Wetland Mitigation Plan

Keetac Expansion Project

Prepared for
U. S. Steel

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BARR

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U. S. Steel Keetac

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1.0 Introduction

On behalf of U. S. Steel Keetac (Keetac), Barr Engineering Company (Barr), has prepared this wetland mitigation plan (Plan) to provide compensatory wetland mitigation to replace unavoidable wetland impacts associated with Keetac's Expansion Project (Tables 1 and 3). A total of 759.5 acres of jurisdictional wetland impacts are proposed as a result of the expansion per Section 404 of the Clean Water Act (Table 1), of which, 562.0 acres are expected to be impacted during the first five years of the project (Table 2). A total of 693.2 acres of regulated wetland impacts are proposed based on the Minnesota Wetland Conservation Act (Table 3), of which, 497.7 acres are expected to be impacted during the first five years of the project (Table 4). The compensatory mitigation activities described in this plan include the planned establishment and enhancement of approximately 620.6 acres of wetlands in the inactive areas of the tailings basin at Keetac and off-site wetland mitigation.

Between 2005 and 2008, a total of 635.5 acres of wetland mitigation areas were identified within inactive areas of the tailings basin. A total of 14.9 acres of those mitigation areas were identified within the 100 feet of the toe of the tailings dam, an area where reinforcement of the dams may be planned should monitoring data indicate the need. Therefore, a total of 620.6 acres of wetland areas are planned for development as mitigation areas, including 430.0 acres of previously permitted mitigation wetlands and 190.6 acres of mitigation wetlands identified in 2008 for the Keetac Expansion Project. Past wetland permits issued to Keetac have included the use of 38.2 acres of those mitigation wetlands leaving a total of 582.3 acres of mitigation to provide compensatory mitigation for the Keetac expansion project. These mitigation areas are expected to compensate for all wetland impacts during the first five years of the project. The remaining 177.2 acres of wetland impacts per Corps mitigation guidelines (Table 1) and 158.5 acres of impacts per WCA guidelines (Table 3); will be compensated through the restoration of wetlands off-site. The final location for off-site wetland mitigation has not been selected, but several possibilities and a preferred site are described in this report.

In-pit stockpiling is proposed to be conducted in a manner that could result in the development of fringe wetlands along the north side of the future, water-filled mine pit. Based on the current mine plan, approximately 42 acres of Type 3-5 wetlands could be developed along the north edge of the pit, however, due to the uncertainties, this is not included in the plan to provide compensatory mitigation for the Keetac expansion project.

This document includes discussion of the wetland creation sites and off-site mitigation sites under consideration. This Plan was developed to comply with Wetland Conservation Act rules (Minnesota Rules Chapter 8420) as administered by the Minnesota Department of Natural Resources (MnDNR) – Division of Lands and Minerals, Section 404 of the Clean Water Act as administered by the U.S. Army Corps of Engineers (Corps), and Minnesota Rules 7050.0186 (wetland mitigation) as administered by the Minnesota Pollution Control Agency (MPCA).

Permanent Conservation Easements will be prepared and recorded to ensure perpetual protection of the wetland creation and restoration areas following certification of the wetland mitigation areas by the appropriate regulatory agencies.

2.0 Wetland Impact Summary

Between June and September 2008, wetlands in the vicinity of the Keetac Expansion Project were field delineated and characterized. The expansion is expected to result in unavoidable impacts to 755.2 acres of previously unpermitted wetlands during the life of the project. In addition, 4.3 acres of previously permitted wetland impacts are planned, for which mitigation has not been provided. The projected wetland impacts are summarized by wetland type using the Eggers and Reed Classification System (Eggers and Reed, 1997) on Table 1. Over 80 percent of the impacts are proposed in inundated wetland types including 361.9 acres of shallow, open water wetlands, 185 acres of shallow marsh wetlands and 82.3 acres of deep marsh wetlands. Over 210 acres of those wetlands are either incidental or are artificially impounded and therefore, are not the same wetland communities that had naturally developed. Shrub wetlands, including shrub carr and alder thicket communities make up 104.2 acres of the projected impacts. Other wetland community types present within the project boundaries include wet meadow (10.8 acres), hardwood swamp (9.5 acres), and seasonally flooded wetlands (5.8 acres). Over 90 percent of the projected wetland impacts are low to moderate quality wetlands encompassing nearly 700 acres.

3.0 Wetland Mitigation Planning

The wetland mitigation planning efforts for the Keetac Expansion Project have proceeded in accordance with the Wetland Conservation Act wetland replacement siting rules to first replace on-site, within the same watershed, and of the same type as the impacted wetlands to the extent practicable. In addition, the Corps compensatory mitigation guidelines have been followed to first replace using wetland mitigation bank credits, then to replace on-site, within the same watershed and of the same type as the impacted wetlands.

3.1 Wetland Conservation Act Mitigation Guidelines

The current Wetland Conservation Act (WCA) rules went into effect August 10, 2009. Several specific changes to the WCA rules affect the overall mitigation plan for the Keetac Expansion Project: 1) replacement wetland credit allocation; 2) the definition of "in-kind" wetland replacement; 3) wetland replacement ratios; and 4) wetlands created by pits, stockpiles, or tailings basins. The first provision only applies to the 190.6 acres of on-site wetland replacement proposed specifically for the Keetac Expansion Project, not the 391.7 acres of on-site replacement wetlands that were previously approved as part of past permit actions. The last three provisions apply to the entire Keetac Expansion Project.

The WCA contains mitigation guidelines that place a preference on restoring drained wetlands over creation and other methods of mitigation. There are also specific criteria and guidelines regarding wetland mitigation credit allocation for various methods of wetland mitigation (M.R. 8420.0526). The mitigation methods and credit allocation guidelines used in the calculations include the permanent WCA rules that went into effect August 10, 2009. There are six main categories of mitigation methods considered as appropriate in northern Minnesota as described below. The establishment of an upland buffer is required for all of these methods except for restoration and preservation of exceptional natural resource value wetlands, of which, none is proposed for this project. For replacement wetlands two acres or larger, the buffer must be a minimum width of 25 feet with an average width of 50 feet. The applicant may request that the local government unit vary the buffer standards when compliance is not practicable or feasible and the replacement will otherwise meet the ecological suitability and sustainability requirements.

1. Restoration of Completely Drained of Filled Wetlands –This is the preferred method for wetland mitigation. Credits are allocated at up to 100 percent for restoring the natural hydrology regime and native, noninvasive vegetation on wetlands that have been completely drained.
2. Restoration of Partially Drained or Filled Wetlands – This category includes the restoration of the natural hydrology regime and native, noninvasive vegetation of wetlands degraded by prior drainage, filling, or a diversion of the natural watershed. Credits are allocated based on the extent of drainage and the agricultural history as follows: up to 50 percent (of the area restored) for partially drained wetlands with less than ten years of agricultural history, up to 100 percent for farmed wetlands based on the percentage of the past 20 years in which the restored area was planted with annually seeded crops, was in a crop rotation seeded to pasture grasses or legumes, or was required to be set aside to receive price supports or equivalent payments.
3. Vegetative Restoration of Farmed Wetlands – This category includes the reestablishment of permanent native, noninvasive vegetative cover on farmed wetlands that have not been affected by prior drainage or filling. Credits are allocated based on the extent of drainage and the agricultural history as follows: up to 50 percent (of the area restored) for partially drained wetlands with less than ten years of agricultural history, up to 100 percent for farmed wetlands based on the percentage of the past 20 years in which the restored area was planted with annually seeded crops, was in a crop rotation seeded to pasture grasses or legumes, or was required to be set aside to receive price supports or equivalent payments.
4. Restoration and Protection of Exceptional Natural Resource Value – This method includes the restoration and protection of high value wetlands such as calcareous fens, white cedar swamps, floodplain or riparian wetlands and upland buffers, habitat corridors with other important resources, wetlands adjacent to designated trout waters, habitat for state-listed species, rare native plant communities, special fish and wildlife resources, sensitive surface waters, and other resources determined to be exceptional by the technical evaluation panel. These areas are eligible for credit when the action improves or directly contributes to the function and sustainability of an exceptional natural resource. Protection is accomplished through the recording of a permanent conservation easement over the wetland. Credit allocation is determined by the local government unit with concurrence of the technical evaluation panel.
5. Creation – This is the least preferred method from a regulatory standpoint due primarily to the greater risk of failure. Wetland creation involves the construction of wetland areas from existing non-wetland areas. Credit allocation is suggested at up to 75 percent of the created wetland area compared to 100 percent credit that was allowed prior to August 10, 2009.

6. Preservation of Wetlands Owned by the State or a Local Unit of Government– This method includes the permanent preservation of high value wetlands that are determined by the technical evaluation panel to have a high probability of becoming degraded or impacted. Replacement credit may only be granted after considering replacement through the other methods described above. Preservation is accomplished through the recording of a permanent conservation easement over the threatened wetland. In the project area, credit allocation is currently suggested at up to 12.5 percent of the area preserved.
7. Upland Buffer Areas – This method applies to protecting upland areas surrounding replacement wetlands. Up to ten percent credit of the buffer area is eligible for replacement credit for preservation and enhancement of nonnative vegetation and 25 percent of the buffer is eligible for credit for establishment and preservation of native, noninvasive vegetation. The credit allocation may be increased to 50 percent if the technical evaluation panel finds that additional buffer will improve replacement wetland sustainability and provide significant functional benefits. Buffers add significant benefit when they:
    - Extend upstream in the watershed, provide slope and soil stability, and otherwise improve water quality;
    - Protect valuable native plant communities or habitats that could otherwise be lost or degraded;
    - Provide important habitat connections; or
    - Otherwise substantially improved important wetland functions based on a functional assessment.

3.2 U.S. Army Corps of Engineers Mitigation Guidelines

The St. Paul District Compensatory Mitigation Policy for Minnesota (U.S. Army Corps, 2009) also contains mitigation guidelines that place a preference on restoring drained wetlands over creation and other methods of mitigation. There are also specific criteria and guidelines regarding wetland mitigation credit allocation for various methods of wetland mitigation. The mitigation methods and credit allocation guidelines used in the calculations include the St. Paul District Compensatory Mitigation Policy for Minnesota (U.S. Army Corps, 2009). There are six main categories of mitigation methods considered as appropriate in northern Minnesota listed in order of preference:

1. Wetland Banking – The use of existing mitigation banking credits is the preferred method.
2. Re-establishment of Wetlands – This category includes techniques for returning wetland functions to a location where no wetland currently exists. This is the preferred method for

wetland mitigation. Credits are allocated at 100 percent for restoring wetlands where none currently exists.

