Aquatic Resources Report

Mullan BUILD Project

Missoula County, Montana

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1.0 Introduction

This report describes the methods and findings of wetlands and waters identified within the study area for the proposed Mullan BUILD project. The report was prepared and reviewed by HDR environmental scientists, and is intended to provide documentation of existing stream and wetland conditions in the study area to support applicable federal, state, and local agency permitting for the project. The wetland and stream delineation was conducted by:

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1.1 Project Background and Location

In 2019, Missoula County, in partnership with the City of Missoula, was awarded $13 million through the Better Utilizing Investments to Leverage Development, or BUILD, Transportation Discretionary Grant program to construct transportation improvements in the Mullan area at the western edge of the city of Missoula. The overall scope of the project as described in the BUILD application includes design and construction of three miles of new collector and minor arterial roadway, new sewer and water infrastructure, 3.7 miles of new trails, and 0.5 mile of stream restoration and flood control along Grant Creek. The transportation infrastructure is necessary to proactively plan development in a responsible manner, improve traffic flows and reduce congestion, create safer corridors for bicyclists and pedestrians, and attract economic development.

Occurring concurrently with the Mullan BUILD design project, Missoula County is conducting the Mullan Area Master Plan, a public planning and design process for the study area that is intended to identify future land use planning and regulations, transportation elements, and plans for amenities through community and stakeholder engagement. The final Mullan Area Master Plan, expected to be complete towards the end of 2020, will provide an illustrative plan meant to help guide future development in the area.

The general study area is located at the western edge of Missoula, Montana, and is partially located within the City of Missoula limits. The study area is approximately bound by West Broadway Street (State Highway 10) to the north, Reserve Street (US 93) to the east, Mullan Road to the south, and Grant Creek and Missoula International Airport to the west. The study area is located within portions of Sections 6, 7, and 18 of Township 13 North, Range 19 West and Sections 10, 11, 12, and 13 of Township 13 North, Range 20 West. The general study area is shown in Figure 1 as represented by the Mullan Master Plan study boundary.

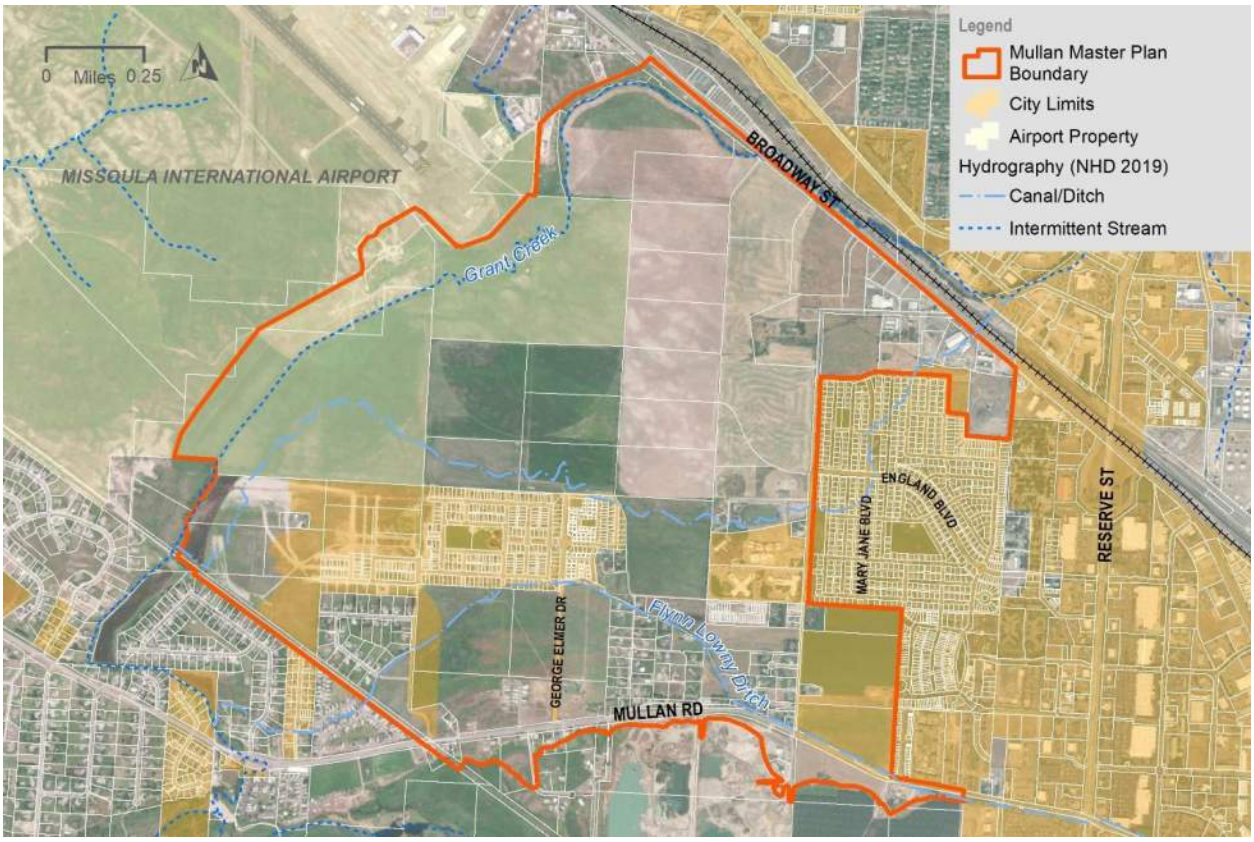

Figure 1. Project Location and Study Area

1.2 Proposed Action

The $13 million awarded for this project was only a portion of the $23.2 million requested from the Federal BUILD program in the 2019 grant application. As a result of partial funding, the entire project will not be able to be constructed using Federal dollars as originally proposed in the 2019 grant application. The City/County are committed to constructing all of the project elements included in the BUILD grant request but, due to the $10.2M shortfall in funding, the City/County must prioritize which project elements will be delivered with the grant funding that is currently available and which elements will be delayed until future funding becomes available.

To that end, an evaluation committee comprised of local government officials and industry experts ranked the ten project elements (both elements 1 and 2 include two separate north-south segments) based on evaluation criteria related to safety, traffic congestion, access to land for economic development, transportation modes, and environmental considerations. Based on the evaluation results, the following five elements, as further described below and shown in Figure 2, have been selected as providing the greatest public benefit and are therefore the proposed scope of the federal project:

1. Mary Jane Boulevard South;
2. Mary Jane Boulevard North;
3. George Elmer Drive South;
4. England Boulevard; and

5. Flynn Lane Trail.

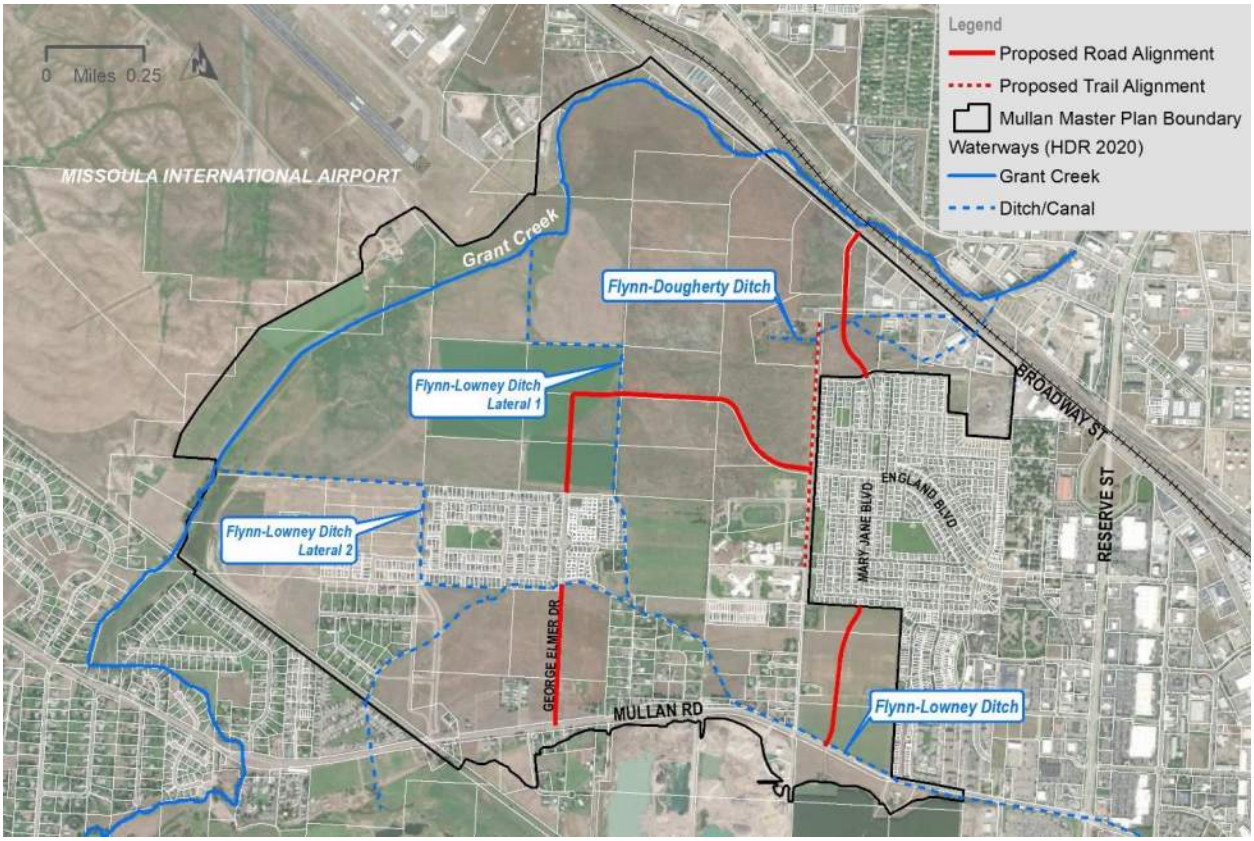

Figure 2. Proposed Project Elements

Mary Jane Boulevard South and North

The proposed Mary Jane Boulevard South and North project elements would construct a roadway connecting to the existing Mary Jane Boulevard within the Pleasant View subdivision. The south portion of the roadway would begin with a new intersection with Mullan Road, cross over the Flynn-Lowney Ditch, and proceed northward through vacant agricultural fields. A large parcel of land immediately south of the existing subdivision is currently being developed. On the north end of the subdivision, the northern portion of the proposed roadway would pass through a vacant field, cross the Flynn-Dougherty Ditch, intersect with Flynn Lane, and then travels northward to a new intersection with West Broadway Street. The total width of the roadway including sidewalk and landscaped boulevard varies from 82 for the south portion to 89 feet for the north portion. When completed, the new Mary Jane Boulevard will create a new north-south minor arterial roadway that connects West Broadway Street to Mullan Road.

George Elmer Drive South

The proposed George Elmer Drive South project element would improve the existing George Elmer Drive south of the existing 44 Ranch Estates subdivision to include a complete street typical section, then construct a new roadway north of the subdivision to connect to the proposed England Boulevard. The total width of the new roadway including sidewalk and landscaped boulevard is 84 feet.

England Boulevard
The proposed England Boulevard project element would construct a new east-west extension from the existing terminus of England Boulevard at Flynn Lane to connect to the proposed George Elmer Drive. The proposed England Boulevard would cross the Flynn-Lowney Lateral 1. The total width of the new roadway including sidewalk and landscaped boulevard is 84 feet.

Flynn Lane Trail
The proposed Flynn Lane Trail is approximately 3340 feet long and begins on the west side of Flynn Lane, North of Camden Street. This trail terminates at the existing shared use path near Hellgate Elementary School. The trail is all within right-of-way yet to be dedicated. This trail contains no horizontal curves or design constraints/concerns.

2.0 Methods

Potential aquatic resources in the study area were identified through a two-step process. HDR staff first conducted an off-site review by examining available existing documents, including soil surveys, wetland and stream inventories, aerial photographs, and other reports for information on wetlands and streams in the project vicinity. After this review, a thorough on-site field investigation of the aquatic resource survey area (described in Section 2.1, below) was completed. Specifics of these methodologies are described below.

2.1 Aquatic Resource Survey Area

The general study area as shown in Figure 1 is over-representative of the actual project limits and the area surveyed for aquatic resources during the field investigations. The aquatic resource survey area was more narrowly limited to the potential disturbance areas associated with the five proposed project elements (Section 1.2), but also encompassed the areas of the other project elements that were defined in the 2019 BUILD grant application (shown in Figure 3).

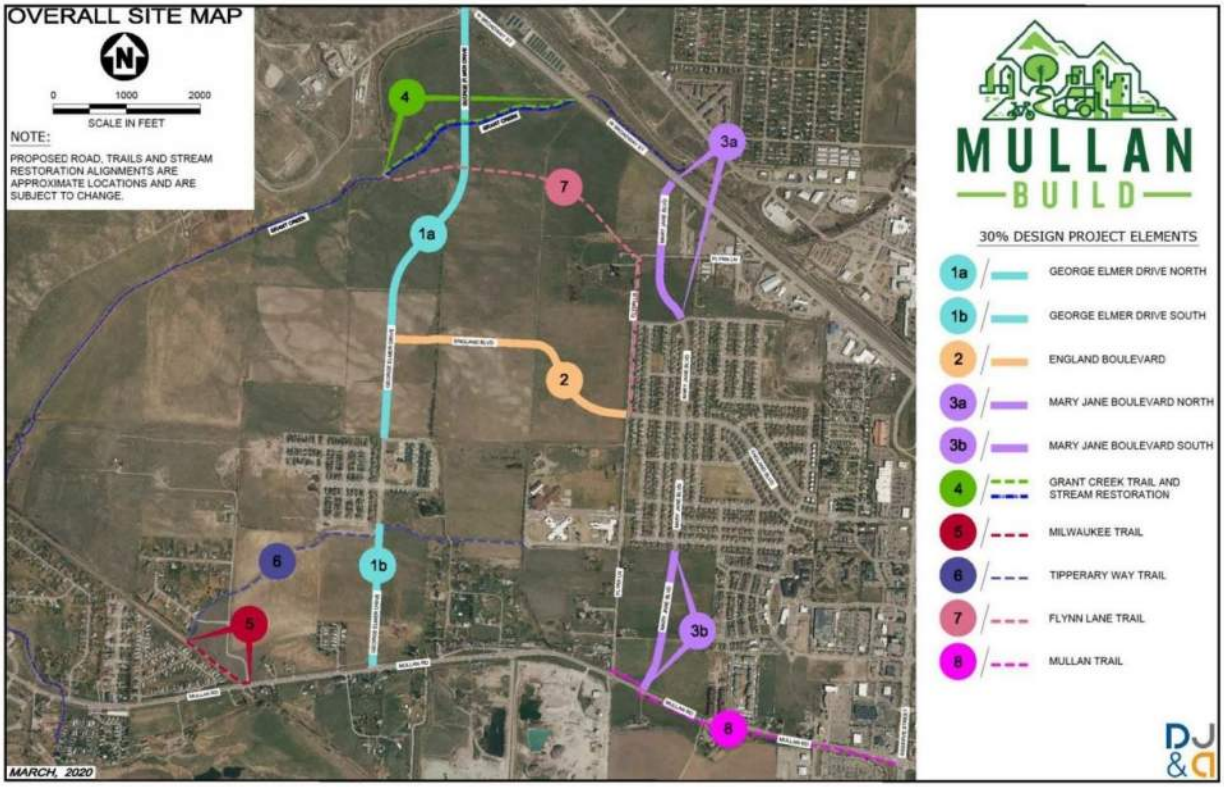

Figure 3. Mullan BUILD Project Elements

The aquatic resource survey area was focused on the proposed roadway and trail alignments, storm water features, and the area proposed for future restoration along Grant Creek. The survey area included an 80-foot-wide corridor (40 feet on either side of the centerline) for the proposed road improvements and a 50-foot-wide corridor (25 feet on either side of the centerline) for proposed trail improvements. It is important to note that, although the first phase on the project will construct the proposed action as described in Section 1.2, the Mullan BUILD team decided to survey the larger study area for wetlands as to inform future design phases for the project. The aquatic resource survey area measures 103.7 acres and is shown in Figure 4.

