



Wetland Delineation and Functional Assessment Report: Keetac Exterior Tailings Basin

Prepared for
U. S. Steel - Keetac

November 2021

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1.0 Introduction

This report describes wetland resources delineated at the United States Steel - Keetac (Keetac) facility located near the City of Keewatin, in Itasca County, Minnesota (Figure 1). This facility mines and processes iron ore for the production of taconite pellets.

During tailings basin planning efforts, Keetac identified the need to update the outer perimeter of their tailings basin (Figure 1). The study area for this project includes a 550 foot buffer from the outer toe of the tailings basin around approximately the southern half of the tailings basin. Barr Engineering Company (Barr) identified, delineated, and mapped wetlands in the study area on August 2-4 and 12, 2021. Several wetland delineation and permitting projects have been previously completed for Keetac; this work supplements the facility's existing wetland inventory in preparation for additional permitting efforts.

This report provides the results of the wetland delineation and functional assessment, and includes general environmental information (Section 2.0), descriptions of the delineation methods and observations (Section 3.0), and a discussion of regulations and the administering authorities (Section 4.0). Wetland determination forms are included in Appendix A and photographs are included as Appendix B. A description of the functional assessment method is included as Appendix C. Historical aerial imagery is included in Appendix D.

1.1 Background

The area within the tailings basin was reviewed in 2021 as part of Keetac's Tailings Management Plan. That wetland delineation report was submitted in July 2021 (Barr, 2021a). A review of wetland boundaries was conducted in September 2021 by the Minnesota Department of Natural Resources (MDNR), the Board of Water and Soil Resources (BWSR), and the St. Louis County Soil and Water Conservation District (SWCD). As of October 2021, Keetac was awaiting a decision on the wetland review. A Wetland Replacement Plan application was submitted for the Tailings Management Plan on October 12, 2021 (Barr 2021b).

A separate jurisdictional determination request was submitted to the United States Army Corps of Engineers (USACE) in April 2021 (Barr, 2021c). As of October 2021, Keetac was awaiting a decision for the jurisdictional determination review.

2.0 General Environmental Setting

2.1 Site Description

The study area consists of a mix of land disturbed by mining and undeveloped forests and wetlands. Some portions of the undeveloped forests have been logged historically. Portions of the study area have been disturbed by the construction of the adjacent tailings basin, including construction of roads, construction of the tailings basin outer berm, grading near the perimeter berm, and excavation of borrow material used to build the outer berm. The study area consists of a 550 foot buffer from the toe of the tailings basin perimeter berm, encompassing approximately 498 acres.

2.2 Topography and Geology

The study area is located south of the Laurentian Divide within the Nashwauk Uplands Ecological Subsection (212Lc) of the Laurentian Mixed Forest Province (MDNR, 2015). This subsection is characterized by glacial drift (of varying thickness) atop Precambrian bedrock that includes gneiss, granite, and metamorphosed volcanic and sedimentary rocks. Till plains, moraines, and outwash plains are common landforms in the vicinity. Soils were formed from glacial till and outwash sand and typically have a loamy cap with dense till at a depth of 20 to 40 inches. Native soil textures range from sandy loam to clay loam along with organic soils.

Ground elevations in the study area range from 1412 to 1514 feet above mean sea level (AMSL) for the study area (Figures 5-1 to 5-6).

2.3 Hydrology

The study area is located within the Mississippi River – Grand Rapids Watershed (major watershed #9) in Wetland Bank Service Area 5 and the St. Louis River Watershed (major watershed #3) in Wetland Bank Service Area 1 (Figure 1). Average annual precipitation at the closest weather station (Hibbing Airport) is 28.6 inches, based on the 1981-2010 WETS records from the Minnesota State Climatology Office website.

The MDNR Public Water Inventory (PWI) identifies one public watercourse (Hay Creek) crossing through the south-central part of the study area, West Swan River running southerly east of the study area, and one unnamed public water basin (Reservoir Number 6) within the northwest part of the study area (Figure 1). The United States Geological Survey (USGS) National Hydrography Dataset (NHD) identifies two additional drainageways south of the study area, one draining to Hay Creek and the other draining to West Swan River. A review of topography and aerial imagery indicates that several wetlands extend outside of the study area into other wetlands or waters.

2.4 National Wetlands Inventory

The National Wetlands Inventory (NWI) was developed by the U. S. Fish and Wildlife Service (USFWS) in the late-1970s, based primarily on interpretation of aerial photographs. The NWI dataset was updated in for Northeastern Minnesota in 2016. The NWI best portrays open water wetlands, but often

underestimates wetlands with dense shrub or forest canopies. Despite these limitations, the NWI is recognized as a useful resource.

The NWI indicates the presence of several wetlands within the study area. The wetlands mapped included freshwater emergent, shrub, forested, and pond communities with many of the wetlands consisting of a combination of these communities. Figure 2 shows the NWI, and Table 2 provides a general key to wetland types.

2.5 Soils

Soil data for the study area were obtained from the NRCS Web Soil Survey (2021). Approximately 60 percent of the study area soils are mapped as native, with the remaining 40 percent consisting of disturbed soils altered by mining activities.

Sixteen soil map units were identified in the evaluation area, including:

- 544, Cathro muck, occasionally ponded, 0 to 1 percent slopes;
- 549, Greenwood peat;
- 619, Keewatin silt loam;
- 797, Mooselake and Lupton mucky peats;
- 995, Seelyeville-Seelyeville, ponded, complex, 0 to 1 percent slopes;
- 1050, Tailings basin;
- 1003B, Udorthents, loamy (cut and fill land);
- 1043C, Udorthents, nearly level to rolling;
- 622B, Nashwauk fine sandy loam, 1 to 10 percent slopes;
- 867B, Eagleview-Menahga complex, 1 to 8 percent slopes;
- B27A, McQuade-Buhl complex, 0 to 3 percent slopes;
- B28B, Buhl loam, 1 to 5 percent slopes;
- B32A, McQuade-Dora, depressional-Fayal, depressional, complex, 0 to 2 percent slopes;
- B33A, McQuade-Fayal, depressional, complex, 0 to 2 percent slopes;
- B67A, Rifle soils, hibbing catena, 0 to 1 percent slopes;
- W, Water.

Table 3 lists each soil series, hydric rating, drainage classes, and percent abundance within the study area. Approximately 79 percent of the study area is mapped with soils classified predominantly as non-hydric, while 12 percent of the study area is mapped with soils classified as 95 percent hydric or higher. The remaining soils are classified as 60 percent hydric. Figure 3 shows the distribution of soil series in the vicinity of the study area.

2.6 Land Use and Vegetation

The study area is located on private land, where the most significant land use has been mining and logging. The MDNR's 2018 Mine Features dataset shows the tailings basin adjacent to the study area and a reservoir within the northwest portion of the study area (Figure 4).

Pre-settlement vegetation primarily included aspen-birch forests and conifer bogs and swamps.

3.0 Wetland Delineation

3.1 Wetland Delineation Methods

Barr delineated and classified wetlands within the study area in August of 2021. The wetland delineations were conducted according to guidance from the USACE including the Routine On-Site Determination Method as specified in the *1987 U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)* (USACE, 2012).

Prior to conducting the field delineation, numerous sources of existing information were gathered and reviewed to evaluate wetlands and surficial connections to waterways. Aerial photographs and other data were compiled for the site, which included:

- MDNR elevation data (2-foot contours and hillshade raster images) (2011)
- MDNR mining features (2018)
- MDNR PWI data
- St. Louis County Imagery (2016, 2019)
- U. S. Department of Agriculture (USDA) - Farm Services Administration (FSA) natural color aerial photographs and color-infrared imagery (2017, 2015, 2013, 2010, 2008, and 2003)
- USDA - NRCS Soil Survey data for St. Louis County including attributes for the hydric soil map units
- USFWS NWI data
- USGS 7.5-minute (1:24,000 scale) quadrangle map
- USGS NHD (1:24,000) compilation of perennial/intermittent flow types for rivers, streams, ditches, etc.
- USGS black and white aerial photographs (1991)
- Previous Keetac wetland delineation and monitoring data.

Using the data described above, preliminary wetland mapping was completed at a scale of 1:1,200 (1 inch = 100 feet) or larger, using ArcView[®] 10.8 Geographic Information System (GIS) software. Areas with any of the following characteristics were mapped as wetlands:

- Areas previously mapped as National Wetlands Inventory (NWI) wetlands
- Areas exhibiting a signature for inundation or surface saturation
- Depressional areas with concave slopes, either linear or fully enclosed (potholes, swales, etc.)
- Areas where the topographic contours indicated lower elevations, flat slopes (contour lines are widely spaced), or a drainageway.

In general, public datasets such as the NWI were mapped at a larger scale and are useful for identifying large or open-water wetlands but are not sufficient for many of the smaller, less obvious wetland areas. The most useful datasets are the high-resolution topography data (2-foot contour elevation lines and hillshade maps) derived from LiDAR and high-resolution aerial photography.

When conducting the field delineation, sample sites were established in both wetland and upland areas, and observations were recorded on wetland determination data forms (Appendix A). Data were collected for soils, vegetation, and hydrology at each sample site. Soils were reviewed by placing borings in and around wetlands to a depth of at least 24 inches below the ground surface or until rock or coarse fragments impeded the boring. Representative soil samples from each boring were examined for color, texture, and the presence of hydric soil indicators. Soil colors (e.g., 7.5YR 4/2, etc.) were determined using Munsell® soil color charts, and soil textures were classified by feel. The NRCS hydric soil indicators (Version 7.0, 2010) were used to identify hydric soils. Hydrologic conditions were evaluated at each sample site. Plant species at each sample site were identified, and percent areal cover was estimated. Dominant species were determined using the 50/20 rule, and the corresponding wetland indicator status of each plant species was recorded using the current National Wetland Plant List (USACE, 2020). A determination of hydrophytic vegetation status was made using the rapid test, dominance test, and prevalence index. Photographs were collected of the study area to document site conditions (Appendix B).

The field work was completed during the 2021 growing season, under drier than normal conditions but were generally favorable for wetland delineation. Although some wetland areas lacked inundation or saturation within the upper 12 inches of the ground surface, evidence of wetland hydrology indicators was observable in all wetland areas.

Wetland boundaries were mapped in the field using a Trimble 7x Global Positioning System (GPS) Unit capable of recording positions with sub-foot horizontal accuracy. Delineated wetlands were classified using the USFWS Circular 39 System (U.S. Fish and Wildlife, 1956), the USFWS Cowardin System (Cowardin et al., 1979), and the Eggers and Reed Plant Community Classification System (Eggers and Reed, 1997). Table 4 and Figures 6-1 to 6-6 show the dominant Eggers and Reed Plant Community Types, and Table 5 includes the subdominant plant community types. A comparison of the various classification systems is provided in Table 2.

3.2 Functional Assessment Methods

Barr used an abbreviated version of the *Minnesota Routine Assessment Method for Evaluating Wetland Functions, Version 3.4* (MNRAM) to assess the functions and values of the wetlands observed within the study areas. A summary of the assessment method is included as Appendix C and the assessment results for each wetland are included in Table 5.

3.3 Antecedent Precipitation

Precipitation data were analyzed in comparison to the statistical climatic WETS table data developed by the NRCS specifically for evaluating climatic normalcy in conducting wetland delineations. Gridded precipitation data were downloaded from the Minnesota Climatology Working Group (2021) website and used as a surrogate for on-site precipitation measurements.

The delineation was conducted on August 2-4 and 13, 2021. When evaluated using the NRCS method, precipitation data for the three prior months (May through July) indicate drier than normal conditions in all months (Table 1). Using the NRCS analysis method, Barr determined that hydrologic conditions were

drier than normal at the time of the delineation. The U. S. Drought Monitor indicated that the study area was in a severe drought on August 3 and 10 and in an extreme drought on August 17.

3.4 Site Observations

Barr has delineated wetlands within the approximate 498-acre study area (Figures 6-1 to 6-6). Observations of the wetlands are summarized below. Wetland Determination Data Forms are included in Appendix A and representative photographs are included in Appendix B. The delineated wetlands are summarized in Tables 4 and 5.

Wetland KETB-01

Wetland KETB-01 is approximately 0.01 acre in size, and is a fresh (wet) meadow community (Figure 6-1). Dominant vegetation includes speckled alder (*Alnus incana* – FACW), pussy willow (*Salix discolor* – FACW), cottongrass bulrush (*Scirpus cyperinus* – OBL), meadow horsetail (*Equisetum pratense* – FACW), and fowl blue grass (*Poa palustris* – FACW). Soils are mineral and met the hydric soil indicator for depleted matrix. Wetland hydrology was observed in the wetland as secondary indicators for geomorphic position, shallow aquitard, and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that formed in an area that was disturbed as a result of the construction of the perimeter berm of the tailings basin. In the 1976 and 1981 aerial photographs, it appears the area around the wetland was graded (Figures D2-D3, Appendix D). Historically, this area was an upland forest located on a ridge above Welcome Creek. The original 1952 U.S. Geological Survey (USGS) quadrangle map (Figure D7, Appendix D), which was created prior to construction of the tailings basin, shows that the area of Wetland KETB-01 was located near the top of a ridge on a 10 percent slope where no wetland historically could have existed. Despite a high rating for vegetative diversity, the wetland is rated medium for upland condition and wildlife habitat and low for outlet configuration and public value. The wetland condition overall is rated medium due to the surrounding disturbances from past mining activities (Table 5). This wetland does not extend outside of the study area. Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with plots SP-01W and SP-02U (Appendix A), and photograph 1 (Appendix B).

Wetland KETB-02

Wetland KETB-02 is approximately 0.10 acre in size and consists of an alder thicket community (Figure 6-1). Dominant vegetation included speckled alder. Soils are mineral, with some reddish soils, and met the hydric soil indicator for red parent material, but the soils represent fill material. At the time of observation, sparsely vegetated concave surface and water stained leaves were observed in the as well as the secondary hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that has formed as a result of mining activity in the area. In the 1976 and 1981 aerial photographs, a road can be seen where KETB-02 currently exists (Figures D2-D3,

Appendix D). The wetland formed on an old road adjacent to the tailings basin perimeter road. The wetland slopes to the south and is impounded on the southern edge by a berm. Historically, this area was an upland forest located on the slope of a ridge above Welcome Creek with 6 percent slopes (Figure D7, Appendix D). Vegetative diversity, wildlife habitat, and upland condition are rated medium, while outlet configuration and public value are rated low with an overall condition rating of medium (Table 5). This wetland does not extend outside of the study area. Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with plots SP-03W and SP-04U (Appendix A) and photograph 2 (Appendix B).

Wetland KETB-03

Wetland KETB-03 is approximately 1.67 acres in size and consists of an alder thicket community (Figure 6-1). Dominant vegetation includes paper birch (*Betula papyrifera* – FACU), black willow (*Salix nigra* – OBL), speckled alder, smooth scouring-rush (*Equisetum laevigatum* – FACW), and spotted touch-me-not (*Impatiens capensis* – FACW). Wetland boundaries are distinct.

Soils consist of a thin layer of mucky modified loamy clay over a sandy clay loam and met the hydric soil indicators for depleted below dark surface, loamy mucky mineral, and depleted matrix. Hydrology was observed as saturation at the ground surface with a water table at one inch below the ground surface and water stained leaves. The hydrology within the wetland appears to be influenced by a seep along the perimeter berm of the reclaim pond (Figure 6-1). The plot also met the secondary hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test.

This appears to be an incidental wetland that has formed as a result of mining activity in the area. In the 1976 and 1981 aerial photographs, a road can be seen where KETB-03 currently exists (Figures D2-D3, Appendix D). The wetland formed on an old road adjacent to the tailings basin perimeter road. Historically, this area was an upland forest located on a ridge slope above Welcome Creek with a 10 percent slope (Figure D7, Appendix D). Vegetative diversity is rated high, while wildlife habitat and upland condition are rated medium, and outlet configuration and public value are rated low with an overall condition rating of medium (Table 5). This wetland does not extend outside of the study area. The wetland slopes to the north and west and outlets into Wetland KETB-04. Wetland KETB-04 is located at the fringe of Keetac's Reservoir 6. Reservoir 6 outlets to the north via a channel into Reservoir 2. Reservoir 2 outlets into Hay Creek via the O'Brien Diversion channel and ultimately outlets into Swan Lake and the Mississippi River.

Site conditions are documented with plots SP-05W and SP-06U (Appendix A), and photograph 3 (Appendix B).

Wetland KETB-04

Wetland KETB-04 is 30.42 acres of deep marsh community delineated within the study area but is part of the larger Reservoir 6 utilized in the Keetac tailings basin operation (Figure 6-1) and is also identified as

PWI basin 31122900 (Figure 1). Dominant vegetation includes hybrid cat-tail (*Typha X glauca* – OBL) and reed canary grass (*Phalaris arundinacea* – FACW). Wetland boundaries are distinct.

Soils consist of a thin layer of mucky modified loamy clay over loamy sand and met the hydric soil indicator for redox dark surface. Hydrology was observed as saturation at 10 inches below the ground surface, water marks, and water-stained leaves. The water marks indicated that water levels in this area are generally much higher but were low due to time of year and the abnormally dry conditions. The wetland also met the secondary hydrology indicators for geomorphic position and FAC-neutral test. Wetland boundaries are distinct.

Wetland KETB-04 is located at within and along the fringe of Keetac's Reservoir 6. Much of this wetland formed when Welcome Creek was impounded between 1961 and 1972 to develop Reservoir 6 (Figures D1-D2, Appendix D). Portions of this area were mapped as historical wetland prior to the impoundment (Figure D7, Appendix D), at which time the wetland varied in elevation from below 1410 to about 1420. Currently, water levels in Reservoir 6 are managed at approximately elevation 1434, about 14-24 feet higher than the historic wetland. Historic wetland within the currently delineated Wetland KETB-04 was mapped based on the historic quad map and the 1961 aerial photos. A total of 9.65 acres of Wetland KETB-04 were present prior to the Welcome Creek impoundment and 20.77 acres are incidental due to the formation of wetland from the Welcome Creek impoundment within non wetland (Figure X). Wildlife habitat and upland condition are rated medium, and vegetative diversity, outlet configuration, and public value are rated low with an overall condition rating of low (Table 5). The portion of wetland identified is the fringe of Reservoir 6 which extends outside the study area and outlets to the north via a channel and into Reservoir 2. Reservoir 2 outlets into Hay Creek via the O'Brien Diversion channel and ultimately outlets into Swan Lake and the Mississippi River.

Site conditions for this wetland are documented with plots SP-07W and SP-08U (Appendix A), and photograph 4 (Appendix B).

Wetland KETB-05

Wetland KETB-05 is approximately 0.48 acre in size and is a hardwood swamp community (Figure 6-1). Dominant vegetation includes black ash (*Fraxinus nigra* - FACW, fowl manna grass (*Glyceria striata* – OBL), and late goldenrod (*Solidago gigantea* – FACW). Soils are mineral, reddish in color, and met the hydric soil indicator for red parent material. No direct hydrology was observed but the wetland met the secondary hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that formed as a result of grading activity in the area. Historically, the area of Wetland KETB-05 was the relatively flat ridge draining east and west to natural wetland areas (Figure D7, Appendix D) The perimeter berm of reclaim pond was constructed adjacent to Wetland KETB-05 between 1976 and 1981 (Figures D2-D3, Appendix D). In addition, fill was placed along the west side of the reclaim pond berm with several ditches constructed to allow water to drain away from the berm (Figure D3, Appendix D). The wetland appears to have formed in that ditch feature adjacent to the tailings basin. Vegetative diversity, wildlife habitat, and upland condition are rated medium, and outlet

configuration and public value are rated low with an overall condition rating of medium (Table 5). It appears that Wetland KETB-05 could discharge to the west via overland flow into Wetland KETB-07 and into Reservoir 2, but there is no defined channel. Reservoir 2 outlets into Hay Creek via the O'Brien Diversion channel and ultimately outlets into Swan Lake and the Mississippi River.

Site conditions for this wetland are documented with plots SP-09W and SP-10U (Appendix A), and photograph 5 (Appendix B).

Wetland KETB-06

Wetland KETB-06 is approximately 0.04 acre in size and is a shrub-carr community (Figure 6-1). Dominant vegetation includes balsam poplar (*Populus balsamifera* – FACW), paper birch, quaking aspen (*Populus tremuloides* – FAC), speckled alder, dwarf red raspberry (*Rubus pubescens* – FACW) and common red raspberry (*Rubus idaeus* – FAC). Soils consists of loamy sand and met the hydric soil indicator for depleted matrix. At the time of delineation, no direct hydrology indicators were observed, but met the secondary wetland hydrology indicators for geomorphic position and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that formed as a result of grading activity in the area. In the 1981 aerial photograph, the area of Wetland KETB-06 appears to have been graded as part of the reclaim pond berm construction (Figure D3, Appendix D). The wetland appears to have formed in a depression within the graded area adjacent to the reclaim pond. Historically, the area of Wetland KETB-06 was a relatively flat ridge (Figure D7, Appendix D) with no evidence of wetland features (Figure D1, Appendix D). Vegetative diversity is rated high, wildlife habitat and upland condition are rated medium, while outlet configuration and public value are rated low with an overall condition rating of medium (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-11W and SP-12U (Appendix A) and photograph 6 (Appendix B).

Wetland KETB-07

Wetland KETB-07 is 27.38 acres in size, of which approximately 1.04 acres is within the study area and consists of hardwood swamp community (Figure 6-1). Dominant vegetation includes black ash, paper birch, quaking aspen, speckled alder, meadow horsetail, fowl manna grass, and woodland horsetail (*Equisetum sylvaticum* – FACW). Soils are mineral and met the hydric soil indicator for redox dark surface. At the time of delineation, saturation was observed at 12 inches below ground surface with a water table at 20 inches below ground surface. The secondary wetland hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test were observed. Wetland boundaries are distinct.

The 1.04 acre portion of Wetland KETB-07 lying within the study area appears to be incidental, formed as a result of grading activity in the area. The remaining 26.34 acres of Wetland KETB-07 appears to be predominantly naturally occurring. In the 1981 aerial photograph, grading is apparent along the west side of the reclaim pond berm with two drainage ditches allowing drainage to the west away from the berm

(Figure D3, Appendix D). The wetland appears to have formed in those ditch features adjacent to the tailings basin. Historically, the portion of Wetland KETB-07 within the study area was a ridge line between wetland complexes to the west and east (Figure D7, Appendix D). Vegetative diversity and wildlife habitat are rated high, outlet configuration and upland condition are rated medium, while public value is rated low with an overall condition rating of medium (Table 5). The wetland extends outside of the study area to the west and outlets into a larger wetland complex adjacent to Reservoir 2. Reservoir 2 outlets into Hay Creek via the O'Brien Diversion channel and ultimately outlets into Swan Lake and the Mississippi River.

Site conditions are documented with SP-13W and SP-14U (Appendix A), and photograph 7 (Appendix B).

Wetland KETB-08

Wetland KETB-08 is approximately 0.22 acre in size and consists of a hardwood swamp community (Figure 6-1). Dominant vegetation includes quaking aspen, black ash, and sensitive fern (*Onoclea sensibilis* – FACW). Soils are mineral and met the hydric soil indicator for redox dark surface. At the time of delineation, no direct hydrology was observed but the secondary wetland hydrology indicators for geomorphic position and FAC-neutral test were observed. Wetland boundaries are distinct.

This is a native wetland located in an enclosed depression, within an area that does not appear to have been significantly disturbed during tailings basin construction, but adjacent to historical grading (Figures D2-D5). The historic quad map (Figure D7, Appendix D) shows the wetland in a relatively flat sloped area (~3 percent slopes) near the base of a hill where wetland development would be plausible within a depressional area. The wetland is rated high for all wetland functions evaluated, except vegetative diversity (medium) and public value (low), with an overall rating of high (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with SP-15W and SP-16U (Appendix A), and photograph 8 (Appendix B).

Wetland KETB-09

Wetland KETB-09 is approximately 0.19 acre in size and consists of a fresh (wet) meadow community (Figure 6-1). Dominant vegetation includes black ash, pussy willow, rattlesnake manna grass (*Glyceria canadensis* – OBL), and Canada bluejoint (*Calamagrostis canadensis* – OBL). Soils are mineral and met the hydric soil indicators for depleted below dark surface and depleted matrix. At the time of delineation, no direct hydrology was observed but the secondary wetland hydrology indicators for geomorphic position and FAC-neutral test were observed. Wetland boundaries are distinct.

This is a native wetland located in an enclosed depression, within an area that does not appear to have been significantly disturbed during tailings basin construction, but adjacent to historical grading (Figures D2-D5), similar to Wetland KETB-08. The historic quad map (Figure D7, Appendix D) shows the wetland in a relatively flat sloped area (~3 percent slopes) near the base of a hill where wetland development would be plausible within a depressional area. The wetland is rated high for all wetland functions evaluated, except public value, which is rated low, with an overall rating of high (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with SP-17W and SP-16U (Appendix A), and photograph 9 (Appendix B).

Wetland KETB-10

Wetland KETB-10 is approximately 0.77 acre in size and consists of a shallow marsh community (Figure 6-1). Dominant vegetation includes grey willow (*Salix bebbiana* – FACW) and narrow-leaf cat-tail (*Typha angustifolia* – OBL). Soils consisted on mucky peat over sandy loam and loamy sand and met the hydric soil indicator for depleted matrix. Wetland hydrology within the wetland consisted of saturation at 20 inches below ground surface and also met the secondary indicators for geomorphic position and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that formed as a result of excavation activity in the area as evidenced by the 1976 and 1981 aerial photographs (Figures D2-D3, Appendix D). This area was excavated for borrow material used to build the tailings basin perimeter berm. The wetland appears to have developed as a result of these activities. Historically, the area of Wetland KETB-10 was on the west slope of a ridge line with 14 percent slopes that would not have supported wetland (Figure D7, Appendix D). Wildlife habitat and upland condition are rated medium, while vegetative diversity, outlet configuration and public value are all rated low with an overall condition rating of low (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with plot SP-18W and SP-19U (Appendix A), and photograph 10 (Appendix B).

Wetland KETB-11

Wetland KETB-11 is a 6.72 acre deep marsh community, of which approximately 3.37 acres lies within the study area (Figure 6-2). Dominant vegetation includes narrow-leaf cat-tail and coon's-tail (*Ceratophyllum demersum* – OBL). Soils consisted of mucky peat over loamy sand and met the hydric soil indicator for 5 cm mucky peat or peat. At the time of delineation, inundation of 3 inches was observed. In addition water marks and the secondary wetland hydrology indicators for geomorphic position and FAC-neutral test were observed. Wetland boundaries are distinct.

This appears to be an incidental wetland that formed in an area that was graded as part of the initial tailings basin perimeter berm construction and subsequent construction efforts. Evidence of grading in the eastern part of Wetland KETB-11 was apparent in the 1976 and 1981 aerial photographs, at which time there was a road running through the western part (Figures D2-D3, Appendix D). By 1991, the western part was completely graded (Figure D5, Appendix D). Historically, this area was an upland forest and cleared area sitting about 10 feet above mapped wetlands to the west (Figure D7, Appendix D). The wetland was rated high for outlet configuration and wildlife habitat, medium for vegetative diversity and upland condition, and low for public value with an overall value of medium (Table 5). This wetland extends outside of the study area to the west and outlets into Wetland KETB-07, which is located at the fringe of Reservoir 2 (Figures 6-1 and 6-2). Reservoir 2 outlets into Hay Creek via the O'Brien Diversion channel and ultimately outlets into Swan Lake and the Mississippi River.

Site conditions are documented with plot SP-20W and SP-21U (Appendix A), and photograph 11 (Appendix B).

Wetland KETB-12

Wetland KETB-12 is a 6.14 acre wetland comprised of shallow marsh and shrub-carr communities, of which approximately 1.22 acres lies within the study area (Figure 6-2). Dominant vegetation includes nodding burr-marigold (*Bidens cernua* – OBL), broad-leaf cat-tail (*Typha latifolia* – OBL), and bearded sedge (*Carex comosa* – OBL). Soils consist of mucky peat over mucky loam and met the hydric soil indicator for loamy mucky mineral. Hydrology was observed as saturation at the ground surface with a water table at 1 inch below the ground surface and water marks. The wetland also met the secondary hydrology indicators for geomorphic position and FAC-neutral test. Wetland boundaries are distinct.

Wetland KETB-12 appears to be partially incidental and partially native. The eastern part of the wetland is located in a historic depression (Figure D7, Appendix D) with a pond feature evident in the 1976 aerial photo before any apparent disturbance was conducted (Figure D2, Appendix D). By 1981, the entire western part of the wetland had been graded as part of the tailings basin perimeter berm construction (Figure D3, Appendix D), which is still apparent in 1991 (Figure D5, Appendix D). A total of 2.40 acres of Wetland KETB-12 was determined to be natural, of which 1.18 acres lies within the study area. A total of 3.74 acres was determined to be incidental, of which 0.04 acre lies within the study area. The wetland was rated high for vegetative diversity and wildlife habitat, medium for outlet configuration and upland condition, and low for public value with an overall value of medium (Table 5). This wetland extends outside of the study area to the west and outlets into a wetland located at the fringe of Reservoir 2. Reservoir 2 outlets into Hay Creek via the O'Brien Diversion channel and ultimately outlets into Swan Lake and the Mississippi River.

Site conditions for this wetland are documented with plots SP-22W and SP-23U (Appendix A), and photograph 12 (Appendix B).

Wetland KETB-13

Wetland KETB-13 is approximately 0.05 acre in size and is a shrub-carr community (Figure 6-2). Dominant vegetation includes speckled alder, balsam poplar, and Canada bluejoint. Soils consist of loam over clay loam that are reddish in color and met the hydric soil indicator for red parent material. No direct hydrology was observed, but the wetland met the secondary hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that formed as a result of grading activity in the area. In the 1976 and 1981 aerial photographs, the area of the wetland appears to have been graded (Figures D2-D3, Appendix D). The area of Wetland KETB-13 is partially located within a historic depression (Figure D7, Appendix D), but the 1948 aerial photo of the area shows no wetland signatures, therefore the wetland appears to have developed in non-wetland. Vegetative diversity is rated high, upland condition and wildlife habitat are rated medium, while outlet configuration and public value are rated low with an overall condition rating of medium (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-24W and SP-25U (Appendix A), and photograph 13 (Appendix B).

Wetland KETB-14

Wetland KETB-14 is approximately 1.31 acre in size and consists of a shallow marsh community (Figure 6-2). Dominant vegetation includes narrow-leaf cat-tail and arrow-leaf tearthumb (*Pericaria sagittata* – OBL). Soils consist of loamy sand over clay loam over loamy sand and met the hydric soil indicator for depleted matrix. Saturation was observed at 18 inches below ground surface, and secondary hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test were present. Wetland boundaries are distinct.

This is a native wetland located in an enclosed depression adjacent to an old road and an area that was graded as part of the tailings basin construction. The wetland is located in a historic depression (Figure D7, Appendix D), no grading was evident in any of the historic photos (Figures D1-D5), and evidence of inundation is evident in some historic photos. The wetland is rated high for wildlife habitat, medium for vegetative diversity, outlet configuration, and upland condition, and low for public value with an overall rating of medium (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-26W and SP-25U (Appendix A), and photograph 14 (Appendix B).

Wetland KETB-15

Wetland KETB-15 is a 0.19 acre fresh (wet) meadow community, of which 0.04 acre lies within the study area (Figure 6-2). Dominant vegetation includes speckled alder, meadow willow (*Salix petiolaris* – FACW), Canada bluejoint, and Tuckerman's sedge (*Carex tuckermanii* – OBL). Soils consist of sandy loam and met the hydric soil indicator for depleted matrix. Hydrology was observed as the secondary hydrology indicators for geomorphic position and FAC-neutral test. Wetland boundaries are distinct.

This is a native wetland located in an enclosed depression with no apparent historical disturbance (Figures D1-D7, Appendix D). The wetland is rated high for all wetland functions evaluated, except public values, including overall condition (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-27W and SP-28U (Appendix A), and photograph 15 (Appendix B).

Wetland KETB-16

Wetland KETB-16 is a 3.17 acre shallow marsh community, of which 1.31 acres lies within the study area (Figure 6-2). Dominant vegetation includes broad-leaf cat-tail and spotted touch-me-not. Soils consist of mucky loam over sand and met the hydric soil indicator for loamy mucky mineral. Hydrology was observed as saturation at 6 inches below ground surface and a water table at 12 inches below the ground surface. The secondary hydrology indicators for geomorphic position and FAC-neutral test were also observed. Wetland boundaries are distinct.

The wetland appears to be native and is located in an enclosed depression, adjacent to a road (Figures D1-D7, Appendix D). Some grading activity was conducted near the wetland in 1976 and 1981. The

wetland appears to have become wetter from 1976 to 1981. The wetland is rated high for all wetland functions evaluated, except upland condition which is rated medium and public value which is rated low (Table 5). The overall wetland condition is rated high. Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-29W and SP-28U (Appendix A), and photograph 16 (Appendix B).

Wetland KETB-17

Wetland KETB-17 is a 4.0 acre deep marsh community, of which 1.84 acres lies within the study area (Figure 6-2). Dominant vegetation includes reed canary grass and soft-stem club-rush (*Schoenoplectus tabernaemontani* – OBL). Soils consist of mucky loam over sand and met the hydric soil indicator for loamy mucky mineral. Hydrology was observed as saturation and a water table at the ground surface and the secondary hydrology indicators for geomorphic position and FAC-neutral test. Wetland boundaries are distinct.

The wetland appears to be native and is located in an enclosed depression, adjacent to a road (Figures D.2-D.5, Appendix D). Some grading activity was conducted near the wetland in 1976 and 1981. The wetland appears to have become wetter from 1976 to 1981. The wetland is rated high for wildlife habitat, medium for vegetative diversity, outlet configuration, and upland condition, and low for public value with an overall condition rating of medium (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-30W and SP-31U (Appendix A), and photograph 17 (Appendix B).

Wetland KETB-18

Wetland KETB-18 is a 42.0 acre coniferous bog community, of which 14.66 acres lies within the study area (Figure 6-2). Dominant vegetation includes tamarack (*Larix laricina* – FACW), speckled alder, yellow bluebead-lily (*Clintonia borealis* – FAC), and velvet-leaf blueberry (*Vaccinium myrtilloides* – FACW). Soils consist of mucky peat over mucky loam and met the hydric soil indicator for histic epipedon. Hydrology was observed as saturation at the ground surface with a water table at 8 inches below ground surface and the secondary hydrology indicators for geomorphic position and FAC-neutral test. Wetland boundaries are distinct. Wetland boundaries are distinct.

The wetland appears to be native and is located in an enclosed depression, adjacent to roads and the tailings basin, but no direct disturbance during construction of the tailings basin (Figures D1-D7, Appendix D). The eastern part of this wetland was logged prior to 1976. Roads and the tailings basin were built in the area around the wetland but appear to have had little impact on the wetland as a whole. The wetland is rated high for vegetative diversity and wildlife habitat, medium for outlet configuration and upland condition, and low for public value with an overall rating of medium (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-32W and SP-33U (Appendix A), and photograph 18 (Appendix B).

Wetland KETB-19

Wetland KETB-19 is 0.01 acre in size and consists of a fresh (wet) meadow community (Figure 6-2). Dominant vegetation included American elm (*Ulmus americana* – FACW), green ash (*Fraxinus pennsylvanica* – FACW), balsam poplar, porcupine sedge (*Carex hystericina* – OBL), and rattlesnake manna grass. Soils consist of loamy sand and met the hydric soil indicator for depleted matrix. Hydrology was observed as the secondary hydrology indicators for geomorphic position and FAC-neutral test. Wetland boundaries are distinct.

The wetland appears to be native and is located in an enclosed depression with no apparent historical disturbance (Figures D1-D7, Appendix D). The wetland is rated high for all wetland functions evaluated, except public values (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-34W and SP-35U (Appendix A), and photograph 19 (Appendix B).

Wetland KETB-20

Wetland KETB-20 is a 12.82 acre shrub-carr community, of which 0.68 acre lies within the study area (Figure 6-2). Dominant vegetation includes black ash, American elm, speckled alder, American hazelnut (*Corylus americana* – FACU), and spotted touch-me-not. Soils consist of loam over sandy loam and met the hydric soil indicators for depleted matrix and redox dark surface. Hydrology was observed as the secondary hydrology indicators for geomorphic position and FAC-neutral test. Wetland boundaries are distinct.

The wetland is located in a depression and appears to be predominantly native, but the eastern lobe was completely graded by 1981 (Figure D3, Appendix D). The area of Wetland KETB-20 was historically fairly flat with approximately 1.5 percent slope and adjacent to a wetland to the south (Figure D7, Appendix D). The 1961 aerial photo, from before tailings basin construction appears to show wetland signatures in the western lobe, but no predominant signatures in the eastern lobe (Figure D1, Appendix D). Therefore, it appears that 3.10 acres of Wetland KETB-20 is incidental, all lying outside of the study area, and 9.72 acres is native wetland, including 0.68 acre within the study area. The wetland is rated high for all wetland functions evaluated, except public values (Table 5). This wetland extends outside of the study area to the south and is contiguous with a large wetland complex that outlets into Hay Creek, ultimately discharging into Swan Lake and the Mississippi River.

Site conditions for this wetland are documented with plots SP-36W and SP-35U (Appendix A), and photograph 20 (Appendix B).

Wetland KETB-21

Wetland KETB-21 is approximately 0.32 acre in size and consists of an alder thicket community (Figure 6-2). Dominant vegetation includes speckled alder, cottongrass bulrush, and pointed broom sedge (*Carex*

scoparia – FACW). Soils consist of clay loam and met the hydric soil indicators for depleted matrix. Hydrology was observed as the secondary hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that formed as a result of grading activity in the area. In the 1981 and 1989 aerial photographs, the area of the wetland appears to have been graded (Figures D3-D4, Appendix D). Historically, the area of Wetland KETB-21 was located on a shoulder slope (Figure D7, Appendix D), in an area of apparent upland, deciduous forest with no evidence of wetland conditions (Figure D1, Appendix D). Vegetative diversity is rated high, upland condition and wildlife habitat are rated medium, while outlet configuration and public value are rated low with an overall condition rating of medium (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-37W and SP-38U (Appendix A), and photograph 21 (Appendix B).

Wetland KETB-22

Wetland KETB-22 is approximately 0.08 acre in size and consists of a shallow marsh community (Figure 6-2). Dominant vegetation includes narrow-leaf cat-tail and nodding burr-marigold. Soils consist of mucky peat over clay loam and met the hydric soil indicators for histic epipedon, depleted below dark surface, and depleted matrix. Hydrology was observed as saturation and a water table at the ground surface and the secondary hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that formed as a result of grading activity in the area. In the 1981 and 1989 aerial photographs, the area of the wetland appears to have been graded (Figures D3-D4, Appendix D). Historically, the area of Wetland KETB-22 was located on a shoulder slope (Figure D7, Appendix D), in an area of apparent upland, deciduous forest with no evidence of wetland conditions (Figure D1, Appendix D). Upland condition and wildlife habitat are rated medium, while vegetative diversity, outlet configuration and public value are rated low with an overall condition rating of low (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-39W and SP-38U (Appendix A).

Wetland KETB-23

Wetland KETB-23 is a 15.0 acre wetland comprised of alder thicket, shallow marsh, and deep marsh communities, of which 10.01 acres lies within the study area (Figure 6-2). Dominant vegetation in the alder thicket includes speckled alder, dwarf red raspberry, and lakebank sedge (*Carex lacustris* – OBL). Soils consist of mucky peat and met the hydric soil indicator for histic epipedon. Hydrology was observed as saturation at the ground surface and a water table at 6 inches below the ground surface. The secondary wetland hydrology indicators for geomorphic position, microtopographic relief, and FAC-neutral test were also observed. Wetland boundaries are distinct.

Wetland KETB-23 appears to be a combination of native and incidental wetland. In the 1981 to 1991 aerial photographs, the shallow and deep marsh communities had been excavated as part of the tailings basin construction. (Figures D3-D5, Appendix D). The alder thicket community and the east half of the deep marsh community show wetland signatures on historic photos (Figure D1, Appendix D). The total delineated wetland includes 2.40 acres of incidental wetland, of which 1.56 acres lies within the study area. Wetland KETB-23 also includes 14.10 acres of natural wetland, in total, of which 9.09 acres lies within the study area. The wetland is rated high for all functions except public value, which is rated low (Table 5). The wetland appears to outlet to the south outside of the study area into a large wetland complex. Wetland KETB-23 is contiguous with a wetland complex that flows into Hay Creek and ultimately outlets into Swan Lake and the Mississippi River.

Site conditions are documented with SP-40W and SP-41U (Appendix A), and photograph 22 (Appendix B).

Wetland KETB-24

Wetland KETB-24 is a 3.18 acre shallow marsh community, of which 2.00 acres lies within the study area (Figure 6-2). Dominant vegetation includes narrow-leaf cat-tail and bearded sedge. Soils consisted of mucky loam over loamy sand and met the hydric soil indicator for depleted matrix. Hydrology was observed as 2 inches of inundation and met the secondary hydrology indicators for geomorphic position and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that formed as a result of grading activity in the area. In the 1981 and 1989 aerial photographs, the area of the wetland appears to have been graded (Figures D3-D4, Appendix D). Historically, the area of Wetland KETB-24 was a forested ridge line with no wetland signatures (Figures D1 and D7, Appendix D). Wildlife habitat was rated high, vegetative diversity and upland condition are rated medium, while outlet configuration and public value are rated low with an overall condition rating of medium (Table 5). The wetland appears to flow south outside of the study area via overland flow to Hay Creek and ultimately into Swan Lake and the Mississippi River.

Site conditions for this wetland are documented with plots SP-42W and SP-43U (Appendix A), and photograph 23 (Appendix B).

Wetland KETB-25

Wetland KETB-25 is a 36.37 acre alder thicket community, of which 3.82 acres lies within the study area (Figure 6-3). Dominant vegetation includes quaking aspen, speckled alder, pussy willow, spotted touch-me-not, woodland horsetail and lakebank sedge. Soils consist of silt loam over loam and met the hydric soil indicator for depleted matrix. At the time of delineation, hydrology was observed as two inches of inundation and the secondary wetland hydrology indicators for geomorphic position, crayfish burrows, and FAC-neutral test were observed. Wetland boundaries are distinct.

Portions of the wetland appears to be incidental, including the area within the study area, while other parts appear to have been historical, native wetland. that formed as a result of grading activity in the area. Between 1981 and 1991 (Figures D3-D5, Appendix D), all but the south-central part of the wetland appears to have been graded or impounded by grading activities associated with tailings basin

construction. Historically, there was a road running through the eastern half of the current wetland footprint, the southern part of Wetland KETB-25 was located along Hay Creek, and the northern part extended upslope, approximately 20 feet higher in elevation (Figure D7, Appendix D). Prior to construction of the tailings basin, the 1961 and 1972 aerial photos show the presence of some wetland signatures in the flat floodplain areas on the north side of Hay Creek, but no evident wetland signatures in the northern part of the wetland, south of Hay Creek, or northeast of the junction between Hay Creek and the road (Figures D1-D2, Appendix D). Therefore, the central portion of Wetland KETB-25 appears to be a natural wetland and the remainder incidental, having formed as a result of tailings basin construction. A total of 14.15 acres of Wetland KETB-25 appear to be natural and 22.22 acres incidental, including the entire wetland within the study area. Vegetative diversity and wildlife habitat were rated high, outlet configuration and upland condition are rated medium, while public value is rated low with an overall condition rating of medium (Table 5). The wetland outlets to the south outside of the study area and into Hay Creek. Hay Creek outlets into Swan Lake and the Mississippi River.

Site conditions are documented with SP-44W and SP-45U (Appendix A), and photograph 24 (Appendix B).

Wetland KETB-26

Wetland KETB-26 is a 33.49 acre shallow marsh community, of which 20.99 acres lies within the study area (Figure 6-3). Dominant vegetation includes speckled alder, Walter's sedge (*Carex striata* – OBL), and broad-leaf cat-tail. Soils consist mucky loam over silt loam and met the hydric soil indicators for thick dark surface and loamy mucky mineral. Hydrology was observed as saturation and a water table at the ground surface and the secondary hydrology indicators for geomorphic position and FAC-neutral test. Wetland boundaries are distinct.

The wetland is partially located in an apparent remnant of the Hay Creek floodplain, with the majority of the wetland disturbed by the tailings basin and excavation activity as evidenced in the 1989 and 1991 aerial photos (Figures D4-D5, Appendix D). Much of Wetland KETB-26 was historically farmland along Hay Creek, outside of a narrow floodplain, with no apparent wetland signatures (Figure D1, Appendix D). The narrow floodplain and a broader floodplain area in the northeastern part of the wetland show apparent wetland signatures (Figures D1, D2, and D7, Appendix D). The total delineated wetland includes 26.28 acres of incidental wetland, of which 14.21 acres lies within the study area. Wetland KETB-23 also includes 7.21 acres of natural wetland, in total, of which 6.78 acres lies within the study area. Vegetative diversity and wildlife habitat are rated high, outlet configuration is rated medium, and upland condition and public value are rated low with an overall condition rating of medium (Table 5). The wetland is isolated by the road along its entire southern extent and has no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-46W and SP-47U (Appendix A), and photograph 25 (Appendix B).

Wetland KETB-27

Wetland KETB-27 is an 11.28 acre shallow marsh community, of which 1.90 acres lies within the study area (Figure 6-3). Dominant vegetation includes narrow-leaf cat-tail. Soils consist of mucky loam over sandy loam and met the hydric soil indicator for thick dark surface and loamy mucky mineral. Hydrology at the

plot location was observed as inundation of two inches and the secondary hydrology indicators for geomorphic position and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that formed as a result of grading activity in the area. In the 1989 and 1991 aerial photographs, the area of the wetland appears to have been graded and excavated (Figures D4-D5, Appendix D). Historically, the area of Wetland KETB-27 was a forested ridge line located between two unnamed creeks with no wetland signatures evident (Figures D1 and D7, Appendix D). Wildlife habitat was rated high, while all other functions are rated low with an overall condition rating of low (Table 5). The wetland is isolated by the road system surrounding it and has no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-48W and SP-49U (Appendix A), and photograph 26 (Appendix B).

Wetland KETB-28

Wetland KETB-28 is approximately 0.71 acre in size and consists of an alder thicket community (Figure 6-3). Dominant vegetation includes speckled alder and fowl manna grass. Soils are silt loam, reddish in color, and met the hydric soil indicators for redox dark surface and red parent material. Hydrology was observed as the secondary wetland hydrology indicators for geomorphic position and FAC-neutral test were observed. Wetland boundaries are distinct.

The wetland appears to be incidental, formed as a result of ditching activity adjacent to the tailings basin berm and a road. Modifications to this area during the construction of the tailings basin are apparent in 1989 and 1991 (Figures D4-D5, Appendix D). Historically, the area of Wetland KETB-28 was on the western slope of a hill with forested cover and no evidence of wetland signatures (Figures D1, D2, and D7). The wetland was rated medium for vegetative diversity, upland condition, and wildlife habitat and rated low for outlet configuration and public value for an overall rating of medium (Table 5). The wetland outlets across an old road and into Wetland KETB-29. Wetland KETB-29 outlets in Wetland KETB-27 which is isolated by the road system surrounding it and has no surficial connection to other wetlands or waterways.

Site conditions are documented with SP-50W and SP-51U (Appendix A), and photograph 27 (Appendix B).

Wetland KETB-29

Wetland KETB-29 is a 3.04 acre shallow marsh community, of which 2.42 acres lies within the study area (Figure 6-3). Dominant vegetation includes narrow-leaf cat-tail. Soils consist of mucky loam over loamy sand and met the hydric soil indicator for loamy mucky mineral and depleted matrix. Hydrology at the plot location was observed as saturation and a water table at the ground surface and the secondary hydrology indicators for geomorphic position and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that formed as a result of excavation activity in the area. In the 1989 and 1991 aerial photographs, the area of the wetland appears to have been excavated (Figures D4-D5, Appendix D). Historically, the area of Wetland KETB-29 was on the western slope of a hill with forested cover and no evidence of wetland signatures (Figures D1, D2, and D7). All wetland functions were rated

low except wildlife habitat which was rated high, with an overall condition rating of low (Table 5). The wetland outlets into Wetland KETB-27 via a notch in an old road. Wetland KETB-27 is isolated by the road system surrounding it and has no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-52W and SP-53U (Appendix A), and photograph 28 (Appendix B).

Wetland KETB-30

Wetland KETB-30 is approximately 0.04 acre in size and consists of a shrub-carr community (Figure 6-3). Dominant vegetation includes pussy willow, cottongrass bulrush, and narrow-leaf cat-tail. Soils consist of reddish clay loam over reddish sand and met the hydric soil indicator for depleted matrix. Hydrology was observed as the secondary hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that has formed as a result of excavation and grading activity in the area. In the 1989 and 1991 aerial photographs, the area of the wetland appears to have been graded and excavated (Figures D4-D5, Appendix D). Historically, the area of Wetland KETB-30 was on a ridge with forested cover and no evidence of wetland signatures (Figures D1, D2, and D7). The wetland was rated low for all functions (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-54W and SP-53U (Appendix A), and photograph 29 (Appendix B).

Wetland KETB-31

Wetland KETB-31 is approximately 0.04 acre in size and consists of a shrub-carr community (Figure 6-3). Dominant vegetation includes pussy willow, cottongrass bulrush, and Canada bluejoint. Soils consist of reddish clay loam and met the hydric soil indicator for red parent material. Hydrology was observed as the secondary hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that has formed as a result of excavation and grading activity in the area. In the 1989 and 1991 aerial photographs, this area was graded, excavated, and roads were constructed (Figures D4-D5, Appendix D). Historically, the area of Wetland KETB-31 was on a ridge with forested cover and no evidence of wetland signatures (Figures D1, D2, and D7). The wetland was rated medium for vegetative diversity and low for all other functions (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-55W and SP-56U (Appendix A), and photograph 30 (Appendix B).