3. Rehabilitation of Degraded Wetlands – This category includes restoring wetland functions, but not wetland acres, typically applied to hydrologic restoration. Credits are allocated based on the degree to which wetland functions are increased ranging from 50 percent to 100 percent.
4. Enhancement – This category includes activities that heighten, intensify or improve a specific function of an existing wetland. Enhancement often takes the form of vegetation management including invasive weed control, prescribed burns, brush removal and plantings of native vegetation. A long-term management plan, financial assurances and/or a dedicated management entity are typically required to ensure the enhancement activities result in more than a temporary increase in wetland functions. Credit is generally allocated at one acre of credit for three acres of enhancement. For wetlands that are row-cropped in at least 6 of 10 years; the elimination of crop production in perpetuity along with the establishment of native vegetation can be eligible for 50 percent credit.
5. Preservation – This method involves actions that would remove a threat or prevent the decline of wetland functions by an action that is outside of regulatory authorities e.g., logging of a cedar swamp or maintenance of an established ditch system. To generate compensation credit, the wetland must perform physical or biological functions that are important to the region and must be under demonstrable threat of loss or substantial degradation due to human activities that might not otherwise be restricted. permanently preserve high value wetlands that are under demonstrable threat. It is mandatory that the site be legally protected by covenants, a permanent conservation easement, or transfer of ownership to a public natural resource agency or private conservation organization. Credit allocation is generally applied at 1 acre of credit for 8 acres of wetland preservation.
6. Creation – Wetland creation involves converting uplands to wetlands, resulting in a net gain in wetland acres and functions. Credit is possible at 100 percent if the creation site is low risk as well as connected to other wetlands and upland buffers/corridors. Lower risk refers to cases where hydrology data from monitoring wells, hydrologic analysis, or modeling is sufficient to ensure the development of sustainable hydrology. Creation sites lacking sufficient hydrology data and those isolated from other wetlands and upland buffers may be allowed 50 percent credit due to the diminished level of wetland functions.

3.3 Wetland Mitigation Study Limits

The project site is located primarily within the Mississippi River-Grand Rapids major watershed and all proposed wetland impacts are located in that watershed. The Corps has identified Bank Service

Areas, which have also been adopted into the Wetland Conservation Act, as larger areas in which the use of established wetland bank credits are considered as in-place compensation for unavoidable wetland losses. The Keetac project lies within Bank Service Area #5, which encompasses various Mississippi River watersheds, including the Mississippi River-Grand Rapids watershed.

The watersheds adjacent to the Mississippi River-Grand Rapids watershed include (Figure 1):

1. Big Fork River
2. Kettle River
3. Leech Lake River
4. Little Fork River
5. Mississippi River – Brainerd
6. Mississippi River – Headwaters
7. Pine River
8. St. Louis River

Therefore, the initial wetland mitigation study scope was identified as the Mississippi River – Grand Rapids watershed, then adjacent watersheds, followed by the next ring of watersheds lying outside of the adjacent watersheds.

3.4 Wetland Banking

A survey of wetland mitigation banking credits available within the project Bank Service Area and adjacent Bank Service Areas was conducted initially to determine if suitable credits were available for purchase. It was determined that insufficient credits were available to satisfy the compensatory mitigation requirements for the project. Only 11 acres of wetland banking credits were available in 9 separate accounts in Bank Service Area 5.

3.5 On-Site Wetland Mitigation Planning

On-site wetland mitigation opportunities were identified within inactive areas of the tailings basin and within the mine pit during closure. The *Tailings Basin Wetland Mitigation Establishment and Enhancement Plan* (Barr, 2009) describes the details regarding the plan, which is also summarized in Section 4.0 of this report.

3.5.1 Wetland Impacts - Wetland Conservation Act

Proposed wetland impacts for the project are summarized in Table 3, including direct and indirect impacts. Since wetlands created by pits, stockpiles, and tailings basins are not regulated by the WCA

(per M.R. 8420.0930, Subp. 1), a total of 66.3 acres of wetland impacts, created solely by stockpiles and tailings basins, have been removed from the regulated wetland impact total (Table 3). Another modification from previous wetland impact calculations is the addition of 4.3 acres of shallow marsh impacts in the northwest stockpile area. These wetlands represent those that were previously permitted, were removed from the mitigation accounting in 2003 (since it was anticipated that they would be avoided), and have been included in the mitigation proposed for the Keetac Expansion Project because they are located within the planned stockpile area (Table 3). Therefore, the total, regulated wetland impacts proposed for replacement under the WCA is 693.2 acres. During the first five years of the project, 497.7 acres of wetland impacts are projected (Table 4).

3.5.2 Wetland Replacement - Wetland Conservation Act

A total of 430.0 acres of on-site wetland mitigation was previously permitted as part of past permit actions. A total of 38.2 acres of the previously permitted wetland mitigation areas have been utilized for past, permitted wetland impacts, leaving 391.75 acres of credit for the Keetac Expansion Project (Table 3). In addition, 190.6 acres of wetland mitigation has been identified within the tailings basin specifically for the Keetac Expansion Project. Since the new mitigation areas have not been previously permitted, credit allocation is based on the current WCA rules at 75 percent credit for a total of 143.0 acres of credit (Table 3). Therefore the total on-site mitigation credits available for the Keetac Expansion Project is 534.7 acres. The new WCA rules allow for in-kind replacement of degraded wetlands based on the historic wetland types present prior to disturbance:

- Wetland Conservation Act M.R. 8420.0522, Subp. 4 – Project specific mitigation within the major watershed, the majority of which is in-kind. Wetland replacement is in-kind if it is: A) the same type or plant community as the impacted wetland or, for degraded wetlands, the same type or plant community that historically occurred at the impact site (M.R. 8420.0522, Subp. 3); or B) the same hydrologic conditions and landscape position as the impacted wetland.

Approximately 434 acres of wet meadow and shrub wetlands were present within the proposed wetland impact areas historically, compared to about 88 acres of those wetland types currently present within regulated wetlands (Table 3). Therefore, a total of 469 acres of on-site wetland replacement is planned in-kind, which represents over 67 percent of the total wetland impacts. The proposed on-site wetland replacement is sufficient to cover the first five years of impacts with approximately 37 acres of mitigation remaining. The on-site wetland replacement is not sufficient for

the entire project, however. A total of 158.5 acres of wetland impacts are proposed to be replaced off-site (see Section 3.6).

All of the wetland impacts projected for the first five years of the project will be compensated by the mitigation planned on-site within the tailings basin (Table 5). Based on the current mine plans, it appears that there is the potential for developing approximately 42 acres of wetlands within the mine pit during closure as described in Section 4.2 of this report. However, no compensatory wetland mitigation credit is proposed for the in-pit wetland development due to the uncertainty in timing and the exact area of wetland that could be developed.

Currently, the tailings basin wetland mitigation plan does not designate upland buffer areas around the mitigation wetlands. The lands surrounding the 190.6 acres of proposed tailings basin mitigation wetlands will be evaluated to determine the potential to establish and protect upland buffer areas. The *Tailings Basin Wetland Mitigation Establishment and Enhancement Plan* (Barr, 2009) will be revised to incorporate upland buffers to the extent practicable prior to development of the Final Environmental Impact Statement.

3.5.3 Wetland Impacts – Section 404 of the Clean Water Act

Proposed wetland impacts for the project are summarized in Table 1, including direct and indirect impacts. An additional 4.3 acres of shallow marsh impacts have been added to previous impacts for impacts proposed in the northwest stockpile area. These wetlands represent those that were previously permitted, were removed from the mitigation accounting in 2003 (since it was anticipated that they would be avoided), and have been included in the mitigation proposed for the Keetac Expansion Project because they are located within the planned stockpile area (Table 1). Therefore, the total, regulated wetland impacts proposed to be mitigated under Section 404 of the Clean Water Act is 759.5 acres. During the first five years of the project, 562.0 acres of wetland impacts are projected (Table 2).

3.5.4 Wetland Replacement - Section 404 of the Clean Water Act

A total of 620.6 acres of on-site wetland mitigation is proposed, including 430.0 acres of mitigation previously approved as part of past permit actions and 190.6 acres of mitigation proposed for the Keetac Expansion Project (Table 1). A total of 38.2 acres of the previously permitted wetland mitigation areas have been utilized for past, permitted wetland impacts, leaving 582.3 acres of credit for the Keetac Expansion Project (Table 1).

The basis for a 1:1 compensation ratio for on-site wetland mitigation is based on the following mitigation rule/guideline provisions:

- Section 404 Clean Water Act, St. Paul District Compensatory Mitigation Policy for Minnesota (U.S. Army Corps, 2009) Section II. G.3. The basic compensation ratio required by the Corps is 1.5:1 for the project area. The basic compensation ratio can be reduced by 0.25 for each of the three factors that apply (in-place, in-advance, and in-kind) to a minimum compensation ratio of 1:1. The tailings basin mitigation have established hydrology and vegetation in place (in most areas and vegetation will be established in the remaining areas prior to the completion of all impacts during the first 5 years) at least one full growing season ahead of impacts, thus meeting the requirements for in-advance. The tailings basin mitigation is also located on-site and in the same 8-digit HUC watershed as the impacts, therefore meeting the requirements for in-place. The mitigation, thus, would qualify for a 1:1 compensation ratio.

With the 1:1 compensation ratio for on-site mitigation, it is expected that compensation for 177.2 acres of wetland impacts will be completed off-site (see Section 3.6). The on-site wetland mitigation is expected to be sufficient to compensate for impacts occurring during the first five years of the project with about 20.3 acres of credits remaining for the second five year portion of the project (Table 2).

