

WHITEHORSE

LIBRARY

72 ✓  
GR-05-021 40  
Drawer #24

Subsurface Logs listed By  
Station 3356+00' to 4365+00'  
Km 102 to Km 133  
June 1972

CAN-1972-33

DEMPESTER HIGHWAY  
DEPT. OF PUBLIC WORKS OF CANADA  
(Pacific Region)



# GRAIN SIZE ANALYSIS

| VE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT |
|----|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|
| 1  | 97.8              |            |                   |            |                   |            |                   |
| 2  | 89.2              |            |                   |            |                   |            |                   |
| 3  | 77.4              |            |                   |            |                   |            |                   |
| 4  | 68.7              |            |                   |            |                   |            |                   |
| 5  | 60.4              |            |                   |            |                   |            |                   |
| 6  | 54.3              |            |                   |            |                   |            |                   |

| CLASSIFICATION            | L.L. | P.L. | P.I. | NAT. %W | F.M. |
|---------------------------|------|------|------|---------|------|
| ML - INORGANIC SANDY SILT | 24.1 | 23.3 | .8   | 29.4    |      |
| SILT-SAND MIXTURE         |      |      |      |         |      |

CRUSH COUNT

%

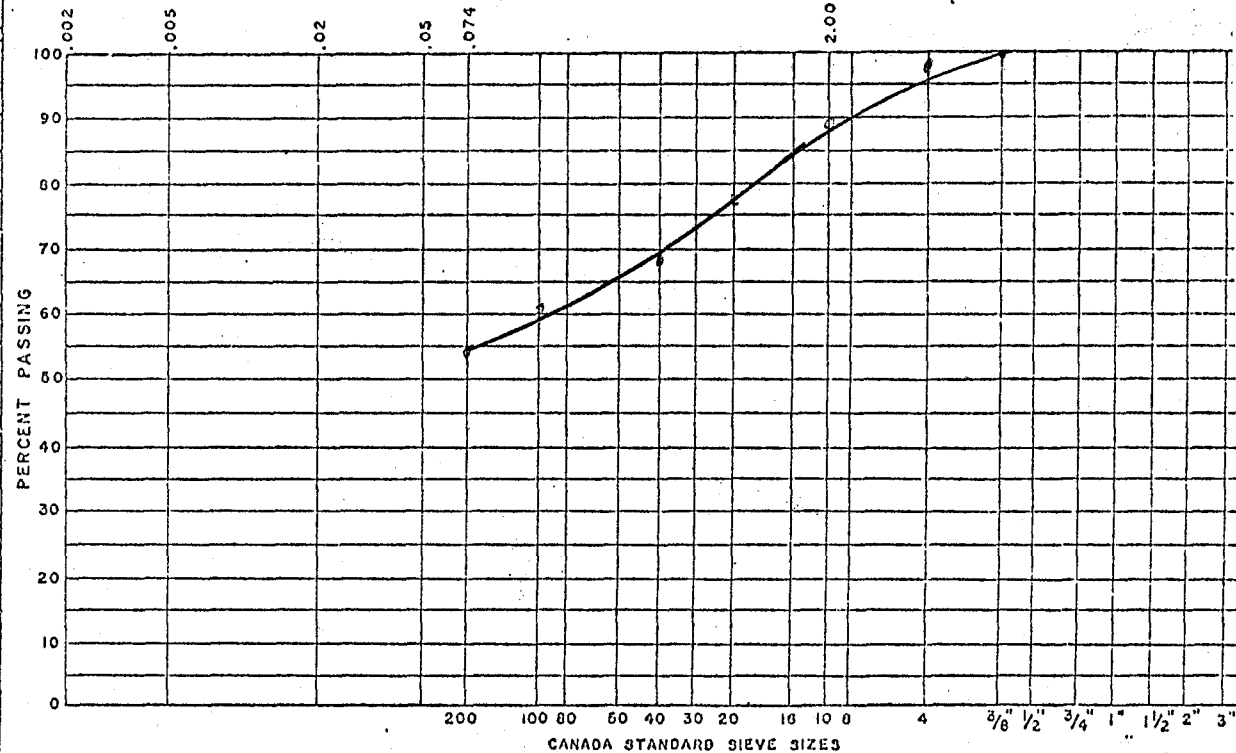
## PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
| ALT           |                   |
| ONE           |                   |
| MYIC          |                   |
| DSTONE        |                   |
| LE            |                   |
| IST           |                   |
| RTZITE        |                   |
| ERS           |                   |

## PARTICLE SHAPE ANALYSIS

|           |  |
|-----------|--|
| ND        |  |
| - ROUNO   |  |
| ULAR      |  |
| - ANGULAR |  |
| TS        |  |

## GRAIN SIZE IN MILLIMETERS



CLAY

SILT

SAND

GRAVEL

PROJECT ..... DENPSTER HIGHWAY .....

LOCATION ..... STATION 3356+00 .....

HOLE NO. .... RR21 .....

DEPTH ..... 9' - 10' ..... FIELD NO. .... 33 .....

SAMPLE TYPE ..... BAC .....

LAB. NO.

4790

## LABORATORY'S REMARKS

SANDY SILT (L.P.)

DATE SAMPLED

24-6-72

DATE RECEIVED

30-6-72

DATE RECORDED

10-8-72

[illegible]

# GRAIN SIZE ANALYSIS

| SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT |
|------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|
| 3/4"       | 100               | 200        | 44.9              |            |                   |            |                   |
| 1/2"       | 96.4              |            |                   |            |                   |            |                   |
| 3/8"       | 93.5              |            |                   |            |                   |            |                   |
| 4"         | 83.1              |            |                   |            |                   |            |                   |
| 10"        | 69.0              |            |                   |            |                   |            |                   |
| 20"        | 58.8              |            |                   |            |                   |            |                   |
| 40"        | 52.9              |            |                   |            |                   |            |                   |
| 20"        | 47.5              |            |                   |            |                   |            |                   |

| CLASSIFICATION    | L.L. | P.L. | P.I. | NAT. %W | F.M. |
|-------------------|------|------|------|---------|------|
| SC - CLAYEY SAND  | 27.3 | 17.9 | 9.4  | 15.2    |      |
| MEDIUM PLASTICITY |      |      |      |         |      |

CRUSH COUNT

%

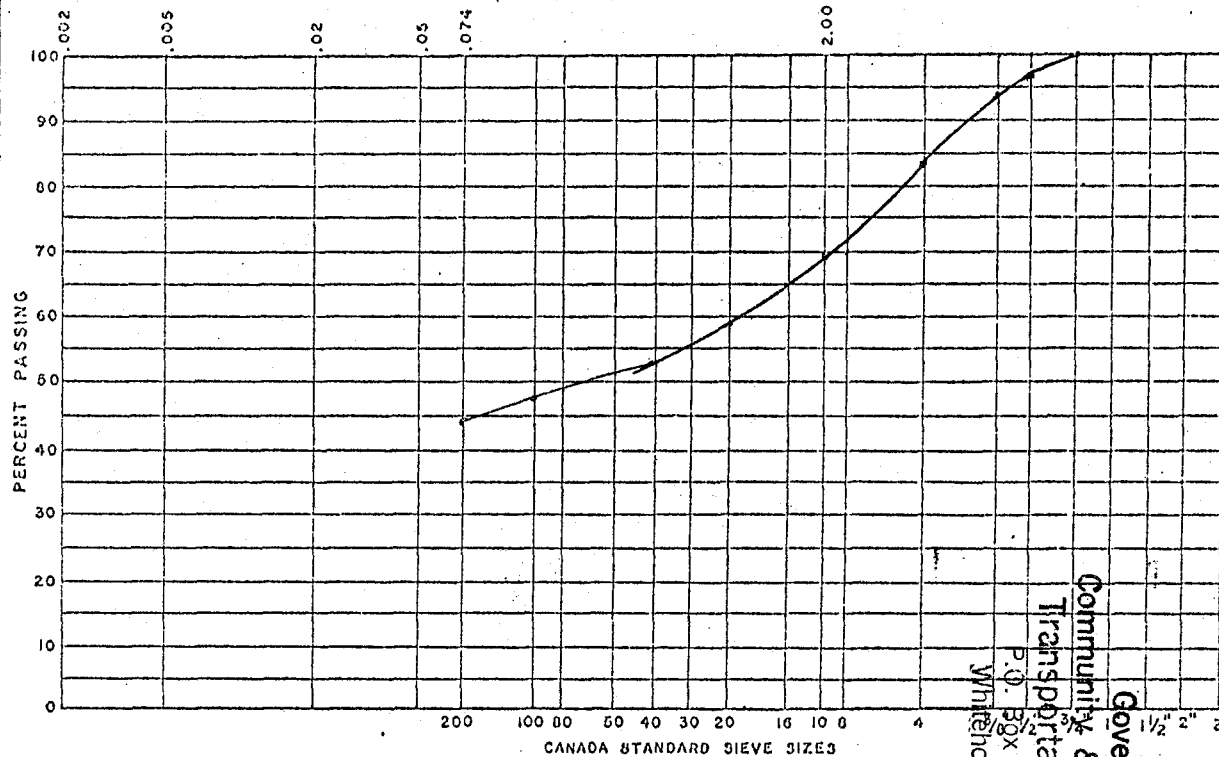
## PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
| SALT          |                   |
| ONE           |                   |
| ANITIC        |                   |
| NDSTONE       |                   |
| ALE           |                   |
| IST           |                   |
| ARTZITE       |                   |
| HENS          |                   |

## PARTICLE SHAPE ANALYSIS

|           |  |
|-----------|--|
| IND       |  |
| I-ROUND   |  |
| SULAR     |  |
| I-ANGULAR |  |
| ITS       |  |

## GRAIN SIZE IN MILLIMETERS



|      |      |      |
|------|------|------|
| CLAY | SILT | SAND |
|------|------|------|

PROJECT DEMPPSTER HWY.

LOCATION 3371 + 60 E

HOLE NO. RR 15

DEPTH 5' FIELD NO. 27

SAMPLE TYPE BA6

## LABORATORY'S REMARKS

CLAYEY SAND (M.P.)

DATE SAMPLED 23-6-72

DATE RECEIVED 30-6-7

DATE RECORDED 16-8-7

Government of Yukon  
Community & Transportation Services  
Transportation Engineering  
P.O. Box 2703 (201 Range Road)  
Whitehorse, Yukon X1A 2C6

NO. 4

## GRAIN SIZE ANALYSIS

| SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT |
|------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|
| 1/2"       | 100.0             |            |                   |            |                   |            |                   |
| 3/8"       | 99.4              |            |                   |            |                   |            |                   |
| 4"         | 95.6              |            |                   |            |                   |            |                   |
| 10         | 87.0              |            |                   |            |                   |            |                   |
| 20         | 78.9              |            |                   |            |                   |            |                   |
| 40         | 73.9              |            |                   |            |                   |            |                   |
| 100        | 68.2              |            |                   |            |                   |            |                   |
| 200        | 65.5              |            |                   |            |                   |            |                   |

| ANALYSIS NO. | CLASSIFICATION                  | L.L. | P.L. | P.I. | NAT. %W | F.M. |
|--------------|---------------------------------|------|------|------|---------|------|
|              |                                 | 32.4 | 19.5 | 12.9 | 5.6     |      |
|              | CL - INORGANIC SILTY SANDY CLAY |      |      |      |         |      |
|              | MEDIUM PLASTICITY               |      |      |      |         |      |

CRUSH COUNT

%

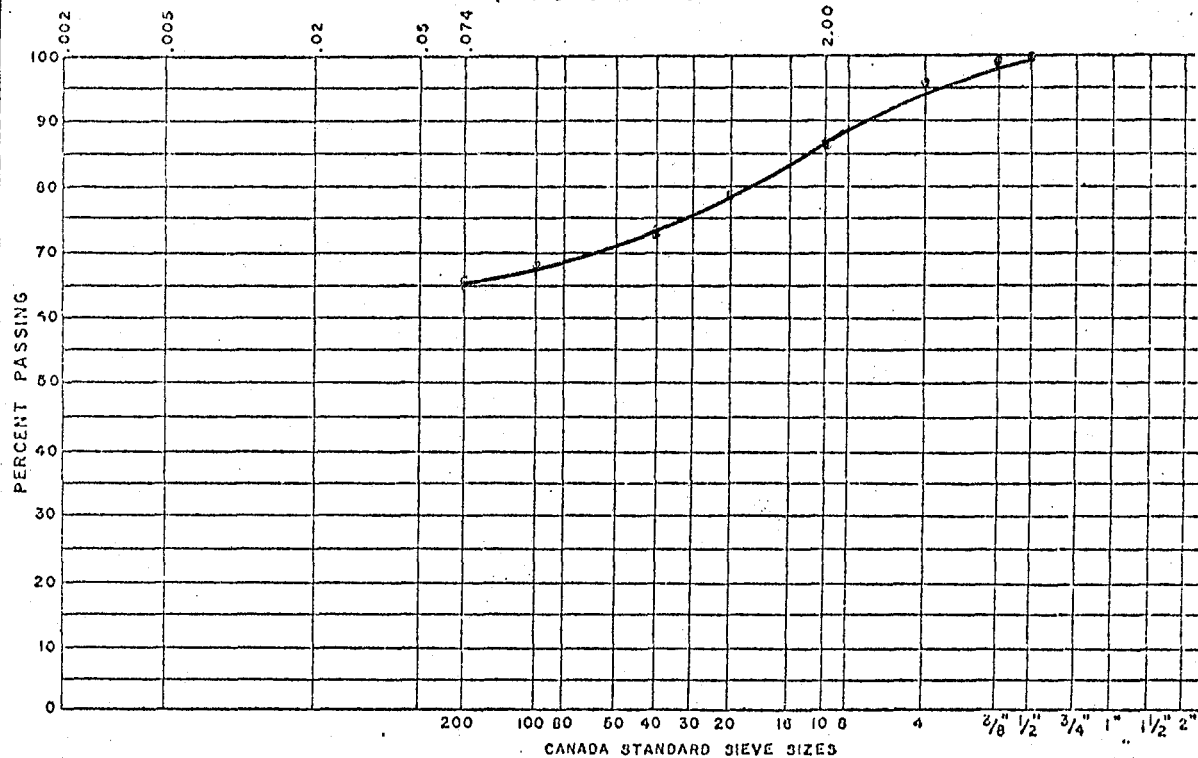
## PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
| BASALT        |                   |
| LIMESTONE     |                   |
| GRANITE       |                   |
| SANDSTONE     |                   |
| SHALE         |                   |
| SCHIST        |                   |
| QUARTZITE     |                   |
| OTHERS        |                   |

## PARTICLE SHAPE ANALYSIS

|             |  |
|-------------|--|
| ROUND       |  |
| SUB-ROUND   |  |
| ANGULAR     |  |
| SUB-ANGULAR |  |
| FLATS       |  |

## GRAIN SIZE IN MILLIMETERS



CLAY

SILT

SAND

GRAVEL

PROJECT ..... DEMPSTER HIGHWAY .....

LOCATION ..... STATION 3371+00 .....

HOLE NO. .... RR 15 .....

DEPTH ..... 10' ..... FIELD NO. 28 .....

SAMPLE TYPE ..... Boc .....

LAB. NO.

4785

## LABORATORY'S REMARKS

SANDY CLAY (M.P.)

DATE SAMPLED

23-6-72

DATE RECEIVED

30-6-72

DATE RECORDED

14-8-72

TD.

V

BORE HOLE NO.

RR-14

BORE HOLE POSITION

Stn 33.96+00 E

DPW TECHNICIAN

CONTRACTOR

DRILLER

METHOD OF BORING

SOIL:

ROCK:

SAMPLE

DESCRIPTION  
OF STRATADEPTH  
(FT.)ELEV.  
(FT.)BLOWS  
PER  
FOOT

NO.

SYM-  
BOL

TYPE

RE-  
TAIN  
IFTBLOWS  
PER  
6 IN.SAMPLE  
NO.SAMPLE DESCRIPTION  
AND  
BORING NOTES

DATE AND TIME

JUNE 23/72

FINISHED:

SURFACE ELEVATION

AGING SIZE

GAUGE  
READING

AGING HAMMER WT. ....LBS.

DROP.....INCHES

organic

0

MOSS, grass,

clayey silt

1

frozen, high m.c

2

||

3

||

4

||

25 IIII A

much ice throughout the  
hole

5

||

clayey silt with  
coarse sand

6

fairly large coarse sand content

7

||

8

||

26 IIII A

9

||

10

# GRAIN SIZE ANALYSIS <sup>D</sup> MM <sup>P</sup> MM

| SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT |
|------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|
| #4         | 100.0             |            |                   | .052       | 84.7              | .0040      | 49.6              |
| 10         | 94.0              |            |                   | .037       | 81.8              |            |                   |
| 20         | 87.4              |            |                   | .027       | 78.8              |            |                   |
| 40         | 85.9              |            |                   | .019       | 75.9              |            |                   |
| 100        | 83.5              |            |                   | .014       | 73.0              |            |                   |
| 200        | 80.9              |            |                   | .010       | 69.5              |            |                   |
|            |                   |            |                   | .0075      | 63.7              |            |                   |
|            |                   |            |                   | .0059      | 57.5              |            |                   |

| TEST NO. | CLASSIFICATION                    | L.L. | P.L. | P.I. | NAT. %W | F.M. |
|----------|-----------------------------------|------|------|------|---------|------|
|          |                                   | 58.1 | 51.6 | 6.5  | 131.2   |      |
|          | ML-CL INORGANIC SANDY CLAYEY SILT |      |      |      |         |      |
|          | LOW PLASTICITY                    |      |      |      |         |      |

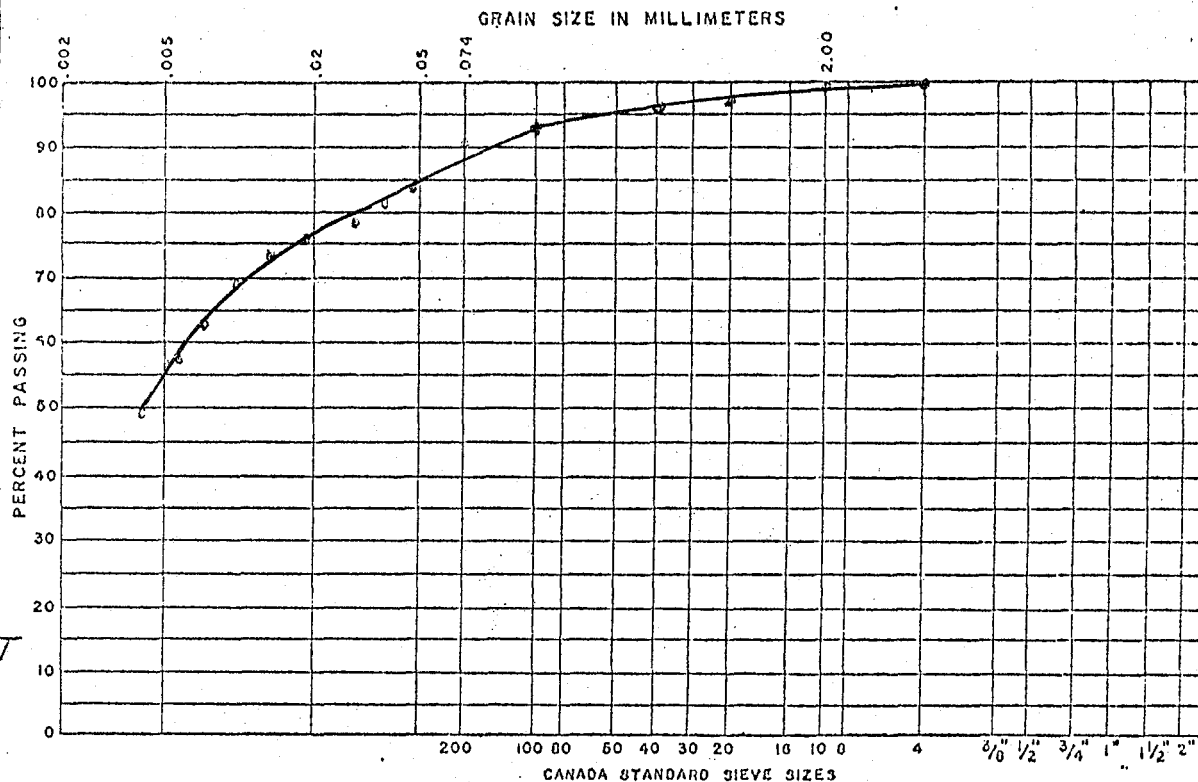
CRUSH COUNT %

## PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
| BASALT        |                   |
| LIMESTONE     |                   |
| GRANITIC      |                   |
| SANDSTONE     |                   |
| SHALE         |                   |
| SCHIST        |                   |
| QUARTZITE     |                   |
| OTHERS        |                   |

## PARTICLE SHAPE ANALYSIS

| ROUND      |  |
|------------|--|
| UB-ROUND   |  |
| ANGULAR    |  |
| UB-ANGULAR |  |
| FLATS      |  |



|      |      |      |        |
|------|------|------|--------|
| CLAY | SILT | SAND | GRAVEL |
|------|------|------|--------|

PROJECT ..... DEMISTAR HIGHWAY .....

LOCATION ..... STATION 3396+000 .....

HOLE NO. .... RR 14 .....

DEPTH ..... 4 1/2' ..... FIELD NO. .... 25 .....

SAMPLE TYPE ..... BAG .....

LAB. NO.

4782

## LABORATORY'S REMARKS

CLAYEY SILT (L.P.)

