

Aggregate Resource Inventory in the Rural Municipality of De Salaberry

by G.L.D. Matile

Manitoba
Energy and Mines
Mines Branch



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Aggregate Report AR89-3

Aggregate Resource Inventory in the Rural Municipality of De Salaberry

by G.L.D. Matile
Winnipeg, 1994

Energy and Mines

Mines Branch

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MAP

| | |
|---|-------------|
| Map AR89-3: Aggregate Resources in the Rural Municipality of De Salaberry | (in pocket) |
|---|-------------|

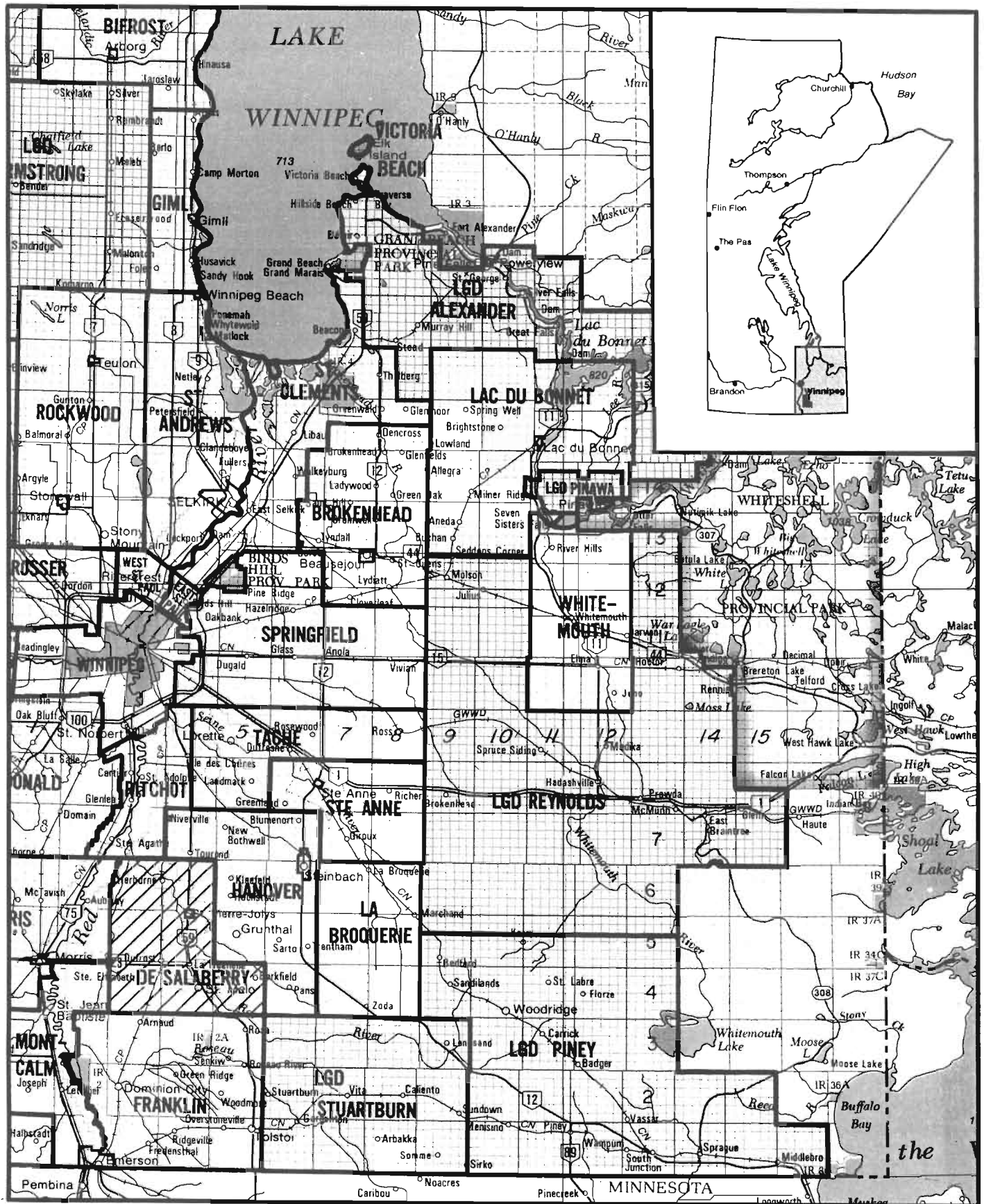


Figure 1: Location map.

INTRODUCTION

OBJECTIVES

An aggregate inventory was carried out in the Rural Municipality of De Salaberry during the summers of 1987 and 1988. The objectives were to delineate sand and gravel deposits at a scale of 1:50 000 and to estimate the quantity and quality of material in each deposit. The aggregate inventory would then provide a database for land-use planning and potential resource users.

LOCATION AND ACCESS

The Rural Municipality of De Salaberry is located 35 km south of Winnipeg via P.T.H. 59 (Fig. 1). It comprises seven townships (650 km²), including townships 4-6, ranges 3-4E and township 4, range 5E. The area is included in NTS areas 62H/6, 62H/7, 62H/10 and 62H/11. A network of provincial trunk highways, provincial roads and section roads provide good access to all areas of the municipality. P.T.H. 59 runs north-south through the area, providing good access to St. Pierre-Jolys and St. Malo, which are the two largest towns. P.T.H. 23 runs westward from P.T.H. 59, providing access to the western aggregate markets of the Winkler - Morden area, where aggregate reserves are sparse. Provincial roads and section roads provide access to essentially every section in the municipality, however many section roads would require upgrading to accommodate truck traffic transporting aggregate.

PHYSIOGRAPHY

Most of the municipality is clay plain with local relief of less than a metre and virtually no aggregate potential. In the eastern third of townships 4-5, range 4E, the till plain rises abruptly from the clay plain and extends throughout township 4, range 5E. The till plain is generally gently rolling however, the greatest local relief, along the western margin, can be up to 10 m. The relatively large local relief coupled with the abundance of glaciofluvial features along the western margin of the till plain in this area suggests that there may have been a glacial ice margin (*moraine*) in this area at one time. The depth to bedrock is generally around 60 m, decreasing slightly to the northwest (Teller *et al.*, 1976).

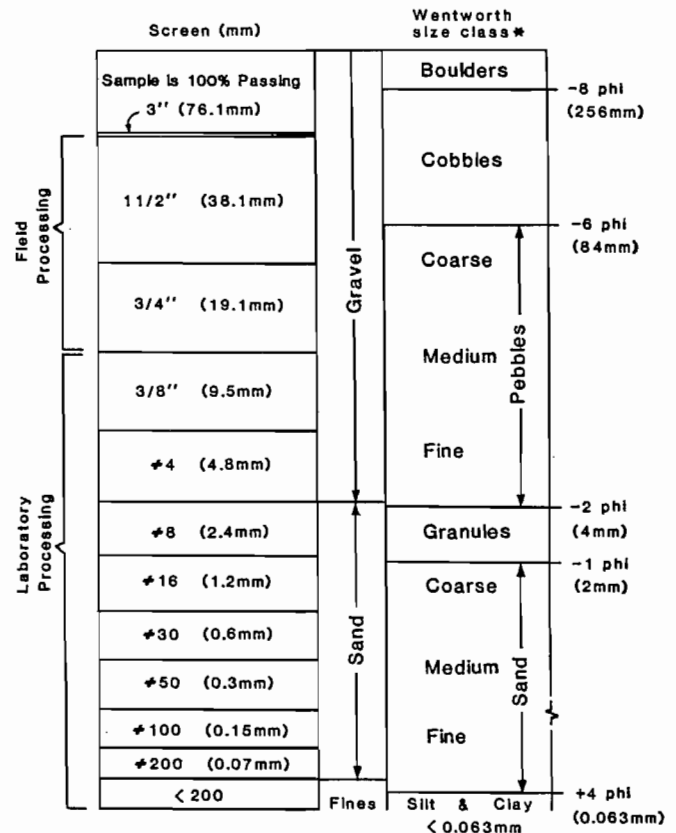
The area is within the Rat River watershed, which is part of the Red River drainage basin. The Rat River and its tributaries, Joubert Creek, Marsh River and Coulee des Nault, drain towards the northwest. A system of drainage ditches carries spring runoff and storm water northwest to the Marsh River.

METHODOLOGY

Potential aggregate deposits were delineated on 1:50 000 scale airphotos, incorporating the following data: interpretation of black and white aerial photographs at scales of 1:50 000 and 1:15 840; pit inventory files from the Manitoba Department of Highways and Transportation; and soil maps (Ehrlich *et al.*, 1976).

Field investigation was conducted over two field seasons commencing in the summer of 1987. All existing exposures, including gravel pits and road cuts, were visited and samples were collected from deposits considered to have economic value. Sites interpreted to have unproven aggregate potential were tested with a backhoe in the latter portion of the field season. In addition, several sites in the municipality were visited and sampled prior to 1987 to satisfy land-use planning requirements; these data are included in Appendix I. In an attempt to locate sites with buried aggregate potential, 35 km of resistivity survey line (EM) was conducted.

Gravel samples were processed in two stages¹. In the first stage, which was conducted at the sampling sites, the material retained on 38 mm (1 1/2 inches) and 19 mm (3/4 inches) screens was weighed and a representative sample (≈ 1 kg) of the material that passed the 19 mm screen was collected. In the second stage, the minus 19 mm material was screened through 11 sieves, each separate weighed (Fig. 2), and a percentage retained was calculated for each size fraction.



* modified from Folk, 1974

Figure 2: Grain size analysis and classification.

1 The maximum grain size sampled was 76 mm (3 inches).

This two-stage procedure was developed to overcome sampling deficiencies in sediments with an abundance of material coarser than 19 mm, ensuring that there was sufficient material in the coarser size fractions to maintain the samples' statistical validity (American Society for Testing and Materials, 1987, see specification **ASTM D75-82**). This procedure made it feasible to take samples in excess of 150 kg where necessary.

Field data and aggregate deposit boundaries were plotted on 1:50 000 scale airphotos, and these were used to produce the final map (Map AR89-3, *in pocket*). Several deposits (1824A and B, 1826 and 1834) are highlighted on the 1:50 000 scale map and detailed on airphoto mosaic inserts at a scale of 1:15 840.

PREVIOUS WORK

Much of the R.M. of De Salaberry had been mapped prior to this study and, where possible, this information has been integrated into this study. Ehrlich *et al.* (1976) mapped the surface deposits as part of the regional soil survey of the Winnipeg and Morris area. Many deposits and pits have been tested by Materials and Research Branch of the Manitoba Department of Highways and Transportation. Preliminary studies by Ringrose *et al.* (1977a, 1977b) covered the entire municipality at a scale of 1:50 000. The R.M. of De Salaberry was also included in an aggregate industry study that examined supply and demand of various qualities of aggregate within the Winnipeg market area (Underwood McLellan and Associates, 1976).

ACKNOWLEDGEMENTS

Phillipe Elias and Carole Tetreault provided able field assistance. Chester Wojciechowski drafted the map.

BEDROCK GEOLOGY

Lower Jurassic rocks of the Amaranth Formation subcrop in all but the extreme northern portion of the R.M. of De Salaberry. This sedimentary sequence comprises an east-west trending outlier of Jurassic rocks known as the *Dominion City Channel*, which infills a channel cut into Ordovician rocks of the Winnipeg and Red River Formations. The Amaranth Formation is composed of red argillaceous siltstone and sandstone overlain by evaporites (gypsum and

anhydrite). Gypsum was mined at the Silver Plains mine, 21 km west of St. Pierre-Jolys, from 1964 to 1975, when flooding of the shaft forced its closure (Manitoba Energy and Mines, non-confidential files).

The Ordovician Red River Formation subcrops to the north around Otterburne. It is predominantly composed of mottled dolomitic limestone (Manitoba Energy and Mines, 1990), commonly known as *Tyndall stone*.

LATE WISCONSINAN HISTORY

Two major glacial ice lobes, the Rainy and Red River lobes, affected southeastern Manitoba during the Late Wisconsinan. These ice lobes deposited unsorted debris generally at the base of the ice (*till*) and sorted debris along meltwater channels within the ice or near the ice margin (*glaciofluvial sand and gravel*). The glaciofluvial sand and gravel is the major source of aggregate in southeastern Manitoba (see Map AR89-3).

The Rainy lobe advanced from the northeast to an unknown point in southern Manitoba and deposited the Senkiw till, in which the pebble size fraction is predominantly composed of Precambrian clasts, and its eastern equivalent, the Whiteshell till. The Rainy lobe advanced at least as far as the western edge of the till plain, as the Senkiw till is exposed in sections along the Roseau River near its namesake, the town of Senkiw (Teller and Fenton, 1980).

During its retreat the Rainy lobe stabilized in the vicinity of the Bedford Hills, where it was met by the advancing Red River lobe, which had advanced from the northwest

and deposited carbonate-rich till. Between these two ice sheets the Bedford Hills interlobate moraine was built by glacial meltwater that flowed southward into a predecessor of glacial Lake Agassiz (Teller and Fenton, 1980). Multiple advances of the Red River lobe are recorded in the Roseau River sections as described by Fenton (1974).

About 13 000 years ago, during the retreat of these two ice lobes, numerous ice marginal lakes merged to form Lake Agassiz. In the deep water of the lake, clay was deposited, while along the shore, beach ridges composed of sand and gravel were being built. These beach ridges are also an important source of aggregate in southeastern Manitoba (see Map AR89-3).

