MAP NO.: 116 B03	PLACER ASSESSMENT REPORT X PROSPECTUS CONFIDENTIAL X OPEN FILE		DOCUMENT NO: 120136 MINING DISTRICT: Dawson TYPE OF WORK: Seismic testing

REPORT FILED UNDER: Tom Morgan/Tim Daly

DATE PERFORMED: March 8,1991 — **DATE FILED:** May 2,1991

LOCATION: **LAT.:** 64°02'N — **AREA:** Klondike River

LONG.: 139°10'W — **VALUE $:** 750.00

CLAIM NAME & NO.: P36742
P36743

WORK DONE BY: Ted Sandor

WORK DONE FOR: Tom Morgan/Tim Daly

DATE TO GOOD STANDING:

REMARKS: Klondike River
A seismic reflection survey was conducted on the claims in 1991. Results were somewhat ambiguous but the author interpreted bedrock to be from three to twelve feet deep.

SEISMIC TESTING REPORT

March 8 - 9, 1991

on INCATEE Placer Claim P36742

of the grouping of placer claims

Incatee P36742
Incatee P36743
(3 Claims Total)

NTS 116B/3B

120136

Prepared for:

Tom Morgan
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YOB 1G0

and

Tim Daly
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Whitehorse, Yukon
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Prepared by:

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Phone/Fax (403) 667-6193

This report has been examined by the Geological Evaluation Unit under Section 41 Yukon Placer Mining Act and is recommended as allowable representation work in the amount of $ 750.00.

for Chief Geologist, Exploration and Geological Services Division, Northern Affairs Program for Commissioner of Yukon Territory.

TABLE OF CONTENTS

ASSESSMENT REPORT

on the March, 1991

SEISMIC SURVEY

on INCATEE PLACER CLAIM

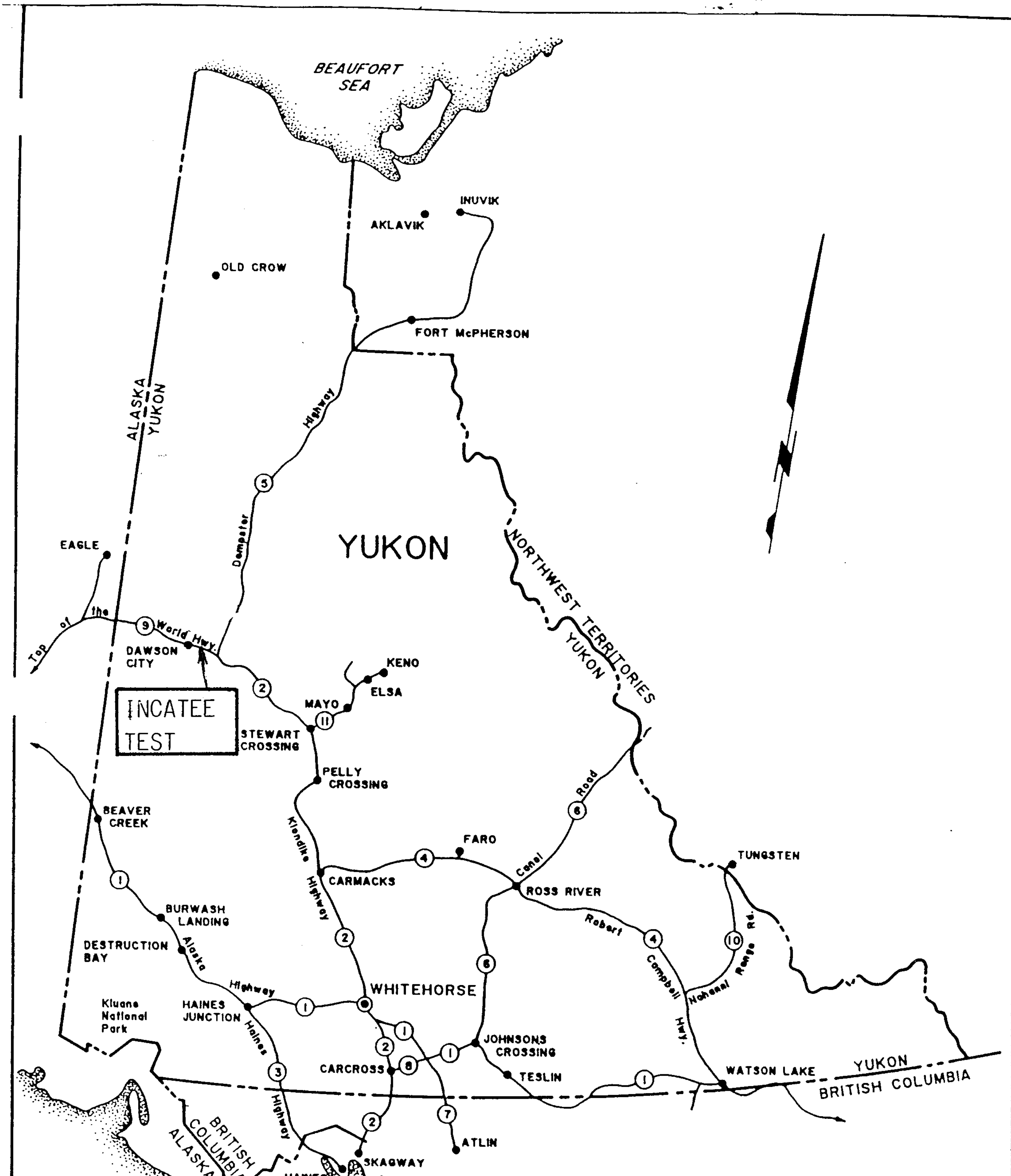
P36742 (Grouped)

on the North Side of the Klondike River

1. INTRODUCTION

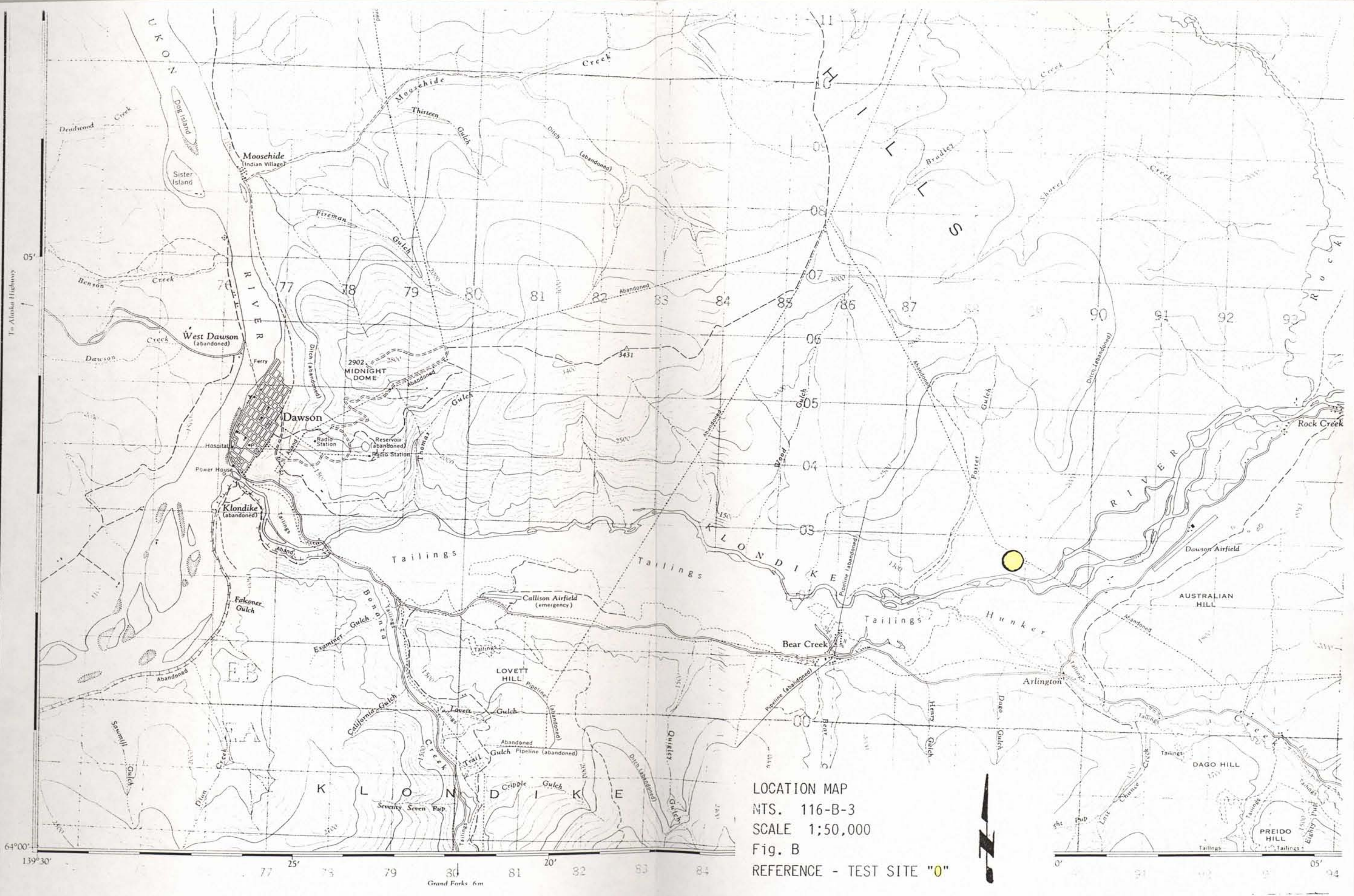
On March 8th and 9th, 1991, a seismic survey was conducted on behalf of the partnership of Tim Daly and Tom Morgan on Placer Claim P36742, located on the North Side of the Klondike River.

Ted Sandor, seismic consultant, and Tom Morgan, using hip chain and compass, located three (3) test sites on the property. Following a very narrow valley in a northern direction up a very steep bank from the lower initial post (#1) toward post #2, we made three tests in 185 meters. Each location was marked and labelled with red flagging. (See Claim Map.)



