

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### Ad--Alluvial land

#### Alluvial land, occasionally flooded

*Extent:* 90 percent of the unit

*Landform(s):* flood plains

*Slope gradient:* 0 to 2 percent

*Parent material:* mixed alluvium

*Restrictive feature(s):*

*Flooding:* occasional

*Ponding:* none

*Drainage class:* somewhat poorly drained

*Soil loss tolerance (T factor):*

*Wind erodibility group (WEG):*

*Wind erodibility index (WEI):*

*Kw (surface layer):*

*Land capability class, nonirrigated:*

*Hydric soil:* no

*Hydrologic group:* B

*Potential frost action:*

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
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### Ba--Barrows loam and sandy loam

#### Barrows

*Extent:* 90 percent of the unit

*Landform(s):* depressions on interdrumlins, swales on interdrumlins

*Slope gradient:* 0 to 1 percent

*Parent material:* glacial till

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* frequent

*Drainage class:* very poorly drained

*Soil loss tolerance (T factor):* 4

*Wind erodibility group (WEG):* 6

*Wind erodibility index (WEI):* 48

*Kw (surface layer):* .32

*Land capability class, nonirrigated:* 4w

*Hydric soil:* yes

*Hydrologic group:* B/D

*Potential frost action:* high

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
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A --	0 to 7 in	loam	moderate	1.4 to 1.6 in	5.6 to 7.3
Bg --	7 to 28 in	sandy loam	moderate	2.5 to 3.5 in	5.6 to 7.3
BC --	28 to 40 in	sandy loam	slow	0.0 to 1.0 in	6.1 to 7.3
BCd --	40 to 60 in	sandy loam	very slow	0.0 to 0.8 in	6.1 to 7.3

### BbA--Brainerd sandy loam, 0 to 2 percent slopes

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### BbA--Brainerd sandy loam, 0 to 2 percent slopes

#### Brainerd

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on drumlins

*Slope gradient:* 0 to 2 percent

*Parent material:* dense glacial till

*Restrictive feature(s):* dense material at 41 to 60 inches

*Flooding:* none

*Ponding:* none

*Drainage class:* moderately well drained

*Soil loss tolerance (T factor):* 4

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .20

*Land capability class, nonirrigated:* 1

*Hydric soil:* no

*Hydrologic group:* C

*Potential frost action:* moderate

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 6 in	sandy loam	moderately rapid	0.8 to 1.1 in	4.5 to 6.0
E -- 6 to 11 in	sandy loam	moderately rapid	0.6 to 0.8 in	4.5 to 6.0
Bt -- 11 to 23 in	sandy loam	moderate	1.4 to 1.9 in	5.1 to 6.5
BC -- 23 to 41 in	sandy loam	slow	0.5 to 1.4 in	5.1 to 7.3
Cd -- 41 to 60 in	sandy loam	very slow	0.0 to 0.8 in	5.6 to 7.3

### BbB--Brainerd sandy loam, 2 to 7 percent slopes

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### BbB--Brainerd sandy loam, 2 to 7 percent slopes

#### Brainerd

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on drumlins

*Slope gradient:* 2 to 7 percent

*Parent material:* dense glacial till

*Restrictive feature(s):* dense material at 41 to 60 inches

*Flooding:* none

*Ponding:* none

*Drainage class:* moderately well drained

*Soil loss tolerance (T factor):* 4

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .20

*Land capability class, nonirrigated:* 2e

*Hydric soil:* no

*Hydrologic group:* C

*Potential frost action:* moderate

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 6 in	sandy loam	moderately rapid	0.8 to 1.1 in	4.5 to 6.0
E -- 6 to 11 in	sandy loam	moderately rapid	0.6 to 0.8 in	4.5 to 6.0
Bt -- 11 to 23 in	sandy loam	moderate	1.4 to 1.9 in	5.1 to 6.5
BC -- 23 to 41 in	sandy loam	slow	0.5 to 1.4 in	5.1 to 7.3
Cd -- 41 to 60 in	sandy loam	very slow	0.0 to 0.8 in	5.6 to 7.3

### BbC--Brainerd sandy loam, 7 to 13 percent slopes

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### BbC--Brainerd sandy loam, 7 to 13 percent slopes

#### Brainerd

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on drumlins

*Slope gradient:* 7 to 13 percent

*Parent material:* dense glacial till

*Restrictive feature(s):* dense material at 41 to 60 inches

*Flooding:* none

*Ponding:* none

*Drainage class:* well drained

*Soil loss tolerance (T factor):* 4

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .20

*Land capability class, nonirrigated:* 3e

*Hydric soil:* no

*Hydrologic group:* C

*Potential frost action:* moderate

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 7 in	sandy loam	moderately rapid	0.9 to 1.3 in	4.5 to 6.5
E -- 7 to 15 in	sandy loam	moderately rapid	0.9 to 1.3 in	5.1 to 6.5
Bt -- 15 to 23 in	sandy loam	moderate	0.9 to 1.3 in	5.1 to 6.5
BC -- 23 to 43 in	sandy loam	slow	0.0 to 1.2 in	5.1 to 7.3
Cd -- 43 to 60 in	sandy loam	very slow	0.0 to 0.7 in	5.6 to 7.3

### BcB--Brainerd-Chetek complex, 2 to 7 percent slopes

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## BcB--Brainerd-Chetek complex, 2 to 7 percent slopes

### Brainerd

<i>Extent:</i> 50 percent of the unit	<i>Soil loss tolerance (T factor):</i> 4
<i>Landform(s):</i> hillslopes on drumlins, hillslopes on moraines	<i>Wind erodibility group (WEG):</i> 3
<i>Slope gradient:</i> 2 to 7 percent	<i>Wind erodibility index (WEI):</i> 86
<i>Parent material:</i> dense glacial till	<i>Kw (surface layer):</i> .20
<i>Restrictive feature(s):</i> dense material at 41 to 60 inches	<i>Land capability class, nonirrigated:</i> 2e
<i>Flooding:</i> none	<i>Hydric soil:</i> no
<i>Ponding:</i> none	<i>Hydrologic group:</i> C
<i>Drainage class:</i> moderately well drained	<i>Potential frost action:</i> moderate

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 6 in	sandy loam	moderately rapid	0.8 to 1.1 in	4.5 to 6.0
E -- 6 to 11 in	sandy loam	moderately rapid	0.6 to 0.8 in	4.5 to 6.0
Bt -- 11 to 23 in	sandy loam	moderate	1.4 to 1.9 in	5.1 to 6.5
BC -- 23 to 41 in	sandy loam	slow	0.5 to 1.4 in	5.1 to 7.3
Cd -- 41 to 60 in	sandy loam	very slow	0.0 to 0.8 in	5.6 to 7.3

