PDR-(1)
LPDR-WM-10(2)

MAY 0 6 1987

101.4/HL/4/1/487

- 1 -

WM Record File 101.4

WM Project 10
Docket No. ---- w/ocnl.
PDR ✓ w/ocnl.
x LPDR ✓ (B) w/ocnl.

Distribution: ----------
(Return to WM, 623-SS) ----------

Mr. Curtis L. Canard
Council of Energy Resource
Tribes 1580 Logan Street
Denver, Colorado 80203

Dear Mr. Canard:

As a follow-up to our conversation of April 7, 1987, Enclosures A and B of the March 17, 1987 letter from J. Keating (DOE) to J. Linehan (NRC) are attached. The letter presents a summary of Rockwell's review of your September 26, 1986 "diagrammatic cross section showing subsurface faulting at the BWIP." Based upon the distribution list the enclosures were apparently not a part of DOE's transmittal to the affected parties.

We hope that your schedule will permit review of DOE's comments on your cross section and that you will be participating in two near-term Richland, Washington BWIP activities - the May 11-15, 1987, drill hole data review and the June 22-25, 1987, geology/geophysics data review.

Sincerely,

ORIGINAL SIGNED BY

Harold E. Lefevre, Project Manager
Technical Review Branch
Division of High Level Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosure:
DOE Letter

cc: S. Hart
Council of Energy Resource Tribes
1580 Logan Street
Denver, Colorado 80203

87189522/5
WM Project: WM
PDR no
(Return to WM, 623-SS)

WM Record File: 101.4 H
LPDR no

8709040395 870506
PDR WASTE
WM-10 PDR

2553

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

87-GTB-24

MAR 17 1987

Mr. John J. Linehan, Acting Chief
Operations Branch
Division of High-Level Waste
Management
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Linehan:

DIAGRAMMATIC CROSS SECTION BY MR. C. L. CANARD

A diagrammatic cross section prepared by Mr. Curtis Canard of the Council of Energy Resource Tribes (CERT) received quite a bit of attention from the NRC in late 1986. Because of the attention given to this cross section and inferences made concerning adverse tectonic conditions in the Hanford area, we asked Rockwell to review the cross section in some detail.

The following is a summary of Rockwell's conclusions:

> "...the cross section is designated as a "work copy," contains no references to data utilized, and has been designated as diagrammatic, which is interpreted to mean that the section is largely conceptual. At best, the section should be considered as a preliminary working hypothesis and subject to change as more comprehensive data are studied." (Page 1 of Enclosure A)
>
> "...although Canard's cross section is considered to be a liberal interpretation of questionable data, the only way to fully address his interpretation, and those of others, is for the BWIP to continue to develop and publish their own cross section." (Page 5 of Enclosure A)

The following is a summary of Rockwell's rebuttal to Mr. Canard's interpretations at seven different locations in the cross section:

1. Canard: imbricate system of low angle thrust faults from the Rattlesnake Hills No. 1 well to the Walla Walla No. 6 well.

   Rockwell: the interpretation of thrust faulting is questionable; the use of dipmeter data on basalt flows is questionable and the dipmeter data shown does not agree with the fault projection shown.

2. Canard: fault in bottom of Walla Walla No. 6 well.

   Rockwell: no evidence of faulting in driller's log.

3. Canard: "zone of postulated seismic faults" at DC-24 location."

   Rockwell: "no present geologic evidence of faulting at this location."

4. Canard: thrust fault in undrilled section of DC-18.

   Rockwell: projection of the Umtanum thrust fault into the undrilled section of DC-18 and projection of the Saddle Mountains fault on the north flank of Saddle Mountain are conjectural.

5. Canard: projection of "Saddle Mountain thrust fault" through the shell BN 1-9 well and indications of major vertical displacement to the south of the well.

   Rockwell: no data referenced to establish such a fault zone; projection of the fault beneath DC-18 is conjectural.

6. Canard: fault at Columbia River locality.

   Rockwell: a fault with minor strike-slip displacement at about this location has been mapped.

7. Canard: fault with 4,000-5,000 feet vertical displacement to the right of Bissa No. 1-29 well.

   Rockwell: published maps show faulting with 50-100 feet displacement in the area.

Please contact Mr. D. Marjaniemi (FTS 444-7059) of my staff if you have any questions.

Sincerely,

J. J. Keating

J. J. Keating, Director
Basalt Waste Isolation Division

BWI:DKM

Enclosure

cc w/encl: K. McConnell, NRC-HQ
cc w/o encl: J. P. Knight, DOE-HQ
R. Stein, DOE-HQ
T. Husseman, State of Wash.
D. Provost, State of Wash.
R. Jim, Yakima Indian Nation
W. Burke, CTUIR
R. Halfmoon, Nez Perce Tribe
F. R. Cook, NRC
A. Alkezweeny, On-Site
Tribal Representative
D. C. Gibbs, Rockwell

ENCLOSURE A

REVIEW OF DIAGRAMMATIC CROSS SECTION BY C. L. CANARD

INTRODUCTION

This enclosure summarizes the results of a preliminary review by the Basalt Waste Isolation Project's (BWIP) geology staff of a "diagrammatic cross section, showing surface faulting at the BWIP" as interpreted by Canard (1986). This cross section has been informally transmitted by Canard to the Nuclear Regulatory Commission (NRC) and has been referred to by the BWIP on-site NRC Representative (Cook, 1986). The cross section has also been the subject of a telephone conference between the BWIP geology staff and the NRC geology staff (Tallman, 1986).

This review was conducted for the purpose of a preliminary evaluation of the subsurface structural and stratigraphic interpretation shown on the cross section. It is important to point out that the cross section is designated as a "work copy," contains no references to data utilized, and has been designated as diagrammatic, which is interpreted to mean that the section is largely conceptual. At best, the section should be considered as a preliminary working hypothesis and subject to change as more comprehensive data are studied. The geologic cross section is included as Enclosure B.

The review has consisted of a study of Canard's interpretations along with a summary review of the information on which it is assumed his interpretations have been made. Because of the Stop Work Order, no detailed study has been made of the original well or borehole data which are shown in the section. Rather, this is a preliminary review focused on the concepts shown in the Canard section.

The section was constructed by Canard on a series of oil and gas company exploratory wells along with some BWIP boreholes, one drilled (RRL-2), one in progress (DC-18), and one as yet undrilled (DC-24). It is apparent that some, but not all, available published geologic mapping has been used.

The line of section extends from the Standard Oil Company Rattlesnake Hills No. 1 (RSH-1) well on the south, northerly through the reference repository location and Hanford Reservation, and ends at the Shell Oil Company Bissa No. 1-29 well, a distance of 69 miles. Horizontal scale of the section is about 1 inch = 15,000 feet and vertical scale is about 1 inch = 1,000 feet; exaggeration is about 15:1.

COMMENTS ON SPECIFIC LOCATIONS IN CROSS SECTION

This discussion will focus on the key wells and boreholes that Canard has selected to show interpretations of subsurface conditions. The wells and boreholes and other locations that will be discussed are numbered in Enclosure B so that the text and geologic section locations correspond.

1. Standard Oil Company Rattlesnake Hills No. 1 (RSH-1) Well

Well data has been projected along strike 10 miles to the Northwestern Natural Gas Company Walla Walla No. 6 (WW-6) well. The section shows an imbricate thrust fault system of low angle faults at depths of 2,000-4,000 feet, which are projected to the north. The lowermost fault, depth about 6,000 feet, has been extended into the WW-6 near the bottom of the well.

Data used is apparently from Raymond and Tillson (1968) and data (especially dipmeter calculations) from well records on file with the Washington Department of Natural Resources (DNR). The concept of low angle thrust faulting is apparently based on Canard's interpretation that "coal beds" in the interval 2,100-4,800 feet are older than Columbia River basalt (CRB). These coal beds contain possible "Oligocene" pollen (Raymond and Tillson, 1968) and thus their presence in the CRB could indicate thrust faulting.

Comment: Pollen correlations and coal bed stratigraphy, as described by Newman in the Raymond and Tillson (1986) report, are not well established. Newman's conclusion that the pollen may be Oligocene in age is based on negative evidence -- lack of the Miocene pollen species Compositae in the assemblage was interpreted by Newman as evidence of a pre-Miocene age. Later, Barnett and Fisk (1980) reported a pollen assemblage in the Vantage interbed of CRB which also lacks Compositae; however, the Vantage interbed has an established middle Miocene age. Therefore, if the primary basis for an imbricate thrust fault interpretation is on duplication of Oligocene beds, then the interpretation is questionable. Furthermore, if the dipmeter data of 20-24^{0} is used and the faulting projected northward at a 1:1 scale (rather than 15:1), faulting would project to the surface approximately six to seven miles south of WW-6. At true scale, the fault plane in RSH-1 would have to dip on the order of 3^{0} to reach the WW-6. Dipmeter data in basalt flows can be misleading if levels of calculations are in joint or fracture plane zones and not on bedding plane contacts.

2. Northwestern Natural Gas Walla Walla No. 6 Well

Canard has shown a fault in the bottom of the well, as a projection of a fault interpreted in the RSH-1 at a depth of about 8,000 feet. Canard has no reference to data on which the fault is based.

Comment: The available data on WW-6, which consists of a drillers log only, have been reviewed. The log makes no reference to faulting at any depth in the well, and there are no indicated zones such as fractured rock or breccia which could be interpreted as fault zones.

