Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project

Prepared for:

Minnkota Power
MPC COOPERATIVE, INC.
Your Touchstone Energy® Partner

May 20, 2008

McCain and Associates, Inc.
2718 Gateway Avenue
Suite 101
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Biological Assessment and Wetland Delineation Report
Pillsbury to Fargo Generation Outlet Project
Minnkota Power Cooperative, Inc.

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1.0 Introduction

McCain and Associates, Inc. (McCain) conducted a biological assessment and delineated wetlands for the Minnkota Power Cooperative Pillsbury to Fargo Generation Outlet project. Surveys for species and habitats of concern and wetland delineations were conducted along a proposed overhead transmission line route from the proposed Pillsbury, North Dakota, substation to the proposed substation located near Reille's Acres north of Fargo, North Dakota. Surveys and delineations were confined to a 200-foot wide corridor as defined by the proposed centerline (100 feet both sides) location. The proposed route is approximately 61 miles in length and extends from Section 7 of Ellsbury Township (Barnes County) to Section 21 of Reed Township (Cass County), North Dakota.

The western portion of the project corridor is located in the Glaciated Drift Prairie Region of North Dakota. This region is characterized by gently rolling hills and numerous prairie wetlands. Cropland is the predominant land-use although grassland areas exist along stream courses and as Conservation Reserve Program (CRP) fields.

The eastern portion of the corridor is located in the Red River Valley. This region is characterized by level topography and deep fertile soils. Relatively few natural wetlands are found in this region. Cultivated croplands and drainage ditches are prevalent in this area.

Surveys and delineations were conducted on April 26 – May 1, May 9, and May 16, 2008. Surveys and delineations were conducted by Greg Meyer, McCain, and Dr. Bruce Seelig, Earth Resources Analytical.

2.0 Biological Assessment

McCain performed a biological assessment for species and habitats of concern for the proposed route. HDR Engineering, Inc. (HDR) solicited comments from state and federal agencies regarding species and habitats of concern that may be affected by the project. Comments were received from the United States Fish and Wildlife Services (USFWS), the North Dakota Game and Fish Department (NDGFD), and the North Dakota Parks and Recreation (NDPR).

Documented locations of species and habitats of concern along the proposed project corridor were obtained from the USFWS and the North Dakota Natural Heritage Inventory (NDNHI). Other potential locations of occurrence were identified by aerial photography interpretation and during the field survey. The documented and potential locations were surveyed for the existence of identified species and habitats during the April 26 – May 1, May 9, and May 16, 2008, field work.

2.1 U.S. Fish and Wildlife Service

The USFWS develops and manages programs for the conservation, protection, and enhancement of fish, wildlife, plants, and their habitats and provides comments and recommendations to projects concerning the Endangered Species Act (ESA) and others. McCain is in receipt of the February 20, 2008, and April 22, 2008, letters from the USFWS that identify two threatened and endangered species that may be located within, or near, the proposed project corridor. The two threatened, endangered, and candidate species identified by the USFWS are:

- Dakota skipper
- Whooping Crane

Discussions regarding impacts to these two species are included below.

2.1.1 Dakota Skipper

Potential habitat for the Dakota skipper is located near the proposed project area. In 1995, the Dakota skipper was listed as a candidate species under the ESA. No legal requirement exists to protect candidate species; however, it is within the spirit of the ESA to consider these species as having significant value and worth protecting (USFWS 2008).

The Dakota skipper is a small to medium-sized, hesperiine butterfly that has been historically found in Barnes County. Dakota skippers are associated with high quality prairie ranging from wet-mesic, tallgrass prairie to dry-mesic, mixed grass prairie. Eastern North Dakota prairies inhabited by Dakota skippers are dominated by warm-season or bluestem grasses that almost always contain wood lilies, harebells and camas (Royer and Marrone 1992 cited in USFWS 2008) and that are generally associated with glacial lake margins with alkaline soils (McCabe 1981).

Larvae of the Dakota skipper feed on grasses, favoring little bluestem. Adults emerge in mid-June, feeding on the nectar of flowering native forbs. Harebell (*Campanula*

rotundifolia), wood lily (*Lilium philadelphicum)*, and purple coneflower (*Echinacea angustifolia*) are common components of their diet (COSWIC 2004a).

McCain surveyed the proposed transmission line route for native prairie habitat. The proposed transmission line route does not cross any tracts of native prairie. Grasslands present along the route are fields seeded for the Conservation Reserve Program (CRP) and pasture areas seeded with non-native grass species. Construction of the overhead transmission line is not likely to adversely affect the Dakota skipper

2.1.2 Whooping Crane

Whooping cranes historically nested in North Dakota but only migrants have been documented in recent years. The primary nesting area for whooping cranes occurs at Canada's Wood Buffalo National Park with wintering areas in Aransas National Wildlife Refuge in Texas. During spring and fall migration they utilize large shallow marshes for roosting and loafing and primarily feed in harvested grain fields.

Whooping cranes migrate through west and central North Dakota counties during the spring and fall migrations. They roost on wetlands and stock dams with high visibility and feed in cultivated areas. Young adults summered in North Dakota in 1989, 1990, and 1993. The total population of whooping cranes is between 140 – 150 birds. There have been historical sightings of migrating whooping cranes in Cass and Barnes counties but the USFWS considers the likelihood of the project impacting whooping cranes discountable (USFWS 2008).

There were no sightings of whooping cranes during the field survey although suitable habitat is present along the overhead transmission line route. Construction of the overhead transmission line is not likely to adversely affect whooping cranes.

2.2 North Dakota Game and Fish Department

The NDGFD manages wildlife and fisheries populations within the State of North Dakota. They also provide comments and recommendations on projects concerning their potential impact to natural resources within North Dakota.

McCain is in receipt of the February 28, 2008, letter from the NDGFD. The letter identifies the importance of protecting wetlands and the fishery resources of the Sheyenne and Maple Rivers; minimizing erosion and sedimentation of streams; and minimizing the destruction of woody vegetation (NDGF 2008).

2.3 North Dakota Parks and Recreation Department

The North Dakota Parks and Recreation Department (NDPR) maintains the North Dakota Natural Heritage biological conservation database known as the NDNHI. The database is an inventory of plant and animal species of concern and significant ecological communities in North Dakota.

McCain is in receipt of the February 28, 2008, letter from the NDPR that identifies eight species and one ecological community (habitat) of concern that occur within one mile of the proposed project. The species and habitat of concern listed in the letter are:

- Fusconaia flava (Wabash pigtoe mussel)
- Ligumia recta (black sandshell mussel)
- Potamilus alatus (pink heelsplitter mussel)
- Quadrula quadrula (mapleleaf mussel)
- Ameiurus natalis (yellow bullhead)
- Eleocharis wolfii (Wolf's spikerush)
- Eumeces septentrionalis (prairie skink)
- Phoxinus eos (Northern redbelly dace)
- Spartina pectinata – Calamagrostis stricta – Carex spp. herbaceous vegetation (wet prairie)

Six of the eight species of concern listed by the NDHNI are riverine species. It is assumed that no construction will occur within rivers/streams; therefore, no surveys were conducted for these species. McCain performed surveys for the remaining species and habitat. Discussions of the results of the survey are included below

2.3.1 Wabash Pigtoe Mussel

The Wabash pigtoe mussel is found in beds of gravel, sand, or mud in the Sheyenne River and to a lesser degree the Red River in North Dakota. Land use practices adjacent to rivers have contributed to its decline (Dyke 2004). The Wabash pigtoe mussel was historically (1974 sighting) located approximately 1.5 miles south of the project area in the Sheyenne River (NDNHI 2008). Construction of an overhead transmission line will not impact flow patterns of the water system in the area. No survey for the Wabash pigtoe mussel was performed.

2.3.2 Black Sandshell Mussel

The Black sandshell mussel is found in sand or gravel bottoms of the Red and Sheyenne Rivers in North Dakota, often in areas of swift current. Land use practices adjacent to rivers have contributed to its decline (Dyke 2004). The black sandshell mussel was historically (1974 sighting) located approximately 1.5 miles south of the project area in the Sheyenne River (NDNHI 2008). Construction of an overhead transmission line will not impact flow patterns of the water system in the area. No survey for the Black sandshell mussel was performed.

2.3.3 Pink Heelsplitter Mussel

The Pink heelsplitter mussel is found in the mud or sand bottoms of the Red and Sheyenne Rivers in North Dakota. Land use practices adjacent to rivers have contributed to its decline (Dyke 2004). The Pink heelsplitter mussel was historically (1974 sighting) located approximately 1.5 miles south of the project area in the Sheyenne River (NDNHI 2008). Construction of an overhead transmission line will not impact flow patterns of the water system in the area. No survey for the Pink heelsplitter mussel was performed.

2.3.4 Mapleleaf Mussel

The Mapleleaf mussel occurs in the sand, mud or gravel bottoms of the Red River and to a lesser degree the Sheyenne River in North Dakota. Land use practices adjacent to rivers have contributed to its decline (Dyke 2004). The Mapleleaf mussel was historically (1974 sighting) located approximately 1.5 miles south of the project area in the Sheyenne River (NDNHI 2008). Construction of an overhead transmission line will not impact flow patterns of the water system in the area. No survey for the Mapleleaf mussel was performed.

2.3.5 Yellow Bullhead

North Dakota is the western edge of this species range. The yellow bullhead has been recorded in the Red and Sheyenne Rivers in North Dakota and may occur in other tributaries of the Red River (Dyke 2004). The yellow bullhead was historically (1959 sighting) located approximately 1.5 miles south of the project area on the Sheyenne River (NDNHI 2008). Construction of an overhead transmission line will not impact flow patterns of the water system in the area. No survey for the Yellow bullhead was performed.

2.3.6 Prairie Skink

The prairie skink is a small insectivorous lizard found in the Red River Valley in North Dakota. The prairie skink prefers grassland habitat in sandy areas (Dyke 2004). The prairie skink requires sandy soils for nesting, summer burrows and overwintering habitat (COSEWIC 2004b). Loss of habitat is attributed to cultivation, suppression of fire (resulting in wooded stands), and invasion of leafy spurge (COSWIC 2004b).

A prairie skink was documented (year and exact location unknown) in Section 19, T 141 N, R 053 W. This location is five miles south of the proposed corridor. There were no sightings of prairie skinks during the field review.

2.3.7 Northern Redbelly Dace

The northern redbelly dace is a small minnow that occurs in slow current areas near springs or seeps. They are especially adapted to beaver ponds and headwaters of small streams. They are considered key species of conservation priority for the Rush River and Sheyenne River of eastern North Dakota, and the Cannonball River, Heart River, Knife River, and the Little Missouri River of western North Dakota (Hagen et al. 2005). Changes in land uses near rivers has been contributed to the decline in number (Dyke 2004).

The northern redbelly dace was historically (1972 sighting) located approximately 0.5 miles north of the project area in Brewer Lake, along the Rush River (NDHI 2008). Construction of an overhead transmission line will not impact flow patterns of the water system in the area. No survey for the northern redbelly dace was performed.

2.3.8 Wolf's Spikerush

Cordgrass and sedge wet prairies support wolf's spikerush. The habitat for this species is threatened by a reduction in native wetland and grassland habitat often caused by invasive species or wetland drainage. Historic records from North Dakota describe habitat for this documented sighting as a roadside ditch that has since been developed (NatureServe 2006). Wolf's spikerush was historically (1901 sighting) documented approximately 3.0 miles from the project area (NDHI 2008). There were no sightings of Wolf's spikerush during the field survey.

2.3.9 Cordgrass Wet Prairie

Wet prairie dominated by prairie cordgrass (*Spartina pectinata) – northern reedgrass (Calamagrostis stricta)* and sedges (*Carex* spp.) herbaceous vegetation occurs in the northern Great Plains. It occurs in poorly drained soils of prairie wetlands, drainage bottoms, and depressions within floodplains of major rivers (NatureServe 2008).

The proposed overhead transmission crosses the quarter section where a sighting was recorded in 1983 (NDHI 2008). It is not known which wet area in the quarter section the habitat was found; however, no habitat was observed during the field review due to agricultural cultivation and drainage. It is recommended that construction activities in this quarter section avoid wet areas as much as practical. Photograph one in Appendix B shows the probable area of the recorded sighting.

3.0 Wetland Delineation

Wetland delineations were conducted in accordance with the U.S. Army Corps of Engineers (COE) 1987 Wetland Delineation Manual (Manual). The determination of permanent or temporary impacts to and mitigation of individual wetlands was outside the scope of work for this project.

3.1 Delineation Procedures

Methodologies and criteria outlined by the Manual were used to identify and delineate wetlands for this project. The Manual provides the technical criteria for determining wetlands for purposes of Section 404 of the Clean Water Act. It specifies that positive evidence of hydrophytic vegetation, hydric soils, and wetland hydrology are criteria for wetland identification and delineation. Areas meeting all three criteria are classified as wetlands.

Wetland boundaries were established in the field based on soils, vegetation, hydrology, and landscape. Wetland areas were systematically characterized by numerous observation points to define the boundaries. The frequency of observation points was increased in transitional areas between uplands and lower areas to adequately characterize the wetland boundary location. Boundaries were digitally recorded with a Trimble XH Global Positioning System (GPS).

Climatic conditions were normal prior to and during the evaluation. Observation points were considered normal if indicators were identifiable during the field visit. Section D and Data Form 1 of the Manual were utilized for all “normal” observation points.

Existing vegetation was classified using hydrophytic vegetation criteria outlined in the Manual and the *National List of Plant Species that Occur in Wetlands: 1996 National Summary* (Kartesz, 1996). Hydric soil indicators were determined using the *Field Indicators of Hydric Soils in the United States*; *Guide for Identifying and Delineating Hydric Soils, Version 6.0* (USDA-NRCS, 2006). Hydrology was determined on-site by observation of hydrologic indicators. Aerial photography was used to assist hydrology determinations.

A review of existing resource information and a field evaluation were used to compile the results. No minimal size or area of wetland delineation was specified. Barnes and Cass County aerial photographs, USDI-Fish and Wildlife Service National Wetland Inventory (NWI) (Environmental Laboratory, 1987), and the digital soil survey of Barnes and Cass Counties (USDA-NRCS, 2008), were consulted prior to field investigations.

3.2 Delineation Results

Sixty one wetland areas were delineated during the field surveys. Individual wetlands are identified with an observation point number. The observation point number is designated by Section, Township, Range, and number of occurrence within that section (i.e. Section 07, Township 143, Range 056, and wetland number 1 in that section: 07143056-1). Wetlands crossed by the proposed centerline that are connected outside of the survey corridor received the same observation point number.

There are numerous wetlands along the corridor route that appear on NWI maps and have NWI designations that McCain did not delineate. It was evident during the field survey that these wetlands have a history of being cultivated and used intensively for agricultural production. Typically, these "farmed" wetlands are small, isolated basins and are not considered jurisdictional by the COE. Representative photographs of wetland areas along the corridor route are included in Appendix B.

Documentation of the vegetation, hydrology, and hydric soils are recorded on the associated COE Data Forms (Appendix C). The delineated wetland locations in relation to the proposed route and survey corridor are depicted on the figures in Appendix D. Table 1 lists individual wetlands by identification number, corresponding figure location (Appendix C), and identifies if the wetland is an isolated basin or may possibly be connected to COE jurisdictional waters.

Table 1. Delineated Wetlands

WETLAND ID	FIGURE	NWI DESIGNATION	ISOLATED[1]/CONNECTED[2]
07143056-1	1	PEMF	ISOLATED
07143056-2	1	PEMC	CONNECTED
08143056-1	1	PEMA	ISOLATED
08143056-2	1		ISOLATED
08143056-3	1	PEMAd/PEMC	CONNECTED
09143056-1	1		CONNECTED
16143056-1	1	PEMC	ISOLATED
16143056-2	1	PEMF	ISOLATED
16143056-3	1	PEMC	ISOLATED
16143056-4	1	PEMF	ISOLATED
16143056-6	1 & 2	PEMA	ISOLATED
15143056-1	2	PEMC/PEMCd	CONNECTED
22143056-1	2	PEMAd	CONNECTED
22143056-2	2		CONNECTED
22143056-3	2		CONNECTED
22143056-4	2	PEMC/PEMA	CONNECTED
22143056-5	2	PEMA	CONNECTED
23143056-1	2	PSSCx	CONNECTED
23143056-3	2		ISOLATED
23143056-4	3		ISOLATED
23143056-5	3	PEMA	ISOLATED
24143056-1	3	PEMA	ISOLATED
30143055-1	3	PEMA	CONNECTED
30143055-2	3	PEMA	ISOLATED

WETLAND ID	FIGURE	NWI DESIGNATION	ISOLATED[1]/CONNECTED[2]
29143055-1	3		CONNECTED
32143055-1	4		CONNECTED
34143055-1	4		CONNECTED
34143055-3	4		CONNECTED
34143055-2	4	PEMA	ISOLATED
34143055-4	4		ISOLATED
34143055-5	4		ISOLATED
01142055-1	5		ISOLATED
01142055-2	5		ISOLATED
11142055-3	5	PEMC	ISOLATED
11142055-4	5		ISOLATED
11142055-5	5	PEMC	CONNECTED
11142055-6	5	PEMA	ISOLATED
07142055-1	5	PEMAd	CONNECTED
17142054-1	6	PEMC	ISOLATED
20142054-1	6		CONNECTED
20142054-2	6		CONNECTED
21142054-1	7	PEMAd	CONNECTED
26142054-1	8		CONNECTED
30142053-1	8	PFOC	CONNECTED
31142053-1	8	PEMA	ISOLATED
33142053-1	9	PABFx/PEMA	CONNECTED
34142053-1	9		CONNECTED
34142053-2	9	PEMC	CONNECTED
35142053-1	10	PEMC	ISOLATED
36142053-1	10	PEMC	CONNECTED
33142052-1	11	PEMA	ISOLATED
35142052-1	12		ISOLATED
35142052-2	12		CONNECTED
06141051-1	12 - 14		CONNECTED
25141051-1	16		CONNECTED
36141051-1	16		CONNECTED
01140051-1	17		CONNECTED
01140051-2	17	Rush River	CONNECTED
10140050-1	19	Raymond Coulee	CONNECTED
07140049-1	20 & 21	R2UBH - Sheyenne River	CONNECTED
17140049-1	21 & 22	PABF and PEMF	CONNECTED

[1] "Isolated" is defined as having no surface connection to other water bodies including wetlands, drainage ditches, streams, or rivers.

[2] "Connected" is defined as having a possible surface connection to other waterbodies including wetlands, drainage ditches, streams, or rivers.

McCain also surveyed the proposed laydown areas for wetlands. Boundaries of the laydown survey areas are depicted on the Figures (Appendix D). No wetlands were found in the proposed laydown areas.

4.0 References

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USDA-NRCS. 2008. Soil Survey of Cass County, North Dakota. <http://websoilsurvey.nrcs.usda.gov/app> Accessed 99 May 2008

USFWS [US Fish and Wildlife Service]. 2008. Letter of response concerning the high-voltage transmission facility from near Luverne, ND, to the Maple River Substation northwest of Fargo, in Barnes and Cass Counties. Dated February 20 and April 22, 2008.

Appendix A

U.S Fish and Wildlife Service Letter(s)
North Dakota Game and Fish Department Letter
North Dakota Parks and Recreation Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501

APR 2 2 2008

RECEIVED
APR 2 4 2008
HDR Engineering, Inc.

Mr. Mitchell Shields
HDR Engineering Inc.
701 Xenia Avenue South
Minneapolis, Minnesota 55416-3636

Re: Shift of High-voltage transmission facility from near Lurverne, ND, to Maple River Substation, northwest of Fargo, in Barnes and Cass Counties

Dear Mr. Shields:

This letter is in response to your April 4, 2008, letter providing information about a proposed expansion in the study corridor for the Pillsbury to Fargo Generation Outlet Project in Barnes and Cass Counties, North Dakota. We offer the following comments under the authority of and in accordance with the Migratory Bird Treaty Act (16 U.S.C. 703 et seq.) and the Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.).