### Chetek

<i>Extent:</i> 30 percent of the unit	<i>Soil loss tolerance (T factor):</i> 3
<i>Landform(s):</i> hillslopes on drumlins, hillslopes on moraines	<i>Wind erodibility group (WEG):</i> 3
<i>Slope gradient:</i> 2 to 7 percent	<i>Wind erodibility index (WEI):</i> 86
<i>Parent material:</i> outwash deposits	<i>Kw (surface layer):</i> .20
<i>Restrictive feature(s):</i>	<i>Land capability class, nonirrigated:</i> 3e
<i>Flooding:</i> none	<i>Hydric soil:</i> no
<i>Ponding:</i> none	<i>Hydrologic group:</i> B
<i>Drainage class:</i> somewhat excessively drained	<i>Potential frost action:</i> low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A,E -- 0 to 10 in	sandy loam	moderate	1.0 to 1.5 in	5.1 to 7.3
Bt -- 10 to 16 in	sandy loam	moderate	0.6 to 1.2 in	5.1 to 7.3
Bw -- 16 to 20 in	gravelly loamy sand	rapid	0.2 to 0.5 in	5.1 to 7.3
2C -- 20 to 60 in	stratified gravelly coarse sand to sand	rapid	0.8 to 1.6 in	5.1 to 7.3

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## BcC--Brainerd-Chetek complex, 7 to 13 percent slopes

### Brainerd

<i>Extent:</i> 50 percent of the unit	<i>Soil loss tolerance (T factor):</i> 4
<i>Landform(s):</i> hillslopes on drumlins, hillslopes on moraines	<i>Wind erodibility group (WEG):</i> 3
<i>Slope gradient:</i> 7 to 13 percent	<i>Wind erodibility index (WEI):</i> 86
<i>Parent material:</i> dense glacial till	<i>Kw (surface layer):</i> .20
<i>Restrictive feature(s):</i> dense material at 41 to 60 inches	<i>Land capability class, nonirrigated:</i> 3e
<i>Flooding:</i> none	<i>Hydric soil:</i> no
<i>Ponding:</i> none	<i>Hydrologic group:</i> C
<i>Drainage class:</i> well drained	<i>Potential frost action:</i> moderate

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 7 in	sandy loam	moderately rapid	0.9 to 1.3 in	4.5 to 6.5
E -- 7 to 15 in	sandy loam	moderately rapid	0.9 to 1.3 in	5.1 to 6.5
Bt -- 15 to 23 in	sandy loam	moderate	0.9 to 1.3 in	5.1 to 6.5
BC -- 23 to 43 in	sandy loam	slow	0.0 to 1.2 in	5.1 to 7.3
Cd -- 43 to 60 in	sandy loam	very slow	0.0 to 0.7 in	5.6 to 7.3

### Chetek

<i>Extent:</i> 30 percent of the unit	<i>Soil loss tolerance (T factor):</i> 3
<i>Landform(s):</i> hillslopes on drumlins, hillslopes on moraines	<i>Wind erodibility group (WEG):</i> 3
<i>Slope gradient:</i> 7 to 13 percent	<i>Wind erodibility index (WEI):</i> 86
<i>Parent material:</i> outwash deposits	<i>Kw (surface layer):</i> .20
<i>Restrictive feature(s):</i>	<i>Land capability class, nonirrigated:</i> 4e
<i>Flooding:</i> none	<i>Hydric soil:</i> no
<i>Ponding:</i> none	<i>Hydrologic group:</i> B
<i>Drainage class:</i> somewhat excessively drained	<i>Potential frost action:</i> low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A,E -- 0 to 10 in	sandy loam	moderate	1.0 to 1.5 in	5.1 to 7.3
Bt -- 10 to 16 in	sandy loam	moderate	0.6 to 1.2 in	5.1 to 7.3
Bw -- 16 to 20 in	gravelly loamy sand	rapid	0.2 to 0.5 in	5.1 to 7.3
2C -- 20 to 60 in	stratified very gravelly coarse sand to sand	rapid	0.8 to 1.6 in	5.1 to 7.3

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[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### BuA--Burkhardt sandy loam, 0 to 2 percent slopes

#### Burkhardt

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on outwash plains

*Slope gradient:* 0 to 2 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* well drained

*Soil loss tolerance (T factor):* 3

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .20

*Land capability class, nonirrigated:* 3s

*Hydric soil:* no

*Hydrologic group:* B

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 12 in	sandy loam	moderately rapid	1.5 to 1.8 in	6.1 to 7.3
Bw -- 12 to 24 in	loamy coarse sand	moderately rapid	1.0 to 1.7 in	6.1 to 7.8
2C -- 24 to 60 in	coarse sand	rapid	0.7 to 2.1 in	7.4 to 8.4

### BuB--Burkhardt sandy loam, 2 to 7 percent slopes

#### Burkhardt

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on outwash plains

*Slope gradient:* 2 to 7 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* well drained

*Soil loss tolerance (T factor):* 3

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .20

*Land capability class, nonirrigated:* 3e

*Hydric soil:* no

*Hydrologic group:* B

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 12 in	sandy loam	moderately rapid	1.5 to 1.8 in	6.1 to 7.3
Bw -- 12 to 24 in	loamy coarse sand	moderately rapid	1.0 to 1.7 in	6.1 to 7.8
2C -- 24 to 60 in	coarse sand	rapid	0.7 to 2.1 in	7.4 to 8.4

### CgA--Chetek gravelly loamy sand, 0 to 2 percent slopes

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### CgA--Chetek gravelly loamy sand, 0 to 2 percent slopes

#### Chetek

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on outwash plains

*Slope gradient:* 0 to 2 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* excessively drained

*Soil loss tolerance (T factor):* 5

*Wind erodibility group (WEG):* 2

*Wind erodibility index (WEI):* 134

*Kw (surface layer):* .17

*Land capability class, nonirrigated:* 4s

*Hydric soil:* no

*Hydrologic group:* B

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 5 in	gravelly loamy sand	rapid	0.5 to 0.6 in	5.1 to 6.5
E -- 5 to 8 in	gravelly loamy coarse sand	rapid	0.2 to 0.2 in	5.1 to 6.5
2Bw -- 8 to 30 in	gravelly sand	rapid	1.1 to 1.5 in	5.1 to 6.5
2C -- 30 to 60 in	gravelly coarse sand	rapid	1.2 to 2.7 in	5.1 to 7.3

### ChA--Chetek sandy loam, 0 to 2 percent slopes

#### Chetek

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on outwash plains

*Slope gradient:* 0 to 2 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* somewhat excessively drained

