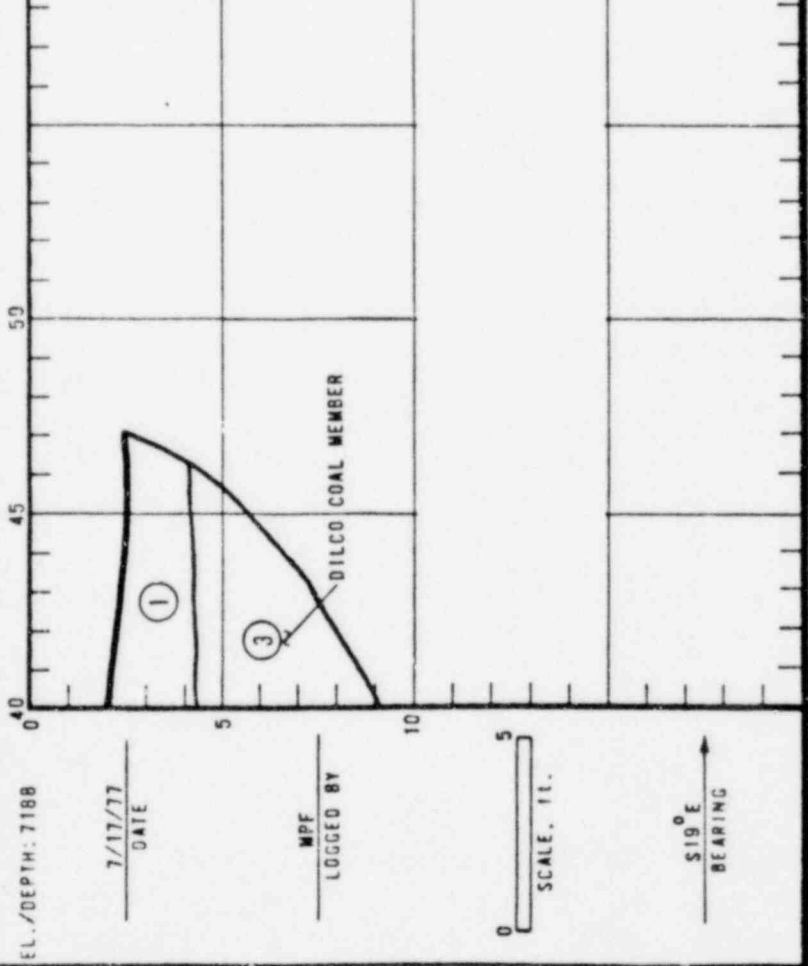
LOCATION: NORTH LEG OF DAM AXIS 6A

NOTES:

UNITS

STRUCTURE

DEPTH	NO.	DESCRIPTION	STRUCTURE			
			NO.	STRIKE	DIP	TYPE
EL./DEPTH: 7188						
7/17/77						
MPF						
LOGGED BY						
0						
5						
10						
40						
45						
50						
55						
60						
65						
70						
75						
80						
85						
90						
95						
100						



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FIELD TRENCH LOG

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO  
GUL-101

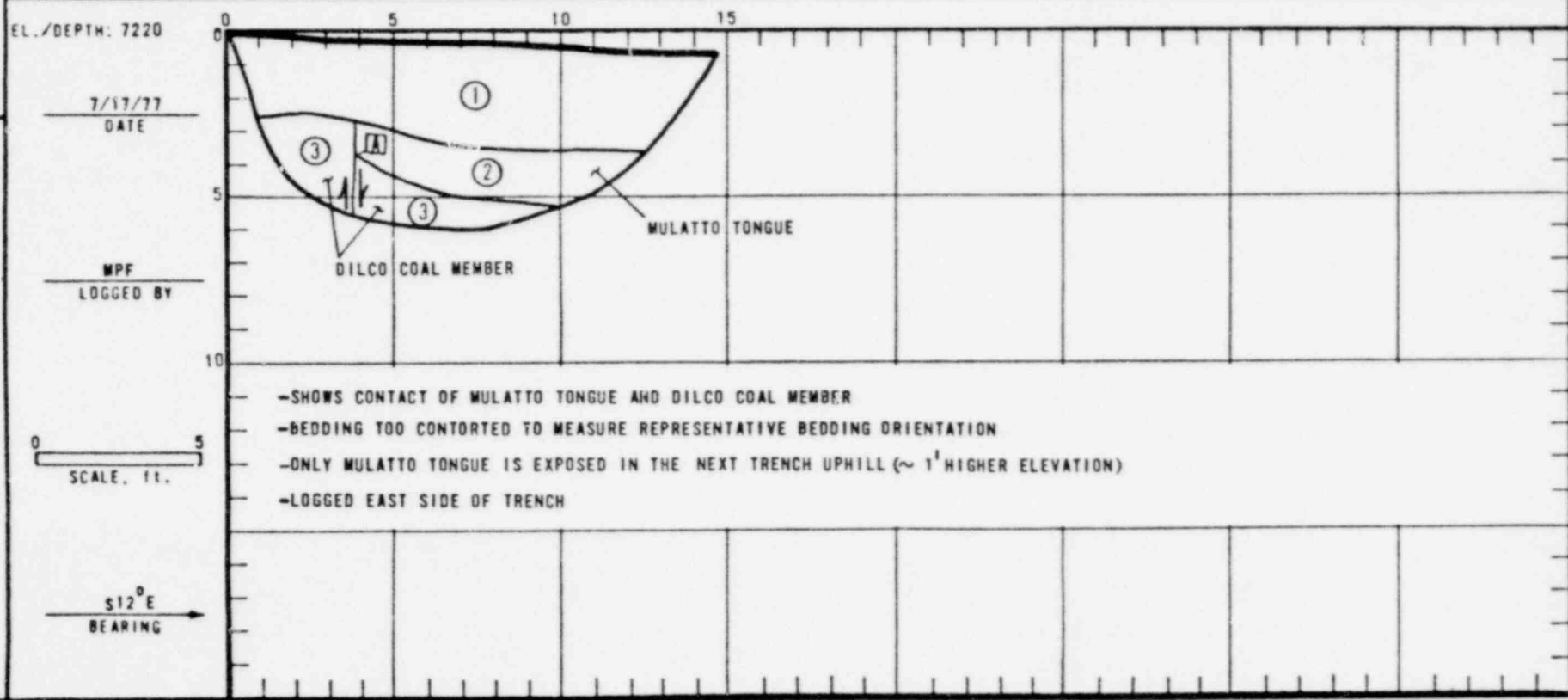
DATE  
SEPTEMBER 1977

DRAWING NO

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 MT. TAYLOR URANIUM MILL PROJECT  
 PROJECT NO. GUL-101  
 DATE: SEPTEMBER 1977  
 DRAWING NO.

TRENCH NO. <u>WT-65</u>		LOCATION: ALONG E-W TRENDING FAULT WEST OF NORTH LEG OF DAM AXIS 6A					
Sheet <u>1</u> of <u>1</u>		NOTES: PURPOSE: TO LOCATE CONTACT BETWEEN MULATTO TONGUE AND DILCO COAL MEMBER					
UNITS				STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE	
	①	SILTY CLAY; LIGHT BROWN, PLASTIC, CONTAINS SILTSTONE FRAGMENTS 1/4"-1/2" DIAMETER, COLLUVIUM.	[A]	N86°E	90°	FAULT	
	②	THIN INTERBEDDED BROWN CARBONACEOUS SHALE AND TAN SILTSTONE; VERY THIN BEDDED (UP TO 1/4" THICK), WELL FRACTURED AND WEATHERED. MICRO-FAULTS CONTAIN GYPSUM; SHALE IS FLAKY, UPPER 6" WEATHERED TO CLAYEY SILT.					
	③	INTERBEDDED PURPLE SILTSTONE AND TAN SILTY SANDSTONE; 2"-4" BEDDING, CRUMBLY, CONTAINS Fe-STAIN ALONG FRACTURES AND BEDDING. FAULT CONTAINS WEATHERED SHALE AND GYPSUM CRYSTALS; ZONE IS ABOUT 1/8"-1/4" WIDE.					



FIELD TRENCH LOG

F. 3/77

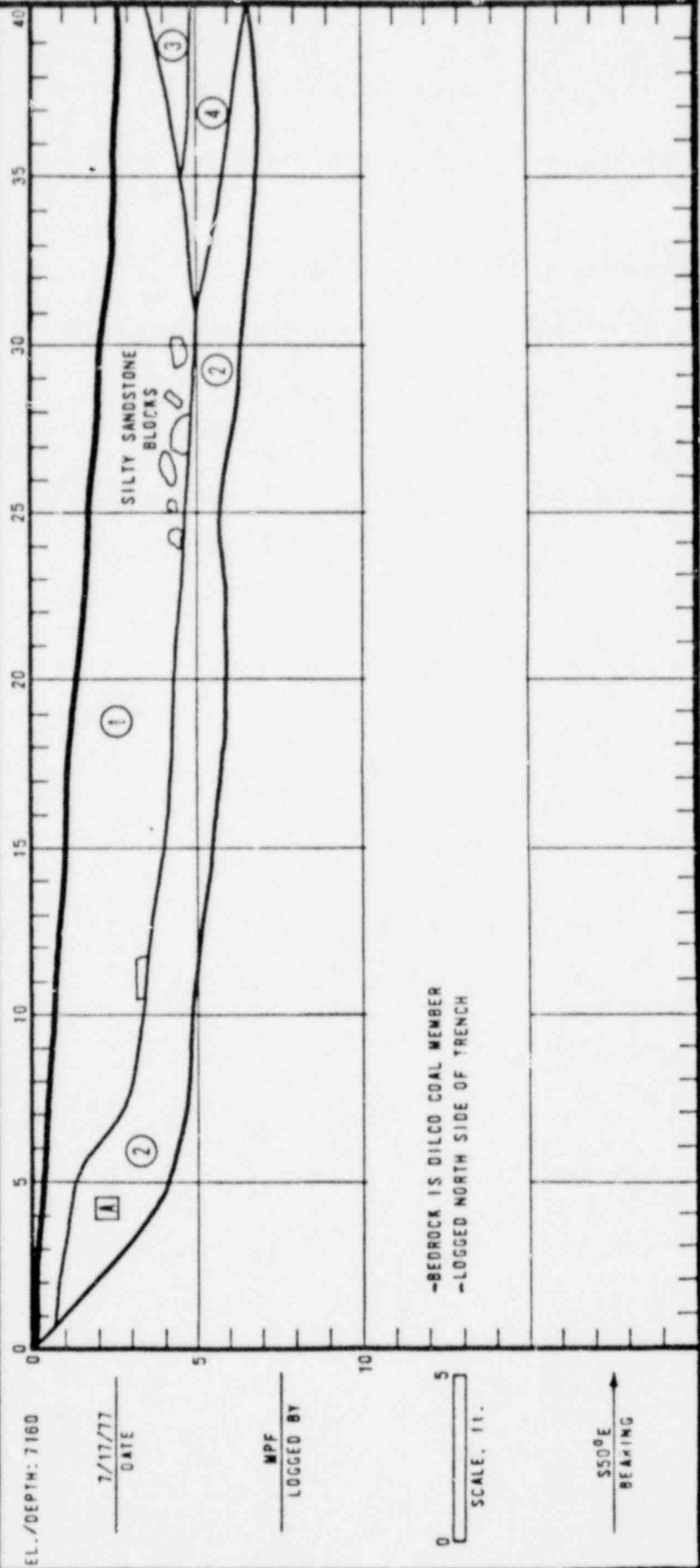
TRENCH NO. WT-66

Sheet 1 of 2

LOCATION: WEST OF NORTH LEG OF AXIS 6A

NOTES: PURPOSE: TO LOCATE POSSIBLE NE-SW TRENDING FAULT--NOT FOUND

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SLOPE WASH AND FLOAT MATERIAL; RED-BROWN, SILTY CLAY, PLASTIC, NOT STRATIFIED, CONTAINS SILTSTONE, SANDSTONE AND Fe STONE GRAVEL TO BLOCKS TO 6" X 6" X 3".	A	N35°W	30°E	BEDDING
	②	SHALE; GRAY TO BROWN WITH Fe STAIN ALONG BEDDING, THIN BEDDED (UP TO 1/2"), BRITTLE, WELL FRACTURED, UPPER 6" WEATHERED TO SILTY CLAY.				
	③	INTERBEDDED GRAY SHALE AND TAN SILTSTONE BEDS; 3" TO 8" THICK BEDS, BRITTLE, WELL FRACTURED, SHOWS Fe STAIN				
	④	ALONG BEDDING, UPPER 6" WEATHERED TO CLAYEY SILT. SILTY SANDSTONE LENS; TAN WITH Fe STAIN, HARD, 2" TO 8" BEDDING.				



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FIELD TRENCH LOG

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SEPTEMBER 1977

DRAWING NO

F. 3/77

TRENCH NO. MT-66

LOCATION: WEST OF NORTH LEG OF DAM AXIS 6A

Sheet 2 of 2

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
			[B]	N70°E	10°S	BEDDING

EL./DEPTH: 7160

7/17/77  
DATE

MPP  
LOGGED BY

0 5  
SCALE, FT.

S50°E  
BEARING

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FIELD TRENCH LOG

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

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TRENCH NO. WT-87

Sheet 1 of 2

LOCATION: ALONG FIRST RIDGE WEST OF NORTH LEG OF DAM AXIS 6A

NOTES:

		UNITS		STRUCTURE		
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SILTY SANDY CLAY; LIGHT BROWN TO RED-BROWN, PLASTIC, UPPER 6" CONTAINS SILTSTONE AND Fe STONE FRAGMENTS UP TO 1/2" DIAMETER, APPARENTLY BEDROCK WEATHERED IN PLACE.	A	N10°E	10°E	BEDDING
	②	INTERBEDDED GRAY SHALE, TAN SILTSTONE, AND DISCONTINUOUS YELLOW SANDSTONE BEDS (4" TO 8" THICK); SILTSTONE AND SHALE BEDDING UP TO 1" THICK, SANDSTONE BEDDING UP TO 4" THICK, BRITTLE, CONTAINS SAND SIZE GYPSUM CRYSTALS ALONG BEDDING, SHOWS LOCAL FOLDING, CONTAINS FEW ISOLATED Fe-STONE LENSES, (3" TO 6" LONG), SOME Fe STAIN ALONG BEDDING, UPPER 6" SEVERELY WEATHERED.	B	N10°E	10°E-30W	BEDDING (LOCAL FOLDS)

EL./DEPTH: 7170

7/18/77  
DATE

MPF  
LOGGED BY

0 5 10  
SCALE: 1".

S75°E  
BEARING

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FIELD TRENCH LOG

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PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

F. 3/77

TRENCH NO. MT-67

Sheet 2 of 2

LOCATION: ALONG FIRST RIDGE WEST OF NORTH LEG OF DAM AXIS SA

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
			[C]	N100E	60E	BEDDING

EL./DEPTH: 7170	7/18/77	MPF	LOGGED BY	SCALE, 1".	S75°E BEARING
40	DATE			0	
45				5	
50				10	
55				15	
				20	
				25	
				30	
				35	
				40	
				45	
				50	
				55	
				60	
				65	
				70	
				75	
				80	
				85	
				90	
				95	
				100	

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FIELD TRENCH LOG

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO	DATE	DRAWING NO
GUL-101	SEPTEMBER 1977	

F. 3/77

TRENCH NO. WT-68

Sheet 1 of 1

LOCATION: NORTH OF WT-69, POND 6A

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	<p>SANDY SILT TO CLAYEY SILT; LIGHT BROWN, DENSE, SLIGHTLY PLASTIC, NOT STRATIFIED, SHOWS CALICHE STAIN.                      SILTY SANDSTONE TO SANDY SILTSTONE; WHITE TO BUFF, LOOSE AND FRIABLE 1/2" TO 2" BEDDING, WAVY BEDDING, SHOWS SOME FE STAIN ALONG BEDDING, UPPER 6" WEATHERED TO SANDY SILT.</p>	A	N20E	210E	BEDDING
	②					

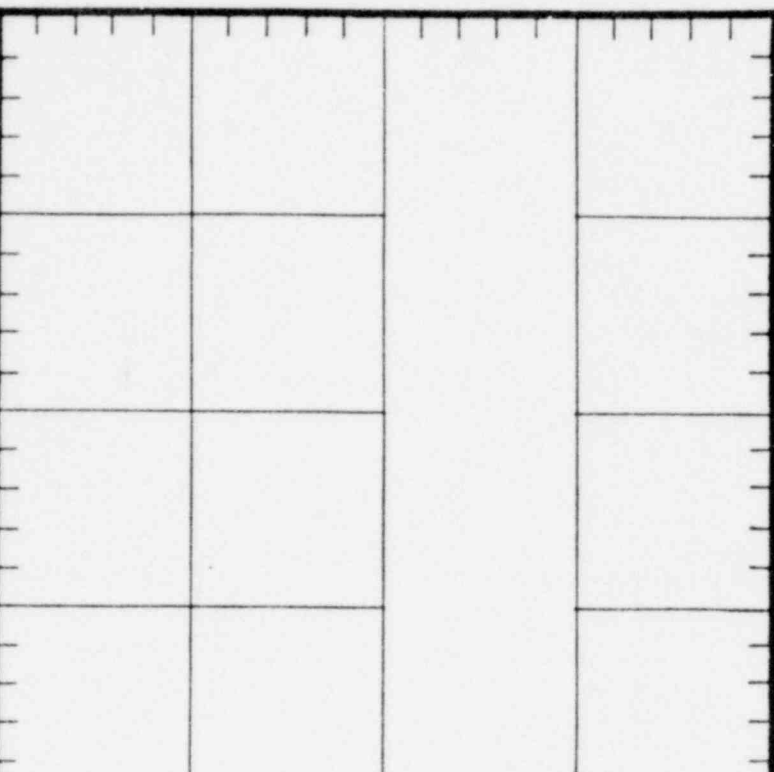
EL./DEPTH: 7186'

7/19/77  
DATE

MPF  
LOGGED BY

0  
SCALE, FT.

N33°E  
BEARING



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FIELD TRENCH LOG

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PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO



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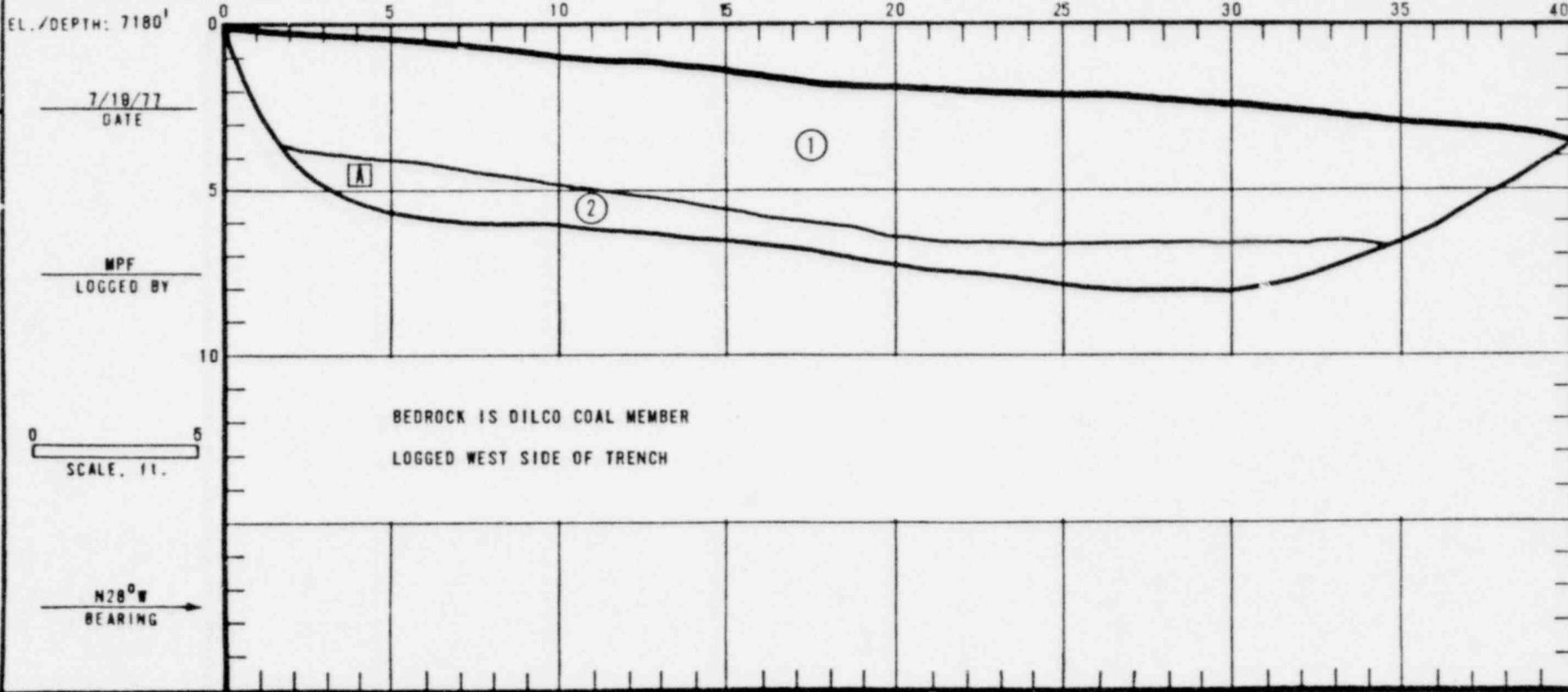
TRENCH NO. WT-69

LOCATION: NORTH SIDE OF CENTRAL RIDGE AND WEST OF DAM AXIS 6A

Sheet 1 of 1

NOTES: \_\_\_\_\_

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SANDY SILT TO CLAYEY SILT; LIGHT BROWN, DENSE, SLIGHTLY PLASTIC, NOT STRATIFIED.	A	N30°E	10°-20°E	BEDDING
	②	SILTY SANDSTONE TO SANDY SILSTONE; WHITE TO BUFF, LOOSE AND CRUMBLY, 1/2" TO 2" BEDDING, WAVY BEDDING, SHOWS SOME Fe STAIN ALONG BEDDING, UPPER 6" WEATHERED TO SANDY SILT.				