DATE SAMPLED 23-6-72

DATE RECEIVED 30-6-72

DATE RECORDED 14-8-72

## GRAIN SIZE ANALYSIS

| SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT |
|------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|
| 4"         | 100.0             | #200       | 41.5              |            |                   |            |                   |
| 3"         | 99.5              |            |                   |            |                   |            |                   |
| 2"         | 99.1              |            |                   |            |                   |            |                   |
| 1"         | 94.3              |            |                   |            |                   |            |                   |
| 10         | 85.1              |            |                   |            |                   |            |                   |
| 20         | 65.7              |            |                   |            |                   |            |                   |
| 40         | 54.4              |            |                   |            |                   |            |                   |
| 60         | 44.6              |            |                   |            |                   |            |                   |

| CLASSIFICATION                                 | L.L. | P.L. | P.I. | NAT. %W | F.M. |
|------------------------------------------------|------|------|------|---------|------|
| SC - GRAVELLY CLAYEY SAND<br>MEDIUM PLASTICITY | 29.6 | 21.3 | 8.3  | 35.7    |      |

CRUSH COUNT

%

## PETROGRAPHIC ANALYSIS

MATERIAL TYPE

% OF TOTAL SAMPLE

SALT

ONE

ANITIC

ROSTONE

ALE

HIST

ARTZITE

HENS

## PARTICLE SHAPE ANALYSIS

JND

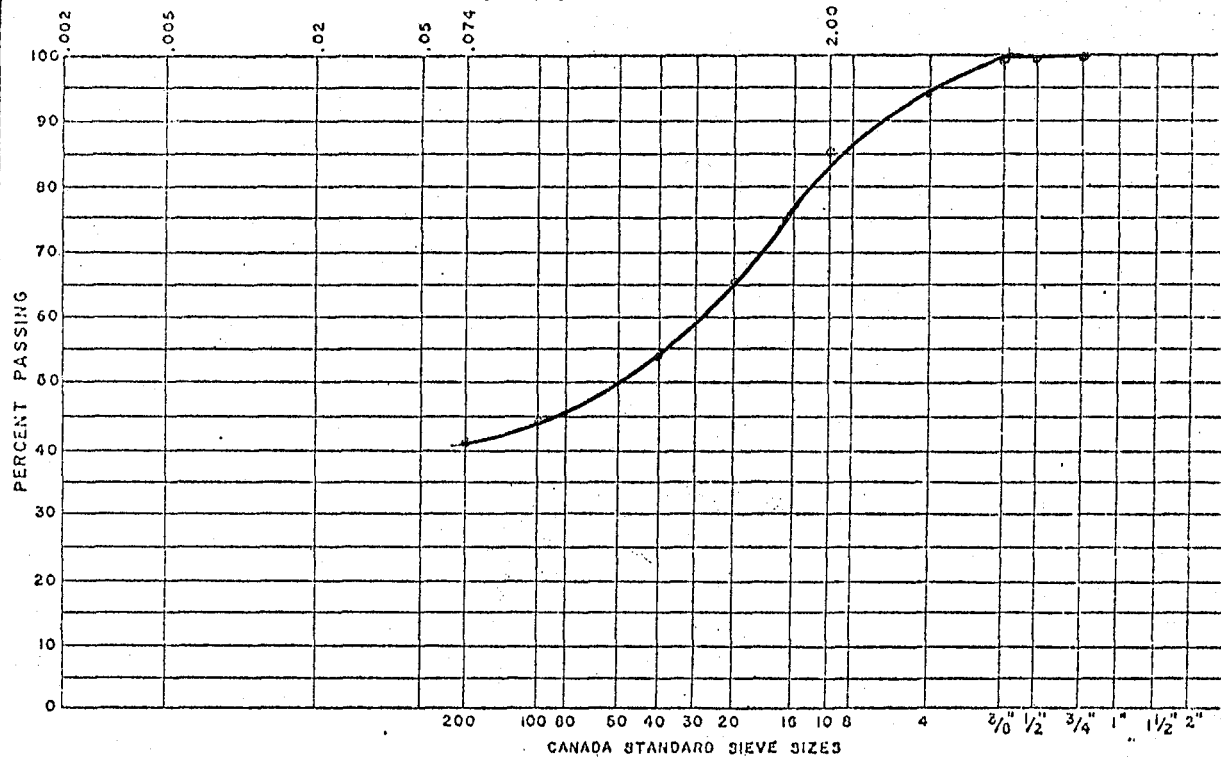
J-ROUND

SULAR

J-ANGULAR

ATS

## GRAIN SIZE IN MILLIMETERS



CLAY

SILT

SAND

GRAVEL

PROJECT ..... DEMPSTER HIGHWAY .....  
 LOCATION ..... STATION 3396+004 .....  
 HOLE NO. .... RR 14 .....  
 DEPTH ..... 9 1/2' ..... FIELD NO. .... 26 .....  
 SAMPLE TYPE ..... BAG .....

LAB. NO.

4783

## LABORATORY'S REMARKS

CLAYEY SAND (M.P.)

DATE SAMPLED

23-6-72

DATE RECEIVED

30-6-72

DATE RECORDED

7-8-72

10



# GRAIN SIZE ANALYSIS

| WAVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT |
|--------------|-------------------------|---------------|-------------------------|---------------|-------------------------|---------------|-------------------------|
| 054          | 85.6                    | 0.075         | 61.8                    |               |                         |               |                         |
| 038          | 84.0                    |               |                         |               |                         |               |                         |
| 027          | 82.4                    |               |                         |               |                         |               |                         |
| 019          | 79.3                    |               |                         |               |                         |               |                         |
| 014          | 78.9                    |               |                         |               |                         |               |                         |
| 010          | 77.3                    |               |                         |               |                         |               |                         |
| 0075         | 71.0                    |               |                         |               |                         |               |                         |
| 0053         | 67.2                    |               |                         |               |                         |               |                         |

| SAMPLE<br>NO. | CLASSIFICATION                                 | L.L. | P.L. | P.I. | NAT.<br>%W | F.M. |
|---------------|------------------------------------------------|------|------|------|------------|------|
|               |                                                | 49.1 | 35.9 | 13.2 | 126.2      |      |
|               | CL - INORGANIC SILTY CLAY<br>MEDIUM PLASTICITY |      |      |      |            |      |

CRUSH COUNT %

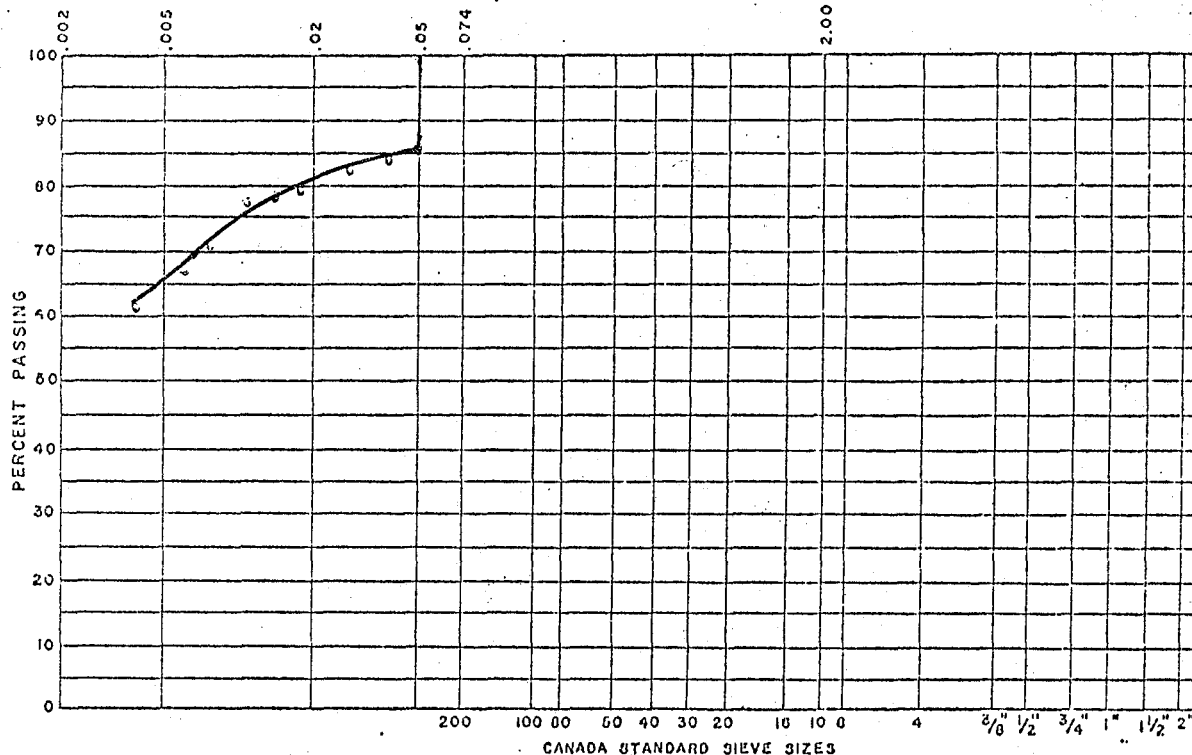
## PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
| BASALT        |                   |
| STONE         |                   |
| GRANITIC      |                   |
| SANDSTONE     |                   |
| SHALE         |                   |
| SCHIST        |                   |
| QUARTZITE     |                   |
| OTHERS        |                   |

## PARTICLE SHAPE ANALYSIS

| OUND       |  |
|------------|--|
| UB-ROUND   |  |
| NGULAR     |  |
| UB-ANGULAR |  |
| LATS       |  |

## GRAIN SIZE IN MILLIMETERS



CLAY SILT SAND GRAVEL

PROJECT ..... DEMISTAR HIGHWAY .....  
 LOCATION ..... STATION 3421+00 .....  
 HOLE NO. .... RR 11 .....  
 DEPTH ..... 4 1/2' ..... FIELD NO. .... 21 .....  
 SAMPLE TYPE ..... B-20 .....

LAB. NO.

4778

## LABORATORY'S REMARKS

SILTY CLAY (M.P.)

DATE SAMPLED 23-6-72

DATE RECEIVED 27-6-72

DATE RECORDED 14-8-72

# GRAIN SIZE ANALYSIS

| SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT |
|------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|
| 3/8"       | 100.0             |            |                   |            |                   |            |                   |
| 4          | 98.9              |            |                   |            |                   |            |                   |
| 10         | 93.8              |            |                   |            |                   |            |                   |
| 20         | 82.1              |            |                   |            |                   |            |                   |
| 40         | 74.9              |            |                   |            |                   |            |                   |
| 100        | 67.6              |            |                   |            |                   |            |                   |
| 200        | 65.3              |            |                   |            |                   |            |                   |

| CLASSIFICATION                   | L.L. | P.L. | P.I. | NAT. %W | F.M. |
|----------------------------------|------|------|------|---------|------|
| CL - INORGANIC SILTY CLAYEY SAND | 34.6 | 22.9 | 11.7 | 10.2    |      |
| MEDIUM PLASTICITY                |      |      |      |         |      |

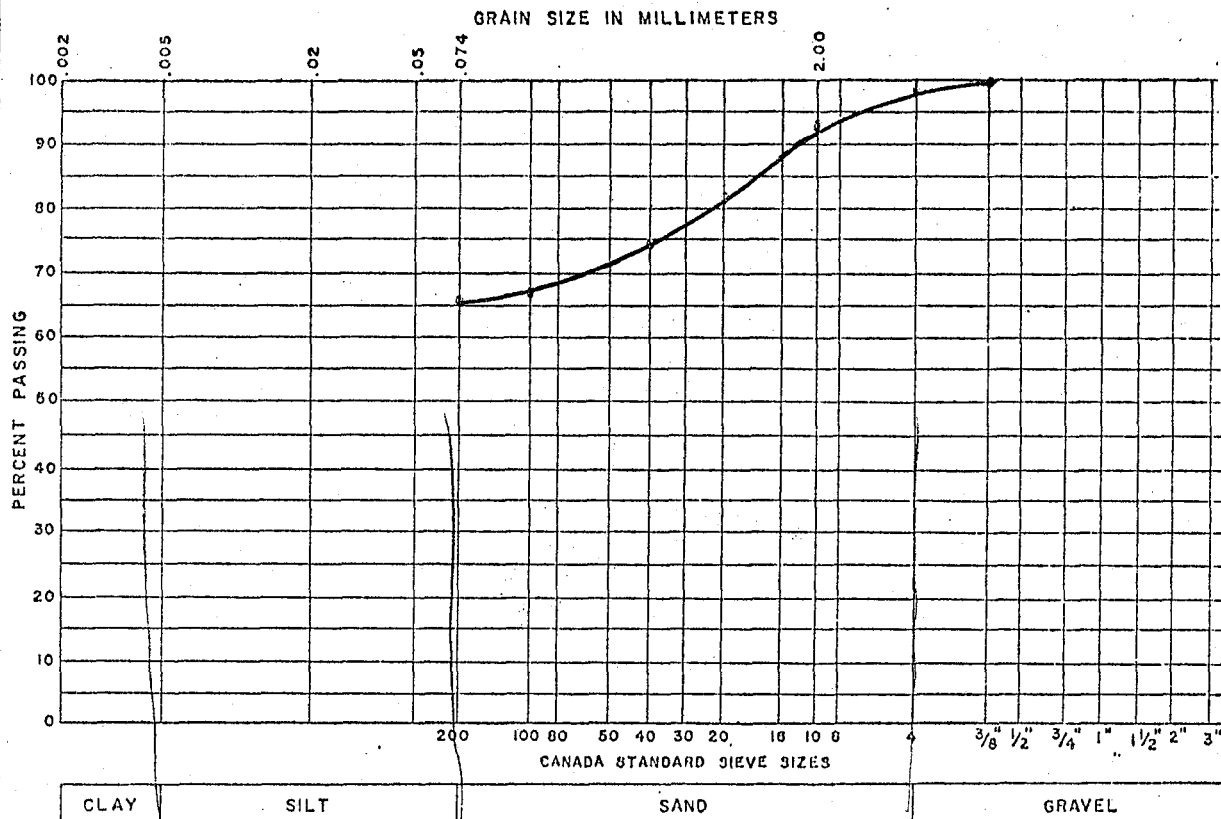
CRUSH COUNT %

## PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
| ASALT         |                   |
| ME-TONE       |                   |
| IA: IC        |                   |
| WOSTONE       |                   |
| IALE          |                   |
| CHIST         |                   |
| JARTZITE      |                   |
| CHERS         |                   |

## PARTICLE SHAPE ANALYSIS

|            |  |
|------------|--|
| OUND       |  |
| UB-ROUND   |  |
| IGULAR     |  |
| UB-ANGULAR |  |
| ATS        |  |
| EDLES      |  |



PROJECT ..... DEMPSTER HIGHWAY .....  
 LOCATION ..... STATION 3421+00 .....  
 HOLE NO. .... RR11 .....  
 DEPTH ..... 9 1/2' ..... FIELD NO. 22 .....  
 SAMPLE TYPE ..... BAG .....

LAB. NO.

4779

## LABORATORY'S REMARKS

CLAY SAND (MP)

DATE SAMPLED 23-6-72

DATE RECEIVED 30-6-72

DATE RECORDED 8-8-72

TESTED BY JP ✓

BORE HOLE NO.

RR-6

BORE HOLE POSITION

see airphoto

DPW TECHNICIAN

CONTRACTOR

DRILLER

METHOD OF BORING

SOIL:

ROCK:

SAMPLE

DESCRIPTION  
OF STRATADEPTH  
(FT.)ELEV.  
(FT.)BLOWS  
PER  
FOOT

NO.

SYM-  
BOL

TYPE

FAT  
(F)BLOWS  
PER  
6 IN.SAMPLE  
NO.SAMPLE DESCRIPTION  
AND  
BORING NOTES

brkn shale

0

some platy, brkn shale

sh. sh.

1

17 100 B

sh. sh.

2

sh. sh.

3

sh. sh.

4

sh. sh.

5

sh. sh.

6

sh. sh.

7

sh. sh.

8

sh. sh.

9

10

- 1 bag Amex  
- hole to 2 1/2'- shale fragments to 4" and  
moist gravel to 3/4"

- moist, unbroken

- sample 15" 7' and 2'

## GRAIN SIZE ANALYSIS

| SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT |
|------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|
| 3"         | 100.0             | #10        | 19.8              |            |                   |            |                   |
| 2"         | 78.7              | 20         | 10.1              |            |                   |            |                   |
| 1 1/2"     | 78.7              | 40         | 6.4               |            |                   |            |                   |
| 1"         | 75.3              | 100        | 3.5               |            |                   |            |                   |
| 3/4"       | 68.1              | 200        | 2.9               |            |                   |            |                   |
| 1/2"       | 58.5              |            |                   |            |                   |            |                   |
| 3/8"       | 50.1              |            |                   |            |                   |            |                   |
| 4"         | 34.8              |            |                   |            |                   |            |                   |

| CLASSIFICATION   | L.L. | P.L.           | P.I. | NAT. %W  | F.M. |
|------------------|------|----------------|------|----------|------|
|                  |      |                |      | N.P. 3.9 |      |
| GW - WELL GRADED |      | SANDY GRAVELLY |      |          |      |

CRUSH COUNT

%

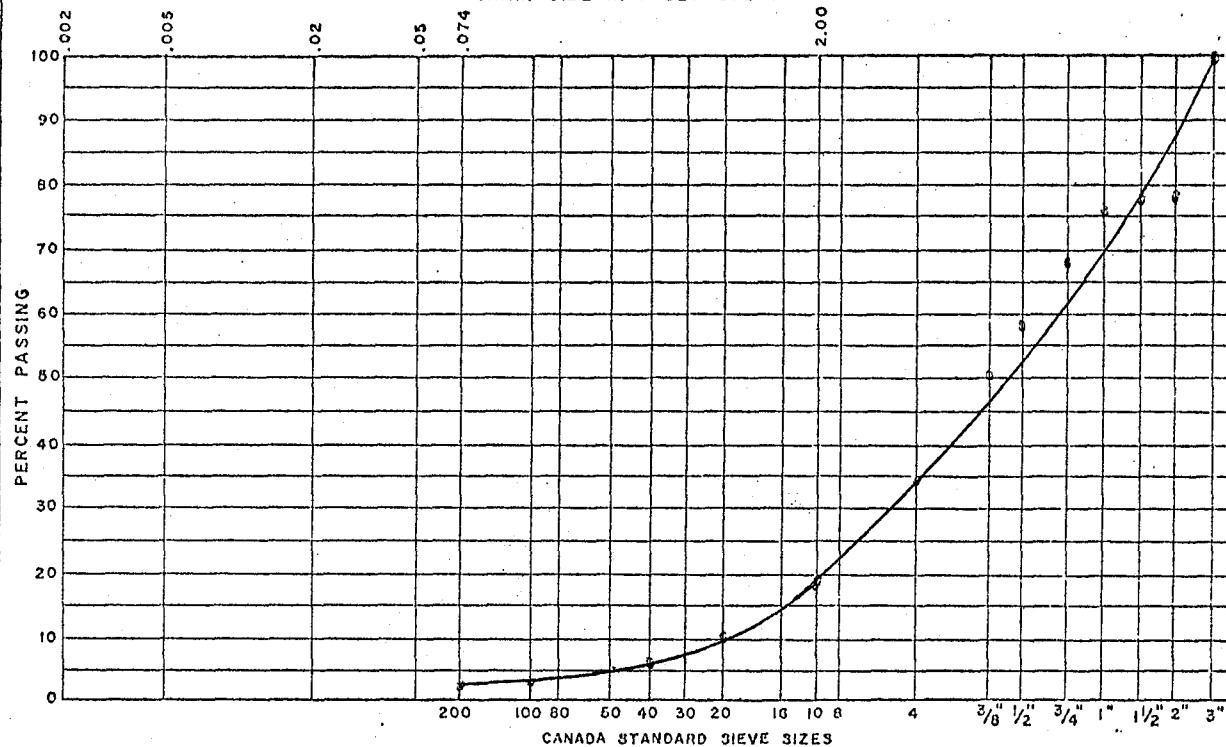
## PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
| SALT          |                   |
| STONE         |                   |
| AMPHIBOL      |                   |
| NDSTONE       |                   |
| ALE           | 85.7%             |
| HIST          |                   |
| ARTZITE       |                   |
| NIERS         | QUARTZ 15%        |

## PARTICLE SHAPE ANALYSIS

|           |  |
|-----------|--|
| JND       |  |
| 1-ROUND   |  |
| SULAR     |  |
| 1-ANGULAR |  |
| ITS       |  |
| DOLES     |  |

## GRAIN SIZE IN MILLIMETERS



|      |      |      |        |
|------|------|------|--------|
| CLAY | SILT | SAND | GRAVEL |
|------|------|------|--------|

PROJECT ..... DEMPSTER HIGHWAY .....  
 LOCATION ..... SEE AIR PHOTO .....  
 HOLE NO. .... RR6 .....  
 DEPTH ..... 2' ..... FIELD NO. .... 17 .....  
 SAMPLE TYPE ..... BLAST HOLE .....

LAB. NO.

4774

## LABORATORY'S REMARKS

ROCK IS VERY HARD  
 (N.P.)

