Appendix G
Real Estate

Fargo-Moorhead Metropolitan Area Flood Risk Management

Final Feasibility Report and Environmental Impact Statement

August 2011

US Army Corps of Engineers ®

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FARGO – MOORHEAD METRO FEASIBILITY STUDY
Fargo, North Dakota and Moorhead, Minnesota
Appendix G
Real Estate Plan

1. GENERAL DESCRIPTION

This Real Estate Plan is a part of the feasibility report for the Fargo-Moorhead Metropolitan Area Flood Risk Management Study.

The selected plan is the Locally Preferred Plan (LPP), a North Dakota diversion channel with a capacity of 20,000 cfs, with upstream staging. The Federally Comparable Plan (FCP), used for cost sharing purposes, is a Minnesota diversion channel with a capacity of 35,000 cfs.

Without some staging or off-channel storage immediately upstream of the diversion works, a North Dakota diversion channel would result in increased flood levels that could extend to the Canadian border and beyond, with approximately 4,500 structures impacted in the United States. Staging and storing water immediately upstream of the diversion would be limited to a well defined area.

The Fargo-Moorhead Metropolitan Area has a relatively high risk of flooding. The highest river stages usually occur as a result of spring snowmelt, but summer rainfall events have also caused significant flood damages. The Red River of the North has exceeded the National Weather Service flood stage of 18 feet in 48 of the past 109 years, and every year from 1993 through 2011. The study area is between the Wild Rice River (North Dakota), the Sheyenne River, and the Red River of the North; inter-basin flows complicate the hydrology of the region and contribute to extensive flooding. Average annual flood damages in the Fargo-Moorhead Metropolitan Area are currently estimated at over $194.8 million.

Fargo and Moorhead are accustomed to dealing with flooding. Sufficient time is usually available to prepare for flood fighting because winter snowfall can be monitored to predict unusual spring runoff. Both communities have well documented standard operating procedures for flood fights. Both communities avoided major flood damage in the historic floods of 2009 and 1997 by either raising existing levees or building temporary barriers. Since the 1997 flood, and in the aftermath of the 2009 flood, both communities implemented mitigation measures including: acquisition of more than 100 Floodplain homes, raising and stabilizing existing levees, installing permanent pump stations, and improving storm sewer lift stations and the sanitary sewer system. Although emergency measures have been very successful, they may also contribute to an unwarranted sense of security that does not reflect the true flood risk in the area. Failure of emergency measures would be catastrophic and could result in billions of dollars in damages.

2. **PROJECT AUTHORIZATION**:

The Fargo-Moorhead Metropolitan Area is part of the Red River of the North Basin. The Red River Reconnaissance Study was authorized by a September 30, 1974, Resolution of the Senate Committee on Public Works:

> RESOLVED BY THE COMMITTEE ON PUBLIC WORKS OF THE UNITED STATES SENATE, That the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review reports on the Red River of the North Drainage Basin, Minnesota, South Dakota and North Dakota, submitted in House Document Numbered 185, 81st Congress, 1st Session, and prior reports, with a view to determining if the recommendations contained therein should be modified at this time, with particular reference to flood control, water supply, waste water management and allied purposes.

The Fargo-Moorhead metropolitan area was included in the Red River Basin Reconnaissance Study approved on September 19, 2002, but the level of detail in that report was insufficient to recommend a feasibility study specifically for measures in Fargo, North Dakota, and Moorhead, Minnesota. A supplemental Reconnaissance Study was approved by the Mississippi Valley Division on April 08, 2008.

Based on the recommendations contained in the Reconnaissance Report, the City of Fargo, the City of Moorhead, and the federal government entered into a Feasibility Cost Share Agreement on September 22, 2008. The study was cost shared 50/50 between the two non-federal sponsors and the federal government. Funds to initiate the feasibility study were provided in the Consolidated Appropriations Act, 2008, approved 26 December 2007 (Public Law 110- 161)

3. **PROJECT DESCRIPTION**:

The selected plan is the North Dakota 20,000 cfs diversion alignment with upstream staging and storage, this is also known as the Locally Preferred Plan (LPP). The National Economic Development (NED) Plan is the Minnesota 40,000 cfs diversion channel. The Federally Comparable Plan (FCP) is the Minnesota 35,000 cfs diversion channel. The NED and FCP follow the same alignments.

3.1 Federally Comparable Plan (Minnesota 35,000 cfs)

The Minnesota 35K short diversion alignment starts just north of the confluence of the Red and Wild Rice Rivers and extends a total of 25 miles east and north around the cities of Moorhead and Dilworth, ultimately re-entering the Red River near the confluence of the Red and Sheyenne Rivers.

The plan includes a large control structure on the Red River which is an operable structure with three tainter gates 50 feet wide and 47 feet high. The gates would normally be fully open, and the structure would not impede flow more than a typical highway

bridge up to about a 9,600 cfs flow event (approximately a 28-percent chance event) when the structure would be put into operation. Once upstream stages rose to an elevation of 898.3 feet (NAVD 1988), flows would begin to go over the diversion inlet weir. The weir would be constructed of sheetpile and rock.

The diversion channel has a maximum excavation depth of 30 feet with a maximum bottom width of 400 feet. The diversion has 1V on 7H side slopes at most locations with steeper 1V on 5H slopes at the 20 highway and 4 railroad bridges. The diversion channel will require the excavation of approximately 55 million cubic yards of material. The diversion channel would be protected with rock riprap at the point that it returns to the Red River.

Soil excavated to construct the channel would be piled adjacent to the channel to a maximum height of 15 feet. The soil disposal piles would be as wide as necessary to contain the excavated material. The spoil slopes are 1V on 7H and 1V on 10H for the diversion side and outside slopes respectively. Portions of the soil disposal piles would be constructed to serve as levees when the water surface in the channel is higher than the natural grade. The total footprint of the diversion channel and soil disposal piles has a maximum width of 2,800 feet, and will affect 6,415 acres of land. Efforts would be made to allow farming to continue on certain portions of the disposal areas, which could be accomplished by placing topsoil on the spoil piles.

In addition to the diversion channel, the plan includes two smaller channels upstream of the Red River control structure to prevent stage increases upstream of the project along the Red and Wild Rice Rivers. A supplementary channel parallels the Red River upstream of the entrance to the diversion channel to allow for additional capacity to offset the breakouts to Drains 27 and 53. This secondary "Minnesota short extension channel" is approximately 3.7 miles long and has a 215 foot bottom width, with side slopes similar to the diversion channel. A second, shorter channel, the Wild Rice River breakout channel, was added near the intersection of I-29 and Cass Highway 16. This channel, which is less than one mile long and crosses under I-29, will convey water across I-29 that would have naturally broken out to Drain 27 and has a 50 foot bottom width, with side slopes similar to the diversion channel.

The plan also includes a 9.9 mile tie-back levee at the southern limits of the project. The tie-back levee connects the Red River control structure to high ground and prevents flood water from flowing over land to the north and west into the protected area. The typical section for the tie-back levee has a top width of ten feet and side slopes of 1V on 4H. The tie-back levee would be constructed of impervious fill obtained from the channel excavation and covered with topsoil and turf.

3.2 Locally Preferred Plan (North Dakota 20,000 cfs with staging and storage)

The North Dakota east diversion alignment, shown in Figure F01, starts approximately four miles south of the confluence of the Red and Wild Rice Rivers and extends west and north around the cities of Horace, Fargo, West Fargo and Harwood. It ultimately re-

enters the Red River north of the confluence of the Red and Sheyenne Rivers near the city of Georgetown, MN. Along the 36 mile path it crosses the Wile Rice, Sheyenne, Maple, Lower Rush and Rush rivers and incorporates the existing Horace to West Fargo Sheyenne River diversion channel. The LPP includes 19 highway bridges and 4 railroad bridges that cross the diversion channel.

The plan includes a large operable control structure on the Red River with three tainter gates 50 feet wide and 47 feet high. The gates would normally be fully open. The structure would not impede flow more than a typical highway bridge when not in operation. The structure would be operated only when the forecasted peak flow of the incoming hydrograph in the Red River of the North at the USGS gage in Fargo is greater than 9,600 cfs (approximately a 28-percent chance event). When it is operated, the control structure would limit the flow passing into the natural Red River channel through the metropolitan area and would back water up into the staging area and Storage Area 1.

The proposed Wild Rice River control structure, similar to the Red River control structure, would be an operable structure with two tainter gates 30 feet wide and 30 feet high. The gates would normally be fully open. The structure would not impede flow more than a typical highway bridge when not in operation. The structure would be operated only when the forecasted peak flow of the incoming hydrograph in the Red River of the North at the USGS gage in Fargo is greater than 9,600 cfs. The Wild Rice River control structure would be conceptually the same as the Red River control structure, except that the Wild Rice structure would have only two gates.

The diversion inlet structure is a passive weir (no gates or other regulation controls) with an effective flow width of 90 feet and a concrete spillway with a crest elevation of 903.25 feet (NAVD1988). The inlet weir is located where the diversion channel crosses Cass County Highway 17 south of Horace, ND.

Hydraulic structures, known as aqueducts, would be located where the diversion crosses the Sheyenne and Maple rivers. The aqueducts would allow for flows in the diversion to pass underneath the existing river channel, while allowing a minimum of a 50-percent chance event flow to continue down the rivers. The excess water would be diverted into the diversion channel.

The structures located at the Lower Rush River and Rush River would include a combination of a vertical drop (also proposed for Drain 14), with a total width of 60 feet and 100 feet at the Lower Rush River and Rush River, respectively; and a fishway consisting of 40 feet wide riffle-pool sequences that would extend from the tributary channel down to the low flow pilot channel of the diversion channel. Both tributaries would be diverted into the diversion channel during all flow conditions.

The outlet structure located where the diversion returns to the Red River of the North would be a concrete spillway with a width of 250 feet and a crest elevation of 866.0 (NAVD 1988).

The typical depth for the diversion is approximately 20 feet, with a maximum depth of 35 feet near the inlet weir. The channel bottom width between the Red and the Wild Rice rivers is 250 feet. Between the Wild Rice River and the diversion inlet weir, the bottom width is 100 feet, and downstream of the diversion inlet weir the width is 250 feet. Generally all side slopes are 1V on 7H and some slopes include benching of varying widths. A low flow pilot channel would run along the bottom of this reach, and erosion protection at the toe of the main channel side slopes would be provided. Soil excavated to construct the channel would be piled adjacent to the channel to a maximum height of 15 feet. The soil disposal piles would be as wide as necessary to contain the excavated material. The spoil slopes are 1V on 7H and 1V on 10H for the diversion side and outside slopes respectively. Portions of the soil disposal piles would be constructed to serve as levees when the water surface in the channel is higher than the natural grade. The total footprint of the LPP diversion channel has a maximum width of 2,200 feet including areas for disposal piles. The affected acreage is 8,054 acres. It is anticipated that farming could continue on certain portions of the disposal areas, which could be accomplished by placing topsoil on the spoil piles.

The main line of flood protection at the south end of the project includes the embankments adjacent to the diversion channel, Storage Area 1 embankments, and a tie-back levee from the Red River control structure to high ground in Minnesota. A small control structure consisting of two 10-foot by 10-foot gated box culverts would be used where Wolverton Creek crosses the Minnesota tie-back levee. The structure would normally be open to allow the creek to pass through the levee, but during floods the structure would be closed to prevent flood flows from passing.

In order to nearly eliminate downstream impacts, upstream staging and storage of approximately 200,000 acre-feet immediately upstream of the diversion channel inlet would be required. The Red River and Wild Rice River control structures would be operated to raise water surface elevations to a maximum of 922.8 feet at the diversion inlet for all events up to a 0.2-percent chance event. Storage Area 1 is a 4,360-acre area on the north side of the LPP diversion channel between the Wild Rice River and the Sheyenne River, and will be formed by nearly 12 miles of embankments. Storage Area 1, combined with staging in the floodplain, will nearly eliminate impacts from the project on flood levels downstream of the diversion channel outlet. A tie-back levee along Cass County Road 17 (CR17) would be needed to keep staged water from crossing overland into the Sheyenne River. The levee would include construction of a ditch to capture local and overland flows. A portion of the CR17 tieback levee would be at an elevation lower than the other tie-back levees. This portion of the levee will act as an emergency spillway for extreme events that exceed the 0.2-percent chance event design capacity of the project.