Wetland KETB-32

Wetland KETB-32 is approximately 0.04 acre in size and consists of a shrub-carr community (Figure 6-3). Dominant vegetation includes pussy willow, cottongrass bulrush, and Canada bluejoint. Soils consist of

sandy loam over reddish clay loam and met the hydric soil indicator for depleted matrix. Hydrology was observed as the secondary hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that has formed as a result of excavation and grading activity in the area. In the 1989 and 1991 aerial photographs, this area was graded, excavated, and roads were constructed (Figures D4-D5, Appendix D). Historically, the area of Wetland KETB-32 was on a ridge with forested cover and no evidence of wetland signatures (Figures D1, D2, and D7). The wetland was rated medium for vegetative diversity and low for all other functions (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-57W and SP-59U (Appendix A), and photograph 31 (Appendix B).

Wetland KETB-33

Wetland KETB-33 is a 4.28 acre deep marsh community, of which 2.67 acres lies within the study area (Figure 6-3). Dominant vegetation includes broad-leaf pondweed (*Potamogeton natans* – OBL) and grass-leaf arrowhead (*Sagittaria graminea* – OBL). Soils consist of sandy loam and met the hydric soil indicator for depleted matrix. Hydrology at the plot location was observed as inundation of 12 inches and the secondary hydrology indicators for geomorphic position and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that formed as a result of excavation activity in the area. In the 1989 and 1991 aerial photographs, the area of the wetland appears to have been excavated (Figures D4-5, Appendix D). Historically, the area of Wetland KETB-33 was on a ridge with forested cover and no evidence of wetland signatures (Figures D1, D2, and D7). Vegetative diversity and wildlife habitat were rated high, while outlet configuration, upland condition, and public value were rated low with an overall condition rating of medium (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions for this wetland are documented with plots SP-58W and SP-59U (Appendix A), and photograph 32 (Appendix B).

Wetland KETB-34

Wetland KETB-34 is a 5.72 acre shallow marsh community, of which 5.41 acres lies within the study area (Figure 6-3). Dominant vegetation includes speckled alder, meadow willow, and narrow-leaf cat-tail. Soils consist of mucky loam over sandy loam over clay loam and met the hydric soil indicators for depleted below dark surface, loamy mucky mineral, and depleted matrix. Hydrology at the plot location was observed as saturation at the ground surface with a water table at two inches below ground surface and the secondary hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that formed as a result of grading and excavation activity in the area. In the 1989 and 1991 aerial photographs, the majority of the wetland appears to have been graded,

excavated, and affected by impoundment berms (Figures D4-D5, Appendix D). The southern portion of the wetland appears to have developed wetland characteristics as a result of beaver dam activity downstream. Historically, the area of Wetland KETB-34 was on a ridge with forested cover at the head of a drainage swale leading south, with no evidence of wetland signatures (Figures D1, D2, and D7). Wildlife habitat was rated high, while vegetative diversity and upland condition were rated medium and outlet configuration and public value were rated low with an overall rating of medium (Table 5). The wetland is contiguous with a series of ponds and wetlands to the south discharging into Hay Creek, which outlets into Swan Lake and ultimately the Mississippi River.

Site conditions for this wetland are documented with plots SP-60W and SP-59U (Appendix A), and photograph 33 (Appendix B).

Wetland KETB-35

Wetland KETB-35 is a 5.82 acre wetland comprised of alder thicket and shallow marsh communities, of which 5.57 acres lies within the study area (Figures 6-3 and 6-4). Dominant vegetation within the alder thicket includes quaking aspen, pussy willow, speckled alder, three-seed sedge (*Carex trisperma* – OBL), and spotted touch-me-not. Dominant vegetation in the shallow marsh includes speckled alder, cottongrass bulrush, and giant manna grass (*Glyceria grandis* – OBL). Soils in the alder thicket consist of silt loam over sandy clay over sandy loam and met the hydric soil indicator for depleted matrix. Soils in the shallow marsh consist of sandy loam over sandy clay and met the hydric soil indicator for depleted matrix. Hydrology within the alder thicket was observed as the secondary hydrology indicators for stunted or stressed plants, geomorphic position, shallow aquitard, microtopographic relief, and FAC-neutral test. Hydrology within the shallow marsh was observed as water marks, algal mat or crust, and aquatic fauna as well as the secondary hydrology indicators for surface soil cracks, drainage patterns, geomorphic position, shallow aquitard, microtopographic relief, and FAC-neutral test. Wetland boundaries are distinct.

The alder thicket portion of the wetland appears to be native and is located in an enclosed depression. The shallow marsh portion of the wetland appears to be incidental, formed as a result of excavation in the area as observed in the 1989 and 1991 aerial photographs (Figures D4-D5, Appendix D). Historically, the alder thicket portion of the wetland was mapped as a depressional wetland on the 1952 USGS quadrangle map (Figure D7, Appendix D) while the shallow marsh area was located in a hummocky landscape. In the 1961 and 1972 aerial photos, the alder thicket portion of the wetland shows clear wetland signatures while the shallow marsh portion of the wetland appears to be upland forest with no wetland signatures (Figures D1-D2, Appendix D). The total delineated wetland includes 1.52 acres of incidental wetland, of which 1.50 acres lies within the study area. Wetland KETB-35 also includes 4.30 acres of natural wetland, in total, of which 4.07 acres lies within the study area. The wetland is rated high for vegetative diversity and wildlife habitat, medium for outlet configuration and upland condition, and low for public value for an overall rating of medium (Table 5). There appears to be an outlet channel leading south and west from the central part of the wetland, discharging to an unnamed creek (Figure 5-4). That unnamed creek discharges into Hay Creek, which outlets into Swan Lake and ultimately the Mississippi River.

Site conditions for this wetland are documented with plots SP-61W, SP-62U, and SP-63W (Appendix A), and photograph 34 (Appendix B).

Wetland KETB-36

Wetland KETB-36 is approximately 2.26 acres in size and consists of an alder thicket and shallow marsh communities (Figures 6-4). Dominant vegetation within the alder thicket includes speckled alder, Canada bluejoint, and cottongrass bulrush. Soils in the alder thicket consist of loam over sandy loam over clay loam and met the hydric soil indicator for depleted matrix. Hydrology within the alder thicket was observed as the secondary hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test. Wetland boundaries are distinct.

This appears to be an incidental wetland that formed as a result of grading and excavation activity in the area. In the 1981 through 1991 aerial photographs, grading and excavation are apparent in the area of Wetland KETB-36 (Figures D3-D5, Appendix D). Historically, the wetland was located in a hummocky landscape (Figure D7, Appendix D). In the 1961 and 1972 aerial photos, the shallow marsh portion of the wetland shows apparent wetland signatures while the alder thicket portion of the wetland appears to be upland forest with no wetland signatures (Figures D1-D2, Appendix D). Vegetative diversity is rated high, wildlife habitat and upland condition are rated medium, and outlet configuration and public value are rated low with an overall condition rating of medium (Table 5). It appears that Wetland KETB-36 discharges south through a swale to Wetland KETB-35 (Figure 5-4), which appears to outlet to an unnamed creek, and subsequently to Hay Creek, Swan Lake, and the Mississippi River.

Site conditions for this wetland are documented with plots SP-64W and SP-65U (Appendix A), and photograph 35 (Appendix B).

Wetland KETB-37

Wetland KETB-37 is approximately 1.34 acre in size and consists of a shrub-carr community (Figure 6-4). Dominant vegetation includes pussy willow, speckled alder, Canada bluejoint, and cottongrass bulrush. Soils consist of sandy loam over a reddish clay loam and met the hydric soil indicator for depleted matrix. Hydrology was observed as the secondary wetland hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test were observed. Wetland boundaries are distinct.

The wetland appears to be incidental, formed as a result of ditching activity adjacent to the tailings basin berm and a road. In the 1989 and 1991 aerial photographs, this area appears to be excavated as part of the tailings basin berm construction (Figures D4-D5, Appendix D). Historically, the area of Wetland KETB-37 ran across a hillslope (Figure D7, Appendix D), and was upland forest with no apparent wetland signatures (Figures D1-D2, Appendix D). The wetland was rated high for vegetative diversity, medium for upland condition and wildlife habitat, and rated low for outlet configuration and public value for an overall rating of medium (Table 5). The wetland outlets into Wetland KETB-36 which outlets to Wetland KETB-35, thereby discharging to an unnamed creek and eventually to Hay Creek, Swan Lake, and the Mississippi River.

Site conditions are documented with SP-66W and SP-65U (Appendix A), and photograph 36 (Appendix B).

Wetland KETB-38

Wetland KETB-38 is a 17.08 acre alder thicket community, of which 2.27 acres lies within the study area

(Figure 6-4). Dominant vegetation includes quaking aspen, pussy willow, speckled alder, lakebank sedge, and swamp red currant (*Ribes triste* – OBL). Soils consist of loam over sandy loam and met the hydric soil indicators for depleted matrix and redox dark surface. Hydrology at the plot location was observed as water stained leaves and the secondary hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test. Wetland boundaries are distinct.

This appears to be a native wetland but has been impacted by grading and farming. The western part of the wetland lies within a natural swale while the eastern part is on a ridge (Figure D7, Appendix D). In the 1961 and 1972 aerial photographs, an active farm covers most of the eastern two-thirds of the wetland with no apparent wetland signatures while the western part is partially forested and shows wetland signatures (Figures D1-D2, Appendix D). In the 1981 aerial photograph, two apparent access roads had been constructed across the northern part of the wetland with a berm along the south side of each road (Figure 5-4) intercepting runoff from the north and directing it to the western part of the wetland. The northern road appears to be about 30 feet in width and the southern road appears to range from about 130 feet to 150 feet in width. The wetland does not appear to have been disturbed after that time, but as more runoff has been directed to the western part of the wetland over the years, the shallow marsh area has grown in size. The wetland was rated high for all functions except public value (Table 5). The wetland discharges through a series of wetlands along an unnamed creek, eventually into the West Swan River. The West Swan River outlets into the St. Louis River and ultimately into Lake Superior.

Site conditions for this wetland are documented with plots SP-67W and SP-68U (Appendix A), and photograph 37 (Appendix B).

Wetlands KETB-39 and KETB-40

Wetlands KETB-39 and KETB-40 are approximately 0.13 acre and 0.06 acre in size, respectively, and consist of shrub-carr communities (Figure 6-4). The conditions of these wetlands is similar to that of Wetland KETB-37. Dominant vegetation includes pussy willow, speckled alder, Canada bluejoint, and cottongrass bulrush. Soils consist of sandy loam over a reddish clay loam and met the hydric soil indicator for depleted matrix. Hydrology was observed as the secondary wetland hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test were observed. Wetland boundaries are distinct.

The wetlands appear to be incidental, formed as a result of ditching activity adjacent to the tailings basin berm and a road. In the 1989 and 1991 aerial photographs, this area appears to be graded as part of the tailings basin berm construction (Figures D4-D5, Appendix D). Historically, the area of Wetlands KETB-39 and KETB-40 was the top of a hill (Figure D7, Appendix D) with forest cover and no evidence of wetland signatures (Figures D1-D-3, Appendix D). The wetland was rated high for vegetative diversity, medium for upland condition and wildlife habitat, and rated low for outlet configuration and public value for an overall rating of medium (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with SP-66W and SP-65U (Appendix A), and photographs 38 and 39 (Appendix B).

Wetland KETB-41

Wetland KETB-41 is a 10.83 acre alder thicket community, of which 8.56 acres lies within the study area (Figure 6-4). Dominant vegetation includes speckled alder, spotted touch-me-not, marsh horsetail (*Equisetum palustre* – FACW), and common red raspberry. Soils consist of silt loam over clay loam and met the hydric soil indicator for depleted matrix. Hydrology was observed as the secondary hydrology indicators for geomorphic position, shallow aquitard, microtopographic relief, and FAC-neutral test. Wetland boundaries are distinct.

The wetland appears to be predominantly native, located partially within a depression swale, but has been impacted by farming and a road. Portions of the wetland were historically farmed and a road ran through the eastern part of the wetland (Figures D1-D3, Appendix D). The western part of the wetland was disturbed by tailings basin construction activities and removal of the road in 1989 and 1991 (Figures D4-D5, Appendix D). Historically, the area of Wetland KETB-41 was within a headwaters swale that drained southeasterly to the West Swan River (Figure D7, Appendix D). Wetland signatures are apparent in the 1961 to 1981 aerial photos within the western lobe and northwestern part, but not the remainder of the wetland (Figures D1-D3, Appendix D). The removal of the road, homestead, and driveway appear to have contributed to the development of a more extensive wetland area from the road east, than was present historically. Soils in that area are mapped as Buhl loam, which are classified as 15 percent hydric, which contributes to the likelihood that wetland developed as a result of the tailings basin construction. The total delineated wetland includes 1.75 acres of incidental wetland, all of which lies within the study area. Wetland KETB-41 also includes 9.08 acres of natural wetland, in total, of which 6.81 acres lies within the study area. The wetland is rated high for vegetative diversity, outlet configuration, and wildlife habitat, medium for upland condition, and low for public value with an overall rating of high (Table 5). Site observations and a review of PWI, NHD, and topography data indicate that Wetland KETB-41 drains southeasterly to the West Swan River which discharges to the St. Louis River and ultimately to Lake Superior.

Site conditions for this wetland are documented with plots SP-69W and SP-70U (Appendix A), and photograph 40 (Appendix B).

Wetland KETB-42

Wetland KETB-42 is approximately 0.02 acre in size and consists of a shrub-carr community (Figure 6-4). Dominant vegetation includes pussy willow, speckled alder, Canada bluejoint, and cottongrass bulrush. Soils consist of sandy loam over a reddish clay loam and met the hydric soil indicator for depleted matrix. Hydrology was observed as the secondary wetland hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test were observed. Wetland boundaries are distinct.

The wetland appears to be incidental, formed as a result of ditching activity adjacent to the tailings basin berm and a road. In the 1989 and 1991 aerial photographs, this area appears to be graded as part of the tailings basin berm construction (Figures D4-D5, Appendix D). Historically, area of the wetland was adjacent to a road with no evidence of wetland conditions (Figures D1-D3, Appendix D). The wetland was rated high for vegetative diversity and rated low for all other functions, including overall condition (Table

5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are representative of conditions documented with SP-66W and SP-65U (Appendix A), and photograph 41 (Appendix B).

Wetland KETB-43

Wetland KETB-43 is approximately 0.41 acre in size and consists of a hardwood swamp community (Figure 6-5). Dominant vegetation includes quaking aspen, black ash, red maple, and dwarf red raspberry. Soils consist of loam and met the hydric soil indicator for depleted matrix. At the time of delineation, no direct hydrology was observed but the secondary wetland hydrology indicators for stunted or stressed plants, geomorphic position, microtopographic relief, and FAC-neutral test were observed. Wetland boundaries are distinct.

This is a native wetland located in an enclosed depression that was historically farmed as seen in the 1961 and 1972 aerial photographs (Figures D1-D2, Appendix D). While the historic photos don't show wetland signatures, there has been no landscape alterations in that area and it appears that the wetland developed naturally upon cessation of farming. The wetland is rated high for all wetland functions evaluated, except public value, which is rated low with an overall rating of high (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with SP-71W and SP-72U (Appendix A), and photograph 42 (Appendix B).

Wetlands KETB-44 and KETB-45

Wetlands KETB-44 and KETB-45 are approximately 0.04 acre and 0.14 acre in size, respectively, and consist of shrub-carr communities (Figure 6-5). The conditions of these wetlands are similar to that of Wetland KETB-37. Dominant vegetation includes pussy willow, speckled alder, Canada bluejoint, and cottongrass bulrush. Soils consist of sandy loam over a reddish clay loam and met the hydric soil indicator for depleted matrix. Hydrology was observed as the secondary wetland hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test were observed. Wetland boundaries are distinct.

The wetlands appear to be incidental, formed as a result of ditching activity adjacent to the tailings basin berm and a road. In the 1989 and 1991 aerial photographs, this area appears to be graded as part of the tailings basin berm construction (Figures D4-D5, Appendix D). Historically, the area of Wetlands KETB-44 and KETB-45 was the top of a hill (Figure D7, Appendix D) with forest cover and no evidence of wetland signatures (Figures D1-D-3, Appendix D). The wetland was rated high for vegetative diversity, medium for upland condition and wildlife habitat, and rated low for outlet configuration and public value for an overall rating of medium (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with SP-66W and SP-65U (Appendix A), and photograph 43 (Appendix B).

Wetland KETB-46

Wetland KETB-46 is approximately 0.12 acre in size and consists of fresh (wet) meadow community (Figure 6-5). Dominant vegetation includes pussy willow, lakebank sedge, and cottongrass bulrush. Soils consist of mucky loam over clay loam over a reddish clay and met the hydric soil indicator for depleted matrix. Hydrology was observed as the secondary wetland hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test were observed. Wetland boundaries are distinct.

The wetlands appear to be incidental, formed as a result of grading and ditching activity adjacent to the tailings basin berm. In the 1989 and 1991 aerial photographs, this area appears to be graded as part of the tailings basin berm construction (Figures D4-D5, Appendix D). Historically, the area of the wetland was located on a ridge line (Figure D7, Appendix D) with forest cover and no apparent wetland signatures (Figures D1-D3, Appendix D). The wetland was rated high for vegetative diversity, medium for upland condition and wildlife habitat, and rated low for outlet configuration and public value with an overall rating of medium (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with SP-73W and SP-74U (Appendix A), and photograph 44 (Appendix B).

Wetland KETB-47

Wetland KETB-47 is a 51.59 acre shrub-carr community, of which 8.70 acres lies within the study area (Figure 6-5). Dominant vegetation includes speckled alder, black ash, pussy willow, Canada bluejoint, lakebank sedge, and fowl manna grass. Soils consist of muck over mucky loam and met the hydric soil indicator for histosol. Hydrology was observed as inundation of one inch and the secondary wetland hydrology indicators for geomorphic position, microtopographic relief, and FAC-neutral test. Wetland boundaries are distinct.

Wetland KETB-47 is predominantly a native wetland located adjacent to the West Swan River. The southwestern portion of the wetland was farmed historically with no apparent wetland signatures (Figures D1-D2). The southwestern area was graded as part of the tailings basin berm construction (Figures D4-D5, Appendix D), resulting in the development of approximately 2.31 acres of incidental wetland, of which 1.47 acres is within the study area. Soils throughout all but the southwestern part of the wetland are mapped as hydric soils, including Rifle, McQuade-Dora, and Bowstring and Fluvaquents (Figure 4) with some evidence of wetland signatures apparent throughout much of the rest of the wetland in historic photos (Figures D1-D4, Appendix D), including 49.28 acres in total and 7.22 acres within the study area. The wetland was rated high for all functions except for public value, which was rated low (Table 5). The wetland is directly connected to the West Swan River floodplain wetlands. The West Swan River outlets into the St. Louis River and ultimately into Lake Superior.

Site conditions are documented with SP-77W and SP-78U (Appendix A), and photograph 45 (Appendix B).

Wetland KETB-48

Wetland KETB-48 is approximately 0.37 acre in size and consists of a shallow marsh community (Figure 6-6). Dominant vegetation includes speckled alder, broad-leaf cat-tail, and Canada bluejoint. Soils consist of

muck over sandy clay over clay and met the hydric soil indicators for depleted matrix and 2 cm muck. Hydrology was observed as thin muck surface and the secondary wetland hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test were observed. Wetland boundaries are distinct.

The wetlands appear to be native, but has been disturbed by grading activity all around the wetland. In the 1961 and 1972 aerial photographs the eastern part of the wetland appeared to be farmed with some evidence of wetland conditions in the western part and by 1981, the entire wetland was farmed (Figures D1-D3, Appendix D). In the 1989 and 1991 aerial photographs, the area around the wetland was graded as part of the tailings basin berm construction (Figures D4-D5, Appendix D). This wetland appeared to become wetter following the grading activity. The wetland was rated high for vegetative diversity, medium for wildlife habitat, and rated low for outlet configuration, upland condition, and public value for an overall rating of medium (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with SP-75W and SP-76U (Appendix A), and photograph 46 (Appendix B).

Wetland KETB-49

Wetland KETB-49 is approximately 0.09 acre in size and consists of an alder thicket community (Figure 6-6). Dominant vegetation includes paper birch, black ash, speckled alder, and fowl manna grass. Soils consist of loam over silt loam and met the hydric soil indicator for redox dark surface. Hydrology was observed as water stained leaves and the secondary wetland hydrology indicators for geomorphic position and FAC-neutral test were observed. Wetland boundaries are distinct.

The wetland is located in an enclosed depression with no apparent historical disturbance (Figures D1-D5, Appendix D). The wetland is rated high for all wetland functions evaluated, except upland condition which is rated medium and public value which is rated low (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with SP-79W and SP-78U (Appendix A), and photograph 47 (Appendix B).

Wetland KETB-50

Wetland KETB-50 is an 8.82 acre shallow marsh community, of which 5.03 acres lies within the study area (Figure 6-5). Dominant vegetation includes speckled alder, lakebank sedge, and broad-leaf cat-tail. Soils consist mucky loam over sandy loam over sandy clay loam and met the hydric soil indicator for loamy mucky mineral. Hydrology was observed as inundation of one inch and the secondary wetland hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test. Wetland boundaries are distinct.

Wetland KETB-50 is a native wetland with some disturbance from roads and grading. The wetland is bordered by a road to the north and there was a historic road through the eastern portion of the wetland (Figures D1-D5, Appendix D). Some grading activity was conducted to the northwest of the wetland. The wetland is rated high for all wetland functions evaluated, except upland condition which is rated medium and public value which is rated low (Table 5). The wetland is contiguous with Wetland KETB-47, which

discharges into the West Swan River. The West Swan River outlets into the St. Louis River and ultimately into Lake Superior.

Site conditions are documented with SP-80W and SP-81U (Appendix A), and photograph 48 (Appendix B).

Wetland KETB-51

Wetland KETB-51 is approximately 0.56 acre in size and consists of a fresh (wet) meadow community (Figure 6-6). Dominant vegetation includes speckled alder, pussy willow, and fowl manna grass. Soils consist of muck over mucky peat and met the hydric soil indicator for histosol and hydrogen sulfide. Hydrology was observed as saturation and a water table at the ground surface and the secondary wetland hydrology indicators for geomorphic position and FAC-neutral test were observed. Wetland boundaries are distinct.

The wetland is located in an enclosed depression with some historical disturbance directly adjacent to the wetland (Figures D1-D5, Appendix D), but appears to be a natural wetland. The wetland is rated high for vegetative diversity, medium for outlet configuration, upland condition, and wildlife habitat, and low for public value for an overall rating of medium (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with SP-82W and SP-83U (Appendix A), and photograph 49 (Appendix B).

Wetland KETB-52

Wetland KETB-52 is approximately 0.03 acre in size and consists of a fresh (wet) meadow community (Figure 6-6). Dominant vegetation includes sandbar willow (*Salix interior* – FACW), speckled alder, pussy willow, broad-leaf cat-tail, and lakebank sedge. Soils consist of mucky loam over clay loam and met the hydric soil indicator for loamy mucky mineral and depleted matrix. Hydrology was observed as saturation and a water table at the ground surface and the secondary wetland hydrology indicators for geomorphic position, shallow aquitard, microtopographic relief, and FAC-neutral test were observed. Wetland boundaries are distinct.

The wetland is located in an enclosed depression with some historical disturbance directly adjacent to the wetland (Figures D1-D5, Appendix D). The wetland is rated high for vegetative diversity and outlet configuration, medium for upland condition and wildlife habitat, and low for public value with an overall rating of medium (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with SP-84W and SP-83U (Appendix A).

Wetland KETB-53

Wetland KETB-53 is approximately 0.04 acre in size and consists of a fresh (wet) meadow community (Figure 6-6). Dominant vegetation includes sandbar willow, Canada bluejoint, and reed canary grass. Soils consist of silt loam over sandy loam and met the hydric soil indicator for redox dark surface. Hydrology was observed as water-stained leaves and the secondary wetland hydrology indicators for geomorphic position, microtopographic, and FAC-neutral test were observed. Wetland boundaries are distinct.

The wetland appears to be incidental, formed as a result of grading and ditching activity adjacent to a road. The road along the south side of the wetland was constructed prior to 1940 and the area was part of a farm operation until 1981 (Figures D1-D3, Appendix D) with no apparent wetland signatures. In the 1989 and 1991 aerial photographs, this area appears to be graded as part of the tailings basin berm construction (Figures D4-D5, Appendix D), after which, the wetland appears to have developed. The wetland was rated medium for vegetative diversity and wildlife habitat, and rated low for outlet configuration, upland condition, and public value for an overall rating of low (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with SP-85W and SP-86U (Appendix A).

Wetland KETB-54

Wetland KETB-54 is approximately 0.30 acre in size and consists of a shallow marsh community (Figure 6-6). Dominant vegetation includes pussy willow, balsam poplar, reed canary grass, cottongrass bulrush, and narrow-leaf cat-tail. Soils consist of mucky loam over clay over a reddish clay loam and met the hydric soil indicators for loamy mucky mineral and depleted matrix. Hydrology was observed as saturation and a water table at the ground surface and the secondary wetland hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test were observed. Wetland boundaries are distinct.

The wetland appears to be incidental, formed as a result of grading activity. The area was part of a farm operation from at least 1940 until 1981 with no apparent wetland signatures (Figures D1-D3, Appendix D). In the 1989 and 1991 aerial photographs, this area appears to be graded as part of the tailings basin berm construction (Figures D4-D5, Appendix D), after which, the wetland appears to have formed. The wetland was rated low for all functions except wildlife habitat which was rated medium (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with SP-87W and SP-86U (Appendix A), and photograph 50 (Appendix B).

Wetland KETB-55

Wetland KETB-55 is a 3.92 acre wetland comprised of shallow marsh and shrub-carr communities, of which 3.12 acres lies within the study area (Figure 6-6). Dominant vegetation in the shrub-carr community includes balsam poplar, paper birch, speckled alder, pussy willow, sandbar willow, smooth scouring-rush, three-seed sedge, and narrow-leaf cat-tail. Soils consist of mucky loam over clay loam over sandy clay loam and met the hydric soil indicators for depleted below dark surface and loamy mucky mineral. Hydrology was observed as inundation of one inch and the secondary wetland hydrology indicators for geomorphic position, shallow aquitard, and FAC-neutral test were observed. Wetland boundaries are distinct.

The wetland appears to be incidental, formed as a result of grading and excavation activity. The area was predominantly part of a farm operation from at least 1940 until 1981 with no apparent wetland signatures (Figures D1-D3, Appendix D). In the 1989 and 1991 aerial photographs, this area appears to be graded

and excavated as part of the tailings basin berm construction (Figures D4-D5, Appendix D), after which, the wetland appears to have formed. The wetland was rated high for vegetative diversity and wildlife habitat, medium for upland condition, and rated low for outlet configuration and public value with an overall rating of medium (Table 5). Site observations and a review of PWI, NHD, and topography data indicate no surficial connection to other wetlands or waterways.

Site conditions are documented with SP-88W and SP-89U (Appendix A), and photograph 51 (Appendix B).

3.4.1 Wetland Functional Assessment

An abbreviated functional assessment was completed on each of the 55 wetlands delineated in the study area. Thirteen of the wetlands were rated as high quality, 31 were rated as medium quality, and 1 were rated as low quality. The high quality wetlands are typically native, have high diversity in vegetative species, and little to no disturbance. The medium quality wetlands are either dominated by native or non-native species, with variable species diversity, and variable disturbance. The low quality wetlands are typically incidental, have low species diversity and high non-native cover, and have high levels of disturbance. Table 5 shows the functional assessment data for each wetland.

3.4.2 Uplands

Uplands in the study area typically consist of mature, mixed forest plant communities dominated by quaking aspen (*Populus tremuloides* – FAC), balsam fir (*Abies balsamea* – FAC), white spruce (*Picea glauca* – FACU), paper birch (*Betula papyrifera* – FACU), red maple (*Acer rubrum* – FAC), mountain maple (*Acer spicatum* – FACU), beaked hazelnut (*Corylus cornuta* – FACU), common red raspberry (*Rubus idaeus* – FAC), honeysuckle (*Diervilla lonicera* – UPL), sarsaparilla (*Aralia nudicaulis* – FACU), large-leaf aster (*Eurybia macrophylla* – UPL), bracken fern (*Pteridium aquilinum* – FACU), orange hawkweed (*Hieracium aurantiacum* – UPL), virginia strawberry (*Fragaria virginiana* – FACU), Pennsylvania sedge (*Carex pennsylvanica* – UPL), bird's foot trefoil (*Lotus corniculatus* – FACU), hairy sweet cicely (*Osmorhiza claytonia* – FACU). Soil textures are typically loams or sandy loams with high-chroma matrix colors and no redoximorphic features. These areas typically have flat or convex slopes, which divert water to depressions and swales. Upland areas typically do not exhibit evidence of prolonged inundation, or soil saturation within 12 inches of the ground surface. Photographs 52-55 in Appendix B are representative of these conditions.

3.5 Wetland Summary

Barr surveyed the study area during the 2021 growing season and mapped 55 wetland areas. The 55 wetlands cover 355.25 acres in total, including 149.02 acres within the study area, which is approximately 30 percent of the study area (Table 4). The plant communities in the study area (as defined by Eggers and Reed) include shallow marsh (31.0 percent), deep marsh (25.7 percent), alder thicket (23.7 percent), coniferous bog (9.8 percent), shrub-carr (7.6 percent), hardwood swamp (1.4 percent), and fresh (wet) meadow (0.7 percent).

Barr used limited field observations and desktop techniques to map wetland boundaries that extend outside of the study areas, which is needed for understanding total wetland sizes and surface water

connections. These estimated wetland boundaries are shown on Figures 6-1 to 6-6 and summarized in Table 4.

4.0 Regulatory Implications

Wetlands in Minnesota are protected under federal, state, and local laws. The USACE administers Section 404 of the Clean Water Act (CWA), which regulates the placement of dredged or fill material into waters of the U.S. Waters of the U.S. are defined by CWA regulations (33 CFR 328.3(a)), and CWA jurisdiction is currently centered on standards presented by the USACE and U.S. Environmental Protection Agency (2007) based on the *Rapanos v United States & Carabell v United States* case. The USACE has the authority to determine the jurisdictional status of wetlands under Section 404 of the CWA. Details on topographic setting, outlets, and flow paths for each wetland are included in Table 5 and descriptions in Section 3.4. Our initial review indicates that some wetland communities may be determined jurisdictional, while others may be determined non-jurisdictional. The U.S. Army Corps of Engineers should be consulted to verify the jurisdictional status of wetlands with respect to their authority to administer Section 404 of the CWA.

Minnesota's WCA is administered by a Local Government Unit (LGU) or by the MDNR for activities associated with projects requiring a permit to mine. The WCA regulates filling, draining, and excavating wetlands. The WCA does not regulate impacts to "incidental" wetlands. Incidental wetlands are defined as "...wetlands that the landowner can demonstrate, to the satisfaction of the local government unit, were created by pits, stockpiles, or tailings basins, and by actions the purpose of which was not to create the wetland..." (M.R. 8420.0930, Subp. 1). In addition, incidental wetlands are further defined in M.R. 8420.0105, Subp. 2.D. as follows:

This chapter does not regulate impacts to incidental wetlands. "Incidental wetlands" are wetland areas that the landowner can demonstrate, to the satisfaction of the local government unit, were created in nonwetland areas solely by actions, the purpose of which was not to create the wetland. Incidental wetlands include drainage ditches, impoundments, or excavations constructed in nonwetlands solely for the purpose of effluent treatment, containment of waste material, storm water retention or detention, drainage, soil and water conservation practices, and water quality improvements and not as part of a wetland replacement process that may, over time, take on wetland characteristics.

Several of the delineated wetlands were created by grading, excavating, or the tailings basin, or for drainage purposes and therefore, may be considered "incidental." Those wetlands are characterized in Table 4 and within the wetland descriptions in Section 3.4. A review of historical imagery documents the history of activity in this area and several years of imagery are presented in Appendix D.

Barr recommends that Keetac request regulatory concurrence with the delineation findings, and a jurisdictional determination. In addition, Keetac should complete all appropriate regulatory consultations prior to impacting any unpermitted wetland areas.

5.0 Reference

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Tables

Table 1
Antecedent Precipitation Analysis

NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination NRCS Engineering Field Handbook Chapter 19			
Date	8/2/2021	Landowner/Project	Keetac Exterior Tailings Basin
Weather Station	MN Climatology Office	State	Minnesota
County	Itasca	Growing Season	2021
Photo/obs Date	2-Aug-21	Soil Name	Various

shaded cells are locked or calculated	Long-term rainfall statistics (from WETS table or State Climatology Office)			Precip	Condition Dry, Wet, Normal	Condition Value	Month Weight Value	Product of Previous 2 Columns
	Month	30% chance <	30% chance >					
1st Prior Month*	July	2.59	4.560	2.46	D	1	3	3
2nd Prior Month*	June	3.29	5.160	2.17	D	1	2	2
3rd Prior Month*	May	2.21	3.280	1.35	D	1	1	1
						Sum		6

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: prior period has been drier than normal

Table 2
Wetland Communities, Classification Systems, and Common Vegetation
Adapted from Eggers and Reed (1997)

Wetland Plant Community Types (Eggers and Reed 1997)	Classification of Wetlands and Deep Water Habitats of the United States (Cowardin et al. 1979)	Circular 39 (Shaw and Fredine 1971)	Examples of Common Vegetation
Shallow, Open Water	Palustrine or lacustrine, littoral; aquatic bed; submergent, floating, and floating-leaved (PAB; 2, 4, 5; G, H; and L2EM; 2; G, H; and L2AB; 2, 4, 5; G, H)	Type 5: Inland open fresh water	White water-lily, Yellow water lily, Northern milfoil, Largeleaf pondweed
Deep Marsh	Palustrine or lacustrine, littoral; aquatic bed; submergent, floating-leaved; and emergent; persistent and nonpersistent (PEM; 1, 2; F, G, H; and PAB; 2, 4, 5; F, G; and PUB; F, G; and L2EM; 2; F, G; and L2AB; 2, 4, 5; F, G)	Type 4: Inland deep fresh marsh	Bulrushes, Cattail, Duckweed, Water shield
Shallow Marsh	Palustrine; emergent; persistent and nonpersistent (PEM; 1, 2; C)	Type 3: Inland shallow fresh marsh	Cattails, Reed canary grass, Common reed
Sedge Meadow	Palustrine; emergent; narrow leaved persistent (PEM1B)	Type 2: Inland fresh meadow	Sedges, Canada bluejoint, Fowl bluegrass
Fresh (Wet) Meadow	Palustrine; emergent; broad and narrow-leaved persistent (PEM1B)	Type 1: Seasonally flooded basin of flat; Type 2: Inland fresh meadow	Reed canary grass, Sawtooth sunflower, Joe-pye-weed, Giant goldenrod
Wet to Wet-Mesic Prairie	Palustrine; emergent; broad- and narrow leaved persistent (PEM1; A, B)	Type 1: Seasonally flooded basin of flat; Type 2: Inland fresh meadow	Cattail, gayfeather, Prairie cordgrass, Slender rush, Black bentgrass
Calcareous Fen	Palustrine; emergent; narrow-leaved persistent; and scrub (PEM; 1; B)	Type 2: Inland fresh meadow	Dioecious sedge, Beaked spikerush, Needle beakrush, Shrubby cinquefoil
Open Bog	Palustrine; moss/lichen; and scrub/shrub; broad-leaved evergreen (PSS; 2, 3, 4, 7; B)	Type 8: Bog	Bog moss, Leatherleaf, Bog rosemary, Cranberry
Coniferous Bog	Palustrine; forested: needle-leaved evergreen and deciduous (PFO; 2, 4, 6, 7; B)	Type 8: Bog	Tamarack, Black spruce, Cotton grass, Leatherleaf
Shrub-Carr	Palustrine; scrub/shrub; broad leaved deciduous (PSS; 1, 6; B, C)	Type 6: Shrub swamp	Meadow willow, Pussy willow, Upright Sedge, Canada blue-joint grass
Alder Thicket	Palustrine; scrub/shrub; broad-leaved deciduous (PSS; 1, 6; B, C)	Type 6: Shrub swamp	Speckled Alder, American elder, Narrowleaf meadowsweet, Cinnamon fern
Hardwood Swamp	Palustrine; forested; broad-leaved deciduous (PFO; 1, 6; A, B, C)	Type 7: Wooded swamp	Black ash, Lake sedge, Ostrich fern, Marsh marigold
Coniferous Swamp	Palustrine; forested; needle-leaved deciduous and evergreen (PFO; 2, 4, 6, 7; B, C)	Type 7: Wooded swamp	Northern white cedar, Cinnamon fern, Yellow birch
Floodplain Forest	Palustrine; forested; broad-leaved deciduous (PFO; 1, 6; A)	Type 1: Seasonally flooded basin or flat	Silver maple, Canada wood-nettle, Canada hornwort, Green ash
Seasonally Flooded Basin	Palustrine; flat; emergent; persistent and non-persistent (PEMA)	Type 1: Seasonally flooded basin or flat	Willow-weed, Pennsylvania smartweed, Barnyard grass, White goosefoot

**Table 3
Soil Series Summary**

Map Unit Symbol	Map Unit Name	Hydric Classification (percent)	Area (acres)	Abundance (percent)
544	Cathro muck, occasionally ponded, 0 to 1 percent slopes	100%	0.1	0.0%
549	Greenwood peat	100%	11.9	2.4%
619	Keewatin silt loam	6%	25.2	5.1%
797	Mooselake and Lupton mucky peats	96%	10.8	2.2%
995	Seelyeville-Seelyeville, ponded, complex, 0 to 1 percent slopes	100%	1.4	0.3%
1050	Tailings basin	0%	47.9	9.6%
1003B	Udorthents, loamy (cut and fill land)	0%	79.6	16.0%
1043C	Udorthents, nearly level to rolling	5%	45.3	9.1%
622B	Nashwauk fine sandy loam, 1 to 10 percent slopes	7%	16.8	3.4%
867B	Eagleview-Menahga complex, 1 to 8 percent slopes	3%	79.2	15.9%
B27A	Mcquade-Buhl complex, 0 to 3 percent slopes	60%	46.3	9.3%
B28B	Buhl loam, 1 to 5 percent slopes	15%	73.9	14.8%
B32A	Mcquade-Dora, depressional-Fayal, depressional, complex, 0 to 2 percent slopes	100%	1.0	0.2%
B33A	Mcquade-Fayal, depressional, complex, 0 to 2 percent slopes	95%	30.7	6.2%
B67A	Rifle soils, hibbing catena, 0 to 1 percent slopes	100%	4.3	0.9%
W	Water	0%	23.7	4.8%
Total:			498.10	100.0%

Table 4
Wetland Summary

Wetland ID	Dominant Eggers and Reed Classification	Secondary Eggers and Reed Classification	Dominant Circular 39 Type	Secondary Circular 39 Type	Dominant Cowardin Type	Secondary Cowardin Type	Field-delineated?	Quality	Total Area (ac)	Area Within Study Boundaries (ac)*	Estimated Origin	Incidental Area Within Study Area (ac)	Major Watershed
KETB-01	Fresh (wet) Meadow		2		PEM1A		Yes	Medium	0.01	0.01	Incidental	0.01	Miss. River-Grand Rapids #9
KETB-02	Alder Thicket		6		PSS1B		Yes	Medium	0.10	0.10	Incidental	0.10	Miss. River-Grand Rapids #9
KETB-03	Alder Thicket		6		PSS1B		Yes	Medium	1.67	1.67	Incidental	1.67	Miss. River-Grand Rapids #9
KETB-04	Deep Marsh		4		PEM1F		Yes	Low	30.42	30.42	Incidental/ Natural	20.770	Miss. River-Grand Rapids #9
KETB-05	Hardwood Swamp		7		PFO1B		Yes	Medium	0.48	0.48	Incidental	0.48	Miss. River-Grand Rapids #9
KETB-06	Shrub-carr		6		PSS1B		Yes	Medium	0.04	0.04	Incidental	0.04	Miss. River-Grand Rapids #9
KETB-07	Hardwood Swamp		7		PFO1B		Yes	Medium	27.38	1.04	Incidental/ Natural	1.04	Miss. River-Grand Rapids #9
KETB-08	Hardwood Swamp		7		PFOB1B		Yes	High	0.22	0.22	Natural	0	Miss. River-Grand Rapids #9
KETB-09	Fresh (wet) Meadow		2		PEM1B		Yes	High	0.19	0.19	Natural	0	Miss. River-Grand Rapids #9
KETB-10	Shallow Marsh		3		PEM1C		Yes	Low	0.77	0.77	Incidental	0.77	Miss. River-Grand Rapids #9
KETB-11	Deep Marsh		4		PEM1F		Yes	Medium	6.72	3.37	Incidental	3.37	Miss. River-Grand Rapids #9
KETB-12	Shallow Marsh	Shrub-carr	3	6	PEM1C	PSS1B	Yes	Medium	6.14	1.22	Incidental/ Natural	0.04	Miss. River-Grand Rapids #9
KETB-13	Shrub-carr		6		PSS1B		Yes	Medium	0.05	0.05	Incidental	0.05	Miss. River-Grand Rapids #9
KETB-14	Shallow Marsh		3		PEM1C		Yes	Medium	1.31	1.31	Natural	0	Miss. River-Grand Rapids #9
KETB-15	Fresh (wet) Meadow		2		PEM1B		Yes	High	0.19	0.04	Natural	0	Miss. River-Grand Rapids #9
KETB-16	Shallow Marsh		3		PEM1C		Yes	High	3.17	1.31	Natural	0	Miss. River-Grand Rapids #9
KETB-17	Deep Marsh		4		PEM1F		Yes	Medium	4.00	1.84	Natural	0	Miss. River-Grand Rapids #9
KETB-18	Coniferous Bog		8		PFO4B		Yes	Medium	42.00	14.66	Natural	0	Miss. River-Grand Rapids #9
KETB-19	Fresh (wet) Meadow		2		PEM1B		Yes	High	0.01	0.01	Natural	0	Miss. River-Grand Rapids #9
KETB-20	Shrub-carr		6		PSS1B		Yes	High	12.82	0.68	Natural	0	Miss. River-Grand Rapids #9
KETB-21	Alder Thicket		6		PSS1B		Yes	Medium	0.32	0.32	Incidental	0.32	Miss. River-Grand Rapids #9
KETB-22	Shallow Marsh		3		PEM1C		Yes	Low	0.08	0.08	Incidental	0.08	Miss. River-Grand Rapids #9
KETB-23	Alder Thicket	Deep Marsh	6	4	PSS1B	PEM1F	Yes	High	15.00	10.01	Incidental/ Natural	1.56	Miss. River-Grand Rapids #9
KETB-24	Shallow Marsh		3		PEM1C		Yes	Medium	3.18	2.00	Incidental	2.00	Miss. River-Grand Rapids #9
KETB-25	Alder Thicket		6		PSS1B		Yes	Medium	36.37	3.82	Incidental/ Natural	3.82	Miss. River-Grand Rapids #9
KETB-26	Shallow Marsh		3		PEM1C		Yes	Medium	33.49	20.99	Incidental/ Natural	14.21	Miss. River-Grand Rapids #9
KETB-27	Shallow Marsh		3		PEM1C		Yes	Low	11.28	1.90	Incidental	1.90	Miss. River-Grand Rapids #9
KETB-28	Alder Thicket		6		PSS1B		Yes	Medium	0.71	0.71	Incidental	0.71	Miss. River-Grand Rapids #9
KETB-29	Shallow Marsh		3		PEM1C		Yes	Low	3.04	2.42	Incidental	2.42	Miss. River-Grand Rapids #9
KETB-30	Shrub-carr		6		PSS1A		Yes	Low	0.04	0.04	Incidental	0.04	Miss. River-Grand Rapids #9
KETB-31	Shrub-carr		6		PSS1B		Yes	Low	0.04	0.04	Incidental	0.04	Miss. River-Grand Rapids #9
KETB-32	Shrub-carr		6		PSS1B		Yes	Low	0.04	0.04	Incidental	0.04	Miss. River-Grand Rapids #9
KETB-33	Deep Marsh		4		PEM1F		Yes	Medium	4.28	2.67	Incidental	2.67	Miss. River-Grand Rapids #9
KETB-34	Shallow Marsh		3		PEM1C		Yes	Medium	5.72	5.41	Incidental	5.41	Miss. River-Grand Rapids #9
KETB-35	Alder Thicket	Shallow Marsh	6	3	PSS1B	PEM1C	Yes	Medium	5.82	5.57	Incidental/ Natural	1.50	Miss. River-Grand Rapids #9
KETB-36	Alder Thicket	Shallow Marsh	6	3	PSS1B	PEM1C	Yes	Medium	2.26	2.26	Incidental	2.26	Miss. River-Grand Rapids #9
KETB-37	Shrub-carr		6		PSS1B		Yes	Medium	1.34	1.34	Incidental	1.34	Miss. River-Grand Rapids #9
KETB-38	Alder Thicket		6		PSS1B		Yes	High	17.08	2.27	Natural	0	St. Louis River #3
KETB-39	Shrub-carr		6		PSS1B		Yes	Medium	0.13	0.13	Incidental	0.13	St. Louis River #3
KETB-40	Shrub-carr		6		PSS1B		Yes	Medium	0.06	0.06	Incidental	0.06	St. Louis River #3
KETB-41	Alder Thicket		6		PSS1B		Yes	High	10.83	8.56	Incidental/ Natural	1.75	St. Louis River #3
KETB-42	Shrub-carr		6		PSS1B		Yes	Low	0.02	0.02	Incidental	0.02	St. Louis River #3
KETB-43	Hardwood Swamp		7		PFO1B		Yes	High	0.41	0.41	Natural	0	St. Louis River #3
KETB-44	Shrub-carr		6		PSS1B		Yes	Medium	0.04	0.04	Incidental	0.04	St. Louis River #3
KETB-45	Shrub-carr		6		PSS1B		Yes	Medium	0.14	0.14	Incidental	0.14	St. Louis River #3
KETB-46	Fresh (wet) Meadow		2		PEM1B		Yes	Medium	0.12	0.12	Incidental	0.12	St. Louis River #3
KETB-47	Shrub-carr		6		PSS1B		Yes	High	51.59	8.70	Incidental/ Natural	1.47	St. Louis River #3
KETB-48	Shallow Marsh		3		PEM1C		Yes	Medium	0.37	0.37	Natural	0	St. Louis River #3
KETB-49	Alder Thicket		6		PSS1B		Yes	High	0.09	0.09	Natural	0	St. Louis River #3
KETB-50	Shallow Marsh		3		PEM1C		Yes	High	8.82	5.03	Natural	0	St. Louis River #3
KETB-51	Fresh (wet) Meadow		2		PEM1B		Yes	Medium	0.56	0.56	Natural	0	St. Louis River #3
KETB-52	Fresh (wet) Meadow		2		PEM1B		Yes	Medium	0.03	0.03	Natural	0	St. Louis River #3
KETB-53	Fresh (wet) Meadow		2		PEM1B		Yes	Low	0.04	0.04	Incidental	0.04	St. Louis River #3
KETB-54	Shallow Marsh		3		PEM1C		Yes	Low	0.30	0.30	Incidental	0.30	St. Louis River #3
KETB-55	Shallow Marsh	Shrub-carr	3	6	PEM1C	PSS1C	Yes	Medium	3.92	3.12	Incidental	3.12	St. Louis River #3

Totals: 355.25 149.02 75.83

* Table does not include adjacent wetlands that are connected outside of the study areas.