PAID ALSO REPORT RECH CALIF

PROJECT NO

DATE

DRAWING NO

FIELD TRENCH LOG

F. 3/77

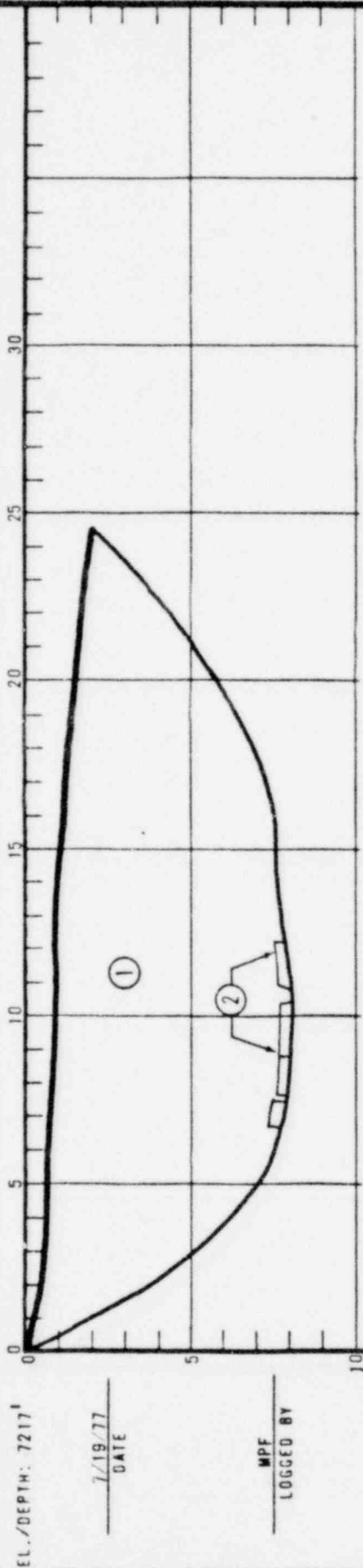
TRENCH NO. WT-70

Sheet 1 of 1

LOCATION: UPSLOPE OF WT-71 NEAR CREST OF CENTRAL RIDGE, POND 6A

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SANDY CLAY; LIGHT BROWN. VERY PLASTIC. HARD, NOT STRATIFIED. CONTAINS TAN SILTSTONE FRAGMENTS UP TO 3" DIAMETER. QUARTZ CONGLOMERATE BLOCKS (COARSE SANDSTONE); GRAY TO TAN. VERY RESISTANT. HARD. SHOWS VERTICAL CLEAVAGE AND HORIZONTAL BEDDING, NOT-IN-SITU MATERIAL.				
	②					



-TAN SILTSTONE OUTCROP EXPOSED ~30' WEST OF TRENCH  
 -BEDROCK IS BASE OF MULATTO TONGUE  
 -LOGGED WEST SIDE OF TRENCH

WA WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

F. 3/77

TRENCH NO. WT-71

LOCATION: ALONG CREST OF CENTRAL RIDGE - SW OF WT-68

Sheet 1 of 1

NOTES:

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FIELD TRENCH LOG

PROJECT NO

GUL-101

DATE

SEPTEMBER 1977

DRAWING NO

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SANDY SILT TO CLAYEY SILT; LIGHT BROWN, DENSE, SLIGHTLY PLASTIC, NOT STRATIFIED, COLLUVIUM. INTERBEDDED TAN SILTSTONE AND GRAY SHALE; CONTAINS FB STAIN AND YELLOW SILT ALONG BEDDING, THIN BEDDED (UP TO 1-1/2"), CONTAINS TAN TO GRAY SILT ALONG BEDDING, UPPER 6" WEATHERED TO SILT.	A	E-W	15°N	BEDDING
	②					

E.L./DEPTH: 7215

7/19/77  
DATE

MPF  
LOGGED BY

0 5 10  
SCALE, FT.

N46°E  
BEARING

-BEDROCK IS DILCO COAL MEMBER  
-LOGGED WEST SIDE OF TRENCH

F. 3/77

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& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

TRENCH NO. WT-72

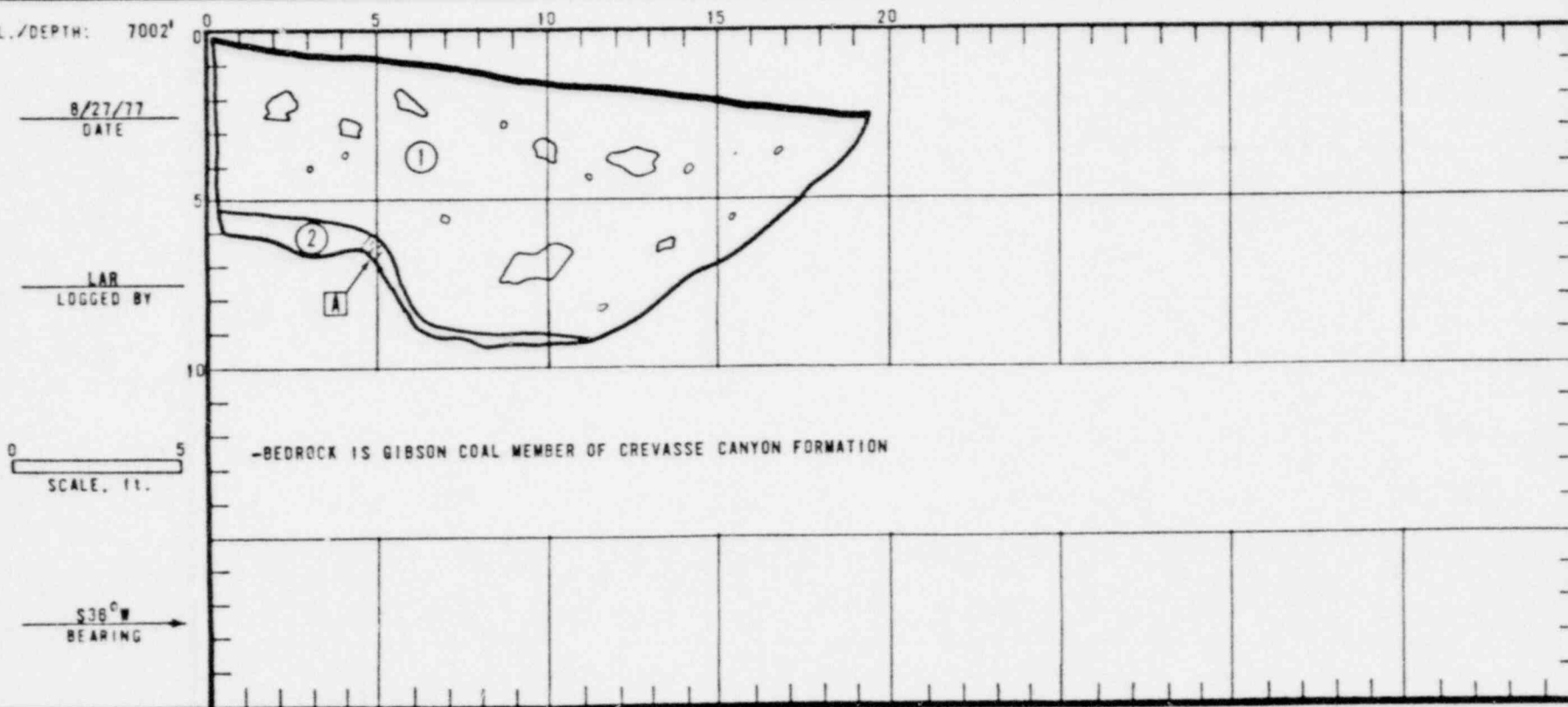
Sheet 1 of 1

LOCATION: MOUTH OF LA POLVADERA CANYON

NOTES: J.D. 510 BACKHOE w/24" BUCKET

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	COLLUVIUM; SILTY SAND, DARK YELLOW BROWN, CONTAINS ANGULAR SANDSTONE GRAVEL, COBBLES AND BOULDERS, DENSE BELOW 2.5'.	A	N14°W	45°NE	SS BEDDING
	②	SANDSTONE; LIGHT OLIVE GRAY, FINE GRAINED, HARD, STRONG, PARTS ALONG 0.5" BEDDING PLANES, NO DISTINCT JOINTS, REFUSES BACKHOE.				

EL./DEPTH: 7002'



-BEDROCK IS GIBSON COAL MEMBER OF CREVASSE CANYON FORMATION

0 5  
SCALE, FT.

S36°W  
BEARING

FIELD TRENCH LOG

TRENCH NO. MT-73

Sheet 1 of 1

LOCATION: MOUTH OF LA. POLVADERA CANYON

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAYSTONE; BROWNISH GRAY, LOW HARDNESS, WEAK TO MODERATELY STRONG, CONTAINS GYPSUM FILLED JOINTS TO 0.5", BEDDING IS INDISTINCT, EXCAVATES EASILY.	A	N52°E	56°S	JOINT
	②	COAL; FRIABLE, 8" AND 4" BEDS 0.3" GYPSUM LAYER ON TOP OF THICKER BED.	B	N69°E	59°W	JOINT
	③	SILTSTONE AND SANDSTONE; INTERBEDDED, SANDSTONE IS GRAYISH ORANGE, SILTSTONE IS OLIVE GRAY, BOTH ARE MODERATELY STRONG, PARTS ALONG 0.5"-2.0" PLANES, EXCAVATES EASILY INTO SMALL BROKEN FRAGMENTS.	C	N10°W	29°E	COAL BED
			D	N6°W	32°E	SS BED
			E	N50°W	63°W	SS JOINT

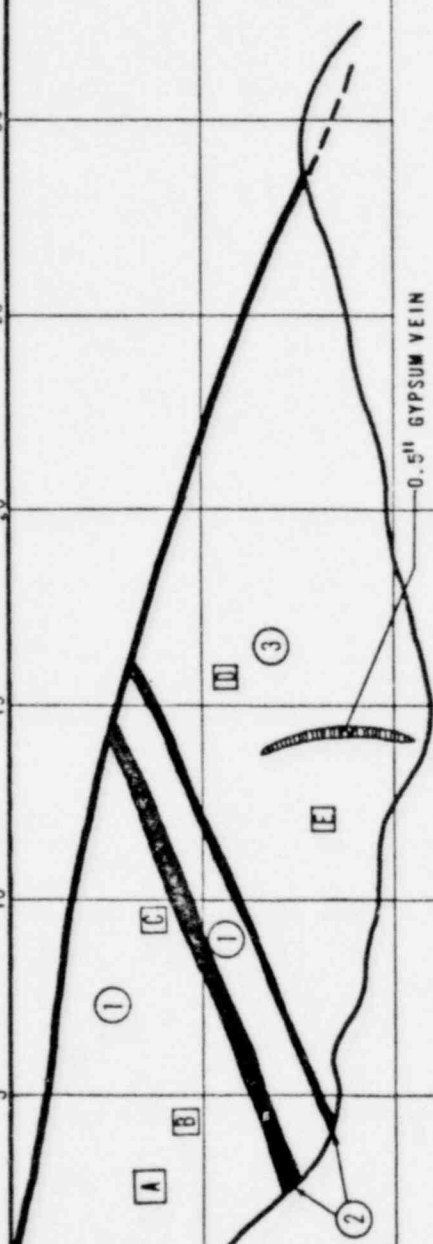
EL./DEPTH: 7020' 0 5 10 15 20 25 30 35

8/27/77  
DATE

LAB  
LOGGED BY

0 5  
SCALE, FT.

S85°W  
BEARING



-BEDROCK IS GIBSON COAL MEMBER OF CREVASES CANYON FORMATION

W.A. WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

F. 3/77

W A WAHLER  
& ASSOCIATES

TRENCH NO. WT-74

LOCATION: MOUTH OF LA POLVADERA CANYON

Sheet 1 of 1

NOTES:

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	COLLUVIUM; SILTY SAND, MODERATE YELLOW BROWN, CONTAINS SANDSTONE COBBLES AND BOULDERS.	A	N10°W	24°E	SS & CLST CONTACT.
	②	SANDSTONE; YELLOW GRAY, FINE GRAINED, WEAK TO MODERATELY STRONG	B	N74°E	80°N	SS JOINT
	③	CLAYSTONE; BROWNISH GRAY WITH GRAYISH ORANGE VEINS THAT CONTAIN SOME GYPSUM, 0.5" GYPSUM LAYER AT CONTACT WITH SANDSTONE LOW HARDNESS, FRIABLE.	C	N6°W	20°E	COAL SEAM
	④	COAL; FRIABLE, 6" AND 3" BEDS.	D	N40°E	57°S	CLST JOINT

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MT. TAYLOR URANIUM MILL PROJECT

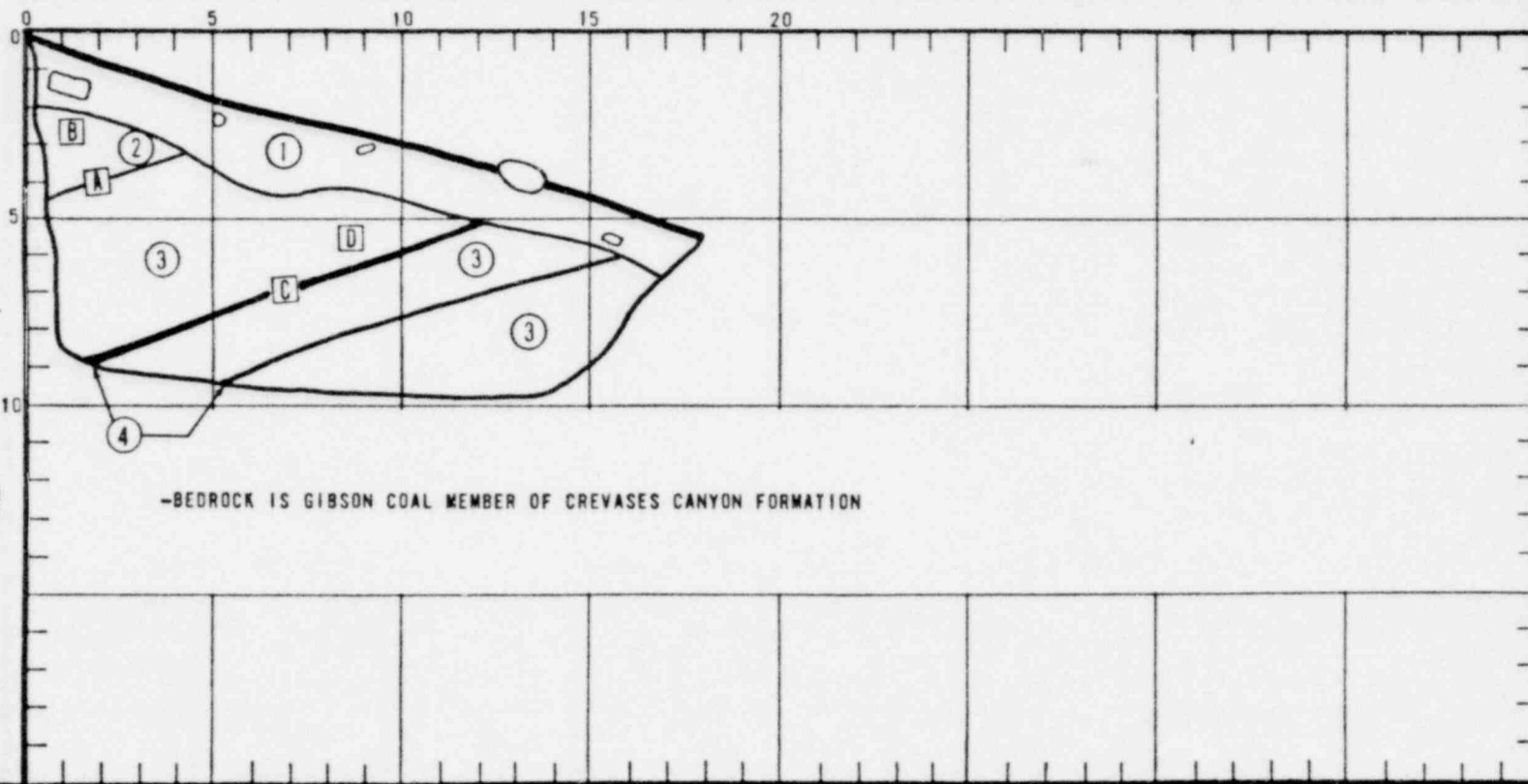
EL./DEPTH: 7004'

8/27/77  
DATE

LAR  
LOGGED BY

0 5  
SCALE, FT.

