# **SD 18**

**Study Area Extension (Square Lake): Wetland and Watercourse Delineation** 







January 17, 2020

#### Melissa Nicholson

Atlantic Mining NS 6749 Moose River Rd, Middle Musquodoboit, Nova Scotia, B0N 1X0

Re: Touquoy Gold Mine – Study Area Extension (Square Lake): Wetland and Watercourse Delineation

#### 1 INTRODUCTION

Atlantic Mining Nova Scotia (AMNS) retained McCallum Environmental Ltd. (MEL) to conduct a wetland and watercourse assessment within an extension of the current Touquoy Mine Site Study Area located in Middle Musquodoboit, NS.

The Study Area extension is bound between Square Lake to the north and the original study area to the south. The Study Area extension exists within PIDs 40747818 and 00457699 and is approximately 10 ha in size. The Square Lake Study Area extension is provided in Figure 1 (Appendix A).

MEL conducted biophysical assessments to determine the locations of potential wetlands and watercourses within the Study Area. The assessment included an evaluation of desktop resources and a field program on November 7<sup>th</sup>, 2019.

The purpose of this report is to provide wetland and watercourse locations and characterizations to support continued future development of the Touquoy Mine.

#### 2 METHODOLOGY

#### 2.1 Desktop Review

A background information review of wetlands and watercourses was completed using the Nova Scotia Topographic Watercourse (NSTD) and the Nova Scotia Environment (NSE) Wetlands database. In addition, the NSE "Wetlands of Special Significance" (WSS) database was also reviewed.

#### 2.2 Field Assessment

The field assessment was completed on November 7<sup>th</sup>, 2019 by MEL wetland delineator Ryan Gardiner. Meandering transects were completed within the Study Area extension to confirm the potential presence of wetlands and watercourses. This report adopts the terms defined by NSE under Section 105 of the *Environment Act*.

#### Wetlands are:

Land referred to as a marsh, swamp, fen, or bog that either periodically or permanently has water table at, near, or above the land surface or that is saturated with water, and sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation, and biological activities adapted to wet conditions.



#### Watercourses are:

The bed and shore of every river, stream, lake, creek, pond, spring, lagoon or other natural body of water, and the water therein, within the jurisdiction of the Province, whether it contains water or not, and all groundwater.

Wetland boundaries were determined as described by the US Army Corps of Engineers, adapted for the Northcentral and Northeast Regions of the US (US Army Corp of Engineers, 2012) based on topography, soil and hydrology properties, and vegetation. All watercourses encountered during the assessment were also identified.

Wetland Data Determination forms were completed within each wetland identified and wetland boundaries and watercourse routes were recorded on a Geneq SX Blue II receiver and SX Blue pad. The Geneq SX Blue II receiver is capable of sub 1 m accuracy.

#### 3 RESULTS

#### 3.1 Desktop Review

According to the database searches a single wetland was identified in the northern extent of Study Area extension along the shoreline of Square Lake. This wetland was verified (WL55) during the field surveys and is described in further detail below. No mapped watercourses are present in the Study Area extension.

Similar to the original Study Area, the desktop review process determined that the Study Area extension is located in an Endangered Mainland Moose Concentration Area. The desktop review also confirmed that the Study Area extension does not exist within or contain the following:

- Ramsar site, Provincial Wildlife Management Area (Crown and Provincial lands only),
   Provincial Park, Nature Reserve, Wilderness Area or lands owned or legally protected by non-government charitable conservation land trusts;
- Wetlands in designated protected water areas as described within Section 106 of the Environment Act; or,
- A designated wetland of special significance (WSS).

The Study Area extension is situated in upper portions of the Fish River – Square Lake Tertiary Watershed (1EL-5-M). Surface water within this watershed drains south towards Scraggy Lake) located approximately 3 km south of the Study Area extension.

#### 3.2 Field Results

#### 3.2.1 Wetlands

Three wetlands were identified within the Study Area extension (Figure 2, Appendix A). The wetlands were identified as WLs 53 to 55. Confirmation of the presence of hydrophytic vegetation, wetland hydrology and hydric soils was established by the completion of a single data point within each wetland and adjacent upland habitat. Wetland Determination Data Forms are provided in Appendix B.



#### Wetland 53

Wetland 53 exists as a lentic fen 821 m<sup>2</sup> in size. The wetland exists in a basin formation and intercepts surface water run-off from surrounding low gradient upland habitat and bidirectional flow from Square Lake.

Hydrological conditions encountered at the data point location within the wetland are indicated by intermittent surface water to a depth of 3 cm, a high-water table and saturation at surface.

A survey for hydrophytic vegetation was completed in the wetland. The vegetative community is dominated by Black Spruce (*Picea mariana*), Balsam Fir (*Abies balsamea*) and Tamarack (*Larix laricina*) in the sparse tree and shrub layers. Leatherleaf (*Chamaedaphne calyculata*) and Reed Canary Grass (*Phalaris arundinacea*) were observed to dominate the herbaceous layer.

A soil pit was completed within the wetland to test for hydric soil conditions. Fibric organic soil to a depth of 50+ cm with no restrictive layer was observed. Hydric soil is present as indicated by a Histosol (Indicator A1).

#### Wetland 54

Wetland 54 exists as an isolated treed swamp 2,058 m<sup>2</sup> in size. The wetland exists in a basin formation and intercepts surface water run-off from surrounding low gradient upland habitat. Wetland 54 is not hydrologically connected to the nearby Square Lake.

Hydrological conditions encountered at the data point location within the wetland are indicated by a high-water table and saturation at surface.

A survey for hydrophytic vegetation was completed in the wetland. The vegetative community is dominated by Balsam Fir in the tree and shrub layers. Sheep Laurel (*Kalmia angustifolia*) and Cinnamon Fern (*Osmunda cinnamomea*) were observed to dominate the herbaceous layer.

A soil pit was completed within the wetland to test for hydric soil conditions. Fibric organic soil to a depth of 20 cm was observed above a restrictive layer of rock. Hydric soil is present as indicated by a Histic Epipedon (Indicator A2).

#### Wetland 55

Wetland 55 exists as a treed swamp and lentic fen complex that extends beyond the Study Area extension boundary to the north. Within the Study Area extension, 7,069 m<sup>2</sup> of Wetland 55 was delineated. The wetland exists in a basin formation with the treed swamp portion intercepting surface water run-off from surrounding low gradient upland habitat and the fen portion receiving bidirectional flow from Square Lake.

Hydrological conditions encountered at the data point location within the treed swamp portion of the wetland are indicated by a high-water table and saturation at surface.



A survey for hydrophytic vegetation was completed in the wetland. The vegetative community is dominated by Black Spruce and Balsam Fir in the tree and shrub layers. Three-seeded Sedge (*Carex trisperma*) and Cinnamon Fern were observed to dominate the herbaceous layer.

A soil pit was completed within the wetland to test for hydric soil conditions. Fibric organic soil to a depth of 20 cm above a restrictive layer of rock. Hydric soil is present as indicated by a Histic Epipedon (Indicator A2).

General observations within the fen portion of the wetlands indicate that the hydrological, soil and vegetation conditions are similar to those described in Wetland 53. A summary of the data point results and wetland characteristics for each wetland are provided in Table 1 and Table 2.

**Table 1: Wetland Determination Data Point Results** 

Data Point ID	Hydrophytic Vegetation Present:	Hydric Soil Indicator	Indicators of Wetland Hydrology	Positive Test for Wetland Habitat
WL 53	Yes – 2.16 PI Value	A1 – Histosol	Surface water, Saturated at surface, High water table,	Yes
WL 54	Yes – 2.97 PI value	A2 – Hist Epipedon	Surface water, High water table	Yes
UP 53/54	No - 3.24 PI Value	N/A	None	No
WL 55	Yes – 2.4 PI Value	A2 – Hist Epipedon	Surface water, High water table	Yes
UP 55	No – 3.2 PI Value	N/A	None	No

<sup>\*</sup>A Prevalence Index (PI) Value equal to or less than 3 indicates hydrophytic vegetation.