**Table 5
Wetland Functional Assessment Results**

Wetland ID	KETB-01	KETB-02	KETB-03	KETB-04	KETB-05	KETB-06	KETB-07	KETB-08	KETB-09	KETB-10	KETB-11	KETB-12	KETB-13	KETB-14
Date	8/2/2021	8/2/2021	8/2/2021	8/2/2021	8/2/2021	8/3/2021	8/3/2021	8/3/2021	8/3/2021	8/3/2021	8/3/2021	8/3/2021	8/3/2021	8/3/2021
Field Team	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2
Community 1 Eggers and Reed	Fresh (wet) Meadow	Alder Thicket	Alder Thicket	Deep Marsh	Hardwood Swamp	Shrub-carr	Hardwood Swamp	Hardwood Swamp	Fresh (wet) Meadow	Shallow Marsh	Deep Marsh	Shallow Marsh	Shrub-carr	Shallow Marsh
Community 1 %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	60%	100%	100%
Wetland Plot ID	SP-01W	SP-03W	SP-05W	SP-07W	SP-09W	SP-11W	SP-13W	SP-15W	SP-17W	SP-18W	SP-20W	SP-22W	SP-24W	SP-26W
Upland Plot ID	SP-02U	SP-04U	SP-06U	SP-08U	SP-10U	SP-12U	SP-14U	SP-16U	SP-16U	SP-19U	SP-21U	SP-23U	SP-25U	SP-25U
Community 2 Eggers and Reed												Shrub-carr		
Community 2 %												40%		
Wetland Plot ID														
Upland Plot ID														
Community 3 Eggers and Reed														
Community 3 %														
Wetland Plot ID														
Upland Plot ID														
Topographic Setting	Depressional - isolated	Depressional - isolated	Slope/ Depressional - tributary	Depressional - tributary	Depressional/ Slope - tributary	Depressional - isolated	Depressional - tributary	Depressional - isolated	Depressional - isolated	Depressional - isolated	Depressional - tributary	Depressional - tributary	Depressional - isolated	Depressional - isolated
Vegetative Diversity ¹	H (1.0)	M (0.5)	H (1.0)	L (0.1)	M (0.5)	H (1.0)	H (1.0)	M (0.5)	H (1.0)	L (0.1)	M (0.5)	H (1.0)	H (1.0)	M (0.5)
Outlet Configuration ¹	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	M (0.5)	H (1.0)	H (1.0)	L (0.1)	H (1.0)	M (0.5)	L (0.1)
Upland Condition ¹	M (0.5)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	H (1.0)	H (1.0)	M (0.5)	M (0.5)	M (0.5)	M (0.5)
Wildlife Habitat ¹	M (0.5)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	H (1.0)	H (1.0)	M (0.5)	H (1.0)	H (1.0)	M (0.5)	H (1.0)
Public Value ¹	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)
Average Value	0.44	0.34	0.44	0.26	0.34	0.44	0.62	0.72	0.82	0.26	0.62	0.62	0.44	0.52
Overall Condition	Medium	Medium	Medium	Low	Medium	Medium	Medium	High	High	Low	Medium	Medium	Medium	Medium
Human Disturbance ¹	H - tailings basin	H - road, tailings basin	H - road, tailings basin	High - impoundment, tailings basin	High - tailings basin	High - tailings basin	High - tailings basin	Low	Low	High - grading	High - tailings basin	High - tailings basin	Medium - road	Medium - roads
Photo ²	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Comments on history, origin, and connectivity	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is impounded on the east sides by the perimeter berm of the tailings basin. This area was historically graded during the construction of the tailings basin. The wetland appears to have formed from tailings basin construction activities.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located on an abandoned road and impounded on the south side by a berm. This area was historically disturbed by the construction of the tailings basin. The wetland appears to have formed from road construction activities.	Wetland is located on an abandoned road and outlets into Wetland KETB-04. Wetland KETB-04 is located at the fringe of Keetac's Reservoir 6. The water in Reservoir 6 discharges via a channel to the north into Reservoir 2. Water from Reservoir 2 is routed into the O'Brien Diversion Channel, which flows into Swan Lake via Hay Creek and ultimately reaches the Mississippi River. This area was historically disturbed by the construction of the tailings basin. The wetland appears to have formed from tailings basin construction activities.	Wetland is located in the fringe of Keetac's Reservoir 6. The water in Reservoir 6 discharges via a channel to the north into Reservoir 2. Water from Reservoir 2 is routed into the O'Brien Diversion Channel, which flows into Swan Lake via Hay Creek and ultimately reaches the Mississippi River. This wetland was formed by the impoundment of Welcome Creek prior to 1972.	Wetland is located in a ditch adjacent to the tailings berm and on a hillslope, with no surficial outlets evident. This wetland appears to have formed as a result of ditch construction.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located adjacent to the tailings basin berm in an area that was historically graded. The wetland appears to have formed as a result of tailings basin construction activities.	Wetland is located in ditches adjacent to the tailings basin and on a slope. The wetland outlets into a large wetland complex adjacent to Reservoir 2. The water in Reservoir 2 is routed into the O'Brien Diversion Channel, which flows into Swan Lake via Hay Creek and ultimately reaches the Mississippi River. The wetland appears to have formed from tailings basin construction activities.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is native.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is native.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is native.	Wetland is located in a depression. The wetland outlets into Wetland KETB-07. Wetland KETB-07 outlets into a large wetland complex adjacent to Reservoir 2. The water in Reservoir 2 is routed into the O'Brien Diversion Channel, which flows into Swan Lake via Hay Creek and ultimately reaches the Mississippi River. This area was graded as part of the construction of the tailings basin. Wetland appears to have formed as a result of grading activity.	Wetland is located in a depression. The wetland outlets into a large wetland complex adjacent to Reservoir 2. The water in Reservoir 2 is routed into the O'Brien Diversion Channel, which flows into Swan Lake via Hay Creek and ultimately reaches the Mississippi River. This area was graded as part of the construction of the tailings basin. Wetland appears to have formed as a result of grading activity.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located in an area that was graded as part of the tailings basin construction. Wetland appears to have formed from construction activities.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is native but appears to have been partially disturbed by roads.

¹Ratings based on MnRAM; see Appendix C.

²See Appendix B: Photo Log.

**Table 5
Wetland Functional Assessment Results**

Wetland ID	KETB-15	KETB-16	KETB-17	KETB-18	KETB-19	KETB-20	KETB-21	KETB-22	KETB-23	KETB-24	KETB-25	KETB-26	KETB-27	KETB-28
Date	8/4/2021	8/4/2021	8/4/2021	8/4/2021	8/4/2021	8/4/2021	8/4/2021	8/4/2021	8/4/2021	8/4/2021	8/13/2021	8/13/2021	8/13/2021	8/13/2021
Field Team	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	AMJ2, MJS2	MJS2	MJS2	MJS2	MJS2
Community 1														
Eggers and Reed	Fresh (wet) Meadow	Shallow Marsh	Deep Marsh	Coniferous Bog	Fresh (wet) Meadow	Shrub-carr	Alder Thicket	Shallow Marsh	Alder Thicket	Shallow Marsh	Alder Thicket	Shallow Marsh	Shallow Marsh	Alder Thicket
Community 1 %	100%	100%	100%	100%	100%	100%	100%	100%	70%	100%	100%	100%	100%	100%
Wetland Plot ID	SP-27W	SP-29W	SP-30W	SP-32W	SP-34W	SP-36W	SP-37W	SP-39W	SP-40W	SP-42W	SP-44W	SP-46W	SP-48W	SP-50W
Upland Plot ID	SP-28U	SP-28U	SP-31U	SP-33U	SP-35U	SP-35U	SP-38U	SP-38U	SP-41U	SP-43U	SP-45U	SP-47U	SP-49U	SP-51U
Community 2														
Eggers and Reed									Deep Marsh					
Community 2 %									20%					
Wetland Plot ID														
Upland Plot ID														
Community 3														
Eggers and Reed									Shallow Marsh					
Community 3 %									10%					
Wetland Plot ID														
Upland Plot ID														
Topographic Setting	Depressional - isolated	Depressional - isolated	Depressional - isolated	Depressional - isolated	Depressional - isolated	Depressional - tributary	Depressional - isolated	Depressional - isolated	Depressional - tributary	Depressional - tributary	Depressional - tributary	Depressional-isolated	Depressional-isolated	Depressional-isolated
Vegetative Diversity¹	H (1.0)	H (1.0)	M (0.5)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	L (0.1)	H (1.0)	M (0.5)	H (1.0)	H (1.0)	L (0.1)	M (0.5)
Outlet Configuration¹	H (1.0)	H (1.0)	M (0.5)	M (0.5)	H (1.0)	H (1.0)	L (0.1)	L (0.1)	H (1.0)	L (0.1)	M (0.5)	M (0.5)	L (0.1)	L (0.1)
Upland Condition¹	H (1.0)	M (0.5)	M (0.5)	M (0.5)	H (1.0)	H (1.0)	M (0.5)	M (0.5)	H (1.0)	M (0.5)	M (0.5)	L (0.1)	L (0.1)	M (0.5)
Wildlife Habitat¹	H (1.0)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	M (0.5)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	M (0.5)
Public Value¹	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)
Average Value	0.82	0.72	0.52	0.62	0.82	0.82	0.44	0.26	0.82	0.44	0.62	0.54	0.28	0.34
Overall Condition	High	High	Medium	Medium	High	High	Medium	Low	High	Medium	Medium	Medium	Low	Medium
Human Disturbance¹	Low	Low - road	Medium - roads, grading	Medium - roads	Low	Low	High - grading	High - ditch, roads	Medium - grading, tailings basin	High - grading	High - roads, grading	High - roads, grading	High - roads, grading	High - roads, tailings basin
Photo²	15	16	17	18	19	20	21	None	22	23	24	25	26	27
Comments on history, origin, and connectivity	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is native.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is native but appears to have been partially disturbed by roads.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is native but has been disturbed by grading and roads.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is native but has been disturbed by roads.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is native.	Wetland is located in a depression. The wetland extends outside of the study area into a large wetland complex. The wetland complex outlets into Swan Lake and ultimately reaches the Mississippi River. The wetland appears to be native but has been impacted by road and grading activities.	Wetland is located in a topographically-enclosed depression, with no surficial outlets evident. The wetland is impounded on the east side by a road and on the west side by a berm. The wetland is located in an area that was graded as part of the tailings basin construction. Wetland appears to have formed as a result of grading activities.	Wetland is located in a ditch feature in an area that was graded as part of the tailings basin construction. The wetland is impounded on all sides and lacks a surficial outlet. Wetland appears to have formed as a result of construction activity.	Wetland is located in a depression. The wetland is part of a large complex that extends outside of the study area to the south. The wetland complex outlets into Hay Creek which outlets into Swan Lake and ultimately reaches the Mississippi River. The wetland appears to be native but has been impacted by grading activity on the west and north sides.	Wetland is located in a depression. The wetland outlets outside of the study area and into a large wetland complex adjacent to Hay Creek. Hay Creek outlets into Swan Lake and ultimately reaches the Mississippi River. The wetland is located in an area that was excavated and graded as part of the tailings basin construction. The wetland appears to have formed as a result of construction activities.	Wetland is located in a depression. The wetland outlets outside of the study area into Hay Creek. Hay Creek outlets into Swan Lake and ultimately reaches the Mississippi River. The portion of wetland located within the study area was graded as part of the tailings basin construction and appears to have developed wetland conditions as a result. Portions of the wetland located outside of the study area are native.	Wetland is located in a depression. The wetland is located in an area that used to be Hay Creek. Hay Creek outlets into Swan Lake and ultimately reaches the Mississippi River. The north and east sides of the wetland are located in an area that was graded as part of the tailings basin construction. A small portion on the west side of the wetland is remnant piece of Hay Creek. A majority of the wetland appears to have formed as a result of construction activity.	Wetland is located in a depression. The wetland is isolated by the road system surrounding it. This area was graded as part of the tailings basin construction and the wetland appears to have formed as a result of this activity.	Wetland is located in a depression. The wetland is located adjacent to roads and the tailings basin berm and appears to have been constructed to move water in this area..

¹Ratings based on MnRAM; see Appendix C.

²See Appendix B: Photo Log.

**Table 5
Wetland Functional Assessment Results**

Wetland ID	KETB-29	KETB-30	KETB-31	KETB-32	KETB-33	KETB-34	KETB-35	KETB-36	KETB-37	KETB-38	KETB-39	KETB-40	KETB-41	KETB-42
Date	8/13/2021	8/13/2021	8/13/2021	8/13/2021	8/13/2021	8/13/2021	8/4/2021	8/13/2021	8/13/2021	8/4/2021	8/4/2021	8/4/2021	8/4/2021	8/4/2021
Field Team	MJS2	MJS2	MJS2	MJS2	MJS2	MJS2	CJE, PLL	MJS2	MJS2	CJE, PLL	CJE, PLL	CJE, PLL	CJE, PLL	CJE, PLL
Community 1 Eggers and Reed	Shallow Marsh	Shrub-carr	Shrub-carr	Shrub-carr	Deep Marsh	Shallow Marsh	Alder Thicket	Alder Thicket	Shrub-carr	Alder Thicket	Shrub-carr	Shrub-carr	Alder Thicket	Shrub-carr
Community 1 %	100%	100%	100%	100%	100%	100%	75%	85%	100%	100%	100%	100%	100%	100%
Wetland Plot ID	SP-52W	SP-54W	SP-55W	SP-57W	SP-58W	SP-60W	SP-61W	SP-64W	SP-66W	SP-67W	SP-66W	SP-66W	SP-69W	SP-66W
Upland Plot ID	SP-53U	SP-53U	SP-56U	SP-59U	SP-59U	SP-59U	SP-62U	SP-65U	SP-65U	SP-68U	SP-65U	SP-65U	SP-70U	SP-65U
Community 2 Eggers and Reed							Shallow Marsh	Shallow Marsh						
Community 2 %								15%						
Wetland Plot ID							SP-63W							
Upland Plot ID							SP-62U							
Community 3 Eggers and Reed														
Community 3 %														
Wetland Plot ID														
Upland Plot ID														
Topographic Setting	Depressional-isolated	Depressional-isolated	Depressional-isolated	Depressional-isolated	Depressional-isolated	Depressional - tributary	Depressional - tributary	Depressional - tributary	Depressional - tributary	Depressional - tributary	Depressional-isolated	Depressional-isolated	Depressional - tributary	Depressional-isolated
Vegetative Diversity ¹	L (0.1)	L (0.1)	M (0.5)	M (0.5)	H (1.0)	M (0.5)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	H (1.0)
Outlet Configuration ¹	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	M (0.5)	L (0.1)	L (0.1)	H (1.0)	L (0.1)	L (0.1)	H (1.0)	L (0.1)
Upland Condition ¹	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	H (1.0)	M (0.5)	M (0.5)	M (0.5)	L (0.1)
Wildlife Habitat ¹	H (1.0)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	H (1.0)	H (1.0)	H (1.0)	M (0.5)	H (1.0)	M (0.5)	M (0.5)	H (1.0)	L (0.1)
Public Value ¹	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)
Average Value	0.28	0.1	0.18	0.18	0.46	0.44	0.62	0.44	0.44	0.82	0.44	0.44	0.72	0.28
Overall Condition	Low	Low	Low	Low	Medium	Medium	Medium	Medium	Medium	High	Medium	Medium	High	Low
Human Disturbance ¹	High - roads, grading	High - grading, ditch	High - roads, ditch	High - roads, ditch	High - roads, grading	High - roads, grading	High - grading	High - grading	High - tailings basin, ditch	Medium - grading, farming	High - tailings basin, ditch	High - tailings basin, ditch	Medium - tailings basin, farming	High - road
Photo ²	28	29	30	31	32	34	34	35	36	37	38	39	40	41
Comments on history, origin, and connectivity	Wetland is located in a depression and is impounded on the west side by an old road. The wetland outlets into Wetland KETB-27 via a notch in an old road. Wetland KETB-27 is isolated by the road system surrounding it. The wetland is located in an area that was graded as part of the tailings basin construction. The wetland appears to have formed as a result of construction activities.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located in an area that was graded as part of the tailings basin construction. Wetland appears to have formed as a result of construction activities.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located adjacent to a road in an area that was graded as part of the tailings basin construction. Wetland appears to have formed as a result of construction activities.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located adjacent to a road in an area that was graded as part of the tailings basin construction. Wetland appears to have formed as a result of construction activities.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located in an area that was excavated as part of the tailings basin construction. Wetland appears to have formed as a result of construction activities.	Wetland is located in a depression. Wetland outlets outside of the project area in a series of ponds and wetlands and eventually into Hay Creek. Hay Creek outlets into Swan Lake and ultimately reaches the Mississippi River. The wetland is located in an area that was excavated as part of the tailings basin construction. The wetland appears to have formed as a result of construction activity.	Wetland is located in a topographically-enclosed depression, with no surficial outlets evident. The eastern part of the wetland is located in an area that was excavated as part of the tailings basin construction. This part of the wetland appears to have formed as a result of construction activity while the western part of the wetland appears to be native but has been disturbed by nearby mining activity.	Wetland is located in a depression. Wetland outlets into KETB-37 which in an enclosed depression with no surficial outlets. Wetland is located in an area that was graded as part of tailings basin construction. This wetland appears to have formed as a result of construction activities.	Wetland is located in a topographically-enclosed depression, with no surficial outlets evident. The wetland is located in a ditch feature adjacent to the tailings basin berm. This area was graded as part of the tailings basin construction activity. The wetland appears to have formed as a result of construction activities.	Wetland is located in a depression. Wetland outlets outside of the study area through a series of wetlands and ponds and into the West Swan River. The West Swan River outlets into the St. Louis River and ultimately reaches Lake Superior. This wetland appears to be native but has been disturbed by historic grading and farming activities.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located in a ditch adjacent to the tailings basin berm. This area was graded during the construction of the tailings basin berm. The wetland appears to have formed as a result of construction activity.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located in a ditch adjacent to the tailings basin berm. This area was graded during the construction of the tailings basin berm. The wetland appears to have formed as a result of construction activity.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is native but has been disturbed by farming and the tailings basin construction.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located on a former road. Wetland appears to have formed as a result of soil compaction.

¹Ratings based on MnRAM; see Appendix C.

²See Appendix B: Photo Log.

**Table 5
Wetland Functional Assessment Results**

Wetland ID	KETB-43	KETB-44	KETB-45	KETB-46	KETB-47	KETB-48	KETB-49	KETB-50	KETB-51	KETB-52	KETB-53	KETB-54	KETB-55
Date	8/3/2021	8/3/2021	8/3/2021	8/3/2021	8/3/2021	8/3/2021	8/3/2021	8/2/2021	8/2/2021	8/2/2021	8/2/2021	8/2/2021	8/2/2021
Field Team	CJE, PLL	CJE, PLL	CJE, PLL	CJE, PLL	CJE, PLL	CJE, PLL	CJE, PLL	CJE, PLL	CJE, PLL	CJE, PLL	CJE, PLL	CJE, PLL	CJE, PLL
Community 1 Eggers and Reed	Hardwood Swamp	Shrub-carr	Shrub-carr	Fresh (wet) Meadow	Shrub-carr	Shallow Marsh	Alder Thicket	Shallow Marsh	Fresh (wet) Meadow	Fresh (wet) Meadow	Fresh (wet) Meadow	Shallow Marsh	Shallow Marsh
Community 1 %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	80%
Wetland Plot ID	SP-71W			SP-73W	SP-77W	SP-75W	SP-79W	SP-80W	SP-82W	SP-84W	SP-85W	SP-87W	
Upland Plot ID	SP-72U			SP-74U	SP-78U	SP-76U	SP-78U	SP-81U	SP-83U	SP-83U	SP-86U	SP-86U	
Community 2 Eggers and Reed													Shrub-carr
Community 2 %													20%
Wetland Plot ID													SP-88W
Upland Plot ID													SP-89U
Community 3 Eggers and Reed													
Community 3 %													
Wetland Plot ID													
Upland Plot ID													
Topographic Setting	Depressional-isolated	Depressional-isolated	Depressional-isolated	Depressional-isolated	Slope-flow-through	Depressional-isolated	Depressional-isolated	Depressional - tributary	Depressional-isolated	Depressional-isolated	Depressional-isolated	Depressional-isolated	Depressional-isolated
Vegetative Diversity ¹	H (1.0)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	H (1.0)	M (0.5)	L (0.1)
Outlet Configuration ¹	H (1.0)	L (0.1)	L (0.1)	L (0.1)	H (1.0)	L (0.1)	L (0.1)	H (1.0)	H (1.0)	M (0.5)	H (1.0)	L (0.1)	L (0.1)
Upland Condition ¹	H (1.0)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	L (0.1)	L (0.1)
Wildlife Habitat ¹	H (1.0)	M (0.5)	M (0.5)	M (0.5)	M (0.5)	H (1.0)	M (0.5)	H (1.0)	H (1.0)	M (0.5)	M (0.5)	M (0.5)	M (0.5)
Public Value ¹	L (0.1)	L (0.1)	L (0.1)	L (0.1)	M (0.5)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)	L (0.1)
Average Value	0.82	0.44	0.44	0.44	0.9	0.36	0.72	0.72	0.52	0.62	0.26	0.18	0.54
Overall Condition	High	Medium	Medium	Medium	High	Medium	High	High	Medium	Medium	Low	Low	Medium
Human Disturbance ¹	Low - farming	High - tailings basin, ditch	High - tailings basin, ditch	High - tailings basin, ditch	Medium - grading	High - grading	Medium - tailings basin	Medium - roads	Medium	Medium - grading	High - grading, roads	High - grading, roads	High - grading
Photo ²	42	43	None	44	45	46	47	48	49	None	None	50	51
Comments on history, origin, and connectivity	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is native but was historically disturbed by farming.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located in a ditch adjacent to the tailings basin berm. This area was graded during the construction of the tailings basin berm. The wetland appears to have formed as a result of construction activity.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located in a ditch adjacent to the tailings basin berm. This area was graded during the construction of the tailings basin berm. The wetland appears to have formed as a result of construction activity.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located in a ditch adjacent to the tailings basin berm. This area was graded during the construction of the tailings basin berm. The wetland appears to have formed as a result of construction activity.	Wetland is located on a slope adjacent to the West Swan River. The West Swan River outlets into the St. Louis River and ultimately reaches Lake Superior. Parts of the wetland adjacent to the tailings basin have been disturbed by grading activity while other portions of the wetland are native.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is native but has been disturbed by grading activities surrounding the wetland.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is native.	Wetland is located in a depression. Wetland outlets into Wetland KETB-47 which is adjacent to the West Swan River. The West Swan River outlets into the St. Louis River and ultimately reaches Lake Superior. Wetland is native but has been disturbed by a road running through the wetland.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is native but has been disturbed by a roads adjacent to the wetland.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is native but has been disturbed by grading adjacent to the wetland.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located adjacent to a road and in an area that was graded as part of the tailings basin construction. Wetland appears to have formed as a result of construction activities.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located in an area that was excavated as part of the tailings basin construction. Wetland appears to have formed as a result of construction activities.	Wetland is located in topographically-enclosed depression, with no surficial outlets evident. Wetland is located in an area that was excavated as part of the tailings basin construction. Wetland appears to have formed as a result of construction activities.

¹Ratings based on MnRAM; see Appendix C.

²See Appendix B: Photo Log.

Figures

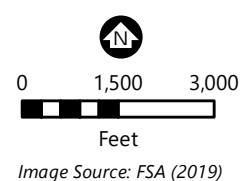
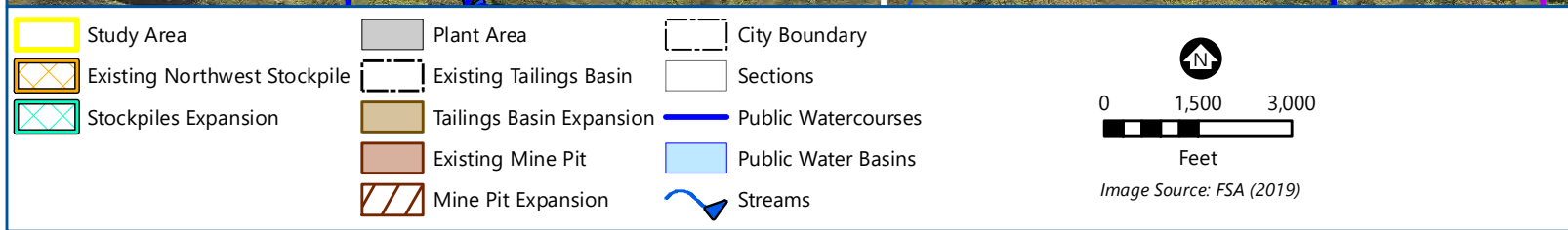
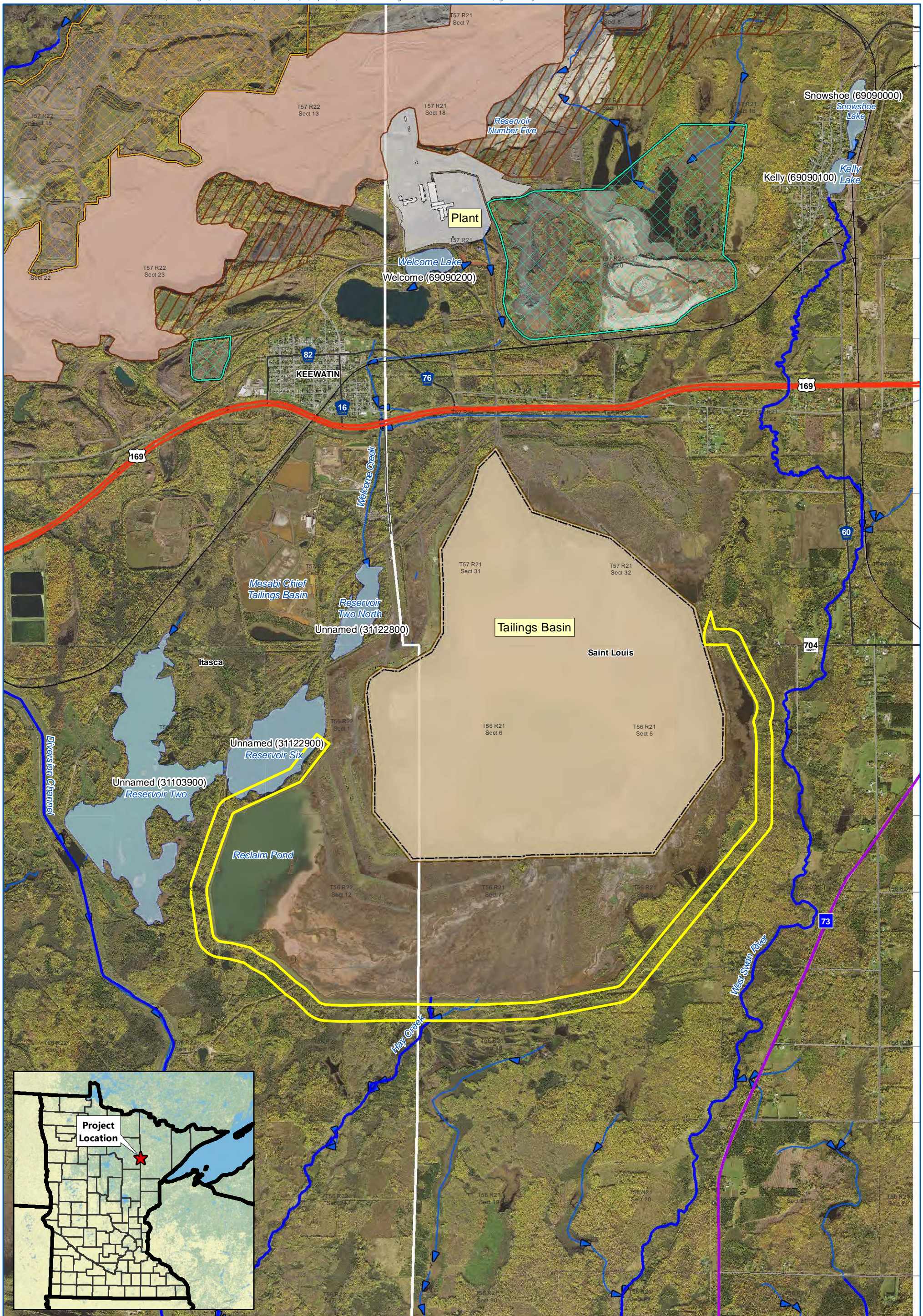


Image Source: FSA (2019)

PROJECT LOCATION
Tailings Basin Wetland Review
U. S. Steel - Keetac

FIGURE 1



- Wetland Review Area
 - PLSS Boundary
 - MnDNR Level 8 Watershed Divide
 - Tailings Pond
- NWI Simplified Plant Community Class**
- Seasonally Flooded/Saturated Emergent Wetland
 - Shallow Marsh
 - Deep Marsh
 - Shallow Open Water Community
 - Non-Vegetated Aquatic Community
 - Coniferous Wetland
 - Hardwood Wetland
 - Shrub Wetland
 - Bog
 - Artificially Flooded

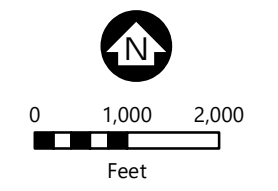


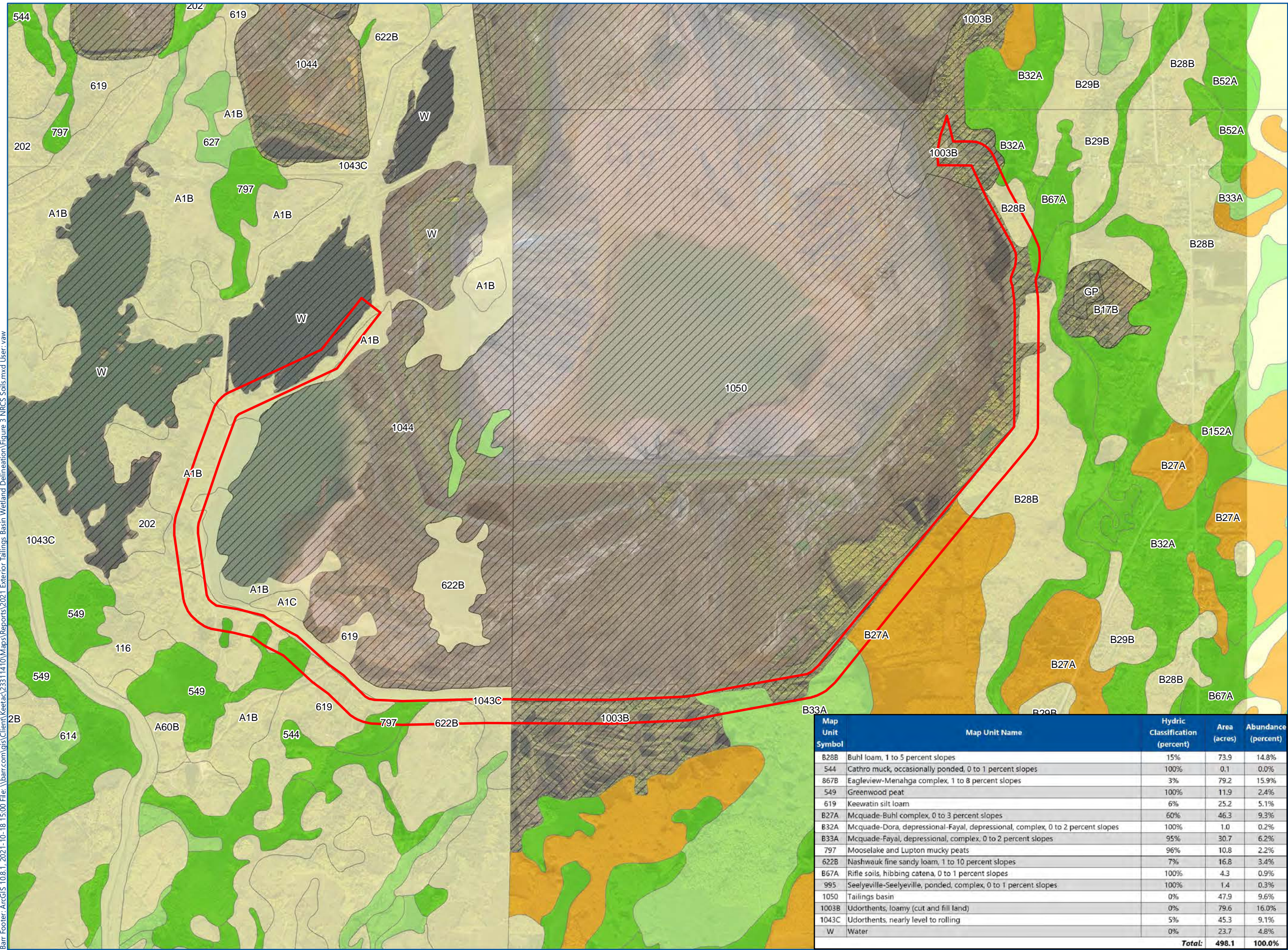
Image Source: FSA/NAIP (2019)

HYDROGRAPHY
 Tailings Basin
 Wetland Review
 U. S. Steel - Keetac
 Itasca & St. Louis
 Counties, Minnesota

FIGURE 2

Barr Footer: ArcGIS 10.8.1, 2021-10-28 15:30 File: I:\Client\Keetac\23311410\Maps\Reports\2021 Wetland Report\Figure 2 NWI Aerial.mxd User: mja

Barr Footer: ArcGIS 10.8.1, 2021-10-18 15:00 File: \\barr.com\gis\client\keetac\33311410\Maps\Reports\2021 Exterior Tailings Basin Wetland Delineation\Figure 3 NRCS Soils.mxd User: vaw



Wetland Review Area
 Wetland Review Area

Soils Hydric Rating

- 0%, Nonhydic
- 1-32%, Predominantly Non Hydic
- 33-66% Partially Hydic
- 66-99%, Predominantly Hydic
- 100%, Hydic

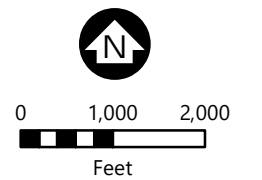


Image Source: FSA/NAIP (2019)

Map Unit Symbol	Map Unit Name	Hydic Classification (percent)	Area (acres)	Abundance (percent)
B28B	Buhl loam, 1 to 5 percent slopes	15%	73.9	14.8%
544	Cathro muck, occasionally ponded, 0 to 1 percent slopes	100%	0.1	0.0%
867B	Eagleview-Menahga complex, 1 to 8 percent slopes	3%	79.2	15.9%
549	Greenwood peat	100%	11.9	2.4%
619	Keewatin silt loam	6%	25.2	5.1%
B27A	Mcquade-Buhl complex, 0 to 3 percent slopes	60%	46.3	9.3%
B32A	Mcquade-Dora, depressional-Fayal, depressional, complex, 0 to 2 percent slopes	100%	1.0	0.2%
B33A	Mcquade-Fayal, depressional, complex, 0 to 2 percent slopes	95%	30.7	6.2%
797	Mooselake and Lupton mucky peats	96%	10.8	2.2%
622B	Nashwauk fine sandy loam, 1 to 10 percent slopes	7%	16.8	3.4%
B67A	Rifle soils, hibbing catena, 0 to 1 percent slopes	100%	4.3	0.9%
995	Seelyeville-Seelyeville, ponded, complex, 0 to 1 percent slopes	100%	1.4	0.3%
1050	Tailings basin	0%	47.9	9.6%
1003B	Udorthents, loamy (cut and fill land)	0%	79.6	16.0%
1043C	Udorthents, nearly level to rolling	5%	45.3	9.1%
W	Water	0%	23.7	4.8%
Total:			498.1	100.0%

USDA NRCS SOILS
 Tailings Basin
 Wetland Review
 U. S. Steel - Keetac
 Itasca & St. Louis
 Counties, Minnesota

FIGURE 3



- Wetland Review Area
- PLSS Boundary
- Mine Features (2018)
 - Stockpile
 - Tailings Basin

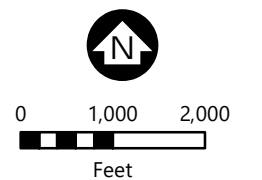


Image Source: FSA/NAIP (2019)

MINE FEATURES
Tailings Basin
Wetland Review
U. S. Steel - Keetac
Itasca & St. Louis
Counties, Minnesota

FIGURE 4



Legend

- Study Area
- Delineated Wetlands**
 - Alder Thicket
 - Coniferous Bog
 - Deep Marsh
 - Fresh (wet) Meadow
 - Hardwood Swamp
 - Shallow Marsh
 - Shrub-carr
- LiDAR Topography**
 - 10-foot contours
 - 2-foot contours

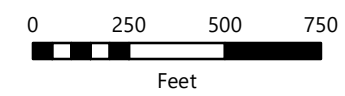
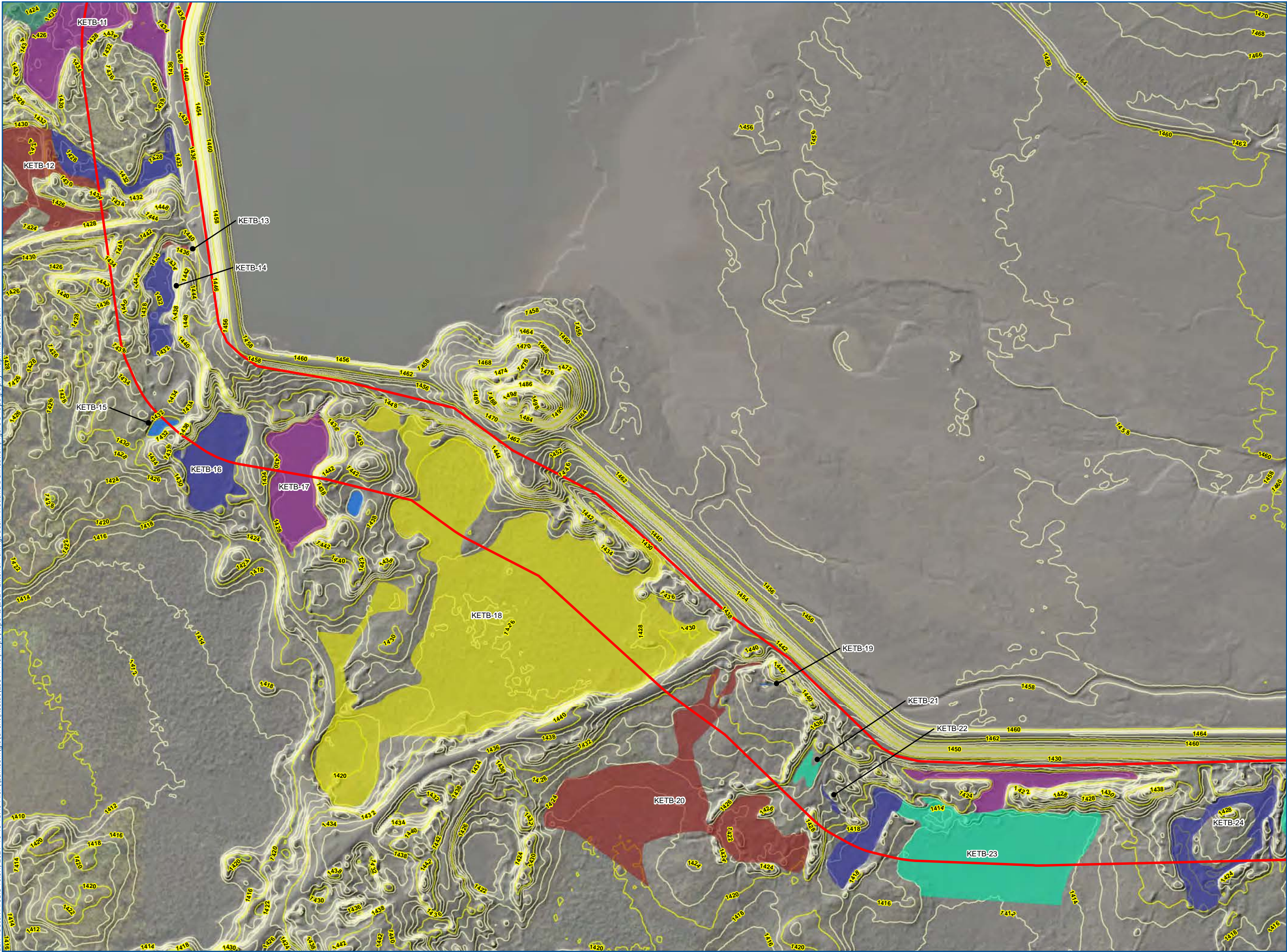


Image Source: FSA/NAIP (2019)

TOPOGRAPHY
Tailings Basin
Wetland Review
U. S. Steel - Keetac
Itasca & St. Louis
Counties, Minnesota

FIGURE 5-1

Barr Footer: ArcGIS 10.8.1, 2021-10-19 13:40 File: \\barr.com\gis\client\keetac\233114\10\Maps\Reports\2021 Exterior Tailings Basin Wetland Delineation\Figure 5 Topography Map.mxd User: vaw



Legend

Study Area

Delineated Wetlands

- Alder Thicket
- Coniferous Bog
- Deep Marsh
- Fresh (wet) Meadow
- Hardwood Swamp
- Shallow Marsh
- Shrub-carr

LiDAR Topography

- 10-foot contours
- 2-foot contours

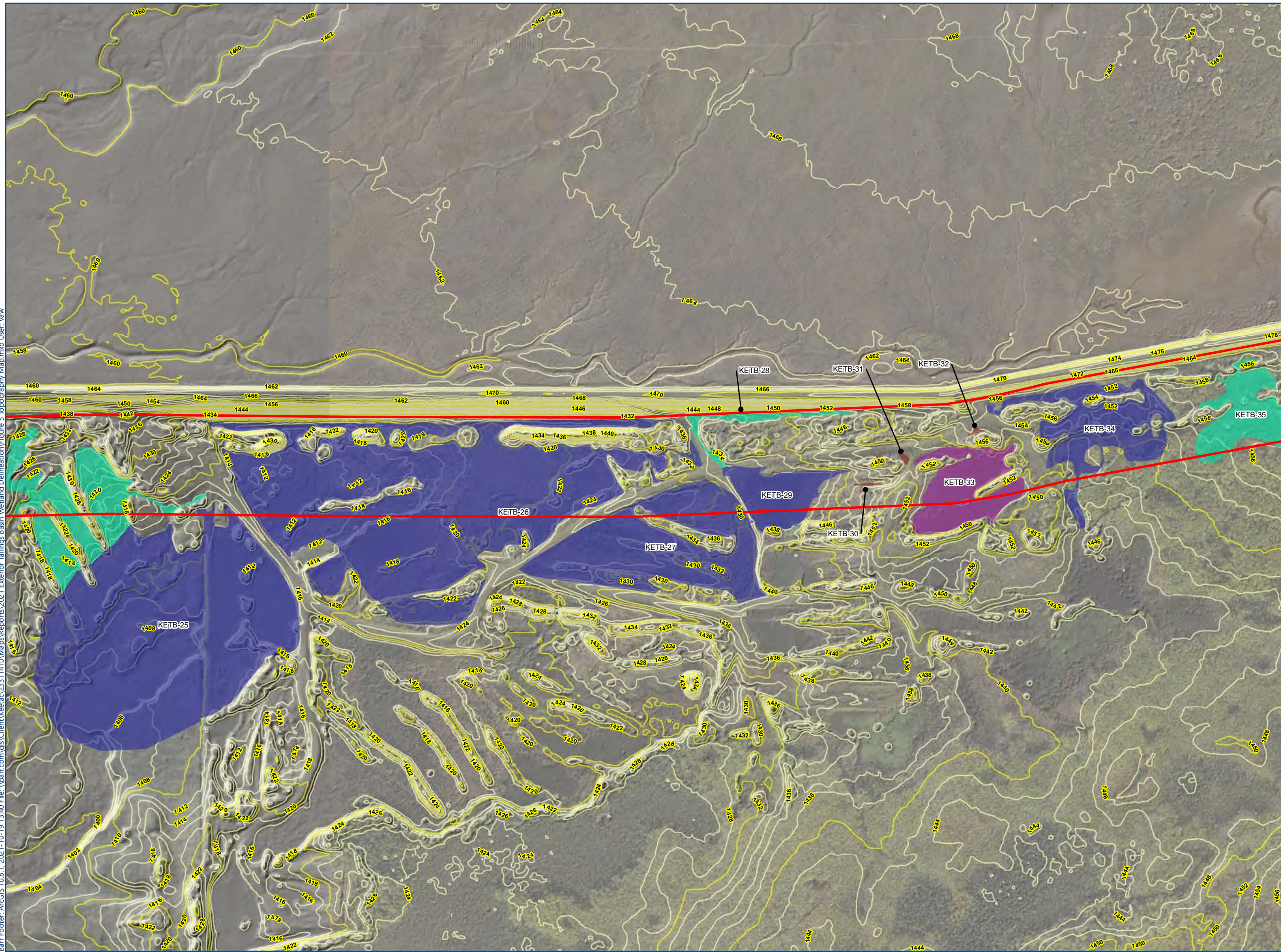
0 250 500 750

Feet

Image Source: FSA/NAIP (2019)

TOPOGRAPHY
Tailings Basin
Wetland Review
U. S. Steel - Keetac
Itasca & St. Louis
Counties, Minnesota

FIGURE 5-2



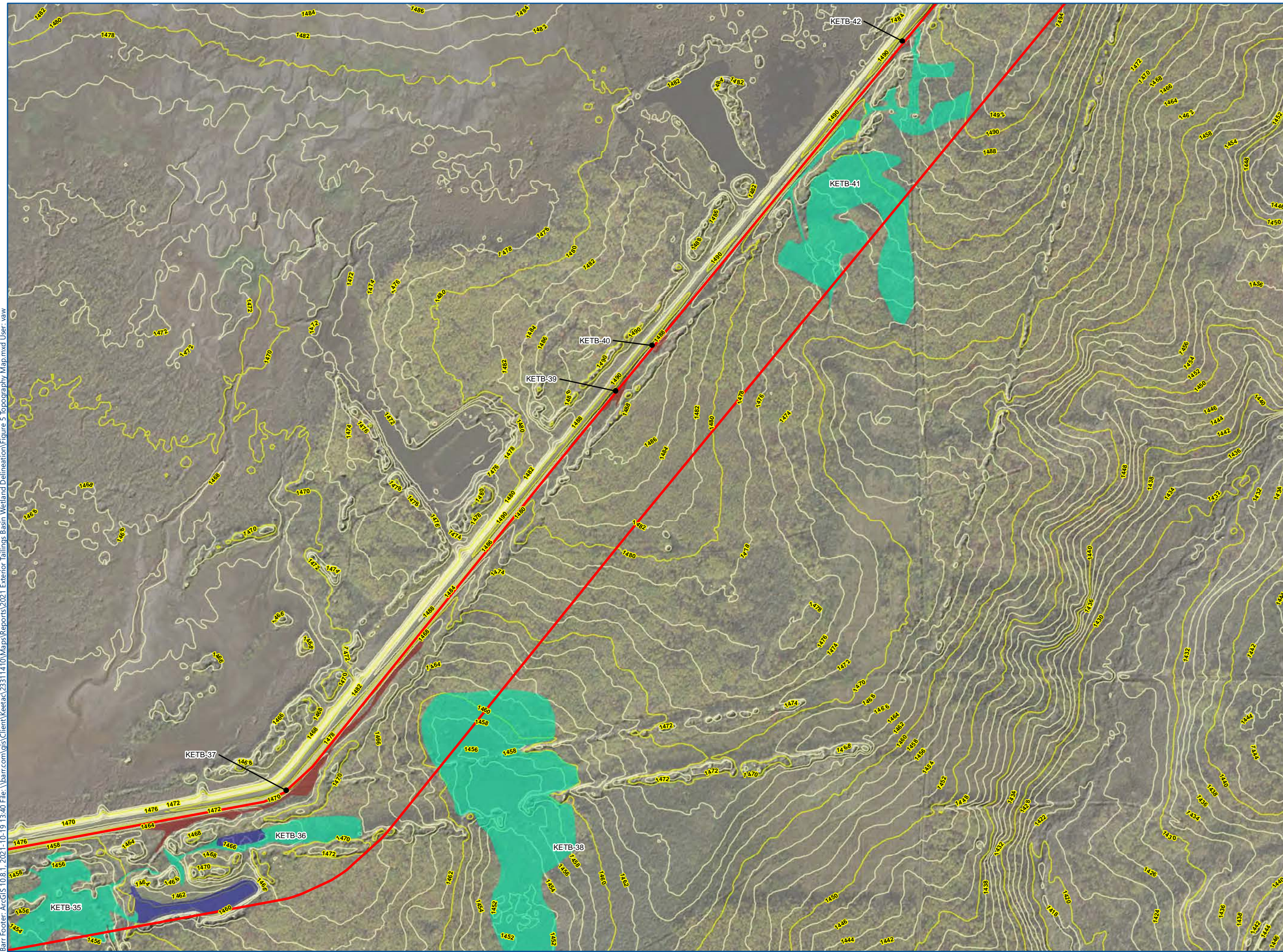
Legend

- Study Area
- Delineated Wetlands**
 - Alder Thicket
 - Coniferous Bog
 - Deep Marsh
 - Fresh (wet) Meadow
 - Hardwood Swamp
 - Shallow Marsh
 - Shrub-carr
- LiDAR Topography**
 - 10-foot contours
 - 2-foot contours

Image Source: FSA/NAIP (2019)

TOPOGRAPHY
Tailings Basin
Wetland Review
U. S. Steel - Keetac
Itasca & St. Louis
Counties, Minnesota

FIGURE 5-3

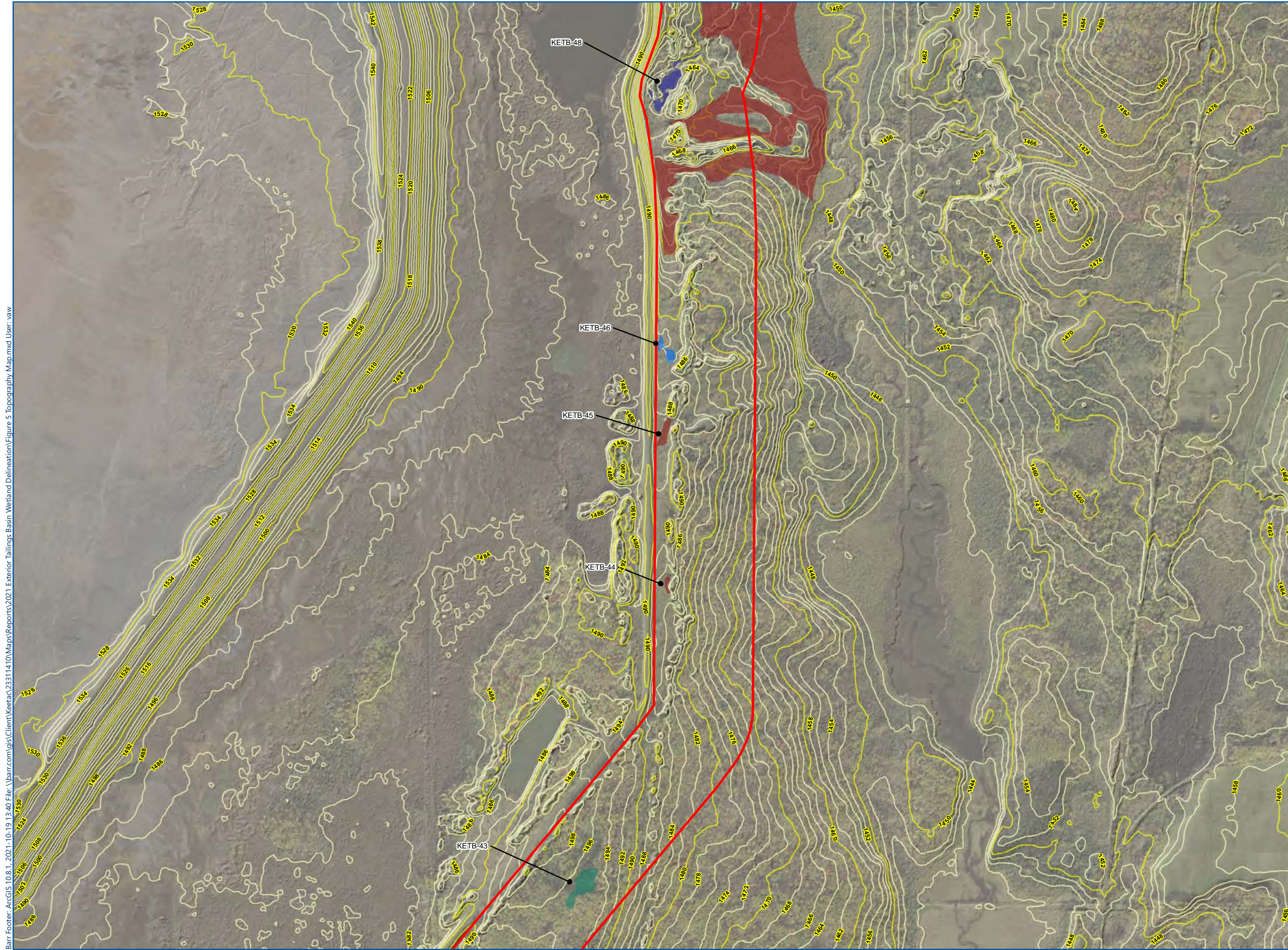


Legend

- Study Area
- Delineated Wetlands**
 - Alder Thicket
 - Coniferous Bog
 - Deep Marsh
 - Fresh (wet) Meadow
 - Hardwood Swamp
 - Shallow Marsh
 - Shrub-carr
- LiDAR Topography**
 - 10-foot contours
 - 2-foot contours