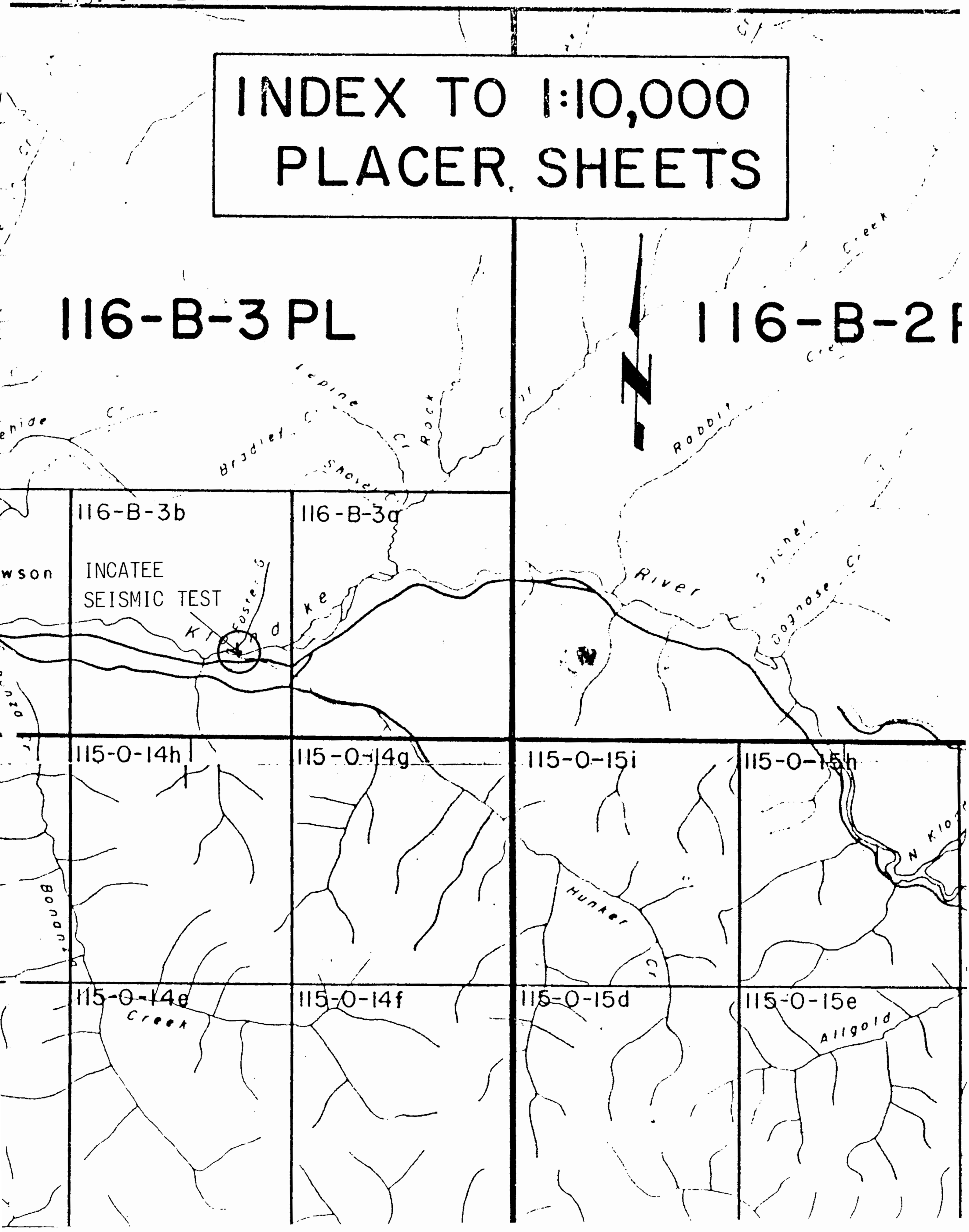
LOCATION MAP

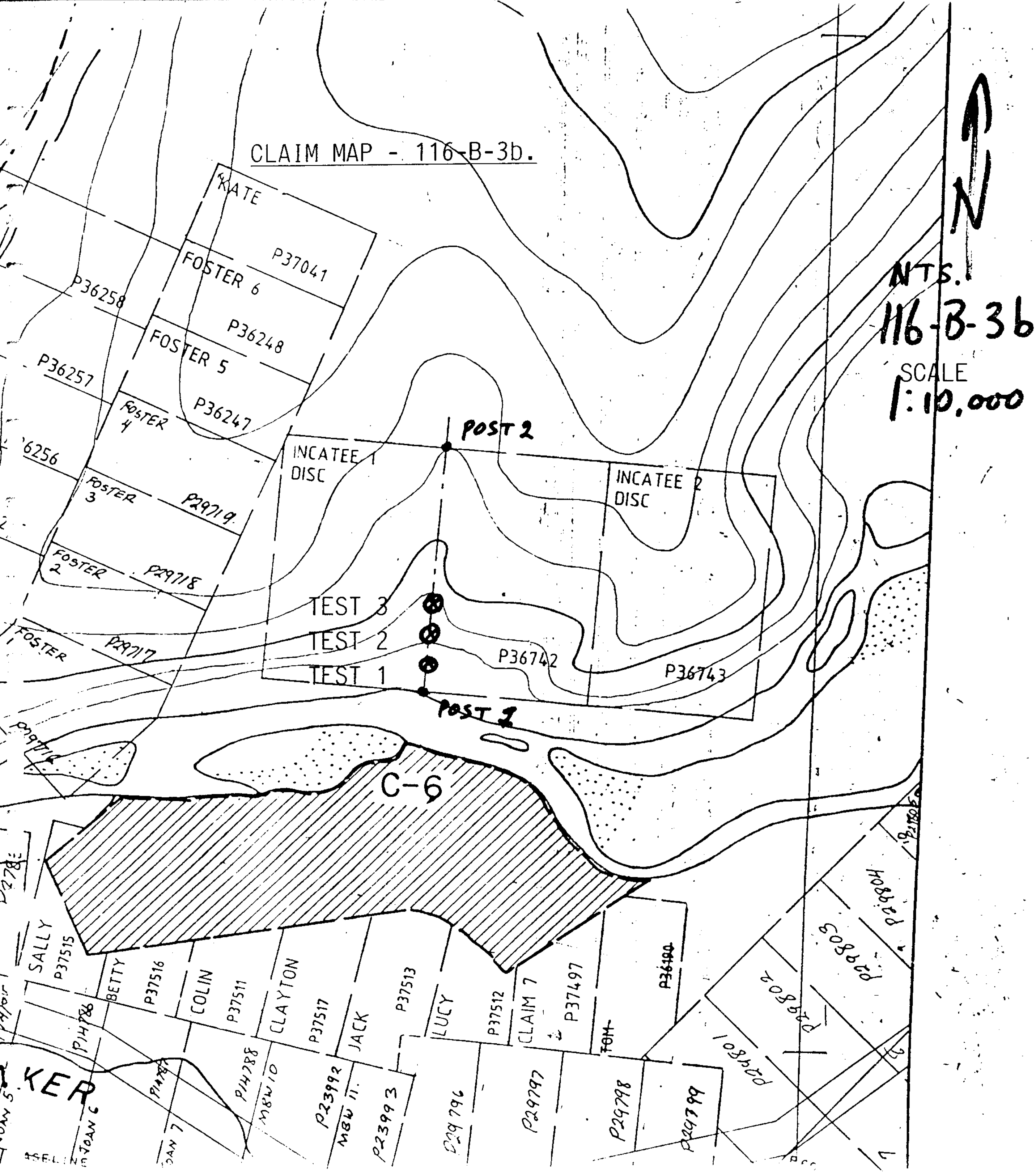
N.T.S.: 116 B/3	TECH:	DATE:
SCALE: 1"=112.5mi.	DRAFTING: HANDESIGN	FIGURE: A



LOCATION MAP
NTS. 116-B-3
SCALE 1;50,000
Fig. B
REFERENCE - TEST SITE "0"