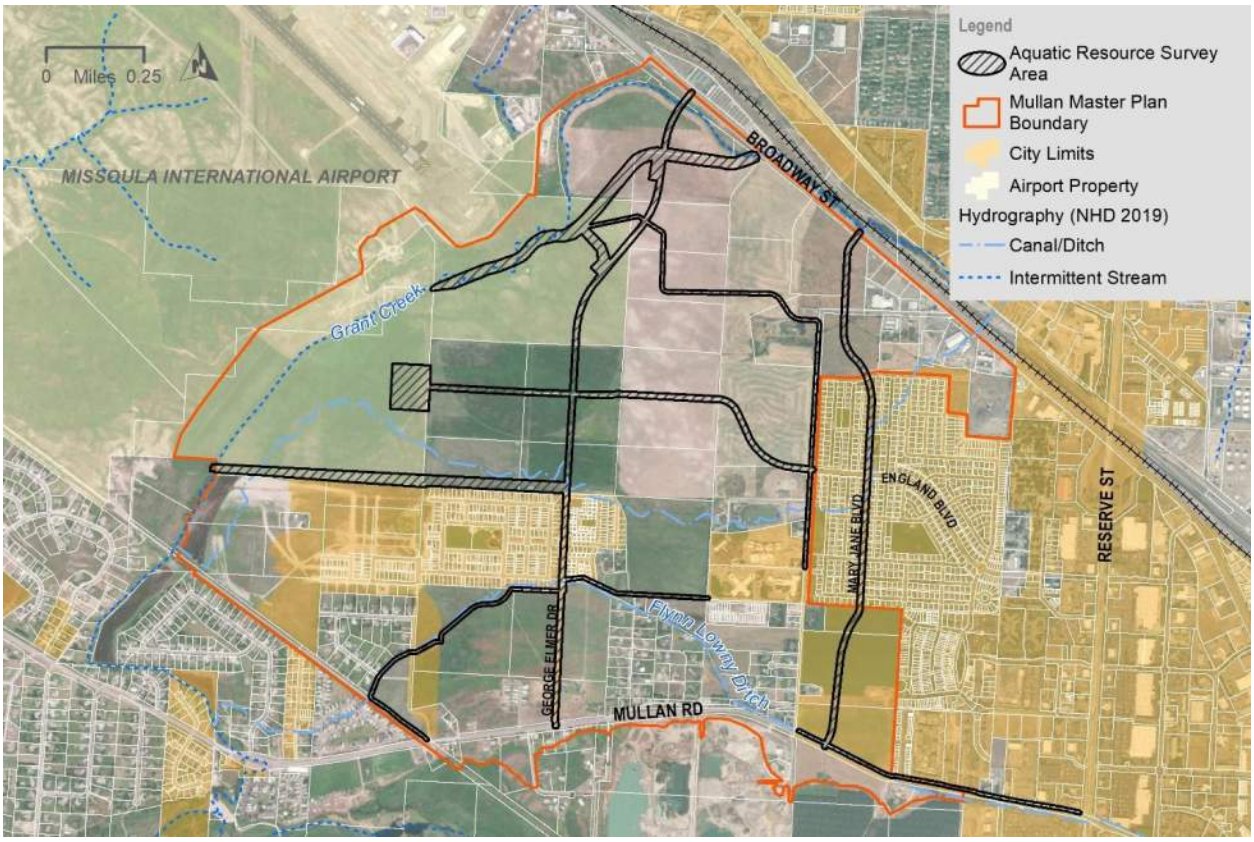

Figure 4. Aquatic Resource Survey Area

2.2 Off-site Review

An initial offsite evaluation for the presence of wetlands and streams within the study area was performed using the following sources:

- Natural Resource Conservation Service (NRCS) (2020) Custom Soil Resource Report for Missoula County Area, Montana
- Montana Natural Heritage Program (MTNHP) (2018) Wetlands and Riparian Framework Database, which includes National Wetland Inventory Data
- U.S. Geological Survey (USGS) National Hydrography Dataset (NHD) (2019) Montana Hydrography Framework
- Water Resources Survey, Missoula County, Montana (State Engineers Office 1960)
- Maxim Technologies Wetland Assessment Grant Creek Environmental Restoration/Flood Control (prepared for Missoula County; 2005)

These documents provide background information on the soils, hydrology, and potential wetlands and streams in the study area.

2.3 On-site Field Investigation

The field investigation was conducted on May 26-27, 2020 and consisted of a detailed inventory of potential wetlands and streams in the aquatic resource survey area.

Wetlands Delineation Methodology

HDR staff investigated the aquatic resource survey area for wetlands using the Routine Determination, Onsite Inspection Necessary method as described in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987), and updated by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountain, Valleys and Coast Region* (USACE 2010). A routine on-site inspection approach was used for this study since wetlands in the study area, if present, do not warrant a comprehensive approach, and since man-induced changes in the study area are assumed to now be "normal circumstances" for the study area (Environmental Laboratory 1987).

The U.S. Army Corps of Engineers (USACE) defines areas as wetlands based on the following:

> Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. (33 Code of Federal Regulations [CFR] 328 3.b)

Wetland delineations are based on the presence of the following three parameters:

- The area must exhibit indicators of wetland hydrology.
- The area must have a predominance of hydrophytic vegetation.
- The area must have a presence of hydric soils.

Atypical areas or problem areas may be missing one or more of the three parameters and still can be classified as wetlands.

USACE Wetland Determination Data Forms were collected for all sampled areas according to USACE procedures and are included as Appendix B. Data plots were established in potential wetland areas and representative vegetation communities. At each plot location, a soil pit was dug for observation of soil and hydrology characteristics. Hydric soil and wetland hydrology characteristics were identified using methods described in the 1987 Manual and WMVC Regional Supplement. The vegetation was analyzed for plant species dominance in a 5-foot radius from the sample pit for the herbaceous layer, in a 15-foot radius for shrub layer, and in a 30-foot radius for overstory trees. The wetland indicator status of plants was identified using the National Wetland Plant List 2016.

Wetland boundaries, data plot locations, and ordinary high water mark (OHWM) in the aquatic resource survey area were marked in the field using an Arrow 100 GPS/GNSS receiver, which is capable of sub-meter accuracy, coupled with an Apple iPad tablet running ArcGIS Collector displaying base mapping and imagery files. The resulting data were incorporated into project

base maps. Using a geographic information system (GIS), an accurate delineation map (refer to Appendix A) was created from the GPS data and field drawings, providing a permanent record of the onsite wetland and stream delineation boundaries for the project.

Stream Delineation Methodology
The presence or absence of streams in the study area was evaluated using the methodology outlined in the USACE Regulatory Guidance Letter 05-05 *Ordinary High Water Mark Identification* (USACE 2005) and *A Guide to Ordinary High Water Mark Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States* (Mersel and Lichvar 2014). For purposes of the Clean Water Act, OHWM is defined as, "that line on the shore established by the fluctuation of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (USACE 2005). HDR staff looked for physical indicators including, but not limited to, a defined bed and bank, scour, destruction of terrestrial vegetation, presence of litter and debris, vegetation matted down, bent or absent, and scour.

3.0 Site Description

3.1 General Site Conditions

The study area is predominantly comprised of decades-old irrigated farm ground, recently established medium- to high-density residential housing, and developed and undeveloped commercial land. There is little-to-no undisturbed native habitat in the study area, as all native habitat has been converted to one of the aforementioned uses.

Irrigated farmland is comprised of alfalfa (*Medicago sativa*) fields and grass haylands with no grain crops occurring in the study area. Irrigation is comprised of wheel lines and center pivots with little observed flood irrigation. Irrigation ditches crisscross the study area and flow seasonally from approximately May through September.

Vegetation
Alfalfa is the primary hay species grown in the study area with other haylands being comprised of various grasses including smooth brome (*Bromus inermis*), crested wheatgrass (*Agropyron cristatum*), slender wheatgrass (*Elymus trachycaulus*), Kentucky bluegrass (*Poa pratensis*), timothy (*Phleum pretense*), and meadow foxtail (*Alopecurus pratensis*). Moist areas adjacent to irrigation ditches and Grant Creek support reed canary grass (*Phalaris arundinacea*), field horsetail (*Equisetum arvense*), mint (*Mentha arvensis*), cattail (*Typha latifolia*), and bulrush (*Schoenoplectus acutus*).

Disturbed ground around field edges, irrigation ditches, roads, and Grant Creek support a variety of noxious weeds and invasive species including: spotted knapweed (*Centaurea stoebe*), Canada thistle (*Cirsium arvense*), musk thistle (*Cardus nutans*), common tansy (*Tanacetum vulgare*), cheatgrass (*Bromus tectorum*), houndstongue (*Cynoglossum officinale*), leafy spurge (*Euphorbia esula*), common mullein (*Verbascum thapsus*), and common kochia (*Kochia*

scoparia). Noxious weeds and other weedy species are prominent on the landscape and are associated with most disturbed ground in the study area.

Aside from a variety of ornamental trees and shrubs associated with private homes in the study area, the only other trees and shrubs in the study area are associated with irrigation ditches and Grant Creek. Mature black cottonwood (*Populus balsamifera*) trees are limited in the study area but do persist along the creek and along some irrigation ditches. Occasional willows documented in the study area include sandbar willow (*Salix exigua*), crack willow (*Salix gragilis*), and Bebb's willow (*Salix bebbiana*). Other shrubs species include chokecherry (*Prunus virginiana*), black hawthorn (*Crataegus douglasii*), red-osier dogwood (*Cornus alba*), common snowberry (*Symphoricarpos albus*), and woods rose (*Rosa woodsii*). A small number of Russian olive (*Elaeagnus angustifolia*) trees occur within the study area as well.

3.2 Precipitation History Prior to Field Delineations

Precipitation history for the study area vicinity was taken from the USDA Agricultural Applied Climate Information System (AgACIS) for the WETS Station: MISSOULA INTERNATIONAL AP, MT. This weather station is located immediately west of the study area and provides an accurate assessment of precipitation conditions within the study area. For the month of April prior to the May 26th and 27th field investigations, the study area vicinity received 1.81 inches of rainfall, which is slightly above the monthly mean in April of 1.30 inches (USDA 2020a). At the time of the May 26th and 27th field investigation, the study area was experiencing higher than normal precipitation levels. Approximately 0.01 inch of precipitation was recorded on May 26th and zero on May 27th. The 2020 precipitation accumulation for the study area vicinity is shown in Figure 5.

