CONSTRUCTION MATERIALS
Oliver County, North Dakota

Construction Materials

These tables give information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

The soils are rated good, fair, or poor as potential sources of topsoil, reclamation material, and roadfill. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

The soils are rated as a probable or improbable source of sand and gravel. A rating of probable means that the source material is likely to be in or below the soil. The numerical ratings in these columns indicate the degree of probability. The number 0.00 indicates that the soil is an improbable source. A number between 0.00 and 1.00 indicates the degree to which the soil is a probable source of sand or gravel.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the first table, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the lowest layer of the soil contains sand or gravel, the soil is rated as a probable source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink–swell potential).

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Aa:					
Alluvial Land-------	90	Not rated		Not rated	
ArA:					
Arnegard----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ArB:					
Arnegard----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ArC:					
Arnegard----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BaC:					
Banks----------	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.33
		Thickest layer	0.00	Thickest layer	0.50
BbA:					
Banks----------	54	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.33
BcA:					
Banks----------	60	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.33
Trembles----------	19	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.07
BcB:					
Banks----------	54	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.33
Trembles----------	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.07
BdA:					
Belfield----------	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Daglum----------	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BdB:					
Belfield----------	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Daglum	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BeA:					
Belfield	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Daglum	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BeB:					
Belfield	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Daglum	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BmA:					
Belfield	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Morton	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BmB:					
Belfield	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Morton	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BmC:					
Morton	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Belfield	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BsA:					
Belfield	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Straw	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.12

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
CaE:					
Cabba	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Shale Outcrop	20	Not rated		Not rated	
CbD:					
Cabba	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Werner	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CbE:					
Cabba	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Werner	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CgE:					
Cohagen	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Sandstone Outcrop	20	Not rated		Not rated	
ChD:					
Cohagen	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Vebar	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Co:					
Colvin	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Regan	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Dm:					
Dimmick	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FaA:					
Farland	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

CONSTRUCTION MATERIALS--Continued
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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
FaB:					
Farland	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FcB:					
Flaxton	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.12
FlA:					
Flaxton	65	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
Livona	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FlB:					
Flaxon	55	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
Livona	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FlC:					
Flaxton	55	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
Livona	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FwA:					
Flaxton	45	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
Williams	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FwB:					
Flaxton	45	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
Williams	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FxB:					
Flaxton	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Williams----------	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FxC:					
Flaxton----------	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
Williams----------	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
FxD:					
Flaxton----------	45	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
Williams----------	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GaA:					
Grail----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GaB:					
Grail----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GcA:					
Grail----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GcB:					
Grail----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GcC:					
Grail----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GnA:					
Grassna----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
GnB:					
Grassna----------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Gp:					
Gravel Pits---------	80	Not rated		Not rated	

CONSTRUCTION MATERIALS--Continued
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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Ha:					
Harriet	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hb:					
Havrelon	79	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hc:					
Havrelon	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hd:					
Havrelon	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Hm:					
Havrelon	49	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Trembles	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.07
Hs:					
Heil	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
La:					
Lallie	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lb:					
Lallie, very wet	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LcA:					
Lawther	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LcB:					
Lawther	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LeA:					
Lefor	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
LhA:					
Lihen	85	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.12
		Thickest layer	0.00	Thickest layer	0.12
LkA:					
Lihen	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.12
LlC:					
Linton	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LnB:					
Linton	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Mandan	24	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lo:					
Lohler	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MaA:					
Mandan	79	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MaB:					
Mandan	79	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MbA:					
Mandan, gravelly substratum	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.07
MbB:					
Mandan, gravelly substratum	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.07
McB:					
Manning	85	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Md:					
Mine Dumps	90	Not rated		Not rated	

CONSTRUCTION MATERIALS--Continued
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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
MoA:					
Morton	84	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MoB:					
Morton	81	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MoC:					
Morton	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MoD:					
Morton	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MpA:					
Morton	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Daglum	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MpB:					
Morton	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Daglum	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MpC:					
Morton	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Daglum	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
MsC:					
Morton, stony	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Sen, stony	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
NfB:					
Noonan	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

