

NATURAL RESOURCES AND CONSERVATION



GREG GIANFORTE, GOVERNOR

1539 ELEVENTH AVENUE

STATE OF MONTANA

DIRECTOR'S OFFICE: (406) 444-2074
FAX: (406) 444-2684PO BOX 201601
HELENA, MONTANA 59620-1601

FINAL ENVIRONMENTAL ASSESSMENT

Project Name:	Whitehall Wastewater System Mapping and Extension
Proposed Implementation Date:	December 2021
Proponent:	Town of Whitehall
Location:	Sections 03 and 04, Township 001N, Range 004W; Sections 33 and 34, Township 002N, Range 004W
County:	Jefferson County

I. TYPE AND PURPOSE OF ACTION

The Whitehall Wastewater System Mapping and Extension project is being proposed by the Town of Whitehall (hereafter Town). The Town proposes to locate and map out their existing water and sewer infrastructure. In addition, the Town proposes to connect Meadowlark Manor, an assisted living facility located in Whitehall with 14 efficiency apartments and a one-bedroom apartment, to the Town's water and wastewater infrastructure (see attached Figure).

The Town of Whitehall does not have accurate maps of the critical water and wastewater system components such as main lines, manholes, valves, curb stops, etc. The Public Works Department struggles to properly maintain the system without accurate maps of the existing sewer and water infrastructure making it difficult to pinpoint and fix problems within the system. Additionally, Meadowlark Manor (hereafter Facility) is an assisted living facility in Whitehall currently served by a supply well and an individual septic system. These systems do not have room for expansion and may cause additional maintenance and operational issues for the assisted living facility in the future. Mapping of the town's existing water and sewer system components will provide the ability to efficiently locate and diagnose future system issues. Additionally, adding the Meadowlark Manor to the Town's water and wastewater systems will provide a safer and more reliable water supply to the high-risk population in the facility, reduce maintenance expense for the facility, and reduce the risk for onsite septic backups.

The proposed project is located in Sections 03 and 04, Township 01N, Range 04W; Sections 33 and 34, Township 02N, Range 04W. This area encompasses the town of Whitehall, in Jefferson County, Montana. The sewer and water system mapping will include using GPS technology to locate and document the critical system components. The water main extension will consist of tying into the existing water main and installing approximately 1,670 feet of 6" DR18 C900 polyvinyl chloride (PVC) pipe to connect Meadowlark Manor to the public water system. The sewer main extension will include tying into the existing sewer system and installing approximately 1,450 feet of SDR35 PVC pipe to connect Meadowlark Manor to the public wastewater system. A map of the proposed water and sewer lines is attached (Triple Tree Engineering). In addition to the installation of PVC pipe, hydrants and manholes will be installed, and mapped.

Project construction is estimated to begin in May 2023.

The Wastewater System Mapping portion of this project does not require an environmental assessment as it fits within Categorical Exclusion rules. This portion of the project will not cause any new ground disturbances. The extension portion of this project that aims to install and connect Meadowlark Manor to the existing system requires an environmental assessment. This environmental assessment only applies to the extension portion of this project.

The Department of Natural Resources and Conservation (DNRC) will approve the grant to provide funding for the Whitehall Wastewater System Mapping and Extension Project using American Rescue Plan Act (ARPA) funds.

II. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED:

Provide a brief chronology of the scoping and ongoing involvement for this project. List number of individuals contacted, number of responses received, and newspapers in which notices were placed and for how long. Briefly summarize issues received from the public.

The Whitehall community was made aware of the Mapping and Extension Project via public council meetings. Council meetings with the Town's contracted engineer, who has provided project updates, have been held. As the project moves forward, there will be an opportunity to update the public on the progress and any issues encountered.

DNRC will post a draft of this Environmental Assessment for public comment for 30 days on the DNRC's webpage. For any comments submitted by the public, the MEPA Coordinator will review and work with the Grant manager and applicant to address those comments.

2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:

Examples: cost-share agreement with U.S. Forest Service, 124 Permit, 3A Authorization, Air Quality Major Open Burning Permit.

Stormwater Discharge General Permit – According to Montana State Stormwater Rules, a stormwater discharge permit is required for projects that have a total disturbance greater than 1 acre and that discharge into state waters. The total ground disturbance associated with this project is estimated to be 2.73 acres, therefore this project will need a Montana Pollutant Discharge Elimination System (MPDES) permit for storm water discharges associated with construction activity. This permit includes a stormwater pollution prevention plan (SWPPP).

3. ALTERNATIVE DEVELOPMENT:

Describe alternatives considered and, if applicable, provide a brief description of how the alternatives were developed. List alternatives that were considered but eliminated from further analysis and why. Include the No Action alternative.

This environmental assessment includes the proposed alternative of connecting Meadowlark Manor to the Town's existing water and sewer system. No alternatives are proposed.

The alternative of no action will be examined to discuss the environmental effects that would occur if this project is not funded.

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

- *RESOURCES potentially impacted are listed on the form, followed by common issues that would be considered.*
- *Explain POTENTIAL IMPACTS AND MITIGATIONS following each resource heading.*
- *Enter "NONE" If no impacts are identified or the resource is not present.*

4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:

Consider the presence of fragile, compactable or unstable soils. Identify unusual geologic features. Specify any special reclamation considerations. Identify direct, indirect, and cumulative effects to soils.

The project area in which disturbance will occur as a result of water and sewer line construction lies on a bench that slopes south-southeast toward the town of Whitehall. The project area is located in a residential area. Soils consist largely of Amesha loam (36% of total area, 0 – 2 % slopes), Bronec Amesha complex (31% of total area, 8 – 15% slopes), and Bronec Amesha Bronec complex (20% of total area, 15 – 35% slopes). These dominant soil complexes are well drained and are described as having no frequency of ponding or flooding (NRCS Soils Report).

Proposed Alternative – There is no expected impact to the soils and/or geology of the project area. The project site has been previously disturbed. Any areas disturbed during construction will be restored to their pre-construction state.

No Action – There is currently no impact to the soils or geology of the project site.

5. WATER QUALITY, QUANTITY AND DISTRIBUTION:

Identify important surface or groundwater resources. Consider the potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality. Identify direct, indirect, and cumulative effects to water resources.

The project site is approximately 950 feet from Big Pipestone Creek. Big Pipestone Creek eventually flows into the Jefferson River. Currently, the potable water for the Town is provided by two Public Water Supply wells. Residences of Meadowlark Manor are on a separate well and septic system. The Town of Whitehall operates a Wastewater Treatment Facility (WWTF) consisting of a primary treatment cell, two secondary storage cells, an irrigation pump, and a center pivot irrigation system for effluent land application. Since 2012, there has been no discharge to Big Pipestone Creek. Treated wastewater is applied to land via the irrigation system. The facility maintains permit coverage for discharge in case there is a need to discharge to Big Pipestone Creek (WWTF Fact Sheet).

Proposed Alternative – The proposed action will have direct cumulative beneficial impacts to water, groundwater, and wetland resources. Discontinuing the use of the Facility’s subsurface wastewater treatment system is likely to have a direct beneficial effect on the groundwater quality immediately downgradient from the drainfield. Wastewater from Meadowlark Manor will now be treated by the WWTF and applied as irrigation.

There is a potential for short-term, localized, non-recurring adverse impacts to water quality in the form of runoff from construction sites. A SWPPP (Stormwater Pollution Prevention Plan) will be required for the construction site. Permitting and protocols outlined in the SWPPP will be followed during construction to mitigate the potential for pollution.

No Action – A subsurface wastewater treatment system has localized adverse impacts on the groundwater quality immediately downgradient. There are no additional impacts to water resources as a result of the no-action alternative.

6. AIR QUALITY:

What pollutants or particulate would be produced (i.e. particulate matter from road use or harvesting, slash pile burning, prescribed burning, etc)? Identify the Airshed and Impact Zone (if any) according to the Montana/Idaho Airshed Group. Identify direct, indirect, and cumulative effects to air quality.

The Whitehall area is not located in a non-attainment area. This means that the air quality is in line with the National Ambient Air Quality Standards (Information from MDEQ Air Quality website).

Proposed Alternative – There will be short-term, negligible, direct adverse impacts to air quality due to dust generated during construction. If excessive dust is produced, this will be mitigated by the contractor during construction.

No Action – There is currently no impact to air quality.

7. VEGETATION COVER, QUANTITY AND QUALITY:

What changes would the action cause to vegetative communities? Consider rare plants or cover types that would be affected. Identify direct, indirect, and cumulative effects to vegetation.

The project area is primarily within a developed, residential, and commercial area, and construction is indicated to be within this area. Terrestrial, avian, and aquatic life and habitats are consistent with those expected to be in developed residential properties within a city. Records from the Montana Natural Heritage Program (MTNHP) indicate the project area is surrounded by mostly private land, developed for human use with no dominant vegetation (Montana Natural Heritage Program Map).

Proposed Alternative – There will be short-term, direct, adverse effects to vegetation at the project site due to construction activity. The vegetation will be restored when construction is completed.

No Action – There is currently no impact to vegetative cover.

8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:

Consider substantial habitat values and use of the area by wildlife, birds or fish. Identify direct, indirect, and cumulative effects to fish and wildlife.

The project area is in a developed residential area. There are 75 species of concern listed as present or potentially present in the project area across various taxa including plants, mammals, birds, reptiles, amphibians, fish, and insects (MTNHP Environmental Report).

Observed plant species include:

- Annual Indian Paintbrush (*Castilleja exilis*)
- Beaked Spikerush (*Eleocharis rostellata*)
- Flatleaf Bladderwort (*Utricularia intermedia*)
- Panic Grass (*Dichanthelium acuminatum*)
- Pale-yellow Jewel-weed (*Impatiens aurella*)

Observed avian species include:

- Bald Eagle (*Haliaeetus leucocephalus*)
- Golden Eagle (*Aquila chrysaetos*)
- Sharp-tailed Grouse (*Tympanuchus phasianellus*)
- Burrowing Owl (*Athene cunicularia*)
- Lewis's Woodpecker (*Melanerpes lewis*)
- Long-billed Curlew (*Numenius americanus*)
- Cassin's Finch (*Haemorhous cassinii*)
- Evening Grosbeak (*Coccothraustes vespertinus*)
- Pinyon Jay (*Gymnorhinus cyanocephalus*)
- Sage Thrasher (*Oreoscoptes montanus*)
- Brewer's Sparrow (*Spizella breweri*)
- Thick-billed Longspur (*Rhynchophanes mccownii*)
- American White Pelican (*Pelecanus erythrorhynchos*)
- Great Blue Heron (*Ardea herodias*)
- Hooded Merganser (*Lophodytes cucullatus*)
- Broad-tailed Hummingbird (*Selasphorus platycercus*)
- Rufous Hummingbird (*Selasphorus rufus*)
- Clark's Nutcracker (*Nucifraga columbiana*)
- Sprague's Pipit (*Anthus spragueii*)
- Northern Goshawk (*Accipiter gentilis*)
- Mountain Plover (*Charadrius montanus*)
- Barrow's Goldeneye (*Bucephala islandica*)

Observed mammal species include:

- North American Porcupine (*Erethizon dorsatum*)
- Columbia Plateau Spotted Mouse (*Perognathus parvus*)
- Western Spotted Skunk (*Spilogale gracilis*)
- Wyoming Ground Squirrel (*Uroditellus elegans*)
- Hoary Bat (*Lasiurus cinereus*)
- Little Brown Myotis (*Myotis lucifugus*)
- Long-legged Myotis (*Myotis volans*)

- Spotted Bat (*Euderma maculatum*)
- Fringed Myotis (*Myotis thysanodes*)
- Long-eared Myotis (*Myotis evotis*)
- Silver-haired Bat (*Lasionycteris noctivagans*)
- Canada Lynx (*Lynx canadensis*)
- Dwarf Shrew (*Sorex nanus*)
- Bat Roost (non-cave)

Proposed Alternative – Potentially direct, negligible, short-term, local, non-recurring adverse impacts to terrestrial, avian, and aquatic life and habitats during construction. The project area is largely comprised of a developed residential and commercial area. The primary disturbance will likely occur on private property; however, disturbance will be minimal, and contractor will be required to restore any disturbance to preexisting conditions.

No Alternative – There is no impact to terrestrial, avian, or aquatic life and habitats.

9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:

Consider any federally listed threatened or endangered species or habitat identified in the project area. Determine effects to wetlands. Consider Sensitive Species or Species of special concern. Identify direct, indirect, and cumulative effects to these species and their habitat.

The National Wetlands Inventory (NWI) website was used to determine whether any wetlands were present within the lands adjacent to the project location (map attached). This search indicated that the project area contains or is adjacent to eight different wetland habitats: four Freshwater Emergent Wetlands, two Freshwater Forested/Shrub Wetlands, and two Riverine Wetlands. The Freshwater Emergent Wetlands are characterized by erect, rooted herbaceous hydrophytes, are flooded frequently, and dominated by perennial plants. Freshwater Forested/Shrub Wetlands are dominated by trees, normally possess an overstory of trees, an understory of shrubs, and an herbaceous layer. Riverine systems include all wetlands and deepwater habitats contained within a channel, is bounded by banks forming the outer limits of the depression within which the water occurs, and terminates at the downstream end where the concentration of ocean-derived salts is higher than average low flow or where it enters a lake.

Project location is not identified as a priority area for terrestrial conservation efforts within the Montana State Wildlife Action Plan (SWAP). The project does not exist within boundaries for Montana Sage Grouse habitat (see attached map; Montana Sage Grouse Habitat Conservation Plan web mapping tool). According to the FWS, no critical habitat exists within the project area.

The U.S. Fish & Wildlife Service's Information for Planning and Consultation (IPaC) mapping tool was used to determine if threatened and endangered species or habitats are present within the project area. Five terrestrial species, seven migratory bird species, and two eagle species were identified that are potentially affected by activities in this location. These terrestrial species include:

- Canada Lynx
- Grizzly Bear (*Ursus arctos horribilis*)
- North American Wolverine (*Gulo gulo luscus*)
- Monarch Butterfly (*Danaus plexippus*)
- Ute Ladies'-tresses (*Spiranthes diluvialis*)

There are nine avian bird species in the area. These species include:

- Bald Eagle
- Cassin's Finch
- Golden Eagle
- Lewis's Woodpecker
- Pinyon Jay
- Rufous Hummingbird
- Lesser Yellowlegs (*Tringa flavipes*)
- Western Grebe (*Aechmophorus occidentalis*)
- Evening Grosbeak

Proposed Alternative – Potentially direct, minor to moderate, short-term, local adverse impacts to unique, endangered, fragile, or limited environmental resources. Since the developed land does not provide habitat to any known species of concern, the disturbance caused by the project should not impact any sensitive environmental resources. Construction that will affect existing vegetation will be required to be revegetated after construction is complete. Efforts should be made to preserve existing vegetation where applicable. BMPs should be installed and monitored.

No Action – No impacts to unique, endangered, fragile, or limited environmental resources.

10. HISTORICAL AND ARCHAEOLOGICAL SITES:

Identify and determine direct, indirect, and cumulative effects to historical, archaeological or paleontological resources.

There are no historical or archaeological sites in the project area. If historical, archaeological, or paleontological resources are discovered during construction, all construction activity will cease and the appropriate parties will be notified and an assessment of the resources can be made. Contact Jessica Bush, State Archaeologist at jbush@mt.gov, (406) 444-0388.

Proposed Alternative and No Action – No cultural or historical resource impacts are anticipated. However, if previously unknown cultural or paleontological materials are identified during project related activities, all work will cease until a professional assessment of such resources can be made.

11. AESTHETICS:

Determine if the project is located on a prominent topographic feature, or may be visible from populated or scenic areas. What level of noise, light or visual change would be produced? Identify direct, indirect, and cumulative effects to aesthetics.

The project site is within an area that is currently developed. The current wastewater and sewer system does not affect the aesthetics of the area since they are located underground.

Proposed Alternative – There will be adverse, short-term, and direct impacts to aesthetics on the site during the construction period. These may include noise from construction activities and equipment, as well as visual impacts during construction. The aesthetic properties of the site will be restored when construction is completed. The completed improvements will be underground so there will be no impact to aesthetics once completed.

No Action – No impacts to aesthetics.

12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:

Determine the amount of limited resources the project would require. Identify other activities nearby that the project would affect. Identify direct, indirect, and cumulative effects to environmental resources.

The project will materials commonly used for utility installation, such as PVC pipe, connections, hydrants, and materials needed for manhole construction. It does not require the use of any limited environmental resources.

Proposed Alternative and No Action – No impacts to demands on environmental resources of land, water, air, or energy. The project is not anticipated to have impacts on energy consumption or conservation exceeding current demands.

13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:

List other studies, plans or projects on this tract. Determine cumulative impacts likely to occur as a result of current private, state or federal actions in the analysis area, and from future proposed state actions in the analysis area that are under MEPA review (scoped) or permitting review by any state agency.

This document was written with help from documents compiled by Triple Tree Engineering, which include an environmental checklist and plans.

IV. IMPACTS ON THE HUMAN POPULATION
<ul style="list-style-type: none"> <i>RESOURCES</i> potentially impacted are listed on the form, followed by common issues that would be considered. Explain <i>POTENTIAL IMPACTS AND MITIGATIONS</i> following each resource heading. Enter "NONE" If no impacts are identified or the resource is not present.

14. HUMAN HEALTH AND SAFETY:

Identify any health and safety risks posed by the project.

The Meadowlark Manor residents currently get their drinking water from the Facility's residential well. The Facility is currently served by an individual septic system. The Town is currently served by two public water supply wells. Per DEQ requirements PWS wells are regularly sampled to verify compliance with water quality standards.