The response we sent, dated February 20, 2008, also applies to your expanded study area corridor. Please refer to our previous comments.

Thank you for the opportunity to comment on this project. If you require further information or the project plans change, please contact Carol Aron of my staff at (701) 250-4481, or at the letterhead address above.

Sincerely,

Jeffrey K. Towner

Jeffrey K. Towner
Field Supervisor
North Dakota Field Office

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501

FEB 20 2008

RECEIVED
FEB 26 2008
HDR Engineering, Inc.

Mr. Mitchell Shields
Project Manager
HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, Minnesota 55416-3636

Re: High-voltage transmission facility from near Luverne, ND, to Maple River Substation, northwest of Fargo, in Barnes and Cass Counties

Dear Mr. Shields:

This letter is regarding the Otter Tail Power Company and Minnkota Power Cooperative planned partnership to provide a generation outlet to transmit power from proposed area wind projects to the regional transmission grid, from near Luverne, ND, to the Maple River Substation northwest of Fargo, in Barnes and Cass Counties. We offer the following comments under the authority of and in accordance with the Migratory Bird Treaty Act (16 U.S.C. 703 et seq.) and the Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.).

The U.S. Fish and Wildlife Service (Service) administers fee title and easement lands throughout North Dakota. A review of our county plat maps indicate that the proposed project crosses several Service easements as shown on the enclosed maps. Special Use or right-of-way permits will be necessary for any construction resulting in impacts to Service administered easements or fee title lands. The issuance of Special Use or right-of-way permits is subject to the final determination of a refuge compatibility review process. For specific information on Service property interests and to determine the need for permits, contact Ed Meendering, Valley City Wetland Management District, 11515 River Road, Valley City, North Dakota 58072 (701-845-3466).

To minimize disturbance to fish and wildlife resources in the project area, the Service provides the following recommendations:

- Defer the timing of construction to late summer (after July 15) or fall so as not to disrupt waterfowl or other wildlife during the nesting season and to avoid high water conditions.

- Locate construction to avoid placement of fill in wetlands along the route.
- Replace unavoidable loss of wetland habitat with functionally equivalent wetlands.
- Install and maintain appropriate erosion control measures to reduce sediment transport to adjacent wetlands and stream channels.
- Reseed disturbed areas with a mixture of native grass and forb species.
- Replant trees/shrubs at a ratio of two planted for each one removed from riparian areas.

A list of federally endangered and threatened species that may be present within the proposed project's area of influence is enclosed. This list fulfills requirements of the Service under Section 7 of the Endangered Species Act.

If a Federal agency authorizes, funds, or carries out a proposed action, the responsible Federal agency, or its delegated agent, is required to evaluate whether the action "may affect" listed species. If the Federal agency determines the action "may affect" listed species, then the responsible Federal agency shall request formal section 7 consultation with this office. If the evaluation shows a "no effect" determination on listed species, further consultation is not necessary. If a private entity receives Federal funding for a construction project, or if any Federal permit is required, the Federal agency may designate the fund recipient or permittee as its agent for purposes of section 7 consultation.

Although there have been historical sightings in Cass and Barnes counties, the project is outside of the major migratory path for the whooping crane and the Service considers the likelihood of the project impacting whooping cranes discountable. To further reduce the potential of a whooping crane striking a line, Otter Tail Power Company and Minnkota Power Cooperative may opt to bury the new transmission lines underground, or mark the overhead lines with state-of-the art line marking devices proactively within one mile of wetlands along the project route. Some of the available marking devices include: aerial marker spheres, swinging plates, spiral vibration dampers, and bird flight diverters.

To minimize the electrocution hazard to birds, including whooping cranes, the Service, with support from the Rural Utilities Service, recommends that new or updated overhead power lines be constructed in accordance with the current guidelines for preventing bird electrocutions. The recommended guidelines can be found in "2006 Suggested Practices for Avian Protection on Power Lines". To increase power line visibility and reduce bird fatalities resulting from collisions with power lines, the Service recommends power lines in the major whooping crane migration zone as well as power lines that cross or run adjacent to rivers or large wetlands be modified according to "Mitigating Bird Collisions with Power Lines: The State of the Art in 1994". Both publications can be obtained by

writing or calling the Edison Electric Institute, P.O. Box 266, Waldorf, Maryland 20604-0266, (1-800-334-5453) or visiting their website at www.eei.org.

Potential habitat for the Dakota skipper is located near the proposed project area. In 1995, the Dakota skipper was listed as a candidate species under the Endangered Species Act (ESA). No legal requirement exists to protect candidate species; however, it is within the spirit of the Endangered Species Act to consider these species as having significant value and worth protecting.

The Dakota skipper, a small to medium-sized hesperiine butterfly, has been recorded on native prairie in Barnes and Griggs Counties. I have enclosed a description of the site and maps where skippers have historically been found, (Valley City Site – Barnes Co., T. 140 N., R. 58 W., Section 17, and Binford Site – Griggs Co., T. 147 N., R. 60 W., NW ¼ Section 16). Dakota skippers are associated with high quality prairie ranging from wet-mesic tallgrass prairie to dry-mesic mixed grass prairie. Eastern North Dakota prairies inhabited by Dakota skippers are dominated by warm-season or bluestem grasses that almost always contain wood lilies, harebells, and camas (Royer and Marrone 1992) and that are generally associated with glacial lake margins with alkaline soils (McCabe 1981). If at all possible, we recommend the proposed project avoid native prairie habitat. If the proposed project will impact this type of habitat along the construction right-of-way, we recommend a qualified biologist conduct surveys of these areas for the presence of Dakota skippers. If Dakota skippers are present along the proposed route, please notify the Service and advise us on how you intend to avoid impacts to skipper habitat.

Thank you for the opportunity to comment on this project. If you require further information or the project plans change, please contact Carol Aron of my staff at (701) 250-4481, or at the letterhead address above.

Sincerely,

Jeffrey K. Towner

Jeffrey K. Towner
Field Supervisor
North Dakota Field Office

Enclosures

References

McCabe, T.L. 1981. The Dakota skipper, *Hesperis dacotae* (Skinner): range and biology, with special reference to North Dakota. Journal of the Lepidopterist' Society 35(3): 179-193.

Royer, R.A. and G.M. Marrone. 1992. Conservation status of the Dakota skipper (*Hesperis dacotae*) in North and South Dakota. Unpublished report, U.S. Fish and Wildlife Service, Denver, CO. 15 March 1992. 44+pp.

FEDERAL THREATENED, ENDANGERED, AND CANDIDATE SPECIES AND DESIGNATED CRITICAL HABITAT FOUND IN CASS COUNTY, NORTH DAKOTA

February 2008

No species present

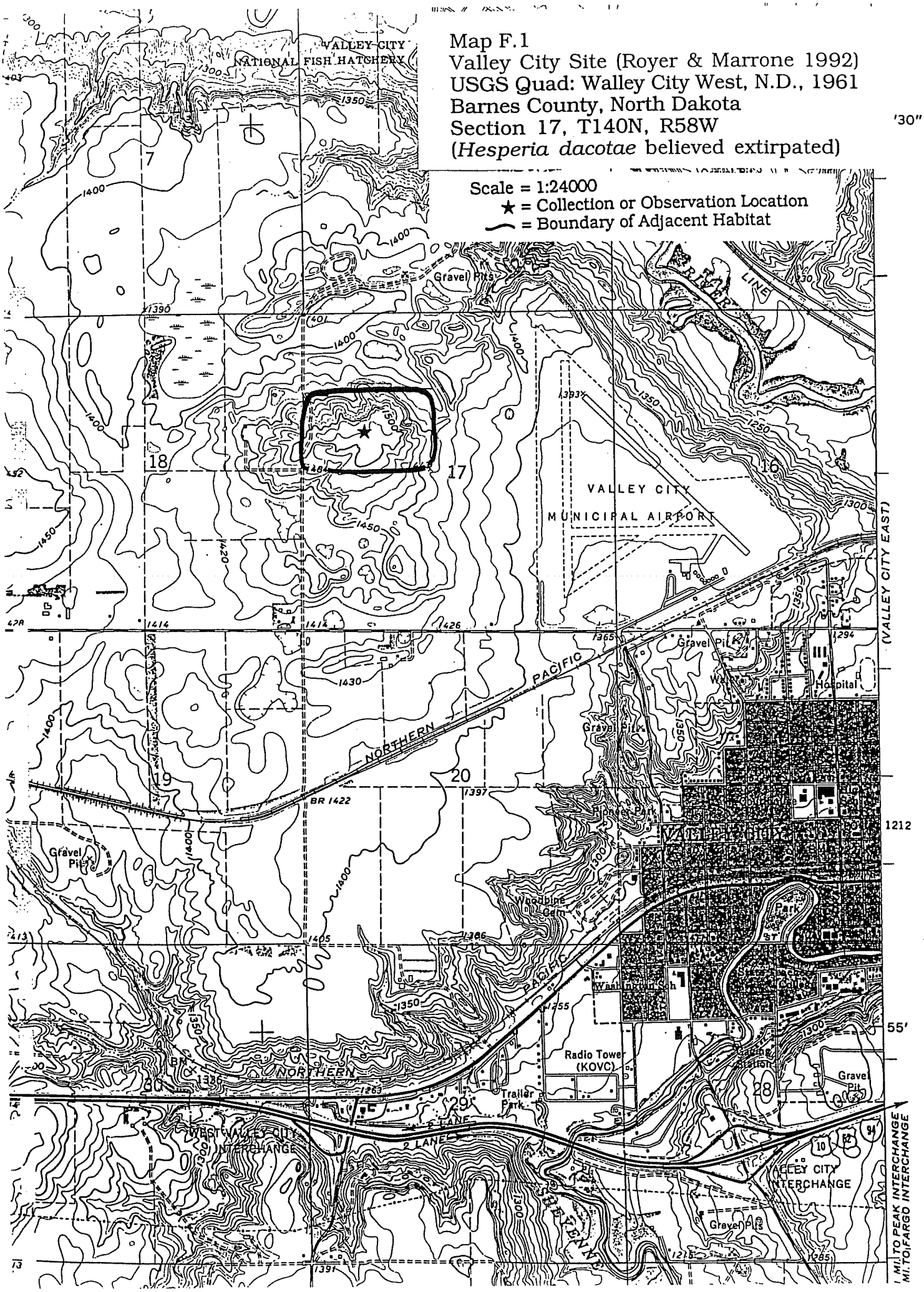
FEDERAL ENDANGERED SPECIES
FOUND IN BARNES COUNTY
NORTH DAKOTA
February 2008

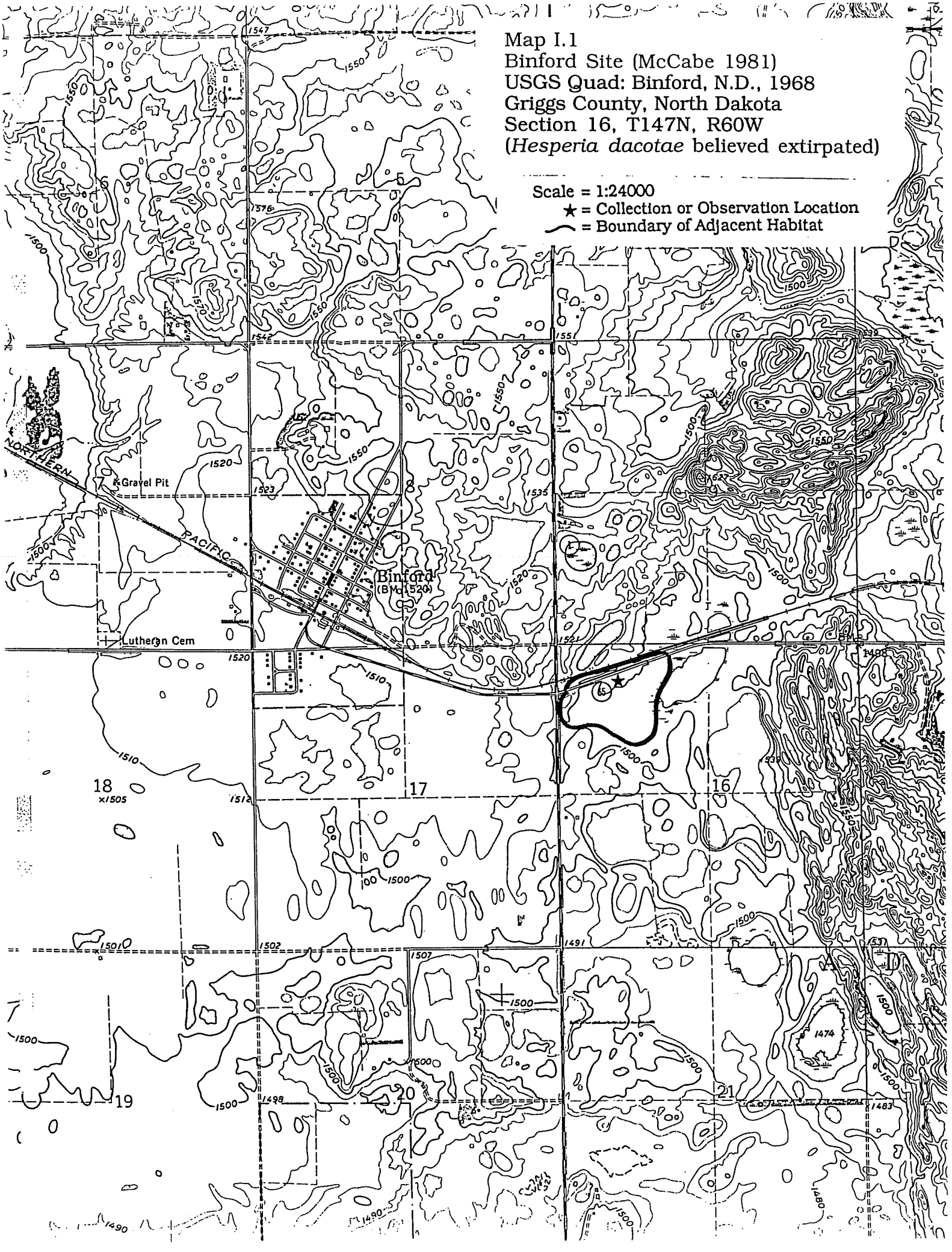
ENDANGERED SPECIES

Birds

Whooping crane (Grus Americana): Migrates through west and central counties during spring and fall. Prefers to roost on wetlands and stockdams with good visibility. Young adult summered in North Dakota in 1989, 1990, and 1993. Total population 140-150 birds.

Map F.1
Valley City Site (Royer & Marrone 1992)
USGS Quad: Walley City West, N.D., 1961
Barnes County, North Dakota
Section 17, T140N, R58W
(*Hesperia dacotae* believed extirpated)




Map I.1
Binford Site (McCabe 1981)
USGS Quad: Binford, N.D., 1968
Griggs County, North Dakota
Section 16, T147N, R60W
(*Hesperia dacotae* believed extirpated)
Scale = 1:24000
★ = Collection or Observation Location
= Boundary of Adjacent Habitat
NORTHERN PACIFIC
Gravel Pit
Binford
(BM 1520)
Lutheran Cem
16
17
18
19
20
21

"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

February 28, 2008

Mitchell Shields
Project Manager
HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636

Dear Mr. Shields:

RE: Proposed High-Voltage Transmission Facility
Luverne to Maple River Substation, North Dakota

The North Dakota Game and Fish Department has reviewed this project for wildlife concerns.

The National Wetland Inventory indicates various wetlands within the proposed project corridor. We recommend that steps be taken to protect wetlands that cannot be avoided, above-ground appurtenances not be placed in wetland areas, and existing drainage patterns be maintained.

The project will cross the Sheyenne and Maple Rivers, both classified as fishery resources. If construction is necessary within either waterway, work should not take place between April 15 and June 1 to protect the resource during the primary spawning season.

We also ask that controls be implemented to minimize erosion and sedimentation into streams, every effort be made to avoid destruction of woody vegetation, and disturbed areas be seeded with suitable native grass and forb species where appropriate.

Sincerely,

Steve Dyke

(for) Michael G. McKenna
Chief
Conservation & Communication Division

js

John Hoeven, Governor
Douglass A. Prchal, Director

1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649
Phone 701-328-5357
Fax 701-328-5363
E-mail parkrec@nd.gov
www.parkrec.nd.gov

February 28, 2008

Mitchell Shields
HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636

Re: Construction of a High-Voltage Transmission Facility From Near Luverne, ND to the Maple River Substation
Barnes and Cass Counties

Dear Mr. Shields:

The North Dakota Parks and Recreation Department (the Department) has reviewed the above referenced project proposal submitted by the Otter Tail Power Company to construct a high-voltage transmission facility from near Luverne, ND to the Maple River Substation located Barnes and Cass Counties.

Our agency scope of authority and expertise covers recreation and biological resources (in particular rare plants and ecological communities). The project as defined does not affect state park lands that we manage. We do have some concerns regarding Land and Water Conservation Fund sites within the project area. Several parks in Page and Reille's Acres have received assistance from the federal Land and Water Conservation Funds and are under protection of section 6(f) of the LWCF Act including project numbers: 38-00693, 38-00945, and 38-00726. Any property taken from within the 6f boundaries of these areas must be replaced with property of equal market value. Should any public or private utilities need to be added or relocated on the LWCF recreational lands, the NDPRD must be consulted prior to any action taken. Please contact Michelle Vetter (701-328-5364 or mvetter@nd.gov) if additional LWCF information is needed.

The North Dakota Natural Heritage biological conservation database has been reviewed to determine if any plant or animal species of concern or other significant ecological communities are known to occur within an approximate one-mile radius of the project area. Based on this review, several occurrences have been identified within or adjacent to the project area including: *Fusconaia flava* (Wabash pigtoe mussel), *Ligumia recta* (black sandshell mussel), *Potamilus alatus* (pink heelsplitter mussel), *Quadrula quadrula* (mapleleaf mussel), *Ameiurus natalis* (yellow bullhead), *Eleocharis wolfii* (Wolf's spikerush), *Eumeces septentrionalis* (prairie skink), *Phoxinus eos* (Northern redbelly dace), and *Spartina pectinata – Calamagrostis stricta – Carex spp. herbaceous vegetation* (wet prairie). Please see attached spreadsheet and map for more specific information on these species. We defer further comments regarding animal species to the North Dakota Game and Fish Department and the United States Fish and Wildlife Service.

Because this information is not based on a comprehensive inventory, there may be species of concern or otherwise significant ecological communities in the area that are not represented in the database. The lack of data for any project area cannot be construed to mean that no significant features are present. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

The Department recommends that the project be accomplished with minimal impacts and that all efforts be made to ensure that critical habitats not be disturbed in the project area to help secure rare species conservation in North Dakota. Regarding any reclamation efforts, we recommend that any impacted areas be revegetated with species native to the project area.

It is our policy to charge out-of-state requests for data services including data retrieval, data analysis, manual and computer searches, packaging and collection of data. An invoice for services provided has been enclosed.

Thank you for the opportunity to comment on this project. Please contact Kathy Duttenhefner (701-328-5370 or kgduttenhefner@nd.gov) of our staff if additional information is needed.

