

## **Enbridge**

### **2018 Wetland Survey Protocols (Rev 0)**

PRESENTED BY MERJENT, INC.  
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**APPENDICES**

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## **1.0 SCOPE**

The objective of the 2018 Wetland Field Survey Protocols is to ensure that Merjent and its subconsultants implement consistent field data collection procedures for wetland surveys. The 2018 Wetland Survey Protocol incorporates all applicable agency and client requirements to facilitate timely and complete permitting applications.

## **2.0 SURVEY PROTOCOLS**

Crews will delineate and collect data for all wetland features encountered in the environmental survey corridor as follows:

- Wetland delineation methods will follow the standardized protocol as described in the U.S. Army Corps of Engineers (“USACE”) Wetland Delineation Manual (1987) and associated Regional Supplements.
  - Surveys will require the collection of wetland boundaries, sample points, and completion of the appropriate USACE Regional Supplement sample point forms. The boundaries of each regional supplement are defined by the U.S. Department of Agriculture Land Resource Regions boundaries.
- Surveys will require the collection of a wetland community observation point location and collection of wetland community observation data for each wetland community.
- In Wisconsin only, a habitat assessment for rare flora will be conducted on public land concurrent with wetland and waterbody field surveys.

## **2.1 SAFETY**

Safety is a priority for Enbridge and Merjent. Compliance with all safety requirements is mandated by Enbridge and Merjent. For specific information on safety requirements, please refer to the Field Crew Handbook and the Safety Plans.

## **3.0 TYPICAL SAMPLING PROTOCOL**

The entire environmental survey corridor will be walked, not just the exterior boundary of a located wetland (as far as safe conditions allow). This will minimize the chance of missing upland inclusions or wetland communities that may affect permitting, construction, or mitigation.

All wetlands will be delineated regardless of potential jurisdictional status. Examples of potential scenarios and sampling can be found in Appendix A.

### **Vegetation**

Vegetation sampling and documentation will follow procedures as described in the appropriate Regional Supplement.

### **Hydrology**

Hydrology sampling and documentation will follow procedures as described in the appropriate Regional Supplement.

## **Soils**

Soil sampling and documentation will follow procedures as described in the appropriate Regional Supplement. This requirement includes one soil sample collected at each data point. Due to safety concerns, two exceptions are:

1. Soil sampling will be restricted to depths of 12 inches when sampling within 16 feet of a buried utility.
2. No soil sampling will occur near roadsides. In cases of roadside wetlands, crews will be restricted from sampling the soils and assume soils are hydric. Crews are to indicate such on their data forms (i.e., in soil notes write: "roadside wetland – soils assumed hydric").

## **Minimum size requirement of Wetlands**

Crews are to delineate isolated wetland features that are greater than 400 square feet in size. Examples include:

- 20-foot x 20-foot area
- 100-foot x 4-foot area

There will be instances where a small component of a larger wetland feature enters the corridor. Delineate these features when the portion within the corridor is greater than 50 square feet in size.

## **Upland Inclusions within Wetland Complexes**

Upland inclusions within a wetland may be observed. Upland inclusions greater than 1,500 square feet will be delineated. In these cases:

- Collect an USACE data form to represent the upland inclusion.

## **Photo Documentation**

Photos of all surveyed wetlands will be captured. The purpose of photos is to characterize the surveyed wetland. A representative photograph should be taken of each wetland. If multiple plant communities are present in each wetland, a representative photograph of each plant community should be taken. Photos of upland areas are not necessary. Photos should:

- Be taken in the landscape (horizontal) orientation;
- Be representative of the wetland plant community. It is not necessary to be standing within the wetland, and it may be preferable to stand back from the wetland plant community while taking the photo;
- Not be taken looking into the sun as this will obscure the photo. When possible, the sun should be at the back of the photographer;
- Be level with the horizon such that the top quarter of the photo captures the sky (assuming flat topography and open conditions); and
- Be taken of National Wetland Inventory ("NWI") wetlands that are entirely upland (see below).