3. Borehole DC-24

This well has not been drilled. Canard's reference to a "zone of postulated seismic faults" at the projected base of the well, is apparently based on assumed faulting associated with the Cold Creek microearthquake swarm. This swarm was recorded in 1979 and reported in the University of Washington Annual Geophysical Report (UWGP, 1980).

Comment: There is no present geologic evidence of faulting at this location, but earthquakes indicate some rupture and slip on geologically unmapped faults is occurring. These faults could be very limited in extent and displacement. The presence of "blind thrusts" is not supported by focal mechanism solutions of earthquakes in the basalt and below. Solutions at varying depths indicate steeply dipping reverse faults on nearly east-west planes.

4. Borehole DC-18

Borehole is in progress and is presently suspended at a depth of 1,507 feet. Canard projects the "Umtanum thrust fault" through the lower part of the undrilled section of the borehole.

Comment: Projection of the Umtanum thrust fault into the undrilled section of the borehole is conjectural. In addition, projection of the Saddle Mountains fault on the north flank of the Saddle Mountains is also conjectural. The BWIP gravity data does not support a significant fault displacement at depth at this location. Breccia zones have been logged in the boring between 1,204 feet and 1,302 feet (3 zones), but as yet no interpretation has been made on possible fault geometry.

5. Shell Oil Company BN No. 1-9 Well

Canard has projected the "Saddle Mountain thrust fault" through the Shell BN No. 1-9 well and has indicated major vertical displacement to the south of the well location.

Comment: No data are referenced to establish the fault zone in the well section nor the displacement to the south of the well location. Grolier and Bingham (1972) and Reidel (1984) have published mapping of the area and have indicated a south dipping fault, 45^{o} or steeper. As previously discussed in Item 4, projection of the fault and its displacement to the south beneath borehole DC-18 is conjectural.

6. Fault at Columbia River Locality

Canard has apparently seen maps showing faulting at about this locality which is near Wanapum Dam. Minor strike-slip faulting was mapped by Mackin (1956) and by Tolan (1986).

Comment: The fault may be part of a larger fault mapped as the Sagebrush Springs fault and shown on Tolan (1986).

7. Shell Oil Company Bissa No. 1-29 Well, North End of Canard's Section

Fault shown to right of the well shows 4,000-5,000 feet vertical displacement at the base of CRB.

Comment: Mapped faulting in this area (Tolan, 1986) shows north-south faulting with relatively small displacement on the order of 50-100 feet. There is no present surface or subsurface information that would support the interpretation of large displacement.

SUMMARY AND RECOMMENDATIONS

The Canard geologic section showing low angle thrust faults that do not reach ground surface is interpreted mostly from data in the Raymond and Tillson report (1968). In this report, ages based on palynology are a major part of the interpretation of structural/stratigraphic conditions beneath the Hanford Reservation and adjacent areas to the north and south. The interpretations indicate a very liberal conceptual reconstruction of limited data and do not appear to be based on a comprehensive study of all available data.

The BWIP geology staff contend that the data from the Raymond and Tillson report (1968) can also be interpreted to reflect a substantially different stratigraphic/structural condition if the basalt stratigraphy in RSH-1 is interpreted using available chemical data. Chemical data are also available from other deep exploratory wells to the north of the Hanford Reservation at the Shell Saddle Mountain No. 1-9, Bissa No. 1-29, and Yakima Minerals No. 1-33 wells. These data are available from previous BWIP studies but the analysis is only partially complete and is now held in abeyance by the present Stop Work Order.

In addition to stratigraphic studies in deep boreholes, geophysical information is critical to the interpretation of structural conditions in the reference repository location, Controlled Area Study Zone (CASZ), and adjacent areas of the Pasco Basin. Detailed seismic reflection surveys are the preferred geophysical method for determining structural conditions.

Therefore, it is recommended the following studies be conducted at the earliest possible time. These studies are summarized below:

1. Columbia River Basalt Stratigraphic Studies in Deep Boreholes to Resolve Structural Problems

   The purpose of examining the CRB stratigraphy in the deep boreholes is to demonstrate the presence or absence of fault-caused stratigraphic offsets in the rock units penetrated in the boreholes. By determining the presence or absence of stratigraphic offsets, constraints can be placed on geologic cross sections.

   Resolving the CRB stratigraphy in the deep boreholes requires a knowledge of the regional stratigraphy developed from surface exposures for comparison purposes. A detailed study of the rock units penetrated in the well follows this. Once a detailed stratigraphy has been established for the region and for the boreholes, the borehole stratigraphy is compared to the regional data base. The comparison is then used to document "repeats" in the stratigraphic sequence which may indicate faults. This can be used to constrain the angle of fault planes. The presence or absence of faults can then be used to constrain the geometry of the ridges when balanced cross sections are constructed.

2. Proposed Seismic Reflection Studies

   In order to assist in defining the fault that is proposed to exist and cut the surface of the basalts on the northern limb of the Gable

Mountain-Gable Butte structures, data for a seismic reflection survey line should be acquired from north of the Gable structures south to Rattlesnake Mountain. Since a fault is believed to exist at or near the surface in the area of the north limb of the Gable structures, it should be possible to identify this feature in the seismic data and trace it at depth to the south as far as it may extend across the site.

The presence of other faulting not now mapped could be identified in the seismic profile as the line is extended across the reference respository location and Rattlesnake Hills. The line should extend to the south flank of Rattlesnake Hills in order to map the entire structural character of the ridge.

In summary, although Canard's cross section is considered to be a liberal interpretation of questionable data, the only way to fully address his interpretation, and those of others, is for the BWIP to continue to develop and publish their own cross section. This BWIP cross section, and subsequent updates, would be based on a comprehensive study of available data and would be documented as to the sources of these data. Recommendations for additional studies supporting cross section development are summarized above and in more detail in study plans currently in preparation.

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Grolier, M. J., and Bingham, J. W., 1978, "Geolgoy of Parts of Grant, Adams, and Franklin Counties, East-Central Washington," Bulletin 71, Washington State Department of Natural Resources, Olympia, Washington.

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Raymond, J. R., and D. D. Tillson, 1968, Evaluation of a Thick Basalt Sequence in South-Central Washington, Geophysical and Hydrological Exploration of the Rattlesnake Hills Deep Stratigraphic Test Well, BNWL 776, Battelle Northwest Laboratory, Richland, Washington.

Reidel, S. P., 1984, "The Saddle Mountains: The Evolution of an Anticline in the Yakima Fold Belt," American Journal of Science, Vol. 284, pp. 942-978.

Tallman, A. M., 1986, "Technical Topics Identified in Previous Department of Energy-Richland Operations Office/Nuclear Regulatory Commission Discussions," Telecon, December 12, 1986.