DATE SAMPLED

23-6-72

DATE RECEIVED

30-6-72

DATE RECORDED

8-8-72

TESTED BY

JR

[illegible]



# GRAIN SIZE ANALYSIS

| % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE |
|-------------------------|---------------|-------------------------|---------------|-------------------------|---------------|-------------------------|---------------|
| 100.0                   |               |                         |               |                         |               |                         |               |
| 93.3                    |               |                         |               |                         |               |                         |               |
| 80.2                    |               |                         |               |                         |               |                         |               |
| 69.7                    |               |                         |               |                         |               |                         |               |
| 63.7                    |               |                         |               |                         |               |                         |               |
| 52.9                    |               |                         |               |                         |               |                         |               |
| 48.9                    |               |                         |               |                         |               |                         |               |

| CLASSIFICATION          |  | L.L. | P.L. | P.I. | NAT.<br>%W | F.M. |
|-------------------------|--|------|------|------|------------|------|
| SM - ORGANIC SILTY SAND |  | 29.4 | 26.0 | 3.4  | 107.0      |      |
| LOW PLASTICITY          |  |      |      |      |            |      |

CRUSH COUNT

%

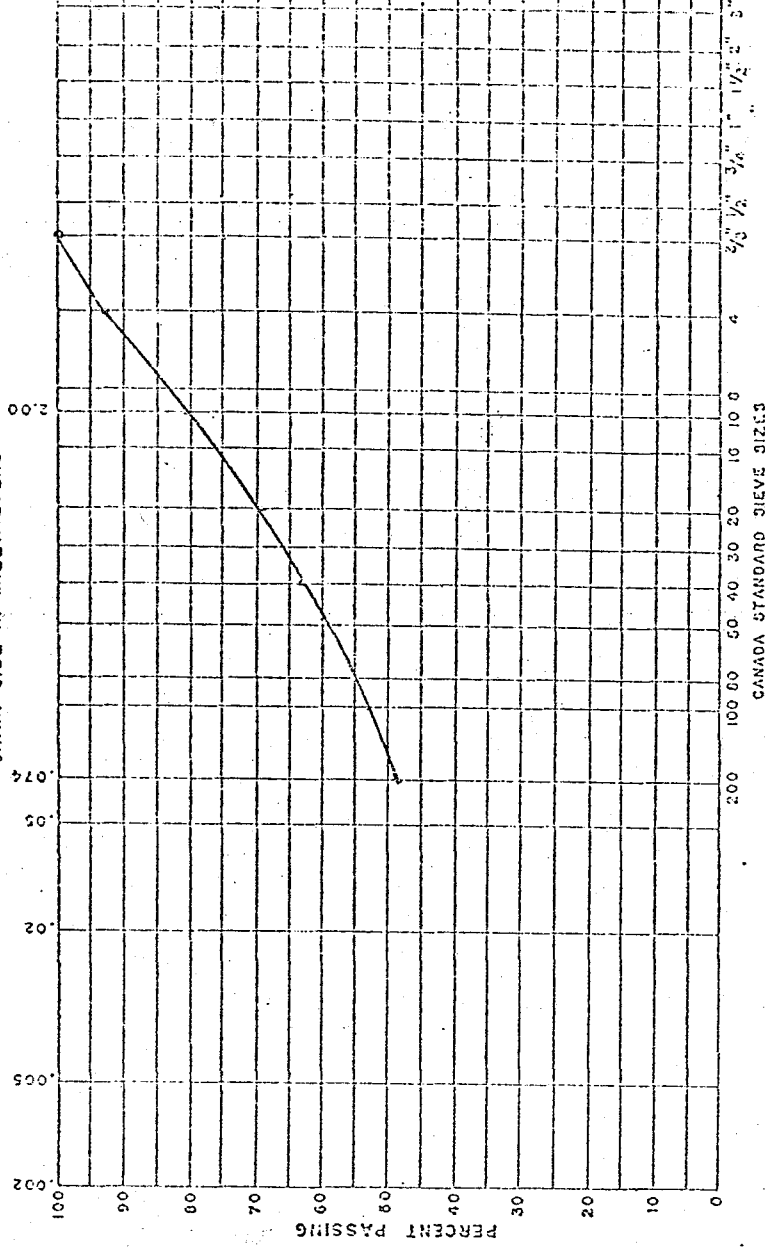
# PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
| ONE           |                   |
| TWO           |                   |
| THREE         |                   |
| FOUR          |                   |
| FIVE          |                   |
| SIX           |                   |
| SEVEN         |                   |
| EIGHT         |                   |
| NINE          |                   |
| TEN           |                   |

# PARTICLE SHAPE ANALYSIS

|        |  |
|--------|--|
| UND    |  |
| R      |  |
| IGULAR |  |

# GRAIN SIZE IN MILLIMETERS



CLAY

SILT

SAND

GRAVEL

LAB. NO.

4616

PROJECT ..... *Dempster Highway* .....  
 LOCATION ..... *Station 400+00* .....  
 HOLE NO. .... *RM 39* .....  
 DEPTH ..... *4 1/2'* ..... FIELD NO. .... *53* .....  
 SAMPLE TYPE ..... *4" Auger - Bed* .....

LABORATORY'S REMARKS

DATE SAMPLED

7-6-72

DATE RECEIVED

16-6-72

DATE RECORDED

21-7-72

GRAIN SIZE ANALYSIS: <sup>D</sup>MM

| INER<br>BY<br>DCHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT |
|--------------------|---------------|-------------------------|---------------|-------------------------|
| 20                 |               |                         | 1057          | 63.2                    |
| 20.8               |               |                         | 1041          | 80.1                    |
| 22.3               |               |                         | 1029          | 58.5                    |
| 24.4               |               |                         | 1021          | 55.4                    |
| 24.4               |               |                         | 1019          | 51.9                    |
| 25.5               |               |                         | 1011          | 48.8                    |
| 26.6               |               |                         | 10029         | 44.6                    |
|                    |               |                         | 10057         | 32.4                    |

| CLASSIFICATION                  | L.L. | P.L. | P.I. | NAT.<br>%W | F.M. |
|---------------------------------|------|------|------|------------|------|
| --- IMPREGANIC FINE SANDY SILTY | 23.6 | 20.6 | 21.0 | 46.9       |      |
| LOW PLASTICITY                  |      |      |      |            |      |

CRUSH COUNTY

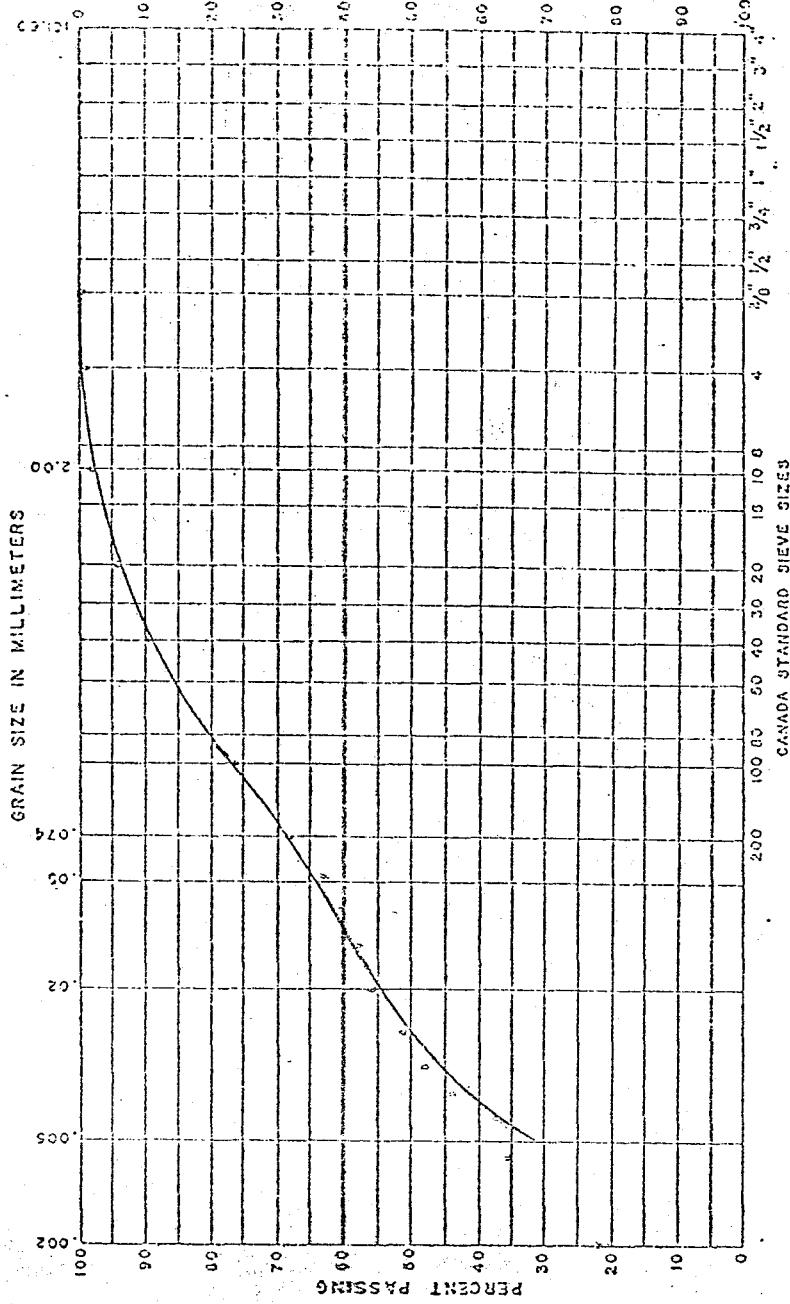
%

# PETROGRAPHIC ANALYSIS

[illegible]

## PARTICLE SHAPE ANALYSIS

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |



CLAY

1715

AND

GRAVEL

LAB. NO.

4617

|             |                  |           |    |
|-------------|------------------|-----------|----|
| PROJECT     | DEMPSTER HIGHWAY |           |    |
| LOCATION    | STATION 4080+00  |           |    |
| HOLE NO.    | RM39             |           |    |
| DEPTH       | 9' 1/3           | FIELD NO. | 59 |
| SAMPLE TYPE | 4" AUGER-BAC-    |           |    |

LABORATORY'S REMARKS

DATE SAMPLED

DATE RECEIVED

DATE RECORDED

[illegible]

GRAIN SIZE ANALYSIS:

| FINER<br>BY<br>SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT |
|------------------------------|-------------------------|---------------|-------------------------|---------------|-------------------------|
| 100                          | 100                     |               |                         |               |                         |
| 80                           | 100                     |               |                         |               |                         |
| 60                           | 100                     |               |                         |               |                         |
| 40                           | 100                     |               |                         |               |                         |
| 20                           | 100                     |               |                         |               |                         |
| 10                           | 100                     |               |                         |               |                         |
| 5                            | 100                     |               |                         |               |                         |
| 2.5                          | 100                     |               |                         |               |                         |
| 1.18                         | 100                     |               |                         |               |                         |
| 0.6                          | 100                     |               |                         |               |                         |
| 0.25                         | 100                     |               |                         |               |                         |
| 0.075                        | 100                     |               |                         |               |                         |

| CLASSIFICATION       | L.L. | P.L. | P.I. | NAT.<br>%W | F.M. |
|----------------------|------|------|------|------------|------|
| 51.8                 | 40.6 | 11.2 | 51.5 |            |      |
| INORGANIC SILTY CLAY |      |      |      |            |      |
| LOW PLASTICITY       |      |      |      |            |      |

CRUSH COUNT

%

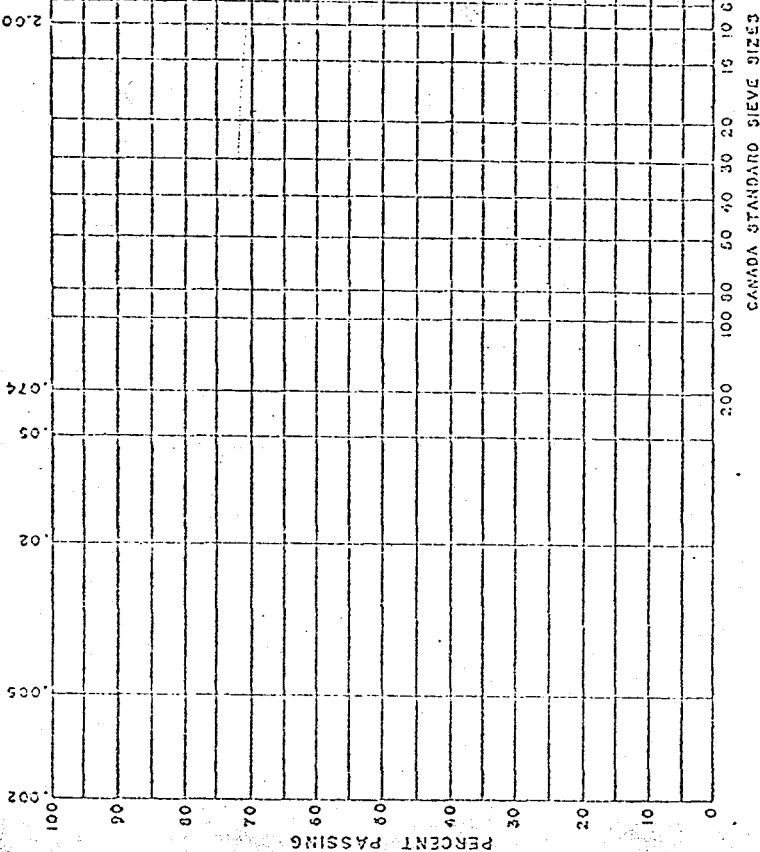
PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |

PARTICLE SHAPE ANALYSIS

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

GRAIN SIZE IN MILLIMETERS



PROJECT ..... *DEMPSTER HIGHWAY* .....  
 LOCATION ..... *STATION 4109.000* .....  
 HOLE NO. .... *RM38* .....  
 DEPTH ..... *2 1/2'* ..... FIELD NO. *49* .....  
 SAMPLE TYPE ..... *4" AUGER - BAC* .....

LAB. NO.

*4612*

LABORATORY REMARKS

*SOIL CLAY (MID)*

DATE SAMPLED

*7-6-72*

DATE RECEIVED

*16-6-72*

DATE RECORDED

*24-7-72*

# GRAIN SIZE ANALYSIS

| % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE |
|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
| 100.0             |            |                   |            |                   |            |                   |            |                   |            |                   |            |
| 96.0              |            |                   |            |                   |            |                   |            |                   |            |                   |            |
| 88.0              |            |                   |            |                   |            |                   |            |                   |            |                   |            |
| 73.3              |            |                   |            |                   |            |                   |            |                   |            |                   |            |
| 60.0              |            |                   |            |                   |            |                   |            |                   |            |                   |            |
| 52.7              |            |                   |            |                   |            |                   |            |                   |            |                   |            |
| 39.1              |            |                   |            |                   |            |                   |            |                   |            |                   |            |
| 25.5              |            |                   |            |                   |            |                   |            |                   |            |                   |            |

| CLASSIFICATION      |  | L.L. | P.L. | NAT. %W | F.M. |
|---------------------|--|------|------|---------|------|
| S.M. - 3.01         |  | 22.9 | 18.9 | 25      | 16.1 |
| GRAVELLY SILTY SAND |  |      |      |         |      |
| LOW PLASTICITY      |  |      |      |         |      |

CRUSH COUNT

%

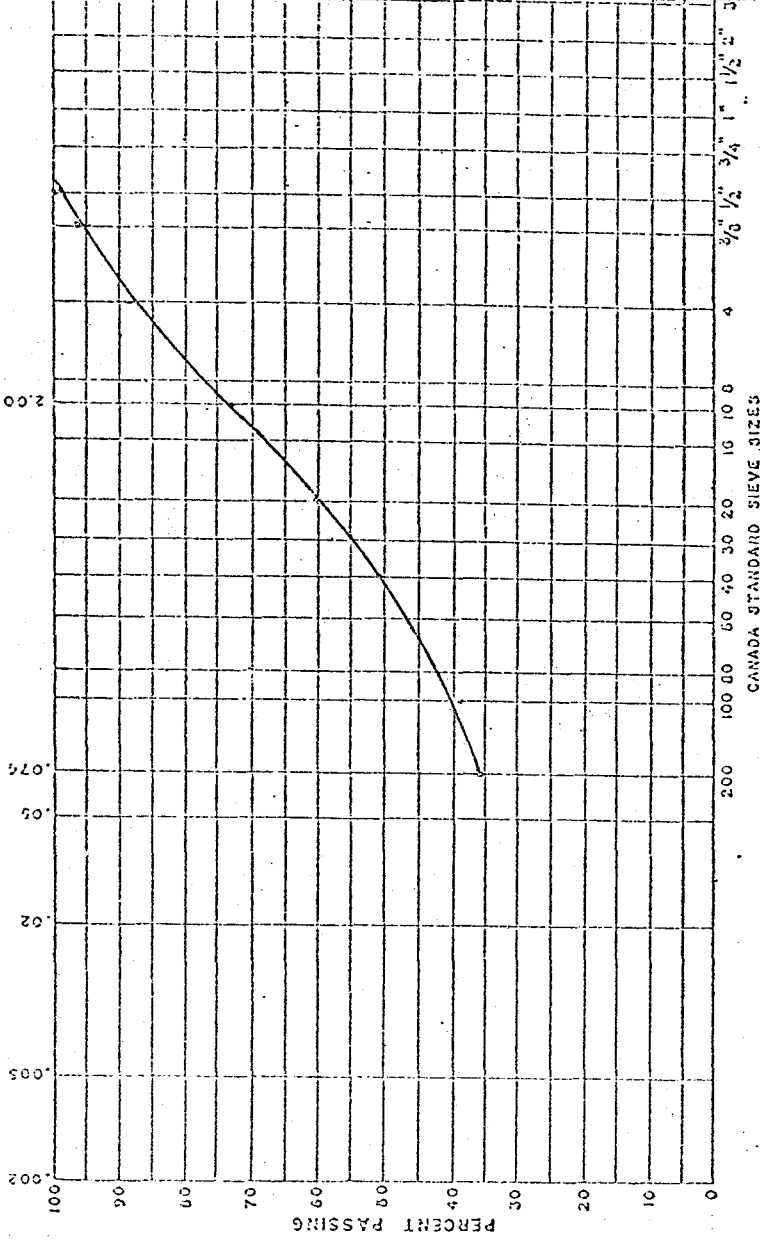
# PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
| CLAY          |                   |
| SILT          |                   |
| SAND          |                   |
| GRAVEL        |                   |

# PARTICLE SHAPE ANALYSIS

|           |  |
|-----------|--|
| ROUND     |  |
| ANGULAR   |  |
| IRREGULAR |  |

# GRAIN SIZE IN MILLIMETERS



# GRAIN SIZE ANALYSIS :

| FINER<br>BY<br>SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT |
|------------------------------|-------------------------|---------------|-------------------------|---------------|-------------------------|
| 75                           | 100                     | 75            | 100                     | 75            | 100                     |
| 150                          | 100                     | 150           | 100                     | 150           | 100                     |
| 300                          | 100                     | 300           | 100                     | 300           | 100                     |
| 600                          | 100                     | 600           | 100                     | 600           | 100                     |
| 1250                         | 100                     | 1250          | 100                     | 1250          | 100                     |
| 2500                         | 100                     | 2500          | 100                     | 2500          | 100                     |
| 5000                         | 100                     | 5000          | 100                     | 5000          | 100                     |
| 10000                        | 100                     | 10000         | 100                     | 10000         | 100                     |

| CLASSIFICATION    | L.L. | P.L. | P.I. | NAT.<br>%W | F.M. |
|-------------------|------|------|------|------------|------|
| 1-SAND - GRANULAR | 24.5 | 18.8 | 2.7  | 13.7       |      |
| LOW PLASTICITY    |      |      |      |            |      |

CRUSH COUNT

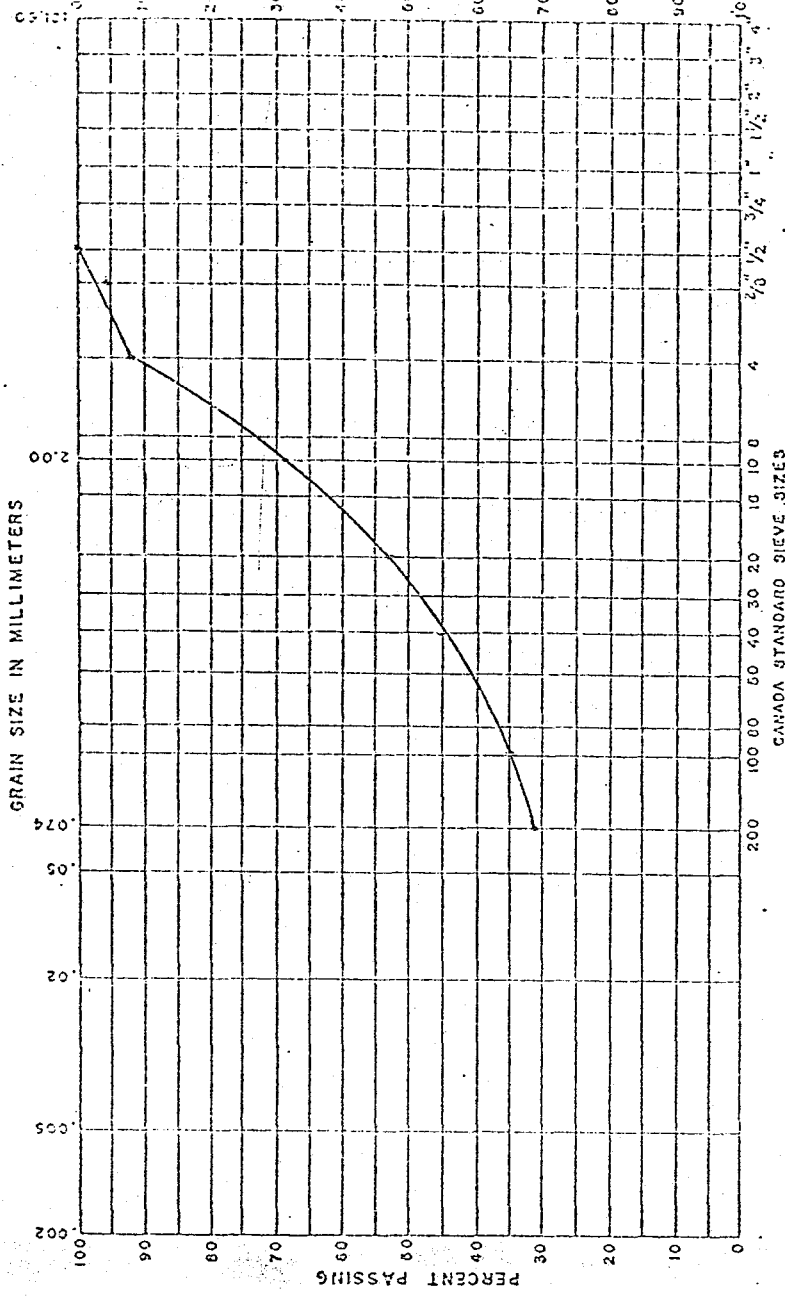
%

## PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |

## PARTICLE SHAPE ANALYSIS

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |



CLAY SILT SAND GRAVEL

LAB. NO.