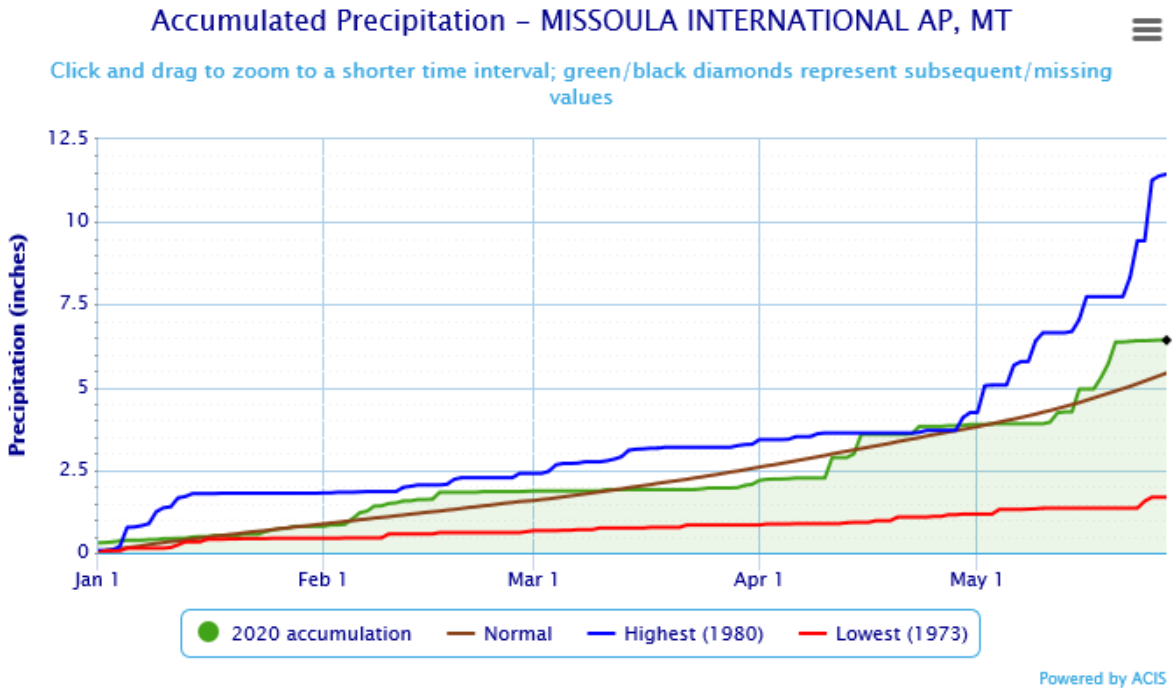

Figure 5. Accumulated Precipitation (2020) for the Study Area

3.3 Soils

A custom soils report was created using the USDA NRCS Web Soil Survey for the area intersecting the specific aquatic resource survey area. There are five distinct soil types found within in the aquatic resource survey area. A summary of the soil map units and their hydric rating are listed in Table 1.

Table 1. Mapped Soil Types in the Study Area

Map Unit Symbol	Map Unit Name	Hydric Rating	Acres in the Study Area	Percent (%) of Total Study Area
4	Aquic Haploxerolls, 0 to 2 percent slopes	Partially Hydric (5%)	3.2	3.1
34	Desmet loam, 0 to 2 percent slopes	Not Hydric	73.1	70.5
44	Grantsdale loam, 0 to 2 percent slopes	Not Hydric	13.9	13.5
45	Grassvalley silty clay loam, 0 to 4 percent slopes	Not Hydric	6.7	6.4
72	Moiese gravelly loam, 0 to 2 percent slopes	Not Hydric	6.8	6.5

Source: USDA 2020b

4.0 Results

4.1 Wetlands

HDR staff identified no wetlands within the aquatic resource survey area. This finding is consistent with the findings of the wetland assessment conducted on July 20th and October 20th, 2004 that included survey of the Grant Creek corridor from upstream of I-90 downstream to the approximate confluence with the Clark Fork River. No wetlands were identified during the 2004 field investigations. The larger study area also includes a flood control basin just north of Hiawatha Road and south of the Flynn-Lowery Lateral 2 ditch. This area appears to be a large wetland containing hydrophytic vegetation but is not within the aquatic resource survey area and was not formally delineated during the field investigations because it is located outside the area of disturbance.

A single sample plot and data form (DP-01) was completed at a location immediately adjacent to Grant Creek at a small vegetated bench outside of the aquatic resource survey area. The data plot was an exploratory point to test for wetland parameters based on site characteristics and, while hydrophytic vegetation and wetland hydrology were present, the soils did not meet the criteria to be considered hydric soils and the site was determined to be a non-wetland area. This site, and several other small, vegetated fringe benches containing riparian vegetation that were observed along the horseshoe bend of Grant Creek are riparian or floodplain fringe areas that do not meet the criteria to be considered a wetland. It should be noted that none of these areas located along the horseshoe bend segment of Grant Creek would be directly impacted by the proposed project. Refer to Appendix A for the location of DP-01. Refer to Appendix B for the completed USACE Wetland Determination Form. Refer to Appendix C for representative site photos.

Because no wetlands were identified within the aquatic resource survey area, no wetland impacts will occur as a result of the proposed project.

4.2 Streams and Ditches

Sources reviewed to assist in identification of water resources include the Water Resources Survey (WRS) for Missoula County (State Engineer's Office 1960) and the USGS National Hydrography Dataset (NHD). Hydrography within the study area consists of Grant Creek and several historic irrigation ditches, including the Flynn-Lowney Ditch, Flynn-Dougherty Ditch, and Grant Creek (identified as the Field-Dougherty Ditch in the 1960 WRS). The OHWM of these features were delineated as described in Section 2.3 above. The OHWM was delineated based on observation of physical characteristics on the shoreline, including identifiers such as presence of litter and debris, wracking, scour, changes in character of soil, changes in plant community, among others, within the study area vicinity to ascertain the lateral limits of USACE jurisdiction. The study area hydrography is displayed in the Appendix A maps and are further described below. Refer to Table 2 at the end of this section for more information on the delineated waterways.

Grant Creek

The study area includes approximately 2.3 miles of Grant Creek between West Broadway Street to Hiawatha Road. Grant Creek is a tributary to the Clark Fork River and is shown and labeled in Figure 1 and Appendix A. It should be noted that the USGS NHD incorrectly identifies Grant Creek as the canal/ditch passing through the center of the study area in an east-west direction, when, in fact, it is located along the northern and western edge of the study area as labeled in Figure 1 and Appendix A.

Grant Creek has been significantly altered and channelized downstream of I-90. The creek has been impacted by construction of I-90, past gravel mining activities, flow diversion for irrigation, and other land use and development activities. Most notable within the study area, Grant Creek has been realigned in the area of the "horseshoe bend," a deeply incised section of the creek with eroding banks, from its original alignment. Historically speaking, the 1960 Water Resources Survey shows Grant Creek terminating at West Broadway Street and, south and downstream of West Broadway Street, Grant Creek is identified as the Field-Dougherty Ditch, which corroborates the past anthropologic modifications that have occurred to lower portions of this stream system.

Grant Creek within the study area is largely void of riparian vegetation, a likely result of agricultural and grazing practices that have historically occurred. Downstream of I-90, a number of bridges and culverts that carry Grant Creek under various roads are undersized. Upstream of I-90, Grant Creek is relatively undisturbed with an active channel width ranging between 16 to 18 feet. At Mullan Road, the upstream watershed area of Grant Creek was measured to be 29.5 square miles.

Grant Creek is a perennial stream in its upper reaches north of I-90 but only flows intermittently April through July south of I-90 and through the study area when flows typically reach the Clark Fork River. Within the study area, flows within the creek go subsurface in the summer through

winter. Occasionally, the Grant Creek channel picks up irrigation flows in various reaches during the summer. Peak flows are estimated to be between 538 cubic feet per second (cfs) for the 50-year event and 864 cfs for the 500-year event (HDR 2020).

Flynn-Lowney Ditch
The Flynn-Lowney Ditch originates at a river diversion along the north side of the Clark Fork River between the Orange Street and Russell Street bridges. The water is conveyed along Mullan Road to just west of Flynn Lane where the ditch travels in a northwesterly then southwesterly direction through the study area. The Flynn-Lowney Ditch ranges from approximately 6 to 20 feet wide and has near vertical banks. The vast majority of the ditch as observed within the study area is un-vegetated. The vegetation along the banks of the ditch typically consists of upland grasses and substantial concentrations of weeds, with the exception of a few various locations where wetland vegetation (i.e., *Carex spp*., *Schoenoplectus spp*.) was observed along the inside of the ditch banks.