3.6 Off-Site Wetland Mitigation Planning

Finally, the potential to restore wetlands first within the Mississippi River-Grand Rapids watershed and then adjacent watersheds was evaluated. A Geographic Information System (GIS) analysis was performed to identify potential wetland mitigation sites within the defined study area. The primary goal of this analysis was to identify potentially drained wetlands located primarily on private land so that more detailed investigations could proceed. The identification of sites was established by overlaying and evaluating numerous existing spatial data sources (primarily from public domain sources) to identify those sites with the greatest potential. Some of the data sources utilized include:

1. Geomorphology/soil types
2. Land ownership (separated by county/state/federal and private ownership)
3. Land slope/DEM
4. Streams/Ditches
5. Major watersheds

6. Land Cover

The geomorphology data is 1:100,000 scale data describing a wide variety of conditions related to surficial geology within a hierarchical classification scheme that was devised for use within Minnesota. The geology data include geomorphic association, glacial phase, topographic expression, and sedimentary association/rock type. The land ownership data includes federal, state, county, city, tax-forfeited, and private land, by 40-acre parcels. The digital elevation model was split into three slope classes: 0-1 percent (high likelihood of wetlands), 1-3 percent (moderate likelihood of wetlands), and >3 percent (diminished likelihood of wetlands). The stream data is a mapping of natural watercourses and ditches by the MnDNR at a 1:24,000 scale. The land cover data consists of land use – land cover mapping divided into 16 classes based on 30-meter resolution satellite imagery from June 1995 to June 1996.

The analysis was conducted by establishing specific filtering criteria to identify potential wetland mitigation sites. The general filtering criteria included the following:

1. Land slopes of ≤ 1 percent slope based on an analysis of the USGS 30-meter digital elevation model,
2. Areas mapped as peat or lacustrine geomorphology,
3. Private or county tax-forfeit property,
4. Areas within 1.1 miles of a ditch, and ultimately
5. Areas meeting all of the above criteria with at least 100 contiguous acres.

The analysis was initially limited to sites with more than 100 acres of wetland mitigation potential due to the anticipated difficulties in planning numerous, small wetland mitigation projects and the desire to identify opportunities that were realistically feasible. In addition, it was felt that the Keetac project represented an opportunity to restore large wetland systems that may provide greater public and ecological benefit that are typically not available to smaller projects. If sufficient wetland mitigation for the project cannot be secured through pursuit of larger site opportunities, it may be necessary to consider smaller sites in the future.

This GIS analysis resulted in the development of a polygon data layer which included numerous sites within the Mississippi River-Grand Rapids watershed and adjacent watersheds. Each of the potential wetland mitigation opportunities identified were identified with a unique number to facilitate communication and tracking of each site. Those numbers are used below in descriptions of individual potential mitigation sites.

3.7 Identification of Wetland Mitigation Opportunities

Potential wetland mitigation sites identified in GIS within the project watershed and adjacent watersheds were evaluated to determine the likely technical feasibility. In some cases, preliminary discussions have been conducted with landowners to determine the level of interest in either selling land or participating in the wetland mitigation program. Details regarding specific sites that were determined to have moderate to high potential for mitigation are described below (Table 5, categorized by watershed and listed from highest to lowest priority) and are shown on Figure 1. In addition to conducting a GIS analysis to identify potential wetland mitigation sites, we contacted agency staff involved in wetland permitting and banking, contacted landowners who have expressed an interest in wetland mitigation or banking, and reviewed properties available for sale in the area. A total of 158.5 acres of wetland impacts will not be replaced on site following the WCA provisions and 177.2 acres of wetland impacts will not be compensated by on-site mitigation following the Corps guidelines. Off-site mitigation opportunities have been identified that could provide compensation for the at least 177.2 acres of wetland impacts.

3.8 Mississippi River-Grand Rapids Watershed

3.8.1 Palisade Site

The Palisade site is located east of the Mississippi River in T48N, R24W; T49N, R24W; and T49N, R25W, Aitkin County, near Palisade, Minnesota (Figure 2). The majority of the site is located in the Mississippi River—Grand Rapids major watershed and the western portion of the site is located within the Mississippi River—Brainerd major watershed. The property consists of approximately 4,400 acres of non-contiguous land controlled by one owner. U. S. Steel has an option agreement with the current landowner to purchase the property. The agricultural history is well-documented and a preliminary assessment of the wetland mitigation potential has been conducted. A site visit was conducted with the permitting and environmental review agencies and the mitigation potential assessment has been shared with the same parties. The land is ditched, but there is no drain tile. There are several public ditches within the property along with several private ditches. Much of the property has been under agricultural production for more than 20 years. A preliminary analysis of the property has indicated the potential for over 2,400 acres of wetland mitigation credit.

3.8.2 Site 3261

Site 3261 is located on the west side of the Mississippi River in T50N, R24W, Aitkin County, near Palisade, Minnesota (Figure 3). The site is located in the Mississippi River – Grand Rapids watershed in Bank Service Area 5. The property is composed of approximately 2,200 acres of agricultural land owned and operated by the same party as Site 355. U. S. Steel has discussed the possibility of

conducting wetland mitigation on the property and the current landowners are interested. The landowners are interested in restoring up to 300-400 acres of wetlands that are adjacent to a large, existing wetland complex. The agricultural history appears to be fairly well-documented and the site should have good wetland mitigation potential. The land is extensively ditched, apparently discharging directly to the Mississippi River. It is expected that the restoration of 300-400 acres of wetland would yield between 150 acres and 400 acres of mitigation credit.

3.8.3 Site 260

Site 260 is a privately owned parcel, approximately 625 acres in size, located in T47N, R26W, Aitkin County, near Aitkin, Minnesota (Figure 4). The site is located in the Mississippi River – Grand Rapids watershed in Bank Service Area 5. Approximately 250 acres of the land has some agricultural history, however the degree of documentation is uncertain. Approximately 100 acres of the land was released from the Conservation Reserve Program in October, 2007. The property is moderately ditched and the presence of drain tiles is uncertain. The landowner has expressed an interest in wetland restoration on the property, either through granting of an easement, or potentially through sale of the property. It is estimated that the site may be eligible for 25-75 percent credit for the area restored, which could result in 60-200 acres of mitigation credit. The potential at this site would have to be investigated further to determine the true value for the Keetac project.

3.8.4 Site 3262

Site 3262 is located in T50N, R24W and R49, R24W, Aitkin County, near Palisade, Minnesota (Figure 3). The site includes approximately 700 acres of privately owned land with the potential for about 250 acres of wetland mitigation. The landowner is currently working with others on wetland restorations and is not likely to pursue restoring wetlands on this property since it is an important part of his operation.

3.9 Mississippi River-Headwaters Watershed

3.9.1 Site 355

Site 355 is located along the Mississippi River in T144N, R24W and T144N, R25W, Itasca County, near Deer River, Minnesota (Figure 5). The site is located in the Mississippi River – Headwaters watershed in Bank Service Area 5. Approximately 700 acres of land is privately owned in this location with about 400 acres in wild rice production. The land has been farmed for about 30 years. About 100 acres of the agricultural land was obtained in an exchange with the county or state and there are apparently some limited, negotiable liabilities remaining from that exchange. The landowner has expressed an interest in wetland restoration, either through a land sale or through sale

of an easement. The farm land is extensively ditched, discharging directly to the Mississippi River. It appears that there are no private structures or property immediately adjacent to the property that would be affected by restoring wetlands. With the extensive ditching and agricultural history, the site may be eligible for up to100 percent credit for the area restored (~400 acres).

3.10 Mississippi River-Brainerd Watershed

3.10.1 Site 1985

Site 1985 is approximately 2,200 acres in size located in T47N, R26W, Aitkin County, near Aitkin, Minnesota (Figure 6). The site is located in the Mississippi River – Headwaters watershed in Bank Service Area 5. Approximately 1,300 acres of the land is currently in agricultural production and about 350 acres is leased for a peat mining operation. The majority of the agricultural land has been in production since 1975 with the exception of the 10-year period from 1986-1996 when it was in the Conservation Reserve Program. The property is extensively ditched with drain tiles typically spaced 160 feet apart. The landowner has expressed some interest in discussing opportunities for wetland restoration on the property, but further discussions would be needed to determine their willingness to participate. It is estimated that the site may be eligible for 50-100 percent credit for the area restored, which could result in up to 1,000 acres of mitigation credit. Given the arrangement of the agricultural activities, it appears that it would be possible to restore a sufficient area of wetland to meet Keetac's needs.

3.10.2 Site 1984

Site 1984 abuts the Mississippi River in T47N, R26W, Aitkin County, near Aitkin, Minnesota (Figure 7). The site is located in the Mississippi River – Brainerd watershed in Bank Service Area 5. The property is composed of 580 acres of privately owned land that was listed for sale approximately one year ago. Approximately 430 acres of the land has been under primarily hay production in recent years and appears to have some agricultural history dating back to 1940 based on a review of aerial photographs. The land has minimal ditching and drainage, which is the likely reason that row crop production may not have been a significant part of the operation. There is a small homestead in the eastern portion of the property and the Aitkin Airport lies directly south of the property. Because the property is not extensively drained and agricultural history may not qualify for full mitigation credit, the site may only be eligible for 10-75 percent credit for the area restored (~40-325 acres of credit). The landowner is currently seeking wetland bank plan approval from Aitkin County, the Local Government Unit administering the Wetland Conservation Act.

3.11 Kettle River Watershed

3.11.1 Site 123

Site 123 is an approximately 2,050 acre site located in T44N, R20W, Pine County, near Willow River, Minnesota (Figure 8). The property is owned by two parties according to the Pine County Plat Book. One owner is shown to own approximately 1,100 acres of potential wetland restoration area and the other appears to own approximately 500 acres with wetland restoration potential. Agricultural activities, including sod production and row crops, are currently being conducted on the entire site. The property appears to have high potential for restoring wetlands. Based on personal observations of the site over the past 10 years, it appears that there is a long-term sod-production and agricultural history on the site. The site is extensively drained with an actively maintained ditch system. It appears that the site drains both north and south with a drainage divide near the center. It may be possible to restore wetlands on a portion of the property while not adversely affecting adjacent areas, thereby lending more flexibility to planning wetland restoration. The landowner has expressed an interest in retiring parts of his farm for wetland mitigation purposes in the past, but his current situation is unknown.