CONSTRUCTION MATERIALS--Continued
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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Flaxton----------	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
Pa:					
Parnell----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
PbA:					
Parshall----------	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.06
PcA:					
Parshall----------	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.06
PcB:					
Parshall----------	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.06
PtC:					
Parshall----------	60	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.06
Tally----------	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.07
Re:					
Regan, very poorly drained----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RgA:					
Regent----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RgB:					
Regent----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RgC:					
Regent----------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RlA:					
Regent----------	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Daglum	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RlB:					
Regent	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Daglum	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RlC:					
Regent	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Daglum	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RoB:					
Rhoades	54	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Daglum	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RvE:					
Ringling	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rw:					
Riverwash	85	Not rated		Not rated	
SaA:					
Savage	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SeC:					
Sen	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Werner	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SmA:					
Amor	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Sen	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SmB:					
Amor	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Sen	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SmC:					
Amor	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Sen	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SmD:					
Amor	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Sen	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
StA:					
Stady	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.09
SuB:					
Stady	55	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.09
Lehr	35	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.01
SuC:					
Stady	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.09
Lehr	40	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.01
SwA:					
Straw	79	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.12

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Sx:					
Channel	40	Not rated		Not rated	
Straw	36	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.12
Sy:					
Strongly Saline Land	75	Not rated		Not rated	
TaB:					
Tally	55	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.07
Parshall	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.06
TbA:					
Tally	55	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.07
Vebar	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
TeD:					
Telfer	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.12
		Thickest layer	0.00	Thickest layer	0.12
Lihen	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.12
		Thickest layer	0.00	Thickest layer	0.12
TmA:					
Temvik	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
TwB:					
Temvik	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Williams	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
TwC:					
Temvik	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Williams	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
TwD:					
Temvik	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Williams	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tx:					
Tonka	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Parnell	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
VaC:					
Vebar	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
VbD:					
Vebar, stony	80	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.03
VhD:					
Vebar	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cohagen	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
VkB:					
Vebar	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tally	25	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.07
VlB:					
Vebar	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tally	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.07
VlC:					
Vebar	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Tally	30	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.04
		Thickest layer	0.00	Bottom layer	0.07
Vs:					
Velva	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Straw	34	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.01
		Thickest layer	0.00	Bottom layer	0.12
WaD:					
Wabek	80	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
WlA:					
Williams	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WlB:					
Williams	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WlC:					
Williams	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WmC:					
Williams	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WnC:					
Flaxton	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.01
Williams	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
WzD:					
Williams	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Zahl	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ZaD:					
Zahl	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Williams----------	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ZaE:					
Zahl----------	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Williams----------	20	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Aa:							
Alluvial Land-------	90	Not rated		Not rated		Not rated	
ArA:							
Arnegard----------	85	Good		Good		Good	
ArB:							
Arnegard----------	85	Good		Good		Good	
ArC:							
Arnegard----------	85	Good		Good		Good	
BaC:							
Banks----------	85	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.06
		Too sandy	0.06				
		Low content of organic matter	0.12				
		Droughty	0.92				
BbA:							
Banks----------	54	Fair		Good		Fair	
		Too sandy	0.06			Too sandy	0.06
		Low content of organic matter	0.12				
		Droughty	0.95				
BcA:							
Banks----------	60	Fair		Good		Fair	
		Too sandy	0.06			Too sandy	0.06
		Low content of organic matter	0.12				
		Droughty	0.92				
Trembles----------	19	Fair		Good		Good	
		Low content of organic matter	0.12				
BcB:							
Banks----------	54	Fair		Good		Fair	
		Too sandy	0.06			Too sandy	0.06
		Low content of organic matter	0.12				
		Droughty	0.92				
Trembles----------	35	Fair		Good		Good	
		Low content of organic matter	0.12				
BdA:							
Belfield----------	60	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Low content of organic matter	0.12			Sodium content	0.22
		Sodium content	0.22				
		Salinity	0.88				
		Water erosion	0.90				