The Flynn-Lowney Ditch exits the study area at approximately the Hiawatha Road. The terminus of the Flynn-Lowney Ditch was not field-verified; however, based on aerial imagery interpretation, it appears to travel to the south side of Mullan Road and connect to a complex of side channels and sloughs of the Clark Fork River. The Flynn-Lowney Ditch is crossed by the proposed southern extension of Mary Jane Boulevard.

Flynn-Lowney Lateral 1
This ditch is a narrow lateral ditch ranging approximately 3 to 6 feet in width that begins at a diversion of the Flynn-Lowney Ditch just west of George Elmer Drive. The lateral ditch flows in a northerly direction for approximately 170 feet, turns west for 880 feet, flows north for 0.25 mile, then flows west approximately 0.5 mile into Grant Creek. This lateral is crossed by the project by the proposed Tipperary Way Trail and the proposed extension of England Boulevard and George Elmer Drive. The north-south segment of the ditch that is crossed by the proposed extension of England Boulevard contained water during the field investigation, although the ditch was not flowing. The east-west segment of the ditch crossed by the proposed extension of George Elmer Drive did not contain water during the field investigation.

Flynn-Lowney Lateral 2
This ditch is a lateral ditch ranging approximately 4 to 10 feet in width that begins at a diversion of the Flynn-Lowney Ditch near Tipperary Way, just east of George Elmer Drive. The lateral ditch flows in a northerly direction for approximately 0.7 mile, turns west for .25 mile, then flows north for 0.25 mile and flows into Grant Creek. This lateral is not crossed by any transportation element of the project; however, there is potential that the ditch conveyance flowing west from the 44 Ranch Estates development could be used to convey stormwater from George Elmer Drive. This ditch was actively conveying water westward and flowing into Grant Creek during the field investigation.

Flynn-Dougherty Ditch
The Flynn-Dougherty Ditch originates at a diversion along Grant Creek on the north side of West Broadway Street and conveys irrigation water to the Dougherty farm property located on Flynn Lane. Within the aquatic resource survey area, the ditch is narrow, approximately 2 feet

wide, and contained water during the field investigation, although the ditch was not flowing. This ditch is crossed by the proposed northern extension of Mary Jane Boulevard and the Flynn Lane Trail. From a review of aerial imagery, it appears this ditch terminates on the Dougherty farm property. Historical imagery reviewed in GoogleEarth shows a small impoundment on the farm property at the terminus of the ditch measuring approximately 0.05 acre. The impoundment area was not visited during the field investigations as no proposed elements of the project would affect this feature.

Table 2. Delineated Waterways within the Aquatic Resource Survey Area

Feature Name	Feature Type	Delineated Area		Classification[a]
		Acres	Square Feet	
Grant Creek	Stream (intermittent)	1.46	63,593	R4SBCx
Flynn-Lowney Ditch	Ditch/Canal	0.36	15,597	R4SBCx
Flynn-Lowney Ditch Lateral 1	Ditch/Canal	0.04	1,861	R4SBCx
Flynn-Lowney Ditch Lateral 2	Ditch/Canal	0.50	21,806	R4SBCx
Flynn-Dougherty Ditch	Ditch/Canal	0.01	508	R4SBCx
	TOTAL	**2.37**	**103,365**	

Source: HDR 2020; [a] Cowardin et al.
Notes: R4SBCx = Riverine (R), Intermittent (4), Streambed (SB), Seasonally Flooded (C), excavated (x)

5.0 Jurisdictional Status and Conclusions

No wetlands were documented within the aquatic resource survey area and, as such, the proposed project would not result in wetland impacts. Under the proposed action, impact on aquatic resources would be limited to the two irrigation crossings occurring at the Flynn-Lowney Ditch and the Flynn-Lowney Ditch Lateral 1.

It is important to note that the definition of waters of the United States (WOUS) with regard to the Clean Water Act (CWA) and USACE jurisdiction of irrigation ditches are in flux. On April 21, 2020, the U.S. Environmental Protection Agency (EPA) and the USACE published the Navigable Waters Protection Rule to define WOUS in the Federal Register. The intent of the agencies is to streamline the definition so that it includes four simple categories of jurisdictional waters, provides clear exclusions for many water features that traditionally have not been regulated, and defines terms in the regulatory text that have never been defined before. This final rule is germane to the Mullan BUILD project as it may affect how the USACE has previously identified the jurisdictional limits of irrigation ditches. The final rule specifically clarifies that WOUS do not include ditches that are not traditional navigable waters, tributaries, or that are not constructed in adjacent wetlands, subject to certain limitations. The final rule became effective on June 22, 2020 and replaced the rule published on October 22, 2019.

The USACE and EPA published a joint memorandum in July 2020 entitled, "*Joint Memorandum to the Field Between the U.S. Department of the Army, Corps of Engineers and The U.S. Environmental Protection Agency Concerning Exempt Construction or Maintenance of Irrigation Ditches and Exempt Maintenance of Drainage Ditches Under Section 404 of the Clean Water Act*" that provides a framework for determining the applicability of the ditch exemptions and the "recapture provision" in CWA Section 404(f)(2).

CWA applicability for the project will be assessed at a later phase of the project through consultation with the USACE. It is also imperative to note that the USACE is ultimately responsible for all jurisdictional determinations. Should a CWA Section 404 permit be required, the anticipated impact on WOUS are expected to be within the threshold to qualify for a Nationwide Permit and compensatory mitigation is not anticipated.

This report describes the wetland and stream delineation process as well as the extent and types of WOUS identified within the study area that may be subject to the jurisdiction of the USACE under authority of Section 404 of the CWA. Final boundary determinations and jurisdictional status of the features identified in this report fall under the authority of the USACE. The results of this delineation will be incorporated into the design documents of the proposed project. Any encroachment on the features identified in this report will require coordination with the USACE.

Future Phases of the Project

Grant Creek flows through the study area and, although not applicable to the current proposed action, future work affecting Grant Creek would be subject to permitting requirements. The future 0.5 mile of stream restoration and flood control along Grant Creek would create a new stream channel from West Broadway Street through the proposed George Elmer Drive crossing (of Grant Creek) to promote improved stream health, aquatic habitat, and water quality. The restoration work would require in-stream work within the bed and banks of Grant Creek in the locations where the stream realignment would tie into the existing Grant Creek stream channel. Grant Creek is an intermittent stream that flows into the Clark Fork River, a Traditional Navigable Water, during the spring and early summer during periods of higher flows. Because it has continuous flows for at least three months of the year, Grant Creek meets the definition of the seasonal relatively permanent water, or RPW. All RPWs are jurisdictional under the Clean Water Act (CWA). As such, the proposed stream restoration element of the project would require a CWA Section 404 permit and Section 401 Water Quality Certification of the CWA (issued by the Montana Department of Environmental Quality) for areas of impact within the OHWM on the existing Grant Creek stream channel. Grant Creek restoration would also need authorization through the Montana Stream Protection Act (SPA 124 Permit) administered by Montana Fish, Wildlife & Parks (MFWP). Other permits required would include a floodplain development permit from Missoula County and a 318 Authorization through the DEQ for short-term or temporary violations of state surface water quality standards for turbidity.