4.0 On-Site Wetland Mitigation

4.1 Wetland Creation Enhancement Plan

The ultimate objective of the on-site wetland mitigation plan is to establish primarily native vegetation within the tailings basin mitigation wetlands. The vegetation will be enhanced by seeding a native seed mixture designed for development on tailings, planting shrubs, followed by vegetation management activities.

The primary goal of the Plan is to restore moderate to high quality wetland communities of the same types as those proposed to be impacted or as were historically present within the expansion project area. While it is not practicable to replace all impacted wetland types with an equivalent area of in-kind wetland due to site limitations, technical feasibility, and other considerations; the goal of the mitigation plan is to replace the wetland types in-kind to the degree practicable in order to replace lost wetland functions and values. A summary of the planned wetland plant communities compared to the projected impacts is provided in Table 1.

4.1.1 Vegetation Establishment and Management

An adaptive management program is proposed to guide the establishment of the wetlands to the targeted conditions. The vegetative enhancement areas for the mitigation wetlands have been identified (Barr, 2009). The enhancement will be conducted to promote the establishment of characteristic native species that are present in similar plant communities within the general area and adjacent wetlands. The process for vegetation enhancement of the wetlands is designed to aid the proposed plant communities in meeting the goals and the performance objectives described in Section 5 in the most effective manner.

The goal of the plan is to help ensure that the tailings basin mitigation wetlands develop into self-sustaining and functioning plant communities to the extent feasible. The proposed wetland communities have been planned in areas that appear to match the desired hydrologic characteristics of each community type.

To aid in tracking the progress of the created wetlands in the past, a reference wetland (a portion of the Mesabi Chief Wetland) was used for comparison. The reference wetland developed within a tailings basin and includes many of the proposed wetland plant communities. In future monitoring reports, the vegetative species diversity, proportion of vegetative cover, and water levels in the

Mesabi Chief Wetland will be characterized and compared to the created wetlands. In addition, natural reference wetlands will be identified and monitored to assist in tracking the development of the mitigation wetlands. It is recognized that the wetland development process cannot be accomplished within a few years, but will take time, and therefore, short-term, interim performance standards are proposed.

The overall schedule for enhancement activities within the tailings basin mitigation wetlands is to complete the initial seeding and planting within the next 3 years (through 2011).

Many of the mitigation wetlands created to compensate for unavoidable impacts will require regular management to become established as sustainable, functioning wetlands. This is critical in the first three to five years and should be recognized as integral to the wetland mitigation success. Management will include both controlling non-native and invasive species, creating ideal conditions for the native plants to flourish, and seeding/planting to supplement natural development. Weeds can become established any time that bare ground is present. Some weeds are very aggressive and will out-compete the desirable wetland seedlings. Therefore, weed control and careful monitoring is important during the early stages of the establishment process. As native plants grow and spread over the years, and as thatch slowly builds, the site will become less vulnerable to weed species. Removal of weeds does continue to be important during the first five to ten years to ensure that the native plant communities become established. After final certification of the mitigation wetlands by the appropriate regulatory agencies, Keetac will record a *Permanent Conservation Easement.*

4.2 In-Pit Wetland Development

There appears to be the potential to develop wetlands within the proposed Keetac mine pit in the future, after the pit has filled with water. The outflow elevation from the mine pit is expected to be at an elevation of 1430 feet MSL with water depths ranging from zero along the north edge to over 400 feet along the south side of the pit. The bottom of the pit is planned to slope down from north to south generally at about a 6-8 percent grade. There appears to be the potential to develop approximately 42 acres of functional littoral, Type 3-5 wetland areas along the north side of the water-filled pit. The south side of the pit will not have any wetland development potential since it will have more steeply sloped pit walls. In-pit stockpiling is currently planned such that several islands would be created within the pit after it fills with water. With the establishment of lacustrine wetlands along the north edge of the pit along with the diversity of water depths and islands within the pit; the deepwater habitats are expected to have some wildlife and fisheries value. Compensatory wetland mitigation credit for in-pit wetland development is not being proposed as part of the Keetac

expansion project wetland mitigation plan due to the uncertainty in the timing and exact acreage of wetland development possible.

5.0 Off-Site Wetland Mitigation

5.1 Preferred Mitigation Site - Palisade

The preferred off-site wetland mitigation property under consideration by U. S. Steel is the Palisade site described in Section 3.6.1. U. S. Steel has a signed option agreement on the property, has reviewed the site with the agencies involved in permitting and environmental review for the project, and determined that the site has suitable mitigation potential for the Keetac expansion project within the same major watershed. The property is drained by surface ditching, of which there is over 36 miles, according to the former landowner. Several of the ditches are public ditches that would have to be abandoned through the ditch abandonment process in order to be eliminated. The majority of the public ditches originate on the property such that no upstream properties would be affected following abandonment. Aitkin County has acknowledged that there is a public process for abandoning ditches and that it may be feasible to do so. All soils within the project site are classified as hydric soils. According to the Natural Resources Conservation Service Soil Survey, the majority of the area located within and immediately adjacent to the property is comprised of either organic or sandy loam soils with natural drainage classes consisting of poorly drained to very poorly drained. The southern portion of the site appears to have been rarely planted or cultivated and wetland hydrology appears evident.

The cropping history for the site has been obtained from the USDA Farm Service Agency for the years 1989 through 2008. The site appears to contain drained wetland, partially drained wetland, and farmed wetland. An analysis of the wetland mitigation potential at the site has been conducted to determine if the site has adequate potential to fulfill Keetac's compensatory wetland mitigation needs. The site was also evaluated to determine if wetland restoration activities could be phased on the property. That evaluation identified an initial phase of restoration that would involve approximately 435 acres on which restoration activities could start as early as 2010 (Figure 2). The initial phase of restoration would not require abandonment of any public ditches. Based on the agricultural history and partial drainage of that area, it was determined that just over 300 acres of mitigation credit could be achieved in the initial phase based on the current state and federal wetland mitigation guidelines.

5.2 Alternative Sites

Site 3261 is an alternative to the preferred site that also has the potential to meet the project needs within the same major watershed. U. S. Steel has discussed wetland mitigation opportunities with the

landowner who has expressed interest. None of the other sites identified in the Mississippi River-Grand Rapids watershed appear to be feasible at this time. However, should the Palisade site and Site 3261 prove infeasible for the Keetac project; other potential opportunities within the project watershed will be reevaluated at that time. Several other potential wetland mitigation alternatives identified in neighboring watersheds have interested landowners and good technical feasibility, but opportunities within the project watershed will be considered first. There are suitable opportunities for developing compensatory wetland mitigation for project impacts planned after the first five years of the project. Wetland mitigation plan details will be developed and submitted for permit approval within 4 years after the start of the project to ensure authorization before subsequent wetland impacts occur.

6.0 References

Barr Engineering Company. 2009. *Tailings Basin Wetland Establishment and Enhancement Plan*. June 2009.

Eggers, S.D. and D.M. Reed. 1997. Wetland Plants and Plant Communities of Minnesota and Wisconsin, Second Edition. U.S. Army Corps of Engineers, St. Paul District, 263 pp.

U.S. Army Corps of Engineers, St. Paul District. 2009. St. Paul District Compensatory Mitigation Policy for Minnesota.

Tables

Table 1
Comparison of Proposed Wetland Impacts and On-Site Wetland Mitigation
Per Corps Compensatory Mitigation Guidelines
Total Project
U. S. Steel Keetac

Wetland Communities	Total Tailings Basin Mitigation (ac)	Mitigation Utilized		Available Tailings Basin Mitigation[1] (ac)	Proposed Keetac Expansion Project Impact Area (ac)[2]	Mitigation Applied at 1:1 Ratio[3] (ac)	Remaining, Uncompensated Impacts (ac)
		2005 Mine and Stockpile Expansion Impact Area (ac)	2007 Aromac Expansion Impact Area (ac)				
Seasonally Flooded (Type 1)	5.1	0.0	0.0	5.1	5.8	5.1	0.7
Wet Meadow (Type 2)	112.5	12.8	0.7	99.0	10.8	99.0	0.0
Shallow Marsh (Type 3)	84.9	0.0	0.3	84.6	185.0	84.6	100.4
Deep Marsh (Type 4)	27.7	0.0	0.7	27.0	82.3	27.0	55.3
Shallow, Open Water (Type 5)	0.0	0.0	0.0	0.0	361.9	0.0	20.8
Shrub Carr (Type 6)	313.7	16.2	1.4	296.1	86.4	296.1	0.0
Alder Thicket (Type 6)	20.6	0.0	0.0	20.6	17.8	20.6	0.0
Hardwood Swamp (Type 7)	32.9	6.2	0.0	26.7	9.5	26.7	0.0
Coniferous Swamp (Type 7)	23.3	0.0	0.0	23.3	0.0	23.3	0.0
Total	**620.57**	**35.21**	**3.03**	**582.33**	**759.5**	**582.33**	**177.2**

[1]Includes a reduction in mitigation requirements of 34.8 acres of wetlands that were avoided from 1996-1999 permitting of northwest stockpile area.

[2]A total of 4.3 acres of shallow marsh impacts have been added for those wetlands located in the northwest stockpile area that were previously permitted, but removed from the mitigation in 2003.