Fig. C LOCATION MAP





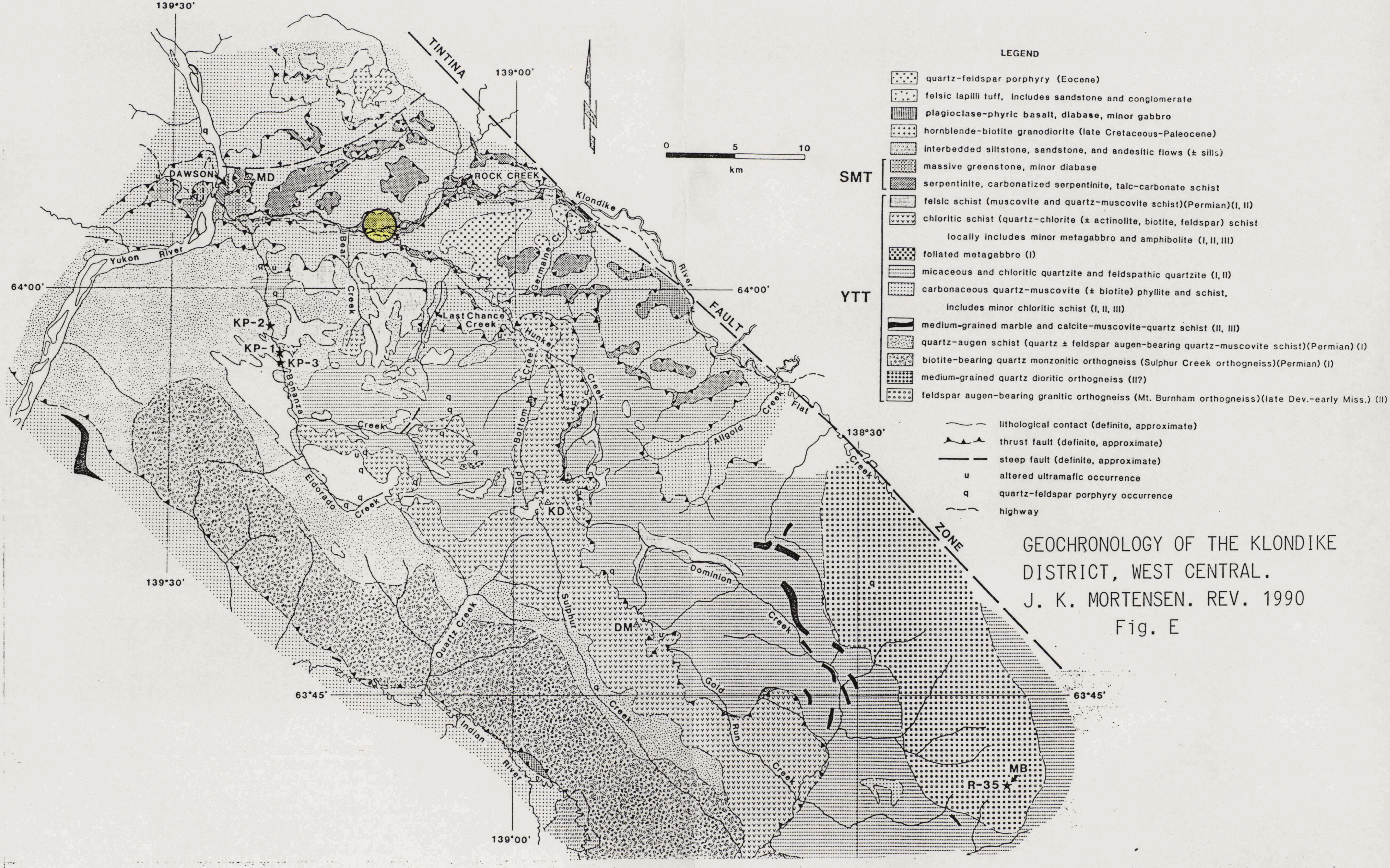
GROUPED CLAIMS ARE HIGHLIGHTED

DATE April 14, 1991

TESTS (⊗) are measured from post #1:

TEST 1-80m. TEST 2-150m. TEST 3-185m.

Fig. D



GEOCHRONOLOGY OF THE KLONDIKE DISTRICT, WEST CENTRAL.
J. K. MORTENSEN. REV. 1990
Fig. E

2. SURVEY LOCATION and ACCESS

The INCATEE grouped placer claims P36742 and P36743 are located on the North side of the Klondike River opposite where Hunker Creek ends. Enclosed location and claim maps show the location of the property and test site locations.

Access to the test site was by 4x4 Toyota pickup via the Klondike Highway, snowmobile to the Klondike River, then on foot by snowshoes the rest of the way.

2.1 Claim Information

Name	Placer Claim Number	Owner
Incatee 1	P36742	Tim Daly
Incatee 2	P36743	Tom Morgan

3. PERSONNEL

Mr. Ted Sandor conducted the seismic tests and was responsible for data quality and direction of survey and data processing and preparation of this report.

Mr. Tom Morgan surveyed the test sites and assisted with logistics and expediting, plus pulling and pushing the snowmachine in the soft, deep snow.

Ms. Jane Gaffin assisted with preparation of this report.

4. GEOLOGY

There is not much known about the geology on this property. The idea on this prospect is a possible two enrichments:

One from the Klondike River itself then the second coming from Hunker Creek drain off. Foliated andesitic greenstone outcrops are showing on the right-hand side of the test sites, facing uphill. These bench gravels deserve a thorough test.

See Map E

5. INSTRUMENTATION

Directional Electrez Microphone
800 OHMS 30 - 18,000 Hz Response

Panasonic Magnetic Tape Recorder Model #RQ-L335
Frequency Range: 180 - 7,000 Hz
Tape Speed: 4.8 cm/s (1-7/8 I.P.S.)
Track System: 2-track monaural, recording and playback

16 ga. shotgun, 1-1/8 oz. shot, #7-1/2 shot

Software
Sound Filler St. Visual Sample Editor
Requires TOS in ROM
This manual and the software described herein were copyrighted in 1987 by Drumware, Inc., Los Angeles, California, with all rights reserved.

Akai Professional S700 Digital Sampler
12-Bit Sampling
Sampling Frequency: 4KHz - 40 KHz
Sampling Time: 8 sec. - .08 sec.
Frequency Response: 25 Hz - 16 KHz

Atari 520 St. Computer
Processor: MC6800, 32 Bit Internal,
16-Bit External Architecture;
8 MHz clock frequency.
Memory: 524,288 Bytes of RAM; 196,608 Bytes of ROM
Keyboard: 94-key Intelligent keyboard, using 6301 Microprocessor
Storage Medium: 3-1/2 inch, Microfloppy disk;
Single-Side, Double Density;
135 Tracks per Inch
Data Transfer Speed: 250 Kilobits per Second

Atari Sc. 1224 RGB Color Monitor

Seikosha SP-1600 Dot Matrix Printer

Printing Method: Impact Dot Matrix Biodirectional Logic
Seeking Printing.
Print Head: 9 pins

6. THEORY

This report is intended as a guide to the application of seismic refraction and reflection techniques to shallow, subsurface exploration of engineering sites. Many civil engineers and geologists have some acquaintance with this basic geophysical tool, but few apply it frequently. The primary purpose of the report is to provide the reader with a working knowledge of the method, with a convenient reference, and further, with a basis to judge the applicability of the method and the results to his particular exploration problem.

Solid state electronics have improved the portability of engineering-type refraction and reflection instruments, but they operate fundamentally in the same way they did 50 years ago. The basic field practices and methods of interpreting the data have not changed with time, although specialized interpretational techniques have been proposed and developed for some difficult cases.

The conduct of refraction and reflection surveys and the interpretation of the data are well-established and reasonably straight forward, although they are not invariant. The user can change the field layout of his equipment and apply judgment and imagination in his handling of the raw data. In common with other indirect methods of subsurface exploration, there are no rigid inflexible approaches to making sense of the data, nor are there any handbooks that infallibly direct the engineer, geologist or geophysicist to the correct answer. The general case will require thought and care; ambiguities and uncertainties are not uncommon. Some foreknowledge of the site conditions and an understanding of what is geologically plausible will always assist in resolving the raw data into meaningful information.

Figure 1 shows a refraction survey. This method could be quite costly and require complicated data processing should multiple layers of soil and gravels be encountered.

6. Theory (continued)

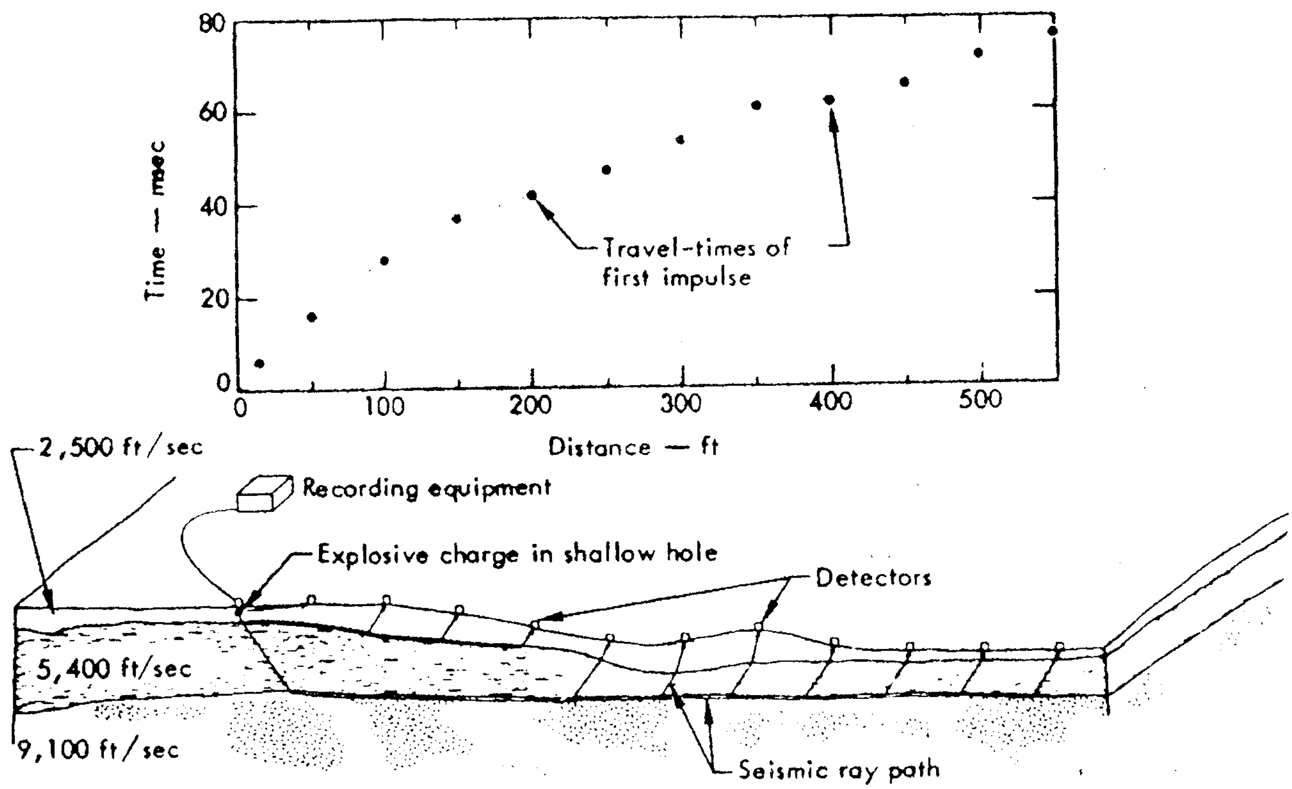


Fig. 1. Schematic of seismic refraction survey.

Figure 2 represents a refraction survey.

