SAND AND GRAVEL RESOURCES OF THE EAST HALF OF
THE MUNICIPAL DISTRICT OF PROVOST, NUMBER 52

W.A.D. Edwards
D.W. Scafe
1990
TABLE OF CONTENTS

ABSTRACT................................................................. 1
INTRODUCTION.......................................................... 2
ACKNOWLEDGMENTS...................................................... 2
METHODS................................................................. 5
GEOLOGY................................................................. 6
  Physiography and Bedrock........................................ 6
  Surficial Geology.................................................... 6
SAND AND GRAVEL RESOURCES........................................ 7
  Meltwater Channel Deposits....................................... 7
  Kame Deposits....................................................... 8
  Outwash Deposits................................................... 8
  Esker Deposits...................................................... 8
  Fan Deposits........................................................ 9
  Eolian Dune Deposits.............................................. 9
RECOMMENDATIONS.................................................... 12
BIBLIOGRAPHY.......................................................... 13

APPENDIX I  Sand and gravel information provided by the Municipal District of Provost No. 52 and Alberta Transportation and Utilities........................................ 14

FIGURES AND TABLES

Figure 1. Study area. ................................................. 3
Figure 2. Study levels .................................................. 4
Figure 3. Potential sand and gravel deposits in eastern half of the Municipal District of Provost No. 52 .................................................. 4

Table 1. Sand and gravel deposits in the study area listed by potential for containing gravel, origin and deposit number .............................................. 10
Table 2. Summary of sand and gravel deposit information provided by the Municipal District of Provost No. 52. .................. 11
ABSTRACT

A reconnaissance level sand and gravel map of the eastern half of the Municipal District of Provost No. 52 was completed by the Alberta Geological Survey in October 1989. The study was funded by Alberta Forestry, Lands and Wildlife. This report provides more detail on the areas delineated as having potential and on the research procedures.

Ninety-six areas with potential for sand or gravel are identified on the initial map and in this report. These areas belong to five different origins: meltwater channel deposits (32 areas), kame deposits (33), outwash deposits (16), esker deposits (10), fan deposits (4) and eolian dune deposits (1).

The meltwater channel and kame deposits have the highest potential for the discovery of gravel. Twenty-two of these type of deposits are reported or rumoured to contain gravel. It is recommended that the M.D. should first test the meltwater channel and kame deposits listed as having highest potential and, if sufficient supplies have not been discovered, then proceed to check areas with lower potential.
INTRODUCTION

This study is part of a program initiated in 1976 by the Alberta Research Council (ARC) and Alberta Forestry, Lands and Wildlife (AFLW) to provide information on the sand and gravel resources of the Province of Alberta. The area of study (figure 1), level of detail and roles of the participants were determined by representatives of the Public Lands Division (AFLW), the Municipal District of Provost No. 52, Alberta Transportation and Utilities (AT&U) and the Alberta Geological Survey (AGS) a department of ARC at a meeting on September 13, 1989.

A reconnaissance level study (level 5 on figure 2) of the eastern half of the Municipal District was completed by the AGS. The initial airphoto interpretation of the area (AGS) was funded by the Public Lands Division (AFLW). A map identifying potential sand and gravel deposits was provided to the Municipal District of Provost No. 52, in October of 1989. The testing and sampling of any or all deposits which the M.D. feels has potential, with the assistance of the AT&U, will follow when the M.D. equipment and personnel are available.

The eastern half of the M.D. of Provost No. 52 is located on the Alberta- Saskatchewan border, in NTS sheet 73E within Townships 36 and 37, Ranges 1 to 3, Townships 38 to 41, Ranges 1 to 5 and Township 42, Range 5, W4thM. Total area is approximately 2060 square kilometers. The major population centre in the study area is the town of Provost.

ACKNOWLEDGMENTS

Public Lands Division of Alberta Forestry, Lands and Wildlife provided the funds for the geological study.

Mrs. Linda MacDonald, Administrator for the Municipal District of Provost No. 52, provided information on sand and gravel operations in the eastern half of the M.D., furnished a base map for the area and
## Aggregate Inventory Mapping Levels

<table>
<thead>
<tr>
<th>Format</th>
<th>Reconnaissance Study</th>
<th>Enhanced Reconnaissance Study</th>
<th>Regional Mapping</th>
<th>Detailed Mapping</th>
<th>Deposit Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scale (Common)</strong></td>
<td>1:250,000</td>
<td>1:250,000</td>
<td>1:50,000</td>
<td>1:10,000</td>
<td>1:10,000 or larger</td>
</tr>
<tr>
<td><strong>Comments</strong></td>
<td>Only potential areas suitable for finding deposits shown. Fairly quick and inexpensive to produce.</td>
<td>Potential areas suitable for finding deposits are shown. Some deposits are examined. A map will take 6 months to a year to produce.</td>
<td>Estimates deposit boundaries and gives quality and quantity estimations. A map may take 8 months to a year to produce.</td>
<td>Establishes deposit boundaries. Refines quantity/quality information. Fairly expensive survey.</td>
<td>Precise quality and quantity estimates. Deposit variations identified. Very expensive survey.</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>2 map sheets per prof-year.</td>
<td>1 map sheet per prof-year.</td>
<td>2 to 3 map sheets per prof-year.</td>
<td>Special projects only.</td>
<td>Special projects only.</td>
</tr>
</tbody>
</table>

Figure 2. Study levels.
called a meeting of the councillors for the M.D. when the initial map was presented and described.

Alberta Transportation and Utilities provided testing and sampling data to AGS through the M.D.

METHODS

The study began with the compilation of existing information. Information available for the area includes water well logs from Alberta Environment, a surficial geology report by the Alberta Research Council and information on sand and gravel pits provided by the M.D. of Provost No. 52.

An airphoto interpretation was completed using 1:30,000 scale photos. The interpretation concentrated on identifying deposits with some potential for gravel because large areas of very fine sand are known to exist in the area and the M.D. is most interested in gravel. Information was transferred to a photo mosaic at a scale of 1:80,000 so that trends could be recognized. Deposits were grouped into categories (high, medium and low potential) to make exploration more focused for the M.D. The outlines of potential deposits were transferred to the 1:100,000 base map and a legend listing the three categories was added (figure 3). All water wells were plotted onto the base map and those penetrating gravel are identified with a separate symbol.

No field work was conducted during this initial study. The geological interpretation and subsequent map is based solely on airphotos, limited subsurface information from water wells and gravel pit data. Field testing is to be done at a later date by the M.D. of Provost No. 52 in co-operation with Alberta Transportation and Utilities.
GEOLGY

PHYSIOGRAPHY AND BEDROCK

The map area lies within the central Alberta plains, a relatively flat, glaciated region underlain by sandstones and some shales of Cretaceous age. Local relief is dominated by features of glacial origin. These include remnants of meltwater channels, which extend generally east-west and northwest-southeast in the northern and eastern parts of the study area, a large esker which cuts across the southwestern part of the study area and higher ground in the southeastern part of the study area formed of glacially contorted bedrock.

Most of the area is underlain by sandstone and shales of the Upper Cretaceous Judith River Formation. Shales of the overlying Bearpaw Formation are present in the extreme southern part of the study area, particularly in areas of glacially disturbed bedrock (Green, 1972).

SURFICIAL GEOLOGY

The bedrock in the area generally is overlain by till in the form of ground moraine. In many places the till is overlain by eolian sands or glaciolacustrine silts and clays. These glaciolacustrine sediments are especially prominent in the central part of the study area.

A large esker, about 30 km long and up to 60 m in height, is present in the southwestern part of the study area. Associated with this esker are many irregularly shaped hills (kames). Both the esker and most of the kames appear to be composed primarily of fine- to medium-grained sand, although pockets of gravel are present. Outwash deposits and terraces along remnants of glacial meltwater channels are present in the Bodo and Hayter areas and along the northern boundary of the study area. Some of these deposits contain gravel. Surficial geology information is derived primarily from the report by Bayrock (1967).
SAND AND GRAVEL RESOURCES

Sand, especially very fine sand, is common in the area. Commercial gravel deposits do occur but are much less common. Ninety-six areas (which may have potential for gravel or sand with some gravel) are identified in the eastern part of the M.D (figure 3). These deposits were identified from airphoto interpretation with supporting data, if available, from water well logs or pit data. The potential deposits fall into six types of surficial deposits: meltwater channel terraces and bars, kames, outwash deposits, eskers, eolian dunes and alluvial fans. The greatest potential for finding gravel in the area is in the meltwater channel terraces. Deposits with the least potential for finding gravel beds are in or beneath the eolian dune deposits and in the fans. Following is a short discussion of each of the six types of deposits.