Proposed Alternative – Connecting Meadowlark Manor to the Town's sewer and water system will have direct, long-term beneficial impacts for the residents of Meadowlark Manor. Being connected to the Town's water and sewer systems eliminates the risk of a septic backup or contamination of the well. In addition, water sourced by PWS wells is monitored closely to ensure its water quality is adequate and safe for drinking.

No Action – There is a potential short term and long-term adverse impact to the project area. There is potential immediate, short and long-term, localized adverse impact if the septic system backs up or fails, and there is an additional risk of contaminants entering the well.

15. INDUSTRIAL, COMMERCIAL AND AGRICULTURE ACTIVITIES AND PRODUCTION:

Identify how the project would add to or alter these activities.

The project site does not have any industrial, commercial, or agriculture activities associated with it. The only business on site is Meadowlark Manor, which will be positively impacted from the sewer and water improvements. The project area is listed as being within two Brownfields sites, the Whitehall School Gymnasium and the Borden's Hotel property, and contains a hazardous waste (RCRA) facility (NEPAssist). These properties are currently unused and may be cleaned up and developed in the future.

Proposed Alternative – There will be no impact to industrial, commercial, or agricultural activities and production associated with this project.

No Action – There is currently no impact to industrial, commercial, or agricultural activities and production.

16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:

Estimate the number of jobs the project would create, move or eliminate. Identify direct, indirect, and cumulative effects to the employment market.

Whitehall is located in Jefferson County. The population of Jefferson County is 12,826. The unemployment rate of Jefferson County is 2.7% (data from 2020 US census). Meadowlark Manor is owned by their parent company, Caslen Living Centers Inc.

Proposed Alternative – There will be no long-term impact on employment in the town of Whitehall or at Meadowlark Manor, but there is a potential short-term beneficial impact for contractors that will install the utility lines.

No Action – There is currently no effect on employment.

17. LOCAL AND STATE TAX BASE AND TAX REVENUES:

Estimate tax revenue the project would create or eliminate. Identify direct, indirect, and cumulative effects to taxes and revenue.

The property of Meadowlark Manor is estimated to have a market value of \$975,818 with a taxable value of \$18,443. Meadowlark Manor may have to pay utility fees to the Town of Whitehall once the project is completed.

Proposed Alternative and No Action – No impact and no change of tax revenues or bases is expected.

18. DEMAND FOR GOVERNMENT SERVICES:

Estimate increases in traffic and changes to traffic patterns. What changes would be needed to fire protection, police, schools, etc.? Identify direct, indirect, and cumulative effects of this and other projects on government services

The project area is in a low traffic area on a residential street. There are no major roadways going through the project site.

Proposed Alternative – There will be temporary, adverse, direct impacts to traffic surrounding Meadowlark Manor during construction. These will be negligible as the neighborhood is a low traffic zone. These adverse impacts will be resolved when construction is completed. There is an anticipated long-term beneficial impact to the water supply for firefighting purposes at Meadowlark Manor.

No Action – There is no impact on the demand for government services.

19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:

List State, County, City, USFS, BLM, Tribal, and other zoning or management plans, and identify how they would affect this project.

The Town does not include the location of Meadowlark Manor in its zoning map (Whitehall Zoning Map).

Proposed Alternative – Connecting Meadowlark Manor will have no impacts or effects to environmental or zoning plans, as it is an existing complex.

No Action – There is no impact to environmental or zoning plans.

20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:

Identify any wilderness or recreational areas nearby or access routes through this tract. Determine the effects of the project on recreational potential within the tract. Identify direct, indirect, and cumulative effects to recreational and wilderness activities.

The project area is in a residential area that is not near any recreational or wilderness areas.

Proposed Alternative – There will be no impact to the access and quality of wilderness activities.

No Action – There is currently no impact to the access and quality of wilderness activities.

21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:

Estimate population changes and additional housing the project would require. Identify direct, indirect, and cumulative effects to population and housing.

The project site consists of 14 efficiency apartments and a 1-bedroom apartment in an assisted living facility called Meadowlark Manor. This provides housing and care for older residents of Whitehall.

Proposed Alternative – The project will allow Meadowlark Manor to expand more easily in the future if needed, because the Facility will not be limited by the capacity of the residential well and septic system. This is a long-term, direct beneficial impact to the availability of housing for older residents of Whitehall.

No Action – There is currently no impact on density and distribution of population and housing.

22. SOCIAL STRUCTURES AND MORES:

Identify potential disruption of native or traditional lifestyles or communities.

Meadowlark Manor is an assisted living facility in Whitehall. It supplies a need of care for the communities' older population.

Proposed Alternative – Potentially direct and indirect beneficial impacts to social structures and mores are expected to occur through improvements to the wastewater system throughout Whitehall and at Meadowlark Manor. The Facility provides a beneficial resource to the social structure of Whitehall and surrounding communities.

No Action – No impact to social structures and mores.

23. CULTURAL UNIQUENESS AND DIVERSITY:

How would the action affect any unique quality of the area?

There are no unique facilities or unique culture or diversity in the project area.

Proposed Alternative and No Action – No impacts to cultural uniqueness and diversity.

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:

Include appropriate economic analysis. Identify potential future uses for the analysis area other than existing management. Identify direct, indirect, and cumulative economic and social effects likely to occur as a result of the proposed action.

The median household income of Whitehall is \$43,125. Fifteen percent of Whitehall residents live below the poverty line (censusreporter.org).

Proposed Alternative – There will be no impact to the social and economic circumstances of Whitehall.

No Action – There is no impact to social and economic circumstances.

25. DRINKING WATER AND/OR CLEAN WATER

Identify potential impacts to water and/or sewer infrastructure (e.g., community water supply, stormwater, sewage system, solid waste management) and identify direct, indirect, and cumulative effects likely to occur as a result of the proposed action.

Currently, Meadowlark Manor is utilizing a residential well and individual septic system. Neither are connected to the water and sewer infrastructure of the Town. Currently, the potable water for the Town is provided from two Public Water Supply wells. The Town's wastewater is treated at a treatment facility and effluent is discharged into Big Pipestone Creek.

Big Pipestone Creek, which is near the project site, is a listed impaired waterway which does not support drinking water use due to the presence of arsenic (CWAIC 2020 Impairment Report for Big Pipestone Creek). This project location is also listed as a National Pollutant Discharge Elimination System (NPDES) site, a permit project that controls water pollution by regulating sources that discharge into water of the United States, as authorized by the Clean Water Act. EPA tracks water discharge permits to determine when a permit was issued and when it expires, how much the applicant is permitted to discharge, and the actual monitoring date showing what the applicant has discharged (NEPAssist).

Proposed Alternative – Meadowlark Manor will experience a direct, long-term beneficial impact by being connected to the Town's sewer and water supply. This will have no adverse impact or strain on the Town's sewer and water system as these systems have adequate capacity to handle the addition of Meadowlark Manor. Indirect beneficial effects from the project will consist of better treatment of the sewage from the Facility, as well as safer, and more controlled drinking water supply.

No Action – There is no impact on the existing water and sewer infrastructure.

26. ENVIRONMENTAL JUSTICE

Will the proposed project result in disproportionately high or adverse human health or environmental effects on minority or low-income populations per the Environmental Justice Executive Order 12898? Identify potential impacts to and identify direct, indirect, and cumulative effects likely to occur as a result of the proposed action.

Meadowlark Manor is an assisted living facility in Whitehall. The population which resides at the Facility is older and residents need varying levels of care. This population is susceptible to illness from a contaminated well.

Proposed Alternative – The project will have a long-term beneficial impact by increasing access to reliably clean water supply for the elderly population who reside in Meadowlark Manor. It will also ensure that there are no adverse impacts to the septic system posed by a potential septic backup.

No Action – There is currently no impact on environmental justice.

EA Prepared By:	Name: Samantha Treu Title: MEPA/NEPA Coordinator	Date: 6/22/2023 Email: samantha.treu@mt.gov
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V. FINDING

27. ALTERNATIVE SELECTED:

The town of Whitehall proposes to locate and map out their existing water and sewer infrastructure. In addition, the Town proposes to connect Meadowlark Manor, an assisted living facility located in Whitehall with 14 efficiency apartments and a one-bedroom apartment, to the Town's water and wastewater infrastructure.

28. SIGNIFICANCE OF POTENTIAL IMPACTS:**Water Quality, Quantity and Distribution**

There is a potential for short-term, localized, non-recurring adverse impacts to water quality in the form of runoff from construction sites. A SWPPP (Stormwater Pollution Prevention Plan) will be required for the construction site. Permitting and protocols outlined in the SWPPP will be followed during construction to mitigate the potential for pollution.

Air Quality

There will be short-term, negligible, direct adverse impacts to air quality due to dust generated during construction. If excessive dust is produced, this will be mitigated by the contractor during construction.

Vegetation Cover, Quantity and Quality

There will be short-term, direct, adverse effects to vegetation at the project site due to construction activity. The vegetation will be restored when construction is completed.

Terrestrial, Avian and Aquatic Life and Habitats

Potentially direct, negligible, short-term, local, non-recurring adverse impacts to terrestrial, avian, and aquatic life and habitats during construction. The project area is largely comprised of a developed residential and commercial area. The primary disturbance will likely occur on private property; however, disturbance will be minimal, and contractor will be required to restore any disturbance to preexisting conditions.

Unique, Endangered, Fragile or Limited Environmental Resources

Potentially direct, minor to moderate, short-term, local adverse impacts to unique, endangered, fragile, or limited environmental resources. Since the developed land does not provide habitat to any known species of concern, the disturbance caused by the project should not impact any sensitive environmental resources. Construction that will affect existing vegetation will be required to be revegetated after construction is complete. Efforts should be made to preserve existing vegetation where applicable. BMPs should be installed and monitored.

Aesthetics

There will be adverse, short-term, and direct impacts to aesthetics on the site during the construction period. These may include noise from construction activities and equipment, as well as visual impacts during construction. The aesthetic properties of the site will be restored when construction is completed. The completed improvements will be underground so there will be no impact to aesthetics once completed.

Demand for Government Services

There will be temporary, adverse, direct impacts to traffic surrounding Meadowlark Manor during construction. These will be negligible as the neighborhood is a low traffic zone. These adverse impacts will be resolved when construction is completed.

29. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

THIS IS THE FINAL ENVIRONMENTAL REVIEW.

☐

EIS

☐

More Detailed EA

☒

No Further Analysis

EA Approved By:	Name: Mark W Bostrom
	Title: Division Administrator
Signature:	Date: 7/27/2023 10:20:09 AM MDT

DocuSigned by:

Mark W Bostrom

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MONTANA STATE LIBRARY

NATURAL HERITAGE PROGRAM

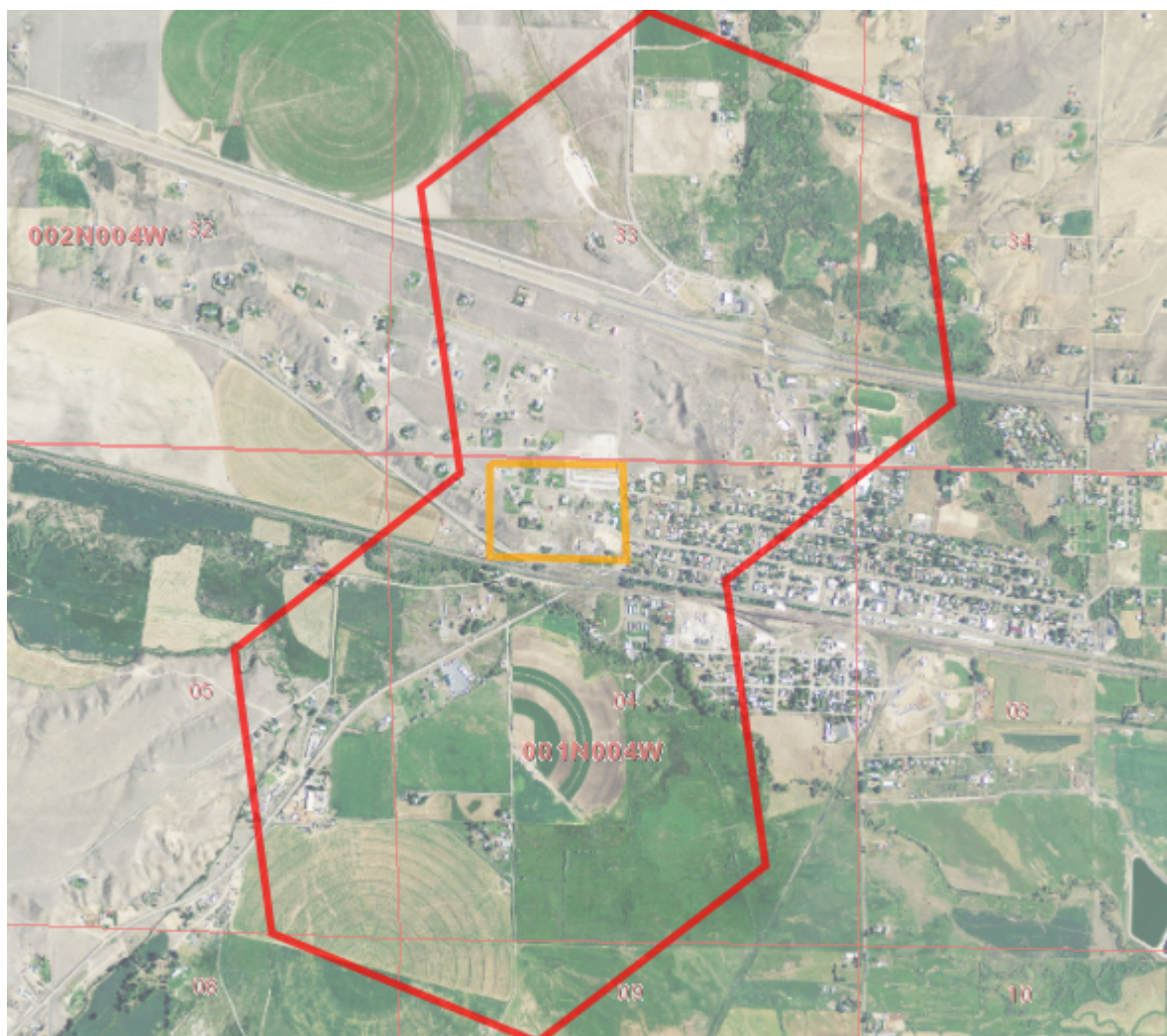
mtnhp.org

1201 11th Ave • P.O. Box 201800 • Helena, MT 59620-1800 • fax 406-444-0266 • phone 406-444-3989



Latitude	Longitude
45.85552	-112.09437
45.88849	-112.12501

Summarized by:
Town of Whitehall
(Custom Area of Interest)



Suggested Citation

Montana Natural Heritage Program. Environmental Summary Report.

for Latitude 45.85552 to 45.88849 and Longitude -112.09437 to -112.12501. Retrieved on 6/6/2023.

The Montana Natural Heritage Program is part of the Montana State Library's Natural Resource Information System. Since 1985, it has served as a neutral and non-regulatory provider of easily accessible information on Montana's species and biological communities to inform all stakeholders in environmental review, permitting, and planning processes. The program is part of the NatureServe network that is composed of over 60 member programs across North America that work to provide current and comprehensive distribution and status information on species and biological communities.



Environmental Summary

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- [Land Cover](#)
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- [Land Management](#)
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Introduction to Environmental Summary Report

Environmental Summary Reports from the Montana Natural Heritage Program (MTNHP) provide information on species and biological communities to inform all stakeholders in environmental review, permitting, and planning processes. For information on environmental permits in Montana, please see permitting overviews by the [Montana Department of Environmental Quality](#), the [Montana Department of Natural Resources and Conservation](#), the [Index of Environmental Permits for Montana](#) and our [Suggested Contacts for Natural Resource Management Agencies](#). The report for your area of interest consists of introductory and related materials in this PDF and an Excel workbook with worksheets summarizing information managed in the MTNHP databases for: (1) species occurrences; (2) other observed species without species occurrences; (3) other species potentially present based on their range, presence of associated habitats, or predictive distribution model output if available; (4) structured surveys that follow a protocol capable of detecting one or more species; (5) land cover mapped as ecological systems; (6) wetland and riparian mapping; (7) land management categories; and (8) biological reports associated with plant and animal observations. If your area of interest corresponds to a statewide polygon layer (e.g., watersheds, counties, or public land survey sections) information summaries in your report will exactly match those boundaries. However, if your report is for a custom area, users should be aware that summaries do not correspond to the exact boundaries of the polygon they have specified, but instead are a summary across a layer of hexagons intersected by the polygon they specified as shown on the report cover. Summarizing by these hexagons which are one square mile in area and approximately one kilometer in length on each side allows for consistent and rapid delivery of summaries based on a uniform grid that has been used for planning efforts across North America.