Sincerely,

Jesse Hanson

Jesse Hanson, Coordinator
Planning and Natural Resources Division

R.USNDNHI*1931

ND Parks and Recreation Department

ND Natural Heritage Inventory
1600 East Century Ave., Suite 3
Bismarck, ND 58503-0649
(701) 328-5370 FAX: (701) 328-5363

INVOICE

INVOICE NO: 0072
DATE: 2/29/2008

To: Mitchell Shields
HDR Engineering, Inc.
701 Xenia Avenue South
Minneapolis, MN 55416-3636

CONTACT	REFERENCE NO.	DATE SHIPPED	SHIPPED VIA	F.O.B. POINT	TERMS
K.Duttenhefner	R.USNDNHI*1931	2/29/2008			

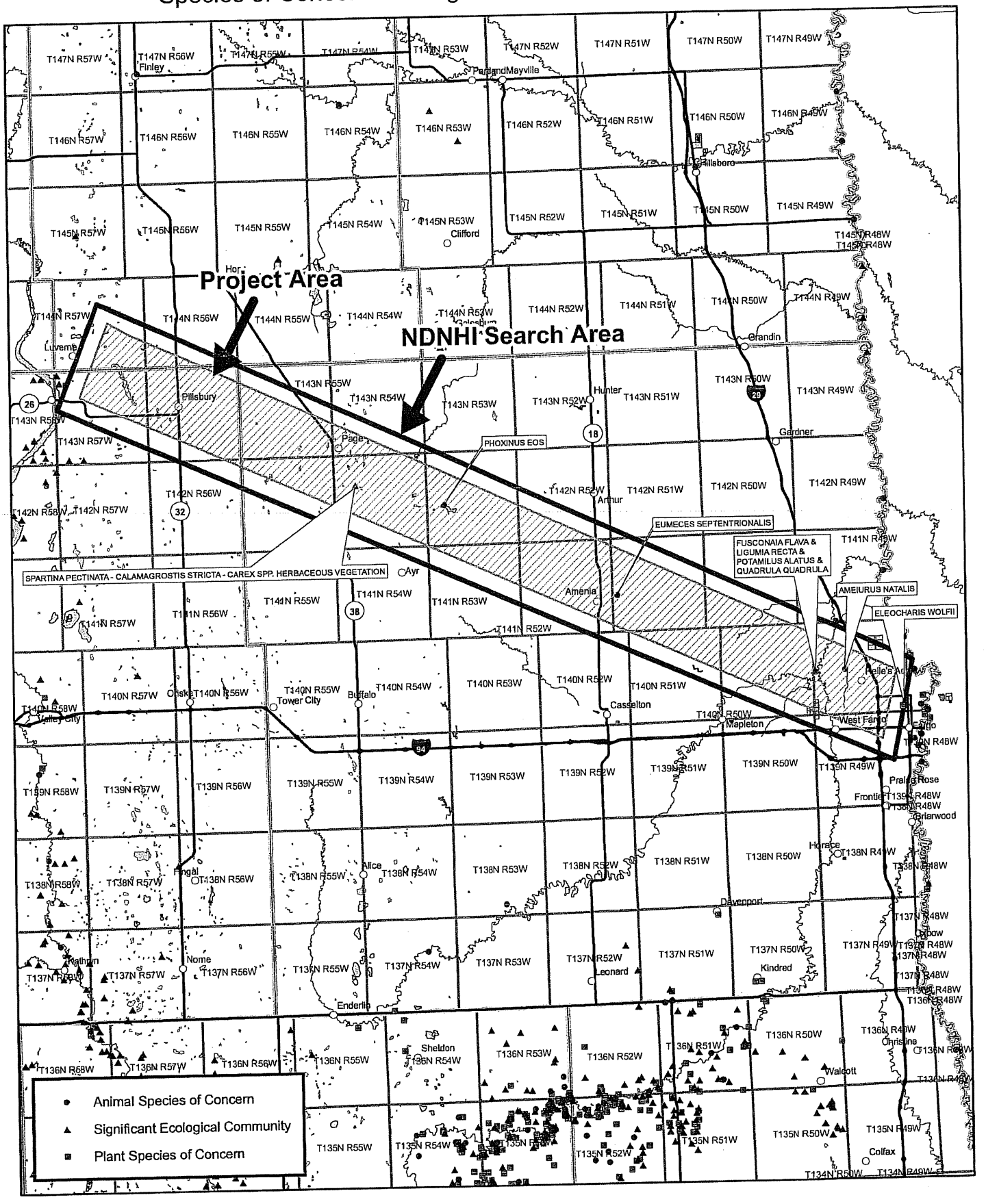
QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT
1	Computer data search, data retrieval , spreadsheet and map creation.	$ 60.00	$ 60.00
		SUBTOTAL	$ 60.00
		SALES TAX	
		SHIPPING & HANDLING	
		TOTAL DUE	$ 60.00

Make all checks payable to: ND Parks and Recreation Department
If you have any questions concerning this invoice, call: Kathy Duttenhefner, (701) 328-5370

THANK YOU FOR YOUR INTEREST IN RARE SPECIES CONSERVATION.

DEPT ID	FUND	ENTRY
1508	398	463021

North Dakota Natural Heritage Inventory
Species of Concern and Significant Ecological Communities



North Dakota Parks & Recreation Department
North Dakota Natural Heritage Inventory
February 2008

North Dakota Natural Heritage Inventory
Species of Concern and Significant Ecological Communities

State Scientific Name	State Common Name	Township & Range	Section	TRS Notes	State Rank	Global Rank	Federal Status	Last Observation
FUSCONAIA FLAVA	WABASH PIGTOE MUSSEL	140N049W	19	NW4NW4	S4	G5		1974
LIGUMIA RECTA	BLACK SANDSHELL MUSSEL	140N049W	19	NW4NW4	S4	G5		1974
POTAMILUS ALATUS	PINK HEELSPLITTER MUSSEL	140N049W	19	NW4NW4	S4	G5		1974
QUADRULA QUADRULA	MAPLELEAF MUSSEL	140N049W	19	NW4NW4	S3	G5		1974
AMEIURUS NATALIS	YELLOW BULLHEAD	140N049W	19		SX	G5		1959-10-05
ELEOCHARIS WOLFII	WOLF'S SPIKERUSH	140N049W	36		SH	G3?		1901-05-29
EUMECES SEPTENTRIONALIS	PRAIRIE SKINK	141N051W	19		S2S3	G5		
PHOXINUS EOS	NORTHERN REDBELLY DACE	142N053W	20		S4	G5		1972-06-20
SPARTINA PECTINATA - CALAMAGROSTIS STRICTA - CAREX SPP. HERBACEOUS VEGETATION	WET PRAIRIE	142N054W	8	SE4SW4	S2S3			1983-07-14

2/27/2008

Appendix B

Photographs

Photograph 1. Area of reported cordgrass wet prairie in Section 8, T. 142 N., R. 054 W. The area is designated as PEMA but is drained and has no hydrophytic vegetation present.

Photograph 2. Wetland 16143056-2 located in a cropped soybean field. This wetland has a NWI designation of PEMF.

Photograph 3. Wetland 08143056-1 located in a Conservation Reserve Program field. This wetland has a NWI designation of PEMA.

Photograph 4. Wetland 01142055-5 located on the edge of a Conservation Reserve Program field. This wetland has a NWI designation of PEMC.

Photograph 5. Wetland 01142055-6 located in a cultivated field. This wetland has a NWI designation of PEMA.

Photograph 6. Wetland 30143055-2 located in a cultivated field. This wetland has sparse hydrophytic vegetation due to cultivation and has a NWI designation of PEMA.

Photograph 7. Wetland 26142054-1. This is a typical, large drainage ditch.

Photograph 8. Wetland 01140051-2 (Rush River). It has been channelized in the corridor area.

Photograph 9. Wetland 07140049-1 (Sheyenne River). It has a NWI designation of R2UBH.

Photograph 10. Wetland 17140049-1. This is a wetland with open water rimmed with cattails and reed canary grass. It has a NWI designation of PABF.

Appendix C

Data Forms

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **07143056-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/26/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Upl-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Glycine max	HERB	UPL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). none

Remarks:Sample point is in upland outside of wetland boundary. Soybeans (Glycine max) were grown in 2007.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology occurs at the observation point.**

SOILS

Map Unit Name (Series and Phase): **Vallers-Parnell complex, 0-1%**	Drainage Class: **poor**
Taxonomy (Subgroup): **Typic Calciaquoll**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-8	**Ap**	**10YR 2/1**			**l, e**
8-18	**Bk1**	**2.5Y 5/2**			**l,ev**
18-30	**Bk2**	**2.5Y 5/3 & 5/4**			**l, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Wetland is cropped around. Soybeans were grown in 2007.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **07143056-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/26/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Eleocharis parvula	Herb	OBL	9.		
2. Alisma plantago-aquatica	Herb	NI	10.		
3. Phalaris arundinacea	Herb	FACW+	11.		
4. Typha latifolia	Herb	OBL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 100

Remarks:Eleocharis parvula, Alisma plantago-aquatica, and Phalaris arundinacea grow throughout the wetland area. Scattered patches of Typha latifolia also grow in the wetland area.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>30** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation - PEMF. Depression on aerial photograph.**

SOILS

Map Unit Name (Series and Phase): **Vallers-Parnell complex, 0-1%**	Drainage Class: **poor to very poor**
Taxonomy (Subgroup): **Vertic Argiaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-13	**A**	**N 2.5/0**			**sicl, n**
13-21	**A2**	**N 2.5/0**	**7.5YR 4/6**	**c1d**	**sicl, n**
21-25	**Btg**	**2.5Y 4/2**	**7.5YR 4/6**	**m1d**	**cl, n**
25-30	**Btg2**	**2.5Y 4/2**			**c, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F5-thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Depression wetland NWI designation - PEMF. Wetland is cropped around. Soybeans were grown in 2007.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **07143056-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/26/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Upl-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Glycine max	Herb	UPL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). none

Remarks:Sample point is in upland outside of wetland boundary.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology was found at the observation point.**

SOILS

Map Unit Name (Series and Phase): **Divide l, 0-2%**	Drainage Class: **somewhat poor**
Taxonomy (Subgroup): **Aeric Calciaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-5	**Ap**	**10YR 2/2**			**l, e**
5-16	**Bk**	**2.5Y 5/3**			**l, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Observation point is not a wetland.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **07143056-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/26/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Artemisia biennis	Herb	FAC	9.		
2. Echinocloa crus-galli	Herb	FACW	10.		
3. Phalaris arundinacea	Herb	FACW+	11.		
4. Rumex crispus	Herb	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >75 of present vegetation

Remarks:The area was cropped last fall and little vegetation is present. Artemisia biennis, Echinocloa crus-galli, Phalaris arundinacea, and Rumex crispus is present within the area.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **> 30** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation - PEMC. Depression on aerial photograph.**

SOILS

Map Unit Name (Series and Phase): **Marysland l, 0-1%**	Drainage Class: **poor to very poor**
Taxonomy (Subgroup): **Typic Calciaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-8	**A**	**10YR 2/1**			**cl, n**
8-18	**Btg1**	**5Y 4/2**			**c, n**
18-30	**Btg2**	**5Y 5/2**			**c, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Depression wetland with NWI designation - PEMC. Wetland is cropped around. Soybeans were grown in 2007.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **08143056-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/26/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Upl-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Zea mays	Herb	UPL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >80

Remarks:Observation point is located within an area planted to corn (Zea mays) in 2007.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology at the observation point.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%**	Drainage Class: **somewhat poor**
Taxonomy (Subgroup): **Aeric Calciaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-14	**A1**	**10YR 2/2**			**l, n**
14-20	**A2**	**10YR 3/1**			**l, n**
20-24	**Bk**	**2.5Y 4/3 & 4/2**			**l, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Observation point is not within a wetland outside of the wetland 08143056-1 wetland boundary.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **08143056-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/26/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha latifolia	Herb	OBL	9.		
2. Polygonum amphibium	Herb	OBL	10.		
3. Cirsium arvense	Herb	FACU	11.		
4. Phalaris arundinacea	Herb	FACW+	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >80

Remarks:Observation point is within a wetland dominated by Typha latifolia, Polygonum amphibium, and Phalaris arundinacea. Scattered Cirsium arvense plants are found around the observation point.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **11** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation PEMC. Depression on aerial photograph.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%**	Drainage Class: **poor**
Taxonomy (Subgroup): **Argiaquic Argialboll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-14	**A**	**N 2.5/0**			**sicl, n**
14-17	**E**	**2.5Y 4/2 & 4/1**	**10YR 4/6**	**m2d**	**sil, n**
17-30	**Btg**	**5Y 3/1**			**c, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F5-Thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Depression wetland with a NWI designation - PEMC.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **08143056-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/26/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Artemisia biennis	Herb	FAC	9.		
2. Eleocharis parvula	Herb	OBL	10.		
3. Taraxacum officinale	Herb	FACU	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 90

Remarks:Observation point is located within an a wetland area with patches of Eleocharis parvula and Artemisia biennis growing within it. Scattered Taraxacum officinale plants grow around the observation point.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>16** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression on aerial photograph.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%** Taxonomy (Subgroup): **Argiaquic Argialboll**	Drainage Class: **poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-12	**A**	**10YR 2/1**			**sicl, n**
12-16	**Btg**	**5Y 4/1**	**10YR 4/6**	**m2p**	**sic, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF7-Thick dark surface 2/1**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Small wetland within a crop field that was planted to corn in 2007.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **08143056-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/26/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Artemisia biennis	Herb	FAC	9.		
2. Eleocharis parvula	Herb	OBL	10.		
3. Taraxacum officinale	Herb	FACU	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 90

Remarks:Observation point is located within an a wetland area with patches of Eleocharis parvula and Artemisia biennis growing within it. Scattered Taraxacum officinale plants grow around the observation point.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>16** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression on aerial photograph.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%** Taxonomy (Subgroup): **Argiaquic Argialboll**	Drainage Class: **poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-12	**A**	**10YR 2/1**			**sicl, n**
12-16	**Btg**	**5Y 4/1**	**10YR 4/6**	**m2p**	**sic, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF7-Thick dark surface 2/1**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Small wetland within a crop field that was planted to corn in 2007.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **08143056-3** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/26/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Upl-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Zea mays	Herb	UPL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). none

Remarks:Observation point is located outside of a wetland area in a cropped field planted with corn (Zea mays) in 2007.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology was found at the observation point.**

SOILS

Map Unit Name (Series and Phase): **Barnes-Svea l, 3-6%** Taxonomy (Subgroup): **Pachic Hapludoll**	Drainage Class: **moderately well to well** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-10	**A**	**10YR 2/1**			**l, n**
10-27	**A2**	**10YR 2/2**			**l, n**
27-30	**Bw**	**10YR 3/1**			**l, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Observation point is located outside of the wetland 08143056-3 boundary.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **08143056-3** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/26/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Scirpus fluviatilis	Herb	OBL	9.		
2. Typha latifolia	Herb	OBL	10.		
3. Elytrigia repens var. repens	Herb	FAC	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 100

Remarks:Observation point is located within a wetland area with Scirpus fluviatilis and Typha latifolia growing within its deeper areas and Elytrigia repens var. repens growing along its boundary.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **7** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation - PEMAd. Depression on aerial photograph.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%**	Drainage Class: **poor**
Taxonomy (Subgroup): **Argiaquic Argialboll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-11	**A**	**N 2.5/0**			**sicl,n**
11-16	**Btg1**	**5Y 3/1**			**sic, n**
16-20	**Btg2**	**5Y 4/1 & 4/2**			**sic, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **NWI designation - PEMAd. Small wetland within a crop field that was planted to corn in 2007 and is found next to ND State Highway 32.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **09143056-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/26/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Upl-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Zea mays	Herb	UPL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). none

Remarks:Observation point is located outside of a drained wetland basin within a cropped field of corn (Zea mays) in 2007.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology at the observation point.**

SOILS

Map Unit Name (Series and Phase): **Vallers-Parnell complex, 0-1%**	Drainage Class: **poor**
Taxonomy (Subgroup): **Typic Calciaquoll**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-7	**Ap**	**10YR 2/1&3/1**			**sicl, e**
7-20	**Bk1**	**2.5Y 6/2**			**sicl, es**
20-24	**Bk2**	**2.5Y 4/3**			**sicl, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Observation point is located outside of the wetland boundaries ofwetland 09143056-1.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **09143056-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/26/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Rumex crispus	Herb	FACW	9.		
2. Eleocharis parvula	Herb	OBL	10.		
3. Artemisia biennis	Herb	FAC	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >75

Remarks:Observation point is located within a wetland area of Rumex crispus, Eleocharis parvula, and Artemisia biennis. The basin was non-cropped in 2007.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **3** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Small depression wetland with a drain flowing out to the northeast.**

SOILS

Map Unit Name (Series and Phase): **Vallers-Parnell complex, 0-1%**	Drainage Class: **very poor to poor**
Taxonomy (Subgroup): **Vertic Argiaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-8	**A**	**10YR 2/1**			**sicl, n**
8-16	**Btg**	**5Y 4/2**	**10YR 4/6**	**c2d**	**sic, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F4-Depleted below dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Small wetland with a visible drain within a crop field that was planted to corn in 2007.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **16143056-1** Applicant/Owner: **McCain and Associates** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **05/09/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Alisma plantago-aquatica	Herb	NI	9.		
2. Eleocharis parvula	Herb	OBL	10.		
3. Artemisia biennis	Herb	FAC	11.		
4. Setaria glauca	Herb	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >75

Remarks:Alisma plantago-aquatica and Eleocharis parvula grows across the wetland area. Typha angustifolia grows in the center of the wetland area.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression on aerial photo and NWI designation - PEMC.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Wygard l, 0-3%**	Drainage Class: **somewhat poor**
Taxonomy (Subgroup): **Typic Endoaquoll**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-7	**A**	**5Y 2.5/1**			**sicl**
7-16	**Bg**	**5Y 3/2 & 4/2**	**7.5YR 4/6**	**m/d**	**sicl**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **F4 - Depleted below dark surface.**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Relatively shallow wetland with NWI designation of PEMC.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **16143056-2** Applicant/Owner: **McCain and Associates** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **05/09/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Upl-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Glycine max	Herb	UPL	9.		
2. Elytrigia repens var. repens	Herb	FAC	10.		
3. Taraxacum officinale	Herb	FACU	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). <30

Remarks:Soybean (Glycine max) stubble with scattered Elytrigia repens var. repens and Taraxacum offinale plants.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression on aerial photo and NWI designation - .**

SOILS

Map Unit Name (Series and Phase): **Hamerly - Wygard l, 0-3%** Taxonomy (Subgroup): **Aeric Calciaquoll**	Drainage Class: **somewhat poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-11	**Ap**	**5Y 2.5/1**			**sicl and se**
11-22	**Bk1**	**2.5Y 3/1 &3/2**			**sicl and ev**
22-26	**Bk2**	**2.5Y 5/3 & 5/2**			**sicl and es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Upland point located outside of wetland 16143056-2.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **16143056-2** Applicant/Owner: **McCain and Associates** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **05/09/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Artemisia biennis	Herb	FAC	9.		
2. Elytrigia repens var. repens	Herb	FAC	10.		
3. Rumex crispus	Herb	FACW	11.		
4. Hordeum jubatum	Herb	FACW	12.		
5. Ranunculus cymbalaria	Herb	OBL	13.		
6. Setaria glauca	Herb	FACU	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >75

Remarks:Artemisia biennis, Elytrigia repens var. repens, Rumex crispus, Hordeum jubatum, and Ranunculus cymbalaria grow throughout the wetland area. Typha angustifolia grow in the center of the wetland area. Setaria glauca grows along the upland edge of the wetland boundary.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression on aerial photo and NWI designation - PEMF.**

SOILS

Map Unit Name (Series and Phase): **Vallers-Parnell Complex 0-1%**	Drainage Class: **poor to very poor**
Taxonomy (Subgroup): **Typic Calciaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-17	**A**	**5Y 2.5/1**			**sicl and se**
17-26	**Bg1**	**5Y 3/1**	**7.5YR 4/6**	**mv1/d**	**sic and n**
26-30	**Bg2**	**5Y 4/2**	**7.5YR 4/6**	**c2/d**	**sic and n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **TF7 - Thick Dark Surface 2/1**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Relatively shallow wetland with NWI designation of PEMF.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **16143056-3** Applicant/Owner: **McCain and Associates** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **05/09/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Eleocharis parvula	Herb	OBL	9.		
2. Taraxacum officinale	Herb	FACU	10.		
3. Ranunculus scleratus	Herb	OBL	11.		
4. Rumex crispus	Herb	FACW	12.		
5. Artemisia biennis	Herb	FAC	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Eleocharis parvula grows across the wetland area. Ranunculus scleratus, Rumex crispus, and Artemisia biennis grow along the wetland edge. Typha angustifolia grows in the center of the weland basin.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression on aerial photo and NWI designation - PEMC.**