There is a definite relation between reflected and refracted energy which could be observed in Figure 2B. Using this principle and Tables A1 and A2 calculation is simplified, for the sound in a reflected survey only has to go down, turn around at point of refraction, where it is also reflected, and then back up to the geophone or microphone without going along the higher velocity layers and then back up. Seismic waves will bounce off of most layers of soil with different velocities and boulders beneath the surface with a lot of amplitude but not necessarily with a wide range of frequencies. The reflected seismic waves returning to the geophone with the strongest amplitude and frequencies should come from the layer with the highest velocity change which, in most cases, should be bedrock (solid rock) or from a gravel layer directly beneath an organic surface cover.

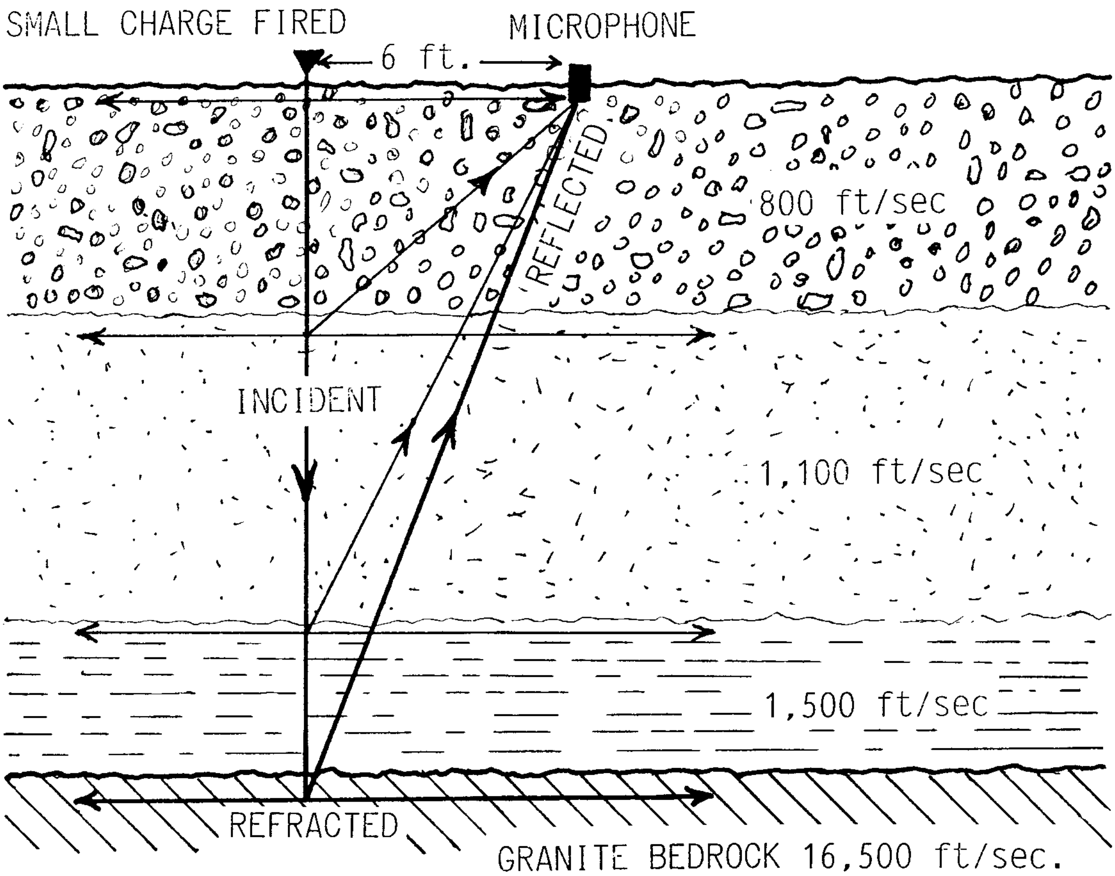


FIG. 2

The thicker line representing the reflected seismic wave from the bedrock to the microphone should be the wave with the highest amplitudes and the widest range of frequencies in fig. 2. The 6 foot distance from microphone to charge is to prevent damage to the delicate recording equipment. The error of this footage can usually be made up by averaging the total of the velocities a little higher to simplify interpretation. In this case " 1,200 ft/sec." will be close enough.

6. Theory (continued)

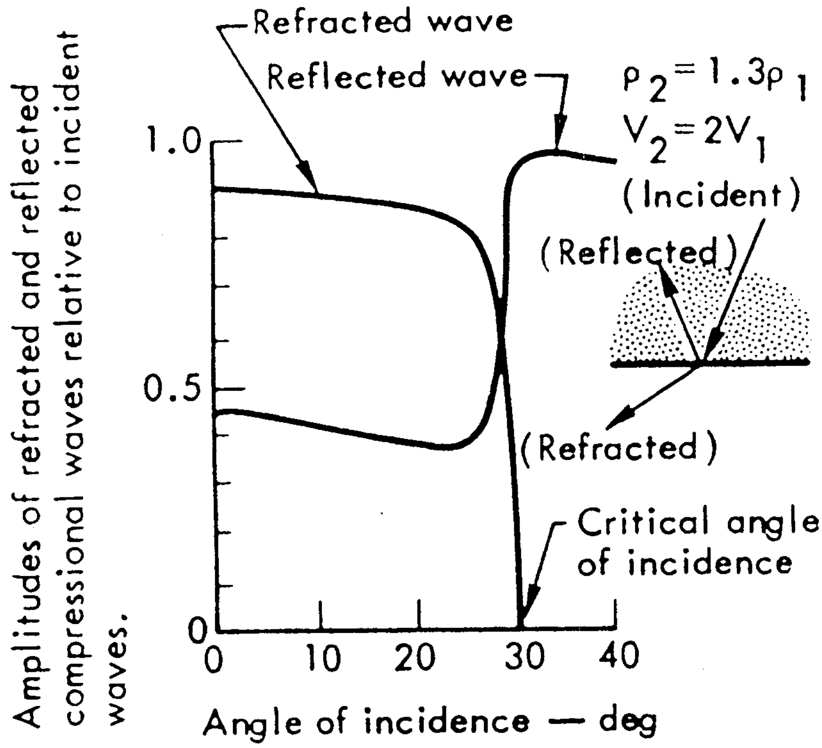


Fig. 2b. Amplitudes of reflected and refracted compressional waves relative to incident waves as a function of angle of incidence.

* It may seem anomalous in Figure 2b that the sum of the amplitudes of the reflected and refracted pulses is greater than that of the incident wave (i.e., greater than 1.0). However, the <u>energy</u> of a pulse is proportional to the square of its amplitude, and the sum of the energies of the reflected and refracted waves is equal to the energy of the incident wave.

Table A1. Speed of propagation of seismic waves in subsurface materials.

MATERIALS	FEET PER SECOND
TOP SOILS:	
LIGHT AND DRY	600 TO 900
MOIST, LOAMY OR SILTY	1,000 TO 1,300
CLAYEY	1,300 TO 2,000
RED CLAY IN COLORADO (A)	1,630
SEMI-CONSOLIDATED SANDY CLAY (B)	1,250 TO 2,150
WET LOAM (B)	2,500
CLAY, DENSE AND WET - DEPENDING ON DEPTH	3,000 TO 5,900
RUBBLE, OR GRAVEL (B)	1,970 TO 2,600
CEMENTED SAND (B)	2,800 TO 3,200
SAND CLAY (B)	3,200 TO 3,800
CEMENTED SAND CLAY (B)	3,800 TO 4,200
WATER SATURATED SAND (B)	4,600
SAND (B)	4,600 TO 8,400
CLAY, CLAYEY SANDSTONE (B)	5,900
GLACIAL TILL UPPER SUSQUEHANNA (C)	5,600 TO 7,400
GLACIAL MORAINE DEPOSIT, DRY-CALIFORNIA (A)	2,500 TO 5,000
GLACIAL MORAINE DEPOSIT, SATURATED-CALIFORNIA	5,000 TO 7,000
CEMENTED LAVA AGGLOMERATE, CALIFORNIA (A)	5,000 TO 6,000
LOOSE ROCK-TALUS	1,250 TO 2,500
WEATHERED AND FRACTURED ROCK	1,500 TO 10,000
SHALE:	
OLENTANGY RIVER, OHIO	9,000 TO 11,000
UPPER SUSQUEHANNA (C)	10,200 TO 12,800
PANAMA CANAL ZONE	7,000 TO 8,000
MANCOS, COLORADO (A)	2,600 TO 2,900
ROMNEY SHALE-SHENNANDOAH RIVER - WEATHERED	4,000 TO 6,500
ROMNEY SHALE-SHENNANDOAH RIVER - GOOD	12,000
JOHN MARSHALL DAM SITE	2,900 TO 4,250
PHYLITE-YORK, PA. (D)	10,000 TO 11,000
SANDSTONE: (B)	7,200 TO 7,900
DEVONIAN-UPPER SUSQUEHANNA (C)	14,000
CANAL ZONE, PACIFIC END	7,000 TO 9,000
COLORADO, DENSE, HARD, AND CONTINUOUS WITH FEW SEAMS (A)	7,250
COLORADO, CONTAINING WEATHERED SEAMS AND SOFT AREAS. (A)	4,725
SMOKY HILL RIVER KANSAS	6,000 TO 7,500
SANDSTONE CONGLOMERATE (B)	8,000
CHALK:	
FORT RANDALL DAMSITE - ABOVE WATER TABLE	6,300 TO 7,000
FORT RANDALL DAMSITE - BELOW WATER TABLE	8,000