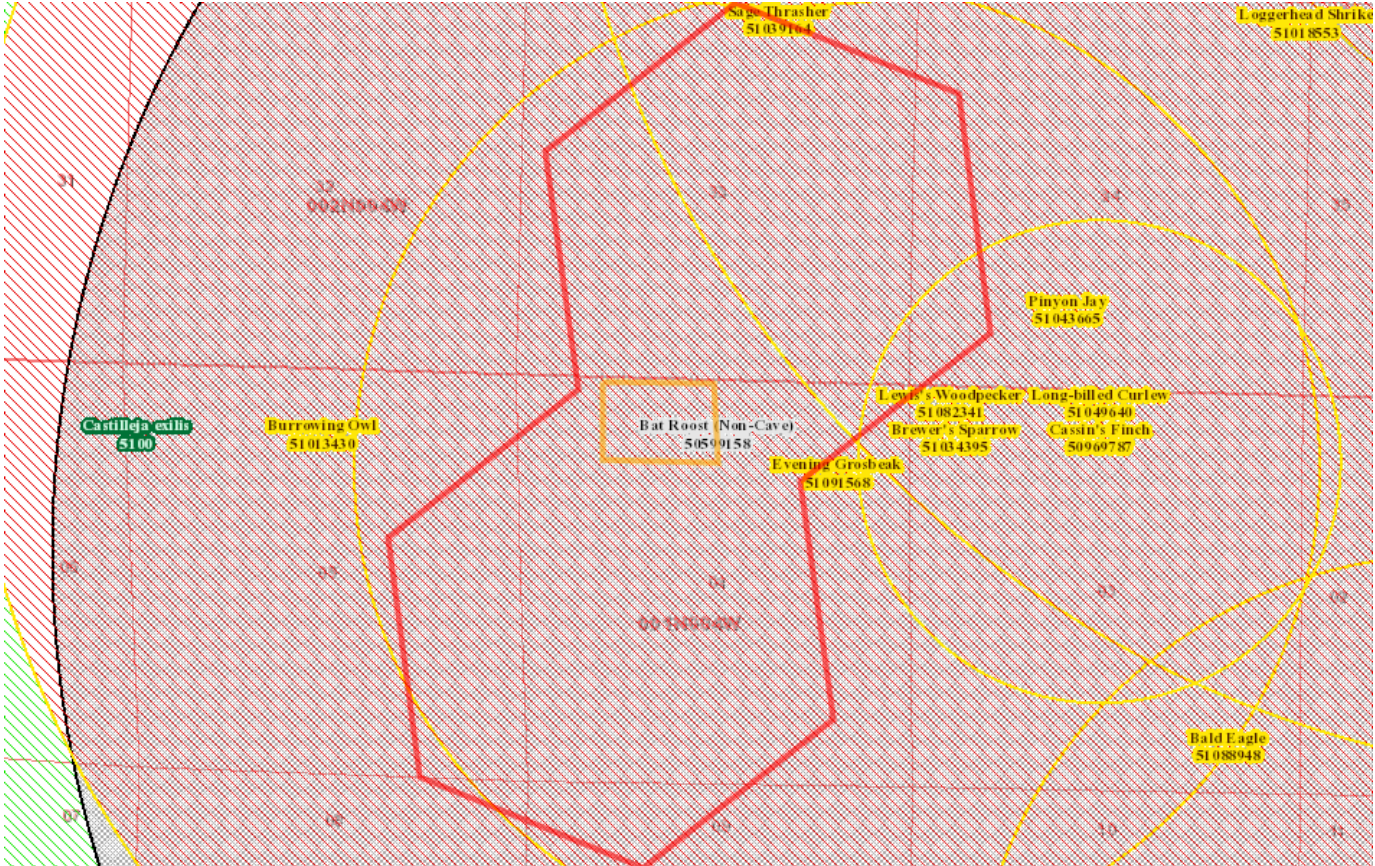
In presenting this information, MTNHP is working towards assisting the user with rapidly assessing the known or potential species and biological communities, land management categories, and biological reports associated with the report area. Users are reminded that this information is likely incomplete and may be inaccurate as surveys to document species are lacking in many areas of the state, species' range polygons often include regions of unsuitable habitat, methods of predicting the presence of species or communities are constantly improving, and information is constantly being added and updated in our databases. **Field verification by professional biologists of the absence or presence of species and biological communities in a report area will always be an important obligation of users of our data. Users are encouraged to only use this environmental summary report as a starting point for more in depth analyses and are encouraged to contact state, federal, and tribal resource management agencies for additional data or management guidelines relevant to your efforts. Please see the Appendix for introductory materials to each section of the report, additional information resources, and a list of relevant agency contacts.**

Model Icons	Habitat Icons	Range Icons	Num Obs
Suitable (native range)	Common	Native / Year-round	Count of obs with 'good precision' (<=1000m)
Optimal Suitability	Occasional	Summer	+ indicates additional 'poor precision' obs (1001m-10,000m)
Moderate Suitability		Winter	
Low Suitability		Migratory	
Suitable (introduced range)		Non-native	
		Historical	

Latitude	Longitude
45.85552	-112.09437
45.88849	-112.12501

Native Species

Summarized by: **Town of Whitehall** (*Custom Area of Interest*)
Filtered by:
Native Species reports are filtered for Species with MT Status = Species of Concern, Special Status, Important Animal Habitat, Potential SOC



Species Occurrences

	USFWS Sec7	# SO	# Obs	Predicted Model	Range
V - Castilleja exilis (<i>Annual Indian Paintbrush</i>) SOC		1	+		
View in Field Guide View Predicted Models View Range Maps Species of Concern - Native Species Global: G5T5 State: S2 USFS: Species of Conservation Concern in Forests (CG) Plant Threat Score: Low CCVI: Extremely Vulnerable Delineation Criteria Individual occurrences are generally based upon a discretely mapped area provided by an observer and are not separated by any pre-defined distance. Individual clusters of plants mapped at fine spatial scales (separated by less than approximately 25-50 meters) may be grouped together into one occurrence if they are not separated by distinct areas of habitat or terrain features. Point observations are buffered to encompass any locational uncertainty associated with the observation. (Last Updated: Jan 29, 2021) Predicted Models: 100% Suitable (native range) (deductive)					
B - Lewis's Woodpecker (<i>Melanerpes lewis</i>) SOC		1	1		
View in Field Guide View Predicted Models View Range Maps Species of Concern - Native Species Global: G4 State: S2B USFWS: MBTA; BCC10; BCC17 USFS: Species of Conservation Concern in Forests (HLC) BLM: SENSITIVE FWP SWAP: SGCN2 PIF: 2 Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 300 meters in order to encompass the likely foraging area used by breeding adults around the nest tree and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Mar 22, 2023) Predicted Models: 100% Moderate (inductive)					
B - Long-billed Curlew (<i>Numenius americanus</i>) SOC		2	3+		
View in Field Guide View Predicted Models View Range Maps Species of Concern - Native Species Global: G5 State: S3B USFWS: MBTA; BCC11 BLM: SENSITIVE FWP SWAP: SGCN3 PIF: 2 Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 200 meters in order to approximate the breeding territory size reported for the species in Idaho and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Jan 04, 2023) Predicted Models: 50% Moderate (inductive), 50% Low (inductive)					
B - Cassin's Finch (<i>Haemorhous cassinii</i>) SOC		1	1		
View in Field Guide View Predicted Models View Range Maps Species of Concern - Native Species Global: G5 State: S3 USFWS: MBTA; BCC10 FWP SWAP: SGCN3 PIF: 3 Delineation Criteria Observations with evidence of breeding activity buffered by a minimum distance of 300 meters in order to be conservative about encompassing the courtship and foraging distance from nesting areas and otherwise buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Dec 28, 2022) Predicted Models: 50% Low (inductive)					

Delineation Criteria Confirmed breeding are based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 1,000 meters in order to encompass the maximum foraging distance from nests reported for the species and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: May 23, 2023)

3 - Pinyon Jay (*Gymnorhinus cyanocephalus*) SOC

Species of Concern - Native Species Global: **G3** State: **S3** USFWS: **MBTA; BCC10; BCC17** FWP SWAP: **SGCN3**

Predicted Models: L 50% Low (inductive)

Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **3**

Predicted Models: L 50% Low (inductive)

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

B - Burrowing Owl (*Athene cunicularia*) SOC

Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**

3 - Thick-billed Longspur (*Rhynchophanes m*)

Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC10; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

D - Bat Roost (Non-Cave) (Bat Roost (Non-Cave))

Important Animal Habitat - Native Species Global: **GNR** State: **SNR**

Delineation Criteria Confirmed area of occupancy based on the documented presence of adults or juveniles of any bat species at non-cave natural roost sites (e.g. rock outcrops, trees), below ground human created roost sites (e.g. mines), and above ground human created roost sites (e.g., bridges, buildings). Point observation locations are buffered by a distance of 4,500 meters in order to encompass the 95% confidence interval for nightly foraging distance reported for Townsend's² Big-eared Bat (a resident Montana bat Species of Concern) and otherwise by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Oct 22, 2019)

Latitude	Longitude
45.85552	-112.09437
45.88849	-112.12501

Native Species reports are filtered for Species with MT Status = Species of Concern, Special Status, Important Animal Habitat, Potential SOC



	USFWS Sec7	# Obs	Predicted Model	Range
<div> <div></div> <div> B - American White Pelican (<i>Pelecanus erythrorhynchos</i>) SOC </div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Species of Concern - Native Species Global: G4 State: S3B USFWS: MBTA FWP SWAP: SGCN3 PIF: 3 </div> <div> Predicted Models: <div></div> 50% Optimal (inductive), <div></div> 50% Moderate (inductive) </div>	1	<div></div>	<div></div>	<div></div>
<div> <div></div> <div> M - North American Porcupine (<i>Erethizon dorsatum</i>) PSOC </div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Potential Species of Concern - Native Species Global: G5 State: S3S4 FWP SWAP: SGIN </div> <div> Predicted Models: <div></div> 100% Moderate (inductive) </div>	+	<div></div>	<div></div>	<div></div>
<div> <div></div> <div> B - Great Blue Heron (<i>Ardea herodias</i>) SOC </div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Species of Concern - Native Species Global: G5 State: S3 USFWS: MBTA FWP SWAP: SGCN3 </div> <div> Predicted Models: <div></div> 100% Moderate (inductive) </div>	1	<div></div>	<div></div>	<div></div>
<div> <div></div> <div> B - Hooded Merganser (<i>Lophodytes cucullatus</i>) PSOC </div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Potential Species of Concern - Native Species Global: G5 State: S4 USFWS: MBTA FWP SWAP: SGIN PIF: 2 </div> <div> Predicted Models: <div></div> 100% Moderate (inductive) </div>	1	<div></div>	<div></div>	<div></div>
<div> <div></div> <div> B - Broad-tailed Hummingbird (<i>Selasphorus platycercus</i>) PSOC </div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Potential Species of Concern - Native Species Global: G5 State: S4B USFWS: MBTA; BCC10 FWP SWAP: SGIN </div> <div> Predicted Models: <div></div> 100% Moderate (inductive) </div>	1	<div></div>	<div></div>	<div></div>
<div> <div></div> <div> B - Rufous Hummingbird (<i>Selasphorus rufus</i>) PSOC </div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Potential Species of Concern - Native Species Global: G4 State: S4B USFWS: MBTA; BCC10 PIF: 3 </div> <div> Predicted Models: <div></div> 100% Moderate (inductive) </div>	2	<div></div>	<div></div>	<div></div>
<div> <div></div> <div> B - Bald Eagle (<i>Haliaeetus leucocephalus</i>) SSS </div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Special Status Species - Native Species Global: G5 State: S4 USFWS: BGEPA; MBTA USFS: Sensitive - Known in Forests (BD, BRT, KOOT, LOLO) BLM: SENSITIVE PIF: 2 </div> <div> Predicted Models: <div></div> 50% Moderate (inductive), <div></div> 50% Low (inductive) </div>	2 +	<div></div>	<div></div>	<div></div>
<div> <div></div> <div> B - Sharp-tailed Grouse (<i>Tympanuchus phasianellus</i>) SOC </div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Species of Concern - Native Species Global: G5 State: SX,S4 FWP SWAP: SGCN1 PIF: 2 </div> <div> Predicted Models: <div></div> 100% Low (inductive) </div>	+	<div></div>	<div></div>	<div></div>
<div> <div></div> <div> B - Clark's Nutcracker (<i>Nucifraga columbiana</i>) SOC </div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Species of Concern - Native Species Global: G5 State: S3 USFWS: MBTA USFS: Species of Conservation Concern in Forests (FLAT) FWP SWAP: SGCN3 PIF: 3 </div> <div> Predicted Models: <div></div> 50% Low (inductive) </div>	1	<div></div>	<div></div>	<div></div>
<div> <div></div> <div> B - Sprague's Pipit (<i>Anthus spragueii</i>) SOC </div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Species of Concern - Native Species Global: G3G4 State: S3B USFWS: MBTA; BCC11; BCC17 BLM: SENSITIVE FWP SWAP: SGCN3 PIF: 1 </div> <div> Predicted Models: <div></div> 50% Low (inductive) </div>	1	<div></div>	<div></div>	<div></div>
<div> <div></div> <div> B - Golden Eagle (<i>Aquila chrysaetos</i>) SOC </div> </div> <div> View in Field Guide View Range Maps </div> <div> Species of Concern - Native Species Global: G5 State: S3 USFWS: BGEPA; MBTA BLM: SENSITIVE FWP SWAP: SGCN3 </div>	2 +	Not Assessed	<div></div>	<div></div>
<div> <div></div> <div> B - Northern Goshawk (<i>Accipiter gentilis</i>) SOC </div> </div> <div> View in Field Guide View Range Maps </div> <div> Species of Concern - Native Species Global: G5 State: S3 USFWS: MBTA FWP SWAP: SGCN3 PIF: 2 </div>	2 +	Not Assessed	<div></div>	<div></div>
<div> <div></div> <div> B - Mountain Plover (<i>Charadrius montanus</i>) SOC </div> </div> <div> View in Field Guide View Range Maps </div> <div> Species of Concern - Native Species Global: G3 State: S2B USFWS: MBTA; BCC10; BCC11; BCC17 BLM: SENSITIVE FWP SWAP: SGCN2 PIF: 1 </div>	+	Not Assessed	<div></div>	<div></div>

	USFWS Sec7	Predicted Model	Range
<div> <div></div> <div>M - Columbia Plateau Pocket Mouse (<i>Perognathus parvus</i>) SOC</div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Species of Concern - Native Species Global: G5 State: S3 USFS: Sensitive - Suspected in Forests (BD) FWP SWAP: SGCN3, SGIN </div> <div> Predicted Models: 100% Moderate (inductive) </div>			
<div> <div></div> <div>M - Western Spotted Skunk (<i>Spilogale gracilis</i>) PSOC</div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Potential Species of Concern - Native Species Global: G5 State: SU FWP SWAP: SGIN </div> <div> Predicted Models: 100% Moderate (inductive) </div>			
<div> <div></div> <div>M - Wyoming Ground Squirrel (<i>Urocitellus elegans</i>) PSOC</div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Potential Species of Concern - Native Species Global: G5 State: S3S4 </div> <div> Predicted Models: 100% Moderate (inductive) </div>			
<div> <div></div> <div>B - Barrow's Goldeneye (<i>Bucephala islandica</i>) PSOC</div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Potential Species of Concern - Native Species Global: G5 State: S4 USFWS: MBTA FWP SWAP: SGIN PIF: 2 </div> <div> Predicted Models: 100% Moderate (inductive) </div>			
<div> <div></div> <div>I - Bombus suckleyi (<i>Suckley Cuckoo Bumble Bee</i>) SOC</div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Species of Concern - Native Species Global: G2G3 State: S1 </div> <div> Predicted Models: 100% Moderate (inductive) </div>			
<div> <div></div> <div>V - Eleocharis rostellata (<i>Beaked Spikerush</i>) SOC</div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Species of Concern - Native Species Global: G5 State: S3 USFS: Species of Conservation Concern in Forests (CG, FLAT, HLC) Plant Threat Score: Unknown CCVI: Less Vulnerable </div> <div> Predicted Models: 100% Moderate (inductive) </div>			
<div> <div></div> <div>V - Utricularia intermedia (<i>Flatleaf Bladderwort</i>) SOC</div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Species of Concern - Native Species Global: G5 State: S2 USFS: Sensitive - Known in Forests (KOOT) Plant Threat Score: No Known Threats </div> <div> Predicted Models: 100% Moderate (inductive) </div>			
<div> <div></div> <div>M - Hoary Bat (<i>Lasiurus cinereus</i>) SOC</div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Species of Concern - Native Species Global: G3G4 State: S3B BLM: SENSITIVE FWP SWAP: SGCN3 </div> <div> Predicted Models: 100% Moderate (inductive) </div>			
<div> <div></div> <div>B - White-faced Ibis (<i>Plegadis chihi</i>) SOC</div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Species of Concern - Native Species Global: G5 State: S3B USFWS: MBTA BLM: SENSITIVE FWP SWAP: SGCN3 PIF: 2 </div> <div> Predicted Models: 100% Moderate (inductive) </div>			
<div> <div></div> <div>I - Danaus plexippus (<i>Monarch</i>) SOC</div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Species of Concern - Native Species Global: G4 State: S2S3 USFWS: C </div> <div> Predicted Models: 100% Moderate (inductive) </div>			
<div> <div></div> <div>M - Little Brown Myotis (<i>Myotis lucifugus</i>) SOC</div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Species of Concern - Native Species Global: G3G4 State: S3 FWP SWAP: SGCN3 </div> <div> Predicted Models: 50% Moderate (inductive), 50% Low (inductive) </div>			
<div> <div></div> <div>M - Long-legged Myotis (<i>Myotis volans</i>) SOC</div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Species of Concern - Native Species Global: G4G5 State: S3 </div> <div> Predicted Models: 50% Moderate (inductive), 50% Low (inductive) </div>			
<div> <div></div> <div>B - Short-eared Owl (<i>Asio flammeus</i>) PSOC</div> </div> <div> View in Field Guide View Predicted Models View Range Maps </div> <div> Potential Species of Concern - Native Species Global: G5 State: S4 USFWS: MBTA; BCC11; BCC17 PIF: 3 </div> <div> Predicted Models: 50% Moderate (inductive), 50% Low (inductive) </div>			

Predicted Models: M 50% Moderate (inductive), L 50% Low (inductive)

Predicted Models: 50% Moderate (inductive), 50% Low (inductive)

Predicted Models: 50% Moderate (inductive), 50% Low (inductive)

Predicted Models:  50% Moderate (inductive),  50% Low (inductive)

A horizontal bar chart representing 100%. The bar is divided into two equal halves. The left half is green and contains the letter 'S'. The right half is yellow and contains the letter 'M'.