0 250 500 750
Feet
Image Source: FSA/NAIP (2019)

TOPOGRAPHY
Tailings Basin
Wetland Review
U. S. Steel - Keetac
Itasca & St. Louis
Counties, Minnesota
FIGURE 5-4

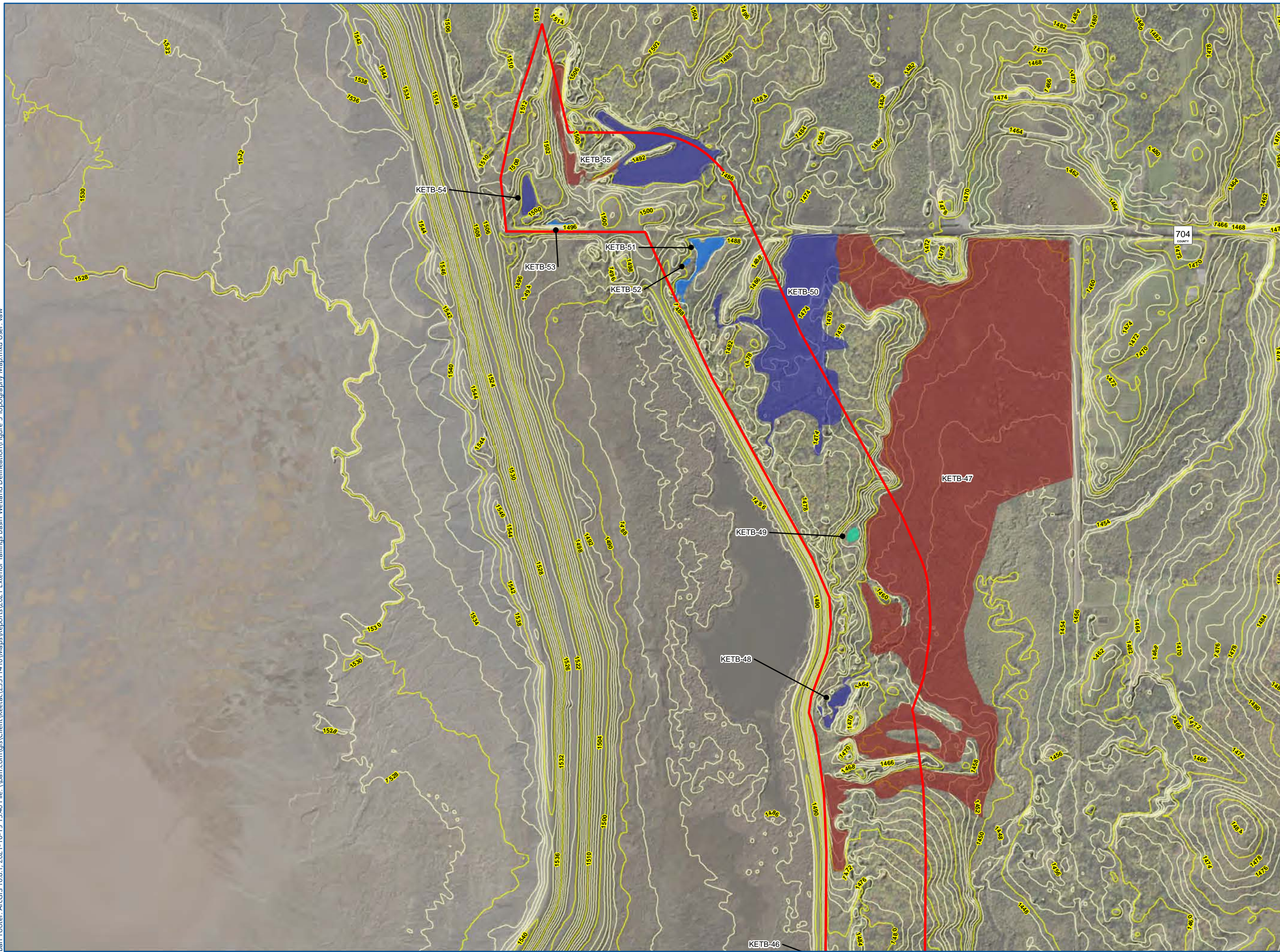


Legend

- Study Area
- Delineated Wetlands**
 - Alder Thicket
 - Coniferous Bog
 - Deep Marsh
 - Fresh (wet) Meadow
 - Hardwood Swamp
 - Shallow Marsh
 - Shrub-carr
- LiDAR Topography**
 - 10-foot contours
 - 2-foot contours

0 250 500 750
Feet
Image Source: FSA/NAIP (2019)

TOPOGRAPHY
Tailings Basin
Wetland Review
U. S. Steel - Keetac
Itasca & St. Louis
Counties, Minnesota
FIGURE 5-5



Legend

- Study Area
- Delineated Wetlands**
 - Alder Thicket
 - Coniferous Bog
 - Deep Marsh
 - Fresh (wet) Meadow
 - Hardwood Swamp
 - Shallow Marsh
 - Shrub-carr
- LiDAR Topography**
 - 10-foot contours
 - 2-foot contours

0 250 500 750
Feet
Image Source: FSA/NAIP (2019)

TOPOGRAPHY
Tailings Basin
Wetland Review
U. S. Steel - Keetac
Itasca & St. Louis
Counties, Minnesota
FIGURE 5-6

Barr Footer: ArcGIS 10.8.1, 2021-11-11 15:57 File: I:\Client\Keetac\23311410\Maps\Reports\2021 Exterior Tailings Basin Wetland Delineation\Figure 6 Delineation Figure_v3.mxd User: maj



Study Area

- Upland
- Wetland

Delineated Wetlands

- Alder Thicket
- Coniferous Bog
- Deep Marsh
- Fresh (wet) Meadow
- Hardwood Swamp
- Shallow Marsh
- Shrub-carr

0 250 500 750
Feet

2021 Wetland Delineation
Tailings Basin Project
U. S. Steel - Keetac
FIGURE 6-1



Barr Footer: ArcGIS 10.8.1, 2021-11-11 15:57 File: I:\Client\Keetac\23311410\Maps\Reports\2021 Exterior Tailings Basin Wetland Delineation\Figure 6 Delineation\Figure_03.mxd User: maj

Study Area

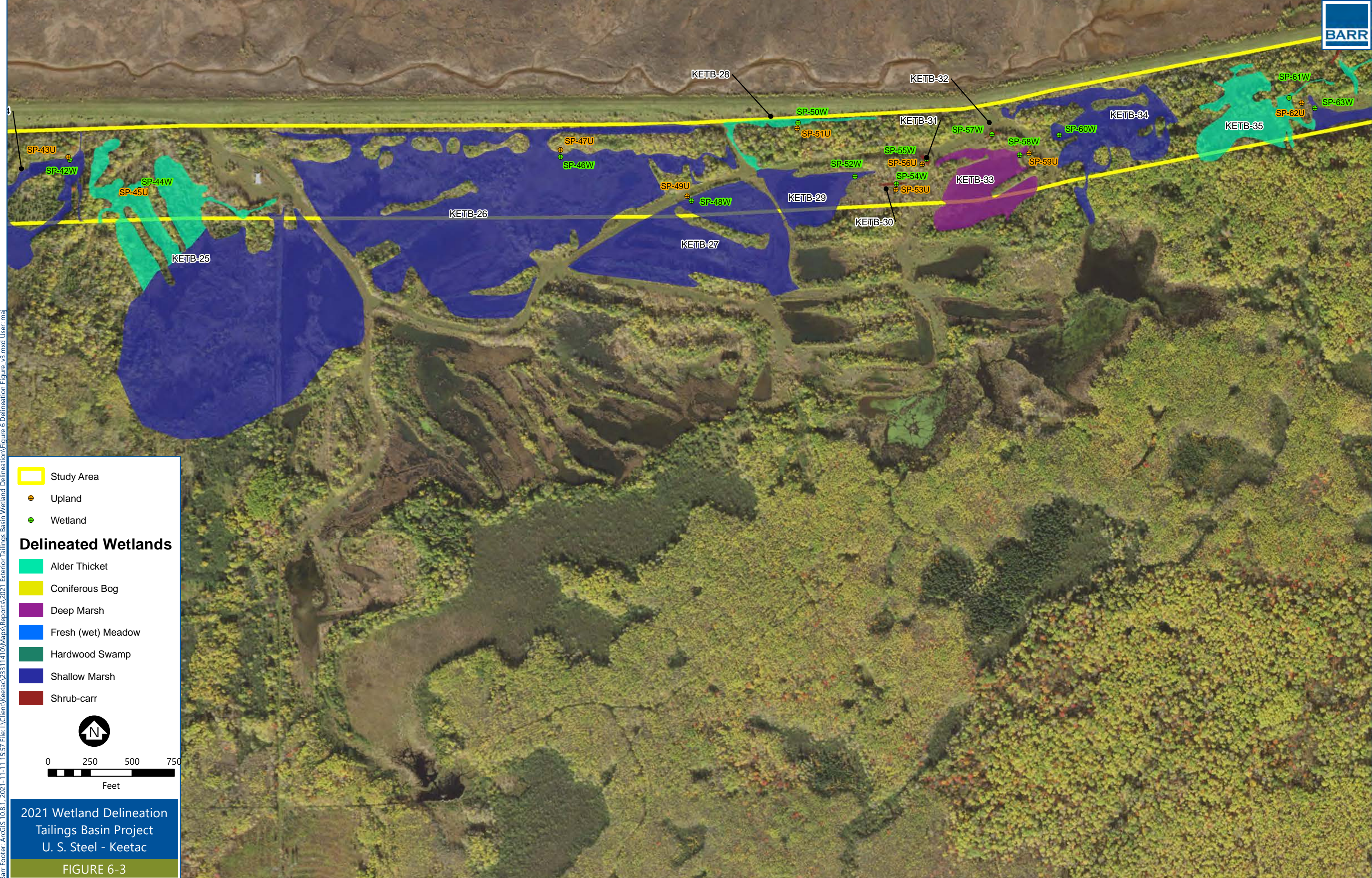
- Upland
- Wetland

Delineated Wetlands

- Alder Thicket
- Coniferous Bog
- Deep Marsh
- Fresh (wet) Meadow
- Hardwood Swamp
- Shallow Marsh
- Shrub-carr

0 250 500 750
Feet

2021 Wetland Delineation
Tailings Basin Project
U. S. Steel - Keetac
FIGURE 6-2



Barr Footer: ArcGIS 10.8.1, 2021-11-11 15:57 File: I:\Client\Keetac\23311410\Maps\Reports\2021 Exterior Tailings Basin Wetland Delineation\Figure 6 Delineation\Figure_03.mxd User: maj

- Study Area
- Upland
- Wetland

Delineated Wetlands

- Alder Thicket
- Coniferous Bog
- Deep Marsh
- Fresh (wet) Meadow
- Hardwood Swamp
- Shallow Marsh
- Shrub-carr

N

0 250 500 750
Feet

2021 Wetland Delineation
Tailings Basin Project
U. S. Steel - Keetac
FIGURE 6-3

Study Area

Upland

Wetland

Delineated Wetlands

Alder Thicket

Coniferous Bog

Deep Marsh

Fresh (wet) Meadow

Hardwood Swamp

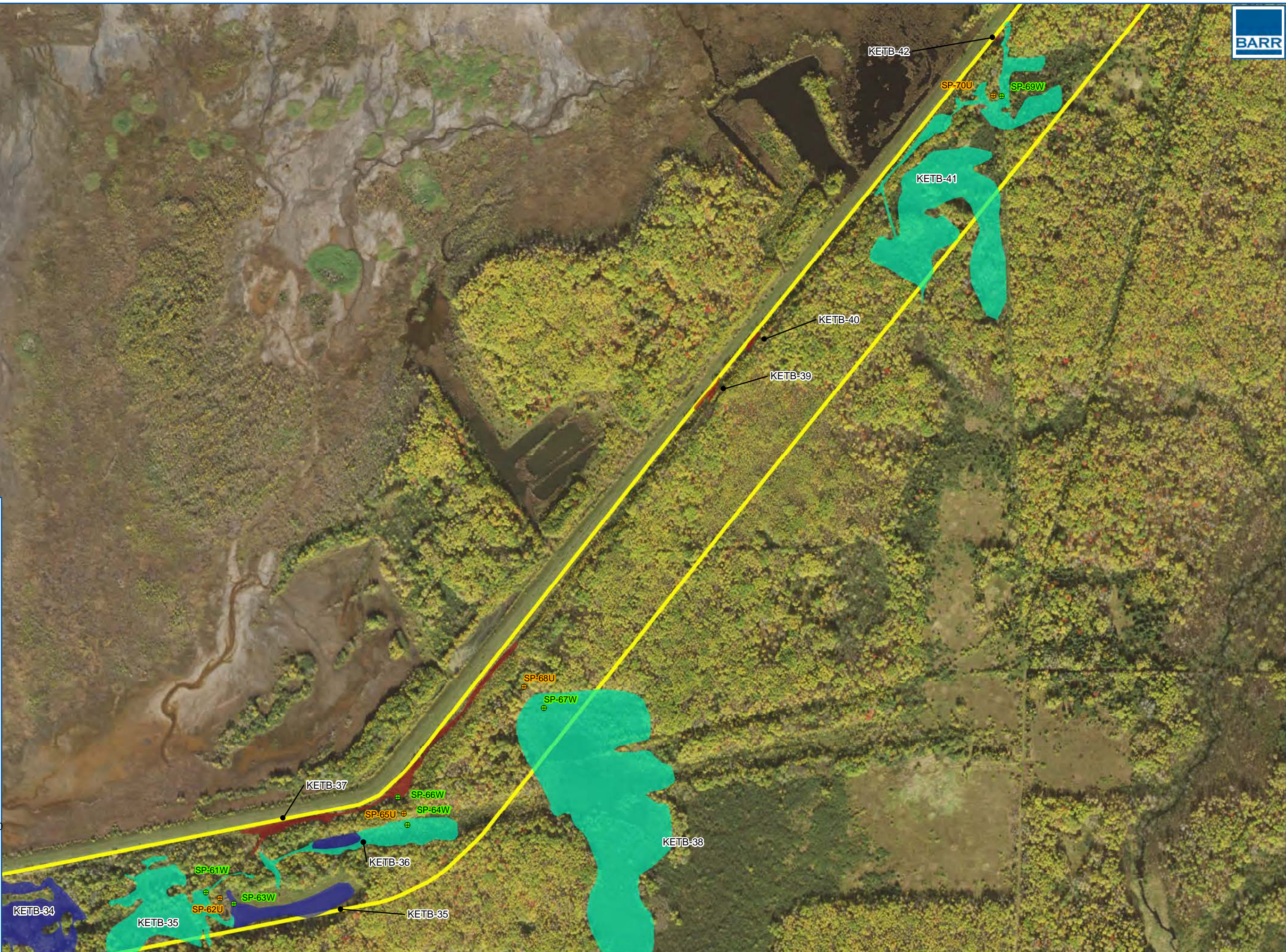
Shallow Marsh

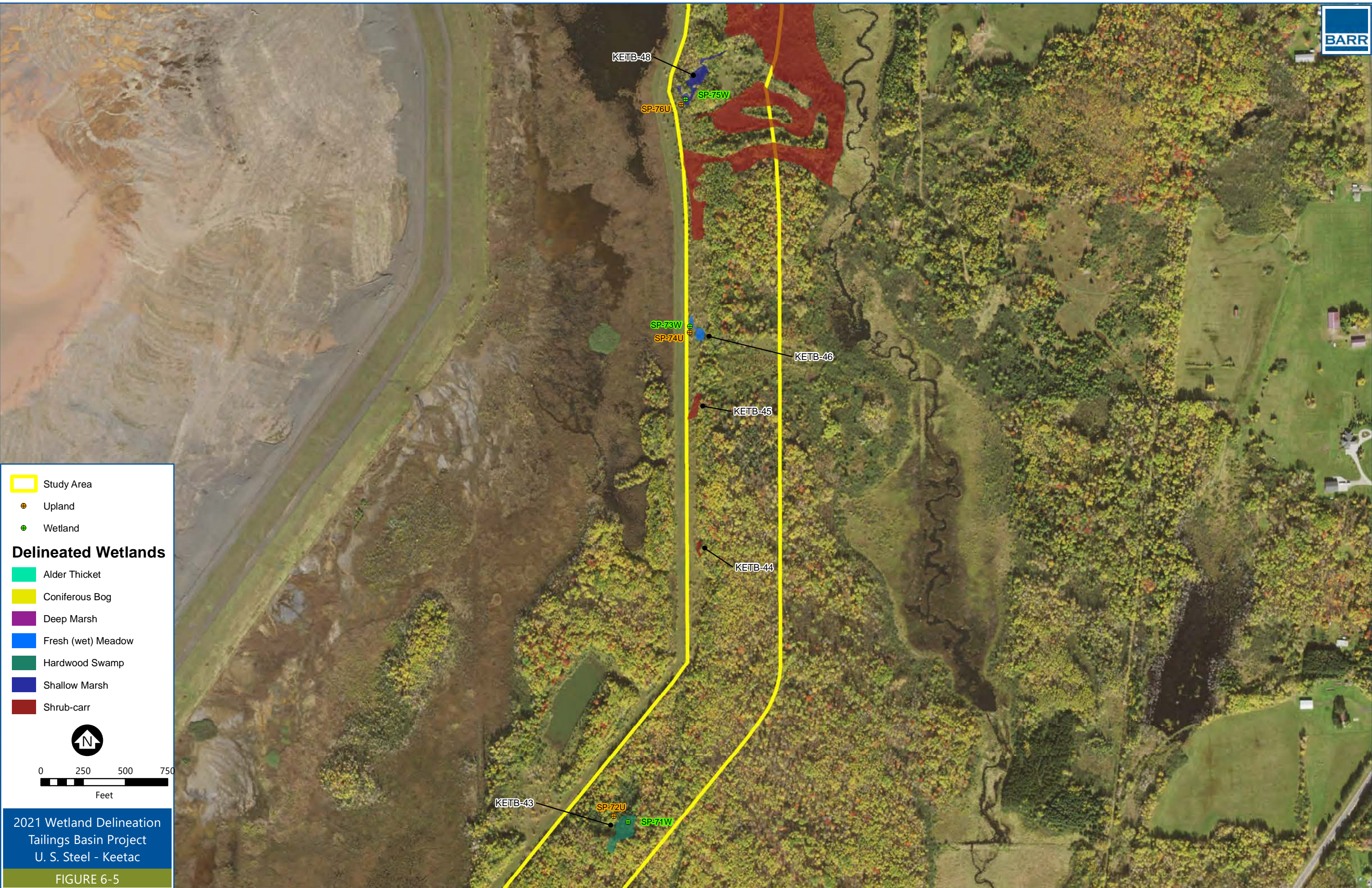
Shrub-carr

0 250 500 750
Feet

2021 Wetland Delineation
Tailings Basin Project
U. S. Steel - Keetac

FIGURE 6-4





Study Area

- Upland
- Wetland

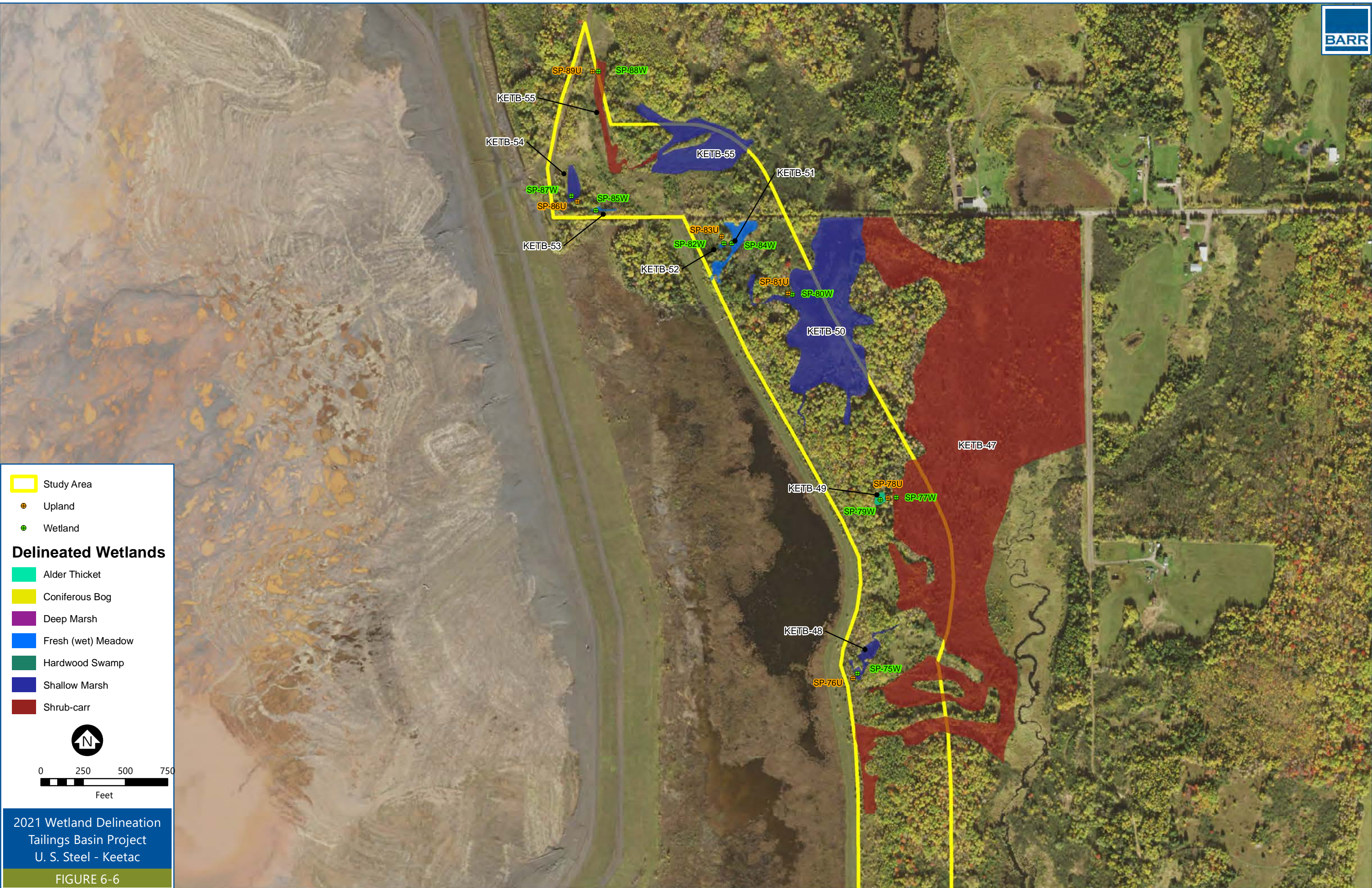
Delineated Wetlands

- Alder Thicket
- Coniferous Bog
- Deep Marsh
- Fresh (wet) Meadow
- Hardwood Swamp
- Shallow Marsh
- Shrub-carr

0 250 500 750
Feet

2021 Wetland Delineation
Tailings Basin Project
U. S. Steel - Keetac
FIGURE 6-5

Barr Footer: ArcGIS 10.8.1, 2021-11-11 15:57 File: I:\Client\Keetac\23311410\Maps\Reports\2021 Exterior Tailings Basin Wetland Delineation\Figure 6 Delineation Figure_v3.mxd User: maj



Study Area

- Upland
- Wetland

Delineated Wetlands

- Alder Thicket
- Coniferous Bog
- Deep Marsh
- Fresh (wet) Meadow
- Hardwood Swamp
- Shallow Marsh
- Shrub-carr

0 250 500 750
Feet

Appendix A

Wetland Delineation Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-01W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S1, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
 Subregion (LRR or MLRA): A Lat: 47.360239 Long: -93.079186 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-01</u>
--	---

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-02U. Wetland community is a fresh (wet) meadow, Type 2, PEM1A.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input checked="" type="checkbox"/> Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
--	---

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-01W

<u>Tree Stratum</u> (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align: right;">Total % Cover of:</td> <td style="width:50%; text-align: left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>30</u></td> <td>x 1 = <u>30</u></td> </tr> <tr> <td>FACW species <u>45</u></td> <td>x 2 = <u>90</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>5</u></td> <td>x 4 = <u>20</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>80</u> (A)</td> <td><u>140</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.75</u>	Total % Cover of:	Multiply by:	OBL species <u>30</u>	x 1 = <u>30</u>	FACW species <u>45</u>	x 2 = <u>90</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>5</u>	x 4 = <u>20</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>80</u> (A)	<u>140</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>30</u>	x 1 = <u>30</u>																	
FACW species <u>45</u>	x 2 = <u>90</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>5</u>	x 4 = <u>20</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>80</u> (A)	<u>140</u> (B)																	
<u>20%</u> = Total Cover																		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Salix discolor</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>20%</u> = Total Cover																		
<u>Herb Stratum</u> (Plot size: <u>5 ft r</u>)																		
1. <u>Scirpus cyperinus</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Equisetum pratense</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Poa palustris</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
4. <u>Carex scoparia</u>	<u>5</u>	_____	<u>FACW</u>															
5. <u>Pyrola elliptica</u>	<u>5</u>	_____	<u>FACU</u>															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>60%</u> = Total Cover																		
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.) 				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														

SOIL

Sampling Point: SP-01W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 5/1	60	10YR 5/6	40	C	M	Clay Loam	
6 - 24	10YR 5/1	80	10YR 5/6	20	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 0

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-02U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S1, T56N, R22W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Convex Slope (%): 3
 Subregion (LRR or MLRA): A Lat: 47.360343 Long: -93.07927 Datum: NAD 83
 Soil Map Unit Name: A1B, Eagleview-Menahga complex, 1 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-01W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-02U

	Absolute % Cover	Dominant Species?	Indicator Status																													
Tree Stratum (Plot size: <u>30 ft r</u>)																																
1. <u>Populus tremuloides</u>	<u>80</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66.7</u> (A/B)																												
2. <u>Betula papyrifera</u>	<u>10</u>		<u>FACU</u>																													
3. _____																																
4. _____																																
5. _____																																
6. _____																																
7. _____																																
	<u>90%</u>																															
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																																
1. <u>Amelanchier alnifolia</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;"></td> <td style="text-align:center;">Total % Cover of:</td> <td style="width:50%;"></td> <td style="text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td style="text-align:center;"><u>0</u></td> <td>x 1 =</td> <td style="text-align:center;"><u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align:center;"><u>0</u></td> <td>x 2 =</td> <td style="text-align:center;"><u>0</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align:center;"><u>155</u></td> <td>x 3 =</td> <td style="text-align:center;"><u>465</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align:center;"><u>75</u></td> <td>x 4 =</td> <td style="text-align:center;"><u>300</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align:center;"><u>0</u></td> <td>x 5 =</td> <td style="text-align:center;"><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align:center;"><u>230</u></td> <td>(A)</td> <td style="text-align:center;"><u>765</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.33</u>		Total % Cover of:		Multiply by:	OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>0</u>	x 2 =	<u>0</u>	FAC species	<u>155</u>	x 3 =	<u>465</u>	FACU species	<u>75</u>	x 4 =	<u>300</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>230</u>	(A)	<u>765</u> (B)
	Total % Cover of:		Multiply by:																													
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>0</u>	x 2 =	<u>0</u>																													
FAC species	<u>155</u>	x 3 =	<u>465</u>																													
FACU species	<u>75</u>	x 4 =	<u>300</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>230</u>	(A)	<u>765</u> (B)																													
2. <u>Sambucus racemosa</u>	<u>10</u>		<u>FACU</u>																													
3. <u>Corylus americana</u>	<u>5</u>		<u>FACU</u>																													
4. <u>Rhamnus cathartica</u>	<u>5</u>		<u>FAC</u>																													
5. _____																																
6. _____																																
7. _____																																
	<u>70%</u>																															
Herb Stratum (Plot size: <u>5 ft r</u>)																																
1. <u>Rubus idaeus</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																												
2. <u>Actaea racemosa</u>	<u>5</u>																															
3. _____																																
4. _____																																
5. _____																																
6. _____																																
7. _____																																
8. _____																																
9. _____																																
10. _____																																
11. _____																																
12. _____																																
	<u>75%</u>																															
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																																
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																												
2. _____																																
3. _____																																
4. _____																																
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																												
_____ = Total Cover																																
Remarks: (Include photo numbers here or on a separate sheet.)																																

SOIL

Sampling Point: SP-02U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR 3/2	100					Sandy Loam	
4 - 10	7.5YR 4/4	100					Sandy Loam	
10 - 24	10YR 4/3	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Historic fill

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-03W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S1, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.360095 Long: -93.079806 Datum: NAD 83
 Soil Map Unit Name: 1043C, Udorthents, nearly level to rolling NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-02</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-04U. Wetland community is an alder thicket, Type 6, PSS1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Presence of Reduced Iron (C4)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Other (Explain in Remarks)	
<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-03W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>2</u></td> <td>x 1 = <u>2</u></td> </tr> <tr> <td>FACW species <u>80</u></td> <td>x 2 = <u>160</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>82</u> (A)</td> <td><u>162</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.98</u>	Total % Cover of:	Multiply by:	OBL species <u>2</u>	x 1 = <u>2</u>	FACW species <u>80</u>	x 2 = <u>160</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>82</u> (A)	<u>162</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>2</u>	x 1 = <u>2</u>																	
FACW species <u>80</u>	x 2 = <u>160</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>82</u> (A)	<u>162</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>80</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>80%</u> = Total Cover				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)														
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Bidens cernua</u>	<u>1</u>	_____	<u>OBL</u>															
2. <u>Carex hystericina</u>	<u>1</u>	_____	<u>OBL</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>2%</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover					Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____													
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-03W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 3/1	90	10YR 4/6	10	C	M	Silt Loam	Historic fill
2 - 6	7.5YR 4/3	80	7.5YR 4/6	20	C	M	Silt Loam	Historic fill
6 - 24	10YR 5/3	5	10YR 5/6	90	C	M	Loamy Sand	Historic fill
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Compacted soil
 Depth (inches): 2

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-04U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S1, T56N, R22W
 Landform (hillslope, terrace, etc.): Upland Local relief (concave, convex, none): Convex Slope (%): 2
 Subregion (LRR or MLRA): A Lat: 47.359996 Long: -93.079948 Datum: NAD 83
 Soil Map Unit Name: 1043C, Udorthents, nearly level to rolling NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-03W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-04U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>10</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)														
2. <u>Abies balsamea</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
3. <u>Betula papyrifera</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
4. <u>Populus balsamifera</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
5. _____																		
6. _____																		
7. _____																		
	<u>90%</u>			Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>20</u></td> <td>x 2 = <u>40</u></td> </tr> <tr> <td>FAC species <u>70</u></td> <td>x 3 = <u>210</u></td> </tr> <tr> <td>FACU species <u>75</u></td> <td>x 4 = <u>300</u></td> </tr> <tr> <td>UPL species <u>90</u></td> <td>x 5 = <u>450</u></td> </tr> <tr> <td>Column Totals: <u>255</u> (A)</td> <td><u>1000</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.92</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>20</u>	x 2 = <u>40</u>	FAC species <u>70</u>	x 3 = <u>210</u>	FACU species <u>75</u>	x 4 = <u>300</u>	UPL species <u>90</u>	x 5 = <u>450</u>	Column Totals: <u>255</u> (A)	<u>1000</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>20</u>	x 2 = <u>40</u>																	
FAC species <u>70</u>	x 3 = <u>210</u>																	
FACU species <u>75</u>	x 4 = <u>300</u>																	
UPL species <u>90</u>	x 5 = <u>450</u>																	
Column Totals: <u>255</u> (A)	<u>1000</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Acer saccharum</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
2. <u>Alnus incana</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Amelanchier alnifolia</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
4. <u>Salix discolor</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
5. _____																		
6. _____																		
7. _____																		
	<u>25%</u>																	
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Eurybia macrophylla</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>UPL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Carex pensylvanica</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>UPL</u>															
3. <u>Rubus idaeus</u>	<u>25</u>		<u>FACU</u>															
4. <u>Pteridium aquilinum</u>	<u>10</u>		<u>FACU</u>															
5. <u>Rubus pubescens</u>	<u>10</u>		<u>FACW</u>															
6. <u>Fragaria virginiana</u>	<u>5</u>		<u>FACU</u>															
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>140%</u>																	
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>														
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-04U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 2/2	100					Loam	
6 - 18	10YR 4/3	80	10YR 4/6	20	C	M	Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Augur refusal at 18 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-05W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S1, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.358443 Long: -93.081635 Datum: NAD 83
 Soil Map Unit Name: 1043C, Udorthents, nearly level to rolling NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-03</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-06U. Wetland community is an alder thicket, Type 6, PSS1B.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	<u>Secondary Indicators (minimum of two required)</u>	
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	
Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-05W

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Betula papyrifera</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B)														
2. <u>Salix nigra</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Populus balsamifera</u>	<u>5</u>		<u>FACW</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>35%</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>12</u></td> <td>x 1 = <u>12</u></td> </tr> <tr> <td>FACW species <u>195</u></td> <td>x 2 = <u>390</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>25</u></td> <td>x 4 = <u>100</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>232</u></td> <td>(A) <u>502</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.16</u>	Total % Cover of:	Multiply by:	OBL species <u>12</u>	x 1 = <u>12</u>	FACW species <u>195</u>	x 2 = <u>390</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>25</u>	x 4 = <u>100</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>232</u>	(A) <u>502</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>12</u>	x 1 = <u>12</u>																	
FACW species <u>195</u>	x 2 = <u>390</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>25</u>	x 4 = <u>100</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>232</u>	(A) <u>502</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>80</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Betula papyrifera</u>	<u>5</u>		<u>FACU</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>85%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Equisetum laevigatum</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Impatiens capensis</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Equisetum pratense</u>	<u>20</u>		<u>FACW</u>															
4. <u>Carex stipata</u>	<u>2</u>		<u>OBL</u>															
5. _____																		
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>112%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>														
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-05W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR 2/2	100					Mucky Loam/Clay	
4 - 24	10YR 5/1	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 4

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-06U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S1, T56N, R22W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Linear Slope (%): 10
 Subregion (LRR or MLRA): A Lat: 47.35836 Long: -93.081515 Datum: NAD 83
 Soil Map Unit Name: 1043C, Udorthents, nearly level to rolling NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-05W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-06U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus balsamifera</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>57.1</u> (A/B)														
2. <u>Abies balsamea</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
3. <u>Betula papyrifera</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>45%</u> = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>30</u></td> <td>x 2 = <u>60</u></td> </tr> <tr> <td>FAC species <u>45</u></td> <td>x 3 = <u>135</u></td> </tr> <tr> <td>FACU species <u>130</u></td> <td>x 4 = <u>520</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>205</u> (A)</td> <td><u>715</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.49</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>30</u>	x 2 = <u>60</u>	FAC species <u>45</u>	x 3 = <u>135</u>	FACU species <u>130</u>	x 4 = <u>520</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>205</u> (A)	<u>715</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>30</u>	x 2 = <u>60</u>																	
FAC species <u>45</u>	x 3 = <u>135</u>																	
FACU species <u>130</u>	x 4 = <u>520</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>205</u> (A)	<u>715</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Populus balsamifera</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>10%</u> = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Lotus corniculatus</u>	<u>35</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
2. <u>Equisetum arvense</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
3. <u>Rubus idaeus</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
4. <u>Solidago canadensis</u>	<u>20</u>	_____	<u>FACU</u>															
5. <u>Tanacetum vulgare</u>	<u>20</u>	_____	<u>FACU</u>															
6. <u>Phleum pratense</u>	<u>10</u>	_____	<u>FACU</u>															
7. <u>Symphotrichum laeve</u>	<u>5</u>	_____	<u>FACU</u>															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>150%</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-06U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 3	10YR 4/3	100					Loamy Sand	
3 - 15	10YR 4/4	100					Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 15 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-07W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S2, T56N, R22W
 Landform (hillslope, terrace, etc.): Fringe Local relief (concave, convex, none): Linear Slope (%): 0
 Subregion (LRR or MLRA): A Lat: 47.356877 Long: -93.08875 Datum: NAD 83
 Soil Map Unit Name: 1043C, Udorthents, nearly level to rolling NWI classification: L2UBKx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-04</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-08U. Wetland community is a deep marsh, Type 4, PEM1F.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	_____ Surface Soil Cracks (B6)
_____ Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9)
_____ High Water Table (A2)	_____ Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	_____ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Water Marks (B1)	_____ Dry-Season Water Table (C2)
_____ Sediment Deposits (B2)	_____ Crayfish Burrows (C8)
_____ Drift Deposits (B3)	_____ Saturation Visible on Aerial Imagery (C9)
_____ Algal Mat or Crust (B4)	_____ Stunted or Stressed Plants (D1)
_____ Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
_____ Inundation Visible on Aerial Imagery (B7)	_____ Shallow Aquitard (D3)
_____ Sparsely Vegetated Concave Surface (B8)	_____ Microtopographic Relief (D4)
	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>10</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
---	--

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

Remarks:
Fringe of open water during abnormally dry conditions.

VEGETATION – Use scientific names of plants.

Sampling Point: SP-07W

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30 ft r</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	_____ = Total Cover			
Herb Stratum (Plot size: <u>5 ft r</u>)				
1. <u>Typha X glauca</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
2. <u>Phalaris arundinacea</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
3. <u>Persicaria amphibia</u>	<u>10</u>		<u>OBL</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	<u>100%</u> = Total Cover			
Woody Vine Stratum (Plot size: <u>30 ft r</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	_____ = Total Cover			
<p>Remarks: (Include photo numbers here or on a separate sheet.)</p>				

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>70</u>	x 1 = <u>70</u>
FACW species <u>30</u>	x 2 = <u>60</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>100</u> (A)	<u>130</u> (B)

Prevalence Index = B/A = 1.30

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0¹
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

SOIL

Sampling Point: SP-07W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 2/2	10	10YR 4/6	10	C	M	Mucky Loam/Clay	
2 - 14	10YR 3/1	80	10YR 6/8	20	C	M	Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 14 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-08U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S2, T56N, R22W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Convex Slope (%): 5
 Subregion (LRR or MLRA): A Lat: 47.356787 Long: -93.088735 Datum: NAD 83
 Soil Map Unit Name: 1043C, Udorthents, nearly level to rolling NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-07W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-08U

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Betula papyrifera</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Populus tremuloides</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
3. <u>Acer saccharum</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

50% = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Corylus americana</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Amelanchier alnifolia</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. <u>Sambucus racemosa</u>	<u>5</u>	_____	<u>FACU</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

30% = Total Cover

Herb Stratum (Plot size: <u>5 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Carex pensylvanica</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>UPL</u>
2. <u>Rubus idaeus</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. <u>Eurybia macrophylla</u>	<u>10</u>	_____	<u>UPL</u>
4. <u>Maianthemum canadense</u>	<u>5</u>	_____	<u>FACU</u>
5. <u>Polygonatum pubescens</u>	<u>3</u>	_____	<u>FACU</u>
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

78% = Total Cover

Woody Vine Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

_____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 14.3 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>20</u>	x 3 = <u>60</u>
FACU species <u>98</u>	x 4 = <u>392</u>
UPL species <u>40</u>	x 5 = <u>200</u>
Column Totals: <u>158</u> (A)	<u>652</u> (B)

Prevalence Index = B/A = 4.13

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-08U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 2/2	100					Loam	
2 - 14	10YR 3/4	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 14 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-09W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
 Subregion (LRR or MLRA): A Lat: 47.354541 Long: -93.092856 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-05</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-010U. Wetland community is a hardwood swamp, Type 7, PFO1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-09W

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Fraxinus nigra</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>60%</u>	= Total Cover																
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Fraxinus nigra</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>60</u></td> <td>x 1 = <u>60</u></td> </tr> <tr> <td>FACW species <u>115</u></td> <td>x 2 = <u>230</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>175</u> (A)</td> <td><u>290</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.66</u>	Total % Cover of:	Multiply by:	OBL species <u>60</u>	x 1 = <u>60</u>	FACW species <u>115</u>	x 2 = <u>230</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>175</u> (A)	<u>290</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>60</u>	x 1 = <u>60</u>																	
FACW species <u>115</u>	x 2 = <u>230</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>175</u> (A)	<u>290</u> (B)																	
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>15%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Glyceria striata</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Solidago gigantea</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>100%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-09W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	7.5YR 3/2	100					Loam	
2 - 12	7.5YR 4/3	80	7.5YR 5/6	20	C	M	Clay Loam	
12 - 24	7.5YR 4/2	80	7.5YR 5/6	20	C	M	Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 2

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-10U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Linear Slope (%): 3
 Subregion (LRR or MLRA): A Lat: 47.354464 Long: -93.092799 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-09W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-10U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>80</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>16.7</u> (A/B)														
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>80%</u>	= Total Cover																
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Acer spicatum</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>5</u></td> <td>x 2 = <u>10</u></td> </tr> <tr> <td>FAC species <u>80</u></td> <td>x 3 = <u>240</u></td> </tr> <tr> <td>FACU species <u>60</u></td> <td>x 4 = <u>240</u></td> </tr> <tr> <td>UPL species <u>20</u></td> <td>x 5 = <u>100</u></td> </tr> <tr> <td>Column Totals: <u>165</u> (A)</td> <td><u>590</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.58</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>5</u>	x 2 = <u>10</u>	FAC species <u>80</u>	x 3 = <u>240</u>	FACU species <u>60</u>	x 4 = <u>240</u>	UPL species <u>20</u>	x 5 = <u>100</u>	Column Totals: <u>165</u> (A)	<u>590</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>5</u>	x 2 = <u>10</u>																	
FAC species <u>80</u>	x 3 = <u>240</u>																	
FACU species <u>60</u>	x 4 = <u>240</u>																	
UPL species <u>20</u>	x 5 = <u>100</u>																	
Column Totals: <u>165</u> (A)	<u>590</u> (B)																	
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>30%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Polygonatum pubescens</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Asarum canadense</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>UPL</u>															
3. <u>Carex gracillima</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
4. <u>Eurybia macrophylla</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>UPL</u>															
5. <u>Osmorhiza claytonii</u>	<u>5</u>		<u>FACU</u>															
6. <u>Rubus pubescens</u>	<u>5</u>		<u>FACW</u>															
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>55%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>														
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-10U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 12	10YR 2/2	100					Loam	
12 - 24	10YR 4/4	90	10YR 4/6	10	C	M	Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-11W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.352917 Long: -93.092124 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-06</u>
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-12U. Wetland community is a shrub-carr, Type 6, PSS1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-11W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Populus balsamifera</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83.3</u> (A/B)														
2. <u>Betula papyrifera</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Populus tremuloides</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>40%</u> = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>5</u></td> <td>x 1 = <u>5</u></td> </tr> <tr> <td>FACW species <u>96</u></td> <td>x 2 = <u>192</u></td> </tr> <tr> <td>FAC species <u>35</u></td> <td>x 3 = <u>105</u></td> </tr> <tr> <td>FACU species <u>10</u></td> <td>x 4 = <u>40</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>146</u> (A)</td> <td><u>342</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.34</u>	Total % Cover of:	Multiply by:	OBL species <u>5</u>	x 1 = <u>5</u>	FACW species <u>96</u>	x 2 = <u>192</u>	FAC species <u>35</u>	x 3 = <u>105</u>	FACU species <u>10</u>	x 4 = <u>40</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>146</u> (A)	<u>342</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>5</u>	x 1 = <u>5</u>																	
FACW species <u>96</u>	x 2 = <u>192</u>																	
FAC species <u>35</u>	x 3 = <u>105</u>																	
FACU species <u>10</u>	x 4 = <u>40</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>146</u> (A)	<u>342</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Acer rubrum</u>	<u>10</u>	_____	<u>FAC</u>															
3. <u>Salix discolor</u>	<u>10</u>	_____	<u>FACW</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>60%</u> = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Rubus pubescens</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Rubus idaeus</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
3. <u>Athyrium angustum</u>	<u>5</u>	_____	<u>FAC</u>															
4. <u>Calamagrostis canadensis</u>	<u>5</u>	_____	<u>OBL</u>															
5. <u>Onoclea sensibilis</u>	<u>5</u>	_____	<u>FACW</u>															
6. <u>Carex scoparia</u>	<u>1</u>	_____	<u>FACW</u>															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>46%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																		
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																		
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																		
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-11W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 4/2	90	10YR 4/6	10	C	M	Loamy Sand	
6 - 24	10YR 5/3	60	10YR 6/8	20	C	M	Loamy Sand	
6 - 24			10YR 6/1	20	D	M	Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-12U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): Convex Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.353012 Long: -93.092309 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-11W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-12U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40</u> (A/B)														
2. <u>Betula papyrifera</u>	<u>5</u>		<u>FACU</u>															
3. <u>Populus balsamifera</u>	<u>5</u>		<u>FACW</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
<u>40%</u> = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>20</u></td> <td>x 2 = <u>40</u></td> </tr> <tr> <td>FAC species <u>37</u></td> <td>x 3 = <u>111</u></td> </tr> <tr> <td>FACU species <u>75</u></td> <td>x 4 = <u>300</u></td> </tr> <tr> <td>UPL species <u>60</u></td> <td>x 5 = <u>300</u></td> </tr> <tr> <td>Column Totals: <u>192</u> (A)</td> <td><u>751</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.91</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>20</u>	x 2 = <u>40</u>	FAC species <u>37</u>	x 3 = <u>111</u>	FACU species <u>75</u>	x 4 = <u>300</u>	UPL species <u>60</u>	x 5 = <u>300</u>	Column Totals: <u>192</u> (A)	<u>751</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>20</u>	x 2 = <u>40</u>																	
FAC species <u>37</u>	x 3 = <u>111</u>																	
FACU species <u>75</u>	x 4 = <u>300</u>																	
UPL species <u>60</u>	x 5 = <u>300</u>																	
Column Totals: <u>192</u> (A)	<u>751</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Salix discolor</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Betula papyrifera</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Abies balsamea</u>	<u>2</u>		<u>FAC</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
<u>17%</u> = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Eurybia macrophylla</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>UPL</u>															
2. <u>Tanacetum vulgare</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Carex pensylvanica</u>	<u>30</u>																	
4. <u>Anaphalis margaritacea</u>	<u>10</u>		<u>FACU</u>															
5. <u>Achillea millefolium</u>	<u>5</u>		<u>FACU</u>															
6. <u>Rubus idaeus</u>	<u>5</u>		<u>FAC</u>															
7. <u>Solidago gigantea</u>	<u>5</u>		<u>FACW</u>															
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
<u>165%</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____																		
2. _____																		
3. _____																		
4. _____																		
_____ = Total Cover					Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>													
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-12U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 5/3	100					Loamy Sand	
6 - 24	10YR 4/3	90	10YR 4/6	10	C	M	Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-13W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Linear Slope (%): 0
 Subregion (LRR or MLRA): A Lat: 47.352789 Long: -93.094035 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-07</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-14U. Wetland community is a hardwood swamp, Type , PFO1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>20</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>12</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-13W