6.0 References

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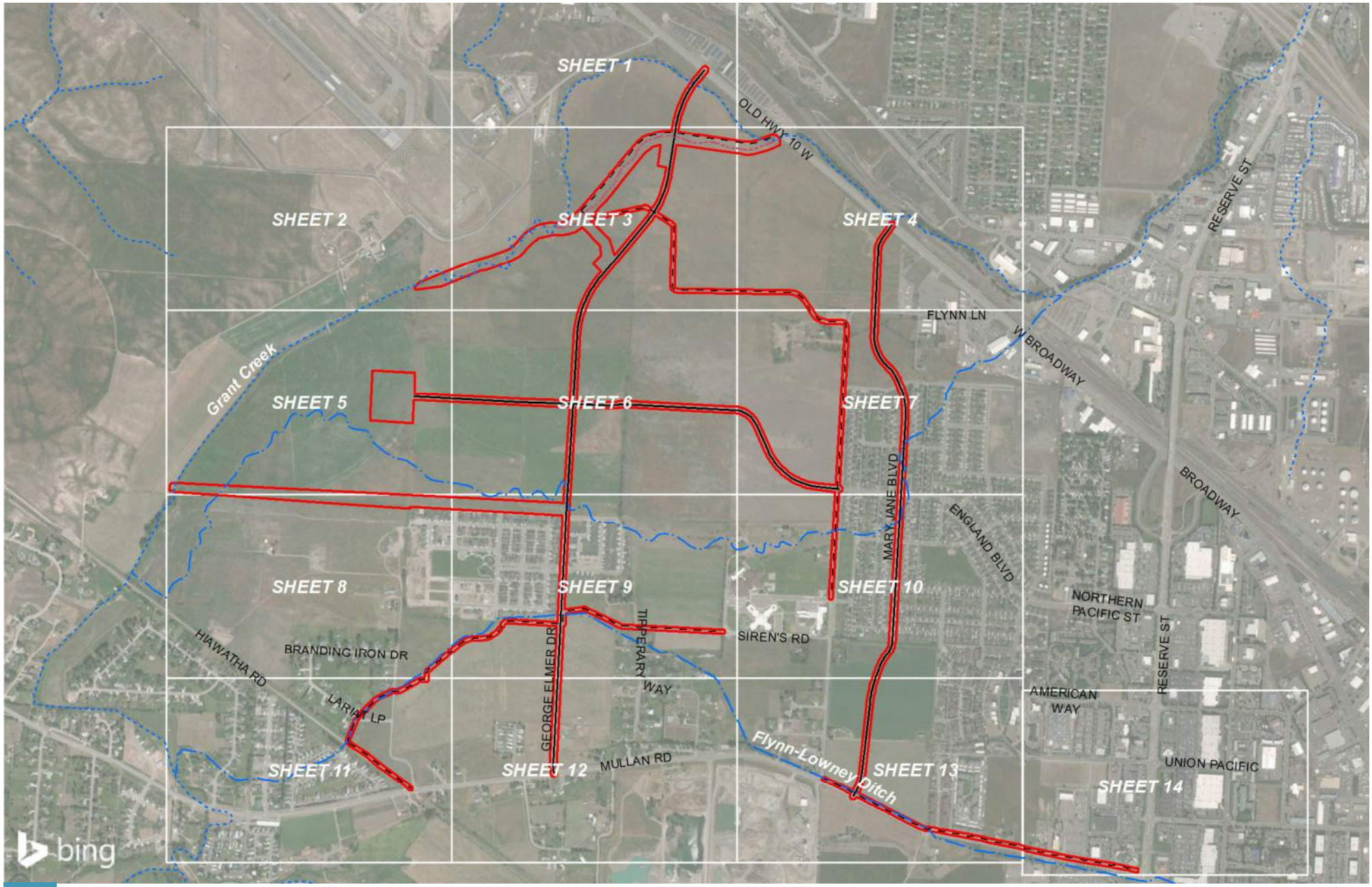
Appendix A – Field Delineation Results Maps



Aquatic Resource Survey Area

Proposed Road

Proposed Trail

Grant Creek Realignment

Hydrography (NHD 2019)

Canal/Ditch

Intermittent Stream

0 Feet 2,000

FIELD DELINEATION RESULTS

OVERVIEW MAP

PATH: G:\PROJECTS\MISSOULA COUNTY\MULLAN BUILD\MAP_DOCS\MULLANBUILD_WETLANDFIELDMAPS_OVERVIEW.MXD - USER: JSCHICK - DATE: 6/2/2020

Upland Determination Form
Aquatic Resource Survey Area
Delineated Waterway
Stream (intermittent)
Proposed Road
Proposed Trail

0 Feet 400

FIELD DELINEATION RESULTS

SHEET 1 OF 14

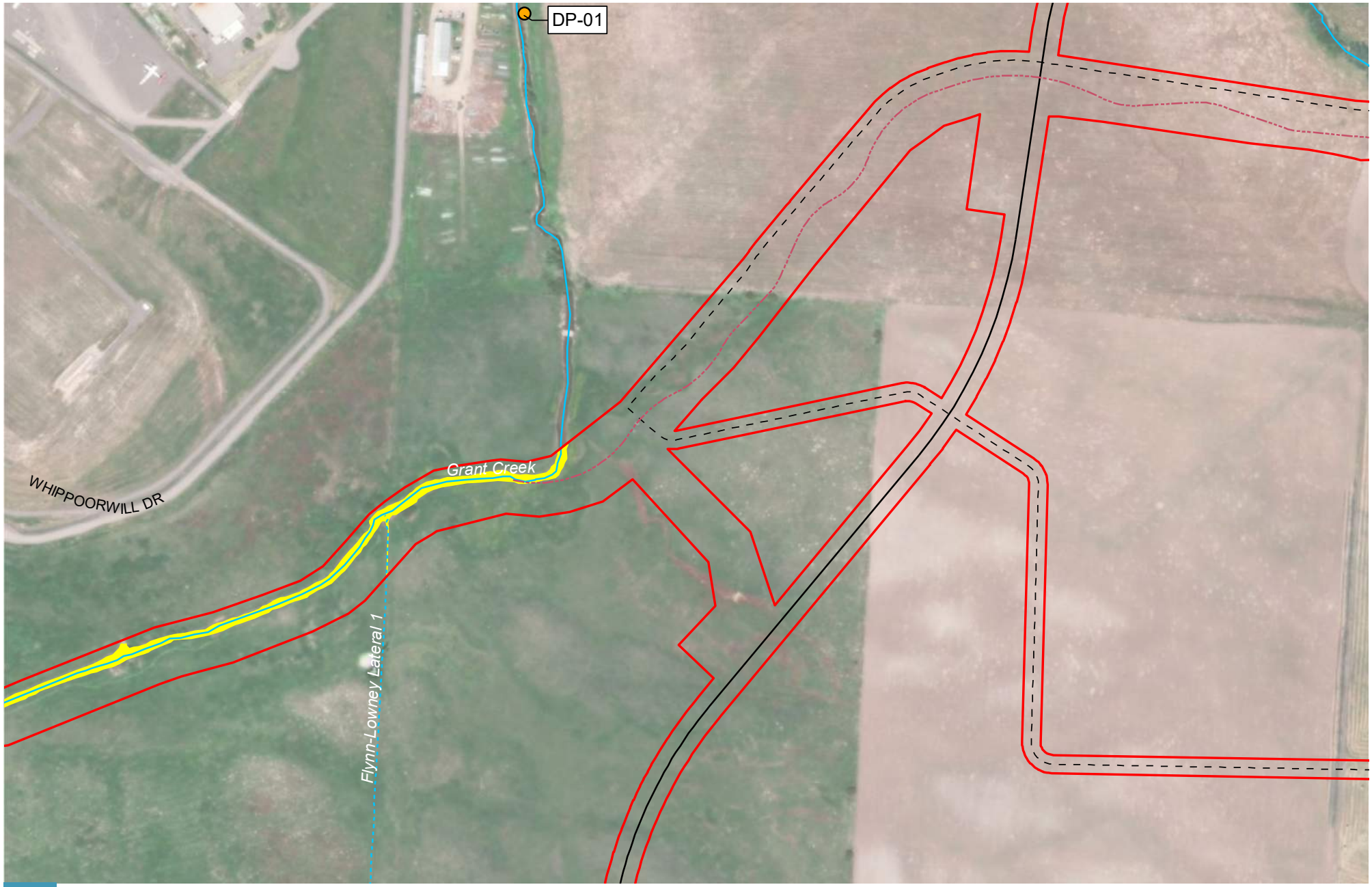
PATH: G:\PROJECTS\MISSOULA COUNTY\MULLAN BUILD\MAP_DOCS\MULLANBUILD_WETLANDDDP_APPENDIXA.MXD - USER: JSCHICK - DATE: 6/2/2020

Aquatic Resource Survey Area
Stream (intermittent)
Delineated Waterway

0 Feet 400

FIELD DELINEATION RESULTS

SHEET 2 OF 14



Upland Determination Form
Aquatic Resource Survey Area
Delineated Waterway
Stream (intermittent)
Ditch/Canal
Grant Creek Realignment
Proposed Road
Proposed Trail