Predicted Models: 50% Moderate (inductive), 50% Low (inductive)

Predicted Models: 50% Moderate (inductive), 50% Low (inductive)

Predicted Models: 50% Moderate (inductive)

7 Y

Predicted Models: 100% Low (inductive)

Predicted Models: 100% Low (inductive)

Predicted Models:  100% Low (inductive)

Predicted Models: 100% Low (inductive)

A diagram showing a 2D coordinate system with a horizontal x-axis and a vertical y-axis. A yellow square is positioned in the first quadrant, and a purple square is positioned in the second quadrant. The yellow square is to the right of the y-axis, and the purple square is to the left of the y-axis. Both squares are centered vertically relative to the x-axis.

Predicted Models: 100% Low (inductive)

[illegible]

Predicted Models: 100% Low (inductive)

	Y

Predicted Models: 100% Low (inductive)

Predicted Models: L 100% Low (inductive)

A simple circuit diagram showing a battery, a switch, and a light bulb connected in a loop. The switch is currently open, and the light bulb is not lit.

Predicted Models: L 100% Low (inductive)

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Predicted Models: L 100% Low (inductive)

Predicted Models: L 100% Low (inductive)

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)

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[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)

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[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)

Diagram illustrating a 2D array structure with 4 rows and 2 columns. The first column contains yellow squares, and the second column contains gray squares. To the right of the array is a purple box containing the letter 'Y'.

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)

Diagram illustrating a 2D array structure. The array has 3 rows and 2 columns. The first column contains yellow squares, and the second column contains light gray squares. To the right of the array is a purple box containing the letter 'Y'.

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)

A diagram showing a 2x2 grid. The left column contains a yellow square and a white square. The right column contains a purple square with the letter 'Y' and a white square.

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)

A diagram showing a 2x2 grid. The top-left cell contains a yellow square. The top-right cell contains a white square. The bottom-right cell contains a purple square with the letter 'Y' inside. The bottom-left cell is empty.

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)

A diagram showing a 2x2 grid. The left column contains a yellow square and a white square. The right column contains a purple square and a white square. To the left of each square is a vertical stack of five dots.

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)

7 Y

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)

B - Meesia triquetra (Meesia Moss) SOC

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USFS: Sensitive - Known in Forests (BRT, KOOT)
Sensitive - Suspected in Forests (LOLO)

Species of Concern - Native Species

Global: G5 State: S2

Species of Conservation Concern in Forests (CG, FLAT)

Predicted Models: 50% Low (inductive)

B - Green-tailed Towhee (Pipilo chlorurus) SOC

View in Field Guide

View Predicted Models

View Range Maps

Species of Concern - Native Species

Global: G5 State: S3B USFWS: MBTA FWP SWAP: SGCN3 PIF: 3

Predicted Models: 50% Low (inductive)

B - Harlequin Duck (Histrionicus histrionicus) SOC

View in Field Guide

View Predicted Models

View Range Maps

Species of Concern - Native Species

Global: G4 State: S2B USFWS: MBTA USFS: Sensitive - Known in Forests (BD, KOOT, LOLO) FWP SWAP: SGCN2 PIF: 1

Predicted Models: 50% Low (inductive)

M - Grizzly Bear (Ursus arctos) SOC

View in Field Guide

View Range Maps

Species of Concern - Native Species

Global: G4 State: S2S3 USFWS: LT BLM: THREATENED FWP SWAP: SGCN2-3

M - Wolverine (Gulo gulo) SOC

View in Field Guide

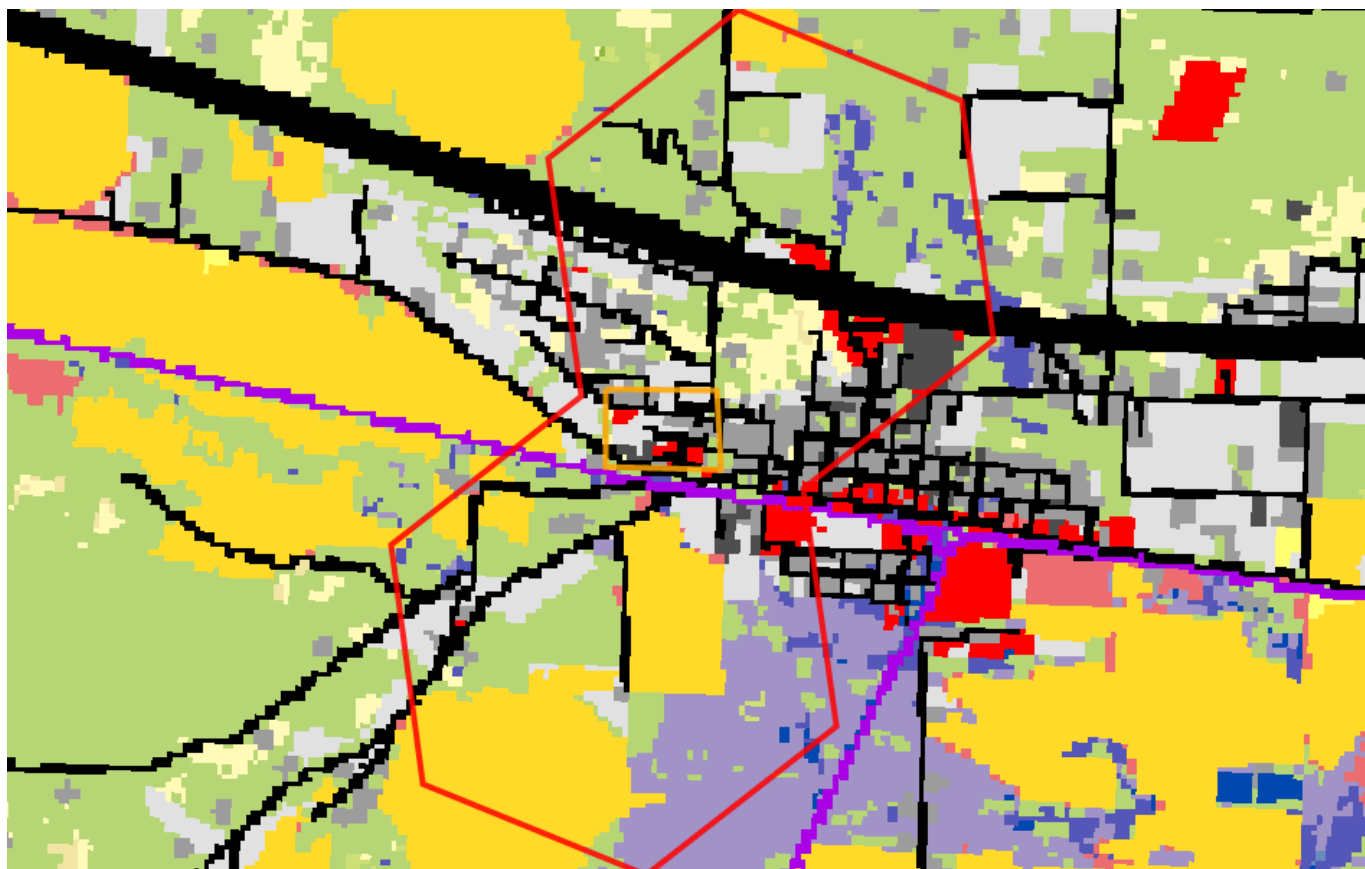
View Range Maps

Species of Concern - Native Species

Global: G4 State: S3 USFS: Sensitive - Known in Forests (BD, BRT, KOOT, LOLO) BLM: SENSITIVE FWP SWAP: SGCN3

Land Cover

Summarized by: **Town of Whitehall** (*Custom Area of Interest*)



Grassland Systems Montane Grassland

30% (380 Acres)

Rocky Mountain Lower Montane, Foothill, and Valley Grassland

This grassland system of the northern Rocky Mountains is found at lower montane to foothill elevations in mountains and valleys throughout Montana. These grasslands are floristically similar to Big Sagebrush Steppe but are defined by shorter summers, colder winters, and young soils derived from recent glacial and alluvial material. They are found at elevations from 548 - 1,650 meters (1,800-5,413 feet). In the lower montane zone, they range from small meadows to large open parks surrounded by conifers; below the lower treeline, they occur as extensive foothill and valley grasslands. Soils are relatively deep, fine-textured, often with coarse fragments, and non-saline. Microphytic crust may be present in high-quality occurrences. This system is typified by cool-season perennial bunch grasses and forbs (>25%) cover, with a sparse shrub cover (<10%). Rough fescue (*Festuca campestris*) is dominant in the northwestern portion of the state and Idaho fescue (*Festuca idahoensis*) is dominant or co-dominant throughout the range of the system. Bluebunch wheatgrass (*Pseudoroegneria spicata*) occurs as a co-dominant throughout the range as well, especially on xeric sites. Western wheatgrass (*Pascopyrum smithii*) is consistently present, often with appreciable coverage (>10%) in lower elevation occurrences in western Montana and virtually always present, with relatively high coverages (>25%), on the edge of the Northwestern Great Plains region. Species diversity ranges from a high of more than 50 per 400 square meter plot on mesic sites to 15 (or fewer) on xeric and disturbed sites. Most occurrences have at least 25 vascular species present. Farmland conversion, noxious species invasion, fire suppression, heavy grazing and oil and gas development are major threats to this system.



17% (220 Acres)

Human Land Use Agriculture

Cultivated Crops

These areas used for the production of crops, such as corn, soybeans, small grains, sunflowers, vegetables, and cotton, typically on an annual cycle. Agricultural plant cover is variable depending on season and type of farming. Other areas include more stable land cover of orchards and vineyards.



10% (123 Acres)

Alpine-Montane Wet Meadow

These moderate-to-high-elevation systems are found throughout the Rocky Mountains, dominated by herbaceous species found on wetter sites with very low-velocity surface and subsurface flows. Occurrences range in elevation from montane to alpine at 1,000 to 3,353 meters (3,280-11,000 feet). This system typically occurs in cold, moist basins, seeps and alluvial terraces of headwater streams or as a narrow strip adjacent to alpine lakes (Hansen et al., 1996). Wet meadows are typically found on flat areas or gentle slopes, but may also occur on sub-irrigated sites with slopes up to 10 percent. In alpine regions, sites are typically small depressions located below late-melting snow patches or on snowbeds. The growing season may only last for one to two months. Soils of this system may be mineral or organic. In either case, soils show typical hydric soil characteristics, including high organic content and/or low chroma and redoximorphic features. This system often occurs as a mosaic of several plant associations, often dominated by graminoids such as tufted hairgrass (*Deschampsia caespitosa*), and a diversity of montane or alpine sedges such as small-head sedge (*Carex illota*), small-winged sedge (*Carex microptera*), black alpine sedge (*Carex nigricans*), Holm’s Rocky Mountain sedge (*Carex scopulorum*) shortstalk sedge (*Carex podocarpa*) and Payson’s sedge (*Carex paysonis*). Drummond’s rush (*Juncus drummondii*), Merten’s rush (*Juncus mertensianus*), and high elevation bluegrasses (*Poa arctica* and *Poa alpina*) are often present. Forbs such as arrow-leaf groundsel (*Senecio triangularis*), slender-sepal marsh marigold (*Caltha leptosepala*), and spreading globeflower (*Trollius laxus*) often form high cover in higher elevation meadows. Wet meadows are associated with snowmelt and are usually not subjected to high disturbance events such as flooding.

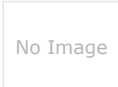


10% (123 Acres)

**Human Land Use
Developed**

Developed, Open Space

Vegetation (primarily grasses) planted in developed settings for recreation, erosion control, or aesthetic purposes. Impervious surfaces account for less than 20% of total cover. This category often includes highway and railway rights of way and graveled rural roads.



8% (104 Acres)

**Human Land Use
Developed**

Other Roads

County, city and or rural roads generally open to motor vehicles.

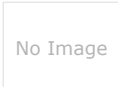


7% (91 Acres)

**Human Land Use
Developed**

Low Intensity Residential

Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20-50% of total cover. These areas most commonly include single-family housing units in rural and suburban areas. Paved roadways may be classified into this category.

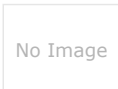


5% (68 Acres)

**Human Land Use
Developed**

Interstate

National Highway System (NHS) limited access highways and their shoulders and rights of way.



3% (41 Acres)

**Human Land Use
Developed**

Major Roads

U.S. and State Highways that are not part of the National Highway System (NHS) Interstate network. This category includes entrance and exit ramps to NHS Interstate highways.



3% (37 Acres)

**Shrubland, Steppe and Savanna Systems
Sagebrush Steppe**

Big Sagebrush Steppe

This widespread ecological system occurs throughout much of central Montana, and north and east onto the western fringe of the Great Plains. In central Montana, where this system occurs on both glaciated and non-glaciated landscapes, it differs slightly, with more summer rain than winter precipitation and more precipitation annually. Throughout its distribution, soils are typically deep and non-saline, often with a microphytic crust. This shrub-steppe is dominated by perennial grasses and forbs with greater than 25% cover. Overall shrub cover is less than 10 percent. In Montana and Wyoming, stands are more mesic, with more biomass of grass, and have less shrub diversity than stands farther to the west, and 50 to 90% of the occurrences are dominated by Wyoming big sagebrush with western wheatgrass (*Pascopyrum smithii*). Japanese brome (*Bromus japonicus*) and cheatgrass (*Bromus tectorum*) are indicators of disturbance, but cheatgrass is typically not as abundant as in the Intermountain West, possibly due to a colder climate. The natural fire regime of this ecological system maintains a patchy distribution of shrubs, preserving the steppe character. Shrubs may increase following heavy grazing and/or with fire suppression. In central and eastern Montana, complexes of prairie dog towns are common in this ecological system.



2% (28 Acres)

**Wetland and Riparian Systems
Floodplain and Riparian**

Rocky Mountain Lower Montane-Foothill Riparian Woodland and Shrubland

This ecological system is found throughout the Rocky Mountain and Colorado Plateau regions. In Montana, it ranges from approximately 945 to 2,042 meters (3,100 to 6,700 feet), characteristically occurring as a mosaic of multiple communities that are tree-dominated with a diverse shrub component. It is dependent on a natural hydrologic regime, especially annual to episodic flooding. Occurrences are found within the flood zone of rivers, on islands, sand or cobble bars, and on immediate streambanks. It can form large, wide occurrences on mid-channel islands in larger rivers or narrow bands on small, rocky canyon tributaries and well-drained benches. It is also typically found in backwater channels and other perennially wet but less scoured sites, such as floodplains swales and irrigation ditches. In some locations, occurrences extend into moderately high intermountain basins where the adjacent vegetation is sage steppe. Dominant trees may include boxelder maple (*Acer negundo*), narrowleaf cottonwood (*Populus angustifolia*), Plains cottonwood (*Populus deltoides*), Douglas-fir (*Pseudotsuga menziesii*), peachleaf willow (*Salix amygdaloides*), or Rocky Mountain juniper (*Juniperus scopulorum*). Dominant shrubs include Rocky Mountain maple (*Acer glabrum*), thinleaf alder (*Alnus incana*), river birch (*Betula occidentalis*), redbud (*Cornus sericea*), hawthorne (*Crataegus spp.*), chokecherry (*Prunus virginiana*), skunkbush sumac (*Rhus trilobata*), Drummond’s willow (*Salix drummondiana*), sandbar willow (*Salix exigua*), Pacific willow (*Salix lucida*), rose (*Rosa species*), silver buffaloberry (*Shepherdia argentea*), or snowberry (*Symphoricarpos species*). Exotic trees of Russian olive (*Elaeagnus angustifolia*) and saltcedar (*Tamarix species*) may invade some stands in southeastern and south-central Montana.



2% (24 Acres)



Commercial / Industrial

Businesses, industrial parks, hospitals, airports; utilities in commercial/industrial areas.



2% (20 Acres)

**Human Land Use
Developed**



High Intensity Residential

Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50-80% of the total cover. These areas most commonly include single-family housing units in urban areas. Paved roadways, parking lots, and other large impervious surfaces may be classified into this category.