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Fraxinus nigra</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>85.7</u> (A/B)														
2. <u>Betula papyrifera</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Populus tremuloides</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>70%</u> = Total Cover			Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>45</u></td> <td>x 1 = <u>45</u></td> </tr> <tr> <td>FACW species <u>180</u></td> <td>x 2 = <u>360</u></td> </tr> <tr> <td>FAC species <u>32</u></td> <td>x 3 = <u>96</u></td> </tr> <tr> <td>FACU species <u>20</u></td> <td>x 4 = <u>80</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>277</u></td> <td>(A) <u>581</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.10</u>	Total % Cover of:	Multiply by:	OBL species <u>45</u>	x 1 = <u>45</u>	FACW species <u>180</u>	x 2 = <u>360</u>	FAC species <u>32</u>	x 3 = <u>96</u>	FACU species <u>20</u>	x 4 = <u>80</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>277</u>	(A) <u>581</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>45</u>	x 1 = <u>45</u>																	
FACW species <u>180</u>	x 2 = <u>360</u>																	
FAC species <u>32</u>	x 3 = <u>96</u>																	
FACU species <u>20</u>	x 4 = <u>80</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>277</u>	(A) <u>581</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Fraxinus nigra</u>	<u>10</u>		<u>FACW</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>70%</u> = Total Cover			¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Equisetum pratense</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>		Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.													
2. <u>Glyceria striata</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Equisetum sylvaticum</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
4. <u>Doellingeria umbellata</u>	<u>15</u>		<u>FACW</u>															
5. <u>Rubus idaeus</u>	<u>10</u>		<u>FAC</u>															
6. <u>Rubus pubescens</u>	<u>10</u>		<u>FACW</u>															
7. <u>Viola cucullata</u>	<u>10</u>		<u>OBL</u>															
8. <u>Juncus effusus</u>	<u>5</u>		<u>OBL</u>															
9. <u>Phalaris arundinacea</u>	<u>5</u>		<u>FACW</u>															
10. <u>Eutrochium purpureum</u>	<u>2</u>		<u>FAC</u>															
11. _____																		
12. _____																		
	<u>137%</u> = Total Cover																	
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
2. _____																		
3. _____																		
4. _____																		
	_____ = Total Cover																	
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-13W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 2/1	70	10YR 6/8	30	C	M	Silt Loam	
6 - 9	10YR 4/1	95	10YR 5/6	5	C	M	Sandy Loam	
9 - 20	10YR 5/3	95	10YR 5/6	5	C		Sandy Loam	
20 - 24	10YR 3/1	100					Sandy Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 20

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-14U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Linear Slope (%): 2
 Subregion (LRR or MLRA): A Lat: 47.352737 Long: -93.093892 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-13W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-14U

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Populus tremuloides</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. <u>Abies balsamea</u>	<u>5</u>	<input type="checkbox"/>	<u>FAC</u>
3. _____	_____	<input type="checkbox"/>	_____
4. _____	_____	<input type="checkbox"/>	_____
5. _____	_____	<input type="checkbox"/>	_____
6. _____	_____	<input type="checkbox"/>	_____
7. _____	_____	<input type="checkbox"/>	_____

75% = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Corylus cornuta</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Acer spicatum</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. <u>Sambucus racemosa</u>	<u>5</u>	<input type="checkbox"/>	<u>FACU</u>
4. <u>Fraxinus pennsylvanica</u>	<u>2</u>	<input type="checkbox"/>	<u>FACW</u>
5. _____	_____	<input type="checkbox"/>	_____
6. _____	_____	<input type="checkbox"/>	_____
7. _____	_____	<input type="checkbox"/>	_____

67% = Total Cover

Herb Stratum (Plot size: <u>5 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Eurybia macrophylla</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>UPL</u>
2. <u>Osmorhiza claytonii</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. <u>Aralia nudicaulis</u>	<u>10</u>	<input type="checkbox"/>	<u>FACU</u>
4. <u>Rubus pubescens</u>	<u>10</u>	<input type="checkbox"/>	<u>FACW</u>
5. <u>Equisetum sylvaticum</u>	<u>5</u>	<input type="checkbox"/>	<u>FACW</u>
6. _____	_____	<input type="checkbox"/>	_____
7. _____	_____	<input type="checkbox"/>	_____
8. _____	_____	<input type="checkbox"/>	_____
9. _____	_____	<input type="checkbox"/>	_____
10. _____	_____	<input type="checkbox"/>	_____
11. _____	_____	<input type="checkbox"/>	_____
12. _____	_____	<input type="checkbox"/>	_____

90% = Total Cover

Woody Vine Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	<input type="checkbox"/>	_____
2. _____	_____	<input type="checkbox"/>	_____
3. _____	_____	<input type="checkbox"/>	_____
4. _____	_____	<input type="checkbox"/>	_____

_____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>17</u>	x 2 = <u>34</u>
FAC species <u>75</u>	x 3 = <u>225</u>
FACU species <u>100</u>	x 4 = <u>400</u>
UPL species <u>40</u>	x 5 = <u>200</u>
Column Totals: <u>232</u> (A)	<u>859</u> (B)

Prevalence Index = B/A = 3.70

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-14U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 10	10YR 2/2	100					Loam	
10 - 24	10YR 4/4	90	10YR 4/6	10	C	M	Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-15W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.350839 Long: -93.094115 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-08</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-16U. Wetland community is a hardwood swamp, Type 7, PFO1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	___ Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-15W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Populus tremuloides</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. <u>Fraxinus nigra</u>	<u>5</u>		<u>FACW</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
<u>75%</u> = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; border:none;">Total % Cover of:</td> <td style="width:50%; border:none;">Multiply by:</td> </tr> <tr> <td style="border:none;">OBL species <u>0</u></td> <td style="border:none;">x 1 = <u>0</u></td> </tr> <tr> <td style="border:none;">FACW species <u>80</u></td> <td style="border:none;">x 2 = <u>160</u></td> </tr> <tr> <td style="border:none;">FAC species <u>80</u></td> <td style="border:none;">x 3 = <u>240</u></td> </tr> <tr> <td style="border:none;">FACU species <u>0</u></td> <td style="border:none;">x 4 = <u>0</u></td> </tr> <tr> <td style="border:none;">UPL species <u>0</u></td> <td style="border:none;">x 5 = <u>0</u></td> </tr> <tr> <td style="border:none;">Column Totals: <u>160</u></td> <td style="border:none;"><u>400</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.50</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>80</u>	x 2 = <u>160</u>	FAC species <u>80</u>	x 3 = <u>240</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>160</u>	<u>400</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>80</u>	x 2 = <u>160</u>																	
FAC species <u>80</u>	x 3 = <u>240</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>160</u>	<u>400</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Fraxinus nigra</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
<u>5%</u> = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Onoclea sensibilis</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Athyrium angustum</u>	<u>10</u>		<u>FAC</u>															
3. <u>Rubus pubescens</u>	<u>10</u>		<u>FACW</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
<u>80%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____																		
2. _____																		
3. _____																		
4. _____																		
_____ = Total Cover																		
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-15W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 2/2	90	10YR 4/6	10	C	M	Sandy Loam	
6 - 18	10YR 5/3	70	10YR 5/6	20	C	M	Loamy Sand	
6 - 18			10YR 6/2	10	D	M	Loamy Sand	
18 - 24	10YR 6/2	70	10YR 5/8	30	C	M	Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-16U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R2W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Convex Slope (%): 2
 Subregion (LRR or MLRA): A Lat: 47.350758 Long: -93.094269 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plots are SP-15W and SP-17W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-16U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus grandidentata</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)														
2. <u>Abies balsamea</u>	<u>5</u>		<u>FAC</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>65%</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>9</u></td> <td>x 3 = <u>27</u></td> </tr> <tr> <td>FACU species <u>130</u></td> <td>x 4 = <u>520</u></td> </tr> <tr> <td>UPL species <u>40</u></td> <td>x 5 = <u>200</u></td> </tr> <tr> <td>Column Totals: <u>179</u> (A)</td> <td><u>747</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>4.17</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>9</u>	x 3 = <u>27</u>	FACU species <u>130</u>	x 4 = <u>520</u>	UPL species <u>40</u>	x 5 = <u>200</u>	Column Totals: <u>179</u> (A)	<u>747</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>9</u>	x 3 = <u>27</u>																	
FACU species <u>130</u>	x 4 = <u>520</u>																	
UPL species <u>40</u>	x 5 = <u>200</u>																	
Column Totals: <u>179</u> (A)	<u>747</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Corylus cornuta</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>30%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Eurybia macrophylla</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>UPL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Pteridium aquilinum</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Aralia nudicaulis</u>	<u>15</u>		<u>FACU</u>															
4. <u>Carex pensylvanica</u>	<u>5</u>		<u>UPL</u>															
5. <u>Dendrolycopodium dendroideum</u>	<u>5</u>		<u>FACU</u>															
6. <u>Diervilla lonicera</u>	<u>5</u>		<u>UPL</u>															
7. <u>Cornus canadensis</u>	<u>2</u>		<u>FAC</u>															
8. <u>Trientalis borealis</u>	<u>2</u>		<u>FAC</u>															
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>84%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>														
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-16U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR 2/2	100					Sandy Loam	
4 - 8	10YR 5/3	90	10YR 5/6	10	C	M	Sandy Loam	
8 - 24	10YR 4/3	100					Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-17W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.350683 Long: -93.094407 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: PEM1D

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-09</u>
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-16U. Wetland community is a fresh (wet) meadow, Type 2, PEM1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-17W

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Fraxinus nigra</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>30%</u>	= Total Cover																
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Fraxinus nigra</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>85</u></td> <td>x 1 = <u>85</u></td> </tr> <tr> <td>FACW species <u>70</u></td> <td>x 2 = <u>140</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>155</u> (A)</td> <td><u>225</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.45</u>	Total % Cover of:	Multiply by:	OBL species <u>85</u>	x 1 = <u>85</u>	FACW species <u>70</u>	x 2 = <u>140</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>155</u> (A)	<u>225</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>85</u>	x 1 = <u>85</u>																	
FACW species <u>70</u>	x 2 = <u>140</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>155</u> (A)	<u>225</u> (B)																	
2. <u>Salix discolor</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>15%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Glyceria canadensis</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Calamagrostis canadensis</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Fraxinus nigra</u>	<u>10</u>		<u>FACW</u>															
4. <u>Scirpus cyperinus</u>	<u>10</u>		<u>OBL</u>															
5. <u>Impatiens capensis</u>	<u>5</u>		<u>FACW</u>															
6. <u>Phalaris arundinacea</u>	<u>5</u>		<u>FACW</u>															
7. <u>Symphotrichum novae-angliae</u>	<u>5</u>		<u>FACW</u>															
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>110%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____																		
2. _____																		
3. _____																		
4. _____																		
		_____ = Total Cover																
<table style="width:100%; border:none;"> <tr> <td style="width:60%;">Hydrophytic Vegetation Present?</td> <td style="width:20%; text-align:center;">Yes <input checked="" type="checkbox"/></td> <td style="width:20%; text-align:center;">No <input type="checkbox"/></td> </tr> </table>					Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>											
Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>																
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-17W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 2/2	100					Silt Loam	
6 - 12	10YR 4/2	80	7.5YR 4/6	20	D	M	Sandy Loam	
12 - 24	10YR 4/2	95	10YR 5/6	5	C	M	Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None observed

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-18W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.349829 Long: -93.094392 Datum: NAD 83
 Soil Map Unit Name: _____ NWI classification: 1043C, Udorthents, nearly level to rolling

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-10</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-19U. Wetland community is a shallow marsh, Type 3, PEM1C.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	_____ Surface Soil Cracks (B6)
_____ Surface Water (A1)	_____ Water-Stained Leaves (B9)
_____ High Water Table (A2)	_____ Drainage Patterns (B10)
_____ Saturation (A3)	_____ Aquatic Fauna (B13)
_____ Water Marks (B1)	_____ Moss Trim Lines (B16)
_____ Sediment Deposits (B2)	_____ Marl Deposits (B15)
_____ Drift Deposits (B3)	_____ Dry-Season Water Table (C2)
_____ Algal Mat or Crust (B4)	_____ Hydrogen Sulfide Odor (C1)
_____ Iron Deposits (B5)	_____ Oxidized Rhizospheres on Living Roots (C3)
_____ Inundation Visible on Aerial Imagery (B7)	_____ Presence of Reduced Iron (C4)
_____ Sparsely Vegetated Concave Surface (B8)	_____ Recent Iron Reduction in Tilled Soils (C6)
	_____ Thin Muck Surface (C7)
	_____ Other (Explain in Remarks)
	_____ Stunted or Stressed Plants (D1)
	<input checked="" type="checkbox"/> Geomorphic Position (D2)
	_____ Shallow Aquitard (D3)
	_____ Microtopographic Relief (D4)
	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>20</u> (includes capillary fringe)	

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-18W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border: none;"> <tr> <td style="width:50%; text-align: center;">Total % Cover of:</td> <td style="width:50%; text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>80</u></td> <td>x 1 = <u>80</u></td> </tr> <tr> <td>FACW species <u>20</u></td> <td>x 2 = <u>40</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>100</u> (A)</td> <td><u>120</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.20</u>	Total % Cover of:	Multiply by:	OBL species <u>80</u>	x 1 = <u>80</u>	FACW species <u>20</u>	x 2 = <u>40</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>100</u> (A)	<u>120</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>80</u>	x 1 = <u>80</u>																	
FACW species <u>20</u>	x 2 = <u>40</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>100</u> (A)	<u>120</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)														
1. <u>Salix bebbiana</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
_____ = Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
Herb Stratum (Plot size: <u>5 ft r</u>)					Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.													
1. <u>Typha angustifolia</u>	<u>80</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-18W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR 2/2	100					Mucky Peat	
4 - 6	10YR 4/2	80	10YR 4/6	20	C	M	Sandy Loam	
6 - 24	2.5Y 4/1	98	10YR 5/8	2	C	M	Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-19U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Linear Slope (%): 20
 Subregion (LRR or MLRA): A Lat: 47.349888 Long: -93.094512 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-18W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-19U

	Absolute % Cover	Dominant Species?	Indicator Status																													
Tree Stratum (Plot size: <u>30 ft r</u>)																																
1. <u>Populus tremuloides</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>20</u> (A/B)																												
2. <u>Betula papyrifera</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>																													
3. _____																																
4. _____																																
5. _____																																
6. _____																																
7. _____																																
	<u>90%</u>	= Total Cover																														
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																																
1. <u>Corylus cornuta</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;"></td> <td style="text-align:center;">Total % Cover of:</td> <td style="width:50%;"></td> <td style="text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td style="text-align:center;"><u>0</u></td> <td>x 1 =</td> <td style="text-align:center;"><u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align:center;"><u>0</u></td> <td>x 2 =</td> <td style="text-align:center;"><u>0</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align:center;"><u>70</u></td> <td>x 3 =</td> <td style="text-align:center;"><u>210</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align:center;"><u>130</u></td> <td>x 4 =</td> <td style="text-align:center;"><u>520</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align:center;"><u>30</u></td> <td>x 5 =</td> <td style="text-align:center;"><u>150</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align:center;"><u>230</u></td> <td>(A)</td> <td style="text-align:center;"><u>880</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.83</u>		Total % Cover of:		Multiply by:	OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>0</u>	x 2 =	<u>0</u>	FAC species	<u>70</u>	x 3 =	<u>210</u>	FACU species	<u>130</u>	x 4 =	<u>520</u>	UPL species	<u>30</u>	x 5 =	<u>150</u>	Column Totals:	<u>230</u>	(A)	<u>880</u> (B)
	Total % Cover of:		Multiply by:																													
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>0</u>	x 2 =	<u>0</u>																													
FAC species	<u>70</u>	x 3 =	<u>210</u>																													
FACU species	<u>130</u>	x 4 =	<u>520</u>																													
UPL species	<u>30</u>	x 5 =	<u>150</u>																													
Column Totals:	<u>230</u>	(A)	<u>880</u> (B)																													
2. _____																																
3. _____																																
4. _____																																
5. _____																																
6. _____																																
7. _____																																
	<u>25%</u>	= Total Cover																														
Herb Stratum (Plot size: <u>5 ft r</u>)																																
1. <u>Carex pensylvanica</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																												
2. <u>Eurybia macrophylla</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>UPL</u>																													
3. <u>Diervilla lonicera</u>	<u>10</u>																															
4. <u>Pteridium aquilinum</u>	<u>10</u>		<u>FACU</u>																													
5. <u>Rubus idaeus</u>	<u>10</u>		<u>FAC</u>																													
6. <u>Osmorhiza claytonii</u>	<u>5</u>		<u>FACU</u>																													
7. _____																																
8. _____																																
9. _____																																
10. _____																																
11. _____																																
12. _____																																
	<u>125%</u>	= Total Cover																														
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																																
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																												
2. _____																																
3. _____																																
4. _____																																
	_____ = Total Cover																															
Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>																																
Remarks: (Include photo numbers here or on a separate sheet.)																																

SOIL

Sampling Point: SP-19U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 2/2	100					Sandy Loam	
2 - 8	10YR 3/3	100					Sandy Loam	
8 - 24	10YR 4/4	100					Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-20W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR or MLRA): A Lat: 47.348517 Long: -93.095819 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-11</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-21U. Wetland community is a deep marsh, Type 4, PEM1F.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	___ Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> Surface Water (A1)	___ Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	___ Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	___ Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	
___ Marl Deposits (B15)	
___ Hydrogen Sulfide Odor (C1)	
___ Oxidized Rhizospheres on Living Roots (C3)	
___ Presence of Reduced Iron (C4)	
___ Recent Iron Reduction in Tilled Soils (C6)	
___ Thin Muck Surface (C7)	
___ Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>3</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-20W

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30 ft r</u>)				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
				_____ = Total Cover
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
				_____ = Total Cover
Herb Stratum (Plot size: <u>5 ft r</u>)				
1. <u>Typha angustifolia</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
2. <u>Ceratophyllum demersum</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
3. <u>Sparganium emersum</u>	<u>10</u>		<u>OBL</u>	
4. <u>Equisetum fluviatile</u>	<u>5</u>		<u>OBL</u>	
5. <u>Potamogeton natans</u>	<u>5</u>		<u>OBL</u>	
6.				
7.				
8.				
9.				
10.				
11.				
12.				
	<u>80%</u>			_____ = Total Cover
Woody Vine Stratum (Plot size: <u>30 ft r</u>)				
1.				
2.				
3.				
4.				
				_____ = Total Cover
Remarks: (Include photo numbers here or on a separate sheet.)				

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>80</u>	x 1 = <u>80</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>80</u> (A)	<u>80</u> (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0¹
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

SOIL

Sampling Point: SP-20W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	N 2.5/1	100					Mucky Peat	
2 - 12	10YR 4/2	100					Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 12 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-21U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Linear Slope (%): 25
 Subregion (LRR or MLRA): A Lat: 47.348471 Long: -93.095784 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-20W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-21U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Betula papyrifera</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>25</u> (A/B)														
2. <u>Prunus serotina</u>	<u>5</u>		<u>FACU</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>65%</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>40</u></td> <td>x 3 = <u>120</u></td> </tr> <tr> <td>FACU species <u>155</u></td> <td>x 4 = <u>620</u></td> </tr> <tr> <td>UPL species <u>30</u></td> <td>x 5 = <u>150</u></td> </tr> <tr> <td>Column Totals: <u>225</u></td> <td>(A) <u>890</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.96</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>40</u>	x 3 = <u>120</u>	FACU species <u>155</u>	x 4 = <u>620</u>	UPL species <u>30</u>	x 5 = <u>150</u>	Column Totals: <u>225</u>	(A) <u>890</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>40</u>	x 3 = <u>120</u>																	
FACU species <u>155</u>	x 4 = <u>620</u>																	
UPL species <u>30</u>	x 5 = <u>150</u>																	
Column Totals: <u>225</u>	(A) <u>890</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Corylus cornuta</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
2. <u>Amelanchier alnifolia</u>	<u>10</u>		<u>FACU</u>															
3. <u>Picea glauca</u>	<u>5</u>		<u>FACU</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>55%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Eurybia macrophylla</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>UPL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Rubus idaeus</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
3. <u>Fragaria virginiana</u>	<u>15</u>		<u>FACU</u>															
4. <u>Galium boreale</u>	<u>10</u>		<u>FAC</u>															
5. <u>Solidago canadensis</u>	<u>10</u>		<u>FACU</u>															
6. <u>Cirsium arvense</u>	<u>5</u>		<u>FACU</u>															
7. <u>Maianthemum canadense</u>	<u>5</u>		<u>FACU</u>															
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>105%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>														
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-21U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR 2/2	100					Loamy Sand	
4 - 24	10YR 3/4	100					Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-22W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR or MLRA): A Lat: 47.346646 Long: -93.094478 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: PEM1Fx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-12</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-23U. Wetland community is a shallow marsh, Type 3, PEM1C.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	___ Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	___ Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	
___ Marl Deposits (B15)	
___ Hydrogen Sulfide Odor (C1)	
___ Oxidized Rhizospheres on Living Roots (C3)	
___ Presence of Reduced Iron (C4)	
___ Recent Iron Reduction in Tilled Soils (C6)	
___ Thin Muck Surface (C7)	
___ Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-22W

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)				<p>Dominance Test worksheet:</p> <p>Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>3</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)</p> <hr/> <p>Prevalence Index worksheet:</p> <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>105</u></td> <td>x 1 = <u>105</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>105</u> (A)</td> <td><u>105</u> (B)</td> </tr> </table> <p style="text-align:right;">Prevalence Index = B/A = <u>1.00</u></p> <hr/> <p>Hydrophytic Vegetation Indicators:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0¹ <input type="checkbox"/> 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation¹ (Explain) <p>¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <hr/> <p>Definitions of Vegetation Strata:</p> <p>Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</p> <p>Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</p> <p>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</p> <p>Woody vines – All woody vines greater than 3.28 ft in height.</p> <hr/> <p>Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	Total % Cover of:	Multiply by:	OBL species <u>105</u>	x 1 = <u>105</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>105</u> (A)	<u>105</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>105</u>	x 1 = <u>105</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>105</u> (A)	<u>105</u> (B)																	
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Bidens cernua</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Typha latifolia</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Carex comosa</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
4. <u>Calamagrostis canadensis</u>	<u>15</u>		<u>OBL</u>															
5. <u>Lythrum salicaria</u>	<u>15</u>		<u>OBL</u>															
6. <u>Sparganium emersum</u>	<u>5</u>		<u>OBL</u>															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>105%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-22W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR 2/1	100					Mucky Peat	
4 - 24	10YR 2/2	100					Mucky Loam/Clay	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-23U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Convex Slope (%): 3
 Subregion (LRR or MLRA): A Lat: 47.3466196 Long: -93.0944920 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-22W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-23U

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Betula papyrifera</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Acer rubrum</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
3. <u>Populus tremuloides</u>	<u>10</u>		<u>FAC</u>
4. _____	_____		_____
5. _____	_____		_____
6. _____	_____		_____
7. _____	_____		_____

90% = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Corylus cornuta</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Abies balsamea</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
3. _____	_____		_____
4. _____	_____		_____
5. _____	_____		_____
6. _____	_____		_____
7. _____	_____		_____

40% = Total Cover

Herb Stratum (Plot size: <u>5 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Eurybia macrophylla</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>UPL</u>
2. <u>Pteridium aquilinum</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. <u>Maianthemum canadense</u>	<u>10</u>		<u>FACU</u>
4. <u>Aralia nudicaulis</u>	<u>5</u>		<u>FACU</u>
5. _____	_____		_____
6. _____	_____		_____
7. _____	_____		_____
8. _____	_____		_____
9. _____	_____		_____
10. _____	_____		_____
11. _____	_____		_____
12. _____	_____		_____

145% = Total Cover

Woody Vine Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____		_____
2. _____	_____		_____
3. _____	_____		_____
4. _____	_____		_____

_____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>40</u>	x 3 = <u>120</u>
FACU species <u>165</u>	x 4 = <u>660</u>
UPL species <u>70</u>	x 5 = <u>350</u>
Column Totals: <u>275</u> (A)	<u>1130</u> (B)

Prevalence Index = B/A = 4.11

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-23U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 4/1	100					Loam	
2 - 6	10YR 4/3	100					Sandy Loam	
6 - 14	10YR 4/4	100					Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 14 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-24W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.345346 Long: -93.094217 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-13</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-25U. Wetland community is a shrub-carr, Type 6, PSS1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-24W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border: none;"> <tr> <td style="width:50%; text-align: right;">Total % Cover of:</td> <td style="width:50%; text-align: left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>47</u></td> <td>x 1 = <u>47</u></td> </tr> <tr> <td>FACW species <u>45</u></td> <td>x 2 = <u>90</u></td> </tr> <tr> <td>FAC species <u>20</u></td> <td>x 3 = <u>60</u></td> </tr> <tr> <td>FACU species <u>3</u></td> <td>x 4 = <u>12</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>115</u> (A)</td> <td><u>209</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.82</u>	Total % Cover of:	Multiply by:	OBL species <u>47</u>	x 1 = <u>47</u>	FACW species <u>45</u>	x 2 = <u>90</u>	FAC species <u>20</u>	x 3 = <u>60</u>	FACU species <u>3</u>	x 4 = <u>12</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>115</u> (A)	<u>209</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>47</u>	x 1 = <u>47</u>																	
FACW species <u>45</u>	x 2 = <u>90</u>																	
FAC species <u>20</u>	x 3 = <u>60</u>																	
FACU species <u>3</u>	x 4 = <u>12</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>115</u> (A)	<u>209</u> (B)																	
_____ = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Populus balsamifera</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Populus tremuloides</u>	<u>10</u>	_____	<u>FAC</u>															
4. <u>Salix discolor</u>	<u>10</u>	_____	<u>FACW</u>															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Calamagrostis canadensis</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Equisetum arvense</u>	<u>10</u>	_____	<u>FAC</u>															
3. <u>Cicuta maculata</u>	<u>5</u>	_____	<u>OBL</u>															
4. <u>Fragaria virginiana</u>	<u>3</u>	_____	<u>FACU</u>															
5. <u>Cirsium muticum</u>	<u>2</u>	_____	<u>OBL</u>															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
_____ = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)																		
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																		
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																		
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-24W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	7.5YR 3/1	100					Loam	
2 - 12	7.5YR 4/3	95	7.5YR 4/6	5	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 2

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 12 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-25U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Linear Slope (%): 3
 Subregion (LRR or MLRA): A Lat: 47.345237 Long: -93.094139 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plots are SP-24W and SP-26W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
--	---

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-25U

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Populus tremuloides</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. <u>Populus balsamifera</u>	<u>10</u>		<u>FACW</u>
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			

70% = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Corylus cornuta</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Viburnum rafinesqueanum</u>	<u>10</u>		
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			

70% = Total Cover

Herb Stratum (Plot size: <u>5 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Aralia nudicaulis</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Eurybia macrophylla</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>UPL</u>
3. <u>Pteridium aquilinum</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
4. <u>Osmorhiza claytonii</u>	<u>10</u>		<u>FACU</u>
5. <u>Rubus pubescens</u>	<u>10</u>		<u>FACW</u>
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

140% = Total Cover

Woody Vine Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			

_____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>20</u>	x 2 = <u>40</u>
FAC species <u>60</u>	x 3 = <u>180</u>
FACU species <u>160</u>	x 4 = <u>640</u>
UPL species <u>30</u>	x 5 = <u>150</u>
Column Totals: <u>270</u> (A)	<u>1010</u> (B)

Prevalence Index = B/A = 3.74

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-25U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 3/2	100					Loamy Sand	
6 - 24	10YR 4/6	100					Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-26W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.345134 Long: -93.094279 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: PEM1Dx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-14</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-25U. Wetland community is a shallow marsh, Type 3, PEM1C.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>18</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-26W

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30 ft r</u>)				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
				_____ = Total Cover
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
				_____ = Total Cover
Herb Stratum (Plot size: <u>5 ft r</u>)				
1.	<u>Typha angustifolia</u>	50	✓	OBL
2.	<u>Persicaria sagittata</u>	30	✓	OBL
3.	<u>Impatiens capensis</u>	20		FACW
4.	<u>Calamagrostis canadensis</u>	10		OBL
5.	<u>Mentha arvensis</u>	10		FACW
6.	<u>Scirpus cyperinus</u>	10		OBL
7.				
8.				
9.				
10.				
11.				
12.				
		<u>130%</u>		= Total Cover
Woody Vine Stratum (Plot size: <u>30 ft r</u>)				
1.				
2.				
3.				
4.				
				_____ = Total Cover
Remarks: (Include photo numbers here or on a separate sheet.)				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 2 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:
 Total % Cover of: Multiply by:
 OBL species 100 x 1 = 100
 FACW species 30 x 2 = 60
 FAC species 0 x 3 = 0
 FACU species 0 x 4 = 0
 UPL species 0 x 5 = 0
 Column Totals: 130 (A) 160 (B)
 Prevalence Index = B/A = 1.23

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

SOIL

Sampling Point: SP-26W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 3/2	100					Loamy Sand	
2 - 6	10YR 5/2	80	10YR 4/6	20	C	M	Clay Loam	
6 - 24	10YR 5/1	80	10YR 4/6	20	C	M	Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 2

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-27W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
 Subregion (LRR or MLRA): A Lat: 47.342674 Long: -93.093971 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: PEM1Fx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-15</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-28U. Wetland community is a fresh (wet) meadow, Type 2, PEM1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	<u>Secondary Indicators (minimum of two required)</u>
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	_____ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Water-Stained Leaves (B9)
___ High Water Table (A2)	___ Drainage Patterns (B10)
___ Saturation (A3)	___ Aquatic Fauna (B13)
___ Water Marks (B1)	___ Moss Trim Lines (B16)
___ Sediment Deposits (B2)	___ Marl Deposits (B15)
___ Drift Deposits (B3)	___ Dry-Season Water Table (C2)
___ Algal Mat or Crust (B4)	___ Hydrogen Sulfide Odor (C1)
___ Iron Deposits (B5)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Inundation Visible on Aerial Imagery (B7)	___ Presence of Reduced Iron (C4)
___ Sparsely Vegetated Concave Surface (B8)	___ Recent Iron Reduction in Tilled Soils (C6)
	___ Thin Muck Surface (C7)
	___ Other (Explain in Remarks)
	___ Stunted or Stressed Plants (D1)
	<input checked="" type="checkbox"/> Geomorphic Position (D2)
	___ Shallow Aquitard (D3)
	___ Microtopographic Relief (D4)
	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	
Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-27W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>100</u></td> <td>x 1 = <u>100</u></td> </tr> <tr> <td>FACW species <u>30</u></td> <td>x 2 = <u>60</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>130</u> (A)</td> <td><u>160</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.23</u>	Total % Cover of:	Multiply by:	OBL species <u>100</u>	x 1 = <u>100</u>	FACW species <u>30</u>	x 2 = <u>60</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>130</u> (A)	<u>160</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>100</u>	x 1 = <u>100</u>																	
FACW species <u>30</u>	x 2 = <u>60</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>130</u> (A)	<u>160</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)														
1. <u>Alnus incana</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Salix petiolaris</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
<u>20%</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Calamagrostis canadensis</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Carex tuckermanii</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Lycopus uniflorus</u>	<u>10</u>	_____	<u>OBL</u>															
4. <u>Impatiens capensis</u>	<u>5</u>	_____	<u>FACW</u>															
5. <u>Mentha arvensis</u>	<u>5</u>	_____	<u>FACW</u>															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
<u>110%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-27W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 3	10YR 3/1	100					Sandy Loam	
3 - 12	10YR 5/1	100					Sandy Loam	
12 - 24	10YR 6/3	95	10YR 6/6	5	C	M	Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-28U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 5
 Subregion (LRR or MLRA): A Lat: 47.342484 Long: -93.093758 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plots are SP-27W and SP-29W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-28U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Abies balsamea</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>20</u> (A/B)														
2. <u>Betula papyrifera</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>90%</u>	= Total Cover																
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Corylus americana</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>71</u></td> <td>x 3 = <u>213</u></td> </tr> <tr> <td>FACU species <u>34</u></td> <td>x 4 = <u>136</u></td> </tr> <tr> <td>UPL species <u>3</u></td> <td>x 5 = <u>15</u></td> </tr> <tr> <td>Column Totals: <u>108</u> (A)</td> <td><u>364</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.37</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>71</u>	x 3 = <u>213</u>	FACU species <u>34</u>	x 4 = <u>136</u>	UPL species <u>3</u>	x 5 = <u>15</u>	Column Totals: <u>108</u> (A)	<u>364</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>71</u>	x 3 = <u>213</u>																	
FACU species <u>34</u>	x 4 = <u>136</u>																	
UPL species <u>3</u>	x 5 = <u>15</u>																	
Column Totals: <u>108</u> (A)	<u>364</u> (B)																	
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>5%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Pteridium aquilinum</u>	<u>4</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Maianthemum canadense</u>	<u>3</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Aralia nudicaulis</u>	<u>2</u>		<u>FACU</u>															
4. <u>Carex pensylvanica</u>	<u>2</u>		<u>UPL</u>															
5. <u>Clintonia borealis</u>	<u>1</u>		<u>FAC</u>															
6. <u>Eurybia macrophylla</u>	<u>1</u>		<u>UPL</u>															
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>13%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>														
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-28U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 1	10YR 3/1	100					Sandy Loam	
1 - 3	10YR 5/1	100					Sandy Loam	
3 - 18	10YR 5/4	95	10YR 6/6	5	C	M	Sandy Loam	
18 - 24	10YR 6/3	95	10YR 6/6	5	C	M	Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-29W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.342417 Long: -93.093426 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: PEM1Cx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: <u>KETB-16</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-28U. Wetland community is a shallow marsh, Type 3, PEM1C.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	___ Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	
___ Marl Deposits (B15)	
___ Hydrogen Sulfide Odor (C1)	
___ Oxidized Rhizospheres on Living Roots (C3)	
___ Presence of Reduced Iron (C4)	
___ Recent Iron Reduction in Tilled Soils (C6)	
___ Thin Muck Surface (C7)	
___ Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>12</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>6</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-29W

<u>Tree Stratum</u> (Plot size: <u>30 ft r</u>)	<u>Absolute % Cover</u>	<u>Dominant Species?</u>	<u>Indicator Status</u>															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="text-align:right;">Total % Cover of:</td> <td style="text-align:right;">Multiply by:</td> </tr> <tr> <td>OBL species <u>90</u></td> <td>x 1 = <u>90</u></td> </tr> <tr> <td>FACW species <u>30</u></td> <td>x 2 = <u>60</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>120</u> (A)</td> <td><u>150</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.25</u>	Total % Cover of:	Multiply by:	OBL species <u>90</u>	x 1 = <u>90</u>	FACW species <u>30</u>	x 2 = <u>60</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>120</u> (A)	<u>150</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>90</u>	x 1 = <u>90</u>																	
FACW species <u>30</u>	x 2 = <u>60</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>120</u> (A)	<u>150</u> (B)																	
_____ = Total Cover																		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover																		
<u>Herb Stratum</u> (Plot size: <u>5 ft r</u>)																		
1. <u>Typha latifolia</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Impatiens capensis</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Carex comosa</u>	<u>20</u>		<u>OBL</u>															
4. <u>Calamagrostis canadensis</u>	<u>10</u>		<u>OBL</u>															
5. <u>Comarum palustre</u>	<u>5</u>		<u>OBL</u>															
6. <u>Leersia oryzoides</u>	<u>5</u>		<u>OBL</u>															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>120%</u> = Total Cover																		
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>														
				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														

SOIL

Sampling Point: SP-29W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 2/1	100					Mucky Loam/Clay	
6 - 10	10YR 4/1	100					Sand	
10 - 24	10YR 3/1	100					Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-30W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.342229 Long: -93.09165 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: PUBHx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-17</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-31U. Wetland community is a deep marsh, Type 4, PEM1F.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	<u>Secondary Indicators (minimum of two required)</u>
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Water-Stained Leaves (B9)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	___ Aquatic Fauna (B13)
___ Water Marks (B1)	___ Moss Trim Lines (B16)
___ Sediment Deposits (B2)	___ Marl Deposits (B15)
___ Drift Deposits (B3)	___ Hydrogen Sulfide Odor (C1)
___ Algal Mat or Crust (B4)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Iron Deposits (B5)	___ Presence of Reduced Iron (C4)
___ Inundation Visible on Aerial Imagery (B7)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Sparsely Vegetated Concave Surface (B8)	___ Thin Muck Surface (C7)
	___ Other (Explain in Remarks)
	___ Stunted or Stressed Plants (D1)
	<input checked="" type="checkbox"/> Geomorphic Position (D2)
	___ Shallow Aquitard (D3)
	___ Microtopographic Relief (D4)
	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	
Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-30W

<u>Tree Stratum</u> (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align: right;">Total % Cover of:</td> <td style="width:50%; text-align: left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>49</u></td> <td>x 1 = <u>49</u></td> </tr> <tr> <td>FACW species <u>20</u></td> <td>x 2 = <u>40</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>69</u> (A)</td> <td><u>89</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.29</u>	Total % Cover of:	Multiply by:	OBL species <u>49</u>	x 1 = <u>49</u>	FACW species <u>20</u>	x 2 = <u>40</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>69</u> (A)	<u>89</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>49</u>	x 1 = <u>49</u>																	
FACW species <u>20</u>	x 2 = <u>40</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>69</u> (A)	<u>89</u> (B)																	
_____ = Total Cover																		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover																		
<u>Herb Stratum</u> (Plot size: <u>5 ft r</u>)																		
1. <u>Phalaris arundinacea</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Schoenoplectus tabernaemontani</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Calamagrostis canadensis</u>	<u>10</u>	_____	<u>OBL</u>															
4. <u>Carex comosa</u>	<u>10</u>	_____	<u>OBL</u>															
5. <u>Juncus effusus</u>	<u>5</u>	_____	<u>OBL</u>															
6. <u>Typha latifolia</u>	<u>5</u>	_____	<u>OBL</u>															
7. <u>Ceratophyllum demersum</u>	<u>3</u>	_____	<u>OBL</u>															
8. <u>Persicaria amphibia</u>	<u>1</u>	_____	<u>OBL</u>															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>69%</u> = Total Cover																		
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																		
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																		
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																		
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-30W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 2/2	100					Mucky Loam/Clay	
6 - 24	10YR 4/1	100					Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-31U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3
 Subregion (LRR or MLRA): A Lat: 47.342138 Long: -93.091696 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-30W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-31U

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Abies balsamea</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. <u>Betula papyrifera</u>	<u>10</u>		<u>FACU</u>
3. <u>Pinus resinosa</u>	<u>5</u>		<u>FACU</u>
4. _____	_____		_____
5. _____	_____		_____
6. _____	_____		_____
7. _____	_____		_____

55% = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Alnus incana</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
2. <u>Abies balsamea</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
3. _____	_____		_____
4. _____	_____		_____
5. _____	_____		_____
6. _____	_____		_____
7. _____	_____		_____

20% = Total Cover

Herb Stratum (Plot size: <u>5 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Carex pensylvanica</u>	<u>5</u>	<input checked="" type="checkbox"/>	
2. <u>Aralia nudicaulis</u>	<u>2</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. <u>Maianthemum canadense</u>	<u>2</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
4. <u>Pteridium aquilinum</u>	<u>2</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
5. <u>Clintonia borealis</u>	<u>1</u>		<u>FAC</u>
6. <u>Trientalis borealis</u>	<u>1</u>		<u>FAC</u>
7. _____	_____		_____
8. _____	_____		_____
9. _____	_____		_____
10. _____	_____		_____
11. _____	_____		_____
12. _____	_____		_____

13% = Total Cover

Woody Vine Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____		_____
2. _____	_____		_____
3. _____	_____		_____
4. _____	_____		_____

_____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>15</u>	x 2 = <u>30</u>
FAC species <u>47</u>	x 3 = <u>141</u>
FACU species <u>21</u>	x 4 = <u>84</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>83</u> (A)	<u>255</u> (B)

Prevalence Index = B/A = 3.07

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-31U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 12	10YR 5/4	98	10YR 6/6	2	C	M	Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 12 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-32W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N-R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
 Subregion (LRR or MLRA): A Lat: 47.341168 Long: -93.086063 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: PFO4Dq

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-18</u>
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-33U. Wetland community is a coniferous bog, Type 8, PFO4B.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <ul style="list-style-type: none"> <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks) 	Secondary Indicators (minimum of two required) <ul style="list-style-type: none"> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>8</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-32W

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Larix laricina</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. <u>Picea mariana</u>	<u>10</u>		<u>FACW</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>70%</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>10</u></td> <td>x 1 = <u>10</u></td> </tr> <tr> <td>FACW species <u>165</u></td> <td>x 2 = <u>330</u></td> </tr> <tr> <td>FAC species <u>20</u></td> <td>x 3 = <u>60</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>195</u> (A)</td> <td><u>400</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.05</u>	Total % Cover of:	Multiply by:	OBL species <u>10</u>	x 1 = <u>10</u>	FACW species <u>165</u>	x 2 = <u>330</u>	FAC species <u>20</u>	x 3 = <u>60</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>195</u> (A)	<u>400</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>10</u>	x 1 = <u>10</u>																	
FACW species <u>165</u>	x 2 = <u>330</u>																	
FAC species <u>20</u>	x 3 = <u>60</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>195</u> (A)	<u>400</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>70%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Clintonia borealis</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Vaccinium myrtilloides</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Bidens cernua</u>	<u>10</u>		<u>OBL</u>															
4. <u>Equisetum sylvaticum</u>	<u>5</u>		<u>FACW</u>															
5. _____																		
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>55%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
<table style="width:100%; border:none;"> <tr> <td style="width:60%;">Hydrophytic Vegetation Present?</td> <td style="width:20%; text-align:center;">Yes <input checked="" type="checkbox"/></td> <td style="width:20%; text-align:center;">No <input type="checkbox"/></td> </tr> </table>					Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>											
Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>																
Remarks: (Include photo numbers here or on a separate sheet.) Sphagnum cover = 60%																		

SOIL

Sampling Point: SP-32W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 12	10YR 2/1	100					Mucky Peat	
12 - 24	10YR 2/1	100					Mucky Loam/Clay	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-33U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S11, T56N, R22W
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Linear Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.341382 Long: -93.086232 Datum: NAD 83
 Soil Map Unit Name: 867B, Menahga and Graycalm soils, 0 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-32W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-33U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>16.7</u> (A/B)														
2. <u>Acer saccharum</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Abies balsamea</u>	<u>5</u>		<u>FAC</u>															
4. _____	_____		_____															
5. _____	_____		_____															
6. _____	_____		_____															
7. _____	_____		_____															
<u>50%</u> = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right">Total % Cover of:</td> <td style="width:50%; text-align:left">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>5</u></td> <td>x 2 = <u>10</u></td> </tr> <tr> <td>FAC species <u>50</u></td> <td>x 3 = <u>150</u></td> </tr> <tr> <td>FACU species <u>105</u></td> <td>x 4 = <u>420</u></td> </tr> <tr> <td>UPL species <u>45</u></td> <td>x 5 = <u>225</u></td> </tr> <tr> <td>Column Totals: <u>205</u> (A)</td> <td><u>805</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.93</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>5</u>	x 2 = <u>10</u>	FAC species <u>50</u>	x 3 = <u>150</u>	FACU species <u>105</u>	x 4 = <u>420</u>	UPL species <u>45</u>	x 5 = <u>225</u>	Column Totals: <u>205</u> (A)	<u>805</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>5</u>	x 2 = <u>10</u>																	
FAC species <u>50</u>	x 3 = <u>150</u>																	
FACU species <u>105</u>	x 4 = <u>420</u>																	
UPL species <u>45</u>	x 5 = <u>225</u>																	
Column Totals: <u>205</u> (A)	<u>805</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Cornus alternifolia</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
2. <u>Corylus cornuta</u>			<u>FACU</u>															
3. _____	_____		_____															
4. _____	_____		_____															
5. _____	_____		_____															
6. _____	_____		_____															
7. _____	_____		_____															
<u>10%</u> = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Aralia nudicaulis</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
2. <u>Pteridium aquilinum</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Eurybia macrophylla</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>UPL</u>															
4. <u>Apocynum androsaemifolium</u>	<u>15</u>		<u>UPL</u>															
5. <u>Diervilla lonicera</u>	<u>15</u>		_____															
6. <u>Athyrium americanum</u>	<u>10</u>		_____															
7. <u>Clintonia borealis</u>	<u>10</u>		<u>FAC</u>															
8. <u>Cornus canadensis</u>	<u>5</u>		<u>FAC</u>															
9. <u>Rubus pubescens</u>	<u>5</u>		<u>FACW</u>															
10. _____	_____		_____															
11. _____	_____		_____															
12. _____	_____		_____															
<u>170%</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____		_____															
2. _____	_____		_____															
3. _____	_____		_____															
4. _____	_____		_____															
_____ = Total Cover				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>														
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-33U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 3/2	100					Sandy Loam	
6 - 12	10YR 4/3	90	10YR 5/6	10	C	M	Sandy Loam	
12 - 24	10YR 5/4	90	10YR 6/6	10	C	M	Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-34W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S13, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Convex Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.338697 Long: -93.080864 Datum: NAD 83
 Soil Map Unit Name: 619, Keewatin silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-19</u>
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-35U. Wetland community is a fresh (wet) meadow, Type 2, PEM1B.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-34W

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Ulmus americana</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>10%</u> = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>30</u></td> <td>x 1 = <u>30</u></td> </tr> <tr> <td>FACW species <u>45</u></td> <td>x 2 = <u>90</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>75</u> (A)</td> <td><u>120</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.60</u>	Total % Cover of:	Multiply by:	OBL species <u>30</u>	x 1 = <u>30</u>	FACW species <u>45</u>	x 2 = <u>90</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>75</u> (A)	<u>120</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>30</u>	x 1 = <u>30</u>																	
FACW species <u>45</u>	x 2 = <u>90</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>75</u> (A)	<u>120</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Fraxinus pennsylvanica</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Populus balsamifera</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>30%</u> = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Carex hystericina</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Glyceria canadensis</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Lycopus uniflorus</u>	<u>5</u>	_____	<u>OBL</u>															
4. <u>Persicaria pensylvanica</u>	<u>5</u>	_____	<u>FACW</u>															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>35%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														

SOIL

Sampling Point: SP-34W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 12	10YR 5/2	90	10YR 5/6	10	C	M	Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 12 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-35U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S13, T56N, R22W
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2
 Subregion (LRR or MLRA): A Lat: 47.338716 Long: -93.081147 Datum: NAD 83
 Soil Map Unit Name: 619, Keewatin silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plots are SP-34W and SP-36W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-35U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Betula papyrifera</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>25</u> (A/B)														
2. <u>Acer rubrum</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
3. <u>Fraxinus pennsylvanica</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>40%</u> = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Corylus americana</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>10</u></td> <td>x 2 = <u>20</u></td> </tr> <tr> <td>FAC species <u>17</u></td> <td>x 3 = <u>51</u></td> </tr> <tr> <td>FACU species <u>152</u></td> <td>x 4 = <u>608</u></td> </tr> <tr> <td>UPL species <u>15</u></td> <td>x 5 = <u>75</u></td> </tr> <tr> <td>Column Totals: <u>194</u> (A)</td> <td><u>754</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.89</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>10</u>	x 2 = <u>20</u>	FAC species <u>17</u>	x 3 = <u>51</u>	FACU species <u>152</u>	x 4 = <u>608</u>	UPL species <u>15</u>	x 5 = <u>75</u>	Column Totals: <u>194</u> (A)	<u>754</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>10</u>	x 2 = <u>20</u>																	
FAC species <u>17</u>	x 3 = <u>51</u>																	
FACU species <u>152</u>	x 4 = <u>608</u>																	
UPL species <u>15</u>	x 5 = <u>75</u>																	
Column Totals: <u>194</u> (A)	<u>754</u> (B)																	
2. <u>Acer spicatum</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>90%</u> = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Osmorhiza claytonii</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Actaea rubra</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Athyrium americanum</u>	<u>10</u>	<input checked="" type="checkbox"/>	_____															
4. <u>Eurybia macrophylla</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>UPL</u>															
5. <u>Asarum canadense</u>	<u>5</u>	_____	<u>UPL</u>															
6. <u>Streptopus lanceolatus</u>	<u>4</u>	_____	<u>FACU</u>															
7. <u>Trillium cernuum</u>	<u>4</u>	_____	<u>FAC</u>															
8. <u>Carex gracillima</u>	<u>3</u>	_____	<u>FACU</u>															
9. <u>Trientalis borealis</u>	<u>3</u>	_____	<u>FAC</u>															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>74%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-35U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 2/1	100					Sandy Loam	
2 - 4	10YR 4/1	100					Sandy Loam	
4 - 8	10YR 6/6	100					Sandy Loam	
8 - 24	10YR 6/4	95	10YR 5/8	5	C	M	Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-36W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S13, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Convex Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.338292 Long: -93.08203 Datum: NAD 83
 Soil Map Unit Name: 619, Keewatin silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-20</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-35U. Wetland community is a shrub-carr, Type 6, PSS1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	<u>Secondary Indicators (minimum of two required)</u>
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Water-Stained Leaves (B9)
___ High Water Table (A2)	___ Drainage Patterns (B10)
___ Saturation (A3)	___ Aquatic Fauna (B13)
___ Water Marks (B1)	___ Moss Trim Lines (B16)
___ Sediment Deposits (B2)	___ Marl Deposits (B15)
___ Drift Deposits (B3)	___ Dry-Season Water Table (C2)
___ Algal Mat or Crust (B4)	___ Hydrogen Sulfide Odor (C1)
___ Iron Deposits (B5)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Inundation Visible on Aerial Imagery (B7)	___ Presence of Reduced Iron (C4)
___ Sparsely Vegetated Concave Surface (B8)	___ Recent Iron Reduction in Tilled Soils (C6)
	___ Thin Muck Surface (C7)
	___ Other (Explain in Remarks)
	___ Stunted or Stressed Plants (D1)
	<input checked="" type="checkbox"/> Geomorphic Position (D2)
	___ Shallow Aquitard (D3)
	___ Microtopographic Relief (D4)
	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	
Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-36W

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Fraxinus nigra</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B)														
2. <u>Ulmus americana</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
<u>25%</u> = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>4</u></td> <td>x 1 = <u>4</u></td> </tr> <tr> <td>FACW species <u>105</u></td> <td>x 2 = <u>210</u></td> </tr> <tr> <td>FAC species <u>10</u></td> <td>x 3 = <u>30</u></td> </tr> <tr> <td>FACU species <u>15</u></td> <td>x 4 = <u>60</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>134</u> (A)</td> <td><u>304</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.27</u>	Total % Cover of:	Multiply by:	OBL species <u>4</u>	x 1 = <u>4</u>	FACW species <u>105</u>	x 2 = <u>210</u>	FAC species <u>10</u>	x 3 = <u>30</u>	FACU species <u>15</u>	x 4 = <u>60</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>134</u> (A)	<u>304</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>4</u>	x 1 = <u>4</u>																	
FACW species <u>105</u>	x 2 = <u>210</u>																	
FAC species <u>10</u>	x 3 = <u>30</u>																	
FACU species <u>15</u>	x 4 = <u>60</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>134</u> (A)	<u>304</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Corylus americana</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
<u>55%</u> = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Impatiens capensis</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Athyrium angustum</u>	<u>10</u>		<u>FAC</u>															
3. <u>Rubus pubescens</u>	<u>5</u>		<u>FACW</u>															
4. <u>Symphotrichum novae-angliae</u>	<u>5</u>		<u>FACW</u>															
5. <u>Glyceria striata</u>	<u>4</u>		<u>OBL</u>															
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
<u>54%</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____																		
2. _____																		
3. _____																		
4. _____																		
_____ = Total Cover					Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____													
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-36W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 8	10YR 3/1	90	10YR 4/6	10	C	M	Loam	
8 - 16	10YR 5/2	90	10YR 5/6	10	C	M	Sandy Loam	
16 - 24	10YR 6/2	90	10YR 5/	10	C	M	Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-37W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S13, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
 Subregion (LRR or MLRA): A Lat: 47.337252 Long: -93.079741 Datum: NAD 83
 Soil Map Unit Name: 619, Keewatin silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-21</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-38U. Wetland community is an alder thicket, Type 6, PSS1B.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-37W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border: none;"> <tr> <td style="width:50%; text-align: right;">Total % Cover of:</td> <td style="width:50%; text-align: left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>60</u></td> <td>x 1 = <u>60</u></td> </tr> <tr> <td>FACW species <u>125</u></td> <td>x 2 = <u>250</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>185</u> (A)</td> <td><u>310</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.68</u>	Total % Cover of:	Multiply by:	OBL species <u>60</u>	x 1 = <u>60</u>	FACW species <u>125</u>	x 2 = <u>250</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>185</u> (A)	<u>310</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>60</u>	x 1 = <u>60</u>																	
FACW species <u>125</u>	x 2 = <u>250</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>185</u> (A)	<u>310</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Salix discolor</u>	<u>10</u>		<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>80%</u> = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Scirpus cyperinus</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
2. <u>Carex scoparia</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Symphotrichum novae-angliae</u>	<u>10</u>		<u>FACW</u>															
4. <u>Equisetum pratense</u>	<u>5</u>		<u>FACW</u>															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>105%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														

SOIL

Sampling Point: SP-37W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 12	10YR 5/2	80	10YR 5/6	20	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine textured soil
 Depth (inches): 0

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 12 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-38U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S13, T56N, R22W
 Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): Linear Slope (%): 2
 Subregion (LRR or MLRA): A Lat: 47.337173 Long: -93.079634 Datum: NAD 83
 Soil Map Unit Name: 619, Keewatin silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: <u>Upland</u>
Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	

Remarks: (Explain alternative procedures here or in a separate report.)