MATERIALS	FEET PER SECOND
GRANITE:	
SIERRA NEVADA RANGE, CALIFORNIA (IN ROAD CUTS)	
FRIABLE AND HIGHLY DECOMPOSED	1,540
BADLY FRACTURED AND PARTLY DECOMPOSED	2,200
SOFTENED AND PARTLY DECOMPOSED BUT SLIGHTLY SEAMED	10,500
SOLID AND MONOLITHIC 70 FEET DEEP	18,500
NEW HAMPSHIRE (C) (COMPARISON OF VELOCITIES WITH DRILLING LOGS)	
BADLY BROKEN AND WEATHERED: FREQUENTLY ONLY CHIPS AND FRAGMENTS RECOVERED. SEGMENTS OF CORE LONGER, BUT WEATHERING HAD PENETRATED ABOUT 1/4 INCH ON EACH SIDE OF THE JOINT PLANES ON WHICH A FILM OF RESIDUAL CLAY HAD FORMED	3,000 TO 8,000
JOINT PLANES SHOW BUT LITTLE SIGN OF WEATHERING, EVEN THOUGH THEY ARE OPEN	10,000 TO 13,000
ENTIRELY UNWEATHERED AND UNSEAMED	16,000 TO 20,000
GRANODIORITE (B)	15,000
BASALT-CANAL ZONE-WEATHERED AND FRACTURED	9,000 TO 14,000
LIMESTONE, DOLOMITE, METAMORPHIC ROCKS, MASSIVE ROCKS (B)	16,400 TO 20,200
DIABASE, IN BED OF BROAD RIVER, SOUTH CAROLINA	19,700
GREENSTONE, TIGHT SEAMED-CALIFORNIA (A)	16,100
GREENSTONE, SLIGHTLY SEAMED-CALIFORNIA	13,300

NOTE:

(A) *Reported by G. H. Williams, U. S. Bureau of Public Roads*

(B) *From Report of Imperial Geophysical Experimental Survey in Australia*

(C) *Reported by A. E. Wood, Corps of Engineers*

(D) *Reported by L. T. Abele, Corps of Engineers*

Table A2. Approximate range of velocities of longitudinal waves for representative materials found in the earth's crust.[a]

A. *Classification According to Material*

Material	Velocity*	
	Ft./Sec.	M./Sec.
Weathered surface material	1,000— 2,000	305— 610
Gravel, rubble, or sand (dry)	1,500— 3,000	468— 915
Sand (wet)	2,000— 6,000	610— 1,830
Clay	3,000— 9,000	915— 2,750
Water (depending on temperature and salt content)	4,700— 5,500	1,430— 1,680
Sea water	4,800— 5,000	1,460— 1,530
Sandstone	6,000—13,000	1,830— 3,970
Shale	9,000—14,000	2,750— 4,270
Chalk	6,000—13,000	1,830— 3,970
Limestone	7,000—20,000	2,140— 6,100
Salt	14,000—17,000	4,270— 5,190
Granite	15,000—19,000	4,580— 5,800
Metamorphic rocks	10,000—23,000	3,050— 7,020
Ice	12,050	

B. *Classification According to Geologic Age*

Age	Type of Rock	Velocity	
		Ft./Sec.	M./Sec.
Quaternary	Sediments (various degrees of consolidation)	1,000— 7,500	305— 2,290
Tertiary	Consolidated Sediments	5,000—14,000	1,530— 4,270
Mesozoic	Consolidated Sediments	6,000—19,500	1,830— 5,950
Paleozoic	Consolidated Sediments	6,500—19,500	1,980— 5,950
Archeozoic	Various	12,500—23,000	3,810— 7,020

C. *Classification According to Depth* †

	0—2000 ft. (0—600 M.) Ft./Sec.	2000—3000 ft. (600—900 M.) Ft./Sec.	3000—4000 ft (900—1200 M.) Ft./Sec.
Devonian	13,300	13,400	13,500
Pennsylvanian	9,500	11,200	11,700
Permian	8,500	10,000	.....
Cretaceous	7,400	9,300	10,700
Eocene	7,100	9,000	10,100
Pleistocene-to-Oligocene	6,500	7,200	8,100

* The higher values in a given range are usually obtained at depth.

† Data from B. B. Weatherby and L. Y. Faust, *Bull. Amer. Assoc. Petrol. Geologists*, 19 (1935) 1.

[a]Reprinted from pg. 660 of Jakosky[2].

7. METHOD

After the grid pattern is established on a given claim by the owner or party in charge, we mark each test with flagging. We clean loose debris to allow firm soil contact with the microphone. We then cover the microphone to lessen the surface noise. A small charge is fired (usually a 16 ga. shotgun) to generate a seismic wave 6 feet from the microphone. The wave going into the ground and the reflected signal coming out is recorded on a magnetic tape recorder. We also do a field test on a nearby area with similar conditions where bedrock depth is known by drilling or excavation to determine the velocity of the gravels.

8. DATA PROCESSING and PRESENTATION

The recording is sent back to base camp and is transferred into the Akai S700 Digital Sampler by means of a coaxal cable with 6.3 mm phone plug jack. The Akai is coupled with the Atari 520 St. computer with Midi Interface. Other peripherals are connected with various other interface connections.

The seismic recording is now analyzed in various formats and then the best choice is printed out on a Seikosha SP-1600 Dot Matrix Printer. A report on the testing and the interpretation of the data is made out to finalize the survey, along with copies of the original Fourier Transform for 3-D wave form analysis.

9. INTERPRETATION

A test conducted on the Klondike River near the Dawson City dump where the gravel was shafted to 38 feet in permafrost gave us the velocity of: 1,500 feet per second (1.5 feet per millisecond). Based on this test the following formula was used to determine bedrock depth:

> Total Milliseconds x 1.5 divided by 2 = feet to bedrock, or the layer to be of interest.
> See Fig. 3 - Sample Copy of Dump Test
> (48 ms x 1.5 divided by 2 = 36 feet to bedrock)

Test 1

38 ms. show the broadest frequency range but that most likely comes from the valley sides and the rock outcrop. In this case the distance between the first ingoing amplitude and the first returning amplitude with a nice range of frequencies should be the best choice at 10 to 11 ms. (8 to 9 feet to bedrock).

Test 2

16 ms. the mike kicks out, indicating a massive return signal. Bedrock should be under 12-feet deep.

Test 3

30 to 36 ms. shows strong return signals more than likely coming from the exposed rock face on the surface. In this case the ingoing sound is mixed up with the reflected sound coming back out of the ground at 5 ms. (3.5 to 4 feet to bedrock).

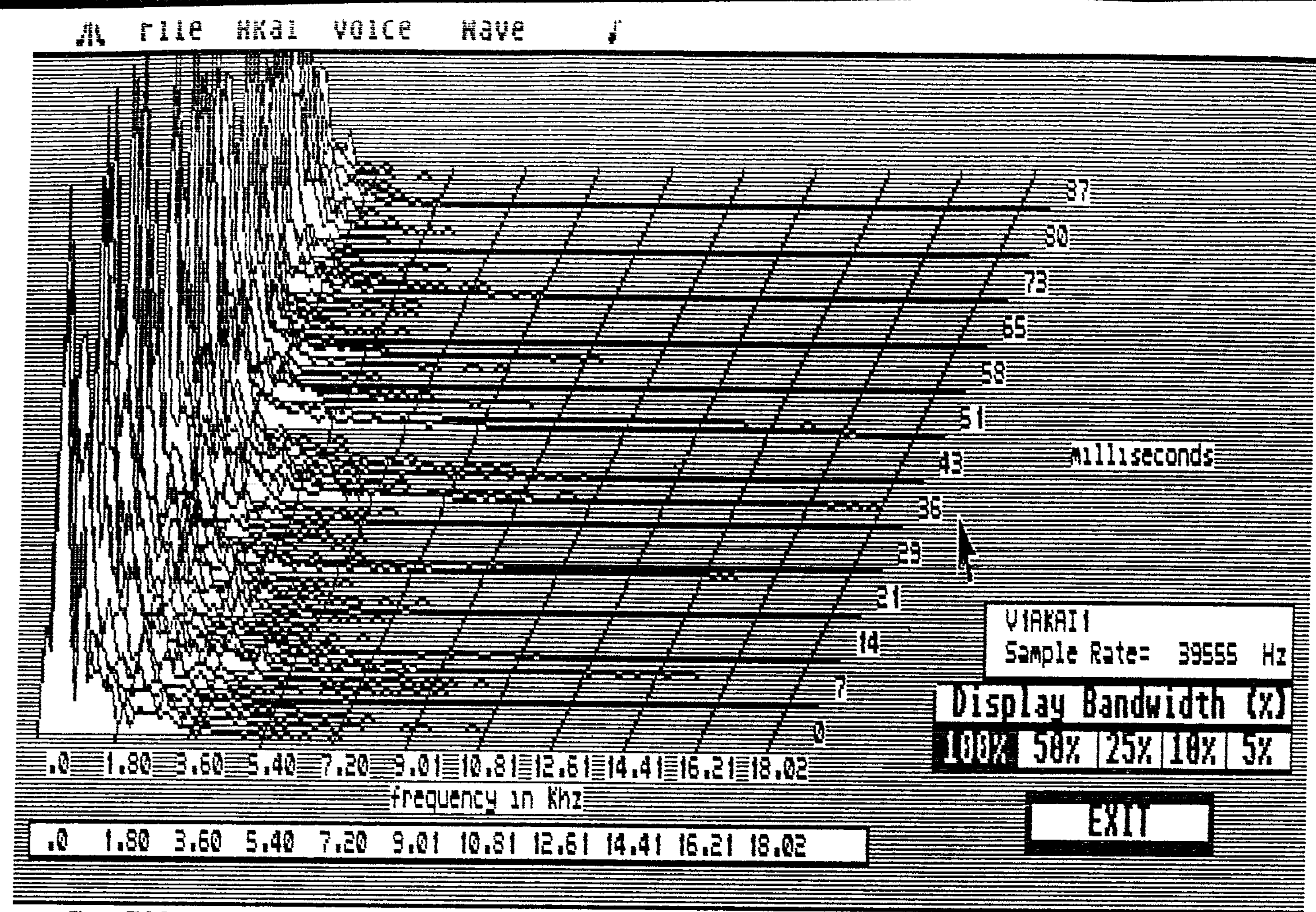
10. CONCLUSION

For the many varying soil conditions in different geographical locations could alter the final results. For this fact, an actual excavation on one of the test sites is strongly recommended. The most shallow reading test site is the best suited for this purpose. More accurate results can be achieved in this manner.