S52°W  
BEARING



PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

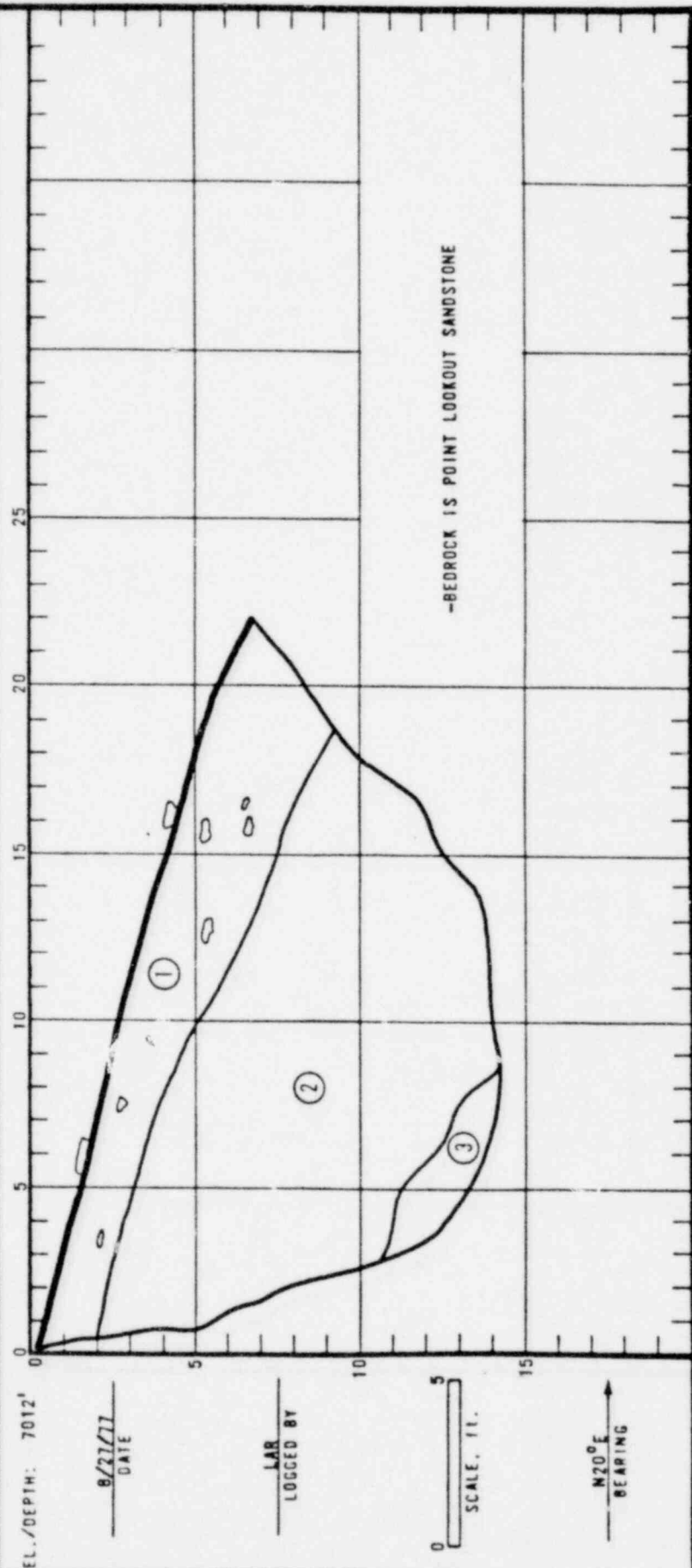
FIELD TRENCH LOG

F.3/77

TRENCH NO. MT-75  
 Sheet 1 of 1

LOCATION: MOUTH OF LA POLVADERA CANYON  
 NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	COLLUVIUM; SILTY SAND, MODERATE TO DARK YELLOW BROWN, CONTAINS ANGULAR SANDSTONE GRAVEL AND COBBLES.				
	②	ALLUVIUM; CLAYEY SAND, MODERATE YELLOW BROWN, FINE GRAINED, APPROXIMATELY 15% LOW PLASTICITY FINES, CONTAINS SCATTERED GRAVEL.				
	③	SANDSTONE; MODERATE YELLOW BROWN, FRIABLE, DEEPLY WEATHERED.				



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FIELD TRENCH LOG

PALO ALTO • HERRING BEACH • CALIF.

PROJECT NO

GUL-101

DATE

SEPTEMBER 1977

DRAWING NO

F. 3/77

TRENCH NO. MT-76

Sheet 1 of 1

LOCATION: MOUTH OF LA POLVADEHA CANYON

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	COLLUVIUM; CLAYEY SAND, MODERATE YELLOW BROWN, VERY FINE GRAINED, APPROXIMATELY 15% LEAN CLAY FINES, CONTAINS SANDSTONE GRAVEL, COBBLES AND BOULDERS TO 8' DIAMETER.				

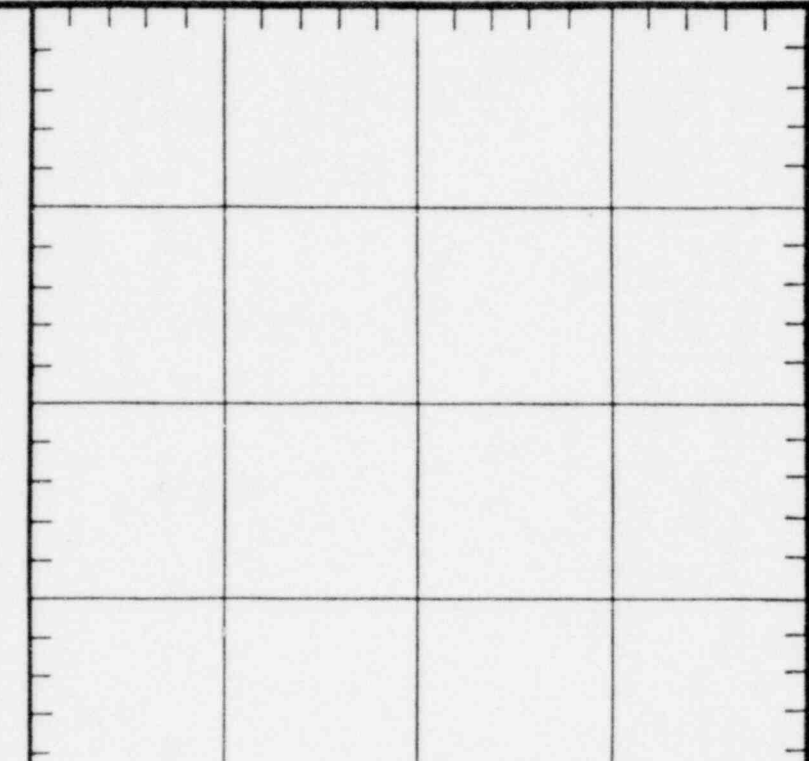
EL./DEPTH: 7012'

8/27/77  
DATE

\_\_\_\_\_  
LOGGED BY

0 5  
SCALE, FT.

↑  
N20°W  
BEARING



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MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

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F. 3/77

TRENCH NO. WT-77

Sheet 1 of 1

LOCATION: Pond BA - NORTH SIDE

NOTES:

DEPTH	UNITS		STRUCTURE			
	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SILTY SHALE; GRAYISH ORANGE AND DARK YELLOW BROWN, VERY THINLY LAMINATED WITH GRANULAR GYPSUM INFILTRATING MANY PARTINGS, LOW HARDNESS, FRIABLE, CONTORTED BEDDING.	A	N28°E	71°E	SS JOINT
	②	SANDSTONE; MODERATE RED BROWN, 1"-3" LAYER CAPPING THE UNDERLYING UNIT.	B	N70°E	3°N	SS-SH CONTACT
	③	SANDSTONE; GRAYISH ORANGE, 6"-8" BEDS WITH THIN INTERBEDS OF SHALE, STRONG.				

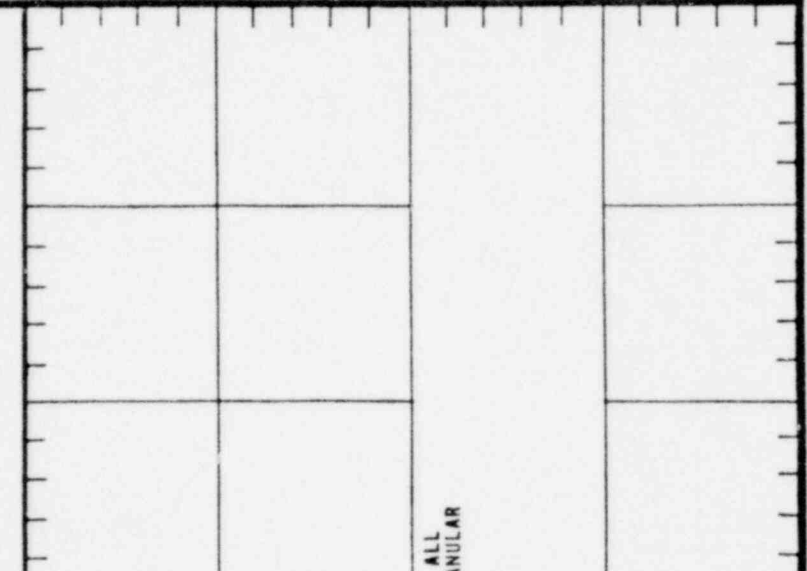
EL./DEPTH: 7094'

8/27/77  
DATE

LAR  
LOGGED BY

0 5 10  
SCALE, FT.

↑  
SIDE BEARING



FIELD TRENCH LOG

W A WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO GUL-101	DATE SEPTEMBER 1977	DRAWING NO
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3/77

TRENCH NO. MT-78

Sheet 1 of 1

LOCATION: POND 8A, NORTH SIDE

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAYEY SHALE; BROWNISH GRAY, THINLY LAMINATED WITH SILTY INTERBEDS. CONTAINS IMPRINTS OF FOSSIL PLANT DEBRIS, INDISTINCT BEDDING BELOW 4.0', YELLOW ORANGE STAINING ON PARTINGS TO 3.0', WEAK.	1	N50°E	30°W	SH BED

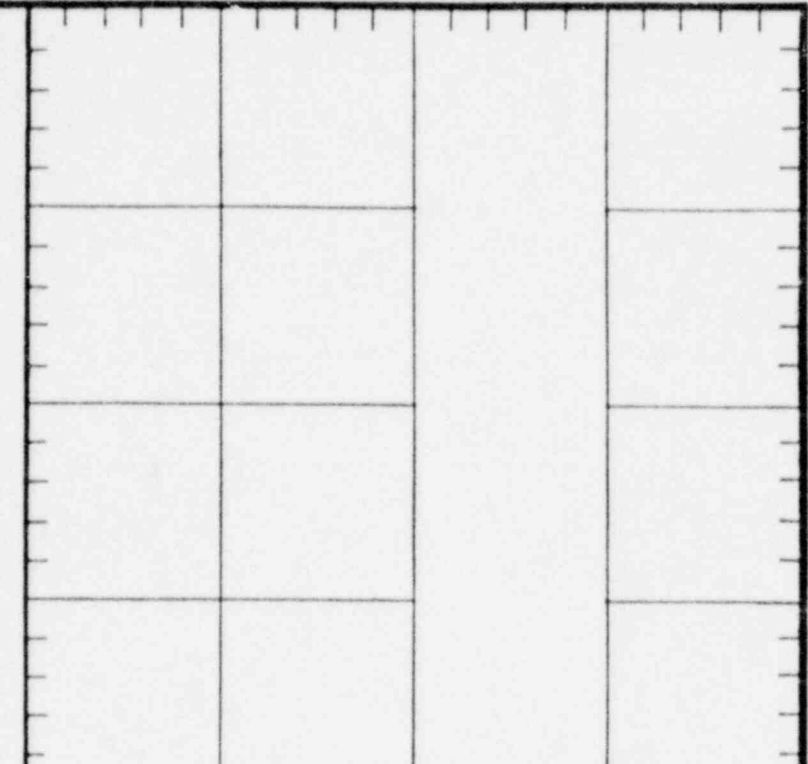
EL./DEPTH: 7122' 0

8/27/77  
DATE

LAR  
LOGGED BY

0 5 10  
SCALE, FT.

N21°W  
BEARING



W A WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PROJECT NO GUL-101	DATE SEPTEMBER 1977	DRAWING NO
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TRENCH NO. MT-79

LOCATION: POND 8A; NORTH SIDE

Sheet 1 of 1

NOTES:

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FIELD TRENCH LOG

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PROJECT NO

GUL-101

DATE

SEPTEMBER 1977

DRAWING NO

DEPTH	NO.	DESCRIPTION	STRUCTURE		
			NO.	STRIKE	DIP
	①	SILTY SHALE; BROWNISH GRAY, THINLY LAMINATED, LOW HARDNESS, MODERATELY STRONG, BECOMES SANDY AND STRONG BELOW 2.5'.	A	N50E	70E
					BED

EL./DEPTH:	8/27/77	DATE	7112'
LAR LOGGED BY			

F. 3/77

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FIELD TRENCH LOG

PROJECT NO

GUL-101

DATE

SEPTEMBER 1977

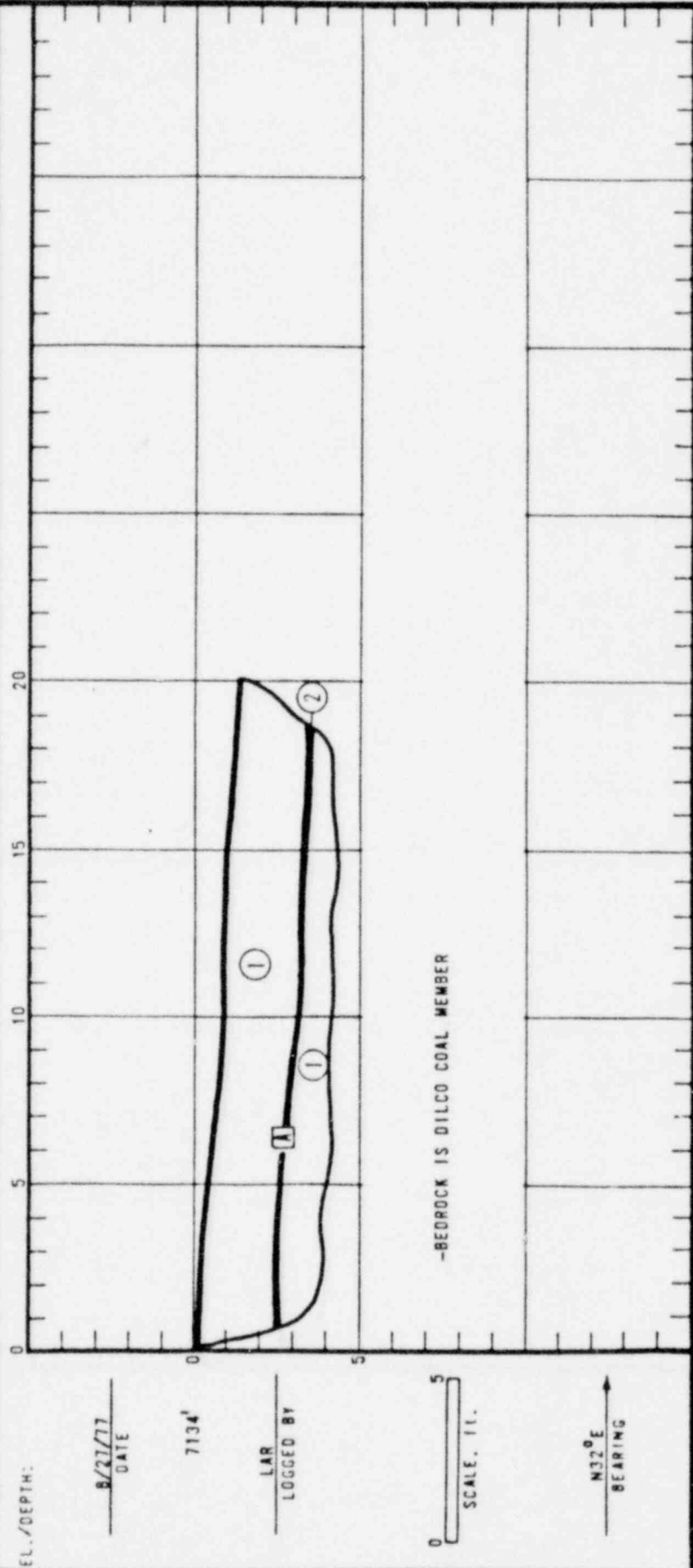
DRAWING NO

TRENCH NO. MT-80  
 Sheet 1 of 1

LOCATION: POND 6A

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SANDSTONE AND SANDY SHALE; LIGHT OLIVE GRAY, BEDS ARE 1/2"-2", MODERATELY HARD, WEAK, GRAYISH ORANGE STAINING TO 2.0'. COAL; 3" THICK SEAM.	1	N36°W	3°N	COAL BED
	②					



EL./DEPTH:

8/27/77  
DATE

7134'

LAR  
LOGGED BY

0 5  
SCALE, FT.

N32°E  
BEARING

-BEDROCK IS DILCO COAL MEMBER

F. 3/77

TRENCH NO. WT-81

LOCATION: POND 8A - SOUTH SIDE

Sheet 1 of 1

NOTES:

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MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

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PROJECT NO

GUL-101

DATE

SEPTEMBER 1977

DRAWING NO

DEPTH	UNITS		STRUCTURE		TYPE	
	NO.	DESCRIPTION	NO.	STRIKE		DIP
	①	SILTY SHALE; LIGHT OLIVE GRAY, THINLY LAMINATED, WEAK.	①	N70°E	18°W	BED

EL./DEPTH:	8/27/77	7146'	LAB LOGGED BY	
	DATE			

W A WAHLER  
& ASSOCIATES

PAULO ALTO & HERBERT RICH - CALIF.

MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

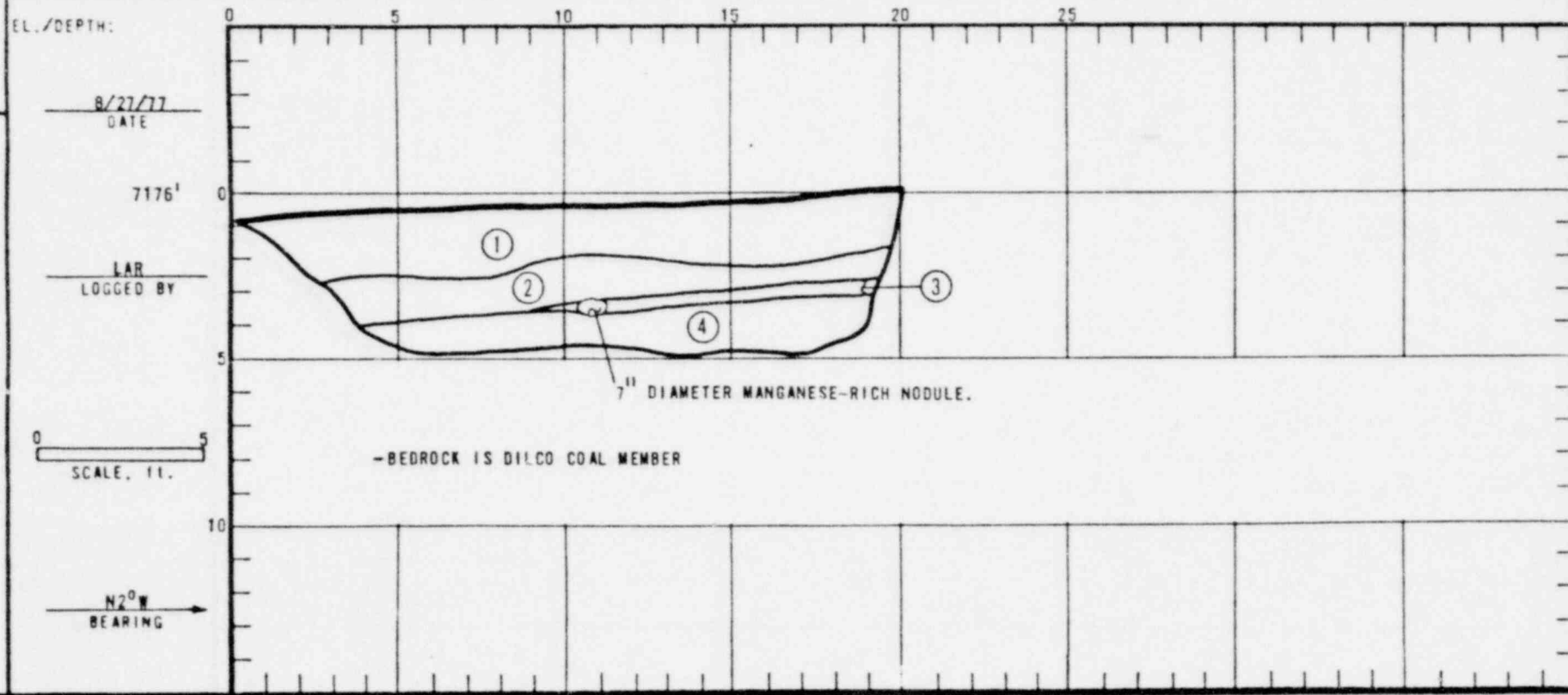
TRENCH NO. WT-82

LOCATION: POND 6A; SOUTH SIDE

Sheet 1 of 1

NOTES: \_\_\_\_\_

		UNITS		STRUCTURE			
DEPTH	NO.	DESCRIPTION		NO.	STRIKE	DIP	TYPE
	①	SANDY CLAY; MODERATELY YELLOWISH BROWN, LOW PLASTICITY 15-20% VERY FINE, SAND, POROUS WITH ROOTS TO 2'.					
	②	CLAY; (WEATHERED SHALE), MODERATELY YELLOWISH BROWN, MEDIUM PLASTIC.					
	③	SANDSTONE; GRAYISH ORANGE, FINE GRAINED, MODERATELY STRONG.					
	④	CLAYEY SHALE; MEDIUM GRAY, VERY THINLY LAMINATED, HACKELY TEXTURE, INDISTINCT BEDDING, WEAK.					