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Daglum----------	25	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Sodium content	0.00			Sodium content	0.00
		Low content of organic matter	0.50			Salinity	0.88
		Salinity	0.50				
BdB:							
Belfield----------	55	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Low content of organic matter	0.12			Sodium content	0.22
		Sodium content	0.22				
		Salinity	0.88				
		Water erosion	0.90				
Daglum----------	25	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Sodium content	0.00			Sodium content	0.00
		Low content of organic matter	0.50			Salinity	0.88
		Salinity	0.50				
BeA:							
Belfield----------	50	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Low content of organic matter	0.12			Sodium content	0.22
		Sodium content	0.22				
		Salinity	0.88				
		Water erosion	0.90				
Daglum----------	30	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Sodium content	0.00			Sodium content	0.00
		Low content of organic matter	0.50			Salinity	0.88
		Salinity	0.50				
BeB:							
Belfield----------	55	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Low content of organic matter	0.12			Sodium content	0.22
		Sodium content	0.22				
		Salinity	0.88				
		Water erosion	0.90				
Daglum----------	30	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Sodium content	0.00			Sodium content	0.00
		Low content of organic matter	0.50			Salinity	0.88
		Salinity	0.50				
BmA:							
Belfield----------	45	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Low content of organic matter	0.12			Sodium content	0.22
		Sodium content	0.22				
		Salinity	0.88				
		Water erosion	0.90				

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Morton----------	40	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87		
		Droughty	0.98				
BmB:							
Belfield----------	45	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Low content of organic matter	0.12			Sodium content	0.22
		Sodium content	0.22				
		Salinity	0.88				
		Water erosion	0.90				
Morton----------	40	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87		
		Droughty	0.98				
BmC:							
Morton----------	45	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87		
		Droughty	0.98				
Belfield----------	40	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Low content of organic matter	0.12			Sodium content	0.22
		Sodium content	0.22				
		Salinity	0.88				
		Water erosion	0.90				
BsA:							
Belfield----------	45	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Low content of organic matter	0.12			Sodium content	0.22
		Sodium content	0.22				
		Salinity	0.88				
		Water erosion	0.90				
Straw----------	40	Fair		Fair		Good	
		Low content of organic matter	0.88				
CaE:							
Cabba----------	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.88	Shrink-swell	0.96	Salinity	0.88
		Water erosion	0.90				
Shale Outcrop-------	20	Not rated		Not rated		Not rated	

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CbD:							
Cabba	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Shrink-swell	0.96	Slope	0.37
		Low content of organic matter	0.88			Salinity	0.88
		Water erosion	0.90				
Werner	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Shrink-swell	0.87	Slope	0.37
		Water erosion	0.90				
CbE:							
Cabba	55	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.88	Shrink-swell	0.96	Salinity	0.88
		Water erosion	0.90				
Werner	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Water erosion	0.90	Shrink-swell	0.87		
CgE:							
Cohagen	55	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.88				
Sandstone Outcrop	20	Not rated		Not rated		Not rated	
ChD:							
Cohagen	50	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.82	Slope	0.00
		Low content of organic matter	0.88				
Vebar	40	Fair		Poor		Poor	
		Low content of organic matter	0.50	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.54	Slope	0.82	Depth to bedrock	0.54
		Droughty	0.71				
Co:							
Colvin	45	Good		Poor		Poor	
				Depth to saturated zone	0.00	Depth to saturated zone	0.00
				Shrink-swell	0.87		
Regan	45	Good		Poor		Poor	
				Depth to saturated zone	0.00	Depth to saturated zone	0.00
				Shrink-swell	0.87		