11. RECOMMENDATION

This type of reflected seismic testing is ideal in shallow placer ground. Without drilling or excavating near the test sites to establish velocity, the contour of the subsurface profile could still be charted in a cross test of a given valley. Old stream beds are possible to locate this way, giving a target area for a drill. A re-analysis of the seismic data after a drill log can make these tests surprisingly accurate. A tighter grid pattern in the future may be of great value in a drilling or mining strategy program.

I



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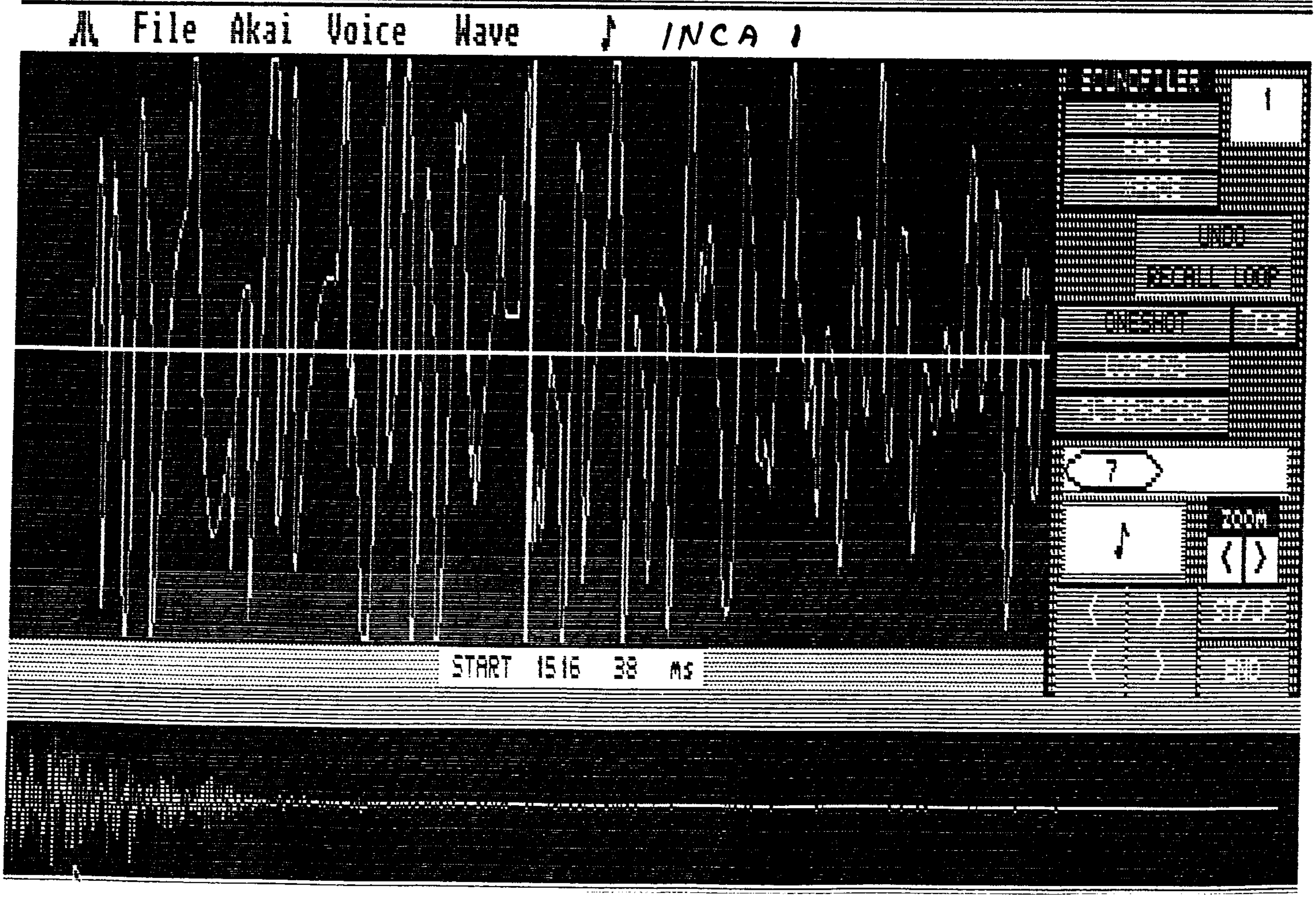
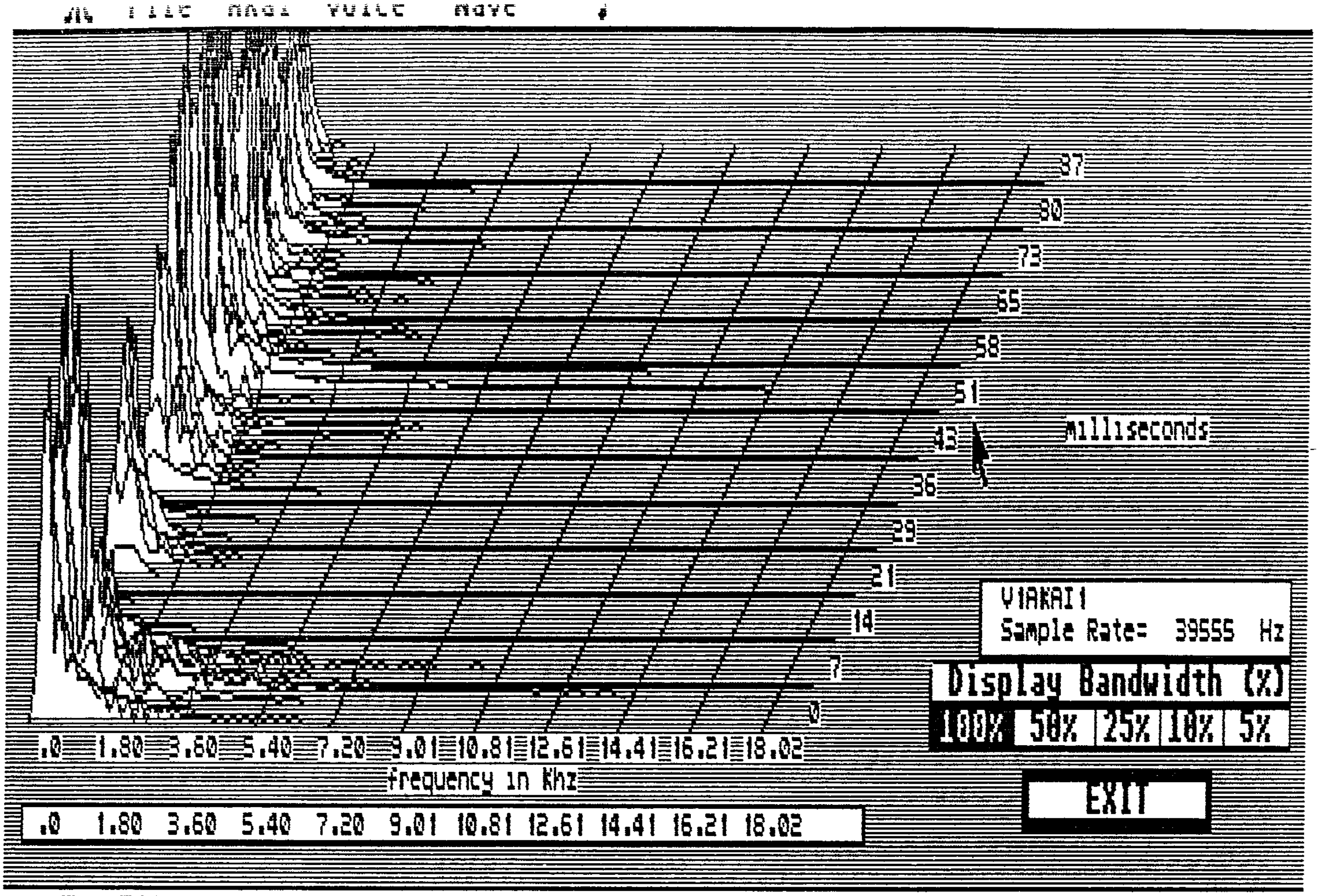
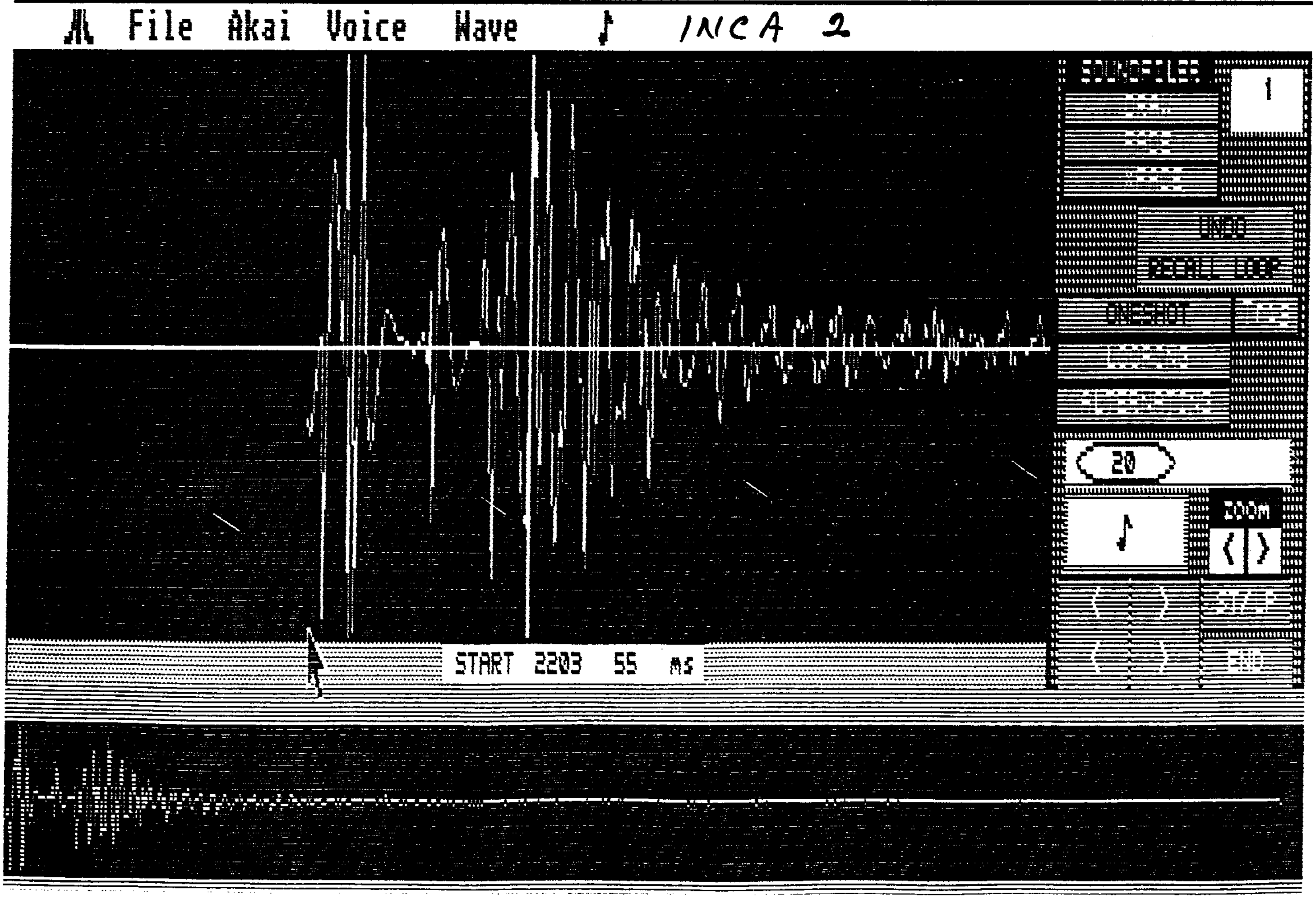
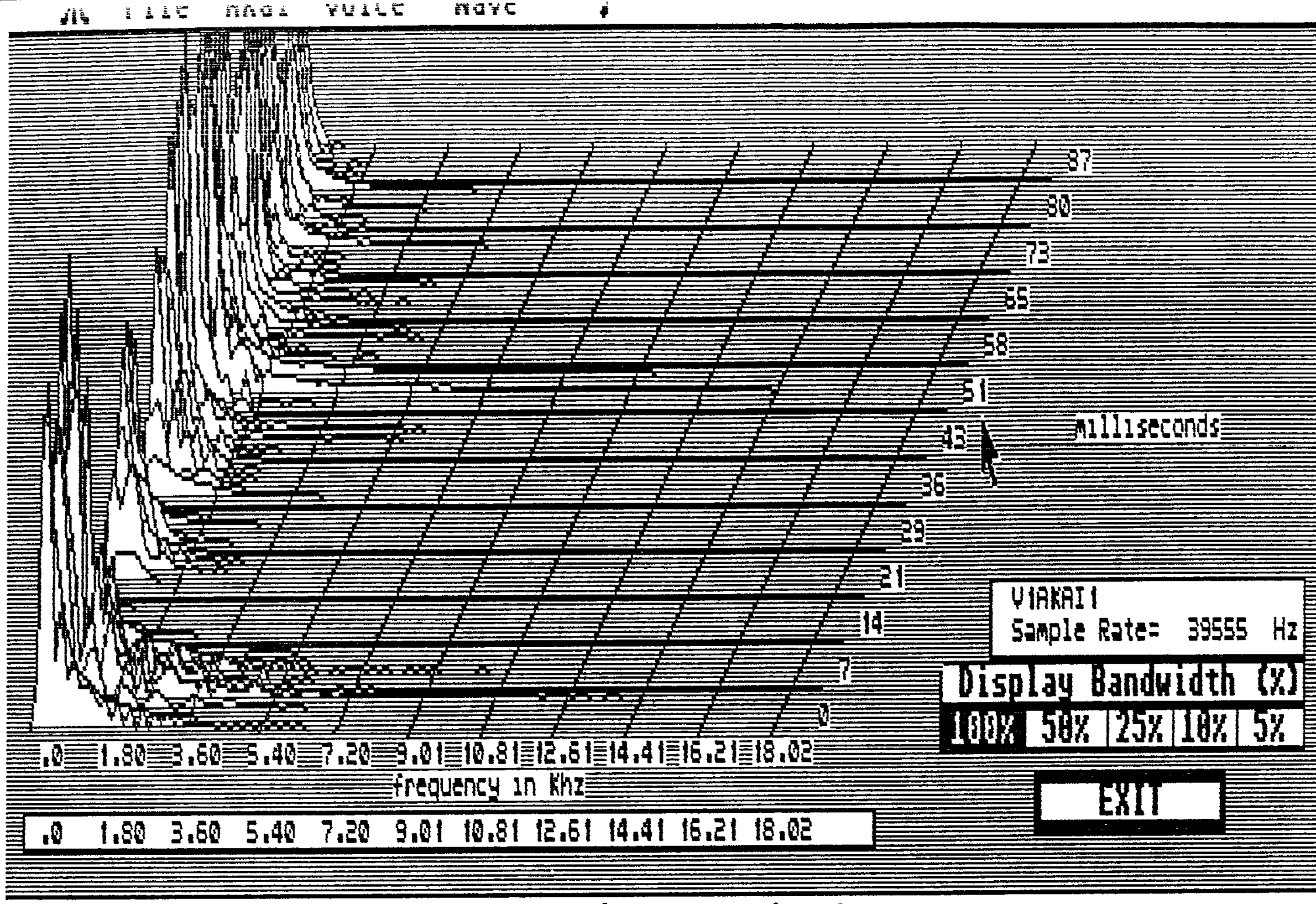