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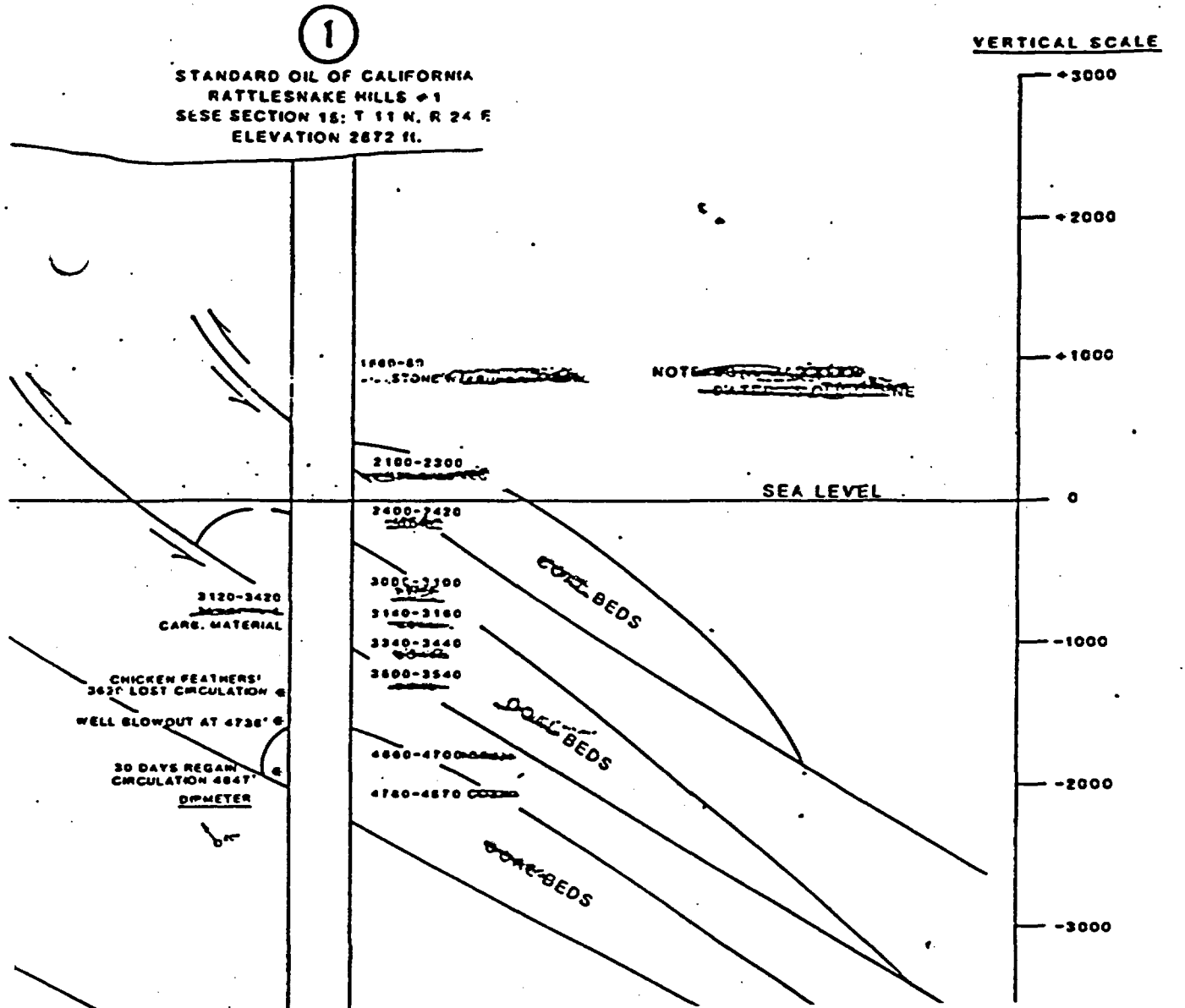
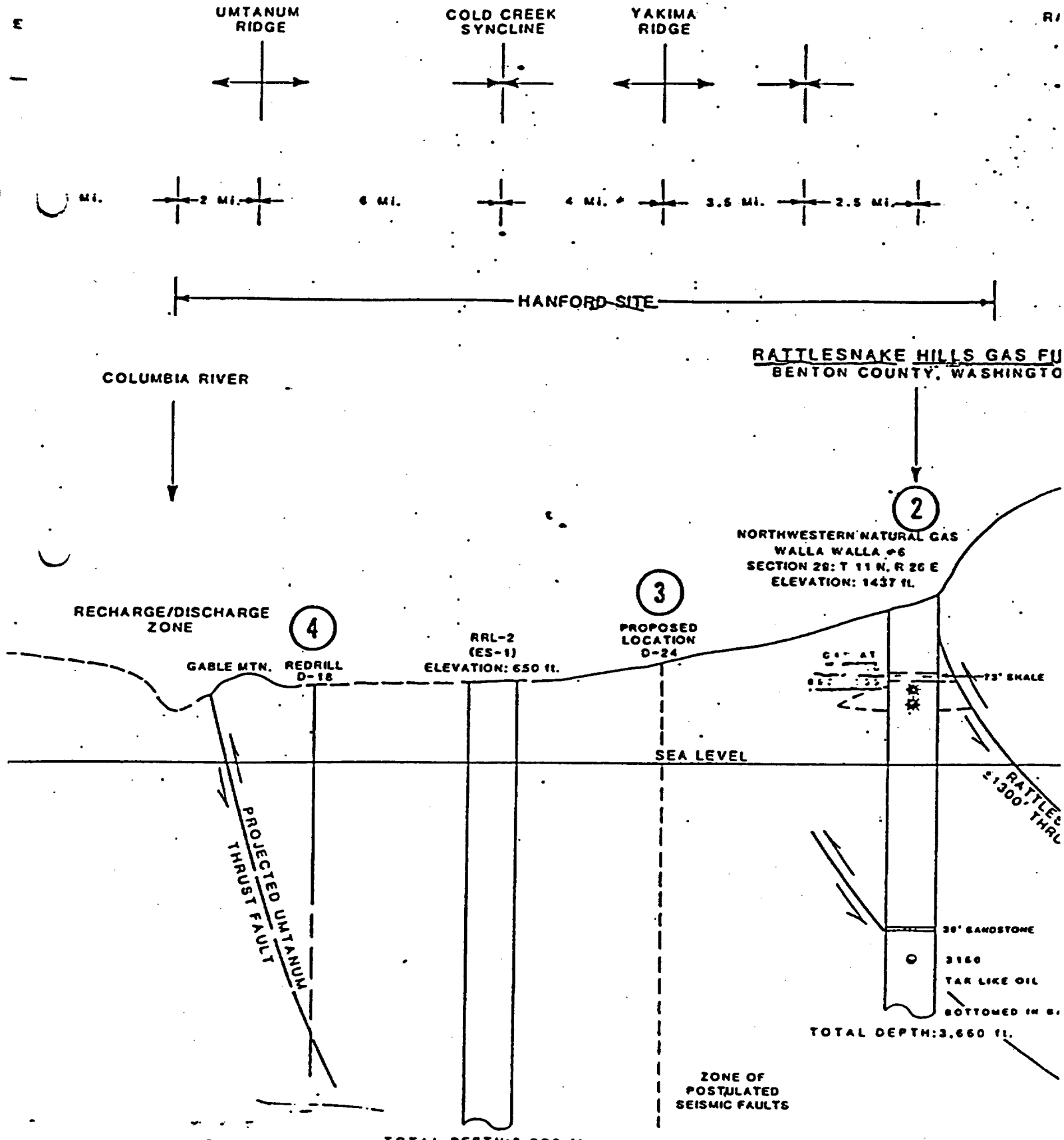
SW

ENCLOSURE B



CROSS SECTION

E FAULTING AT BWIP



DIAGRAMMATIC C
SHOWING SUBSURFACE

SADDLE MOUNTAIN ANTICLINE

PASCO SYNCLINE

BEN
ECTION

16 MI.

5 MI.

COLUMBIA RIVER

1-8 BN SADDLE MOUNTAIN WELL
GRANT COUNTY, WASHINGTON
SECTION 8: T 15 N, R 25 E
ELEVATION: 2400 ft.