**Table 2: Wetland Characteristic Summary** 

WL ID	Size (m <sup>2</sup> )	Type	Landform	<b>Landscape Position</b>	Water Flow Path
WL 53	821	Fen	Basin	Lentic	Bidirectional – nontidal
WL 54	2058	Treed Swamp	Basin	Terrene	Isolated
WL 55	7069	Fen/Swamp Complex	Sloped/Basin	Lentic	Bidirectional - nontidal

The locations of the wetlands are provided in Figure 1 (Appendix A). Representative photos are provided in Appendix C.

#### 3.2.2 Watercourses

The field survey confirmed that no watercourses are present within the Study Area extension.



#### 4 SUMMARY

The identified wetlands present characteristics typical of fen and treed swamp wetlands in Nova Scotia and the region generally. The three wetlands encompass a total combined area of 9,948 m<sup>2</sup> within the Study Area extension. Although the detailed functional assessment process has not been completed at this time, there are no conditions or wetland characteristics observed which trigger the wetland to exist as a Wetland of Special Significance.

#### 4.1 Recommendations

Should alteration of the identified wetlands be required, a wetland alteration application should be compiled and submitted to NSE. To fulfill the requirements of a wetland alteration application additional field surveys are required between June 1<sup>st</sup> and September 30<sup>th</sup> to complete wetland functions assessment and species at risk surveys.

If you have any questions, please don't hesitate to contact the undersigned with any questions you might have.

Sincerely,

Ryan Gardiner,

Intermediate Environmental Scientist

McCallum Environmental Ltd.

Andy Walter

Senior Project Manager

McCallum Environmental Ltd.



