SOIL INTERPRETATIONS FOR AIDING IN THE PLANNING OF MOBILE HOME SITES WITHIN THE TOWN OF BASHAW, ALBERTA

by: M.D. Scheelar

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SOIL INTERPRETATIONS

FOR

AIDING IN THE PLANNING OF

MOBILE HOME SITES

Within The Town Of

BASHAW, ALBERTA

Prepared for: Battle River Regional Planning Commission

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INTRODUCTION

This report describes a detailed soil survey and soil interpretations for mobile home sites of approximately 50 acres within the town of Bashaw, Alberta. Bashaw is located in section 2, Township 42, Range 21, west of the 4th meridian. It is approximately 90 miles south of Edmonton and can be reached by way of highways 14 and 21.

The map, printed at a scale of 200 feet to the inch, shows the location and extent of the soil areas. The legend included with the map indicates the classification of the soils for each soil area.

The report describes the cultural and physical features of the area, the classification of the soils, and some of the physical and chemical properties of the soils. A list of limiting soil properties, a table of soil interpretations and short notes on soil interpretations for each use constitutes the remainder of the report.

CULTURAL AND PHYSICAL FEATURES OF THE AREA

At present, the land in the map area is being used for pasture and recreation.

The topography is composed of level to depressional lowlands, gently sloping areas and gently undulating uplands. The soils of the lowland area are developed from saline silty clay overlying sand, sandy loam and sandy clay loam in variable strata. On the gentle slopes between the lowland and upland areas the soils are developed from stony saline material that ranges from loam to clay loam in texture. The upland area comprises of soils developed from cobbles and gravel overlying shales and sandstones of the Edmonton formation at fairly shallow depths. The high salinity of the lowlands and gently sloping areas is due to groundwater discharge where salts have been brought

near the surface by a fluctuating water table.

The area is drained by the Red Deer River drainage system.

THE SOILS

For the purpose of this report the soils were outlined into areas 1 to 8 each of which has unique parent material, topography, stone content and/or soil characteristics.

Area 1 - consists of soils of the Hercules 2(Hr2) mapping unit. These are poorly drained, Saline Humic Gleysols developed from saline silty clay. They occur on level topography and their water table level varies from 18 to 60 inches from the surface. However, they differ from typical Hercules soils in that they are underlain by variable strata of sand, sandy loam and sandy clay loam.

The topsoil is mildly to moderately alkaline in reaction, may be saline, ranges in texture from loam to silt loam and is from 4 to 10 inches thick.

The upper subsoil is moderately alkaline in reaction, is saline and gleyed, ranges in texture from silty clay to clay and is from 12 to 30 inches thick.

The lower subsoil is mildly alkaline in reaction, may be saline, is gleyed and ranges in texture from sand to sandy clay loam.

Area 2 - is similar to Area 1 except that the soils occur on slightly more depressional topography and the water table level varies from 0 to 48 inches from the surface.

Area 3 - is similar to Area 1 except that enough stones over 10 inches in diameter are prevalent on the surface to cause a problem unless removed.

Area 4 - consists of soils of the Gwynne 3 (Gw3) mapping unit. These are imperfectly drained Gleyed Solonetz soils developed on saline, stony clay loam material. They occur on gently sloping topography and the water table level varies from 36 to 72 inches from the surface.

The topsoil is neutral in reaction, ranges in texture from sandy loam to loam and is from 2 to 4 inches thick.

The upper subsoil is mildly alkaline in reaction, is gleyed, has dark organic staining on its aggregate surfaces and is very hard and impermeable when dry. It ranges in texture from clay to clay loam and is from 6 to 12 inches thick.

The lower subsoil is moderately to strongly alkaline in reaction, is gleyed and saline and ranges in texture from loam to clay loam.

Area 5 - consists of soils of the Sedgewick 1 (Sgw1/b) mapping unit. However, they differ from typical Sedgewick soils in that they have many stones over 10 inches in diameter in the upper subsoil and also in that they overly bedrock at fairly shallow depths. They are well to rapidly drained Orthic Black soils and occur on gently undulating topography.

The topsoil is slightly acid to neutral in reaction, ranges in texture from gravelly loam to gravelly sandy loam and is from 2 to 4 inches thick.