[3]All on-site mitigation is assumed

Section 404 - The mitigation has been started at least one full growing season ahead of impacts and is located in the same major watershed as the impacts (Section II. G.3, St. Paul District Compensatory Mitigation Policy for Minnesota)

Table 2
Comparison of Proposed Wetland Impacts and On-Site Wetland Mitigation
Per Corps Compensatory Mitigation Guidelines
First 5-year Impacts
U. S. Steel Keetac

Wetland Communities	Total Tailings Basin Mitigation (ac)	Mitigation Utilized		Available Tailings Basin Mitigation[1] (ac)	Proposed Keetac Expansion Project 5-Yr Impact Area (ac)[3]	Mitigation Applied at 1:1 Ratio[4] (ac)	Wetland Mitigation Balance After 5-Yr Impacts (ac)
		2005 Mine and Stockpile Expansion Impact Area (ac)	2007 Aromac Expansion Impact Area (ac)				
Seasonally Flooded (Type 1)	5.1	0.0	0.0	5.1	0.3	0.3	4.8
Wet Meadow (Type 2)	112.5	12.8	0.7	99.0	8.3	83.7	15.3
Shallow Marsh (Type 3)	84.9	0.0	0.3	84.6	106.9	84.6	0.0
Deep Marsh (Type 4)	27.7	0.0	0.7	27.0	26.8	26.8	0.2
Shallow, Open Water (Type 5)	0.0	0.0	0.0	0.0	360.5	0.0	0.0
Shrub Carr (Type 6)	313.7	16.2	1.4	296.1	31.8	296.1	0.0
Alder Thicket (Type 6)	20.6	0.0	0.0	20.6	17.8	20.6	0.0
Hardwood Swamp (Type 7)	32.9	6.2	0.0	26.7	9.5	26.7	0.0
Coniferous Swamp (Type 7)	23.3	0.0	0.0	23.3	0.0	23.3	0.0
Total	**620.57**	**35.21**	**3.03**	**582.33**	**562.0**	**562.0**	**20.3**

[1]Includes a reduction in mitigation requirements of 34.8 acres of wetlands that were avoided from 1996-1999 permitting of northwest stockpile area.

[2]Mitigation applied to the following communities: coniferous swamp, shallow marsh, deep marsh and shallow open water.

[3]A total of 4.3 acres of wetland impacts have been added for those wetlands located in the northwest stockpile area that were previously permitted, but removed from the mitigation accounting in 2003.

[4]All on-site mitigation is assumed to provide mitigation at a 1:1 ratio based on the following rule provisions:

Section 404 - The mitigation has been started at least one full growing season ahead of impacts and is located in the same major watershed as the impacts (Section II. G.3, St. Paul District Compensatory Mitigation Policy for Minnesota)

Table 3
Comparison of Proposed Wetland Impacts and On-Site Wetland Mitigation
Per WCA Wetland Replacement Guidelines
Total Project
U. S. Steel Keetac

Wetland Communities	Previously Permitted Tailings Basin Mitigation (ac)	Mitigation Utilized		Proposed Tailings Basin Wetland Mitigation Area (ac)	Proposed Tailings Basin Wetland Mitigation Credit[1] (ac)	Available Tailings Basin Mitigation[2] (ac)	Regulated Keetac Expansion Project Impact Area Current Type[3, 4] (ac)	Proposed Keetac Expansion Project Impact Area Historic Type (ac)	In-Kind Mitigation[5] (ac)	Mitigation Applied at 1:1 Ratio[6] (ac)	Remaining, Uncompensated Impacts (ac)
		2005 Mine and Stockpile Expansion Impact Area (ac)	2007 Aromac Expansion Impact Area (ac)								
Seasonally Flooded (Type 1)	5.1	0.0	0.0	0.0	0.0	5.1	5.6	0.0	5.1	5.1	0.5
Wet Meadow (Type 2)	108.4	12.8	0.7	4.1	3.1	98.0	2.1	202.1	98.0	98.0	0.0
Shallow Marsh (Type 3)	75.6	0.0	0.3	9.2	6.9	82.2	147.2	0.0	82.2	82.2	64.9
Deep Marsh (Type 4)	26.0	0.0	0.7	1.7	1.3	26.6	63.7	0.0	26.6	26.6	37.1
Shallow, Open Water (Type 5)	0.0	0.0	0.0	0.0	0.0	0.0	361.5	0.0	0.0	0.0	56.0
Shrub Carr (Type 6)	163.3	16.2	1.4	150.4	112.8	258.5	85.8	232.1	232.1	258.5	0.0
Alder Thicket (Type 6)	0.0	0.0	0.0	20.6	15.5	15.5	17.8	0.0	15.5	15.5	0.0
Hardwood Swamp (Type 7)	32.6	6.2	0.0	0.3	0.2	26.6	9.5	0.0	9.5	26.6	0.0
Coniferous Swamp (Type 7)	19.0	0.0	0.0	4.3	3.2	22.2	0.0	0.0	0.0	22.2	0.0
Non-Wetland							NA	63.1			
Total	**430.0**	**35.21**	**3.03**	**190.6**	**143.0**	**534.7**	**693.2**	**497.3**	**469.0**	**534.7**	**158.5**

[1]Credit allocated at 75% based on WCA rules as of August 10, 2009.

[2]Includes a reduction in mitigation requirements of 34.8 acres of wetlands that were avoided from 1996-1999 permitting of northwest stockpile area.

[3]A total of 4.3 acres of shallow marsh impacts have been added for those wetlands located in the northwest stockpile area that were previously permitted, but removed from the mitigation in 2003.

[4]Wetlands created by pits, stockpiles, or tailings basins are not regulated by the WCA per M.R. 8420.0930, Subp. 1 (formerly referred to as "incidental wetlands") and have been removed from the regulated impact total.

[5]In-kind replacement based on either current types or historic types for degraded wetlands.

[6]All on-site mitigation is assumed

WCA - Project specific mitigation within the major watershed, of which, over 85% is in-kind (M.R. 8420.0522, Subp. 4).

Table 4
Comparison of Proposed Wetland Impacts and On-Site Wetland Mitigation
Per WCA Wetland Replacement Guidelines
First 5-year Impacts
U. S. Steel Keetac

Wetland Communities	Previously Permitted Total Tailings Basin Mitigation (ac)	Mitigation Utilized		Proposed Tailings Basin Wetland Mitigation Area (ac)	Proposed Tailings Basin Wetland Mitigation Credit[1] (ac)	Available Tailings Basin Mitigation[2] (ac)	Regulated Keetac Expansion Project 5-Yr Impact Area Current Type[3,4] (ac)	Proposed Keetac Expansion Project 5-Yr Impact Area Historic Type (ac)	In-Kind Mitigation[5]	Mitigation Applied at 1:1 Ratio[6] (ac)	Wetland Mitigation Balance (ac)
		2005 Mine and Stockpile Expansion Impact Area (ac)	2007 Aromac Expansion Impact Area (ac)								
Seasonally Flooded (Type 1)	5.1	0.0	0.0	0.0	0.0	5.1	0.3	0.0	0.3	5.1	0.0
Wet Meadow (Type 2)	108.4	12.8	0.7	4.1	3.1	98.0	1.1	93.4	93.4	98.0	0.0
Shallow Marsh (Type 3)	75.6	0.0	0.3	9.2	6.9	82.2	69.2	0.0	82.2	82.2	0.0
Deep Marsh (Type 4)	26.0	0.0	0.7	1.7	1.3	26.6	8.2	0.0	26.6	26.6	0.0
Shallow, Open Water (Type 5)	0.0	0.0	0.0	0.0	0.0	0.0	360.2	0.0	0.0	0.0	0.0
Shrub Carr (Type 6)	163.3	16.2	1.4	150.4	112.8	258.5	31.4	232.1	232.1	258.5	0.0
Alder Thicket (Type 6)	0.0	0.0	0.0	20.6	15.5	15.5	17.8	0.0	15.5	15.5	0.0
Hardwood Swamp (Type 7)	32.6	6.2	0.0	0.3	0.2	26.6	9.5	0.0	9.5	11.8	14.8
Coniferous Swamp (Type 7)	19.0	0.0	0.0	4.3	3.2	22.2	0.0	0.0	0.0	0.0	22.2
Non-Wetland								63.1			
Total	**430.0**	**35.21**	**3.03**	**190.6**	**143.0**	**534.7**	**497.7**		**459.6**	**497.7**	**37.0**

[1]Credit allocated at 75% based on WCA rules as of August 10, 2009.

[2]Includes a reduction in mitigation requirements of 34.8 acres of wetlands that were avoided from 1996-1999 permitting of northwest stockpile area.

[3]A total of 4.3 acres of wetland impacts have been added for those wetlands located in the northwest stockpile area that were previously permitted, but removed from the mitigation accounting in 2003.

[4]Wetlands created by pits, stockpiles, or tailings basins are not regulated by the WCA per M.R. 8420.0930, Subp. 1 (formerly referred to as "incidental wetlands") and have been removed from the regulated impact total.

[5]In-kind replacement based on either current types or historic types for degraded wetlands.

[6]All on-site mitigation is assumed to provide mitigation at a 1:1 ratio based on the following rule provisions:

WCA - Project specific mitigation within the major watershed, of which, 90% is in-kind (M.R. 8420.0522, Subp. 4).

Table 5
Off-Site Wetland Mitigation Priority Sites
U. S. Steel Keetac

Site ID	Site Area (acres)	Major Watershed	County	Bank Service Area	Contact Information	Type of Restoration	Likely Mitigation Credit (%)[1]	Likely Credit Area (acres)[2]	Potential Agreement Type	Realistic Mitigation Potential	Potential Complications	Potential Wetland Restoration Types
Palisade	4,400	Miss. River - Grand Rapids	Aitkin	5	Confidential	Active agricultural land, documented agricultural history; drained, partially drained, and farmed wetland.	50-85	306+	Property purchase	High	Public ditch abandonment	2, 6, 7
3261	2,200	Miss. River - Grand Rapids	Aitkin	5	Steve Gilbertson	Wild rice farmland, completely controlled hydrology, agricultural restoration.	25-100	550-2,200	Easement acquisition	High	Potentially validating mitigation credit allocation	2, 6, 7, 8
260	625	Miss. River - Grand Rapids	Aitkin	5	Tom Thompson 218-820-1720	Agricultural, partially to completely drained	50	250	Easement acquisition	Low	May not have suitable credit potential due to agricultural history, drainage, and CRP	2, 6, 7
3262	686	Miss. River - Grand Rapids	Aitkin	5	Owner is currently working with another company.	Wild rice farmland, prior converted, documented agricultural history, controlled hydrology	75-100	250-300	Unknown	None at the moment	Could become available as an opportunity in the future	2, 6, 7
355	1,840	Miss. River-Headwaters (adjacent to project)	Itasca	5	Steve Gilbertson	Active wild rice farm land. Has been in agricultural production for 30 years. Located ~3 mi. southwest of Deer River.	100	400	Easement acquisition or purchase	High	Outstanding liabilities associated with 100-acre county land exchange	2, 3, 6, 7
1985	2,200	Miss. River - Brainerd (adjacent to project)	Aitkin	5	Curtis Sampson	Farmed, completely and partially drained	50-100	500-1000	Third-party property purchase/ easement acquisition	Moderate-High	Landowner willingness uncertain, existing peat mining operation could complicate restoration of adjacent areas	2, 6, 7, maybe 8
1984	580	Miss. River - Brainerd (adjacent to project)	Aitkin	5	Gayle Momchilovich Points North Properties (currently pursuing bank plan approval)	Farmed, partially drained wetland	10-75	40-325	Property purchase or possibly third-party purchase with easement acquisition	Moderate	May not have suitable credit potential due to agricultural history and drainage, owners pursuing wetland bank approval	2, 6, maybe 7
123	1,525	Kettle River (adjacent to project)	Pine	6	Rehbein Sod	Farmed mostly for sod production, completely drained	100	1,200	Easement acquisition or purchase	Moderate	Landowner was interested about a year or so ago, but his price was a bit higher than typical at the time.	2, 6, maybe 7

[1]Likely credit for wetland areas that have the potential to be restored.
[2]Assumption for partial drainage: 150 ft width of drainage along ditches for 50% credit.