6

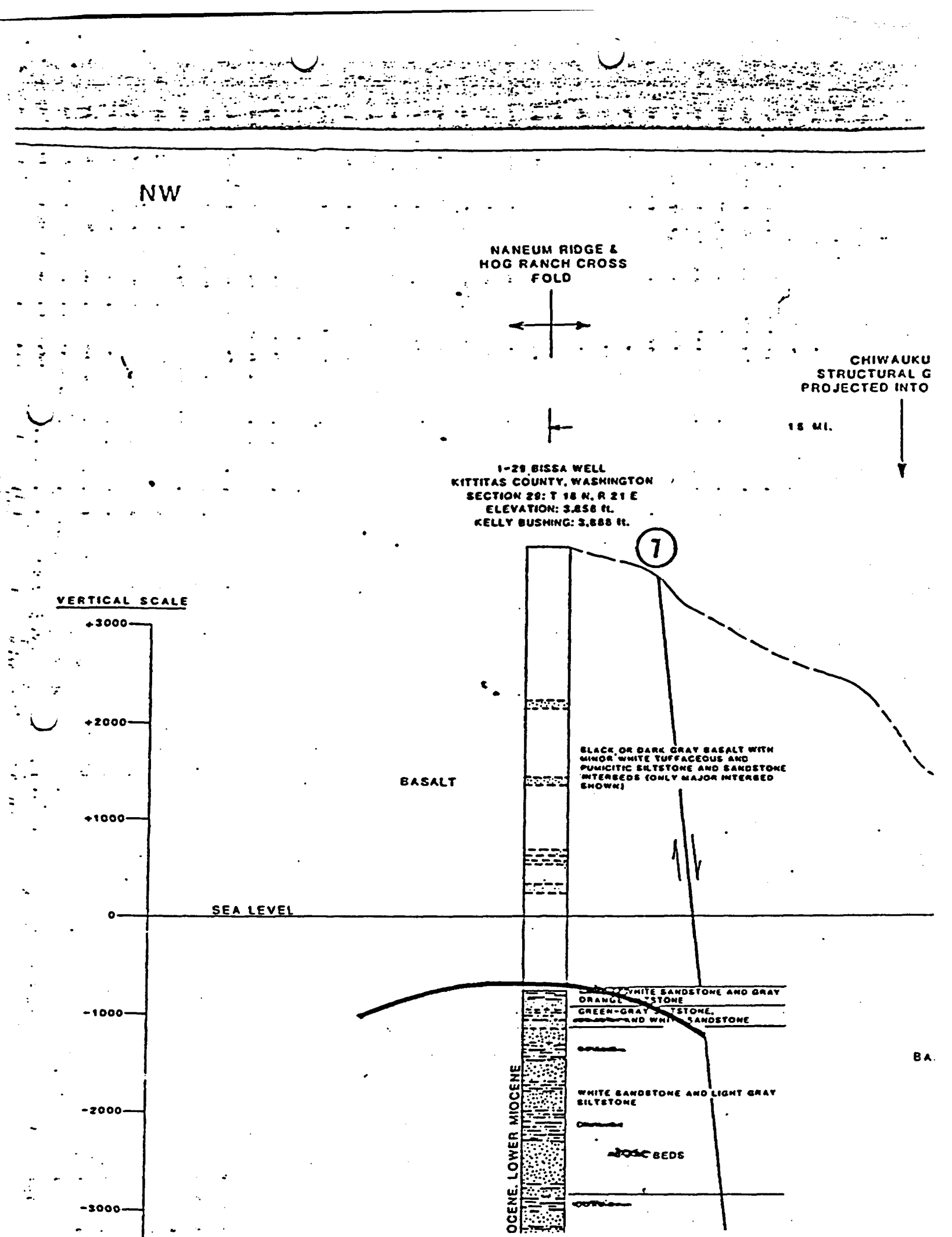
RECHARGE/DISCHARGE ZONE

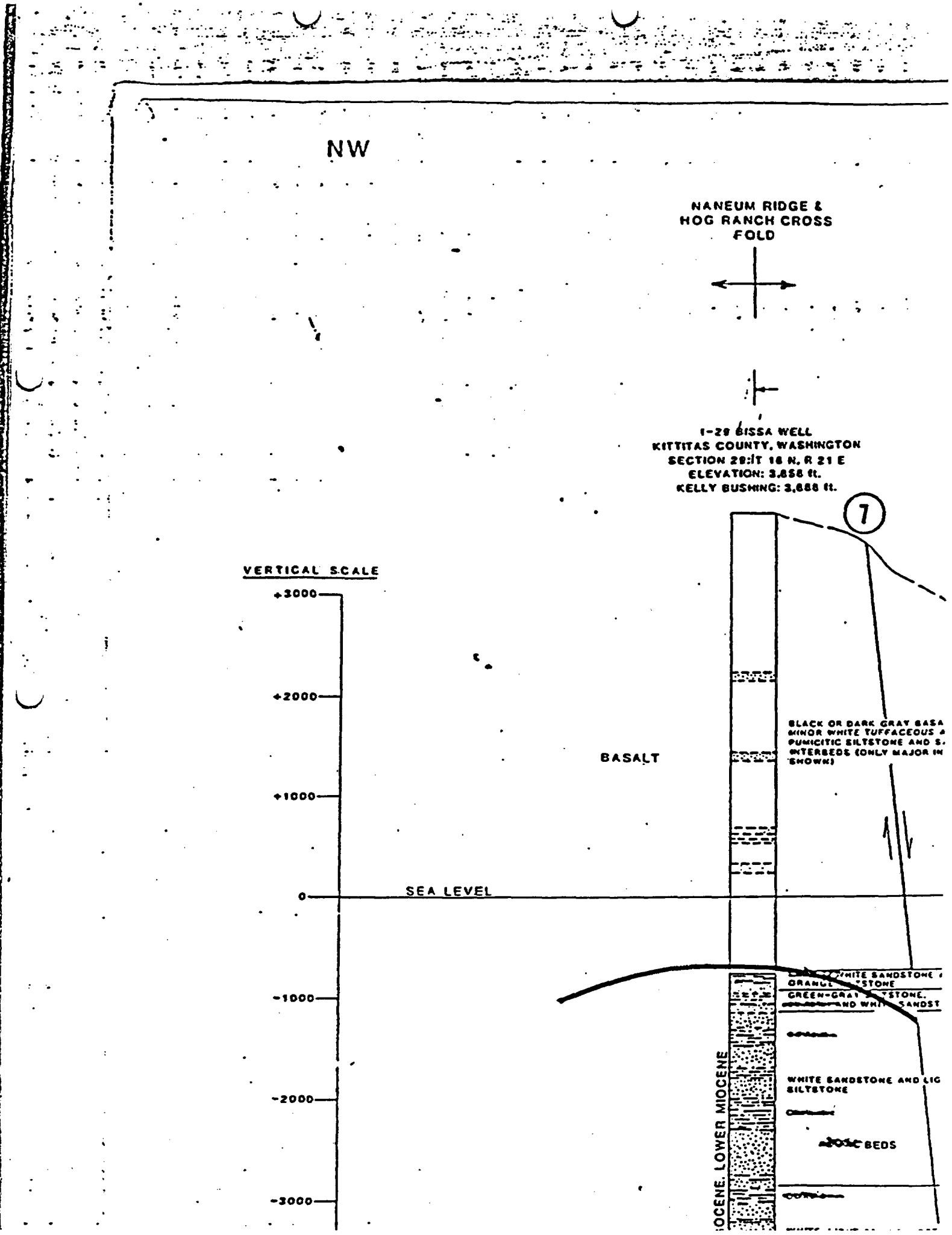
5

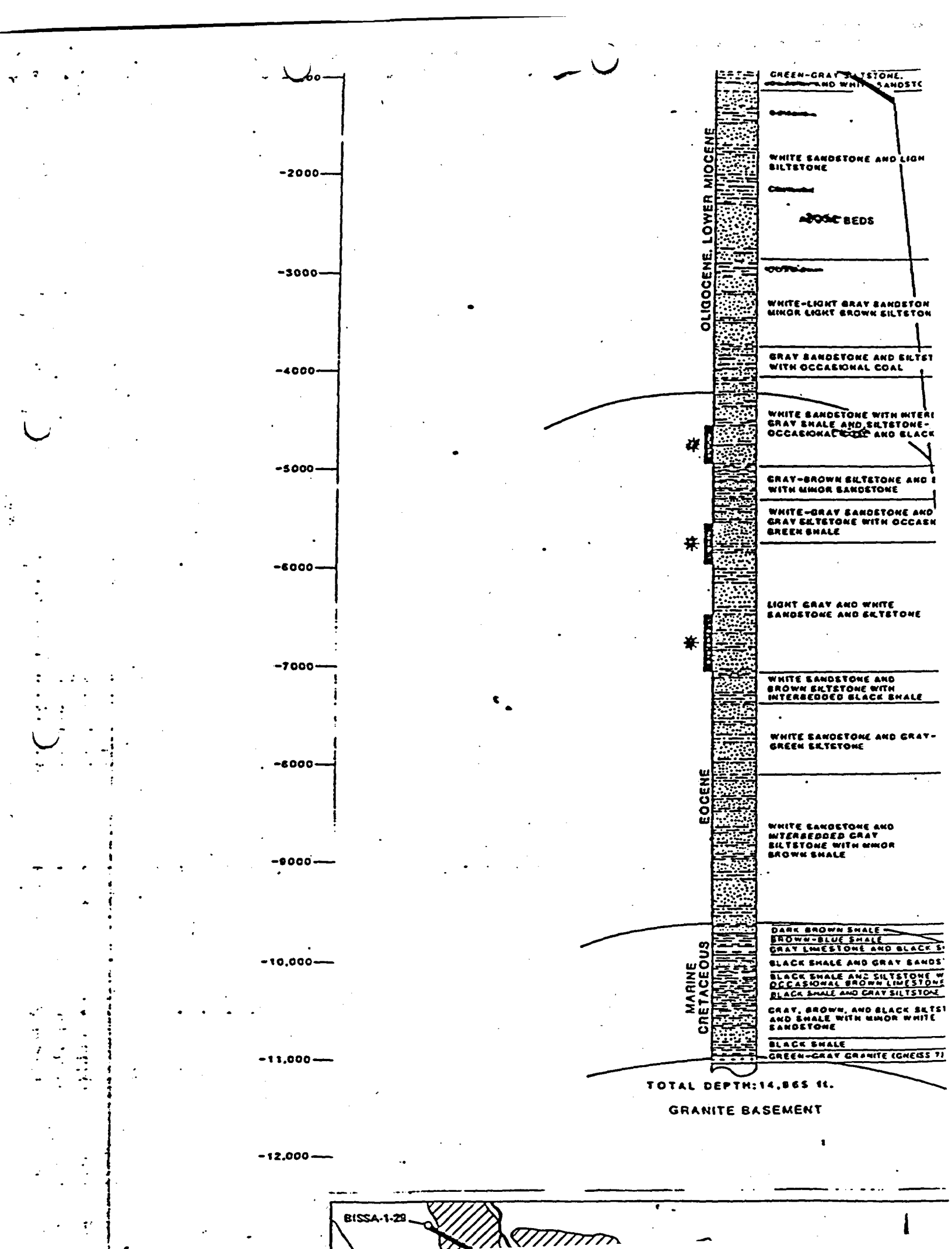
SEA LEVEL

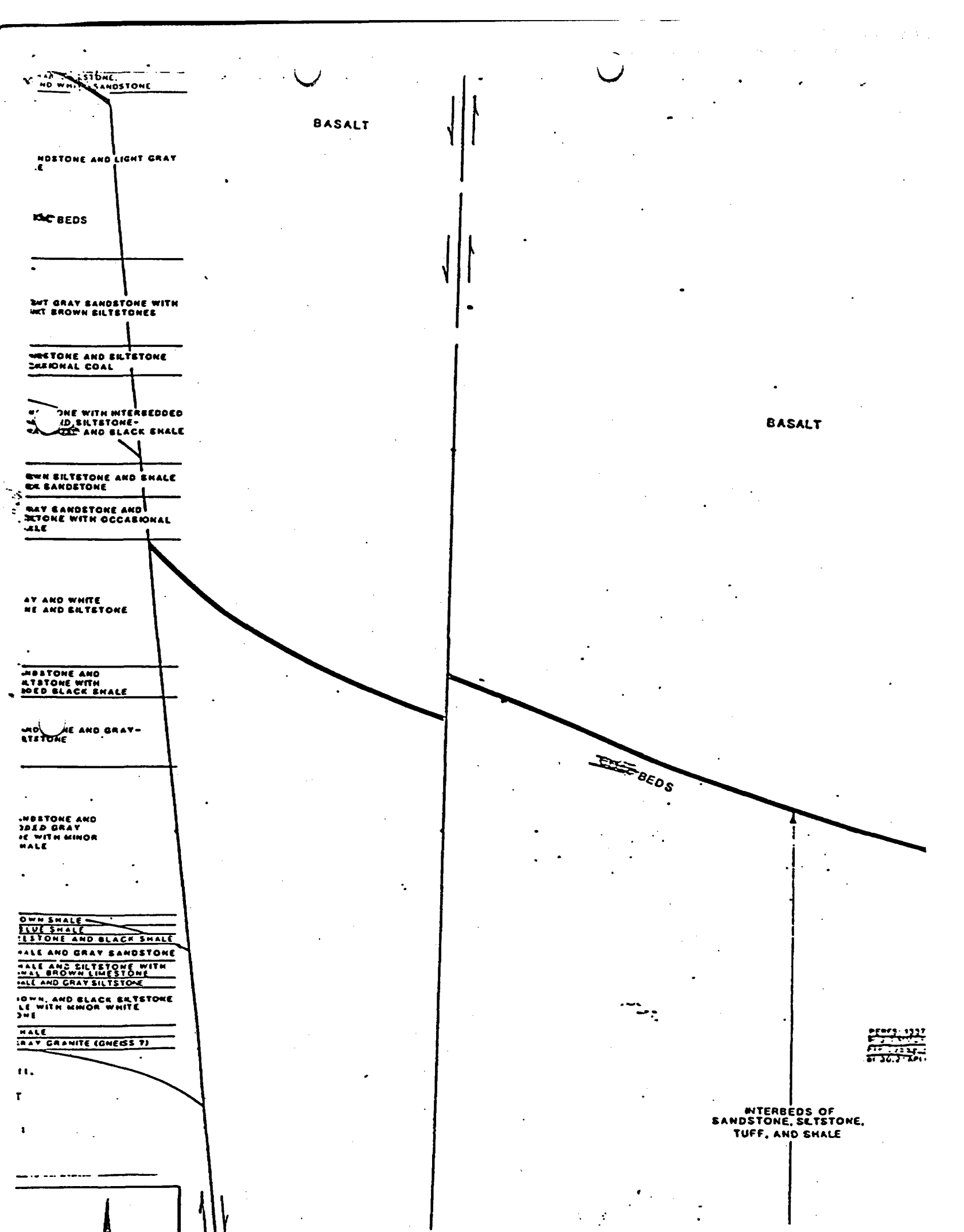
T

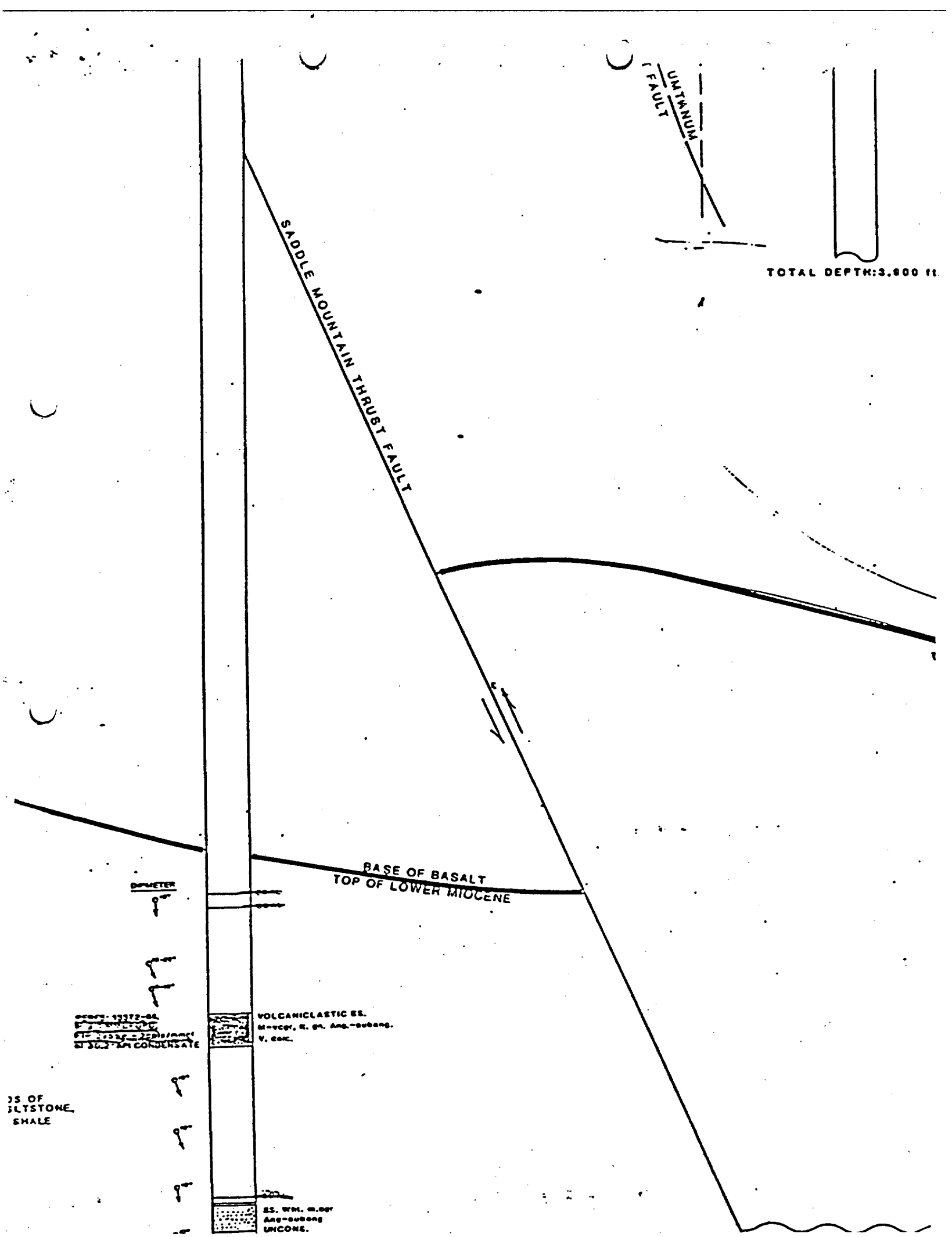
SADDLE

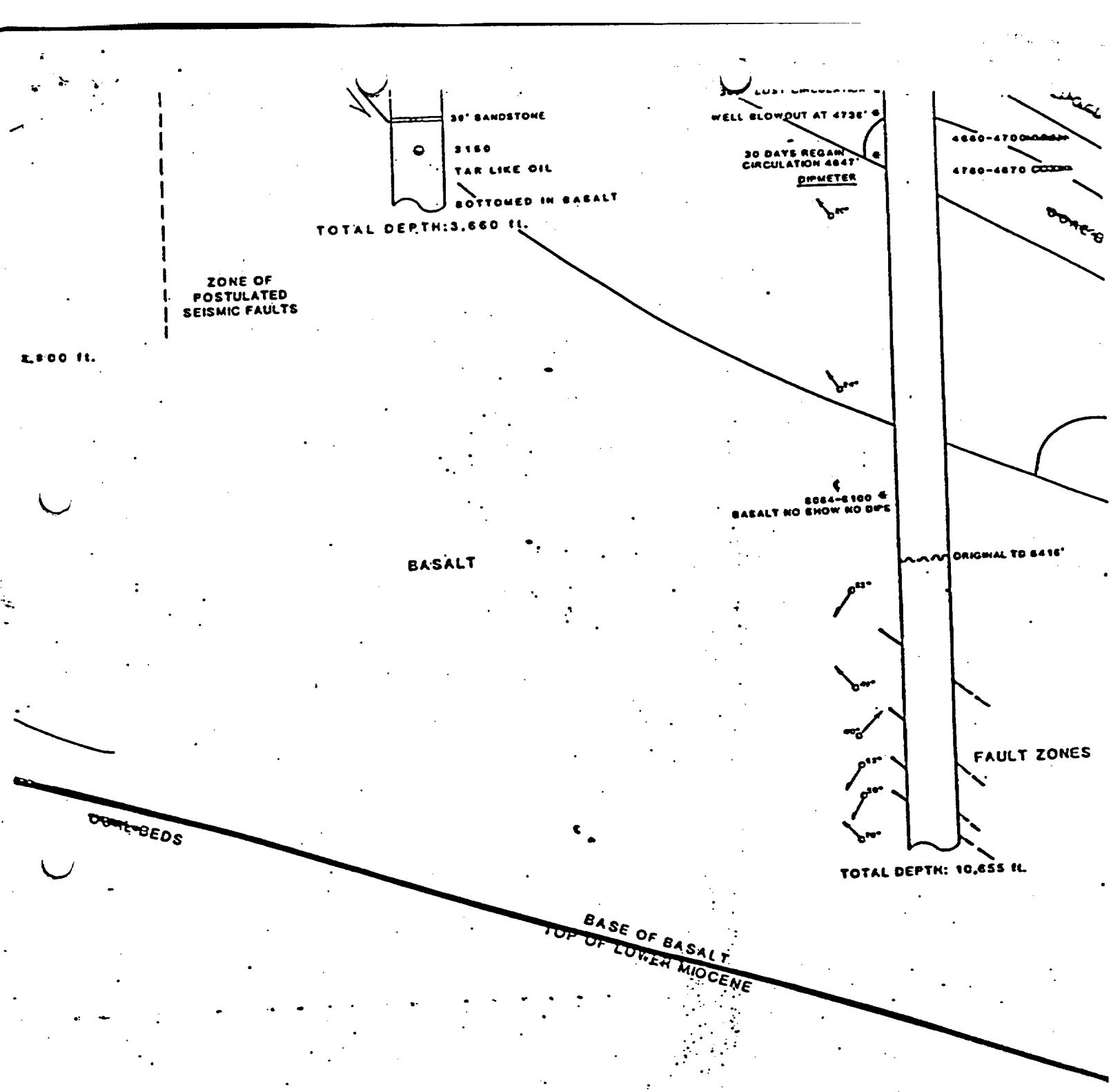

NW
NANEUM RIDGE &
HOG RANCH CROSS
FOLD
CHIWAUKU
STRUCTURAL G
PROJECTED INTO
15 MI.
1-29 BISSA WELL
KITTITAS COUNTY, WASHINGTON
SECTION 29: T 18 N, R 21 E
ELEVATION: 3,858 ft.
KELLY BUSHING: 3,888 ft.
7
VERTICAL SCALE
+3000
+2000
+1000
0
-1000
-2000
-3000
SEA LEVEL
BASALT
BLACK OR DARK GRAY BASALT WITH
MINOR WHITE TUFFACEOUS AND
PUMICITIC SILTSTONE AND SANDSTONE
INTERBEDS (ONLY MAJOR INTERBED
SHOWN)
WHITE SANDSTONE AND GRAY
ORANGE
STONE
GREEN-GRAY
TSTONE,
ND WHI
SANDSTONE
WHITE SANDSTONE AND LIGHT GRAY
SILTSTONE
BEDS
OCENE, LOWER MIOCENE
BA