Additional Limited Land Cover

1% (11 Acres)



Railroad

<1% (4 Acres)



Introduced Upland Vegetation - Annual and Biennial Forbland

<1% (3 Acres)



Rocky Mountain Subalpine-Montane Mesic Meadow

<1% (1 Acres)



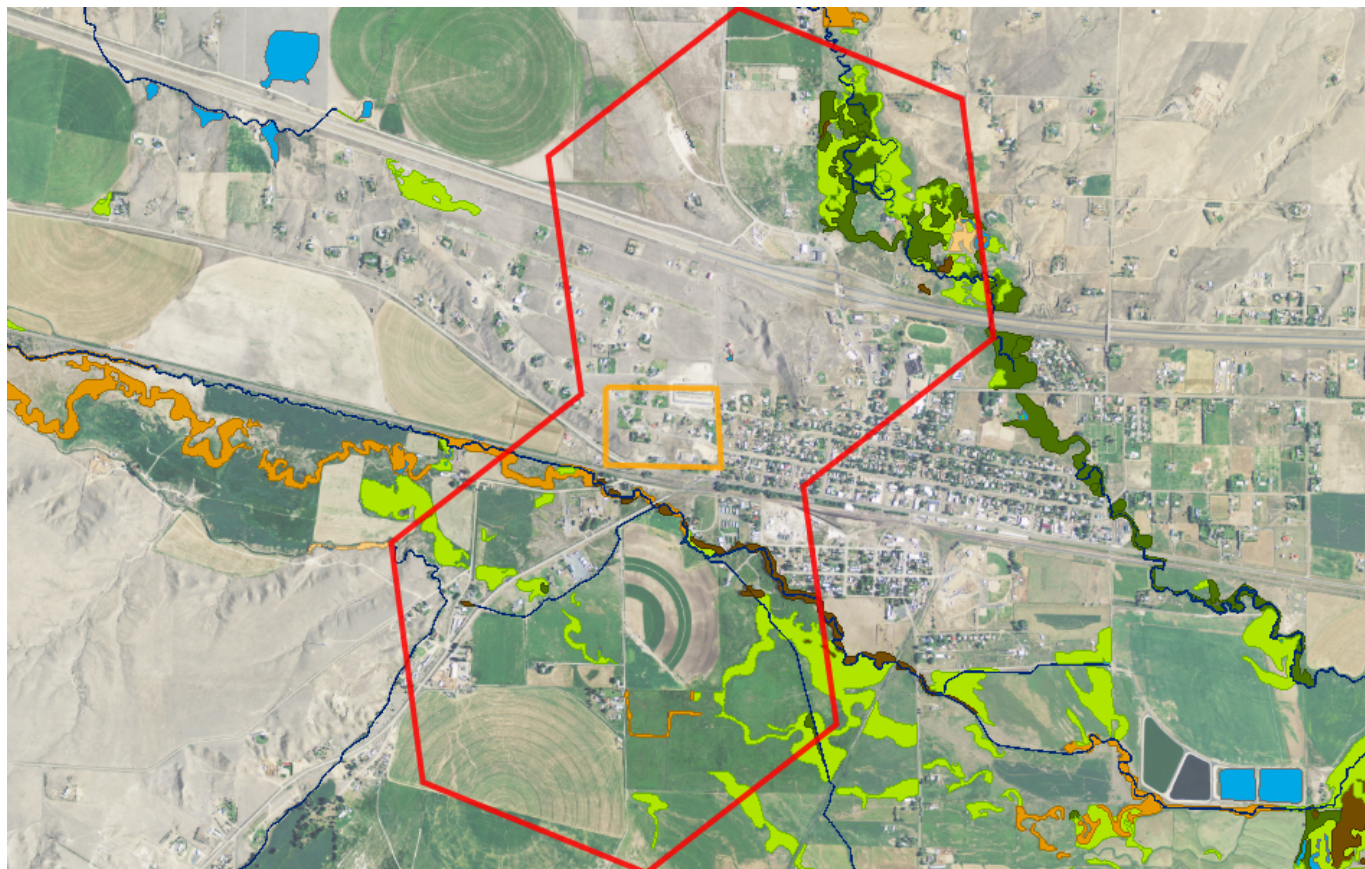
Montane Sagebrush Steppe

<1% (1 Acres)



Open Water

Wetland and Riparian

 Summarized by: **Town of Whitehall** (Custom Area of Interest)


Wetland and Riparian Mapping

[Explain](#)

P - Palustrine

AB - Aquatic Bed

F - Semipermanently Flooded	1 Acres
(no modifier)	<1 Acres PABF
h - Diked/Impounded	<1 Acres PABFh
x - Excavated	1 Acres PABFx

P - Palustrine, AB - Aquatic Bed

Wetlands with vegetation growing on or below the water surface for most of the growing season.

US - Unconsolidated Shore

A - Temporarily Flooded	<1 Acres
(no modifier)	<1 Acres PUSA

P - Palustrine, US - Unconsolidated Shore

Wetlands with less than 75% areal cover of stones, boulders, or bedrock. AND with less than 30% vegetative cover AND the wetland is irregularly exposed due to seasonal or irregular flooding and subsequent drying.

EM - Emergent

A - Temporarily Flooded	59 Acres
(no modifier)	59 Acres PEMA
C - Seasonally Flooded	8 Acres
(no modifier)	8 Acres PEMC
F - Semipermanently Flooded	<1 Acres
(no modifier)	<1 Acres PEMF

P - Palustrine, EM - Emergent

Wetlands with erect, rooted herbaceous vegetation present during most of the growing season.

SS - Scrub-Shrub

A - Temporarily Flooded	24 Acres
(no modifier)	24 Acres PSSA
C - Seasonally Flooded	6 Acres
(no modifier)	6 Acres PSSC

P - Palustrine, SS - Scrub-Shrub

Wetlands dominated by woody vegetation less than 6 meters (20 feet) tall. Woody vegetation includes tree saplings and trees that are stunted due to environmental conditions.

R - Riverine (Rivers)

3 - Upper Perennial

UB - Unconsolidated Bottom

H - Permanently Flooded	3 Acres
(no modifier)	3 Acres R3UBH

R - Riverine (Rivers), 3 - Upper Perennial, UB - Unconsolidated Bottom

Stream channels where the substrate is at least 25% mud, silt or other fine particles.

4 - Intermittent

x - Excavated	1 Acres	R4SBAx
C - Seasonally Flooded	3 Acres	
(no modifier)	2 Acres	R4SBC
x - Excavated	1 Acres	R4SBCx

Rp - Riparian

1 - Lotic

<div><div>SS - Scrub-Shrub</div><div>(no modifier)</div></div>	8 Acres	Rp1SS	<div><div>Rp - Riparian, 1 - Lotic, SS - Scrub-Shrub</div><div><i>This type of riparian area is dominated by woody vegetation that is less than 6 meters (20 feet) tall. Woody vegetation includes tree saplings and trees that are stunted due to environmental conditions.</i></div></div>
<div><div>FO - Forested</div><div>(no modifier)</div></div>	7 Acres	Rp1FO	<div><div>Rp - Riparian, 1 - Lotic, FO - Forested</div><div><i>This riparian class has woody vegetation that is greater than 6 meters (20 feet) tall.</i></div></div>
<div><div>EM - Emergent</div><div>(no modifier)</div></div>	2 Acres	Rp1EM	<div><div>Rp - Riparian, 1 - Lotic, EM - Emergent</div><div><i>Riparian areas that have erect, rooted herbaceous vegetation during most of the growing season.</i></div></div>

Land Management Summary						Explain
		Ownership	Tribal	Easements	Other Boundaries (possible overlap)	
+ 📁	Public Lands	4 Acres (<1%)				
+ 📁	Federal	2 Acres (<1%)				
+ 📁	US Forest Service	2 Acres (<1%)				
🟩	USFS Owned	2 Acres (<1%)				
+ 📁	USFS Ranger Districts				3 Acres	
🟨	Beaverhead-Deerlodge National Forest, Butte-Jefferson Ranger District				3 Acres	
+ 📁	USFS National Forest Boundaries				3 Acres	
🟨	Beaverhead-Deerlodge National Forest				3 Acres	
+ 📁	State					
+ 📁	Montana Department of Transportation					
🔵	MTDOT Owned					
+ 📁	Local	2 Acres (<1%)				
+ 📁	Local Government	2 Acres (<1%)				
🟤	Local Government Owned	2 Acres (<1%)				
📁	Private Lands or Unknown Ownership	1,275 Acres (100%)				



NATURAL HERITAGE PROGRAM

A program of the Montana State Library's
Natural Resource Information System

Latitude	Longitude
45.85552	-112.09437
45.88849	-112.12501

Biological Reports

Summarized by: **Town of Whitehall** (*Custom Area of Interest*)

Within the report area you have requested, citations for all reports and publications associated with plant or animal observations in Montana Natural Heritage Program (MTNHP) databases are listed and, where possible, links to the documents are included.

The MTNHP plans to include reports associated with terrestrial and aquatic communities in the future as allowed for by staff resources. If you know of reports or publications associated with species or biological communities within the report area that are not shown in this report, please let us know: mtnhp@mt.gov

No Biological Reports were found in the selected area



A program of the Montana State Library's
Natural Resource Information System

- Model Icons**
- Suitable (native range)
 - Optimal Suitability
 - Moderate Suitability
 - Low Suitability
 - Suitable (introduced range)

- Habitat Icons**
- Common
 - Occasional

- Range Icons**
- Non-native

Num Obs
Count of obs with
'good precision'
(<=1000m)
+ indicates
additional 'poor
precision' obs
(1001m-
10,000m)



Latitude
45.85552
45.88849


Longitude
-112.09437
-112.12501

Invasive and Pest Species



Summarized by: **Town of Whitehall** (*Custom Area of Interest*)

	# Obs	Predicted Model	Range
Aquatic Invasive Species			
<input type="checkbox"/> V - Iris pseudacorus (<i>Yellowflag Iris</i>) N2A/AIS			
View in Field Guide View Predicted Models View Range Maps Noxious Weed: Priority 2A - Aquatic Invasive Species - Non-native Species Global: GNR State: SNA Predicted Models: 50% Optimal (inductive), 50% Moderate (inductive)			
<input type="checkbox"/> V - Myriophyllum spicatum (<i>Eurasian Water-milfoil</i>) N2A/AIS			
View in Field Guide View Predicted Models View Range Maps Noxious Weed: Priority 2A - Aquatic Invasive Species - Non-native Species Global: GNR State: SNA Predicted Models: 100% Low (inductive)			
<input type="checkbox"/> V - Potamogeton crispus (<i>Curly-leaf Pondweed</i>) N2B/AIS			
View in Field Guide View Predicted Models View Range Maps Noxious Weed: Priority 2B - Aquatic Invasive Species - Non-native Species Global: G5 State: SNA Predicted Models: 100% Low (inductive)			
Noxious Weeds: Priority 1A			
<input type="checkbox"/> V - Centaurea solstitialis (<i>Yellow Starthistle</i>) N1A			
View in Field Guide View Predicted Models View Range Maps Noxious Weed: Priority 1A - Non-native Species Global: GNR State: SNA Predicted Models: 100% Optimal (inductive)			
<input type="checkbox"/> V - Isatis tinctoria (<i>Dyer's Woad</i>) N1A			
View in Field Guide View Predicted Models View Range Maps Noxious Weed: Priority 1A - Non-native Species Global: GNR State: SNA Predicted Models: 100% Optimal (inductive)			
<input type="checkbox"/> V - Phragmites australis ssp. australis (<i>European Common Reed</i>) N1A			
View in Field Guide View Predicted Models View Range Maps Noxious Weed: Priority 1A - Non-native Species Global: G5T5 State: SNA Predicted Models: 50% Moderate (inductive), 50% Low (inductive)			
<input type="checkbox"/> V - Taeniatherum caput-medusae (<i>Medusahead</i>) N1A			
View in Field Guide View Predicted Models View Range Maps Noxious Weed: Priority 1A - Non-native Species Global: G4G5 State: SNA Predicted Models: 100% Low (inductive)			
Noxious Weeds: Priority 1B			
<input type="checkbox"/> V - Lythrum salicaria (<i>Purple Loosestrife</i>) N1B			
View in Field Guide View Predicted Models View Range Maps Noxious Weed: Priority 1B - Non-native Species Global: G5 State: SNA Predicted Models: 100% Optimal (inductive)			
<input type="checkbox"/> V - Polygonum cuspidatum (<i>Japanese Knotweed</i>) N1B			
View in Field Guide View Predicted Models View Range Maps Noxious Weed: Priority 1B - Non-native Species Global: GNR TNR State: SNA Predicted Models: 100% Optimal (inductive)			
<input type="checkbox"/> V - Echium vulgare (<i>Blueweed</i>) N1B			
View in Field Guide View Predicted Models View Range Maps Noxious Weed: Priority 1B - Non-native Species Global: GNR State: SNA Predicted Models: 50% Moderate (inductive), 50% Low (inductive)			
<input type="checkbox"/> V - Cytisus scoparius (<i>Scotch Broom</i>) N1B			
View in Field Guide View Predicted Models View Range Maps Noxious Weed: Priority 1B - Non-native Species Global: GNR State: SNA Predicted Models: 100% Low (inductive)			
<input type="checkbox"/> V - Polygonum x bohemicum (<i>Bohemian Knotweed</i>) N1B			
View in Field Guide View Predicted Models View Range Maps Noxious Weed: Priority 1B - Non-native Species Global: GNA State: SNA Predicted Models: 100% Low (inductive)			
Noxious Weeds: Priority 2A			
<input type="checkbox"/> V - Rhamnus cathartica (<i>Common Buckthorn</i>) N2A			
View in Field Guide View Predicted Models View Range Maps Noxious Weed: Priority 2A - Non-native Species Global: GNR State: SNA Predicted Models: 100% Optimal (inductive)			
<input type="checkbox"/> V - Iris pseudacorus (<i>Yellowflag Iris</i>) N2A/AIS			
View in Field Guide View Predicted Models View Range Maps Noxious Weed: Priority 2A - Aquatic Invasive Species - Non-native Species Global: GNR State: SNA Predicted Models: 50% Optimal (inductive), 50% Moderate (inductive)			

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Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA**
Predicted Models:  100% Moderate (inductive)

☒ **V - *Lepidium latifolium*** (*Perennial Pepperweed*) **N2A**

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)
Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA**
Predicted Models:  50% Moderate (inductive),  50% Low (inductive)

V - Ranunculus acris (*Tall Buttercup*) **N2A**

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)

Noxious Weed: Priority 2A - Non-native Species
Global: **G5** State: **SNA**

Predicted Models:
■ 50% Moderate (inductive),
 ■ 50% Low (inductive)

☒ **V - Myriophyllum spicatum** (*Eurasian Water-milfoil*) **N2A/AIS**

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)

Noxious Weed: Priority 2A - Aquatic Invasive Species - Non-native Species
Global: **GNR** State: **SNA**

Predicted Models: L 100% Low (inductive)

☐ V - **Senecio jacobaea** (*Tansy Ragwort*) **N2A**


[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)
Noxious Weed: Priority 2A - Non-native Species
Global: **GNR** State: **SNA**
Predicted Models: L 50% Low (inductive)

Noxious Weeds: Priority 2B

V - Lepidium draba (*Whitetop*) **N2B**

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)


Noxious Weed: Priority 2B - Non-native Species
 Global: **GNR** State: **SNA**

Predicted Models:  100% Optimal (inductive)

☒ **V - Centaurea diffusa** (*Diffuse Knapweed*) **N2B**

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)


Noxious Weed: Priority 2B - Non-native Species
 Global: **GNR** State: **SNA**

Predicted Models:  100% Moderate (inductive)

☐ V - *Centaurea stoebe* (Spotted Knapweed) N2B

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)

Noxious Weed: Priority 2B - Non-native Species
 Global: **GNR** State: **SNA**

Predicted Models:  100% Moderate (inductive)


☒ V - **Cirsium arvense** (*Canada Thistle*) **N2B**

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)


Noxious Weed: Priority 2B - Non-native Species
Global: **G5** State: **SNA**

Predicted Models: M 100% Moderate (inductive)

V - Cynoglossum officinale (*Common Hound's-tongue*) **N2B**

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models:  100% Moderate (inductive)

V - Euphorbia virgata (*Leafy Spurge*) **N2B**

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)
Noxious Weed: Priority 2B - Non-native Species
Global: **GNR** State: **SNA**
Predicted Models:  100% Moderate (inductive)

☐ V - *Linaria dalmatica* (Dalmatian Toadflax) N2E

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)

Noxious Weed: Priority 2B - Non-native Species
 Global: **G5** State: **SNA**

Predicted Models: M 100% Moderate (inductive)

V - Tanacetum vulgare (*Common Tansy*) **N2B**

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)

Noxious Weed: Priority 2B - Non-native Species
 Global: **GNR** State: **SNA**

Predicted Models: M 100% Moderate (inductive)

☐ V - *Linaria vulgaris* (Yellow Toadflax) N2B

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)

Noxious Weed: Priority 2B - Non-native Species
 Global: **GNR** State: **SNA**

Predicted Models:
M 50% Moderate (inductive),
 L 50% Low (inductive)

☐ V - *Tamarix ramosissima* (Salt Cedar) N2B

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)

Noxious Weed: Priority 2B - Non-native Species
Global: **GNR** State: **SNA**

Predicted Models:
M 50% Moderate (inductive),
 L 50% Low (inductive)


V - Acroptilon repens (*Russian Knapweed*) **N2B**

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)

Noxious Weed: Priority 2B - Non-native Species
 Global: **GNR** State: **SNA**

Predicted Models: L 100% Low (inductive)

☐ V - *Berteroa incana* (Hoary False-alyssum) N2B

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models:  100% Low (inductive)

Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models:  100% Low (inductive)

☒ **V - Leucanthemum vulgare** (*Oxeye Daisy*) **N2B**

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)
Noxious Weed: Priority 2B - Non-native Species
Global: **GNR** State: **SNA**
Predicted Models: L 100% Low (inductive)

V - Potamogeton crispus (*Curly-leaf Pondweed*) **N2B/AIS**

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)

Noxious Weed: Priority 2B - Aquatic Invasive Species - Non-native Species
Global: **G5** State: **SNA**

Predicted Models: L 100% Low (inductive)

V - Hypericum perforatum (*Common St. John's-wort*) **N2B**


[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 50% Low (inductive)

V - Potentilla recta (*Sulphur Cinquefoil*) **N2B**



[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 50% Low (inductive)

Regulated Weeds: Priority 3

V - *Elaeagnus angustifolia* (Russian Olive) R3

[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)
Regulated Weed: Priority 3 - Non-native Species Global: **GNR** State: **SNA**
Predicted Models:  100% Moderate (inductive)

V - Bromus tectorum (*Cheatgrass*) **R3**


[View in Field Guide](#) [View Predicted Models](#) [View Range Maps](#)
Regulated Weed: Priority 3 - Non-native Species Global: **GNR** State: **SNA**
Predicted Models:  50% Moderate (inductive).  50% Low (inductive)

Biocontrol Species

☒ **I - *Aphthona lacertosa*** (*Brown-legged Leafy Spurge Flea Beetle*) **BIOCNTRL**

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)

[Biocontrol Species - Non-native Species](#)
 Global: **GNR** State: **SNA**

Predicted Models:  100% Moderate (inductive)

I - *Mecinus janthiniformis* (Dalmatian Toadflax Stem-boring Weevil) BIOCNTL

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)

Biocontrol Species - Non-native Species
 Global: **GNR** State: **SNA**

Predicted Models:
M 50% Moderate (inductive),
 L 50% Low (inductive)

I - Oberea erythrocephala (Red-headed Leafy Spurge Stem Borer) **BIOCNTRL**

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)

[Biocontrol Species - Non-native Species](#)
 Global: **GNR** State: **SNA**

Predicted Models:
M 50% Moderate (inductive),
 L 50% Low (inductive)

I - *Aphthona nigriscutis* (Black Dot Leafy Spurge Flea Beetle) BIOCNTL

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)

[Biocontrol Species - Non-native Species](#)
 Global: **GNR** State: **SNA**

Predicted Models: L 100% Low (inductive)


☒ I - *Cyphocleonus achates* (Knapweed Root Weevil) **BIOCNTRL**

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)

[Biocontrol Species - Non-native Species](#)
 Global: **GNR** State: **SNA**

Predicted Models: L 100% Low (inductive)

I - *Mecinus janthinus* (Yellow Toadflax Stem-boring Weevil) **BIOCNTRL**

[View in Field Guide](#)
[View Predicted Models](#)
[View Range Maps](#)
Biocontrol Species - Non-native Species
Global: **GNR** State: **SNA**
Predicted Models:  100% Low (inductive)

Introduction to Montana Natural Heritage Program



P.O. Box 201800 • 1515 East Sixth Avenue • Helena, MT 59620-1800 • fax 406.444.0266 • phone 406.444.5363 • mtnhp.org

INTRODUCTION

The Montana Natural Heritage Program (MTNHP) is Montana's source for reliable and objective information on Montana's native species and habitats, emphasizing those of conservation concern. MTNHP was created by the Montana legislature in 1983 as part of the Natural Resource Information System (NRIS) at the Montana State Library (MSL). MTNHP is "a program of information acquisition, storage, and retrieval for data relating to the flora, fauna, and biological community types of Montana" (MCA 90-15-102). MTNHP's activities are guided by statute as well as through ongoing interaction with, and feedback from, principal data source agencies such as Montana Fish, Wildlife, and Parks, the Montana Department of Environmental Quality, the Montana Department of Natural Resources and Conservation, the Montana University System, the US Forest Service, and the US Bureau of Land Management. Since the first staff was hired in 1985, the Program has logged a long record of success, and developed into a highly respected, service-oriented program. MTNHP is widely recognized as one of the most advanced and effective of over 60 natural heritage programs that are distributed across North America.