SOILS

Map Unit Name (Series and Phase): **Vallers-Parnell Complex 0-1%** Taxonomy (Subgroup): **Vertic Argiaquoll**	Drainage Class: **poor to very poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-16	**A**	**5Y 2.5/1**			**sicl and n**
16-22	**A2**	**2.5Y 3/1**			**sicl and n**
22-26	**Bg**	**2.5Y 3/1 & 4/2**	**10YR 4/6**	**cv1/d**	**sicl and n**
26-28	**Bg2**	**2.5Y 4/2**	**10YR 4/6**	**c1d**	**sicl and n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **TF7 - Thick Dark Surface 2/1**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Relatively shallow wetland with NWI designation of PEMC.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **16143056-4** Applicant/Owner: **McCain and Associates** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **05/09/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Eleocharis parvula	Herb	OBL	9.		
2. Agrostis stolonifera	Herb	FACW	10.		
3. Artemisia biennis	Herb	FAC	11.		
4. Setaria glauca	Herb	FACU	12.		
5. Amaranthus retroflexus	Herb	FACU	13.		
6. Xanthium strumarium	Herb	FAC	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Eleocharis parvula grows across the wetland area. Agrostis stolonifera, Artemisia biennis, and Xanthium strumarium grow along the wetland edge and Setaria glauca and Amaranthus retroflexus grows along the upland edge.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression on aerial photo and NWI designation - PEMF**

SOILS

Map Unit Name (Series and Phase): **Barnes-Buse l, 3-6%** Taxonomy (Subgroup): **Calcic Hapludoll**	Drainage Class: **well** Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-16	**A**	**5Y 2.5/1**			**l and n**
16-30	**Bg**	**2.5Y 4/2**	**7.5YR 5/6**	**c2p to m3p/d**	**sil/sicl and n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **TF7 - Thick Dark Surface 2/1**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Relatively shallow wetland with NWI designation of PEMF.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **16143056-5** Applicant/Owner: **McCain and Associates** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **05/09/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Agrostis stolonifera	Herb	FACW	9.		
2. Artemisia biennis	Herb	FAC	10.		
3. Amaranthus retroflexus	Herb	FACU	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Agrostis stolonifera in the center of the wetland area. Artemisia biennis and Amaranthus retroflexus grows around the edge of the area.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☒ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression on aerial photo and NWI designation - .**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Wygard l, 0-3%** Taxonomy (Subgroup): **Typic Endoaquoll**	Drainage Class: **somewhat poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-20	**A**	**2.5Y 2.5/1**			**l and n**
20-30	**Bg1**	**2.5Y 3/1**			**sic and n**
30-43	**Bg2**	**2.5Y 4/3 & 3/2**			**sic and n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Not a wetland even though it has a NWI designation of __.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **16143056-6** Applicant/Owner: **McCain and Associates** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **05/09/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Xanthium strumarium	Herb	FAC	9.		
2. Agrostis stolonifera	Herb	FACW	10.		
3. Taraxacum officinale	Herb	FACU	11.		
4. Glycine max	Herb	UPL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Area with Xanthium strumarium and Agrostis stolonifera growing across it. Taraxacum officinale and Glycine max grows along the edge of the wetland.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☒ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression on aerial photo and NWI designation - PEMA.**

SOILS

Map Unit Name (Series and Phase): **Barnes-Buse l, 3-6%**	Drainage Class: **well**
Taxonomy (Subgroup): **Calcic Hapludoll**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-18	**A**	**2.5Y 2.5/1**			**l**
18-30	**Bg**	**2.5Y 4/2 & 5/2**	**7.5YR 4/6**	**c1d to m2d**	**sicl**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **TF7 - Thick Dark Surface 2/1**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Relatively shallow wetland with NWI designation of PEMA.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **15143056-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/26/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Upl-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Bromus inermis	Herb	FACU*	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). none

Remarks:Observation point is located outside of a wetland area and is dominated by Bromus inermis.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology is present at the observation point.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%**	Drainage Class: **somewhat poor**
Taxonomy (Subgroup): **Aeric Calciaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-12	**A**	**10YR 2/2**			**l, n**
12-16	**Bw**	**10YR 3/2&2/2**			**l, n**
16-24	**Bk**	**2.5Y 5/3 & 5/4**			**l, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **The observation point is not located within a wetland and is located just outside of the wetland boundary of wetland 15143056-1.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **15143056-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/26/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Hordeum jubatum	Herb	FACW	9.		
2. Elymus trachycaulus ssp. trachycaulus	Herb	FAC	10.		
3. Grindelia squarrosa	Herb	UPL	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 90

Remarks:Observation point is located within a wetland area consisting of Hordeum jubatum, Elymus trachycaulus ssp. trachycaulus, and scattered Grindelia squarrosa.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **16** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression and visible channel on aerial photograph.**

SOILS

Map Unit Name (Series and Phase): **Vallers l, saline, 0-1%** Taxonomy (Subgroup): **Typic Calciaquoll**	Drainage Class: **poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-11	**A**	**N 2.5/0**			**sicl, n**
11-20	**Bg1**	**5Y 3/1**			**sicl, n**
20-27	**Bg2**	**5Y 5/1**	**2.5Y 4/3**	**c1d**	**sicl, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F5-Thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **The wetland area is found within a planted Conservation Reserve Program field and consists of a depressional wetland and connected meandering channel.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **22143056-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2. Scirpus fluviatilis	Herb	OBL	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 100

Remarks:Small diverse wetland with Phalaris arundinacea and Scirpus fluviatilis within its basin.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **9** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Wetland is a depressional wetland with a shallow drain running out to the south. NWI designation - PEMAd.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%** Taxonomy (Subgroup): **Argiaquic Argialboll**	Drainage Class: **poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-20	**A**	**N 2.5/0**			**sicl, n**
20-28	**Btg**	**5Y 3/1**			**sic, n**
28-35	**Cg**	**5Y 5/2**	**10YR 6/8**	**m1p**	**sic, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F5-Thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **The wetland is a depressional wetland that has a drain flowing out of it to the south with a NWI designation - PEMAd.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **22143056-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Scirpus validus	Herb	OBL	9.		
2. Artemisia biennis	Herb	FAC	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 90

Remarks:Observation point is located within a wetland area that consists of Scirpus validus and Artemisia biennis.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>24** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Wetland is a depressional wetland with a shallow drain running out to the south.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%** Taxonomy (Subgroup): **Argiaquic Argialboll**	Drainage Class: **poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-16	**A**	**N 2.5/0**			**sicl, n**
16-21	**Btg1**	**5Y 2.5/1**	**7.5YR 4/6**	**c1d**	**sic, n**
21-24	**Btg2**	**2.5Y 4/2**	**7.5YR 4/6**	**m1p**	**sic, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F5-Thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **The wetland is a depressional wetland that has a drain flowing out of it to the south. There is open water within the wetland basin. The wetland is located within a cropped field and was mowed last fall (2007).**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **22143056-3** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Upl-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Poa pratensis	Herb	FACU	9.		
2. Elymus trachycaulus ssp. trachycaulus	Herb	FAC	10.		
3. Setaria glauca	Herb	FACU	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). <50

Remarks:Observation point is located outside of a wetland area and is comprised of Poa pratensis, Elylmus trachycaulus ssp. trachycalus, and Setaria glauca.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology is present.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%** Taxonomy (Subgroup): **Aeric Calciaquoll**	Drainage Class: **somewhat poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-9	**A**	**10YR 2/2**			**l, e**
9-16	**Bk1**	**2.5Y 4/2**			**sicl, es**
16-25	**Bk2**	**2.5Y 5/2 & 5/3**			**sicl, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Wetland Hydrology Present? Hydric Soils Present?	Yes ☐ Yes ☐ Yes ☐	No ☒ No ☒ No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒

Remarks : **The observation point is not located within a wetland.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **22143056-3** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Hordeum jubatum	Herb	FACW	9.		
2. Xanthium strumarium	Herb	FAC	10.		
3. Aster lanceolatus ssp. hesperius	Herb	OBL	11.		
4. Rumex crispus	Herb	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >60

Remarks:Observation point is located within a wetland area that consists of Hordeum jubatum, Xanthium strumarium, Aster lanceolatus ssp. hesperius, and Rumex crispus.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **10** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Wetland is a depressional wetland with a shallow drain running out to the south.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%**	Drainage Class: **poor**
Taxonomy (Subgroup): **Argiaquic Argialboll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-13	**A**	**10YR 2/1**			**cl, n**
13-17	**Btg**	**2.5Y 4/2**	**10YR 5/6**	**c1d**	**cl, n**
17-28	**Bk**	**2.5Y 4/2**	**10YR 5/6**	**c1d**	**cl, es**
28-32	**Bk2**	**5Y 5/2**	**10YR 5/6**	**f1d**	**cl, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark Surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **The wetland is a depressional wetland that has a drain flowing out of it to the south. The wetland is located within a planted Conservation Reserve Program field.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **22143056-4** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Upl-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Bromus inermis	Herb	FACU*	9.		
2. Poa pratensis	Herb	FACU	10.		
3. Cirsium arvense	Herb	FACU	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). <10

Remarks:Observation point is located outside of a wetland area and is comprised of Bromus inermis, Poa pratensis, and Cirsium arvense.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology is present.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%**	Drainage Class: **somewhat poor**
Taxonomy (Subgroup): **Aeric Calciaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-12	**A**	**10YR 2/2**			**l, e**
12-25	**Bk**	**2.5Y 5/3**			**l, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **The observation point is not located within a wetland.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **22143056-4** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha latifolia	Herb	OBL	9.		
2. Artemisia biennis	Herb	FAC	10.		
3. Phalaris arundinacea	Herb	FACW+	11.		
4. Elymus caninus	Herb	NI	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 95

Remarks:Observation point is located within a wetland area that consists of Typha latifolia, Artemisia biennis, Phalaris arundinacea, and Elymus caninus. An area of Hordeum jubatum is present in the southern lobe of the wetland.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **19** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation - PEMC and PEMA. Wetland is a depressional wetland.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%** Taxonomy (Subgroup): **Argiaquic Argiaquoll**	Drainage Class: **poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-8	**A**	**10YR 2/1**			**cl, e**
8-21	**Bk1**	**5Y 5/2**			**cl, es**
21-27	**BK2**	**5Y 6/2**	**10YR 5/6**	**c1d**	**cl, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF6-Calcic dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **The depression wetland is designated as PEMC and PEMA.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **22143056-5** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Up-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Triticum aestivum	Herb	UPL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). <10

Remarks:Observation point is located outside of a wetland area and is comprised of wheat stubble (Triticum aestivum) from 2007.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology is present.**

SOILS

Map Unit Name (Series and Phase): **Barnes-Buse l, 3-6%**	Drainage Class: **well**
Taxonomy (Subgroup): **Calcic Hapludoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-5	**Ap**	**10YR 3/2**			**l, se**
5-12	**Bk**	**10YR 4/4**			**l, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **The observation point is not located within a wetland.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **22143056-5** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Hordeum jubatum	Herb	FACW	9.		
2. Beckmannia syzigachne	Herb	OBL	10.		
3. Rumex maritimus	Herb	FACW	11.		
4. Kochia scoparia	Herb	FAC	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Observation point is located within a wetland area that consists of Hordeum jubatum, Beckmannia syzigachne, Rumx maritimus, and Kochia scoparia. The wetand was non-cropped in 2007 but much of the vegetation has been knocked down.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>30** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation - PEMA. Wetland is a depressional wetland on the edge of a cropped field.**

SOILS

Map Unit Name (Series and Phase): **Barnes-Buse l, 3-6%**	Drainage Class: **well**
Taxonomy (Subgroup): **Calcic Hapludoll**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-2.5	**A**	**10YR 2/1**			**sicl, e to n**
17-22	**Bg**	**2.5Y 3/1**			**sic, n**
22-30	**Cg**	**2.5Y 5/1 & 5/2**			**sic, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **The wetland is a depressional wetland located on the edge of a cropped field and is designated as a PEMA.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **23143056-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Upl-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Bromus inermis	Herb	FACU*	9.		
2. Poa pratensis	Herb	FACU	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). <10

Remarks:Observation point is located outside of a wetland area and is comprised of Bromus inermis and Poa pratensis. The observation point is slightly elevated compared to nearby wetland areas.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Observation point is slightly elevated compared to nearby wetland areas. No hydrology is present.**

SOILS

Map Unit Name (Series and Phase): **Barnes-Buse l, 0-6%** Taxonomy (Subgroup): **Calcic Hapludoll**	Drainage Class: **well** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-14	**A**	**10YR 2/2**			**l, e to es**
14-20	**Bk**	**2.5Y 4/3 & 4/2**			**grscl, ev**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Observation point is not located within a wetland.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **23143056-1** Applicant/Owner: **McCain and Associates, Inc** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/08** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 100

Remarks:Phalaris arundinacea grows along the wetland edge. Typha spp. and Phragmites spp. grow within the deeper portions of the wetland.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **30** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large wetland area with NWI designation - PSSCx.**

SOILS

Map Unit Name (Series and Phase): **Lamoure sil, channeled, 0-6** Taxonomy (Subgroup): **Cumulic Endoaquoll**	Drainage Class: **somewhat poor to poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-14	**A**	**10YR 2/1**			**sicl, se**
14-24	**Bg**	**2.5Y 3/1**			**sicl, se**
24-30	**Cg**	**2.5Y 5/2**	**10YR 5/6**	**c1d**	**sicl, se**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF7-Thick dark surface 2/1**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Large wetland area with NWI designation - PSSCx.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **23143056-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/08** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-2**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha angustifolia	Herb	OBL	9.		
2. Bromus inermis	Herb	FACU*	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 90

Remarks:Wetland edge with Typha angustifolia in the center and Bromus inermis grows along its edge.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **3** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☒ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large wetland area with NWI designation - PSSCx.**

SOILS

Map Unit Name (Series and Phase): **Lamoure sil, channeled, 0-6** Taxonomy (Subgroup): **Cumulic Endoaquoll**	Drainage Class: **somewhat poor to poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-18	**A**	**10YR 2/1**			**l, n**
18-29	**Bg**	**2.5Y 4/2**	**7.5YR 4/6**	**m3p**	**l, se to e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF7-Thick dark surface 2/1**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Large wetland area with NWI designation - PSSCx.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **23143056-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/08** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-3**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix discolor	Shrub	FACW	9.		
2. Phalaris arundinacea	Herb	FACW+	10.		
3. Polygonum amphibium	Herb	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 100

Remarks:Wetland area with Salix discolor, Phalaris arundinacea, and Polygonum amphibium growing along the edge. Typha angustifolia grows in the center.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>30** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large wetland area with NWI designation - PSSCx.**

SOILS

Map Unit Name (Series and Phase): **Lamoure sil, channeled, 0-6** Taxonomy (Subgroup): **Cumulic Endoaquoll**	Drainage Class: **somewhat poor to poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-19	**A**	**N 2.5/0**			**l, se to es**
19-28	**Bg**	**2.5Y 3/1**			**l, se to es**
28-30	**Cg**	**5Y 5/2**			**l, se**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Large wetland area with NWI designation - PSSCx.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **23143056-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha angustifolia	Herb	OBL	9.		
2. Elymus caninus	Herb	NI	10.		
3. Salix discolor	Shrub	FACW	11.		
4. Carex lanuginosa	Herb	OBL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Typha angustifolia and Salix discolor in the center of the area. Elymus caninus and Carex lanuginosa grows along the edge of the area.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>31** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression on aerial photograph.**

SOILS

Map Unit Name (Series and Phase): **Divide l, 0-2%** Taxonomy (Subgroup): **Aeric calciaquoll**	Drainage Class: **somewhat poor** Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-18	**A**	**10YR 2/1**			**sicl, n**
18-26	**Btg1**	**2.5Y 3/1**			**cl, n**
26-31	**Btg2**	**2.5Y 4/2**			**sic, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric because the Btg2 horizon was lacking common distinct mottles**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **The area is not a wetland.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **23143056-3** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2. Salix discolor	Shrub	FACW	10.		
3. Typha angustifolia	Herb	OBl	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >75

Remarks:Small wetland area with Salix discolor and Typha angustifolia in its center and Phalaris arundinacea along its edge.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression on aerial photograph.**

SOILS

Map Unit Name (Series and Phase): **Divide l, 0-2%**	Drainage Class: **somewhat poor**
Taxonomy (Subgroup): **Aeric Calciaquoll**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-14	**A**	**10YR 2/1**			**sicl, se**
14-24	**Bg**	**2.5Y 3/1**			**sicl, se**
24-30	**Cg**	**2.5Y 5/2**	**10YR 5/6**	**c1d**	**sicl, se**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI -TF7 Thick dark surface 2/1**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Small depression wetland.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **23143056-4** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **reg Meyer and Dr. Bruce Seelig**			Date: **4/27/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Agrostis stolonifera	Herb	FACW	9.		
2. Alisma plantago-aquatica	Herb	NI	10.		
3. Rumex maritimus	Herb	FACW	11.		
4. Hordeum jubatum	Herb	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 90

Remarks:Small wetland area with Agrostis stolonifera, Alisma plantago-aquatica, Rumex maritimus, and Hordeum jubatum growing within it.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **23** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Small depression wetland.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%**	Drainage Class: **poor**
Taxonomy (Subgroup): **Argiaquic Argialboll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-10	**A**	**2.5Y 2/1**			**l, e**
10-19	**Bk1**	**2.5Y 3/1**			**l, es**
19-24	**Bk2**	**5Y 6/2**	**10YR 4/6**	**c1d**	**l, ev**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF6-Calcic dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Small depression wetland.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **23143056-5** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha angustifolia	Herb	OBL	9.		
2. Carex atherodes	Herb	OBL	10.		
3. Elymus caninus	Herb	NI	11.		
4. Hordeum jubatum	Herb	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 90

Remarks:Wetland area with Typha angustifolia within its center and Hordeum jubatum, Carex atherodes, and Elymus caninus growing along its edge.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **23** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Small depression wetland with NWI designation - PEMA.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%**	Drainage Class: **poor**
Taxonomy (Subgroup): **Argiaquic Argialboll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-10	**A**	**2.5Y 2/1**			**l, e**
10-19	**Bk1**	**2.5Y 3/1**			**l, es**
19-24	**Bk2**	**5Y 6/2**	**10YR 4/6**	**c1d**	**l, ev**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF6-Calcic dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Small depression wetland with NWI designation - PEMA.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **24143056-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/2008** County: **Barnes** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha angustifolia	Herb	OBL	9.		
2. Agrostis stolonifera	Herb	FACW	10.		
3. Muhlenbergia asperfolia	Herb	FACW	11.		
4. Scirpus validus	Herb	OBL	12.		
5. Alisma plantago-aquatica	Herb	NI	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >90

Remarks:Wetland area with Typha angustifolia and Scirpus validus within its center and Agrostis stolonifera, Muhlenbergia asperfolia, and Alisma plantago-aquatica growing along its edge.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>30** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Small depression wetland with NWI designation - PEMA.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%**	Drainage Class: **poor**
Taxonomy (Subgroup): **Argiaquic Argialboll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-9	**A**	**10YR 2/1**			**cl, se**
9-30	**ABtg**	**10YR 2/1 & 2.5Y 4/2**	**7.5YR4/6**	**c1d**	**cl, se to n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **ABtg is a mixed horizon; HI - TF7-Thick dark surface 2/1**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Small depression wetland with NWI designation - PEMA.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **30142053-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/29/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	OBL	9.		
2. Urtica dioica	Herb	FACW	10.		
3. Iva xanthifolia	Herb	FACU	11.		
4. Bromus inermis	Herb	FACU*	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Phalaris arundinacea grows along the channel edge. No vegetation was present within the channel. Urtica dioica also found along the edge of Phalaris arundinacea.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **10** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation - PFOC. Channel has >3 feet deep water within it.**