F. 3/77

TRENCH NO. MT-83

LOCATION: POND 6A RECLAMATION BORROW AREA

Sheet 1 of 1

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SANDY CLAY; MODERATELY YELLOWISH BROWN. LOW TO MEDIUM PLASTIC. 15% VERY FINE SAND, POROUS WITH FINE ROOTS AND CALICHE VEINLETS TO 4.5'				

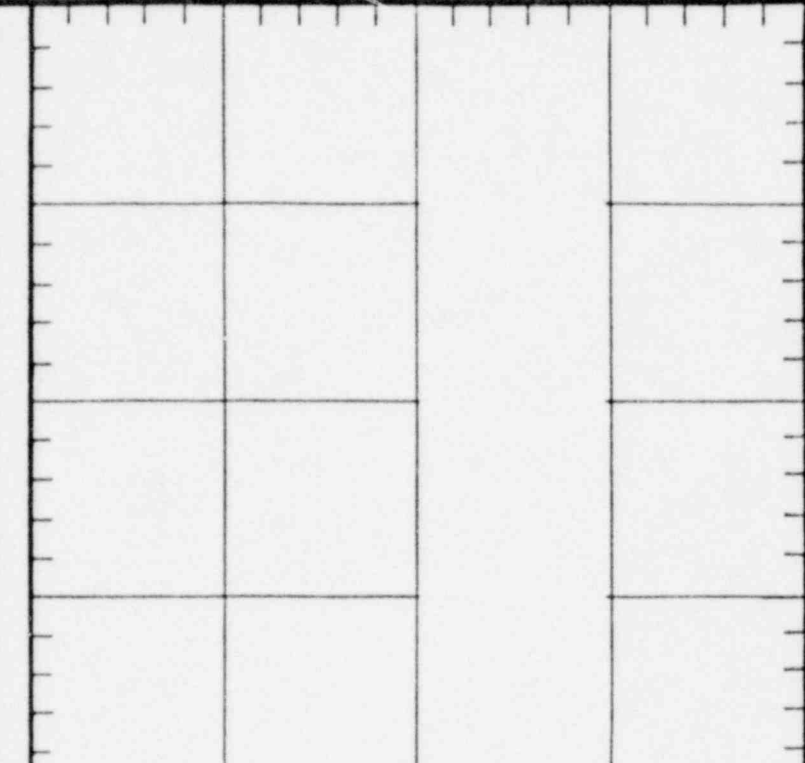
EL./DEPTH: 7260' 0

8/27/77  
DATE

\_\_\_\_\_  
LOGGED BY

0 5  
SCALE, FT.

↑  
N12°E  
BEARING



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MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PROJECT NO GUL-101	DATE SEPTEMBER 1977	DRAWING NO
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TRENCH NO. MT-84

Sheet 1 of 1

LOCATION: POND 8A, UPSTREAM

NOTES:

UNITS

STRUCTURE

NO. STRIKE DIP TYPE

DEPTH NO.

DESCRIPTION

①

SILTSTONE; MODERATELY YELLOWISH BROWN, DEEPLY WEATHERED, BEDDING IS INDISTINCT, LOW HARDNESS, FRILABLE TO WEAK, CONTAINS NUMEROUS ANIMAL BURROWS TO 4' DEPTH.

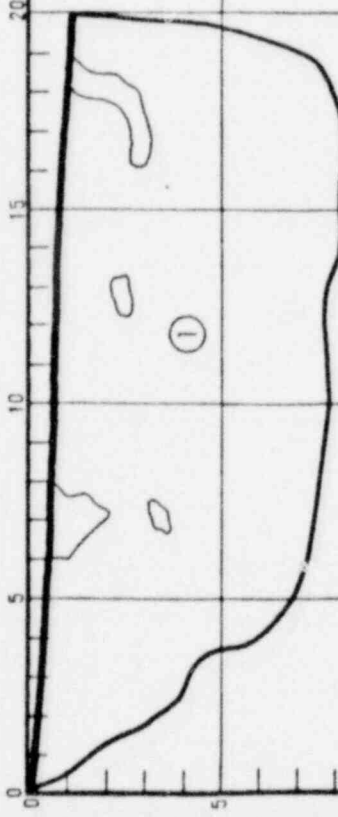
EL./DEPTH: 7239'

8/27/77  
DATE

                      
LOGGED BY

0 5  
SCALE, FT.

                      
NBSSE BEARING



-BEDROCK IS MULATTO TONGUE

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MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO

DATE

DRAWING NO

GUL-101

SEPTEMBER 1977



F. 3/77

WA WALKER  
8 ASSOCIATES

TRENCH NO. WT-85

LOCATION: POND 6A, RESERVOIR; NORTH SIDE

Sheet 1 of 1

NOTES:

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SANDY CLAY; MODERATELY YELLOWISH BROWN, LEAN, 20-30% VERY FINE SAND, CONTAINS NUMEROUS ANIMAL BURROWS, FINE ROOTS TO 4' DEPTH.				
	②	SANDSTONE; PALE YELLOWISH BROWN, FINE GRAIN, HARD, MODERATELY STRONG TO STRONG, BEDDING INDISTINCT EXCAVATES INTO IRREGULAR, FLAGGY PLATES 1" TO 2" THICK.				

EL./DEPTH: 7210'

0 5 10 15 20

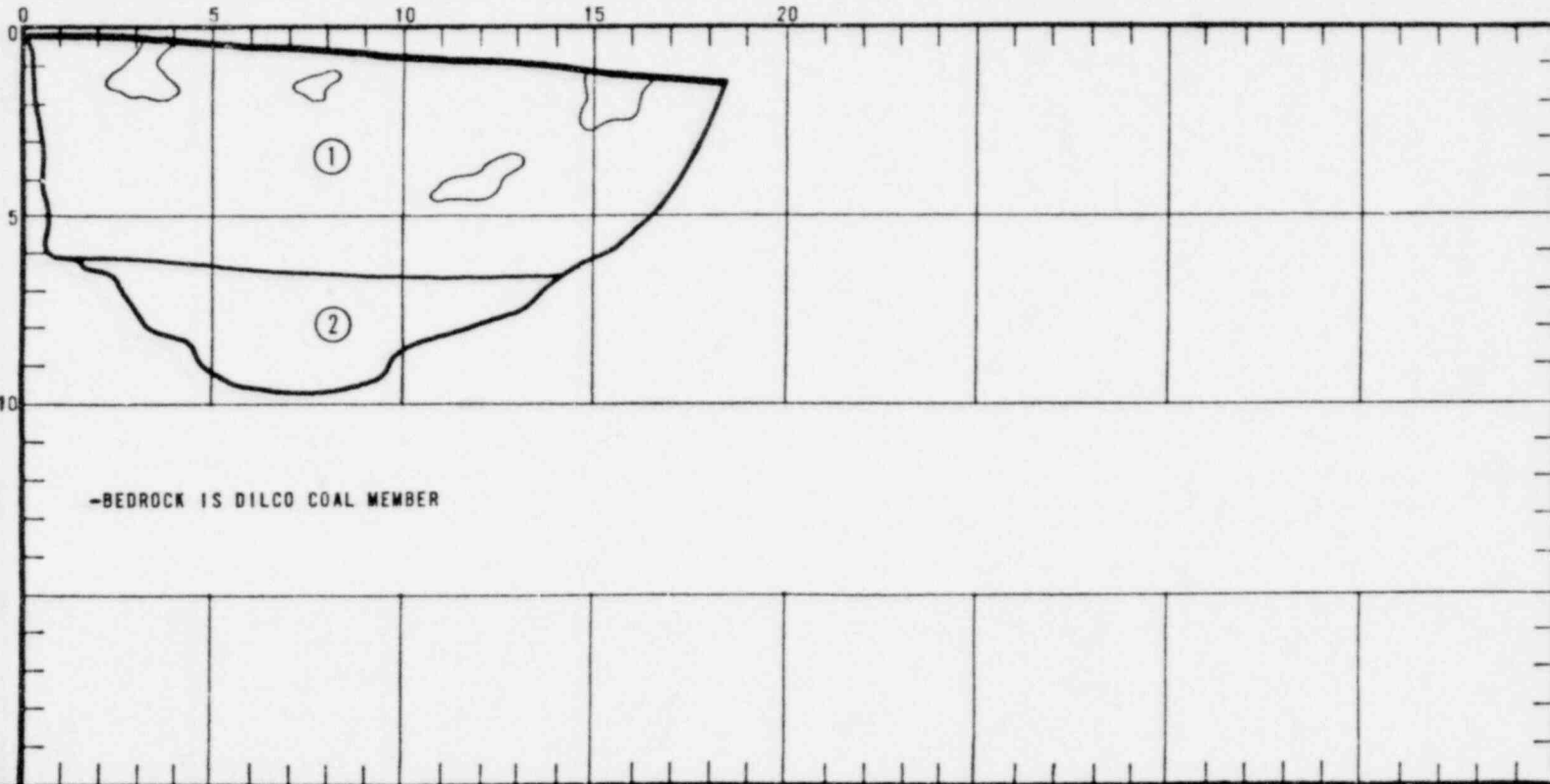
8/28/77  
DATE

LAR  
LOGGED BY

0 5  
SCALE, FT.

-BEDROCK IS DILCO COAL MEMBER

S80°W  
BEARING



MT. TAYLOR URANIUM MILL PROJECT

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PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

FIELD TRENCH LOG

F. 3/77

TRENCH NO. MT-85

LOCATION: POND 6A, RESERVOIR

Sheet 1 of 1

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAY; MODERATELY YELLOWISH BROWN, LOW PLASTICITY 15% VERY FINE SAND BELOW 5' WITH SOME GRANULAR GYPSUM IN SANDY SEAMS, POROUS WITH FINE ROOTS TO 4'. DRY, HARD, COLLUVIUM AND SAPROLITE.				

EL./DEPTH: 7210'	0	5	10	15	20
8/28/77	DATE				
	LOGGED BY				
0	SCALE, FT.				
	N82°E BEARING				

WA WAHLER & ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO

DATE

DRAWING NO

GUL-101

SEPTEMBER 1977

F. 3/77

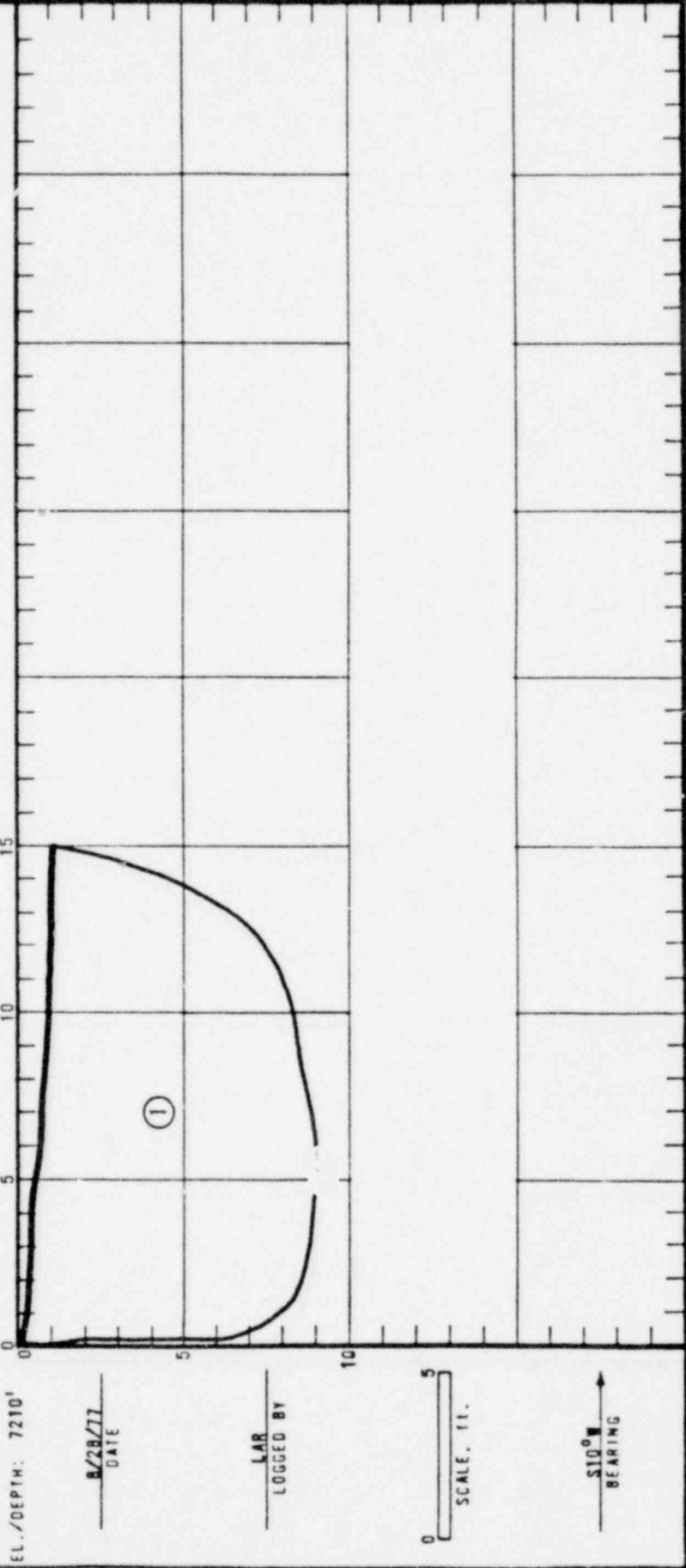
TRENCH NO. WT-87

LOCATION: POND 6A, RESERVOIR

Sheet 1 of 1

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	CLAY; MODERATELY YELLOWISH BROWN, LOW PLASTICITY, APPROXIMATELY 5% VERY FINE SAND, FINE POROSITY, ROOTS AND CALICHE VEINLETS TO 4' DEPTH, DRY, HARD, COLLUVIUM.				



EL./DEPTH: 7210'

8/28/77  
DATE

\_\_\_\_\_  
LOGGED BY

0 5  
SCALE, FT.

\_\_\_\_\_  
S10°W  
BEARING

W A WAHLER & ASSOCIATES

WT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PROJECT NO	DATE	DRAWING NO
GUL-101	SEPTEMBER 1977	

PALO ALTO • NEWPORT BEACH • CALIF.

TRENCH NO. WT-88

LOCATION: POND GA, RESERVOIR

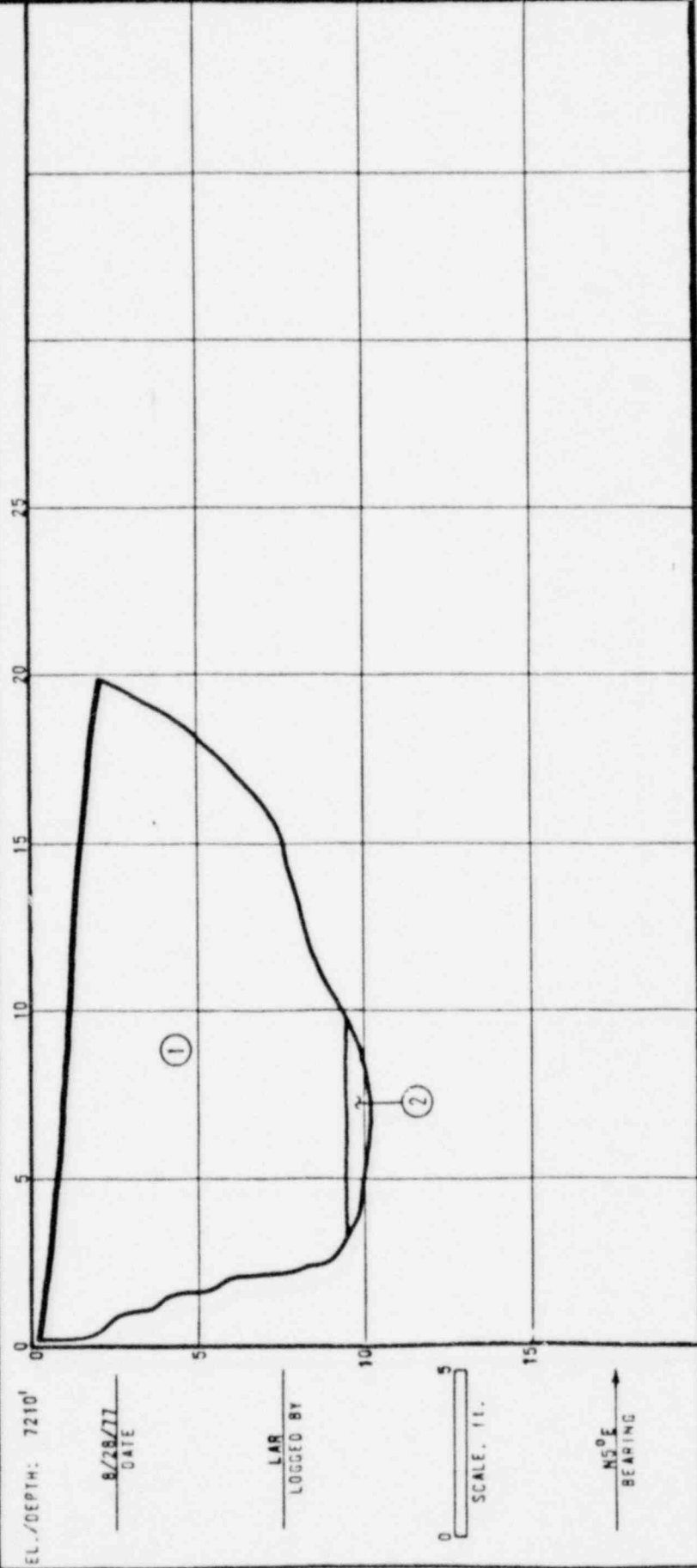
Sheet 1 of 1

NOTES:

UNITS

STRUCTURE		
NO.	STRIKE	DIP

NO.	DEPTH	DESCRIPTION
1		CLAY; MODERATELY YELLOWISH BROWN, LOW TO MEDIUM PLASTIC, SLIGHTLY POROUS WITH FINE ROOTS TO 2.5', DRY, HARD.
2		SAPPROLITE; CLAY BROWNISH GRAY, MEDIUM TO HIGH PLASTICITY (CL-CH), DARK YELLOW ORANGE STAINING AND VERY LIGHT GRAY CALICHE STREAMS, MANY DECOMPOSED FINE ROOT FRAGMENTS.