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Dm:							
Dimmick----------	90	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too Clayey	0.00
				Shrink-swell	0.12	Depth to saturated zone	0.00
FaA:							
Farland----------	85	Fair		Fair		Fair	
		Too clayey	0.98	Shrink-swell	0.87	Too Clayey	0.93
FaB:							
Farland----------	85	Fair		Fair		Fair	
		Too clayey	0.98	Shrink-swell	0.87	Too Clayey	0.93
FcB:							
Flaxton----------	85	Poor		Fair		Fair	
		Wind erosion	0.00	Shrink-swell	0.99	Too sandy	0.78
		Low content of organic matter	0.12				
		Too sandy	0.78				
		Water erosion	0.99				
FlA:							
Flaxton----------	65	Fair		Fair		Good	
		Low content of organic matter	0.12	Shrink-swell	0.99		
		Water erosion	0.99				
Livona----------	25	Fair		Fair		Good	
		Low content of organic matter	0.50	Shrink-swell	0.87		
		Water erosion	0.99				
FlB:							
Flaxon----------	55	Fair		Fair		Good	
		Low content of organic matter	0.12	Shrink-swell	0.99		
		Water erosion	0.99				
Livona----------	30	Fair		Fair		Good	
		Low content of organic matter	0.50	Shrink-swell	0.87		
		Water erosion	0.99				
FlC:							
Flaxton----------	55	Fair		Fair		Good	
		Low content of organic matter	0.12	Shrink-swell	0.99		
		Water erosion	0.99				
Livona----------	30	Fair		Fair		Good	
		Low content of organic matter	0.50	Shrink-swell	0.87		
		Water erosion	0.99				
FwA:							
Flaxton----------	45	Fair		Fair		Good	
		Low content of organic matter	0.12	Shrink-swell	0.99		
		Water erosion	0.99				

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Williams----------	30	Fair		Fair		Good	
		Low content of organic matter	0.50	Shrink-swell	0.87		
		Water erosion	0.99				
FwB:							
Flaxton----------	45	Fair		Fair		Good	
		Low content of organic matter	0.12	Shrink-swell	0.99		
		Water erosion	0.99				
Williams----------	30	Fair		Fair		Good	
		Low content of organic matter	0.50	Shrink-swell	0.87		
		Water erosion	0.99				
FxB:							
Flaxton----------	40	Fair		Fair		Good	
		Low content of organic matter	0.50	Shrink-swell	0.99		
		Water erosion	0.99				
Williams----------	35	Fair		Fair		Good	
		Low content of organic matter	0.50	Shrink-swell	0.87		
		Water erosion	0.99				
FxC:							
Flaxton----------	40	Fair		Fair		Good	
		Low content of organic matter	0.50	Shrink-swell	0.99		
		Water erosion	0.99				
Williams----------	35	Fair		Fair		Good	
		Low content of organic matter	0.50	Shrink-swell	0.87		
		Water erosion	0.99				
FxD:							
Flaxton----------	45	Fair		Fair		Fair	
		Low content of organic matter	0.50	Shrink-swell	0.99	Slope	0.63
		Water erosion	0.99				
Williams----------	30	Fair		Fair		Fair	
		Low content of organic matter	0.50	Shrink-swell	0.87	Slope	0.63
		Water erosion	0.99				
GaA:							
Grail----------	85	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.69	Too Clayey	0.00
		Water erosion	0.99				
GaB:							
Grail----------	85	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.69	Too Clayey	0.00
		Water erosion	0.99				
GcA:							
Grail----------	85	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.64	Too Clayey	0.00
		Water erosion	0.99				

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
GcB:							
Grail	85	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.64	Too Clayey	0.00
		Water erosion	0.99				
GcC:							
Grail	85	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.64	Too Clayey	0.00
		Water erosion	0.99				
GnA:							
Grassna	85	Fair		Fair		Good	
		Water erosion	0.90	Shrink-swell	0.87		
GnB:							
Grassna	80	Fair		Fair		Good	
		Water erosion	0.90	Shrink-swell	0.87		
Gp:							
Gravel Pits	80	Not rated		Not rated		Not rated	
Ha:							
Harriet	80	Poor		Poor		Poor	
		Sodium content	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Carbonate content	0.46	Shrink-swell	0.87	Sodium content	0.00
		Salinity	0.88			Salinity	0.00
		Low content of organic matter	0.88			Carbonate content	0.46
		Water erosion	0.99				
Hb:							
Havrelon	79	Fair		Fair		Good	
		Low content of organic matter	0.12	Shrink-swell	0.87		
Hc:							
Havrelon	85	Fair		Fair		Good	
		Low content of organic matter	0.12	Shrink-swell	0.76		
Hd:							
Havrelon	80	Fair		Fair		Good	
		Low content of organic matter	0.12	Shrink-swell	0.76		
Hm:							
Havrelon	49	Fair		Fair		Good	
		Low content of organic matter	0.12	Shrink-swell	0.95		
Trembles	30	Poor		Good		Good	
		Low content of organic matter	0.00				
Hs:							
Heil	85	Fair		Poor		Poor	
		Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Too clayey	0.50	Shrink-swell	0.12	Salinity	0.00
		Salinity	0.88			Too Clayey	0.29
		Water erosion	0.99				