*Soil loss tolerance (T factor):* 3

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .20

*Land capability class, nonirrigated:* 3s

*Hydric soil:* no

*Hydrologic group:* B

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A,E -- 0 to 10 in	sandy loam	moderate	1.0 to 1.5 in	5.1 to 7.3
Bt -- 10 to 16 in	sandy loam	moderate	0.6 to 1.2 in	5.1 to 7.3
Bw -- 16 to 20 in	gravelly loamy sand	rapid	0.2 to 0.5 in	5.1 to 7.3
2C -- 20 to 60 in	stratified very gravelly coarse sand to sand	rapid	0.8 to 1.6 in	5.1 to 7.3

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### ChA--Chetek sandy loam, 0 to 2 percent slopes

### ChB--Chetek sandy loam, 2 to 7 percent slopes

#### Chetek

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on outwash plains

*Slope gradient:* 2 to 7 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* somewhat excessively drained

*Soil loss tolerance (T factor):* 3

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .20

*Land capability class, nonirrigated:* 3e

*Hydric soil:* no

*Hydrologic group:* B

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A,E -- 0 to 10 in	sandy loam	moderate	1.0 to 1.5 in	5.1 to 7.3
Bt -- 10 to 16 in	sandy loam	moderate	0.6 to 1.2 in	5.1 to 7.3
Bw -- 16 to 20 in	gravelly loamy sand	rapid	0.2 to 0.5 in	5.1 to 7.3
2C -- 20 to 60 in	stratified very gravelly coarse sand to sand	rapid	0.8 to 1.6 in	5.1 to 7.3

### ChC--Chetek sandy loam, 7 to 13 percent slopes

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### ChC--Chetek sandy loam, 7 to 13 percent slopes

#### Chetek

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on outwash plains

*Slope gradient:* 7 to 13 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* somewhat excessively drained

*Soil loss tolerance (T factor):* 3

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .20

*Land capability class, nonirrigated:* 4e

*Hydric soil:* no

*Hydrologic group:* B

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A,E -- 0 to 10 in	sandy loam	moderate	1.0 to 1.5 in	5.1 to 7.3
Bt -- 10 to 16 in	gravelly sandy loam	moderate	0.6 to 1.2 in	5.1 to 7.3
Bw -- 16 to 20 in	gravelly sand	rapid	0.2 to 0.5 in	5.1 to 7.3
2C -- 20 to 60 in	stratified very gravelly coarse sand to sand	rapid	0.8 to 1.6 in	5.1 to 7.3

### ChD--Chetek sandy loam, 13 to 18 percent slopes

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### ChD--Chetek sandy loam, 13 to 18 percent slopes

#### Chetek

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on outwash plains

*Slope gradient:* 13 to 18 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* somewhat excessively drained

*Soil loss tolerance (T factor):* 3

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .20

*Land capability class, nonirrigated:* 6e

*Hydric soil:* no

*Hydrologic group:* B

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A,E -- 0 to 10 in	sandy loam	moderate	1.0 to 1.5 in	5.1 to 7.3
Bt -- 10 to 16 in	gravelly loamy sand	moderate	0.6 to 1.2 in	5.1 to 7.3
Bw -- 16 to 20 in	gravelly sand	rapid	0.2 to 0.5 in	5.1 to 7.3
2C -- 20 to 60 in	stratified very gravelly coarse sand to sand	rapid	0.8 to 1.6 in	5.1 to 7.3

### ChE--Chetek sandy loam, 18 to 30 percent slopes

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### ChE--Chetek sandy loam, 18 to 30 percent slopes

#### Chetek

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on outwash plains

*Slope gradient:* 18 to 30 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* somewhat excessively drained

*Soil loss tolerance (T factor):* 3

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .20

*Land capability class, nonirrigated:* 7e

*Hydric soil:* no

*Hydrologic group:* B

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A,E -- 0 to 10 in	sandy loam	moderate	1.0 to 1.5 in	5.1 to 7.3
Bt -- 10 to 16 in	gravelly loamy sand	moderate	0.6 to 1.2 in	5.1 to 7.3
Bw -- 16 to 20 in	gravelly sand	rapid	0.2 to 0.5 in	5.1 to 7.3
2C -- 20 to 60 in	stratified very gravelly coarse sand to sand	rapid	0.8 to 1.6 in	5.1 to 7.3

### Ha--Halder loam

#### Halder

*Extent:* 90 percent of the unit

*Landform(s):* swales on outwash plains

*Slope gradient:* 0 to 1 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* somewhat poorly drained

*Soil loss tolerance (T factor):* 4

*Wind erodibility group (WEG):* 5

*Wind erodibility index (WEI):* 56

*Kw (surface layer):* .28

*Land capability class, nonirrigated:* 2w

*Hydric soil:* no

*Hydrologic group:* C

*Potential frost action:* high

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A,E -- 0 to 10 in	loam	moderate	2.0 to 2.2 in	4.5 to 7.3
Bt -- 10 to 31 in	loam	moderate	2.8 to 4.7 in	4.5 to 6.5
2BC -- 31 to 35 in	sandy loam	moderate	0.2 to 0.5 in	4.5 to 6.5
2C -- 35 to 60 in	gravelly sand	rapid	0.5 to 1.0 in	5.6 to 6.5

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### Ha--Halder loam

### HbB--Hibbing silt loam, 2 to 7 percent slopes

#### Hibbing

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on moraines

*Slope gradient:* 2 to 7 percent

*Parent material:* till

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* well drained

*Soil loss tolerance (T factor):* 3

*Wind erodibility group (WEG):* 6

*Wind erodibility index (WEI):* 48

*Kw (surface layer):* .37

*Land capability class, nonirrigated:* 2e

*Hydric soil:* no

*Hydrologic group:* C

*Potential frost action:* moderate

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 8 in	silt loam	moderate	1.4 to 1.7 in	3.5 to 6.0
Bt -- 8 to 34 in	clay	slow	2.6 to 4.2 in	5.1 to 7.8
C -- 34 to 60 in	clay	very slow	2.3 to 3.9 in	7.4 to 8.4

### HbC--Hibbing silt loam, 7 to 13 percent slopes

#### Hibbing

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on moraines

*Slope gradient:* 7 to 13 percent

*Parent material:* till

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* well drained

*Soil loss tolerance (T factor):* 3

*Wind erodibility group (WEG):* 6

*Wind erodibility index (WEI):* 48

*Kw (surface layer):* .37

*Land capability class, nonirrigated:* 3e

*Hydric soil:* no

*Hydrologic group:* C

*Potential frost action:* moderate

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 8 in	silt loam	moderate	1.4 to 1.7 in	3.5 to 6.0
Bt -- 8 to 34 in	clay	slow	2.6 to 4.2 in	5.1 to 7.8
C -- 34 to 60 in	clay	very slow	2.3 to 3.9 in	7.4 to 8.4