The history of Lake Agassiz is complex due to ice advances into the lake and numerous inlets and outlets that controlled the lake level. Each lake level is recorded by a developed shoreline, commonly defined by beach ridges, although many have been destroyed by subsequent events in the lake. Drumlinoid ridges, straight glacial ridges commonly

composed of sand and gravel, attest to a late glacial advance of the Red River lobe into Lake Agassiz. The Bedford Hills moraine was almost entirely surrounded by glacial ice at that time, but not overridden (Matile, 1991). Shortly after

the retreat of this ice, the Bedford Hills would have become an island within Lake Agassiz. Drainage of Lake Agassiz from southeastern Manitoba occurred around 8500 years BP.

AGGREGATE RESOURCES

Aggregate reserves have been calculated on a per-quarter-section basis, taking into account proven depths and the amount of depletion and sterilization. Sample and deposit quality were established using the guidelines shown in Figure 3.

Deposit reserves, exposure information and grain size distribution of aggregate samples are included in Appendix I. This information correlates to the aggregate map by deposit number, exposure number, and legal description. The lithology of the gravel fraction of aggregate samples in the municipality is approximately 70% carbonate (Paleozoic)

clasts and 30% crystalline (Precambrian) clasts. Shale and other deleterious lithologies are rare.

Mining activity within the municipality is very limited, partially due to the lack of high quality reserves in the area and partially due to the large distance to major aggregate markets. Several small pits produce aggregate on an intermittent basis for local consumption.

Neighbouring municipalities are more active. Gravel mined in the Grunthal and Rosa areas is being used for building roads, particularly the twinning of P.T.H. 75, and for redi-mix plants in the Niverville, Altona and Winkler areas.

| | Criteria | HIGH | MEDIUM | LOW |
|-------------------------------------|----------------------|----------|--------------|------------|
| AGGREGATE QUALITY | Stone % | >30 | 15-30 | 0-15 |
| | Sand % | 0-35 | 35-70 | >70 |
| | Mud % | 0-7 | 7-17 | >17 |
| | Shale % | 0-5 | 5-12 | >12 |
| | Other Deleterious | low | medium | high |
| | Thickness | >5 m | 2-5 m | 2 m |
| | Uniformity | high | medium | low |
| DEPOSIT DEVELOPMENT POTENTIAL | Aggregate Quality | high | medium | low |
| | Crushable | abundant | moderate | minor |
| | Overburden | <2 m | 2-4 m | >4 m |
| | Binder | yes | minor | none |
| | Water Table | >5 m | 2-5 m | 0-2 m |
| | Geological Potential | good | moderate | low |
| | Verification | proven | limited | untested |
| | Local Access | 0-1 km | 1-5 km | >5 km |
| | Quarrying Status | active | intermittent | inactive |
| | Transportation Diff. | high | medium | low |
| | Planning Constraints | none | conditional | sterilized |
| | Speciality Material | yes | | no |
| | Aggregate Substitute | none | marginal | proximal |

Figure 3: Aggregate quality and development potential guidelines. **Note:** These guidelines are an attempt to classify deposits in a broad spectrum of areas throughout Manitoba. Importance of individual criteria varies greatly depending on availability of aggregate within each region.

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APPENDIX I
DEPOSIT RESERVES, EXPOSURE INFORMATION AND GRAIN SIZE DISTRIBUTION OF GRAVEL SAMPLES

DEPOSIT # 001801 (WEST END IS IN WILDLIFE MANAGEMENT AREA)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| SE-06-004-05E | 40 | 614500 | PRIVATE/PRIVATE | |
| SW-06-004-05E | 0 | 38000 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 652500 | | |

EXPOSURE INFORMATION

EXPOSURE #: CJ871 (SE-06-004-05E) VISITED: 87/03
 EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: FOREST NATURAL
 SURROUNDING LAND USE: HIGHWAY,ROADWAY,RAILWAY
 ECONOMIC THICKNESS: 3.0 METRES ESTIMATED STONE CONTENT: MEDIUM HIGH QUALITY
 SECTION: A MATERIAL DESCRIPTION: TILL OVER SANDY, COBBLY COARSE
 PEBBLE GRAVEL
 SECTION HEIGHT: 3.6 M. DEPTH TO WATER TABLE: 3.6 M.
 LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
 DELETERIOUS: OVERBURDEN THICKNESS: 0.6 M
 MATERIAL AT BASE: SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

EXPOSURE #: CJ872 (SE-06-004-05E) VISITED: 87/03
 EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: FOREST NATURAL
 SURROUNDING LAND USE: HIGHWAY,ROADWAY,RAILWAY
 ECONOMIC THICKNESS: 3.3 METRES ESTIMATED STONE CONTENT: MEDIUM HIGH QUALITY
 SECTION: A MATERIAL DESCRIPTION: TILL OVER SANDY COBBLY COARSE
 PEBBLE GRAVEL
 SECTION HEIGHT: 4.1 M. DEPTH TO WATER TABLE: 4.1 M.
 LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
 DELETERIOUS: OVERBURDEN THICKNESS: 0.8M
 MATERIAL AT BASE: SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

EXPOSURE #: CJ873 (SE-06-004-05E) VISITED: 87/03
 EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: FOREST NATURAL
 SURROUNDING LAND USE: HIGHWAY,ROADWAY,RAILWAY
 ECONOMIC THICKNESS: 3.9 METRES ESTIMATED STONE CONTENT: MEDIUM QUALITY
 SECTION: A MATERIAL DESCRIPTION: TILL OVER SANDY, FINE PEBBLE
 GRAVEL
 SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE: 4.0 M.
 LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
 DELETERIOUS: OVERBURDEN THICKNESS: 0.1M
 MATERIAL AT BASE SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

EXPOSURE #: CJ874 (SE-06-004-05E) VISITED: 87/03
 EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: PIT-TEMPORARY USE
 SURROUNDING LAND USE: FOREST NATURAL
 ECONOMIC THICKNESS: 5.5 METRES ESTIMATED STONE CONTENT: MEDIUM HIGH QUALITY
 SECTION: A MATERIAL DESCRIPTION: SANDY COBBLY COARSE PEBBLE GRAVEL HOLE
 SECTION HEIGHT: 5.5 M. DEPTH TO WATER TABLE: 4.0 M.
 LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
 DELETERIOUS: OVERBURDEN THICKNESS:
 MATERIAL AT BASE: SAME AS IN PIT WALL
 NO CHANNEL SAMPLE TAKEN

EXPOSURE #: GB249 (SE-06-004-05E) VISITED: 80/08
 EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: PIT-TEMPORARY USE
 SURROUNDING LAND USE: FOREST NATURAL
 ECONOMIC THICKNESS: 3.5 METRES ESTIMATED STONE CONTENT: MEDIUM HIGH QUALITY
 SECTION: A MATERIAL DESCRIPTION: SANDY COBBLY PEBBLE GRAVEL
 SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
 LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
 DELETERIOUS: OVERBURDEN THICKNESS:
 MATERIAL AT BASE: SAME AS IN PIT WALL
 NO CHANNEL SAMPLE TAKEN

EXPOSURE #: GM137 (SE-06-004-05E) VISITED: 78/10
 EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT-TEMPORARY USE
 SURROUNDING LAND USE: HIGHWAY, ROADWAY, RAILWAY
 ECONOMIC THICKNESS: 3.0 METRES ESTIMATED STONE CONTENT: MEDIUM HIGH QUALITY
 SECTION: A MATERIAL DESCRIPTION:
 SECTION HEIGHT: 3.0 M. DEPTH TO WATER TABLE:
 LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
 DELETERIOUS: OVERBURDEN THICKNESS:
 MATERIAL AT BASE: SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

EXPOSURE #: LM034 (SW-06-004-05E) VISITED: 87/08
 EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: SUPERVISED WILDLIFE
 SURROUNDING LAND USE: HABITAT FOREST NATURAL
 ECONOMIC THICKNESS: 1.2 METRES ESTIMATED STONE CONTENT: MEDIUM HIGH QUALITY
 SECTION: A MATERIAL DESCRIPTION: SILT TILL OVER SANDY COBBLY PEBBLE GRAVEL
 SECTION HEIGHT: 3.2 M. DEPTH TO WATER TABLE: 2.7 M.
 LITHOLOGY: 85% GENERAL CARBONATES 15% GENERAL PRECAMBRIAN
 DELETERIOUS: OVERBURDEN THICKNESS: 1.8M
 MATERIAL AT BASE: SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

EXPOSURE #: LM035 (SW-06-004-05E) VISITED: 87/08
 EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: SUPERVISED WILDLIFE
 SURROUNDING LAND USE: HABITAT FOREST NATURAL
 ECONOMIC THICKNESS: 1.4 METRES ESTIMATED STONE CONTENT: MEDIUM HIGH QUALITY
 SECTION: A MATERIAL DESCRIPTION: SILT TILL OVER SANDY COBBLY
 PEBBLE GRAVEL
 SECTION HEIGHT: 3.2 M. DEPTH TO WATER TABLE: 2.7 M.
 LITHOLOGY: 85% GENERAL CARBONATES 15% GENERAL PRECAMBRIAN
 DELETERIOUS: WEATHERED OVERBURDEN 1.8M
 PEBBLES
 MATERIAL AT BASE: SAME AS IN PIT WALL
 SEE SIEVE ANALYSIS

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | OVERSIZE |
| CJ871 A (SE 06 004 05E) | 94 | 85 | 76 | 65 | 52 | 33 | 11 | 5 | 2 | 1 | ABUNDANT |
| CJ872 A (SE 06 004 05E) | 98 | 90 | 74 | 54 | 34 | 19 | 10 | 5 | 3 | 3 | ABUNDANT |
| CJ873 A (SE 06 004 05E) | 93 | 83 | 68 | 53 | 36 | 63 | 13 | 9 | 7 | 5 | ABUNDANT |
| GM137 A (SE 06 004 05E) | 94 | 84 | 77 | 65 | 49 | 65 | 12 | 7 | 5 | 4 | ABUNDANT |
| LM034 A (SW 06 004 05E) | 97 | 91 | 80 | 69 | 53 | 35 | 60 | 9 | 6 | 4 | ABUNDANT |
| LM035 A (SW 06 004 05E) | 94 | 87 | 77 | 65 | 53 | 42 | 67 | 11 | 7 | 5 | ABUNDANT |

(NOTE : ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001802 (POOR ACCESS)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| SE-01-004-04E | 40 | 4800 | PRIVATE/CROWN | |
| DEPOSIT RESERVES | | 4800 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM023 (SE-01-004-04E) VISITED: 78/08
 EXPOSURE TYPE: BULLDOZER TEST PIT LAND USE: PASTURE, GRAZING
 ECONOMIC THICKNESS: 1.5 METRES ESTIMATED STONE CONTENT: LOW QUALITY
 SECTION: A MATERIAL DESCRIPTION: PEBBLY SAND
 SECTION HEIGHT: 1.5 M. DEPTH TO WATER TABLE:
 LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
 DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
 INCRUSTATION
 MATERIAL AT BASE: SAME AS IN PIT WALL
 SEE SIEVE ANALYSIS

SIEVE ANALYSIS

DEPOSIT # 001803 (REQUIRES TESTING)

EXPOSURE INFORMATION

SIEVE ANALYSIS

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DEPOSIT # 001806B

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| NW-01-004-04E | 20 | 48000 | PRIVATE/PRIVATE | |
| SW-12-004-04E | 0 | 46000 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 94000 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM138 (SW-12-004-04E) VISITED: 78/10
EXPOSURE TYPE: HAND DUG HOLE LAND USE: AGRICULTURE,HAYING
SURROUNDING LAND USE:
ECONOMIC THICKNESS: 2.0 METRES ESTIMATED STONE CONTENT: MEDIUM QUALITY
SECTION: A MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL
SECTION HEIGHT: 0.7 M. DEPTH TO WATER TABLE:
LITHOLOGY: 80% GENERAL CARBONATES 20% GENERAL PRECAMBRIAN
DELETERIOUS: OVERBURDEN THICKNESS:
MATERIAL AT BASE: SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | OVERSIZE |
| GM138 A (SW-12-004-04E) | 99 | 97 | 90 | 74 | 58 | 43 | 31 | 22 | 8 | 6 | SPARSE |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001807 (MANY BOULDERS)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| SE-10-004-05E | 30 | 42000 | PRIVATE/CROWN | |
| SW-10-004-05E | 0 | 4000 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 46000 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM977 (SE-10-004-05E) VISITED: 87/06
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT-NOT IN USE(COMMONLY REVEGETATED)
SURROUNDING LAND USE: PASTURE,GRAZING
ECONOMIC THICKNESS: 2.5 METRES ESTIMATED STONE CONTENT: MEDIUM QUALITY
SECTION: A MATERIAL DESCRIPTION: SANDY PEBBLE GRAVEL
SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE: 2.0 M.
LITHOLOGY: 80% GENERAL CARBONATES 20% GENERAL PRECAMBRIAN
DELETERIOUS: OVERBURDEN THICKNESS:
MATERIAL AT BASE: SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | OVERSIZE |
| GM977 A (SE-10-004-05E) | 100 | 99 | 84 | 67 | 51 | 34 | 18 | 5 | 4 | 3 | ABUNDANT |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001808 (REQUIRES TESTING)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|---------------|--------------------------------------|--|---------------------------|----------------------------|
| NW-11-004-05E | 0 | 52000 | PRIVATE/CROWN | |
| | DEPOSIT RESERVES | 52000 | | |