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
La:							
Lallie----------	85	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Water erosion	0.90	Shrink-swell	0.12	Too Clayey	0.00
		Carbonate content	0.92			Carbonate content	0.92
Lb:							
Lallie, very wet----	85	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Water erosion	0.90	Shrink-swell	0.12	Too Clayey	0.00
		Carbonate content	0.92			Carbonate content	0.92
LcA:							
Lawther----------	80	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Low content of organic matter	0.12				
		Salinity	0.88				
LcB:							
Lawther----------	85	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Low content of organic matter	0.12				
		Salinity	0.88				
LeA:							
Lefor----------	85	Fair		Poor		Fair	
		Low content of organic matter	0.12	Depth to bedrock	0.00	Depth to bedrock	0.54
		Depth to bedrock	0.54				
		Droughty	0.75				
		Too acid	0.97				
LhA:							
Lihen----------	85	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.78
		Too sandy	0.78				
		Droughty	0.96				
LkA:							
Lihen----------	80	Good		Good		Good	
LlC:							
Linton----------	85	Fair		Good		Good	
		Low content of organic matter	0.50				
LnB:							
Linton----------	60	Fair		Good		Good	
		Low content of organic matter	0.50				
Mandan----------	24	Fair		Good		Good	
		Water erosion	0.90				

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lo:							
Lohler	85	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Low content of organic matter	0.12				
MaA:							
Mandan	79	Fair		Good		Good	
		Water erosion	0.90				
MaB:							
Mandan	79	Fair		Good		Good	
		Water erosion	0.90				
MbA:							
Mandan, gravelly substratum	85	Fair		Good		Poor	
		Water erosion	0.90			Hard to reclaim	0.00
MbB:							
Mandan, gravelly substratum	85	Fair		Good		Poor	
		Water erosion	0.90			Hard to reclaim	0.00
McB:							
Manning	85	Fair		Good		Poor	
		Low content of organic matter	0.50			Hard to reclaim	0.00
		Droughty	0.98				
Md:							
Mine Dumps	90	Not rated		Not rated		Not rated	
MoA:							
Morton	84	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87		
		Droughty	0.98				
MoB:							
Morton	81	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87		
		Droughty	0.98				
MoC:							
Morton	80	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87		
		Droughty	0.98				
MoD:							
Morton	75	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Slope	0.37
		Water erosion	0.68	Shrink-swell	0.87	Depth to bedrock	0.54
		Droughty	0.98				
MpA:							
Morton	50	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87		
		Droughty	0.98				

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Daglum----------	35	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Sodium content	0.00			Sodium content	0.00
		Low content of organic matter	0.50			Salinity	0.88
		Salinity	0.50				
MpB:							
Morton----------	45	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87		
		Droughty	0.98				
Daglum----------	35	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Sodium content	0.00			Sodium content	0.00
		Low content of organic matter	0.50			Salinity	0.88
		Salinity	0.50				
MpC:							
Morton----------	50	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87		
		Droughty	0.98				
Daglum----------	35	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Sodium content	0.00			Sodium content	0.00
		Low content of organic matter	0.50			Salinity	0.88
		Salinity	0.50				
MsC:							
Morton, stony-------	45	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87	Rock fragments	0.88
		Droughty	0.98				
Sen, stony----------	45	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87	Rock fragments	0.88
		Droughty	0.98				
NfB:							
Noonan----------	45	Fair		Fair		Fair	
		Low content of organic matter	0.12	Shrink-swell	0.75	Sodium content	0.60
		Sodium content	0.22			Salinity	0.88
		Carbonate content	0.92			Carbonate content	0.92
		Water erosion	0.99				
Flaxton----------	40	Fair		Fair		Good	
		Low content of organic matter	0.12	Shrink-swell	0.99		
		Water erosion	0.99				
Pa:							
Parnell----------	85	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
				Shrink-swell	0.12	Too Clayey	0.00