## National & Wisconsin Wetland Inventories – Upland Verification

An area may be identified as an NWI or Wisconsin Wetland Inventory (“WWI”) wetland, but field indicators may conclude that the area is entirely upland. In these situations, field crews will:

1. Collect a USACE wetland determination data point location within the area indicated by NWI to be wetland.
2. Complete a USACE wetland determination data form (including soils) to document why the NWI-indicated area is entirely upland.
3. Take a photograph of the NWI-indicated area to further characterize its upland nature.

In other instances, crews may locate an NWI or WWI that overlaps the observed wetland or is “skewed” from the observed wetland. In those cases, no additional documentation is needed for the upland fragment of the NWI area.

## Lakes & Ponds

Lakes, ponds, and areas of small open water will be delineated as wetland features and classified according to the Cowardin Classification System (i.e., either Lacustrine or Palustrine).

A USACE wetland determination data point per feature may not be necessary where a lake or pond feature either lacks a vegetative fringe or has a narrow fringe comprised of annual or perennial vegetation.

Crews are to collect a wetland USACE determination point in the vegetative fringe if one is present. In that situation, crews should note in the data form that the emergent component is associated with an open water feature and crews should identify the Cowardin class for the open water component within the remarks section of the wetland data form (e.g., PUBx, L1UBH).

## Roadside Ditches

As outlined in the safety plans, no digging may occur in roadside ditches because of the increased likelihood that buried utilities will be present. Roadside ditches may fall into one of the three following categories:

The crews will delineate roadside ditches as wetlands when:

- They are entirely vegetated and dominated by hydrophytic vegetation; and
- A bed and bank are not present (i.e., no ordinary high water mark [“OHWM”]).

“Roadside ditch wetlands” will use the Wetland ID nomenclature outlined in this document, and only the vegetation and hydrology section of the USACE wetland determination data form will be filled out. Indicate in the soil comments, “Soils not sampled due to safety requirements – soils assumed hydric”.

The crews will delineate roadside ditches as waterbodies when:

- A bed and bank are present (i.e., OHWM present).

“Roadside ditch waterbodies” will use the Waterbody ID nomenclature outlined in the Merjent 2018 Waterbody Survey Protocol.

The crews will not delineate roadside ditches and consider roadside ditches upland ditches when:

- They are entirely vegetated and dominated by facultative upland and upland species (not wetland species); and
- A bed and bank are not present (i.e., no OHWM).

### **Flora Habitat Assessment (Wisconsin Only)**

In Wisconsin, a rare flora habitat assessment will be conducted on previously un-surveyed public properties concurrent with wetland and waterbody field surveys. The habitat assessment will determine if suitable habitat for rare flora is present. Specifically, the focus will be on habitat for the neat spike-rush (*Eleocharis nitida*). The neat spike-rush is found in moist old fields, ditches, and prairies.

### **Special Resources**

Special resources are features of unique agency designation or meet the criteria of unique agency designations. In general, all special resources wetlands will be delineated following standard delineation methods as described above. In addition, special resource wetlands will likely be evaluated by the team's botanical staff separate from the delineation process.

### **Existing (Known) Special Resources**

Known special resources such as areas identified as High and Outstanding Sites of Biological Significance by the Minnesota Biological Survey (formerly Minnesota County Biological Survey) and the Pokegama-Carnegie Wetland Complex in Douglas County will automatically be surveyed by the team's botanical staff. The areas will be identified during the desktop review and targeted for rare plant surveys. The results of the botanical surveys will be addressed in a separate report.

### **Unknown Special Resources**

There may be situations where field crews identify a previously undocumented special resource, such as calcareous fens. In these situations, field crews will report their findings to the biological lead, who will immediately alert the team. The team will formulate an adaptive field survey strategy to address these types of occurrences.

## **4.0 FIELD DATA COLLECTION**

Data collection is limited to the bounds of the environmental survey corridor. Data will be collected electronically using a GPS datalogger and a mobile tablet computer (tablet). Survey teams will consist of two people. Recommended division of responsibility is as follows:

- Crew Member A will operate a sub-meter GPS datalogger (i.e., Trimble GeoXT) to GPS the wetland boundary and USACE sample point locations.
- Crew Member B will operate a tablet to collect wetland parameter data, which includes:
  - USACE Wetland Determination Data Form information;
  - Wetland community observation point information;
  - Photo, caption, and location; and

- In Wisconsin only, flora habitat characterization on previously un-surveyed public land.