BEST ATTAINABLE IMAGE


37
80
73
65
58
51
43
36
29
21
14
7
0
milliseconds
V1AKAI1
Sample Rate= 39555 Hz
Display Bandwidth (%)
100% 50% 25% 10% 5%
.0 1.80 3.60 5.40 7.20 9.01 10.81 12.61 14.41 16.21 18.02
frequency in Khz
.0 1.80 3.60 5.40 7.20 9.01 10.81 12.61 14.41 16.21 18.02
EXIT


File Akai Voice Wave
INCA 2
1
UNDO
RECALL LOOP
ONESHOT
20
ZOOM
START 2203 55 ms



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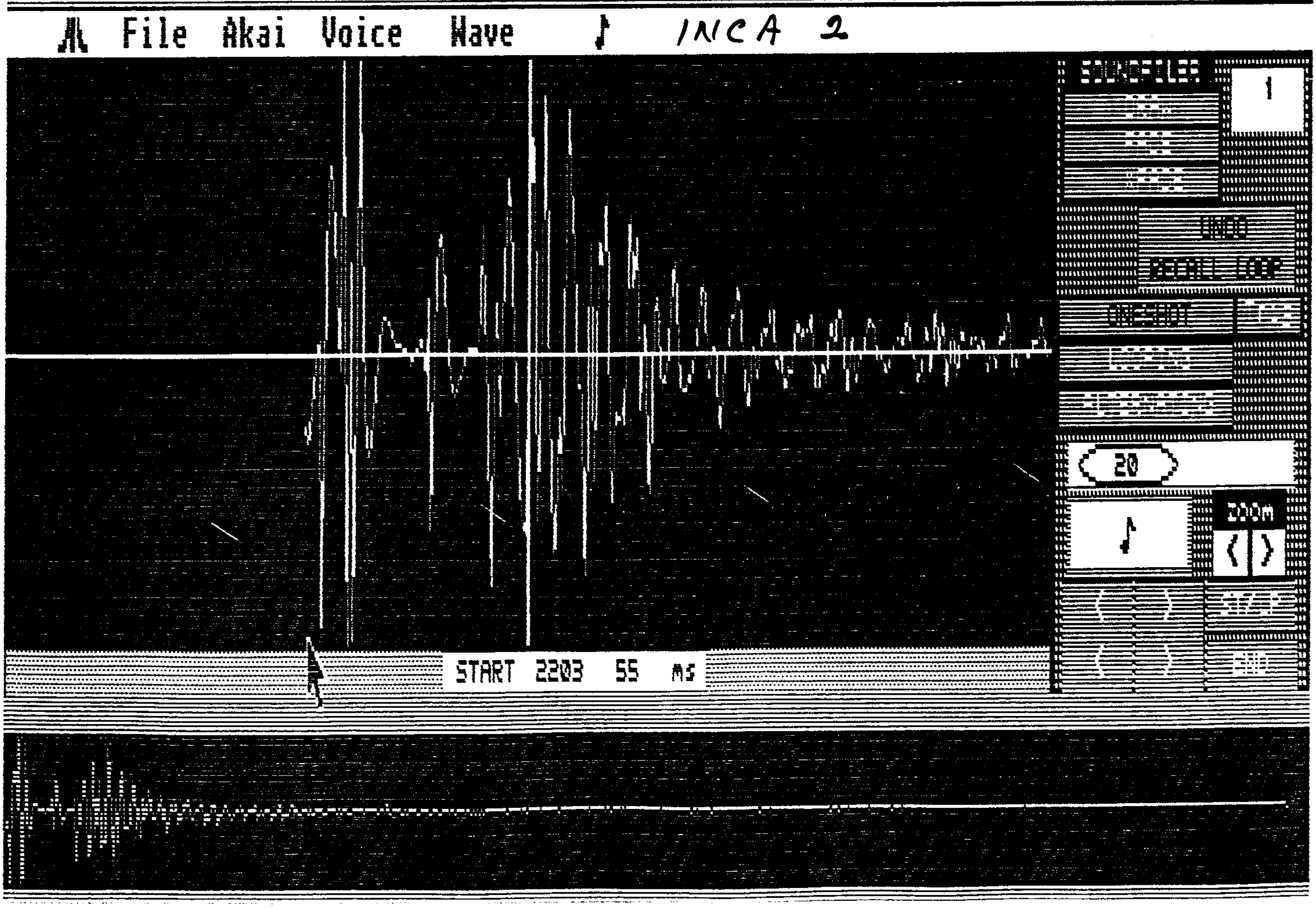