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
PbA:							
Parshall----------	85	Fair		Good		Good	
		Low content of organic matter	0.50				
PcA:							
Parshall----------	80	Fair		Good		Good	
		Low content of organic matter	0.50				
PcB:							
Parshall----------	80	Fair		Good		Good	
		Low content of organic matter	0.50				
PtC:							
Parshall----------	60	Fair		Good		Good	
		Low content of organic matter	0.50				
Tally----------	25	Fair		Good		Good	
		Low content of organic matter	0.12				
Re:							
Regan, very poorly drained----------	85	Good		Poor		Poor	
				Depth to saturated zone	0.00	Depth to saturated zone	0.00
				Shrink-swell	0.87		
RgA:							
Regent----------	85	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too Clayey	0.00
		Depth to bedrock	0.54	Shrink-swell	0.12	Depth to bedrock	0.54
		Low content of organic matter	0.88				
		Water erosion	0.90				
		Droughty	0.99				
RgB:							
Regent----------	85	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too Clayey	0.00
		Depth to bedrock	0.54	Shrink-swell	0.12	Depth to bedrock	0.54
		Low content of organic matter	0.88				
		Water erosion	0.90				
		Droughty	0.99				
RgC:							
Regent----------	85	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too Clayey	0.00
		Depth to bedrock	0.54	Shrink-swell	0.12	Depth to bedrock	0.54
		Low content of organic matter	0.88				
		Water erosion	0.90				
		Droughty	0.99				

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RlA:							
Regent----------	60	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too Clayey	0.00
		Depth to bedrock	0.54	Shrink-swell	0.12	Depth to bedrock	0.54
		Low content of organic matter	0.88				
		Water erosion	0.90				
		Droughty	0.99				
Daglum----------	25	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Sodium content	0.00			Sodium content	0.00
		Salinity	0.50			Salinity	0.88
		Droughty	0.97				
RlB:							
Regent----------	45	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too Clayey	0.00
		Depth to bedrock	0.54	Shrink-swell	0.12	Depth to bedrock	0.54
		Low content of organic matter	0.88				
		Water erosion	0.90				
		Droughty	0.99				
Daglum----------	25	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Sodium content	0.00			Sodium content	0.00
		Low content of organic matter	0.50			Salinity	0.88
		Salinity	0.50				
RlC:							
Regent----------	40	Poor		Poor		Poor	
		Too clayey	0.00	Depth to bedrock	0.00	Too Clayey	0.00
		Depth to bedrock	0.54	Shrink-swell	0.12	Depth to bedrock	0.54
		Low content of organic matter	0.88				
		Water erosion	0.90				
		Droughty	0.99				
Daglum----------	35	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Sodium content	0.00			Sodium content	0.00
		Low content of organic matter	0.50			Salinity	0.88
		Salinity	0.50				
RoB:							
Rhoades----------	54	Poor		Fair		Poor	
		Sodium content	0.00	Shrink-swell	0.12	Salinity	0.00
		Low content of organic matter	0.12			Too Clayey	0.51
		Salinity	0.50				
		Too clayey	0.88				
Daglum----------	35	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Sodium content	0.00			Sodium content	0.00
		Low content of organic matter	0.50			Salinity	0.88
		Salinity	0.50				