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### HbC--Hibbing silt loam, 7 to 13 percent slopes

### HuA--Hubbard loamy sand, 0 to 2 percent slopes

#### Hubbard

*Extent:* 90 percent of the unit

*Landform(s):* flats on outwash plains

*Slope gradient:* 0 to 2 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* excessively drained

*Soil loss tolerance (T factor):* 5

*Wind erodibility group (WEG):* 2

*Wind erodibility index (WEI):* 134

*Kw (surface layer):* .15

*Land capability class, nonirrigated:* 4s

*Hydric soil:* no

*Hydrologic group:* A

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 20 in	loamy sand	rapid	1.6 to 2.4 in	5.1 to 7.3
Bw -- 20 to 46 in	sand	rapid	0.8 to 1.8 in	5.1 to 7.3
C -- 46 to 60 in	sand	rapid	0.4 to 1.0 in	5.6 to 7.3

### HuA2--Hubbard loamy sand, 0 to 2 percent slopes, moderately wind eroded

#### Hubbard, eroded

*Extent:* 90 percent of the unit

*Landform(s):* flats on outwash plains

*Slope gradient:* 0 to 2 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* excessively drained

*Soil loss tolerance (T factor):* 5

*Wind erodibility group (WEG):* 2

*Wind erodibility index (WEI):* 134

*Kw (surface layer):* .15

*Land capability class, nonirrigated:* 4s

*Hydric soil:* no

*Hydrologic group:* A

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 20 in	loamy sand	rapid	1.6 to 2.4 in	5.1 to 7.3
Bw -- 20 to 46 in	sand	rapid	0.8 to 1.8 in	5.1 to 7.3
C -- 46 to 60 in	sand	rapid	0.4 to 1.0 in	5.6 to 7.3

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### HuA2--Hubbard loamy sand, 0 to 2 percent slopes, moderately wind eroded

### HuB--Hubbard loamy sand, 2 to 7 percent slopes

#### Hubbard

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on outwash plains

*Slope gradient:* 2 to 7 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* excessively drained

*Soil loss tolerance (T factor):* 5

*Wind erodibility group (WEG):* 2

*Wind erodibility index (WEI):* 134

*Kw (surface layer):* .15

*Land capability class, nonirrigated:* 4s

*Hydric soil:* no

*Hydrologic group:* A

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 20 in	loamy sand	rapid	1.6 to 2.4 in	5.1 to 7.3
Bw -- 20 to 46 in	sand	rapid	0.8 to 1.8 in	5.1 to 7.3
C -- 46 to 60 in	sand	rapid	0.4 to 1.0 in	5.6 to 7.3

### HuC--Hubbard loamy sand, 7 to 13 percent slopes

#### Hubbard

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on outwash plains

*Slope gradient:* 7 to 13 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* excessively drained

*Soil loss tolerance (T factor):* 5

*Wind erodibility group (WEG):* 2

*Wind erodibility index (WEI):* 134

*Kw (surface layer):* .15

*Land capability class, nonirrigated:* 6s

*Hydric soil:* no

*Hydrologic group:* A

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 20 in	loamy sand	rapid	1.6 to 2.4 in	5.1 to 7.3
Bw -- 20 to 46 in	sand	rapid	0.8 to 1.8 in	5.1 to 7.3
C -- 46 to 60 in	sand	rapid	0.4 to 1.0 in	5.6 to 7.3

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### HuC--Hubbard loamy sand, 7 to 13 percent slopes

### lo--losco loamy sand, shallow

#### losco, shallow

*Extent:* 90 percent of the unit

*Landform(s):* swales on lake plains

*Slope gradient:* 0 to 2 percent

*Parent material:* outwash deposits over glacial till

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* poorly drained

*Soil loss tolerance (T factor):* 5

*Wind erodibility group (WEG):* 2

*Wind erodibility index (WEI):* 134

*Kw (surface layer):* .17

*Land capability class, nonirrigated:* 3w

*Hydric soil:* yes

*Hydrologic group:* B/D

*Potential frost action:* moderate

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 9 in	loamy sand	rapid	0.7 to 1.1 in	5.1 to 7.3
E -- 9 to 25 in	loamy sand	rapid	0.8 to 1.3 in	5.1 to 7.3
2Btg -- 25 to 32 in	clay loam	moderate	0.9 to 1.1 in	5.1 to 7.3
2BCg -- 32 to 60 in	clay loam	moderate	2.8 to 4.2 in	6.1 to 8.4

### Is--Isanti sandy loam

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### Is--Isanti sandy loam

#### Isanti

*Extent:* 90 percent of the unit

*Landform(s):* flats on lake plains, swales on outwash plains

*Slope gradient:* 0 to 2 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* poorly drained

*Soil loss tolerance (T factor):* 3

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .20

*Land capability class, nonirrigated:* 4w

*Hydric soil:* yes

*Hydrologic group:* A/D

*Potential frost action:* moderate

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 10 in	sandy loam	moderately rapid	1.3 to 1.8 in	5.1 to 6.5
Bg -- 10 to 31 in	fine sand	rapid	1.3 to 1.7 in	5.1 to 6.5
C -- 31 to 60 in	fine sand	rapid	1.4 to 2.0 in	5.6 to 7.8

### Lb--Lake beaches

#### Beaches, lake

*Extent:* 90 percent of the unit

*Landform(s):* flats on lake terraces

*Slope gradient:* 0 to 4 percent

*Parent material:* sandy lake beach sediments

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:*

*Soil loss tolerance (T factor):* 3

*Wind erodibility group (WEG):*

*Wind erodibility index (WEI):*

*Kw (surface layer):*

*Land capability class, nonirrigated:*

*Hydric soil:* yes

*Hydrologic group:*

*Potential frost action:*

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
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### Lo--Lino loamy sand

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### Lo--Lino loamy sand

#### Lino

<i>Extent:</i> 90 percent of the unit	<i>Soil loss tolerance (T factor):</i> 5
<i>Landform(s):</i> hillslopes on outwash plains, rises on outwash plains	<i>Wind erodibility group (WEG):</i> 2
<i>Slope gradient:</i> 0 to 2 percent	<i>Wind erodibility index (WEI):</i> 134
<i>Parent material:</i> outwash deposits	<i>Kw (surface layer):</i> .17
<i>Restrictive feature(s):</i>	<i>Land capability class, nonirrigated:</i> 3s
<i>Flooding:</i> none	<i>Hydric soil:</i> no
<i>Ponding:</i> none	<i>Hydrologic group:</i> A
<i>Drainage class:</i> somewhat poorly drained	<i>Potential frost action:</i> moderate