4614

PROJECT ..... DENVER HIGHWAY  
 LOCATION ..... STATION 100+00  
 HOLE NO. .... 7488  
 DEPTH ..... 9' FIELD NO. 51  
 SAMPLE TYPE ..... 4" AUGER - BAC

LABORATORY'S REMARKS

100% SAND (L.P.)

DATE SAMPLED 7-6-72

DATE RECEIVED 16-6-72

DATE RECORDED 20-7-72



GRAIN SIZE IN MILLIMETERS

A blank graph grid for plotting data. The vertical axis is labeled 'PERCENT PASSING' and has major tick marks at 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100. The horizontal axis is labeled '2.0' and has major tick marks at 0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, and 2.0. The grid consists of 10 major divisions on the vertical axis and 20 major divisions on the horizontal axis, with each major division further subdivided into 5 minor divisions.

%

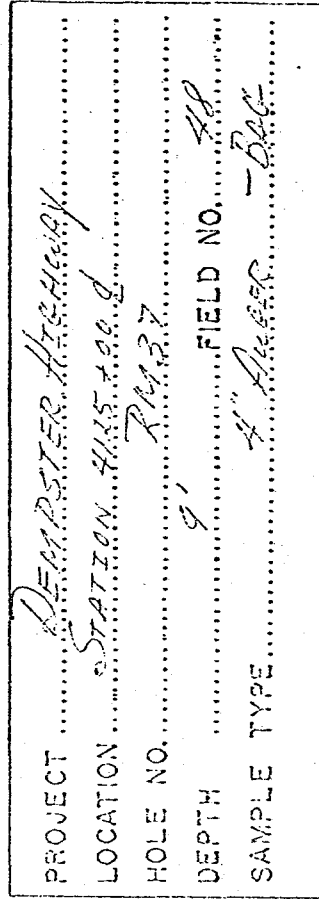
GRAVEL

|                   |                    |           |      |
|-------------------|--------------------|-----------|------|
| PROJECT .....     | DENVER HIGHWAY     | LAB. NO.  | 4609 |
| LOCATION .....    | STATION 412.5+00.0 |           |      |
| HOLE NO. ....     | R437               |           |      |
| DEPTH .....       | 2'                 | FIELD NO. | 46   |
| SAMPLE TYPE ..... | 4" AUGER BOR       |           |      |

|                            |               |
|----------------------------|---------------|
| LABORATORY'S REMARKS       | DATE SAMPLED  |
| SAMPLE IS SHOWN CONTAINING | 7-6-72        |
| A Mixture OF SAND AND CLAY | DATE RECEIVED |
|                            | 16-6-72       |
|                            | DATE RECORDED |
|                            | 24-7-72       |

4609





|                      |               |              |
|----------------------|---------------|--------------|
| LABORATORY'S REMARKS | DATE SAMPLED  | 7-6-72       |
|                      | DATE RECEIVED | 16-6-72      |
|                      | DATE RECORDED | 21-7-72      |
|                      |               | TESTED BY 70 |

| % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT |
|-------------------------|---------------|-------------------------|-------------------------|---------------|-------------------------|---------------|-------------------------|
| 100.0                   |               |                         |                         |               |                         |               |                         |
| 97.1                    |               |                         |                         |               |                         |               |                         |
| 93.7                    |               |                         |                         |               |                         |               |                         |
| 83.4                    |               |                         |                         |               |                         |               |                         |
| 74.3                    |               |                         |                         |               |                         |               |                         |
| 69.0                    |               |                         |                         |               |                         |               |                         |
| 60.7                    |               |                         |                         |               |                         |               |                         |
| 57.4                    |               |                         |                         |               |                         |               |                         |

| CLASSIFICATION | L.L. | P.L. | P.I. | NAT.<br>%W | F.M. |
|----------------|------|------|------|------------|------|
| MA-FL          | 23.5 | 19.4 | 4.1  | 36.0       |      |
| MA-FL          | 23.5 | 19.4 | 4.1  | 36.0       |      |
| MA-FL          | 23.5 | 19.4 | 4.1  | 36.0       |      |

| CRUSH COUNT | %   |
|-------------|-----|
| 1           | 100 |
| 2           | 100 |
| 3           | 100 |
| 4           | 100 |
| 5           | 100 |
| 6           | 100 |
| 7           | 100 |
| 8           | 100 |
| 9           | 100 |
| 10          | 100 |
| 11          | 100 |
| 12          | 100 |
| 13          | 100 |
| 14          | 100 |
| 15          | 100 |
| 16          | 100 |
| 17          | 100 |
| 18          | 100 |
| 19          | 100 |
| 20          | 100 |
| 21          | 100 |
| 22          | 100 |
| 23          | 100 |
| 24          | 100 |
| 25          | 100 |
| 26          | 100 |
| 27          | 100 |
| 28          | 100 |
| 29          | 100 |
| 30          | 100 |
| 31          | 100 |
| 32          | 100 |
| 33          | 100 |
| 34          | 100 |
| 35          | 100 |
| 36          | 100 |
| 37          | 100 |
| 38          | 100 |
| 39          | 100 |
| 40          | 100 |
| 41          | 100 |
| 42          | 100 |
| 43          | 100 |
| 44          | 100 |
| 45          | 100 |
| 46          | 100 |
| 47          | 100 |
| 48          | 100 |
| 49          | 100 |
| 50          | 100 |
| 51          | 100 |
| 52          | 100 |
| 53          | 100 |
| 54          | 100 |
| 55          | 100 |
| 56          | 100 |
| 57          | 100 |
| 58          | 100 |
| 59          | 100 |
| 60          | 100 |
| 61          | 100 |
| 62          | 100 |
| 63          | 100 |
| 64          | 100 |
| 65          | 100 |
| 66          | 100 |
| 67          | 100 |
| 68          | 100 |
| 69          | 100 |
| 70          | 100 |
| 71          | 100 |
| 72          | 100 |
| 73          | 100 |
| 74          | 100 |
| 75          | 100 |
| 76          | 100 |
| 77          | 100 |
| 78          | 100 |
| 79          | 100 |
| 80          | 100 |
| 81          | 100 |
| 82          | 100 |
| 83          | 100 |
| 84          | 100 |
| 85          | 100 |
| 86          | 100 |
| 87          | 100 |
| 88          | 100 |
| 89          | 100 |
| 90          | 100 |
| 91          | 100 |
| 92          | 100 |
| 93          | 100 |
| 94          | 100 |
| 95          | 100 |
| 96          | 100 |
| 97          | 100 |
| 98          | 100 |
| 99          | 100 |
| 100         | 100 |

[illegible]

| BORE HOLE NO.         |    | BORE HOLE POSITION |             | DATE AND TIME              |            |                                        |
|-----------------------|----|--------------------|-------------|----------------------------|------------|----------------------------------------|
| DPW TECHNICIAN        |    | DRILLER            |             | STARTED: FINISHED:         |            |                                        |
| METHOD OF BORING      |    | Gauge Reading      |             | Casing Size                |            |                                        |
| Soil:                 |    | Rock:              |             | Casing Hammer Wt. ....LBS. |            |                                        |
| Drop.....inches       |    |                    |             |                            |            |                                        |
| Description of Strata |    | Depth (ft.)        | Elev. (ft.) | Blows per foot             | Sample No. | Sample Description and Boring Notes    |
| organic clay & gravel | 0  |                    |             |                            |            | sugary & moss                          |
| "                     | 1  |                    |             |                            |            | fine ice crystals                      |
| sandy silt            | 2  |                    |             |                            |            | visible ice lenses, black              |
| "                     | 3  |                    |             |                            |            |                                        |
| "                     | 4  |                    |             |                            |            |                                        |
| sandy silt            | 5  |                    |             | 15                         | 1111 1A1   | frozen, high m.c., black               |
| "                     | 6  |                    |             |                            |            | frozen, high m.c., black, ice crystals |
| "                     | 7  |                    |             |                            |            | sandy black                            |
| "                     | 8  |                    |             |                            |            | very high m.c., many ice crystals      |
| "                     | 9  |                    |             |                            |            |                                        |
| "                     | 10 |                    |             |                            |            |                                        |



|                                |  |                                            |  |
|--------------------------------|--|--------------------------------------------|--|
| BORE HOLE NO.<br><b>R 1731</b> |  | BORE HOLE POSITION<br><b>Sta 1194+00 L</b> |  |
| DPW TECHNICIAN                 |  | DATE AND TIME<br><b>June 6/72</b>          |  |
| CONTRACTOR                     |  | DRILLER                                    |  |
| METHOD OF BORING               |  | Gauge Reading                              |  |
| SOIL:                          |  | Casing Hammer Wt. .... LBS.                |  |
| ROCK:                          |  | Drop ..... INCHES                          |  |

| DESCRIPTION OF STRATA          | DEPTH (FT.) | ELEV. (FT.) | BLOWS PER FOOT | SAMPLE |         |      |                 | BLOWS PER 6 IN. | SAMPLE NO. | SAMPLE DESCRIPTION AND BORING NOTES                           |
|--------------------------------|-------------|-------------|----------------|--------|---------|------|-----------------|-----------------|------------|---------------------------------------------------------------|
|                                |             |             |                | NO.    | SYM-BOL | TYPE | RE-TAINED (FT.) |                 |            |                                                               |
| shale gravel & organic silt    | 0           |             |                |        |         |      |                 |                 |            | small shale chips & organic silt, mottled grey, mottled brown |
|                                | 1           |             |                |        |         |      |                 |                 |            |                                                               |
| gravelly silt                  | 2           |             |                | 40     |         | 1A   |                 |                 | 40         | drier & mottled brown                                         |
|                                | 3           |             |                |        |         |      |                 |                 |            |                                                               |
| clayey silt & gravel           | 4           |             |                |        |         |      |                 |                 |            | clay & dk. brown                                              |
|                                | 5           |             |                | 41     |         | A    |                 |                 | 41         |                                                               |
| clayey silt with silt & gravel | 6           |             |                |        |         |      |                 |                 |            | dk. grey & frozen & high m.c.                                 |
|                                | 7           |             |                |        |         |      |                 |                 |            |                                                               |
|                                | 8           |             |                | 42     |         | A    |                 |                 | 42         |                                                               |
| gravel with clayey silt        | 9           |             |                |        |         |      |                 |                 |            | base moisture                                                 |
|                                | 10          |             |                |        |         |      |                 |                 |            |                                                               |
|                                | 11          |             |                |        |         |      |                 |                 |            |                                                               |
| clayey silt & gravel           | 12          |             |                |        |         |      |                 |                 |            | base moisture & grey                                          |
| "                              | 13          |             |                |        |         |      |                 |                 |            |                                                               |
| shale gravel with clayey silt  | 14          |             |                |        |         |      |                 |                 |            |                                                               |
|                                | 15          |             |                | 43     |         | A    |                 |                 | 43         |                                                               |

| BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT |
|-----------|------------|-------------------|
| 100       | 10         | 100               |
| 100       | 20         | 99.7              |
| 100       | 40         | 99.1              |
| 100       | 60         | 73.9              |
| 100       | 80         | 64.2              |
| 100       | 100        | 59.1              |
| 100       | 120        | 51.8              |
| 100       | 150        | 43.7              |

| LE | CLASSIFICATION | L.L.     | R.L.       | R.I. | NAT.<br>%W | F.M. |
|----|----------------|----------|------------|------|------------|------|
|    |                | 318      | 277        | 4.1  | 26.8       |      |
|    | SA-SC          | CLIN 457 | SILTY SAND |      |            |      |
|    |                | 10W      | PLASTIC    |      |            |      |

CRASH COUNT

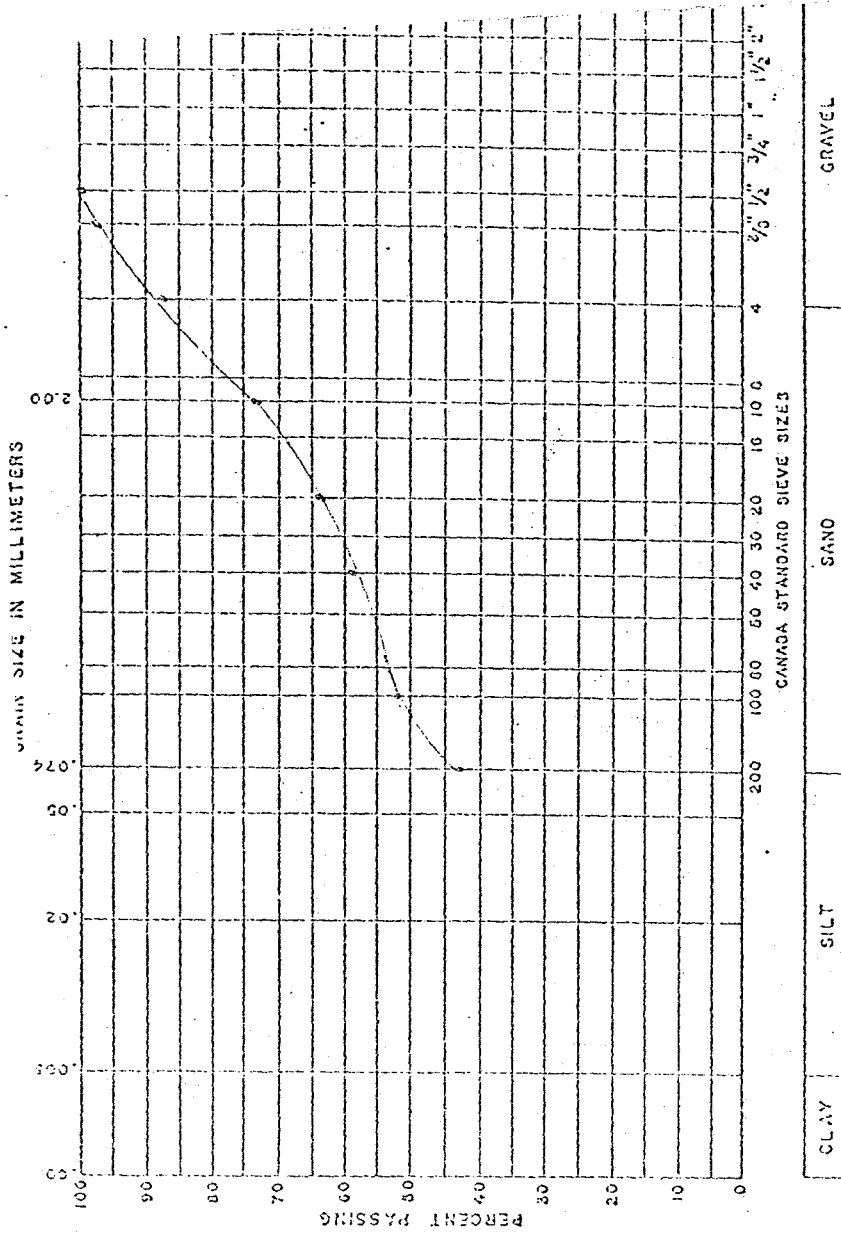
%

# PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
| T             |                   |
| TOPE          |                   |
| IC            |                   |
| (X)           |                   |
|               |                   |
|               |                   |
| LITE          |                   |

## PARTICLE SHAPE ANALYSIS

|      |  |
|------|--|
|      |  |
|      |  |
|      |  |
|      |  |
| ING  |  |
|      |  |
|      |  |
| ULAR |  |
|      |  |
|      |  |
|      |  |



卷五

2715

075.

GRAVEL

|             |                     |
|-------------|---------------------|
| PROJECT     | DENPSTER HIGHWAY    |
| LOCATION    | STATION HIGH + 0.00 |
| HOLE NO.    | RM 31               |
| DEPTH       | 5'                  |
| SAMPLE TYPE | FIELD NO. 41<br>BAG |

LAB. NO. 8258

LABORATORY'S RESULTS

| DATE SAMPLED | 6-6-72 |
|--------------|--------|
| 1            | 1      |
| 2            | 2      |
| 3            | 3      |
| 4            | 4      |
| 5            | 5      |
| 6            | 6      |
| 7            | 7      |
| 8            | 8      |
| 9            | 9      |
| 10           | 10     |
| 11           | 11     |
| 12           | 12     |
| 13           | 13     |
| 14           | 14     |
| 15           | 15     |
| 16           | 16     |
| 17           | 17     |
| 18           | 18     |
| 19           | 19     |
| 20           | 20     |
| 21           | 21     |
| 22           | 22     |
| 23           | 23     |
| 24           | 24     |
| 25           | 25     |
| 26           | 26     |
| 27           | 27     |
| 28           | 28     |
| 29           | 29     |
| 30           | 30     |
| 31           | 31     |
| 32           | 32     |
| 33           | 33     |
| 34           | 34     |
| 35           | 35     |
| 36           | 36     |
| 37           | 37     |
| 38           | 38     |
| 39           | 39     |
| 40           | 40     |
| 41           | 41     |
| 42           | 42     |
| 43           | 43     |
| 44           | 44     |
| 45           | 45     |
| 46           | 46     |
| 47           | 47     |
| 48           | 48     |
| 49           | 49     |
| 50           | 50     |
| 51           | 51     |
| 52           | 52     |
| 53           | 53     |
| 54           | 54     |
| 55           | 55     |
| 56           | 56     |
| 57           | 57     |
| 58           | 58     |
| 59           | 59     |
| 60           | 60     |
| 61           | 61     |
| 62           | 62     |
| 63           | 63     |
| 64           | 64     |
| 65           | 65     |
| 66           | 66     |
| 67           | 67     |
| 68           | 68     |
| 69           | 69     |
| 70           | 70     |
| 71           | 71     |
| 72           | 72     |
| 73           | 73     |
| 74           | 74     |
| 75           | 75     |
| 76           | 76     |
| 77           | 77     |
| 78           | 78     |
| 79           | 79     |
| 80           | 80     |
| 81           | 81     |
| 82           | 82     |
| 83           | 83     |
| 84           | 84     |
| 85           | 85     |
| 86           | 86     |
| 87           | 87     |
| 88           | 88     |
| 89           | 89     |
| 90           | 90     |
| 91           | 91     |
| 92           | 92     |
| 93           | 93     |
| 94           | 94     |
| 95           | 95     |
| 96           | 96     |
| 97           | 97     |
| 98           | 98     |
| 99           | 99     |
| 100          | 100    |

DATE RECEIVED  
10-6-72

DATE RECORDED 11-1-72

GRAIN SIZE IN MILLIMETERS

The graph illustrates the relationship between the percentage of material passing through a sieve and the percentage retained. The Y-axis, labeled 'PERCENT PASSING', uses a logarithmic scale from 0.00 to 100. The X-axis, labeled 'PERCENT RETAINED', uses a linear scale from 0 to 100. The plotted curve shows that as the percentage of material retained increases, the percentage of material passing decreases, following a concave-up trend.

| PERCENT RETAINED (X) | PERCENT PASSING (Y) |
|----------------------|---------------------|
| 0                    | 100                 |
| 10                   | 80                  |
| 20                   | 60                  |
| 30                   | 45                  |
| 40                   | 35                  |
| 50                   | 25                  |
| 60                   | 18                  |
| 70                   | 12                  |
| 80                   | 8                   |
| 90                   | 5                   |
| 100                  | 0                   |

PERCENT PASSING

A blank graph grid for plotting data. The vertical axis is labeled 'PERCENT' and has major tick marks at 0, 10, 20, 30, 40, 50, 60, 70, and 80. The horizontal axis has major tick marks every 10 units from 0 to 100. The grid consists of solid lines for the major axes and dashed lines for the minor grid.