VISION

Our vision is that public agencies, the private sector, the education sector, and the general public will trust and rely upon MTNHP as the source for information and expertise on Montana's species and habitats, especially those of conservation concern. We strive to provide easy access to our information to allow users to save time and money, speed environmental reviews, and make informed decisions.

CORE VALUES

- We endeavor to be a single statewide source of accurate and up-to-date information on Montana's plants, animals, and aquatic and terrestrial biological communities.
- We actively listen to our data users and work responsively to meet their information and training needs.
- We strive to provide neutral, trusted, timely, and equitable service to all of our information users.
- We make every effort to be transparent to our data users in setting work priorities and providing data products.

CONFIDENTIALITY

All information requests made to the Montana Natural Heritage Program are considered library records and are protected from disclosure by the Montana Library Records Confidentiality Act (MCA 22-1-11).

INFORMATION MANAGED

Information managed at the Montana Natural Heritage Program is botanical, zoological, and ecological information that describes the distribution (e.g., observations, structured surveys, range polygons, predicted habitat suitability models), conservation status (e.g., global and state conservation status ranks, including threats), and other supporting information (e.g., accounts and references) on the biology and ecology of species and biological communities.

Data Use Terms and Conditions


- Montana Natural Heritage Program (MTNHP) products and services are based on biological data and the objective interpretation of those data by professional scientists. MTNHP does not advocate any particular philosophy of natural resource protection, management, development, or public policy.
- MTNHP has no natural resource management or regulatory authority. Products, statements, and services from MTNHP are intended to inform parties as to the state of scientific knowledge about certain natural resources, and to further develop that knowledge. The information is not intended as natural resource management guidelines or prescriptions or a determination of environmental impacts. MTNHP recommends consultation with appropriate state, federal, and tribal resource management agencies and authorities in the area where your project is located.
- Information on the status and spatial distribution of biological resources produced by MTNHP are intended to inform parties of the state-wide status, known occurrence, or the likelihood of the presence of those resources. **These products are not intended to substitute for field-collected data, nor are they intended to be the sole basis for natural resource management decisions.**
- MTNHP does not portray its data as exhaustive or comprehensive inventories of rare species or biological communities. **Field verification of the absence or presence of sensitive species and biological communities will always be an important obligation of users of our data.**
- MTNHP responds equally to all requests for products and services, regardless of the purpose or identity of the requester.
- Because MTNHP constantly updates and revises its databases with new data and information, products will become outdated over time. Interested parties are encouraged to obtain the most current information possible from MTNHP, rather than using older products. We add, review, update, and delete records on a daily basis. Consequently, we strongly advise that you update your MTNHP data sets at a minimum of every four months for most applications of our information.
- MTNHP data require a certain degree of biological expertise for proper analysis, interpretation, and application. Our staff is available to advise you on questions regarding the interpretation or appropriate use of the data that we provide. See [Contact Information for MTNHP Staff](#)
- The information provided to you by MTNHP may include sensitive data that if publicly released might jeopardize the welfare of threatened, endangered, or sensitive species or biological communities. This information is intended for distribution or use only within your department, agency, or business. Subcontractors may have access to the data during the course of any given project, but should not be given a copy for their use on subsequent, unrelated work.
- MTNHP data are made freely available. Duplication of hard-copy or digital MTNHP products with the intent to sell is prohibited without written consent by MTNHP. Should you be asked by individuals outside your organization for the type of data that we provide, please refer them to MTNHP.
- MTNHP and appropriate staff members should be appropriately acknowledged as an information source in any third-party product involving MTNHP data, reports, papers, publications, or in maps that incorporate MTNHP graphic elements.
- Sources of our data include museum specimens, published and unpublished scientific literature, field surveys by state and federal agencies and private contractors, and reports from knowledgeable individuals. MTNHP actively solicits and encourages additions, corrections and updates, new observations or collections, and comments on any of the data we provide.
- MTNHP staff and contractors do not enter or cross privately-owned lands without express permission from the landowner. However, the program cannot guarantee that information provided to us by others was obtained under adherence to this policy.

Suggested Contacts for Natural Resource Management Agencies

As required by Montana statute (MCA 90-15), the Montana Natural Heritage Program works with state, federal, tribal, nongovernmental organizations, and private partners to ensure that the latest animal and plant distribution and status information is incorporated into our databases so that it can be used to inform a variety of permitting and planning processes and management decisions. We encourage you to contact state, federal, and tribal resource management agencies in the area where your project is located and review the permitting overviews by the [Montana Department of Environmental Quality](#), the [Montana Department of Natural Resources and Conservation](#) and the [Index of Environmental Permits for Montana](#) for guidelines relevant to your efforts. In particular, we encourage you to contact the Montana Department of Fish, Wildlife, and Parks for the latest data and management information regarding hunted and high-profile management species and to use the U.S. Fish and Wildlife Service's [Information Planning and Consultation \(IPAC\) website regarding](#) U.S. Endangered Species Act listed Threatened, Endangered, or Candidate species.

For your convenience, we have compiled a list of relevant agency contacts and links below:

Montana Fish, Wildlife, and Parks

Fish Species	Zachary Shattuck zshattuck@mt.gov (406) 444-1231 or Eric Roberts eroberts@mt.gov (406) 444-5334																												
American Bison Black-footed Ferret Black-tailed Prairie Dog Bald Eagle Golden Eagle Common Loon Least Tern Piping Plover Whooping Crane	Kristian Smucker KSmucker@mt.gov (406) 444-5209																												
Grizzly Bear Greater Sage Grouse Trumpeter Swan Big Game Upland Game Birds Furbearers	Brian Wakeling brian.wakeling@mt.gov (406) 444-3940																												
Managed Terrestrial Game Data	Cara Whalen– MFWP Data Analyst cara.whalen@mt.gov (406) 444-3759																												
Fisheries Data and Nongame Animal Data	Ryan Alger – MFWP Data Analyst ryan.alger@mt.gov (406) 444-5365																												
Wildlife and Fisheries Scientific Collector’s Permits	https://fwp.mt.gov/buyandapply/commercialwildlifeandscientificpermits/scientific Kristina Smucker for Wildlife ksmucker@mt.gov (406) 444-5209 Dave Schmetterling for Fisheries dschmetterling@mt.gov (406) 542-5514																												
Fish and Wildlife Recommendations for Subdivision Development	Charlie Sperry csperry@mt.gov (406) 444-3888 See https://fwp.mt.gov/conservation/living-with-wildlife/subdivision-recommendations																												
Regional Contacts 	<table><tr><td>Region 1</td><td>(Kalispell)</td><td>(406) 752-5501</td><td>fwprg12@mt.gov</td></tr><tr><td>Region 2</td><td>(Missoula)</td><td>(406) 542-5500</td><td>fwprg22@mt.gov</td></tr><tr><td>Region 3</td><td>(Bozeman)</td><td>(406) 577-7900</td><td>fwprg3@mt.gov</td></tr><tr><td>Region 4</td><td>(Great Falls)</td><td>(406) 454-5840</td><td>fwprg42@mt.gov</td></tr><tr><td>Region 5</td><td>(Billings)</td><td>(406) 247-2940</td><td>fwprg52@mt.gov</td></tr><tr><td>Region 6</td><td>(Glasgow)</td><td>(406) 228-3700</td><td>fwprg62@mt.gov</td></tr><tr><td>Region 7</td><td>(Miles City)</td><td>(406) 234-0900</td><td>fwprg72@mt.gov</td></tr></table>	Region 1	(Kalispell)	(406) 752-5501	fwprg12@mt.gov	Region 2	(Missoula)	(406) 542-5500	fwprg22@mt.gov	Region 3	(Bozeman)	(406) 577-7900	fwprg3@mt.gov	Region 4	(Great Falls)	(406) 454-5840	fwprg42@mt.gov	Region 5	(Billings)	(406) 247-2940	fwprg52@mt.gov	Region 6	(Glasgow)	(406) 228-3700	fwprg62@mt.gov	Region 7	(Miles City)	(406) 234-0900	fwprg72@mt.gov
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Region 2	(Missoula)	(406) 542-5500	fwprg22@mt.gov																										
Region 3	(Bozeman)	(406) 577-7900	fwprg3@mt.gov																										
Region 4	(Great Falls)	(406) 454-5840	fwprg42@mt.gov																										
Region 5	(Billings)	(406) 247-2940	fwprg52@mt.gov																										
Region 6	(Glasgow)	(406) 228-3700	fwprg62@mt.gov																										
Region 7	(Miles City)	(406) 234-0900	fwprg72@mt.gov																										

Montana Department of Agriculture

General Contact Information: <https://agr.mt.gov/About/Office-Locations/Office-Locations-and-Field-Offices>

Noxious Weeds: <https://agr.mt.gov/Noxious-Weeds>

Montana Department of Environmental Quality

Permitting and Operator Assistance for all Environmental Permits: <https://deq.mt.gov/Permitting>

Montana Department of Natural Resources and Conservation

Overview of, and contacts for, licenses and permits for state lands, water, and forested lands:

<https://dnrc.mt.gov/Permits-Services>

Stream Permitting (310 permits) and an overview of various water and stream related permits (e.g., Stream Protection Act 124, Federal Clean Water Act 404, Federal Rivers and Harbors Act Section 10, Short-term Water Quality Standard for Turbidity 318 Authorization, etc.).

<https://dnrc.mt.gov/Licenses-and-Permits/Stream-Permitting>

Wildfire Resources: <https://dnrc.mt.gov/Forestry/Wildfire>

Bureau of Land Management

Montana Field Office Contacts:



Billings	(406) 896-5013
Butte	(406) 533-7600
Dillon	(406) 683-8000
Glasgow	(406) 228-3750
Havre	(406) 262-2820
Lewistown	(406) 538-1900
Malta	(406) 654-5100
Miles City	(406) 233-2800
Missoula	(406) 329-3914

United States Army Corps of Engineers

Montana Regulatory Office for federal permits related to construction in water and wetlands

<https://www.nwo.usace.army.mil/Missions/Regulatory-Program/Montana/> (406) 441-1375

United States Environmental Protection Agency

Environmental information, notices, permitting, and contacts <https://www.epa.gov/mt>

Gateway to state resource locators <https://www.envcap.org/srl/index.php>

United States Fish and Wildlife Service

Information Planning and Conservation (IPAC) website: <https://ipac.ecosphere.fws.gov>

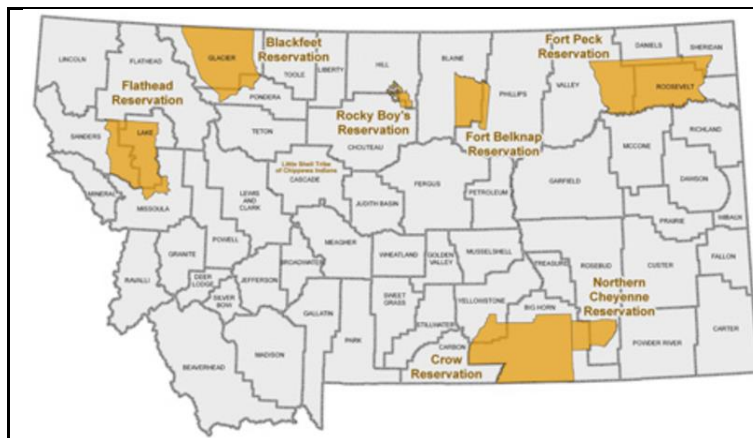
Montana Ecological Services Field Office: <https://www.fws.gov/office/montana-ecological-services> (406) 449-5225

United States Forest Service

Regional Office – Missoula, Montana Contacts

Wildlife Program Leader	Tammy Fletcher	tammy.fletcher2@usda.gov	(406) 329-3086
Wildlife Ecologist	Cara Staab	cara.staab@usda.gov	(406) 329-3677
Aquatic Ecologist	Justin Jimenez	justin.jimenez@usda.gov	(435) 370-6830
TES Program	Lydia Allen	lydia.allen@usda.gov	(406) 329-3558
Interagency Grizzly Bear Coordinator	Scott Jackson	scott.jackson@usda.gov	(406) 329-3664
Regional Botanist	Amanda Hendrix	amanda.hendrix@usda.gov	(651) 447-3016
Regional Vegetation Ecologist	Mary Manning	marry.manning@usda.gov	(406) 329-3304
Invasive Species Program Manager	Michelle Cox	michelle.cox2@usda.gov	(406) 329-3669

Tribal Nations



[Assiniboine & Gros Ventre Tribes – Fort Belknap Reservation](#)

[Assiniboine & Sioux Tribes – Fort Peck Reservation](#)

[Blackfeet Tribe - Blackfeet Reservation](#)

[Chippewa Creek Tribe - Rocky Boy's Reservation](#)

[Crow Tribe – Crow Reservation](#)

[Little Shell Chippewa Tribe](#)

[Northern Cheyenne Tribe – Northern Cheyenne Reservation](#)

[Salish & Kootenai Tribes - Flathead Reservation](#)

Natural Heritage Programs and Conservation Data Centers in Surrounding States and Provinces

[Alberta Conservation Information Management System](#)

[British Columbia Conservation Data Centre](#)

[Idaho Natural Heritage Program](#)

[North Dakota Natural Heritage Program](#)

[Saskatchewan Conservation Data Centre](#)

[South Dakota Natural Heritage Program](#)

[Wyoming Natural Diversity Database](#)

Invasive Species Management Contacts and Information

Aquatic Invasive Species

[Montana Fish, Wildlife, and Parks Aquatic Invasive Species staff](#)

[Montana Department of Natural Resources and Conservation's Aquatic Invasive Species Grant Program](#)

[Montana Invasive Species Council \(MISC\)](#)

[Upper Columbia Conservation Commission \(UC3\)](#)

Noxious Weeds

[Montana Weed Control Association Contacts Webpage](#)

[Montana Biological Weed Control Coordination Project](#)

[Montana Department of Agriculture - Noxious Weeds](#)

[Montana Weed Control Association](#)

[Montana Fish, Wildlife, and Parks - Noxious Weeds](#)

[Montana State University Integrated Pest Management Extension](#)

[Integrated Noxious Weed Management after Wildfires](#)

[Fire Management and Invasive Plants](#)

Introduction to Native Species

Within the report area you have requested, separate summaries are provided for: (1) Species Occurrences (SO) for plant and animal Species of Concern, Special Status Species (SSS), Important Animal Habitat (IAH) and some Potential Plant Species of Concern; (2) other observed non Species of Concern or Species of Concern without suitable documentation to create Species Occurrence polygons; and (3) other non-documented species that are potentially present based on their range, predicted suitable habitat model output, or presence of associated habitats. Each of these summaries provides the following information when present for a species: (1) the number of [Species Occurrences](#) and associated delineation criteria for construction of these polygons that have long been used for considerations of documented Species of Concern in environmental reviews; (2) the number of observations of each species; (3) the geographic range polygons for each species that the report area overlaps; (4) predicted relative habitat suitability classes that are present if a predicted suitable habitat model has been created; (5) the percent of the report area that is mapped as commonly associated or occasionally associated habitat as listed for each species in the [Montana Field Guide](#); and (6) a variety of conservation status ranks and links to species accounts in the [Montana Field Guide](#). Details on each of these information categories are included under relevant section headers below or are defined on our [Species Status Codes](#) page. In presenting this information, the Montana Natural Heritage Program (MTNHP) is working towards assisting the user with rapidly determining what species have been documented and what species are potentially present in the report area. We remind users that this information is likely incomplete as surveys to document native and introduced species are lacking in many areas of the state, information on introduced species has only been tracked relatively recently, the MTNHP's staff and resources are restricted by budgets, and information is constantly being added and updated in our databases. **Thus, field verification by professional biologists of the absence or presence of species and biological communities will always be an important obligation of users of our data.**

If you are aware of observation datasets that the MTNHP is missing, please report them to the Program Botanist apipp@mt.gov or Senior Zoologist dbachen@mt.gov. If you have animal or plant observations that you would like to contribute, you can also submit them via Excel spreadsheets, geodatabases, iNaturalist, or a Survey123 form. Various methods of data submission are reviewed in this playlist of videos: <https://www.youtube.com/playlist?list=PLRaydtZpHu2qOHPoSPq9cnM9uXGmEXACx>

Observations

The MTNHP manages information on several million animal and plant observations that have been reported by professional biologists and private citizens from across Montana. The majority of these observations are submitted in digital format from standardized databases associated with research or monitoring efforts and spreadsheets of incidental observations submitted by professional biologists and amateur naturalists. At a minimum, accepted observation records must contain a credible species identification (i.e. appropriate geographic range, date, and habitat and, if species are difficult to identify, a photograph and/or notes on key identifying features), a date or date range, observer name, locational information (ideally with latitude and longitude in decimal degrees), notes on numbers observed, and species behavior or habitat use (e.g., is the observation likely associated with reproduction). Bird records are also required to have information associated with date-appropriate breeding or overwintering status of the species observed. MTNHP reviews observation records to ensure that they are mapped correctly, occur within date ranges when the species is known to be present or detectable, occur within the known seasonal geographic range of the species, and occur in appropriate habitats. MTNHP also assigns each record a locational uncertainty value in meters to indicate the spatial precision associated with the record's mapped coordinates. Only records with locational uncertainty values of 10,000 meters or less are included in environmental summary reports and number summaries are only provided for records with locational uncertainty values of 1,000 meters or less.