**Plot is located in an upland, corresponding wetland plots are SP-37W and SP-39W.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.**

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	___ Geomorphic Position (D2)
___ Iron Deposits (B5)	___ Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-38U

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Populus balsamifera</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
2. <u>Salix discolor</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
3. <u>Populus tremuloides</u>	<u>10</u>	_____	<u>FAC</u>
4. <u>Alnus incana</u>	<u>5</u>	_____	<u>FACW</u>
5. <u>Larix laricina</u>	<u>5</u>	_____	<u>FACW</u>
6. <u>Picea glauca</u>	<u>2</u>	_____	<u>FACU</u>
7. _____	_____	_____	_____

_____ = Total Cover

Herb Stratum (Plot size: <u>5 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Hieracium aurantiacum</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>UPL</u>
2. <u>Fragaria virginiana</u>	<u>10</u>	_____	<u>FACU</u>
3. <u>Poa pratensis</u>	<u>10</u>	_____	<u>FACU</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

62% = Total Cover

Woody Vine Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

_____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>50</u>	x 2 = <u>100</u>
FAC species <u>10</u>	x 3 = <u>30</u>
FACU species <u>22</u>	x 4 = <u>88</u>
UPL species <u>50</u>	x 5 = <u>250</u>
Column Totals: <u>132</u> (A)	<u>468</u> (B)

Prevalence Index = B/A = 3.55

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-38U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 12	10YR 4/4	80	10YR 4/6	20	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 12 inches below ground surface by rock. Soils compacted from old road.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-39W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S13, T56N< R22W
 Landform (hillslope, terrace, etc.): Ditch Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.337059 Long: -93.07945 Datum: NAD 83
 Soil Map Unit Name: 619, Keewatin silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-22</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-38U. Wetland community is a shallow marsh, Type 3, PEM1C.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-39W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border: none;"> <tr> <td style="width:50%; text-align: center;">Total % Cover of:</td> <td style="width:50%; text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>90</u></td> <td>x 1 = <u>90</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>90</u> (A)</td> <td><u>90</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.00</u>	Total % Cover of:	Multiply by:	OBL species <u>90</u>	x 1 = <u>90</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>90</u> (A)	<u>90</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>90</u>	x 1 = <u>90</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>90</u> (A)	<u>90</u> (B)																	
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)														
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-39W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 8	10YR 2/2	100					Mucky Peat	
8 - 24	2.5Y 5/1	100					Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 8

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-40W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S13, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.336485 Long: -93.073599 Datum: NAD 83
 Soil Map Unit Name: 622B, Nashwauk fine sandy loam, 1 to 10 percent slopes NWI classification: PSS1D

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-23</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-41U. Wetland community is an alder thicket, Type 6, PSS1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	___ Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>6</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-40W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>25</u></td> <td>x 1 = <u>25</u></td> </tr> <tr> <td>FACW species <u>150</u></td> <td>x 2 = <u>300</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>175</u> (A)</td> <td><u>325</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.86</u>	Total % Cover of:	Multiply by:	OBL species <u>25</u>	x 1 = <u>25</u>	FACW species <u>150</u>	x 2 = <u>300</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>175</u> (A)	<u>325</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>25</u>	x 1 = <u>25</u>																	
FACW species <u>150</u>	x 2 = <u>300</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>175</u> (A)	<u>325</u> (B)																	
<u>100%</u> = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>100</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>100%</u> = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Rubus pubescens</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Carex lacustris</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Equisetum sylvaticum</u>	<u>10</u>	_____	<u>FACW</u>															
4. <u>Caltha palustris</u>	<u>5</u>	_____	<u>OBL</u>															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>75%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)																		
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																		
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																		
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-40W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 12	10YR 2/1	100					Mucky Peat	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 12 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-41U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S13, T56N, R22W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Linear Slope (%): 3
 Subregion (LRR or MLRA): A Lat: 47.336436 Long: -93.073335 Datum: NAD 83
 Soil Map Unit Name: 622B, Nashwauk fine sandy loam, 1 to 10 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-40W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
--	---

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-41U

	Absolute % Cover	Dominant Species?	Indicator Status																													
Tree Stratum (Plot size: <u>30 ft r</u>)																																
1. <u>Populus tremuloides</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)																												
2. <u>Abies balsamea</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>																													
3. <u>Betula papyrifera</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>																													
4. _____																																
5. _____																																
6. _____																																
7. _____																																
	<u>80%</u>			Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;"></td> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%;"></td> <td style="width:50%; text-align:right;">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td style="text-align:center;"><u>0</u></td> <td>x 1 =</td> <td style="text-align:center;"><u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align:center;"><u>20</u></td> <td>x 2 =</td> <td style="text-align:center;"><u>40</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align:center;"><u>95</u></td> <td>x 3 =</td> <td style="text-align:center;"><u>285</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align:center;"><u>100</u></td> <td>x 4 =</td> <td style="text-align:center;"><u>400</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align:center;"><u>20</u></td> <td>x 5 =</td> <td style="text-align:center;"><u>100</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align:center;"><u>235</u></td> <td>(A)</td> <td style="text-align:center;"><u>825</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.51</u>		Total % Cover of:		Multiply by:	OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>20</u>	x 2 =	<u>40</u>	FAC species	<u>95</u>	x 3 =	<u>285</u>	FACU species	<u>100</u>	x 4 =	<u>400</u>	UPL species	<u>20</u>	x 5 =	<u>100</u>	Column Totals:	<u>235</u>	(A)	<u>825</u> (B)
	Total % Cover of:		Multiply by:																													
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>20</u>	x 2 =	<u>40</u>																													
FAC species	<u>95</u>	x 3 =	<u>285</u>																													
FACU species	<u>100</u>	x 4 =	<u>400</u>																													
UPL species	<u>20</u>	x 5 =	<u>100</u>																													
Column Totals:	<u>235</u>	(A)	<u>825</u> (B)																													
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																																
1. <u>Acer spicatum</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>																													
2. <u>Fraxinus nigra</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>																													
3. <u>Corylus cornuta</u>	<u>10</u>		<u>FACU</u>																													
4. _____																																
5. _____																																
6. _____																																
7. _____																																
	<u>60%</u>																															
Herb Stratum (Plot size: <u>5 ft r</u>)																																
1. <u>Cornus canadensis</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																												
2. <u>Pteridium aquilinum</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACU</u>																													
3. <u>Eurybia macrophylla</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>UPL</u>																													
4. <u>Aralia nudicaulis</u>	<u>10</u>		<u>FACU</u>																													
5. <u>Clintonia borealis</u>	<u>5</u>		<u>FAC</u>																													
6. <u>Maianthemum canadense</u>	<u>5</u>		<u>FACU</u>																													
7. _____																																
8. _____																																
9. _____																																
10. _____																																
11. _____																																
12. _____																																
	<u>95%</u>																															
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																																
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																												
2. _____																																
3. _____																																
4. _____																																
				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>																												
_____ = Total Cover																																
Remarks: (Include photo numbers here or on a separate sheet.)																																

SOIL

Sampling Point: SP-41U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR 2/1	100					Sandy Loam	
4 - 8	10YR 3/2	100					Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 8 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-42W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S13, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.337066 Long: -93.069754 Datum: NAD 83
 Soil Map Unit Name: 622B, Nashwauk fine sandy loam, 1 to 10 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-24</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-43U. Wetland community is a shallow marsh, Type 3, PEM1C.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	___ Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> Surface Water (A1)	___ Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	___ Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	
___ Marl Deposits (B15)	
___ Hydrogen Sulfide Odor (C1)	
___ Oxidized Rhizospheres on Living Roots (C3)	
___ Presence of Reduced Iron (C4)	
___ Recent Iron Reduction in Tilled Soils (C6)	
___ Thin Muck Surface (C7)	
___ Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-42W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>70</u></td> <td>x 1 = <u>70</u></td> </tr> <tr> <td>FACW species <u>10</u></td> <td>x 2 = <u>20</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>80</u> (A)</td> <td><u>90</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.13</u>	Total % Cover of:	Multiply by:	OBL species <u>70</u>	x 1 = <u>70</u>	FACW species <u>10</u>	x 2 = <u>20</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>80</u> (A)	<u>90</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>70</u>	x 1 = <u>70</u>																	
FACW species <u>10</u>	x 2 = <u>20</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>80</u> (A)	<u>90</u> (B)																	
_____ = Total Cover																		
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)														
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>														
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-42W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	N 2.5/1	100					Mucky Loam/Clay	
2 - 24	10YR 5/1	100					Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-43U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S13, T56N, R22W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Linear Slope (%): 30
 Subregion (LRR or MLRA): A Lat: 47.3371333 Long: -93.0697813 Datum: NAD 83
 Soil Map Unit Name: 622B, Nashwauk fine sandy loam, 1 to 10 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-42W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
--	---

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-43U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33.3</u> (A/B)														
2. <u>Acer rubrum</u>	<u>10</u>		<u>FAC</u>															
3. <u>Betula papyrifera</u>	<u>10</u>		<u>FACU</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>80%</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>80</u></td> <td>x 3 = <u>240</u></td> </tr> <tr> <td>FACU species <u>100</u></td> <td>x 4 = <u>400</u></td> </tr> <tr> <td>UPL species <u>70</u></td> <td>x 5 = <u>350</u></td> </tr> <tr> <td>Column Totals: <u>250</u></td> <td>(A) <u>990</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.96</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>80</u>	x 3 = <u>240</u>	FACU species <u>100</u>	x 4 = <u>400</u>	UPL species <u>70</u>	x 5 = <u>350</u>	Column Totals: <u>250</u>	(A) <u>990</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>80</u>	x 3 = <u>240</u>																	
FACU species <u>100</u>	x 4 = <u>400</u>																	
UPL species <u>70</u>	x 5 = <u>350</u>																	
Column Totals: <u>250</u>	(A) <u>990</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Corylus cornuta</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
2. <u>Populus tremuloides</u>	<u>10</u>		<u>FAC</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>60%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Carex pensylvanica</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>UPL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Lotus corniculatus</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Eurybia macrophylla</u>	<u>20</u>		<u>UPL</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>110%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
<table style="width:100%; border:none;"> <tr> <td style="width:60%;"></td> <td style="width:20%; text-align:center;">Hydrophytic Vegetation Present?</td> <td style="width:10%; text-align:center;">Yes _____</td> <td style="width:10%; text-align:center;">No <input checked="" type="checkbox"/></td> </tr> </table>						Hydrophytic Vegetation Present?	Yes _____	No <input checked="" type="checkbox"/>										
	Hydrophytic Vegetation Present?	Yes _____	No <input checked="" type="checkbox"/>															
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-43U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 2/2	100					Sandy Loam	
2 - 14	10YR 4/3	100					Silty Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 14 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-44W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R21W
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.336573 Long: -93.068082 Datum: NAD 83
 Soil Map Unit Name: 622B, Nashwauk fine sandy loam, 1 to 10 percent loams NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-25</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-45U. Wetland community is an alder thicket, Type 6, PSS1B.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	___ Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> Surface Water (A1)	___ Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	<input checked="" type="checkbox"/> Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	___ Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
--	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-44W

	Absolute % Cover	Dominant Species?	Indicator Status																													
Tree Stratum (Plot size: <u>30 ft r</u>)																																
1. <u>Populus tremuloides</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																												
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
7. _____	_____	_____	_____																													
	<u>10%</u>	= Total Cover																														
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																																
1. <u>Alnus incana</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;"></td> <td style="text-align:center;">Total % Cover of:</td> <td style="width:50%;"></td> <td style="text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td style="text-align:center;"><u>20</u></td> <td>x 1 =</td> <td style="text-align:center;"><u>20</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align:center;"><u>165</u></td> <td>x 2 =</td> <td style="text-align:center;"><u>330</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align:center;"><u>10</u></td> <td>x 3 =</td> <td style="text-align:center;"><u>30</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align:center;"><u>10</u></td> <td>x 4 =</td> <td style="text-align:center;"><u>40</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align:center;"><u>0</u></td> <td>x 5 =</td> <td style="text-align:center;"><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align:center;"><u>205</u></td> <td>(A)</td> <td style="text-align:center;"><u>420</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.05</u>		Total % Cover of:		Multiply by:	OBL species	<u>20</u>	x 1 =	<u>20</u>	FACW species	<u>165</u>	x 2 =	<u>330</u>	FAC species	<u>10</u>	x 3 =	<u>30</u>	FACU species	<u>10</u>	x 4 =	<u>40</u>	UPL species	<u>0</u>	x 5 =	<u>0</u>	Column Totals:	<u>205</u>	(A)	<u>420</u> (B)
	Total % Cover of:		Multiply by:																													
OBL species	<u>20</u>	x 1 =	<u>20</u>																													
FACW species	<u>165</u>	x 2 =	<u>330</u>																													
FAC species	<u>10</u>	x 3 =	<u>30</u>																													
FACU species	<u>10</u>	x 4 =	<u>40</u>																													
UPL species	<u>0</u>	x 5 =	<u>0</u>																													
Column Totals:	<u>205</u>	(A)	<u>420</u> (B)																													
2. <u>Salix discolor</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
5. _____	_____	_____	_____																													
6. _____	_____	_____	_____																													
7. _____	_____	_____	_____																													
	<u>80%</u>	= Total Cover																														
Herb Stratum (Plot size: <u>5 ft r</u>)																																
1. <u>Impatiens capensis</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																												
2. <u>Equisetum sylvaticum</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>																													
3. <u>Carex lacustris</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>OBL</u>																													
4. <u>Fragaria virginiana</u>	<u>10</u>	_____	<u>FACU</u>																													
5. <u>Doellingeria umbellata</u>	<u>10</u>	_____	<u>FACW</u>																													
6. <u>Ribes hirtellum</u>	<u>5</u>	_____	<u>FACW</u>																													
7. _____	_____	_____	_____																													
8. _____	_____	_____	_____																													
9. _____	_____	_____	_____																													
10. _____	_____	_____	_____																													
11. _____	_____	_____	_____																													
12. _____	_____	_____	_____																													
	<u>115%</u>	= Total Cover																														
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																																
1. _____	_____	_____	_____																													
2. _____	_____	_____	_____																													
3. _____	_____	_____	_____																													
4. _____	_____	_____	_____																													
	_____	= Total Cover																														
<table style="width:100%; border:none;"> <tr> <td style="width:60%;"></td> <td style="width:20%;">Hydrophytic Vegetation Present?</td> <td style="width:10%; text-align:center;">Yes <input checked="" type="checkbox"/></td> <td style="width:10%; text-align:center;">No _____</td> </tr> </table>						Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No _____																								
	Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No _____																													
Remarks: (Include photo numbers here or on a separate sheet.)																																

SOIL

Sampling Point: SP-44W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR 3/2	100					Silt Loam	
4 - 15	2.5Y 5/1	100					Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 15 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-45U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R22W
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Linear Slope (%): 10
 Subregion (LRR or MLRA): A Lat: 47.336666 Long: -93.06788 Datum: NAD 83
 Soil Map Unit Name: 622B, Nashwauk fine sandy loam, 1 to 10 percent loams NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-44W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-45U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33.3</u> (A/B)														
2. <u>Abies balsamea</u>	<u>10</u>		<u>FAC</u>															
3. <u>Betula papyrifera</u>	<u>10</u>		<u>FACU</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>90%</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>95</u></td> <td>x 3 = <u>285</u></td> </tr> <tr> <td>FACU species <u>170</u></td> <td>x 4 = <u>680</u></td> </tr> <tr> <td>UPL species <u>30</u></td> <td>x 5 = <u>150</u></td> </tr> <tr> <td>Column Totals: <u>295</u></td> <td>(A) <u>1115</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.78</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>95</u>	x 3 = <u>285</u>	FACU species <u>170</u>	x 4 = <u>680</u>	UPL species <u>30</u>	x 5 = <u>150</u>	Column Totals: <u>295</u>	(A) <u>1115</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>95</u>	x 3 = <u>285</u>																	
FACU species <u>170</u>	x 4 = <u>680</u>																	
UPL species <u>30</u>	x 5 = <u>150</u>																	
Column Totals: <u>295</u>	(A) <u>1115</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Corylus americana</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
2. <u>Populus tremuloides</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>65%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Aralia nudicaulis</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Eurybia macrophylla</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>UPL</u>															
3. <u>Pteridium aquilinum</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
4. <u>Fragaria virginiana</u>	<u>10</u>		<u>FACU</u>															
5. _____																		
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>140%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>														
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-45U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 3/2	100					Loam	
2 - 8	10YR 4/3	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 8 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-46W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.337048 Long: -93.057978 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: PEM1D

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-26</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-47U. Wetland community is a shallow marsh, Type 3, PEM1C.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	___ Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	
___ Marl Deposits (B15)	
___ Hydrogen Sulfide Odor (C1)	
___ Oxidized Rhizospheres on Living Roots (C3)	
___ Presence of Reduced Iron (C4)	
___ Recent Iron Reduction in Tilled Soils (C6)	
___ Thin Muck Surface (C7)	
___ Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-46W

<u>Tree Stratum</u> (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align: right;">Total % Cover of:</td> <td style="width:50%; text-align: left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>105</u></td> <td>x 1 = <u>105</u></td> </tr> <tr> <td>FACW species <u>10</u></td> <td>x 2 = <u>20</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>115</u> (A)</td> <td><u>125</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.09</u>	Total % Cover of:	Multiply by:	OBL species <u>105</u>	x 1 = <u>105</u>	FACW species <u>10</u>	x 2 = <u>20</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>115</u> (A)	<u>125</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>105</u>	x 1 = <u>105</u>																	
FACW species <u>10</u>	x 2 = <u>20</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>115</u> (A)	<u>125</u> (B)																	
<u>10%</u> = Total Cover																		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>10%</u> = Total Cover																		
<u>Herb Stratum</u> (Plot size: <u>5 ft r</u>)																		
1. <u>Carex striata</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Typha latifolia</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Calamagrostis canadensis</u>	<u>5</u>	_____	<u>OBL</u>															
4. <u>Carex comosa</u>	<u>5</u>	_____	<u>OBL</u>															
5. <u>Eutrochium maculatum</u>	<u>5</u>	_____	<u>OBL</u>															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>105%</u> = Total Cover																		
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														

SOIL

Sampling Point: SP-46W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 14	10YR 3/2	100					Mucky Loam/Clay	
14 - 24	2.5Y 5/1	100					Silt Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-47U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R22W
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Linear Slope (%): 10
 Subregion (LRR or MLRA): A Lat: 47.337163 Long: -93.057975 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-46W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Water-Stained Leaves (B9)
___ High Water Table (A2)	___ Drainage Patterns (B10)
___ Saturation (A3)	___ Aquatic Fauna (B13)
___ Water Marks (B1)	___ Moss Trim Lines (B16)
___ Sediment Deposits (B2)	___ Marl Deposits (B15)
___ Drift Deposits (B3)	___ Dry-Season Water Table (C2)
___ Algal Mat or Crust (B4)	___ Hydrogen Sulfide Odor (C1)
___ Iron Deposits (B5)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Inundation Visible on Aerial Imagery (B7)	___ Presence of Reduced Iron (C4)
___ Sparsely Vegetated Concave Surface (B8)	___ Recent Iron Reduction in Tilled Soils (C6)
	___ Thin Muck Surface (C7)
	___ Other (Explain in Remarks)
	___ Stunted or Stressed Plants (D1)
	___ Geomorphic Position (D2)
	___ Shallow Aquitard (D3)
	___ Microtopographic Relief (D4)
	___ FAC-Neutral Test (D5)

Field Observations:	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	
Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-47U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>25</u> (A/B)														
2. <u>Populus balsamifera</u>	<u>10</u>		<u>FACW</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>70%</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>10</u></td> <td>x 2 = <u>20</u></td> </tr> <tr> <td>FAC species <u>70</u></td> <td>x 3 = <u>210</u></td> </tr> <tr> <td>FACU species <u>70</u></td> <td>x 4 = <u>280</u></td> </tr> <tr> <td>UPL species <u>30</u></td> <td>x 5 = <u>150</u></td> </tr> <tr> <td>Column Totals: <u>180</u></td> <td>(A) <u>660</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.67</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>10</u>	x 2 = <u>20</u>	FAC species <u>70</u>	x 3 = <u>210</u>	FACU species <u>70</u>	x 4 = <u>280</u>	UPL species <u>30</u>	x 5 = <u>150</u>	Column Totals: <u>180</u>	(A) <u>660</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>10</u>	x 2 = <u>20</u>																	
FAC species <u>70</u>	x 3 = <u>210</u>																	
FACU species <u>70</u>	x 4 = <u>280</u>																	
UPL species <u>30</u>	x 5 = <u>150</u>																	
Column Totals: <u>180</u>	(A) <u>660</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Salix sp</u>	<u>10</u>	<input checked="" type="checkbox"/>																
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>10%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Poa pratensis</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Eurybia macrophylla</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>UPL</u>															
3. <u>Fragaria virginiana</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
4. <u>Equisetum arvense</u>	<u>10</u>		<u>FAC</u>															
5. _____																		
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>110%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>														
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-47U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 3	10YR 3/2	100					Loam	
3 - 10	10YR 4/3	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 10 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-48W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R22W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.336308 Long: -93.054848 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-27</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-49U. Wetland community is a shallow marsh, Type 3, PEM1C.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	___ Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> Surface Water (A1)	___ Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	___ Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	
___ Marl Deposits (B15)	
___ Hydrogen Sulfide Odor (C1)	
___ Oxidized Rhizospheres on Living Roots (C3)	
___ Presence of Reduced Iron (C4)	
___ Recent Iron Reduction in Tilled Soils (C6)	
___ Thin Muck Surface (C7)	
___ Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
--	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-48W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status																
1. _____	_____	_____	_____																
2. _____	_____	_____	_____																
3. _____	_____	_____	_____																
4. _____	_____	_____	_____																
5. _____	_____	_____	_____																
6. _____	_____	_____	_____																
7. _____	_____	_____	_____																
	_____ = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																			
1. _____	_____	_____	_____																
2. _____	_____	_____	_____																
3. _____	_____	_____	_____																
4. _____	_____	_____	_____																
5. _____	_____	_____	_____																
6. _____	_____	_____	_____																
7. _____	_____	_____	_____																
	_____ = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																			
1. <u>Typha angustifolia</u>	<u>80</u>	<input checked="" type="checkbox"/>	<u>OBL</u>																
2. <u>Lysimachia thyrsoiflora</u>	<u>5</u>	<input type="checkbox"/>	<u>OBL</u>																
3. <u>Scirpus cyperinus</u>	<u>5</u>	<input type="checkbox"/>	<u>OBL</u>																
4. _____	_____	_____	_____																
5. _____	_____	_____	_____																
6. _____	_____	_____	_____																
7. _____	_____	_____	_____																
8. _____	_____	_____	_____																
9. _____	_____	_____	_____																
10. _____	_____	_____	_____																
11. _____	_____	_____	_____																
12. _____	_____	_____	_____																
	<u>90%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																			
1. _____	_____	_____	_____																
2. _____	_____	_____	_____																
3. _____	_____	_____	_____																
4. _____	_____	_____	_____																
	_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)				<p>Dominance Test worksheet:</p> <p>Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>1</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)</p> <hr/> <p>Prevalence Index worksheet:</p> <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>90</u></td> <td>x 1 = <u>90</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>90</u> (A)</td> <td><u>90</u> (B)</td> </tr> </table> <p style="text-align:right;">Prevalence Index = B/A = <u>1.00</u></p> <hr/> <p>Hydrophytic Vegetation Indicators:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0¹ <input type="checkbox"/> 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation¹ (Explain) <p>¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <hr/> <p>Definitions of Vegetation Strata:</p> <p>Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</p> <p>Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</p> <p>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</p> <p>Woody vines – All woody vines greater than 3.28 ft in height.</p> <hr/> <p>Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>		Total % Cover of:	Multiply by:	OBL species <u>90</u>	x 1 = <u>90</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>90</u> (A)	<u>90</u> (B)
Total % Cover of:	Multiply by:																		
OBL species <u>90</u>	x 1 = <u>90</u>																		
FACW species <u>0</u>	x 2 = <u>0</u>																		
FAC species <u>0</u>	x 3 = <u>0</u>																		
FACU species <u>0</u>	x 4 = <u>0</u>																		
UPL species <u>0</u>	x 5 = <u>0</u>																		
Column Totals: <u>90</u> (A)	<u>90</u> (B)																		

SOIL

Sampling Point: SP-48W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 12	10YR 3/2	100					Mucky Loam/Clay	
12 - 24	10YR 5/1	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-49U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R22W
 Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): Linear Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.336384 Long: -93.05495 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-48W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-49U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)														
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>140</u></td> <td>x 4 = <u>560</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>140</u> (A)</td> <td><u>560</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>4.00</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>140</u>	x 4 = <u>560</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>140</u> (A)	<u>560</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>140</u>	x 4 = <u>560</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>140</u> (A)	<u>560</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Lotus corniculatus</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
2. <u>Tanacetum vulgare</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Phleum pratense</u>	<u>20</u>		<u>FACU</u>															
4. <u>Poa pratensis</u>	<u>10</u>		<u>FACU</u>															
5. <u>Solidago canadensis</u>	<u>10</u>		<u>FACU</u>															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>140%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present?														
				Yes _____ No <input checked="" type="checkbox"/>														

SOIL

Sampling Point: SP-49U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	7.5YR 4/3	100					Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 6 inches below ground surface by compacted soil.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-50W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R21W
 Landform (hillslope, terrace, etc.): Ditch Local relief (concave, convex, none): Concave Slope (%): 0
 Subregion (LRR or MLRA): A Lat: 47.3375412 Long: -93.0522567 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-28</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-51U. Wetland community is an alder thicket, Type 6, PSS1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	___ Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	
___ Marl Deposits (B15)	
___ Hydrogen Sulfide Odor (C1)	
___ Oxidized Rhizospheres on Living Roots (C3)	
___ Presence of Reduced Iron (C4)	
___ Recent Iron Reduction in Tilled Soils (C6)	
___ Thin Muck Surface (C7)	
___ Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-50W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border: none;"> <tr> <td style="width:50%; text-align: right;">Total % Cover of:</td> <td style="width:50%; text-align: left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>80</u></td> <td>x 1 = <u>80</u></td> </tr> <tr> <td>FACW species <u>110</u></td> <td>x 2 = <u>220</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>190</u> (A)</td> <td><u>300</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.58</u>	Total % Cover of:	Multiply by:	OBL species <u>80</u>	x 1 = <u>80</u>	FACW species <u>110</u>	x 2 = <u>220</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>190</u> (A)	<u>300</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>80</u>	x 1 = <u>80</u>																	
FACW species <u>110</u>	x 2 = <u>220</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>190</u> (A)	<u>300</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
1. <u>Alnus incana</u>	<u>90</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
_____ = Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
Herb Stratum (Plot size: <u>5 ft r</u>)					Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.													
1. <u>Glyceria striata</u>	<u>80</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Doellingeria umbellata</u>	<u>10</u>	_____	<u>FACW</u>															
3. <u>Equisetum pratense</u>	<u>10</u>	_____	<u>FACW</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-50W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR 3/2	90	10YR 4/6	10	C	M	Silt Loam	
4 - 24	7.5YR 4/3	80	7.5YR 4/6	20	C	M	Silt Loam	Slough.
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-51U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R21W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Convex Slope (%): 10
 Subregion (LRR or MLRA): A Lat: 47.337476 Long: -93.052292 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-50W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Water-Stained Leaves (B9)
___ High Water Table (A2)	___ Drainage Patterns (B10)
___ Saturation (A3)	___ Aquatic Fauna (B13)
___ Water Marks (B1)	___ Moss Trim Lines (B16)
___ Sediment Deposits (B2)	___ Marl Deposits (B15)
___ Drift Deposits (B3)	___ Dry-Season Water Table (C2)
___ Algal Mat or Crust (B4)	___ Hydrogen Sulfide Odor (C1)
___ Iron Deposits (B5)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Inundation Visible on Aerial Imagery (B7)	___ Presence of Reduced Iron (C4)
___ Sparsely Vegetated Concave Surface (B8)	___ Recent Iron Reduction in Tilled Soils (C6)
	___ Thin Muck Surface (C7)
	___ Other (Explain in Remarks)
	___ Stunted or Stressed Plants (D1)
	___ Geomorphic Position (D2)
	___ Shallow Aquitard (D3)
	___ Microtopographic Relief (D4)
	___ FAC-Neutral Test (D5)

Field Observations:	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	
Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-51U

	Absolute % Cover	Dominant Species?	Indicator Status																																	
Tree Stratum (Plot size: <u>30 ft r</u>)																																				
1. <u>Populus tremuloides</u>	<u>90</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33.3</u> (A/B)																																
2. _____																																				
3. _____																																				
4. _____																																				
5. _____																																				
6. _____																																				
7. _____																																				
	<u>90%</u>	= Total Cover																																		
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																																				
1. <u>Corylus americana</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;"></td> <td style="text-align:center;">Total % Cover of:</td> <td style="width:50%;"></td> <td style="text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td style="text-align:center;"><u>0</u></td> <td>x 1 =</td> <td style="text-align:center;"><u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align:center;"><u>0</u></td> <td>x 2 =</td> <td style="text-align:center;"><u>0</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align:center;"><u>105</u></td> <td>x 3 =</td> <td style="text-align:center;"><u>315</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align:center;"><u>85</u></td> <td>x 4 =</td> <td style="text-align:center;"><u>340</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align:center;"><u>50</u></td> <td>x 5 =</td> <td style="text-align:center;"><u>250</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align:center;"><u>240</u></td> <td>(A)</td> <td style="text-align:center;"><u>905</u> (B)</td> </tr> <tr> <td colspan="4" style="text-align:center;">Prevalence Index = B/A = <u>3.77</u></td> </tr> </table>		Total % Cover of:		Multiply by:	OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>0</u>	x 2 =	<u>0</u>	FAC species	<u>105</u>	x 3 =	<u>315</u>	FACU species	<u>85</u>	x 4 =	<u>340</u>	UPL species	<u>50</u>	x 5 =	<u>250</u>	Column Totals:	<u>240</u>	(A)	<u>905</u> (B)	Prevalence Index = B/A = <u>3.77</u>			
	Total % Cover of:		Multiply by:																																	
OBL species	<u>0</u>	x 1 =	<u>0</u>																																	
FACW species	<u>0</u>	x 2 =	<u>0</u>																																	
FAC species	<u>105</u>	x 3 =	<u>315</u>																																	
FACU species	<u>85</u>	x 4 =	<u>340</u>																																	
UPL species	<u>50</u>	x 5 =	<u>250</u>																																	
Column Totals:	<u>240</u>	(A)	<u>905</u> (B)																																	
Prevalence Index = B/A = <u>3.77</u>																																				
2. _____																																				
3. _____																																				
4. _____																																				
5. _____																																				
6. _____																																				
7. _____																																				
	<u>70%</u>	= Total Cover																																		
Herb Stratum (Plot size: <u>5 ft r</u>)																																				
1. <u>Eurybia macrophylla</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>UPL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																																
2. <u>Osmorhiza claytonii</u>	<u>10</u>		<u>FACU</u>																																	
3. <u>Rubus idaeus</u>	<u>10</u>		<u>FAC</u>																																	
4. <u>Fragaria virginiana</u>	<u>5</u>		<u>FACU</u>																																	
5. <u>Trientalis borealis</u>	<u>5</u>		<u>FAC</u>																																	
6. _____																																				
7. _____																																				
8. _____																																				
9. _____																																				
10. _____																																				
11. _____																																				
12. _____																																				
	<u>80%</u>	= Total Cover																																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																																				
1. _____																																				
2. _____																																				
3. _____																																				
4. _____																																				
		= Total Cover																																		
<table style="width:100%; border:none;"> <tr> <td style="width:60%;"></td> <td style="text-align:center;">Hydrophytic Vegetation Present?</td> <td style="text-align:center;">Yes _____</td> <td style="text-align:center;">No <input checked="" type="checkbox"/></td> </tr> </table>						Hydrophytic Vegetation Present?	Yes _____	No <input checked="" type="checkbox"/>																												
	Hydrophytic Vegetation Present?	Yes _____	No <input checked="" type="checkbox"/>																																	
Remarks: (Include photo numbers here or on a separate sheet.)																																				

SOIL

Sampling Point: SP-51U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 3/2	100					Loam	
2 - 8	10YR 4/3	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 8 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-52W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R21W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.336682 Long: -93.050916 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: PEM1Cx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: <u>KETB-29</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-53U. Wetland community is a shallow marsh, Type 3, PEM1C.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	___ Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-52W

	Absolute % Cover	Dominant Species?	Indicator Status																																				
Tree Stratum (Plot size: <u>30 ft r</u>)																																							
1.																																							
2.																																							
3.																																							
4.																																							
5.																																							
6.																																							
7.																																							
				_____ = Total Cover																																			
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																																							
1.																																							
2.																																							
3.																																							
4.																																							
5.																																							
6.																																							
7.																																							
				_____ = Total Cover																																			
Herb Stratum (Plot size: <u>5 ft r</u>)																																							
1. <u>Typha angustifolia</u>	<u>90</u>	<input checked="" type="checkbox"/>	<u>OBL</u>																																				
2. <u>Schoenoplectus tabernaemontani</u>	<u>10</u>		<u>OBL</u>																																				
3.																																							
4.																																							
5.																																							
6.																																							
7.																																							
8.																																							
9.																																							
10.																																							
11.																																							
12.																																							
				<u>100%</u> = Total Cover																																			
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																																							
1.																																							
2.																																							
3.																																							
4.																																							
				_____ = Total Cover																																			
<p>Dominance Test worksheet:</p> <p>Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>1</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)</p> <hr/> <p>Prevalence Index worksheet:</p> <table style="width:100%; border:none;"> <tr> <td style="width:50%;"></td> <td style="width:10%; text-align:center;">Total % Cover of:</td> <td style="width:10%;"></td> <td style="width:10%; text-align:center;">Multiply by:</td> <td style="width:10%;"></td> </tr> <tr> <td>OBL species</td> <td style="text-align:center;"><u>100</u></td> <td></td> <td style="text-align:center;">x 1 =</td> <td style="text-align:center;"><u>100</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align:center;"><u>0</u></td> <td></td> <td style="text-align:center;">x 2 =</td> <td style="text-align:center;"><u>0</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align:center;"><u>0</u></td> <td></td> <td style="text-align:center;">x 3 =</td> <td style="text-align:center;"><u>0</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align:center;"><u>0</u></td> <td></td> <td style="text-align:center;">x 4 =</td> <td style="text-align:center;"><u>0</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align:center;"><u>0</u></td> <td></td> <td style="text-align:center;">x 5 =</td> <td style="text-align:center;"><u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align:center;"><u>100</u></td> <td style="text-align:center;">(A)</td> <td></td> <td style="text-align:center;"><u>100</u> (B)</td> </tr> </table> <p style="text-align:right;">Prevalence Index = B/A = <u>1.00</u></p> <hr/> <p>Hydrophytic Vegetation Indicators:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0¹ <input type="checkbox"/> 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation¹ (Explain) <p>¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <hr/> <p>Definitions of Vegetation Strata:</p> <p>Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</p> <p>Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</p> <p>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</p> <p>Woody vines – All woody vines greater than 3.28 ft in height.</p> <hr/> <p>Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>						Total % Cover of:		Multiply by:		OBL species	<u>100</u>		x 1 =	<u>100</u>	FACW species	<u>0</u>		x 2 =	<u>0</u>	FAC species	<u>0</u>		x 3 =	<u>0</u>	FACU species	<u>0</u>		x 4 =	<u>0</u>	UPL species	<u>0</u>		x 5 =	<u>0</u>	Column Totals:	<u>100</u>	(A)		<u>100</u> (B)
	Total % Cover of:		Multiply by:																																				
OBL species	<u>100</u>		x 1 =	<u>100</u>																																			
FACW species	<u>0</u>		x 2 =	<u>0</u>																																			
FAC species	<u>0</u>		x 3 =	<u>0</u>																																			
FACU species	<u>0</u>		x 4 =	<u>0</u>																																			
UPL species	<u>0</u>		x 5 =	<u>0</u>																																			
Column Totals:	<u>100</u>	(A)		<u>100</u> (B)																																			
Remarks: (Include photo numbers here or on a separate sheet.)																																							

SOIL

Sampling Point: SP-52W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 2/1	100					Mucky Loam/Clay	
6 - 18	10YR 5/1	100					Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 18 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-53U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R21W
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Linear Slope (%): 2
 Subregion (LRR or MLRA): A Lat: 47.3364716 Long: -93.0499573 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plots are SP-52W and SP-54W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-53U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)														
2. <u>Abies balsamea</u>	<u>10</u>		<u>FAC</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>60%</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>70</u></td> <td>x 3 = <u>210</u></td> </tr> <tr> <td>FACU species <u>70</u></td> <td>x 4 = <u>280</u></td> </tr> <tr> <td>UPL species <u>20</u></td> <td>x 5 = <u>100</u></td> </tr> <tr> <td>Column Totals: <u>160</u> (A)</td> <td><u>590</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.69</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>70</u>	x 3 = <u>210</u>	FACU species <u>70</u>	x 4 = <u>280</u>	UPL species <u>20</u>	x 5 = <u>100</u>	Column Totals: <u>160</u> (A)	<u>590</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>70</u>	x 3 = <u>210</u>																	
FACU species <u>70</u>	x 4 = <u>280</u>																	
UPL species <u>20</u>	x 5 = <u>100</u>																	
Column Totals: <u>160</u> (A)	<u>590</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>10%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Fragaria virginiana</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Lotus corniculatus</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Eurybia macrophylla</u>	<u>10</u>		<u>UPL</u>															
4. <u>Hieracium caespitosum</u>	<u>10</u>		<u>UPL</u>															
5. _____																		
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>90%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>														
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-53U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 12	7.5YR 4/3	100					Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 12 inches below ground surface by compacted soil.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-54W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R21W
 Landform (hillslope, terrace, etc.): Ditch Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.336558 Long: -93.049921 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-30</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-14U. Wetland community is a shrub-carr, Type 6, PSS1A.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>20</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-54W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border: none;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>30</u></td> <td>x 1 = <u>30</u></td> </tr> <tr> <td>FACW species <u>50</u></td> <td>x 2 = <u>100</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>80</u> (A)</td> <td><u>130</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.63</u>	Total % Cover of:	Multiply by:	OBL species <u>30</u>	x 1 = <u>30</u>	FACW species <u>50</u>	x 2 = <u>100</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>80</u> (A)	<u>130</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>30</u>	x 1 = <u>30</u>																	
FACW species <u>50</u>	x 2 = <u>100</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>80</u> (A)	<u>130</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Salix discolor</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>50%</u> = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Scirpus cyperinus</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
2. <u>Typha angustifolia</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>30%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-54W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	7.5YR 3/2	100					Clay Loam	
2 - 20	7.5YR 4/2	80	7.5YR 4/6	20	C	M	Clay Loam	
20 - 24	7.5YR 4/2	90	7.5YR 4/6	10	C	M	Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 0

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-55W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R21W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.336953 Long: -93.049191 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-31</u>
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-56U. Wetland community is a shrub-carr, Type 6, PSS1B.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input checked="" type="checkbox"/> Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-55W

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>60</u></td> <td>x 1 = <u>60</u></td> </tr> <tr> <td>FACW species <u>50</u></td> <td>x 2 = <u>100</u></td> </tr> <tr> <td>FAC species <u>10</u></td> <td>x 3 = <u>30</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>120</u> (A)</td> <td><u>190</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.58</u>	Total % Cover of:	Multiply by:	OBL species <u>60</u>	x 1 = <u>60</u>	FACW species <u>50</u>	x 2 = <u>100</u>	FAC species <u>10</u>	x 3 = <u>30</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>120</u> (A)	<u>190</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>60</u>	x 1 = <u>60</u>																	
FACW species <u>50</u>	x 2 = <u>100</u>																	
FAC species <u>10</u>	x 3 = <u>30</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>120</u> (A)	<u>190</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Salix discolor</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Populus tremuloides</u>	<u>10</u>		<u>FAC</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
_____ = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Calamagrostis canadensis</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Scirpus cyperinus</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
_____ = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present?														
				Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>														

SOIL

Sampling Point: SP-55W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 12	7.5YR 4/4	70	7.5YR 4/6	20	C	M	Clay Loam	
0 - 12			7.5YR 5/1	10	D	M	Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 0

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 12 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-56U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R21W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Convex Slope (%): 3
 Subregion (LRR or MLRA): A Lat: 47.3368663 Long: -93.0493227 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-55W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-56U

	Absolute % Cover	Dominant Species?	Indicator Status																																	
Tree Stratum (Plot size: <u>30 ft r</u>)																																				
1. <u>Populus tremuloides</u>	<u>90</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)																																
2. _____																																				
3. _____																																				
4. _____																																				
5. _____																																				
6. _____																																				
7. _____																																				
	<u>90%</u>	= Total Cover																																		
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																																				
1. <u>Corylus cornuta</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;"></td> <td style="text-align:center;">Total % Cover of:</td> <td style="width:50%;"></td> <td style="text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td style="text-align:center;"><u>0</u></td> <td>x 1 =</td> <td style="text-align:center;"><u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align:center;"><u>0</u></td> <td>x 2 =</td> <td style="text-align:center;"><u>0</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align:center;"><u>140</u></td> <td>x 3 =</td> <td style="text-align:center;"><u>420</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align:center;"><u>15</u></td> <td>x 4 =</td> <td style="text-align:center;"><u>60</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align:center;"><u>50</u></td> <td>x 5 =</td> <td style="text-align:center;"><u>250</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align:center;"><u>205</u></td> <td>(A)</td> <td style="text-align:center;"><u>730</u> (B)</td> </tr> <tr> <td colspan="4" style="text-align:right;">Prevalence Index = B/A = <u>3.56</u></td> </tr> </table>		Total % Cover of:		Multiply by:	OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>0</u>	x 2 =	<u>0</u>	FAC species	<u>140</u>	x 3 =	<u>420</u>	FACU species	<u>15</u>	x 4 =	<u>60</u>	UPL species	<u>50</u>	x 5 =	<u>250</u>	Column Totals:	<u>205</u>	(A)	<u>730</u> (B)	Prevalence Index = B/A = <u>3.56</u>			
	Total % Cover of:		Multiply by:																																	
OBL species	<u>0</u>	x 1 =	<u>0</u>																																	
FACW species	<u>0</u>	x 2 =	<u>0</u>																																	
FAC species	<u>140</u>	x 3 =	<u>420</u>																																	
FACU species	<u>15</u>	x 4 =	<u>60</u>																																	
UPL species	<u>50</u>	x 5 =	<u>250</u>																																	
Column Totals:	<u>205</u>	(A)	<u>730</u> (B)																																	
Prevalence Index = B/A = <u>3.56</u>																																				
2. _____																																				
3. _____																																				
4. _____																																				
5. _____																																				
6. _____																																				
7. _____																																				
	<u>10%</u>	= Total Cover																																		
Herb Stratum (Plot size: <u>5 ft r</u>)																																				
1. <u>Diervilla lonicera</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>UPL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																																
2. <u>Rubus idaeus</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FAC</u>																																	
3. <u>Rosa acicularis</u>	<u>5</u>		<u>FACU</u>																																	
4. _____																																				
5. _____																																				
6. _____																																				
7. _____																																				
8. _____																																				
9. _____																																				
10. _____																																				
11. _____																																				
12. _____																																				
	<u>105%</u>	= Total Cover																																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																																				
1. _____																																				
2. _____																																				
3. _____																																				
4. _____																																				
		_____ = Total Cover																																		
Hydrophytic Vegetation Present?				Yes _____ No <input checked="" type="checkbox"/>																																
Remarks: (Include photo numbers here or on a separate sheet.)																																				