EL./DEPTH: 7210'

8/28/77  
DATE

LAR  
LOGGED BY

0 5  
SCALE, FT.

N 50° E  
BEARING

W.A. WAHLER & ASSOCIATES

WT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

F. 3/77

TRENCH NO. WT-99

LOCATION: POND 8A, RESERVOIR

Sheet 1 of 1

NOTES:

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FIELD TRENCH LOG

PROJECT NO

GUL-101

DATE

SEPTEMBER 1977

DRAWING NO

DEPTH	UNITS			DESCRIPTION	STRUCTURE						
	NO.	STRIKE	DIP		NO.	STRIKE	DIP	TYPE			
	①			ALLUVIUM; CLAY, MODERATELY YELLOWISH BROWN, LOW PLASTICITY, TRACE OF VERY FINE SAND, FINE ROOTS TO 2.5', FINE CALICHE VEINLETS TO 6', DRY TO 7', THEN SLIGHTLY DAMP, VERY STIFF.							

EL./DEPTH: 7168'

8/28/77  
DATE

LOGGED BY

SCALE: 1" = 5'

NGA °E  
BEARING

F. 3/77

W A WAHLER  
8 ASSOCIATES

PAID KUTV • MEMPHIS REC'D • CALIF

MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

FIELD TRENCH LOG

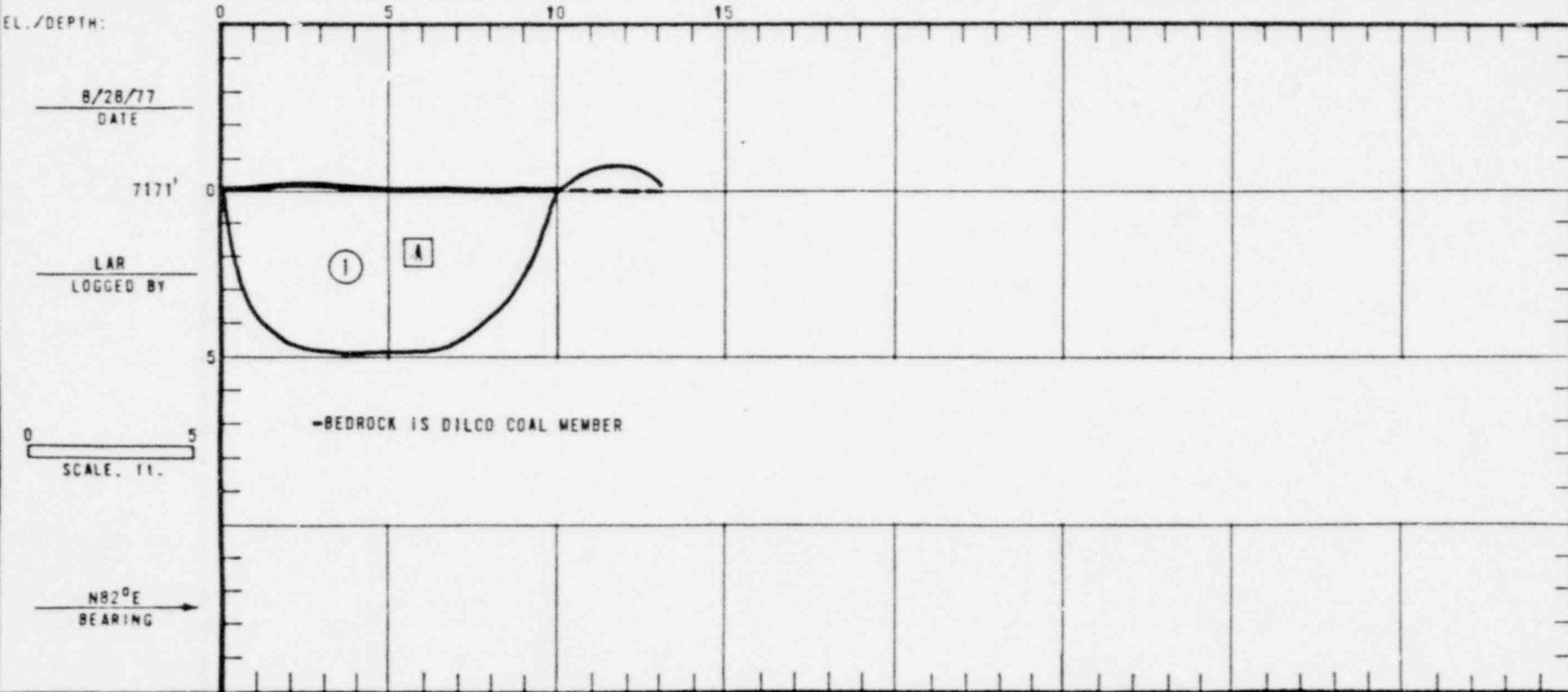
TRENCH NO. WT-90

LOCATION: POND 8A, RESERVOIR

Sheet 1 of 1

NOTES: \_\_\_\_\_

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SANDSTONE AND SHALE; INTERBEDDED, SANDSTONE IS GRAYISH ORANGE, 1/2" TO 2" BEDS, MODERATELY HARD. MODERATELY STRONG, SHALE IS LIGHT BROWNISH GRAY, THINLY LAMINATED, FRIABLE, CONTAINS CARBONACEOUS FRAGMENTS. BACKHOE REFUSED AT 5'.	A	N45°W	3°W	BEDDING ON SHALE



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& ASSOCIATES

TRENCH NO. WT-91

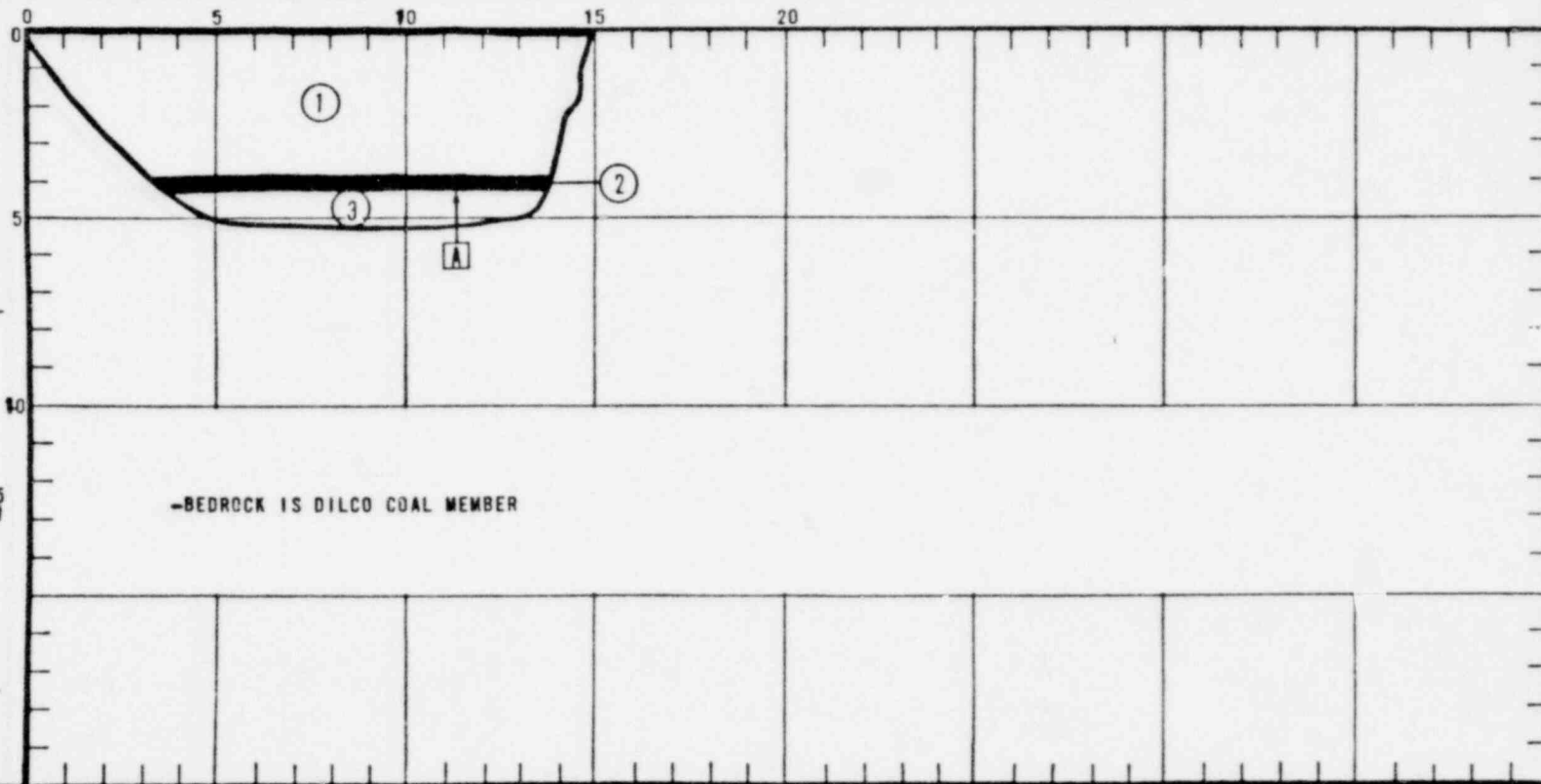
LOCATION: POND BA, RESERVOIR

Sheet 1 of 1

NOTES:

UNITS			STRUCTURE			
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	SILTSTONE; YELLOWISH GRAY, THIN BEDDED, WEAK, GRAYISH YELLOW COATINGS ST 3.5'.	[A]	HORIZONTAL	----	COAL BED
	②	COAL; 8" THICK SEAM.				
	③	SANDSTONE; YELLOWISH GRAY, MODERATELY HARD, STRONG, EXCAVATES INTO 1/2" TO 1 1/2" FLAGGY PIECES, REFUSES BACKHOE AT 5'.				

EL./DEPTH: 7170'



8/28/77  
DATE

LAR  
LOGGED BY

0 5  
SCALE, FT.

N20°W  
BEARING

PAID AT/O • REPORT BEACH • CALIF  
MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO  
GUL-108

DATE  
SEPTEMBER 1977

DRAWING NO

FIELD TRENCH LOG

F. 3/77

W A WAHLER  
8 ASSOCIATES

TRENCH NO. WT-92

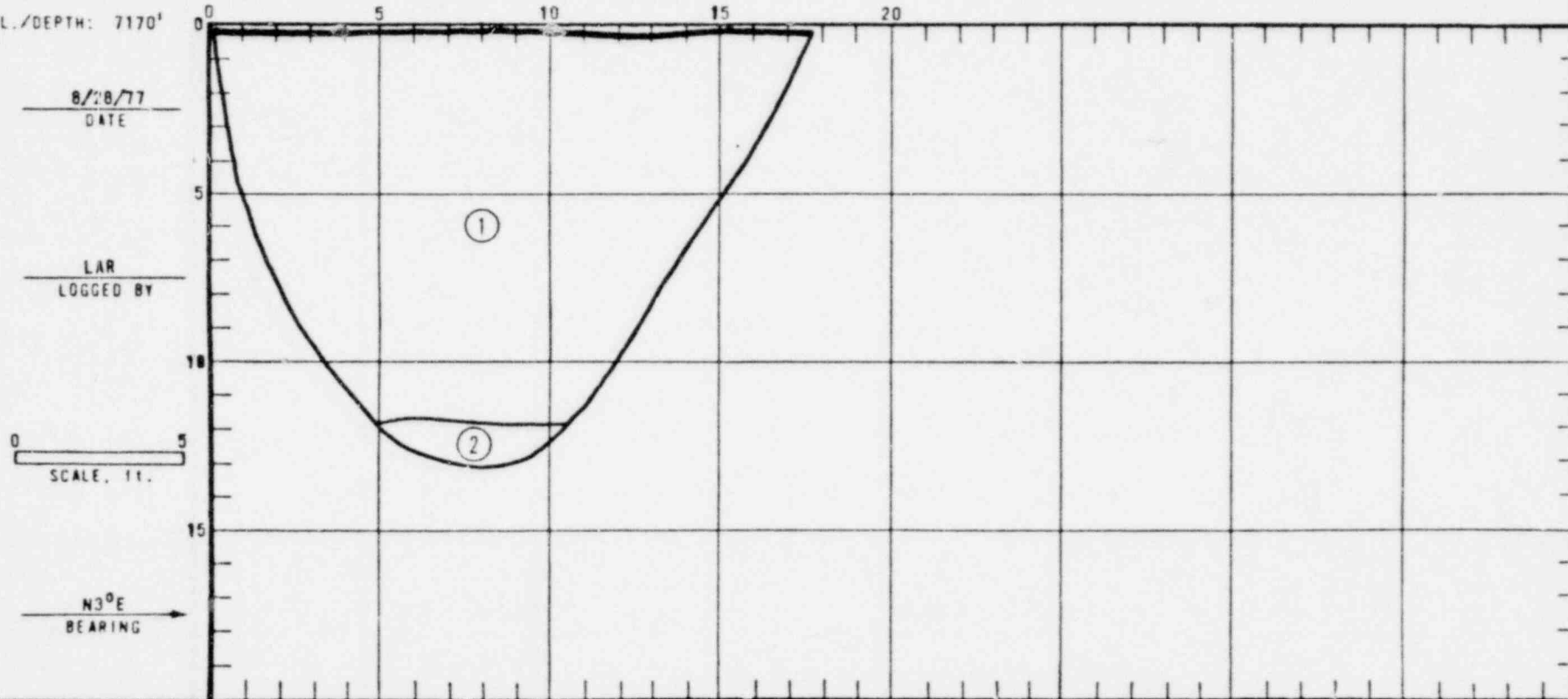
LOCATION: POND 8A, RESERVOIR

Sheet 1 of 1

NOTES: \_\_\_\_\_

		UNITS		STRUCTURE			
DEPTH	NO.	DESCRIPTION		NO.	STRIKE	DIP	TYPE
	①	SANDY CLAY; MODERATELY YELLOWISH BROWN, LEAN, 20-30% VERY FINE SAND, MANY FINE ROOTS AND CALICHE COATED POROSITIES TO 9 <sup>1</sup> , DRY.					
	②	CLAY; (SAPPROLITE ?), BROWNISH GRAY, MEDIUM TO HIGH PLASTICITY, SHALEY TEXTURE, FINE DECAYED ROOTS AND GRANULAR GYPSUM IN PARTINGS, WEATHERED DILCO COAL MEMBER.					

EL./DEPTH: 7170'



8/28/77  
DATE

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SCALE, FT.

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PAID \$110 • REPORT STICK • CALIF

MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO. GUL-708  
DATE SEPTEMBER 1977  
DRAWING NO.

FIELD TRENCH LOG



F. 3/77

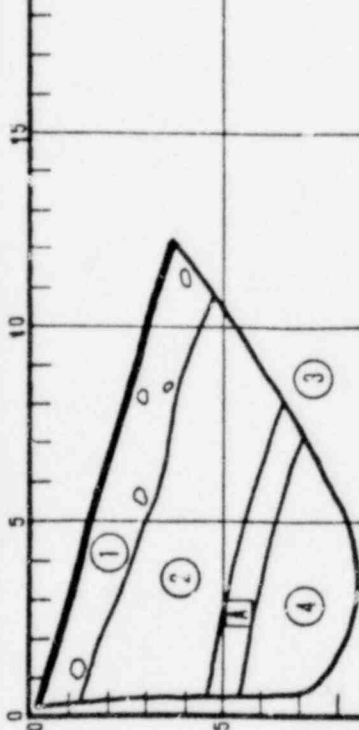
TRENCH NO. WT-93

Sheet 1 of 1

LOCATION: MILL SLIC. CATCH DAM, LEFT ABUTMENT

NOTES:

DEPTH	NO.	DESCRIPTION	STRUCTURE			
			NO.	STRIKE	DIP	TYPE
	①	SLOPEWASH; CLAYEY SAND. MODERATELY YELLOWISH BROWN MOSTLY FINE TO MEDIUM GRAY WITH APPROXIMATELY 10% GRAVEL AND SEVERAL COBBLES. 40-50% LOW PLASTICITY FINES (SC-CL). MANY ROOTS TO 1.5'. MENESEE FORMATION	A	N46°E	10°E	SANDSTONE SILTSTONE CONTACT
	②	SILTSTONE; DARK YELLOWISH BROWN, LOW HARDNESS, WEAR.				
	③	SANDSTONE; GRAYISH ORANGE, FINE GRAINED, WEAK TO MODERATELY STRONG.				
	④	CLAYSTONE; OLIVE GRAY, SOFT, RIABLE, SLIGHTLY DAMP, NO DISTINCT BEDDING.				



8/30/77  
DATE

LAB  
LOGGED BY

SCALE: 1" = 5'

S80°E  
BEARING

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MT. TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

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PROJECT NO  
GUL-109

DATE  
SEPTEMBER 1977

DRAWING NO

F. 3/77

TRENCH NO. MT-84

Sheet 1 of 1

LOCATION: MILL SITE CATCH DAM, CENTRAL FOUNDATION

NOTES:

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FIELD TRENCH LOG

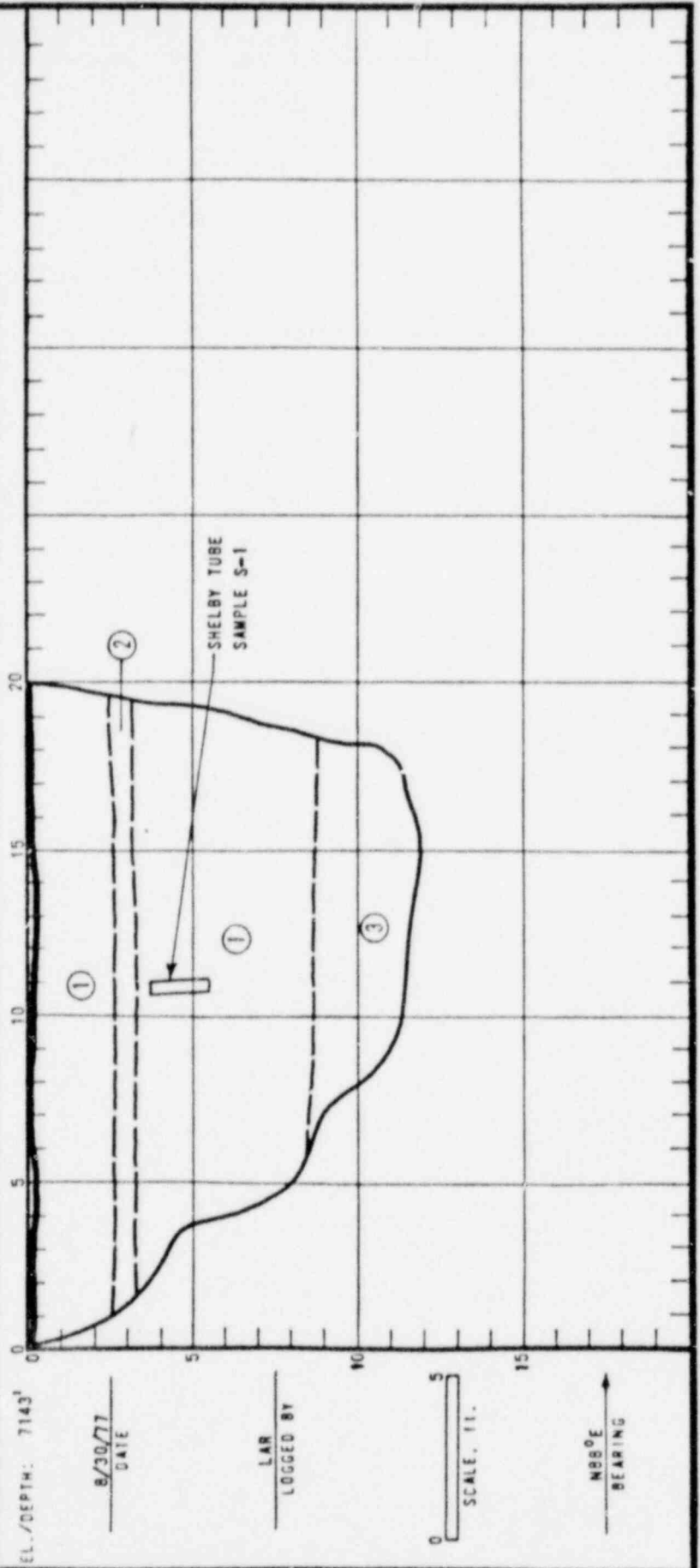
PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	ALLOVIUM				
	②	CLAYEY SAND; MODERATE TO DARK YELLOWISH BROWN, FINE TO MEDIUM GRAIN, 20-30% LOW PLASTICITY, FINES, MANY FINE ROOTS TO 1.5' DEPTH, DENSE BELOW 3'.				
	③	SILTY SAND; DARK YELLOWISH BROWN, FINE GRAINED, APPROXIMATELY 40% NON PLASTIC FINES. CLAYEY SAND; MODERATELY YELLOWISH BROWN, FINE GRAINED, 25-30% LEAN FINES, A FEW VERY FINE ROOT HOLES AND SOME CALICHE STAINING, DENSE.				