DEPOSIT # 001809 (NO ACCESS-HIGH WATERTABLE)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|---------------|--------------------------------------|--|---------------------------|----------------------------|
| NE-10-004-05E | 0 | 38000 | PRIVATE/PRIVATE | |
| NW-10-004-05E | 0 | 4000 | PRIVATE/PRIVATE | |
| SE-15-004-05E | 0 | 2000 | PRIVATE/PRIVATE | |
| | DEPOSIT RESERVES | 44000 | | |

EXPOSURE INFORMATION

| | |
|---|--|
| EXPOSURE #: GM976 (NE-10-004-05E) | VISITED: 87/06 |
| EXPOSURE TYPE: DITCH OR ROAD CUT | LAND USE: AGRICULTURE,HAYING |
| | SURROUNDING LAND USE: AGRICULTURE,HAYING |
| ECONOMIC THICKNESS: 1.0 METRES | ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL |
| SECTION HEIGHT: 1.0 M. | DEPTH TO WATER TABLE: 1.0 M. |
| LITHOLOGY: 80% GENERAL CARBONATES 20% GENERAL PRECAMBRIAN | |
| DELETERIOUS: | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: SAME AS IN PIT WALL | |
| SEE SIEVE ANALYSIS | |

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | | OVERSIZE |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|--------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | | |
| GM976 A (NE-10-004-05E) | 100 | 87 | 81 | 71 | 63 | 56 | 47 | 34 | 17 | 12 | SPARSE | |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001810

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| SE-12-004-04E | 60 | 18000 | PRIVATE/PRIVATE | |
| SW-12-004-04E | 10 | 25650 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 43650 | | |

DEPOSIT # 001811 (MOSTLY DEPLETED)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| NE-11-004-04E | 99 | 575 | PRIVATE/PRIVATE | |
| NW-12-004-04E | 99 | 475 | PRIVATE/PRIVATE | |
| SW-13-004-04E | 99 | 1225 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 2275 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM139 (NE-11-004-04E) VISITED: 78/10
 EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
 ECONOMIC THICKNESS: 2.5 METRES ESTIMATED STONE CONTENT: MEDIUM QUALITY
 SECTION: A MATERIAL DESCRIPTION: SANDY PEBBLE GRAVEL
 SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE:
 LITHOLOGY: 80% GENERAL CARBONATES 20% GENERAL PRECAMBRIAN
 DELETERIOUS: OVERBURDEN THICKNESS:
 MATERIAL AT BASE:
SEE SIEVE ANALYSIS

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | OVERSIZE |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | |
| GM139 A (NE-11-004-04E) | 94 | 87 | 67 | 54 | 38 | 24 | 15 | 11 | 10 | 9 | SPARSE |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001812 (OUTWASH-ALONG HWY.59)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| SW-13-004-04E | 90 | 6000 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 6000 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM079 (SW-13-004-04E)

EXPOSURE TYPE: HAND DUG HOLE

ECONOMIC THICKNESS: 0.5 METRES

SECTION: A

SECTION HEIGHT: 5.0 M.

LITHOLOGY:

DELETERIOUS:

MATERIAL AT BASE: TILL

NO CHANNEL SAMPLE TAKEN

VISITED: 78/10

LAND USE: HIGHWAY,ROADWAY,RAILWAY

SURROUNDING LAND USE: PASTURE,GRAZING

ESTIMATED STONE CONTENT: MEDIUM HIGH QUALITY

MATERIAL DESCRIPTION: MINOR COARSE GRAVEL OVER TILL

DEPTH TO WATER TABLE:

OVERBURDEN THICKNESS:

DEPOSIT # 001813

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| SE-16-004-05E | 40 | 15300 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 15300 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM020 (SE-16-004-05E)

EXPOSURE TYPE: SAND AND GRAVEL PIT

ECONOMIC THICKNESS: 1.5 METRES

SECTION: A

SECTION HEIGHT: 1.5 M.

LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN

DELETERIOUS: CARBONATE
INCRUSTATION

MATERIAL AT BASE SAME AS IN PIT WALL

SEE SIEVE ANALYSIS

VISITED: 78/08

LAND USE: AGRICULTURE,HAYING

ESTIMATED STONE CONTENT: LOW QUALITY

MATERIAL DESCRIPTION: SILTY PEBBLY SAND WITH
OCCASIONAL BOULDERS

DEPTH TO WATER TABLE: 1.5 M.

OVERBURDEN THICKNESS:

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | OVERSIZE |
| GM020 A (SE-16-004-05E) | 100 | 95 | 82 | 68 | 59 | 50 | 42 | 32 | 23 | 18 | ABUNDANT |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001814

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| NE-16-004-05E | 80 | 6900 | PRIVATE/PRIVATE | |
| SE-16-004-05E | 80 | 5700 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 12600 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM962 (SE-16-004-05E) VISITED: 87/06
 EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
 SURROUNDING LAND USE: FOREST NATURAL
 ECONOMIC THICKNESS: 1.5 METRES ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY
 SECTION: A MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL
 SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE: 2.0 M.
 LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
 DELETERIOUS: OVERBURDEN THICKNESS:
 MATERIAL AT BASE SAME AS IN PIT WALL
 SEE SIEVE ANALYSIS

SIEVE ANALYSIS

| | | PERCENT PASSING | | | | | | | | | | |
|-------------------------|-----|-----------------|-----|-----|----|----|-----|-----|-----|------|--------|----------|
| | | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | OVERSIZE |
| GM962 A (SE-16-004-05E) | 100 | 64 | 56 | 47 | 36 | 21 | 11 | 2 | 2 | 1 | SPARSE | |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001815

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| NE-17-004-05E | 0 | 98000 | PRIVATE/PRIVATE | |
| SE-17-004-05E | 0 | 16000 | PRIVATE/PRIVATE | |
| NE-20-004-05E | 99 | 2180 | PRIVATE/CROWN | |
| SE-20-004-05E | 30 | 74200 | PRIVATE/CROWN | |
| SE-29-004-05E | 0 | 30000 | CROWN(PROVINCIAL)/CROWN | |
| DEPOSIT RESERVES | | 220380 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM142 (NE-20-004-05E) VISITED: 78/10
 EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY,ROADWAY,RAILWAY
 SURROUNDING LAND USE:
 ECONOMIC THICKNESS: 1.5 METRES ESTIMATED STONE CONTENT: MEDIUM QUALITY
 SECTION: A MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL
 SECTION HEIGHT: 1.5 M. DEPTH TO WATER TABLE:
 LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
 DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
 INCRUSTATION
 MATERIAL AT BASE: SAME AS IN PIT WALL
 SEE SIEVE ANALYSIS

EXPOSURE #: GM361 (NE-20-004-05E) VISITED: 80/07
 EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: HIGHWAY,ROADWAY,RAILWAY
 ECONOMIC THICKNESS: 1.5 METRES ESTIMATED STONE CONTENT: MEDIUM QUALITY
 SECTION: A MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL
 SECTION HEIGHT: 1.0 M. DEPTH TO WATER TABLE:
 LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
 DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
 INCRUSTATION
 MATERIAL AT BASE: TILL
SEE SIEVE ANALYSIS

EXPOSURE #: GM363 (SE-20-004-05E) VISITED: 80/07
 EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: ACTIVE PIT
 SURROUNDING LAND USE:
 ECONOMIC THICKNESS: 3.0 METRES ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY
 SECTION: A MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL
 SECTION HEIGHT: 3.0 M. DEPTH TO WATER TABLE: 3.0 M.
 LITHOLOGY: 75% GENERAL CARBONATES 25% GENERAL PRECAMBRIAN
 DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
 INCRUSTATION
 MATERIAL AT BASE SAND
SEE SIEVE ANALYSIS

EXPOSURE #: LM026 (SE-29-004-05E) VISITED: 87/08
 EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY,ROADWAY,RAILWAY PASTURE,GRAZING
 SURROUNDING LAND USE:
 ECONOMIC THICKNESS: 0.4 METRES ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY
 SECTION: A MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL OVER
 SILT TILL
 SECTION HEIGHT: 2.5 M. DEPTH TO WATER TABLE:
 LITHOLOGY:
 DELETERIOUS:
 MATERIAL AT BASE: TILL
 NO CHANNEL SAMPLE TAKEN

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | OVERSIZE |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | |
| GM142 A (NE 20 004 05E) | 99 | 95 | 81 | 65 | 51 | 34 | 18 | 8 | 7 | 6 | ABUNDANT |
| GM361 A (NE 20 004 05E) | 100 | 95 | 77 | 58 | 42 | 28 | 10 | 4 | 3 | 2 | ABUNDANT |
| GM363 A (SE 20 004 05E) | 100 | 97 | 84 | 67 | 48 | 37 | 29 | 21 | 2 | 1 | SPARSE |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001816

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|-------------------------------|----------------------------|
| NE-16-004-05E | 0 | 34500 | PRIVATE/PRIVATE | |
| NW-16-004-05E | 30 | 11550 | PRIVATE/CROWN | |
| SW-21-004-05E | 20 | 36000 | PRIVATE/CROWN PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 82050 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM975 (NW-16-004-05E) VISITED: 87/06
EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY,ROADWAY,RAILWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 1.5 METRES ESTIMATED STONE CONTENT: MEDIUM QUALITY
SECTION: A MATERIAL DESCRIPTION: SANDY PEBBLE GRAVEL
SECTION HEIGHT: 1.5 M. DEPTH TO WATER TABLE: 1.5 M.
LITHOLOGY: 75% GENERAL CARBONATES 25% GENERAL PRECAMBRIAN
DELETERIOUS: OVERBURDEN THICKNESS:
MATERIAL AT BASE: TILL
SEE SIEVE ANALYSIS

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | OVERSIZE |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | |
| GM975 A (NW-16-004-05E) | 97 | 89 | 77 | 62 | 45 | 29 | 19 | 13 | 9 | 8 | SPARSE |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001817 (REQUIRES TESTING)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| NE-13-004-04E | 20 | 18000 | PRIVATE/PRIVATE | CROWN(PROVINCIAL)/CROWN |
| SE-13-004-04E | 20 | 13200 | PRIVATE/PRIVATE | |
| SW-13-004-04E | 0 | 12000 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 43200 | | |

DEPOSIT # 001818 (MOSTLY DEPLETED)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| NW-13-004-04E | 80 | 12300 | PRIVATE/PRIVATE | |
| NE-14-004-04E | 99 | 1470 | PRIVATE/PRIVATE | PRIVATE/CROWN |
| SE-23-004-04E | 90 | 1200 | PRIVATE/PRIVATE | |
| SW-24-004-04E | 90 | 600 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 15570 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM133 (SE-23-004-04E) VISITED: 78/10
 EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY,ROADWAY,RAILWAY
 ECONOMIC THICKNESS: 1.5 METRES ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY
 SECTION: A MATERIAL DESCRIPTION: PEBBLY COBBLY COARSE SAND
 SECTION HEIGHT: 1.0 M. DEPTH TO WATER TABLE:
 LITHOLOGY: 80% GENERAL CARBONATES 20% GENERAL PRECAMBRIAN
 DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
 INCRUSTATION
 MATERIAL AT BASE: SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

EXPOSURE #: GM134 (NE-14-004-04E) VISITED: 78/10
 EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT-NOT IN USE(COMMONLY REVEGETATED)
 SURROUNDING LAND USE:
 ECONOMIC THICKNESS: 1.5 METRES ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY
 SECTION: A MATERIAL DESCRIPTION: PEBBLY SAND
 SECTION HEIGHT: 1.5 M. DEPTH TO WATER TABLE: 1.5 M.
 LITHOLOGY: 80% GENERAL CARBONATES 20% GENERAL PRECAMBRIAN
 DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
 INCRUSTATION
 MATERIAL AT BASE: CLAY
SEE SIEVE ANALYSIS

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | OVERSIZE |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | |
| GM133 A (SE-23-004-04E) | 91 | 82 | 77 | 67 | 49 | 25 | 11 | 6 | 5 | 4 | ABUNDANT |
| GM134 A (NE-14-004-04E) | 100 | 96 | 84 | 73 | 58 | 40 | 22 | 12 | 5 | 3 | ABUNDANT |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001819 (OUTWASH-PIT ON HWY.59)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|---------------|--------------------------------------|--|---------------------------|----------------------------|
| SE-23-004-04E | 70 | 40800 | PRIVATE/PRIVATE | |
| | DEPOSIT RESERVES | 40800 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM972 (SE-23-004-04E) VISITED: 87/06
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT-TEMPORARY USE
SURROUNDING LAND USE: HIGHWAY, ROADWAY, RAILWAY
ECONOMIC THICKNESS: 2.0 METRES ESTIMATED STONE CONTENT: MEDIUM HIGH QUALITY
SECTION: A MATERIAL DESCRIPTION: SANDY COBBLY PEBBLE GRAVEL
W/BOULDERS
SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE:
LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
DELETERIOUS: WEATHERED PEBBLES
MATERIAL AT BASE: SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | | |
|---|-----------------|-----|-----|----|----|-----|-----|-----|------|------|--|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | | OVERSIZE |
| GM972 A (SE-23-004-04E) | 88 | 75 | 68 | 60 | 48 | 33 | 17 | 8 | 6 | 5 | | ABUNDANT |
| (NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES) | | | | | | | | | | | | |

DEPOSIT # 001820

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|---------------|--------------------------------------|--|---------------------------|----------------------------|
| NE-23-004-05E | 15 | 35700 | PRIVATE/PRIVATE | |
| | DEPOSIT RESERVES | 35700 | | |