[illegible]

|   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | 000 | 001 | 002 | 003 | 004 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 013 | 014 | 015 | 016 | 017 | 018 | 019 | 020 | 021 | 022 | 023 | 024 | 025 | 026 | 027 | 028 | 029 | 030 | 031 | 032 | 033 | 034 | 035 | 036 | 037 | 038 | 039 | 040 | 041 | 042 | 043 | 044 | 045 | 046 | 047 | 048 | 049 | 050 | 051 | 052 | 053 | 054 | 055 | 056 | 057 | 058 | 059 | 060 | 061 | 062 | 063 | 064 | 065 | 066 | 067 | 068 | 069 | 070 | 071 | 072 | 073 | 074 | 075 | 076 | 077 | 078 | 079 | 080 | 081 | 082 | 083 | 084 | 085 | 086 | 087 | 088 | 089 | 090 | 091 | 092 | 093 | 094 | 095 | 096 | 097 | 098 | 099 | 100 |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

| CLAY | SILT | SAND | GRAVEL |
|------|------|------|--------|
|      |      |      |        |

|             |                 |
|-------------|-----------------|
| PROJECT     | DENVER HIGHWAY  |
| LOCATION    | STATION 4154+00 |
| HOLE NO.    | DM 31           |
| DEPTH       | 8'              |
| SAMPLE TYPE | Bag-            |
| LAB. NO.    | 41569           |

|           |       |
|-----------|-------|
| LAB. NO.  | 4569  |
| LOCATION  |       |
| HOLE NO.  | R1431 |
| DEPTH     | 8'    |
| FIELD NO. | 42    |

## LABORATORY'S REMARKS

|               |         |
|---------------|---------|
| DATE SAMPLED  | 6-6-72  |
| DATE RECEIVED | 13-6-72 |
| DATE RECORDED | 13-7-72 |

# GRAIN SIZE ANALYSIS :

| % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE |
|-------------------------|---------------|-------------------------|---------------|-------------------------|---------------|-------------------------|---------------|
| 100.0                   |               |                         |               |                         |               |                         |               |
| 97.9                    |               |                         |               |                         |               |                         |               |
| 76.3                    |               |                         |               |                         |               |                         |               |
| 46.3                    |               |                         |               |                         |               |                         |               |
| 30.1                    |               |                         |               |                         |               |                         |               |
| 24.1                    |               |                         |               |                         |               |                         |               |
| 18.9                    |               |                         |               |                         |               |                         |               |
| 16.5                    |               |                         |               |                         |               |                         |               |

| CLASSIFICATION           | L.L. | P.L. | P.I. | NAT.<br>%W | F.M. |
|--------------------------|------|------|------|------------|------|
| SC - CLAY SAND           | 25.3 | 17.2 | 8.1  | 116        |      |
| LOW TO MEDIUM PLASTICITY |      |      |      |            |      |

CRUSH COUNT

%

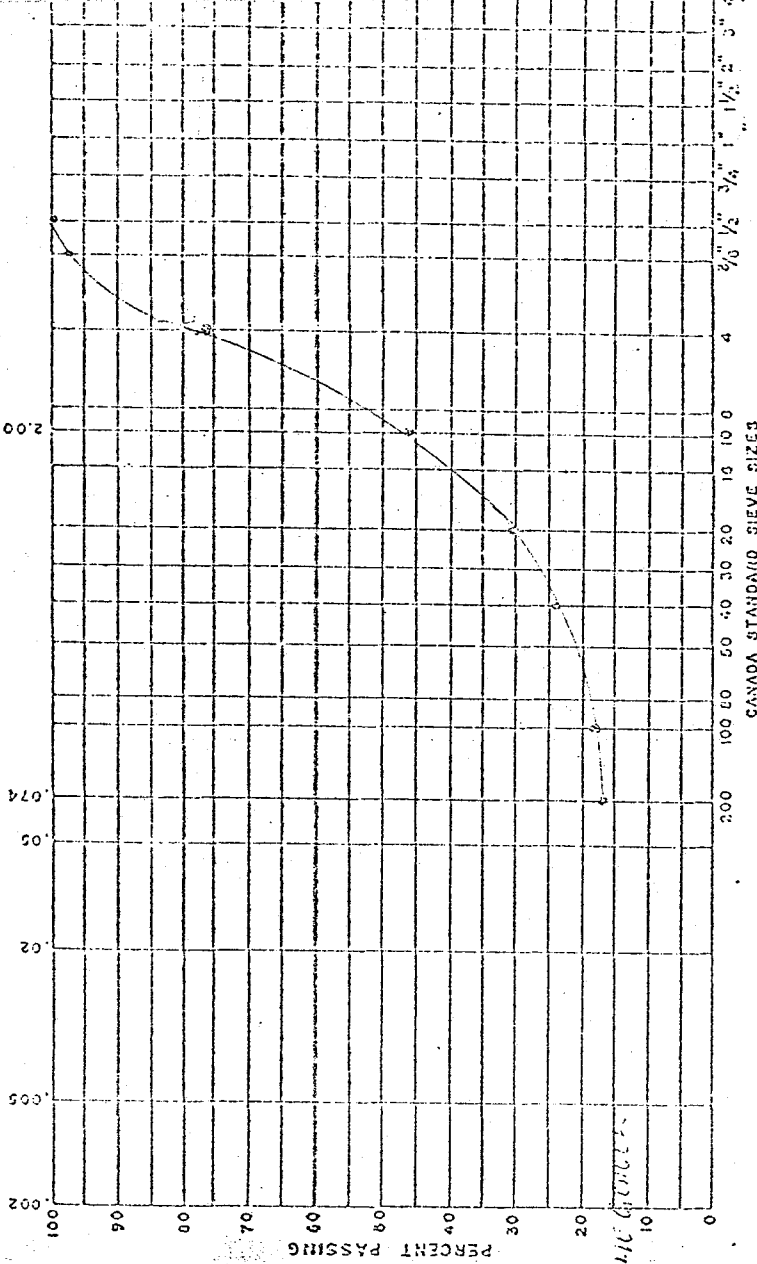
## PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |

## PARTICLE SHAPE ANALYSIS

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

GRAIN SIZE IN MILLIMETERS



PROJECT ..... DEMETER HIGHWAY  
 LOCATION ..... STATION 1194+00 d  
 HOLE NO. .... 21431  
 DEPTH ..... 15' FIELD NO. 43  
 SAMPLE TYPE ..... Bag

LAB. NO.

4570

LABORATORY'S REMARKS

|               |         |
|---------------|---------|
| DATE SAMPLED  | 6-6-72  |
| DATE RECEIVED | 13-6-72 |
| DATE RECORDED | 11-7-72 |

|                                   |                                          |
|-----------------------------------|------------------------------------------|
| BORE HOLE NO.<br><b>RM 30</b>     | BORE HOLE POSITION<br><b>Sta 4-198 ♀</b> |
| DATE AND TIME<br><b>June 6/72</b> |                                          |
| DPW TECHNICIAN                    | FINISHED:                                |
| CONTRACTOR                        | DRILLER                                  |
| METHOD OF BORING                  | GAUGE READING                            |
| SOIL:                             | CASING HAMMER WT. .... LBS.              |
| ROCK:                             | DROP..... INCHES                         |

| DESCRIPTION OF STRATA  | DEPTH (FT.) | ELEV. (FT.) | BLOWS PER FOOT | SAMPLE |         |      |                 | BLOWS PER 6 IN. | SAMPLE NO. | SAMPLE DESCRIPTION AND BORING NOTES              |
|------------------------|-------------|-------------|----------------|--------|---------|------|-----------------|-----------------|------------|--------------------------------------------------|
|                        |             |             |                | NO.    | SYM-BOL | TYPE | RE-TAINED (FT.) |                 |            |                                                  |
| organic                | 0           |             |                |        |         |      |                 |                 |            | unfrozen                                         |
| silty clay             | 1           |             |                |        |         |      |                 |                 |            | dark brown, compact, unfrozen                    |
| ll                     | 2           |             |                |        |         |      |                 |                 |            |                                                  |
| ll                     | 3           |             |                |        |         |      |                 |                 |            |                                                  |
| silty clay with gravel | 4           |             |                |        |         |      |                 |                 |            | hard drilling, dk. grey, frozen                  |
| ll                     | 5           |             |                |        |         |      |                 |                 |            |                                                  |
| ll                     | 6           |             |                |        |         |      |                 |                 |            | after drilling, dk. grey, frozen                 |
| ll                     | 7           |             |                |        |         |      |                 |                 |            |                                                  |
| ll                     | 8           |             |                |        |         |      |                 |                 |            |                                                  |
| ll                     | 9           |             |                |        |         |      |                 |                 |            |                                                  |
| ll                     | 10          |             |                |        |         |      |                 |                 |            |                                                  |
| ll                     | 11          |             |                |        |         |      |                 |                 |            |                                                  |
| ll                     | 12          |             |                |        |         |      |                 |                 |            |                                                  |
| silty clay & gravel    | 13          |             |                |        |         |      |                 |                 |            | dk. grey & dk. grey, frozen with little moisture |
| ll                     | 14          |             |                |        |         |      |                 |                 |            |                                                  |
| ll                     | 15          |             |                | 39     | 111     | A    |                 |                 | 39         |                                                  |

# GRAIN SIZE ANALYSIS :

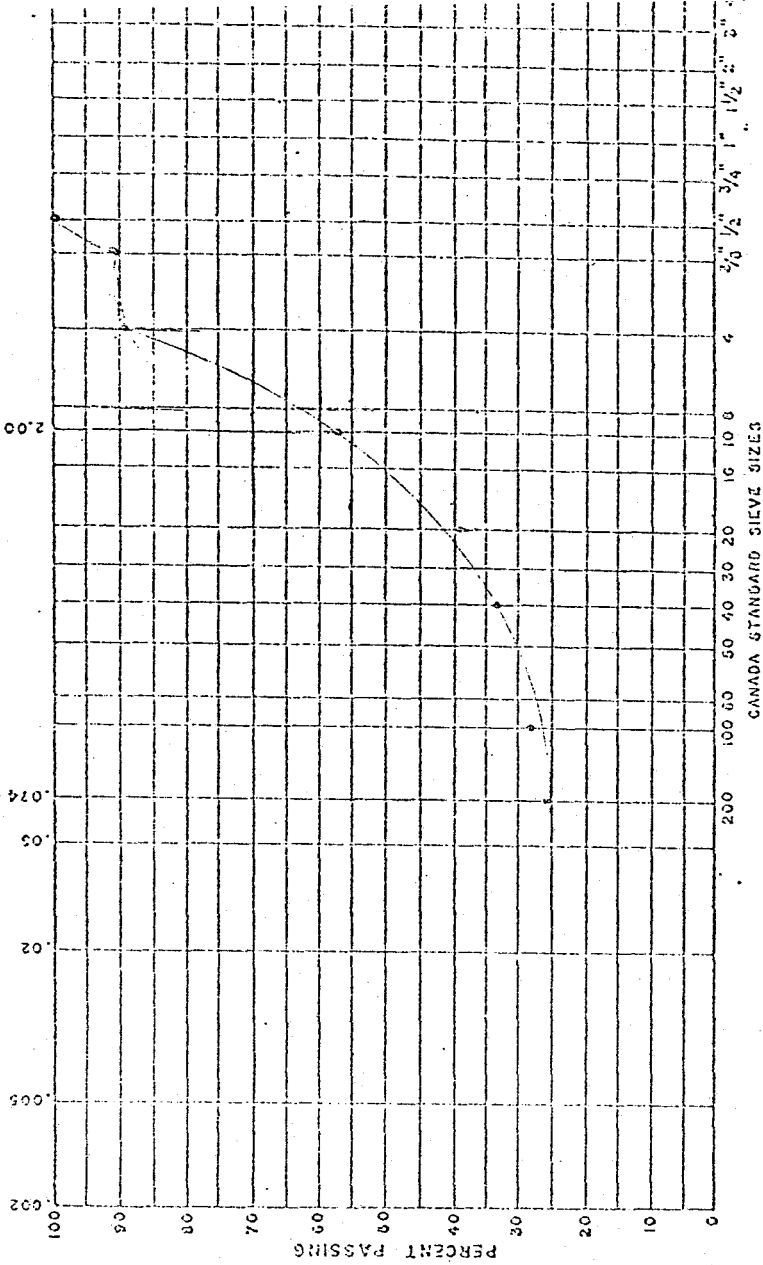
| % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE |
|-------------------------|---------------|-------------------------|---------------|-------------------------|---------------|-------------------------|---------------|
| 100.0                   |               |                         |               |                         |               |                         |               |
| 99.2                    |               |                         |               |                         |               |                         |               |
| 89.1                    |               |                         |               |                         |               |                         |               |
| 57.3                    |               |                         |               |                         |               |                         |               |
| 39.7                    |               |                         |               |                         |               |                         |               |
| 33.8                    |               |                         |               |                         |               |                         |               |
| 28.1                    |               |                         |               |                         |               |                         |               |
| 25.2                    |               |                         |               |                         |               |                         |               |

| CLASSIFICATION           | L.L. | P.L. | P.L. | NAT.<br>%W | F.M. |
|--------------------------|------|------|------|------------|------|
| SILT-CLAYEY SAND         | 27.1 | 18.3 | 8.8  | 9.3        |      |
| LOW TO MEDIUM PLASTICITY |      |      |      |            |      |

CRUSH COUNT

%

GRAIN SIZE IN MILLIMETERS



## PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |

## PARTICLE SHAPE ANALYSIS

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

PROJECT ..... *DEMPSEY HIGHWAY* .....  
 LOCATION ..... *STATION 4198+00.0* .....  
 HOLE NO. .... *R430* .....  
 DEPTH ..... *15'* ..... FIELD NO. .... *39* .....  
 SAMPLE TYPE ..... *BAC* .....

LAB. NO.  
4571

LABORATORY'S REMARKS

|               |         |
|---------------|---------|
| DATE SAMPLED  | 6-6-72  |
| DATE RECEIVED | 13-6-72 |
| DATE RECORDED | 11-7-72 |

| BORE HOLE NO.         |  | BORE HOLE POSITION                  |  | DATE AND TIME              |  |
|-----------------------|--|-------------------------------------|--|----------------------------|--|
| CONTRACTOR            |  | DRILLER                             |  | Gauge Reading              |  |
| METHOD OF BORING      |  | SOIL:                               |  | Casing Hammer Wt. ....LBS. |  |
| ROCK:                 |  | DROP.....INCHES                     |  | Casing Size                |  |
| DESCRIPTION OF STRATA |  | DEPTH (FT.)                         |  | ELEV. (FT.)                |  |
| BLOWS PER FOOT        |  | SAMPLE NO.                          |  | SYM-BOL                    |  |
| TYPE                  |  | RE-TAINED (FT.)                     |  | BLOWS PER 6 IN.            |  |
| SAMPLE NO.            |  | SAMPLE DESCRIPTION AND BORING NOTES |  |                            |  |
| rocks & sandy silt    |  | 0                                   |  |                            |  |
| 1                     |  |                                     |  |                            |  |
| 2                     |  | 31                                  |  | 1111 1A                    |  |
| 3                     |  |                                     |  |                            |  |
| 4                     |  |                                     |  |                            |  |
| 5                     |  |                                     |  |                            |  |
| 6                     |  |                                     |  |                            |  |
| silty gravel          |  | 7                                   |  |                            |  |
| 8                     |  |                                     |  |                            |  |
| clayey silty gravel   |  | 9                                   |  | 32 1111 1A                 |  |
| 10                    |  |                                     |  |                            |  |
| 11                    |  |                                     |  |                            |  |
| 12                    |  |                                     |  |                            |  |
| 13                    |  |                                     |  |                            |  |
| 14                    |  |                                     |  |                            |  |
| 15                    |  |                                     |  |                            |  |

[illegible]

# GRAIN SIZE ANALYSIS:

| % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE |
|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
| 100               |            |                   |            |                   |            |                   |            |                   |            |
| 94.3              |            |                   |            |                   |            |                   |            |                   |            |
| 87.7              |            |                   |            |                   |            |                   |            |                   |            |
| 69.5              |            |                   |            |                   |            |                   |            |                   |            |
| 34.4              |            |                   |            |                   |            |                   |            |                   |            |
| 44.5              |            |                   |            |                   |            |                   |            |                   |            |
| 39.6              |            |                   |            |                   |            |                   |            |                   |            |

| CLASSIFICATION | L.L. | P.L. | P.I. | NAT. %W | F.M. |
|----------------|------|------|------|---------|------|
| SM - SILT SAND |      |      | 1.0  | 27.3    |      |
| LOW PLASTICITY |      |      |      |         |      |

CRUSH COUNT

%

## PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |

## PARTICLE SHAPE ANALYSIS

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

GRAIN SIZE IN MILLIMETERS

100 90 80 70 60 50 40 30 20 10 0

PERCENT PASSING

CANADA STANDARD SIEVE SIZES

200 100 60 50 40 30 20 10 6 4

1/2 3/4 1 1 1/2 2 3 4

CLAY

SILT

SAND

GRAVEL

LAB. NO.

4572

PROJECT DEMETER HIGHWAY

LOCATION STATION 433+70.4

HOLE NO. RM 25

DEPTH 2' FIELD NO. 31

SAMPLE TYPE PAC

LABORATORY'S REMARKS

DATE SAMPLED

6-6-72

DATE RECEIVED

12-6-72

DATE RECORDED

12-7-72

GRAIN SIZE IN MILLIMETERS

PERCENT PASSING

CANADIAN STANDARD SIEVE SIZES

| Sieve Size | Percent Passing |
|------------|-----------------|
| 200        | 0.075           |
| 100        | 0.15            |
| 50         | 0.3             |
| 25         | 0.6             |
| 12         | 1.2             |
| 6          | 2.5             |
| 5          | 3.5             |

|      |      |      |        |
|------|------|------|--------|
| CLAY | SILT | SAND | GRAVEL |
|------|------|------|--------|

PETROGRAPHIC ANALYSIS

|             |                   |
|-------------|-------------------|
| PROJECT     | DEANSTER HIGHWAY  |
| LOCATION    | STATION 4233.1756 |
| HOLE NO.    | RM 25             |
| DEPTH       | 9' 1/2"           |
| SAMPLE TYPE | BAG               |
|             | FIELD NO. 32      |

## PARTICLE SHAPE ANALYSIS

|                      |               |         |
|----------------------|---------------|---------|
| LABORATORY'S REMARKS | DATE SAMPLED  | 6-6-72  |
|                      | DATE RECEIVED | 13-6-72 |
|                      | DATE RECORDED | 11-7-72 |

# GRAIN SIZE ANALYSIS:

| FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT |
|-----------------------|---------------|-------------------------|---------------|-------------------------|---------------|-------------------------|
| 100.0                 |               |                         |               |                         |               |                         |
| 86.1                  |               |                         |               |                         |               |                         |
| 43.5                  |               |                         |               |                         |               |                         |
| 34.3                  |               |                         |               |                         |               |                         |
| 30.4                  |               |                         |               |                         |               |                         |
| 25.4                  |               |                         |               |                         |               |                         |
| 22.5                  |               |                         |               |                         |               |                         |

| CLASSIFICATION    |  |  | L.L. | P.L. | P.I. | NAT.<br>%W | F.M. |
|-------------------|--|--|------|------|------|------------|------|
| C - CORRELLEN     |  |  | 21.7 | 19.2 | 11.5 | 9.7        |      |
| MEDIUM PLASTICITY |  |  |      |      |      |            |      |

CRUSH COUNT

%

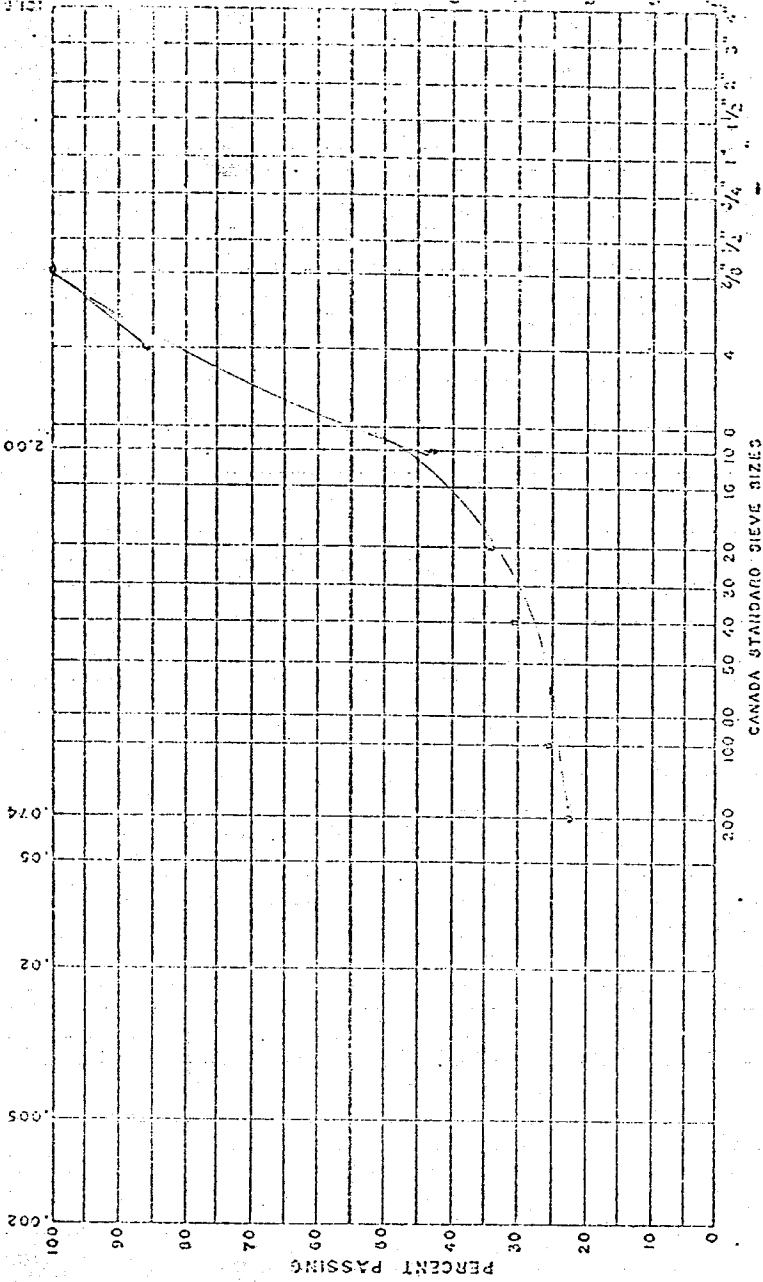
## PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |

## PARTICLE SHAPE ANALYSIS

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

# GRAIN SIZE IN MILLIMETERS



PROJECT ..... DENNISER HIGHWAY.....

LOCATION ..... STATION 47+33.1754.....

HOLE NO. .... RM 25.....

DEPTH ..... 16' ..... FIELD NO. .... 33.....

SAMPLE TYPE ..... Bag.....