3.3 Upstream Storage

The LPP includes storage and staging on the upstream side of the project. Much of the land impacted by this staging would be inundated with flood waters under existing conditions, but the staging raises the 1-percent chance flood stage about eight feet at the Red River Control Structure. In addition to the staging on areas outside (upstream) of

the protected areas, a large storage area, designated as Storage Area 1, was included in a location within the protected area. This area is located west (downstream) of the Wild Rice River and the approximate boundaries are formed by Interstate 29 on the east, County Road 14 on the north and County Road 17 on the West.

This upstream staging is part of the Locally Preferred Plan. The non-federal sponsors will be responsible for the acquisitions throughout the entire staging area. The impact of this upstream storage increases the potential to acquire lands in fee. See Section 11 (baseline cost estimate) of this REP for affects on LERRDs crediting.

The non-structural mitigation measures recommended consist of fee acquisitions, construction of ring levees and the acquisition of flowage easements. These measures are recommended within the staging and storage areas as indicated in Figures 27 and 39 of section 3.13.1.2 of the Main Report. The staging area is defined by the red boundary and the storage area is defined by the purple boundary shown in Figure 39; this area is needed for the operation of the project and a number of mitigation features are being recommended within this area. The proposed mitigation for the area is broken into two parts, one for homes, structures, and businesses and the other for agricultural lands. Impacted homes, structures, and businesses that have greater than 3 feet of flooding for the 1-percent chance event with the project in place would be purchased, those with 1 to 3 feet of flooding would be considered for ring levees or a purchase (a risk and safety analysis will be conducted for determination of viability of a ring levee), and those with less than 1 foot of flooding would have flowage easements purchased for the property. Farmsteads in the staging or storage area will be given additional consideration based on the depth of flooding, duration of flooding, and access. Acquisition of farmsteads will generally follow the mitigation plan listed above, however under some circumstances it may be viable to construct a ring levee or raise the farmstead. In any case, where farmsteads would have greater than 3 feet of flooding a buyout would be offered to the owner prior to consideration of other options. Impacts to agricultural lands in the staging area would be mitigated through the acquisition of flowage easements. A property-by-property analysis will be conducted to ensure that the specifics of each parcel are taken into account when determining the appropriate mitigation. Alternative mitigation options will be considered when application of the general rule does not result in adequate mitigation for a particular parcel.

Areas where fee acquisitions would occur include the communities of Oxbow, Hickson, and Bakke, ND. Comstock, MN would be impacted by the project and would generally have 1 to 3 feet of flooding with the LPP in place; a ring levee would be pursued for Comstock.

In areas with greater than 1 foot of flooding for the 1-percent chance event, no residential development will be allowed. In areas with less than 1 foot of flooding for the 1-percent chance event that are contained in the staging and storage areas, future residential development must be raised above the 0.2-percent chance event elevation.

Flowage easements will be acquired over agricultural land within the staging area. Agricultural lands would be impacted by the project primarily in the spring and it is anticipated that in most areas farming could continue without significant impacts. There is the potential for summer impacts which could cause damage to agricultural properties and in the past 108 years of record this would have occurred 4 times in 1975, 2005, 2007, and 2009. The largest summer flow occurred in 2007 with a flow of 13,500 cfs, in that situation only a small portion of the staging area would have been impacted by operation of the project. The summer operation plan will be revisited in during the design phase to determine if a different operating plan can be used in the summer to reduce agricultural impacts without causing additional damage to the Fargo-Moorhead communities. Local concerns have been raised regarding crop insurance within the storage and staging area and coordination has been ongoing with the USDA Risk Management Agency (RMA). The RMA has indicated that the purchase of crop insurance in these areas could still be obtained, however flood impacts resulting from the project may not be covered.

Some areas along the Red River, Wild Rice River and connected drains that are outside of the designated staging area will be affected by staging operations. Impacts outside of the designated staging area are estimated to be less than one foot of additional flood depth for a one percent chance event, and most of the impacted area would be inundated under existing conditions. A legal analysis will be conducted to determine if the impacts in these areas rise to the level of a taking under the Fifth Amendment of the U.S. Constitution. Outside of the designated staging area, landowners will be compensated appropriately for any takings.

4. NON-FEDERAL SPONSOR OWNED LER

The St. Paul District Engineering Division, Design Branch, identified preliminary project construction areas and furnished the Real Estate Division with projected acreages. In reviewing the project footprint identified on the current "Right-Of-Way General Plan" map, it appears that a very minimal amount of the required acreage for the project is Non-Federal Sponsor owned LER. There does not appear to be any NFS LER in the Minnesota Alignments, while there is 2.95 acres identified as potential NFS LER on the North Dakota side in the area where the diversion channel intersects with the previously completed Sheyenne River project.

5. ESTATES

The U.S. Army Corps of Engineers Standard Estates for Fee-Simple, Flood Protection Levee Easement, Flowage Easements, Permanent Channel Improvement Easement, Temporary Work Area Easement, may be used for the Project. The Standard Estate language for the various estates is provided below:

FLOOD PROTECTION LEVEE EASEMENT:

A perpetual and assignable right and easement in (the land described in Schedule A) (Tracts Nos. , and) to construct, maintain, repair, operate, patrol and replace a

flood protection levee, including all appurtenances thereto; reserving, however, to the owners, their heirs and assigns, all such rights and privileges in the land as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

FLOWAGE EASEMENT (Occasional Flooding):

The perpetual right, power, privilege and easement occasionally to overflow, flood and submerge (the land described in Schedule A) (Tracts Nos. , and) in connection with the operation and maintenance of the _____ Flood Damage Reduction Project as authorized by the Act of Congress approved , together with all right, title and interest in and to the structures and improvements now situate on the land, excepting fencing (and also excepting (here identify those structures not designed for human habitation which the District Engineer determines may remain on the land)); provided that no structures for human habitation shall be constructed or maintained on the land, that no other structures shall be constructed or maintained on the land except as may be approved in writing by the representative of the United States in charge of the project, and that no excavation shall be conducted and no landfill placed on the land without such approval as to the location and method of excavation and/or placement of landfill; the above estate is taken subject to existing easements for public roads and highways, public utilities, railroads and pipelines; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used and enjoyed without interfering with the use of the project for the purposes authorized by Congress or abridging the rights and easement hereby acquired; provided further that any use of the land shall be subject to Federal and State laws with respect to pollution.

FEE:

The fee simple title to (the land described in Schedule A) (Tracts Nos. , and), Subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

TEMPORARY WORK AREA EASEMENT:

A temporary easement and right-of-way in, on, over and across (the land described in Schedule A) (Tracts Nos. , and), for a period not to exceed , beginning with date possession of the land is granted to the United States, for use by the United States, its representatives, agents, and contractors as a work area, including the right to move, store and remove equipment and supplies, and erect and remove temporary structures on the land and to perform any other work necessary and incident to the construction of the Dawson Flood Damage Reduction Project, together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions, and any other vegetation, structures, or obstacles within the limits of the right of way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired;

subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

CHANNEL IMPROVEMENT EASEMENT:

A perpetual and assignable right and easement to construct, operate, and maintain channel improvement works on, over and across (the land described in Schedule A) (Tracts Nos. _____, _____ and _____) for the purposes as authorized by the Act of Congress approved_____, including the right to clear, cut, fell, remove and dispose of any and all timber, trees, underbrush, buildings, improvements and/or other obstructions therefrom; to excavate: dredge, cut away, and remove any or all of said land and to place thereon dredge or spoil material; and for such other purposes as may be required in connection with said work of improvement; reserving, however, to the owners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements far public roads and highways, public utilities, railroads and pipelines.

6. EXISTING FEDERAL PROJECT(S):

Lands required for this project are not within the scope of any other known existing Federal project. The following projects have previously been completed in the Fargo-Moorhead area.

Fargo levees: The Corps participated in a permanent flood control project completed in Fargo in 1963. The project was recommended in the Corps' 1947 comprehensive plan for the Red River basin and authorized by the Flood Control Acts of 1948 and 1950. The project included four channel cutoffs, the Midtown Dam, and a 3,500-foot levee east of 4th Street South between 1st Avenue South and 10th Avenue South. The top of levee is at approximately a 40.0-foot stage. The city later extended the levee south to 13th Avenue. Fargo has several other publicly and privately owned sections of levee throughout the city. The current line of protection has top elevations that vary from a stage of 30 feet to 42 feet, but several reaches are at or below 37 feet. (Note: the proposed new FEMA 1-percent-chance flood stage is expected to be approximately 39.3 feet.)

Moorhead levees: No federally constructed levees are in Moorhead. The Corps proposed a 1,800-foot-long levee in the 1947 comprehensive plan for the Red River basin. It was authorized by the Flood Control Acts of 1948 and 1950, but the city declined to participate in the project. The city has built four small levees and several lift stations and control structures on storm water lines that can be closed or operated during high-water events. The city has also installed valves on the sanitary sewer lines at several individual flood-prone residences to prevent floodwater from inundating the system. The city also builds emergency levees when necessary.

The Sheyenne River project was authorized by the 1986 Water Resources Development Act. The project originally included four components: a 5-foot raise of the Baldhill Dam

flood control pool; a dam to provide approximately 35,000 acre-feet of storage on the Maple River; a 7.5-mile flood diversion channel from Horace to West Fargo, North Dakota; and a 6.7-mile flood diversion channel at West Fargo. The Southeast Cass Water Resource District and the St. Paul District, Corps of Engineers, signed cost share agreements for the West Fargo Diversion project in 1988 and the Horace to West Fargo Diversion in 1990. The projects were essentially completed in 1993 and 1994, respectively. A pump station was added to the West Fargo project in 2003 and emergency generators were provided in 2007. The Maple River dam was deauthorized in 2002 for Federal participation, and the Southeast Cass Water Resource District completed the project without Federal assistance in 2007. These projects protect the cities of Horace and West Fargo and the west side of Fargo from Sheyenne River flooding. From Horace to West Fargo, the system is designed for a 1-percent-chance event plus 2 feet. At West Fargo, the channel and left bank levee contain the 1-percent-chance event plus 2 feet; the right bank levee is higher, providing the city with protection from the Standard Project Flood plus 3 feet. Although these features reduce the risk associated with Sheyenne River flooding, these cities are still potentially affected by floods on the Wild Rice and Red Rivers that are larger than the 1-percent chance event.

A Section 208 (1954 Flood Control Act) clearing and snagging project was completed in Fargo-Moorhead in 1991 to remove trees affected by Dutch elm disease. Dead and dying trees were removed along a 9.7-mile reach of the Red River.

Three Section 14 (1946 Flood Control Act) emergency stream bank protection projects were completed in Fargo between 2001 and 2003. Erosion from the Red River of the North occurred at three separate project locations. At Reach A, erosion along 4,100 feet of riverbank threatened a levee near 37th Avenue. At Reach B, erosion along a 950-foot reach threatened Kandi Lane and North Broadway and utilities located beneath them. At Reach C, erosion along a 1,900-foot reach threatened Elm Street between 13th and 17th Avenues North and the utilities located beneath it. The erosion progressed to within 50 feet of the roadway. The projects involved shaping the banks and placing rockfill or granular fill and riprap along the eroded areas.

Two **Section 206 (1996 Water Resource Development Act)** aquatic ecosystem restoration projects were implemented to improve fish passage over two dams on the Red River within the metropolitan area. Rock slope fishways were constructed at the 12th Avenue North Dam and the 32nd Avenue South Dam in 2002 and 2004, respectively. A similar fishway was constructed at the Midtown Dam in 1998 without Corps construction assistance.

A Section 205 (1948 Flood Control Act) small flood control project is under construction for Fargo's Ridgewood neighborhood. The project will tie into a recently reconstructed floodwall at the Department of Veterans Affairs hospital.