MELTWATER CHANNEL DEPOSITS

Terraces and bars formed in meltwater channels at the end of the last glaciation. Sand and gravel derived from the glacier or eroded from the sides of the channels was carried and deposited as great volumes of meltwater issued from the failing ice mass. The remnant meltwater channels now are visible as misfit valleys or linear depressions without stream channels at the present time. Some of the channels are visible only as a series of small remnant or chain lakes. Thirty-two deposits of this origin are identified. They have the highest potential of all deposits in the area for containing gravel. In fact, ten meltwater channel deposits identified as having highest potential are documented or rumoured to contain gravel. Table 1 lists the origin of deposits and their ranking (potential) for containing gravel. Table 2 lists all deposits that are reported or rumoured to contain gravel or sand or have some unspecified potential.
KAME DEPOSITS

Deposits with the second highest likelihood of containing gravel are the kame deposits. Thirty-three deposits of probable kame origin are identified in the study area. These deposits formed at an ice margin when meltwater carrying sand and gravel cascaded from the ice surface to deposit material that now appears as irregularly shaped hills. These deposits may contain lenses of sand, gravel or till. Gravel beds are often irregular in shape, variable in dip and seemingly random in distribution. Tracing and mining the gravel is difficult. Kame deposits in the area reported or rumoured to carry gravel are listed in Table 2. Most of the kame deposits are present in the western and southwestern part of the study area near the large esker.

OUTWASH DEPOSITS

Outwash deposits are widespread in the study area and sixteen are identified. They have moderate to very low potential for the presence of gravel. Outwash deposits are formed when meltwater carrying sand and gravel flows from the melting ice surface and spreads out to deposit a thin layer of material unconfined by a channel. Eight of the deposits in the area are described in data supplied by the M.D., all are reported to contain only sand. Outwash deposits may be present in the same vicinity as meltwater channel deposits and care must be taken to distinguish the two types of deposits as the meltwater channel deposits have higher potential for gravel.

ESKER DEPOSITS

Esker ridges are common in the study area and ten segments were identified as possible sources of gravel. The eskers in this area are commonly sand, only one is reported to contain sandy gravel, and for this reason have a moderate to low potential as a source of gravel. Eskers are formed when meltwater drains through ice-walled channels and leaves beds of sand or sand and gravel. When the ice walls melt the beds are left as a ridge marking the course of the former channel.
FAN DEPOSITS

There are only four deposits in the area which are categorized as having alluvial fan origin. These deposits form when a temporary stream carries material from the side of the valley onto the valley side and floor and is deposited in a fan shape. These deposits are unlikely to contain gravel.

EOLIAN DUNE DEPOSITS

Eolian dunes were formed in the area immediately after melting of the continental ice when the land surface was bare and strong winds moved the exposed sand. Eolian dunes, by nature, do not contain gravel, but information on one deposit (#9) is reported in the records provided by the M.D., so this is included on the map (in pocket). Much of the study area is covered by fine-grained sand which is probably of eolian origin. Areas covered by eolian sand should not be excluded entirely from gravel exploration, as these areas may have only a thin blanket of sand over other types of deposits such as meltwater channel terrace bars or outwash. The sand moved by the wind originated in some other type of deposit and if the direction of sand movement can be determined the source deposit, which may contain coarser materials, may be determined.
Table 1. Sand and gravel deposits in the study area listed by potential for containing gravel, origin and deposit number (see figure 3 in pocket).

<table>
<thead>
<tr>
<th>Potential</th>
<th>Type of Deposit</th>
<th>Deposit Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>Meltwater Channel</td>
<td>4,5,7,11,53,54,61,63,80,88</td>
</tr>
<tr>
<td>High</td>
<td>Meltwater Channel</td>
<td>56,57,67,68,69,75,14,15,35</td>
</tr>
<tr>
<td></td>
<td>Kame</td>
<td></td>
</tr>
<tr>
<td>Moderately High</td>
<td>Meltwater Channel</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Esker</td>
<td>49</td>
</tr>
<tr>
<td>Moderate</td>
<td>Meltwater Channel</td>
<td>2,3,8,65,66,70,71,81</td>
</tr>
<tr>
<td></td>
<td>Kame</td>
<td>22,28,30,31,33,34,36,37,39,41,42,44</td>
</tr>
<tr>
<td></td>
<td>Outwash</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Fan</td>
<td>12,64</td>
</tr>
<tr>
<td></td>
<td>Esker</td>
<td>13,47,50,51,55</td>
</tr>
<tr>
<td>Moderately Low</td>
<td>Meltwater Channel</td>
<td>58,59</td>
</tr>
<tr>
<td></td>
<td>Kame</td>
<td>60,87</td>
</tr>
<tr>
<td></td>
<td>Outwash</td>
<td>52,82,85,86</td>
</tr>
<tr>
<td>Low</td>
<td>Meltwater Channel</td>
<td>76,77</td>
</tr>
<tr>
<td></td>
<td>Kame</td>
<td>16,17,23,24,26,27,29,32,40,90,91</td>
</tr>
<tr>
<td></td>
<td>Outwash</td>
<td>6,10,19,45,46,48,84</td>
</tr>
<tr>
<td></td>
<td>Fan</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Esker</td>
<td>25,38,78</td>
</tr>
<tr>
<td>Very Low</td>
<td>Meltwater Channel</td>
<td>21,43,73</td>
</tr>
<tr>
<td></td>
<td>Kame</td>
<td>18,20,72,93,95</td>
</tr>
<tr>
<td></td>
<td>Outwash</td>
<td>62,89,94,96</td>
</tr>
<tr>
<td></td>
<td>Dune</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Fan</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>Esker</td>
<td>92</td>
</tr>
</tbody>
</table>
Table 2. Summary of sand and gravel deposit information provided by the Municipal District of Provost No. 52. Deposits are listed by origin with some indication given as to the material present (reported or rumoured). The code for these descriptions is shown at the bottom of the page.

<table>
<thead>
<tr>
<th>Deposit Type</th>
<th>Deposit Number and Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meltwater Channel</td>
<td>1(g),2(NI),3(g),4(sg),7(NI),8(NI)9(g),12(g),13(g),14(g),16(NI),17(g),18(s),19(fg),20(g),21(g),23(g?),24(NI),24(NI),25(NI),26(NI),29(g),30(NI),33(g),35(g),42(g),43(g),56(g),58(g),64(s),67(s)</td>
</tr>
<tr>
<td>Kame</td>
<td>10(g?),11(NI),15(g?),32(g)</td>
</tr>
<tr>
<td>Outwash</td>
<td>5(s),6(s),34(s),52(s),53(s),54(s),65(s),66(s)</td>
</tr>
<tr>
<td>Esker</td>
<td>31(s),55(sg),57(s),60(s)</td>
</tr>
<tr>
<td>Fan</td>
<td>22(NI)</td>
</tr>
</tbody>
</table>

NI - No information on material; ? - speculative, g-gravel, sg-sandy gravel, fg-fine gravel, s-sand.
RECOMMENDATIONS

The investigation identifies 96 areas which could contain sand or gravel. The likelihood is that less than 10 percent of these areas will, in fact, contain gravel and many of these deposits already have been tested. Recommendations are that the deposits with the highest potential should be investigated first. Deposits containing known gravel should have an expanded program of testing to determine the extent of the gravel present. Deposits with moderate potential should be field checked before any testing is committed. Surface geophysics using equipment such as a Geonics EM-31 could be performed over deposits with any surface indication of gravel. Deposits with low or very low potential should be investigated only if other evidence indicates there may be gravel present, or if all other options have been exhausted.

Other deposits may exist in the area, especially if these deposits are buried. If long hauls of material are contemplated, interested parties in the region should consider the possibility of deep probing airborne or ground geophysics to examine the possibility of buried gravel deposits.
BIBLIOGRAPHY

Green, R., 1972, Geological map of Alberta; Edmonton: Alberta Research Council.

APPENDIX I

Sand and gravel information provided by the Municipal District of Provost No. 52 and Alberta Transportation and Utilities
October 17, 1989

W.A. Dixon Edwards
Alberta Geological Survey
7th Floor, Terrace Plaza
4445 Calgary Trail South
Edmonton, Alberta

VIA COURRIER

Dear Mr. Edwards

RE: GRAVEL SURVEY
M.D. OF PROVOST NO. 52

Enclosed please find the information you requested for the gravel survey within out Municipality. Enclosed also find 10 Municipal Maps as per your request. Trusting this meets with your requirements.

Yours Truly,

Lynda L. McDonald (Mrs.)
Administrator

LLM/cn
encl.
HISTORY OF GRAVEL INFORMATION
M.D. OF PROVOST RANGES 1 - 5
AND ADJACENT TOWNSHIPS

RANGE 1.

SPECIAL AREAS: Spoke to Gerald Benedict of Special Areas
3. Youngstown 779-3733. The only pit they have in the area is the
Vogel pit on Sec. 25-34-1-4. There is only 5000 - 6000 left. Saskat-
chewan have a pit on the other side of the border. Alberta Transpor-
tation have checked all around the area and haven't found anything. A
study was done by Mollard and all the locations identified in the east
side have not proved out.