DEPOSIT # 001821 (LARGELY DEPLETED)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|---------------|--------------------------------------|--|---------------------------|----------------------------|
| NW-23-004-05E | 0 | 22000 | PRIVATE/PRIVATE | |
| SW-26-004-05E | 90 | 16600 | PRIVATE/PRIVATE | |
| SE-27-004-05E | 70 | 29400 | PRIVATE/PRIVATE | |
| | DEPOSIT RESERVES | 68000 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM143 (SW-26-004-05E) VISITED: 87/06
 EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT-NOT IN USE(COMMONLY REVEGETATED)
 SURROUNDING LAND USE: PASTURE, GRAZING
 ECONOMIC THICKNESS: 2.0 METRES ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY
 SECTION: A MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL
 SECTION HEIGHT: 1.0 M. DEPTH TO WATER TABLE:
 LITHOLOGY: 80% GENERAL CARBONATES 20% GENERAL PRECAMBRIAN
 DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
 INCRUSTATION
 MATERIAL AT BASE: SILT
SEE SIEVE ANALYSIS

SECTION: B MATERIAL DESCRIPTION:
 SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE: 2.0 M.
 LITHOLOGY: 75% GENERAL CARBONATES 25% GENERAL PRECAMBRIAN
 DELETERIOUS: OVERBURDEN THICKNESS:
 MATERIAL AT BASE: TILL
SEE SIEVE ANALYSIS

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | OVERSIZE |
| GM143 A (SW-26-004-05E) | 94 | 78 | 66 | 54 | 43 | 35 | 24 | 12 | 5 | 3 | ABUNDANT |
| GM143 B (SW-26-004-05E) | 100 | 97 | 88 | 72 | 53 | 24 | 9 | 4 | 3 | 2 | ABUNDANT |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001822 (REQUIRES TESTING)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| NW-27-004-05E | 0 | 79500 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 79500 | | |

DEPOSIT # 001823

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| NE-27-004-05E | 0 | 27000 | PRIVATE/PRIVATE | |
| SE-34-004-05E | 0 | 23400 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 50400 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM974 (NE-27-004-05E) VISITED: 87/06
 EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: AGRICULTURE, HAYING
 SURROUNDING LAND USE:
 ECONOMIC THICKNESS: 1.8 METRES ESTIMATED STONE CONTENT: MEDIUM QUALITY
 SECTION: A MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL
 SECTION HEIGHT: 1.8 M. DEPTH TO WATER TABLE:
 LITHOLOGY: 85% GENERAL CARBONATES 15% GENERAL PRECAMBRIAN
 DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
 INCRUSTATION
 MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | OVERSIZE |
| GM974 A (NE 27-004-05E) | 100 | 100 | 85 | 68 | 55 | 41 | 23 | 13 | 8 | 5 | SPARSE |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001824A (PREDOMINANTLY SAND)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| NE-23-004-04E | 30 | 2310 | CROWN(PROVINCIAL)/CROWN | |
| NE-24-004-04E | 0 | 9000 | CROWN(PROVINCIAL)/CROWN | |
| NW-24-004-04E | 10 | 34560 | CROWN(PROVINCIAL)/CROWN | |
| SE-25-004-04E | 0 | 19000 | PRIVATE/PRIVATE | |
| SW-25-004-04E | 15 | 38505 | PRIVATE/PRIVATE | |
| SE-26-004-04E | 0 | 1200 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 104575 | | |

EXPOSURE INFORMATION

EXPOSURE GM964 (SW-25-004-04E) VISITED: 87/06
 EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PASTURE, GRAZING
 SURROUNDING LAND USE: PASTURE, GRAZING
 ECONOMIC THICKNESS: 1.5 METRES ESTIMATED STONE CONTENT: LOW QUALITY
 SECTION: A MATERIAL DESCRIPTION: DIAMICTON OVER PEBBLY SAND
 SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE: 4.0 M.
 LITHOLOGY: 60% GENERAL CARBONATES 40% GENERAL PRECAMBRIAN
 DELETERIOUS: OVERBURDEN THICKNESS:
 MATERIAL AT BASE: SAME AS IN PIT WALL
 NO CHANNEL SAMPLE TAKEN

| | | | |
|---------------------------|--|--------------------------|------------------------------------|
| EXPOSURE #: | GM965 (NW-24-004-04E) | VISITED: | 87/06 |
| EXPOSURE TYPE: | SAND AND GRAVEL PIT | LAND USE: | PIT-TEMPORARY USE |
| ECONOMIC THICKNESS: | 1.5 METRES | SURROUNDING LAND USE: | RECREATION SITE |
| SECTION: | A | ESTIMATED STONE CONTENT: | MEDIUM QUALITY |
| SECTION HEIGHT: | 3.0 M. | MATERIAL DESCRIPTION: | DIAMICTON OVER SANDY PEBBLE GRAVEL |
| LITHOLOGY: | 60% GENERAL CARBONATES 40% GENERAL PRECAMBRIAN | | |
| DELETERIOUS: | | | |
| MATERIAL AT BASE: | SAME AS IN PIT WALL | | |
| SEE SIEVE ANALYSIS | | | |

| | | | |
|---------------------------|-----------------------|--------------------------|---------------------------------|
| EXPOSURE #: | LM052 (SW-25-004-04E) | VISITED: | 88/09 |
| EXPOSURE TYPE: | BACKHOE TEST PIT | LAND USE: | PASTURE, GRAZING |
| ECONOMIC THICKNESS: | 0.0 METRES | SURROUNDING LAND USE: | HIGHWAY, ROADWAY, RAILWAY |
| SECTION: | A | ESTIMATED STONE CONTENT: | LOW QUALITY |
| SECTION HEIGHT: | 4.5 M. | MATERIAL DESCRIPTION: | SILT DIAMICTON OVER MEDIUM SAND |
| LITHOLOGY: | | DEPTH TO WATER TABLE: | |
| DELETERIOUS: | | OVERBURDEN THICKNESS: | |
| MATERIAL AT BASE: | SAND | | |
| SEE SIEVE ANALYSIS | | | |

| | | | |
|---------------------------|-----------------------|--------------------------|---------------------------------|
| EXPOSURE #: | LM053 (SW-25-004-04E) | VISITED: | 88/09 |
| EXPOSURE TYPE: | BACKHOE TEST PIT | LAND USE: | PASTURE, GRAZING |
| ECONOMIC THICKNESS: | 0.0 METRES | SURROUNDING LAND USE: | HIGHWAY, ROADWAY, RAILWAY |
| SECTION: | A | ESTIMATED STONE CONTENT: | LOW QUALITY |
| SECTION HEIGHT: | 4.5 M. | MATERIAL DESCRIPTION: | SILT DIAMICTON OVER MEDIUM SAND |
| LITHOLOGY: | | DEPTH TO WATER TABLE: | |
| DELETERIOUS: | | OVERBURDEN THICKNESS: | |
| MATERIAL AT BASE: | SAND | | |
| SEE SIEVE ANALYSIS | | | |

| | | | |
|---------------------------|-----------------------|--------------------------|--------------------|
| EXPOSURE #: | LM054 (SW-25-004-04E) | VISITED: | 88/09 |
| EXPOSURE TYPE: | BACKHOE TEST PIT | LAND USE: | PIT-TEMPORARY USE |
| ECONOMIC THICKNESS: | 0.0 METRES | SURROUNDING LAND USE: | PASTURE, GRAZING |
| SECTION: | A | ESTIMATED STONE CONTENT: | MEDIUM LOW QUALITY |
| SECTION HEIGHT: | 6.7 M. | MATERIAL DESCRIPTION: | FINE SAND |
| LITHOLOGY: | | DEPTH TO WATER TABLE: | 6.1 M. |
| DELETERIOUS: | | OVERBURDEN THICKNESS: | |
| MATERIAL AT BASE: | SAND | | |
| SEE SIEVE ANALYSIS | | | |

| | |
|---|--|
| EXPOSURE #: LM055 (SW-25-004-04E) | VISITED: 88/09 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: PASTURE, GRAZING |
| | SURROUNDING LAND USE: HIGHWAY, ROADWAY, RAILWAY |
| ECONOMIC THICKNESS: 1.8 METRES | ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: SILT DIAMICTON OVER SANDY PEBBLE GRAVEL |
| SECTION HEIGHT: 4.4 M. | DEPTH TO WATER TABLE: |
| LITHOLOGY: 50% GENERAL CARBONATES 50% GENERAL PRECAMBRIAN | |
| DELETERIOUS: CARBONATE INCRUSTATION | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: SAND | |
| SEE SIEVE ANALYSIS | |
| EXPOSURE #: LM056 (SW-25-004-04E) | VISITED: 88/09 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: PASTURE, GRAZING |
| | SURROUNDING LAND USE: HIGHWAY, ROADWAY, RAILWAY |
| ECONOMIC THICKNESS: 1.5 METRES | ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: SILT DIAMICTON OVER SANDY COBBLY PEBBLE GRAVEL |
| SECTION HEIGHT: 3.9 M. | DEPTH TO WATER TABLE: |
| LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN | |
| DELETERIOUS: WEATHERED PEBBLES | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: SAND | |
| SEE SIEVE ANALYSIS | |
| EXPOSURE #: LM057 (SW-25-004-04E) | VISITED: 88/09 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: PASTURE, GRAZING |
| | SURROUNDING LAND USE: HIGHWAY, ROADWAY, RAILWAY |
| ECONOMIC THICKNESS: 1.2 METRES | ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: SILT DIAMICTON OVER SANDY COARSE PEBBLE GRAVEL |
| SECTION HEIGHT: 4.2 M. | DEPTH TO WATER TABLE: |
| LITHOLOGY: 60% GENERAL CARBONATES 40% GENERAL PRECAMBRIAN | |
| DELETERIOUS: WEATHERED PEBBLES | OVERBURDEN THICKNESS: 1.3M |
| MATERIAL AT BASE: SAND | |
| SEE SIEVE ANALYSIS | |
| EXPOSURE #: LM058 (SW-25-004-04E) | VISITED: 88/09 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: PASTURE, GRAZING |
| | SURROUNDING LAND USE: HIGHWAY, ROADWAY, RAILWAY |
| ECONOMIC THICKNESS: 2.0 METRES | ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: SILT TILL OVER SANDY PEBBLE GRAVEL |
| SECTION HEIGHT: 4.5 M. | DEPTH TO WATER TABLE: |
| LITHOLOGY: 60% GENERAL CARBONATES 40% GENERAL PRECAMBRIAN | |
| DELETERIOUS: | OVERBURDEN THICKNESS: 1.0M |
| MATERIAL AT BASE: SAND | |
| NO CHANNEL SAMPLE TAKEN | |

| | | | |
|---------------------|--|--------------------------|-------------------------------------|
| EXPOSURE #: | LM059 (SE-25-004-04E) | VISITED: | 88/09 |
| EXPOSURE TYPE: | BACKHOE TEST PIT | LAND USE: | WILDLIFE HABITAT-NATURAL,UNATTENDED |
| | | SURROUNDING LAND USE: | HIGHWAY,ROADWAY,RAILWAY |
| ECONOMIC THICKNESS: | 3.9 METRES | ESTIMATED STONE CONTENT: | MEDIUM LOW QUALITY |
| SECTION: | A | MATERIAL DESCRIPTION: | SAND W/SANDY PEBBLE GRAVEL LAYERS |
| COMMENT: | SAMPLE 1.2-2.7M | | |
| SECTION HEIGHT: | 3.9 M. | DEPTH TO WATER TABLE: | 3.9 M. |
| LITHOLOGY: | 60% GENERAL CARBONATES 40% GENERAL PRECAMBRIAN | | |
| DELETERIOUS: | | OVERBURDEN THICKNESS: | |
| MATERIAL AT BASE: | SAND | | |
| | SEE SIEVE ANALYSIS | | |

| | | | |
|---------------------|--|--------------------------|-------------------------------------|
| EXPOSURE #: | LM060 (SE-25-004-04E) | VISITED: | 88/09 |
| EXPOSURE TYPE: | BACKHOE TEST PIT | LAND USE: | WILDLIFE HABITAT-NATURAL,UNATTENDED |
| | | SURROUNDING LAND USE: | HIGHWAY,ROADWAY,RAILWAY |
| ECONOMIC THICKNESS: | 2.7 METRES | ESTIMATED STONE CONTENT: | MEDIUM LOW QUALITY |
| SECTION: | A | MATERIAL DESCRIPTION: | PEBBLY SAND W/SAND LAYERS |
| SECTION HEIGHT: | 4.5 M. | DEPTH TO WATER TABLE: | 4.5 M. |
| LITHOLOGY: | 60% GENERAL CARBONATES 40% GENERAL PRECAMBRIAN | | |
| DELETERIOUS: | | OVERBURDEN THICKNESS: | SAMPLE 0.0-1.8M |
| MATERIAL AT BASE: | SAND | | |
| | SEE SIEVE ANALYSIS | | |

| | | | |
|---------------------|--|--------------------------|--------------------------|
| EXPOSURE #: | LM061 (NE-24-004-04E) | VISITED: | 88/09 |
| EXPOSURE TYPE: | BACKHOE TEST PIT | LAND USE: | RECREATION SITE |
| | | SURROUNDING LAND USE: | HIGHWAY,ROADWAY,RAILWAY |
| ECONOMIC THICKNESS: | 0.0 METRES | ESTIMATED STONE CONTENT: | LOW QUALITY |
| SECTION: | A | MATERIAL DESCRIPTION: | SAND MINOR GRAVEL LAYERS |
| SECTION HEIGHT: | 4.5 M. | DEPTH TO WATER TABLE: | 4.5 M. |
| LITHOLOGY: | 60% GENERAL CARBONATES 40% GENERAL PRECAMBRIAN | | |
| DELETERIOUS: | | OVERBURDEN THICKNESS: | |
| MATERIAL AT BASE: | SAND | | |
| | NO CHANNEL SAMPLE TAKEN | | |

| | | | |
|---------------------|-------------------------|--------------------------|-------------------------------|
| EXPOSURE #: | LM062 (NW-24-004-04E) | VISITED: | 88/09 |
| EXPOSURE TYPE: | BACKHOE TEST PIT | LAND USE: | PIT-TEMPORARY USE |
| | | SURROUNDING LAND USE: | RECREATION SITE |
| ECONOMIC THICKNESS: | 0.0 METRES | ESTIMATED STONE CONTENT: | LOW QUALITY |
| SECTION: | A | MATERIAL DESCRIPTION: | SILT DIAMICTON OVER FINE SAND |
| SECTION HEIGHT: | 3.3 M. | DEPTH TO WATER TABLE: | |
| LITHOLOGY: | | OVERBURDEN THICKNESS: | |
| DELETERIOUS: | | | |
| MATERIAL AT BASE: | SAND | | |
| | NO CHANNEL SAMPLE TAKEN | | |