## **APPENDIX A: Figures**





### **APPENDIX B: Wetland Determination Data Forms**

Project # 15-065 7

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etland Hydrology Indicators: imary Indicators (minimum of one is required; check all that apply) Surface Water (A1) High Water Table (A2) High Water Table (A2) Saturation (A3) Marl Deposits (B15) Sediment Deposits (B2) Drift Deposits (B3) Presence of Reduced Iron (C4) Algal Mat or Crust (B4) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Indicators (Minimum of two required; check all that apply) Sediment Deposits (B5) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Sediment Deposits (B3) Presence of Reduced Iron (C4) Algal Mat or Crust (B4) Incon Deposits (B5) Incon Deposits (B5) Thin Muck Surface (C7) Sparsely Vegetated Concave Surface (B8) Indicator Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Indicator Visible on Aerial Imagery (B7) Sparsely Present? Yes No Depth (inches): Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  Wetland Hydrology Present? Yes No Depth (inches): Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  Wetland Hydrology Present? Yes No Depth (inches): Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  No Depth (inches): Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  No Depth (inches): Orm Wetland Hydrology Present? Yes No Depth (inches): Orm No Depth (inc	Type:			_	
etland Hydrology Indicators: imary Indicators (minimum of one is required; check all that apply)  Surface Water (A1)  High Water Table (A2)  Aquatic Fauna (B13)  Marl Deposits (B15)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Sparsely Vegetated Concave Surface (B8)  Eld Observations:  Irace Water Present?  Yes  No  Depth (inches):  Ituration Present?  Yes  No  Depth (inches):  Ituration Present?  Yes  No  Depth (inches):  Ituration Present on Living Roats (B1)  Aquatic Fauna (B13)  Moss Trim Lines (B16)  Drift Deposits (B15)  Dry-Season Water Table (C2)  Saturation Visible on Aerial Imagery (C9)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  Indicatory Visible on Aerial Imagery (B7)  Other (Explain in Remarks)  FAC-Neutral Test (D5)  Ituration Present?  Yes  No  Depth (inches):  Ituration Present?  Yes  No  No  Depth (inches):  Ituration Present?  Ye	Туре:		H	lydric Soil P	resent? Yes No
Surface Soil Cracks (B6)  Surface Water (A1)  Water-Stained Leaves (B9)  Prainage Patterns (B10)  Moss Trim Lines (B16)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Iron Deposits (B5)  Iron Deposits (B5)  Sparsely Vegetated Concave Surface (B8)  Eld Observations:  Irace Water Present?  Yes  No  Depth (inches):  Depth (inches):  Current Saturation (B10)  Water-Stained Leaves (B9)  Drianage Patterns (B10)  Moss Trim Lines (B16)  Dry-Season Water Table (C2)  Saturation Visible on Aerial Imagery (C9)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Incomplete (D4)  FAC-Neutral Test (D5)  Sparsely Vegetated Concave Surface (B8)  Eld Observations:  Irrace Water Present?  Yes  No  Depth (inches):  Demonth of available:	Type: Depth (inches): emarks:			lydric Soil P	resent? Yes No
Surface Water (A1)  High Water Table (A2)  Aquatic Fauna (B13)  Marl Deposits (B15)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Iron Deposits (B5)  Iron Deposits (B5)  Iron Deposits (B5)  Iron Muck Surface (C7)  Sparsely Vegetated Concave Surface (B8)  Alder Observations:  rface Water Present?  Yes  No  Depth (inches):  Drainage Patterns (B10)  Moss Trim Lines (B16)  Dry-Season Water Table (C2)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)  FAC-Neutral Test (D5)  Sparsely Vegetated Concave Surface (B8)  Seter Table Present?  Yes  No  Depth (inches):  Oww  Wetland Hydrology Present?  Yes  No  No  Depth (inches):  Oww  Wetland Hydrology Present?  Yes  No  No  Depth (inches):  Drainage Patterns (B10)  Moss Trim Lines (B16)  Moss Trim Lines (B16)  Dry-Season Water Table (C2)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Stunted or Stressed Plants (D1)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Hydrogen Sufface (C7)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)  Stunted or Stressed Plants (D1)  FAC-Neutral Test (D5)  No  Depth (inches):  Oww  Wetland Hydrology Present? Yes  No  No  Social Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	Type: Depth (inches): emarks:				
High Water Table (A2) Saturation (A3) Marl Deposits (B15) Dry-Season Water Table (C2) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8)  Pet Mo Depth (inches): Depth (inches): Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Saturation Visible on Aerial Imagery (C9) Microtopographic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  Wetland Hydrology Present? Yes No Depth (inches): Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  Wetland Hydrology Present? Yes No Depth (inches): Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  Wetland Hydrology Present? Yes No Depth (inches): Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  Wetland Hydrology Present? Yes No Depth (inches): Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  Wetland Hydrology Present? Yes No Depth (inches): Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Saturation Visible on Aerial Imagery (C9) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  Wetland Hydrology Present? Yes No Depth (inches): Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Saturation Visible on Aerial Imagery (C9) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)	Type: Depth (inches): emarks:  DROLOGY  etland Hydrology Indicators:	***		Secondary	r Indicators (minimum of two requir
Marl Deposits (B15)	Type: Depth (inches): emarks:  DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is requ Surface Water (A1)	ired; check all that apply)		Secondary	Indicators (minimum of two requires soil Cracks (B6)
Water Marks (B1)	Type: Depth (inches): emarks:  DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is requ Surface Water (A1)	ired; check all that apply) Water-Stained Leaves (B9)		Secondary Surfac	r Indicators (minimum of two requir se Soil Cracks (B6) age Patterns (B10)
	Type:	ired; check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)		Secondary Surface Draina Moss	r Indicators (minimum of two requir se Soil Cracks (B6) age Patterns (B10) Trim Lines (B16)
Drift Deposits (B3)	Type:	ired; check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  Marl Deposits (B15)		Secondary Surface Draina Moss Dry-Se	v Indicators (minimum of two requires Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2)
Algal Mat or Crust (B4)	Type:	ired; check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  Marl Deposits (B15)  Hydrogen Sulfide Odor (C1)		Secondary Surface Draina Moss Dry-Se	r Indicators (minimum of two requires Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9)
Thin Muck Surface (C7) Microtopographic Relief (D4) Inundation Visible on Aerial Imagery (B7) Other (Explain in Remarks) FAC-Neutral Test (D5) Sparsely Vegetated Concave Surface (B8) Eld Observations:  Inface Water Present?	Type:	ired; check all that apply)  — Water-Stained Leaves (B9)  — Aquatic Fauna (B13)  — Marl Deposits (B15)  — Hydrogen Sulfide Odor (C1)  — Oxidized Rhizospheres on Living		Secondary Surface Draina Moss Dry-Se Satura	r Indicators (minimum of two requir ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) atton Visible on Aerial Imagery (C9)
	Type:	ired; check all that apply)  — Water-Stained Leaves (B9)  — Aquatic Fauna (B13)  — Marl Deposits (B15)  — Hydrogen Sulfide Odor (C1)  — Oxidized Rhizospheres on Living  — Presence of Reduced Iron (C4)	Roots (C3)	Secondary Surface Draina Moss Dry-Se Satura Stunte Geom	r Indicators (minimum of two requires Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) atton Visible on Aerial Imagery (C9) and or Stressed Plants (D1) orphic Position (D2)
Sparsely Vegetated Concave Surface (B8)  eld Observations:  Inface Water Present? Yes No Depth (inches): Zea	Type:	ired; check all that apply)  — Water-Stained Leaves (B9)  — Aquatic Fauna (B13)  — Marl Deposits (B15)  — Hydrogen Sulfide Odor (C1)  — Oxidized Rhizospheres on Living  — Presence of Reduced Iron (C4)  — Recent Iron Reduction in Tilled S  — Thin Muck Surface (C7)	Roots (C3)	Secondary Surface Draina Moss Dry-Sc Satura Stunte Geom Shallo	r Indicators (minimum of two requires Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) and or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3)
ater Table Present? Yes No Depth (inches): ater Table Present? Yes No Depth (inches): occupant turation Present? Yes No Depth (inches): Occupant turation Present? Yes No Depth (inches): Occupant Wetland Hydrology Present? Yes No Scribe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	Type:	ired; check all that apply)  — Water-Stained Leaves (B9)  — Aquatic Fauna (B13)  — Marl Deposits (B15)  — Hydrogen Sulfide Odor (C1)  — Oxidized Rhizospheres on Living  — Presence of Reduced Iron (C4)  — Recent Iron Reduction in Tilled S  — Thin Muck Surface (C7)  7) — Other (Explain in Remarks)	Roots (C3)	Secondary Surface Draina Moss Dry-Se Satura Stunte Geom Shallo	r Indicators (minimum of two requires Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) and or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4)
ater Table Present?  Yes No Depth (inches): Cum  turation Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No  cludes capillary fringe)  scribe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	Type:	ired; check all that apply)  — Water-Stained Leaves (B9)  — Aquatic Fauna (B13)  — Marl Deposits (B15)  — Hydrogen Sulfide Odor (C1)  — Oxidized Rhizospheres on Living  — Presence of Reduced Iron (C4)  — Recent Iron Reduction in Tilled S  — Thin Muck Surface (C7)  7) — Other (Explain in Remarks)	Roots (C3)	Secondary Surface Draina Moss Dry-Se Satura Stunte Geom Shallo	r Indicators (minimum of two requires Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) and or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4)
turation Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No Scribe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	Type:	ired; check all that apply)  — Water-Stained Leaves (B9)  — Aquatic Fauna (B13)  — Marl Deposits (B15)  — Hydrogen Sulfide Odor (C1)  — Oxidized Rhizospheres on Living  — Presence of Reduced Iron (C4)  — Recent Iron Reduction in Tilled S  — Thin Muck Surface (C7)  7) — Other (Explain in Remarks)	Roots (C3)	Secondary Surface Draina Moss Dry-Se Satura Stunte Geom Shallo	r Indicators (minimum of two requires Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) and or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4)
turation Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No Scribe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	Type:	ired; check all that apply)  — Water-Stained Leaves (B9)  — Aquatic Fauna (B13)  — Marl Deposits (B15)  — Hydrogen Sulfide Odor (C1)  — Oxidized Rhizospheres on Living  — Presence of Reduced Iron (C4)  — Recent Iron Reduction in Tilled S  — Thin Muck Surface (C7)  7) — Other (Explain in Remarks)  B8)	Roots (C3)	Secondary Surface Draina Moss Dry-Se Satura Stunte Geom Shallo	r Indicators (minimum of two requires Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) and or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4)
	Type:	ired; check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  Marl Deposits (B15)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled S  Thin Muck Surface (C7)  Other (Explain in Remarks)  No Depth (inches): 3	Roots (C3)	Secondary Surface Draina Moss Dry-Se Satura Stunte Geom Shallo	r Indicators (minimum of two requires Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) and or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4)
marks:	Type:	ired; check all that apply)  — Water-Stained Leaves (B9)  — Aquatic Fauna (B13)  — Marl Deposits (B15)  — Hydrogen Sulfide Odor (C1)  — Oxidized Rhizospheres on Living  — Presence of Reduced Iron (C4)  — Recent Iron Reduction in Tilled S  — Thin Muck Surface (C7)  7) — Other (Explain in Remarks)  88)  No — Depth (inches): 3	Roots (C3) oils (C6) Wetland	Secondary Surface Draina Moss Dry-Si Satura Stunte Geom Shallo Microt FAC-N	v Indicators (minimum of two requires Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) at or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4) leutral Test (D5)
	Type:	ired; check all that apply)  — Water-Stained Leaves (B9)  — Aquatic Fauna (B13)  — Marl Deposits (B15)  — Hydrogen Sulfide Odor (C1)  — Oxidized Rhizospheres on Living  — Presence of Reduced Iron (C4)  — Recent Iron Reduction in Tilled S  — Thin Muck Surface (C7)  7) — Other (Explain in Remarks)  88)  No — Depth (inches): 3	Roots (C3) oils (C6) Wetland	Secondary Surface Draina Moss Dry-Si Satura Stunte Geom Shallo Microt FAC-N	v Indicators (minimum of two requires Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) at or Stressed Plants (D1) orphic Position (D2) w Aquitard (D3) opographic Relief (D4) leutral Test (D5)

Applicant/Owner:AMNS nvestigator(s):R_G_d_inv		A COLUMN	17	Sampling Point: Wet 54
The state of the s				
Slope (%): Lat: 50 5 8 4	-			of (concave, convex, none):
		Long:		Suitorni
coil Map Unit Name/Type:				retland Type: I reed swang
re climatic / hydrologic conditions on the site typical fo				
re Vegetation, Soil, or Hydrology				"Normal Circumstances" present? Yes No
re Vegetation, Soil, or Hydrology				needed, explain any answers in Remarks.)
UMMARY OF FINDINGS – Attach site ma	ap showing	sampling	g point l	ocations, transects, important features, etc
Hydrophytic Vegetation Present? Yes	No	Is th	e Sample	d Area
	No	with	in a Wetla	and? Yes No
Wetland Hydrology Present? Yes	No	If ye	s, optional	Wetland Site ID:
Remarks: (Explain alternative procedures here or in a	separate repor	t.)		
EGETATION - Use scientific names of plan	nts.	-		
	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 10 m )  1 (hodbut		Species?	-	Number of Dominant Species 4
2. Abici bolianga	10	_	FAC	That Are OBL, FACW, or FAC: (A)
3				Total Number of Dominant
1.				Species Across All Strata:(B)
5			-	Percent of Dominant Species That Are OBL, FACW, or FAC:
Continue/Ohm to Ohm to	75	= Total Cov	/er	
Sapling/Shrub Stratum (Plot size: Smil. About bulsenea	25		ev.	Prevalence Index worksheet:
fices mariana	_ 65		FACW	Total % Cover of:Multiply by:
B.			Theod	OBL species x 1 = / D  FACW species x 2 = / D
fo				FAC species 150 x3 = 450
,				FACU species x 4 =
Jorh Stratum (Plateines 1	36	= Total Cov	er	UPL species x 5 =
Herb Stratum (Plot size: 100 )	20	-	544	Column Totals: 155 (A) 460 (B)
Lalmia angustifolia	- 30	-	TAC	Prevalence Index = B/A = 2-97 %
Coptis trifolia	-3		FAC	Hydrophytic Vegetation Indicators:
				Rapid Test for Hydrophytic Vegetation
				✓ Dominance Test is >50%
¥				Prevalence Index is ≤3.01
£				Morphological Adaptations <sup>1</sup> (Provide supporting
				data in Remarks or on a separate sheet)  Problematic Hydrophytic Vegetation¹ (Explain)
4				reoremand riyotopriyiid vegetation: (Explain)
. Sphagnum ground com				Traditional and the state of th
Sphagnum ground com	- 50	T-1/15		<sup>1</sup> Indicators of hydric soil and wetland hydrology must
4	62	= Total Cove	er	be present, unless disturbed or problematic.
. Sphagnum ground com	20	= Total Cove	er	be present, unless disturbed or problematic.
		= Total Cove	er ———	be present, unless disturbed or problematic.  Hydrophytic Vegetation Present?  Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