R.M. OF EYEHILL, SASKATCHEWAN:

Range

28

N.E. 5, Township 38, West of the 3rd - Dept. of Highways
large pit.
W1/2 30, Township 38, West of the 3rd - Operators R.M. of
Eyehill and Dept. of Highways - large extensive pit used for Highway
14 and 17. Depleted to sand and fines. No good rock left.
S.W. 17, Township 39, West of the 3rd - Stanton Fair - next
to St. Lawrence Lake.

The Secretary Treasurer advised good quality gravel is scarce. Mostly
small pockets and sandy. There are also some small private pits.

M.D. OF PROVOST #52:

Range 1

Township

36

None
37

W1/2 14 - Alberta Transportation
S.E. 15 - Allen Heck - less than 5 acres
38

None
39

N1/2 12 - Gar Val Holdings (this was recently offered for
sale $80,000. - Engineers estimate 35,000 yards left. Gravel is baled
out of water hole adjacent to St. Lawrence Lake. (same 13 acres sold
for $80,000 in 1985).
S.E. 12 - M.D. of Provost - Department of Highways Agree-
ments January 13, 1958, December 31, 1959. 1958 Department of High-
ways 12946 cubic yards - December 3, 1959, December 31, 1964 no yard-
age available. At present there is a water hole which the M.D. has
baled twice (appr. 70000 cubic yards). The M.D. plans to bale again
and expects about 30,000 yards. Total yardage from 1978 - 89, 230,646
cubic yards.
S.W. 12 - M.D. of Provost No. 52, Dept. of Highways agree-
Hal Caesar, Alberta Transportation Aggregate specialist tested in 1987
for 899N. No written results other than he said it was too sandy.
N.W. 18 - Norbert Holzinger - some sand pit used for own
purpose.
N.E. 20 - Phillip Hansen - native pasture farmer suspects
there may be some gravel.
N.E. 30 - C.G. Paulgaard
S.W. 31 -  
(S.E. 36, Township 39, Range 2) 
There are three small gravel pits (under 5 acres) located on these quarters. One is sandy the other two are pretty good gravel. The M.D. tested with a backhoe, he said Andy said it was only three feet deep. He would be interested in further testing.  
N.W. 11 - Phillip Hansen - farmer has pulled some gravel out - old private pit - suggests testing.  
40 N.W. 35 - Old hager pit (Ernest Hager) extensive private pit. Rumour has it depleted.

Range 2  
Township  
37 E1/2 3 - Palmer Paulgaard Estate - Operator Dan Paulgaard - Large extensive pit used for 8998.  
S.W. 11 - Bernard Pit Surface Materials Lease #820008 operated by the M.D. of Provost since 1965. Approximately 155,000 cubic yards removed. All areas at #4 reclaimed. Limited amount of gravel left.  
S.W. 16-37-2-4 Netherlands Investment Co. Small pocket located on the northwest corner along the fence line approximately 30 rods from the corner. 10,000 yards taken 1956 - 1959. May be some on S.E. 17-37-2-4 and further testing could be done.  
N.W. 25-40-2-4 Calvin Ferrier Private Pit.  
S.W. 3-41-2-4 M.D. of Provost No. 52. Known as the Taylor pit this pit has been operated by the M.D. since 1977. The M.D. has used 215,000 cubic yards and the Town of Provost operated a 5 acre pit and used about 100,000 cubic yards. The gravel from this pit varies from good to poor and there is no good gravel left. It contains a lot of clay balls. Further development is limited. Map of pit is enclosed.
N.W. 3-41-2-4 Keith Read large pit depleted
N.E. 4-41-2-4 M. D. of Provost. This is a reclaimed pit.
However Council have opened a small area in the N.W. corner which has
large rock. 20,000 cubic yards crushed in 1989. Limited amount.
N.W. 4-41-2-4 Keith Read gravel pit now depleted.
S.E. 4-41-2-4 Keith Read gravel pit now depleted.
W1/2 6-41-2-4 Keith Read Private Pit. still active.
S.E. 10-41-2-4 Keith Read Pit. Owner thinks there is still
gravel on this quarter but fairly deep. Would approve further test-
ing.

Range 3

N.W. 31-38-3-4 Used for M.D. stockpiling
N.E. 34-40-3-4 Angeltvedt. Pasture, under 5 acres, small
pocket. High water table - still open could be tested further.
N1/2-2-41-3-4 Bill Wagner Private Pit - supplies cement
plant.
S1/2 7-41-3-4 Roy Symington

Range 4

N.E. 31-38-4-4 Shenk's Sand Pit
S.W. 25-39-4-4 Stockpile
S.W. 6-40-4-4 R.H. Trenerry
N.W. 17-41-4-4 J. Clair Scott. see attached Pit Operations
S.W. 17-41-4-4 Ralph Maull opened for paving project 1989.
30% sand elimination.

NOTE*** Former Public Works Foreman said he was told there was 90
feet of gravel from the Scott Pit West to the Divison boundaries. All
along the creek. He also said there would be quite a bit of overbur-
den.

Range 5

N.E. 24-38-5-4 Exploration, sand only.
-see attached Wainwright Prospect
N.W. 31-38-5-4 Finley Pit - Crown Land - See sand and gravel
application #3275. Operated by the M.D. from 1972. Only 22,000 cubic
yards removed. Reclaimed.
M.D. OF WAINWRIGHT NO. 61

Greenwood Pit - S.E. 34-45-3-4

Hager Pit - S.W. 33-41-1-4 fairly new.

McNalley Pit 27-42-1-4

Alberta Transportation has done a study on the eastern side of the M.D. of Wainwright.
The data as shown has been compiled for the use of Alberta Transportation. No responsibility will be assumed by the Department for the correctness or completeness of the data shown and should any such data be found incorrect or incomplete the Contractor shall have no claim on that account.
AGGREGATES TESTING SUMMARY

DATE: July 19 87

LOCATION: 50° 16' SEC. 12 TWP. 223 RGE. W. 4 M.
PIT NAME: M D C P 1987

TESTER: BABB. R. J.

OWNERSHIP:
- A.T. PIT
- PRIVATE
- CROWN PIT
- RESERVATION
- D.R.S.
- P.M.T.
- C.A.T.
- LEASEE:
- LEASE TYPE & NO.

AGGREGATE SUITABILITY:
- I & M COURSE
- ASBGC
- OBGC
- A.C.P.
- OBC
- C.S.B.C.
- BLEND SAND
- WINTER SAND
- SILT

QUANTITY:
- GRAVEL __________ m³
- SAND ______________ m³
- DEPTH OF DEPOSIT ______ m
- CLEARING REQUIRED
- TIMBER SALVAGE
- WINTER HAUL ONLY
- FENCING:
- PIPELINE:
- RAILROAD:
- BEST AREA TO WORK PIT:

AGGREGATE DESCRIPTION

<table>
<thead>
<tr>
<th>TOP SIZE</th>
<th>mm * 300 mm</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>WELL GRADED</td>
<td>EXCESSIVE FINE</td>
<td></td>
</tr>
<tr>
<td>EXCESSIVE GRAVEL</td>
<td>SHORT GRAVEL</td>
<td></td>
</tr>
<tr>
<td>EXCESSIVE PEA GRAVEL</td>
<td>SHORT COARSE SAND</td>
<td></td>
</tr>
<tr>
<td>EXCESSIVE COARSE SAND</td>
<td>SHORT FINE SAND</td>
<td></td>
</tr>
<tr>
<td>EXCESSIVE FINE SAND</td>
<td>CLEAN</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ROCK</th>
<th>SAND</th>
<th>PLASTICITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANGULAR</td>
<td>SHARP</td>
<td>HIGH</td>
</tr>
<tr>
<td>SUBANGULAR</td>
<td>ROUND</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>SUBMOUND</td>
<td></td>
<td>LOW</td>
</tr>
<tr>
<td>ROUND</td>
<td></td>
<td>TRACE OR NIL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BULL CRUSHER</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>W. M.</td>
<td></td>
</tr>
<tr>
<td>NO</td>
<td>W. M.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SURFACE TEXTURE</th>
<th></th>
<th></th>
<th>TYPE OF DEPOSIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROUGH</td>
<td>SMOOTH</td>
<td></td>
<td>STREAM TERRACE</td>
</tr>
<tr>
<td>ENCRUSTED</td>
<td></td>
<td></td>
<td>DUNES BARCHANE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>STREAM ISLAND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DUNES FINGER</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GLACIAL TERRACE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DUNES SHEET</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GLACIAL DELTA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BEACH RIDGE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GLACIAL KAME</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GRAVEL BAR</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>OTHER</td>
</tr>
</tbody>
</table>

TESTED FOR:
- ACRE PURCHASE
- FUTURE
- R.O.W.
- PROJECT:
- DISTRICT:
- I.D.:
- M.D.:

SPECIAL PROVISIONS:

COMMENTS:

SIGNED ____________________________
| PIT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | PIT |
|-----|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|
|     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |

**LOG OF PITS**

**OVERBURDEN**

2'

4'

SAVAD

SAVAD

6'

8'

10'

12'

14'