LAB. NO.  
4574

LABORATORY'S REMARKS

DATE SAMPLED 6-6-72

DATE RECEIVED 13-6-72

DATE RECORDED 11-7-72

# GRAIN SIZE ANALYSIS

| % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE |
|-------------------|------------|-------------------|------------|-------------------|------------|-------------------|------------|
| 100.0             |            |                   |            |                   |            |                   |            |
| 96.2              |            |                   |            |                   |            |                   |            |
| 81.3              |            |                   |            |                   |            |                   |            |
| 60.1              |            |                   |            |                   |            |                   |            |
| 49.7              |            |                   |            |                   |            |                   |            |
| 41.3              |            |                   |            |                   |            |                   |            |
| 38.4              |            |                   |            |                   |            |                   |            |

| CLASSIFICATION    |      |      |          | F.M.              |  |
|-------------------|------|------|----------|-------------------|--|
| L.L.              | P.L. | P.L. | NAT. % W |                   |  |
| 311               | 194  | 117  | 9.9      |                   |  |
| SC - CLAYEY SAND  |      |      |          | SAND-SILT MIXTURE |  |
| MEDIUM PLASTICITY |      |      |          |                   |  |

CRUSH COUNT

%

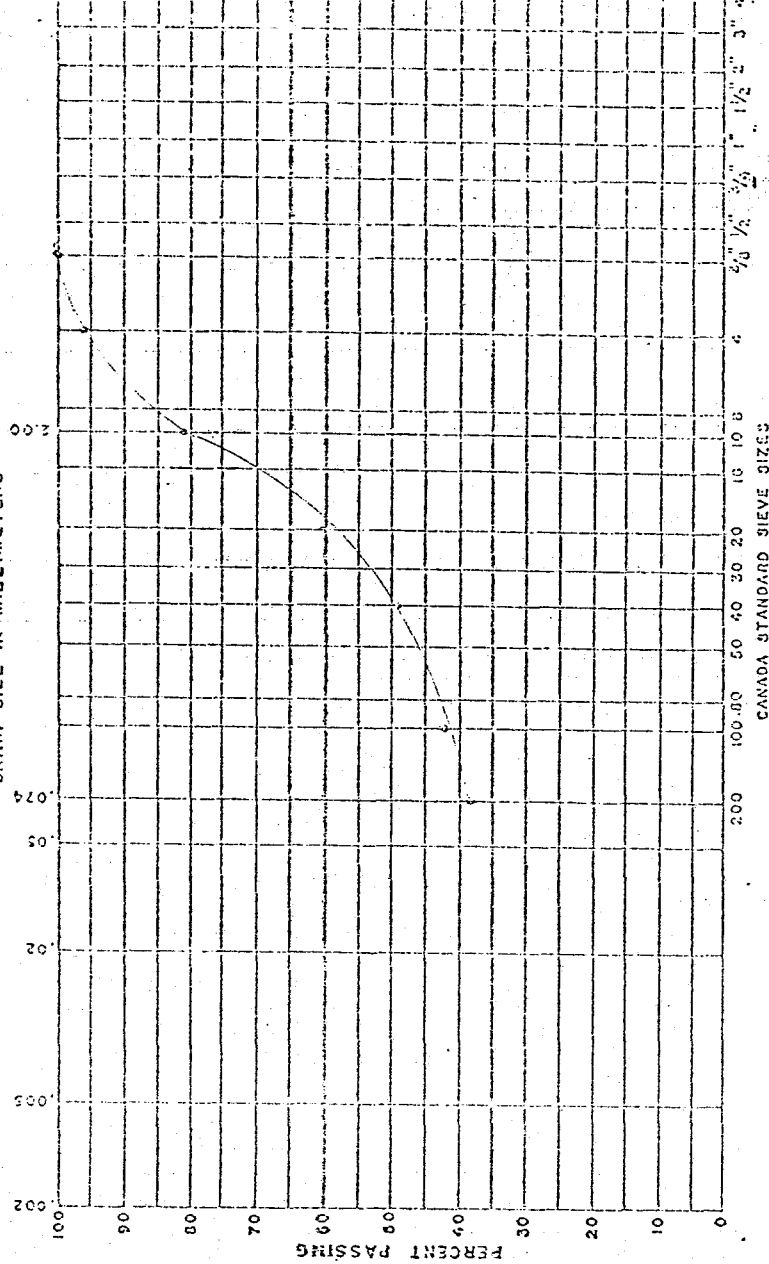
## PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |

## PARTICLE SHAPE ANALYSIS

|  |  |
|--|--|
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

GRAIN SIZE IN MILLIMETERS



CLAY

SILT

SAND

GRAVEL

LAB. NO.

4575

PROJECT ..... DEMPSTER HIGHWAY

LOCATION ..... STATION 4233 + 75d

HOLE NO. .... RM 35

DEPTH ..... 21' FIELD NO. .... 34

SAMPLE TYPE ..... DOC

LABORATORY'S REMARKS

DATE SAMPLED

6-6-72

DATE RECEIVED

13-6-72

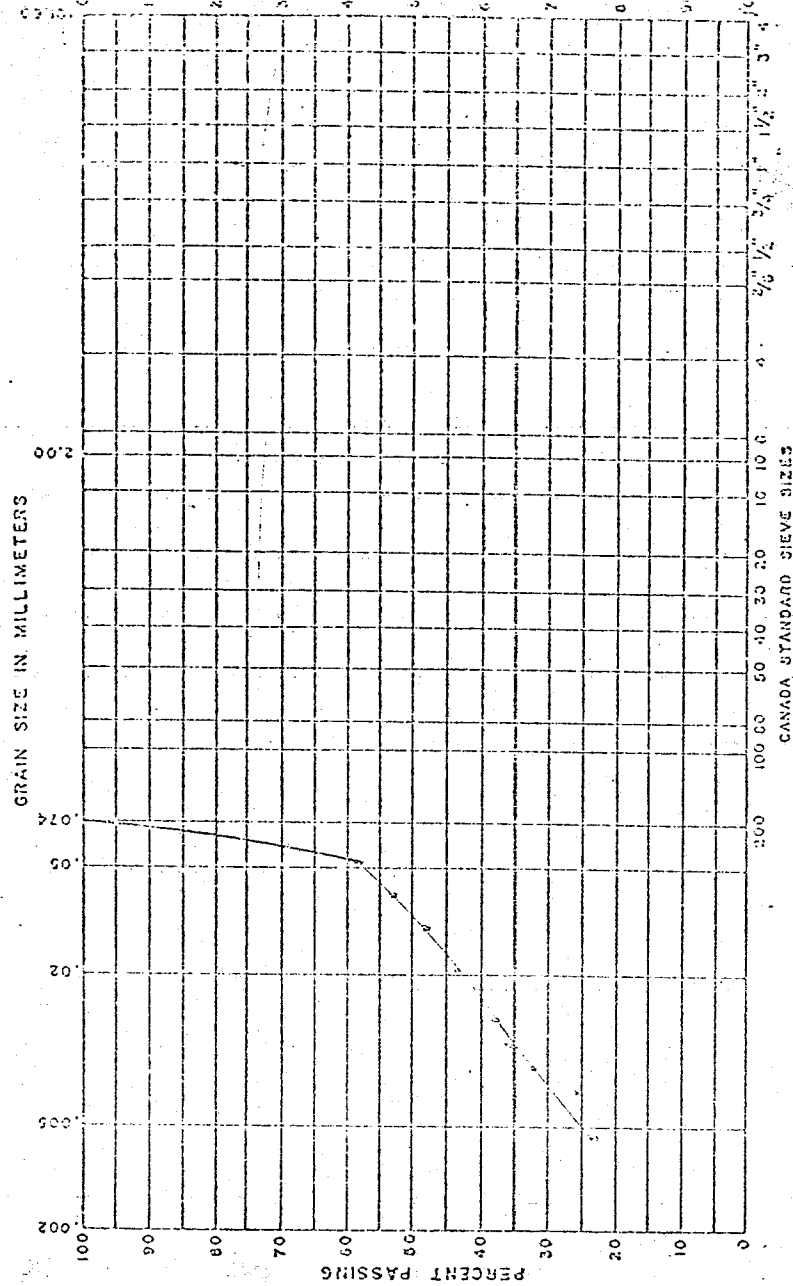
DATE RECORDED

11-7-72

[illegible]



| GRAIN SIZE ANALYSIS   |               |                         |               |                         |               |                         |
|-----------------------|---------------|-------------------------|---------------|-------------------------|---------------|-------------------------|
| D <sub>75</sub> 100   |               |                         |               |                         |               |                         |
| FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | STEVE<br>SIZE | % FINER<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINER<br>BY<br>WEIGHT |
|                       |               |                         | 1056          | 57.28                   | 100           | 23.9                    |
|                       |               |                         | 1041          | 43.1                    |               |                         |
|                       |               |                         | 1029          | 48.4                    |               |                         |
|                       |               |                         | 1021          | 43.3                    |               |                         |
|                       |               |                         | 1014          | 35.6                    |               |                         |
|                       |               |                         | 1011          | 35.2                    |               |                         |
|                       |               |                         | 10083         | 31.7                    |               |                         |
|                       |               |                         | 10058         | 26.1                    |               |                         |
| CLASSIFICATION        |               |                         | LL            | PL                      | NAT.<br>%W    | F.M.                    |
|                       |               |                         | 30.2          | 15.2                    | 26.4          |                         |
| AK - INORGANIC        |               |                         | 50.00         | 51.7                    |               |                         |
| LCL                   |               |                         | 2.05          | 1.7                     |               |                         |
| CRUSH COUNT           |               |                         |               |                         |               |                         |
| %                     |               |                         |               |                         |               |                         |



|      |      |      |         |
|------|------|------|---------|
| CLAY | SILT | SAND | GRAVEL. |
|------|------|------|---------|

LAB. NO. 4577

|             |                   |
|-------------|-------------------|
| PROJECT     | DEMPSTER HIGHWAY  |
| LOCATION    | STATION 4338+00.0 |
| HOLE NO.    | DP24              |
| DEPTH       | 6' 1/2'           |
| SAMPLE TYPE | DRG               |
| FIELD NO.   | 22                |

| LABORATORY'S REMARKS            | DATE SAMPLED |
|---------------------------------|--------------|
| INSUFFICIENT FOR SPECT ANALYSIS | 6-6-72       |
| (ID)                            | 13-6-72      |
|                                 | 13-7-72      |

[illegible]

[illegible]

2, 3, 4, 1

| % FINE<br>BY<br>WEIGHT | SIEVE<br>SIZE | % FINE<br>BY<br>WEIGHT |
|------------------------|---------------|------------------------|
| .0967                  | No. 20        | .0967                  |
| .829                   | No. 60        | .829                   |
| .014                   | No. 100       | .014                   |
| .011                   | No. 200       | .011                   |
| .003                   | No. 425       | .003                   |
| .0058                  | No. 600       | .0058                  |

| CLASSIFICATION | L.L. | PL.  | RI.  | NAT.<br>%W | FM. |
|----------------|------|------|------|------------|-----|
| 15.8           | 14.4 | 14.4 | 56.5 |            |     |
| 14.4           | 14.4 | 14.4 | 56.5 |            |     |

CRUSH COUNT

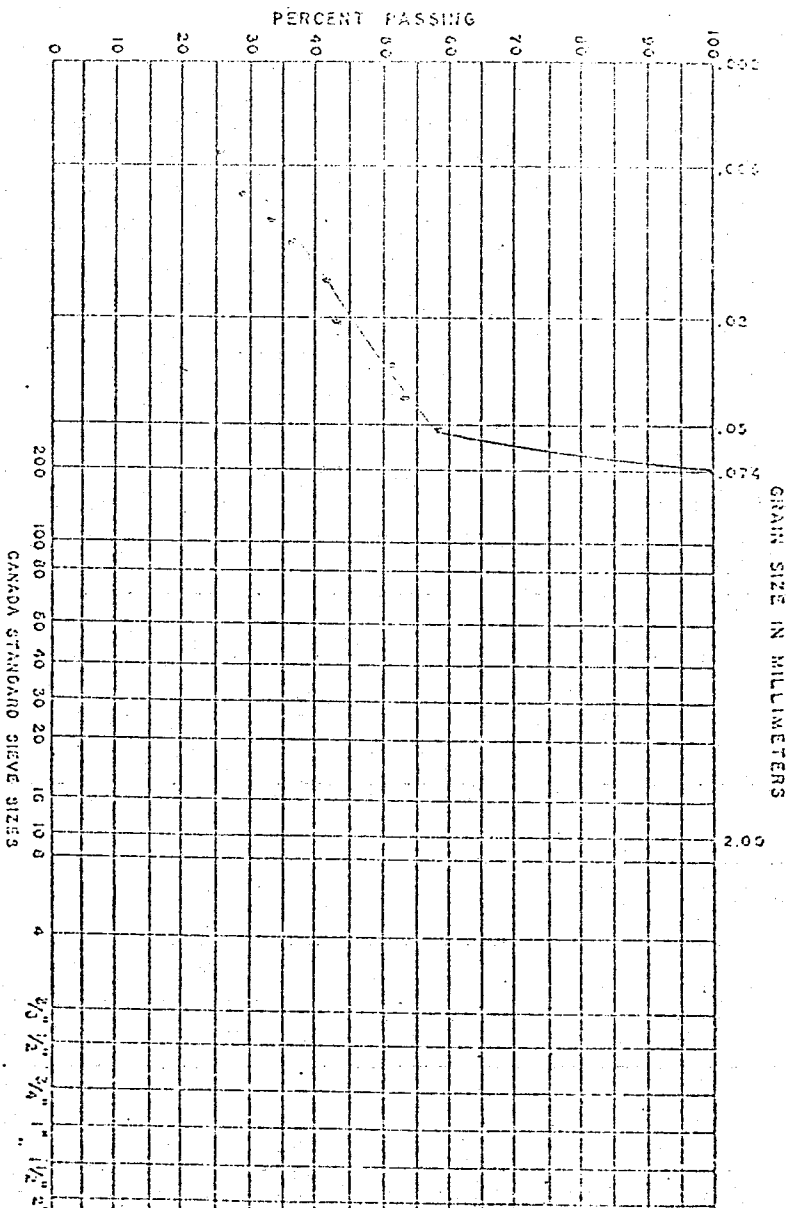
%

# PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
| SALT          |                   |
| CLAY          |                   |
| LIMESTONE     |                   |
| GRAVEL        |                   |
| SANDSTONE     |                   |
| SLATE         |                   |
| QUARTZITE     |                   |
| DIORITE       |                   |
| OTHER         |                   |

# PARTICLE SHAPE ANALYSIS

|             |  |
|-------------|--|
| CTG         |  |
| RYANOVN - D |  |
| RYANOVN     |  |
| RYANOVN - E |  |
| CTG         |  |



| CLAY | SILT | SAND | GRAVEL |
|------|------|------|--------|
|      |      |      |        |

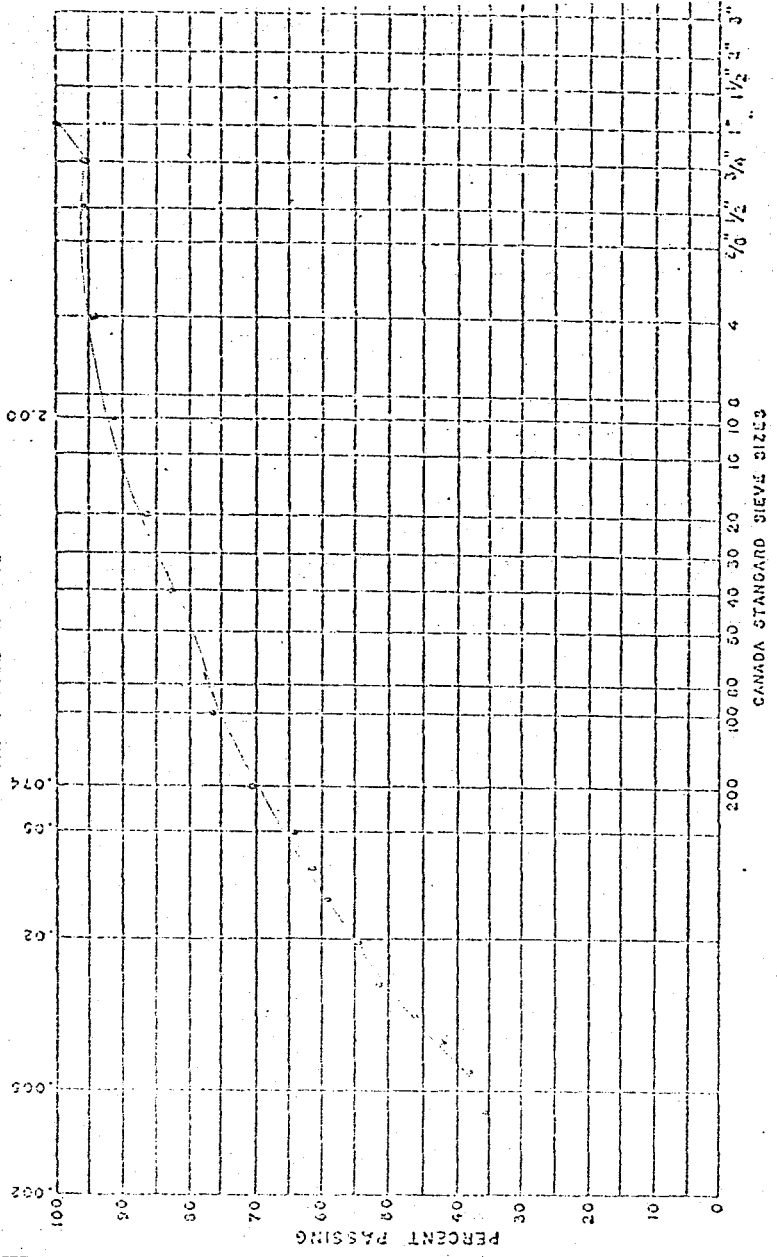
|                   |                     |              |
|-------------------|---------------------|--------------|
| PROJECT .....     | DENNIS T. HEDGECOCK |              |
| LOCATION .....    | STATION #271400 d   |              |
| HOLE NO. ....     | R4119               |              |
| DEPTH .....       | 6'                  | FIELD NO. 23 |
| SAMPLE TYPE ..... | 1200                |              |

LAB. NO.  
4578

| LABORATORY'S REMARKS        |  |
|-----------------------------|--|
| TAN. RESIDUAL TAN. RESIDUAL |  |
| DATE RECEIVED 10-6-72       |  |
| DATE SAMPLED 5-6-73         |  |
| DATE RECORDED 11-7-72       |  |
| TESTED BY 211               |  |

[illegible]

GRAIN SIZE IN MILLIMETERS



LAB. NO.  
4579

PROJECT ..... DENVER HIGHWAY .....  
LOCATION ..... STATION 4288+000 .....  
HOLE NO. .... RAIL .....  
DEPTH ..... 3' ..... FIELD NO. .... 31 .....  
SAMPLE TYPE ..... BAG .....