Species Occurrences

The MTNHP evaluates plant and animal observation records for species of higher conservation concern to determine whether they are worthy of inclusion in the [Species Occurrence](#) (SO) layer for use in environmental reviews; observations not worthy of inclusion in this layer include long distance dispersal events, migrants observed away from key migratory stopover habitats, and winter observations. An SO is a polygon depicting what is known about a species occupancy from direct observation with a defined level of locational uncertainty and any inference that can be made about adjacent habitat use from the latest peer-reviewed science. If an observation can be associated with a map feature that can be tracked (e.g., a wetland boundary for a wetland associated plant) then this polygon feature is used to represent the SO. Areas that can be inferred as probable occupied habitat based on direct observation of a species location and what is known about the foraging area or home range size of the species may be incorporated into the SO. Species Occurrences generally belong to one of the following categories:

Plant Species Occurrences

A documented location of a specimen collection or observed plant population. In some instances, adjacent, spatially separated clusters are considered subpopulations and are grouped as one occurrence (e.g., the subpopulations occur in ecologically similar habitats, and their spatial proximity likely allows them to interbreed). Tabular information for multiple observations at the same SO location is generally linked to a single polygon. Plant SO's are only created for Species of Concern and Potential Species of Concern.

Animal Species Occurrences

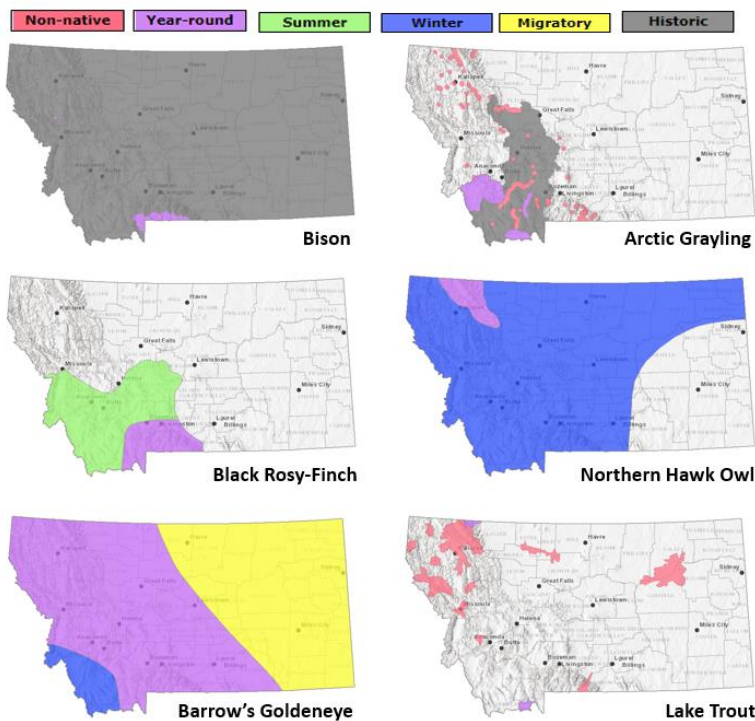
The location of a verified observation or specimen record typically known or assumed to represent a breeding population or a portion of a breeding population. Animal SO's are generally: (1) buffers of terrestrial point observations based on documented species' home range sizes; (2) buffers of stream segments to encompass occupied streams and immediate adjacent riparian habitats; (3) polygonal features encompassing known or likely breeding populations (e.g., a wetland for some amphibians or a forested portion of a mountain range for some wide-ranging carnivores); or (4) combinations of the above. Tabular information for multiple observations at the same SO location is generally linked to a single polygon. Species Occurrence polygons may encompass some unsuitable habitat in some instances in order to avoid heavy data processing associated with clipping out habitats that are readily assessed as unsuitable by the data user (e.g., a point buffer of a terrestrial species may overlap into a portion of a lake that is obviously inappropriate habitat for the species). Animal SO's are only created for Species of Concern and Special Status Species (e.g., Bald Eagle).

Other Occurrence Polygons

These include significant biological features not included in the above categories, such as Important Animal Habitats like bird rookeries and bat roosts, and peatlands or other wetland and riparian communities that support diverse plant and animal communities.

Geographic Range Polygons

Geographic range polygons are still under development for most plant and invertebrate species. Native year-round, summer, winter, migratory and historic geographic range polygons as well as polygons for introduced



populations have been defined for most vertebrate animal species for which there are enough observations, surveys, and knowledge of appropriate seasonal habitat use to define them (see examples to left). These native or introduced range polygons bound the extent of known or likely occupied habitats for non-migratory and relative sedentary species and the regular extent of known or likely occupied habitats for migratory and long-distance dispersing species; polygons may include unsuitable intervening habitats. For most species, a single polygon can represent the year-round or seasonal range, but breeding ranges of some colonial nesting water birds and some introduced species are represented more patchily when supported by data. Some ranges are mapped more broadly than actual distributions in order to be visible on statewide maps (e.g., fish).

Predicted Suitable Habitat Models

Predicted habitat suitability models have been created for plant and animal Species of Concern and are undergoing development for non-Species of Concern. For species for which models have been completed, the environmental summary report includes simple rule-based associations with streams for aquatic species and seasonal habitats for game species as well as mathematically complex Maximum Entropy models (Phillips et al. 2006, *Ecological Modeling* 190:231-259) constructed from a variety of statewide biotic and abiotic layers and presence only data for individual species for most terrestrial species. For the Maximum Entropy models, we reclassified 90 x 90-meter continuous model output into suitability classes (unsuitable, low, moderate, and optimal) then aggregated that into the one square mile hexagons used in the environmental summary report; this is the finest spatial scale we suggest using this information in management decisions and survey planning. Full model write ups for individual species that discuss model goals, inputs, outputs, and evaluation in much greater detail are posted on the MTNHP's [Predicted Suitable Habitat Models](#) webpage. Evaluations of predictive accuracy and specific limitations are included with the metadata for models of individual species. **Model outputs should not be used in place of on-the-ground surveys for species. Instead model outputs should be used in conjunction with habitat evaluations to determine the need for on-the-ground surveys for species.** We suggest that the percentage of predicted optimal and moderate suitable habitat within the report area be used in conjunction with geographic range polygons and the percentage of commonly associated habitats to generate lists of potential species that may occupy broader landscapes for the purposes of landscape-level planning.

Associated Habitats

Within the boundary of the intersected hexagons, we provide the approximate percentage of commonly or occasionally associated habitat for vertebrate animal species that regularly breed, overwinter, or migrate through the state; a detailed list of commonly and occasionally associated habitats is provided in individual species accounts in the [Montana Field Guide](#). We assigned common or occasional use of each of the ecological

systems mapped in Montana by: (1) using personal knowledge and reviewing literature that summarizes the breeding, overwintering, or migratory habitat requirements of each species; (2) evaluating structural characteristics and distribution of each ecological system relative to the species' range and habitat requirements; (3) examining the observation records for each species in the state-wide point observation database associated with each ecological system; and (4) calculating the percentage of observations associated with each ecological system relative to the percent of Montana covered by each ecological system to get a measure of numbers of observations versus availability of habitat. Species that breed in Montana were only evaluated for breeding habitat use, species that only overwinter in Montana were only evaluated for overwintering habitat use, and species that only migrate through Montana were only evaluated for migratory habitat use. In general, species were listed as associated with an ecological system if structural characteristics of used habitat documented in the literature were present in the ecological system or large numbers of point observations were associated with the ecological system. However, species were not listed as associated with an ecological system if there was no support in the literature for use of structural characteristics in an ecological system, even if point observations were associated with that system. Common versus occasional association with an ecological system was assigned based on the degree to which the structural characteristics of an ecological system matched the preferred structural habitat characteristics for each species as represented in the scientific literature. The percentage of observations associated with each ecological system relative to the percent of Montana covered by each ecological system was also used to guide assignment of common versus occasional association.

We suggest that the percentage of commonly associated habitat within the report area be used in conjunction with geographic range polygons and the percentage of predicted optimal and moderate suitable habitat from predictive models to generate lists of potential species that may occupy broader landscapes for the purposes of landscape-level planning. Users of this information should be aware that land cover mapping accuracy is particularly problematic when the systems occur as small patches or where the land cover types have been altered over the past decade. Thus, particular caution should be used when using the associations in assessments of smaller areas (e.g., evaluations of public land survey sections).

Introduction to Land Cover

Land Use/Land Cover is one of 15 [Montana Spatial Data Infrastructure](#) framework layers considered vital for making statewide maps of Montana and understanding its geography. The layer records all Montana natural vegetation, land cover and land use, classified from satellite and aerial imagery, mapped at a scale of 1:100,000, and interpreted with supporting ground-level data. The baseline map is adapted from the Northwest ReGAP (NWGAP) project land cover classification, which used 30m resolution multi-spectral Landsat imagery acquired between 1999 and 2001. Vegetation classes were drawn from the Ecological System Classification developed by NatureServe (Comer et al. 2003). The land cover classes were developed by Anderson et al. (1976). The NWGAP effort encompasses 12 map zones. Montana overlaps seven of these zones. The two NWGAP teams responsible for the initial land cover mapping effort in Montana were Sanborn and NWGAP at the University of Idaho. Both Sanborn and NWGAP employed a similar modeling approach in which Classification and Regression Tree (CART) models were applied to Landsat ETM+ scenes. The Spatial Analysis Lab within the Montana Natural Heritage Program was responsible for developing a seamless Montana land cover map with a consistent statewide legend from these two separate products. Additionally, the Montana land cover layer incorporates several other land cover and land use products (e.g., MSDI Structures and Transportation themes and the Montana Department of Revenue Final Land Unit classification) and reclassifications based on plot-level data and the latest NAIP imagery to improve accuracy and enhance the usability of the theme. Updates are done as partner support and funding allow, or when other MSDI datasets can be incorporated. Recent updates include fire perimeters and agricultural land use (annually), energy developments such as wind, oil and gas installations (2014), roads, structures and other impervious surfaces (various years): and local updates/improvements to specific ecological systems (e.g., central Montana grassland and sagebrush ecosystems). Current and previous versions of the Land Use/Land Cover layer with full metadata are available for download from the Montana State Library's [GIS Data List](#). More information on the land cover layer is available at: https://msl.mt.gov/geoinfo/msdi/land_use_land_cover/

Within the report area you have requested, land cover is summarized by acres of Level 1, Level 2, and Level 3 Ecological Systems.

Literature Cited

- Anderson, J.R. E.E. Hardy, J.T. Roach, and R.E. Witmer. 1976. A land use and land cover classification system for use with remote sensor data. U.S. Geological Survey Professional Paper 964.
- Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow, and J. Teague. 2003. Ecological systems of the United States: A working classification of U.S. terrestrial systems. NatureServe, Arlington, VA.

Introduction to Wetland and Riparian

Within the report area you have requested, wetland and riparian mapping is summarized by acres of each classification present. Summaries are only provided for modern MTNHP wetland and riparian mapping and not for outdated (NWI Legacy) or incomplete (NWI Scalable) mapping efforts; [described here](#). MTNHP has made all three of these datasets and associated metadata available for separate download on the Montana [Wetland and Riparian Framework](#) web page.

Wetland and Riparian mapping is one of 15 [Montana Spatial Data Infrastructure](#) framework layers considered vital for making statewide maps of Montana and understanding its geography. The wetland and riparian framework layer consists of spatial data representing the extent, type, and approximate location of wetlands, riparian areas, and deep water habitats in Montana.

Wetland and riparian mapping is completed through photointerpretation of 1-m resolution color infrared aerial imagery acquired from 2005 or later. A coding convention using letters and numbers is assigned to each mapped wetland. These letters and numbers describe the broad landscape context of the wetland, its vegetation type, its water regime, and the kind of alterations that may have occurred. Ancillary data layers such as topographic maps, digital elevation models, soils data, and other aerial imagery sources are also used to improve mapping accuracy. Wetland mapping follows the federal Wetland Mapping Standard and classifies wetlands according to the Cowardin classification system of the National Wetlands Inventory (NWI) (Cowardin et al. 1979, FGDC Wetlands Subcommittee 2013). Federal, State, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands differently than the NWI. Similar coding, based on U.S. Fish and Wildlife Service conventions, is applied to riparian areas (U.S. Fish and Wildlife Service 2009). These are mapped areas where vegetation composition and growth is influenced by nearby water bodies, but where soils, plant communities, and hydrology do not display true wetland characteristics. **These data are intended for use at a scale of 1:12,000 or smaller. Mapped wetland and riparian areas do not represent precise boundaries and digital wetland data cannot substitute for an on-site determination of jurisdictional wetlands.**

See detailed overviews, with examples, of both wetland and riparian classification systems and associated codes as a [storymap](#) and companion [guide](#)

Literature Cited

- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service, FWS/OBS-79/31. Washington, D.C. 103pp.
- Federal Geographic Data Committee. 2013. Classification of wetlands and deepwater habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, D.C.
- U.S. Fish and Wildlife Services. 2009. A system for mapping riparian areas in the western United States. Division of Habitat and Resource Conservation, Branch of Resource and Mapping Support, Arlington, Virginia.

Introduction to Land Management

Within the report area you have requested, land management information is summarized by acres of federal, state, and local government lands, tribal reservation boundaries, private conservation lands, and federal, state, local, and private conservation easements. Acreage for “Owned”, “Tribal”, or “Easement” categories represents non-overlapping areas that may be totaled. However, “Other Boundaries” represents managed areas such as National Forest boundaries containing private inholdings and other mixed ownership which may cause boundaries to overlap (e.g. a wilderness area within a forest). Therefore, acreages may not total in a straight-forward manner.

Because information on land stewardship is critical to effective land management, the Montana Natural Heritage Program (MTNHP) began compiling ownership and management data in 1997. The goal of the Montana Land Management Database is to manage a single, statewide digital data set that incorporates information from both public and private entities. The database assembles information on public lands, private conservation lands, and conservation easements held by state and federal agencies and land trusts and is updated on a regular basis. Since 2011, the Information Management group in the Montana State Library’s Digital Library Division has led the Montana Land Management Database in partnership with the MTNHP.

Public and private conservation land polygons are attributed with the name of the entity that owns it. The data are derived from the statewide [Montana Cadastral Parcel layer](#). Conservation easement data shows land parcels on which a public agency or qualified land trust has placed a conservation easement in cooperation with the landowner. The dataset contains no information about ownership or status of the mineral estate. For questions about the dataset or to report errors, please contact the Montana Natural Heritage Program at (406) 444-5363 or mtnhp@mt.gov. You can download various components of the Land Management Database and view associated metadata at the Montana State Library’s [GIS Data List](#) at the following links:

[Public Lands](#)

[Conservation Easements](#)

[Private Conservation Lands](#)

[Managed Areas](#)

Map features in the Montana Land Management Database or summaries provided in this report are not intended as a legal depiction of public or private surface land ownership boundaries and should not be used in place of a survey conducted by a licensed land surveyor. Similarly, map features do not imply public access to any lands. The Montana Natural Heritage Program makes no representations or warranties whatsoever with respect to the accuracy or completeness of this data and assumes no responsibility for the suitability of the data for a particular purpose. The Montana Natural Heritage Program will not be liable for any damages incurred as a result of errors displayed here. Consumers of this information should review or consult the primary data and information sources to ascertain the viability of the information for their purposes.

Introduction to Invasive and Pest Species

Within the report area you have requested, separate summaries are provided for: Aquatic Invasive Species, Noxious Weeds, Agricultural Pests, Forest Pests, and Biocontrol species that have been documented or potentially occur there based on the predicted suitability of habitat. Definitions for each of these invasive and pest species categories can be found on our [Species Status Codes](#) page.