(includes capillary fringe)

Remarks:

Project/Site: 1 Q	Municipalit	y/County:	1-16	Sampling Date: 7-10-1-
Donat Control of the				Sampling Point: Up 53/54
nvestigator(s): R Creations		Affiliation:	MeCa	llum Environmental
andform (hillslope, terrace, etc.):			Local relief	f (concave, convex, none):
Slope (%): Lat: 505 92 156		Long:	499	52156 Datum: NA) 83
Soil Map Unit Name/Type:				
are climatic / hydrologic conditions on the site typical f				
				"Normal Circumstances" present? Yes No
are Vegetation, Soil, or Hydrology				eeded, explain any answers in Remarks.)
				ocations, transects, important features, etc
Hydrophytic Vegetation Present? Yes	- /	ls t	the Sample	
#120 cm - 1 mm -	No /			Wetland Site ID:
Remarks: (Explain alternative procedures here or in				
Tree Stratum (Plot size: 10 m )	Absolute		nt Indicator	Dominance Test worksheet:
1. Abill basance	% Cover	Species	? Status FAC	Number of Dominant Species
2. Acr rubrum	10	-	FAC	That Are OBL, FACW, or FAC:(A)
3				Total Number of Dominant Species Across All Strata:  (B)
4				Percent of Dominant Species
5	40	= Total Co		That Are OBL, FACW, or FAC:
Sapling/Shrub Stratum (Plot size:	_)		- Jvei	Prevalence Index worksheet:
1. Abier balsances	40	-/	_F41	Total % Cover of:Multiply by:
2. Picea glance			FAC	OBL species x1 =
3 4		-	_	FACW species x 2 = FAC species (13 x 3 = 33 9
5				FACU species
	60	= Total Co	over	UPL species x 5 =
Herb Stratum (Plot size: /m/)	-70 -	,	Fire	Column Totals: 14° (A) 479 (B)
Cornus canadensis	<u>5€</u> _		FACY	Prevalence Index = B/A = 3,74
3. Trienhalir borealis	2	-	FAC	Hydrophytic Vegetation Indicators:
4. Kalmin angustiblia	3		FAC	Rapid Test for Hydrophytic Vegetation
5.				
5				X Prevalence Index is ≤3.01
7-				Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
3		-		Problematic Hydrophytic Vegetation¹ (Explain)
0				
Noody Vine Stratum (Plot size:)	48	= Total Co	ver	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
\				Hydrophytic
				Vegetation
2.		= Total Co	-	Present? Yes No

7-Nev-19 Sampling Point: Up 53
he absence of indicators.)