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 7 in	loamy sand	rapid	0.7 to 0.9 in	5.1 to 6.0
Bw -- 7 to 45 in	fine sand	rapid	2.3 to 3.0 in	5.1 to 6.0
C -- 45 to 60 in	fine sand	rapid	0.7 to 1.0 in	5.1 to 6.5

### MaA--Menahga loamy sand and sand, 0 to 2 percent slopes

#### Menahga

<i>Extent:</i> 90 percent of the unit	<i>Soil loss tolerance (T factor):</i> 5
<i>Landform(s):</i> flats on outwash plains	<i>Wind erodibility group (WEG):</i> 1
<i>Slope gradient:</i> 0 to 2 percent	<i>Wind erodibility index (WEI):</i> 220
<i>Parent material:</i> outwash deposits	<i>Kw (surface layer):</i> .15
<i>Restrictive feature(s):</i>	<i>Land capability class, nonirrigated:</i> 4s
<i>Flooding:</i> none	<i>Hydric soil:</i> no
<i>Ponding:</i> none	<i>Hydrologic group:</i> A
<i>Drainage class:</i> excessively drained	<i>Potential frost action:</i> low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 4 in	loamy sand	rapid	0.3 to 0.4 in	4.5 to 6.5
Bw -- 4 to 24 in	sand	rapid	1.0 to 1.4 in	4.5 to 6.5
C -- 24 to 60 in	sand	rapid	1.8 to 2.5 in	5.6 to 7.8

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### MaB--Menahga loamy sand and sand, 2 to 7 percent slopes

#### Menahga

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on outwash plains

*Slope gradient:* 2 to 7 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* excessively drained

*Soil loss tolerance (T factor):* 5

*Wind erodibility group (WEG):* 1

*Wind erodibility index (WEI):* 220

*Kw (surface layer):* .15

*Land capability class, nonirrigated:* 4s

*Hydric soil:* no

*Hydrologic group:* A

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 4 in	loamy sand	rapid	0.3 to 0.4 in	4.5 to 6.5
Bw -- 4 to 24 in	sand	rapid	1.0 to 1.4 in	4.5 to 6.5
C -- 24 to 60 in	sand	rapid	1.8 to 2.5 in	5.6 to 7.8

### MaC--Menahga loamy sand and sand, 7 to 13 percent slopes

#### Menahga

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on outwash plains

*Slope gradient:* 7 to 13 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* excessively drained

*Soil loss tolerance (T factor):* 5

*Wind erodibility group (WEG):* 1

*Wind erodibility index (WEI):* 220

*Kw (surface layer):* .15

*Land capability class, nonirrigated:* 6s

*Hydric soil:* no

*Hydrologic group:* A

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 4 in	loamy sand	rapid	0.3 to 0.4 in	4.5 to 6.5
Bw -- 4 to 24 in	sand	rapid	1.0 to 1.4 in	4.5 to 6.5
C -- 24 to 60 in	sand	rapid	1.8 to 2.5 in	5.6 to 7.8

### Mr--Marsh

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### Mr--Marsh

#### Marsh

*Extent:* 95 percent of the unit

*Landform(s):* depressions on interdrumlins, depressions on lake plains, depressions on moraines, depressions on outwash plains

*Slope gradient:* 0 to 1 percent

*Parent material:* till

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* frequent

*Drainage class:* very poorly drained

*Soil loss tolerance (T factor):*

*Wind erodibility group (WEG):*

*Wind erodibility index (WEI):*

*Kw (surface layer):*

*Land capability class, nonirrigated:*

*Hydric soil:* yes

*Hydrologic group:* D

*Potential frost action:*

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
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### Nk--Nokasippi sandy loam

#### Nokasippi

*Extent:* 90 percent of the unit

*Landform(s):* depressions on moraines, depressions on outwash plains

*Slope gradient:* 0 to 1 percent

*Parent material:* outwash deposits

*Restrictive feature(s):* dense material at 41 to 60 inches

*Flooding:* none

*Ponding:* frequent

*Drainage class:* very poorly drained

*Soil loss tolerance (T factor):* 3

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .24

*Land capability class, nonirrigated:* 6w

*Hydric soil:* yes

*Hydrologic group:* B/D

*Potential frost action:* high

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 14 in	loamy sand	moderately rapid	1.8 to 2.6 in	4.5 to 6.5
Bg1 -- 14 to 25 in	loamy sand	rapid	0.7 to 1.3 in	4.5 to 7.3
2Bg2 -- 25 to 38 in	sandy loam	moderately rapid	1.4 to 2.3 in	4.5 to 7.3
2BC -- 38 to 48 in	sandy loam	slow	0.0 to 0.8 in	4.5 to 7.3
2BCd -- 48 to 60 in	sandy loam	very slow	0.0 to 0.5 in	5.1 to 7.3

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### Nk--Nokasippi sandy loam

### NoA--Nokay sandy loam, 0 to 2 percent slopes

#### Nokay

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on drumlins

*Slope gradient:* 0 to 2 percent

*Parent material:* dense glacial till

*Restrictive feature(s):* dense material at 41 to 60 inches

*Flooding:* none

*Ponding:* none

*Drainage class:* somewhat poorly drained

*Soil loss tolerance (T factor):* 4

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .20

*Land capability class, nonirrigated:* 2w

*Hydric soil:* no

*Hydrologic group:* C

*Potential frost action:* high

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 6 in	sandy loam	moderately rapid	0.8 to 1.1 in	4.5 to 5.5
E -- 6 to 14 in	sandy loam	moderately rapid	1.0 to 1.6 in	4.5 to 5.5
Bt -- 14 to 31 in	sandy loam	moderate	2.0 to 3.2 in	5.1 to 6.5
BC -- 31 to 41 in	sandy loam	slow	0.0 to 0.8 in	5.6 to 7.3
Cd -- 41 to 60 in	sandy loam	very slow	0.0 to 0.8 in	5.6 to 7.3

### NoB--Nokay sandy loam, 2 to 7 percent slopes

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### NoB--Nokay sandy loam, 2 to 7 percent slopes

#### Nokay

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on drumlins

*Slope gradient:* 2 to 7 percent

*Parent material:* dense glacial till

*Restrictive feature(s):* dense material at 41 to 60 inches

*Flooding:* none

*Ponding:* none

*Drainage class:* moderately well drained

*Soil loss tolerance (T factor):* 4

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .20

*Land capability class, nonirrigated:* 2e

*Hydric soil:* no

*Hydrologic group:* C

*Potential frost action:* moderate

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 6 in	sandy loam	moderately rapid	0.8 to 1.1 in	4.5 to 6.0
E -- 6 to 11 in	sandy loam	moderately rapid	0.6 to 0.8 in	4.5 to 6.0
Bt -- 11 to 23 in	sandy loam	moderate	1.4 to 1.9 in	5.1 to 6.5
BC -- 23 to 41 in	sandy loam	slow	0.5 to 1.4 in	5.1 to 7.3
Cd -- 41 to 60 in	fine sandy loam	very slow	0.0 to 0.8 in	5.6 to 7.3