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RvE:							
Ringling----------	80	Poor		Poor		Poor	
		Cobble content	0.00	Cobble content	0.00	Hard to reclaim	0.00
		Droughty	0.00	Slope	0.00	Rock fragments	0.00
		Low content of organic matter	0.12			Slope	0.00
Rw:							
Riverwash----------	85	Not rated		Not rated		Not rated	
SaA:							
Savage----------	90	Poor		Fair		Poor	
		Too clayey	0.00	Shrink-swell	0.12	Too Clayey	0.00
		Low content of organic matter	0.88				
		Water erosion	0.90				
SeC:							
Sen----------	50	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87	Carbonate content	0.92
		Carbonate content	0.92				
Werner----------	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Shrink-swell	0.87		
		Water erosion	0.68				
SmA:							
Amor----------	40	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Low content of organic matter	0.88	Shrink-swell	0.87	Carbonate content	0.97
		Water erosion	0.90				
		Droughty	0.92				
		Carbonate content	0.97				
Sen----------	40	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87	Carbonate content	0.92
		Carbonate content	0.92				
SmB:							
Amor----------	40	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Low content of organic matter	0.88	Shrink-swell	0.87	Carbonate content	0.97
		Water erosion	0.90				
		Droughty	0.92				
		Carbonate content	0.97				
Sen----------	40	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87	Carbonate content	0.92
		Carbonate content	0.92				

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SmC:							
Amor	40	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Low content of organic matter	0.88	Shrink-swell	0.87	Carbonate content	0.97
		Water erosion	0.90				
		Droughty	0.92				
		Carbonate content	0.97				
Sen	40	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87	Carbonate content	0.92
		Carbonate content	0.92				
SmD:							
Amor	40	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Low content of organic matter	0.88	Shrink-swell	0.87	Slope	0.63
		Water erosion	0.90			Carbonate content	0.97
		Droughty	0.92				
		Carbonate content	0.97				
Sen	40	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Water erosion	0.68	Shrink-swell	0.87	Slope	0.63
		Carbonate content	0.92			Carbonate content	0.92
StA:							
Stady	80	Fair		Good		Fair	
		Low content of organic matter	0.12			Hard to reclaim	0.98
SuB:							
Stady	55	Fair		Good		Fair	
		Low content of organic matter	0.12			Hard to reclaim	0.98
Lehr	35	Fair		Good		Poor	
		Low content of organic matter	0.50			Rock fragments	0.00
		Droughty	0.65			Hard to reclaim	0.00
SuC:							
Stady	50	Fair		Good		Fair	
		Low content of organic matter	0.12			Hard to reclaim	0.98
Lehr	40	Fair		Good		Poor	
		Low content of organic matter	0.50			Rock fragments	0.00
		Droughty	0.65			Hard to reclaim	0.00
SwA:							
Straw	79	Fair		Good		Good	
		Low content of organic matter	0.12				
Sx:							
Channel	40	Not rated		Not rated		Not rated	

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Straw----------	36	Fair Low content of organic matter	 0.12	Good		Good	
Sy: Strongly Saline Land	75	Not rated		Not rated		Not rated	
TaB: Tally----------	55	Fair Low content of organic matter	 0.12	Good		Good	
Parshall----------	30	Fair Low content of organic matter	 0.50	Good		Good	
TbA: Tally----------	55	Fair Low content of organic matter	 0.12	Good		Good	
Vebar----------	30	Fair Depth to bedrock Droughty	 0.54 0.71	Poor Depth to bedrock	 0.00	Fair Depth to bedrock	 0.54
TeD: Telfer----------	40	Poor Wind erosion Low content of organic matter Too sandy Droughty	 0.00 0.50 0.78 0.84	Good		Fair Slope Too sandy	 0.37 0.78
Lihen----------	35	Poor Wind erosion Too sandy Droughty	 0.00 0.78 0.96	Good		Fair Slope Too sandy	 0.37 0.78
TmA: Temvik----------	85	Fair Low content of organic matter Water erosion	 0.50 0.90	Fair Shrink-swell	 0.98	Good	
TwB: Temvik----------	60	Fair Low content of organic matter Water erosion	 0.50 0.90	Fair Shrink-swell	 0.98	Good	
Williams----------	20	Fair Low content of organic matter Water erosion	 0.50 0.99	Fair Shrink-swell	 0.87	Good	
TwC: Temvik----------	50	Fair Low content of organic matter Water erosion	 0.50 0.90	Fair Shrink-swell	 0.98	Good	