Depth	Matrix	Redox Features			
(inches) Color (r			pe¹ Loc²	Texture	Remarks
3-0 cm				3260	Organis
					0.3 82.1
				_	
Type: C=Concentration	n, D=Depletion, RM	=Reduced Matrix, CS=Covered or 0	Coated Sand Gr	ains. <sup>2</sup> Loca	ation: PL=Pore Lining, M=Matrix.
tydric Soil Indicators:				Indicators	or Problematic Hydric Soils <sup>3</sup> :
Histosol (A1)		Stripped Matrix (S6)		Sandy	Gleyed Matrix (S4)
Histic Epipedon (A2)	)	Polyvalue Below Surface (S	88)	Coast F	rairie Redox (A16)
Black Histic (A3)	. Ko	Thin Dark Surface (S9)			ucky Peat or Peat (S3)
Hydrogen Sulfide (A		Loamy Mucky Mineral (F1)			nganese Masses (F12)
Stratified Layers (A5		Loamy Gleyed Matrix (F2)		Other (	Explain in Remarks)
<ul> <li>Depleted Below Dar</li> <li>Thick Dark Surface</li> </ul>		Depleted Matrix (F3)			
Sandy Mucky Minera		Redox Dark Surface (F6)			
<ul> <li>Sandy Mucky Minera</li> <li>Depleted Dark Surfa</li> </ul>		Redox Depressions (F8)			
<ul> <li>Depleted Dark Surfa</li> <li>Sandy Redox (S5)</li> </ul>	ice (F/)	Red Parent Material (TF2)			
_ Salidy Redox (S5)					
ndicators of hydrophytic	c vegetation and w	etland hydrology must be present, u	place disturbed	ar problematic	
estrictive Layer (if ob	served):	otalio nydrology must be present, u	illess distarbed	or problematic.	
Type: Roc					
Depth (inches);	3 cm				
lemarks:				Hydric Soil F	resent? Yes No _=
YDROLOGY Vetland Hydrology Indi					y Indicators (minimum of two requir
Vetland Hydrology Indi rimary Indicators (minim		red; check all that apply)			y Indicators (minimum of two requir ce Soil Cracks (B6)
Vetland Hydrology Indi rimary Indicators (minim Surface Water (A1)	num of one is requi	Water-Stained Leaves (B	9)	Surfa	
Vetland Hydrology Indi rimary Indicators (minim Surface Water (A1) High Water Table (A	num of one is requi		9)	Surfa Drain	ce Soil Cracks (B6) age Patterns (B10)
Vetland Hydrology Indi 'rimary Indicators (minim Surface Water (A1) High Water Table (A Saturation (A3)	num of one is requi	Water-Stained Leaves (B	9)	Surfa Drain Moss	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16)
Vetland Hydrology Indi rimary Indicators (minim Surface Water (A1) High Water Table (A Saturation (A3) Water Marks (B1)	num of one is requi	<ul><li>Water-Stained Leaves (B: Aquatic Fauna (B13)</li><li>Marl Deposits (B15)</li></ul>		Surfa Drain Moss Dry-S	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2)
Vetland Hydrology Indi Primary Indicators (minim Surface Water (A1) High Water Table (A Saturation (A3) Water Marks (B1) Sediment Deposits (I	num of one is requi	<ul> <li>Water-Stained Leaves (Bt</li> <li>Aquatic Fauna (B13)</li> <li>Marl Deposits (B15)</li> <li>Hydrogen Sulfide Odor (C</li> </ul>	21)	Surfa Drain Moss Dry-S Satur	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9
Vetland Hydrology Indi  Vrimary Indicators (minim  Surface Water (A1)  High Water Table (A)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B3)	num of one is requi	<ul> <li>Water-Stained Leaves (B:</li> <li>Aquatic Fauna (B13)</li> <li>Marl Deposits (B15)</li> <li>Hydrogen Sulfide Odor (C</li> <li>Oxidized Rhizospheres or</li> </ul>	(1) n Living Roots (0	Surfa Drain Moss Dry-S Satur. C3) Stunta	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1)
Vetland Hydrology Indi Primary Indicators (minim Surface Water (A1) High Water Table (A Saturation (A3) Water Marks (B1) Sediment Deposits (I	num of one is requi	<ul> <li>Water-Stained Leaves (Bit Aquatic Fauna (B13)</li> <li>Marl Deposits (B15)</li> <li>Hydrogen Sulfide Odor (Compared of Compared Presence of Reduced Iron</li> </ul>	C1) n Living Roots (0 n (C4)	Surfa Drain Moss Dry-S Satur. C3) Stunte Geom	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) corphic Position (D2)
Vetland Hydrology Indi  Vrimary Indicators (minim  Surface Water (A1)  High Water Table (A)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B3)	num of one is requi	Water-Stained Leaves (Bit Aquatic Fauna (B13)     Marl Deposits (B15)     Hydrogen Sulfide Odor (City Oxidized Rhizospheres or Presence of Reduced Iron Recent Iron Reduction in Market (City Oxidized Rhizospheres)	C1) n Living Roots (0 n (C4)	Surfa Drain Moss Dry-S Saturt C3) Stunte Geom Shallo	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) orphic Position (D2) ow Aquitard (D3)
Vetland Hydrology Indi  Vrimary Indicators (minim  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B3)  Algal Mat or Crust (B2)  Iron Deposits (B5)	num of one is requi 2) B2) 34)	Water-Stained Leaves (Bit Aquatic Fauna (B13) Aquatic Fauna (B15) Marl Deposits (B15) Hydrogen Sulfide Odor (Cit Oxidized Rhizospheres or Presence of Reduced Iron Recent Iron Reduction in Thin Muck Surface (C7)	C1) n Living Roots (0 n (C4) Tilled Soils (C6)	Surfa Drain Moss Dry-S Saturt Geom Shalld	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) corphic Position (D2) ow Aquitard (D3) copographic Relief (D4)
Vetland Hydrology Indi rimary Indicators (minim Surface Water (A1) High Water Table (A Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Algal Mat or Crust (B	num of one is requi 2) B2) 34) Aerial Imagery (B	Water-Stained Leaves (Bit Aquatic Fauna (B13) Aquatic Fauna (B15) Marl Deposits (B15) Hydrogen Sulfide Odor (Compared of Presence of Reduced Iron Recent Iron Reduction in Thin Muck Surface (C7) Other (Explain in Remarks	C1) n Living Roots (0 n (C4) Tilled Soils (C6)	Surfa Drain Moss Dry-S Saturt Geom Shalld	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) orphic Position (D2) ow Aquitard (D3)
Vetland Hydrology Indi rimary Indicators (minim Surface Water (A1) High Water Table (A Saturation (A3) Water Marks (B1) Sediment Deposits (I Drift Deposits (B3) Algal Mat or Crust (B Iron Deposits (B5) Inundation Visible on Sparsely Vegetated (	num of one is requi 2) B2) 34) Aerial Imagery (B	Water-Stained Leaves (Bit Aquatic Fauna (B13) Aquatic Fauna (B15) Marl Deposits (B15) Hydrogen Sulfide Odor (Compared of Presence of Reduced Iron Recent Iron Reduction in Thin Muck Surface (C7) Other (Explain in Remarks	C1) n Living Roots (0 n (C4) Tilled Soils (C6)	Surfa Drain Moss Dry-S Saturt Geom Shalld	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) corphic Position (D2) ow Aquitard (D3) copographic Relief (D4)
Vetland Hydrology Indi rimary Indicators (minim Surface Water (A1) High Water Table (A Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Algal Mat or Crust (B Iron Deposits (B5) Inundation Visible on Sparsely Vegetated (ield Observations:	num of one is requi 2) B2) 34) Aerial Imagery (B' Concave Surface (I	Water-Stained Leaves (Bit Aquatic Fauna (B13) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (Condition of the Condition of th	C1) n Living Roots (0 n (C4) Tilled Soils (C6)	Surfa Drain Moss Dry-S Saturt Geom Shalld	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) corphic Position (D2) ow Aquitard (D3) copographic Relief (D4)
Vetland Hydrology Indi  Vrimary Indicators (minim  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B3)  Algal Mat or Crust (B2)  Iron Deposits (B5)  Inundation Visible on	num of one is requi 2) B2) Aerial Imagery (B' Concave Surface (I	Water-Stained Leaves (Bit   Aquatic Fauna (B13)     Marl Deposits (B15)     Hydrogen Sulfide Odor (Cit       Oxidized Rhizospheres or       Presence of Reduced Iron       Recent Iron Reduction in       Thin Muck Surface (C7)     Other (Explain in Remarks   B8)	c1) n Living Roots (6 n (C4) Tilled Soils (C6) s)	Surfa Drain Moss Dry-S Saturt Geom Shalld	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) corphic Position (D2) ow Aquitard (D3) copographic Relief (D4)
Vetland Hydrology Indi  Vrimary Indicators (minim  Surface Water (A1)  High Water Table (A  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B3)  Algal Mat or Crust (B  Iron Deposits (B5)  Inundation Visible on  Sparsely Vegetated (Collections:  Vater Table Present?	B2) Aerial Imagery (B' Concave Surface (I	Water-Stained Leaves (Bit Aquatic Fauna (B13)  Marl Deposits (B15)  Hydrogen Sulfide Odor (Compared of the compared of the com	c1) n Living Roots (0 n (C4) Tilled Soils (C6) s)	Surfa Drain Moss Dry-S Saturta Geom Shalla FAC-I	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) corphic Position (D2) ow Aquitard (D3) copographic Relief (D4) Neutral Test (D5)
Vetland Hydrology Indi  Vrimary Indicators (minim  Surface Water (A1)  High Water Table (A  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B3)  Algal Mat or Crust (B  Iron Deposits (B5)  Inundation Visible on  Sparsely Vegetated (Colored Water Present?  Vater Table Present?  aturation Present?	B2)  Aerial Imagery (B' Concave Surface (I	Water-Stained Leaves (Bit   Aquatic Fauna (B13)     Marl Deposits (B15)     Hydrogen Sulfide Odor (Cit       Oxidized Rhizospheres or       Presence of Reduced Iron       Recent Iron Reduction in       Thin Muck Surface (C7)     Other (Explain in Remarks   B8)	c1) n Living Roots (0 n (C4) Tilled Soils (C6) s)	Surfa Drain Moss Dry-S Saturta Geom Shalla FAC-I	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) corphic Position (D2) ow Aquitard (D3) copographic Relief (D4)
Vetland Hydrology Indi  Virimary Indicators (minim  Surface Water (A1)  High Water Table (A  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B3)  Algal Mat or Crust (B5)  Inundation Visible on  Sparsely Vegetated (Cield Observations:  urface Water Present?  //ater Table Present?  aturation Present?	B2)  Aerial Imagery (B' Concave Surface (I	Water-Stained Leaves (Bit Aquatic Fauna (B13)  Aquatic Fauna (B13)  Marl Deposits (B15)  Hydrogen Sulfide Odor (Condition of the Condition of	c1) n Living Roots (0 n (C4) Tilled Soils (C6) s)  Wetlan	Surfa  Drain  Moss  Dry-S  Satura  Geom  Shalla  FAC-I	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) corphic Position (D2) ow Aquitard (D3) copographic Relief (D4) Neutral Test (D5)
Vetland Hydrology Indi  Virimary Indicators (minim  Surface Water (A1)  High Water Table (A  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B3)  Algal Mat or Crust (B5)  Inundation Visible on  Sparsely Vegetated (Cield Observations:  urface Water Present?  //ater Table Present?  aturation Present?	B2)  Aerial Imagery (B' Concave Surface (I	Water-Stained Leaves (Bit Aquatic Fauna (B13)  Marl Deposits (B15)  Hydrogen Sulfide Odor (Compared of the compared of the com	c1) n Living Roots (0 n (C4) Tilled Soils (C6) s)  Wetlan	Surfa  Drain  Moss  Dry-S  Satura  Geom  Shalla  FAC-I	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) corphic Position (D2) ow Aquitard (D3) copographic Relief (D4) Neutral Test (D5)
Vetland Hydrology Indi  Virimary Indicators (minim  Surface Water (A1)  High Water Table (A  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B3)  Algal Mat or Crust (B5)  Inundation Visible on  Sparsely Vegetated (Cield Observations:  urface Water Present?  //ater Table Present?  aturation Present?	B2)  Aerial Imagery (B' Concave Surface (I	Water-Stained Leaves (Bit Aquatic Fauna (B13)  Aquatic Fauna (B13)  Marl Deposits (B15)  Hydrogen Sulfide Odor (Condition of the Condition of	c1) n Living Roots (0 n (C4) Tilled Soils (C6) s)  Wetlan	Surfa  Drain  Moss  Dry-S  Satura  Geom  Shalla  FAC-I	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) corphic Position (D2) ow Aquitard (D3) copographic Relief (D4) Neutral Test (D5)
Vetland Hydrology Indi  Vrimary Indicators (minim  Surface Water (A1)  High Water Table (A  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B3)  Algal Mat or Crust (B  Iron Deposits (B5)  Inundation Visible on  Sparsely Vegetated (Collection)  ield Observations:  urface Water Present?  Vater Table Present?  aturation Present?  aturation Present?  noludes capillary fringe) escribe Recorded Data	B2)  Aerial Imagery (B' Concave Surface (I	Water-Stained Leaves (Bit Aquatic Fauna (B13)  Aquatic Fauna (B13)  Marl Deposits (B15)  Hydrogen Sulfide Odor (Condition of the Condition of	c1) n Living Roots (0 n (C4) Tilled Soils (C6) s)  Wetlan	Surfa  Drain  Moss  Dry-S  Satura  Geom  Shalla  FAC-I	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) corphic Position (D2) ow Aquitard (D3) copographic Relief (D4) Neutral Test (D5)
Vetland Hydrology Indi rimary Indicators (minim Surface Water (A1) High Water Table (A Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Algal Mat or Crust (B Iron Deposits (B5) Inundation Visible on Sparsely Vegetated (ield Observations: urface Water Present? raturation Present? aturation Present? noludes capillary fringe) escribe Recorded Data	B2)  Aerial Imagery (B' Concave Surface (I	Water-Stained Leaves (Bit Aquatic Fauna (B13)  Aquatic Fauna (B13)  Marl Deposits (B15)  Hydrogen Sulfide Odor (Condition of the Condition of	c1) n Living Roots (0 n (C4) Tilled Soils (C6) s)  Wetlan	Surfa  Drain  Moss  Dry-S  Satura  Geom  Shalla  FAC-I	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) eason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) corphic Position (D2) ow Aquitard (D3) copographic Relief (D4) Neutral Test (D5)