7. FEDERALLY OWNED LANDS:

Preliminary alignments indicate that no Federally-owned lands appear to be within the LER required for the Project.

8. NAVIGATIONAL SERVITUDE:

Rights afforded the Federal government by way of Navigational Servitude may apply to the Red River Control Structure for both the Minnesota and North Dakota alignments. For the North Dakota alternative, small areas of Navigational Servitude may be affected as the channel crosses other rivers and tributaries. Determination of these areas will not be available until specific designs are formulated.

9. REAL ESTATE MAPS:

The Project Overview Map Figure F01 is included for Reference for FCP and LPP portion of the project. (Includes: Storage Area 1). 10, 50, 100 & 500 year Upstream Impacted Structure map also included. Real Estate Drawings for proposed diversion channel are included.

10. INDUCED FLOODING:

The upstream and downstream effects of a diversion channel continue to be analyzed. A preliminary takings analysis has been completed and there appear to be takings for all diversion channel alternatives. However, additional data with specific elevations is needed in order to complete the analysis. Each of the properties will need to be analyzed on a case by case basis. When the data becomes available, a takings analysis will be completed for both upstream and downstream to determine any additional LER as it may relate to individual homestead sites. A full takings analysis will be completed during PED.

11. BASELINE COST ESTIMATE:

The Federally Comparable Plan is the Minnesota Diversion, 35,000 cfs. Therefore, The Minnesota Short FCP, will set the basis for the cost share, although the North Dakota East Diversion, 20,000 cfs, is the Locally Preferred Plan. The following table is a synopsis of the estimated real estate land cost, and possible damages to the remainder parcels for these possibilities. A preliminary footprint is completed at this time, therefore, this cost estimate is based on the preliminary alignments. A preliminary gross appraisal was completed for the estimated alignment and acreages. An updated gross appraisal reflecting the current footprint including the upstream staging and storage area is currently being finalized.

The cost is estimated on 1133 tracts of land containing 393 residences and over 500 non-residential structures.

MINNESOTA DIVERSION CHANNEL – 35,000 CFS (FCP)

	Federal Costs	NFS Costs	Total
Lands / Damages	-	$42,049,500	$42,049,500
RE Administrative Costs	$323,441	$1,080,000	$1,403,441
Total	**$323,441**	**$43,129,500**	**$43,452,941**
Contingencies (25%)	$80,860	$10,782,375	$10,863235
Total	**$404,301**	**$53,911,875**	**$54,316,176**

NORTH DAKOTA DIVERSION LOCALLY PREFERRED PLAN – (LPP)
Grand total of all costs for LPP is $254,712,748 as outlined below:

DIVERSION CHANNEL AND STORAGE AREA

	Federal Costs	NFS Costs	Total
Lands / Damages*	-	$36,741,250	$36,741,250
RE Administrative Costs	$820,989	$2,628,000	$3,448,989
Total	**$820,989**	**$39,369,250**	**$40,190,239**
Contingencies (25%)	$205,247	$9,842,312	$10,047,559
SubTotal	**$1,026,236**	**$49,211,562**	**$50,237,798**

NOTE: * lands/damages for Diversion channel and Storage area include:

Type of property	*Value/acre or site*	*number of acres/sites*	*Approx. # of Sites*	*Total costs*
Acres/Fee	$3,900.00	4132	103	$16,114,800.00
Acres/Fee	$2,150.00	7171	179	$15,417,650.00
Acres/Easement	$800.00	136	5	$108,800.00
Non-Residential/Fee	$15,000.00	52	52	$780,000.00
Residential/Fee	$240,000.00	18	18	$4,320,000.00
				$36,741,250.00

UPSTREAM STAGING AREA

	Federal Costs	NFS Costs	Total
Lands / Damages**	-	$155,711,300	$155,711,300
RE Administrative Costs	$1,497,660	$6,371,000,	$7,868,660
Total	**$1,497,660**	**$162,082,300**	**$163,579,960**
Contingencies (25%)	$374,415	$40,520,575	$40,894,990
SubTotal	**$1,872,075**	**$202,602,875**	**$204,474,950**

NOTE: ** lands/damages for upstream storage include:

Type of property	*Value/acre or site*	*number of acres/sites*	*number of sites*	*Total costs*
Acres/Fee	$3,900.00	9750	244	$38,025,000.00
Acres/Fee	$2,150.00	11554	289	$24,841,100.00
Acres/Easement	$800.00	12659	316	$10,127,200.00
Non-Residential/Ease.	$140,000.00	165	165	$23,100,000.00
Non-Residential/Fee	$14,000.00	264	264	$3,696,000.00
Residential/Fee	$245,000.00	218	218	$53,410,000.00
Residential/Ease.	$16,000.00	157	157	$2,512,000.00
				$155,711,300.00

LLP TOTAL for lands and damages only is: $192,452,550

LPP TOTAL Real estate Base line cost estimate is: $254,712,748

Note: An estimate for environmental mitigation lands has been considered and included in the Total Project Cost estimate, Appendix L Cost Engineering, in the amount of $14,045,000 ($17,696,700 with contingencies). This possible future mitigation is addressed in Appendix F Environmental, Section 1.7 and is not included in the Real Estate Baseline cost estimate above.

Contingencies are added to account for potential severance damages due landowners whereby the larger parcel is adversely affected by a partial acquisition; and increases in market conditions at the time of acquisition; and potential effects following the completion of an Integrated Cost and Risk Assessment. Relocation Benefits are included as a part of the NFS Administrative Costs.

The basis for LERRDs crediting will be determined against the cost analysis of the FCP, all costs above the LERRDs crediting basis determined by the FCP for the LPP will be borne 100% by the non-federal sponsors.

12. PL 91-646 RESIDENCE / BUSINESS RELOCATIONS:

Based on mapping provided by the St. Paul District Design Branch, an estimated 504 structures (to include numerous farm sites) may need to be relocated under Public Law 91-646 requirements. A formal relocation plan and survey have not been conducted, but will be completed prior to the initiation of acquisition. The Baseline Cost Estimate includes an estimated value for these structures as well as the potential relocation benefits. The potential non-federal sponsors are all advised that PL91-646 must be adhered to throughout the process and that detailed documentation of expenses for LERRDs crediting must be conducted.

13. MINERAL ACTIVITY:

There is no present or anticipated mineral activity within the proposed project limits.

14. NON-FEDERAL SPONSOR ASSESSMENT:

It is anticipated that the non-federal sponsors will include both the cities of Fargo and Moorhead. The "Assessment of Non-Federal Sponsor's Real Estate Acquisition Capability" checklist is completed and attached for both Fargo and Moorhead. Both Cities have the legal authority, ample qualified personnel, and experience from previous projects necessary to acquire the necessary LER for the project.

15. ZONING:

No application or enactment of zoning ordinances will be utilized for the proposed project.

16. ACQUISITION SCHEDULE:

The following schedule is based on an anticipated duration of real estate related activities and begins at 0 months with the approval of the Feasibility Report: (it should be noted that the project will most likely be constructed in phases for which each phase will have a different acquisition time period)

Feasibility Report Approval	0 Month
Initiate Plans & Specifications	1 Month
Execute PPA	18 Months
Complete Plans and Specs	18 Months
Final Real Estate ROW Maps	18 Months
Sponsor Begins Acquisition	18 Months
Certify Real Estate	22 Months
Construction starts	24 Months

17. FACILITY/UTILITY RELOCATIONS:

A Preliminary Attorney's Opinion of Compensability has not been completed by the St. Paul District Office of Counsel at the time of this report. A Final Opinion will be completed during the Plans, Engineering and Design (PED) phase of the Project.

In accordance with ER 1165-2-131, the costs associated with the railroad bridges would be cost-shared between the Federal Government and the Sponsor.

18. ENVIRONMENTAL CLEARANCE:

A Phase I, Environmental Site Assessment (ESA), was completed for both the Minnesota and North Dakota diversion channel alternatives in December 2010. The ESA recommended a limited Phase II Environmental Site Assessment depending upon the ultimate selected diversion alternative. For the LPP a Phase I Supplemental HTRW will be completed to include the areas that were not identified in the December 2010 report.

These areas include the alignment shift along the northern portion of the diversion, the extensions on the tie-back levee in Minnesota, the tie-back levee along Hwy 17, the storage area and the staging area.

19. LANDOWNER ATTITUDE:

In general landowners have indicated an understanding that a permanent solution to the flood problems in the metro area is needed, however when speaking with individual landowners at the public meetings, there is opposition to the project by people directly impacted. Although there are those who accept the need for the project there is a divergence of attitudes and opinions as to the scope, need, design and alignment of the project. There will need to be more informational meetings to educate the public on the project as it progresses.

Numerous public meetings have been held (detailed in Section 6 and Appendix Q of the main report) and a website (http://www.internationalwaterinstitute.org/feasibility/index.htm) was established as the project's primary website. The purpose of this site was to deliver information to the public that was made available at public meetings and for distribution of information as part of the NEPA process. The website also gave the interested public opportunities to ask questions, submit comments through e-mail, or be added to an email mailing list.

20. NON-FEDERAL SPONSOR NOTIFICATION:

Although the potential NFS are identified, there is no firm determination on what entities will be the NFS for the PPA, and thus no formal notification of the risk of acquiring LER prior to the execution of the PPA has been made at this point. The non-federal sponsors for this study are the City of Fargo, North Dakota and the City of Moorhead, Minnesota. The cities have been supported and have received input during the study from the Southeast Cass Water Resource District; Cass County, ND; Buffalo-Red Watershed District; and Clay County, MN.

John P. Albrecht
Chief of Real Estate

4 Aug 2011
Date

ASSESSMENT OF NON-FEDERAL SPONSOR'S REAL ESTATE ACQUISITION CAPABILITY
Fargo/Moorhead Diversion Project - City of Fargo

	YES	NO	N/A
I. Legal Authority:			
a. Does the sponsor have legal authority to acquire and hold title to real property for project purposes?	X		
b. Does the sponsor have the power of eminent domain for this project?	X		
c. Does the sponsor have "quick-take" authority for this project?	X		
d. Are any of the lands/interests in land required for the project located outside the sponsor's political boundary?	X		
e. Are any of the lands/interests in land required for the project owned by an entity whose property the sponsor cannot condemn?		X	
COMMENTS:			
II. Human Resource Requirements:			
a. Will the sponsor's in-house staff require training to become familiar with the real estate requirements of Federal projects including PL 91-646, as amended?		X	
b. If the answer to II.a. is "yes", has a reasonable plan been developed to provide such training?			X
c. Does the sponsor's in-house staff have sufficient real estate acquisition experience to meet its responsibilities for the project?	X		
d. Is the sponsor's projected in-house staffing level sufficient considering its other workload, if any, and the project schedule?	X		
e. Can the sponsor obtain contractor support, if required, in a timely fashion?	X		
f. Will the sponsor likely request USACE assistance in acquiring real estate? (If "yes", provide description.)		X	
COMMENTS:			
III. Other Project Variables:			
a. Will the sponsor's staff be located within reasonable proximity to the project site?	X		
b. Has the sponsor approved the project/real estate schedule/milestones?	X		
COMMENTS:			
IV. Overall Assessment:			
a. Has the sponsor performed satisfactorily on other USACE projects?	X		
b. With regard to this project, the sponsor is anticipated to be:	**highly capable**		
	fully capable		
	moderately capable		
	marginally capable		
	insufficiently capable		
(If sponsor is believed to be "insufficiently capable", provide explanation).			
COMMENTS:			
V. Coordination:			
a. Has this assessment been coordinated with the sponsor?	X		
b. Does the sponsor concur with this assessment? (If "no", provide explanation)	X		
COMMENTS:			

Prepared by: Rodney R. Peterson

14 JUL, 2011

Realty Specialist

Reviewed and Approved by:

John P. Albrecht

Chief, Real Estate Division

ASSESSMENT OF NON-FEDERAL SPONSOR'S REAL ESTATE ACQUISITION CAPABILITY
Fargo/Moorhead Diversion Project - City of Moorhead