## **4.1 DATA PROCESSING**

### **4.1.1 Daily Data Upload**

All data collected with the GPS datalogger will be converted to a GIS shapefile format and uploaded nightly to Merjent's Sharepoint site. Merjent shall review this data to confirm daily progress in the field.

All data collected via tablet, or otherwise, will be uploaded to Merjent's SharePoint site on a daily basis.

The daily uploaded data (GIS, tablet data and photos) shall be considered "raw" data that has not undergone post-processing, QA/QC, or editing. Merjent shall review all raw data to confirm completeness.

### **4.1.2 Post-Processed Data**

Spatial data collected in the field will be post-processed by Merjent's subconsultant. Line data of wetlands and waterbodies will be processed into appropriate polygons and lines. The subconsultant will QA/QC attribute data collected by Crew Member B on the tablets. GIS data will also include point data representing data collection points. The Feature ID of wetland polygons and waterbody lines must match that of the point data.

Post processing of the data will include edits to wetland lines and community polygons within a given wetland complex. Data sheets may also require editing following collection in the field. Community polygons will be created during post-process within each wetland feature to match collected community observation points. A unique numerical ID will be assigned for each community within a wetland.

An updated, contractor QA/QC Geodatabase of all GIS data, and updated data sheets are due Mondays at 9:00 a.m. CDT. This data shall include all data collected up to eight days prior to the due date (i.e., the May 21 data submittal shall include all data collected through May 14). Merjent will conduct an additional QA/QC review of all data submitted.

### **4.1.3 Coordinate System**

The following coordinate systems and projections will be used for all field-collected data. The transition shall occur at the North Dakota/Minnesota state border.

- North Dakota: North Dakota State Plane North, NAD 83 U.S. feet
- Minnesota and Wisconsin: Minnesota State Plane North, NAD 83 (2011) U.S. feet

## 4.1.4 Electronic Devices

### Trimble GeoXT

Sub-meter Trimble GeoXT units will be used to locate wetland boundaries and USACE sample point locations within the environmental survey corridor.

### Mobile Tablet Computer

USACE data form information, wetland community observation point data, and photos will be collected using a tablet.

## 4.2 FIELD DATA ID NOMENCLATURE

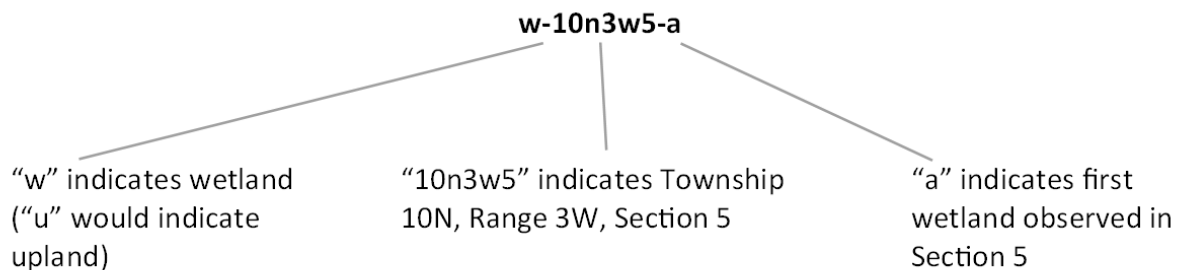
### 4.2.1 Community Type Classification

The wetland community type will be categorized based on the Cowardin Classification System, Eggers & Reed Classification System, and Circular 39.

For wetlands with multiple Cowardin classes, each discrete community will be identified when it comprises 10 percent or more of the wetland complex. Each discrete community within a wetland complex will require a “wetland community observation point” form and photo. Each unique community will also require a representative USACE Wetland Determination Form.