Project/Site: 1 Q	Municipal	ity/County:	H	RM	Sampling Date: 7-Neu-
Applicant/Owner: HMN3					Sampling Point: Wt 55
nvestigator(s): R. Curd av		Affiliation:	M	Callum	Environmental
andform (hillslope, terrace, etc.):			Local relie	of (concave co	novey none): Partaul
Slope (%): Lat: 505 2 6 7		Long:	498	2560	Datum: NAD 83
Soil Map Unit Name/Type:					
are climatic / hydrologic conditions on the site typical for				(If no	evoluin in Remarks \
are VegetationX_, Soil>, or HydrologyY	significantly	disturbed			umstances" present? Yes No
are Vegetation _ 노, Soil _ 노, or Hydrology _ 노	naturally pr	oblematic?			
SUMMARY OF FINDINGS – Attach site map					n any answers in Remarks.)
Hydrophytic Vegetation Present?	No No No	Is t	he Sample hin a Wetla	d Area	Yes No
EGETATION - Use scientific names of plans  Tree Stratum (Plot size:/ Ow)  1 Picca narrang	Absolute	Dominan Species?	t Indicator Status FAC い	Number of	e Test worksheet:  Dominant Species BL FACW or FAC:
2. Abres halsanen	10	_	FAC	That Are O	BL, FACW, or FAC: (A)
3			-1112	Total Numb	per of Dominant
4				Carlotte a	cross All Strata: (B)
5				Percent of	Dominant Species BL, FACW, or FAC:
Sapling/Shrub Stratum (Plot size: 5m )	40	= Total Co	ver		
1. Abres be sames	7 -			100000000000000000000000000000000000000	e Index worksheet:
Picea muigna	10	-	FACW		6 Cover of: Multiply by: 25 x1 = 25
3			Lacos	FACW specie	
				FAC specie	
L				A COLUMN TO SERVICE STATE OF THE PARTY OF TH	
derb Stratum (Plot size:/ in)	40	= Total Co	ver	UPL specie	s x5=
· Osmurda oin samoures	40	/	EAA	Column Tot	ies x4 = s x5 = rals: (A) 36 o (B)
· Carex hispens	25	-	FAC	Preva	lence Index = B/A = 2.4
Kolmia anguitifalia	- 5		FAC		c Vegetation Indicators:
			-100	100000000000000000000000000000000000000	Fest for Hydrophytic Vegetation
					ance Test is >50%
					ence Index is ≤3.01
				Morpho	logical Adaptations (Provide supporting
				data	in Remarks or on a separate sheet)
				Problem	natic Hydrophytic Vegetation <sup>1</sup> (Explain)
0	70	= Total Cov	er	<sup>1</sup> Indicators of be present,	of hydric soil and wetland hydrology must unless disturbed or problematic.
				Hydrophytic	c
				Vegetation	
		= Total Cov	er	Present?	Yes No
Remarks: (Include photo numbers here or on a separate					