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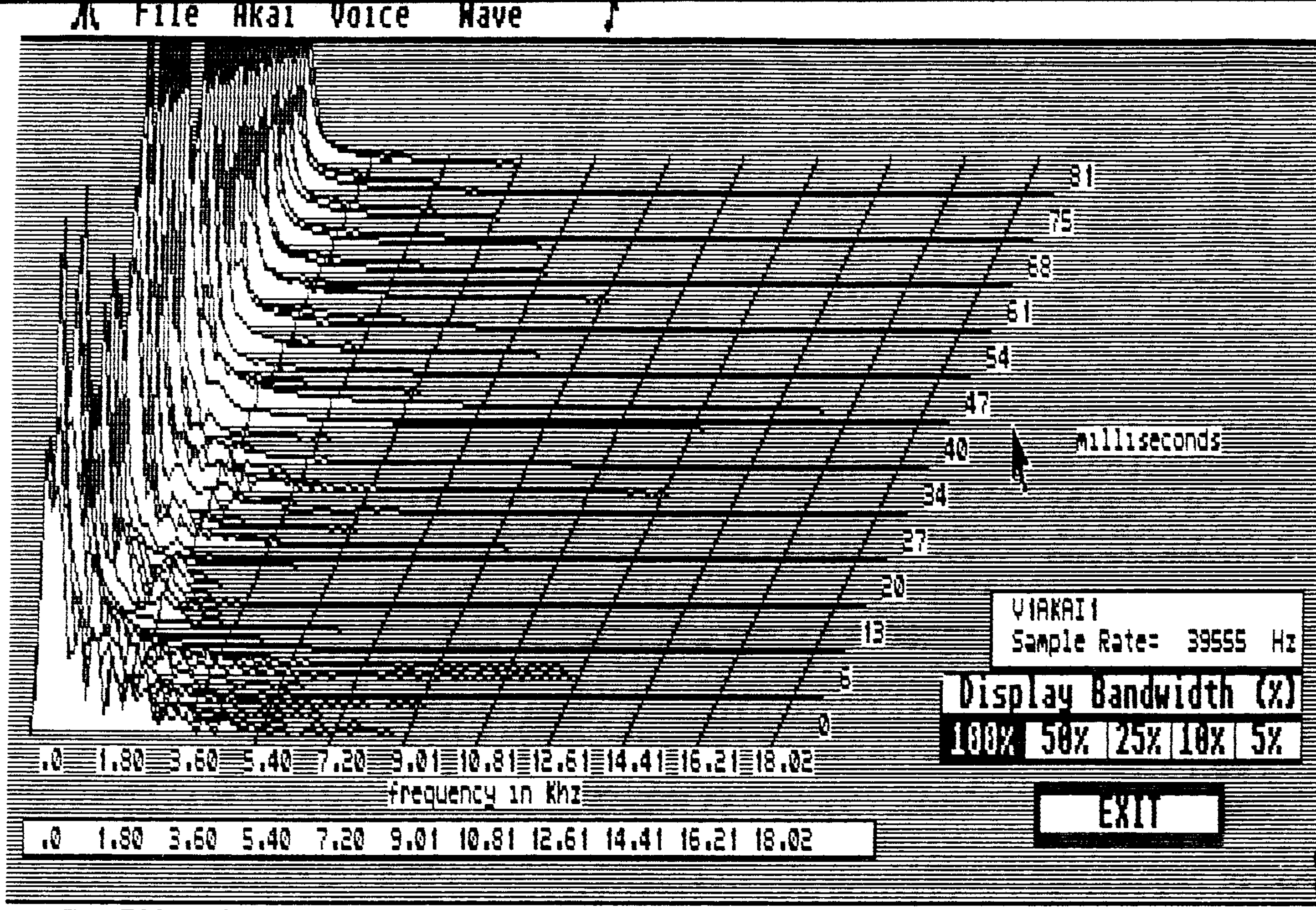
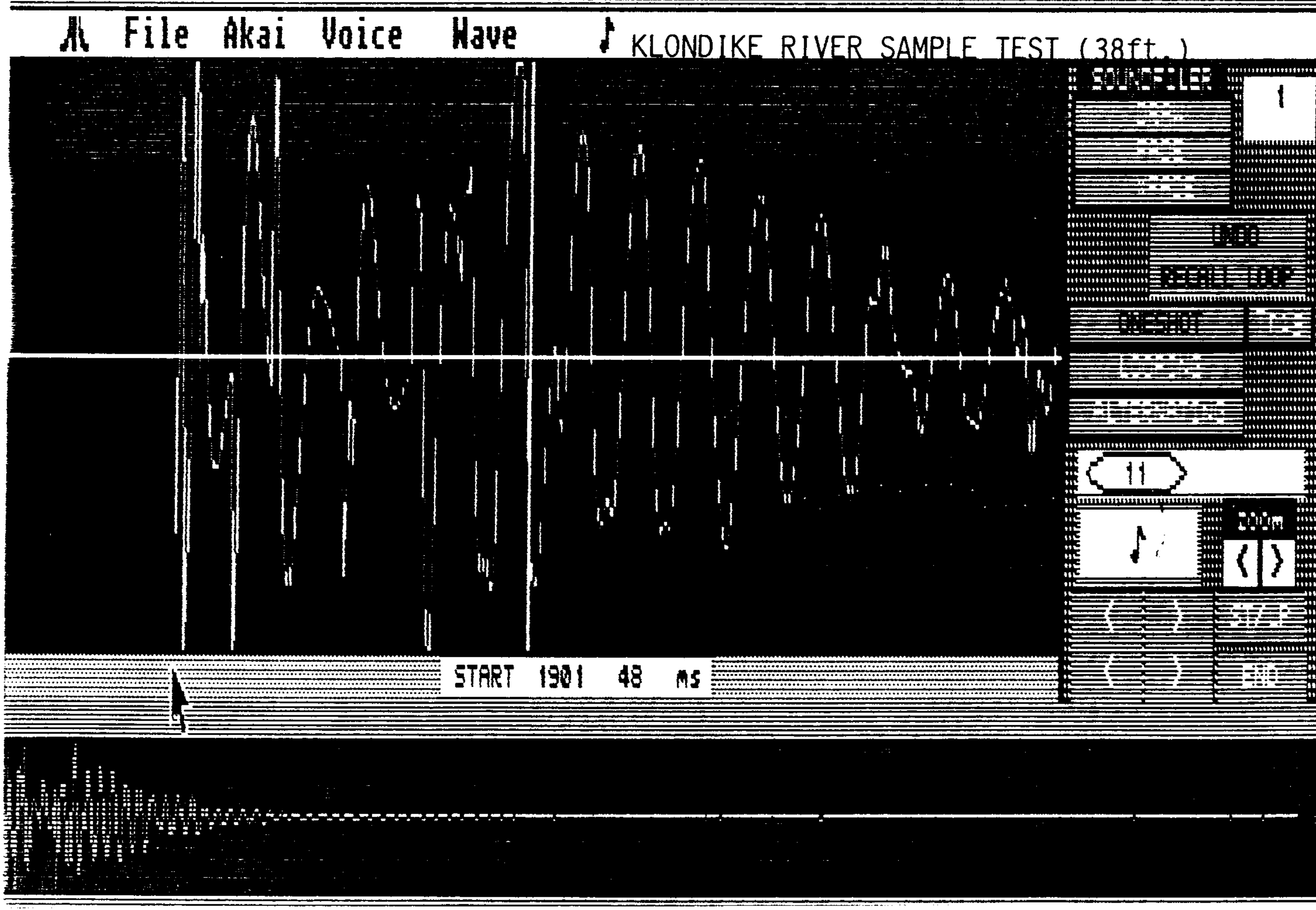
BEST ATTAINABLE IMAGE





ORIGINAL SAMPLE

BEST ATTAINABLE IMAGE

12. STATEMENT OF ASSESSMENT COSTS

For seismic survey conducted on INCATEE Claim Group P36742 and P36743 along the Klondike River in the Dawson City Mining District.

Seismic Test

$250.00 per test x 3 shots	$ 750.00

includes:

Seismic consultant, 2 days
Assistant, 2 days
Computer and printer time
Computer program time
Computer down-loading (off-loading/data dumping)
Seismic interpretation
Equipment--snowshoes, snowmobile, axe, belt saw, hipchain, hipchain thread, flagging tape, shotgun with ammunition, shovel and recording device.

Transportation

Truck and expenses Whitehorse to Dawson, return	200.00

Meal Costs

2 people, 2 days @ $35/day/person	140.00

Hotel Costs

1 room, 1 night @ $75/night	75.00

Report Preparation

Report writing, drafting, map and figure preparation, photocopying and binding	550.00

TOTAL COST	$ 1,715.00

13. REFERENCES

1. M.B. Dobrin, Introduction to Geophysical Prospecting. (McGraw-Hill, New York. 1960).

2. J.J. Jakosky, Exploration Geophysics, (Trija Publishing Co., Newport Beach, Calif., 1957).

3. Technical Report E-73-4 Seismic Refraction Exploration for Engineering Site Investigations. Bruce B. Redpath (May, 1973).

4. 1984 Open File, R.L. Debicki, Bedrock Geology and Mineralization of the Klondike Area (West), 1150/14, 15 and 116B/2,3.

5. J.K. Mortensen, Geochemistry of the Klondike District, West Central Revised, 1990.