SOILS

Map Unit Name (Series and Phase): **Heimdal-Emrick l, 0-3%** Taxonomy (Subgroup): **Pachic Hapludoll**	Drainage Class: **well to moderately well** Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-16	**A**	**5Y 2.5/1 & 4/2**			**mucky sl & ls, n to e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - A5-Stratified layers; ditched stream bottom**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Deep ditch channel with NWI designation of PFOC with Phalaris arundinacea along its banks.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **30143055-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/27/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Hordeum jubatum	Herb	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 90

Remarks:Observation point is located within a wetland area that consists of Hordeum jubatum. It was plowed through in 2007.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **16** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depressional wetland with a NWI designation - PEMA.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%**	Drainage Class: **poor**
Taxonomy (Subgroup): **Argiaquic Argialboll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-17	**A**	**5Y2.5/1&N2/0**			**sicl, e to se**
17-29	**A2**	**N 2.5/0**			**sicl, e to se**
29-31	**Bg**	**5Y 4/2**			**sicl, e to se**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **This is a depressional wetland that was cultivated through in 2007 and is designated as PEMA. Hordeum jubatum is the dominant vegetation within the wetland basin. The wetland basin is highly saline.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **30143055-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Upl-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Glycine max	Herb	UPL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). none

Remarks:Observation point is located outside of a wetland area and in a cropped field with soybean (Glycine max) residue.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Observation point is slightly elevated compared to nearby wetland areas. No hydrology present.**

SOILS

Map Unit Name (Series and Phase): **Barnes-Buse l, 3-6%**	Drainage Class: **well**
Taxonomy (Subgroup): **Calcic Hapludoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-9	**Ap**	**10YR 2/1**			**l, n**
9-17	**Bk**	**2.5Y 4/4**			**l, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Point is located outside of the wetland boundary of wetland 30143055-2.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **30143055-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Artemisia biennis	Herb	FAC	9.		
2. Echinocloa crus-galli	Herb	FACW	10.		
3. Rumex crispus	Herb	FACW	11.		
4. Setaria glauca	Herb	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Observation point is located within a wetland area that consists of Artemisia biennis, Echinocloa crus-galli, Rumex crispus, and Setaria glauca. The wetland area is cropped and bare soil is prevalent across the wetland basin.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>32** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depressional wetland with a NWI designation - PEMA in a cultivated field.**

SOILS

Map Unit Name (Series and Phase): **Barnes-Buse l, 3-6%**	Drainage Class: **well**
Taxonomy (Subgroup): **Calcic Hapludoll**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-12	**A**	**10YR 2/1**			**l, n**
12-18	**E**	**2.5Y 4/2**	**7.5YR 3/6**	**c1d**	**sil, n**
18-25	**Btg**	**5Y 4/2**			**cl, n**
25-32	**Cg**	**5Y 4/2**			**l, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F4-Depleted below dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **This is a depressional wetland that has a NWI designation of PEMA. Although the wetland has been cultivated last year hydrophytic vegetation is still present.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **29143055-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Salix discolor	Herb	FACW	9.		
2. Phalaris arundinacea	Herb	FACW+	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Observation point is located within a wetland area that consists of Salix discolor and Phalaris arundinacea. The observation point is found along the edge of a large ditch.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **8** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large drainage ditch with running water in the bottom.**

SOILS

Map Unit Name (Series and Phase): **Colvin sicl, 0-1%** Taxonomy (Subgroup): **Typic Calciaquoll**	Drainage Class: **poor to very poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-10	**A**	**10YR 2/1 &3/1**			**cl, se**
10-16	**Cg**	**5Y 5/2**	**7.5YR 4/6**	**m2p**	**cl, se**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F4-Depleted below dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **This is a large drainage ditch with Salix discolor and Phalaris arundinacea along its banks. Patches of Typha angustifolia and running water are found in the bottom of the ditch.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **32143055-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha angustifolia	Herb	OBL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 100

Remarks:Observation point is located within a wetland area in a road ditch that consists of Typha angustifolia.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **12** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Drainage ditch with surface water in the bottom.**

SOILS

Map Unit Name (Series and Phase): **Colvin-Borup sil, saline, 0-1%** Taxonomy (Subgroup): **Typic Calciaquoll**	Drainage Class: **poor to very poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-14	**A**	**N 2.5/0**			**sicl, n**
14-16	**Bg**	**5Y 5/2**	**2.5Y 5/4**	**c2f**	**sic, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F5-Thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **This is a drainage ditch alongside a section line road. Patches of Typha angustifolia are in the ditch.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **34143055-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Upl-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Agropyron elongatum	Herb	NI	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). none

Remarks:Observation point is located outside of a wetland area in a planted field of tall wheatgrass (Agropyron elongatum).

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Observation point is slightly elevated compared to nearby wetland areas. No hydrology is present.**

SOILS

Map Unit Name (Series and Phase): **Bearden sil, saline, 0-2%**	Drainage Class: **somewhat poor**
Taxonomy (Subgroup): **Aeric Calciaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-9	**A**	**10YR 2/1**			**l, e**
9-15	**Bk1**	**2.5Y 4/2**			**cl, es**
15-23	**Bk2**	**2.5Y 5/3**			**cl, ev**
23-30	**C**	**2.5Y 4/4**			**cl, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Point is located outside of wetland boundary of wetland 34143055-1.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **34143055-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2. Typha angustifolia	Herb	OBL	10.		
3. Rumex crispus	Herb	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 100

Remarks:Observation point is located within a wetland area of a depressional wetland of Phalaris arundinacea, Typha angustifolia, and Rumex crispus.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **14** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Small depressional wetland.**

SOILS

Map Unit Name (Series and Phase): **Beardon sil, saline, 0-2%** Taxonomy (Subgroup): **Aeric Calciaquoll**	Drainage Class: **somewhat poor** Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-11	**A**	**10YR 2/1**			**sil, e**
11-17	**Bk**	**2.5Y 6/2**			**sil, es**
17-29	**Cgy**	**2.5Y 5/2**	**10YR 5/4**	**m3p**	**sil, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF6-Calcic dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **This is a small depressional wetland within a planted grassland field. Typha angustifolia is found in the center of the wetland and Phalaris arundinacea and Rumex crispus grows along its wetland boundary. Tall wheatgrass (Agropyron elongatum) grows in the upland around the wetland.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **34143055-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Up-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Elymus trachycaulus ssp. trachycaulus	Herb	NI	9.		
2. Bromus inermis	Herb	FACU*	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). none

Remarks:Elymus trachycaulus ssp. trachycaulus has been planted within the upland areas. Scattered patches of Bromus inermis are present within the area.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology present.**

SOILS

Map Unit Name (Series and Phase): **Colvin-Borup sil, saline, 0-1%** Taxonomy (Subgroup): **Typic Calciaquoll**	Drainage Class: **poor to very poor** Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-10	**A**	**10YR 2/1**			**sil, es**
10-20	**Bk**	**2.5Y 4/2 & 3/2**			**sicl, es**
20-30	**C**	**5y 4/3 & 4/2**	**10YR 5/4**	**fld**	**vfsl, se**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Wetland Hydrology Present? Hydric Soils Present?	Yes ☐ Yes ☐ Yes ☐	No ☒ No ☒ No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒

Remarks : **This observation point is found outside of the wetland boundary of wetland 34143055-2.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **34143055-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 100

Remarks:Typha angustifolia is present in the center of the basin. Phalaris arundinacea is found around the edge of the wetland.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>13** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation - PEMA. Open water in center of basin.**

SOILS

Map Unit Name (Series and Phase): **Bearden sil, saline, 0-2%**	Drainage Class: **somewhat poor**
Taxonomy (Subgroup): **Aeric Calciaquoll**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-32	**A**	**N 2.5/0**			**l, se to e**
32-38	**Cg**	**5Y 4/2**	**7.5YR 4/6**	**m2p**	**sicl, se**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F5-Thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Depression wetland with Typha angustifolia and open water within its center and Phalaris arundinacea growing along its boundary.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **34143055-3** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha angustifolia	Herb	OBL	9.		
2. Salix discolor	Shrub	FACW	10.		
3. Phalaris arundinacea	Herb	FACW+	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 100

Remarks:Observation point is located within a wetland area of a large ditch with Typha angustifolia, Salix discolor, and Phalaris arundinacea. There is surface water within the bottom of the drainage ditch.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **10** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large drainage ditch with flowing water within it.**

SOILS

Map Unit Name (Series and Phase): **Bearden sil, saline, 0-2%** Taxonomy (Subgroup): **Aeric Caciaquoll**	Drainage Class: **somewhat poor** Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-4	**A**	**5Y 2.5/1**			**sicl, se**
4-16	**Cg**	**5Y 4/2**	**7.5YR 4/6**	**c2d**	**sicl, se**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F4-Depleted below dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **This is a large drainage ditch with patches of Typha angustifolia, Salix discolor, and Phalaris arundinacea in and along its banks.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **34143055-3** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-2**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Scirpus fluviatilis	Herb	OBL	9.		
2. Phalaris arundinacea	Herb	FACW+	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 100

Remarks:Hydrophytic vegetion along the edge of a large ditch. Scirpus fluviatilis is located in the bottom of the ditch and Phalaris arundinacea grows along its edge.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>16** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large ditch with open water in its bottom.**

SOILS

Map Unit Name (Series and Phase): **Colvin-Borup sil, saline, 0-1%**	Drainage Class: **poor to very poor**
Taxonomy (Subgroup): **Typic Calciaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-16	**A**	**N 2.5/0 & 5Y 3/1**	**7.5YR 4/6**	**c1p**	**l to grl, se**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **Ditch edge; HI - F6-Redox dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Large ditch with open water in its bottom.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **34143055-4** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2. Elymus caninus	Herb	NI	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >60

Remarks:Typha angustifolia is present within the center of the wetland and Phalaris arundinacea grows along its edge.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>28** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression wetland located along the edge of a large drainage ditch.**

SOILS

Map Unit Name (Series and Phase): **Bearden sil, saline, 0-2%**	Drainage Class: **somewhat poor**
Taxonomy (Subgroup): **Aeric Calciaquoll**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-14	**A**	**10YR 2/1**			**sicl, es**
14-21	**Bk**	**5y 4/2**	**10YR 5/6**	**c1p**	**sicl, es**
21-28	**Cg**	**5Y 4/2**	**10YR 5/6**	**m2d**	**sicl, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF6-Calcic dark surface; f2f 5Y 5/1 depletions in the Cg**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Depression wetland located just east of a large ditch with Typha angustifolia growing in its center and Phalaris arundinacea growing along its edge.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **34143055-5** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Aster lanceolatus var. hesperius	Herb	OBL	9.		
2. Elymus trachycalus ssp. trachycaulus	Herb	NI	10.		
3. Carex atherodes	Herb	OBL	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Carex atherodes and Typha angustifolia is present within the center of the wetland and Aster lanceolatus var. hesperius and Spartina pectinata grow along its edge. The wetland is located within a field planted with Elymus trachycaulus ssp. trachycaulus.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **15** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression on aerial photograph.**

SOILS

Map Unit Name
(Series and Phase): **Bearden sil, saline, 0-2%**

Taxonomy (Subgroup): **Aeric Calciaquoll**

Drainage Class: **somewhat poor**

Field Observation
Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-17	**A**	**N 2.5/0**			**cl, e to se**
17-25	**Bg**	**5Y 3/1**			**cl, n**
25-31	**Cg**	**5y 4/2**	**10YR 5/6**	**f1d**	**vfsl, n**

Hydric Soil Indicators

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Shallow depressional wetland.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **01142055-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2. Elymus caninus	Herb	NI	10.		
3. Salix discolor	Herb	FACW	11.		
4. Typha angustifolia	Herb	OBL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >60

Remarks:Salix discolor and Typha angustifolia are present within the center of the wetland. Phalaris arundinacea and Elymus caninus grow along the edge of the wetland.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>16** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Small depression wetland.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%** Taxonomy (Subgroup): **Argiaquic Argialboll**	Drainage Class: **poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-6	**A**	**N 2.5/0**			**l, se**
6-16	**Bk**	**5Y 4/2**	**7.5YR 4/6**	**c2d**	**sl, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F4-Depleted below dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Wetland Hydrology Present? Hydric Soils Present?	Yes ☒ Yes ☒ Yes ☒	No ☐ No ☐ No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐

Remarks : **Small despression wetland.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **01142055-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Up-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Elymus trachycaulus ssp. trachycaulus	Herb	NI	9.		
2. Cirsium arvense	Herb	UPL	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). none

Remarks:Point is outside of a wetland.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology present.**

SOILS

Map Unit Name (Series and Phase): **Barnes-Svea l, 3-6%**	Drainage Class: **well**
Taxonomy (Subgroup): **Calcic Hapludoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-14	**A**	**10YR 2/1**			**sicl, n**
14-22	**Bk1**	**2.5Y 5/2**			**sicl, ev**
22-30	**Bk2**	**2.5Y 5/3 & 5/4**			**sil, ev**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Point is located outside of the hydric boundary of wetland 01142055-2.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **01142055-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2. Aster lanceolatus var. hesperius	Herb	OBL	10.		
3. Elymus caninus	Herb	NI	11.		
4. Typha angustifolia	Herb	OBL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >75

Remarks:Phalaris arundinacea and Typha angustifolia grow in the center of the wetland. Aster lanceolatus var. hesperius and Elymus caninus grow along the edge of the wetland.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>30** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Small depression wetland.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%** Taxonomy (Subgroup): **Argiaquic Argialboll**	Drainage Class: **poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-10	**A**	**N 2.5/0**			**sicl, n**
10-22	**Bg1**	**5Y 4/2**	**10YR 5/6**	**f1d**	**sicl, n**
22-30	**Bg2**	**5Y 5/2**			**sicl, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF4-2.5Y/5Y below dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Small depression wetland.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **01142055-3** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Up-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Bromus inermis	Herb	FACU*	9.		
2. Aster ericoides	Herb	FACU	10.		
3. Solidago canadensis	Herb	FACU	11.		
4. Cirsium arvense	Herb	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). <25

Remarks:Upland vegetation are the dominant species within the observation point.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology is present.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%**	Drainage Class: **somewhat poor**
Taxonomy (Subgroup): **Aeric Calciaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-9	**A**	**10YR 2/1**			**sicl, se to e**
9-18	**Bk1**	**2.5Y 4/2**			**sil, es**
18-27	**Bk2**	**5Y 6/3**			**sicl, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Point is located just outside of the wetland boundary of wetland 01142055-3.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **01142055-3** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Aster lanceolatus var. lanceolatus	Herb	FACW	9.		
2. Solidago canadensis	Herb	FACU	10.		
3. Elymus caninus	Herb	NI	11.		
4. Juncus torreyii	Herb	FACW	12.		
5. Triglochin maritimus	Herb	OBL	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Observation point is located along a shallow connection of two cattail dominated areas.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **15** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation - PEMC. Depression wetland.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%** Taxonomy (Subgroup): **Argiaquic Argialboll**	Drainage Class: **poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-10	**A**	**10YR 2/1**			**sicl, se to e**
10-16	**Bk1**	**2.5Y 4/1**			**sicl, ev**
16-29	**Bk2**	**2.5Y 6/2 & 6/3**	**10YR 5/6**	**c2d**	**sicl, ev**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF6-Calcic dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Wetland Hydrology Present? Hydric Soils Present?	Yes ☒ Yes ☒ Yes ☒	No ☐ No ☐ No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐

Remarks : **Depression wetland with PEMC designation.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **01142055-4** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	OBL	9.		
2. Agropyron elongatum	Herb	NI	10.		
3. Aster lanceolatus var. lanceolatus	Herb	FACW	11.		
4. Polygonum amphibium	Herb	OBL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Phalaris arundinacea grows along edge of wetland and Typha angustifolia is present within the center of the wetland.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **20** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression on aerial photograph.**

SOILS

Map Unit Name (Series and Phase): **Barnes-Buse-Langhei l, 6-9%** Taxonomy (Subgroup): **Calcic Hapludoll**	Drainage Class: **well** Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-17	**A**	**N 2.5/0**			**sicl, n**
17-27	**Bg**	**5Y 3/1**			**l, n**
17-31	**Cg**	**5Y 5/2**			**vfsl, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Depression wetland.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **01142055-5** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phlaris arundinacea	Herb	FACW+	9.		
2. Aster lanceolatus var. lanceolatus	Herb	FACW	10.		
3. Typha angustifolia	Herb	OBL	11.		
4. Solidago canadensis	Herb	FACU	12.		
5. Polygonum amphibium	Herb	OBL	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Phalaris arundinacea and Aster lanceolatus var. lanceolatus grow along the edge of the wetland. Typha angustifolia grow within the center of the wetland.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **18** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation - PEMC. Depression wetland.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Wyard l, 0-3%**	Drainage Class: **somewhat poor**
Taxonomy (Subgroup): **Typic Endoaquoll**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-20	**A**	**N 2.5/0**			**sicl, n**
20-30	**Bg1**	**2.5Y 3/1**			**sicl, n**
30-34	**Bg2**	**5Y 5/2**			**sicl, e**
34-42	**Cg**	**5Y 5/2**	**10YR 5/6**	**m2p**	**sicl, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F5-Thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Depression wetland with PEMC designation.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **01142055-6** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Up-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Glycine max	Herb	UPL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). none

Remarks:Point located within a soybean (Glycine max) field.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology present.**

SOILS

Map Unit Name (Series and Phase): **Barnes-Buse-Langhei l, 6-9%** Taxonomy (Subgroup): **Calcic Hapludoll**	Drainage Class: **well** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-10	**Ap**	**10YR 2/2**			**l, n**
10-17	**Bw**	**10YR 3/2 & 3/3**			**l, e**
17-26	**Bk**	**2.5Y 4/3 & 4/4**			**l, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Point located outside of the wetland boundary of wetland 01142055-6.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **01142055-6** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/28/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Eleocharis parvula	Herb	OBL	9.		
2. Alisma plantago-aquatica	Herb	NI	10.		
3. Beckmannia syzigachne	Herb	OBL	11.		
4. Scirpus fluviatilis	Herb	OBL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >80

Remarks:Eleocharis parvula is prevalent across the wetland. Alisma plantago-aquatica also grows within the basin. Scirpus fluviatils is the dominant vegetion within the center of the wetland.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>30** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation-PEMA.**

SOILS

Map Unit Name (Series and Phase): **Vallers l, 0-1%** Taxonomy (Subgroup): **Typic Calciaquoll**	Drainage Class: **poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-12	**A**	**N 2.5/0**			**sicl, n**
12-22	**Btg**	**5Y 4/2**	**7.5YR 4/6**	**m1p**	**sic, n**
22-30	**Cg**	**5Y 4/2 & 5/3**	**7.5YR 4/6**	**c1d**	**sicl, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F5-Thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Depression wetland with PEMA designation.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **07142054-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/29/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2. Typha angustifolia	Herb	OBL	10.		
3. Rumex crispus	Herb	FACW	11.		
4. Alisma plantago-aquatica	Herb	NI	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 100

Remarks:Drainage ditch with sparse vegetion.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **10** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Surface water is found within the bottom of the ditch. The ditch has a NWI designation of PEMAd.**