	YES	NO	N/A
I. Legal Authority:			
a. Does the sponsor have legal authority to acquire and hold title to real property for project purposes?	X		
b. Does the sponsor have the power of eminent domain for this project?	X		
c. Does the sponsor have "quick-take" authority for this project?	X		
d. Are any of the lands/interests in land required for the project located outside the sponsor's political boundary?	X		
e. Are any of the lands/interests in land required for the project owned by an entity whose property the sponsor cannot condemn?		X	
COMMENTS:			
II. Human Resource Requirements:			
a. Will the sponsor's in-house staff require training to become familiar with the real estate requirements of Federal projects including PL 91-646, as amended?		X	
b. If the answer to II.a. is "yes", has a reasonable plan been developed to provide such training?			X
c. Does the sponsor's in-house staff have sufficient real estate acquisition experience to meet its responsibilities for the project?	X		
d. Is the sponsor's projected in-house staffing level sufficient considering its other workload, if any, and the project schedule?	X		
e. Can the sponsor obtain contractor support, if required, in a timely fashion?	X		
f. Will the sponsor likely request USACE assistance in acquiring real estate? (If "yes", provide description.)		X	
COMMENTS:			
III. Other Project Variables:			
a. Will the sponsor's staff be located within reasonable proximity to the project site?	X		
b. Has the sponsor approved the project/real estate schedule/milestones?	X		
COMMENTS:			
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a. Has the sponsor performed satisfactorily on other USACE projects?	X		
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	fully capable		
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	marginally capable		
	insufficiently capable		
(If sponsor is believed to be "insufficiently capable", provide explanation).			
COMMENTS:			
V. Coordination:			
a. Has this assessment been coordinated with the sponsor?	X		
b. Does the sponsor concur with this assessment? (If "no", provide explanation)	X		
COMMENTS:			

Prepared by: Rodney R. Peterson

14 July, 2011

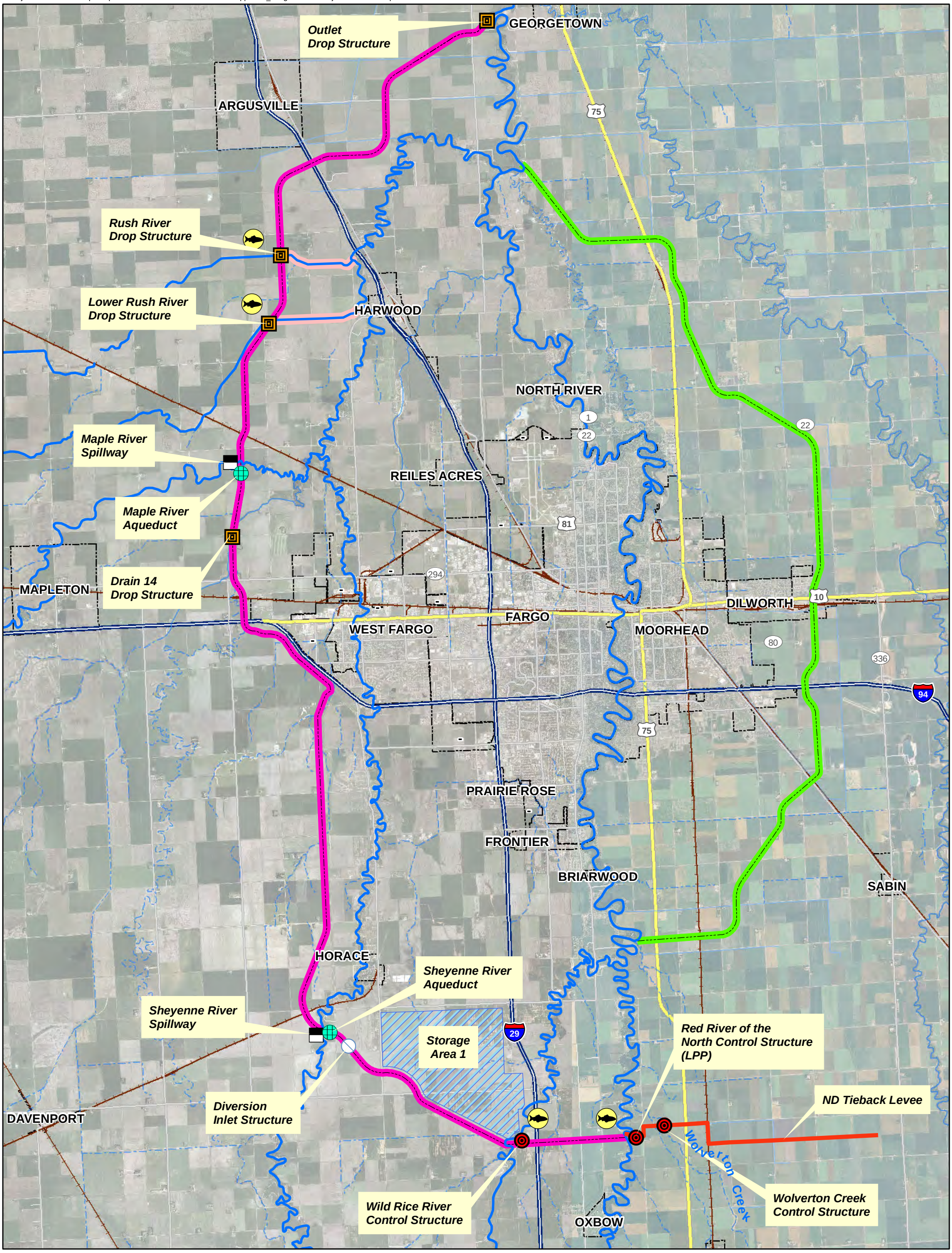
Realty Specialist

Reviewed and Approved by:

John P. Albrecht

Chief, Real Estate Division

I:\Projects\34\09\1004\Maps\Reports\PhaseIV Event Flow and WSEL\Appendix_F\Figure F01 - Project Overview Map.mxd



Hydraulic Structures

- Weir
- Aqueduct
- Control Structure
- Drop Structure
- Spillway
- Fish Passageway

- ND Tieback Levee
- North Dakota Diversion
  Locally Preferred Plan (LPP)
- Minnesota Diversion
  Federally Comparable Plan (FCP)
- Channel Reclamation Reaches
- Storage Area 1

Figure F01

PROJECT
OVERVIEW

Fargo - Moorhead Area

N

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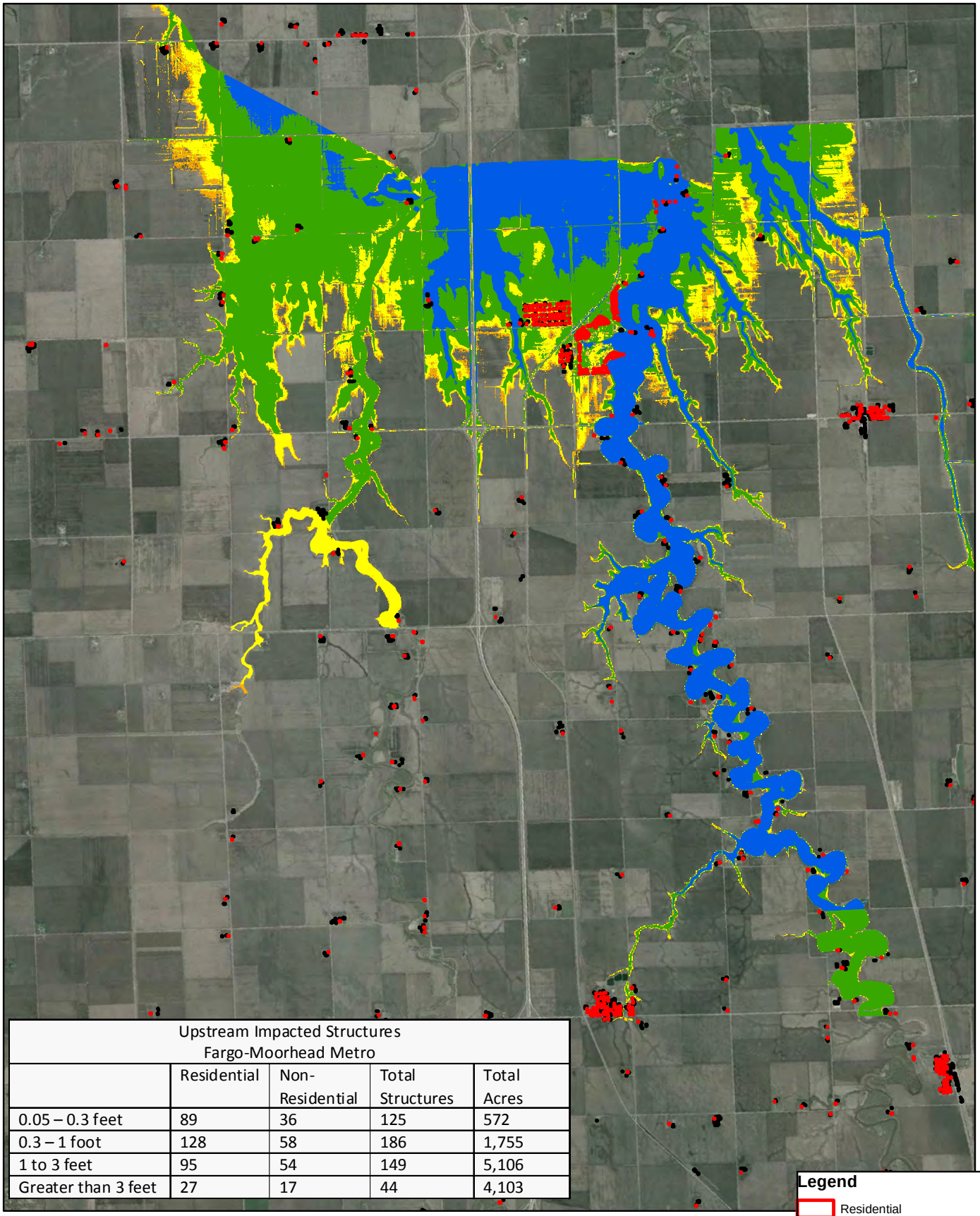
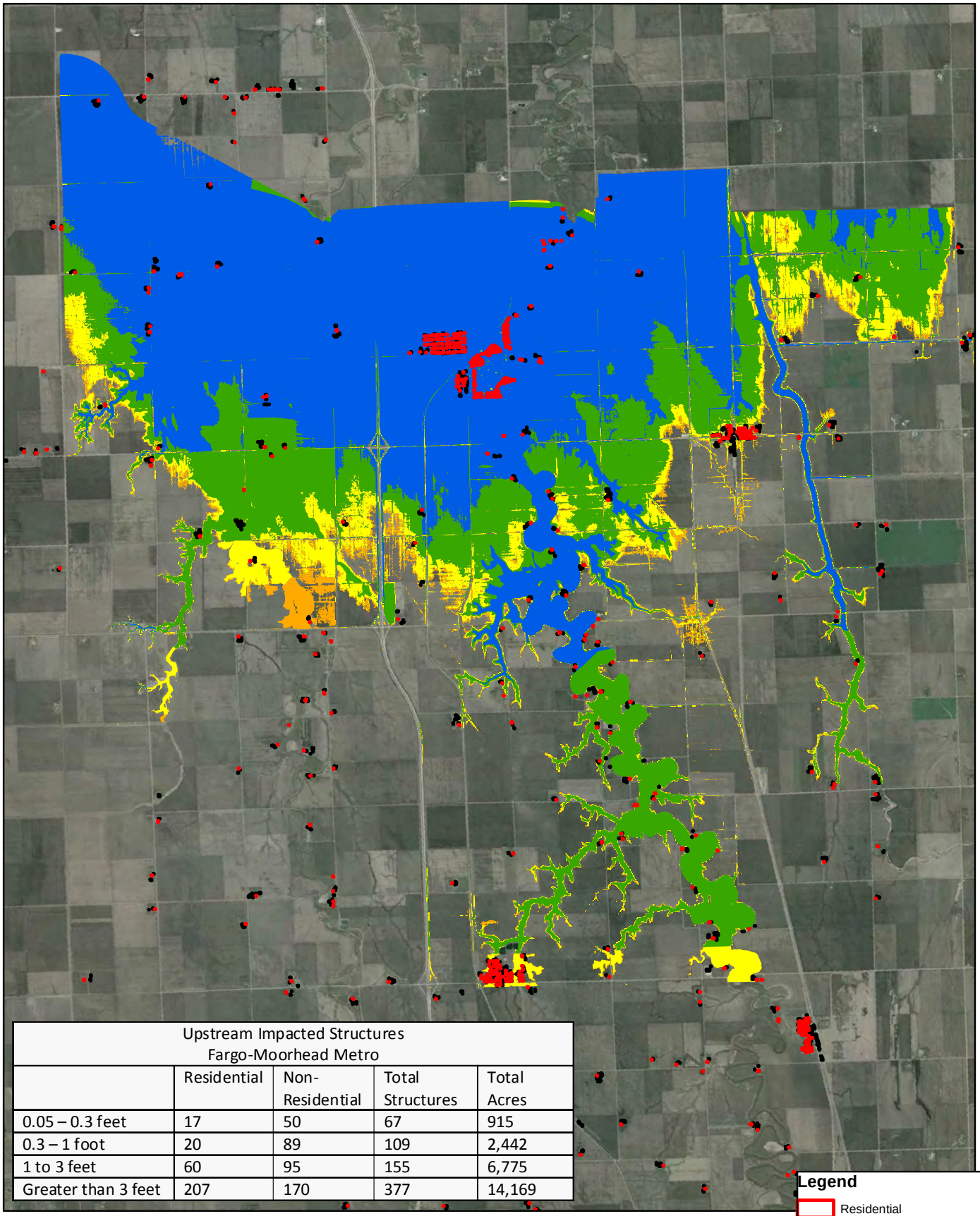
Miles