8/30/77  
DATE

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0 5 15  
SCALE, FT.

N85°E  
BEARING

F. 3/77

TRENCH NO. WT-95

LOCATION: MILL SITE CATCH DAM, RIGHT ABUTMENT

Sheet 1 of 1

NOTES:

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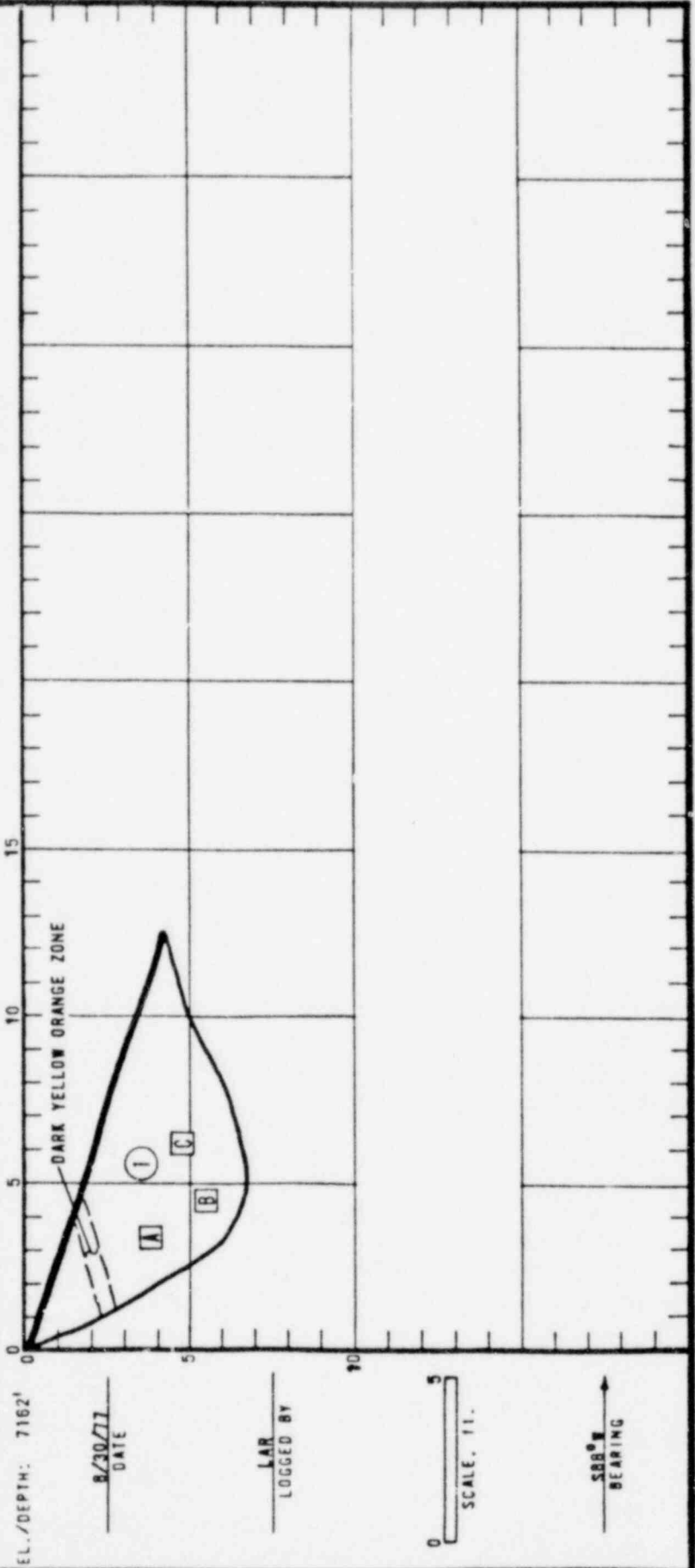
FIELD TRENCH LOG

PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

DEPTH	NO.	DESCRIPTION	STRUCTURE			
			NO.	STRIKE	DIP	TYPE
	①	MENEFFEE FORMATION SANDSTONE; GRAYISH ORANGE TO PALE YELLOWISH BROWN, FINE TO MEDIUM GRAIN, BEDDING SURFACES 0.2-1" THICK THAT DO NOT READILY PART, MASSIVE, MODERATE TO LITTLE WEATHERED, MODERATELY STRONG.	A	N22°E	43°E	CROSS BEDDING
			B	N60°W	87°N	JOINT
			C	N70°E	64°S	JOINT



EL./DEPTH: 7162'

8/30/77  
DATE

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SCALE, FT.

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BEARING

F. 3/77

W.A. WAHLER  
& ASSOCIATES

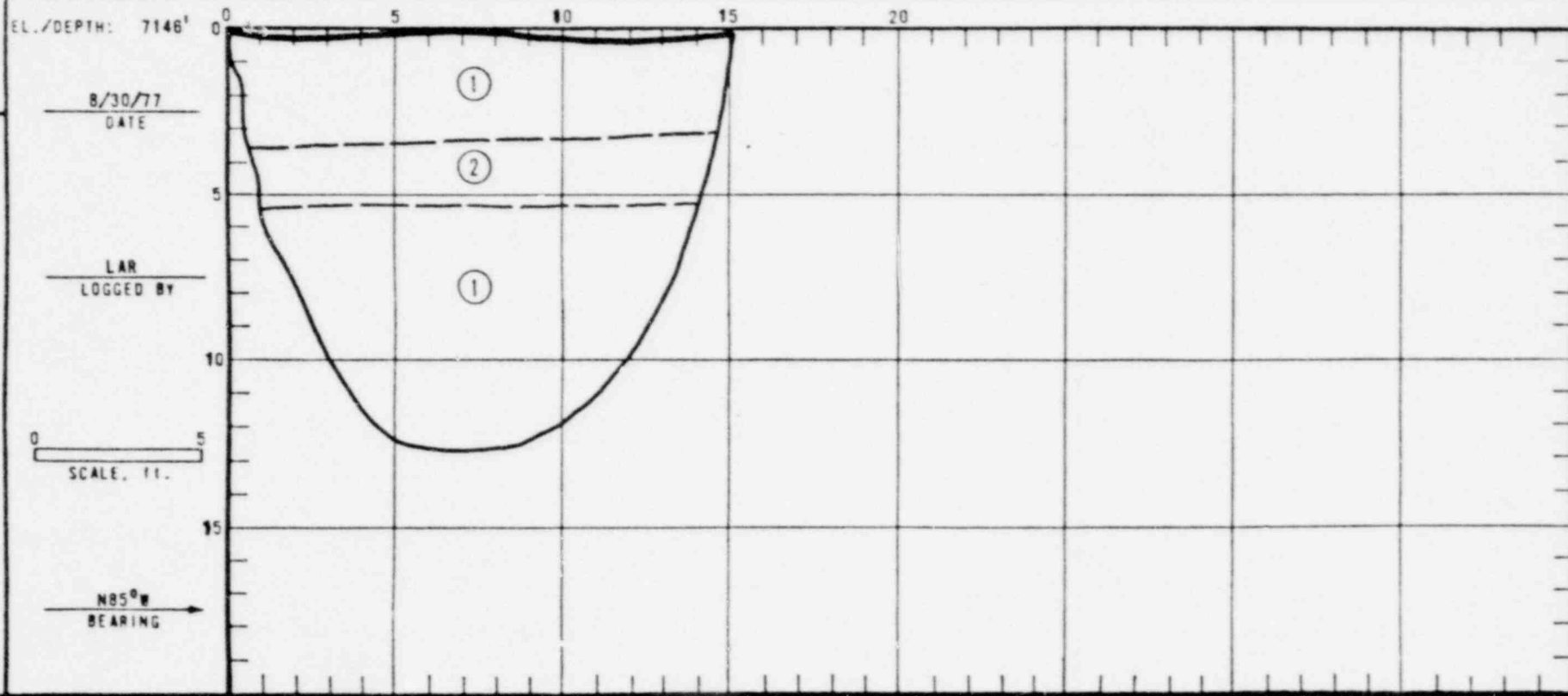
TRENCH NO. WT-86

LOCATION: MILL SITE CATCH DAM, LOWER POND AREA

Sheet 1 of 1

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	ALLUVIUM CLAYEY SAND; MODERATE TO DARK YELLOWISH BROWN, FINE GRAIN, APPROXIMATELY 40% LOW TO MEDIUM PLASTIC FINES, MANY FINE ROOTS TO 1.5' DEPTH.				
	②	SANDY CLAY; DARK YELLOWISH BROWN, MEDIUM PLASTIC, CALICHE MOTTLED, SLIGHTLY DAMP, 25-35% FINE SAND.				



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PROJECT NO. GUL-101  
DATE SEPTEMBER 1977  
DRAWING NO.

FIELD TRENCH LOG

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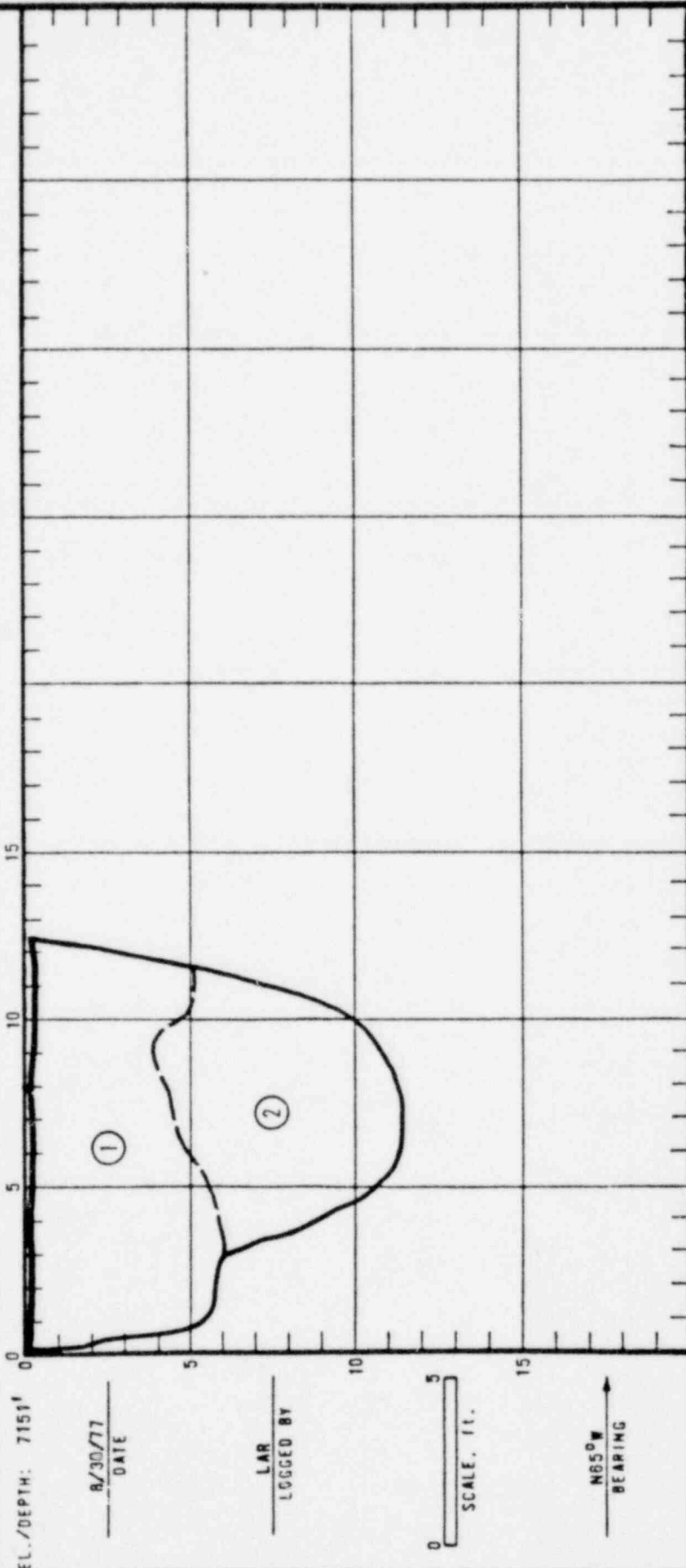
TRENCH NO. WT-97

LOCATION: MILL SITE CATCH DAM, UPPER POND AREA

Sheet 1 of 1

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
	①	ALLUVIUM SILTY SAND; MODERATE TO DARK YELLOWISH, BROWN, FINE GRAIN, 30-40% NON-PLASTIC FINES, DAMP BELOW 2'				
	②	CLAYEY SAND; YELLOWISH ORANGE, VERY FINE GRAIN, 20-25% LOW PLASTICITY FINES.				



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WT, TAYLOR URANIUM MILL PROJECT

FIELD TRENCH LOG

PROJECT NO GUL-101	DATE SEPTEMBER 1977	DRAWING NO
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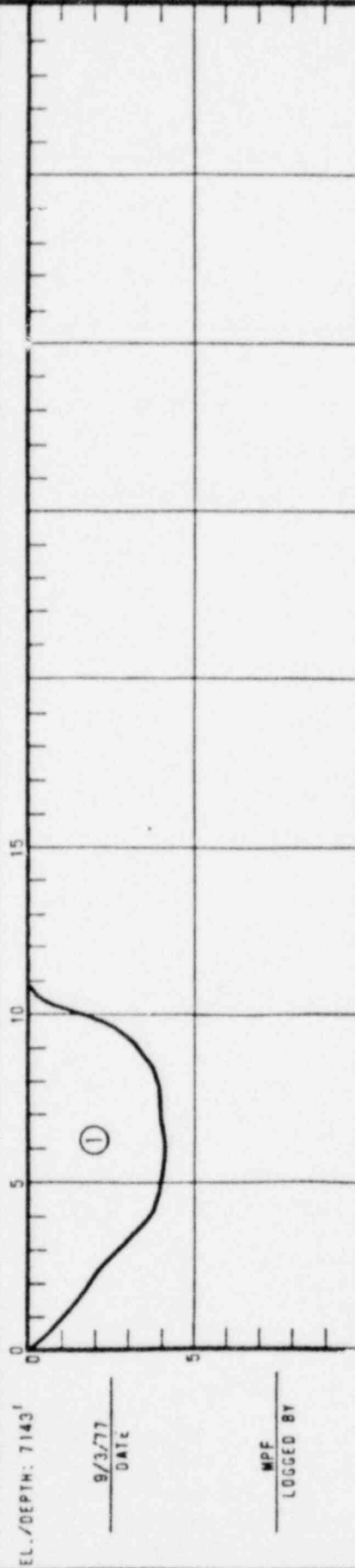
TRENCH NO. MT-98

LOCATION: ALONG AXIS OF MILL SITE CATCHMENT DAM

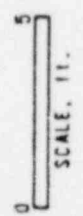
Sheet 1 of 1

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
0.0'-4.0'	①	SILTY SAND; MEDIUM BROWN, DAMP, NON-PLASTIC, ALLUVIUM.				



-TOOK SHELBY TUBE SAMPLE: 4' -5' DEEP.



N88°E  
BEARING

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FIELD TRENCH LOG

PROJECT NO GUL-101	DATE SEPTEMBER 1977	DRAWING NO
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PALO ALTO • NEWPORT BEACH • CALIF.

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TRENCH NO. MT-99

LOCATION: ALONG AXIS OF MILL SITE CATCHMENT DAM

Sheet 1 of 1

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
0-3.5'	①	SILTY SAND; LIGHT BROWN, DAMP, NON-PLASTIC.				
3.5-4'	②	SANDY CLAY; MEDIUM BROWN, PLASTIC.				

EL./DEPTH: 7143

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SCALE, FT.

N88°E  
BEARING

MT. TAYLOR URANIUM MILL PROJECT

PROJECT NO: GUL-101

FIELD TRENCH LOG

DATE: SEPTEMBER 1977

DRAWING NO:

-TOOK SHELBY TUBE SAMPLE: 4'-5' DEEP  
-SOIL IS ALLUVIUM

F. 3/77

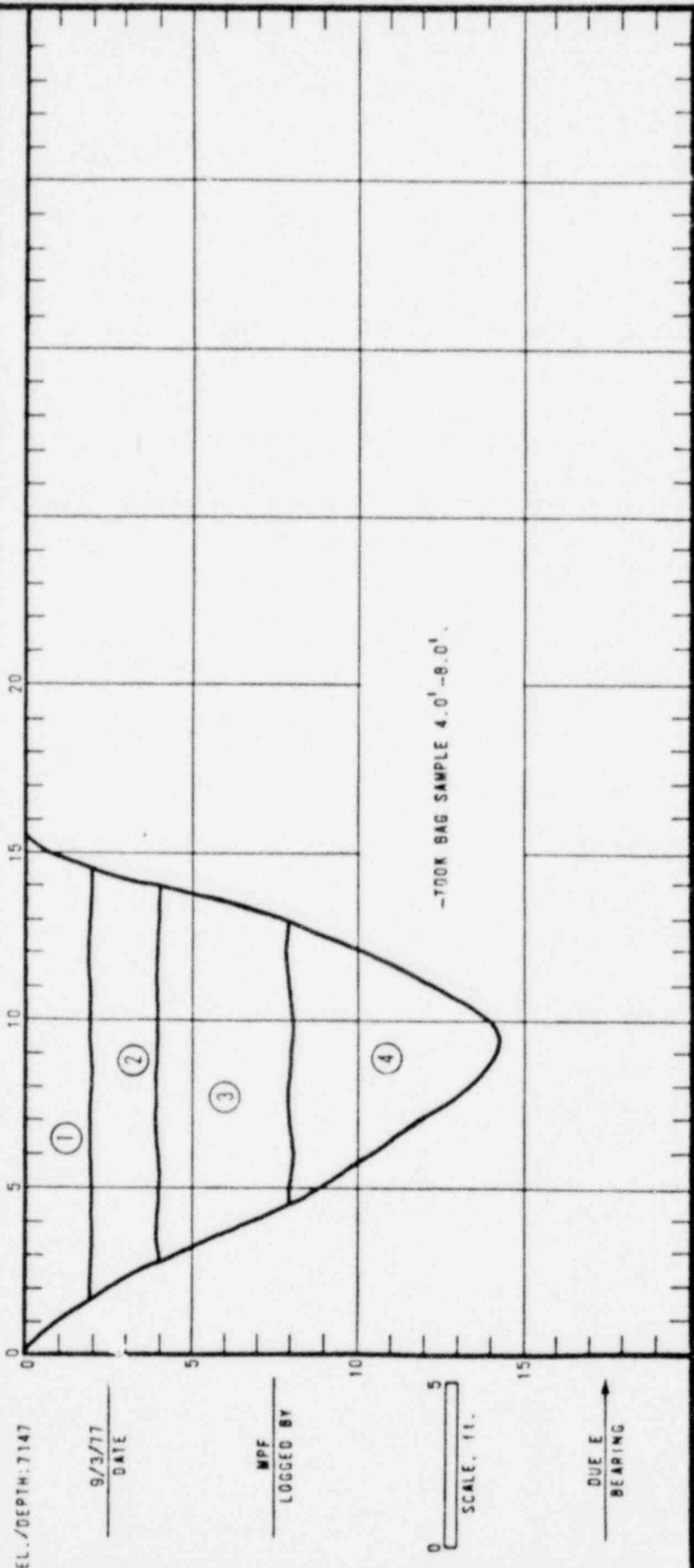
TRENCH NO. MT-100

LOCATION: UPSTREAM OF CATCHMENT DAM AXIS IN DAL.