SOIL

Sampling Point: SP-56U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 4/3	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 6 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-57W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R21W
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.337352 Long: -93.04762 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-32</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-56U. Wetland community is a shrub-carr, Type 6, PSS1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-57W

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: center;">Total % Cover of:</td> <td style="width:50%; text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>70</u></td> <td>x 1 = <u>70</u></td> </tr> <tr> <td>FACW species <u>95</u></td> <td>x 2 = <u>190</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>165</u> (A)</td> <td><u>260</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.58</u>	Total % Cover of:	Multiply by:	OBL species <u>70</u>	x 1 = <u>70</u>	FACW species <u>95</u>	x 2 = <u>190</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>165</u> (A)	<u>260</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>70</u>	x 1 = <u>70</u>																	
FACW species <u>95</u>	x 2 = <u>190</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>165</u> (A)	<u>260</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Salix discolor</u>	<u>80</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Salix petiolaris</u>	<u>10</u>		<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Calamagrostis canadensis</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Scirpus cyperinus</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Doellingeria umbellata</u>	<u>5</u>		<u>FACW</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
_____ = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present?														
				Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>														

SOIL

Sampling Point: SP-57W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 8	10YR 4/2	60	10YR 5/1	20	D	M	Sandy Loam	
0 - 8			10YR 4/6	20	C	M	Sandy Loam	
8 - 16	7.5YR 4/4	60	7.5YR 5/1	20	D	M	Clay Loam	
8 - 16			7.5YR 5/6	20	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 8

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 16 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-58W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R21W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR or MLRA): A Lat: 47.337009 Long: -93.046958 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: PUBHx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-33</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-59U. Wetland community is a deep marsh, Type 4, PEM1F.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	___ Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> Surface Water (A1)	___ Drainage Patterns (B10)
___ Water-Stained Leaves (B9)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Saturation (A3)	___ Crayfish Burrows (C8)
<input checked="" type="checkbox"/> Water Marks (B1)	___ Saturation Visible on Aerial Imagery (C9)
___ Sediment Deposits (B2)	___ Stunted or Stressed Plants (D1)
___ Drift Deposits (B3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Algal Mat or Crust (B4)	___ Shallow Aquitard (D3)
___ Iron Deposits (B5)	___ Microtopographic Relief (D4)
___ Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
___ Sparsely Vegetated Concave Surface (B8)	

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>12</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-58W

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align: center;">Total % Cover of:</td> <td style="width:50%; text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>100</u></td> <td>x 1 = <u>100</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>100</u> (A)</td> <td><u>100</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.00</u>	Total % Cover of:	Multiply by:	OBL species <u>100</u>	x 1 = <u>100</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>100</u> (A)	<u>100</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>100</u>	x 1 = <u>100</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>100</u> (A)	<u>100</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Potamogeton natans</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Sagittaria graminea</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>100%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present?														
				Yes <input checked="" type="checkbox"/> No _____														

SOIL

Sampling Point: SP-58W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 24	10YR 5/1	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-59U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R21W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Linear Slope (%): 2
 Subregion (LRR or MLRA): A Lat: 47.337037 Long: -93.046732 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plots are SP-58W and SP-60W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-59U

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Betula papyrifera</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Picea glauca</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

40% = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Corylus cornuta</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Betula papyrifera</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. <u>Populus balsamifera</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
4. <u>Salix discolor</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

50% = Total Cover

Herb Stratum (Plot size: <u>5 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Eurybia macrophylla</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>UPL</u>
2. <u>Fragaria virginiana</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. <u>Hieracium aurantiacum</u>	<u>20</u>	_____	<u>UPL</u>
4. <u>Carex gracillima</u>	<u>5</u>	_____	<u>FACU</u>
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

115% = Total Cover

Woody Vine Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
_____	_____	_____	_____

_____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>20</u>	x 2 = <u>40</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>105</u>	x 4 = <u>420</u>
UPL species <u>80</u>	x 5 = <u>400</u>
Column Totals: <u>205</u> (A)	<u>860</u> (B)

Prevalence Index = B/A = 4.20

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-59U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 12	7.5YR 4/4	100					Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 12 inches below ground surface by compacted soil.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-60W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S18, T56N, R21W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.33733 Long: -93.046008 Datum: NAD 83
 Soil Map Unit Name: B33A, McQuade-Fayal, depressional, complex, 0 to 2 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-34</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-59U. Wetland community is a shallow marsh, Type 3, PEM1C.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-60W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border: none;"> <tr> <td style="width:50%; text-align: right;">Total % Cover of:</td> <td style="width:50%; text-align: left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>110</u></td> <td>x 1 = <u>110</u></td> </tr> <tr> <td>FACW species <u>10</u></td> <td>x 2 = <u>20</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>120</u> (A)</td> <td><u>130</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.08</u>	Total % Cover of:	Multiply by:	OBL species <u>110</u>	x 1 = <u>110</u>	FACW species <u>10</u>	x 2 = <u>20</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>120</u> (A)	<u>130</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>110</u>	x 1 = <u>110</u>																	
FACW species <u>10</u>	x 2 = <u>20</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>120</u> (A)	<u>130</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Salix petiolaris</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Typha angustifolia</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
2. <u>Bidens cernua</u>	<u>10</u>	_____	<u>OBL</u>															
3. <u>Calamagrostis canadensis</u>	<u>10</u>	_____	<u>OBL</u>															
4. <u>Carex comosa</u>	<u>10</u>	_____	<u>OBL</u>															
5. <u>Glyceria canadensis</u>	<u>10</u>	_____	<u>OBL</u>															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
_____ = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														

SOIL

Sampling Point: SP-60W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR 2/2	100					Mucky Loam/Clay	
4 - 14	10YR 5/2	80	10YR 5/6	20	C	M	Sandy Loam	
14 - 24	7.5YR 4/4	60	7.5YR 4/6	30	C	M	Clay Loam	
14 - 24			7.5YR 5/1	10	D	M	Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 14

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-61W
 Investigator(s): CJE, PLL Section, Township, Range: S17, T56N, R21W
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 0
 Subregion (LRR or MLRA): A Lat: 47.3379015 Long: -93.0405043 Datum: NAD 83
 Soil Map Unit Name: 1050, Tailings basin NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-35</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-62U. Wetland community is an alder thicket, Type 6, PSS1B.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	<input checked="" type="checkbox"/> Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	
___ Marl Deposits (B15)	
___ Hydrogen Sulfide Odor (C1)	
___ Oxidized Rhizospheres on Living Roots (C3)	
___ Presence of Reduced Iron (C4)	
___ Recent Iron Reduction in Tilled Soils (C6)	
___ Thin Muck Surface (C7)	
___ Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-61W

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. <u>Salix discolor</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>20%</u> = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>40</u></td> <td>x 1 = <u>40</u></td> </tr> <tr> <td>FACW species <u>115</u></td> <td>x 2 = <u>230</u></td> </tr> <tr> <td>FAC species <u>15</u></td> <td>x 3 = <u>45</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>170</u> (A)</td> <td><u>315</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.85</u>	Total % Cover of:	Multiply by:	OBL species <u>40</u>	x 1 = <u>40</u>	FACW species <u>115</u>	x 2 = <u>230</u>	FAC species <u>15</u>	x 3 = <u>45</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>170</u> (A)	<u>315</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>40</u>	x 1 = <u>40</u>																	
FACW species <u>115</u>	x 2 = <u>230</u>																	
FAC species <u>15</u>	x 3 = <u>45</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>170</u> (A)	<u>315</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>85</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Salix discolor</u>	<u>5</u>	_____	<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>90%</u> = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Carex trisperma</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Impatiens capensis</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Scirpus atrovirens</u>	<u>10</u>	_____	<u>OBL</u>															
4. <u>Equisetum palustre</u>	<u>5</u>	_____	<u>FACW</u>															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>60%</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
<table style="width:100%; border:none;"> <tr> <td style="width:60%;">Hydrophytic Vegetation Present?</td> <td style="width:20%; text-align:center">Yes <input checked="" type="checkbox"/></td> <td style="width:20%; text-align:center">No _____</td> </tr> </table>					Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No _____											
Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No _____																

Remarks: (Include photo numbers here or on a separate sheet.)

Moss cover 15%

SOIL

Sampling Point: SP-61W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 1	10YR 2/1	100					Silt Loam	
1 - 8	10YR 4/2	90	10YR 4/6	10	C	M	Sandy Clay	
8 - 18	10YR 5/3	50					Sandy Clay	
8 - 18	10YR 4/3	50					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 1

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 18 inches below ground surface by compacted soil.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-62U
 Investigator(s): CJE PLL Section, Township, Range: S17, T56N, R21W
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR or MLRA): A Lat: 47.3378410 Long: -93.0402080 Datum: NAD 83
 Soil Map Unit Name: 1050, Tailings basin NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plots are SP-61W and SP-63W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-62U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>35</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)														
2. <u>Betula papyrifera</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Ulmus americana</u>	<u>7</u>		<u>FACW</u>															
4. <u>Abies balsamea</u>	<u>3</u>		<u>FAC</u>															
5. _____																		
6. _____																		
7. _____																		
	<u>65%</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>7</u></td> <td>x 2 = <u>14</u></td> </tr> <tr> <td>FAC species <u>113</u></td> <td>x 3 = <u>339</u></td> </tr> <tr> <td>FACU species <u>75</u></td> <td>x 4 = <u>300</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>195</u> (A)</td> <td><u>653</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.35</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>7</u>	x 2 = <u>14</u>	FAC species <u>113</u>	x 3 = <u>339</u>	FACU species <u>75</u>	x 4 = <u>300</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>195</u> (A)	<u>653</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>7</u>	x 2 = <u>14</u>																	
FAC species <u>113</u>	x 3 = <u>339</u>																	
FACU species <u>75</u>	x 4 = <u>300</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>195</u> (A)	<u>653</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
2. <u>Betula papyrifera</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>20%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Rubus idaeus</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Pteridium aquilinum</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Rosa blanda</u>	<u>15</u>		<u>FACU</u>															
4. <u>Aralia nudicaulis</u>	<u>5</u>		<u>FACU</u>															
5. <u>Galium aparine</u>	<u>5</u>		<u>FACU</u>															
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>110%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>														
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-62U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 2/1	100					Loam	
2 - 12	10YR 3/3	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 12 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-63W
 Investigator(s): CJE PLL Section, Township, Range: S17, T56N, R21W
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.33773 Long: -93.039869 Datum: NAD 83
 Soil Map Unit Name: 1050, Tailings basin NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-35</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-14U. Wetland community is a shallow marsh, Type 3, PEM1C.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	<input checked="" type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input checked="" type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-63W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)	
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>3</u> (B)	
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
_____ = Total Cover				Prevalence Index worksheet:	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)				Total % Cover of: _____ Multiply by: _____	
1. <u>Alnus incana</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	OBL species <u>110</u>	x 1 = <u>110</u>
2. _____	_____	_____	_____	FACW species <u>20</u>	x 2 = <u>40</u>
3. _____	_____	_____	_____	FAC species <u>0</u>	x 3 = <u>0</u>
4. _____	_____	_____	_____	FACU species <u>0</u>	x 4 = <u>0</u>
5. _____	_____	_____	_____	UPL species <u>0</u>	x 5 = <u>0</u>
6. _____	_____	_____	_____	Column Totals: <u>130</u> (A)	<u>150</u> (B)
7. _____	_____	_____	_____	Prevalence Index = B/A = <u>1.15</u>	
<u>20%</u> = Total Cover				Hydrophytic Vegetation Indicators:	
Herb Stratum (Plot size: <u>5 ft r</u>)				<input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation	
1. <u>Scirpus cyperinus</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	<input checked="" type="checkbox"/> 2 - Dominance Test is >50%	
2. <u>Glyceria grandis</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	<input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹	
3. <u>Persicaria amphibia</u>	<u>15</u>	_____	<u>OBL</u>	___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
4. <u>Carex bebbii</u>	<u>10</u>	_____	<u>OBL</u>	___ Problematic Hydrophytic Vegetation ¹ (Explain)	
5. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
6. _____	_____	_____	_____	Definitions of Vegetation Strata:	
7. _____	_____	_____	_____	Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.	
8. _____	_____	_____	_____	Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.	
9. _____	_____	_____	_____	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.	
10. _____	_____	_____	_____	Woody vines – All woody vines greater than 3.28 ft in height.	
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
<u>110%</u> = Total Cover					
Woody Vine Stratum (Plot size: <u>30 ft r</u>)					
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
_____ = Total Cover					
Remarks: (Include photo numbers here or on a separate sheet.)					

SOIL

Sampling Point: SP-63W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 1	10YR 2/2	100					Sandy Loam	
1 - 10	7.5YR 5/2	70	10YR 4/6	30	C	M	Sandy Clay	
10 - 18	10YR 4/3	90	10YR 5/6	10	C	PL	Sandy Clay	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil

Depth (inches): 1

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 18 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-64W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S17, T56N, R21W
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.338904 Long: -93.035989 Datum: NAD 83
 Soil Map Unit Name: B33A, McQuade-Fayal, depressional, complex, 0 to 2 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-36</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-65U. Wetland community is an alder thicket, Type 6, PSS1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-64W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>75</u></td> <td>x 1 = <u>75</u></td> </tr> <tr> <td>FACW species <u>105</u></td> <td>x 2 = <u>210</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>180</u> (A)</td> <td><u>285</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.58</u>	Total % Cover of:	Multiply by:	OBL species <u>75</u>	x 1 = <u>75</u>	FACW species <u>105</u>	x 2 = <u>210</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>180</u> (A)	<u>285</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>75</u>	x 1 = <u>75</u>																	
FACW species <u>105</u>	x 2 = <u>210</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>180</u> (A)	<u>285</u> (B)																	
<u>80%</u> = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>80</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>80%</u> = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Calamagrostis canadensis</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Scirpus cyperinus</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Equisetum sylvaticum</u>	<u>10</u>	_____	<u>FACW</u>															
4. <u>Rubus pubescens</u>	<u>10</u>	_____	<u>FACW</u>															
5. <u>Cicuta maculata</u>	<u>5</u>	_____	<u>OBL</u>															
6. <u>Poa palustris</u>	<u>5</u>	_____	<u>FACW</u>															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>100%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)																		
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																		
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																		
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-64W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 3/2	100					Loam	
2 - 12	10YR 6/2	70	10YR 5/6	20	C	M	Sandy Loam	
2 - 12			10YR 5/1	10	D	M	Sandy Loam	
12 - 18	7.5YR 4/4	80	7.5YR 5/8	20	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 12

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 18 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-65U
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S17, T56N, R21W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Convex Slope (%): 3
 Subregion (LRR or MLRA): A Lat: 47.339073 Long: -93.036071 Datum: NAD 83
 Soil Map Unit Name: B33A, McQuade-Fayal, depressional, complex, 0 to 2 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plots are SP-64W and SP-66W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-65U

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Betula papyrifera</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Populus tremuloides</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

100% = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Corylus cornuta</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____

30% = Total Cover

Herb Stratum (Plot size: <u>5 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Eurybia macrophylla</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>UPL</u>
2. <u>Rubus idaeus</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
3. <u>Pteridium aquilinum</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
4. <u>Carex pensylvanica</u>	<u>15</u>	_____	<u>UPL</u>
5. <u>Osmorhiza claytonii</u>	<u>10</u>	_____	<u>FACU</u>
6. <u>Fragaria virginiana</u>	<u>5</u>	_____	<u>FACU</u>
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____

140% = Total Cover

Woody Vine Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

_____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>70</u>	x 3 = <u>210</u>
FACU species <u>145</u>	x 4 = <u>580</u>
UPL species <u>55</u>	x 5 = <u>275</u>
Column Totals: <u>270</u> (A)	<u>1065</u> (B)

Prevalence Index = B/A = 3.94

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-65U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 3/2	100					Loamy Sand	
2 - 12	10YR 4/3	100					Loamy Sand	
12 - 24	10YR 6/4	100					Loamy Sand	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-13
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-66W
 Investigator(s): MJS2, AMJ2 Section, Township, Range: S17, T56N, R21W
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.3393179 Long: -93.0362484 Datum: NAD 83
 Soil Map Unit Name: 1050, Tailings basin NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-37</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-65U. Wetland community is a shrub-carr, Type 6, PSS1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-66W

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30 ft r</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)				
1. <u>Salix discolor</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
2. <u>Alnus incana</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
3. <u>Salix petiolaris</u>	<u>10</u>		<u>FACW</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	<u>80%</u> = Total Cover			
Herb Stratum (Plot size: <u>5 ft r</u>)				
1. <u>Calamagrostis canadensis</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
2. <u>Scirpus cyperinus</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
3. <u>Doellingeria umbellata</u>	<u>5</u>		<u>FACW</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	<u>75%</u> = Total Cover			
Woody Vine Stratum (Plot size: <u>30 ft r</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	_____ = Total Cover			
Remarks: (Include photo numbers here or on a separate sheet.)				

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>70</u>	x 1 = <u>70</u>
FACW species <u>85</u>	x 2 = <u>170</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>155</u> (A)	<u>240</u> (B)

Prevalence Index = B/A = 1.55

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

SOIL

Sampling Point: SP-66W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 8	10YR 4/2	60	10YR 5/1	20	D	M	Sandy Loam	
0 - 8			10YR 4/6	20	C	M	Sandy Loam	
8 - 16	7.5YR 4/4	60	7.5YR 5/1	20	D	M	Clay Loam	
8 - 16			7.5YR 5/6	20	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 8

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 16 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-67W
 Investigator(s): CJE PLL Section, Township, Range: S17, T56N, R21W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR or MLRA): A Lat: 47.340653 Long: -93.032929 Datum: NAD 83
 Soil Map Unit Name: B33A, McQuade-Fayal, depressional, complex, 0 to 2 percent slopes NWI classification: PSS1D

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-38</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-68U. Wetland community is an alder thicket, Type 6, PSS1B.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	___ <input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	___ Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ <input checked="" type="checkbox"/> Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	___ <input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-67W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Populus tremuloides</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. <u>Salix discolor</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
<u>10%</u> = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>30</u></td> <td>x 1 = <u>30</u></td> </tr> <tr> <td>FACW species <u>85</u></td> <td>x 2 = <u>170</u></td> </tr> <tr> <td>FAC species <u>10</u></td> <td>x 3 = <u>30</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>125</u> (A)</td> <td><u>230</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.84</u>	Total % Cover of:	Multiply by:	OBL species <u>30</u>	x 1 = <u>30</u>	FACW species <u>85</u>	x 2 = <u>170</u>	FAC species <u>10</u>	x 3 = <u>30</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>125</u> (A)	<u>230</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>30</u>	x 1 = <u>30</u>																	
FACW species <u>85</u>	x 2 = <u>170</u>																	
FAC species <u>10</u>	x 3 = <u>30</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>125</u> (A)	<u>230</u> (B)																	
<u>75%</u> = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Salix discolor</u>	<u>5</u>		<u>FACW</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
<u>75%</u> = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Carex lacustris</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Ribes triste</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Equisetum palustre</u>	<u>5</u>		<u>FACW</u>															
4. <u>Populus tremuloides</u>	<u>5</u>		<u>FAC</u>															
5. _____																		
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
<u>40%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
_____ = Total Cover																		
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____																		

Remarks: (Include photo numbers here or on a separate sheet.)

Sparingly vegetated herb layer. Plants stressed due to dry conditions.

SOIL

Sampling Point: SP-67W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 2/1	95	10YR 4/6	5	C	PL / M	Loam	
6 - 12	10YR 5/2	90	10YR 4/6	10	C	M	Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 12 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-68U
 Investigator(s): CJE PLL Section, Township, Range: S17, T56N, R21W
 Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): None Slope (%): 2
 Subregion (LRR or MLRA): K Lat: 47.340974 Long: -93.033368 Datum: NAD 83
 Soil Map Unit Name: B33A, McQuade-Fayal, depressional, complex, 0 to 2 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-67W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
---	--

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-68U

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Populus tremuloides</u>	<u>80</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. <u>Ostrya virginiana</u>	<u>10</u>		<u>FACU</u>
3. _____	_____		_____
4. _____	_____		_____
5. _____	_____		_____
6. _____	_____		_____
7. _____	_____		_____

90% = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Corylus cornuta</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Rhamnus cathartica</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
3. <u>Populus tremuloides</u>	<u>5</u>		<u>FAC</u>
4. _____	_____		_____
5. _____	_____		_____
6. _____	_____		_____
7. _____	_____		_____

35% = Total Cover

Herb Stratum (Plot size: <u>5 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Rubus pubescens</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
2. <u>Agrimonia striata</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. <u>Carex pensylvanica</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>UPL</u>
4. <u>Corylus cornuta</u>	<u>5</u>		<u>FACU</u>
5. <u>Petasites hybridus</u>	<u>5</u>		<u>FAC</u>
6. <u>Ribes cynosbati</u>	<u>5</u>		<u>FACU</u>
7. _____	_____		_____
8. _____	_____		_____
9. _____	_____		_____
10. _____	_____		_____
11. _____	_____		_____
12. _____	_____		_____

65% = Total Cover

Woody Vine Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____		_____
2. _____	_____		_____
3. _____	_____		_____
4. _____	_____		_____

_____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>30</u>	x 2 = <u>60</u>
FAC species <u>100</u>	x 3 = <u>300</u>
FACU species <u>50</u>	x 4 = <u>200</u>
UPL species <u>10</u>	x 5 = <u>50</u>
Column Totals: <u>190</u> (A)	<u>610</u> (B)

Prevalence Index = B/A = 3.21

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-68U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 3	10YR 2/1	100					Loam	
3 - 7	10YR 3/2	100					Sandy Loam	
7 - 8	10YR 3/3	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 8 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-69W
 Investigator(s): CJE PLL Section, Township, Range: S8, T56N, R21W
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 0
 Subregion (LRR or MLRA): A Lat: 47.349851 Long: -93.022613 Datum: NAD 83
 Soil Map Unit Name: B28B, Buhl loam, 1 to 5 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-41</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-70U. Wetland community is an alder thicket, Type 6, PSS1B.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	
___ Marl Deposits (B15)	
___ Hydrogen Sulfide Odor (C1)	
___ Oxidized Rhizospheres on Living Roots (C3)	
___ Presence of Reduced Iron (C4)	
___ Recent Iron Reduction in Tilled Soils (C6)	
___ Thin Muck Surface (C7)	
___ Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-69W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>20</u></td> <td>x 1 = <u>20</u></td> </tr> <tr> <td>FACW species <u>105</u></td> <td>x 2 = <u>210</u></td> </tr> <tr> <td>FAC species <u>25</u></td> <td>x 3 = <u>75</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>150</u> (A)</td> <td><u>305</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.03</u>	Total % Cover of:	Multiply by:	OBL species <u>20</u>	x 1 = <u>20</u>	FACW species <u>105</u>	x 2 = <u>210</u>	FAC species <u>25</u>	x 3 = <u>75</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>150</u> (A)	<u>305</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>20</u>	x 1 = <u>20</u>																	
FACW species <u>105</u>	x 2 = <u>210</u>																	
FAC species <u>25</u>	x 3 = <u>75</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>150</u> (A)	<u>305</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
1. <u>Alnus incana</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
<u>50%</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
Herb Stratum (Plot size: <u>5 ft r</u>)					Footnote: ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.													
1. <u>Impatiens capensis</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Equisetum palustre</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Rubus idaeus</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
4. <u>Athyrium angustum</u>	<u>10</u>	_____	<u>FAC</u>															
5. <u>Calamagrostis canadensis</u>	<u>10</u>	_____	<u>OBL</u>															
6. <u>Scirpus atrovirens</u>	<u>10</u>	_____	<u>OBL</u>															
7. <u>Salix discolor</u>	<u>5</u>	_____	<u>FACW</u>															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
<u>100%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-69W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 4/2	90	10YR 4/6	10	C	PL / M	Silt Loam	
6 - 10	10YR 5/2	90	10YR 5/6	10	C	M	Clay Loam	
10 - 24	7.5YR 4/3	95	7.5YR 4/6	5	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 6

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-04
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-70U
 Investigator(s): CJE PLL Section, Township, Range: S8, T56N, R21W
 Landform (hillslope, terrace, etc.): Upland Local relief (concave, convex, none): Convex Slope (%): 1
 Subregion (LRR or MLRA): K Lat: 47.34986 Long: -93.022804 Datum: NAD 83
 Soil Map Unit Name: B27A, McQuade-Buhl complex, 0 to 3 complex slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-69W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-70U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33.3</u> (A/B)														
2. <u>Abies balsamea</u>	<u>5</u>		<u>FAC</u>															
3. <u>Betula papyrifera</u>	<u>5</u>		<u>FACU</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>70%</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>20</u></td> <td>x 2 = <u>40</u></td> </tr> <tr> <td>FAC species <u>70</u></td> <td>x 3 = <u>210</u></td> </tr> <tr> <td>FACU species <u>113</u></td> <td>x 4 = <u>452</u></td> </tr> <tr> <td>UPL species <u>20</u></td> <td>x 5 = <u>100</u></td> </tr> <tr> <td>Column Totals: <u>223</u></td> <td>(A) <u>802</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.60</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>20</u>	x 2 = <u>40</u>	FAC species <u>70</u>	x 3 = <u>210</u>	FACU species <u>113</u>	x 4 = <u>452</u>	UPL species <u>20</u>	x 5 = <u>100</u>	Column Totals: <u>223</u>	(A) <u>802</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>20</u>	x 2 = <u>40</u>																	
FAC species <u>70</u>	x 3 = <u>210</u>																	
FACU species <u>113</u>	x 4 = <u>452</u>																	
UPL species <u>20</u>	x 5 = <u>100</u>																	
Column Totals: <u>223</u>	(A) <u>802</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Corylus cornuta</u>	<u>45</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
2. <u>Abies balsamea</u>	<u>5</u>		<u>FAC</u>															
3. <u>Fraxinus nigra</u>	<u>5</u>		<u>FACW</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>55%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Pteridium aquilinum</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Eurybia macrophylla</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>UPL</u>															
3. <u>Fragaria virginiana</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
4. <u>Rubus pubescens</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
5. <u>Corylus cornuta</u>	<u>10</u>		<u>FACU</u>															
6. <u>Diervilla lonicera</u>	<u>10</u>		<u>NI</u>															
7. <u>Streptopus lanceolatus</u>	<u>5</u>		<u>FACU</u>															
8. <u>Trifolium pratense</u>	<u>3</u>		<u>FACU</u>															
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>108%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>														
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-70U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR 3/2	100					Loam	
4 - 8	10YR 4/3	100					Loam	
8 - 12	10YR 5/3	100					Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 12 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-71W
 Investigator(s): CJE PLL Section, Township, Range: S9, T56N, R21W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR or MLRA): K Lat: 47.352327 Long: -93.019187 Datum: NAD 83
 Soil Map Unit Name: B28B, Buhl loam, 1 to 5 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-43</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-72U. Wetland community is a hardwood swamp, Type 7, PFO1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	<input checked="" type="checkbox"/> Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	___ Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	
___ Marl Deposits (B15)	
___ Hydrogen Sulfide Odor (C1)	
___ Oxidized Rhizospheres on Living Roots (C3)	
___ Presence of Reduced Iron (C4)	
___ Recent Iron Reduction in Tilled Soils (C6)	
___ Thin Muck Surface (C7)	
___ Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-71W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Populus tremuloides</u>	<u>35</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. <u>Fraxinus nigra</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
3. <u>Acer rubrum</u>	<u>5</u>		<u>FAC</u>
4. _____	_____		_____
5. _____	_____		_____
6. _____	_____		_____
7. _____	_____		_____

60% = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Fraxinus nigra</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
2. <u>Acer rubrum</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
3. <u>Corylus americana</u>	<u>5</u>		<u>FACU</u>
4. _____	_____		_____
5. _____	_____		_____
6. _____	_____		_____
7. _____	_____		_____

30% = Total Cover

Herb Stratum (Plot size: <u>5 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Rubus pubescens</u>	<u>35</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
2. <u>Fraxinus nigra</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
3. <u>Poa palustris</u>	<u>15</u>		<u>FACW</u>
4. <u>Gymnocarpium dryopteris</u>	<u>10</u>		<u>FACU</u>
5. <u>Acer rubrum</u>	<u>5</u>		<u>FAC</u>
6. _____	_____		_____
7. _____	_____		_____
8. _____	_____		_____
9. _____	_____		_____
10. _____	_____		_____
11. _____	_____		_____
12. _____	_____		_____

85% = Total Cover

Woody Vine Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____		_____
2. _____	_____		_____
3. _____	_____		_____
4. _____	_____		_____

_____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>105</u>	x 2 = <u>210</u>
FAC species <u>55</u>	x 3 = <u>165</u>
FACU species <u>15</u>	x 4 = <u>60</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>175</u> (A)	<u>435</u> (B)

Prevalence Index = B/A = 2.49

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation perching on tree roots. Concave surfaces are mostly un vegetated.

SOIL

Sampling Point: SP-71W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 3	10YR 2/1	95	10YR 4/4	5	C	PL	Loam	
3 - 6	10YR 5/1	100					Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock
 Depth (inches): 6

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 6 inches below ground surface by rock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-72U
 Investigator(s): CJE PLL Section, Township, Range: S9, T56N, R21W
 Landform (hillslope, terrace, etc.): Upland Local relief (concave, convex, none): Linear Slope (%): 2
 Subregion (LRR or MLRA): K Lat: 47.352418 Long: -93.019531 Datum: NAD 83
 Soil Map Unit Name: B28B, Buhl loam, 1 to 5 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-71W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-72U

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Populus tremuloides</u>	<u>55</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
2. <u>Acer rubrum</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FAC</u>
3. <u>Betula papyrifera</u>	<u>5</u>		<u>FACU</u>
4. _____	_____		_____
5. _____	_____		_____
6. _____	_____		_____
7. _____	_____		_____

75% = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Corylus cornuta</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. _____	_____		_____
3. _____	_____		_____
4. _____	_____		_____
5. _____	_____		_____
6. _____	_____		_____
7. _____	_____		_____

40% = Total Cover

Herb Stratum (Plot size: <u>5 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Eurybia macrophylla</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>UPL</u>
2. <u>Streptopus lanceolatus</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. <u>Aralia nudicaulis</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
4. <u>Carex pensylvanica</u>	<u>5</u>		<u>UPL</u>
5. <u>Rubus pubescens</u>	<u>5</u>		<u>FACW</u>
6. _____	_____		_____
7. _____	_____		_____
8. _____	_____		_____
9. _____	_____		_____
10. _____	_____		_____
11. _____	_____		_____
12. _____	_____		_____

100% = Total Cover

Woody Vine Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____		_____
2. _____	_____		_____
3. _____	_____		_____
4. _____	_____		_____

_____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>5</u>	x 2 = <u>10</u>
FAC species <u>70</u>	x 3 = <u>210</u>
FACU species <u>95</u>	x 4 = <u>380</u>
UPL species <u>45</u>	x 5 = <u>225</u>
Column Totals: <u>215</u> (A)	<u>825</u> (B)

Prevalence Index = B/A = 3.84

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-72U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR 3/1	100					Sandy Loam	
4 - 12	10YR 4/3	80	10YR 4/6	20	C	M	Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 12 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-73W
 Investigator(s): CJE, PLL Section, Township, Range: S4, T56N, R21W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR or MLRA): K Lat: 47.360351 Long: -93.01605 Datum: NAD 83
 Soil Map Unit Name: 1050, Tailings basin NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-46</u>
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Remarks: (Explain alternative procedures here or in a separate report.)

Dryer than normal Plot is located in a wetland, corresponding upland plot is SP-74U. Wetland community is a fresh (wet) meadow, Type 2, PEM1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:	
Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-73W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>35</u></td> <td>x 1 = <u>35</u></td> </tr> <tr> <td>FACW species <u>50</u></td> <td>x 2 = <u>100</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>85</u> (A)</td> <td><u>135</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.59</u>	Total % Cover of:	Multiply by:	OBL species <u>35</u>	x 1 = <u>35</u>	FACW species <u>50</u>	x 2 = <u>100</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>85</u> (A)	<u>135</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>35</u>	x 1 = <u>35</u>																	
FACW species <u>50</u>	x 2 = <u>100</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>85</u> (A)	<u>135</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)														
1. <u>Salix discolor</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
<u>25%</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
Herb Stratum (Plot size: <u>5 ft r</u>)					¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.													
1. <u>Carex lacustris</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Salix discolor</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Scirpus cyperinus</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
4. <u>Equisetum sylvaticum</u>	<u>10</u>	_____	<u>FACW</u>															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
<u>60%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		
Moss covers approximately 30 percent of the bare ground.																		

SOIL

Sampling Point: SP-73W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 1	10YR 2/1	100					Mucky Loam/Clay	
1 - 12	10YR 4/2	75	7.5YR 4/6	25	C	M	Clay Loam	
12 - 18	7.5YR 3/3	90	7.5YR 4/6	10	C	M	Clay	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 1

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-74U
 Investigator(s): CJE, PLL Section, Township, Range: S4, T56N, R21W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Linear Slope (%): 3
 Subregion (LRR or MLRA): K Lat: 47.3602709 Long: -93.0176824 Datum: NAD 83
 Soil Map Unit Name: 1050, Tailings basin NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-73W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-74U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)														
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>10%</u>			Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>23</u></td> <td>x 2 = <u>46</u></td> </tr> <tr> <td>FAC species <u>30</u></td> <td>x 3 = <u>90</u></td> </tr> <tr> <td>FACU species <u>70</u></td> <td>x 4 = <u>280</u></td> </tr> <tr> <td>UPL species <u>20</u></td> <td>x 5 = <u>100</u></td> </tr> <tr> <td>Column Totals: <u>143</u> (A)</td> <td><u>516</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.61</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>23</u>	x 2 = <u>46</u>	FAC species <u>30</u>	x 3 = <u>90</u>	FACU species <u>70</u>	x 4 = <u>280</u>	UPL species <u>20</u>	x 5 = <u>100</u>	Column Totals: <u>143</u> (A)	<u>516</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>23</u>	x 2 = <u>46</u>																	
FAC species <u>30</u>	x 3 = <u>90</u>																	
FACU species <u>70</u>	x 4 = <u>280</u>																	
UPL species <u>20</u>	x 5 = <u>100</u>																	
Column Totals: <u>143</u> (A)	<u>516</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
2. <u>Salix discolor</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Alnus incana</u>	<u>5</u>		<u>FACW</u>															
4. <u>Populus balsamifera</u>	<u>3</u>		<u>FACW</u>															
5. _____																		
6. _____																		
7. _____																		
	<u>43%</u>																	
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Hieracium aurantiacum</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>UPL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Viola pubescens</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Lotus corniculatus</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
4. <u>Achillea millefolium</u>	<u>10</u>		<u>FACU</u>															
5. <u>Fragaria virginiana</u>	<u>10</u>		<u>FACU</u>															
6. <u>Poa pratensis</u>	<u>10</u>		<u>FACU</u>															
7. <u>Trifolium hybridum</u>	<u>5</u>		<u>FACU</u>															
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>90%</u>																	
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
	_____ = Total Cover																	
Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-74U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 4/3	100					Sandy Loam	
6 - 10	7.5YR 5/2	100					Clay	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 6

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 10 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin - CJE_PLL City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-75W
 Investigator(s): CJE PLL Section, Township, Range: S4, T56N, R21W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): K Lat: 47.364037 Long: -93.017655 Datum: NAD 83
 Soil Map Unit Name: 1050, Tailings basin NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-48</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-76U. Wetland community is a shallow marsh, Type 3, PEM1C.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-75W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border: none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>70</u></td> <td>x 1 = <u>70</u></td> </tr> <tr> <td>FACW species <u>48</u></td> <td>x 2 = <u>96</u></td> </tr> <tr> <td>FAC species <u>2</u></td> <td>x 3 = <u>6</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>120</u> (A)</td> <td><u>172</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.43</u>	Total % Cover of:	Multiply by:	OBL species <u>70</u>	x 1 = <u>70</u>	FACW species <u>48</u>	x 2 = <u>96</u>	FAC species <u>2</u>	x 3 = <u>6</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>120</u> (A)	<u>172</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>70</u>	x 1 = <u>70</u>																	
FACW species <u>48</u>	x 2 = <u>96</u>																	
FAC species <u>2</u>	x 3 = <u>6</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>120</u> (A)	<u>172</u> (B)																	
_____ = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Salix discolor</u>	<u>3</u>		<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover																		
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Typha latifolia</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Calamagrostis canadensis</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Equisetum sylvaticum</u>	<u>20</u>		<u>FACW</u>															
4. <u>Galium asprellum</u>	<u>10</u>		<u>OBL</u>															
5. <u>Mentha arvensis</u>	<u>10</u>		<u>FACW</u>															
6. <u>Scirpus cyperinus</u>	<u>5</u>		<u>OBL</u>															
7. <u>Rumex crispus</u>	<u>2</u>		<u>FAC</u>															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
_____ = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																		
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																		
Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																		
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-75W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 1	10YR 2/1	100					Muck	
1 - 13	10YR 5/2	70	10YR 5/4	30	C	M	Sandy Clay	
13 - 24	10YR 4/2	60	7.5YR 5/6	40	C	M	Clay	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil

Depth (inches): 1

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-76U
 Investigator(s): CJE, PLL Section, Township, Range: S4, T56N, R21W
 Landform (hillslope, terrace, etc.): Upland, Flat Local relief (concave, convex, none): Linear Slope (%): 1
 Subregion (LRR or MLRA): K Lat: 47.363956 Long: -93.017762 Datum: NAD 83
 Soil Map Unit Name: 1050, Tailings basin NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-75W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-76U

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Populus balsamifera</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
2. <u>Picea glauca</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. <u>Larix laricina</u>	<u>5</u>		<u>FACW</u>
4. _____	_____		_____
5. _____	_____		_____
6. _____	_____		_____
7. _____	_____		_____

30% = Total Cover

Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Populus balsamifera</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>
2. <u>Picea glauca</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. <u>Salix humilis</u>	<u>5</u>		<u>FACU</u>
4. _____	_____		_____
5. _____	_____		_____
6. _____	_____		_____
7. _____	_____		_____

30% = Total Cover

Herb Stratum (Plot size: <u>5 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Fragaria virginiana</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
2. <u>Poa pratensis</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
3. <u>Trifolium hybridum</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>
4. <u>Achillea millefolium</u>	<u>10</u>		<u>FACU</u>
5. <u>Hieracium aurantiacum</u>	<u>10</u>		<u>UPL</u>
6. <u>Taraxacum officinale</u>	<u>10</u>		<u>FACU</u>
7. <u>Lotus corniculatus</u>	<u>5</u>		<u>FACU</u>
8. _____	_____		_____
9. _____	_____		_____
10. _____	_____		_____
11. _____	_____		_____
12. _____	_____		_____

85% = Total Cover

Woody Vine Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____		_____
2. _____	_____		_____
3. _____	_____		_____
4. _____	_____		_____

_____ = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 28.6 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>35</u>	x 2 = <u>70</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>100</u>	x 4 = <u>400</u>
UPL species <u>10</u>	x 5 = <u>50</u>
Column Totals: <u>145</u> (A)	<u>520</u> (B)

Prevalence Index = B/A = 3.59

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP-76U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 2/1	100					Loam	
2 - 6	10YR 4/3	70	10YR 4/6	30	C	M	Sandy Clay	
6 - 18	10YR 5/3	80	7.5YR 4/6	20	C	M	Sandy Clay	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 18 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-77W
 Investigator(s): CJE PLL Section, Township, Range: S4, T56N, R21W
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 0
 Subregion (LRR or MLRA): K Lat: 47.366891 Long: -93.016684 Datum: NAD 83
 Soil Map Unit Name: B28B, Buhl loam, 1 to 5 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-47</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-78U. Wetland community is a shrub-carr, Type 6, PSS1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	___ Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> Surface Water (A1)	___ Drainage Patterns (B10)
___ Water-Stained Leaves (B9)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Saturation (A3)	___ Crayfish Burrows (C8)
___ Water Marks (B1)	___ Saturation Visible on Aerial Imagery (C9)
___ Sediment Deposits (B2)	___ Stunted or Stressed Plants (D1)
___ Drift Deposits (B3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Algal Mat or Crust (B4)	___ Shallow Aquitard (D3)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Microtopographic Relief (D4)
___ Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
___ Sparsely Vegetated Concave Surface (B8)	
___ Aquatic Fauna (B13)	
___ Marl Deposits (B15)	
___ Hydrogen Sulfide Odor (C1)	
___ Oxidized Rhizospheres on Living Roots (C3)	
___ Presence of Reduced Iron (C4)	
___ Recent Iron Reduction in Tilled Soils (C6)	
___ Thin Muck Surface (C7)	
___ Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-77W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align: right;">Total % Cover of:</td> <td style="width:50%; text-align: left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>60</u></td> <td>x 1 = <u>60</u></td> </tr> <tr> <td>FACW species <u>85</u></td> <td>x 2 = <u>170</u></td> </tr> <tr> <td>FAC species <u>5</u></td> <td>x 3 = <u>15</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>150</u> (A)</td> <td><u>245</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.63</u>	Total % Cover of:	Multiply by:	OBL species <u>60</u>	x 1 = <u>60</u>	FACW species <u>85</u>	x 2 = <u>170</u>	FAC species <u>5</u>	x 3 = <u>15</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>150</u> (A)	<u>245</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>60</u>	x 1 = <u>60</u>																	
FACW species <u>85</u>	x 2 = <u>170</u>																	
FAC species <u>5</u>	x 3 = <u>15</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>150</u> (A)	<u>245</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Alnus incana</u>	<u>35</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Fraxinus nigra</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Salix discolor</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
4. <u>Abies balsamea</u>	<u>5</u>	_____	<u>FAC</u>															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>75%</u> = Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
Herb Stratum (Plot size: <u>5 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Calamagrostis canadensis</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>OBL</u>		Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.													
2. <u>Carex lacustris</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Glyceria striata</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
4. <u>Equisetum palustre</u>	<u>10</u>	_____	<u>FACW</u>															
5. <u>Galium asprellum</u>	<u>5</u>	_____	<u>OBL</u>															
6. <u>Impatiens capensis</u>	<u>5</u>	_____	<u>FACW</u>															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>75%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-77W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 2/1	100					Muck	
6 - 18	10YR 2/1	100					Mucky Loam/Clay	
18 - 24	10YR 2/1	100					Mucky Loam/Clay	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil

Depth (inches): 18

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-78U
 Investigator(s): CJE, PLL Section, Township, Range: S4, T56N, R21W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Convex Slope (%): 5
 Subregion (LRR or MLRA): K Lat: 47.366879 Long: -93.016891 Datum: NAD 83
 Soil Map Unit Name: 1050, Tailings basin NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)

**Plot is located in an upland, corresponding wetland plots are SP-77W and SP-79W.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.**

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) ___ High Water Table (A2) ___ Aquatic Fauna (B13) ___ Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-78U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>42.9</u> (A/B)														
2. <u>Abies balsamea</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
3. <u>Picea glauca</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>50%</u>			Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>47</u></td> <td>x 3 = <u>141</u></td> </tr> <tr> <td>FACU species <u>55</u></td> <td>x 4 = <u>220</u></td> </tr> <tr> <td>UPL species <u>58</u></td> <td>x 5 = <u>290</u></td> </tr> <tr> <td>Column Totals: <u>160</u> (A)</td> <td><u>651</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>4.07</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>47</u>	x 3 = <u>141</u>	FACU species <u>55</u>	x 4 = <u>220</u>	UPL species <u>58</u>	x 5 = <u>290</u>	Column Totals: <u>160</u> (A)	<u>651</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>47</u>	x 3 = <u>141</u>																	
FACU species <u>55</u>	x 4 = <u>220</u>																	
UPL species <u>58</u>	x 5 = <u>290</u>																	
Column Totals: <u>160</u> (A)	<u>651</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Corylus cornuta</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
2. <u>Abies balsamea</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>20%</u>																	
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Eurybia macrophylla</u>	<u>50</u>	<input checked="" type="checkbox"/>	<u>UPL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Pteridium aquilinum</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Aralia nudicaulis</u>	<u>10</u>		<u>FACU</u>															
4. <u>Diervilla lonicera</u>	<u>5</u>		<u>UPL</u>															
5. <u>Fragaria vesca</u>	<u>3</u>		<u>UPL</u>															
6. <u>Abies balsamea</u>	<u>2</u>		<u>FAC</u>															
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>90%</u>																	
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
<table style="width:100%; border:none;"> <tr> <td style="width:60%;"></td> <td style="width:10%; text-align:center;">Yes</td> <td style="width:10%; text-align:center;">No</td> <td style="width:20%;"></td> </tr> <tr> <td></td> <td></td> <td></td> <td style="text-align:right;"><input checked="" type="checkbox"/></td> </tr> </table>						Yes	No					<input checked="" type="checkbox"/>						
	Yes	No																
			<input checked="" type="checkbox"/>															
_____ = Total Cover Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-78U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	7.5YR 3/2	100					Loam	
2 - 5	10YR 5/3						Loam	
5 - 8	10YR 3/3	100					Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 8 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-03
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-79W
 Investigator(s): CJE, PLL Section, Township, Range: S4, T56N, R21W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR or MLRA): K Lat: 47.366852 Long: -93.017069 Datum: NAD 83
 Soil Map Unit Name: 1050, Tailings basin NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-49</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-78U. Wetland community is an alder thicket, Type 6, PSS1B.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		___ Surface Soil Cracks (B6)
___ Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	___ Drainage Patterns (B10)
___ High Water Table (A2)	___ Aquatic Fauna (B13)	___ Moss Trim Lines (B16)
___ Saturation (A3)	___ Marl Deposits (B15)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Hydrogen Sulfide Odor (C1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Oxidized Rhizospheres on Living Roots (C3)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Presence of Reduced Iron (C4)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	___ Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	___ Thin Muck Surface (C7)	___ Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Other (Explain in Remarks)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____		
Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____		
Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-79W

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Betula papyrifera</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75</u> (A/B)														
2. <u>Fraxinus nigra</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>20%</u> = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>80</u></td> <td>x 1 = <u>80</u></td> </tr> <tr> <td>FACW species <u>95</u></td> <td>x 2 = <u>190</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>10</u></td> <td>x 4 = <u>40</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>185</u> (A)</td> <td><u>310</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.68</u>	Total % Cover of:	Multiply by:	OBL species <u>80</u>	x 1 = <u>80</u>	FACW species <u>95</u>	x 2 = <u>190</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>10</u>	x 4 = <u>40</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>185</u> (A)	<u>310</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>80</u>	x 1 = <u>80</u>																	
FACW species <u>95</u>	x 2 = <u>190</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>10</u>	x 4 = <u>40</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>185</u> (A)	<u>310</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Alnus incana</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Fraxinus nigra</u>	<u>5</u>	_____	<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>65%</u> = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Glyceria striata</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Fraxinus nigra</u>	<u>10</u>	_____	<u>FACW</u>															
3. <u>Carex lacustris</u>	<u>5</u>	_____	<u>OBL</u>															
4. <u>Galium asprellum</u>	<u>5</u>	_____	<u>OBL</u>															
5. <u>Rubus pubescens</u>	<u>5</u>	_____	<u>FACW</u>															
6. <u>Symphotrichum novae-angliae</u>	<u>5</u>	_____	<u>FACW</u>															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>100%</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-79W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 10	10YR 2/1	95	10YR 4/4	5	C	PL	Loam	
10 - 16	10YR 6/1	100					Silt Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Compacted soil
 Depth (inches): 16

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 16 inches below ground surface by compacted soil.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-80W
 Investigator(s): CJE, PLL Section, Township, Range: S4, T56N, R21W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): K Lat: 47.370195 Long: -93.019122 Datum: NAD 83
 Soil Map Unit Name: B28B, Buhl loam, 1 to 5 percent slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-50</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-81U. Wetland community is a shallow marsh, Type 3, PEM1C.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	___ Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> Surface Water (A1)	___ Drainage Patterns (B10)
___ Water-Stained Leaves (B9)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Saturation (A3)	___ Crayfish Burrows (C8)
___ Water Marks (B1)	___ Saturation Visible on Aerial Imagery (C9)
___ Sediment Deposits (B2)	___ Stunted or Stressed Plants (D1)
___ Drift Deposits (B3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Iron Deposits (B5)	___ Microtopographic Relief (D4)
___ Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
___ Sparsely Vegetated Concave Surface (B8)	
___ Thin Muck Surface (C7)	
___ Other (Explain in Remarks)	

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
--	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-80W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>60</u></td> <td>x 1 = <u>60</u></td> </tr> <tr> <td>FACW species <u>65</u></td> <td>x 2 = <u>130</u></td> </tr> <tr> <td>FAC species <u>5</u></td> <td>x 3 = <u>15</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>130</u> (A)</td> <td><u>205</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.58</u>	Total % Cover of:	Multiply by:	OBL species <u>60</u>	x 1 = <u>60</u>	FACW species <u>65</u>	x 2 = <u>130</u>	FAC species <u>5</u>	x 3 = <u>15</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>130</u> (A)	<u>205</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>60</u>	x 1 = <u>60</u>																	
FACW species <u>65</u>	x 2 = <u>130</u>																	
FAC species <u>5</u>	x 3 = <u>15</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>130</u> (A)	<u>205</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Alnus incana</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>20%</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
Herb Stratum (Plot size: <u>5 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Carex lacustris</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>		Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____													
2. <u>Typha latifolia</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Impatiens capensis</u>	<u>15</u>	_____	<u>FACW</u>															
4. <u>Cirsium palustre</u>	<u>10</u>	_____	<u>FACW</u>															
5. <u>Rubus pubescens</u>	<u>10</u>	_____	<u>FACW</u>															
6. <u>Geum macrophyllum</u>	<u>5</u>	_____	<u>FACW</u>															
7. <u>Rubus idaeus</u>	<u>5</u>	_____	<u>FAC</u>															
8. <u>Solidago gigantea</u>	<u>5</u>	_____	<u>FACW</u>															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>110%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-80W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 5	10YR 2/1	100					Mucky Loam/Clay	
5 - 8	10YR 3/1	100					Sandy Loam	
8 - 24	2.5Y 5/1	90	7.5YR 5/6	10	C	M	Sandy Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 8