### NyA--Nymore loamy sand, 0 to 2 percent slopes

#### Nymore

*Extent:* 90 percent of the unit

*Landform(s):* flats on outwash plains

*Slope gradient:* 0 to 2 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* excessively drained

*Soil loss tolerance (T factor):* 5

*Wind erodibility group (WEG):* 2

*Wind erodibility index (WEI):* 134

*Kw (surface layer):* .17

*Land capability class, nonirrigated:* 4s

*Hydric soil:* no

*Hydrologic group:* A

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 8 in	loamy sand	rapid	0.8 to 0.9 in	5.1 to 6.5
Bw -- 8 to 33 in	sand	rapid	0.5 to 2.0 in	5.1 to 7.3
C -- 33 to 60 in	sand	rapid	0.5 to 2.1 in	5.1 to 7.8

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### NyA--Nymore loamy sand, 0 to 2 percent slopes

### NyB--Nymore loamy sand, 2 to 7 percent slopes

#### Nymore

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on outwash plains

*Slope gradient:* 2 to 7 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* excessively drained

*Soil loss tolerance (T factor):* 5

*Wind erodibility group (WEG):* 2

*Wind erodibility index (WEI):* 134

*Kw (surface layer):* .17

*Land capability class, nonirrigated:* 4s

*Hydric soil:* no

*Hydrologic group:* A

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 8 in	loamy sand	rapid	0.8 to 0.9 in	5.1 to 6.5
Bw -- 8 to 33 in	sand	rapid	0.5 to 2.0 in	5.1 to 7.3
C -- 33 to 60 in	sand	rapid	0.5 to 2.1 in	5.1 to 7.8

### NyC--Nymore loamy sand, 7 to 13 percent slopes

#### Nymore

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on outwash plains

*Slope gradient:* 7 to 13 percent

*Parent material:* outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* excessively drained

*Soil loss tolerance (T factor):* 5

*Wind erodibility group (WEG):* 2

*Wind erodibility index (WEI):* 134

*Kw (surface layer):* .17

*Land capability class, nonirrigated:* 6s

*Hydric soil:* no

*Hydrologic group:* A

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 8 in	loamy sand	rapid	0.8 to 0.9 in	5.1 to 6.5
Bw -- 8 to 33 in	sand	rapid	0.5 to 2.0 in	5.1 to 7.3
C -- 33 to 60 in	sand	rapid	0.5 to 2.1 in	5.1 to 7.8

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### NyC--Nymore loamy sand, 7 to 13 percent slopes

### OnA--Onamia sandy loam, 0 to 2 percent slopes

#### Onamia

*Extent:* 90 percent of the unit

*Landform(s):* flats on outwash plains

*Slope gradient:* 0 to 2 percent

*Parent material:* loamy mantled outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* well drained

*Soil loss tolerance (T factor):* 4

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .20

*Land capability class, nonirrigated:* 2s

*Hydric soil:* no

*Hydrologic group:* B

*Potential frost action:* moderate

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 8 in	sandy loam	moderately rapid	0.8 to 1.4 in	4.5 to 7.3
E -- 8 to 13 in	fine sandy loam	moderately rapid	0.5 to 1.1 in	4.5 to 6.5
Bt1 -- 13 to 28 in	sandy loam	moderately rapid	1.3 to 2.8 in	4.5 to 6.5
2Bt2 -- 28 to 34 in	gravelly coarse sandy loam	moderately rapid	0.2 to 0.9 in	4.5 to 6.5
2C -- 34 to 60 in	stratified coarse sand to extremely gravelly sand	rapid	0.5 to 1.0 in	5.1 to 6.5

### OnB--Onamia sandy loam, 2 to 7 percent slopes

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### OnB--Onamia sandy loam, 2 to 7 percent slopes

#### Onamia

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on outwash plains

*Slope gradient:* 2 to 7 percent

*Parent material:* loamy mantled outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* well drained

*Soil loss tolerance (T factor):* 4

*Wind erodibility group (WEG):* 3

*Wind erodibility index (WEI):* 86

*Kw (surface layer):* .20

*Land capability class, nonirrigated:* 2e

*Hydric soil:* no

*Hydrologic group:* B

*Potential frost action:* moderate

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 8 in	sandy loam	moderately rapid	0.8 to 1.4 in	4.5 to 7.3
E -- 8 to 13 in	fine sandy loam	moderately rapid	0.5 to 1.1 in	4.5 to 6.5
Bt1 -- 13 to 28 in	sandy loam	moderately rapid	1.3 to 2.8 in	4.5 to 6.5
2Bt2 -- 28 to 34 in	gravelly coarse sandy loam	moderately rapid	0.2 to 0.9 in	4.5 to 6.5
2C -- 34 to 60 in	stratified coarse sand to extremely gravelly sand	rapid	0.5 to 1.0 in	5.1 to 6.5

### OnC--Onamia sandy loam, 7 to 13 percent slopes

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### OnC--Onamia sandy loam, 7 to 13 percent slopes

#### Onamia

<p><i>Extent:</i> 90 percent of the unit</p> <p><i>Landform(s):</i> hillslopes on outwash plains</p> <p><i>Slope gradient:</i> 7 to 13 percent</p> <p><i>Parent material:</i> loamy mantled outwash deposits</p> <p><i>Restrictive feature(s):</i></p> <p><i>Flooding:</i> none</p> <p><i>Ponding:</i> none</p> <p><i>Drainage class:</i> well drained</p>	<p><i>Soil loss tolerance (T factor):</i> 4</p> <p><i>Wind erodibility group (WEG):</i> 3</p> <p><i>Wind erodibility index (WEI):</i> 86</p> <p><i>Kw (surface layer):</i> .20</p> <p><i>Land capability class, nonirrigated:</i> 3e</p> <p><i>Hydric soil:</i> no</p> <p><i>Hydrologic group:</i> B</p> <p><i>Potential frost action:</i> moderate</p>
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<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 8 in	sandy loam	moderately rapid	0.8 to 1.4 in	4.5 to 7.3
E -- 8 to 13 in	fine sandy loam	moderately rapid	0.5 to 1.1 in	4.5 to 6.5
Bt1 -- 13 to 28 in	sandy loam	moderately rapid	1.3 to 2.8 in	4.5 to 6.5
2Bt2 -- 28 to 34 in	gravelly coarse sandy loam	moderately rapid	0.2 to 0.9 in	4.5 to 6.5
2C -- 34 to 60 in	stratified coarse sand to extremely gravelly sand	rapid	0.5 to 1.0 in	5.1 to 6.5