0 Feet 400

FIELD DELINEATION RESULTS

SHEET 3 OF 14

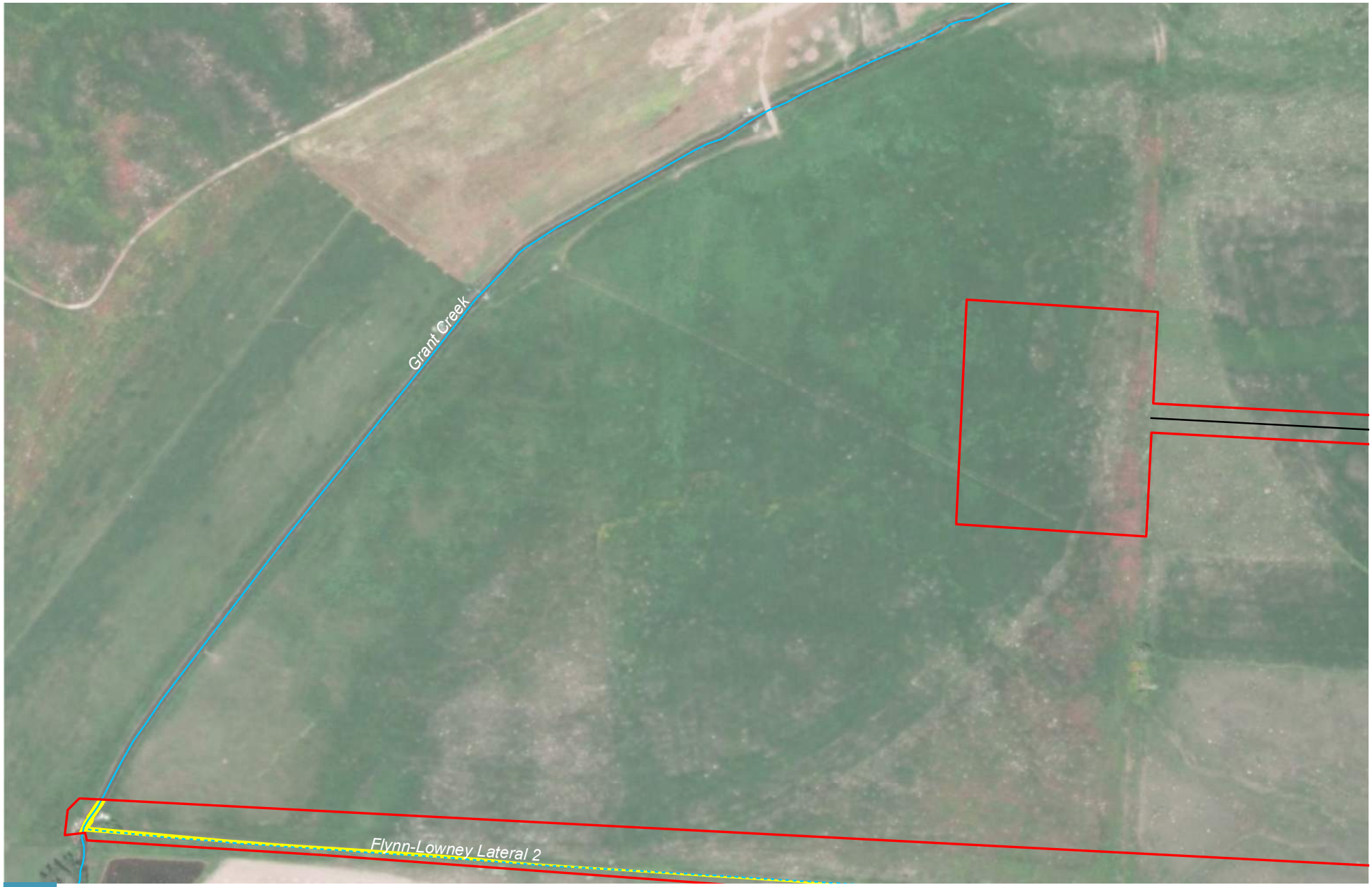
PATH: G:\PROJECTS\MISSOULA COUNTY\MULLAN BUILD\MAP_DOCS\MULLANBUILD_WETLANDDDP_APPENDIXA.MXD - USER: JSCHICK - DATE: 6/2/2020

Aquatic Resource Survey Area
Delineated Waterway
Stream (intermittent)
Grant Creek Realignment
Proposed Road
Proposed Trail

0 Feet 400

FIELD DELINEATION RESULTS

SHEET 4 OF 14



Aquatic Resource Survey Area
Delineated Waterway
Stream (intermittent)
Ditch/Canal
Proposed Road

0 Feet 400

FIELD DELINEATION RESULTS

SHEET 5 OF 14

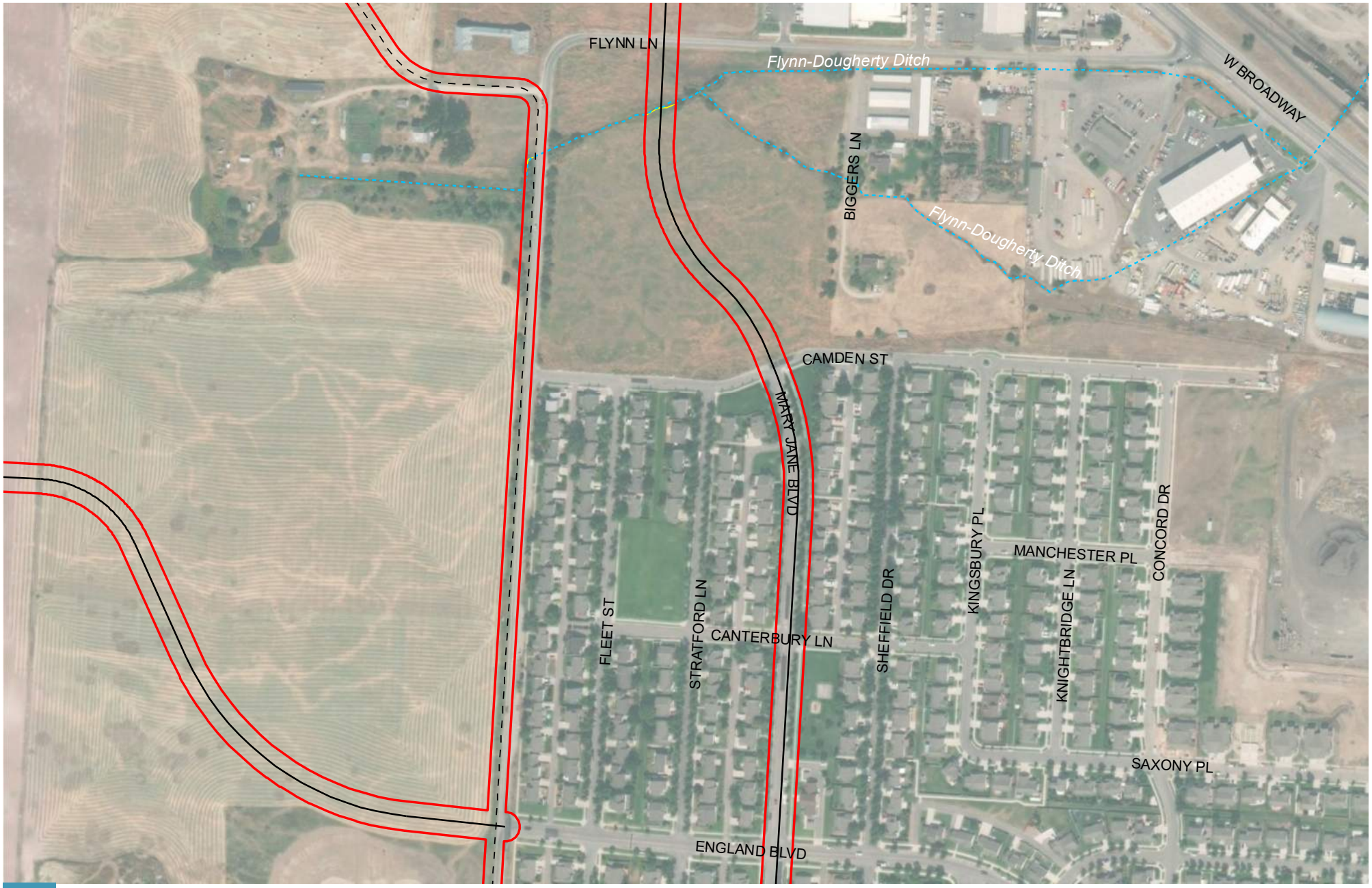
Aquatic Resource Survey Area
Ditch/Canal
Proposed Road
Delineated Waterway

0 Feet 400

FIELD DELINEATION RESULTS

SHEET 6 OF 14

PATH: G:\PROJECTS\MISSOULA COUNTY\MULLAN BUILD\MAP_DOCS\MULLANBUILD_WETLANDDDP_APPENDIXA.MXD - USER: JSCHICK - DATE: 6/2/2020



Aquatic Resource Survey Area
Delineated Waterway
Ditch/Canal
Proposed Road
Proposed Trail