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | OVERSIZE |
|-------------------------|-----------------|-----|-----|-----|-----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | |
| GM965 A (NW-24-004-04E) | 97 | 92 | 87 | 77 | 67 | 52 | 36 | 24 | 2 | 1 | ABUNDANT |
| LM052 A (SW-25-004-04E) | 100 | 100 | 100 | 100 | 100 | 99 | 99 | 73 | 11 | 2 | SPARSE |
| LM053 A (SW-25-004-04E) | 100 | 99 | 98 | 98 | 97 | 97 | 78 | 20 | 7 | 3 | SPARSE |
| LM054 A (SW-25-004-04E) | 100 | 100 | 100 | 100 | 100 | 99 | 98 | 98 | 73 | 13 | ABUNDANT |
| LM055 A (SW-25-004-04E) | 99 | 95 | 94 | 88 | 78 | 54 | 26 | 14 | 6 | 4 | ABUNDANT |
| LM056 A (SW-25-004-04E) | 95 | 87 | 79 | 68 | 58 | 49 | 40 | 29 | 20 | 12 | ABUNDANT |
| LM057 A (SW-25-004-04E) | 98 | 96 | 94 | 87 | 78 | 67 | 57 | 44 | 23 | 9 | ABUNDANT |
| LM059 A (SE-25-004-04E) | 97 | 92 | 86 | 75 | 66 | 56 | 42 | 23 | 4 | 2 | SPARSE |
| LM060 A (SE-25-004-04E) | 100 | 98 | 94 | 90 | 88 | 84 | 80 | 70 | 29 | 6 | SPARSE |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001824B (PREDOMINANTLY SAND)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| SW-25-004-04E | 0 | 9000 | PRIVATE/PRIVATE | |
| SE-26-004-04E | 0 | 40800 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 49800 | | |

DEPOSIT # 001825 (MOSTLY DEPLETED)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| NE-23-004-04E | 99 | 195 | PRIVATE/PRIVATE | CROWN(PROVINCIAL)/CROWN |
| NW-24-004-04E | 99 | 120 | PRIVATE/PRIVATE | CROWN(PROVINCIAL)/CROWN |
| NW-25-004-04E | 90 | 1350 | PRIVATE/PRIVATE | |
| SW-25-004-04E | 70 | 23850 | PRIVATE/PRIVATE | |
| SE-26-004-04E | 99 | 540 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 26055 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM024 (SW-25-004-04E) VISITED: 78/08
 EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PASTURE, GRAZING
 SURROUNDING LAND USE:
 ECONOMIC THICKNESS: 1.0 METRES ESTIMATED STONE CONTENT: LOW QUALITY
 SECTION: A MATERIAL DESCRIPTION: PEBBLY SAND BEACH
 SECTION HEIGHT: 1.0 M. DEPTH TO WATER TABLE:
 LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
 DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
 INCRUSTATION
 MATERIAL AT BASE: SAND
 SEE SIEVE ANALYSIS

| | | | |
|---------------------------|--|--------------------------|---|
| EXPOSURE #: | GM360 (SE-26-004-04E) | VISITED: | 80/07 |
| EXPOSURE TYPE: | SAND AND GRAVEL PIT | LAND USE: | GARBAGE DUMP-AUTHORIZED,ACTIVE |
| | | SURROUNDING LAND USE: | HIGHWAY,ROADWAY,RAILWAY |
| ECONOMIC THICKNESS: | 2.5 METRES | ESTIMATED STONE CONTENT: | MEDIUM QUALITY |
| SECTION: | A | MATERIAL DESCRIPTION: | SANDY FINE PEBBLE GRAVEL |
| SECTION HEIGHT: | 3.0 M. | DEPTH TO WATER TABLE: | |
| LITHOLOGY: | 60% GENERAL CARBONATES 40% GENERAL PRECAMBRIAN | | |
| DELETERIOUS: | CARBONATE INCRUSTATION | OVERBURDEN THICKNESS: | |
| MATERIAL AT BASE: | SAND | | |
| SEE SIEVE ANALYSIS | | | |
| | | | |
| EXPOSURE #: | GM966 (NE-23-004-04E) | VISITED: | 87/06 |
| EXPOSURE TYPE: | SAND AND GRAVEL PIT | LAND USE: | PIT-TEMPORARY USE |
| | | SURROUNDING LAND USE: | RECREATION SITE |
| ECONOMIC THICKNESS: | 2.5 METRES | ESTIMATED STONE CONTENT: | LOW QUALITY |
| SECTION: | A | MATERIAL DESCRIPTION: | DIAMICTON OVER PEBBLY SAND |
| SECTION HEIGHT: | 2.5 M. | DEPTH TO WATER TABLE: | 2.5 M. |
| LITHOLOGY: | | | |
| DELETERIOUS: | | OVERBURDEN THICKNESS: | |
| MATERIAL AT BASE: | SAME AS IN PIT WALL | | |
| NO CHANNEL SAMPLE TAKEN | | | |
| | | | |
| EXPOSURE #: | GM967 (SE-26-004-04E) | VISITED: | 87/06 |
| EXPOSURE TYPE: | SAND AND GRAVEL PIT | LAND USE: | PIT-NOT IN USE(COMMONLY REVEGETATED) |
| | | SURROUNDING LAND USE: | BUILDING SITE(PERMANENT) |
| ECONOMIC THICKNESS: | 2.0 METRES | ESTIMATED STONE CONTENT: | MEDIUM QUALITY |
| SECTION: | A | MATERIAL DESCRIPTION: | SANDY PEBBLE GRAVEL |
| SECTION HEIGHT: | 2.0 M. | DEPTH TO WATER TABLE: | |
| LITHOLOGY: | | | |
| DELETERIOUS: | | OVERBURDEN THICKNESS: | |
| MATERIAL AT BASE: | SAME AS IN PIT WALL | | |
| NO CHANNEL SAMPLE TAKEN | | | |
| | | | |
| EXPOSURE #: | GM968 (SW-25-004-04E) | VISITED: | 87/06 |
| EXPOSURE TYPE: | SAND AND GRAVEL PIT | LAND USE: | PIT-NOT IN USE(COMMONLY REVEGETATED) |
| | | SURROUNDING LAND USE: | PASTURE,GRAZING |
| ECONOMIC THICKNESS: | 1.5 METRES | ESTIMATED STONE CONTENT: | MEDIUM LOW QUALITY |
| SECTION: | A | MATERIAL DESCRIPTION: | SANDY FINE PEBBLE GRAVEL W/OCCASIONAL BOULDERS |
| SECTION HEIGHT: | 1.5 M. | DEPTH TO WATER TABLE: | |
| LITHOLOGY: | | | |
| DELETERIOUS: | | OVERBURDEN THICKNESS: | |
| MATERIAL AT BASE: | SAME AS IN PIT WALL | | |
| NO CHANNEL SAMPLE TAKEN | | | |

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | OVERSIZE |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | |
| GM024 A (SW-25-004-04E) | 100 | 99 | 95 | 85 | 80 | 76 | 70 | 35 | 3 | 2 | ABUNDANT |
| GM360 A (SE-26-004-04E) | 91 | 80 | 72 | 65 | 59 | 53 | 38 | 17 | 3 | 1 | ABUNDANT |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001826 (PREDOMINANTLY SAND)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| NW-25-004-04E | 5 | 25840 | PRIVATE/PRIVATE | |
| SE-25-004-04E | 0 | 12000 | PRIVATE/PRIVATE | |
| SW-25-004-04E | 0 | 30200 | PRIVATE/PRIVATE | |
| NE-26-004-04E | 0 | 3800 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 71840 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM970 (NW-25-004-04E) VISITED: 87/06
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT-NOT IN USE(COMMONLY REVEGETATED)
SURROUNDING LAND USE: PASTURE, GRAZING
ECONOMIC THICKNESS: 2.0 METRES ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY
SECTION: A MATERIAL DESCRIPTION: SANDY PEBBLE GRAVEL MANY BOULDERS
SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE:
LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
DELETERIOUS: OVERBURDEN THICKNESS:
MATERIAL AT BASE: SAME AS IN PIT WALL
NO CHANNEL SAMPLE TAKEN

EXPOSURE #: GM971 (NW-25-004-04E) VISITED: 87/06
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT-NOT IN USE(COMMONLY REVEGETATED)
SURROUNDING LAND USE: PASTURE, GRAZING
ECONOMIC THICKNESS: 2.0 METRES ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY
SECTION: A MATERIAL DESCRIPTION: SANDY PEBBLE GRAVEL MANY BOULDERS
SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE:
LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
DELETERIOUS: OVERBURDEN THICKNESS:
MATERIAL AT BASE: SAME AS IN PIT WALL
NO CHANNEL SAMPLE TAKEN

DEPOSIT # 001827 (MOSTLY DEPLETED)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| SE-25-004-04E | 99 | 260 | PRIVATE/PRIVATE | |
| SW-25-004-04E | 99 | 300 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 560 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM969 (SW-25-004-04E) VISITED: 87/06
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT-NOT IN USE(COMMONLY REVEGETATED)
SURROUNDING LAND USE: PASTURE, GRAZING
ECONOMIC THICKNESS: 2.0 METRES ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY
SECTION: A MATERIAL DESCRIPTION: SANDY PEBBLE GRAVEL
W/OCCASIONAL BOULDERS
SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE:
LITHOLOGY:
DELETERIOUS: OVERBURDEN THICKNESS:
MATERIAL AT BASE: SAME AS IN PIT WALL
NO CHANNEL SAMPLE TAKEN

DEPOSIT # 001828 (REHABILITATED IN SECTION 36)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| NE-25-004-04E | 80 | 20520 | PRIVATE/PRIVATE | |
| SE-25-004-04E | 0 | 14400 | PRIVATE/PRIVATE | |
| NE-36-004-04E | 90 | 7380 | PRIVATE/PRIVATE | |
| NW-36-004-04E | 99 | 540 | PRIVATE/PRIVATE | |
| SE-36-004-04E | 99 | 612 | PRIVATE/PRIVATE | PRIVATE/CROWN |
| SW-36-004-04E | 80 | 17640 | PRIVATE/PRIVATE | PRIVATE/CROWN |
| SE-01-005-04E | 10 | 30780 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 91872 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM025 (NW-36-004-04E) VISITED: 78/08
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PASTURE, GRAZING
SURROUNDING LAND USE:
ECONOMIC THICKNESS: 2.0 METRES ESTIMATED STONE CONTENT: LOW QUALITY
SECTION: A MATERIAL DESCRIPTION: PEBBLY SAND
SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE:
LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
INCRUSTATION
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS

EXPOSURE #: GM963 (NE-25-004-04E) VISITED: 87/06
 EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY,ROADWAY,RAILWAY
 SURROUNDING LAND USE: AGRICULTURE,HAYING
 ECONOMIC THICKNESS: 1.8 METRES ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY
 SECTION: A MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL
 SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE:
 LITHOLOGY: 80% GENERAL CARBONATES 20% GENERAL PRECAMBRIAN
 DELETERIOUS: OVERBURDEN THICKNESS:
 MATERIAL AT BASE:
SEE SIEVE ANALYSIS

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | OVERSIZE |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | |
| GM025 A (NW-36-004-04E) | 100 | 99 | 92 | 78 | 67 | 59 | 51 | 35 | 6 | 3 | ABUNDANT |
| GM963 A (NE-25-004-04E) | 100 | 98 | 93 | 82 | 43 | 23 | 17 | 10 | 3 | 2 | SPARSE |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001829 (PREDOMINATLY SAND)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| SE-35-004-04E | 0 | 0 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 0 | | |

EXPOSURE INFORMATION

EXPOSURE #: GB270 (SE-35-004-04E) VISITED: 80/10
 EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY,ROADWAY,RAILWAY
 SURROUNDING LAND USE: PASTURE,GRAZING
 ECONOMIC THICKNESS: 0.0 METRES ESTIMATED STONE CONTENT: LOW QUALITY
 SECTION: A MATERIAL DESCRIPTION: 0-1M TILL,1-5.5M FINE SAND
 SECTION HEIGHT: 5.5 M. DEPTH TO WATER TABLE: 7.0 M.
 LITHOLOGY:
 DELETERIOUS: OVERBURDEN THICKNESS: 1 M.
 MATERIAL AT BASE: SAND
 NO CHANNEL SAMPLE TAKEN