Each wetland will be labeled in the following manner:

- “w”; Township; Range; Section; Alphabetical Designation
  - “w” – Each Wetland ID begins with a static “w”
  - Township – Unique USGS Township where the subject feature is located
  - Range – Unique USGS Range where the subject feature is located
  - Sections – Unique USGS Section where the subject feature is located
  - Alphabetical designation in consecutive order within the Township, Range, Section (“TRS”)
    - If there are more than 26 waterbodies located within a TRS, lettering designation will continue as “aa”, “ab”, “ac”, etc.
  - Nomenclature 2 – Wetland ID, continued





Example 1 (above): w-10n3w5-a is the first waterbody delineated within Section 5 of Township 10 N, Range 3W. Note the usage of hyphens.

## **USACE Wetland Determination Data Sheets & Points (Wetland & Upland)**

Each USACE wetland determination data point will be labeled in the following manner.

- Wetland (“w”) or Upland (“u”); Township/Range/Section; Alphabetical Designation; Point Number.
  - As with the “w-10n3w5-a” example above, all data points for this wetland will contain 10n3w5-a, which identifies these data points as part of the first wetland delineated within Section 5, Township 10 N, Range 3W.
  - Wetland data sheets will begin with “w” and end with a Point Number that increases with each wetland data point collected (“w-10n3w5-a2” “w-10n3w5-a3” and so on).
  - Upland data sheets will begin with “u” and end with a Point Number that increases with each upland data point collected (“u-10n3w5-a2” “u-10n3w5-a3” and so on).
  - Transects of upland/wetland data points should have matching point numbers when possible (“u-10n3w5-a2” paired with “w-10n3w5-a2”).

## **Photos**

Photo IDs should match Wetland IDs. To take a photo of a wetland, or a specific plant community within a complex, it may be necessary to do so from outside the wetland or community. The name for the photo should match the wetland or community being photographed; not the location where it was taken. For example, a photo of a wetland taken from an upland should be labeled with a W, not a U or upland label.

### **4.2.2 Data Collection Fields**

#### ***Wetland Line Data – Collected on a Trimble GeoXT***

1. Feature\_ID – See above for naming convention.
2. Survey\_Date – Date data was collected in the field. Format should be month/day/year (xx/xx/xxxx).
3. Staff – Three-letter initials in all caps for all crew members (i.e., ABC/DEF).

#### ***Wetland Community Observation Point – Collected on a Trimble GeoXT***

1. Feature\_ID – See above for naming convention.
2. Sub Community ID – Starting with “01”, increase incrementally for each wetland community within a wetland complex.
3. Survey\_Date – Date data was collected in the field. Format should be month/day/year (xx/xx/xxxx).
4. Cowardin – Select PEM, PFO, PSS, PUB, L1UB, L2UB.

#### ***USACE Data Form Point – Collected on a Trimble GeoXT***

1. USACE Form ID – Must match USACE Form ID collected on tablet device.
2. Survey\_Date – Date data was collected in the field. Format should be month/day/year (xx/xx/xxxx).
3. Cowardin – Select PEM, PFO, PSS, PUB, L1UB, L2UB or UPL.

**Wetland Community Observation Form – Collected on a tablet**

1. Feature\_ID – See above for naming convention.
2. Sub Community ID – Starting with “01”, increase incrementally for each wetland community within a wetland complex.
3. Survey\_Date – Date data was collected in the field. Format should be month/day/year (xx/xx/xxxx).
4. Staff – Three-letter initials in all caps for all crew members (i.e., ABC/DEF).
5. Cowardin – Select PEM, PFO, PSS, PUB, L1UB, L2UB.
6. Eggers & Reed – Identify the appropriate community type.
  - a) Seasonally Flooded Basin
  - b) Shallow, Open Water Community
  - c) Fresh (Wet) Meadow
  - d) Wet to Wet-Mesic Prairie
  - e) Calcareous Fen
  - f) Deep Marsh
  - g) Shallow Marsh
  - h) Sedge Meadow
  - i) Open Bog
  - j) Shrub-Carr
  - k) Alder Thicket
  - l) Coniferous Swamp
  - m) Coniferous Bog
  - n) Hardwood Swamp
  - o) Floodplain Forest
7. Circular 39
  - a) Type 1 – Seasonally Flooded Basins or Floodplains
  - b) Type 2 – Wet Meadows
  - c) Type 3 – Shallow Marshes
  - d) Type 4 – Deep Marshes
  - e) Type 5 – Open Water Wetlands
  - f) Type 6 – Shrub Swamps
  - g) Type 7 – Wooded Swamps
  - h) Type 8 – Bogs
8. Dominant Plants – List the top three dominant plants.
9. Notes – Relevant information observed by crews in the field.
10. Data Sheet – Was a data sheet completed for the sample point (Y/N).
11. County – County the wetland is located in.
12. State – State the wetland is located in.