**DEPTH OF PIT 1 IN. = 2 FT.**
DATE: JUNE 19 87  LOCATION: E 1/2 X Sec. 3  TP. 37  RGE. 2 W. 4 M.
TESTER: PERREAS  PIT NAME: PAULGAARD

☐ CROWN  ☑ PRIVATE  ☐ UNKNOWN

DEPOSIT POTENTIAL: EXISTING PIT, VERY NEAR DEPLETION

TYPE OF DEPOSIT: DISTRICT

DEPOSIT REPORTED BY: DISTRICT

FURTHER ACTION: TESTED WITH BACKHOE. RANDOM HOLES FOUND SOME GRAVEL, BUT WHEN TESTING WAS EXTENDED IT WAS APPARENT THAT THE PIT WAS VERY NEAR DEPLETION AND THAT THE ONLY GRAVEL LEFT WAS LOCATED IN VERY SMALL PUCKERS, WITH THE MAJORITY OF IT BEING IN A SMALL RIDGE EAST OF THE OPEN PIT (AREA A). EVEN BY COMBINING AREA A (APPROX. 6700 M³) AND THE THREE STOCKPILES (APPROX. 3000 M³) WE WOULD STILL BE WELL SHORT OF THE REQ'D 20,000 M³. AT THE TIME OF TESTING MR. PAULGAARD WAS NOT INTERESTED IN SELLING GRAVEL FROM THE 3 CRUSHED STOCKPILES. SEE ATTACHED PLAN.

![Diagram]

L.S.  

L.S.  

L.S.  

L.S.  

W  

E  

N  

S  

0°  30°  60°  90°  120°  150°  180°  210°  240°  270°  300°
**Application (13)**

- **Renewal of Sand & Gravel Lease No. 2975**
- **Exploration Licence for:** Acres  
  - Clay  
  - Marl  
  - Sand & Gravel

- **Sand & Gravel Lease for:** Acres  
  - Clay  
  - Marl  
  - Sand & Gravel

- **Sand & Gravel Licence for:** Acres  
  - Clay  
  - Marl  
  - Sand & Gravel

**For renewal of:** Co. Yrs.

- **For Sand & Gravel Licence operations:** Proposed Dates of:
  - A) Commencement
  - B) Completion

**Place of Incorporation:**

**Principal Place of Business in Alberta:**

**Address:**

**Telephone:**

**Are you an employee of the government or member of the Legislative Assembly of the Province of Alberta?** Yes ☐ Dept.

**Are you a Canadian citizen?** Yes ☐ No ☐ N/A ☐

**Have you attained the age of 18 years?** Yes ☐ No ☐ N/A ☐

**Attached:**
- Sketch ☒ Linen or Polyester Plan ☐
- Occupant's Consent ☐ Attached ☐ Not Required ☐

### Land Description (Attach schedule if insufficient space)

<table>
<thead>
<tr>
<th>Twp.</th>
<th>Rge.</th>
<th>Mer.</th>
<th>% Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>2</td>
<td>0.471</td>
<td>1/2 of LSD. 1 8</td>
</tr>
</tbody>
</table>

**Important:** Every application for a Sand and Gravel licence or lease must be accompanied with a sketch showing the lands required and the means of access. A Sand and Gravel operating plan questionnaire and plan is required with every Sand and Gravel licence application. No operation of any kind must take place on the lands applied for until such time as an operation plan has been approved in writing by the Director of Lands.

**Date:** October 25, 1976

**Signature of Applicant:**

**Official Use Only**

Authorization is hereby granted to enter upon and immediately occupy the public land as described by this form and as shown on the attached sketch subject to the following conditions:

**For Deputy Minister of Renewable Resources**

- **SRTC:** Conflicts Yes ☐ Records ☐
  - No ☐
- **Aerial Photo Blending Required:** Yes ☐ No ☐ Legal Description:
  - Yes ☐ No ☐ Sketch:
  - Yes ☐ No ☐
- **Operating Plan Approved:** Operating Acreage:
  - Yes ☐ No ☐
  - Audit Card Completed ☐

### Disposition

- **Date of Dec.:**
- **Term:**
- **From:**
- **Area:**
- **Lease For Sig.:**
- **Executed:**

- **Fee:**
- **Advance Royalty:**
- **Security Deposit:**
- **Tbr. Damages:**
- **Other:**

**Total:**

**Annual Rent: $**

- **Amount Due:**
- **Refund:**

**Advance Royalty:**

- **Amount:**
- **Refund:**

**Municipal Authority:**

**Transportation:**

**Accounts Use Only**

- **Acct. No.:**
- **Index:**

**Prepared By:**

**Checked By:**

**Accounts Use Only**

**Prepared By:**

**Checked By:**

**F&W:**

**DSA:**

**APS:**

**DSA:**
SECTIONS:
Outline Lease boundary in the color green.
Outline location and dimensions of operating area in relation to the Lease boundary in the color red. Show dimensions and distances in feet.
Indicate the location of initial gravel excavation and the direction operations will be carried out using an arrow.
Show location of any watercourse in the color blue and illustrate nearest distance from operating area in feet.
Outline and shade in the known boundary of the gravel deposit in yellow.
Show location and width of access trail into Lease and operating area.
Show gravel tested areas using the symbol.
Show location where overburden will be stockpiled using the symbol.
Show location where gravel stockpiles will be located using the symbol.
Show location of settling ponds to be used in washing operation using the symbol.

LOCATION:
LSD 1 4 8 Section 10 Township 77 Range 24 W 4th Mer.

SCALE: 1 inch = 600 feet
2440 feet (3 mile)

THIS IS A QUARTER SECTION

Date: ___________________________ Signed: ___________________________

Operations are authorized subject to the conditions attached.

Date: ___________________________ Approved By: ___________________________

For Director Lands
Alberta Energy and Natural Resources
SAND AND GRAVEL OPERATING PLAN

NAME: Municipal District of Provost
ADDRESS: Provost, Alberta
TOB 350

A. Method of Operation: (check & explain)
   - Front End Loader [X]
   - Dragline [ ]
   - Shovel [ ]
   - Scraper [ ]
   - Other [ ]
   Explain: __________________________

B. Location of Gravel Deposit: (check)
   - Streambed [ ]
   - Floodplain [ ]
   - Highland [X]

C. Thickness of Gravel Deposit: 7 Feet

D. Size of Gravel in Deposit: Estimate
   - 0-1" [50%]
   - 1"-2" [20%]
   - 2"-3" [20%]
   - 3" [10%]

E. Type of Gravel Operation: Pit Run [ ]
   - Screened [ ]
   - Washed [ ]
   - Crushed [X]
   Size of gravel to be used: 3/4 Inch

F. If crushed and washed, where will water be obtained from:
   - Lake [ ]
   - Stream [ ]
   - River [ ]
   - Other [ ]
   N.A.

G. If gravel washed, describe method of retaining fine material and sediment:
   __________________________

H. Thickness of gravel deposit to be excavated: 10 Feet

I. Depth of overburden to be removed: 3 Feet

J. Duff & Moss: _______ Inches
   - Loam: _______ Feet
   - Clay, Sand Silt: 3 Feet

K. Describe how the operating area will be reclaimed:
   __________________________

L. If Watercourse Involved:
   - Name: N.A.
   - Width: _______ Feet
   - Bank Height: _______ Feet

M. Forest Cover: Grassland [ ]
   - Poplar [ ]
   - Pine [ ]
   - Spruce [ ]
   - Brushland [ ]
   - Other [ ]
   N.A.

See Sketch Page 11
Alberta Forestry, Lands and Wildlife
Petroleum Plaza - South Tower
9915 - 108 Street
Edmonton, Alberta
T5K 2C9

Attention: Rita Allen (Mrs.)
Surface Materials Unit

Dear Madam:

Re: Sec 11 37-2W4
Surface Materials Lease No. SML 820008
Return Period: Oct. 23/86 to Apr 23/87
and April 24/87 to April 23/88

We are sending a cheque in the amount of $182.25 covering the royalties on the two lease periods. Also included are the two surface material returns required for these periods.

We wish to delete pits #1, #2, #3, #5 and #6 from our lease. This is the area highlighted in yellow on our sketch. We wish to keep the area marked #4. This is the area highlighted in green. This pit #4 has an area of approximately 2.5 acres.

Yours truly,

Linda McDonald
Secretary-Treasurer

LLM/iwm
enc.
PHOTO PLAN OF PROPOSED GRAVEL OPERATIONS

Please complete the following on the photo-sketch:

Symbol for Sketch

(1) Area of proposed excavation (E)
(2) Average depth of overburden (O)
(3) Area of placement overburden (P)
(4) Placement of any debris (prior to burning) (D)
(5) Outline of access roadway (A)
(6) Stock-pile size if on lease (S)
(7) Building on lease (B)
(8) Direction of movement of proposed operations

PHOTO-SKETCH OF QUARTER SECTION SW 1/4

Twp. 37  Rge. 2  West of 4 M.