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Williams----------	30	Fair		Fair		Good	
		Low content of organic matter	0.50	Shrink-swell	0.87		
		Water erosion	0.99				
TwD:							
Temvik----------	45	Fair		Fair		Fair	
		Low content of organic matter	0.50	Shrink-swell	0.98	Slope	0.63
		Water erosion	0.90				
Williams----------	35	Fair		Fair		Fair	
		Low content of organic matter	0.50	Shrink-swell	0.87	Slope	0.63
		Water erosion	0.99				
Tx:							
Tonka----------	50	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Water erosion	0.90	Shrink-swell	0.43	Too Clayey	0.00
Parnell----------	30	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
				Shrink-swell	0.12	Too Clayey	0.00
VaC:							
Vebar----------	80	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Droughty	0.71				
VbD:							
Vebar, stony--------	80	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Droughty	0.71			Slope	0.63
VhD:							
Vebar----------	55	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Droughty	0.71			Slope	0.63
Cohagen----------	25	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00			Slope	0.63
		Low content of organic matter	0.88				
VkB:							
Vebar----------	60	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Droughty	0.71				
Tally----------	25	Fair		Good		Good	
		Low content of organic matter	0.12				
VlB:							
Vebar----------	50	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Droughty	0.71				

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Tally----------	35	Fair		Good		Good	
		Low content of organic matter	0.12				
VlC:							
Vebar----------	55	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Droughty	0.71				
Tally----------	30	Fair		Good		Good	
		Low content of organic matter	0.12				
Vs:							
Velva----------	55	Good		Good		Good	
Straw----------	34	Fair		Good		Good	
		Low content of organic matter	0.12				
WaD:							
Wabek----------	80	Poor		Fair		Poor	
		Droughty	0.00	Slope	0.82	Rock fragments	0.00
		Low content of organic matter	0.50			Hard to reclaim	0.00
						Slope	0.00
WlA:							
Williams----------	80	Fair		Fair		Good	
		Low content of organic matter	0.50	Shrink-swell	0.87		
		Water erosion	0.99				
WlB:							
Williams----------	80	Fair		Fair		Good	
		Low content of organic matter	0.50	Shrink-swell	0.87		
		Water erosion	0.99				
WlC:							
Williams----------	80	Fair		Fair		Good	
		Low content of organic matter	0.50	Shrink-swell	0.87		
		Water erosion	0.99				
WmC:							
Williams----------	85	Fair		Fair		Fair	
		Low content of organic matter	0.50	Stone content	0.80	Hard to reclaim	0.95
		Stone content	0.81	Shrink-swell	0.87	Rock fragments	0.95
WnC:							
Flaxton----------	40	Fair		Fair		Good	
		Low content of organic matter	0.12	Shrink-swell	0.99		
		Water erosion	0.99				
Williams----------	40	Fair		Fair		Good	
		Low content of organic matter	0.50	Shrink-swell	0.87		
		Water erosion	0.99				

CONSTRUCTION MATERIALS--Continued
Oliver County, North Dakota

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WzD:							
Williams----------	50	Fair		Fair		Fair	
		Low content of organic matter	0.50	Shrink-swell	0.87	Slope	0.63
		Water erosion	0.99				
Zahl----------	35	Fair		Fair		Fair	
		Carbonate content	0.92	Shrink-swell	0.87	Slope	0.63
		Water erosion	0.99			Carbonate content	0.92
ZaD:							
Zahl----------	55	Fair		Fair		Fair	
		Carbonate content	0.92	Shrink-swell	0.87	Slope	0.37
		Water erosion	0.99			Carbonate content	0.92
Williams----------	30	Fair		Fair		Fair	
		Low content of organic matter	0.50	Shrink-swell	0.87	Slope	0.37
		Water erosion	0.99				
ZaE:							
Zahl----------	60	Fair		Poor		Poor	
		Carbonate content	0.92	Slope	0.00	Slope	0.00
		Water erosion	0.99	Shrink-swell	0.87	Carbonate content	0.92
Williams----------	20	Fair		Poor		Poor	
		Low content of organic matter	0.50	Slope	0.00	Slope	0.00
		Water erosion	0.99	Shrink-swell	0.87		