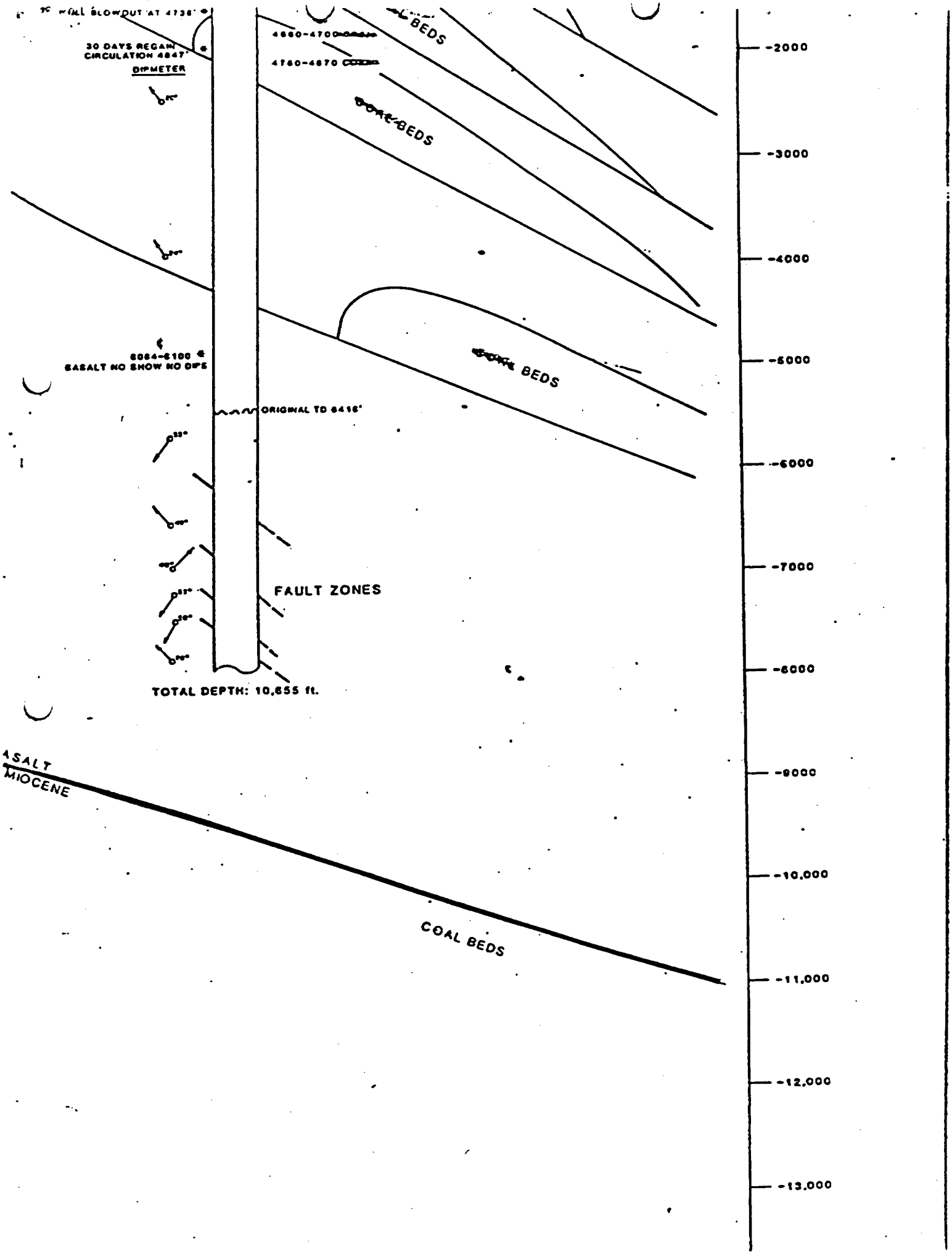

NW
NANEUM RIDGE &
HOG RANCH CROSS
FOLD
1-29 BISSA WELL
KITTITAS COUNTY, WASHINGTON
SECTION 29:T 18 N, R 21 E
ELEVATION: 3,858 ft.
KELLY BUSHING: 3,888 ft.
7
VERTICAL SCALE
+3000
+2000
+1000
0
-1000
-2000
-3000
SEA LEVEL
BASALT
BLACK OR DARK GRAY BASA
MINOR WHITE TUFFACEOUS
PUMICITIC SILTSTONE AND S.
INTERBEDS (ONLY MAJOR IN
SHOWN)
WHITE SANDSTONE
GRANUL TSTONE
GREEN-GRA TSTONE,
AND WHI SANDST
WHITE SANDSTONE AND LIG
SILTSTONE
BEDS
OCENE, LOWER MIOCENE