The upper subsoil consists mainly of cobbles and boulders mixed with some gravel and coarse sand and is from 18 to 24 inches thick.

The lower subsoil consists mainly of unconsolidated and consolidated shales and sandstones.

Area 6 - consists of soils of the Mill Woods 3 (Ms3) mapping unit. These soils are imperfectly drained Gleyed Solonetz soils developed on similar parent material to that of Area 1. They differ from typical Mill Woods soils in that they often have thicker topsoils and have sandy lower subsoils. They occur on gently sloping topography and the water table level varies from 36 to 72 inches from the surface.

The topsoil is neutral in reaction, ranges in texture from loam to silt loam and is from 6 to 12 inches thick.

The upper subsoil is mildly to moderately alkaline in reaction, ranges in texture from clay to silty clay and is from 18 to 30 inches thick. The upper 4 to 6 inches has dark organic staining, is columnar and is very hard and impermeable when dry. The remainder of the upper subsoil is strongly gleyed and saline.

The lower subsoil is similar to that of Area 1.

Area 7 - consists of soils of the Bigstone 1 (Bgt1) mapping unit. These are well drained, Orthic Black soils developed from alluvial and/or aeolian material. They occur on gently undulating topography.

The topsoil is slightly acid to neutral in reaction, ranges in texture from loamy fine sand to fine sandy loam and is from 6 to 12 inches thick.

The subsoil is mildly alkaline in reaction and ranges in texture from sand to fine sandy loam.

Area 8 - consists of soils of the Millet 1 (Mlt1) mapping unit. These soils are poorly drained, Orthic Humic Gleysols developed from alluvial parent material. They occur on level to depressional topography and the water table level varies from 18 to 60 inches from the surface.

The topsoil is neutral in reaction, ranges in texture from loamy fine sand to fine sandy loam and is from 8 to 12 inches thick.

The subsoil is mildly alkaline in reaction, is mottled and gleyed, non-saline and ranges in texture from sand to fine sandy loam.

Disturbed Land - consists of soils that have been sufficiently disturbed by man's activities to make soil horizon differentiation impossible.

Slough - is a permanent water body.

SOIL SURVEY INTERPRETATIONS

Soil survey interpretations are useful in aiding site selection and in assisting planners, engineers or developers. However, they should be treated as evaluations of soil performance, not as recommendations for the use of soil. The decision as to whether or not a soil will be used for a specific purpose is beyond the scope of this report.

The main uses for which the soils of this area are likely to be required are (a) lawns and landscaping, (b) shallow excavations, (c) mobile home sites, (d) underground concrete conduits, (e) roads and streets.

For each use the soils are rated in terms of degree of limitation - slight, moderate or severe. These categories are defined as follows: slight - soils with few known limitations for the use indicated; moderate - soils that have one or more properties that limit their use. Correcting these factors will increase construction costs but if not corrected maintenance costs will increase; severe - soils that have one or more properties that seriously limit their use. The cost of development may be very high but using these soils without employing corrective measures could result in failure.

Soil properties that appear important in affecting the designated uses of the soils in this area are presented in Table 1.

TABLE 1 - LIMITING PROPERTIES OF SOILS

1. Seasonal or permanent high water table.
2. High topsoil salinity.
3. High subsoil salinity.
4. Low permeability of upper subsoil.
5. Thin topsoil.
6. Sandy texture in lower subsoil.
7. High stone content on soil surface.
8. High stone content in upper subsoil.
9. Shallow depth to bedrock.
10. High potential concrete corrosion hazard.
11. High flooding hazard.
12. High clay content in upper subsoil.

The numbers that correspond to the designated soil properties are those that appear in Table 2.

Table 2 shows the suitability of each of the soil areas for the selected uses.

Lawns and Landscaping

The properties that are considered as having an effect on the use of soils for lawns and landscaping in this area are numbered 1, 2, 3, 4, 5, 7, 8, and 11 in Table 1.

High subsoil salinity is considered to be a property that presents a problem for the establishment of shrubs and trees.

Shallow Excavations

The properties that are considered as having an effect on the use of soils for shallow excavations in this area are numbered 1, 6, 7, 8, 9, and 11 in Table 1.

A sandy texture in the lower subsoil would present a problem of a low resistance to sloughing in the excavation.