Date of Photography  13-5-77
Photo number  1581  147
Scale 1: 5000
The data shown has been compiled for use by Alberta Transportation. No responsibility is assumed by the
Department for the correctness or completeness of the data shown and
no claim is made that the data is representative of the material.
Any use data by this user is entirely at his own risk.
In case of any dispute the Contractor shall have
no claim on that account.

LEGEND

SOIL CEMENT SAND

LABORATORY TECHNOLOGIST
DATE: JUNE 19 88  LOCATION: NE 1/4 SEC 4 TP. 41 RGE. 22 W. 4 M.
TESTER: PEPEAS  PM NAME: M.D. OF PROSPECT

DEPOSIT POTENTIAL:

TYPE OF DEPOSIT:

DEPOSIT REPORTED BY:

FURTHER ACTION:

---

Due to random cores to test for gravel, some very fine gravel present, not enough gravel present that was large enough to crush to make deposit suitable for use.
NOTE:
The Contractor will be responsible for clearing, grubbing, burning, removal of topsoil, redistribution of topsoil to the extent possible on side slopes and overall pit landscaping and cleanup.

NOTE
The data as shown has been compiled for the use of the engineer. No responsibility will be assumed by the engineer or owner for the correctness or completeness of the data shown and should any such data be found incorrect or incomplete the Contractor shall have no claim on that account.

S.R. 600

MINIMUM 30m BUFFER

NE 31-38-4-W4M

SHENK'S SAND PIT
PROVINCE OF ALBERTA
DEPARTMENT OF HIGHWAYS
REPORT ON GRAVEL PROSPECTS

Owner  ED MASON  Date  FEB. 1968
Address  METISKOW  File  3166-1274
Location  SW¼ Sec. 6  Tp. 40  R 4  W 4 M
Agreement  05  1967
Suitable for  SOIL CEMENT
Approx. Area  Approx. Yardage  52,400 C.Y.
Best Area to Work Pit  AREA C
Dead Haul  .04 MILES TO MILE 13.3 ½ PROJ. 13.5
Condition of Dead Haul  TO BE BUILT

Approx. % Crush  Estimated P.I.  TRACE
Grading  WELL GRADED  Sand Available  ✔
Overburden  6" - 1'
Description of  SAND VARIES FROM FINE TO
GRavel SAND  MEDIUM, QUITE CLEAN
Type of Deposit  WIND

Remarks  SAND IS SLIGHTLY DAMP AT
LOWER LEVELS.

Signed  Hal Cean
July 7, 1989

Alberta Environment
3rd Floor, Oxbridge Place
9820 - 106 Street
Edmonton, Alberta
T5K 2J6

Dear Sir;

RE: DEVELOPMENT & RECLAMATION
APPROVAL INFORMATION SHEET
FOR PIT OPERATIONS
LSD 11 & 12 17-41-4-W4M

Mining activities have been carried out within the 1/4 section by Alberta Transportation, Municipal District of Wainwright and the Municipal District of Provost.

A meeting was held on site with representatives from both Municipalities and the crushing operator. This was to determine what area would be considered mined operations of the Provost Municipal District. The area of 1 & 2 of Drawing I was indicated by the crushing operator and will have to be confirmed by Wainwright M.D. A letter on June 29, 1989 including a sketch indicating Drawing I was sent requesting confirmation of this area. A copy of same was sent to your office.

PIT ACTIVITIES ARE AS FOLLOWS:

(i) Area 1 and 2 are presumed to be mined out with the exception of gravel stock piles and a small stripped area in area 2. There is some pit run areas but the majority had been mixed and crushed within the pit areas of Area 1 and 2.

Washing was not carried out in operations. The water table is estimated at approximately 2 feet below present base of excavation. Under wet conditions water will pond in lower pockets and disappear under drier conditions.

(ii) The depth of top soil may vary from 3 to 6 inches. Overburden may vary to a depth of 18". There is separation of top soil and overburden as indicated in Area 1 and 2 as to Drawing I and a stripped area in Area 2. The overburden in area 3 is from joint mining operations.
PROVINCE OF ALBERTA
DEPARTMENT OF HIGHWAYS
REPORT ON GRAVEL PROSPECTS

Owner J.C. SCOTT Date MARCH 1962
Address EDGERTON File 3166-1017
Location NW 1/4 Sec. 17 Tp. 41 R 4 W 4 M
Agreement 10/1 1966

Suitable for BASE COURSE
Approx. Area Approx. Yardage
Best Area to Work Pit EXTEND PRESENT PIT.
Dead Haul

Condition of Dead Haul

Approx. % Crush 30% - 40% Estimated P.I. TRACE
Grading FINE Sand Available YES
Overburden 1'-5'

Description of Gravel CLEAN MEDIUM GRAVEL. ROCK
TO 6" ENCRUSTED SURROUND + SUBANGULAR
STONE. EXCESSIVE FINES.
Type of Deposit TERRACE

Remarks GRAVEL BECOMES MORE SANDY
TOWARDS BOTTOM OF TEST PITS.

Signed Hal Coen
(iii) The overburden in area 3 will be used and distributed throughout Area 1 and 2. Overburden of area 3 will be removed to the level of top soil if this exists. This area will then be stripped and soil stockpiled on east end of Area 3. Additional overburden stocked piled on westerly edge of Area 3. Top soil and overburden will be retained for reclamation of Area 3.

All crushing will take place in the mined area.

Reclamation of part of Areas 1 and 2 can be reclaimed and contoured and seeded with pasture grasses in conjunction with further mining operations. All slopes will be provided with a minimum of a 4 to 1 slope.

Area 3 excavation and contour will be extended equivalent to that of drawing A-A and portion of B-B within LSD 12.

(iv) The area to be reclaimed will have sufficient coverage above the water table so groundwater should not effect the pit area.

Changes that may occur will be addressed and submitted at the time of the annual reports or when reclaimed areas are carried out.
DRAWING 1

Existing Site Conditions

Legal: Land Location:
LSD 11 and 12
TOWNSHIP 41 RANGE 4 W 4 M
APPROX. 17.5 ACRE AREA OF 1/2
APPROX. 7 ACRE IN AREA 3

T/S
TOP SOIL 15% PROPOSED
O/B
OVER BURDEN 20% PROPOSED
S/P
STOCKPILE 5% PROPOSED

Scale:
1:1500 or 1 inch = 125 feet

Approved by:

[Signature]

Name:

Date:
CROSS-SECTIONS

A-A EASY PIT AREA APPROX 500' NORTH/SOUTH
B-B EAST TO WEST DRAKE 2000 FT
C-C WEST PIT AREA APPROX 1600' NORTH/SOUTH

Legal Land Location:

LSD 1142 SEC 17 Tp 41 Rg 4 W4 M
All those parcels or tracts of land, situate, lying, and being in the 38th township, in the 5th range, west of the 4th meridian, in the Province of Alberta, Canada, and being composed of:

The south half of legal subdivision 9, and all that portion of the south half of legal subdivision 10 of section 24 of the said township, which lies to the west of the westerly limit of a power line right-of-way, as shown upon a plan of survey on file in the Department of Energy and Natural Resources at Edmonton as No. 1663 T (file No. 2904 EZ), and which lies to the south and west of the south-westerly limit of an access roadway, as shown upon a plan of survey on file in the said Department of Energy and Natural Resources as No. 12368 MS (file No. 11251 MS).

The lands herein described containing 26.80 acres, more or less.

<table>
<thead>
<tr>
<th>ALBERTA</th>
<th>TITLE No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENERGY AND NATURAL RESOURCES</td>
<td>SML780015</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NAME</th>
<th>ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town of Provost-</td>
<td>Box 449, Provost, Alberta</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TERM</th>
<th>FROM</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Years</td>
<td>February 20, 1978</td>
</tr>
</tbody>
</table>

Lee: MD #52
cc: Field Service

\[ \text{Well} = \frac{1320}{660} \times \frac{1}{3} = 1 \frac{3}{8} \]
A. METHOD OF OPERATION: (CHECK AND EXPLAIN)
- FRONT END LOADER ☑
- DREDGING ☐
- SHOVEL ☐
- SCRAPER ☐
- OTHER ☐
EXPLAIN: Used front end loader for Pit Run and gravel from stockpile which was crushed by crusher (3/4" Screen).