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-81U
 Investigator(s): CJE, PLL Section, Township, Range: S4, T56N, R21W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Convex Slope (%): 3
 Subregion (LRR or MLRA): K Lat: 47.370216 Long: -93.019226 Datum: NAD 83
 Soil Map Unit Name: B28B, Buhl loam, 1 to 5 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-80W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-81U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Abies balsamea</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40</u> (A/B)														
2. <u>Populus tremuloides</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>40%</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>10</u></td> <td>x 2 = <u>20</u></td> </tr> <tr> <td>FAC species <u>40</u></td> <td>x 3 = <u>120</u></td> </tr> <tr> <td>FACU species <u>80</u></td> <td>x 4 = <u>320</u></td> </tr> <tr> <td>UPL species <u>50</u></td> <td>x 5 = <u>250</u></td> </tr> <tr> <td>Column Totals: <u>180</u> (A)</td> <td><u>710</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.94</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>10</u>	x 2 = <u>20</u>	FAC species <u>40</u>	x 3 = <u>120</u>	FACU species <u>80</u>	x 4 = <u>320</u>	UPL species <u>50</u>	x 5 = <u>250</u>	Column Totals: <u>180</u> (A)	<u>710</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>10</u>	x 2 = <u>20</u>																	
FAC species <u>40</u>	x 3 = <u>120</u>																	
FACU species <u>80</u>	x 4 = <u>320</u>																	
UPL species <u>50</u>	x 5 = <u>250</u>																	
Column Totals: <u>180</u> (A)	<u>710</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Corylus cornuta</u>	<u>45</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
2. <u>Alnus incana</u>	<u>10</u>		<u>FACW</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>55%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Eurybia macrophylla</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>UPL</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Diervilla lonicera</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>UPL</u>															
3. <u>Maianthemum canadense</u>	<u>15</u>		<u>FACU</u>															
4. <u>Pteridium aquilinum</u>	<u>10</u>		<u>FACU</u>															
5. <u>Solidago canadensis</u>	<u>5</u>		<u>FACU</u>															
6. <u>Viola pubescens</u>	<u>5</u>		<u>FACU</u>															
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>85%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>														
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-81U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	7.5YR 3/2	100					Sandy Loam	
6 - 10	7.5YR 4/3	100					Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 10 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-82W
 Investigator(s): CJE, PLL Section, Township, Range: S4, T56N, R21W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): K Lat: 47.371034 Long: -93.020556 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-51</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-83U. Wetland community is a fresh (wet) meadow, Type 2, PEM1B.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	<u>Surface Soil Cracks (B6)</u>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-82W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>105</u></td> <td>x 1 = <u>105</u></td> </tr> <tr> <td>FACW species <u>40</u></td> <td>x 2 = <u>80</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>145</u></td> <td>(A) <u>185</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.28</u>	Total % Cover of:	Multiply by:	OBL species <u>105</u>	x 1 = <u>105</u>	FACW species <u>40</u>	x 2 = <u>80</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>145</u>	(A) <u>185</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>105</u>	x 1 = <u>105</u>																	
FACW species <u>40</u>	x 2 = <u>80</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>145</u>	(A) <u>185</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)														
1. <u>Alnus incana</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Salix discolor</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
<u>40%</u> = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Glyceria striata</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
2. <u>Lycopus americanus</u>	<u>15</u>	_____	<u>OBL</u>															
3. <u>Carex lacustris</u>	<u>10</u>	_____	<u>OBL</u>															
4. <u>Carex trisperma</u>	<u>10</u>	_____	<u>OBL</u>															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>105%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-82W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 24	10YR 2/1	100					Muck	
24 - 36	10YR 2/1	100					Mucky Peat	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-83U
 Investigator(s): CJE, PLL Section, Township, Range: S4, T56N, R21W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Convex Slope (%): 3
 Subregion (LRR or MLRA): K Lat: 47.3711491 Long: -93.0208686 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plots are SP-82W and SP-84W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-83U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Populus tremuloides</u>	<u>65</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>16.7</u> (A/B)														
2. <u>Picea glauca</u>	<u>2</u>		<u>FACU</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>67%</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>5</u></td> <td>x 2 = <u>10</u></td> </tr> <tr> <td>FAC species <u>80</u></td> <td>x 3 = <u>240</u></td> </tr> <tr> <td>FACU species <u>141</u></td> <td>x 4 = <u>564</u></td> </tr> <tr> <td>UPL species <u>27</u></td> <td>x 5 = <u>135</u></td> </tr> <tr> <td>Column Totals: <u>253</u></td> <td>(A) <u>949</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.75</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>5</u>	x 2 = <u>10</u>	FAC species <u>80</u>	x 3 = <u>240</u>	FACU species <u>141</u>	x 4 = <u>564</u>	UPL species <u>27</u>	x 5 = <u>135</u>	Column Totals: <u>253</u>	(A) <u>949</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>5</u>	x 2 = <u>10</u>																	
FAC species <u>80</u>	x 3 = <u>240</u>																	
FACU species <u>141</u>	x 4 = <u>564</u>																	
UPL species <u>27</u>	x 5 = <u>135</u>																	
Column Totals: <u>253</u>	(A) <u>949</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Betula papyrifera</u>	<u>7</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
2. <u>Corylus cornuta</u>	<u>7</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. <u>Amelanchier interior</u>	<u>2</u>		<u>UPL</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>16%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Pteridium aquilinum</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Eurybia macrophylla</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>UPL</u>															
3. <u>Rubus idaeus</u>	<u>15</u>		<u>FAC</u>															
4. <u>Solidago canadensis</u>	<u>15</u>		<u>FACU</u>															
5. <u>Poa pratensis</u>	<u>10</u>		<u>FACU</u>															
6. <u>Phalaris arundinacea</u>	<u>5</u>		<u>FACW</u>															
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>110%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Parthenocissus quinquefolia</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
	<u>60%</u>	= Total Cover																
<table style="width:100%; border:none;"> <tr> <td style="width:60%;">Hydrophytic Vegetation Present?</td> <td style="width:20%; text-align:center;">Yes _____</td> <td style="width:20%; text-align:center;">No <input checked="" type="checkbox"/></td> </tr> </table>					Hydrophytic Vegetation Present?	Yes _____	No <input checked="" type="checkbox"/>											
Hydrophytic Vegetation Present?	Yes _____	No <input checked="" type="checkbox"/>																
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-83U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 12	10YR 4/3	100					Sandy Loam	
12 - 16	10YR 4/3	100					Silt Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 16 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-84W
 Investigator(s): CJE, PLL Section, Township, Range: S4, T56N, R21W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): K Lat: 47.371036 Long: -93.020749 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-52</u>
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Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-83U. Wetland community is a fresh (wet) meadow, Type 2, PEM1B.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) ___ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) ___ Marl Deposits (B15) ___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks) ___ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input checked="" type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-84W

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Salix interior</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
	<u>25%</u>	= Total Cover																
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Salix interior</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>95</u></td> <td>x 1 = <u>95</u></td> </tr> <tr> <td>FACW species <u>65</u></td> <td>x 2 = <u>130</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>160</u> (A)</td> <td><u>225</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.41</u>	Total % Cover of:	Multiply by:	OBL species <u>95</u>	x 1 = <u>95</u>	FACW species <u>65</u>	x 2 = <u>130</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>160</u> (A)	<u>225</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>95</u>	x 1 = <u>95</u>																	
FACW species <u>65</u>	x 2 = <u>130</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>160</u> (A)	<u>225</u> (B)																	
2. <u>Alnus incana</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Salix discolor</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
	<u>35%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Typha latifolia</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Carex lacustris</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Calamagrostis canadensis</u>	<u>15</u>	_____	<u>OBL</u>															
4. <u>Glyceria canadensis</u>	<u>10</u>	_____	<u>OBL</u>															
5. <u>Geum macrophyllum</u>	<u>5</u>	_____	<u>FACW</u>															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
	<u>100%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
	_____ = Total Cover																	
<table style="width:100%; border:none;"> <tr> <td style="width:60%;">Hydrophytic Vegetation Present?</td> <td style="width:20%; text-align:center;">Yes <input checked="" type="checkbox"/></td> <td style="width:20%; text-align:center;">No _____</td> </tr> </table>					Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No _____											
Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No _____																
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-84W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	10YR 2/2	100					Mucky Loam/Clay	
4 - 14	7.5YR 4/1	90	10YR 4/6	10	C	M	Clay Loam	
14 - 24	10YR 4/1	20	10YR 4/6	80	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 4

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-85W
 Investigator(s): CJE, PLL Section, Township, Range: S33, T57N, R21W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
 Subregion (LRR or MLRA): K Lat: 47.371582 Long: -93.0238 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-53</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-86U. Wetland community is a fresh (wet) meadow, Type 2, PEM1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	___ Surface Soil Cracks (B6)
___ Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9)	___ Drainage Patterns (B10)
___ High Water Table (A2) ___ Aquatic Fauna (B13)	___ Moss Trim Lines (B16)
___ Saturation (A3) ___ Marl Deposits (B15)	___ Dry-Season Water Table (C2)
___ Water Marks (B1) ___ Hydrogen Sulfide Odor (C1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3) ___ Presence of Reduced Iron (C4)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5) ___ Thin Muck Surface (C7)	___ Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks)	<input checked="" type="checkbox"/> Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-85W

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Salix interior</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
	<u>5%</u>	= Total Cover																
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Salix interior</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>60</u></td> <td>x 1 = <u>60</u></td> </tr> <tr> <td>FACW species <u>50</u></td> <td>x 2 = <u>100</u></td> </tr> <tr> <td>FAC species <u>10</u></td> <td>x 3 = <u>30</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>120</u> (A)</td> <td><u>190</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.58</u>	Total % Cover of:	Multiply by:	OBL species <u>60</u>	x 1 = <u>60</u>	FACW species <u>50</u>	x 2 = <u>100</u>	FAC species <u>10</u>	x 3 = <u>30</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>120</u> (A)	<u>190</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>60</u>	x 1 = <u>60</u>																	
FACW species <u>50</u>	x 2 = <u>100</u>																	
FAC species <u>10</u>	x 3 = <u>30</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>120</u> (A)	<u>190</u> (B)																	
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
	<u>5%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Calamagrostis canadensis</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Phalaris arundinacea</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Salix interior</u>	<u>15</u>	_____	<u>FACW</u>															
4. <u>Rubus idaeus</u>	<u>10</u>	_____	<u>FAC</u>															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
	<u>110%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
	_____	= Total Cover																
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-85W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	7.5YR 2.5/2	95	7.5YR 4/4	5	C	M	Silt Loam	
4 - 8	5YR 4/2	95	7.5YR 4/4	5	C	M	Sandy Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 8 inches below ground surface by compacted soil.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-86U
 Investigator(s): CJE, PLL Section, Township, Range: S33, T57N, R21W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Convex Slope (%): 3
 Subregion (LRR or MLRA): K Lat: 47.371731 Long: -93.024244 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
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Remarks: (Explain alternative procedures here or in a separate report.)

**Plot is located in an upland, corresponding wetland plots are SP-85W and SP-87W.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.**

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
---	--

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-86U

	Absolute % Cover	Dominant Species?	Indicator Status															
Tree Stratum (Plot size: <u>30 ft r</u>)																		
1. <u>Betula papyrifera</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66.7</u> (A/B)														
2. <u>Populus tremuloides</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>45%</u>	= Total Cover																
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																		
1. <u>Betula papyrifera</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>10</u></td> <td>x 2 = <u>20</u></td> </tr> <tr> <td>FAC species <u>45</u></td> <td>x 3 = <u>135</u></td> </tr> <tr> <td>FACU species <u>58</u></td> <td>x 4 = <u>232</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>113</u> (A)</td> <td><u>387</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.42</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>10</u>	x 2 = <u>20</u>	FAC species <u>45</u>	x 3 = <u>135</u>	FACU species <u>58</u>	x 4 = <u>232</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>113</u> (A)	<u>387</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>10</u>	x 2 = <u>20</u>																	
FAC species <u>45</u>	x 3 = <u>135</u>																	
FACU species <u>58</u>	x 4 = <u>232</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>113</u> (A)	<u>387</u> (B)																	
2. <u>Populus tremuloides</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>															
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
	<u>25%</u>	= Total Cover																
Herb Stratum (Plot size: <u>5 ft r</u>)																		
1. <u>Rubus idaeus</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Phalaris arundinacea</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Solidago canadensis</u>	<u>5</u>		<u>FACU</u>															
4. <u>Taraxacum officinale</u>	<u>5</u>		<u>FACU</u>															
5. <u>Populus tremuloides</u>	<u>3</u>		<u>FACU</u>															
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
	<u>43%</u>	= Total Cover																
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
2. _____																		
3. _____																		
4. _____																		
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>														
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-86U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 12	7.5YR 3/2	100					Sandy Loam	
12 - 18	10YR 5/3	100					Silt Loam	
18 - 24	10YR 2/1	90	10YR 5/6	10	C	M	Silt Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-87W
 Investigator(s): CJE, PLL Section, Township, Range: S33, T57N, R21W
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): K Lat: 47.371826 Long: -93.024383 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: PUBF

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-54</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-86U. Wetland community is a shallow marsh, Type 3, PEM1C.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	
___ Marl Deposits (B15)	
___ Hydrogen Sulfide Odor (C1)	
___ Oxidized Rhizospheres on Living Roots (C3)	
___ Presence of Reduced Iron (C4)	
___ Recent Iron Reduction in Tilled Soils (C6)	
___ Thin Muck Surface (C7)	
___ Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes _____ No Depth (inches): _____
 Water Table Present? Yes No _____ Depth (inches): 0
 Saturation Present? Yes No _____ Depth (inches): 0
 (includes capillary fringe)

Wetland Hydrology Present? Yes No _____

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-87W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>50</u></td> <td>x 1 = <u>50</u></td> </tr> <tr> <td>FACW species <u>60</u></td> <td>x 2 = <u>120</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>110</u> (A)</td> <td><u>170</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.55</u>	Total % Cover of:	Multiply by:	OBL species <u>50</u>	x 1 = <u>50</u>	FACW species <u>60</u>	x 2 = <u>120</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>110</u> (A)	<u>170</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>50</u>	x 1 = <u>50</u>																	
FACW species <u>60</u>	x 2 = <u>120</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>0</u>	x 4 = <u>0</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>110</u> (A)	<u>170</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
1. <u>Salix discolor</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Populus balsamifera</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
<u>25%</u> = Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.														
Herb Stratum (Plot size: <u>5 ft r</u>)					Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____													
1. <u>Phalaris arundinacea</u>	<u>35</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
2. <u>Scirpus cyperinus</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Typha angustifolia</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
<u>85%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																		
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: SP-87W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 4	7.5YR 2.5/1	100					Mucky Loam/Clay	Mucky loam
4 - 12	10YR 5/1	80	10YR 5/6	20	C	M	Clay	
12 - 24	7.5YR 4/3	95	7.5YR 4/6	5	C	M	Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 4

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-88W
 Investigator(s): CJE, PLL Section, Township, Range: S33, T57N, R21W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): A Lat: 47.37384 Long: -93.023712 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: <u>KETB-55</u>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in a wetland, corresponding upland plot is SP-89U. Wetland community is a shrub-carr, Type 6, PSS1B.
 Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	___ Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> Surface Water (A1)	___ Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	___ Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Saturation (A3)	___ Dry-Season Water Table (C2)
___ Water Marks (B1)	___ Crayfish Burrows (C8)
___ Sediment Deposits (B2)	___ Saturation Visible on Aerial Imagery (C9)
___ Drift Deposits (B3)	___ Stunted or Stressed Plants (D1)
___ Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
___ Iron Deposits (B5)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
___ Inundation Visible on Aerial Imagery (B7)	___ Microtopographic Relief (D4)
___ Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
--	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-88W

Tree Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Populus balsamifera</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>87.5</u> (A/B)														
2. <u>Betula papyrifera</u>	<u>5</u>	<input checked="" type="checkbox"/>	<u>FACU</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>15%</u> = Total Cover				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:right;">Total % Cover of:</td> <td style="width:50%; text-align:left;">Multiply by:</td> </tr> <tr> <td>OBL species <u>40</u></td> <td>x 1 = <u>40</u></td> </tr> <tr> <td>FACW species <u>135</u></td> <td>x 2 = <u>270</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>10</u></td> <td>x 4 = <u>40</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>185</u> (A)</td> <td><u>350</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>1.89</u>	Total % Cover of:	Multiply by:	OBL species <u>40</u>	x 1 = <u>40</u>	FACW species <u>135</u>	x 2 = <u>270</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>10</u>	x 4 = <u>40</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>185</u> (A)	<u>350</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>40</u>	x 1 = <u>40</u>																	
FACW species <u>135</u>	x 2 = <u>270</u>																	
FAC species <u>0</u>	x 3 = <u>0</u>																	
FACU species <u>10</u>	x 4 = <u>40</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>185</u> (A)	<u>350</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Alnus incana</u>	<u>35</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)														
2. <u>Salix discolor</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
3. <u>Salix interior</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>															
4. <u>Picea mariana</u>	<u>5</u>	_____	<u>FACW</u>															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>70%</u> = Total Cover				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
Herb Stratum (Plot size: <u>5 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Equisetum laevigatum</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACW</u>		Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.													
2. <u>Carex trisperma</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
3. <u>Typha angustifolia</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>OBL</u>															
4. <u>Equisetum variegatum</u>	<u>15</u>	_____	<u>FACW</u>															
5. <u>Equisetum palustre</u>	<u>5</u>	_____	<u>FACW</u>															
6. <u>Lotus corniculatus</u>	<u>5</u>	_____	<u>FACU</u>															
7. <u>Salix discolor</u>	<u>5</u>	_____	<u>FACW</u>															
8. <u>Salix interior</u>	<u>5</u>	_____	<u>FACW</u>															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
<u>100%</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>30 ft r</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____														
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover																		

Remarks: (Include photo numbers here or on a separate sheet.)

PSS with Emergent community pocket. Moss spp cover ground.

SOIL

Sampling Point: SP-88W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	7.5YR 2.5/2	100					Mucky Loam/Clay	Saturated
6 - 12	7.5YR 5/2	95	7.5YR 4/4	5	C	M	Clay Loam	Saturated
12 - 18	7.5YR 5/3	90	7.5YR 5/8	10	C	M	Sandy Clay Loam	Saturated
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fine-textured soil
 Depth (inches): 6

Hydric Soil Present? Yes No

Remarks:

Auger refusal at 18 inches below ground surface by coarse fragments.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 2021 Keetac Exterior Tailings Basin City/County: Keewatin/ Itasca Sampling Date: 2021-08-02
 Applicant/Owner: U. S. Steel - Keetac State: Minnesota Sampling Point: SP-89U
 Investigator(s): CJE PLL Section, Township, Range: S33, T57N, R21W
 Landform (hillslope, terrace, etc.): Upland, Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR or MLRA): K Lat: 47.373842 Long: -93.023853 Datum: NAD 83
 Soil Map Unit Name: 1003B, Udorthents, loamy (cut and fill land) NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
--	--

Remarks: (Explain alternative procedures here or in a separate report.)

Plot is located in an upland, corresponding wetland plot is SP-88W.
Per NRCS analysis method, the antecedent precipitation for the three months prior to August was rated 6 out of a possible 18, indicating that the prior period has been drier than normal.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: SP-89U

	Absolute % Cover	Dominant Species?	Indicator Status																						
Tree Stratum (Plot size: <u>30 ft r</u>)																									
1. <u>Betula papyrifera</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40</u> (A/B)																					
2. <u>Populus balsamifera</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>FACW</u>																						
3. <u>Salix humilis</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACU</u>																						
4. _____																									
5. _____																									
6. _____																									
7. _____																									
	<u>40%</u>	= Total Cover		Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%;"></td> <td style="width:25%; text-align:center;">Total % Cover of:</td> <td style="width:25%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td style="text-align:center;"><u>0</u></td> <td style="text-align:center;">x 1 = <u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align:center;"><u>30</u></td> <td style="text-align:center;">x 2 = <u>60</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align:center;"><u>0</u></td> <td style="text-align:center;">x 3 = <u>0</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align:center;"><u>85</u></td> <td style="text-align:center;">x 4 = <u>340</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align:center;"><u>15</u></td> <td style="text-align:center;">x 5 = <u>75</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align:center;"><u>130</u> (A)</td> <td style="text-align:center;"><u>475</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.65</u>		Total % Cover of:	Multiply by:	OBL species	<u>0</u>	x 1 = <u>0</u>	FACW species	<u>30</u>	x 2 = <u>60</u>	FAC species	<u>0</u>	x 3 = <u>0</u>	FACU species	<u>85</u>	x 4 = <u>340</u>	UPL species	<u>15</u>	x 5 = <u>75</u>	Column Totals:	<u>130</u> (A)	<u>475</u> (B)
	Total % Cover of:	Multiply by:																							
OBL species	<u>0</u>	x 1 = <u>0</u>																							
FACW species	<u>30</u>	x 2 = <u>60</u>																							
FAC species	<u>0</u>	x 3 = <u>0</u>																							
FACU species	<u>85</u>	x 4 = <u>340</u>																							
UPL species	<u>15</u>	x 5 = <u>75</u>																							
Column Totals:	<u>130</u> (A)	<u>475</u> (B)																							
Sapling/Shrub Stratum (Plot size: <u>15 ft r</u>)																									
1. <u>Alnus incana</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FACW</u>																						
2. _____																									
3. _____																									
4. _____																									
5. _____																									
6. _____																									
7. _____																									
	<u>10%</u>	= Total Cover																							
Herb Stratum (Plot size: <u>5 ft r</u>)																									
1. <u>Solidago canadensis</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																					
2. <u>Hieracium aurantiacum</u>	<u>15</u>	<input checked="" type="checkbox"/>	<u>UPL</u>																						
3. <u>Achillea millefolium</u>	<u>10</u>		<u>FACU</u>																						
4. <u>Carex gracillima</u>	<u>10</u>		<u>FACU</u>																						
5. <u>Poa pratensis</u>	<u>10</u>		<u>FACU</u>																						
6. <u>Phalaris arundinacea</u>	<u>5</u>		<u>FACW</u>																						
7. _____																									
8. _____																									
9. _____																									
10. _____																									
11. _____																									
12. _____																									
	<u>80%</u>	= Total Cover																							
Woody Vine Stratum (Plot size: <u>30 ft r</u>)																									
1. _____				Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																					
2. _____																									
3. _____																									
4. _____																									
				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>																					
_____ = Total Cover																									
Remarks: (Include photo numbers here or on a separate sheet.)																									

SOIL

Sampling Point: SP-89U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 3/2	100					Sandy Loam	
2 - 6	7.5YR 3/3	100					Clay Loam	
6 - 12	5YR 4/3	100					Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Auger refusal at 12 inches below ground surface by compacted soil.

Appendix B

Photographs

Appendix B: Wetland Delineation Photograph Log



Photograph 1 (IMG_3986): View southwest into the fresh wet meadow of Wetland KETB-01 on August 2, 2021.



Photograph 2 (IMG_4005): View northeast of the alder thicket community in Wetland KETB-02 on August 2, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 3 (IMG_4048): View southwest of the alder thicket community in Wetland KETB-03 on August 2, 2021.



Photograph 4 (IMG_4131): View northwest of the deep marsh community in Wetland KETB-04 on August 2, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 5 (IMG_4234): View northwest of the hardwood swamp community in Wetland KETB-05 on August 2, 2021.



Photograph 6 (IMG_4284): View south of the shrub-carr community Wetland KETB-06 on August 53, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 7 (IMG_4300): View west of the hardwood swamp community in Wetland KETB-07 on August 3, 2021.



Photograph 8 (IMG_4393): View southwest of the hardwood swamp community in Wetland KETB-08 on August 3, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 9 (IMG_4421): View northwest of the fresh wet meadow community in Wetland KETB-09 on August 3, 2021.



Photograph 10 (IMG_4445): View east of the shallow marsh community in Wetland KETB-10 on August 3, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 11 (IMG_4473): View southwest of the deep marsh community in Wetland KETB-11 on August 3, 2021.



Photograph 12 (IMG_4504): View southeast of the shallow marsh community in Wetland KETB-12 on August 3, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 13 (IMG_4532): View south of the shrub-carr community in Wetland KETB-13 on August 3, 2021.



Photograph 14 (IMG_4561): View southwest of the shallow marsh community in Wetland KETB-14 on August 3, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 15 (IMG_4591): View west of the fresh wet meadow community in Wetland KETB-15 on August 4, 2021.



Photograph 16 (IMG_4607): View south of the shallow marsh community in Wetland KETB-16 on August 4, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 17 (IMG_4638): View east of the deep marsh community in Wetland KETB-17 on August 4, 2021.



Photograph 18 (IMG_4693): View north of coniferous bog community in Wetland KETB-18 on August 4, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 19 (IMG_4751): View southeast of the fresh wet meadow community in Wetland KETB-19 on August 4, 2021.



Photograph 20 (IMG_4740): View northeast of the shrub-carr community in Wetland KETB-20 on August 4, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 21 (IMG_4812): View north of the alder thicket community in Wetland KETB-21 on August 4, 2021.



Photograph 22 (IMG_4823): View west of the alder thicket community in Wetland KETB-23 on August 4, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 23 (IMG_4876): View west of the shallow marsh community in Wetland KETB-24 on August 4, 2021.



Photograph 24 (IMG_5634): View southwest of the alder thicket community in Wetland KETB-25 on August 13, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 25 (IMG_5608): View northeast of the shallow marsh community in Wetland KETB-26 on August 13, 2021.



Photograph 26 (IMG_5546): View southeast of the shallow marsh community in Wetland KETB-27 on August 13, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 27 (IMG_5521): Photo of the alder thicket community in Wetland KETB-28 on August 13, 2021.



Photograph 28 (IMG_5499): View southwest of the shallow marsh community in Wetland KETB-29 on August 13, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 29 (IMG_5487): View west of the shrub-carr community in Wetland KETB-30 on August 13, 2021.



Photograph 30 (IMG_5479): View south of the shrub-carr community in Wetland KETB-31 on August 13, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 31 (IMG_5475): View northeast of the shrub-carr community in Wetland KETB-32 on August 13, 2021.



Photograph 32 (IMG_5459): View southwest of the deep marsh community in Wetland KETB-33 on August 13, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 33 (IMG_5446): View south of the shallow marsh community in Wetland KETB-34 on August 13, 2021.



Photograph 34 (IMG_2142): View southeast of the shallow marsh community in Wetland KETB-35 on August 4, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 35 (IMG_5359): View east of the alder thicket community in Wetland KETB-36 on August 13, 2021.



Photograph 36 (IMG_2141): View west of the shrub-carr community in Wetland KETB-37 on August 4, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 37 (IMG_2134): View south of the alder thicket community in Wetland KETB-38 on August 4, 2021.



Photograph 38 (IMG_2123): View northeast of the shrub-carr community in Wetland KETB-39 on August 4, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 39 (IMG_2121): View south of the shrub-carr community in Wetland KETB-40 on August 4, 2021.



Photograph 40 (IMG_2107): View northeast of the alder thicket community in Wetland KETB-41 on August 4, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 41 (IMG_2114): View southeast of the shrub-carr community in Wetland KETB-42 on August 4, 2021.



Photograph 42 (IMG_2102): View east of the hardwood swamp community in Wetland KETB-43 on August 3, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 43 (IMG_2095): View southwest of the shrub-carr community in Wetland KETB-44 on August 3, 2021.



Photograph 44 (IMG_2087): View north of the fresh wet meadow community in Wetland KETB-46 on August 3, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 45 (IMG_2070): View northeast of the shrub-carr community in Wetland KETB-47 on August 3, 2021.



Photograph 46 (IMG_2079): View northeast of the shallow marsh community in Wetland KETB-48 on August 3, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 47 (IMG_2073): View northwest of the alder thicket community in Wetland KETB-49 on August 3, 2021.



Photograph 48 (IMG_2066): View east of the shallow marsh community in Wetland KETB-50 on August 2, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 49 (IMG_2062): View southwest of the fresh-wet meadow community in Wetland KETB-51 on August 2, 2021.



Photograph 50 (114732): View north of the shallow marsh community in Wetland KETB-54 on August 2, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 51 (110012): View east of the shallow marsh community in Wetland KETB-55 on August 2, 2021.



Photograph 52 (IMG_4203): View north of an upland mixed forest community on August 2, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 53 (IMG_5561): View northeast of an upland forest opening community on August 13, 2021.



Photograph 54 (IMG_4787): View south of a disturbed upland on August 4, 2021.

Appendix B: Wetland Delineation Photograph Log



Photograph 55 (IMG_4137): View southwest of the tailings basin berm on August 2, 2021.

Appendix C

Functional Assessment Method

**Select Wetland Functional Assessment Field Guidance
For Mining Project Permitting
Barr Engineering Company
June 2015**

1.0 Field Functional Assessments

The objective of the field functional assessment is to collect data to allow for an evaluation of potential direct and indirect impacts from project development. Therefore, documentation of functional condition is needed to be able to determine impacts resulting from project development. This project will follow guidance for evaluation of wetland functions from the *Minnesota Routine Assessment Method for Evaluating Wetland Functions, Version 3.4* (MnRAM); however, a full MnRAM evaluation will not be completed. Select MnRAM functions will be used to evaluate the wetland functions for this project based on MnRAM 3.4 guidance. Wetland information should be collected in the field, as described below.

1. Wetland Community Classification – Follow Eggers and Reed classification system (17 communities as described in MnRAM) to identify the major (at least 10 percent of the wetland), distinct communities within each wetland and approximate percentage of each.
2. Topographic setting, which is used to define outlet characteristics
 - Depressional – no obvious inlets or outlets
 - Depressional – Flow-through (defined inflow and outflow)
 - Depressional – Tributary (no inlet, defined outflow)
 - Riverine (within the river/stream banks)
 - Lacustrine fringe (edge of deepwater areas) / shoreland
 - Extensive peatland / organic flat – noting percent cover of sphagnum moss and vegetation exemptions with percent cover if not true bog (therefore minerotrophic, not ombrotrophic)
 - Slope
 - Floodplain (outside waterbody banks)
3. Vegetative Diversity / Integrity (question 1 of MnRAM; carry full guidance in the field)
 - High – generally <20% invasive/non-native vegetation, inundated wetlands dominated by 3 or more native species, 5-10+ native species present in other communities
 - Medium – generally 20-50% invasive/non-native vegetation, inundated wetlands dominated by 2 species, <5-9 species present in other communities
 - Low – generally >50% invasive/non-native vegetation, inundated wetlands dominated by 1 species, 50% or more of the trees are dead
4. Wetland Outlet Configuration
 - High – natural outlet condition
 - Medium – constructed outlet that is located close to historic wetland boundary (i.e., culvert, weir, permeable rock, ditch, etc.)
 - Low – constructed ditch outlet causing drainage or impounded wetland with no outlet or higher than the natural outlet

5. Upland Conditions / Land Uses
 - High – unaltered; full grass, shrub, or forest cover, natural slopes, no evidence of erosion
 - Medium – moderate vegetative cover, some artificial slopes, some evidence of erosion affecting wetland
 - Low – significant disturbance; intensive mining activities affecting wetland, limited vegetative cover, clear evidence of erosion

6. Wildlife Habitat
 - High – natural habitats surrounding wetland and connecting to other natural communities, no barriers to access from the wetland
 - Medium – moderate access to other natural communities, limited barriers to access from the wetland
 - Low – isolated from other natural communities or difficult access to other natural habitats (i.e., stockpiles, mine pits, roads, steep slopes, buildings, infrastructure, etc.)

7. Public Value
 - High – accessible to the public and provides recreational value
 - Medium – cumbersome public access with some recreational value
 - Low – no public access or no recreational value

8. Human Disturbance
 - High – significant alterations; roads stockpiles, mine pits, soil removal or disturbance, invasive species have significantly affected wetland
 - Medium – moderate alterations; roads stockpiles, mine pits, soil removal or disturbance, invasive species have affected wetland
 - Low – Unaltered; little evidence of human disturbances affecting wetland

Ratings for each of these characteristics will be utilized to develop a functional quality rating for each wetland. Ratings for items 3 through 7 will be given a score, as follows:

Low = 0.1, Medium = 0.5, High = 1.0

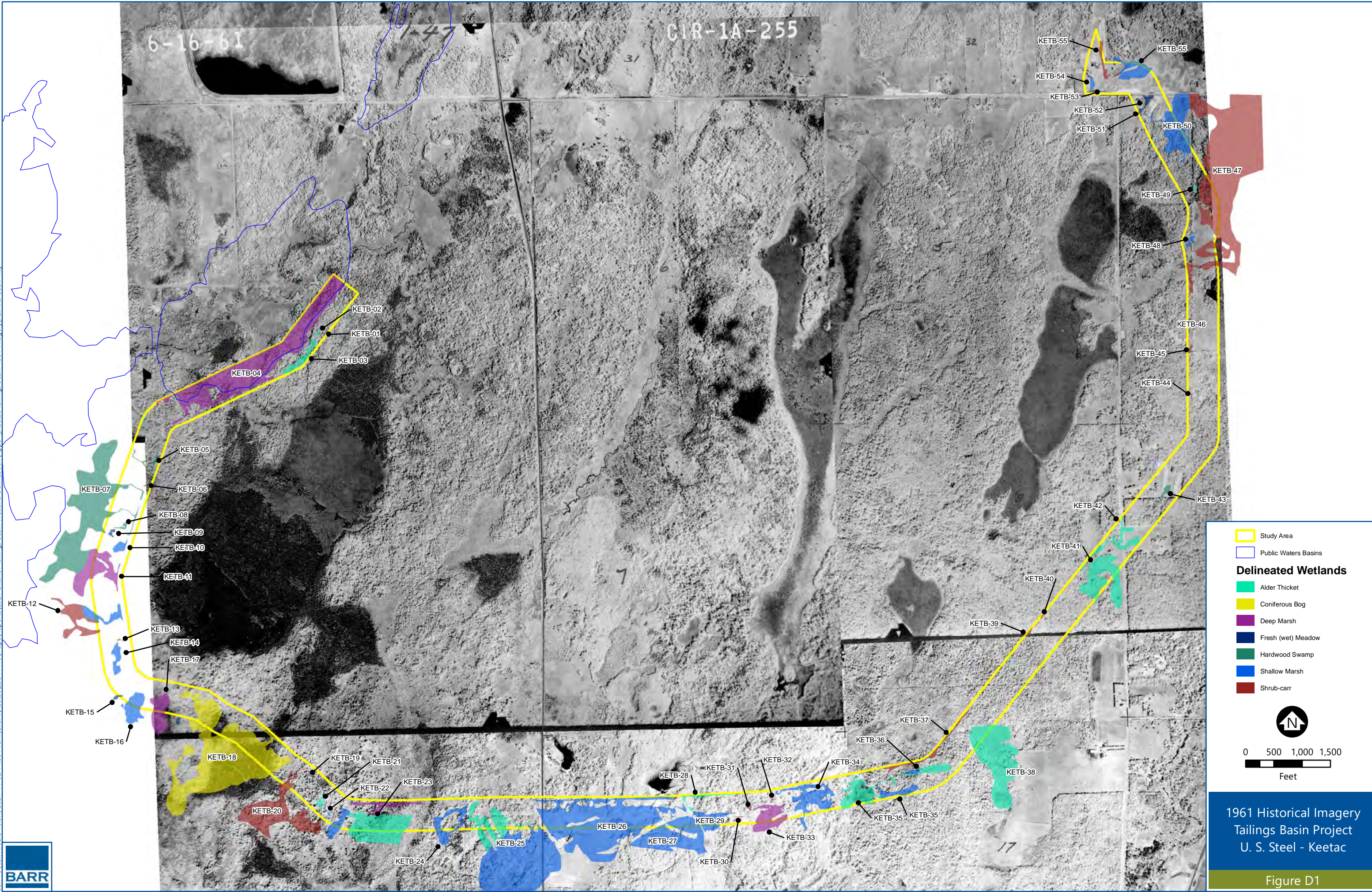
Based on these ratings for items 3 through 7, an average value will be calculated. An overall wetland functional assessment rating would then be given to the wetland based on the average value, as follows:

0 to 0.32 = Low, 0.33 to 0.65 = Medium, 0.66 to 1.0 = High

Item 8, human disturbance, would also be given a separate rating for each wetland.

Appendix D

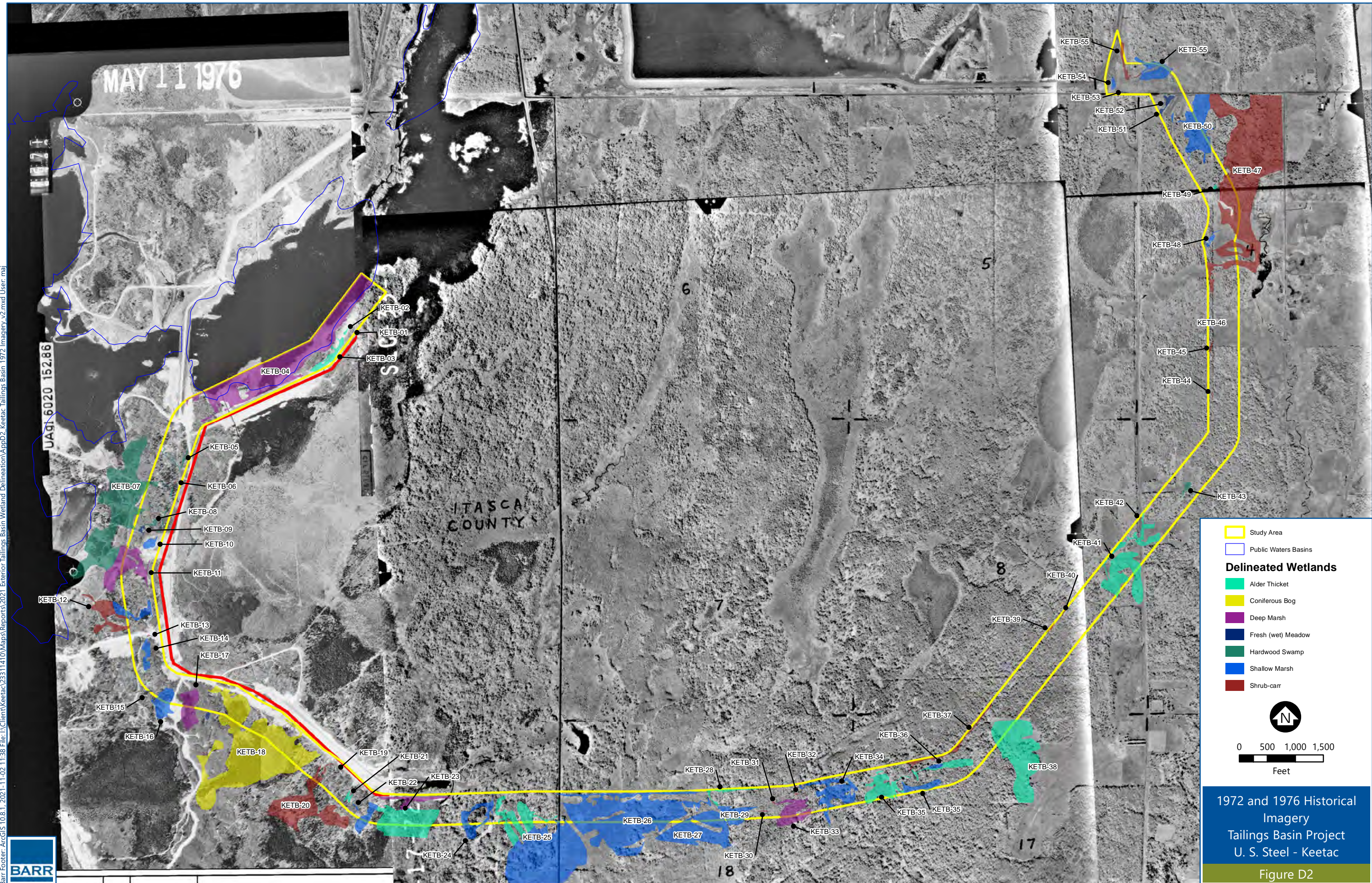
Historical Imagery Review



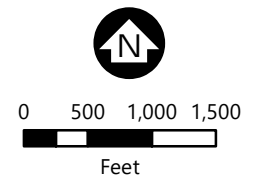
1961 Historical Imagery
Tailings Basin Project
U. S. Steel - Keetac

Figure D1





- Study Area
- Public Waters Basins
- Delineated Wetlands**
- Alder Thicket
- Coniferous Bog
- Deep Marsh
- Fresh (wet) Meadow
- Hardwood Swamp
- Shallow Marsh
- Shrub-carr



1972 and 1976 Historical Imagery
Tailings Basin Project
U. S. Steel - Keetac

Figure D2



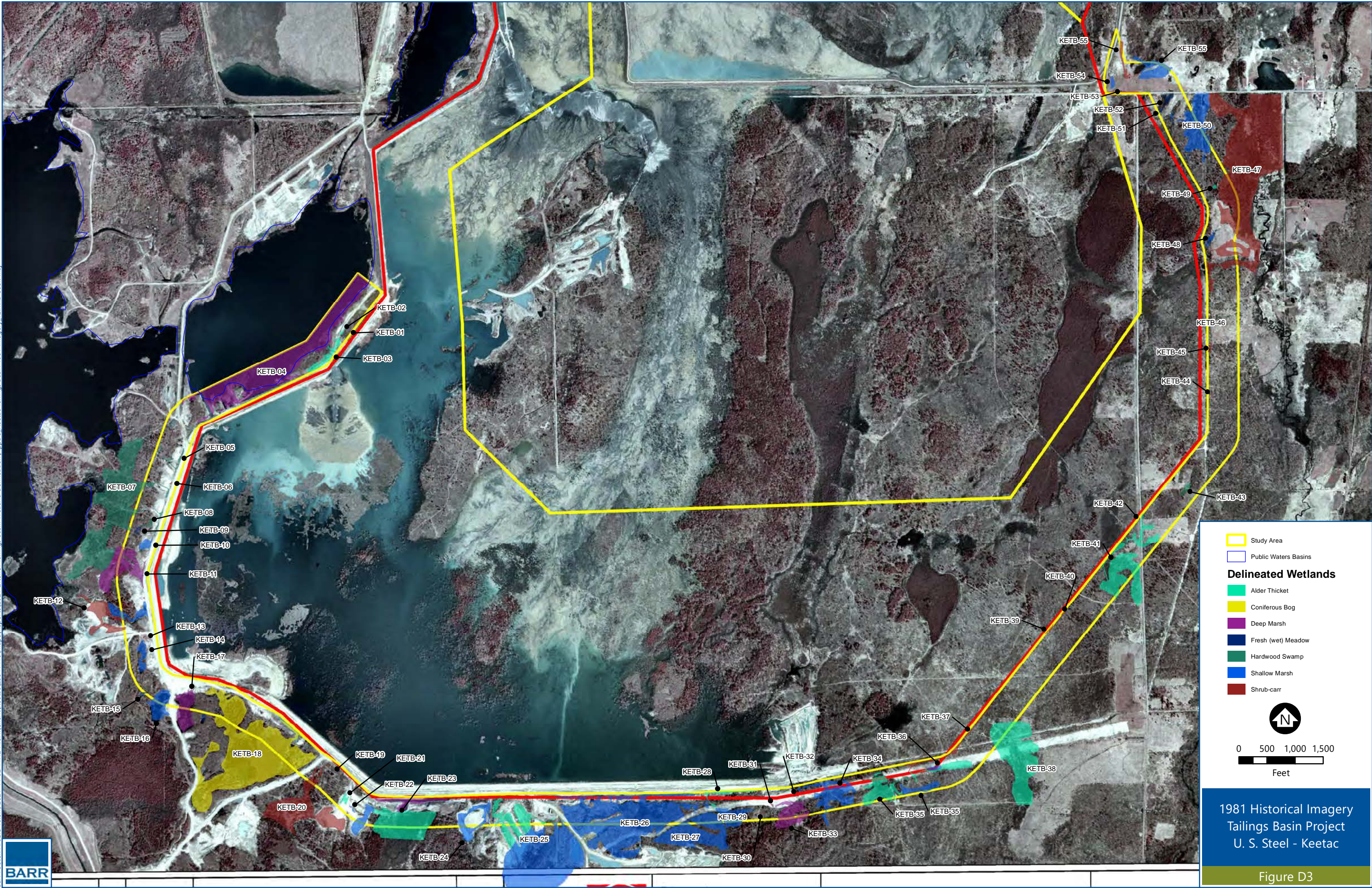
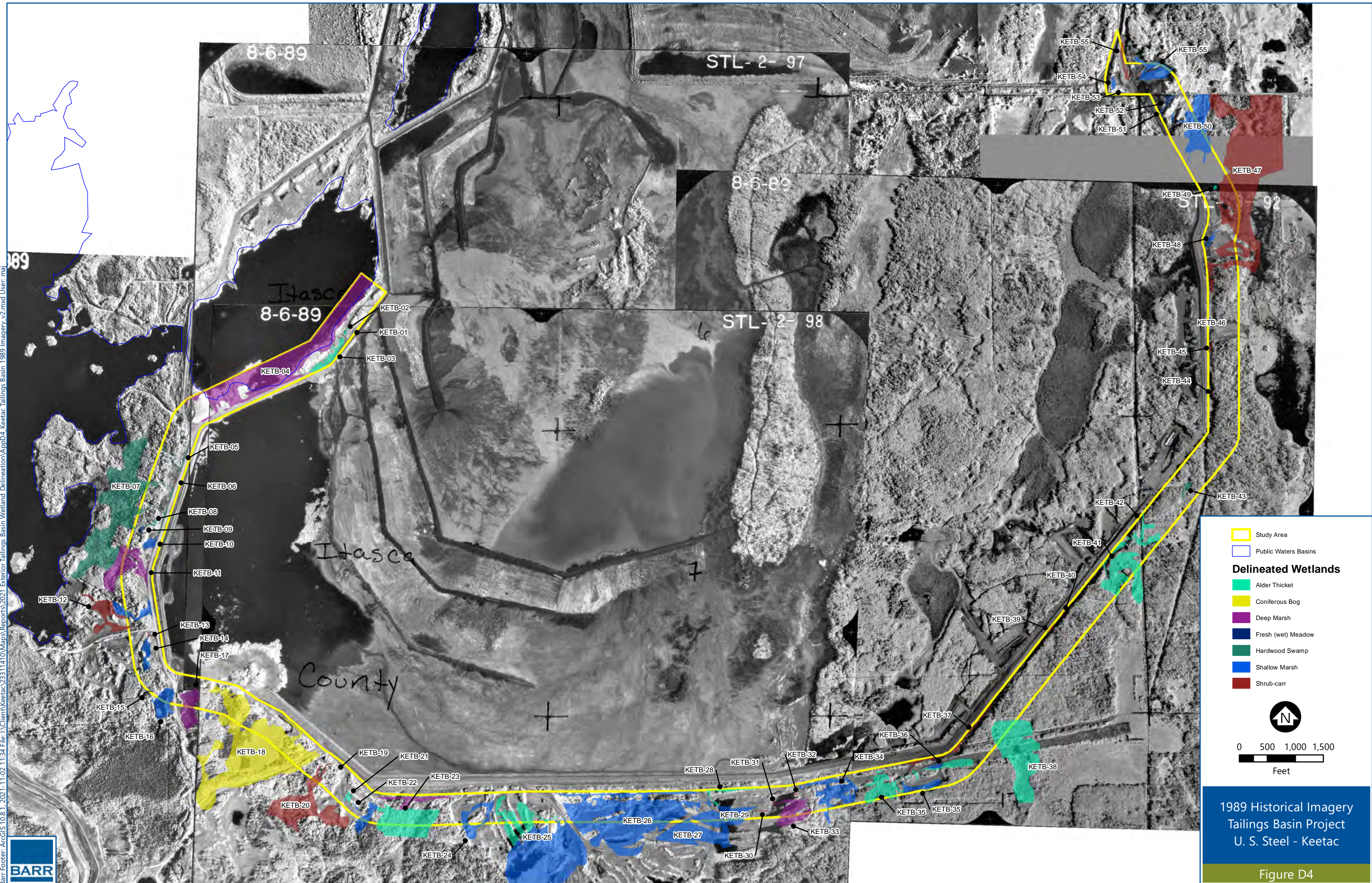


Figure D3



Study Area
Public Waters Basins

Delineated Wetlands

- Alder Thicket
- Coniferous Bog
- Deep Marsh
- Fresh (wet) Meadow
- Hardwood Swamp
- Shallow Marsh
- Shrub-carr

0 500 1,000 1,500
Feet

1989 Historical Imagery
Tailings Basin Project
U. S. Steel - Keetac

Figure D4

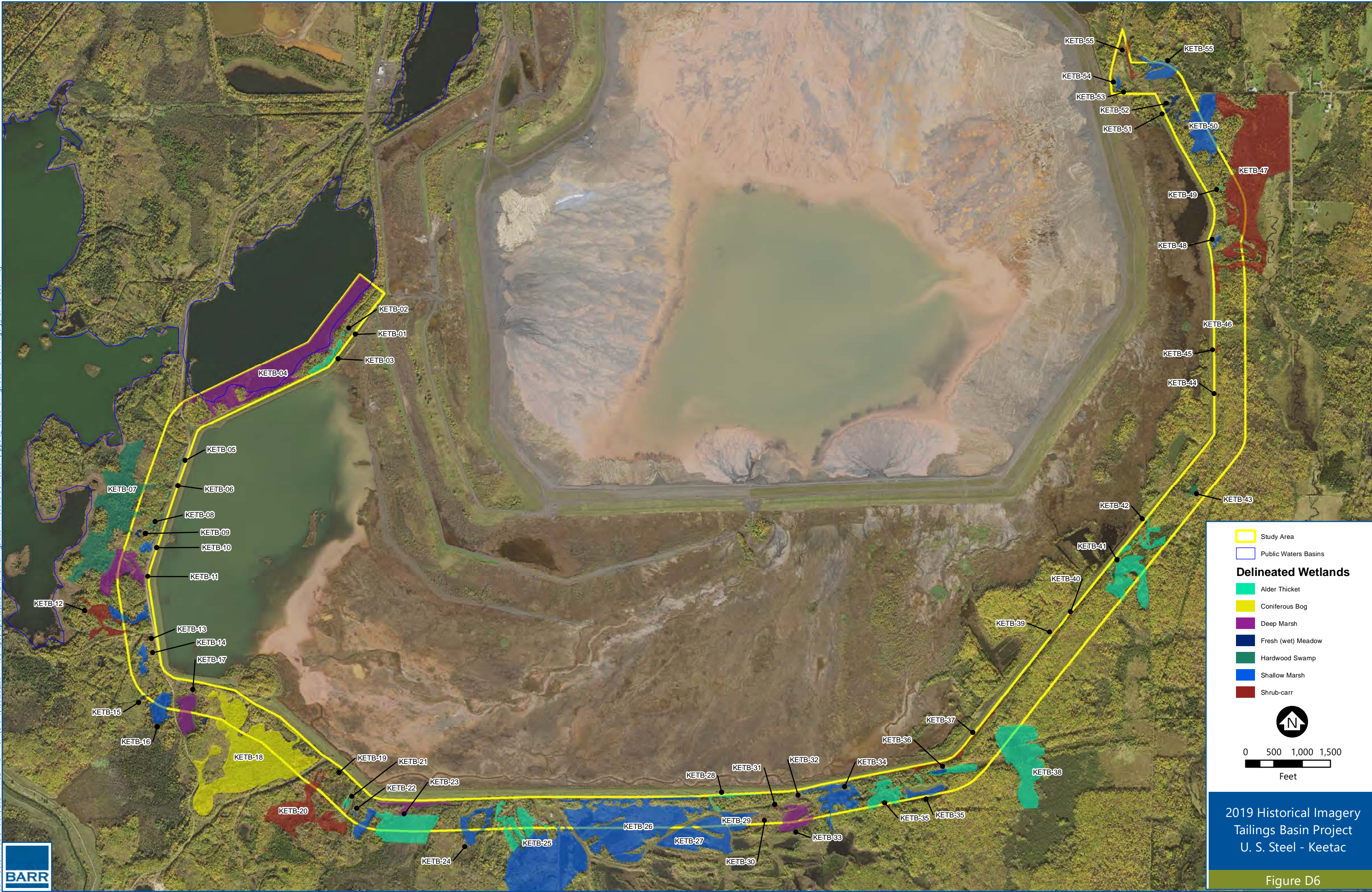




1991 Historical Imagery
Tailings Basin Project
U. S. Steel - Keetac

Figure D5





2019 Historical Imagery
Tailings Basin Project
U. S. Steel - Keetac
Figure D6



Study Area
Public Waters Basins

Delineated Wetlands

- Alder Thicket
- Coniferous Bog
- Deep Marsh
- Fresh (wet) Meadow
- Hardwood Swamp
- Shallow Marsh
- Shrub-carr

0 500 1,000 1,500
Feet

1952 USGS Quadrangle
Tailings Basin Project
U. S. Steel - Keetac
Figure D7