**USACE Wetland Determination Forms (applicable regional supplement)**

1. Standard USACE form information.

**5.0 DATA REVIEW PROCESS****5.1.1 Field QA/QC**

All geospatial data created and maintained by Merjent shall be subject to QA/QC, which may include checks for completeness, physical consistency, logical consistency, positional accuracy,

thematic accuracy, and temporal accuracy. Please reference the Geospatial Data Management Plan for additional information about field data QA/QC.

**Appendix A**  
**Illustrated Field Scenario Examples**

## ILLUSTRATED FIELD SCENARIOS

### Example 1. Small Size (<750' linear boundary length) and One Vegetative Community

Collection should include:

- 1) **1 red point** to represent upland USACE wetland determination data form (on the tablet) and associated GPS location (on the Trimble);
- 2) **1 blue point** to represent wetland USACE wetland determination data form (tablet) and associated GPS location (Trimble);
- 3) **1 gold star** to represent wetland community observation point form with photo (tablet); and
- 4) **Blue lines** to represent GPS location of wetland boundary (Trimble).
  - a. Crews should collect enough vertices to capture the true shape of the wetland feature and avoid square or rectangular boundaries.
  - b. At a minimum, five points should be recorded per vertex.



## Example 2. Large Size (>750' linear boundary length) and One Vegetative Community

Collection should include:

- 1) **2 red points** to represent upland USACE wetland determination data forms (on the tablet) and associated GPS location (on the Trimble);
- 2) **2 blue points** to represent wetland USACE wetland determination data forms (tablet) and associated GPS location (Trimble);
- 3) **1 gold star** to represent wetland community observation point form with photo (tablet); and
- 4) **Blue lines** to represent GPS location of wetland boundary (Trimble).
  - a. Crews should collect enough vertices to capture the true shape of the wetland feature and avoid square or rectangular boundaries.
  - b. At a minimum, five points should be recorded per vertex.