B. LOCATION OF GRAVEL DEPOSIT: (CHECK)
- STREAMBED ☐
- FLOODPLAIN ☐
- HIGHLAND ☑

C. THICKNESS OF GRAVEL DEPOSIT: FIVE FEET.

D. SIZE OF GRAVEL IN DEPOSIT:
- ESTIMATE:
  - 0 - 1": 90 %
  - 1" - 2": 10 %
  - 2" - 3": NIL %
  - 3" +: NIL %

E. TYPE OF GRAVEL OPERATION
- PIT RUN ☑
- SCREENED ☐
- WASHED ☐
- CRUSHED ☑
- SIZE OF GRAVEL TO BE USED: 3/4" INCH

F. IF CRUSHED AND WASHED, WHERE WILL WATER BE OBTAINED FROM:
- LAKE ☐
- STREAM ☐
- RIVER ☐
- OTHER ☐

G. IF GRAVEL WASHED, DESCRIBE METHOD OF RETAINING FINER MATERIAL AND SEDIMENT:

H. THICKNESS OF GRAVEL DEPOSIT TO BE EXCAVATED: FIVE FEET

I. DEPTH OF OVERBURDEN TO BE REMOVED: TWO FEET.

J. TYPE OF OVERBURDEN:
- DUFF & MOSS: INCHES
- LOAN: FEET
- CLAY, SAND, Silt: 20 FEET

K. SPECIFY HOW THE OPERATING AREA WILL BE RECLAIMED: GRAZED FOR

L. IF WATERFOWL INVOLVED:
- NAME:
- WIND:
- BANK HEIGHT:

M. PERCENT COVER:
- GRASSLAND ☑
- POPULAR ☑
- PINE ☐
- SHRUB ☐
- BRUSHLAND ☐
- OTHER ☐

One Sketch Page
1. Fill in legal description of lease.

2. Outline lease boundary in the color green.

3. Outline location and dimensions of operating area in relation to the lease boundary. In the color red, show dimensions and distances in feet.

4. Indicate the location of initial gravel excavation and the direction operations will be carried out using an arrow.

5. Show location of any water sources in the color blue and indicate the nearest distance from operating area in feet.

6. Outline and shade in the yellow boundary of the gravel deposit in yellow.

7. Show location and width of access trail into lease and operating area.

8. Show gravel testing areas using the symbol (C).

9. Show location where overburden will be stockpiled using symbol (O).

10. Show location of settling ponds to be used in washing operation using symbol (E).

LOCATION: 12 31 38 5

SCALE = 1" = 100 FT.
GRADATION CHART - SOIL CEMENT SAND

NAME OF SOURCE: MAULL
LOCATION OF SOURCE: SE 13-41-4-4
LAB SAMPLE NO.: 330721 - 724

[Diagram of gradation chart with axes labeled for sieve sizes and cumulative percent passing.]
PROVINCE OF ALBERTA
DEPARTMENT OF PUBLIC WORKS
REPORT ON GRAVEL PROSPECTS

Owner Mr. R. Maull Jr. Date June 15, 1955
Address Mervin, R.-T.A. File 8166 - 4 - 4
Location NE1, Sec. 17, Tp. 41, R. 9, W. 9, M.
Agreement - To agree to take -
Suitable for - Unsuitable -
Approx. Area Extensive Approx. Yardage Extensive
Best Area to Work Fit -
Dead Haul -
Condition of Dead Haul -
Approx. % Crush 50% Estimated P.I. -
Grading Very fair. Sand Available Extensive
Overburden 1 ft to 3 ft.
Description of Gravel Acid rock, sand 5% mainly K. sand, few gravel fragments sand.

Type of Deposit Alluvial.

Remarks Two tests were made over a wide
length with all the same types
of any fine material

Signed: [Signature]
PROVINCE OF ALBERTA
DEPARTMENT OF HIGHWAYS
REPORT ON GRAVEL PROSPECTS

Owner  T.C. CLARK  Date  OCT. 1960
Address  CZAB  File  3/44-6-9
Location  N.W 1/4 Sec. 1  Tp. 41  R 6 W 4 M
Agreement  10' 1965
Suitable for  BASE COURSE
Approx. Area  Approx. Yardage  62,000 CU. YDS
Best Area to Work Pit  AREA A, B, C, D, E
Dead Haul  0.80 MILES
Condition of Dead Haul  GRADE TO BE CONSTRUCTED
Approx. % Crush  10% - 20%  Estimated P.I.  0 - 6
Grading  FINE  Sand Available  ✔
Overburden  1' - 3' AVERAGE 2'
Description of Gravel  FINE CLEAN GRAVEL SUBROUND 1 SUBANGULAR ROCK
Type of Deposit  TERRACE

Remarks

Signed  Hal Green
AGGREGATE GRADATION CHART

PROJECT ___________________________ FROM ___________________________
JOB NO. ___________________________ TO ___________________________
PIT NAME BECK SAND WEEK ENDING ___________________________
PIT LOCATION NE 10-41-6-4 TYPE OF WORK ___________________________
REGION ___________________________ SAMPLE SOURCE ___________________________
DISTRICT ___________________________ METRIC SERIES SPEC. 70-40

SIEVE SIZE - U.S. STANDARD SIEVE SIZE

325 200 100 50 40 30 20 16 10 8 4 3 3 1/4 5/8 3/4 1 1/2 2 2 1/2 3 5

SAND
FINE MEDIUM COARSE FINE

GRAVEL
COARSE

CUMULATIVE PERCENT PASSING

0 10 20 30 40 50 60 70 80 90 100

LEGEND

DESIGN GRADATION LIMITS

This material is suitable for use in soil cement

Krenskyman
02-10-95

MATERIAL SIEVES
CGS3 8-GP-21A

mm 0.02 0.03 0.04 0.06 0.08 0.1 0.12 0.14 0.16 0.18 0.2 0.24 0.3 0.36 0.4 0.48 0.5 0.6 0.8 1 1.1 1.2 1.4 1.5 1.8 2 2.4 3

inch 0.0002 0.0003 0.0004 0.0006 0.0008 0.001 0.0012 0.0014 0.0016 0.0018 0.002 0.0024 0.003 0.0036 0.004 0.0048 0.005 0.006 0.008 0.01 0.012 0.014 0.016 0.018 0.02 0.024 0.03 0.036 0.04 0.048 0.05 0.06 0.08 0.1 0.12 0.14 0.16 0.18 0.2 0.22 0.24 0.3 0.36 0.4 0.48 0.5 0.6 0.8 1 1.1 1.2 1.4 1.5 1.8 2 2.4 3
<table>
<thead>
<tr>
<th>Pit 1</th>
<th>3</th>
<th>0</th>
<th>6</th>
<th>3</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>19</td>
<td>20</td>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
</tr>
<tr>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pit 2</th>
<th>3</th>
<th>0</th>
<th>6</th>
<th>3</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>19</td>
<td>20</td>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
</tr>
<tr>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overburden</th>
</tr>
</thead>
<tbody>
<tr>
<td>O.B.</td>
</tr>
</tbody>
</table>

**Log of Pits**

**Owner:**

**Address:**

**Plotted by:**

**Date:**

**File:**

**Page:**

**Book:**

**Date:**

**File:**
Owner P. R. K. VILL Date MARCH 1967
Address METISKOW File 3160-5-4
Location E 1/2 Sec. 10 Tp. 40 R 5 W 4 M
Agreement 5' 1967
Suitable for SOIL CEMENT
Approx. Area ___________ Approx. Yardage 10,000 CU. YDS. ✓
Best Area to Work Pit AREA A
Dead Haul 0.5 MILES FROM TEST HOLE #4 TO MILE LINE "A" PROJ. 13-4
Condition of Dead Haul FIELD: HAUL ROAD TO BE BUILT
Approx. % Crush ___________ Estimated P.I. TR.
Grading WELL GRADED Sand Available ✓
Overburden 6'-1'
Description of Sand MEDIUM TO COARSE, SHARP CLEAN SAND
Type of Deposit WIND DEPOSIT
Remarks WATER AT 11' IN HOLE 4. OTHERWISE DRY. MORE SAND CAN BE FOUND IN THIS QUARTER.

Signed [Signature]
GRAVEL PROSPECTING

SCALE 1 IN. = 400 FT.

SAMPLE MARKED AS
TEST PIT # 9

SAMPLE MARKED AS
TEST PIT # 6
Owner: R. Hargreaves  Date: June 12 1972
Address: CZAB  File: 3166 - 6 - W
Location: S.E. 4 Sec. 27  Tp. 40  R 6  W 4
Agreement: Yes (10.6)
Suitable for: 
Approx. Area: 
Approx. Yardage: 
Best Area to Work Pit: 
Dead Haul: 
Condition of Dead Haul: 
Approx. % Crush: 
Estimated P.I.: 
Grading: 
Sand Available: 
Overburden: 
Description of Gravel: Mostly fine with some per gravel.
Type of Deposit: 
Remarks: Gravel was found in small shallow pockets and too small a quantity was found too be of use.

Signed: Hal. Cochrane
PROVINCE OF ALBERTA
DEPARTMENT OF HIGHWAYS
REPORT ON GRAVEL PROSPECTS

Owner ___________________________ Date _______________________

Address __________________________ File _______________________

Location A. __ Sec. __ Tp. __ R __ W __

Agreement _________________________

Suitable for _________________________

Approx. Area ______________________ Approx. Yardage _______________

Best Area to Work Pit _________________________

Dead Haul __________________________

Condition of Dead Haul _________________________

Approx. % Crush ______________________ Estimated P.I. _______________

Grading ___________________________ Sand Available __________________

Overburden _________________________

Description of Gravel __________________________

Type of Deposit _______________________

Remarks THIS GRAVEL CONSISTS ENTIRELY OF SAND AND SAND DIRT. NO TESTING WAS DONE FOR THIS SEASON.