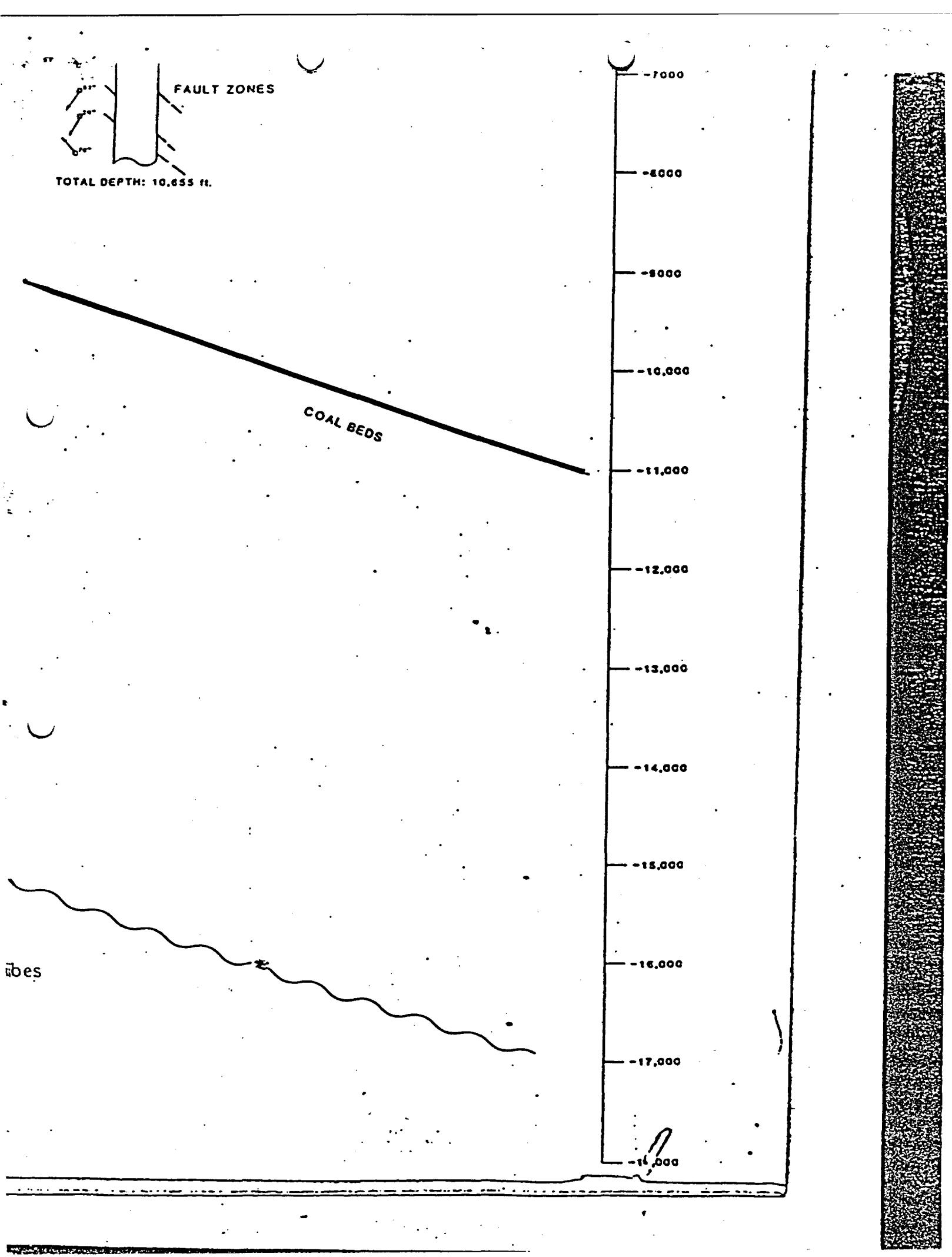

-2000
-3000
-4000
-5000
-6000
-7000
-8000
-9000
-10,000
-11,000
-12,000
OLIGOCENE, LOWER MIOCENE
EOCENE
MARINE CRETACEOUS
WHITE SANDSTONE AND LIGH
SILTSTONE
BEDS
WHITE-LIGHT GRAY SANDSTON
MINOR LIGHT BROWN SILTSTON
GRAY SANDSTONE AND SILTST
WITH OCCASIONAL COAL
WHITE SANDSTONE WITH INTERI
GRAY SHALE AND SILTSTONE-
GRAY-BROWN SILTSTONE AND
WITH MINOR SANDSTONE
WHITE-GRAY SANDSTONE AND
GRAY SILTSTONE WITH OCCASN
GREEN SHALE
LIGHT GRAY AND WHITE
SANDSTONE AND SILTSTONE
WHITE SANDSTONE AND
BROWN SILTSTONE WITH
INTERBEDDED BLACK SHALE
WHITE SANDSTONE AND GRAY-
GREEN SILTSTONE
WHITE SANDSTONE AND
INTERBEDDED GRAY
SILTSTONE WITH MINOR
BROWN SHALE
DARK BROWN SHALE
BROWN-BLUE SHALE
BLACK SHALE AND GRAY SANDS
BLACK SHALE AND SILTSTONE W
OCCASIONAL BROWN LIMESTONE
BLACK SHALE AND GRAY SILTSTONE
GRAY, BROWN, AND BLACK SILTS
AND SHALE WITH MINOR WHITE
SANDSTONE
BLACK SHALE
GREEN-GRAY GRANITE (GNEISS ?)
TOTAL DEPTH: 14,865 ft.
GRANITE BASEMENT
BISSA-1-29

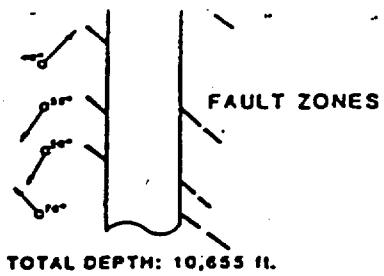

BASALT
BASALT
BEDS
INTERBEDS OF
SANDSTONE, SILTSTONE,
TUFF, AND SHALE


UMTANUM FAULT
TOTAL DEPTH:3,800 ft
SADDLE MOUNTAIN THRUST FAULT
BASE OF BASALT
TOP OF LOWER MIOCENE
DIPMETER
VOLCANICLASTIC SS.
M-vcgr, R. gr. Ang.-subang.
V. calc.
SS. WHL. m.gr
Ang-subang
UNCONS.


30' SANDSTONE
3150
TAR LIKE OIL
BOTTOMED IN BASALT
TOTAL DEPTH:3,660 ft.
ZONE OF
POSTULATED
SEISMIC FAULTS
2,800 ft.
WELL BLOWOUT AT 4736'
30 DAYS REGAIN
CIRCULATION 4847'
DIPMETER
4660-4700
4760-4870
6084-6100
BASALT NO SHOW NO DIPS
ORIGINAL TD 6416'
BASALT
FAULT ZONES
COAL BEDS
TOTAL DEPTH: 10,655 ft.
BASE OF BASALT
TOP OF LOWER MIOCENE


TO WELL BLOWOUT AT 4736'
30 DAYS REGAIN CIRCULATION 4847'
DIPMETER
4660-4700
4760-4870
BEDS
BEDS
BEDS
6084-6100
BASALT NO SHOW NO DIPS
ORIGINAL TD 6416'
FAULT ZONES
TOTAL DEPTH: 10,655 ft.
BASALT
MIOCENE
COAL BEDS
-2000
-3000
-4000
-5000
-6000
-7000
-8000
-9000
-10,000
-11,000
-12,000
-13,000


FAULT ZONES
TOTAL DEPTH: 10,655 ft.
COAL BEDS
-7000
-8000
-9000
-10,000
-11,000
-12,000
-13,000
-14,000
-15,000
-16,000
-17,000