Upstream Impacted Structures Fargo-Moorhead Metro				
	Residential	Non-Residential	Total Structures	Total Acres
0.05 – 0.3 feet	89	36	125	572
0.3 – 1 foot	128	58	186	1,755
1 to 3 feet	95	54	149	5,106
Greater than 3 feet	27	17	44	4,103

Upstream Impacted Structures 10 Year
Difference from Exisiting to Project Conditons

Fargo - Moorhead Metro Study



Upstream Impacted Structures Fargo-Moorhead Metro				
	Residential	Non-Residential	Total Structures	Total Acres
0.05 – 0.3 feet	17	50	67	915
0.3 – 1 foot	20	89	109	2,442
1 to 3 feet	60	95	155	6,775
Greater than 3 feet	207	170	377	14,169

Upstream Impacted Structures 50 Year
Difference from Exisiting to Project Conditons

Fargo - Moorhead Metro Study

0 0.3 0.6 1.2 1.8 2.4

Miles

St. Paul District GIS CENTER
US Army Corps of Engineers

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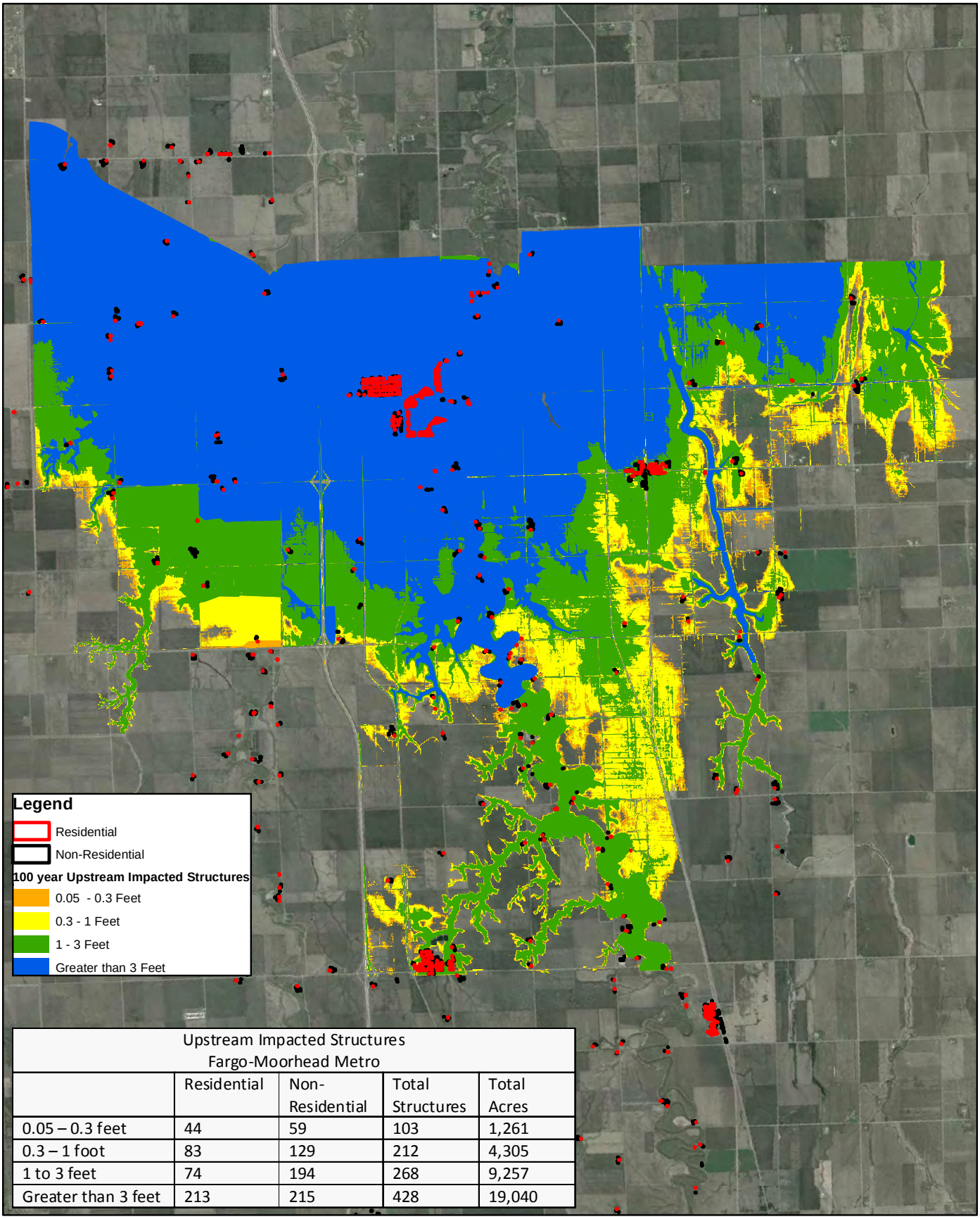

Upstream Impacted Structures Fargo-Moorhead Metro				
	Residential	Non-Residential	Total Structures	Total Acres
0.05 – 0.3 feet	44	59	103	1,261
0.3 – 1 foot	83	129	212	4,305
1 to 3 feet	74	194	268	9,257
Greater than 3 feet	213	215	428	19,040

Upstream Impacted Structures 100 Year
Difference from Exisiting to Project Conditons

St. Paul District GIS CENTER
US Army Corps of Engineers

Fargo - Moorhead Metro Study
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Miles

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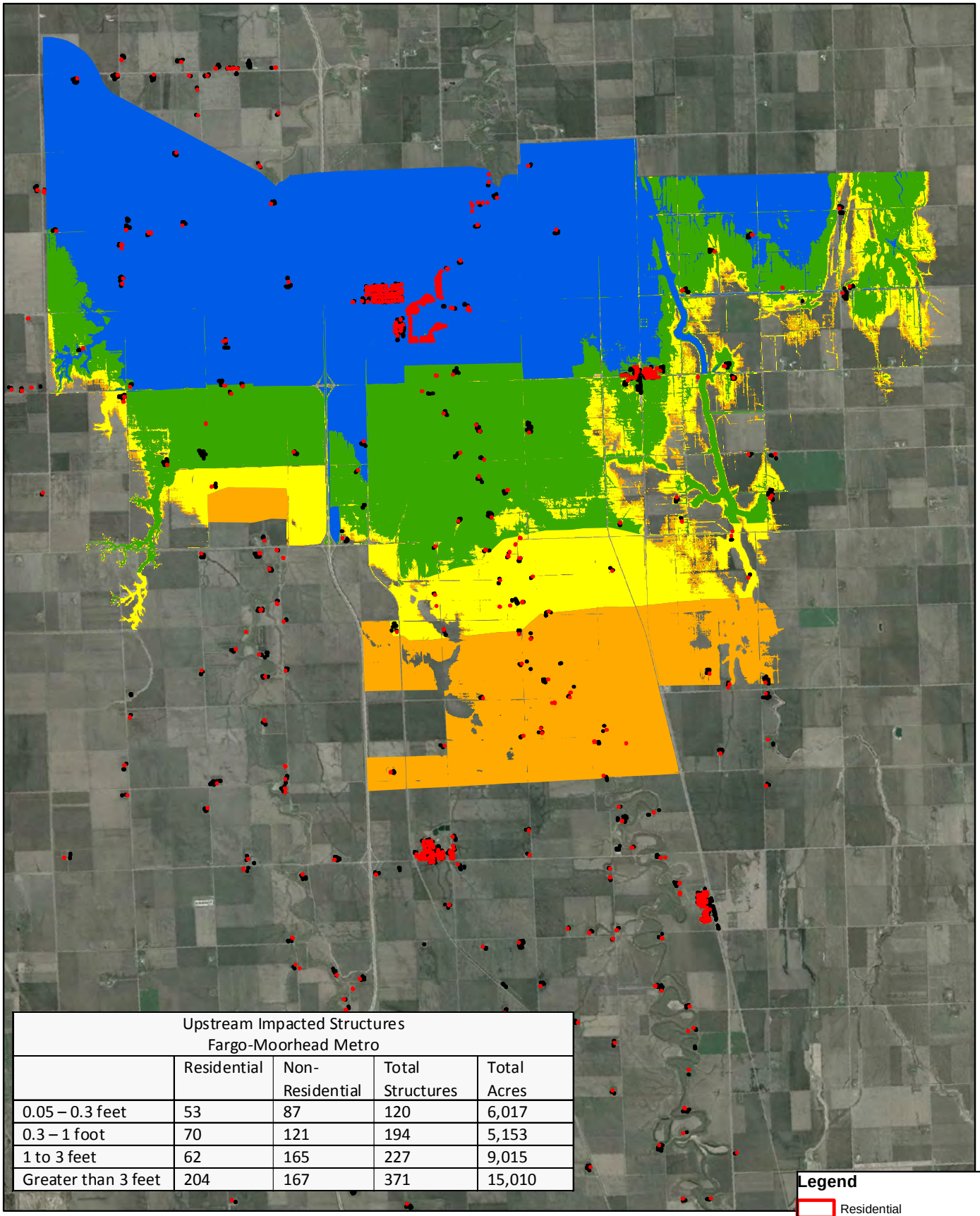

Upstream Impacted Structures Fargo-Moorhead Metro				
	Residential	Non-Residential	Total Structures	Total Acres
0.05 – 0.3 feet	53	87	120	6,017
0.3 – 1 foot	70	121	194	5,153
1 to 3 feet	62	165	227	9,015
Greater than 3 feet	204	167	371	15,010

Upstream Impacted Structures 500 Year
Difference from Exisiting to Project Conditons