0 Feet 400

FIELD DELINEATION RESULTS

SHEET 7 OF 14

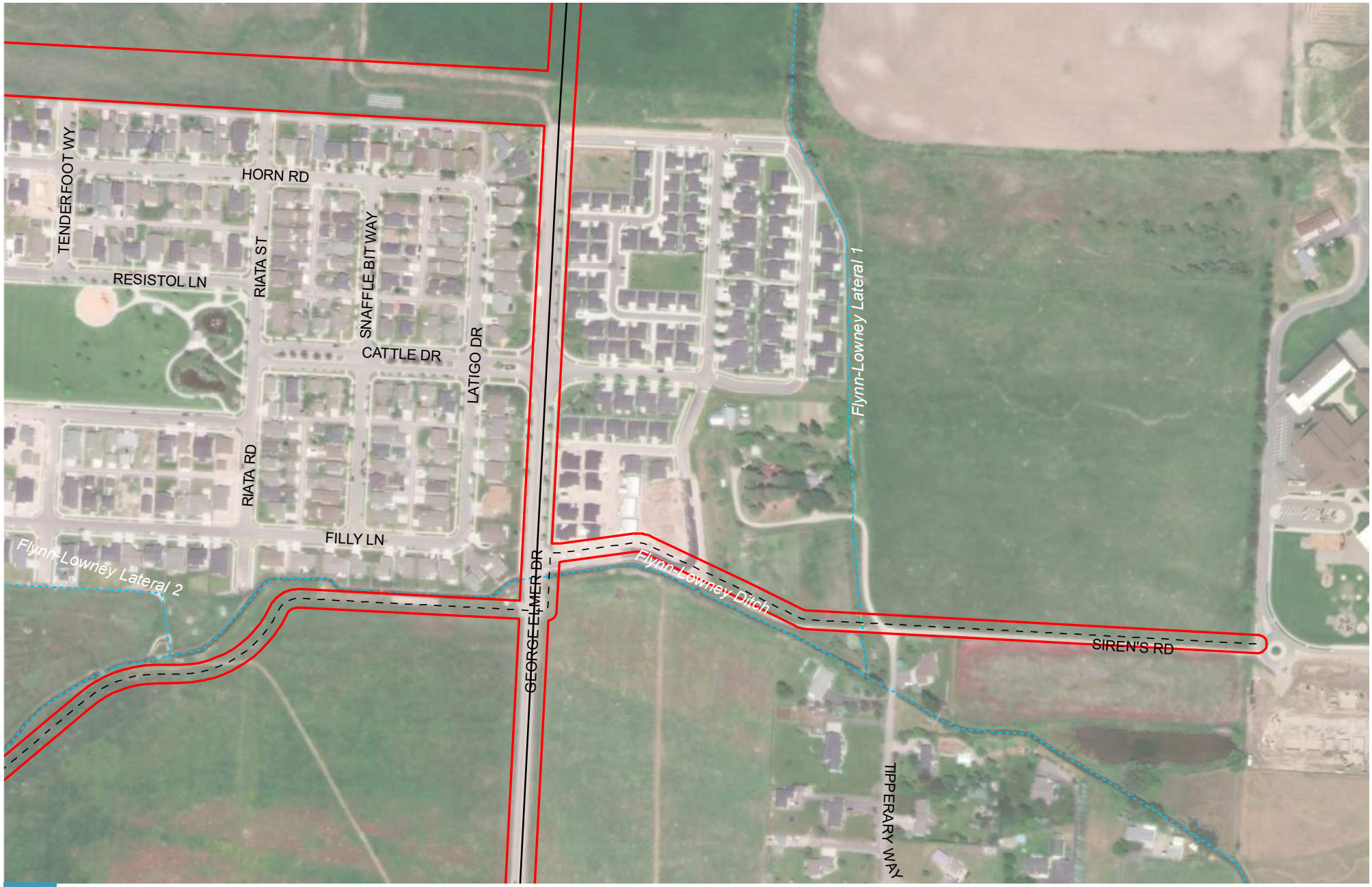
PATH: G:\PROJECTS\MISSOULA COUNTY\MULLAN BUILD\MAP_DOCS\MULLANBUILD_WETLANDDDP_APPENDIXA.MXD - USER: JSCHICK - DATE: 6/2/2020

Aquatic Resource Survey Area
Delineated Waterway
Stream (intermittent)
Ditch/Canal
Proposed Trail

0 Feet 400

FIELD DELINEATION RESULTS

SHEET 8 OF 14



Aquatic Resource Survey Area
Delineated Waterway
Ditch/Canal
Proposed Road
Proposed Trail

0 Feet 400

FIELD DELINEATION RESULTS

SHEET 9 OF 14

Aquatic Resource Survey Area

Proposed Road

Proposed Trail

0 Feet 400

FIELD DELINEATION RESULTS

SHEET 10 OF 14

PATH: G:\PROJECTS\MISSOULA COUNTY\MULLAN BUILD\MAP_DOCS\MULLANBUILD_WETLANDDDP_APPENDIXA.MXD - USER: JSCHICK - DATE: 6/2/2020

Aquatic Resource Survey Area
Delineated Waterway
Stream (intermittent)
Ditch/Canal
Proposed Trail

0 Feet 400

FIELD DELINEATION RESULTS

SHEET 11 OF 14

Aquatic Resource Survey Area Ditch/Canal Proposed Road

0 Feet 400

FIELD DELINEATION RESULTS

SHEET 12 OF 14

PATH: G:\PROJECTS\MISSOULA COUNTY\MULLAN BUILD\MAP_DOCS\MULLANBUILD_WETLANDDDP_APPENDIXA.MXD - USER: JSCHICK - DATE: 6/2/2020

Aquatic Resource Survey Area
Delineated Waterway
Ditch/Canal
Proposed Road
Proposed Trail

0 Feet 400

FIELD DELINEATION RESULTS

SHEET 13 OF 14

PATH: G:\PROJECTS\MISSOULA COUNTY\MULLAN BUILD\MAP_DOCS\MULLANBUILD_WETLANDDDP_APPENDIXA.MXD - USER: JSCHICK - DATE: 6/2/2020

Aquatic Resource Survey Area
Ditch/Canal
Proposed Trail

0 Feet 400

FIELD DELINEATION RESULTS

PATH: G:\PROJECTS\MISSOULA COUNTY\MULLAN BUILD\MAP_DOCS\MULLANBUILD_WETLANDDDP_APPENDIXA.MXD - USER: JSCHICK - DATE: 6/2/2020

Appendix B – USACE Wetland Determination Data Form

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Mullan BUILD **City/County:** Missoula/Missoula **Sampling Date:** 26-May-20

Applicant/Owner: Missoula County **State:** MT **Sampling Point:** DP-01

Investigator(s): Mark Traxler, Jon Schick **Section, Township, Range:** S 01 T 13N R 20W

Landform (hillslope, terrace, etc.): Floodplain **Local relief (concave, convex, none):** flat **Slope:** 2.0 % / 1.1 °

Subregion (LRR): LRR E **Lat.:** 46.9090272 **Long.:** -114.069971 **Datum:** WGS84

Soil Map Unit Name: Grassvalley silty clay loam, 0 to 4 percent slopes **NWI classification:** NA

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

Data point is located on a low lying floodplain bench adjacent to flowing water in Grant Creek. This small bench is seasonally flooded/saturated during high spring runoff periods.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5'x5')			
1. Phalaris arundinacea	85	☑ 97.7%	FACW
2. Equisetum arvense	1	☐ 1.1%	FAC
3. Cirsium arvense	1	☐ 1.1%	FACU
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	87	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 13

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	85	x 2 =	170
FAC species	1	x 3 =	3
FACU species	1	x 4 =	4
UPL species	0	x 5 =	0
Column Totals:	87 (A)		177 (B)

Prevalence Index = B/A = 2.034

Hydrophytic Vegetation Indicators:

- ☑ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

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

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

Other species occupying the bench but not in the data point includes black cottonwood (Populus balsamifera) and crack willow (Salix fragilis).

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: DP-01

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-20	10YR 3/3	100					Silt Loam	roots

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

No Hydric soil indicators in upper 20 inches of soil profile. Likely not saturated for long enough duration throughout the year to develop anaerobic conditions and hydric soils.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☑ Sediment Deposits (B2)
- ☑ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):	
Water Table Present?	Yes ◉	No ○	Depth (inches):	2
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Datapoint was adjacent to flowing water in Grant Creek. Soil was saturated to the surface and water in the pit was measured at 2 inches. This saturation is seasonal and only occurs during the spring runoff period.

Appendix C – Site Photographs

(All photos taken on May 26-27, 2020.)

Photo 1. Agricultural field located along the proposed George Elmer Drive alignment, looking north.	Photo 2. Agricultural field located along the proposed England Boulevard alignment, looking east towards Flynn Lane.
Photo 3. Agricultural field located along the proposed northern extension of Mary Jane Boulevard alignment, looking west.	Photo 4. Agricultural field located at the proposed crossing of George Elmer Drive and the realigned Grant Creek, looking north.

Photo 5. Agricultural field located along the proposed intersection of George Elmer Drive and England Boulevard, looking south.	Photo 6. Flynn-Lowney Ditch near the intersection of the proposed Tipperary Way Trail and the existing George Elmer Drive, looking east.
Photo 7. Vacant field located between Roundup Drive and Lariat Loop at the location of the proposed Tipperary Way Trail.	Photo 8. Lateral 1 of Flynn-Lowney Ditch near Tipperary Way Road near the location of the proposed Tipperary Way Trail, looking north.

Photo 9. Lateral 1 of Flynn-Lowney Ditch at the proposed England Boulevard crossing, looking south.

Photo 10. Lateral 1 of Flynn-Lowney Ditch at the proposed George Elmer Drive crossing, looking east.

Photo 11. Lateral 1 of Flynn-Lowney Ditch where it joins Grant Creek, looking west.

Photo 12. Lateral 1 of Flynn-Lowney Ditch near its confluence with Grant Creek, looking east.

Photo 13. Lateral 2 of Flynn-Lowney Ditch where it enters Grant Creek, looking south.	Photo 14. Lateral 2 of Flynn-Lowney Ditch, looking east.