SOILS

Map Unit Name (Series and Phase): **Vallers-Parnell complex, 0-1%**	Drainage Class: **poor**
Taxonomy (Subgroup): **Typic Calciaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-10	**A**	**2.5Y 3/1**	**5Y 5/2**	**f3d mixings**	**cl, e to es**
10-16	**Bk**	**5Y 5/2**	**10YR 5/6**	**m2p**	**cl, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF6-Calcic dark surface; ditch bank**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Ditch with surface water within it and it connects to multiple areas including one with a PEMAd designation.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **17142054-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/29/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Up-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Elymus trachycaulus ssp. trachycaulus	Herb	NI	9.		
2. Bromus inermis	Herb	FACU	10.		
3. Cirsium arvense	Herb	FACU	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). none

Remarks:Elymus trachycaulus ssp. trachycaulus was seeded in the area. Scattered patches of Bromus inermis and Cirsium arvense grow in the area.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **16** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%** Taxonomy (Subgroup): **Argiaquic Argialboll**	Drainage Class: **poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-13	**A**	**10YR 2/1**			**sicl, es**
13-27	**Bk**	**5Y 3/1**			**sicl, es**
27-34	**Cg**	**5Y 4/2**	**7.5YR 4/6**	**c2p**	**sicl, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF7-Thick dark surface 2/1; hydric soil present beyond hydrophytic vegetation**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Non-hydrophytic vegetation grows upon the observation point possibly due to being planted.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **17142054-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/29/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2. Elymus caninus	Herb	NI	10.		
3. Scirpus pungens	Herb	OBL	11.		
4. Typha angustifolia	Herb	OBL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >60

Remarks:Phalaris arundinacea grows along of the wetland. The center of the wetland is Typha angustifolia.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **14** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation - PEMC. Large depression wetland with open water in its center.**

SOILS

Map Unit Name (Series and Phase): **Hamerly-Tonka complex, 0-3%**	Drainage Class: **poor**
Taxonomy (Subgroup): **Argiaquic Argialboll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-7	**A**	**5Y 2.5/1**			**sicl, e to es**
7-24	**ACg**	**5Y 3/1 & 5Y 4/2 to 6/2**	**7.5YR 4/6**	**m2p**	**sicl, e to es**
24-27	**Cg**	**5Y 6/2**			**sicl, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F7-Depleted dark surface; ACg is a mixed horizon**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Large cattail wetland with a PEMC designation.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **20142054-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/29/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Scirpus validus	Herb	OBL	9.		
2. Bromus inermis	Herb	FACU*	10.		
3. Phalaris arundinacea	Herb	OBL	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Drainage ditch with Scirpus validus in its bottom, Phalaris arundinacea along its edge and Bromus inermis growing on the top of its bank.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **12** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Drainage ditch with surface water within it.**

SOILS

Map Unit Name (Series and Phase): **Vallers l, 0-1%** Taxonomy (Subgroup): **Typic Calciaquoll**	Drainage Class: **poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-6	**A1**	**N 2.5/0**			**l, n**
6-12	**A2**	**N 2.5/0**	**7.5YR 5/8**	**c1d**	**l, n**
12-40	**A3**	**5Y 2.5/1 & 3/1**			**l, se to n**
40-43	**Cg**	**5Y 4/2**			**l, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F6-Redox dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Wetland Hydrology Present? Hydric Soils Present?	Yes ☒ Yes ☒ Yes ☒	No ☐ No ☐ No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐

Remarks : **Drainage ditch with surface water present.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **20142054-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/29/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Typha angustifolia	Herb	OBL	9.		
2. Equisetum hymale	Herb	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >90

Remarks:Equisetum hymale grows along the edge of the ditch and Typha angustifolia grows within the center of the ditch.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **15** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☒ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Drainage ditch with surface water in its center.**

SOILS

Map Unit Name (Series and Phase): **Heimdal-Emrick l, 3-6%** Taxonomy (Subgroup): **Pachic Hapludoll**	Drainage Class: **well to moderately well** Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-28	**A1**	**N 2.5/0**			**l, n**
28-40	**A2**	**5Y 2.5/1 & 3/1**			**l, n**
40-43	**Cg**	**5Y 4/2**	**10YR 4/6**	**c1d**	**l,n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F5-Thick dark surface; some Cg mixings in the A1 horizon (12-16 inches)**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Drainage ditch with surface water within its center.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **21142054-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/29/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Juncus dudleyi	Herb	NI	9.		
2. Juncus torreyi	Herb	FACW	10.		
3. Carex atherodes	Herb	OBL	11.		
4. Setaria glauca	Herb	FACU	12.		
5. Taraxicum officinale	Herb	FACU	13.		
6. Equisetum hymale	Herb	FACW	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Drainage swale with Typha angustifolia in its bottom and Juncus dudleyi, Juncus torreyi, Carex atherodes, and Artemisia biennis growing along its edge.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **14** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Drainage swale with intermittent pools of water along its course.**

SOILS

Map Unit Name (Series and Phase): **Heimdal-Esmond-Sisseton l, 6-9%** Taxonomy (Subgroup): **Calcic Hapludoll**	Drainage Class: **well** Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-8	**A**	**10YR 2/1**	**7.5YR 4/6**	**c3d**	**l, se**
8-22	**Ab**	**N 2.5/0**			**l, n**
22-30	**Ab2**	**5Y 2.5/1**			**l,n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F6-Redox dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Drainage swale.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **28142054-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/29/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Up-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Glycine max	Herb	UPL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). none

Remarks:No wetland vegetation is present. Area was cultivated last fall (2007).

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **14** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Surface water across the area.**

SOILS

Map Unit Name (Series and Phase): **Barnes-Svea l, 0-3%** Taxonomy (Subgroup): **Cumulic Hapludoll**	Drainage Class: **well to moderately well** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-9	**Ap**	**10YR 2/2**			**l, n**
9-13	**A2**	**10YR 3/2 & 3/3**			**sl, n**
13-16	**Bw**	**10YR 4/3**			**sl, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Area is not a wetland but pools spring melt water.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **26142054-1** Applicant/Owner: **McCain and Associates** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **05/09/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW	9.		
2. Bromus inermis	Herb	FACU*	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >75

Remarks:Phalaris arundinacea grows along the bottom of the drainage ditch banks. Typha angustifolia grows in the bottom of the drainage ditch. Bromus inermis grows along the upland edge of the drainage banks.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☒ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large drainage ditch that flows to Brewer Lake approximately 3 miles downstream.**

SOILS

Map Unit Name (Series and Phase): **Barnes-Swea l, 0-3%**	Drainage Class: **moderately well**
Taxonomy (Subgroup): **Packic Hapludolll**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-5	**A1**	**2.5Y 3/2**			**l**
5-14	**A & Cg**	**2.5Y 3/2 & 4/2**	**2.5YR 3/6**	**m2p**	**l**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **F4 - Depleted Below Dark Surface**
F6 - Redox Dark Surface.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Large drainage ditch with open water flowing in its channel.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **30142053-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/29/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	OBL	9.		
2. Urtica dioica	Herb	FACW	10.		
3. Iva xanthifolia	Herb	FACU	11.		
4. Bromus inermis	Herb	FACU*	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Phalaris arundinacea grows along the channel edge. No vegetation was present within the channel. Urtica dioica also found along the edge of Phalaris arundinacea.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **10** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation - PFOC. Channel has >3 feet deep water within it.**

SOILS

Map Unit Name (Series and Phase): **Heimdal-Emrick l, 0-3%** Taxonomy (Subgroup): **Pachic Hapludoll**	Drainage Class: **well to moderately well** Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-16	**A**	**5Y 2.5/1 & 4/2**			**mucky sl & ls, n to e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - A5-Stratified layers; ditched stream bottom**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Deep ditch channel with NWI designation of PFOC with Phalaris arundinacea along its banks.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **31142053-1** Applicant/Owner: **McCain and Associates** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **05/09/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Eleocharis parvula	Herb	OBL	9.		
2. Rumex crispus	Herb	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50 of present vegetation

Remarks:Eleocharis parvula and Rumex crispus grows along the edge of the wetland boundary. Wetland has been cultivated.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☒ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Depression on aerial photo and NWI designation - PEMA.**

SOILS

Map Unit Name (Series and Phase): **Barnes-Swea l, 0-3%**	Drainage Class: **moderately well**
Taxonomy (Subgroup): **Packic Hapludolll**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-21	**Ap & A**	**10YR 2/1**			**l**
21-28	**Bg1**	**10YR 3/1**	**7.5YR 4/6**	**m2d**	**l**
28-30	**Bg2**	**10YR 4/2**	**7.56YR 4/6**	**c2d**	**cl**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **TF7- Thick dark surface 2/1**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Shallow depression with NWI designation of PEMA. Wetland is cultivated.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **34142053-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/29/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Up-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Bromus inermis	Herb	FACU*	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). <5

Remarks:Bromus inermis is prevalent within this area.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology present.**

SOILS

Map Unit Name (Series and Phase): **Glyndon l, 0-2%**	Drainage Class: **somewhat poor**
Taxonomy (Subgroup): **Aeric Calciaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-10	**A**	**2.5Y 2.5/2**			**sicl, e**
10-23	**Bk1**	**2.5Y 4/2**			**sil, ev**
23-30	**Bk2**	**2.5Y 5/2**			**sicl, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Observation point located outside of the hydric boundary of wetland 34142053-1.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **34142053-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/29/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Spartina pectinata	Herb	OBL	9.		
2. Aster lanceolatus var. lanceolatus	Herb	FAC	10.		
3. Agropyron elongatum	Herb	NI	11.		
4. Solidago canadensis	Herb	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >75

Remarks:Wetland area has a deep channel and two connecting lobes. Typha angustifolia is prevalent within the deep portions of the channel and the lobes. Spartina pectinata and Aster lanceolatus var. lanceolatus grow along the wetland boundary.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>33** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Wetland area has a deep channel and two connecting lobes. Open water approximately 3 feet deep is present within the channel portion of the wetland.**

SOILS

Map Unit Name (Series and Phase): **Glyndon l, 0-2%**	Drainage Class: **somewhat poor**
Taxonomy (Subgroup): **Aeric Calciaquoll**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-12	**A**	**5Y 2.5/1**			**sicl, es**
12-19	**Bk1**	**5Y 3/1**			**sicl, ev**
19-33	**Bk2**	**5Y 5/1**			**sicl, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **TF5 - 2.5Y/5Y below thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Wetland area has a deep channel and two connecting lobes. Open water approximately 3 feet deep is present within the channel portion of the wetland. The wetland is located within a tame-grass field.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **34142053-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Upl-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Bromus inermis	Herb	FACU*	9.		
2. Melilotus officinale	Herb	FACU-	10.		
3. Aster lanceolatus var. lanceolatus	Herb	FAC	11.		
4. Solidago canadensis	Herb	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). <15

Remarks:Bromus inermis and Melilotus officinale are predominant upon the observation point.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology present.**

SOILS

Map Unit Name (Series and Phase): **LaPrairie sil, 0-2%**	Drainage Class: **moderately well**
Taxonomy (Subgroup): **Cumulic Hapludoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-10	**A1**	**2.5Y 2.5/1**			**sil, es**
10-24	**A2**	**2.5Y 3/1**			**sil, es**
24-30	**Bw**	**2.5Y 4/2 & 4/3**	**10YR 4/4**	**c1f**	**sil, es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Point is located outside of the wetland boundary of wetland 34142053-2.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **34142053-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Aster lanceolatus var. hesperius	Herb	OBL	9.		
2. Solidago canadensis	Herb	FACU	10.		
3. Equisetum arvense	Herb	FAC	11.		
4. Bromus inermis	Herb	FACU*	12.		
5. Solidago gigantia	Herb	FACW	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Observation point is located along the edge of a flowing creek. Aster lanceolatus var. hesperius is prevalent along the creek bank.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **12** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large wetland with a creek along its western edge and a NWI designation - PEMC along its eastern edge.**

SOILS

Map Unit Name (Series and Phase): **Lamoure sicl, 0-1%** Taxonomy (Subgroup): **Cumulic Endoaquoll**	Drainage Class: **somewhat poor to poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-8	**A1**	**5Y 2.5/1**	**2.5Y 5/1**	**f2d (depl)**	**l, se**
8-18	**A2**	**5Y 2.5/1**	**7.7YR 4/6**	**m1d**	**l, se**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F6-Redox dark surface; channel bank**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Wetland Hydrology Present? Hydric Soils Present?	Yes ☒ Yes ☒ Yes ☒	No ☐ No ☐ No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐

Remarks : **Wetland area has a small flowing creek along its western edge and is connected to a PEMC designated wetland by a channel.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **34142053-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-2**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Aster lanceolatus ssp. lanceolatus	Herb	FACW	9.		
2. Solidago canadensis	Herb	FACU	10.		
3. Equisetum arvense	Herb	FAC	11.		
4. Bromus inermis	Herb	FACU	12.		
5. Solidago gigantea	Herb	FACW	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Observation point along edge of wetland area of predominantly Aster lanceolatus ssp. lanceolatus. Upland vegetation species grow nearby.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **19** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large wetland with a creek along its western edge and a NWI designation - PEMC along its eastern edge.**

SOILS

Map Unit Name (Series and Phase): **LaPrairie sil, 0-2%**	Drainage Class: **moderately well**
Taxonomy (Subgroup): **Cumulic Hapludoll**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-15	**A1**	**5Y 2.5/1**			**l, se**
15-26	**A2**	**5Y 3/1**			**sl to ls, se to e**
26-30	**Cg**	**5Y 4/2**			**ls, se**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Wetland area has a small flowing creek along its western edge and is connect to a PEMC designated wetland by a channel.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **35142053-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/29/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Up-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Xanthium strumarium	Herb	FAC	9.		
2. Kochia scoparia	Herb	FAC	10.		
3. Artemisia biennis	Herb	FAC	11.		
4. Setaria glauca	Herb	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Observation point has Xanthium strumarium, Kochia scoparia, Artemisia biennis and Setaria glauca growing around it.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology present.**

SOILS

Map Unit Name (Series and Phase): **Borup sil, very poor, 0-1%**	Drainage Class: **poor to very poor**
Taxonomy (Subgroup): **Typic Calciaquoll**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-9	**A**	**2.5Y 2/1**			**fsl, e**
9-17	**Bk**	**2.5Y 4/2**			**fsl, es**
17-25	**C**	**2.5Y 4/3**	**10YR 4/6**	**f1f**	**lfs, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Point is located outside of the wetland boundary of wetland 35142053-1.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **35142053-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/29/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Carex atherodes	Herb	OBL	9.		
2. Phalaris arundinacea	Herb	FACW+	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 100

Remarks:Large wetland area with Typha angustifolia and Carex atherodes growing within its center. Phalaris arundinacea grows along the wetland edge.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **16** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation - PEMC. Large depression wetland with open water areas in its center.**

SOILS

Map Unit Name (Series and Phase): **Borup sil, very poor, 0-1%**	Drainage Class: **poor to very poor**
Taxonomy (Subgroup): **Typic Calciaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-17	**A**	**5Y 2.5/1**			**fsl, n**
17-30	**A2**	**5Y 3/1**			**fsl, se**
30-38	**Cg**	**5Y5/2**	**7.5YR 4/6**	**c1d**	**lfs, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF7-Thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Large depression wetland (PEMC) with open water areas in its center.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **36142053-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Up-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Bromus inermis	Herb	FACU*	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). none

Remarks:Observation point is located above the wetland boundary and consists of Bromus inermis.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology present.**

SOILS

Map Unit Name (Series and Phase): **Water** Taxonomy (Subgroup): **N/A**	Drainage Class: **N/A** Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-9	**A**	**10YR 2/1**			**l, n**
9-16	**Bw**	**2.Y 4/4 & 5/3**	**10YR 5/6**	**f2d**	**l, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Observation point is located outside of the wetland boundary of 36142053-1.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **36142053-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW	9.		
2. Spartina pectinata	Herb	FACW	10.		
3. Bromus inermis	Herb	FACU*	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >75

Remarks:Large stream with Phalaris arundinacea and Spartina pectinata growing along its banks. Bromus inermis grows on top of the stream banks.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **8** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation - PEMC. The stream has flowing open water within its channel.**

SOILS

Map Unit Name (Series and Phase): **Water** Taxonomy (Subgroup): **N/A**	Drainage Class: **N/A** Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-10	**A**	**5Y 2.5/1**			**l, n**
10-16	**Cg**	**5Y 4/2**	**10YR 5/6**	**c3p**	**l,n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F4-Depleted below dark surface; Maple river bank**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Large stream with a PEMC designation. Open water areas exist within its channel.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **33142052-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Up-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Bromus inermis	Herb	FACU*	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). none

Remarks:Bromus inermis grows in the observation point.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **No hydrology present.**

SOILS

Map Unit Name (Series and Phase): **Lankin-Antler l, 0-2%** Taxonomy (Subgroup): **Pachic Hapludoll**	Drainage Class: **moderately well** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-16	**A1**	**10YR 2/1**			**l, se**
16-32	**A2**	**10YR 3/1**			**l,n**
32-38	**A3**	**10YR 3/2**			**l, se**
38-43	**Bw**	**10YR 4/2**			**lfs, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **non-hydric**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Is this Sampling Point Within a Wetland	Yes ☐	No ☒
Wetland Hydrology Present?	Yes ☐	No ☒			
Hydric Soils Present?	Yes ☐	No ☒			

Remarks : **Observation point is located outside of the wetland boundary of wetland 33142052-1.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **33142052-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Polygonum amphibium	Herb	OBL	9.		
2. Iva xanthifolia	Herb	FACU	10.		
3. Bromus inermis	Herb	FACU*	11.		
4. Rumex crispus	Herb	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Polygonum amphibium grows throughout the wetland basin. Scattered patches of Bromus inermis, Iva xanthifolia, and Rumex crispus grow around the wetland edge. Phalaris arundinacea is prevalent within the center of the wetland.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>30** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **NWI designation - PEMA. Areas of surface water are present within the wetland's center.**

SOILS

Map Unit Name (Series and Phase): **Lankin-Antler l, 0-2%** Taxonomy (Subgroup): **Aeric Calciaquoll**	Drainage Class: **somewhat poor** Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-20	**A1**	**2.5Y 2.5/1**			**sicl,n**
20-25	**A2**	**2.5Y 3/1**			**l,n**
25-30	**Cg**	**5Y 4/2**	**7.5YR 4/6**	**f1d**	**l,n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Small depression wetland with a PEMA designation. Polygonum amphibium grows throughout the wetland basin and surface water is also present within the basin.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **35142052-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Rumex crispus	Herb	FACW	9.		
2. Artemisia biennis	Herb	FAC	10.		
3. Elymus caninus	Herb	NI	11.		
4. Eleocharis parvula	Herb	OBL	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Rumex crispus and Eleocharis parvula grow in the center of the wetland. Artemisia biennis and Elymus caninus grow along the edge of the wetland.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>30** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Small depression with open water.**

SOILS

Map Unit Name (Series and Phase): **Fargo sic, depressional, 0-1%** Taxonomy (Subgroup): **Typic Epiaquert**	Drainage Class: **poor to very poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-10	**A1**	**5Y 2.5/1**			**l, n**
10-16	**A2**	**5Y 3/1**			**l, n**
16-24	**Bg1**	**5Y 4/2**	**10YR 5/6**	**f1d**	**cl, n**
24-30	**Bg2**	**5Y 4/1**			**sic, se**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Small depression wetland with surface water approximately 2 feet deep.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **35142052-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	OBL	9.		
2. Poa pratensis	Herb	FACU	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Phalaris arundinacea grows along the bottom and edges of the ditch. Poa pratensis grows along the top of the ditch bank.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>12** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Drainage ditch with surface water within it.**

SOILS

Map Unit Name (Series and Phase): **Fargo sic, depressional, 0-1%** Taxonomy (Subgroup): **Typic Epiaquert**	Drainage Class: **poor to very poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-4	**A**	**5Y 2.5/1**			**sicl, se**
4-12	**Cg**	**5Y 5/2**	**10YR 5/6**	**c2d**	**sicl, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F4-Depleted below dark surface; ditch bank**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Drainage ditch with surface water within it.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **06141051-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2. Bromus inermis	Herb	FACU*	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Phalaris arundinacea within the bottom of the drainage ditch and along the banks. Bromus inermis grows higher up the ditch bank. Scattered patches of Typha angustifolia grow within the bottom of the drainage ditch.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>14** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large drainage ditch with water flowing within it.**

SOILS

Map Unit Name (Series and Phase): **Galchutt-Fargo sicl, 0-2%** Taxonomy (Subgroup): **Typic Epiaquert**	Drainage Class: **poor to very poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-2	**A**	**5Y 3/1**			**c, n**
2-14	**Cg**	**5Y 4/2 & 4/1**	**10YR 5/6**	**f1d**	**c, se**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF4-2.5Y/5Y below dark surface; ditch bank**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Wetland Hydrology Present? Hydric Soils Present?	Yes ☒ Yes ☒ Yes ☒	No ☐ No ☐ No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐

Remarks : **Large drainage ditch.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **06141051-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-2**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2. Bromus inermis	Herb	FACU*	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >75

Remarks:Phalaris arundinacea and scattered patches of Typha angustifolia grow within the center of the drainage ditch. Bromus inermis grows along the upper edge of the banks.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>16** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large drainage ditch with flowing surface water within it.**

SOILS

Map Unit Name (Series and Phase): **Galchutt-Fargo sicl, 0-2%** Taxonomy (Subgroup): **Typic Epiaquert**	Drainage Class: **poor to very poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-16	**Cg**	**5Y 4/2**	**10YR 5/6**	**c1d**	**c, se to e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F3-Depleted matrix; ditch bank**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Large drainage ditch.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **06141051-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-3**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2. Bromus inermis	Herb	FACU*	10.		
3. Xanthium strumarium	Herb	FAC	11.		
4. Elymus caninus	Herb	NI	12.		
5. Equisetum hymale	Herb	FACW	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Phalaris arundinacea and scattered patches of Typha angustifolia grow within the center of the drainage ditch. Bromus inermis grows along the upper edge of the banks..