Fargo - Moorhead Metro Study

0 0.350.7 1.4 2.1 2.8

Miles

St. Paul District GIS CENTER
US Army Corps of Engineers

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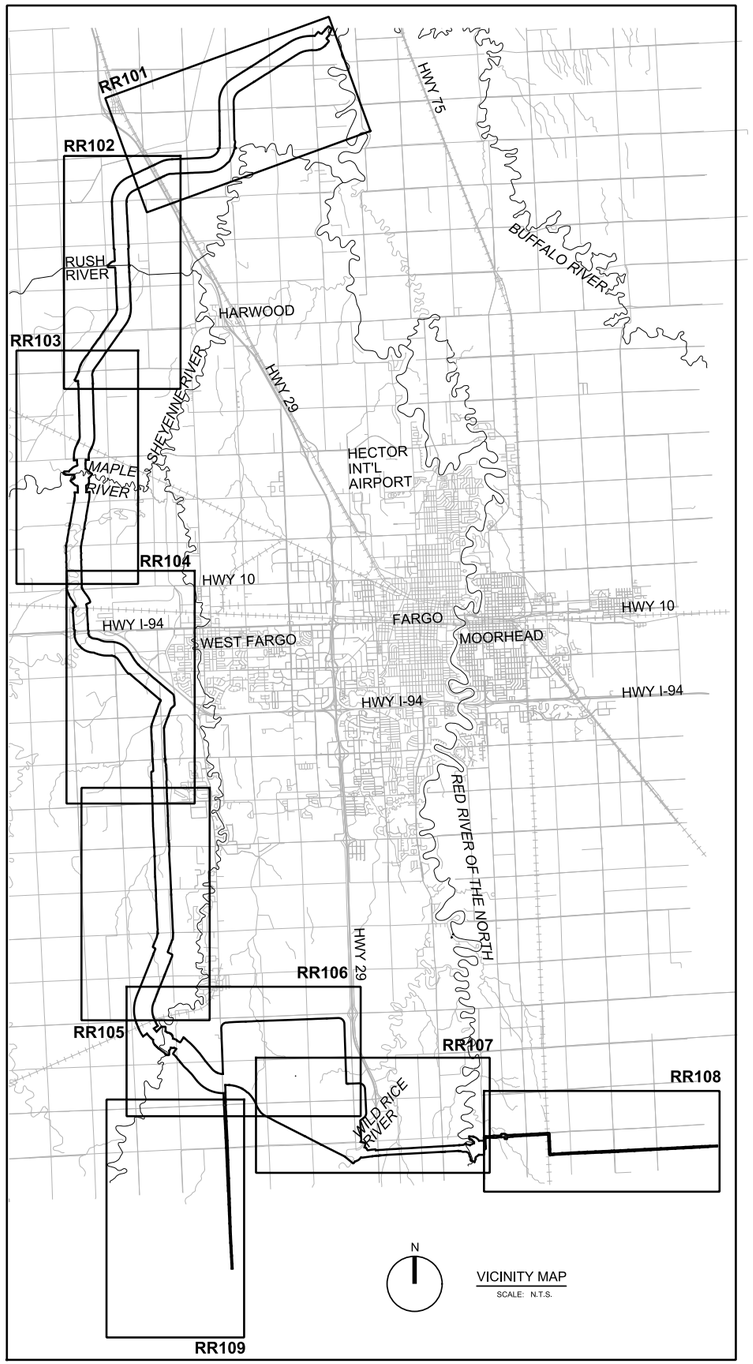

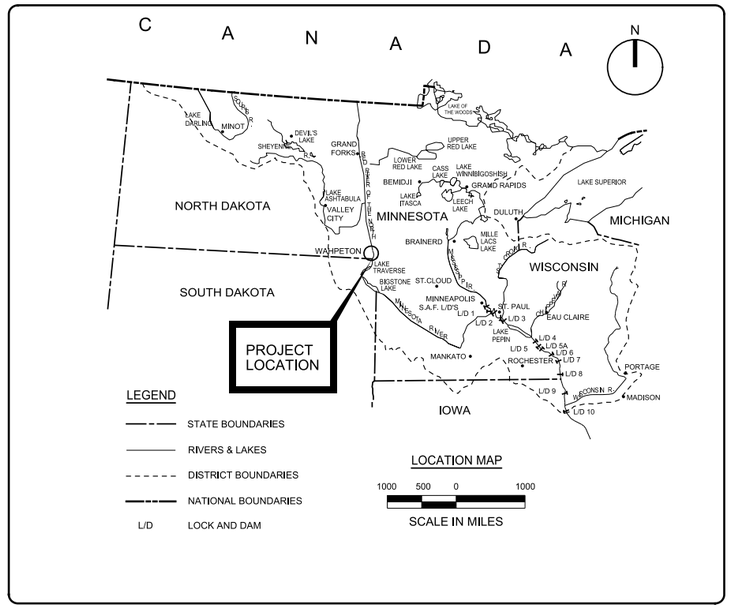

ACREAGE TABLE	
TEMPORARY WORK AREA EASEMENT =	136 ACRES
PERMANENT LEVEE EASEMENT =	11,438 ACRES

REAL ESTATE DRAWING INDEX

AS-BUILT DRAWING NO.	SHEET REF.	DESCRIPTION	PRODUCT I.D.
		REAL ESTATE DRAWINGS	
	RR001	VICINITY AND LOCATION MAPS , DRAWING INDEX & ACREAGE TABLE	FMM_RR001---.DGN
	RR101	REAL ESTATE PLAN SHEET 1 OF 9	FMM_RR101---.DGN
	RR102	REAL ESTATE PLAN SHEET 2 OF 9	FMM_RR102---.DGN
	RR103	REAL ESTATE PLAN SHEET 3 OF 9	FMM_RR103---.DGN
	RR104	REAL ESTATE PLAN SHEET 4 OF 9	FMM_RR104---.DGN
	RR105	REAL ESTATE PLAN SHEET 5 OF 9	FMM_RR105---.DGN
	RR106	REAL ESTATE PLAN SHEET 6 OF 9	FMM_RR106---.DGN
	RR107	REAL ESTATE PLAN SHEET 7 OF 9	FMM_RR107---.DGN
	RR108	REAL ESTATE PLAN SHEET 8 OF 9	FMM_RR108---.DGN
	RR109	REAL ESTATE PLAN SHEET 9 OF 9	FMM_RR109---.DGN

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETRMINED

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ST. PAUL DISTRICT

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DRWN BY: EPP
SUBMITTED BY: MGM
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CHD BY: JBM
PLOT DATE: No
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SOLICITATION NO.:
CONTRACT NO.
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA

REAL ESTATE DRAWINGS-LPP
VICINITY AND LOCATION MAPS
DRAWING INDEX & ACREAGE TABLE

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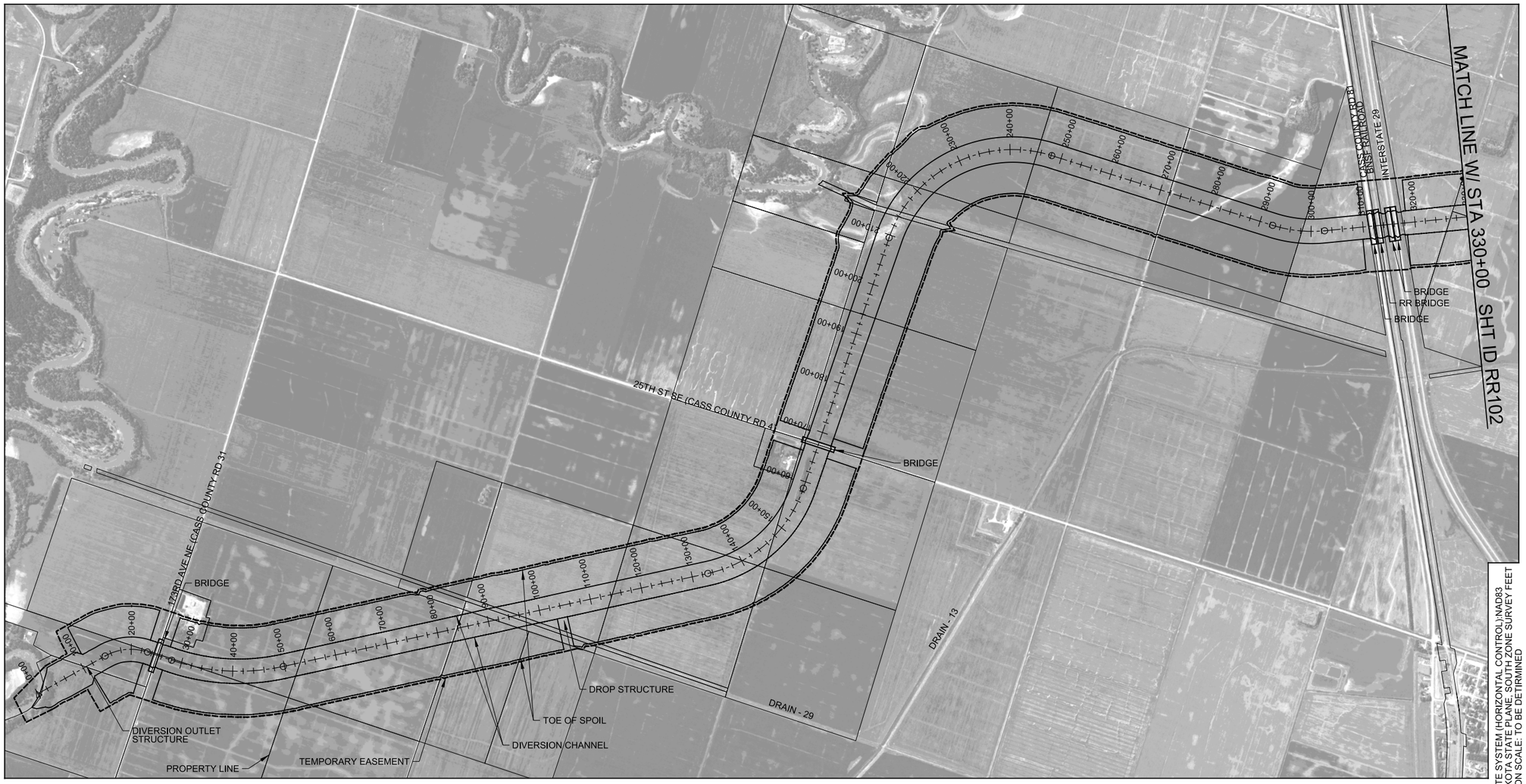
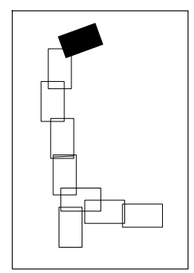


PLAN VIEW

1000' 500' 0 1000'

NOTES:

1. PERMANENT EASEMENTS - 30' OUTSIDE THE T0E OF SPOIL OR LEVEE,
2. TEMPORARY EASEMENTS - 15' BEYOND THE PERMANENT EASEMENT.
3. ONLY TEMPORARY EASMENTS ARE DISPLAYED IN PLAN VIEW.



ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

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SUBMITTED BY: MGM
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FARGO-MOORHEAD METRO FEASIBILITY REPORT
REDUCED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
REAL ESTATE DRAWINGS-LPP
REAL ESTATE PLAN
SHEET 1 OF 9

Sheet ID
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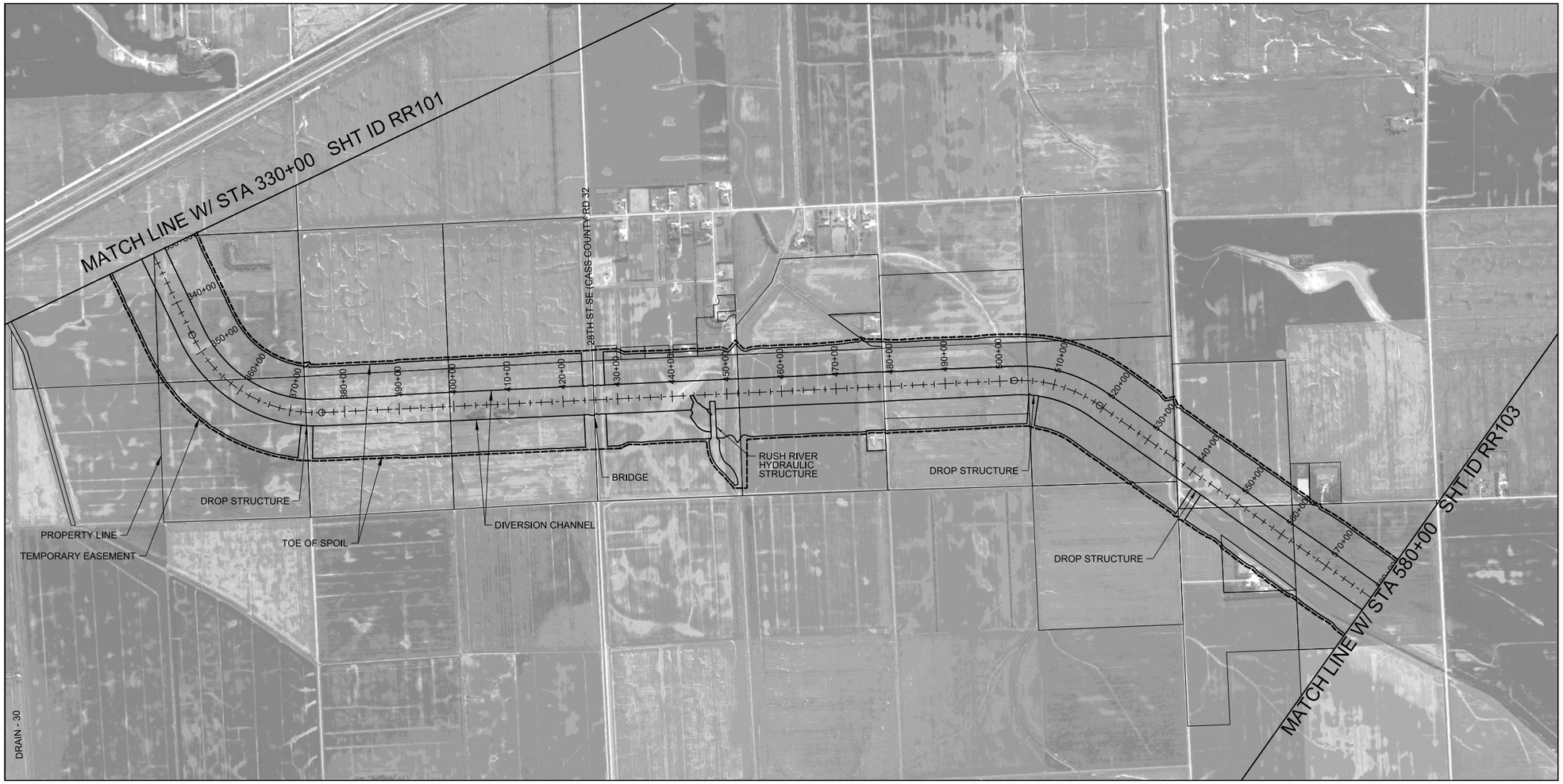

PLAN VIEW

1000' 500' 0 1000'

NOTES:

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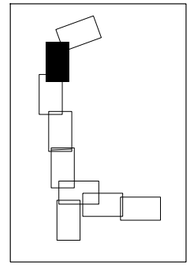

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988 GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83 NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET CORRECTION SCALE: TO BE DETIRMINED

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FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
REAL ESTATE DRAWINGS-LPP
REAL ESTATE PLAN
SHEET 1 OF 9

Sheet ID
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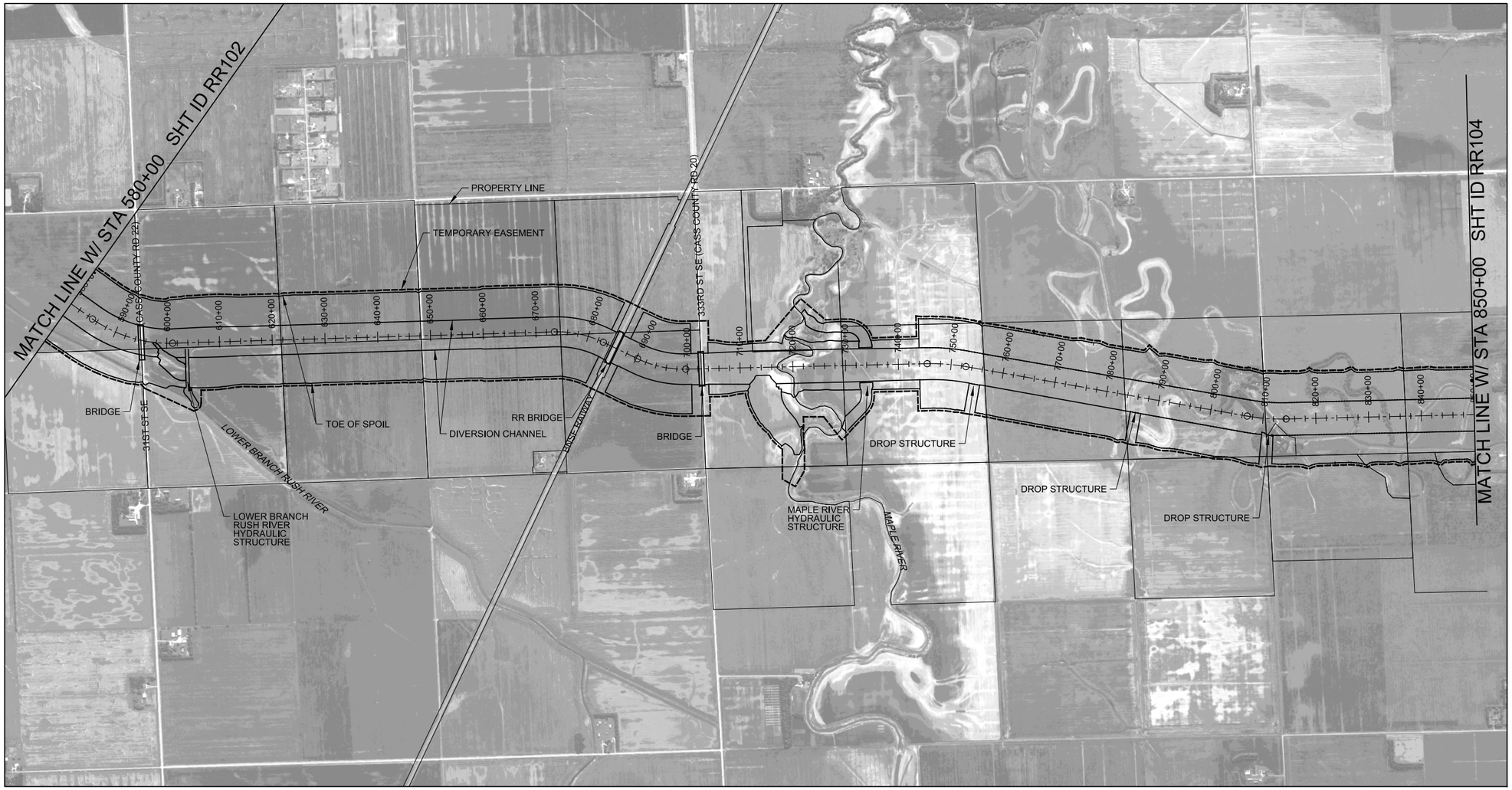

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PLAN VIEW

1000' 500' 0 1000'

NOTES:

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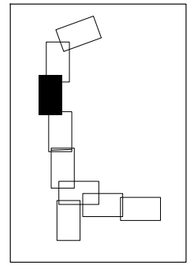

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

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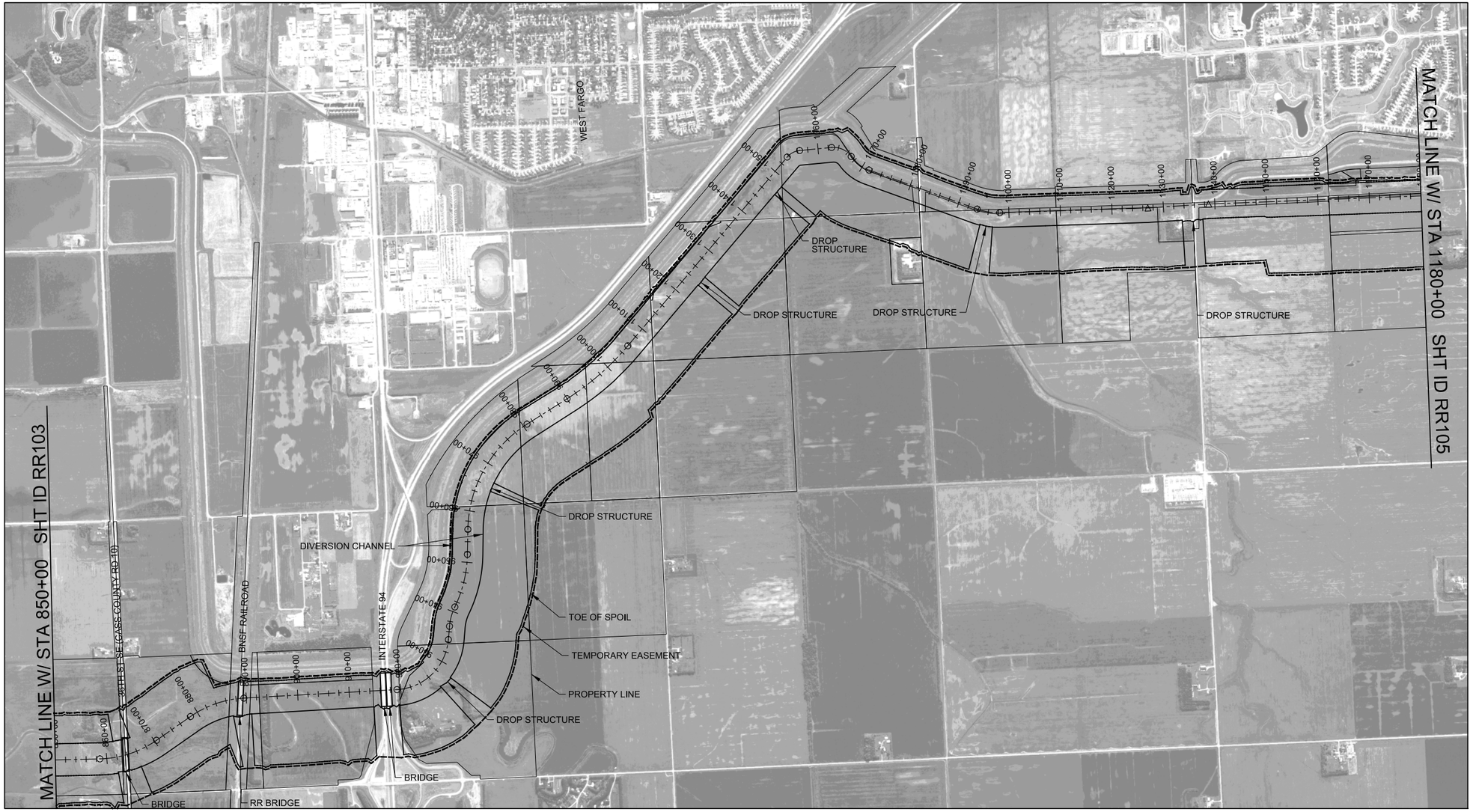
FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
REAL ESTATE DRAWINGS-LPP
REAL ESTATE PLAN
SHEET 3 OF 9

Sheet ID
RR103



PLAN VIEW

1000' 500' 0 1000'

NOTES:

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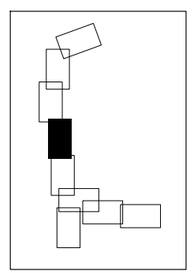

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

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FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
REAL ESTATE DRAWINGS-LPP
REAL ESTATE PLAN
SHEET 4 OF 9

Sheet ID
RR104

PLAN VIEW

1000' 500' 0 1000'

NOTES:

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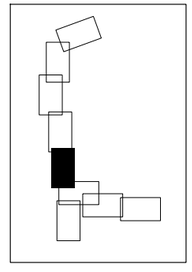

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N.A.V.D. 1988
GEOID09

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NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers
ST. PAUL DISTRICT