### Pa--Peat, deep

#### Peat, deep

<p><i>Extent:</i> 90 percent of the unit</p> <p><i>Landform(s):</i> depressions on moraines, depressions on outwash plains</p> <p><i>Slope gradient:</i> 0 to 2 percent</p> <p><i>Parent material:</i> organic deposits</p> <p><i>Restrictive feature(s):</i></p> <p><i>Flooding:</i> none</p> <p><i>Ponding:</i> frequent</p> <p><i>Drainage class:</i> very poorly drained</p>	<p><i>Soil loss tolerance (T factor):</i> 3</p> <p><i>Wind erodibility group (WEG):</i> 7</p> <p><i>Wind erodibility index (WEI):</i> 38</p> <p><i>Kw (surface layer):</i> .02</p> <p><i>Land capability class, nonirrigated:</i> 6w</p> <p><i>Hydric soil:</i> yes</p> <p><i>Hydrologic group:</i> A/D</p> <p><i>Potential frost action:</i> high</p>
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<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
Oi -- 0 to 4 in	peat	very rapid	2.3 to 2.8 in	
Oe -- 4 to 60 in	mucky peat	rapid	26.8 to 32.4 in	

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### Pa--Peat, deep

### Pc--Peat, moderately shallow over clays

#### Peat, moderately shallow over clays

*Extent:* 90 percent of the unit

*Landform(s):* depressions on moraines

*Slope gradient:* 0 to 1 percent

*Parent material:* organic deposits over lacustrine or till

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* frequent

*Drainage class:* very poorly drained

*Soil loss tolerance (T factor):* 2

*Wind erodibility group (WEG):* 5

*Wind erodibility index (WEI):* 56

*Kw (surface layer):* .02

*Land capability class, nonirrigated:* 6w

*Hydric soil:* yes

*Hydrologic group:* B/D

*Potential frost action:* high

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
Oe -- 0 to 12 in	mucky peat	rapid	4.1 to 6.5 in	
Oa -- 12 to 32 in	muck	moderately rapid	7.0 to 11.0 in	
Cg1 -- 32 to 36 in	mucky silty clay loam	moderately slow	0.7 to 0.9 in	
Cg2 -- 36 to 60 in	silty clay	very slow	2.4 to 4.8 in	

### Pg--Peat, moderately shallow over sands

#### Peat, moderately shallow over sands

*Extent:* 90 percent of the unit

*Landform(s):* depressions on outwash plains

*Slope gradient:* 0 to 2 percent

*Parent material:* organic deposits over outwash

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* frequent

*Drainage class:* very poorly drained

*Soil loss tolerance (T factor):* 2

*Wind erodibility group (WEG):* 2

*Wind erodibility index (WEI):* 134

*Kw (surface layer):* .02

*Land capability class, nonirrigated:* 6w

*Hydric soil:* yes

*Hydrologic group:* A/D

*Potential frost action:* high

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
Oa -- 0 to 32 in	muck	moderately rapid	11.2 to 14.4 in	
Cg -- 32 to 60 in	coarse sand	rapid	0.8 to 2.2 in	5.6 to 8.4

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### Pg--Peat, moderately shallow over sands

### PoA--Pomroy loamy sand, 0 to 2 percent slopes

#### Pomroy

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on moraines, hillslopes on outwash plains

*Slope gradient:* 0 to 2 percent

*Parent material:* outwash deposits over dense glacial till

*Restrictive feature(s):* dense material at 41 to 60 inches

*Flooding:* none

*Ponding:* none

*Drainage class:* somewhat poorly drained

*Soil loss tolerance (T factor):* 4

*Wind erodibility group (WEG):* 2

*Wind erodibility index (WEI):* 134

*Kw (surface layer):* .17

*Land capability class, nonirrigated:* 3s

*Hydric soil:* no

*Hydrologic group:* C

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 10 in	loamy fine sand	rapid	1.0 to 1.2 in	5.1 to 6.5
E -- 10 to 24 in	loamy fine sand	rapid	0.9 to 1.3 in	5.1 to 6.5
2Bt -- 24 to 30 in	sandy loam	moderate	0.6 to 0.9 in	5.1 to 6.5
2BC -- 30 to 42 in	sandy loam	slow	0.4 to 1.0 in	5.1 to 7.3
2BCd -- 42 to 60 in	sandy loam	very slow	0.0 to 0.7 in	5.6 to 7.3

### PoB--Pomroy loamy sand, 2 to 7 percent slopes

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### PoB--Pomroy loamy sand, 2 to 7 percent slopes

#### Pomroy

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on moraines, hillslopes on outwash plains

*Slope gradient:* 2 to 7 percent

*Parent material:* outwash deposits over dense glacial till

*Restrictive feature(s):* dense material at 41 to 60 inches

*Flooding:* none

*Ponding:* none

*Drainage class:* well drained

*Soil loss tolerance (T factor):* 4

*Wind erodibility group (WEG):* 2

*Wind erodibility index (WEI):* 134

*Kw (surface layer):* .17

*Land capability class, nonirrigated:* 3s

*Hydric soil:* no

*Hydrologic group:* C

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 6 in	loamy fine sand	rapid	0.6 to 0.7 in	5.1 to 6.5
E -- 6 to 22 in	loamy fine sand	rapid	1.0 to 1.5 in	5.1 to 6.5
2Bt -- 22 to 31 in	sandy loam	moderately slow	0.0 to 0.7 in	5.1 to 6.5
2BC -- 31 to 41 in	sandy loam	slow	0.0 to 0.8 in	5.6 to 7.3
2BCd -- 41 to 60 in	sandy loam	very slow	0.0 to 0.8 in	5.6 to 7.3

### PoC--Pomroy loamy sand, 7 to 13 percent slopes

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### PoC--Pomroy loamy sand, 7 to 13 percent slopes

#### Pomroy

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on moraines, hillslopes on outwash plains

*Slope gradient:* 7 to 13 percent

*Parent material:* outwash deposits over dense glacial till

*Restrictive feature(s):* dense material at 41 to 60 inches

*Flooding:* none

*Ponding:* none

*Drainage class:* well drained

*Soil loss tolerance (T factor):* 4

*Wind erodibility group (WEG):* 2

*Wind erodibility index (WEI):* 134

*Kw (surface layer):* .17

*Land capability class, nonirrigated:* 4s

*Hydric soil:* no

*Hydrologic group:* C

*Potential frost action:* low

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 6 in	loamy fine sand	rapid	0.6 to 0.7 in	5.1 to 6.5
E -- 6 to 22 in	loamy fine sand	rapid	1.0 to 1.5 in	5.1 to 6.5
2Bt -- 22 to 31 in	sandy loam	moderately slow	0.0 to 0.7 in	5.1 to 6.5
2BC -- 31 to 41 in	sandy loam	slow	0.0 to 0.8 in	5.6 to 7.3
2BCd -- 41 to 60 in	sandy loam	very slow	0.0 to 0.8 in	5.6 to 7.3