Signed ____________________________
| Pit  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | Pit |
|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 28'  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 24'  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 20'  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 16'  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 12'  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 8'   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 4'   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
The information pertaining to the data as shown has been compiled for the use of the Department of Highways. No responsibility will be assumed by the Department for the correctness or completeness of the data shown and should any such data be found incorrect or incomplete the contractor shall have no claim on that account.
REQUIRED PROCEDURE FOR OPERATIONS IN THE R. RICHARDS PIT

NOTE:
- D BEGIN AGGREGATE EXCAVATION IN AREA "B" OUTLINED WITH A DASHED LINE
- D BEGIN AGGREGATE EXCAVATION IN AREA DESIGNATED BY THE ENGINEER
- D PLACE OVERBURDEN IN AREA "P" OUTLINED WITH A DASHED LINE
- D PLACE OVERBURDEN IN AREA DESIGNATED BY THE ENGINEER

LEGEND:
- OP = OPEN PIT
- A = AGGREGATE AREA
- D = DEPLETED AREA
- O = OVERBURDEN AREA
- TS = TOPSOIL

DATE OCT. 5 1982

AGGREGATES ENGINEER
DATE: JUNE 19 87  LOCATION NW 1/4SEC 1 TP 39 RSE 1 W 4 M.
TESTER: PERKAS  PIT NAME: M.D. OF PROVST

OF CROWN  □ PRIVATE  □ UNKNOWN

DEPOSIT POTENTIAL: POSSIBLE USE AS BLEND SAND OR SOIL CEMENT
TYPE OF DEPOSIT: GLACIAL OUTWASH
DEPOSIT REPORTED BY: M.D. OF PROVST
FURTHER ACTION: DUG RANDOM HOLES TO TEST FOR GRAVEL. SOME 15 FT IN HILLS ON WEST SIDE OF W. HOLES IN LOWER AREAS SEEMED TO BE MORE OF A MEDIUM SAND.

---

**Diagram:**

- LS 13
- LS 14
- LS 12
- LS 11
- Pasture

---

**Legend:**

- N
- W
- E
NE 1/4 SEC. 11  TP. 39  RGE. 1  W. 4 M.

OWNER  M.D.

ADDRESS  HAYTER, ALTA.

TESTED BY  D.W. LOUGHEED  DATE  OCT. 17 1957

GRAVEL PROSPECTING

SCALE 1 IN. = 400 FT.

ST. LAWRENCE LAKE.
PROVINCE OF ALBERTA
DEPARTMENT OF PUBLIC WORKS
REPORT ON GRAVEL PROSPECTS

Owner: CANADIAN PACIFIC RAILWAY  Date: DECEMBER 1959

Address: File 3166-15

Location: NW 1/4 Sec. 17 Tp. 39 R 1 W 4 M.

Suitable for: SOIL CEMENT

Approx. Area: Approx. Yardage: 127,000

Best Area to Work: Pit ANYWHERE IN TESTED AREA

Dead Haul: 0.25

Condition of Dead Haul: VERY GOOD - HIGH, WIDE, AND GRAVELED

Approx. % Crush: Estimated P.I.

Grading: Sand Available

Overburden: 1'-6'

Description of Crop: SAND MOSTLY FINE AND CLEAN.

Type of Deposit: GLACIAL

Remarks: THIS PIT WAS TESTED WITH A DRILL. NO SAMPLES TAKEN:

Signed: [Signature]

[Photo]
PROVINCE OF ALBERTA  
DEPARTMENT OF HIGHWAYS  
REPORT ON GRAVEL PROSPECTS

Owner  N. IMSEON  Date  MAY 1939
Address  HAYTER  File  3166 - K1.  
Location  S.W. 1/4 Sec. 17 Tp. 39 R 1 W 4TH  

Suitable for

Approx. Area  Approx. Yardage

Best Area to Work Pit

Dead Haul

Condition of Dead Haul

Approx. % Crush  Estimated P.I.
Grading  Sand Available
Overburden

Description of Gravel  FINE SANDY GRAVEL WITH  
CLAY LUMPS

Type of Deposit  GLACIAL

Remarks  GRAVEL WAS FOUND IN SMALL POCKET  
ONLY GRAVEL IN ALL TEST HOLES WAS FINE AND  
VERY DIRTY.

Signed  

PROVINCE OF ALBERTA
DEPARTMENT OF HIGHWAYS
REPORT ON GRAVEL PROSPECTS

Owner: MILL DROBOSKY Date: JULY 1959
Address: PROVOST File: 3166 - 107.76
Location: NE 1/4 Sec. 13 Tp. 32 R 2 W 4 M
Agreement: YES AT 10 X 16
Suitable for: SOIL CEMENT
Approx. Area: Approx. Yardage: 90,000
Best Area to Work Pit: CENTRE OF TESTED AREA
Dead Haul: END OF FIELD TAIL
10 MILES OF GOOD M.D. ROAD
Condition of Dead Haul: GOOD

Approx. % Crush: Estimated P.I.: TRACE
Grading: Sand Available: 
Overburden: 6" - 1
Description of Gravel: CLEAN FINE SAND

Type of Deposit: GLACIAL

Remarks:

Signed: Hal Coon
**AGGREGATES TESTING SUMMARY**

**DATE:** 10/25/87

**LOCATION:** SEC 18, T. 38, R. 22, W. 1 N.

**OWNER:** IAN WAGAR

**PIT NAME:** WAGAR

**QUANTITY:**
- Gravel: __________ m³
- Sand: __________ m³

**DEPTH OF OVERBURDEN:**
- Top: __________ m
- Bottom: __________ m

**DEPTH OF DEPOSIT:**
- Top: __________ m
- Bottom: __________ m

**AGGREGATE DESCRIPTION**

<table>
<thead>
<tr>
<th>Top Size, mm</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grading</td>
<td>Deleterious Material</td>
</tr>
<tr>
<td>WELL GRADED</td>
<td>EXCESSIVE FINES</td>
</tr>
<tr>
<td>EXCESSIVE GRAVEL</td>
<td>SHORT GRAVEL</td>
</tr>
<tr>
<td>EXCESSIVE PEA GRAVEL</td>
<td>SHORT COARSE SAND</td>
</tr>
<tr>
<td>EXCESSIVE COARSE SAND</td>
<td>SHORT FINE SAND</td>
</tr>
<tr>
<td>EXCESSIVE FINE SAND</td>
<td>CLEAN</td>
</tr>
<tr>
<td></td>
<td>ROCK COATED, CLAY</td>
</tr>
</tbody>
</table>

**GRAINSHAPE**

- ANGULAR
- SUBANGULAR
- SUBROUND
- ROUND

**SAND**

- SHARP
- ROUND

**PLASTICITY**

- HIGH
- MEDIUM
- LOW
- TRACE OR NIL

**SURFACE TEXTURE**

- ROUGH
- SMOOTH

**BULL CRUSHER**

- YES
- NO

**TYPE OF DEPOSIT**

- STREAM TERRACE
- DUNES BARCHANE
- STREAM ISLAND
- DUNES FINGER
- GLACIAL TERRACE
- DUNES SHEET
- GLACIAL DELTA
- BEACH RIDGE
- GLACIAL KAME
- GRAVEL BAR
- GLACIAL ESKER
- OTHER

**TESTED FOR:**

- ACRE PURCHASE
- FUTURE
- P.L.O.
- PROJECT
- DISTRICT
- ID.
- M.D.

**SPECIAL PROVISIONS:**

**COMMENTS:**

*Extensively Tested Because Mr. Wagar Would Not Sign an Agreement For Land/Lease.*

"Good Looking Gravel. Possibly 1,000,000,000 Tons Available. Mr. Wagar Lives In Medicine, Sask. P. O. 733. 2140"
Owner __________________________ Date ______________
Address ________________________ File ____________
Location Sec. ________ Tp. ________ R ______ W ______ M
Agreement ________________________
Suitable for ______________________
Approx. Area ________________ Approx. Yardage __________
Best Area to Work Pit __________________________
Dead Haul __________________________
Condition of Dead Haul _______________________
Approx. % Crush ________________ Estimated P.I. __________
Grading ______________________ Sand Available __________
Overburden ______________________
Description of Gravel _______________________ 
____________________________________
____________________________________
Type of Deposit ______________________
Remarks __________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Signed ____________  

[Handwritten signature]
**Reservations/Notation Amendment**

### Agency (Dept/Branch)
- Energy and Natural Resources

### Client I.D. No.
- 81000 20-201

### Purpose of the Amendment
- □ Add Land
- □ Delete Land
- [ ] Amend Expiry Date
- □ Amend Code
- □ Amend Other (see explanation)

### Explanation for Amendment Change:
- Amended Agency Comments: "Please amend for a 5-year term in favor of Alberta Transportation Utilities"