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MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: MSM
SUBMITTED BY: MSM
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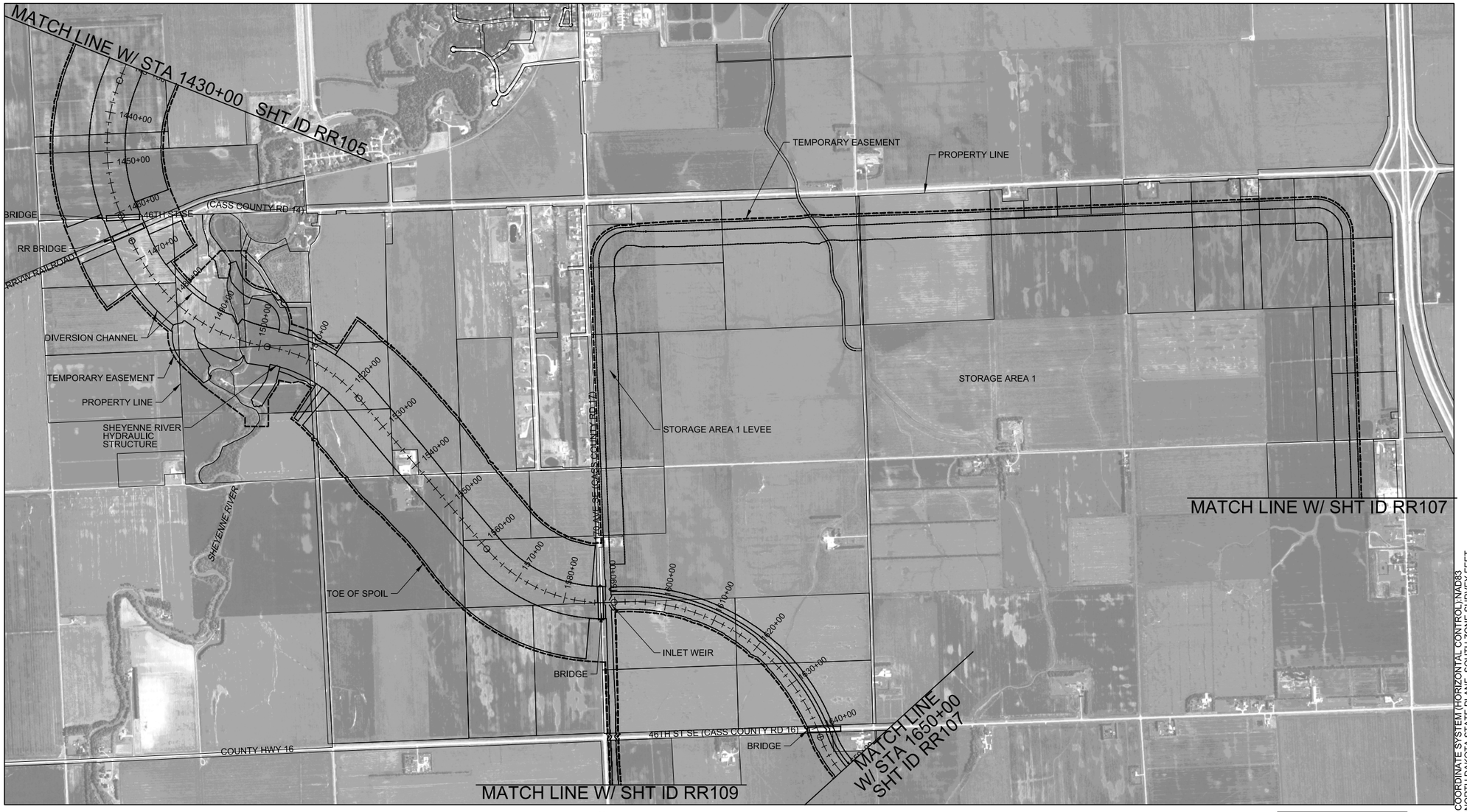
PLOT DATE: No
SIZE: D
DATE: JULY 2011
CKD BY: JBM
FILE NAME: File_RR105.dgn
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

FARGO-MOORHEAD METRO FEASIBILITY REPORT
FEDERAL PORTION
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
REAL ESTATE DRAWINGS-LPP
REAL ESTATE PLAN
SHEET 5 OF 9

Sheet ID
RR105



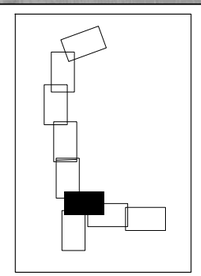
N

PLAN VIEW

1000' 500' 0 1000'

NOTES:

1. PERMANENT EASEMENTS - 30' OUTSIDE THE T0E OF SPOIL OR LEVEE,
2. TEMPORARY EASEMENTS - 15' BEYOND THE PERMANENT EASEMENT.
3. ONLY TEMPORARY EASMENTS ARE DISPLAYED IN PLAN VIEW.



COORDINATE SYSTEM (HORIZONTAL CONTROL):
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

ELEVATION DATUM (VERTICAL CONTROL):
N.A.V.D. 1988
GEOID09

US Army Corps of Engineers
ST. PAUL DISTRICT

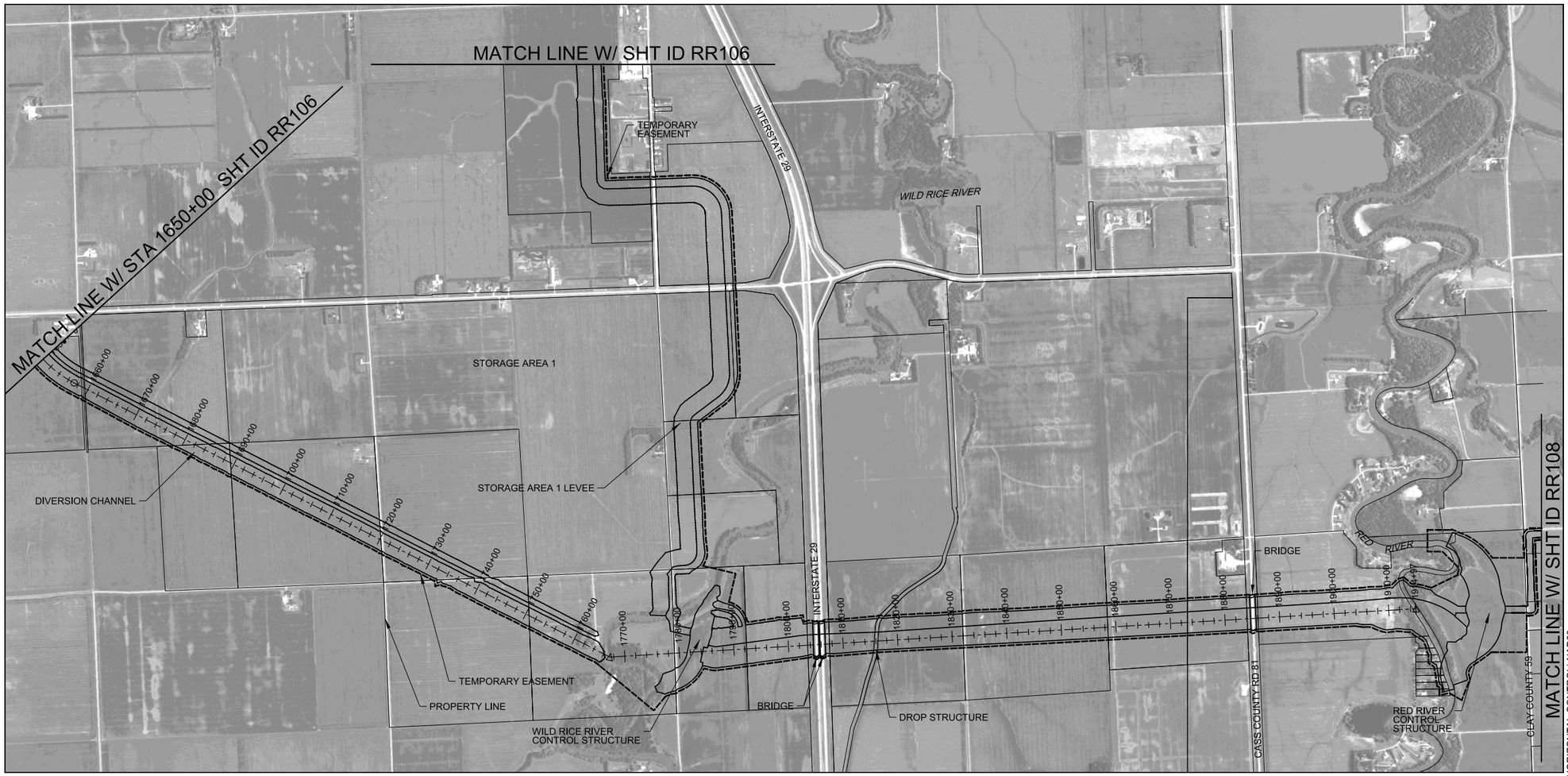
MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: EPP
DRN BY: EPP
SUBMITTED BY: MSM
DATE: JULY 2011
CKD BY: JBB
PLOT SCALE: No
PLOT DATE:
SIZE:
FILE NAME: RR106.dgn
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
REAL ESTATE DRAWINGS-LPP
REAL ESTATE PLAN
SHEET 6 OF 9

Sheet ID
RR106



N

PLAN VIEW

1000' 500' 0 1000'

NOTES:

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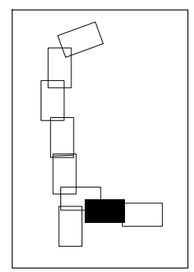

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP		DATE: JULY 2011	
DWN BY: MGM	CKD BY: JMH	SOLICITATION NO.:	
SUBMITTED BY: MGM		CONTRACT NO.:	
PLOT SCALE: No	PLOT DATE:	FILE NUMBER:	
SIZE:	FILE NAME: FARE_RR107---.dgn		

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
REAL ESTATE DRAWINGS-LPP
REAL ESTATE PLAN
SHEET 7 OF 9

Sheet ID
RR107

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PLAN VIEW

1000' 500' 0 1000'

NOTES:

1. PERMANENT EASEMENTS - 30' OUTSIDE THE T0E OF SPOIL OR LEVEE.
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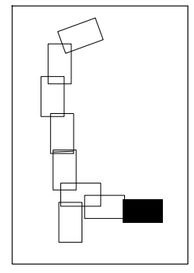

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL): NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers®
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.

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DRWN BY: EPP
SUBMITTED BY: MSM
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CONTRACT NO.:
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U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
REAL ESTATE DRAWINGS-LPP
REAL ESTATE PLAN
SHEET 8 OF 9

Sheet ID
RR108

auto_time

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PLAN VIEW

1000' 500' 0 1000'

NOTES:

1. PERMANENT EASEMENTS - 30' OUTSIDE THE T0E OF SPOIL OR LEVEE,
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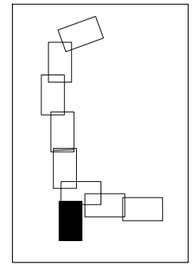

ELEVATION DATUM (VERTICAL CONTROL): N.A.V.D. 1988
GEOID09

COORDINATE SYSTEM (HORIZONTAL CONTROL):NAD83
NORTH DAKOTA STATE PLANE, SOUTH ZONE SURVEY FEET
CORRECTION SCALE: TO BE DETIRMINED

US Army Corps of Engineers
ST. PAUL DISTRICT

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
ST. PAUL, MINNESOTA

DESIGNED BY: EPP
DWN BY: EPP
SUBMITTED BY: MSM
PLOT SCALE:
PLOT DATE: No
SIZE:
FILE NAME: File_Sheets—.dgn
DATE: JULY 2011
CKD BY: JBB
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FARGO-MOORHEAD METRO FEASIBILITY REPORT
RED RIVER OF THE NORTH
CASS COUNTY & CLAY COUNTY
FARGO NORTH DAKOTA, MOORHEAD MINNESOTA
REAL ESTATE DRAWINGS-LPP
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SHEET 9 OF 9

Sheet ID
RR109