Figures

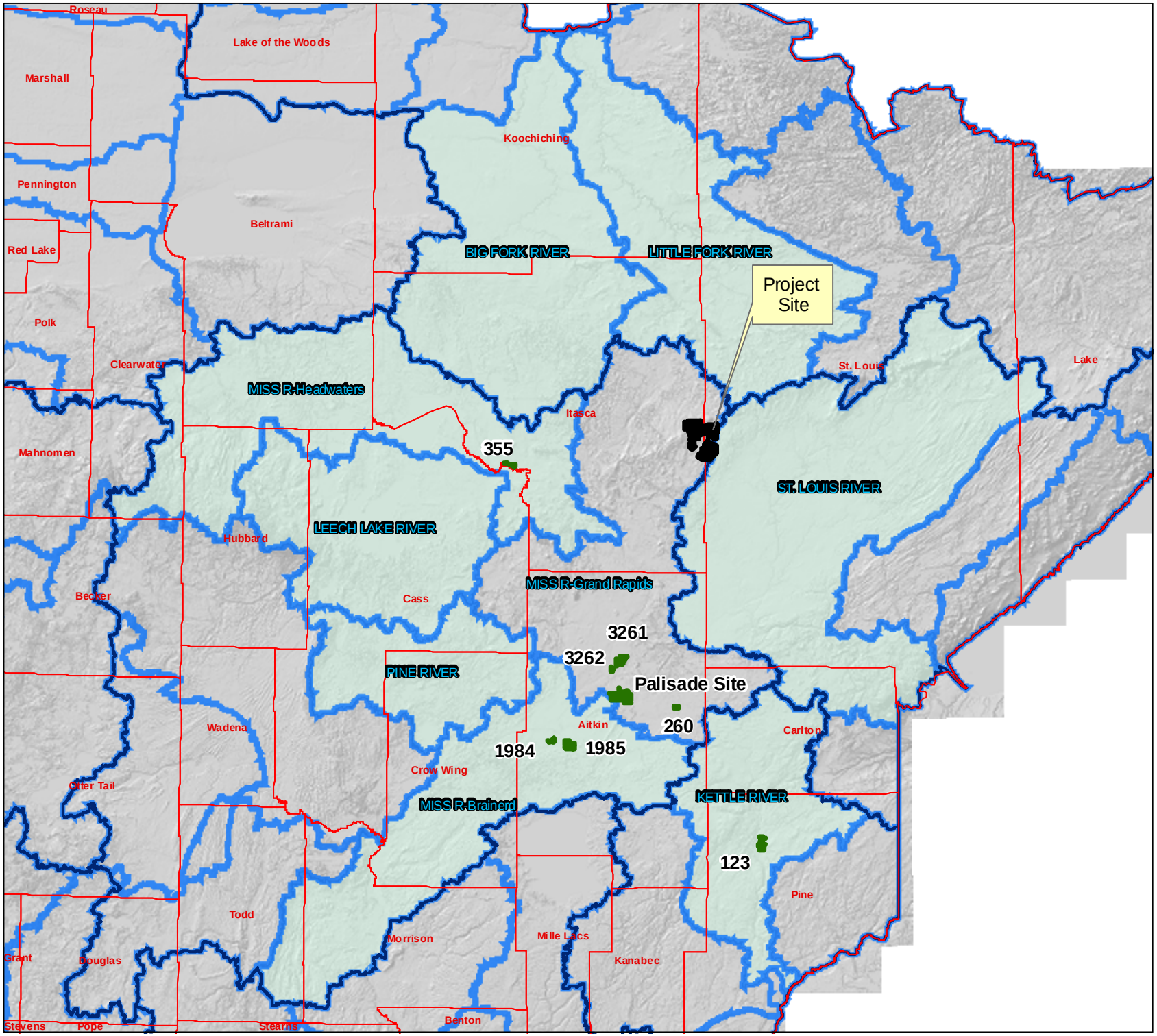
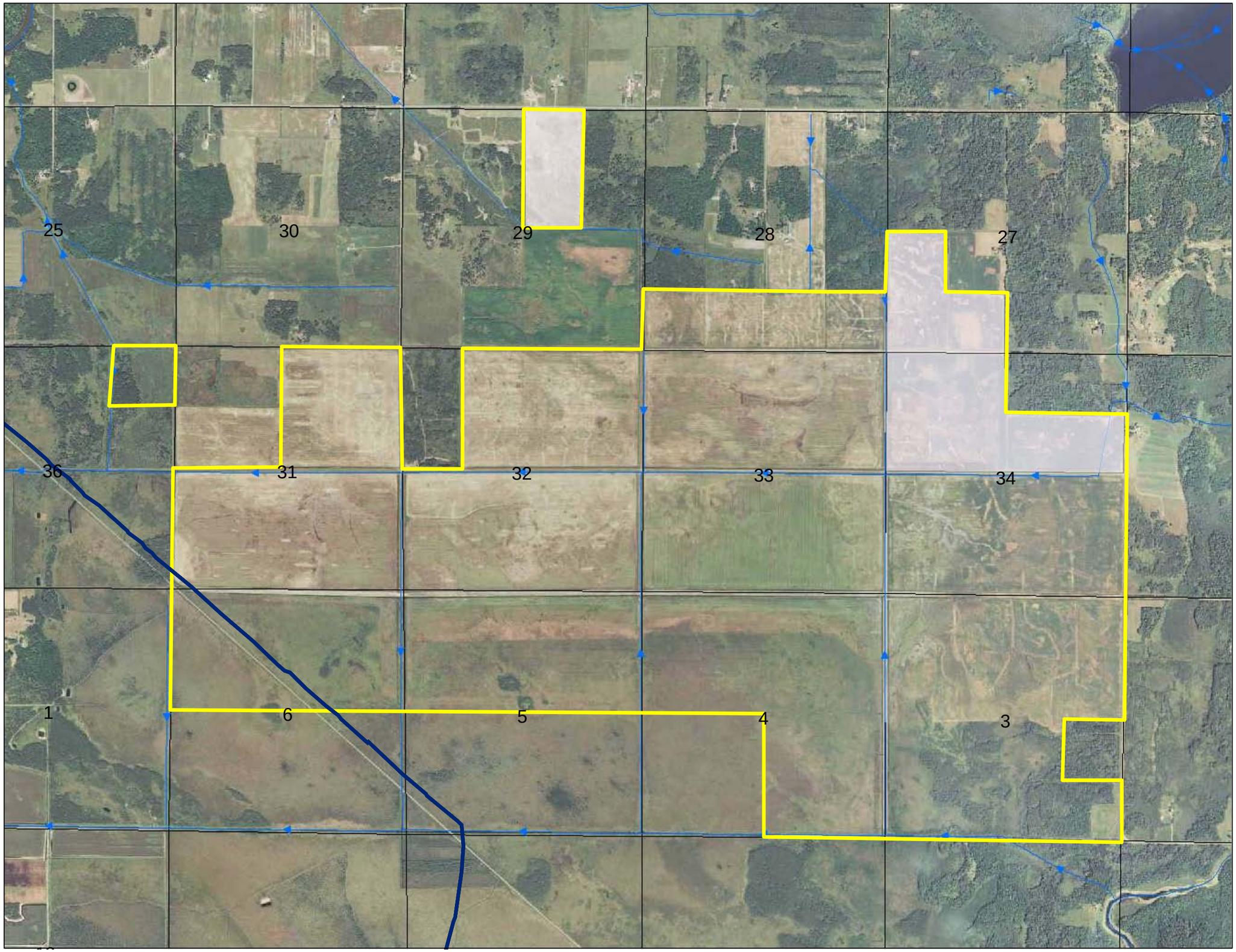


Figure 1

SELECTED WETLAND MITIGATION AREAS
Keetac Mine
Expansion Project

Barr Footer: Date: 8/27/2009 3:27:51 PM File: I:\Client\Keetac\2331335_Line_1\Workorders\Wetlands\Maps\ReportMaps\Wetland Mitigation Plan\Figure 1 OffSiteSelectSiteLocations.mxd User: MAJ