Mobile Home Sites

The properties that are considered in having an effect on the use of soils for mobile home sites in this area are numbered 1, 7, 8, 9, and 11 in Table 1.

Soils having a seasonal or permanent high water table above a depth of 20 inches at any time of the year or have occasional to frequent flooding hazard are considered to have severe limitations for mobile home sites.

Underground Concrete Conduits

The properties that are considered as having an effect on the use of soils for underground concrete conduits in this area are numbered 1, 3, 8, 9, 10, 11, and 12 in Table 1.

The high potential concrete corrosion hazard in Hercules, Gwynne and Mill Woods soils is due to high subsoil salinity. The principle soluble salt in the soil solution is sodium sulphate. The Concrete Manual of the United States Bureau of Reclamation recognizes that severe attack occurs when the percent soluble sulfate is greater than 0.5 percent. The high clay content in the upper subsoil of Hercules and Mill Woods soils would also present a problem with respect to a high shrink-swell potential.

Roads and Streets

The properties that are considered in having an effect on the use of soils for roads and streets in this area are numbered 1, 6, 7, 8, 9, 11 and 12 in Table 1.

The upper subsoil of Hercules and Mill Woods soils would have high shrink swell potential, low bearing value when wet and is elastic which makes it difficult to compact properly. This would make it an undesirable subgrade for flexible pavements such as asphalt.

The presence of large cobbles and boulders and the close proximity to bedrock in Sedgewick soils would pose a problem due to the expense of needing heavier equipment to move these soils.

TABLE 2 - SOIL SUITABILITY FOR SELECTED USES

Area	Mapping Unit	SOIL LIMITATION FOR: Lawns and Landscaping	Shallow Excavations	Mobile Home Sites	Underground Concrete Conduits	Roads and Streets
1	Hr2	V1,2,3,11	V1,6,11	V1,11	V1,3,10,11,12	V1,11,12
2	Hr2	V1,2,3,11	V1,6,11	V1,11	V1,3,10,11,12	V1,11,12
3	Stony Phase Hr2	V1,2,3,7,11	V1,6,7,11	V1,7,11	V1,3,10,11,12	V1,7,11,12
4	Gw3	V1,3,4,5	M1	S	V1,3,10	M1
5	Sgw1/b	V5,8	V8,9	V8,9	V8,9	M8,9
6	Ms3	V1,3,4	V1,6	S	V1,3,6,10,11,12	V1,12
7	Bgt1	S	M6	S	S	S
8	M1t1	V1	V1,6	V1	V1,6	V1