Sheet 1 of 1

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
0.0' - 2.0'	①	ALLUVIUM SILTY SAND; LIGHT BROWN, DAMP, NON-PLASTIC.				
2.0' - 4.0'	②	SANDY CLAY; MEDIUM BROWN, DAMP, SLIGHTLY PLASTIC.				
4.0' - 8.0'	③	CLAYEY SAND; LIGHT BROWN, DAMP, MEDIUM DENSE.				
8.0' - 14.0'	④	CLAYEY SAND WITH SANDSTONE LOBBLES AND GRAVEL; LIGHT BROWN, MEDIUM DENSE.				



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FIELD TRENCH LOG

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO

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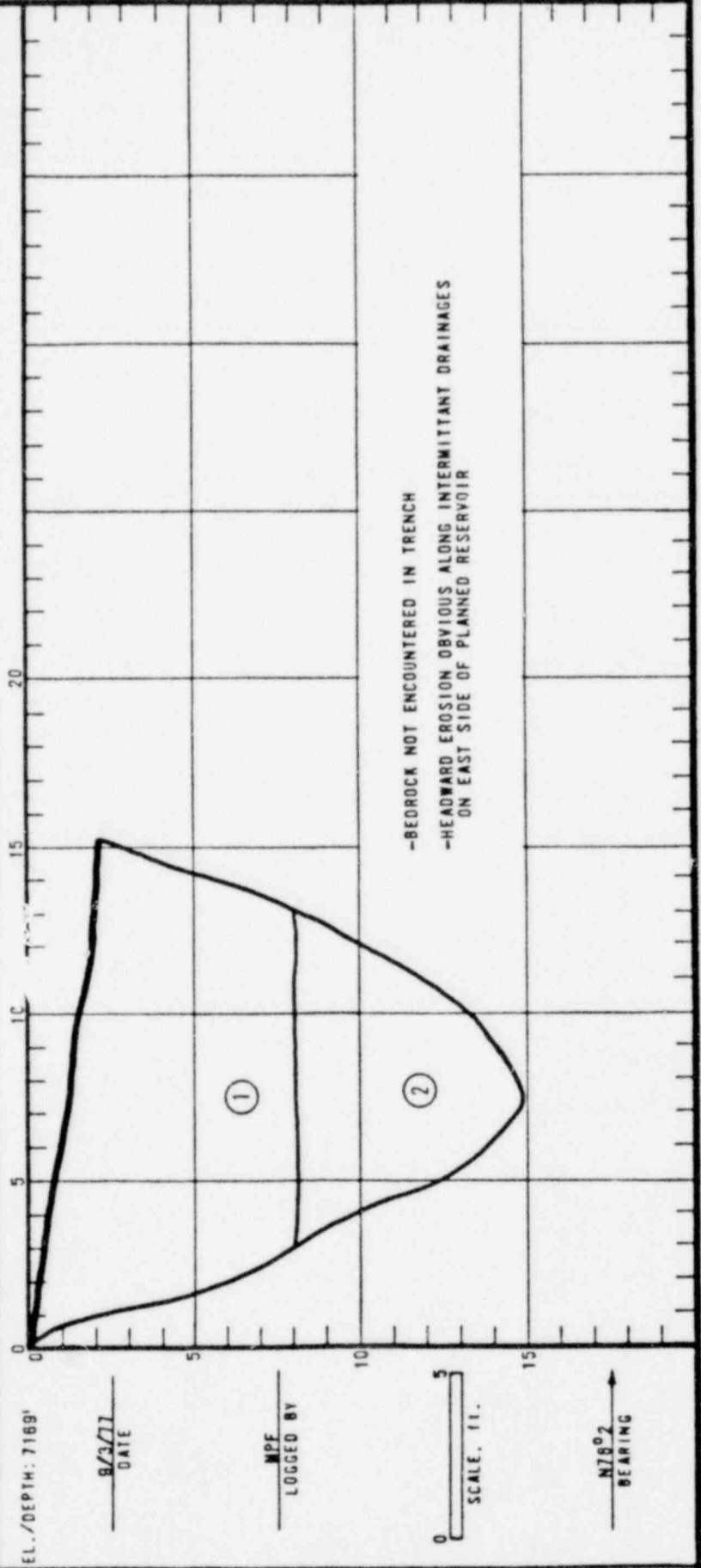
TRENCH NO. WT-101

LOCATION: EAST SIDE MILL SITE RESERVOIR, UPSTREAM OF DAM.

Sheet 1 of 1

NOTES:

UNITS		DESCRIPTION	STRUCTURE			
DEPTH	NO.		NO.	STRIKE	DIP	TYPE
0.0' - 8.0'	①	SLOPEWASH DEPOSIT SILTY SAND; WITH GRAVEL-SIZE BASALT FLOAT, YELLOW-BROWN, LOOSE, SLIGHTLY DAMP.				
8.0' - 15'	②	CLAYEY SILTY SAND; WITH BASALT GRAVEL AND COBBLES, LIGHT BROWN, SLIGHTLY DENSE, DAMP.				



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FIELD TRENCH LOG

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PROJECT NO  
GUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

F. 3/77

TRENCH NO. WT-102

LOCATION: WEST SIDE OF MILL SITE RESERVOIR, UPSTREAM OF DAM

Sheet 1 of 1

NOTES:

UNITS		STRUCTURE				
DEPTH	NO.	DESCRIPTION	NO.	STRIKE	DIP	TYPE
0.0'-4.5'	①	SILTY SAND; WITH CALICHE STAINED BASALT FLOAT FROM 1" TO 8" DIAMETER. YELLOW BROWN, LOOSE, DRY, SLOPEWASH DEPOSIT.				
4.5'-5.5'	②	CLAY; (SAPROLITE), DARK GRAY, HARD, PLASTIC, SHOWS SLICKENSIDES.				
5.5'-7.5'	③	SILTSTONE; TAN WITH Fe STAIN ALONG BEDDING. 1" TO 3" BEDDING, HARD.				

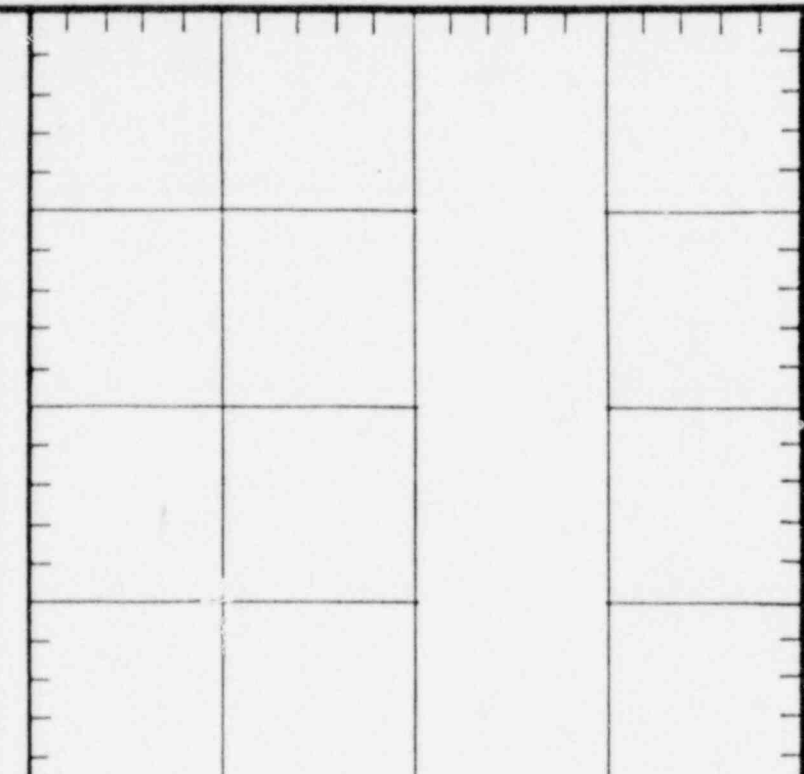
EL./DEPTH: 7174' 0

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DATE

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BEARING



-- BEDROCK IS MENEFFEE FORMATION

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FIELD TRENCH LOG

PALO ALTO • NEWPORT BEACH • CALIF.

PROJECT NO  
CUL-101

DATE  
SEPTEMBER 1977

DRAWING NO

SHEET No. 1 OF 3		DATE LOGGED October 28, 1977		LOGGED BY MPF	
RIG Backhoe			PIT WIDTH 24"		
PIT NO.	DEPTH IN FEET	SOIL TYPE	DESCRIPTION	SAMPLE	
WT-103	0 - 2.0'	SM	SILTY SAND; medium brown; loose.	J-1 2.0- 4.5'	
	2.0 - 4.5'	ML	CLAYEY SANDY SILT; SLOPEWASH; medium brown; stiff, slightly plastic (dug out in chunks 2-6" across).		
WT-104	0 - 2.0'	SC	CLAYEY SAND; SLOPEWASH; stiff; medium brown.	J-1 2.0- 4.5'	
	2.0 - 4.5'	SM	SILTY FINE SAND; SLOPEWASH; medium brown; slightly plastic; (few blocks of soil up to 8" across); contains few basalt fragments 1-2" across and some white caliche mottles.		
WT-105	0 - 3.0'	SC	CLAYEY SAND; SLOPEWASH; stiff; light brown; blocky; shows caliche mottles.	J-1 3.0- 5.5'	
	3.0 - 5.5'	SM	SILTY SAND; yellow-brown; shows cross-bedded structure; platy fragments recovered; stiff to hard; caliche mottled; weathered bedrock.		
WT-106	0 - 2.5'	ML	CLAYEY SANDY SILT; SLOPEWASH; medium brown; stiff; slightly plastic; contains few basalt cobbles up to 3" across; slight caliche mottling.	J-1 2.5- 5.0'	
	2.5 - 5.0'	SM	SILTY SAND; yellow-brown; blocky; shows faint cross-bedding; dense.		

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& ASSOCIATES

MT. TAYLOR URANIUM MILL PROJECT

TEST PIT LOGS

PALO ALTO • NEWPORT BEACH • CALIF

PROJECT NO

GUL-101

DATE

NOV. 1977

DRAWING NO

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SHEET No. 2 OF 3		DATE LOGGED October 28, 1977		LOGGED BY MPF	
RIG Backhoe			PIT WIDTH 24"		
PIT NO.	DEPTH IN FEET	SOIL TYPE	DESCRIPTION	SAMPLE	
WT-107	0.0 - 3.5'	ML	CLAYEY SANDY SILT; SLOPEWASH; medium brown; stiff, blocky; contains basalt cobbles up to 8" across at lower contact. NOTE: Silty Sand intermittently exposed along walls of gully just to east of WT-105.	J-1 1.0- 3.0'	
	3.5 - 6.0'	SM	SILTY SAND; SLOPEWASH; yellow-brown; blocky; shows faint cross-bedding; dense		
WT-108	0.0 - 2.0'	SM	SILTY SAND with basalt and sandstone fragments up to 3" in diameter; light brown; loose; shows caliche mottles.		
	2.0 - 5.0'	Bedrock	SANDSTONE; white to light yellow to gray; hard; thin bedded (1/2-2"); contains thin lenses of hard quartz-sandstone; cross-bedded. Bedrock is Menefee Formation		
WT-109	0.0 - 6.0'	Bedrock	SANDY SILTSTONE WITH THIN DARK BROWN SHALE PARTINGS; tan; 1-4" bedding; partially weathered; contains gypsum crystals between bedding (up to 1/8" thick); material dumped at surface range from pulverized rock to 6"x6"x4" fragments; shows near vertical frac- tures 3-8" apart. NOTE: Thin soil cover at surface; light brown silty clay with siltstone fragments up to 1.0' across; 0-6" thick. Bedrock is Mulatto Tongue Member.	J-1 3.0- 6.5'  B-1 3.0- 6.5'	
WT-110	0.0 - 6.0'	Bedrock	SANDY SILTSTONE WITH THIN DARK BROWN SHALE PARTINGS; tan; 1-4" bedding; partially weathered; contains thin quartz sandstone; beds 1/2-1" thick; hard-resistant. NOTE: Thin soil cover at surface; light brown silty clay with siltstone fragments up to 1.0' across; 0-6" thick. Bedrock is Mulatto Tongue Member.	J-1 4.0- 6.0'  B-1 4.0- 6.0'	

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TEST PIT LOGS

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PROJECT NO  
CUL-101

DATE  
NOV. 1977

DRAWING NO  
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SHEET No. 3 OF 3		DATE LOGGED October 28, 1977		LOGGED BY MPF	
RIG Backhoe			PIT WIDTH 24"		
PIT NO.	DEPTH IN FEET	SOIL TYPE	DESCRIPTION	SAMPLE	
WT-111	0.0 - 7.0'	Bedrock	<p>SHALE WITH INTERBEDDED LIGHT BROWN SILT- STONE; beds 1/2-2" thick; dark brown; 1-4" bedding; contains gypsum crystals between bedding; shale is weathered; contains near vertical fractures spaced 4-18"; recovered as pulverized rock to 4"x6"x8" fragments.</p> <p>NOTE: Thin soil cover at surface; light brown silty clay with thin silt- stone and shale fragments up to 6" across; plastic. Bedrock is Mulatto Tongue Member.</p>	<p>J-1 5.0- 7.0'</p> <p>B-1 5.0- 7.0'</p>	
W. A. WAHLER & ASSOCIATES		MT. TAYLOR URANIUM MILL PROJECT		TEST PIT LOGS	
PALO ALTO • NEWPORT BEACH • CALIF.		PROJECT NO	DATE	DRAWING NO	
		GUL-101	NOV. 1977	---	

Observation Trenches Not Logged

<u>Trench No.</u>	<u>Purpose</u>	<u>Reason not Logged</u>
WT-8	To locate fault	Fault not found.
WT-9	To locate fault	Trench did not reach bedrock due to thick soil cover.
WT-11	To locate fault	Caving hazard; trench exposed large boulders 2 to 4 feet diameter.

WATER INJECTION AND  
FALLING HEAD TEST RESULTS

POOR ORIGINAL

## CORE HOLE NO. WPC-19

LOCATION: Upstream of Michael Tank, Pond 6A, Hole Elevation 7,082'

DESCRIPTION: Vertical, NX size

MATERIALS ENCOUNTERED: 0-60' Alluvium; 60-78' Gallup Sandstone; 78-118' Mancos Shale.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1a	77-86	0.02	10	15	1.01	0.7	
1b	77-86	0.02	30	10	0.7	0.7	
1c	77-86	0.04	50	5	1.08	0.7	
2a	65-86	5.25	10	23	144.0	0.0	
2b	65-86	12.0	30	6	224.0	0.0	
3a	88.9-118.9	0.0	10	30	0.0	0.0	
3b	88.9-118.9	0.02	30	30	0.23	0.0	
3c	88.9-118.9	0.0	50	30	0.0	0.0	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	61.25-86	48	0.25	0.18		

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.



CORE HOLE NO. WPC-25

LOCATION: Channel leg, dam axis 6A, upstream of Michael Tank; Hole Elevation 7,085'

DESCRIPTION: Vertical, NX size, 39.0' total depth

MATERIALS ENCOUNTERED: 0-7.0' Sandy Silt-Alluvium; 7.0-16.0' Gallup-Dilco Transition Zone; 16.0-39.0' Gallup Sandstone.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	28-39	0.0	10	10	0.0	0.0	Attempted further WPT, unsuccessful because of broken pressure gage.

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	23.3-39.0	795	10.0	1.87		
2	29.5-39.0	150	1.5	2.15		
3	30.7-39.0	1,328	5.1	1.72		

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

CORE HOLE NO. WPC-26

LOCATION: Channel leg, dam axis 6A, north of Michael Tank

DESCRIPTION: Vertical, NX size, 39.0 total depth

MATERIALS ENCOUNTERED: 0-1.0' Slope Debris; 1.0-21.0' Dilco Coal Member; 21.0-27.5' Dilco-Gallup Transition Zone; 27.5-39.0' Gallup Sandstone.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	28-39	1.93	30	15	87.1	66	
2	28-39	0.66	15	10	44.9	66	
3	17.0-27.5	13.34	15	5	1,127.0	1,127	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	38-39	60	0.5	70.35		
2	36.9-39.0	90	1.3	58.75		

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

## CORE HOLE NO. WPC-27

LOCATION: Channel leg, dam axis 6A

DESCRIPTION: Vertical, NX size, 58.5' total depth

MATERIALS ENCOUNTERED: 0-2.0' Slope Debris; 2.0-22.5' Dilco Coal Member; 22.5-31.5' Dilco-Gallup Transition Zone; 31.5-58.5' Gallup Sandstone.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1a	47.5-58.5	0.0	5	14	0.0	0.0	
1b	47.5-58.5	0.0	20	15	0.0	0.0	
1c	47.5-58.5	0.0	40	15	0.0	0.0	
2a	36.0-47.5	0.063	10	30	4.27	5.0	
2b	36.0-47.5	0.38	20	15	19.0	5.0	
2c	36.0-47.5	0.57	30	15	22.6	5.0	
3a	22.0-33.5	0.0	5	15	0.0	0.0	
3b	22.0-33.5	0.0	10	30	0.0	0.0	
3c	22.0-33.5	1.25	15	15	88.0	0.0	Hydro-fracturing

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	45.5-58.5	1,035	6.0	0.15		
2	44.1-58.5	60	1.3	2.17		
3	48.3-58.5	46	0.9	3.77		

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

CORE HOLE NO. WPC-30

LOCATION: North leg, dam axis 6A

DESCRIPTION: Vertical, NX size, 59.0' total depth

MATERIALS ENCOUNTERED: 0-13.0' Alluvium; 13.0-49.0' Dilco Coal Member; 49.0-57.5' Dilco-Gallup Transition Zone; 57.5-59.0' Gallup Sandstone.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1a	48-59	1.26	10	30	6.11	4.0	
1b	48-59	1.66	30	15	3.20	4.0	
2a	36-47.5	0.08	10	15	5.43	5.0	
2b	36-47.5	0.16	30	15	6.06	5.0	
3a	26-37.5	0.14	10	15	11.2	12.0	
3b	26-37.5	1.09	30	20	47.2	12.0	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	33.3-59	211	16.2	5.0		
2	42.5-59	148	2.5	1.43		