DEPOSIT # 001830 (EXTENSION OF DEPOSIT # 1711)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SURFACE/GRAVEL) | OWNER2 (SURFACE/GRAVEL) |
|------------------|--------------------------------------|--|---------------------------|----------------------------|
| NE-33-004-05E | 0 | 26000 | PRIVATE/PRIVATE | |
| NW-34-004-05E | 80 | 8200 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 34200 | | |

EXPOSURE INFORMATION

EXPOSURE #: LM014 (NW-34-004-05E) VISITED: 87/08
EXPOSURE TYPE: BACKHOE TEST PIT LAND-USE: HIGHWAY,ROADWAY,RAILWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 1.2 METRES ESTIMATED STONE CONTENT: MEDIUM QUALITY
SECTION: A MATERIAL DESCRIPTION: SANDY PEBBLE GRAVEL OVER MED.
SAND
SECTION HEIGHT: 3.9 M. DEPTH TO WATER TABLE: 3.9 M.
LITHOLOGY: 69% GENERAL CARBONATES 31% GENERAL PRECAMBRIAN
DELETERIOUS: WEATHERED OVERBURDEN THICKNESS:
PEBBLES
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS

EXPOSURE #: LM017 (NE-33-004-05E) VISITED: 87/08
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: HIGHWAY,ROADWAY,RAILWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 1.0 METRES ESTIMATED STONE CONTENT: LOW QUALITY
SECTION: A MATERIAL DESCRIPTION: SANDY COBBLY PEBBLE GRAVEL
SECTION HEIGHT: 2.5 M. DEPTH TO WATER TABLE:
LITHOLOGY:
DELETERIOUS: OVERBURDEN THICKNESS:
MATERIAL AT BASE: TILL
NO CHANNEL SAMPLE TAKEN

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | OVERSIZE |
| LM014 A (NW 34 004 05E) | 96 | 87 | 80 | 72 | 63 | 57 | 47 | 20 | 5 | 3 | ABUNDANT |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001831

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER | OWNER2 |
|------------------|--------------------------------------|--|-----------------|---------------|
| NE-31-004-05E | 0 | 4000 | PRIVATE/PRIVATE | PRIVATE/CROWN |
| NW-32-004-05E | 70 | 14700 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 18700 | | |

EXPOSURE INFORMATION

EXPOSURE #: LM013 (NW-32-004-05E)
 EXPOSURE TYPE: BACKHOE TEST PIT

ECONOMIC THICKNESS: 0.7 METRES

SECTION: A

SECTION HEIGHT: 2.5 M.

LITHOLOGY:

DELETERIOUS:

MATERIAL AT BASE: TILL

NO CHANNEL SAMPLE TAKEN

VISITED: 87/08

LAND USE: HIGHWAY,ROADWAY,RAILWAY

SURROUNDING LAND USE: PASTURE,GRAZING

ESTIMATED STONE CONTENT: MEDIUM QUALITY

MATERIAL DESCRIPTION: SANDY COARSE PEBBLE GRAVEL

DEPTH TO WATER TABLE:

OVERBURDEN THICKNESS: 0.3 M.

DEPOSIT # 001832 (VERY SANDY)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SAND/GRAVEL) | OWNER2 (SAND/GRAVEL) |
|---------------|--------------------------------------|--|------------------------|-------------------------|
| NE-31-004-05E | 0 | 18000 | PRIVATE/CROWN | PRIVATE/PRIVATE |
| | DEPOSIT RESERVES | 18000 | | |

EXPOSURE INFORMATION

EXPOSURE #: LM004 (NE-31-004-05E)
 EXPOSURE TYPE: BACKHOE TEST PIT

ECONOMIC THICKNESS: 1.5 METRES

SECTION: A

SECTION HEIGHT: 2.1 M.

LITHOLOGY: 75% GENERAL CARBONATES 25% GENERAL PRECAMBRIAN

DELETERIOUS:

MATERIAL AT BASE: TILL

SEE SIEVE ANALYSIS

VISITED: 87/08

LAND USE: HIGHWAY,ROADWAY,RAILWAY

SURROUNDING LAND USE: AGRICULTURE,HAYING

ESTIMATED STONE CONTENT: MEDIUM QUALITY

MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL

DEPTH TO WATER TABLE:

OVERBURDEN THICKNESS:

EXPOSURE #: LM005 (NE-31-004-05E)
 EXPOSURE TYPE: BACKHOE TEST PIT

ECONOMIC THICKNESS: 0.8 METRES

SECTION: A

SECTION HEIGHT: 3.0 M.

LITHOLOGY: 75% GENERAL CARBONATES 25% GENERAL PRECAMBRIAN

DELETERIOUS:

MATERIAL AT BASE: TILL

SEE SIEVE ANALYSIS

VISITED: 87/08

LAND USE: HIGHWAY,ROADWAY,RAILWAY

SURROUNDING LAND USE: PASTURE,GRAZING

ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY

MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL OVER
 PEBBLY SAND

DEPTH TO WATER TABLE:

OVERBURDEN THICKNESS:

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | |
|-------------------------|-----------------|-----|----|----|-----|-----|-----|------|------|----------|----------|
| | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | OVERSIZE | |
| LM004 A (NE 31 004 05E) | 100 | 94 | 80 | 61 | 34 | 21 | 16 | 11 | 9 | 4 | ABUNDANT |
| LM005 A (NE 31 004 05E) | 100 | 99 | 96 | 91 | 80 | 74 | 70 | 63 | 6 | 3 | SPARSE |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001833 (PREDOMINANTLY SAND)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER | OWNER2 |
|------------------|--------------------------------------|--|-----------------|--------|
| NE-35-004-04E | 10 | 0 | PRIVATE/PRIVATE | |
| NW-35-004-04E | 0 | 0 | PRIVATE/PRIVATE | |
| NW-36-004-04E | 0 | 0 | PRIVATE/PRIVATE | |
| SW-01-005-04E | 0 | 0 | PRIVATE/PRIVATE | |
| SE-02-005-04E | 0 | 0 | PRIVATE/PRIVATE | |
| SW-02-005-04E | 0 | 0 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 0 | | |

EXPOSURE INFORMATION

| | |
|-----------------------------------|--|
| EXPOSURE #: GB269 (SE-02-005-04E) | VISITED: 80/10 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: HIGHWAY,ROADWAY,RAILWAY |
| | SURROUNDING LAND USE: PASTURE,GRAZING |
| ECONOMIC THICKNESS: 0.0 METRES | ESTIMATED STONE CONTENT: LOW QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: 1.2-5.5M FINE SAND |
| SECTION HEIGHT: 5.5 M. | DEPTH TO WATER TABLE: 7.0 M. |
| LITHOLOGY: | |
| DELETERIOUS: | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: SAND | |
| NO CHANNEL SAMPLE TAKEN | |

DEPOSIT # 001834 (PREDOMINANTLY SAND, MINOR GRAVEL LENSES)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SAND/GRAVEL) | OWNER2 (SAND/GRAVEL) |
|------------------|--------------------------------------|--|------------------------|-------------------------|
| NE-36-004-04E | 60 | 26400 | PRIVATE/PRIVATE | |
| NE-01-005-04E | 0 | 26500 | PRIVATE/PRIVATE | |
| NW-01-005-04E | 0 | 96000 | PRIVATE/PRIVATE | |
| SE-01-005-04E | 30 | 113400 | PRIVATE/PRIVATE | |
| SW-01-005-04E | 5 | 114475 | PRIVATE/PRIVATE | |
| NE-02-005-04E | 0 | 7500 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 384275 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM318 (NE-36-004-04E) VISITED: 80/07
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT-NOT IN USE(COMMONLY REVEGETATED)
SURROUNDING LAND USE: ACTIVE PIT
ECONOMIC THICKNESS: 1.5 METRES ESTIMATED STONE CONTENT: MEDIUM QUALITY
SECTION: A MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL
SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE: 2.0 M.
LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
DELETERIOUS: CARBONATE INCRUSTATION
MATERIAL AT BASE: CLAY
SEE SIEVE ANALYSIS

EXPOSURE #: GM959 (SE-01-005-04E) VISITED: 87/06
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: FOREST NATURAL
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 1.8 METRES ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY
SECTION: A MATERIAL DESCRIPTION: SANDY PEBBLE GRAVEL OCC.
COBBLES + BOULDERS
SECTION HEIGHT: 1.8 M. DEPTH TO WATER TABLE: 2.0 M.
LITHOLOGY: 77% GENERAL CARBONATES 23% GENERAL PRECAMBRIAN
DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
INCRUSTATION
MATERIAL AT BASE: TILL
SEE SIEVE ANALYSIS

EXPOSURE #: GM960 (SE-01-005-04E) VISITED: 87/06
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT-TEMPORARY USE
SURROUNDING LAND USE: FOREST NATURAL
ECONOMIC THICKNESS: 4.0 METRES ESTIMATED STONE CONTENT: MEDIUM QUALITY
SECTION: A MATERIAL DESCRIPTION: SANDY COBBLY PEBBLE GRAVEL
W/SAND LAYERS
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE:
LITHOLOGY: 75% GENERAL CARBONATES 25% GENERAL PRECAMBRIAN
DELETERIOUS: WEATHERED OVERBURDEN THICKNESS:
PEBBLES
MATERIAL AT BASE: SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

EXPOSURE #: GM961 (SE-01-005-04E) VISITED: 87/06
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT-TEMPORARY USE
SURROUNDING LAND USE: FOREST NATURAL
ECONOMIC THICKNESS: 3.0 METRES ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY
SECTION: A MATERIAL DESCRIPTION: DIAMICTON OVER SANDY COBBLY
PEBBLE GRAVEL
SECTION HEIGHT: 4.0 M. DEPTH TO WATER TABLE: M.
LITHOLOGY: 55% GENERAL CARBONATES 45% GENERAL PRECAMBRIAN
DELETERIOUS: WEATHERED OVERBURDEN THICKNESS: 1.0 M.
PEBBLES
MATERIAL AT BASE: SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

| | |
|---|--|
| EXPOSURE #: GM979 (NW-01-005-04E) | VISITED: 87/06 |
| EXPOSURE TYPE: BORROW PIT | LAND USE: PASTURE, GRAZING |
| | SURROUNDING LAND USE: PASTURE, GRAZING |
| ECONOMIC THICKNESS: 1.8 METRES | ESTIMATED STONE CONTENT: MEDIUM HIGH QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: SANDY COBBLY PEBBLE GRAVEL |
| SECTION HEIGHT: 1.8 M. | DEPTH TO WATER TABLE: |
| LITHOLOGY: 75% GENERAL CARBONATES 25% GENERAL PRECAMBRIAN | |
| DELETERIOUS: CARBONATE INCRUSTATION | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: SAND | |
| SEE SIEVE ANALYSIS | |
| | |
| EXPOSURE #: GM990 (NW-01-005-04E) | VISITED: 87/08 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: FOREST NATURAL |
| | SURROUNDING LAND USE: FOREST NATURAL |
| ECONOMIC THICKNESS: 0.5 METRES | ESTIMATED STONE CONTENT: MEDIUM QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL |
| SECTION HEIGHT: 3.4 M. | DEPTH TO WATER TABLE: 3.1 M. |
| LITHOLOGY: | |
| DELETERIOUS: | OVERBURDEN THICKNESS: 3 M. |
| MATERIAL AT BASE: SAME AS IN PIT WALL | |
| SEE SIEVE ANALYSIS | |
| | |
| EXPOSURE #: GM991 (NW-01-005-04E) | VISITED: 87/08 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: PASTURE, GRAZING |
| | SURROUNDING LAND USE: PASTURE, GRAZING |
| ECONOMIC THICKNESS: 0.0 METRES | ESTIMATED STONE CONTENT: LOW QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: SAND, PEBBLY @ 2 AND 3.5 METRES |
| SECTION HEIGHT: 3.9 M. | DEPTH TO WATER TABLE: 3.5 M. |
| LITHOLOGY: | |
| DELETERIOUS: | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: SAME AS IN PIT WALL | |
| NO CHANNEL SAMPLE TAKEN | |
| | |
| EXPOSURE #: GM992 (NW-01-005-04E) | VISITED: 87/08 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: PASTURE, GRAZING |
| | SURROUNDING LAND USE: PASTURE, GRAZING |
| ECONOMIC THICKNESS: 0.0 METRES | ESTIMATED STONE CONTENT: LOW QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: MEDIUM TO COARSE SAND OVER FINE SAND |
| SECTION HEIGHT: 3.9 M. | DEPTH TO WATER TABLE: 3.5 M. |
| LITHOLOGY: | |
| DELETERIOUS: | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: SAND | |
| NO CHANNEL SAMPLE TAKEN | |

EXPOSURE #: GM993 (NW-01-005-04E)
EXPOSURE TYPE: BACKHOE TEST PIT

ECONOMIC THICKNESS: 0.0 METRES
SECTION: A
SECTION HEIGHT: 4.2 M.
LITHOLOGY:
DELETERIOUS:
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN

VISITED: 87/08
LAND USE: PASTURE, GRAZING
SURROUNDING LAND USE: PASTURE, GRAZING
ESTIMATED STONE CONTENT: LOW QUALITY
MATERIAL DESCRIPTION: MEDIUM TO FINE SAND
DEPTH TO WATER TABLE:

EXPOSURE #: GM994 (NW-01-005-04E)
EXPOSURE TYPE: BACKHOE TEST PIT

ECONOMIC THICKNESS: 0.0 METRES
SECTION: A
SECTION HEIGHT: 3.9 M.
LITHOLOGY:
DELETERIOUS:
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN

VISITED: 87/08
LAND USE: PASTURE, GRAZING
SURROUNDING LAND USE: PASTURE, GRAZING
ESTIMATED STONE CONTENT: LOW QUALITY
MATERIAL DESCRIPTION: MEDIUM SAND
DEPTH TO WATER TABLE:

OVERBURDEN THICKNESS:

EXPOSURE #: GM995 (SW-01-005-04E)
EXPOSURE TYPE: BACKHOE TEST PIT

ECONOMIC THICKNESS: 1.6 METRES
SECTION: A

SECTION HEIGHT: 3.6 M.