iches) Color (moist) %	Color (moist) % Type <sup>1</sup> L	oc <sup>2</sup> Texture	Remarks
0 - 0			Organie
pe: C=Concentration, D=Depletion, RM	=Reduced Matrix, CS=Covered or Coated S		<sup>2</sup> Location: PL=Pore Lining, M=Matrix. ors for Problematic Hydric Soils <sup>3</sup> :
Histosol (A1)	Stripped Matrix (S6)		ndy Gleyed Matrix (S4)
Histic Epipedon (A2)	Polyvalue Below Surface (S8)		ast Prairie Redox (A16)
Black Histic (A3)	Thin Dark Surface (S9)	5 0	m Mucky Peat or Peat (S3)
Hydrogen Sulfide (A4)	Loamy Mucky Mineral (F1)		n-Manganese Masses (F12)
Stratified Layers (A5)	Loamy Gleyed Matrix (F2)	Oti	ner (Explain in Remarks)
Depleted Below Dark Surface (A11)	Depleted Matrix (F3)		
Thick Dark Surface (A12)	Redox Dark Surface (F6)		- v
Sandy Mucky Mineral (S1)	Redox Depressions (F8)		
Depleted Dark Surface (F7) Sandy Redox (S5)	Red Parent Material (TF2)		
dicators of hydrophytic vegetation and w	retland hydrology must be present, unless dis	turbed or problen	natic.
strictive Layer (if observed):	33.33.16.33.10.31.23.11.33.11.2	9	2
strictive Layer (if observed): Type:			
strictive Layer (if observed):		Hydric \$	Soil Present? Yes No
strictive Layer (if observed):  Type: Roc lc  Depth (inches): 20 (w^			
strictive Layer (if observed):  Type: Roc lc  Depth (inches): 20 (  marks:  DROLOGY  etland Hydrology Indicators:		Seco	ondary Indicators (minimum of two require
strictive Layer (if observed):  Type:		Seco	ondary Indicators (minimum of two require Surface Soil Cracks (B6)
Strictive Layer (if observed): Type:	Water-Stained Leaves (B9)	Seco	ondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10)
DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one is requested) Surface Water (A1) High Water Table (A2)	Water-Stained Leaves (B9) Aquatic Fauna (B13)	Seco	ondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16)
DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one is requested Water (A1) High Water Table (A2) Saturation (A3)	<ul><li>Water-Stained Leaves (B9)</li><li>Aquatic Fauna (B13)</li><li>Marl Deposits (B15)</li></ul>	Seco	ondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2)
Strictive Layer (if observed): Type:	<ul> <li>Water-Stained Leaves (B9)</li> <li>Aquatic Fauna (B13)</li> <li>Marl Deposits (B15)</li> <li>Hydrogen Sulfide Odor (C1)</li> </ul>	Seco	ondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9)
Strictive Layer (if observed): Type:	<ul> <li>Water-Stained Leaves (B9)</li> <li>Aquatic Fauna (B13)</li> <li>Marl Deposits (B15)</li> <li>Hydrogen Sulfide Odor (C1)</li> <li>Oxidized Rhizospheres on Living</li> </ul>	Seco	ondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)
Strictive Layer (if observed): Type:	<ul> <li>Water-Stained Leaves (B9)</li> <li>Aquatic Fauna (B13)</li> <li>Marl Deposits (B15)</li> <li>Hydrogen Sulfide Odor (C1)</li> <li>Oxidized Rhizospheres on Living</li> <li>Presence of Reduced Iron (C4)</li> </ul>	Secondary Second	ondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2)
Strictive Layer (if observed): Type:	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Sc	Second Se	ondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3)
Strictive Layer (if observed): Type:	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Sc	Second Se	Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4)
DROLOGY  tland Hydrology Indicators: mary Indicators (minimum of one is requested Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Sc Thin Muck Surface (C7) Other (Explain in Remarks)	Second Se	ondary Indicators (minimum of two require Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3)
Strictive Layer (if observed): Type:	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Sc Thin Muck Surface (C7) Other (Explain in Remarks)	Second Se	Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4)
Strictive Layer (if observed): Type:	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Sc Thin Muck Surface (C7) Other (Explain in Remarks) (B8)	Second Se	Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4)
Strictive Layer (if observed): Type:	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Sc Thin Muck Surface (C7) Other (Explain in Remarks)  No Depth (inches):	Second Se	Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4)
Strictive Layer (if observed): Type:	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Sc Thin Muck Surface (C7) Other (Explain in Remarks) (B8)	Second Se	Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4)
Strictive Layer (if observed): Type:	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled So Thin Muck Surface (C7) Other (Explain in Remarks)  No Depth (inches): No Depth (inches):	Secondary Second	Surface Soil Cracks (B6) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5)  logy Present? Yes No

pplicant/Owner: AMNS vestigator(s): R Grading		A		Sampling Point:55
andform (hillelana torress et )		Affiliation:_	M	EC
one /9/.):			Local relie	of (concave, convex, none):
Cat. 3057	96	Long:	U	[982553 Datum:
oil Map Unit Name/Type:			W	etland Type:
re climatic / hydrologic conditions on the site typical	for this time of ye	ear? Yes_	_ No	(If no, explain in Remarks.)
re Vegetation <u> </u>	significantly	disturbed?		"Normal Circumstances" present? Yes No
re Vegetation <u> </u>	naturally pro	oblematic?		needed, explain any answers in Remarks.)
UMMARY OF FINDINGS – Attach site r	nap showing	sampling		ocations, transects, important features, etc
	No_		e Sample	
Hydric Soil Present? Yes	No V			and? Yes No
Vetland Hydrology Present? Yes		7 85		
Remarks: (Explain alternative procedures here or in	n a separate repo	rt.)	s, optional	Wetland Site ID:
EGETATION - Use scientific names of pl	lants.			
ree Stratum (Plot size;)	Absolute	Dominant	Indicator	Dominance Test worksheet:
Betula papyrillera	% Cover	Species?		Number of Dominant Species
Picea glacca			FACU	That Are OBL, FACW, or FAC: (A)
June			FAC	Total Number of Dominant
				Species Across All Strata: (B)
				Percent of Dominant Species
	70	= Total Cov	er	That Are OBL, FACW, or FAC:(A/B)
apling/Shrub Stratum (Plot size: 5 m	_)			Prevalence Index worksheet:
Abres balkanner		_/	FACU	Total % Cover of:Multiply by:
Pixea glance	25		FAC	OBL species x 1 =
			FAC	FACW species x 2 =
				FAC species 120 x3 = 360
		= Total Cov	-	FACU species 30 x4 = 120
erb Stratum (Plot size:)		- Total Cov	er	UPL species
Kalmia areustofelis	55	_/	FAC	
Cornus canadralis	25		FAC	Prevalence Index = B/A = 3. 7
Chaulthria hispidula	5		FAC	Hydrophytic Vegetation Indicators:
				Rapid Test for Hydrophytic Vegetation
				∠ Prevalence Index is ≤3.0¹
				<ul> <li>Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)</li> </ul>
			_	Problematic Hydrophytic Vegetation¹ (Explain)
			-	(Explain)
4				
		Total C-		Indicators of hydric soil and wetland hydrology must
oody Vine Stratum (Plot size:)	85	= Total Cove	er	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
oody Vine Stratum (Plot size:)	85 =	= Total Cove	er	be present, unless disturbed or problematic.
	85 =	= Total Cove	er	Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.  Hydrophytic Vegetation Present? Yes No