### Agency Contact Person:
- P. Helus

---

### ADD LANDS

<table>
<thead>
<tr>
<th>Subdivision Plan No.</th>
<th>Block</th>
<th>Lot</th>
<th>Parcel</th>
<th>Subdivision Plan No.</th>
<th>Block</th>
<th>Lot</th>
<th>Parcel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DELETE LANDS

<table>
<thead>
<tr>
<th>Subdivision Plan No.</th>
<th>Block</th>
<th>Lot</th>
<th>Parcel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### LANDS NOW REQUIRED

<table>
<thead>
<tr>
<th>Subdivision Plan No.</th>
<th>Block</th>
<th>Lot</th>
<th>Parcel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

- SRPU Conflicts: □ Yes □ No □ see attached
- Energy & Natural Resources Use Only

---

### Reservation/Notation

<table>
<thead>
<tr>
<th>Type</th>
<th>Current Code</th>
<th>Amended Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CNT</td>
<td>GNT</td>
</tr>
</tbody>
</table>

### Purpose

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0541</td>
<td>0541</td>
</tr>
</tbody>
</table>

### Exception(s)

- [ ]

### Action by

- Doc/SRPU (App)
- Admin. Support
- Land Mg’t
- Doc/SRPU (Disp)
- File Records

### Referral Dates (Sent/Received)

- Land Mg’t
- AFS
- F & W
- Envir.
- Transp.
- Minerals
- Other

---

### LSAS Note:

- LSAS Input Id: LSAS 05
- TX No. 188082 2 A04 1983
- Received: 12.03.93
- LSAS

---

### Amendment Details

- Amendment Date: [Y/M/D]
- Expiry Date: [Y/M/D]
Special Problems encountered in using this source:

Recommendations for further use of this source:

Remarks:

**An excellent source for future haul data.** Focus Source job.

SWS-38-6-W4

PROJECT AVERAGE TEST RESULTS

Please produce and enter below a weighted average of the test results obtained for each class of material used on your project.

<table>
<thead>
<tr>
<th>NUMER</th>
<th>METRIC</th>
<th>IMPERIAL</th>
<th>15'</th>
<th>3'</th>
<th>1'</th>
<th>1/2'</th>
<th>1/4'</th>
<th>1/8'</th>
<th>1/16'</th>
</tr>
</thead>
<tbody>
<tr>
<td>753</td>
<td>CLASS 40</td>
<td>1/2''</td>
<td>1/4''</td>
<td>1/8''</td>
<td>1/16''</td>
<td>1/32''</td>
<td>1/64''</td>
<td>1/128''</td>
<td>1/256''</td>
</tr>
<tr>
<td>753</td>
<td>CLASS 40</td>
<td>1/2''</td>
<td>1/4''</td>
<td>1/8''</td>
<td>1/16''</td>
<td>1/32''</td>
<td>1/64''</td>
<td>1/128''</td>
<td>1/256''</td>
</tr>
<tr>
<td>753</td>
<td>CLASS 40</td>
<td>1/2''</td>
<td>1/4''</td>
<td>1/8''</td>
<td>1/16''</td>
<td>1/32''</td>
<td>1/64''</td>
<td>1/128''</td>
<td>1/256''</td>
</tr>
<tr>
<td>753</td>
<td>CLASS 40</td>
<td>1/2''</td>
<td>1/4''</td>
<td>1/8''</td>
<td>1/16''</td>
<td>1/32''</td>
<td>1/64''</td>
<td>1/128''</td>
<td>1/256''</td>
</tr>
</tbody>
</table>

DEADNAILS

Please plot on the diagram below:

1. The pit.
2. Your project.
3. The common haul points you used.
4. The deadnails you used, with distances to the common haul points.
**Reserve/Notation Amendment**

- **Agency (Dept./Branch):** E & NR Control No.
- **Client I.D. No.:** E & NR File No.
- **Telephone:** 433-3101
- **Date of Request:** May 25/89
- **Agency File No.:** GT 36-02-A
- **Purpose of the Amendment:**
  - [ ] Add Land
  - [ ] Delete Land
  - [x] Amend Expiry Date
  - [ ] Amend Code
  - [ ] Amend Other (see explanation)

**ADD LANDS**

<table>
<thead>
<tr>
<th>Subdivision Plan No.</th>
<th>Block</th>
<th>Lot</th>
<th>Parcel</th>
</tr>
</thead>
</table>

**DELETE LANDS**

<table>
<thead>
<tr>
<th>Subdivision Plan No.</th>
<th>Block</th>
<th>Lot</th>
<th>Parcel</th>
</tr>
</thead>
</table>

**LANDS NOW REQUIRED**

<table>
<thead>
<tr>
<th>Subdivision Plan No.</th>
<th>Block</th>
<th>Lot</th>
<th>Parcel</th>
</tr>
</thead>
</table>

**SRPU Conflicts**

- [ ] Yes
- [ ] No
- [ ] See attached

**Energy & Natural Resources Use Only**

- **Comments:**
- **Amendment Date (Y.M.D):** 87/06/10
- **Expiry Date (Y.M.D):** 87/11/31

**Action by (Date & Initial):**

- **Referral Dates (Sent/Received):**
- **LSAS Note:**
  - **LSAS INPUT ID:** LSASI 08
  - **TX No.:** 1890620 83

**LSAS**

- **Energy & Natural Resources Use Only**
  - **Comments:**
  - **Amendment Date (Y.M.D):** 87/06/10
  - **Expiry Date (Y.M.D):** 87/11/31

**LSAS Note:**

- **Copy for:**
  - **Field:**

**LSAS**

- **Energy & Natural Resources Use Only**
  - **Comments:**
  - **Amendment Date (Y.M.D):** 87/06/10
  - **Expiry Date (Y.M.D):** 87/11/31

**LSAS Note:**

- **Copy for:**
  - **Field:**

**LSAS**

- **Energy & Natural Resources Use Only**
  - **Comments:**
  - **Amendment Date (Y.M.D):** 87/06/10
  - **Expiry Date (Y.M.D):** 87/11/31

**LSAS Note:**

- **Copy for:**
  - **Field:**

**LSAS**

- **Energy & Natural Resources Use Only**
  - **Comments:**
  - **Amendment Date (Y.M.D):** 87/06/10
  - **Expiry Date (Y.M.D):** 87/11/31

**LSAS Note:**

- **Copy for:**
  - **Field:**
PIT PLAN

REQUIRED PROCEDURE FOR OPERATIONS IN THE HECK SAND PIT

NE 1/4 SEC. 32 TP. 36 RGE. 1 W. 4 M.

NOTE:
- OPEN PIT
- ORE AREA
- DEPLETED AREA
- STRIPPING
- TOPSOIL
- MAPP. R.M.W.
- P.E.
- T.F.
- S.G.

LEGEND:
- SP. STOCKPILE
- CRUSH STOCKPILE
- BOUNDARY OF RESERVATION AREA
- BOUNDARY OF AGREEMENT AREA
- HIGHWAY RIGHT OF WAY
- PEACE LINE
- WATER

DATE August 21 1987

FOR MATERIALS ENGINEERING BRANCH
MEMORANDUM

TRANSPORTATION

FROM John Penner, C.E.T.
Project Services Tech.
STETTLER

TO Bruce Blue
Info Technologist
Materials Engineering Br.
EDMONTON

SUBJECT PROPOSED S.C.B.C. - SR899:08
NORTH OF BODO TO SOUTH OF BODO

Regard regarding the gravel and sand information submitted
concerning the above project I wish to clarify the
pit locations as follows:

1) Gravel Pit (Paulgaard Pit) - location should
read NE 3-37-2-4. This is an existing pit but needs
( ) testing for determining quantity remaining.

2) Sand Pit (SE 32-36-1-4) this location has
not been previously used but is a passable source
of sand for the S.C.B.C. We obtained a sample and
the sieve results are attached. The sieve results
show a clean uniform material lacking in silty filler
and therefore a filler may be required. We are
submitting this as an area that warrants testing
due to its proximity to the project.

If further information is required please give
me a call.

John Penner, C.E.T.
Project Services Tech.

JP/yll
Att'd
REQUIRED PROCEDURE FOR OPERATIONS IN THE KISSLINGER SAND PIT

SE 1/4 SEC. 32... TP. 36... RGE 2... W. 4... M.

NOTE:
- DEPOSIT AGGREGATE EXCAVATION IN AREA "B" OUTLINED WITH A DASHED LINE
- BEGIN AGGREGATE EXCAVATION IN AREA DESIGNATED BY THE ENGINEER
- PLACE OVERBURDEN IN AREA "P" OUTLINED WITH A DASHED LINE
- PLACE OVERBURDEN IN AREA DESIGNATED BY THE ENGINEER

LEGEND:
- OP = OPEN PIT
- A = AGGREGATE AREA
- D = DEPLETED AREA
- O = OVERBURDEN AREA
- TS = TOPSOIL

LOCATION MAP
SCALE: 1 in. = 12 mi.

DATE ........ OCT., 1979.

SECONDARY ROADS ENGINEER