### PoD--Pomroy loamy sand, 13 to 18 percent slopes

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### PoD--Pomroy loamy sand, 13 to 18 percent slopes

#### Pomroy

<p><i>Extent:</i> 90 percent of the unit</p> <p><i>Landform(s):</i> hillslopes on moraines, hillslopes on outwash plains</p> <p><i>Slope gradient:</i> 13 to 18 percent</p> <p><i>Parent material:</i> outwash deposits over dense glacial till</p> <p><i>Restrictive feature(s):</i> dense material at 41 to 60 inches</p> <p><i>Flooding:</i> none</p> <p><i>Ponding:</i> none</p> <p><i>Drainage class:</i> well drained</p>	<p><i>Soil loss tolerance (T factor):</i> 4</p> <p><i>Wind erodibility group (WEG):</i> 2</p> <p><i>Wind erodibility index (WEI):</i> 134</p> <p><i>Kw (surface layer):</i> .17</p> <p><i>Land capability class, nonirrigated:</i> 6s</p> <p><i>Hydric soil:</i> no</p> <p><i>Hydrologic group:</i> C</p> <p><i>Potential frost action:</i> low</p>
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<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 6 in	loamy fine sand	rapid	0.6 to 0.7 in	5.1 to 6.5
E -- 6 to 22 in	loamy fine sand	rapid	1.0 to 1.5 in	5.1 to 6.5
2Bt -- 22 to 31 in	sandy loam	moderately slow	0.0 to 0.7 in	5.1 to 6.5
2BC -- 31 to 41 in	sandy loam	slow	0.0 to 0.8 in	5.6 to 7.3
2BCd -- 41 to 60 in	sandy loam	very slow	0.0 to 0.8 in	5.6 to 7.3

### W--Water

#### Water

<p><i>Extent:</i> 100 percent of the unit</p> <p><i>Landform(s):</i></p> <p><i>Slope gradient:</i></p> <p><i>Parent material:</i></p> <p><i>Restrictive feature(s):</i></p> <p><i>Flooding:</i></p> <p><i>Ponding:</i></p> <p><i>Drainage class:</i></p>	<p><i>Soil loss tolerance (T factor):</i></p> <p><i>Wind erodibility group (WEG):</i></p> <p><i>Wind erodibility index (WEI):</i></p> <p><i>Kw (surface layer):</i></p> <p><i>Land capability class, nonirrigated:</i></p> <p><i>Hydric soil:</i></p> <p><i>Hydrologic group:</i></p> <p><i>Potential frost action:</i></p>
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<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### Wa--Warman loam

#### Warman

*Extent:* 90 percent of the unit

*Landform(s):* depressions on outwash plains

*Slope gradient:* 0 to 1 percent

*Parent material:* loamy mantled outwash deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* frequent

*Drainage class:* very poorly drained

*Soil loss tolerance (T factor):* 4

*Wind erodibility group (WEG):* 5

*Wind erodibility index (WEI):* 56

*Kw (surface layer):* .24

*Land capability class, nonirrigated:* 4w

*Hydric soil:* yes

*Hydrologic group:* B/D

*Potential frost action:* high

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 9 in	loam	moderately rapid	1.7 to 2.3 in	4.5 to 6.0
Bg -- 9 to 33 in	fine sandy loam	moderate	3.6 to 4.8 in	5.1 to 7.3
2Cg -- 33 to 60 in	sand	rapid	0.3 to 2.1 in	6.1 to 7.3

### Wt--Watab loamy sand

#### Watab

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on drumlins

*Slope gradient:* 0 to 2 percent

*Parent material:* outwash over dense till

*Restrictive feature(s):* dense material at 41 to 60 inches

*Flooding:* none

*Ponding:* none

*Drainage class:* poorly drained

*Soil loss tolerance (T factor):* 4

*Wind erodibility group (WEG):* 2

*Wind erodibility index (WEI):* 134

*Kw (surface layer):* .17

*Land capability class, nonirrigated:* 3w

*Hydric soil:* yes

*Hydrologic group:* C

*Potential frost action:* moderate

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 8 in	loamy sand	rapid	0.8 to 0.9 in	5.1 to 6.0
E,Bw -- 8 to 30 in	loamy sand	rapid	1.3 to 2.0 in	5.1 to 6.5
2Bt -- 30 to 39 in	sandy loam	moderately rapid	0.7 to 1.1 in	5.1 to 6.5
2BC -- 39 to 51 in	sandy loam	slow	0.4 to 1.0 in	5.6 to 7.3
2BCd -- 51 to 60 in	sandy loam	very slow	0.0 to 0.3 in	5.6 to 7.3

## Map Unit Description (MN)

Crow Wing County, Minnesota

[Data apply to the entire extent of the map unit within the survey area. Map unit and soil properties for a specific parcel of land may vary somewhat and should be determined by onsite investigation]

### Wt--Watab loamy sand

### Zc--Zim silt loam

#### Zim

*Extent:* 90 percent of the unit

*Landform(s):* hillslopes on lake plains, hillslopes on moraines

*Slope gradient:* 0 to 2 percent

*Parent material:* clayey lacustrine deposits

*Restrictive feature(s):*

*Flooding:* none

*Ponding:* none

*Drainage class:* somewhat poorly drained

*Soil loss tolerance (T factor):* 3

*Wind erodibility group (WEG):* 5

*Wind erodibility index (WEI):* 56

*Kw (surface layer):* .37

*Land capability class, nonirrigated:* 1

*Hydric soil:* no

*Hydrologic group:* C

*Potential frost action:* high

<i>Representative soil profile:</i>	<i>Texture</i>	<i>Permeability</i>	<i>Available water capacity</i>	<i>pH</i>
A -- 0 to 4 in	silt loam	moderate	0.8 to 0.9 in	4.5 to 6.0
E -- 4 to 22 in	silt loam	moderate	2.9 to 4.0 in	4.5 to 6.0
Bt -- 22 to 55 in	silty clay loam	moderately slow	5.0 to 6.3 in	5.1 to 7.3
C -- 55 to 80 in	silty clay loam	slow	2.5 to 3.7 in	6.6 to 7.8

This report provides a semi tabular listing of some soil and site properties and interpretations valuable in communicating the concept of a map unit. It also includes commonly used conservation planning information in one place for easy access. Major soil components are always displayed and minor components are also displayed if they are included in the database and they are selected at the time the report is generated.