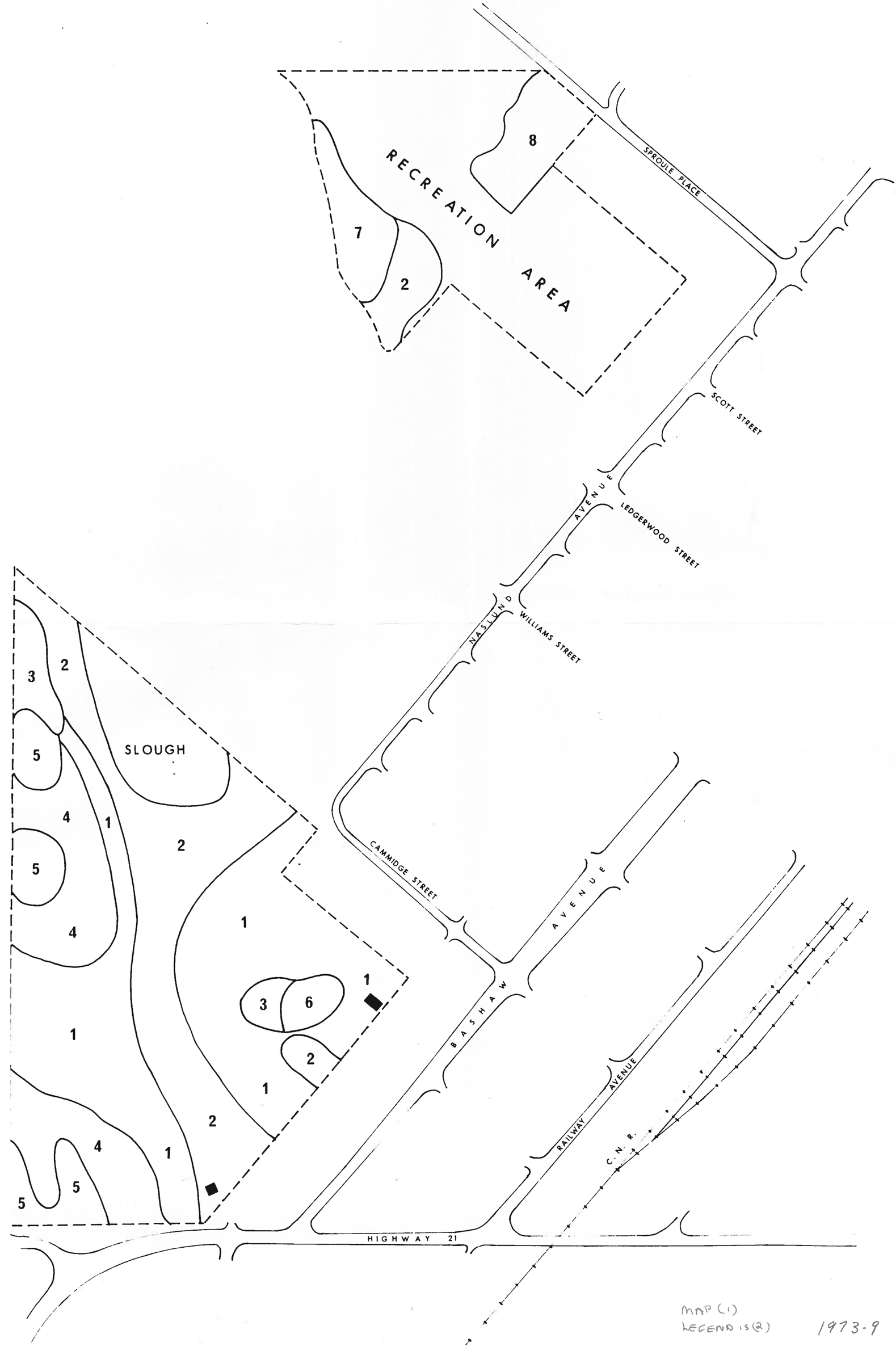
S - Slight

M - Moderate

V - Severe

1. Seasonal High Water Table
2. High Topsoil Salinity
3. High Subsoil Salinity
4. Low Permeability
5. Thin Topsoil
6. Sandy Lower Subsoil
7. High Stone Content on Soil Surface
8. High Stone Content in Upper Subsoil
9. Shallow Depth to Bedrock
10. High Potential Concrete Corrosion Hazard
11. High Flooding Hazard
12. High Clay Content in Subsoil

SOIL SURVEY OF SELECTED AREAS WITHIN THE TOWN OF BASHAW



MAP (1)
LEGEND IS (2) 1973-9 V2

SOILS LEGEND:

AREA	PARENT MATERIAL	SOIL ASSOCIATION	MAPPING UNIT	% SLOPE	SURFACE TEXTURE	DOMINANT SUBGROUP	SIGNIFICANT SUBGROUP
1	Lacustrine	Hercules	Hr 2	0 - 0.5	Si L	Saline Humic Gleysol	
2	Lacustrine	Hercules	Hr 2	0	Si L	Saline Humic Gleysol	
3	Lacustrine	Hercules	Hr 2 st	0 - 0.5	Si L	Saline Humic Gleysol	
4	Till	Gwynne	Gw 3	0.5 - 2	L	Gleyed Black Solonetz	Gleyed Black Solod
5	Outwash over Bedrock	Sedgewick	Sgw 1/b	0.5 - 2	G S L	Orthic Black Chernozem	
6	Lacustrine	Mill Woods	Ms 3	0.5 - 2	Si L	Gleyed Black Solonetz	Gleyed Black Solod
7	Alluvial - Aeolian	Bigstone	Bgt 1	0.5 - 2	F S L	Orthic Black Chernozem	
8	Alluvial - Aeolian	Millet	Mlt 1	0 - 0.5	F S L	Orthic Humic Gleysol	

st - stoney phase

/b - overlying bedrock

SCALE: 1 inch to 200 feet .

— — — Boundary of survey area

—~— Soil line

Mapped and Compiled by: M. D. Scheelar
Soils Division

Alberta
RESEARCH
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