LABORATORY'S REMARKS

DATE SAMPLED 5-6-22

DATE RECEIVED 13-6-22

DATE RECORDED 14-7-22

| % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | NAT. %W | F.M. |
|-------------------|------------|-------------------|------------|-------------------|---------|------|
| 100               | #10        | 100               | #10        | 100               |         |      |
| 95                | #20        | 95                | #20        | 95                |         |      |
| 90                | #40        | 90                | #40        | 90                |         |      |
| 85                | #60        | 85                | #60        | 85                |         |      |
| 80                | #80        | 80                | #80        | 80                |         |      |
| 75                | #100       | 75                | #100       | 75                |         |      |
| 70                | #120       | 70                | #120       | 70                |         |      |
| 65                | #150       | 65                | #150       | 65                |         |      |
| 60                | #200       | 60                | #200       | 60                |         |      |
| 55                | #250       | 55                | #250       | 55                |         |      |
| 50                | #300       | 50                | #300       | 50                |         |      |
| 45                | #350       | 45                | #350       | 45                |         |      |
| 40                | #400       | 40                | #400       | 40                |         |      |
| 35                | #450       | 35                | #450       | 35                |         |      |
| 30                | #500       | 30                | #500       | 30                |         |      |
| 25                | #550       | 25                | #550       | 25                |         |      |
| 20                | #600       | 20                | #600       | 20                |         |      |
| 15                | #650       | 15                | #650       | 15                |         |      |
| 10                | #700       | 10                | #700       | 10                |         |      |
| 5                 | #750       | 5                 | #750       | 5                 |         |      |
| 0                 | #800       | 0                 | #800       | 0                 |         |      |

| PETROGRAPHIC ANALYSIS   |                   |
|-------------------------|-------------------|
| MATERIAL TYPE           | % OF TOTAL SAMPLE |
|                         |                   |
|                         |                   |
|                         |                   |
| ONE                     |                   |
|                         |                   |
|                         |                   |
|                         |                   |
|                         |                   |
| SITE                    |                   |
|                         |                   |
| PARTICLE SHAPE ANALYSIS |                   |
|                         |                   |
|                         |                   |
| UND                     |                   |
| R                       |                   |
| GULAR                   |                   |
|                         |                   |

# GRAIN SIZE ANALYSIS

7/4/41

| VE  | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT |
|-----|-------------------|------------|-------------------|------------|-------------------|
| 10  | 100.0             |            | 100.0             |            | 100.0             |
| 20  | 98.3              |            | 98.3              |            | 98.3              |
| 40  | 93.9              |            | 93.9              |            | 93.9              |
| 60  | 88.8              |            | 88.8              |            | 88.8              |
| 80  | 85.1              |            | 85.1              |            | 85.1              |
| 100 | 80.5              |            | 80.5              |            | 80.5              |
| 120 | 77.9              |            | 77.9              |            | 77.9              |

| CLASSIFICATION    | L.L. | P.L. | NAT. %W | F.M. |
|-------------------|------|------|---------|------|
| ML - MOD. CLAY    | 32.8 | 22.9 | 50.9    |      |
| CLAY TO MOD. CLAY |      |      |         |      |

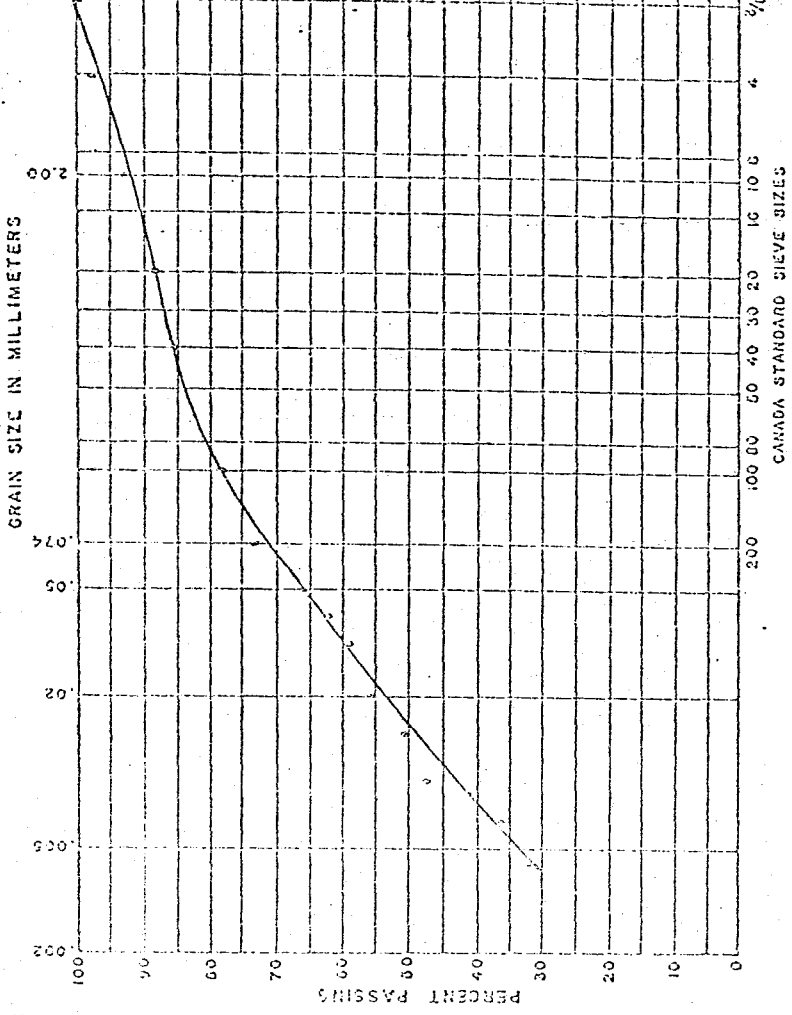
| CRUSH COUNT | % |
|-------------|---|
|             |   |

## PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
| CLAY          |                   |
| STONE         |                   |
| GLASS         |                   |
| ITZITE        |                   |
| IND           |                   |

## PARTICLE SHAPE ANALYSIS

| ROUND | ANGULAR |
|-------|---------|
|       |         |



LAB. NO.  
4580

PROJECT ..... DEMETER HIGHWAY

LOCATION ..... STATION 4280+00

HOLE NO. .... RM 18

DEPTH ..... 7' FIELD NO. .... 32

SAMPLE TYPE ..... BAG

LABORATORY'S REMARKS

DATE SAMPLED 5-6-72

DATE RECEIVED 13-6-72

DATE RECORDED 20-7-72

[illegible]

| WEIGHT | SIZE | BY WEIGHT | STAVE SIZE | WEIGHT | % FINER BY WEIGHT |
|--------|------|-----------|------------|--------|-------------------|
| 107.0  |      |           | 105.9      | 66.3   | 100.0             |
| 91.1   |      |           | 104.2      | 57.3   | 93.1              |
| 85.6   |      |           | 103.0      | 55.8   |                   |
| 81.3   |      |           | 102.1      | 54.8   |                   |
| 77.7   |      |           | 101.5      | 53.2   |                   |
| 75.4   |      |           | 101.1      | 51.9   |                   |
| 68.2   |      |           | 100.9      | 50.9   |                   |
|        |      |           | 100.0      | 37.6   |                   |

| CLASSIFICATION    | L.L. | P.L. | R.I. | NAT. %W | F.M. |
|-------------------|------|------|------|---------|------|
| CLAYEY SILTY SAND | 24.4 | 16.7 | 7.7  | 37.8    |      |
| CLAYEY SILTY SAND |      |      |      |         |      |
| CLAYEY SILTY SAND |      |      |      |         |      |

CRUSH COUNT

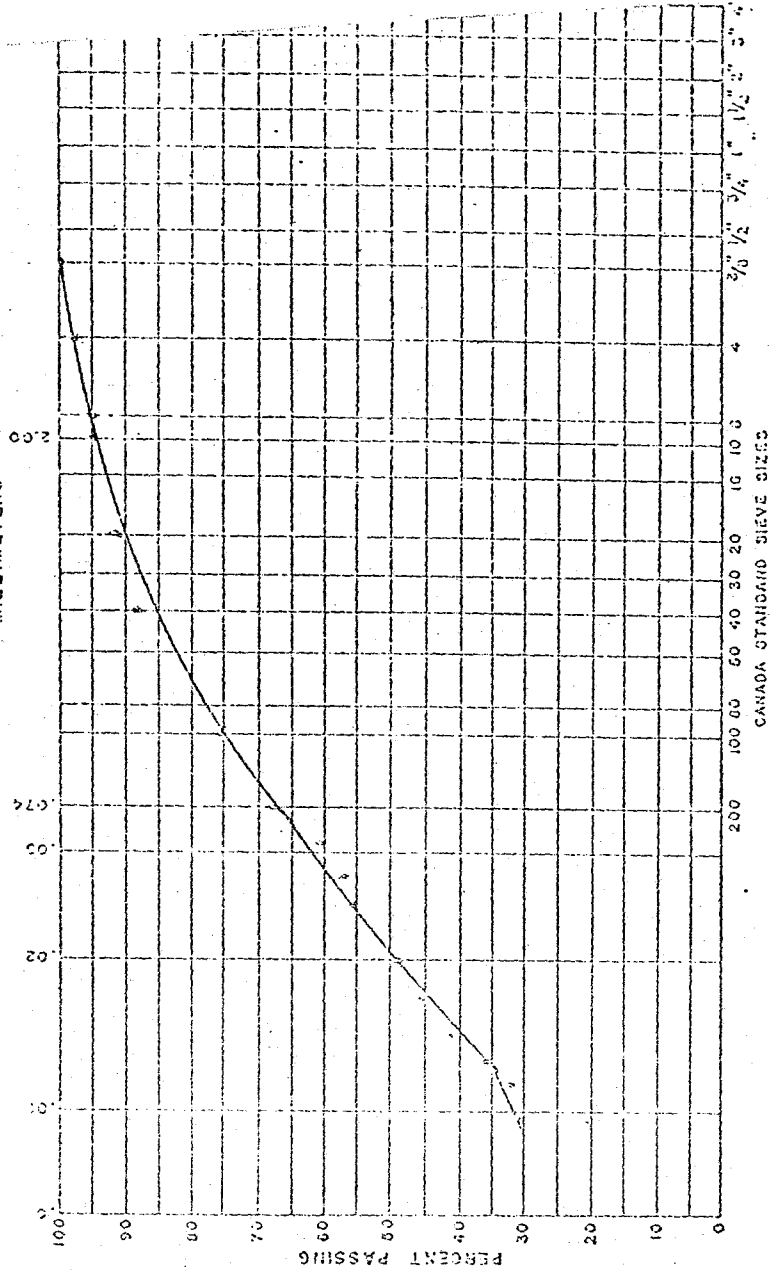
%

# PETROGRAPHIC ANALYSIS

| MATERIAL TYPE | % OF TOTAL SAMPLE |
|---------------|-------------------|
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |
|               |                   |

# PARTICLE SHAPE ANALYSIS

|  |
|--|
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |



| CLAY | SILT | SAND | GRAVEL |
|------|------|------|--------|
|------|------|------|--------|

PROJECT ..... *DEMPSTER HIGHWAY* .....

LOCATION ..... *STATION 1305+00* .....

HOLE NO. .... *RN 14* .....

DEPTH ..... *5'* ..... FIELD NO. .... *17* .....

SAMPLE TYPE ..... *BAC* .....

LAB. NO.  
*4581*

LABORATORY'S REMARKS

DATE SAMPLED *5-6-72*

DATE RECEIVED *13-6-72*

DATE RECORDED *20-7-72*

TESTER *RV*

GRAIN SIZE IN MILLIMETERS

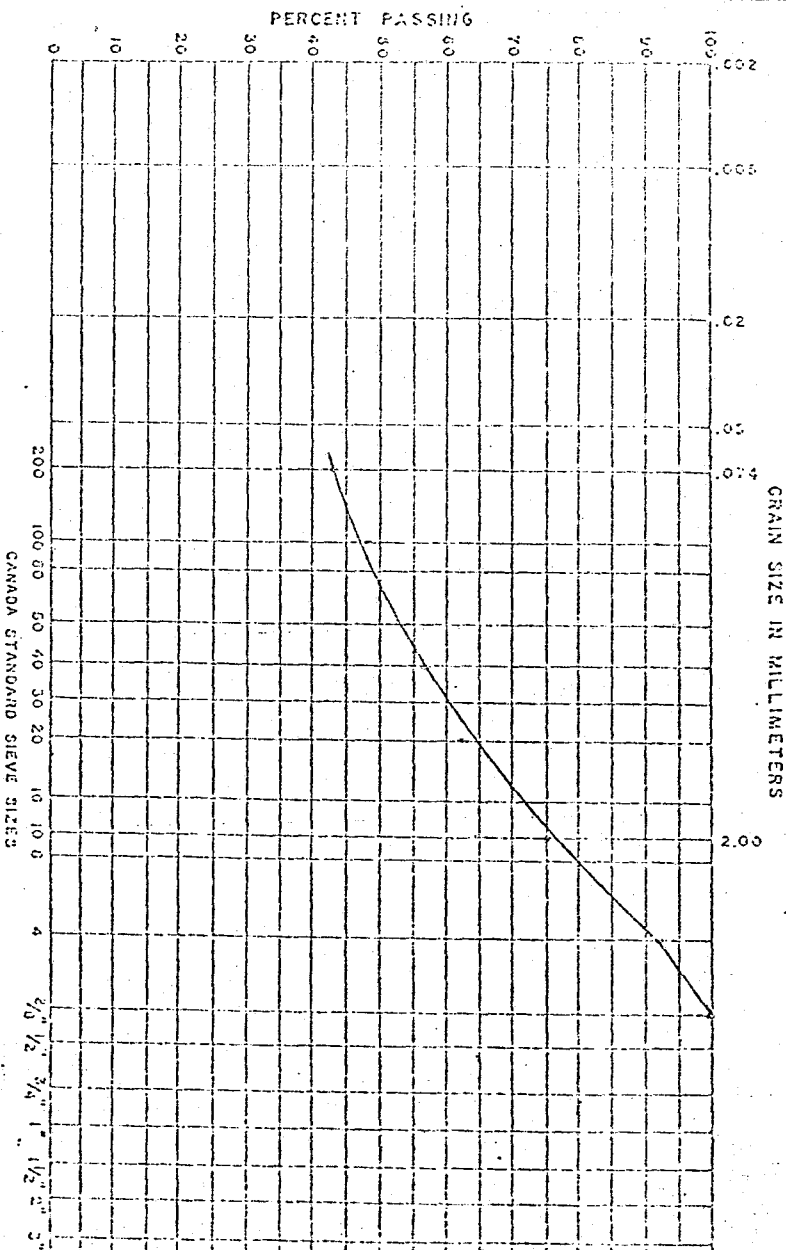
| CLASSIFICATION | L.L.   | P.L.   | P.I.   | NAT.<br>%W | F.M. |
|----------------|--------|--------|--------|------------|------|
| 342            | 123    | 69     | 10.2   |            |      |
| 342-00         | CLANCT | 342-00 | CLANCT |            |      |
| 342-00         | CLANCT | 342-00 | CLANCT |            |      |
| 342-00         | CLANCT | 342-00 | CLANCT |            |      |

---

|                   |                   |
|-------------------|-------------------|
| PROJECT .....     | DEWATER HIGHWAY   |
| LOCATION .....    | STATION 4305+00.0 |
| HOLE NO. ....     | NH14              |
| DEPTH .....       | 9'                |
| SAMPLE TYPE ..... | Flow              |
|                   | FIELD NO. 18      |

## LABORATORY'S RESULTS

|               |         |
|---------------|---------|
| DATE SAMPLED  | 5-6-72  |
| DATE RECEIVED | 13-6-72 |
| DATE RECORDED | 20-7-72 |



[illegible]

Am

[illegible]

| CLASSIFICATION   | L.L. | P.L.       | P.I. | NAT.<br>%W | F.M. |
|------------------|------|------------|------|------------|------|
|                  | 28.1 | 47.2       | 0.9  | 14.5       |      |
| F.M. - QUARTZITE |      | SAND       |      |            |      |
|                  |      | PEA GRAVEL |      |            |      |

CRUSH COUNT

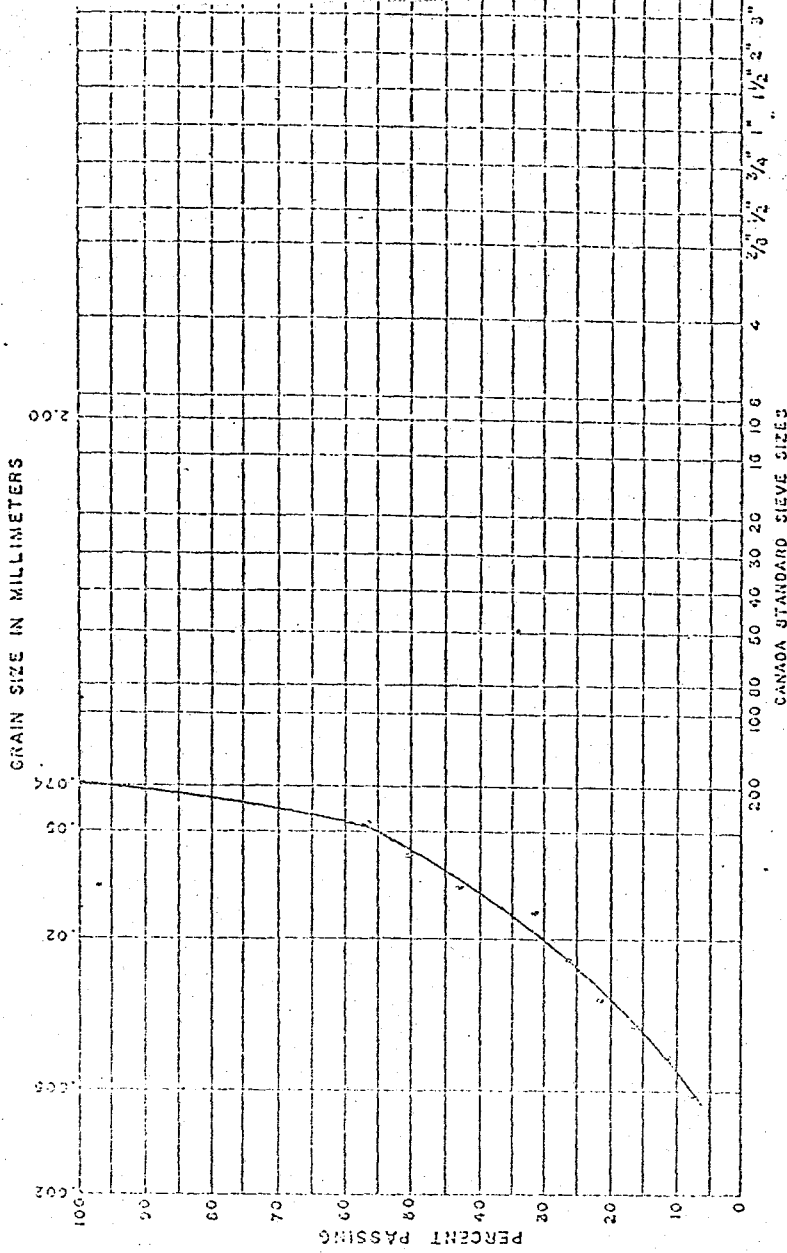
210

# PETROGRAPHIC ANALYSIS

[illegible]

# PARTICLE SHAPE ANALYSIS

|  |  |       |
|--|--|-------|
|  |  | BY 76 |
|  |  |       |
|  |  |       |
|  |  |       |
|  |  | CA    |
|  |  |       |



CLAY

**SILT**

**SAND**

GRAVEL

LAS. NO.

154

|             |                     |
|-------------|---------------------|
| PROJECT     | DENVER HIGHWAY      |
| LOCATION    | STATION 330+00      |
| HOLE NO.    | R.M. 9              |
| DEPTH       | 1 1/3' FIELD NO. 11 |
| SAMPLE TYPE | BOC                 |

LABORATORY'S REMARKS

DATE SAMPLED

22-6-6

DATE RECEIVED

13-6-73

DATE RECORDED

2-2-20

Why?

[illegible]

| CLASSIFICATION    | L.L. | P.L. | R.L.  | NAT.<br>%W | A.M. |
|-------------------|------|------|-------|------------|------|
| Sym - Hippocampus |      |      | Trace |            |      |
| Low Purity        |      |      |       |            |      |

CRUSH CONT-1-

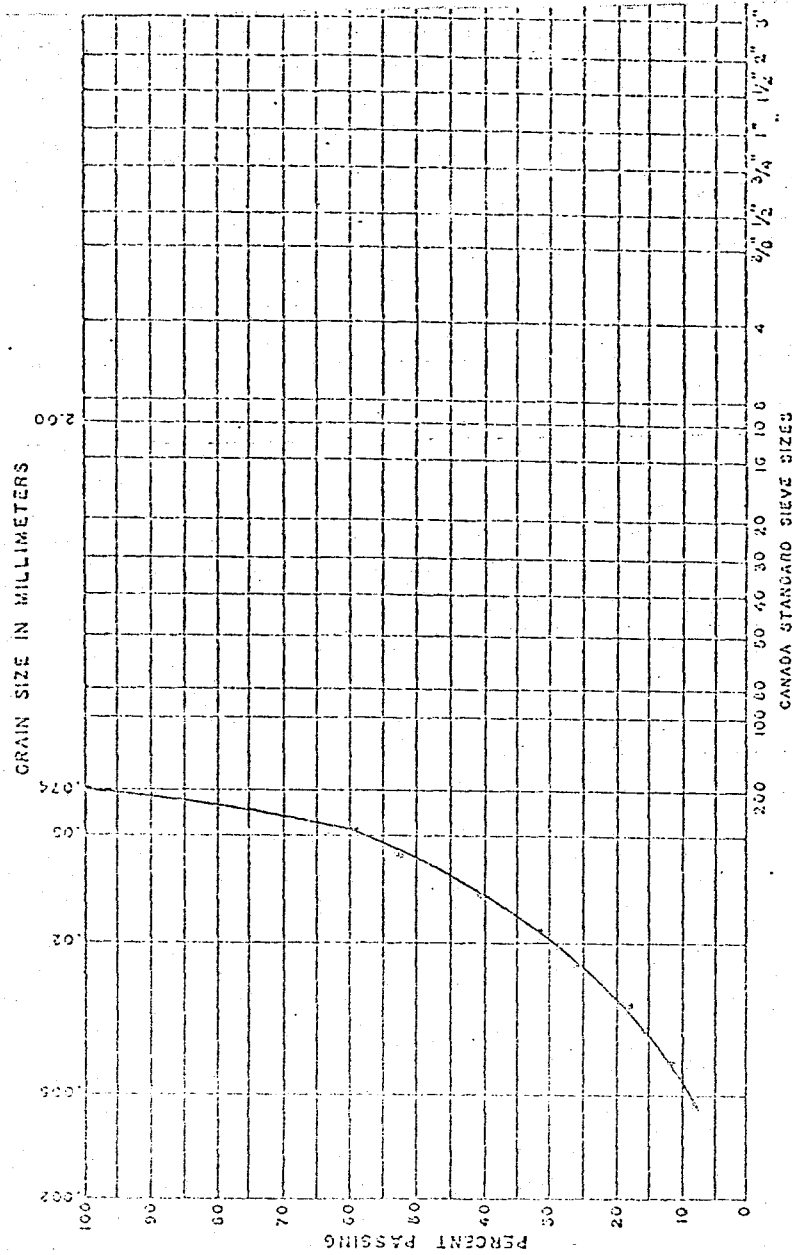
%

# PETROGRAPHIC ANALYSIS

[illegible]