LITHOLOGY: 80% GENERAL CARBONATES 20% GENERAL PRECAMBRIAN

DELETERIOUS: CARBONATE INCRUSTATION

MATERIAL AT BASE: SAME AS IN PIT WALL

SEE SIEVE ANALYSIS

VISITED: 87/08
LAND USE: PASTURE, GRAZING
SURROUNDING LAND USE: PASTURE, GRAZING
ESTIMATED STONE CONTENT: MEDIUM QUALITY
MATERIAL DESCRIPTION: SANDY PEBBLE GRAVEL
W/OCCASIONAL COBBLES

DEPTH TO WATER TABLE:

OVERBURDEN THICKNESS:

EXPOSURE #: GM996 (NW-01-005-04E)
EXPOSURE TYPE: BACKHOE TEST PIT

ECONOMIC THICKNESS: 0.0 METRES

SECTION: A

SECTION HEIGHT: 3.6 M.

LITHOLOGY:

DELETERIOUS:

MATERIAL AT BASE: SAND

NO CHANNEL SAMPLE TAKEN

VISITED: 87/08
LAND USE: FOREST NATURAL
SURROUNDING LAND USE: FOREST NATURAL
ESTIMATED STONE CONTENT: LOW QUALITY
MATERIAL DESCRIPTION: SILTY SAND DIAMICTON OVER SAND
DEPTH TO WATER TABLE:

| | |
|---|---|
| EXPOSURE #: GM997 (SW-01-005-04E) | VISITED: 87/08 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: FOREST NATURAL |
| ECONOMIC THICKNESS: 2.1 METRES | SURROUNDING LAND USE: FOREST NATURAL |
| SECTION: A | ESTIMATED STONE CONTENT: MEDIUM QUALITY |
| SECTION HEIGHT: 3.6 M. | SURROUNDING LAND USE: SANDY COBBLY PEBBLE GRAVEL |
| LITHOLOGY: 75% GENERAL CARBONATES 25% GENERAL PRECAMBRIAN | DEPTH TO WATER TABLE: |
| DELETERIOUS: WEATHERED PEBBLES | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: SAND | |
| SEE SIEVE ANALYSIS | |
| EXPOSURE #: GM998 (SW-01-005-04E) | VISITED: 87/08 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: FOREST NATURAL |
| ECONOMIC THICKNESS: 0.0 METRES | SURROUNDING LAND USE: FOREST NATURAL |
| SECTION: A | ESTIMATED STONE CONTENT: LOW QUALITY |
| SECTION HEIGHT: 3.6 M. | MATERIAL DESCRIPTION: SAND W/TWO GRAVELLY LAYERS |
| LITHOLOGY: | DEPTH TO WATER TABLE: |
| DELETERIOUS: | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: SAND | |
| NO CHANNEL SAMPLE TAKEN | |
| EXPOSURE #: GM999 (SW-01-005-04E) | VISITED: 87/08 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: FOREST NATURAL |
| ECONOMIC THICKNESS: 0.0 METRES | SURROUNDING LAND USE: FOREST NATURAL |
| SECTION: A | ESTIMATED STONE CONTENT: LOW QUALITY |
| SECTION HEIGHT: 3.6 M. | MATERIAL DESCRIPTION: 0-1M SILT TILL OVER MEDIUM SAND |
| LITHOLOGY: | DEPTH TO WATER TABLE: |
| DELETERIOUS: | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: SAND | |
| NO CHANNEL SAMPLE TAKEN | |
| EXPOSURE #: LM001 (SW-01-005-04E) | VISITED: 87/08 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: FOREST NATURAL |
| ECONOMIC THICKNESS: 0.0 METRES | SURROUNDING LAND USE: FOREST NATURAL |
| SECTION: A | ESTIMATED STONE CONTENT: LOW QUALITY |
| SECTION HEIGHT: 3.6 M. | MATERIAL DESCRIPTION: 0-2M SILT TILL OVER MEDIUM SAND |
| LITHOLOGY: | DEPTH TO WATER TABLE: |
| DELETERIOUS: | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: SAND | |
| NO CHANNEL SAMPLE TAKEN | |

EXPOSURE #: LM002 (SW-01-005-04E)
EXPOSURE TYPE: BACKHOE TEST PIT

ECONOMIC THICKNESS: 0.0 METRES
SECTION: A
SECTION HEIGHT: 3.5 M.
LITHOLOGY:
DELETERIOUS:
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN

VISITED: 87/08
LAND USE: FOREST NATURAL
SURROUNDING LAND USE: FOREST NATURAL
ESTIMATED STONE CONTENT: LOW QUALITY
MATERIAL DESCRIPTION: SILT TILL OVER FINE SAND
DEPTH TO WATER TABLE:

EXPOSURE #: LM003 (NW-01-005-04E)
EXPOSURE TYPE: BACKHOE TEST PIT

ECONOMIC THICKNESS: 0.0 METRES
SECTION: A
SECTION HEIGHT: 3.5 M.
LITHOLOGY:
DELETERIOUS:
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN

VISITED: 87/08
LAND USE: FOREST NATURAL
SURROUNDING LAND USE: FOREST NATURAL
ESTIMATED STONE CONTENT: LOW QUALITY
MATERIAL DESCRIPTION: FINE SAND
DEPTH TO WATER TABLE:

OVERBURDEN THICKNESS:

EXPOSURE #: LM006 (NW-01-005-04E)
EXPOSURE TYPE: BACKHOE TEST PIT

ECONOMIC THICKNESS: 0.0 METRES
SECTION: A
SECTION HEIGHT: 3.0 M.
LITHOLOGY:
DELETERIOUS:
MATERIAL AT BASE: SAND
NO CHANNEL SAMPLE TAKEN

VISITED: 87/08
LAND USE: HIGHWAY,ROADWAY,RAILWAY
SURROUNDING LAND USE: AGRICULTURE,HAYING
ESTIMATED STONE CONTENT: LOW QUALITY
MATERIAL DESCRIPTION: SILT TILL OVER FINE SAND
DEPTH TO WATER TABLE:

OVERBURDEN THICKNESS:

EXPOSURE #: LM007 (SE-01-005-04E)
EXPOSURE TYPE: BACKHOE TEST PIT

ECONOMIC THICKNESS: 2.1 METRES
SECTION: A

SECTION HEIGHT: 3.7 M.
LITHOLOGY: 75% GENERAL CARBONATES 25% GENERAL PRECAMBRIAN
DELETERIOUS: WEATHERED PEBBLES

MATERIAL AT BASE:
SEE SIEVE ANALYSIS

VISITED: 87/08
LAND USE: HIGHWAY,ROADWAY,RAILWAY
SURROUNDING LAND USE: PASTURE,GRAZING
ESTIMATED STONE CONTENT: MEDIUM QUALITY
MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL
W/OCCASIONAL COBBLES

DEPTH TO WATER TABLE:
OVERBURDEN THICKNESS:

| | |
|---|--|
| EXPOSURE #: LM008 (SE-01-005-04E) | VISITED: 87/08 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: FOREST NATURAL |
| | SURROUNDING LAND USE: FOREST NATURAL |
| ECONOMIC THICKNESS: 1.5 METRES | ESTIMATED STONE CONTENT: MEDIUM QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL |
| SECTION HEIGHT: 2.7 M. | DEPTH TO WATER TABLE: |
| LITHOLOGY: 85% GENERAL CARBONATES 15% GENERAL PRECAMBRIAN | |
| DELETERIOUS: WEATHERED PEBBLES | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: TILL | |
| SEE SIEVE ANALYSIS | |
| EXPOSURE #: LM009 (SE-01-005-04E) | VISITED: 87/08 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: FOREST NATURAL |
| | SURROUNDING LAND USE: FOREST NATURAL |
| ECONOMIC THICKNESS: 2.5 METRES | ESTIMATED STONE CONTENT: MEDIUM HIGH QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL |
| SECTION HEIGHT: 3.5 M. | DEPTH TO WATER TABLE: |
| LITHOLOGY: 75% GENERAL CARBONATES 25% GENERAL PRECAMBRIAN | |
| DELETERIOUS: | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: SAND | |
| SEE SIEVE ANALYSIS | |
| EXPOSURE #: LM010 (SE-01-005-04E) | VISITED: 87/08 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: FOREST NATURAL |
| | SURROUNDING LAND USE: FOREST NATURAL |
| ECONOMIC THICKNESS: 0.6 METRES | ESTIMATED STONE CONTENT: LOW QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: FINE SAND W/SANDY FINE PEBBLE GRAVEL LAYER |
| SECTION HEIGHT: 3.0 M. | DEPTH TO WATER TABLE: |
| LITHOLOGY: 75% GENERAL CARBONATES 25% GENERAL PRECAMBRIAN | |
| DELETERIOUS: | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: SAND | |
| NO CHANNEL SAMPLE TAKEN | |
| EXPOSURE #: LM011 (SE-01-005-04E) | VISITED: 87/08 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: FOREST NATURAL |
| | SURROUNDING LAND USE: FOREST NATURAL |
| ECONOMIC THICKNESS: 0.0 METRES | ESTIMATED STONE CONTENT: LOW QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: SILT TILL |
| SECTION HEIGHT: 2.4 M. | DEPTH TO WATER TABLE: |
| LITHOLOGY: | |
| DELETERIOUS: | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: TILL | |
| NO CHANNEL SAMPLE TAKEN | |

EXPOSURE #: LM012 (SE-01-005-04E)
 EXPOSURE TYPE: BACKHOE TEST PIT

VISITED: 87/08
 LAND USE: FOREST NATURAL
 SURROUNDING LAND USE: FOREST NATURAL
 ESTIMATED STONE CONTENT: LOW QUALITY
 MATERIAL DESCRIPTION: FINE SAND
 DEPTH TO WATER TABLE:

ECONOMIC THICKNESS: 0.0 METRES
 SECTION: A
 SECTION HEIGHT: 2.4 M.
 LITHOLOGY:
 DELETERIOUS:
 MATERIAL AT BASE: SAND
 NO CHANNEL SAMPLE TAKEN

OVERBURDEN THICKNESS:

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | OVERSIZE |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | |
| GM318 A (NE-36-004-04E) | 94 | 93 | 87 | 81 | 72 | 59 | 26 | 13 | 5 | 4 | ABUNDANT |
| GM959 A (SE 01 005 04E) | 99 | 96 | 91 | 85 | 76 | 57 | 38 | 6 | 2 | 2 | ABUNDANT |
| GM960 A (SE 01 005 04E) | 91 | 79 | 71 | 60 | 48 | 34 | 22 | 12 | 7 | 4 | ABUNDANT |
| GM961 A (SE 01 005 04E) | 94 | 85 | 78 | 68 | 56 | 45 | 35 | 21 | 12 | 7 | ABUNDANT |
| GM979 A (NW 01 005 04E) | 88 | 78 | 69 | 59 | 45 | 34 | 25 | 17 | 13 | 10 | ABUNDANT |
| GM990 A (NW 01 005 04E) | 100 | 99 | 94 | 76 | 59 | 46 | 34 | 17 | 6 | 4 | SPARSE |
| GM995 A (SW 01 005 04E) | 94 | 85 | 77 | 66 | 54 | 40 | 24 | 12 | 6 | 4 | ABUNDANT |
| GM997 A (SW 01 005 04E) | 91 | 84 | 78 | 74 | 69 | 65 | 59 | 43 | 28 | 15 | ABUNDANT |
| LM007 A (SE 01 005 04E) | 94 | 87 | 82 | 76 | 67 | 58 | 46 | 28 | 11 | 5 | ABUNDANT |
| LM008 A (SE 01 005 04E) | 98 | 89 | 75 | 64 | 53 | 43 | 32 | 20 | 10 | 6 | SPARSE |
| LM009 A (SE 01 005 04E) | 98 | 94 | 90 | 76 | 55 | 43 | 33 | 22 | 11 | 5 | SPARSE |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001835

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SAND/GRAVEL) | OWNER2 (SAND/GRAVEL) |
|------------------|--------------------------------------|--|------------------------|-------------------------|
| NE-01-005-04E | 0 | 4500 | PRIVATE/PRIVATE | |
| SE-12-005-04E | 30 | 11550 | PRIVATE/PRIVATE | PRIVATE/CROWN |
| DEPOSIT RESERVES | | 16050 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM015 (SE-12-005-04E) VISITED: 87/06
 EXPOSURE TYPE: DITCH OR ROAD CUT LAND USE: HIGHWAY,ROADWAY,RAILWA
 SURROUNDING LAND USE: AGRICULTURE,HAYING
 ECONOMIC THICKNESS: 1.5 METRES ESTIMATED STONE CONTENT: MEDIUM QUALITY
 SECTION: A MATERIAL DESCRIPTION: SANDY PEBBLE GRAVEL OCCASIONAL
 COBBLES AND BOULDERS
 SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE:
 LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
 DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
 INCRUSTATION
 MATERIAL AT BASE: SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

SECTION: B MATERIAL DESCRIPTION:
 SECTION HEIGHT: 1.5 M. DEPTH TO WATER TABLE:
 LITHOLOGY: 80% GENERAL CARBONATES 20% GENERAL PRECAMBRIAN
 DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
 INCRUSTATION
 MATERIAL AT BASE: SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | OVERSIZE |
| GM015 A (SE-12-005-04E) | 82 | 72 | 64 | 55 | 46 | 33 | 18 | 5 | 4 | 3 | ABUNDANT |
| GM015 B (SE-12-005-04E) | 97 | 92 | 89 | 83 | 75 | 67 | 57 | 45 | 43 | 42 | MODERATE |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001836 (REQUIRES TESTING)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SAND/GRAVEL) | OWNER2 (SAND/GRAVEL) |
|------------------|--------------------------------------|--|------------------------|-------------------------|
| SW-12-005-04E | 40 | 23400 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 23400 | | |

DEPOSIT # 001837

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SAND/GRAVEL) | OWNER2 (SAND/GRAVEL) |
|------------------|--------------------------------------|--|------------------------|-------------------------|
| NE-12-005-04E | 30 | 26600 | PRIVATE/PRIVATE | PRIVATE/CROWN |
| SE-12-005-04E | 80 | 9200 | PRIVATE/PRIVATE | PRIVATE/CROWN |
| DEPOSIT RESERVES | | 35800 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM957 (NE-12-005-04E)

EXPOSURE TYPE: SAND AND GRAVEL PIT

ECONOMIC THICKNESS: 2.0 METRES

SECTION: A

SECTION HEIGHT: 2.5 M.