Legend

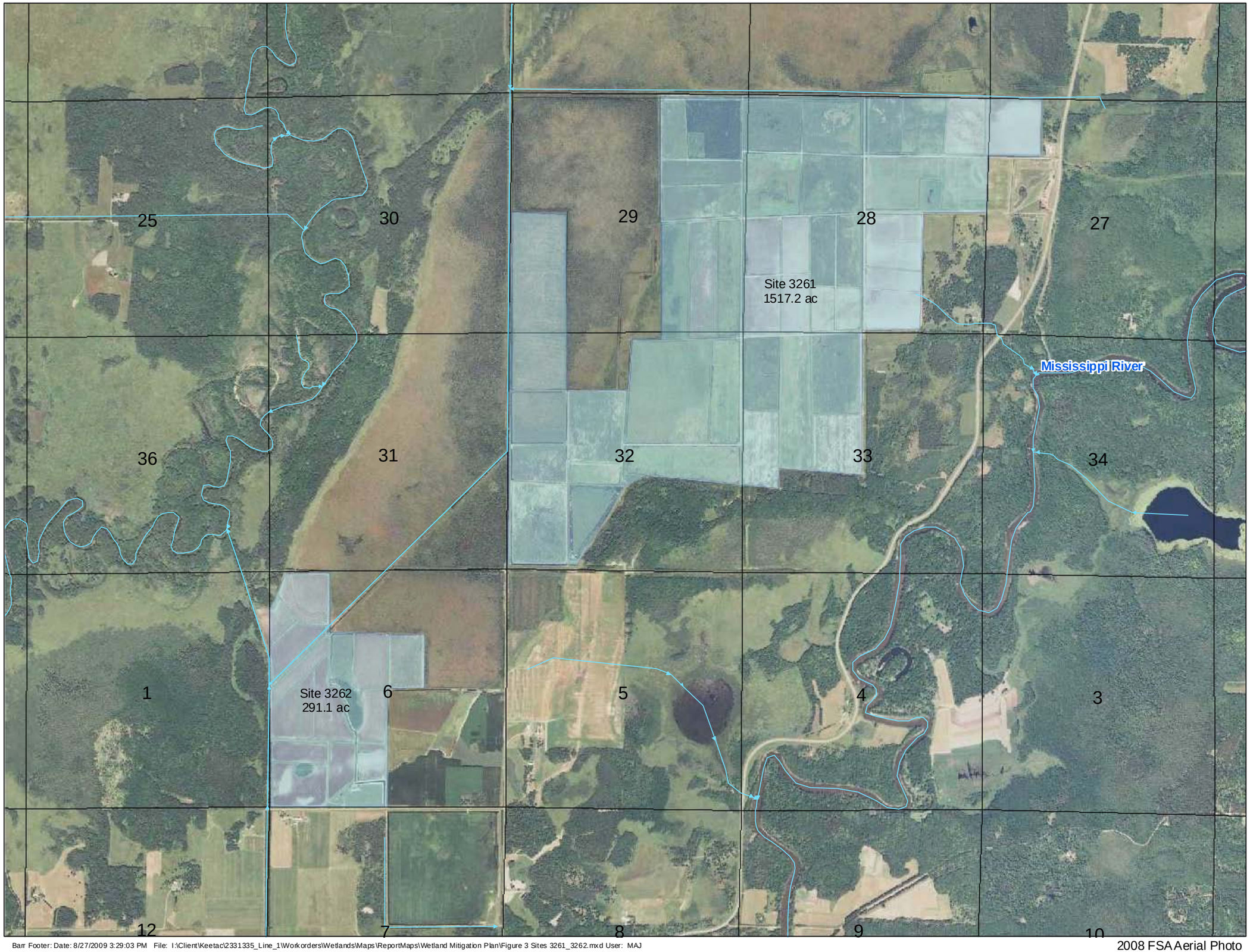
- Major Watersheds
- Approximate Property
- Phase 1 Restoration Potential
- Ditches and Flow Direction
- Public Land Survey

0 1,000 2,000 4,000 Feet

Figure 2

POTENTIAL MITIGATION
PALISADE SITE
PHASE I RESTORATION AREA
Mississipi River-Grand Rapids Watershed
Aitkin County

2008 FSA Aerial Photo



Legend

- Ditches
- Wetland Mitigation Potential
- Section Lines

0 1,000 2,000 4,000 Feet

Figure 3

POTENTIAL WETLAND
MITIGATION SITES 3261 AND 3262
Mississippi River Watershed
Aitkin County

Barr Footer: Date: 8/27/2009 3:29:03 PM File: I:\Client\Keetac\2331335_Line_1\Workorders\Wetlands\Maps\ReportMaps\Wetland Mitigation Plan\Figure 3 Sites 3261_3262.mxd User: MAJ

2008 FSA Aerial Photo

2008 FSA Aerial Photo

Legend

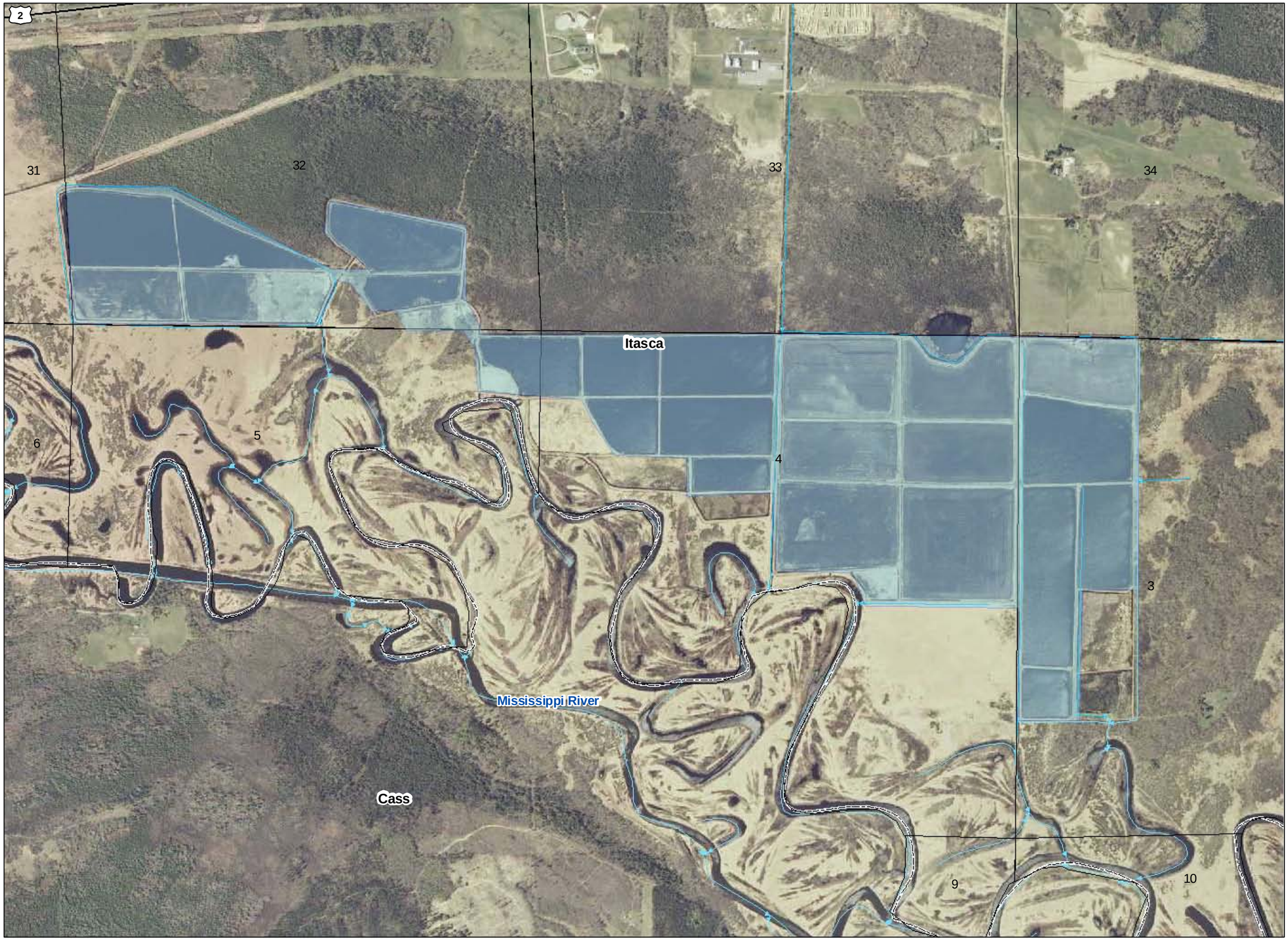
- Potential Wetland Restoration - 250 ac
- Public Land Survey
- Counties
- Ditches

0 1,000 2,000

Feet

Figure 4

POTENTIAL WETLAND
MITIGATION SITE 260
Mississippi River Watershed
Aitkin County



Legend

- Counties
- MnDNR Ditches
- NHDFlowline
- Cities
- Wetland Restoration Potential - ~400 acres