7-NOV-19

Sampling Point: U/ 5

( ) ( )	trix	Red	ox Features				
(inches) Color (mois	st) %	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
3-0							Organic
							9
			<del></del>				
							CONTRACTOR OF THE STATE OF THE
<del></del>							
<u> </u>							
							**************************************
Type: C=Concentration, D=	=Depletion, RM=F	Reduced Matrix, C	S=Covered	or Coate	d Sand Gra	ins. <sup>2</sup> Loc	ation: PL=Pore Lining, M=Matrix.
lydric Soil Indicators:					o ourid ord		for Problematic Hydric Soils <sup>3</sup> :
Histosol (A1)		Stripped Ma				Sandy	Gleyed Matrix (S4)
Histic Epipedon (A2)			elow Surface	€ (S8)			Prairie Redox (A16)
Black Histic (A3)		Thin Dark S				5 cm M	ucky Peat or Peat (S3)
Hydrogen Sulfide (A4)			ky Mineral (F		1)#		inganese Masses (F12)
<ul><li>Stratified Layers (A5)</li><li>Depleted Below Dark St</li></ul>	urfood (Add)		red Matrix (F	2)		Other (I	Explain in Remarks)
Thick Dark Surface (A12	onace (ATT)	Depleted M					
Sandy Mucky Mineral (S			Surface (F6 ressions (F8)				1.4
Depleted Dark Surface (			Material (TF:				
Sandy Redox (S5)	N /6		matorial (11)	-,			
unanerana automo e na							
Indicators of hydrophytic ve	getation and wetl	and hydrology mu	st be presen	t, unless	disturbed o	r problematic.	
Restrictive Layer (if observ				V			9
Type: Rock		-					
Depth (inches):5	ст	_				Hydric Soil F	Present? Yes No
			-500				
Vetland Hydrology Indicate		V 100 M 10 2			100-	Secondar	y Indicators (minimum of two require
Vetland Hydrology Indicate Primary Indicators (minimum							y Indicators (minimum of two require ce Soil Cracks (B6)
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1)		Water-Sta	ined Leaves	(B9)		Surfa	
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1) High Water Table (A2)			ined Leaves	(B9)		_ Surfa _ Drain	ce Soil Cracks (B6)
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3)		Water-Sta Aquatic F Marl Depo	ained Leaves auna (B13) osits (B15)			Surfa Drain Moss	ce Soil Cracks (B6) age Patterns (B10)
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)		Water-Sta Aquatic F Marl Depo	ained Leaves auna (B13) osits (B15) Sulfide Odo	r (C1)		Surfa Drain Moss Dry-S Satur	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16)
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)		Water-Sta Aquatic F Marl Depo	ained Leaves auna (B13) osits (B15)	r (C1)	ng Roots (C	Surfa Drain Moss Dry-S Satur	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) season Water Table (C2)
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)		Water-Sta Aquatic F. Marl Depo Hydrogen Oxidized	ained Leaves auna (B13) osits (B15) Sulfide Odo Rhizospheres of Reduced	r (C1) s on Livir Iron (C4)		Surfa Drain Moss Dry-S Saturt 3) Stunt	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) season Water Table (C2) ation Visible on Aerial Imagery (C9)
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)		Water-Sta Aquatic F. Marl Depo Hydrogen Oxidized I Presence Recent Iro	ained Leaves auna (B13) osits (B15) Sulfide Odo Rhizospheres of Reduced on Reduction	r (C1) s on Livir Iron (C4) in Tilled		Surfa Drain Moss Dry-S Satur 3) Stunt Geom	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) beason Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1)
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5)	of one is require	Water-Sta Aquatic F. Marl Depo Hydrogen Oxidized I Presence Recent Iro	ained Leaves auna (B13) osits (B15) Sulfide Odo Rhizospheres of Reduced on Reduction & Surface (C7	r (C1) s on Livir Iron (C4) in Tilled		Surfa Drain Moss Dry-S Satur 3) Stunt Geom Shallo	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) season Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) norphic Position (D2)
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aei	of one is required	Water-Sta Aquatic F. Marl Depo Hydrogen Oxidized I Presence Recent Irc Thin Muck Other (Ex	ained Leaves auna (B13) osits (B15) Sulfide Odo Rhizospheres of Reduced on Reduction	r (C1) s on Livir Iron (C4) in Tilled		Surfa Drain Moss Dry-S Saturt Geom Shalld	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) season Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) norphic Position (D2) ow Aquitard (D3)
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aer Sparsely Vegetated Cone	of one is required	Water-Sta Aquatic F. Marl Depo Hydrogen Oxidized I Presence Recent Irc Thin Muck Other (Ex	ained Leaves auna (B13) osits (B15) Sulfide Odo Rhizospheres of Reduced on Reduction & Surface (C7	r (C1) s on Livir Iron (C4) in Tilled		Surfa Drain Moss Dry-S Saturt Geom Shalld	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) season Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) norphic Position (D2) ow Aquitard (D3) topographic Relief (D4)
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aer Sparsely Vegetated Conditional	rial Imagery (B7) cave Surface (B8	Water-Sta Aquatic F. Marl Depo Hydrogen Oxidized I Presence Recent Iro Thin Muck Other (Exp	ained Leaves auna (B13) osits (B15) Sulfide Odo Rhizospheres of Reduced on Reduction a Surface (C7 olain in Rema	r (C1) s on Livir Iron (C4) in Tilled 7) arks)	Soils (C6)	Surfa Drain Moss Dry-S Saturt Geom Shalld	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) season Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) norphic Position (D2) ow Aquitard (D3) topographic Relief (D4)
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aet Sparsely Vegetated Condicited Observations: urface Water Present?	rial Imagery (B7) cave Surface (B8	Water-Sta Aquatic F. Aquatic F. Marl Depo Hydrogen Oxidized I Presence Recent Iro Thin Muck Other (Exp	ained Leaves auna (B13) osits (B15) Sulfide Odo Rhizospheres of Reduced on Reduction a Surface (C7 olain in Rema	r (C1) s on Livir Iron (C4) in Tilled r) arks)	Soils (C6)	Surfa Drain Moss Dry-S Saturt Geom Shalld	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) season Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) norphic Position (D2) ow Aquitard (D3) topographic Relief (D4)
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aer Sparsely Vegetated Conditional Conditiona	rial Imagery (B7) cave Surface (B8  Yes No Yes No	Water-Sta Aquatic F. Aquatic F. Marl Depo Hydrogen Oxidized Presence Recent Iro Thin Muck Other (Exp )  Depth (in	ained Leaves auna (B13) osits (B15) Sulfide Odo Rhizospheres of Reduced on Reduction a Surface (C7 olain in Rema	r (C1) s on Livir Iron (C4) in Tilled ') arks)	Soils (C6)	Surfa Drain Moss Dry-S Saturt Geom Shallc Micro FAC-I	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) season Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) norphic Position (D2) ow Aquitard (D3) topographic Relief (D4) Neutral Test (D5)
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aer Sparsely Vegetated Condicited Observations: urface Water Present? Vater Table Present? aturation Present?	rial Imagery (B7) cave Surface (B8  Yes No Yes No	Water-Sta Aquatic F. Marl Depo Hydrogen Oxidized I Presence Recent Irc Thin Muck Other (Exp )  Depth (in	ained Leaves auna (B13) osits (B15) Sulfide Odo Rhizospheres of Reduced on Reduction a Surface (C7 colain in Rema	r (C1) s on Livir Iron (C4) in Tilled r) arks)	Soils (C6)	Surfa Drain Moss Dry-S Saturt Geom Shalk Micro FAC-I	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) season Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) norphic Position (D2) ow Aquitard (D3) topographic Relief (D4)
High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aei	rial Imagery (B7) cave Surface (B8  Yes No Yes No	Water-Sta Aquatic F. Marl Depo Hydrogen Oxidized I Presence Recent Irc Thin Muck Other (Exp )  Depth (in	ained Leaves auna (B13) osits (B15) Sulfide Odo Rhizospheres of Reduced on Reduction a Surface (C7 colain in Rema	r (C1) s on Livir Iron (C4) in Tilled r) arks)	Soils (C6)	Surfa Drain Moss Dry-S Saturt Geom Shalk Micro FAC-I	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) season Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) norphic Position (D2) ow Aquitard (D3) topographic Relief (D4) Neutral Test (D5)
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aer Sparsely Vegetated Conditions: Furface Water Present? Vater Table Present? Further Table Present Present? Further Table Present Pre	rial Imagery (B7) cave Surface (B8  Yes No Yes No	Water-Sta Aquatic F. Marl Depo Hydrogen Oxidized I Presence Recent Irc Thin Muck Other (Exp )  Depth (in	ained Leaves auna (B13) osits (B15) Sulfide Odo Rhizospheres of Reduced on Reduction a Surface (C7 colain in Rema	r (C1) s on Livir Iron (C4) in Tilled r) arks)	Soils (C6)	Surfa Drain Moss Dry-S Saturt Geom Shalk Micro FAC-I	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) season Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) norphic Position (D2) ow Aquitard (D3) topographic Relief (D4) Neutral Test (D5)
Vetland Hydrology Indicate Primary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aer Sparsely Vegetated Condicited Observations: Furface Water Present? Vater Table Present? Includes capillary fringe)	rial Imagery (B7) cave Surface (B8  Yes No Yes No	Water-Sta Aquatic F. Marl Depo Hydrogen Oxidized I Presence Recent Irc Thin Muck Other (Exp )  Depth (in	ained Leaves auna (B13) osits (B15) Sulfide Odo Rhizospheres of Reduced on Reduction a Surface (C7 colain in Rema	r (C1) s on Livir Iron (C4) in Tilled r) arks)	Soils (C6)	Surfa Drain Moss Dry-S Saturt Geom Shalk Micro FAC-I	ce Soil Cracks (B6) age Patterns (B10) Trim Lines (B16) season Water Table (C2) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) norphic Position (D2) ow Aquitard (D3) topographic Relief (D4) Neutral Test (D5)



## **APPENDIX C: Photolog**

### Appendix C: Photolog



Photo 1: Representative Fen Habitat in WL 53



Photo 2: Representative Fen Habitat in WL 53



Photo 3: Representative Swamp Habitat in WL 54



Photo 4: Representative Swamp Habitat in WL 54



Photo 5: Representative Swamp Habitat in WL 55



Photo 6: Representative Fen Habitat in WL 55