LITHOLOGY: 80% GENERAL CARBONATES 20% GENERAL PRECAMBRIAN

DELETERIOUS:

MATERIAL AT BASE: TILL

SEE SIEVE ANALYSIS

VISITED: 87/08

LAND USE: FOREST NATURAL

SURROUNDING LAND USE: AGRICULTURE,HAYING

ESTIMATED STONE CONTENT: MEDIUM QUALITY

MATERIAL DESCRIPTION: SANDY PEBBLE GRAVEL OCCASION COBBLES AND BOULDERS

DEPTH TO WATER TABLE: 2.0 M.

OVERBURDEN THICKNESS:

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | |
|---|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | OVERSIZE |
| GM957 A (NE-12-005-04E) | 93 | 79 | 65 | 54 | 44 | 33 | 22 | 12 | 5 | 4 | ABUNDANT |
| (NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES) | | | | | | | | | | | |

DEPOSIT # 001838

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SAND/GRAVEL) | OWNER2 (SAND/GRAVEL) |
|------------------|--------------------------------|--------------------------------------|---------------------|----------------------|
| NW-12-005-04E | 50 | 19500 | PRIVATE/PRIVATE | |
| SW-12-005-04E | 80 | 3300 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 22800 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM958 (SW-12-005-04E)

EXPOSURE TYPE: SAND AND GRAVEL PIT

ECONOMIC THICKNESS: 1.5 METRES

SECTION: A

SECTION HEIGHT: 1.5 M.

LITHOLOGY: 85% GENERAL CARBONATES 15% GENERAL PRECAMBRIAN

DELETERIOUS:

MATERIAL AT BASE: TILL

SEE SIEVE ANALYSIS

VISITED: 87/06

LAND USE: PIT-NOT IN USE(COMMONLY REVEGETATED)

SURROUNDING LAND USE: AGRICULTURE,HAYING

ESTIMATED STONE CONTENT: MEDIUM LOW QUALITY

MATERIAL DESCRIPTION: SANDY PEBBLE GRAVEL OCCASIONAL COBBLES, MANY BOULDERS

DEPTH TO WATER TABLE:

OVERBURDEN THICKNESS:

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | |
|---|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | OVERSIZE |
| GM958 A (SW-12-005-04E) | 100 | 97 | 93 | 81 | 67 | 48 | 28 | 8 | 5 | 4 | ABUNDANT |
| (NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES) | | | | | | | | | | | |

DEPOSIT # 001839 (MOSTLY DEPLETED)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SAND/GRAVEL) | OWNER2 (SAND/GRAVEL) |
|------------------|--------------------------------------|--|------------------------|-------------------------|
| NE-13-005-04E | 90 | 30200 | PRIVATE/PRIVATE | |
| SE-13-005-04E | 0 | 8000 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 38200 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM017 (NE-13-005-04E) VISITED: 78/08
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT-TEMPORARY USE
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 2.0 METRES ESTIMATED STONE CONTENT: MEDIUM QUALITY
SECTION: A MATERIAL DESCRIPTION: SANDY COARSE PEBBLE GRAVEL
SECTION HEIGHT: 1.5 M. DEPTH TO WATER TABLE:
LITHOLOGY: 70% GENERAL CARBONATES 30% GENERAL PRECAMBRIAN
DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
INCRUSTATION
MATERIAL AT BASE: SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

SIEVE ANALYSIS

| | | PERCENT PASSING | | | | | | | | | |
|-------------------------|----|-----------------|-----|----|----|-----|-----|-----|------|------|----------|
| | | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | OVERSIZE |
| GM017 A (NE 13 005 04E) | 95 | 84 | 66 | 51 | 41 | 32 | 24 | 13 | 6 | 3 | SPARSE |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

DEPOSIT # 001840 (PREDOMINANTLY SAND)

| LOCATION | PERCENT DEPLETED OR STERILIZED | REMAINING RESERVES (m ³) | OWNER (SAND/GRAVEL) | OWNER2 (SAND/GRAVEL) |
|------------------|--------------------------------------|--|------------------------|-------------------------|
| NE-23-005-04E | 10 | 78300 | PRIVATE/PRIVATE | |
| NW-24-005-04E | 0 | 102000 | PRIVATE/PRIVATE | |
| SW-25-005-04E | 20 | 51200 | PRIVATE/PRIVATE | |
| DEPOSIT RESERVES | | 231500 | | |

EXPOSURE INFORMATION

EXPOSURE #: GM010 (NW-24-005-04E) VISITED: 78/08
EXPOSURE TYPE: BULLDOZER TEST PIT LAND USE: FOREST NATURAL
SURROUNDING LAND USE:
ECONOMIC THICKNESS: 1.0 METRES ESTIMATED STONE CONTENT: MEDIUM QUALITY
SECTION: A MATERIAL DESCRIPTION: SANDY PEBBLE GRAVEL
SECTION HEIGHT: 1.0 M. DEPTH TO WATER TABLE:
LITHOLOGY: 80% GENERAL CARBONATES 20% GENERAL PRECAMBRIAN
DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
INCRUSTATION
MATERIAL AT BASE: SAME AS IN PIT WALL
NO CHANNEL SAMPLE TAKEN

EXPOSURE #: GM011 (SW-25-005-04E) VISITED: 87/06
EXPOSURE TYPE: SAND AND GRAVEL PIT LAND USE: PIT-NOT IN USE(COMMONLY REVEGETATED)
SURROUNDING LAND USE: FOREST NATURAL
ECONOMIC THICKNESS: 5.0 METRES ESTIMATED STONE CONTENT: MEDIUM QUALITY
SECTION: A MATERIAL DESCRIPTION: SANDY PEBBLE GRAVEL SOME
BOULDERS GLACIOFLUVIAL
SECTION HEIGHT: 2.0 M. DEPTH TO WATER TABLE:
LITHOLOGY: 80% GENERAL CARBONATES 20% GENERAL PRECAMBRIAN
DELETERIOUS: CARBONATE OVERBURDEN THICKNESS:
INCRUSTATION
MATERIAL AT BASE: SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

SECTION: B MATERIAL DESCRIPTION:
SECTION HEIGHT: 6.0 M. DEPTH TO WATER TABLE:
LITHOLOGY: 75% GENERAL CARBONATES 25% GENERAL PRECAMBRIAN
DELETERIOUS: OVERBURDEN THICKNESS:
MATERIAL AT BASE: SAND
SEE SIEVE ANALYSIS

EXPOSURE #: GM982 (NW-24-005-04E) VISITED: 87/08
EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: FOREST NATURAL
SURROUNDING LAND USE: AGRICULTURE,HAYING
ECONOMIC THICKNESS: 0.0 METRES ESTIMATED STONE CONTENT: LOW QUALITY
SECTION: A MATERIAL DESCRIPTION: SILT TILL / FINE SAND OVER MEDIUM
SAND
SECTION HEIGHT: 4.5 M. DEPTH TO WATER TABLE:
LITHOLOGY:
DELETERIOUS: OVERBURDEN THICKNESS:
MATERIAL AT BASE: SAME AS IN PIT WALL
NO CHANNEL SAMPLE TAKEN

| | |
|---------------------------------------|--|
| EXPOSURE #: GM983 (NW-24-005-04E) | VISITED: 87/08 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: FOREST NATURAL |
| | SURROUNDING LAND USE: AGRICULTURE,HAYING |
| ECONOMIC THICKNESS: 0.0 METRES | ESTIMATED STONE CONTENT: LOW QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: SILT TILL / FINE SAND OVER MEDIUM SAND |
| SECTION HEIGHT: 2.7 M. | DEPTH TO WATER TABLE: |
| LITHOLOGY: | |
| DELETERIOUS: | OVERBURDEN THICKNESS: 2.3 M. |
| MATERIAL AT BASE: SAME AS IN PIT WALL | |
| NO CHANNEL SAMPLE TAKEN | |
| | |
| EXPOSURE #: GM984 (NW-24-005-04E) | VISITED: 87/08 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: FOREST NATURAL AGRICULTURE,HAYING |
| ECONOMIC THICKNESS: 0.0 METRES | ESTIMATED STONE CONTENT: LOW QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: FINE SAND OVER MEDIUM SAND |
| SECTION HEIGHT: 4.5 M. | DEPTH TO WATER TABLE: |
| LITHOLOGY: | |
| DELETERIOUS: | OVERBURDEN THICKNESS: 2.0 M. |
| MATERIAL AT BASE: SAME AS IN PIT WALL | |
| SEE SIEVE ANALYSIS | |
| | |
| EXPOSURE #: GM985 (NW-24-005-04E) | VISITED: 87/08 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: FOREST NATURAL |
| | SURROUNDING LAND USE: AGRICULTURE,HAYING |
| ECONOMIC THICKNESS: 0.0 METRES | ESTIMATED STONE CONTENT: LOW QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: FINE SAND OVER MEDIUM SAND |
| SECTION HEIGHT: 4.5 M. | DEPTH TO WATER TABLE: |
| LITHOLOGY: | |
| DELETERIOUS: | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: SAME AS IN PIT WALL | |
| NO CHANNEL SAMPLE TAKEN | |
| | |
| EXPOSURE #: GM986 (NW-24-005-04E) | VISITED: 87/08 |
| EXPOSURE TYPE: BACKHOE TEST PIT | LAND USE: FOREST NATURAL |
| | SURROUNDING LAND USE: AGRICULTURE,HAYING |
| ECONOMIC THICKNESS: 3.0 METRES | ESTIMATED STONE CONTENT: LOW QUALITY |
| SECTION: A | MATERIAL DESCRIPTION: SANDY FINE PEBBLE GRAVEL W/BOULDERS |
| SECTION HEIGHT: 3.0 M. | DEPTH TO WATER TABLE: |
| LITHOLOGY: | |
| DELETERIOUS: | OVERBURDEN THICKNESS: |
| MATERIAL AT BASE: SAND | |
| NO CHANNEL SAMPLE TAKEN | |

EXPOSURE #: GM987 (NW-24-005-04E) VISITED: 87/08
 EXPOSURE TYPE: BACKHOE TEST PIT LAND USE: FOREST NATURAL
 ECONOMIC THICKNESS: 2.7 METRES ESTIMATED STONE CONTENT: MEDIUM HIGH QUALITY
 SECTION: A MATERIAL DESCRIPTION: FINE SAND AND SILT OVER SANDY
 PEBBLE GRAVEL, OCCASIONAL
 COBBLES
 SECTION HEIGHT: 4.8 M. DEPTH TO WATER TABLE:
 LITHOLOGY: 80% GENERAL CARBONATES 20% GENERAL PRECAMBRIAN
 DELETERIOUS: WEATHERED OVERBURDEN THICKNESS: 2.1 M.
 PEBBLES
 MATERIAL AT BASE: SAME AS IN PIT WALL
SEE SIEVE ANALYSIS

SIEVE ANALYSIS

| | PERCENT PASSING | | | | | | | | | | OVERSIZE |
|-------------------------|-----------------|-----|-----|----|----|-----|-----|-----|------|------|----------|
| | 1.5 | 3/4 | 3/8 | #4 | #8 | #16 | #30 | #50 | #100 | #200 | |
| GM011 A (SW 25 005 04E) | 95 | 88 | 82 | 73 | 62 | 45 | 26 | 12 | 6 | 4 | ABUNDANT |
| GM011 B (SW 25 005 04E) | 98 | 87 | 74 | 62 | 49 | 32 | 21 | 11 | 5 | 4 | ABUNDANT |
| GM984 A (NW 24 005 04E) | 100 | 100 | 100 | 99 | 98 | 90 | 56 | 28 | 8 | 3 | SPARSE |
| GM987 A (NW 24 005 04E) | 95 | 83 | 72 | 61 | 51 | 44 | 38 | 28 | 10 | 4 | ABUNDANT |

(NOTE: ALL SAMPLES ARE 100% PASSING 3 INCHES)