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>16** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large drainage ditch with flowing surface water within it.**

SOILS

Map Unit Name (Series and Phase): **Galchutt-Fargo sicl, 0-2%** Taxonomy (Subgroup): **Typic Epiaquert**	Drainage Class: **poor to very poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-16	**Cg**	**5Y 4/2**	**10YR 5/6**	**c1d**	**c, se to e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F3-Depleted matrix; ditch bank**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Large drainage ditch.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **25141051-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundincea	Herb	FACW+	9.		
2. Spartina pectinata	Herb	FACW	10.		
3. Bromus inermis	Herb	FACU*	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >75

Remarks:Drainage ditch with Phalaris arundinacea in the bottom and Spartina pectinata grows around the culverts. Bromus inermis grows along the top of the ditch banks.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>30** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Drainage ditch with surface water.**

SOILS

Map Unit Name (Series and Phase): **Bearden-Lindaas sicl, 0-2%**	Drainage Class: **poor**
Taxonomy (Subgroup): **Typic Argiaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-16	**A**	**5Y 2.5/1**			**sic, n**
16-20	**Bg**	**5Y 4/2**			**sic, n**
20-30	**Cg**	**5Y 5/2**	**7.5YR 4/6**	**c1d**	**c, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark surface; ditch bank**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Drainage ditch with surface water.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **36141051-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2. Bromus inermis	Herb	FACU*	10.		
3. Poa pratensis	Herb	FACU	11.		
4. Solidago canadensis	Herb	FACU	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Phalaris arundinacea grows within the ditch bottom and up the edge of the bank. Bromus inermis, Poa pratensis, and Solidago canadensis grows on the upper edge of the ditch bank.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **14** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Drainage ditch with flowing surface water.**

SOILS

Map Unit Name (Series and Phase): **Bearden-Lindaas sicl, 0-2%**	Drainage Class: **poor**
Taxonomy (Subgroup): **Typic Argiaquoll**	Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth		Matrix Color	Mottle colors	Mottle	Texture, Concretions
(inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	Structure, etc.
0-16	**A**	**5Y 2.5/1**	**5Y 4/2**	**fcd (mixings)**	**sic, n**
16-22	**Bk**	**5Y 4/2**			**sic, e**
22-27	**Cg**	**5Y 5/2**	**7.5YR 4/6**	**c1d**	**c, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark surface; ditch bank**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Drainage ditch with flowing surface water.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **01140051-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Carex atherodes	Herb	FACW+	9.		
2. Phalaris arundinacea	Herb	OBL	10.		
3. Typha angustifolia	Herb	OBL	11.		
4. Bromus inermis	Herb	FACU*	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >75

Remarks:Carex atherodes grow along the bottom and banks of the ditch. Sporadic patches of Phalaris arundinacea and Typha angustifolia grow within the center of the ditch. Bromus inermis grows along the top of the ditch banks.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **7** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Drainage ditch with approximately 8 inch deep water.**

SOILS

Map Unit Name (Series and Phase): **Fargo sicl, 0-1%** Taxonomy (Subgroup): **Typic Epiaquert**	Drainage Class: **poor to very poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-18	**A1**	**5Y 2.5/1**			**sic, n**
18-25	**A2**	**5Y 3/1**			**sic, se**
25-31	**Bg**	**5Y 5/2**	**10YR 5/6**	**f1d**	**c, se**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark surface; ditch bank**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Drainage ditch with flowing surface water within it.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **01140051-2** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Spartina pectinata	Herb	FACW	9.		
2. Xanthium strumarium	Herb	FAC	10.		
3. Salix discolor	Herb	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 85

Remarks:Banks along Rush River consists of patches of Spartina pectinata, Xanthium strumarium, and Salix discolor. No vegetation occurs within the main channel due to high water current.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **>13** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Channelized portion of Rush River.**

SOILS

Map Unit Name (Series and Phase): **Fargo sic, 0-1%** Taxonomy (Subgroup): **Typic Epiaquert**	Drainage Class: **poor to very poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-13	**Cg**	**5Y 4/2 & 4/3**	**5Y 4/1**	**f2f depl**	**c, n to se**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F3-Depleted matrix; ditch bank**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Channelized portion of Rush River.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **10140050-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2. Bromus inermis	Herb	FACU	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Phalaris arundinacea grows along the bank edge of the large ditch. Bromus inermis grows along the upper edge of the ditch banks.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **11** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large drainage ditch named Raymond Coulee. Surface water approximately 3 feet deep are found within the ditch.**

SOILS

Map Unit Name (Series and Phase): **Fargo sic, 0-1%** Taxonomy (Subgroup): **Typic Epiaquert**	Drainage Class: **poor to very poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-12	**A**	**5Y 3/1**			**sic, n**
12-17	**Cg**	**5Y 5/2**	**7.5YR 4/6**	**m3p**	**c, n**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark surface; ditch bank**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Large drainage ditch named Raymond Coulee. Surface water approximately 3 feet deep are found within the ditch.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **07140049-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2. Acer negundo	Tree	FAC	10.		
3. Rumex crispus	Herb	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Phalaris arundinacea is the prevalent vegetation growing along the river banks. Scattered Acer negundo trees and Rumex crispus plants grow along the river edge.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **2** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Sheyenne River with a NWI designation - R2UBH.**

SOILS

Map Unit Name (Series and Phase): **Fairdale sil, channeled, 0-6%**	Drainage Class: **moderately well**
Taxonomy (Subgroup): **Mollic Udifluvent**	Field Observation Confirm Mapped Type Yes ☐ No ☒

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-12	**Cg**	**5Y 3/1 & 4/2**	**10YR 3/4**	**c3d**	**sic & sil, se to e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - A5-Stratified layers; Sheyenne River bottom.**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Sheyenne River with a NWI designation - R2UBH.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **17140049-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **4/30/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-1**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Phalaris arundinacea	Herb	FACW+	9.		
2. Typha angustifolia	Herb	OBL	10.		
3. Bromus inermis	Herb	FACU*	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >75

Remarks:Large wetland with open water in its center and cattail (Typha angustifolia) growing in the edge of the water. Phalaris arundinacea grows along the cattail edge and up the edge. Bromus inermis grows on the top of the banks.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **13** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large wetland with open water and NWI designation - PABF.**

SOILS

Map Unit Name (Series and Phase): **Rauville sicl, 0-1%** Taxonomy (Subgroup): **Cumulic Endoaquoll**	Drainage Class: **very poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-20	**A1**	**5Y 2.5/1**			**sic, n**
20-34	**A2**	**5Y 3/1**	**5Y 4/2**	**fcd mixings**	**sic, se**
34-36	**Cg**	**5Y 4/2**			**c, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - TF5-2.5Y/5Y below thick dark surface; ditch bank**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Large wetland with open water and NWI designation - PABF.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **17140049-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **5/16/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-2**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Spartina pectinata	Herb	FACW	9.		
2. Phalaris arundinacea	Herb	FACW+	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >75

Remarks:Large wetland area with cattails (Typha sp.) and Phragmites sp. growing in its center and Spartina pectinata and Phalaris arundinacea growing along its edge.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **7** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large wetland area that consists of a channel with an NWI designation of PEMF that is connected to a PABF designated wetland.**

SOILS

Map Unit Name (Series and Phase): **Rauville sicl, 0-1%** Taxonomy (Subgroup): **Cumulic Endoaquoll**	Drainage Class: **very poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-24	**A1**	**N 2.5/0**			**sicl to sic, n**
24-30	**A2**	**5Y 2.5/1**			**sic, n**
30-34	**Cg**	**5Y 4/2 & 4/1**	**10YR 5/4**	**cv/d**	**sic**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI - F5-Thick Dark Surface**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Large wetland area consisting of drainage with a designation of PEMF and connected to a PABF wetland.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **17140049-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **5/16/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-3**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Spartina pectinata	Herb	FACW	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). 100

Remarks:Large wetland area with cattails (Typha sp.) and Phragmites sp. growing in its center and Spartina pectinata and Phalaris arundinacea growing along its edge. Another drainage way connects to this wetland in this area.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water **0** (in.)

Depth to Free Water in Pit: **10** (in.)

Depth to Saturated Soil: **0** (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☒ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☒ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large wetland area that consists of a channel with an NWI designation of PEMF that is connected to a PABF designated wetland.**

SOILS

Map Unit Name (Series and Phase): **Rauville sicl, 0-1%** Taxonomy (Subgroup): **Cumulic Endoaquoll**	Drainage Class: **very poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-18	**A1**	**5Y 2.5/1**			**sicl to sic, n**
18-30	**A2**	**5Y 3/1**			**sic, se to e**
30-46	**Cg**	**5Y 4/1**			**sic, e to es**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI TF5- 2.5Y/5Y below thick dark surface**
c/d soluable salt accumulation in A1 (8-18")

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Large wetland area consisting of drainage with a designation of PEMF and connected to a PABF wetland.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: **17140049-1** Applicant/Owner: **McCain and Associates, Inc.** Investigator: **Greg Meyer and Dr. Bruce Seelig**			Date: **5/16/2008** County: **Cass** State: **ND**
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation) Is the area a potential problem area? (if needed, explain on reverse)	Yes ☒ Yes ☐ Yes ☐	No ☐ No ☒ No ☒	Community ID: Transect ID: Plot ID: **Wet-4**

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Spartina pectinata	Herb	FACW	9.		
2. Urtica dioica	Herb	FAC	10.		
3. Bromus inermis	Herb	FACU*	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (Excluding FAC-). >50

Remarks:Large wetland area with cattails (Typha sp.) and Phragmites sp. growing in its center and Spartina pectinata and Urtica dioica growing along the wetland boundary. Bromus inermis grows within the uplands along the observation point.

HYDROLOGY

☐ Recorded Data (Describe In Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

Field Observations:

Depth of Surface Water (in.)

Depth to Free Water in Pit: (in.)

Depth to Saturated Soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns In Wetlands

Secondary Indicators (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☒ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Sediment Deposits
- ☐ Other (Explain in Remarks)

Remarks: **Large wetland area that consists of a channel with an NWI designation of PEMF that is connected to a PABF designated wetland.**

SOILS

Map Unit Name (Series and Phase): **Rauville sicl, 0-1%** Taxonomy (Subgroup): **Cumulic Endoaquoll**	Drainage Class: **very poor** Field Observation Confirm Mapped Type Yes ☒ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-16	**A**	**5Y 2.5/1**			**sic, n**
16-22	**Bg**	**5Y 4/1 & 3/1**	**7.5YR 4/6**	**c/d**	**c, n**
22-30	**Cg**	**5Y 4/1**			**c, e**

Hydric Soil Indicators

☐ Histosol	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☒ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☒ Reducing Conditions	☒ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: **HI TF7- Thick dark surface 2/1**

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Is this Sampling Point Within a Wetland	Yes ☒	No ☐
Wetland Hydrology Present?	Yes ☒	No ☐			
Hydric Soils Present?	Yes ☒	No ☐			

Remarks : **Large wetland area consisting of drainage with a designation of PEMF and connected to a PABF wetland.**

Appendix D

Figures

12143057

7143056

8143056

9143056

13143057

18143056

17143056

16143056

20143056

07143056-1

07143056-2

08143056-1

08143056-2

08143056-3

16143056-1

09143056-1

16143056-2

16143056-3

16143056-4

16143056-6

MATCHLINE

Legend

- % Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Surveyed Laydown Area
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Barnes County

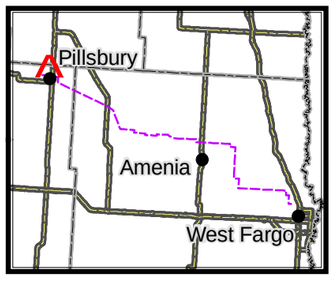


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Figure 1

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Pillsbury to Fargo Generation Outlet Project
Minnkota Power Cooperative, Inc.

9143056
10143056
11143056
12143056
16143056-6
MATCHLINE
16143056
15143056
14143056
13143056
15143056-1
22143056-1
22143056-2
22143056-3
22143056-4
22143056-5
23143056
24143056
23143056-1
23143056-3
MATCHLINE

Legend

- % Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Barnes County

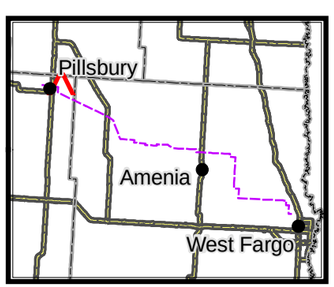

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Figure 2

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
Minnkota Power Cooperative, Inc.

MATCHLINE

23143056

23143056-4

23143056-5

24143056

24143056-1

19143055

20143055

30143055-1

30143055

30143055-2

29143055

29143055-1

MATCHLINE

26143056

25143056

31143055

Legend

- % Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Barnes/Cass County

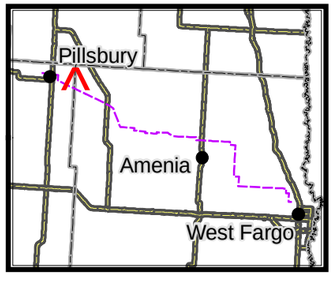

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Figure 3

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
Minnkota Power Cooperative, Inc.

29143055
28143055
27143055
26143055
MATCHLINE
32143055-1
34143055-1
34143055-3
34143055-2
34143055-4
34143055-5
32143055
33143055
34143055
35143055
MATCHLINE
42055
3142055
2142055

Legend

- % Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Cass County

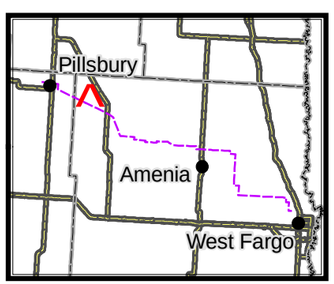

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Figure 4

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
Minnkota Power Cooperative, Inc.

35143055
36143055
31143054
32143054
MATCHLINE
01142055-1
01142055-2
11142055-3
11142055-4
11142055-5
11142055-6
2142055
1142055
6142054
5142054
07142054-1
07142054-1
12142055
7142054
8142054
MATCHLINE

Legend

- % Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Surveyed Laydown Area
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Cass County

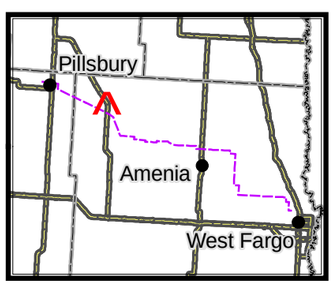

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Figure 5

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
Minnkota Power Cooperative, Inc.

MATCHLINE

7142054

8142054

9142054

10142054

18142054

17142054

17142054-1

16142054

15142054

20142054

20142054-1

20142054-2

21142054

22142054

MATCHLINE

Legend

- % Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Cass County

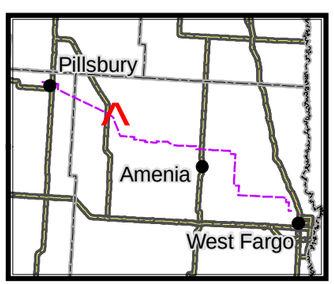

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Figure 6

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
Minnkota Power Cooperative, Inc.

MATCHLINE

20142054

21142054

21142054-1

22142054

23142054

29142054

29142054

27142054

26142054

MATCHLINE

34142054

Legend

- % Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Cass County

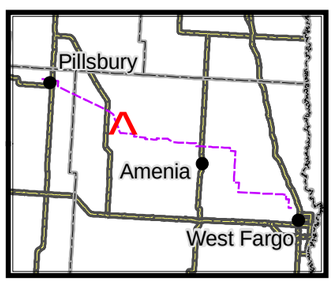

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Figure 7
Biological Assessment and Wetland Delineation Report
Pillsbury to Fargo Generation Outlet Project
Minnkota Power Cooperative, Inc.