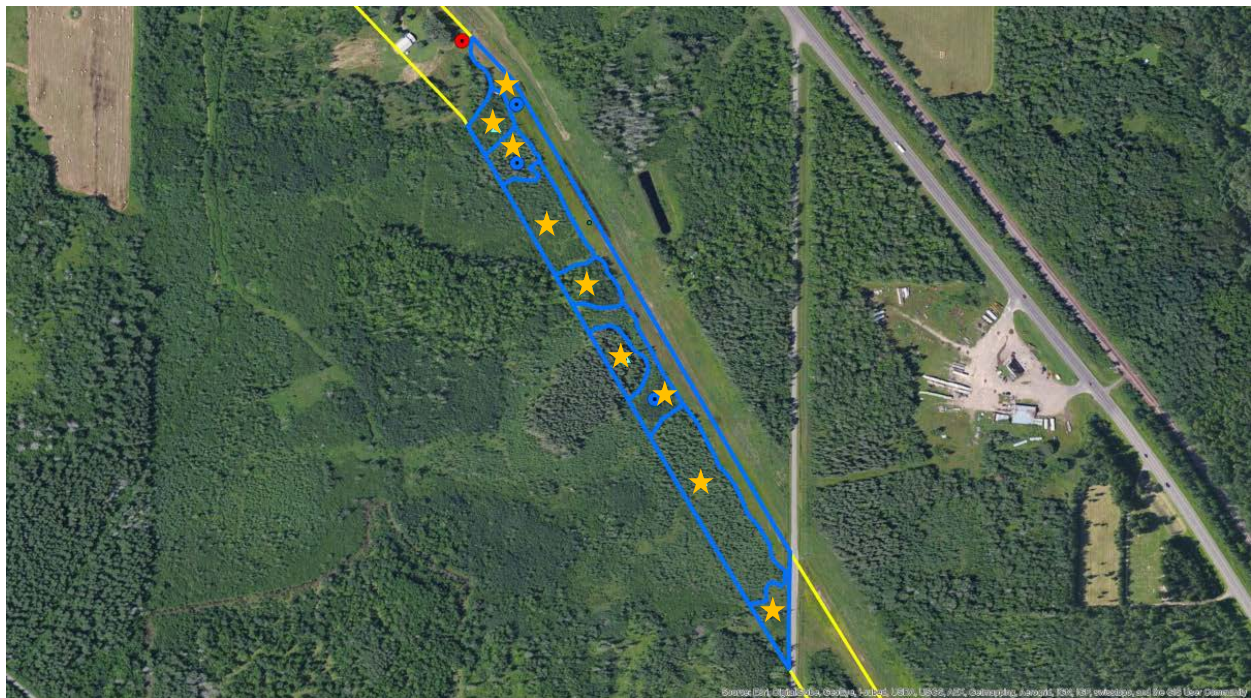


**Example 3. Large Size (>750' linear boundary length), 3 Unique Vegetative Communities Comprised of 9 Discrete Areas, and One Wetland Boundary Adjacent to the Road**

Collection should include:

- 5) **1 red point** to represent upland USACE wetland determination data form (on the tablet) and associated GPS location ( on the Trimble);
- 6) **3 blue points** to represent wetland USACE wetland determination data forms (tablet) and associated GPS location (Trimble);
- 7) **9 gold stars** to represent wetland community observation point forms with photo (tablet); and
- 8) **Blue lines** to represent GPS location of wetland boundary (Trimble).
  - a. Crews should collect enough vertices to capture the true shape of the wetland feature and avoid square or rectangular boundaries.
  - b. At a minimum, five points should be recorded per vertex.

When multiple wetland community boundaries (gold stars) are present, respective GIS staff will align them during the QA/QC process.



#### Example 4. Upland Inclusions (>1,500 ft<sup>2</sup>) and 2 Unique Vegetative Communities

Collection should include:

- 1) **3 red points** to represent upland USACE wetland determination data forms (on the tablet) and associated GPS location (on the Trimble);
- 2) **2 blue points** to represent wetland USACE wetland determination data forms (tablet) and associated GPS location (Trimble);
- 3) **2 gold stars** to represent wetland community observation point forms with photo (tablet); and
- 4) **Blue lines** to represent GPS location of wetland boundary (Trimble).
  - a. Crews should collect enough vertices to capture the true shape of the wetland feature and avoid square or rectangular boundaries.
  - b. At a minimum, five points should be recorded per vertex.

When multiple wetland community boundaries are present, respective GIS staff will align them during the QA/QC process.





### Example 5. Series of 2 Wetlands in Close Proximity to One Another

Collection should include:

- 1) **4 red points** to represent upland USACE wetland determination data forms (on the tablet) and associated GPS location (on the Trimble);
- 2) **3 blue points** to represent wetland USACE wetland determination data forms (tablet) and associated GPS location (Trimble);
- 3) **2 gold stars** to represent community observation point forms with photo (tablet); and
- 4) **Blue lines** to represent GPS location of wetland boundary (Trimble).
  - a. Crews should collect enough vertices to capture the true shape of the wetland feature and avoid square or rectangular boundaries.
  - b. At a minimum, five points should be recorded per vertex.

When multiple wetland community boundaries (gold stars) are present, respective GIS staff will align them during the QA/QC process.



## Example 6. Lakes, Ponds and Open Water

Collection should include:

- 1) **1 red point** to represent upland USACE wetland determination data form (on the tablet) and associated GPS location (on the Trimble);
- 2) **1 blue point** to represent wetland USACE wetland determination data form (tablet) and associated GPS location (Trimble);
- 3) **1 gold star** to represent wetland community observation point form with photo (tablet); and
- 4) **Blue lines** to represent GPS location of wetland boundary (Trimble).
  - a. Crews should collect enough vertices to capture the true shape of the wetland feature and avoid square or rectangular boundaries.
  - b. At a minimum, five points should be recorded per vertex.