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

## CORE HOLE NO. WPC-31

LOCATION: North leg, dam axis 6A

DESCRIPTION: Vertical, NX size, 190' total depth

MATERIALS ENCOUNTERED: 0-4.0' Slope Debris; 4.0-78.5' Dilco Coal Member; 78.5-86.3' Gallup Transition; 86.3-170.0' Gallup Sandstone; 170.0-190.0' Mancos Shale.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1a	21.5-33.0	11.7	5	5	1,327.0	1,201.0	
1b	21.5-33.0	12.33	10	5	1,077.0	1,201.0	
2a	96.5-127.5	0.7	15	8	9.4	8.6	
2b	96.5-127.5	0.66	25	5	7.7	8.6	
2c	96.5-127.5	1.0	50	6	8.7	8.6	
3a	81.5-103.0	0.25	11	15	5.65	6.2	
3b	81.5-103.0	0.33	20	15	6.34	6.2	
3c	81.5-103.0	0.46	40	15	6.63	6.2	
4a	168.5-190.0	0.0	30	20	0.0	0.0	
4b	168.5-190.0	0.045	50	20	0.41	0.0	
4c	168.5-190.0	0.080	80	15	0.58	0.0	
5a	127.0-168.5	0.193	25	15	1.46	1.5	
5b	127.0-168.5	0.26	50	10	1.53	1.5	
5c	127.0-168.5	0.34	75	10	1.64	1.5	
6a	58.5-80.0	0.02	10	10	0.58	1.0	
6b	58.5-80.0	0.12	20	10	2.78	1.0	
6c	58.5-80.0	0.28	30	5	5.40	1.0	
7a	48.5-60.0	0.01	10	10	0.56	1.0	
7b	48.5-60.0	0.12	30	10	4.23	1.0	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	87.0-130	963	32.0	0.91		
2	101.5-130	82	3.2	1.03		
3	127.2-190	15	1.0	0.42		
4	115.1-190	895	46.5	0.35		
5	146.4-190	176	0.6	0.04		

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

CORE HOLE NO. WPC-32

LOCATION: Near intersection of north leg, dam axis 8A and channel leg, dam axis 6A

DESCRIPTION: Vertical hole, NX size, 160.5' total depth

MATERIALS ENCOUNTERED: 0-5.0' Colluvium; 5.0-66.0' Dilco Coal Member; 66.0-144.8' Gallup Sandstone; 144.8-160.5' Mancos Shale.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	149.5-160.5	0.04	25	40	0.85	0.0	
2	149.5-160.5	0.0	50	40	0.0	0.0	
3	149.5-160.5	0.0	75	40	0.0	0.0	
4	136.5-148.0	0.0	10	35	0.0	0.0	
5	136.5-148.0	0.17	20	35	3.97	0.0	
6	136.5-148.0	0.39	40	35	7.31	0.0	
7	106.5-138.0	1.47	10	35	12.07	11.3	
8	106.5-138.0	1.16	25	25	12.57	11.3	
9	106.5-138.0	1.11	50	20	9.35	11.3	
10	71.5-103.0	0.09	10	30	1.59	1.0	
11	71.5-103.0	1.37	25	25	18.42	1.0	
12	71.5-103.0	0.95	40	32	10.31	1.0	
13	56.5-68.0	0.0	10	25	0.0	0.0	
14	56.5-68.0	0.53	20	32	21.5	0.0	
15	56.5-68.0	0.76	30	27	25.4	0.0	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

LOCATION: Channel leg, dam axis 8A

DESCRIPTION: NX size, 120.0' total depth

MATERIALS ENCOUNTERED: 0-84.0' Alluvium; 84.0-105.0' Gallup Sandstone; 105.0-120.0' Mancos Shale.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1a	104-120	0.0	20	20	0.0	0.0	
1b	104-120	0.0	35	25	0.0	0.0	
1c	104-120	0.0	60	30	0.0	0.0	
2a	89-120	0.0	20	20	0.0	0.0	
2b	89-120	0.0	40	30	0.0	0.0	
2c	89-120	0.07	60	40	0.57	0.0	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

## CORE HOLE NO. WPC-34

LOCATION: South leg, dam axis 8A

DESCRIPTION: Rotary Drill, 160.0' total depth

MATERIALS ENCOUNTERED: 0-2.0' Soil Cover; 2.0-49.0' Dilco Coal Member; 49.0-137.0' Gallup Sandstone; 137.0-160.0' Mancos Shale.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	134-160	0.11	10	40	1.47	0.0	
2	134-160	0.43	25	35	4.79	0.0	
3	134-160	0.0	60	20	0.0	0.0	
4	59-160	0.21	10	30	1.16	4.0	
5	59-160	0.78	20	30	4.96	4.0	
6	59-160	1.36	30	20	5.59	4.0	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	113.5-160	1,285	5.3	0.05		

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.



## CORE HOLE NO. WPC-41

LOCATION: South leg, dam axis 8A

DESCRIPTION: NX size, 100.0' total depth

MATERIALS ENCOUNTERED: 0-4.0' Slope Wash; 4.0-25.5' Dilco Coal Member; 25.5-100.0' Gallup Sandstone.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1a	78-100	0.34	10	16	7.89	11.0	
1b	78-100	0.08	25	16	14.17	11.0	
1c	78-100	1.04	40	30	14.91	11.0	
2a	68-100	1.63	10	16	26.96	33.0	
2b	68-100	2.69	25	16	36.44	33.0	
2c	68-100	3.73	40	30	40.6	33.0	
3a	33-100	0.10	5	12	1.33	1.4	
3b	33-100	0.12	10	15	1.39	1.4	
3c	33-100	0.16	15	23	1.65	1.4	
4a	19-100	4.15	5	16	51.85	56.0	
4b	19-100	6.38	15	40	60.11	56.0	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	93-100	1,405	6	3.67		

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

## CORE HOLE NO. WPC-42

LOCATION: North leg, dam axis 8A

DESCRIPTION: NX size, 39.0' total depth

MATERIALS ENCOUNTERED: 0-2.0' Slope Wash; 2.0-39.0' Dilco Coal Member.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1a	18-39	0.0	5	16	0.0	0.0	
1b	18-39	0.0	10	16	0.0	0.0	
1c	18-39	4.0	15	30	171.0	0.0	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	24.9-39	85	0.2	0.23		

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

LOCATION: North leg, dam axis 8A

DESCRIPTION: NX size, 70.0' total depth

MATERIALS ENCOUNTERED: 0-49.5' Dilco Coal Member; 49.5-70.0' Gallup Sandstone.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1a	47-68	0.70	10	16	23.45	24.5	
1b	47-68	0.87	15	45	25.5	24.5	
2a	32-68	0.83	5	19	23.6	19.0	
2b	32-68	0.79	10	20	18.9	19.0	
2c	32-68	2.2	20	22	40.2	19.0	
3a	18-69	0.88	5	20	20.61	21.0	
3b	18-67	1.39	10	21	27.13	21.0	
3c	18-69	2.02	15	21	33.6	21.0	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

## CORE HOLE NO. WPC-44

LOCATION: North leg. dam axis 6A

DESCRIPTION: NX size, 39.0' total depth

MATERIALS ENCOUNTERED: 0-1.0' Colluvium; 1.0-29.5' Mulatto Tongue; 29.5-39.0'  
Dilco Coal Member.WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1a	23-39	18	5	16	1,425	1,400	
1b	23-39	22.5	10	8	1,402	1,400	
2a	18-39	0.0	5	14	0	1,135	
2b	18-39	21.7	10	16	1,135	1,135	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

LOCATION: North leg, fault zone, dam axis 6A

DESCRIPTION: NX size; 79.0' total depth

MATERIALS ENCOUNTERED: 0-2.0' Colluvium; 2.0-32.5' Mulatto Tongue; 32.5-79.0' Dilco Coal Member.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	63-79	0.3	10	30	10.74		
2	63-79	0.12	20	25	3.45		
3	63-79	0.0	30	20	0.0		
4	38-79	0.35	10	30	6.73		
5	38-79	0.10	15	25	1.69		
6	38-79	0.34	20	25	5.10		
7	18-79	0.03	5	15	0.56		

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	32-79	35	0.1	0.03		

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

LOCATION: North end of north leg, dam axis 6A

DESCRIPTION: NX size, 50.0' total depth

MATERIALS ENCOUNTERED: 0-2.0' Soil Cover; 2.0-50.0' Mulatto Tongue.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	34-50	23.1	10	6	1,194		
2	34-50	15.1	20	5	592		

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

LOCATION: Pond 6A, reservoir area

DESCRIPTION: NX size, 60.0' total depth

MATERIALS ENCOUNTERED: 0-22.0' Alluvium; 22.0-60.0' Dilco Coal Member.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	39-60	0.0	5	20	0.0	0.0	
2	39-60	0.74	10	30	27.6	0.0	
3	39-60	2.26	20	30	64.0	0.0	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	14.5-60.0	29	2.75	1.14		

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

## CORE HOLE NO. WPC-48

LOCATION: Pond 6A, reservoir area

DESCRIPTION: NX size, 49.0' total depth

MATERIALS ENCOUNTERED: 0.0-3.0' Colluvium; 3.0-31.5' Mulatto Tongue; 31.5-49.0'  
Dilco Coal Member.WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1	33-49	14.3	5	10	917		

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.



CORE HOLE NO. WPC-49

LOCATION: Pond 6A near Polvadera Well

DESCRIPTION: NX size, 100.0' total depth

MATERIALS ENCOUNTERED: 0-39.0' Alluvium; 39.0-76.8' Dilco Coal Member; 76.8-100.0' Gallup Sandstone.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1a	89-100	0.0	5	10	0.0	0.0	
1b	89-100	0.0	15	10	0.0	0.0	
1c	89-100	0.1	30	30	2.44	0.0	
2a	54-100	0.0	10	10	0.0	0.0	
2b	54-100	0.36	20	40	4.16	0.0	
2c	54-100	0.84	35	18	7.58	0.0	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

## CORE HOLE NO. WPC-50

LOCATION: Pond 6A

DESCRIPTION: NX size, 70.0' total depth

MATERIALS ENCOUNTERED: 0-38.0' ALLUVIUM; 38.0-70.0' Gallup Sandstone.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks
1a	59-70	0.0	5	13	0.0	0.0	
1b	59-70	8.85	15	10	401.0	0.0	
1c	59-70	6.72	5	9	398.0	0.0	
2a	41-58	0.04	10	25	1.76	1.8	
2b	41-58	10.73	20	11	359.0	1.8	
2c	41-58	6.75	10	8	298.0	1.8	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference, $\Delta T$ (min)	Head Difference, $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Probable Field Permeability (ft/yr)	Remarks

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

## CORE HOLE NO. LP-1

LOCATION: Southwest La Polvadera Canyon

DESCRIPTION: Vertical, Nx size, total depth 81.5

MATERIALS ENCOUNTERED: 0-8.5' Sandy Silt, Alluvium; 8.5'-53.5' Dilco Coal Member;  
53.5'-81.5' Gallup SandstoneWATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Holding Test (Apparent) Field Coefficient of Permeability (ft/yr)	Remarks
1.	47-81.5	17.8	0	10	416 +		Hole drilled entirely with air.
2.	15-26.5	19.5	0	9	2785 +		
3.	26.5-38	1.4	57.8	10	56.5		Max. Pump output Test No. and 2.
4.	26.5-38	1.3	34.7	6	68.9	84.2	
5.	38-49.5	2.6	34.7	10	119.3		
6.	38-49.5	3.3	69.3	10	107.6	125.7	
7.	52-63.5	16.5	0	21	1000 +		
-							
8.	15-45	7.0	10	15	218	88.0	Test 8 & 9 from boring 12' east of boring LP-1
9.	20-45	10.8	10	15	373	155.0	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference $\Delta T$ (min)	Head Difference $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Remarks
1	61.5-81.5	30	23.3	325	
1A	22.4-45	20	8.2	31.1	Test 1A from boring 12' east of boring 1.

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

## CORE HOLE NO. LP-2

LOCATION: Southwest La Polvadera Canyon

DESCRIPTION: Vertical, Nx size, total depth 72.0'

MATERIALS ENCOUNTERED: 0-6.9' Sandy Silt Alluvium; 6.9-22.5 Dilco Coal Member;  
22.5-72.0' Gallup SandstoneWATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Holding Test (Apparent) Field Coefficient of Permeability (ft/yr)	Remarks
1.	20-72	19.5	9.2	60	375 +	537	Hole drilled entirely with air; maximum pump output, all tests.
2.	10-21.5	6.5	34.6	16	445	168	
3.	20-72	20.8	23.1	20	327 +	229	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference $\Delta T$ (min)	Head Difference $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Remarks
1.	48.2-72	60	2.6	3.5	

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

## CORE HOLE NO. LP-3

LOCATION: Southwest La Polvadera Canyon

DESCRIPTION: Vertical, NX, total depth 171.5'

MATERIALS ENCOUNTERED: 0-13 Sandy Clay Alluvium; 13-33 Mulatto Tongue; 33-154.5 Dilco Member; 154.5-171.5 Gallup Sandstone.

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Holding Test (Apparent) Field Coefficient of Permeability (ft/yr)	Remarks
1.	25-171.5	6.8	23.1	14	26.6	30.8	
2.	155-166.5	0.47	69.3	27	7.7	8.3	
3.	153-164.5	2.1	34.7	20	40.9	30.7	Packer leak
4.	135-146.5	0.67	69.3	15	12.0	22.1	
5.	35-46.5	1.1	34.7	21	52.3	77.0	
6.	115-126.5	0.19	69.3	10	3.8	13.2	
7.	103-114.5	0.17	69.3	12	3.59	11.1	
8.	90-101.5	0.45	69.3	15	10.2	18.8	
9.	72-83.5	1.25	34.7	13	40.9	61.9	
10.	57-68.5	0.9	69.3	15	25.3	23.1	
11.	44-55.5	0.57	34.7	16	24.4	66.5	
12.	33-44.5	0.82	34.7	18	39.9	98.7	
13.	25-171.5	7.1	23.1	12	27.7	23.1	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference $\Delta T$ (min)	Head Difference $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Remarks
1.	34.7-171.5	5	4.8	3.7	

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

## CORE HOLE NO. LP-5

LOCATION: West Central La Polvadera Canyon

DESCRIPTION: Vertical; Nx; total depth 160'

MATERIALS ENCOUNTERED: 0-19.6 Sand Silt/Clay Alluvium; 18,6-119.0 Dilco Coal Member;  
119.-160 Gallup SandstoneWATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Holding Test (Apparent) Field Coefficient of Permeability (ft/yr)	Remarks
1.	77-102	0.03	69.3	20	0.39	7.7	
2.	57-102	0.09	69.3	18	0.77	3.5	
3.	35-102	0.80	34.7	20	7.9	4.7	
4.	34-102	2.19	69.3	10	14.6	---	
5.	143-154.5	17.2	25.4	19	371	653.2	Max. pump output.
6.	132.5-144	0.48	69.3	17	8.47	21.0	
7.	119-130.5	8.8	46.2	20	19.3	174.9	
8.	1050116.5	1.35	69.3	21	28.2	40.3	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference $\Delta T$ (min)	Head Difference $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Remarks
1.	135-159	2	24	3580 +	Zone of water loss in log; pumped continuously for 14 minutes.

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

CORE HOLE NO. LP-6A

LOCATION: West Central La Polvadera Canyon

DESCRIPTION: Vertical; Nx; total depth 182.0'

MATERIALS ENCOUNTERED: 0-30.5 Sandy Silt/Sand Alluvium; 30.5-166.6 Dilco Coal Member; 166.6-182 Gallup Sandstone

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Holding Test (Apparent) Field Coefficient of Permeability (ft/yr)	Remarks
1.	44-182	2.18	69.3	6	---	---	Packer leaking
2.	166-182	0.07	69.3	18	0.85	5.34	
3.	128-182	0.17	69.3	22	0.85	1.35	
4.	86-182	0.26	69.3	18	0.88	0.77	
5.	48-182	0.36	69.3	20	1.02	0.91	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference $\Delta T$ (min)	Head Difference $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Remarks
1.	41-182	20	2.3	0.14	

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.

CORE HOLE NO. LP-7

LOCATION: West Central La Polvadera Canyon

DESCRIPTION: Vertical; Nx; total depth 272.0'

MATERIALS ENCOUNTERED: 0-6 Clayey Silt Alluvium; 6-7.5 Mutatto Tongue; 20.5-166.3 Dilco Coal Member; 166.3-237.5 Gallup Sandstone; 237.5-272 Mancos Shale

WATER-INJECTION TEST

Test No.	Depth Interval (ft)	Water Loss (gpm)	Applied Gage Pressure (psi)	Length of Test (min)	(Apparent) Field Coefficient of Permeability (ft/yr)	Holding Test (Apparent) Field Coefficient of Permeability (ft/yr)	Remarks
1.	64-272	20 +	0	30	--(Abort test)		Max. pump output
2.	254-265.5	1.36	69.3	22	15.8	31.1	
3.	243-254.5	0.51	69.3	19	6.1	38.8	Max. pump output
4.	222-233.5	1.79	69.3	19	22.9	60.8	
5.	202-213.5	3.79	69.3	18	52.1	87.5	
6.	169-180.5	20 +	0	14	430 +	----	
7.	142-121.5	1.83	69.3	16	31.9	33.9	
8.	110-121.5	12.4	69.3	16	252	156	
9.	70-81.5	19.6 +	34.7	17	653 +	382	Max. pump output
10.	40-51.5	21.6 +	11.6	17	1318 +	----	

FALLING HEAD TEST

Test No.	Depth Interval (ft)	Time Difference $\Delta T$ (min)	Head Difference $\Delta H$ (ft)	(Apparent) Field Coefficient of Permeability (ft/yr)	Remarks
1.	77.9-272	10	5.4	1.0	

NOTE: A value of 0 for the coefficient of permeability indicates that no measurable water loss occurred under the conditions of the test as performed.



SUMMARY  
FIELD PERMEAMETER  
TEST RESULTS

POOR ORIGINAL

SUMMARY OF FIELD PERMEAMETER TESTS<sup>a</sup>

Permeameter Hole Number	Location	Tested interval		Permeability (ft/yr)	Comments
		(ft)	Formation		
WP-1	North La Polvadera Canyon		Gallup Sandstone		Test was not done due to silting from runoff; replaced by WP-12.
WP-2	North La Polvadera Canyon	4 - 13.5	Gallup Sandstone	38	
WP-3	North La Polvadera Canyon	5 - 13	Dilco Coal Member	>890	intake of water exceeded capacity of permeameter valve. Permeability value based on valve capacity.
WP-4	South La Polvadera Canyon	5 - 13.5	Dilco Coal Member	16	
WP-5	South La Polvadera Canyon	5 - 13.5	Dilco Coal Member	417	
WP-6	South La Polvadera Canyon	5 - 13.5	Dilco Coal Member	4	
WP-7	South La Polvadera Canyon	5 - 13.5	Dilco Coal Member	13	
WP-8	South La Polvadera Canyon	5 - 13	Dilco Coal Member	5	
WP-9	South La Polvadera Canyon	5 - 13.5	Dilco Coal Member	538	
WP-10	North La Polvadera Canyon	5 - 13	Dilco Coal Member	448	
WP-11	North La Polvadera Canyon	5 - 13	Dilco Coal Member	8	
WP-12	North La Polvadera Canyon	9 - 18.5	Gallup Sandstone	46	Replaces Test WP-1
WP-13	North La Polvadera Canyon	5 - 13	Dilco Coal Member	272	
WP-14	North La Polvadera Canyon	4 - 15	Dilco Coal Member	7	
WP-15	South La Polvadera Canyon	5 - 17	Dilco Coal Member	199	
WP-16	South La Polvadera Canyon	5 - 18	Dilco Coal Member	>334	Intake of water exceeded capacity of permeameter valve.
WP-17	North La Polvadera Canyon	5 - 18	Dilco Coal Member	>384	Intake of water exceeded capacity of permeameter valve.
WP-18	North La Polvadera Canyon	5 - 15	Dilco Coal Member	76	

<sup>a</sup>USBR Designation E-19, 1974, Earth Manual, U.S. Bureau of Reclamation. Tests conducted from July 26, to August 10, 1977.