23142054

24142054

19142053

20142053

MATCHLINE

26142054

25142054

30142053-1

30142053

29142053

26142054-1

26142054-1

31142053-1

MATCHLINE

142054

31142053

32142053

Legend

- % Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Cass County

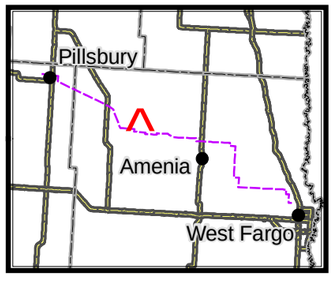

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Figure 8

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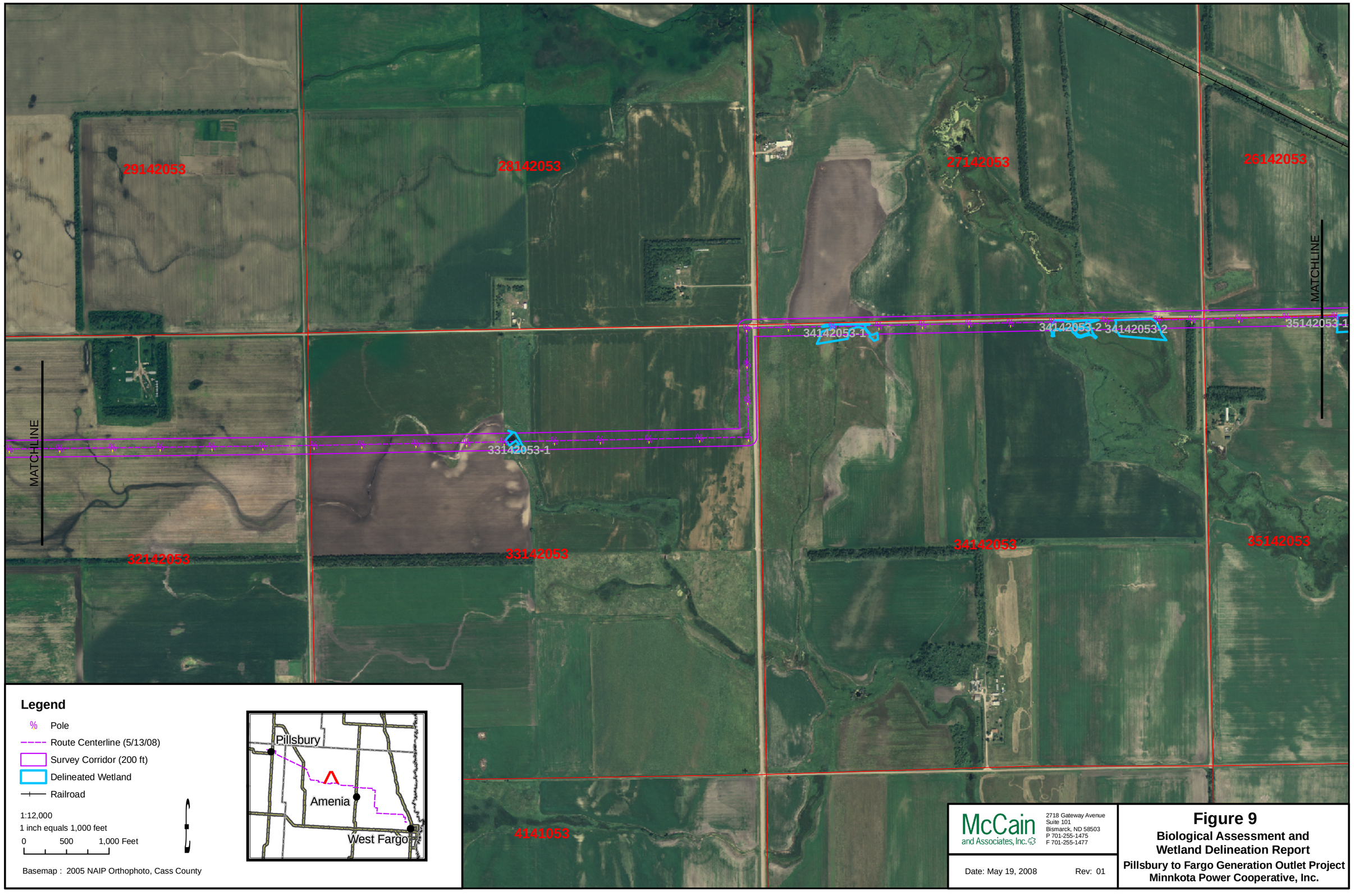

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Figure 9
Biological Assessment and Wetland Delineation Report
Pillsbury to Fargo Generation Outlet Project
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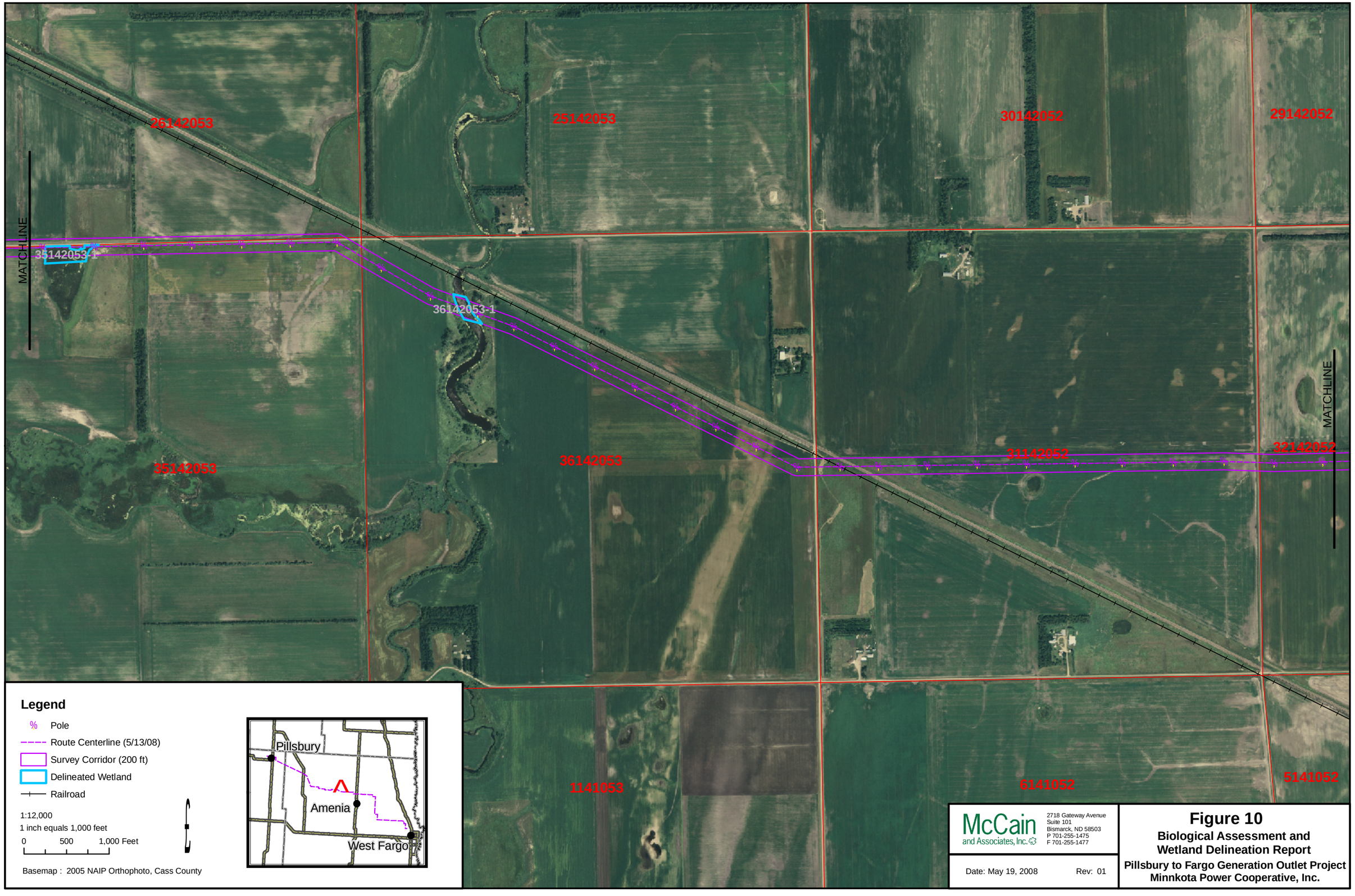

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Figure 10
Biological Assessment and Wetland Delineation Report
Pillsbury to Fargo Generation Outlet Project
Minnkota Power Cooperative, Inc.

MATCHLINE

MATCHLINE

32142052

331420521

33142052

34142052

35142052

5141052

4141052

3141052

2141052

9141052

Legend

- % Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Cass County

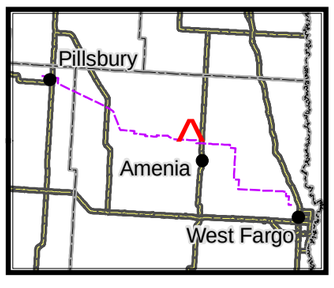

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Figure 11

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
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35142052

36142052

31142051

MATCHLINE

35142052-1

35142052-2

06141051-1

MATCHLINE

2141052

1141052

6141051

12141052

Legend

- % Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Cass County

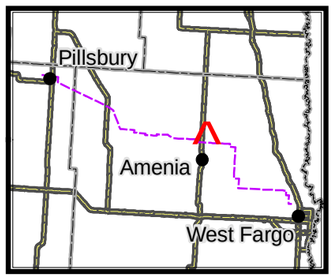

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Figure 12

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
Minnkota Power Cooperative, Inc.

31142051

32142051

33142051

34142051

MATCHLINE

06141051-1

MATCHLINE

6141051

5141051

4141051

3141051

9141051

Legend

- % Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Cass County

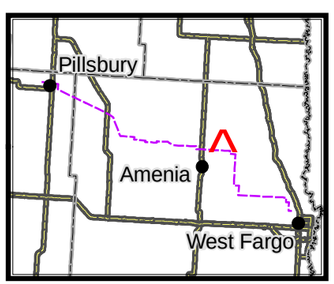

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Figure 13

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
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34142051
35142051
36142051
31142050
06141051
MATCHLINE
3141051
2141051
1141051
6141050
11141051
12141051
7141050
MATCHLINE

Legend

- % Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Cass County

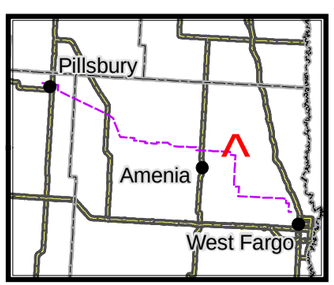

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Figure 14

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
Minnkota Power Cooperative, Inc.

MATCHLINE

10141051

11141051

12141051

7141050

15141051

14141051

13141051

18141050

051

24141051

19141050

MATCHLINE

Legend

- % Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Cass County

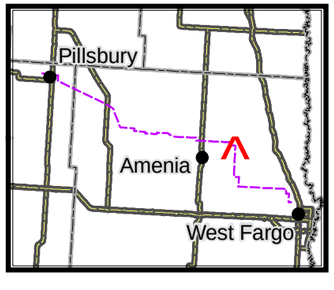

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Figure 15

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
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MATCHLINE

22141051

23141051

24141051

19141050

27141051

26141051

25141051

30141050

25141051-1

36141051-1

36141051

31141050

MATCHLINE

Legend

- % Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Cass County

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Figure 16
Biological Assessment and Wetland Delineation Report
Pillsbury to Fargo Generation Outlet Project
Minnkota Power Cooperative, Inc.

36141051-1

MATCHLINE

35141051

36141051

31141050

32141050

01140051-1

01140051-2

3140051

2140051

1140051

6140050

11140051

12140051

7140050

MATCHLINE

Legend

- Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Surveyed Laydown Area
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Cass County

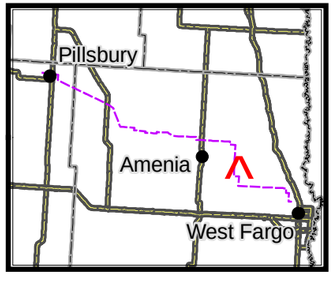

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Figure 17

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
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2140051

1140051

6140050

5140050

MATCHLINE

11140051

12140051

7140050

8140050

MATCHLINE

18140050

17140050

Legend

- Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Surveyed Laydown Area
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Cass County

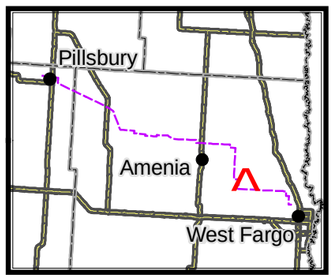

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Figure 18

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
Minnkota Power Cooperative, Inc.

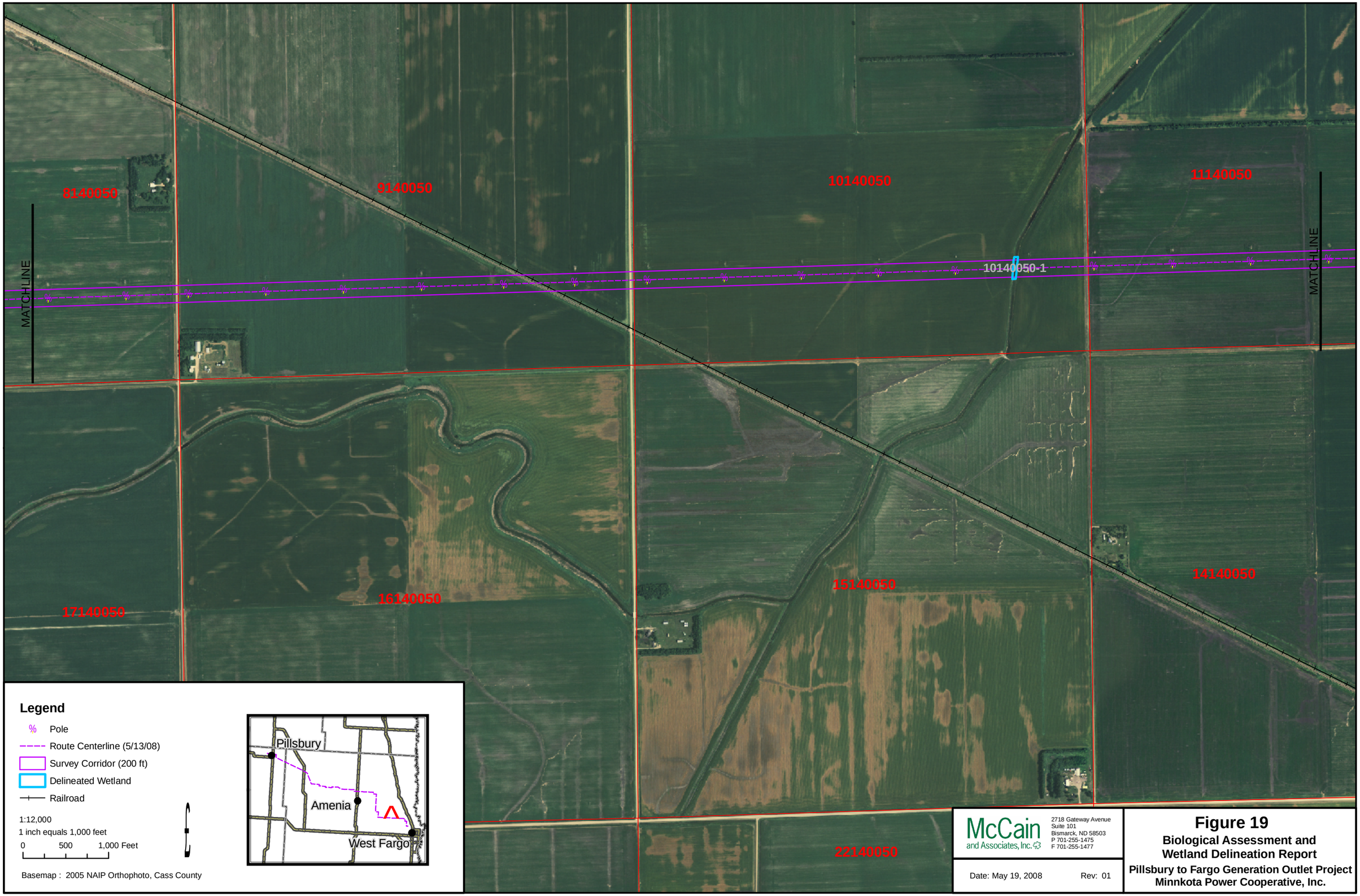

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Figure 19

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
Minnkota Power Cooperative, Inc.

11140050

12140050

7140049

8140049

MATCHLINE

MATCHLINE

07140049-1

14140050

13140050

18140049

17140049

Legend

% Pole

Route Centerline (5/13/08)

Survey Corridor (200 ft)

Delineated Wetland

Railroad

1:12,000

1 inch equals 1,000 feet

0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Cass County

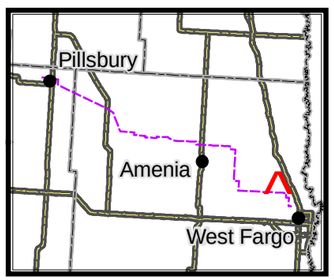

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Figure 20

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
Minnkota Power Cooperative, Inc.

MATCHLINE

7140049

07140049-1

8140049

9140049

10140049

18140049

17140049

17140049-1

16140049

15140049

17140049-1

20140049

21140049

22140049

MATCHLINE

Legend

- % Pole
- Route Centerline (5/13/08)
- Survey Corridor (200 ft)
- Delineated Wetland
- Railroad

1:12,000
1 inch equals 1,000 feet
0 500 1,000 Feet

Basemap : 2005 NAIP Orthophoto, Cass County

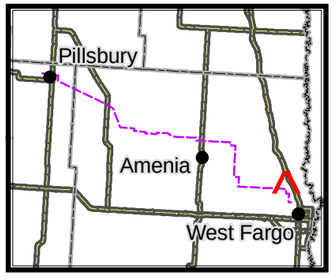

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Figure 21

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
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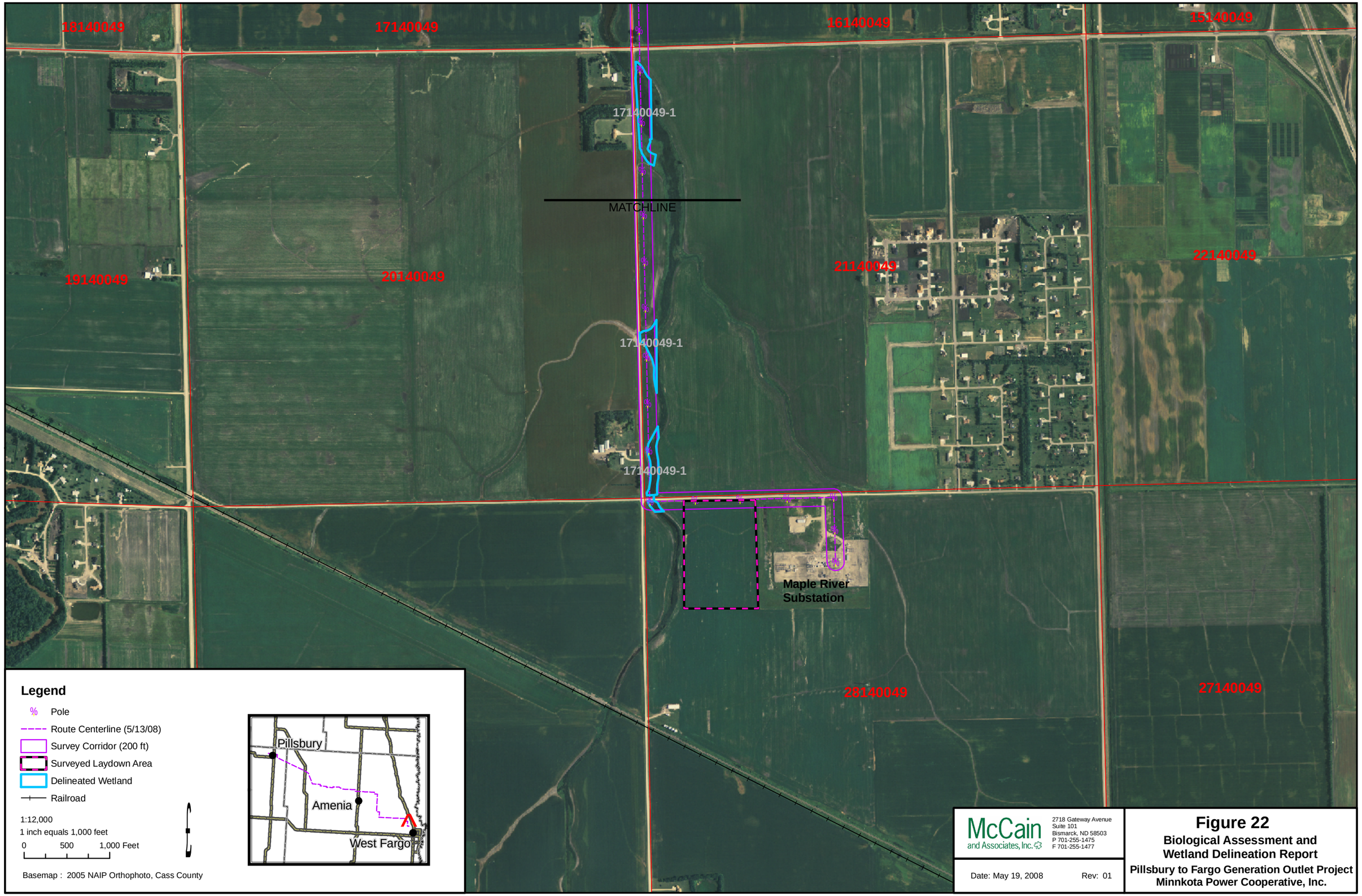

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Figure 22

Biological Assessment and Wetland Delineation Report

Pillsbury to Fargo Generation Outlet Project
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