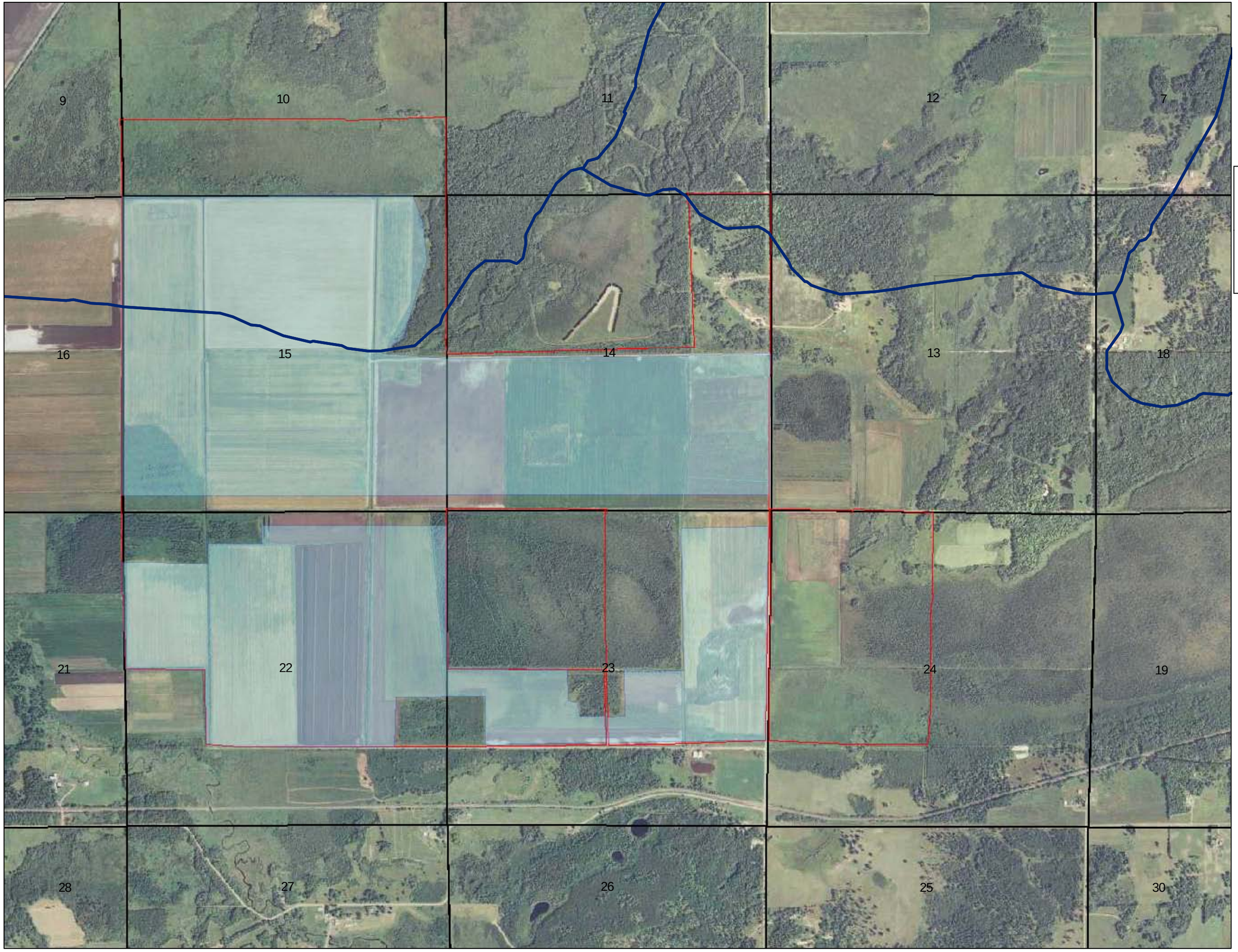
0 1,000

Feet

2008 FSA Aerial Photo

Figure 5

POTENTIAL WETLAND
MITIGATION SITE 355
Mississippi River Watershed
Itasca County



Legend

- Minor Watershed Boundaries
- Potential Mitigation Area
- Approximate Property Boundaries
- Section Boundaries

2008 FSA Aerial Photo

N
W E
S

Feet
1,000 0 1,000 2,000

Figure 6

POTENTIAL WETLAND MITIGATION SITE 1985
Mississippi River Watershed
Aitkin County

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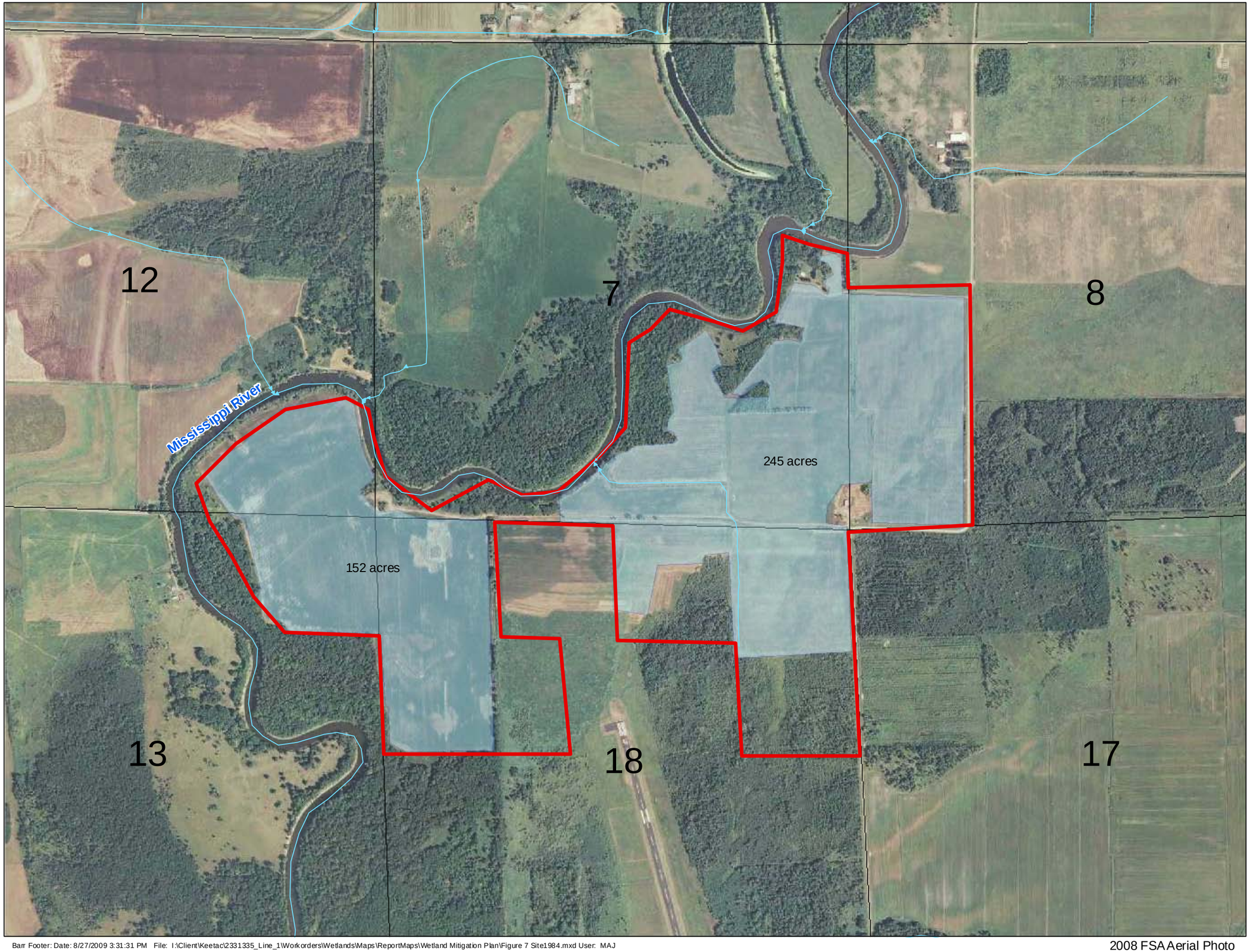


Legend

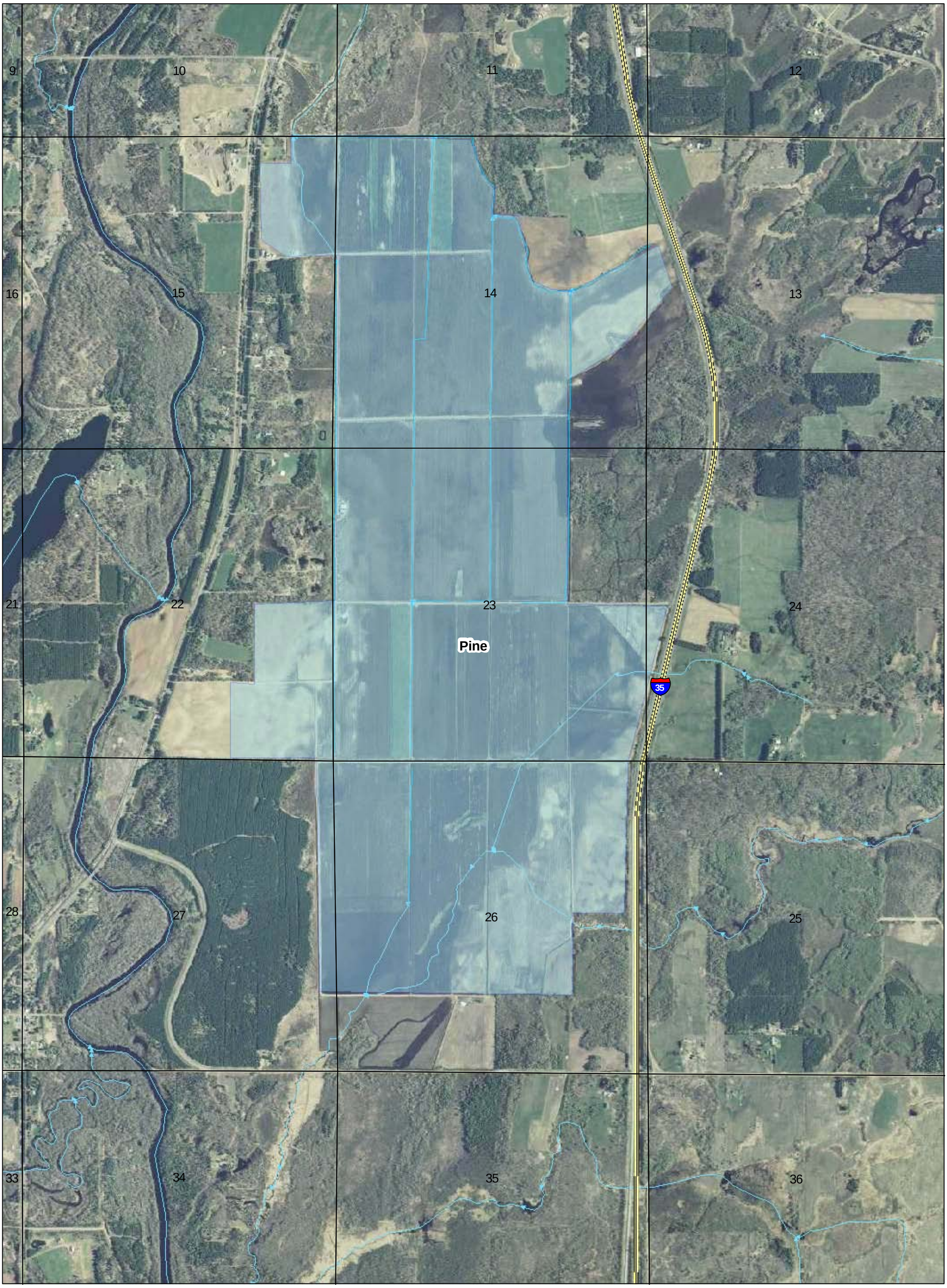
- Ditches
- Approximate Property Boundaries
- Wetland Mitigation Potential
- Section Lines

0 500 1,000 2,000 Feet

Figure 7

POTENTIAL WETLAND
MITIGATION SITE 1984
Mississippi River Watershed
Aitkin County

2008 FSA Aerial Photo



2008 FSA Aerial Photo

Legend

- Section Lines
- Wetland Restoration Potential - 1,600 ac
- MnDNR Ditches
- Counties

0 1,500 3,000

Feet

Figure 8

POTENTIAL WETLAND MITIGATION SITE 123
Kettle River Watershed
Pine County