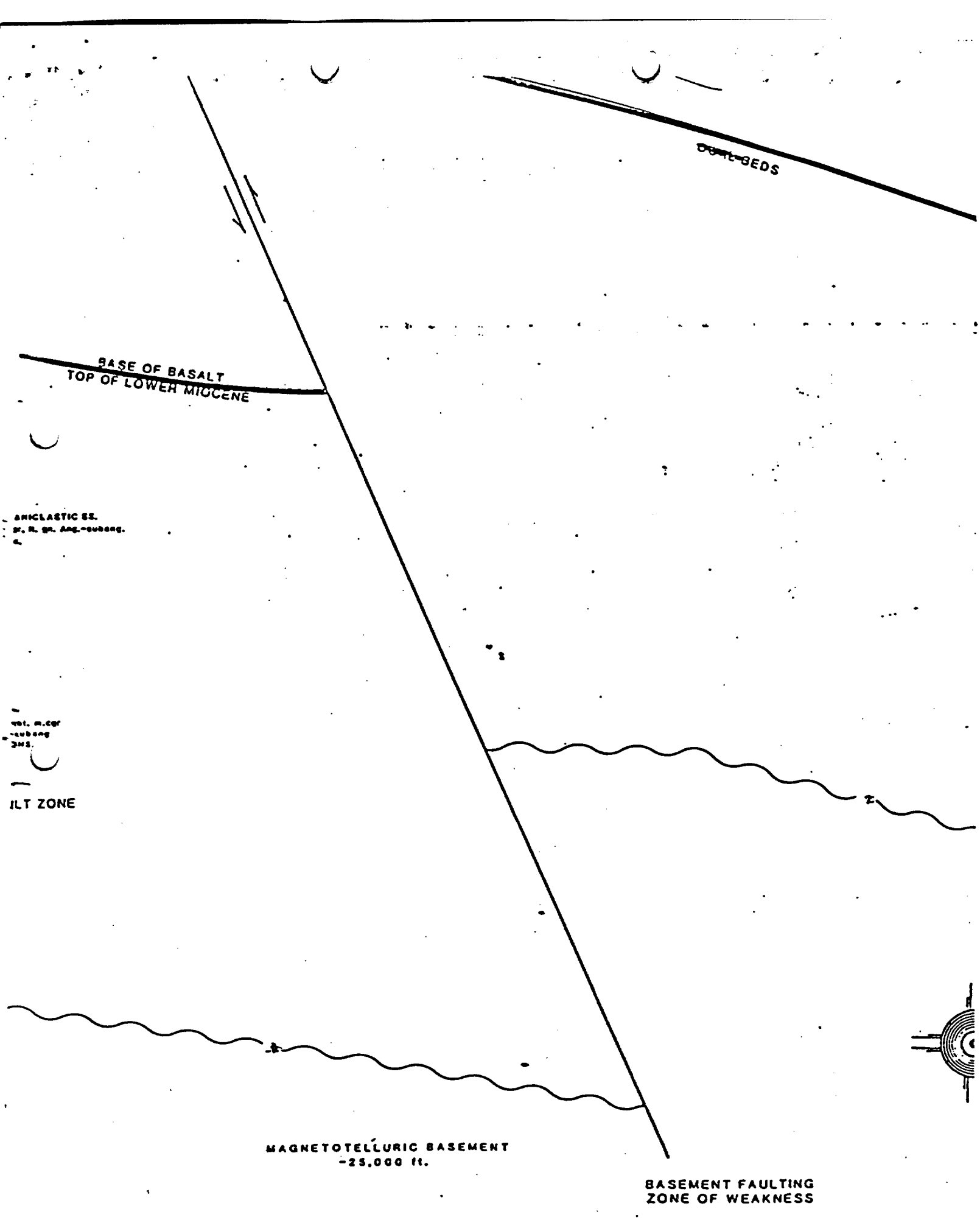


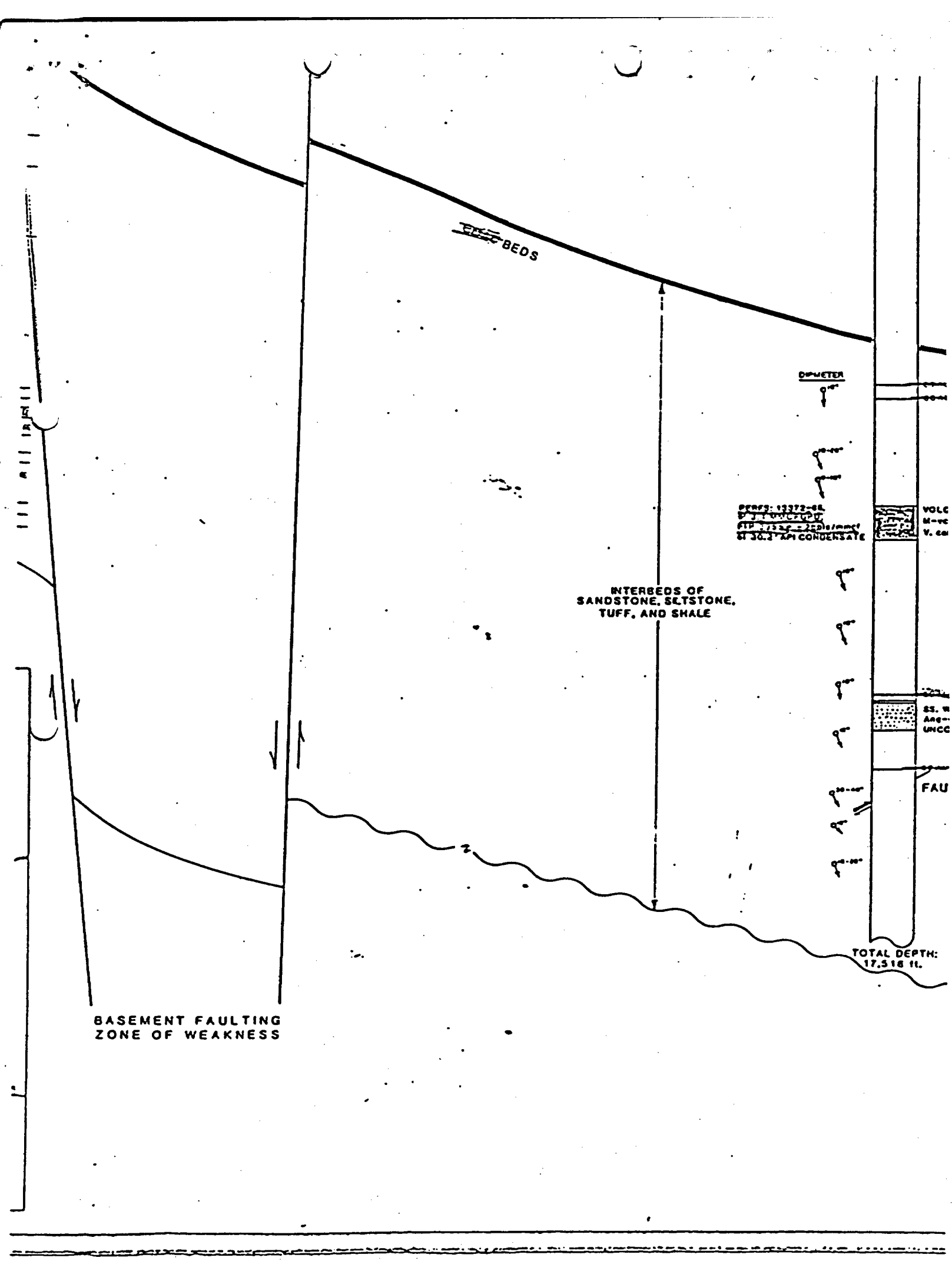
BASE OF BASALT
TOP OF LOWER MIOCENE

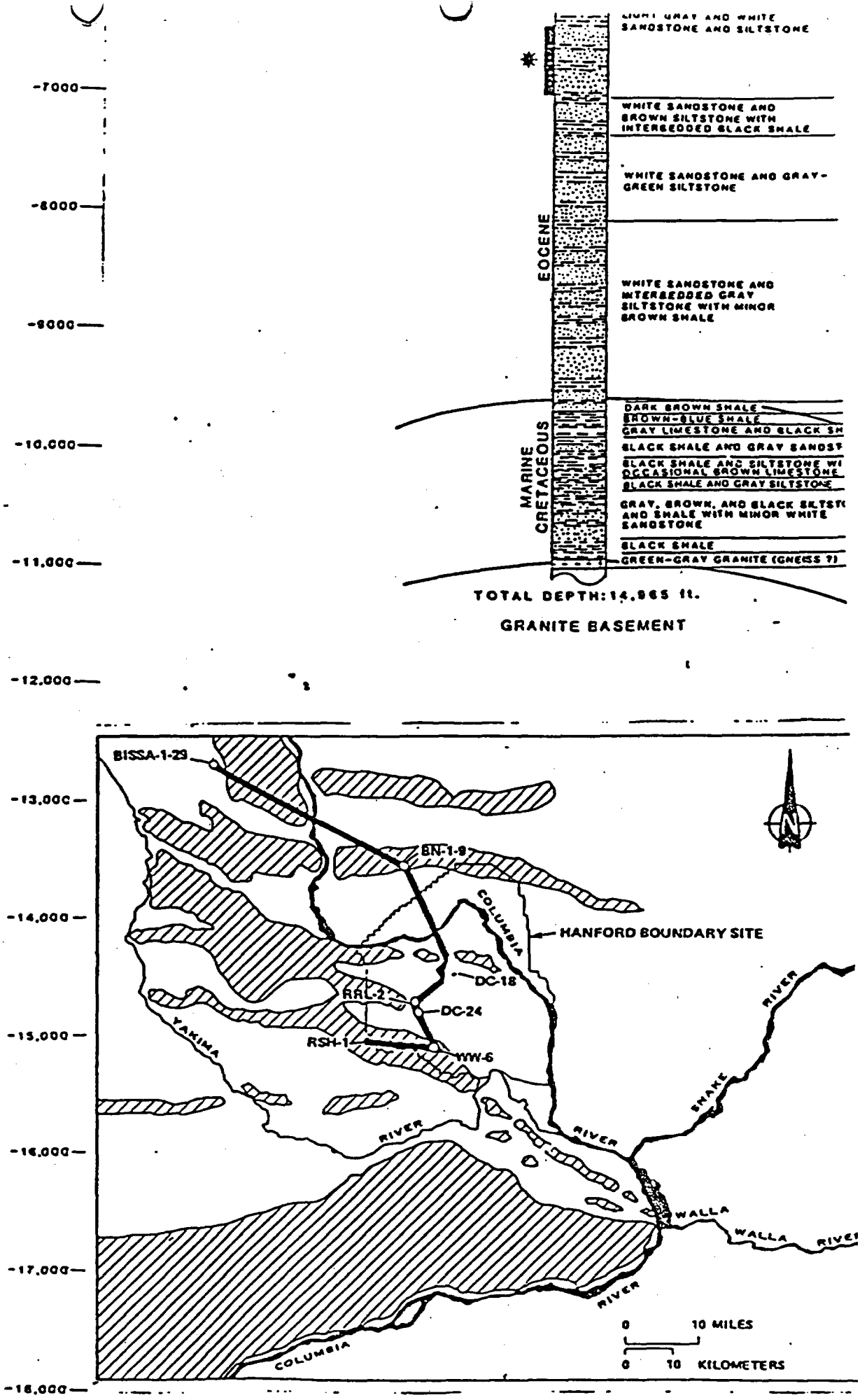
COAL BEDS

Council of Energy Resource Tribes

WORK COPY
SEPTEMBER 26, 1986
C.L. CANARD


BASE OF BASALT
TOP OF LOWER MIOCENE
MAGNETOTELLURIC BASEMENT
-25,000 ft.
BASEMENT FAULTING
ZONE OF WEAKNESS


BEDS
DIPMETER
INTERBEDS OF
SANDSTONE, SILTSTONE,
TUFF, AND SHALE
TOTAL DEPTH:
17,516 ft.
BASEMENT FAULTING
ZONE OF WEAKNESS


-7000
-8000
-9000
-10,000
-11,000
-12,000
-13,000
-14,000
-15,000
-16,000
-17,000
-18,000
EOCENE
MARINE CRETACEOUS
LIGHT GRAY AND WHITE SANDSTONE AND SILTSTONE
WHITE SANDSTONE AND BROWN SILTSTONE WITH INTERBEDDED BLACK SHALE
WHITE SANDSTONE AND GRAY-GREEN SILTSTONE
WHITE SANDSTONE AND INTERBEDDED GRAY SILTSTONE WITH MINOR BROWN SHALE
DARK BROWN SHALE
BROWN-BLUE SHALE
GRAY LIMESTONE AND BLACK SH
BLACK SHALE AND GRAY SANDST
BLACK SHALE AND SILTSTONE WI
OCCASIONAL BROWN LIMESTONE
BLACK SHALE AND GRAY SILTSTONE
GRAY, BROWN, AND BLACK SILTST
AND SHALE WITH MINOR WHITE SANDSTONE
BLACK SHALE
GREEN-GRAY GRANITE (GNEISS ?)
TOTAL DEPTH: 14,965 ft.
GRANITE BASEMENT
BISSA-1-29
BN-1-9
HANFORD BOUNDARY SITE
DC-18
DC-24
RRL-2
RSH-1
WW-6
COLUMBIA
YAKIMA
RIVER
SNAKE
WALLA
WALLA RIVER
0 10 MILES
0 10 KILOMETERS

MAY 0 6 1987

101.4/HL/4/1/487

OFFICIAL CONCURRENCE AND DISTRIBUTION RECORD

LETTER TO: Mr. Curtis L. Canard
Council of Energy Resource Tribes
1580 Logan Street
Denver, Colorado 80203

FROM: Harold E. Lefevre, Project Manager
Technical Review Branch
Division of High Level Waste Management
Office of Nuclear Material Safety
and Safeguards

SUBJECT: TRANSMITTAL OF ATTACHMENTS TO DOE LETTER OF MARCH 17, 1987

DATE:

DISTRIBUTION w/o enclosure

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JBunting, HLSE	RBallard, HLTR	PJustus, HLTR	JLinehan, HLOB
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HLefevre, HLTR & r/f			

CONCURRENCES

ORGANIZATION/CONCUREE	INITIALS	DATE CONCURRED
HLWM/TR HLefevre	HEL	87/04/15
HLWM/TR JTrapp		87/04/15
HLWM/TR RBallard		87/04/16
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