## PARTICLE SHAPE ANALYSIS

|      |      |
|------|------|
| 6042 | 6042 |
| 6043 | 6043 |
| 6044 | 6044 |
| 6045 | 6045 |
| 6046 | 6046 |
| 6047 | 6047 |
| 6048 | 6048 |
| 6049 | 6049 |
| 6050 | 6050 |
| 6051 | 6051 |
| 6052 | 6052 |
| 6053 | 6053 |
| 6054 | 6054 |
| 6055 | 6055 |
| 6056 | 6056 |
| 6057 | 6057 |
| 6058 | 6058 |
| 6059 | 6059 |
| 6060 | 6060 |
| 6061 | 6061 |
| 6062 | 6062 |
| 6063 | 6063 |
| 6064 | 6064 |
| 6065 | 6065 |
| 6066 | 6066 |
| 6067 | 6067 |
| 6068 | 6068 |
| 6069 | 6069 |
| 6070 | 6070 |
| 6071 | 6071 |
| 6072 | 6072 |
| 6073 | 6073 |
| 6074 | 6074 |
| 6075 | 6075 |
| 6076 | 6076 |
| 6077 | 6077 |
| 6078 | 6078 |
| 6079 | 6079 |
| 6080 | 6080 |
| 6081 | 6081 |
| 6082 | 6082 |
| 6083 | 6083 |
| 6084 | 6084 |
| 6085 | 6085 |
| 6086 | 6086 |
| 6087 | 6087 |
| 6088 | 6088 |
| 6089 | 6089 |
| 6090 | 6090 |
| 6091 | 6091 |
| 6092 | 6092 |
| 6093 | 6093 |
| 6094 | 6094 |
| 6095 | 6095 |
| 6096 | 6096 |
| 6097 | 6097 |
| 6098 | 6098 |
| 6099 | 6099 |
| 6100 | 6100 |
| 6101 | 6101 |
| 6102 | 6102 |
| 6103 | 6103 |
| 6104 | 6104 |
| 6105 | 6105 |
| 6106 | 6106 |
| 6107 | 6107 |
| 6108 | 6108 |
| 6109 | 6109 |
| 6110 | 6110 |
| 6111 | 6111 |
| 6112 | 6112 |
| 6113 | 6113 |
| 6114 | 6114 |
| 6115 | 6115 |
| 6116 | 6116 |
| 6117 | 6117 |
| 6118 | 6118 |
| 6119 | 6119 |
| 6120 | 6120 |
| 6121 | 6121 |
| 6122 | 6122 |
| 6123 | 6123 |
| 6124 | 6124 |
| 6125 | 6125 |
| 6126 | 6126 |
| 6127 | 6127 |
| 6128 | 6128 |
| 6129 | 6129 |
| 6130 | 6130 |
| 6131 | 6131 |
| 6132 | 6132 |
| 6133 | 6133 |
| 6134 | 6134 |
| 6135 | 6135 |
| 6136 | 6136 |
| 6137 | 6137 |
| 6138 | 6138 |
| 6139 | 6139 |
| 6140 | 6140 |
| 6141 | 6141 |
| 6142 | 6142 |
| 6143 | 6143 |
| 6144 | 6144 |
| 6145 | 6145 |
| 6146 | 6146 |
| 6147 | 6147 |
| 6148 | 6148 |
| 6149 | 6149 |
| 6150 | 6150 |
| 6151 | 6151 |
| 6152 | 6152 |
| 6153 | 6153 |
| 6154 | 6154 |
| 6155 | 6155 |
| 6156 | 6156 |
| 6157 | 6157 |
| 6158 | 6158 |
| 6159 | 6159 |
| 6160 | 6160 |
| 6161 | 6161 |
| 6162 | 6162 |
| 6163 | 6163 |
| 6164 | 6164 |
| 6165 | 6165 |
| 6166 | 6166 |
| 6167 | 6167 |
| 6168 | 6168 |
| 6169 | 6169 |
| 6170 | 6170 |
| 6171 | 6171 |
| 6172 | 6172 |
| 6173 | 6173 |
| 6174 | 6174 |
| 6175 | 6175 |
| 6176 | 6176 |
| 6177 | 6177 |
| 6178 | 6178 |
| 6179 | 6179 |
| 6180 | 6180 |
| 6181 | 6181 |
| 6182 | 6182 |
| 6183 | 6183 |
| 6184 | 6184 |
| 6185 | 6185 |
| 6186 | 6186 |
| 6187 | 6187 |
| 6188 | 6188 |
| 6189 | 6189 |
| 6190 | 6190 |
| 6191 | 6191 |
| 6192 | 6192 |
| 6193 | 6193 |
| 6194 | 6194 |
| 6195 | 6195 |
| 6196 | 6196 |
| 6197 | 6197 |
| 6198 | 6198 |
| 6199 | 6199 |
| 6200 | 6200 |
| 6201 | 6201 |
| 6202 | 6202 |
| 6203 | 6203 |
| 6204 | 6204 |
| 6205 | 6205 |
| 6206 | 6206 |
| 6207 | 6207 |
| 6208 | 6208 |
| 6209 | 6209 |
| 6210 | 6210 |
| 6211 | 6211 |
| 6212 | 6212 |
| 6213 | 6213 |
| 6214 | 6214 |
| 6215 | 6215 |
| 6216 | 6216 |
| 6217 | 6217 |
| 6218 | 6218 |
| 6219 | 6219 |
| 6220 | 6220 |
| 6221 | 6221 |
| 6222 | 6222 |
| 6223 | 6223 |
| 6224 | 6224 |
| 6225 | 6225 |
| 6226 | 6226 |
| 6227 | 6227 |



CLAY

4-1-17

SAVO

GRAVEL

|             |                    |           |    |
|-------------|--------------------|-----------|----|
| PROJECT     | DENPSTER HIGHWAY   |           |    |
| LOCATION    | STATION 4340 + 0.0 |           |    |
| HOLE NO.    | R149               |           |    |
| DEPTH       | 5' 1/2'            | FIELD NO. | 12 |
| SAMPLE TYPE | BAC                |           |    |

LAS. NO.

159

LABORATORY'S REMARKS

CALDWELL, INC.

5-6-72

TABLE 4. VARIATION OF

515.11604 30.7.85.

05/11/2008 14:00

13-6-77

0  
6  
C  
C  
C  
C  
C  
C  
C  
C

20-2-22

FIGURE 100-1. *Staphylococcus aureus*.

1300 G

## 11 AND TIME

• APTED:  
A TUM

June 3/72

FINISHED:

## CONTRACTOR

## DRILLER

### GROUND SURFACE ELEVATION

GAUGE  
READING

## METHOD OF BORING

## WEAVING SIZE

SOIL:

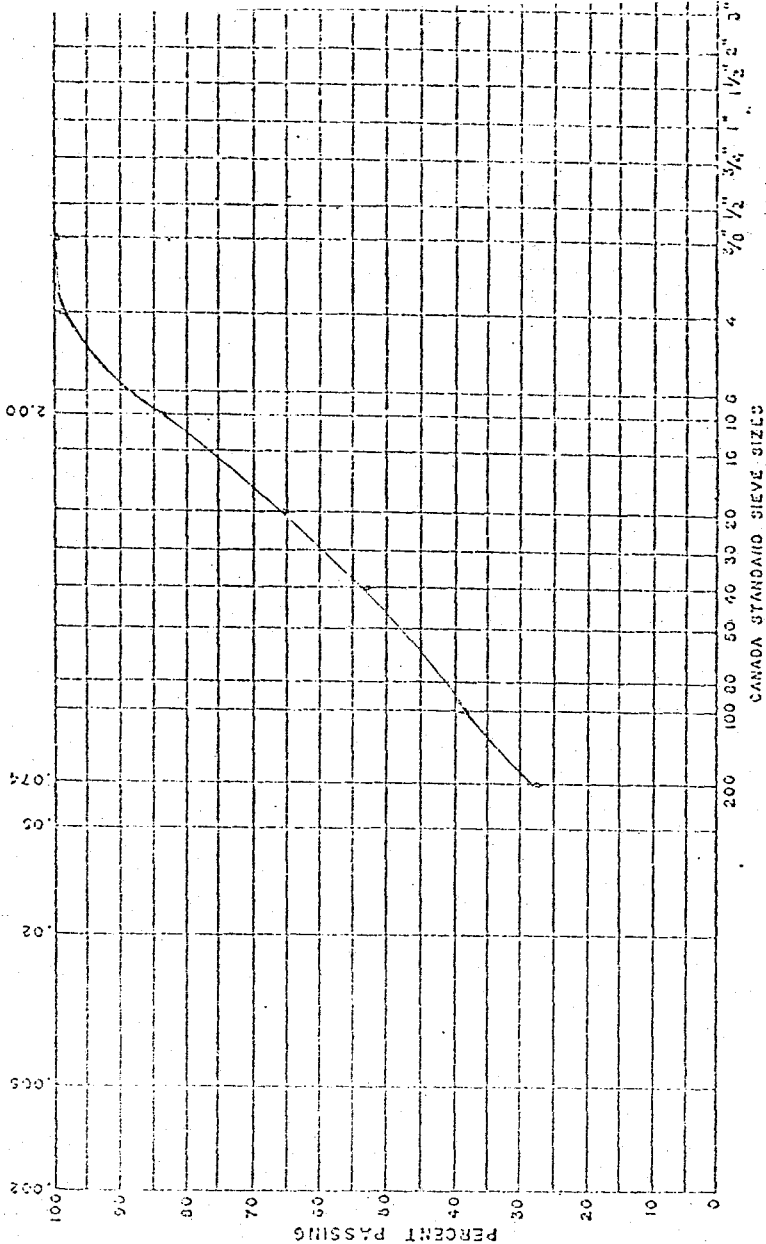
ROCK:

SLASHING HAMMER WT. ....LBS.

DROP.....INCHES

[illegible]

GRAIN SIZE IN MILLIMETERS



GRAVEL

**SAND**

2715

KL 7

LAS. NO.

1558

|             |                  |
|-------------|------------------|
| PROJECT     | DEMPSTER HIGHWAY |
| LOCATION    | STATION 4365+000 |
| HOLE NO.    | RW 8             |
| DEPTH       | 0 1/2 "          |
| SAMPLE TYPE | FIELD NO. 9      |
|             | Bag-             |

LABORATORY REPORTS

DATE SAMPLED

১৬৭

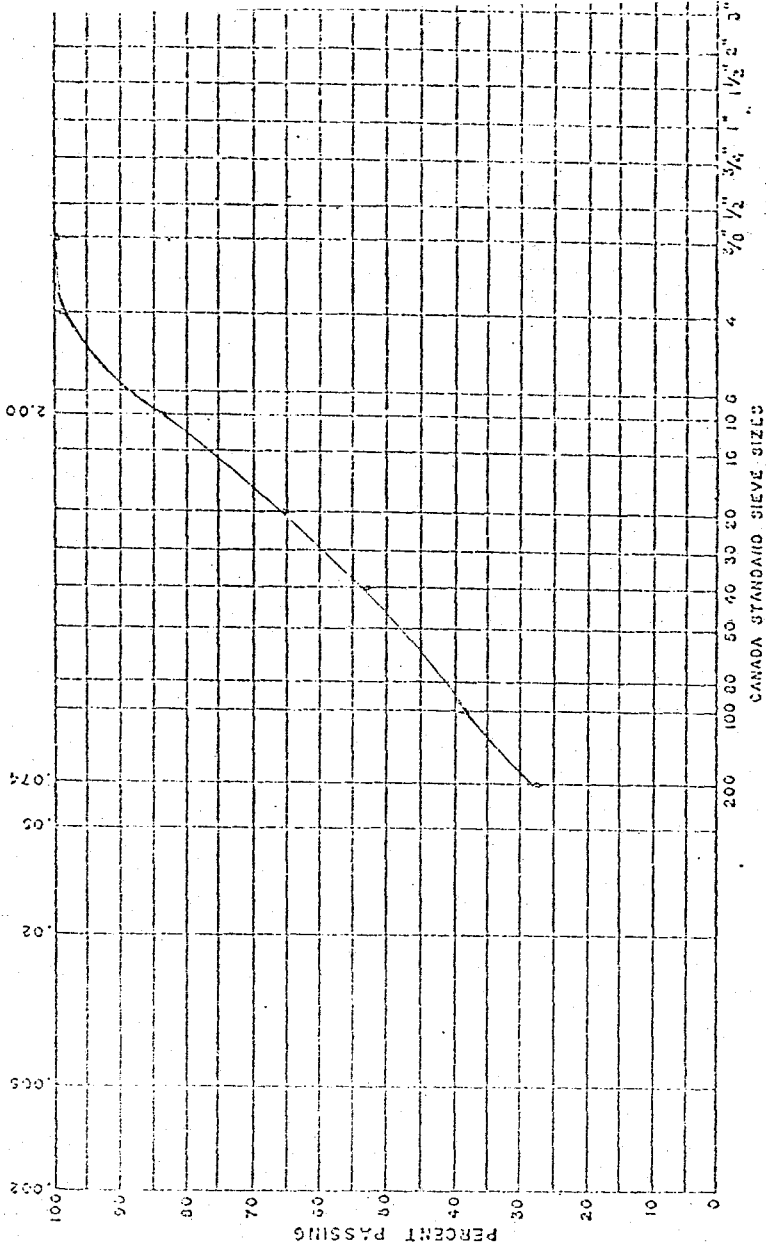
DATE RECEIVED-

22

DATE RECORDED

12-7-2

GRAIN SIZE IN MILLIMETERS



GRAVEL

**SAND**

2715

KL 7

LAS. NO.

1558

|             |                  |
|-------------|------------------|
| PROJECT     | DEMPSTER HIGHWAY |
| LOCATION    | STATION 4365+000 |
| HOLE NO.    | RW 8             |
| DEPTH       | 0 1/2 "          |
| SAMPLE TYPE | FIELD NO. 9      |
|             | Bag-             |

LABORATORY REPORTS

DATE SAMPLED

১৬৭

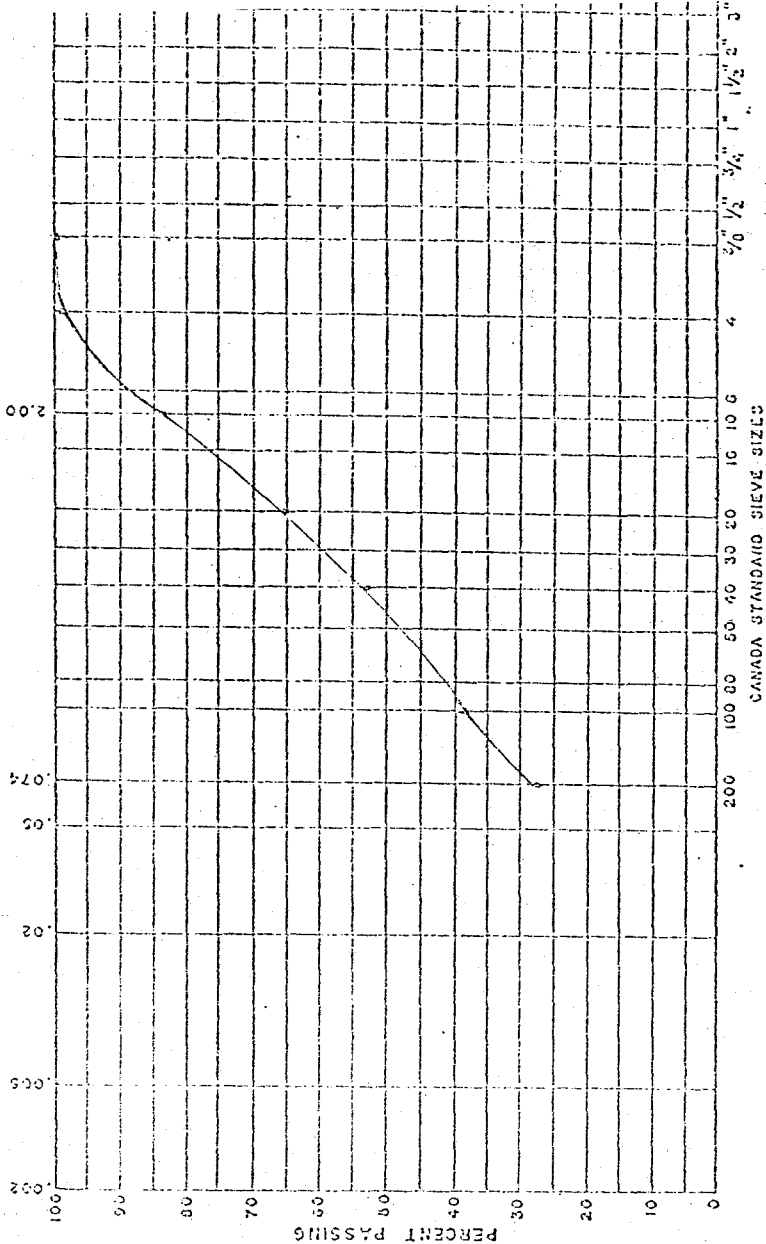
DATE RECEIVED-

22

DATE RECORDED

12-7-2

GRAIN SIZE IN MILLIMETERS



GRAVEL

**SAND**

2715

KL 7

LAS. NO.

1558

|             |                  |
|-------------|------------------|
| PROJECT     | DEMPSTER HIGHWAY |
| LOCATION    | STATION 4365+000 |
| HOLE NO.    | RW 8             |
| DEPTH       | 0' 1/2"          |
| SAMPLE TYPE | FIELD NO. 9      |
|             | Bag-             |

LABORATORY REPORTS

DATE SAMPLED

১৬৭

DATE RECEIVED-

22

DATE RECORDED

12-7-2

## GRAIN SIZE ANALYSIS

| VE  | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT |  | SIEVE SIZE | % FINER BY WEIGHT | SIEVE SIZE | % FINER BY WEIGHT |
|-----|-------------------|------------|-------------------|--|------------|-------------------|------------|-------------------|
| 100 | 100.0             |            |                   |  |            |                   |            |                   |
| 75  | 97.7              |            |                   |  |            |                   |            |                   |
| 4   | 90.3              |            |                   |  |            |                   |            |                   |
| 20  | 78.7              |            |                   |  |            |                   |            |                   |
| 60  | 71.0              |            |                   |  |            |                   |            |                   |
| 100 | 67.6              |            |                   |  |            |                   |            |                   |
| 200 | 51.3              |            |                   |  |            |                   |            |                   |
| 425 | 33.4              |            |                   |  |            |                   |            |                   |

| CLASSIFICATION              | L.L. | P.L. | P.I. | NAT. %W | F.M. |
|-----------------------------|------|------|------|---------|------|
| GM-SM - GRAVELLY SILTY SAND | 22.4 | 19.7 | 2.7  | 5.1     |      |
| LOW PLASTICITY              |      |      |      |         |      |

CRUSH COUNT

%

## PETROGRAPHIC ANALYSIS

MATERIAL TYPE

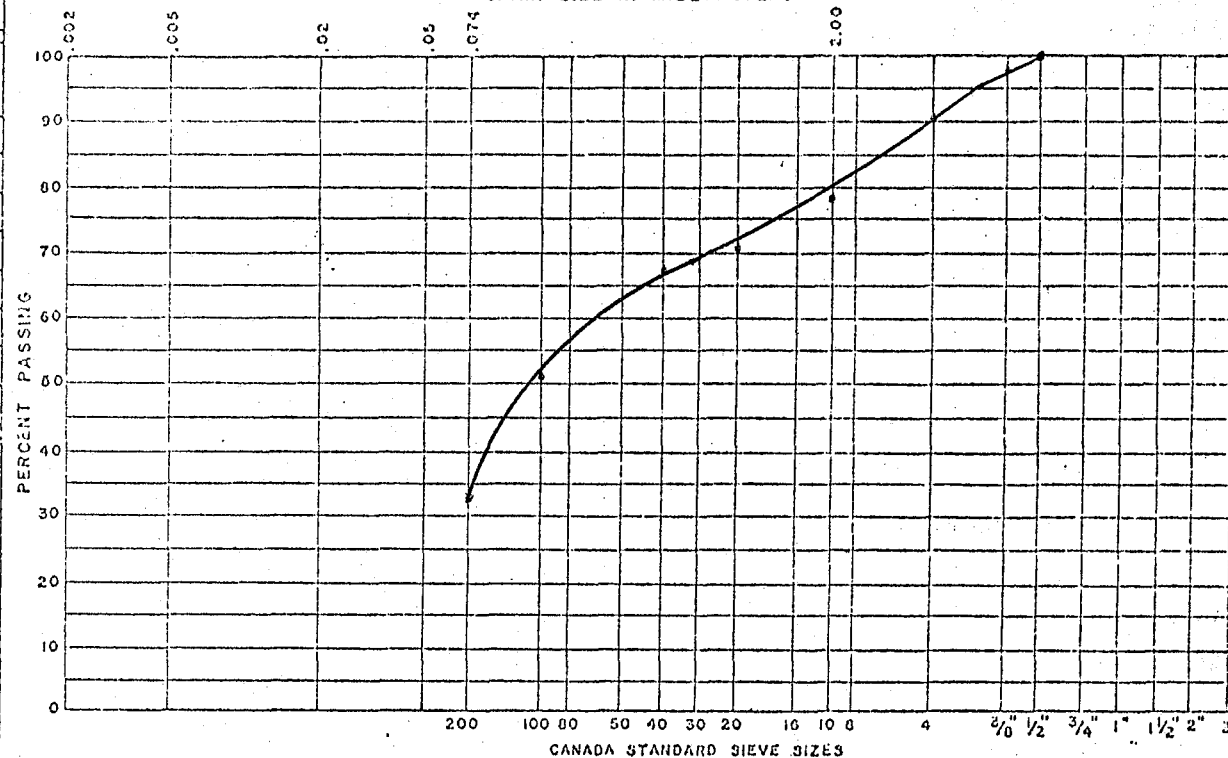
% OF TOTAL SAMPLE

|         |  |
|---------|--|
| ALT     |  |
| ONE     |  |
| INTIC   |  |
| IDSTONE |  |
| ILE     |  |
| IST     |  |
| ARTZITE |  |
| ERS     |  |

## PARTICLE SHAPE ANALYSIS

|           |  |
|-----------|--|
| NO        |  |
| - ROUND   |  |
| ULAR      |  |
| - ANGULAR |  |
| TS        |  |

## GRAIN SIZE IN MILLIMETERS



CLAY

SILT

SAND

GRAVEL

PROJECT ..... DENPSTER HIGHWAY .....

LOCATION ..... STATION 4365+000 .....

HOLE NO. .... RM 8 .....

DEPTH ..... 4' ..... FIELD NO. .... 10 .....

SAMPLE TYPE ..... SAND .....

LAB. NO.

4555

## LABORATORY'S REMARKS

|                 |
|-----------------|
| SILTY SAND (LP) |
|                 |
|                 |
|                 |
|                 |

DATE SAMPLED

3-6-72

DATE RECEIVED

6-6-72

DATE RECORDED

31-7-72

-D