Each of these summaries provides the following information when present for a species: (1) the number of observations of each species; (2) the geographic range polygons for each species, if developed, that the report area overlaps; (3) predicted relative habitat suitability classes that are present if a predicted suitable habitat model has been created; (4) the percent of the report area that is mapped as commonly associated or occasionally associated habitat as listed for each species in the [Montana Field Guide](#); and (5) links to species accounts in the [Montana Field Guide](#). Details on each of these information categories are included under relevant section headers under the Introduction to Native Species above or are defined on our [Species Status Codes](#) page. In presenting this information, the Montana Natural Heritage Program (MTNHP) is working towards assisting the user with rapidly determining what invasive and pest species have been documented and what species are potentially present in the report area. We remind users that this information is likely incomplete as surveys to document introduced species are lacking in many areas of the state, information on introduced species has only been tracked relatively recently, the MTNHP's staff and resources are limited, and information is constantly being added and updated in our databases. **Thus, field verification by professional biologists of the absence or presence of species will always be an important obligation of users of our data.**

If you are aware of observation or survey datasets for invasive or pest species that the MTNHP is missing, please report them to the Program Coordinator bmaxell@mt.gov Program Botanist apipp@mt.gov or Senior Zoologist dbachen@mt.gov If you have animal or plant observations that you would like to contribute, you can also submit them via Excel spreadsheets, geodatabases, iNaturalist, or a Survey123 form. Various methods of data submission are reviewed in this playlist of videos:

<https://www.youtube.com/playlist?list=PLRaydtZpHu2qOHPoSPq9cnM9uXGmEXACx>

Additional Information Resources

[MTNHP Staff Contact Information](#)

[Montana Field Guide](#)

[MTNHP Species of Concern Report - Animals and Plants](#)

[MTNHP Species Status Codes - Explanation](#)

[MTNHP Predicted Suitable Habitat Models](#) (for select Animals and Plants)

[MTNHP Request Information page](#)

[Montana Cadastral](#)

[Montana Code Annotated](#)

[Montana Fisheries Information System](#)

[Montana Fish, Wildlife, and Parks Subdivision Recommendations](#)

[Montana GIS Data Layers](#)

[Montana GIS Data Bundler](#)

[Montana Greater Sage-Grouse Project Submittal Site](#)

[Montana Ground Water Information Center](#)

[Montana Index of Environmental Permits, 21st Edition \(2018\)](#)

[Montana Environmental Policy Act \(MEPA\)](#)

[Montana Environmental Policy Act Analysis Resource List](#)

[Laws, Treaties, Regulations, and Agreements on Animals and Plants](#)

[Montana Spatial Data Infrastructure Layers](#)

[Montana State Historic Preservation Office Review and Compliance](#)

[Montana Stream Permitting: a guide for conservation district supervisors and others](#)

[Montana Water Information System](#)

[Montana Web Map Services](#)

[National Environmental Policy Act](#)

[Penalties for Misuse of Fish and Wildlife Location Data](#) (MCA 87-6-222)

[U.S. Fish and Wildlife Service Information for Planning and Consultation](#) (Section 7 Consultation)

[Web Soil Survey Tool](#)

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Gallatin County, Montana



Local office

Montana Ecological Services Field Office

☎ (406) 449-5225

📅 (406) 449-5339

585 Shenhard Way Suite 1

333 Shepherd Way, Suite 1

Helena, MT 59601-6287

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

-
1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
<p>Canada Lynx <i>Lynx canadensis</i></p> <p>There is final critical habitat for this species. Your location does not overlap the critical habitat.</p> <p>https://ecos.fws.gov/ecp/species/3652</p>	Threatened
<p>Grizzly Bear <i>Ursus arctos horribilis</i></p> <p>There is proposed critical habitat for this species.</p> <p>https://ecos.fws.gov/ecp/species/7642</p>	Threatened
<p>North American Wolverine <i>Gulo gulo luscus</i></p> <p>Wherever found</p> <p>No critical habitat has been designated for this species.</p> <p>https://ecos.fws.gov/ecp/species/5123</p>	Proposed Threatened

Insects

NAME	STATUS
<p>Monarch Butterfly <i>Danaus plexippus</i></p> <p>Wherever found</p> <p>No critical habitat has been designated for this species.</p> <p>https://ecos.fws.gov/ecp/species/9743</p>	Candidate

Flowering Plants

NAME	STATUS
<p>Ute Ladies'-tresses <i>Spiranthes diluvialis</i></p> <p>Wherever found</p> <p>No critical habitat has been designated for this species.</p> <p>https://ecos.fws.gov/ecp/species/2159</p>	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the [Bald and Golden Eagle Protection Act](#) and the [Migratory Bird Treaty Act](#).

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds
<https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide conservation measures for birds
<https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

There are bald and/or golden eagles in your project area.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON

Bald Eagle *Haliaeetus leucocephalus*

Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

Golden Eagle *Aquila chrysaetos*

Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1680>

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the

probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

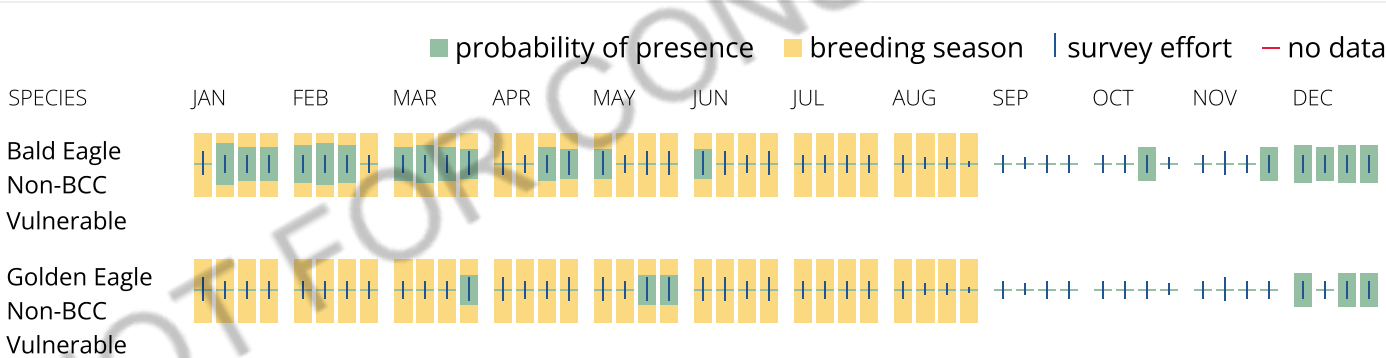
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply). To see a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the [Eagle Act](#) should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds
<https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide conservation measures for birds
<https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date

range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Aug 31
Cassin's Finch <i>Carpodacus cassinii</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9462	Breeds May 15 to Jul 15
Evening Grosbeak <i>Coccothraustes vespertinus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Aug 10
Golden Eagle <i>Aquila chrysaetos</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Lesser Yellowlegs <i>Tringa flavipes</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Pinyon Jay <i>Gymnorhinus cyanocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9420	Breeds Feb 15 to Jul 15

Western Grebe *aechmophorus occidentalis*

Breeds Jun 1 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/6743>

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (I)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

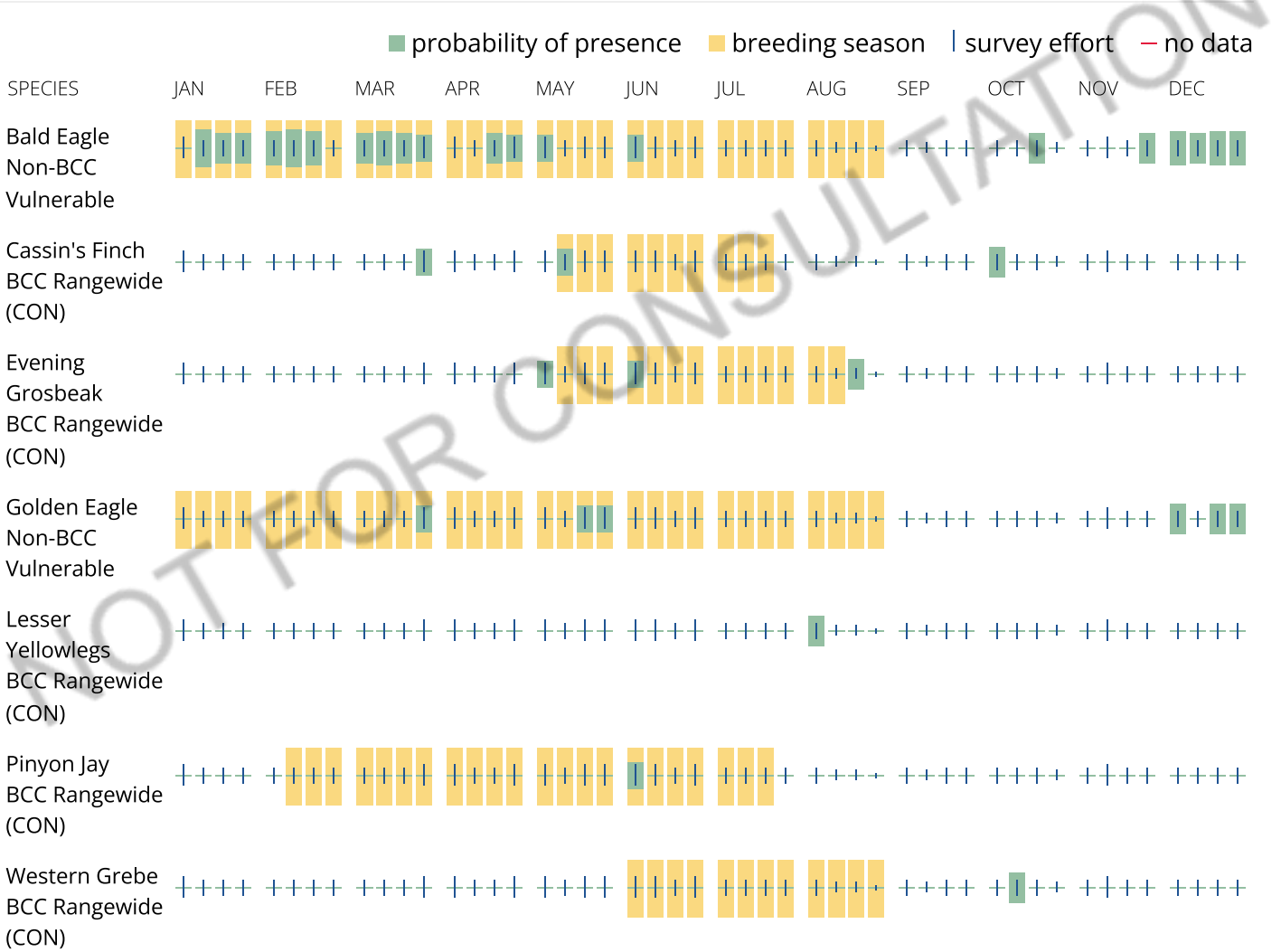
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure.

To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in

offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

[PEM1C](#)

[PEM1Cx](#)

[PEM1Ax](#)

[PEM1A](#)

FRESHWATER FORESTED/SHRUB WETLAND

[PSSAx](#)

[PSSA](#)

RIVERINE

[R3UBG](#)

[R4SBCx](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

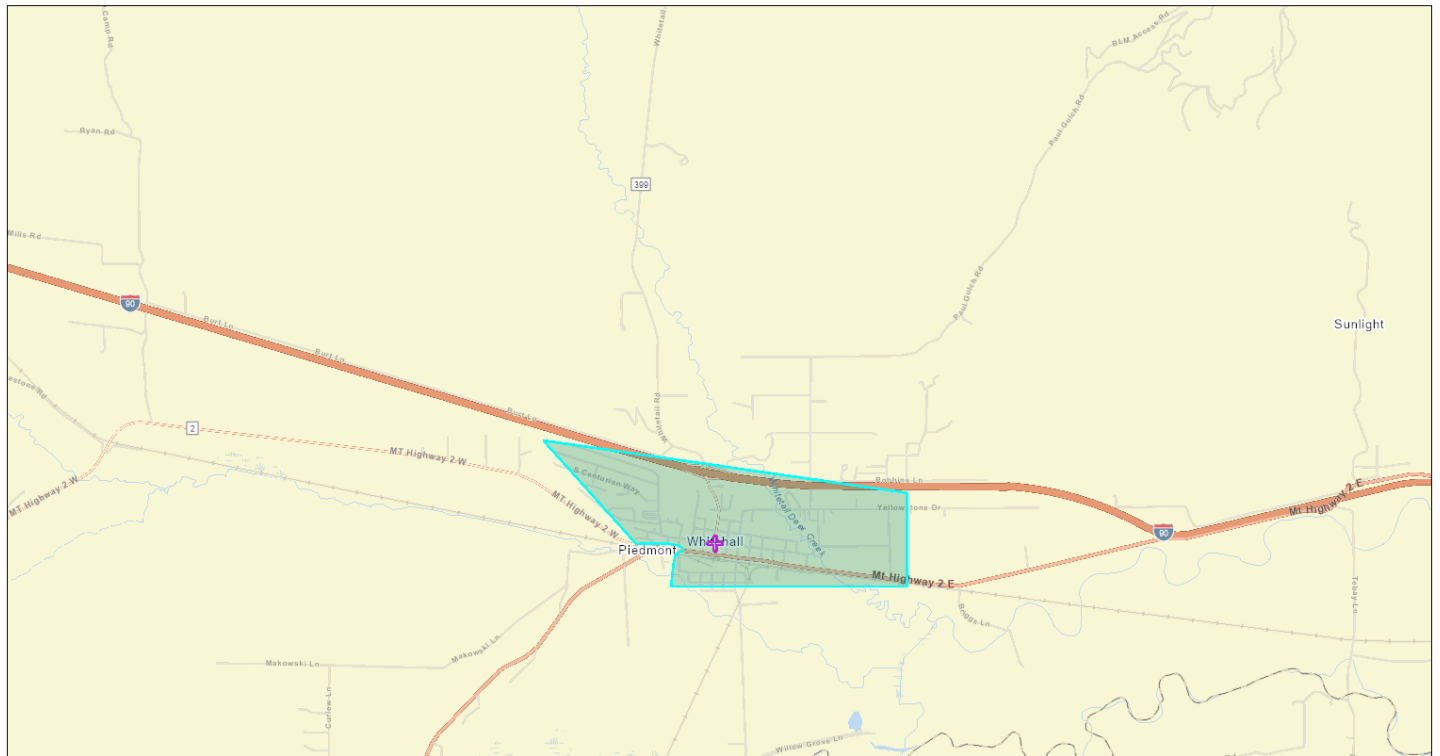
Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NEPAssist Report

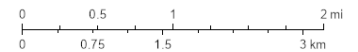


June 22, 2023

Project 1

 Search Result (point)

1:54,569



Montana State Library, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA


Input Coordinates: 45.880816,-112.124456,45.875797,-112.074417,45.866833,-112.074417,45.866833,-112.084202,45.866833,-112.106861,45.868984,-112.106518,45.869821,-112.106260,45.869881,-112.106260,45.869881,-112.106174,45.870000,-112.106089,45.870060,-112.105831,45.870060,-112.105745,45.870239,-112.105316,45.870359,-112.105144,45.870418,-112.105144,45.870478,-112.105230,45.870598,-112.105488,45.870777,-112.106089,45.870956,-112.107548,45.870896,-112.111668,45.880816,-112.124456

Project Area	1.46 sq mi
Within an Ozone 8-hr (1997 standard) Non-Attainment/Maintenance Area?	no
Within an Ozone 8-hr (2008 standard) Non-Attainment/Maintenance Area?	no
Within a Lead (2008 standard) Non-Attainment/Maintenance Area?	no
Within a SO2 1-hr (2010 standard) Non-Attainment/Maintenance Area?	no
Within a PM2.5 24hr (2006 standard) Non-Attainment/Maintenance Area?	no
Within a PM2.5 Annual (1997 standard) Non-Attainment/Maintenance Area?	no
Within a PM2.5 Annual (2012 standard) Non-Attainment/Maintenance Area?	no
Within a PM10 (1987 standard) Non-Attainment/Maintenance Area?	no
Within a Federal Land?	no
Within an impaired stream?	yes
Within an impaired waterbody?	no
Within a waterbody?	no
Within a stream?	yes
Within an NWI wetland?	Available Online
Within a Brownfields site?	yes
Within a Superfund site?	no
Within a Toxic Release Inventory (TRI) site?	no

Within a water discharger (NPDES)?	yes
Within a hazardous waste (RCRA) facility?	yes
Within an air emission facility?	no
Within a school?	yes
Within an airport?	no
Within a hospital?	yes
Within a designated sole source aquifer?	no
Within a historic property on the National Register of Historic Places?	yes
Within a Toxic Substances Control Act (TSCA) site?	no
Within a Land Cession Boundary?	yes
Within a tribal area (lower 48 states)?	no
Within the service area of a mitigation or conservation bank?	yes
Within the service area of an In-Lieu-Fee Program?	yes
Within a Public Property Boundary of the Formerly Used Defense Sites?	no
Within a Munitions Response Site?	no
Within an Essential Fish Habitat (EFH)?	no
Within a Habitat Area of Particular Concern (HAPC)?	no
Within an EFH Area Protected from Fishing (EFHA)?	no
Within a Bureau of Land Management Area of Critical Environmental Concern?	no
Within an ESA-designated Critical Habitat Area per U.S. Fish & Wildlife Service?	no
Within an ESA-designated Critical Habitat river, stream or water feature per U.S. Fish & Wildlife Service?	no

Created on: 6/22/2023 12:17:04 PM



 Project Area = 2.73 Acres



NO.	DESCRIPTION	DATE	DRAFT	REVIEW
1	MAP CREATION	5/15/23	KK	IS
2				
3				
4				
5				

NOTES

PROJECT AREA

MEADOWLARK MANOR SEWER & WATER MAIN EXTENSION - WHITEHALL, MT

FIGURE 1

JOB#: DNRCARPAM02
DATE: 5/15/2023

Path: M:\DNRCARPAM02\GIS\Environment\EnviroAssessment.aprx, Author: kresan





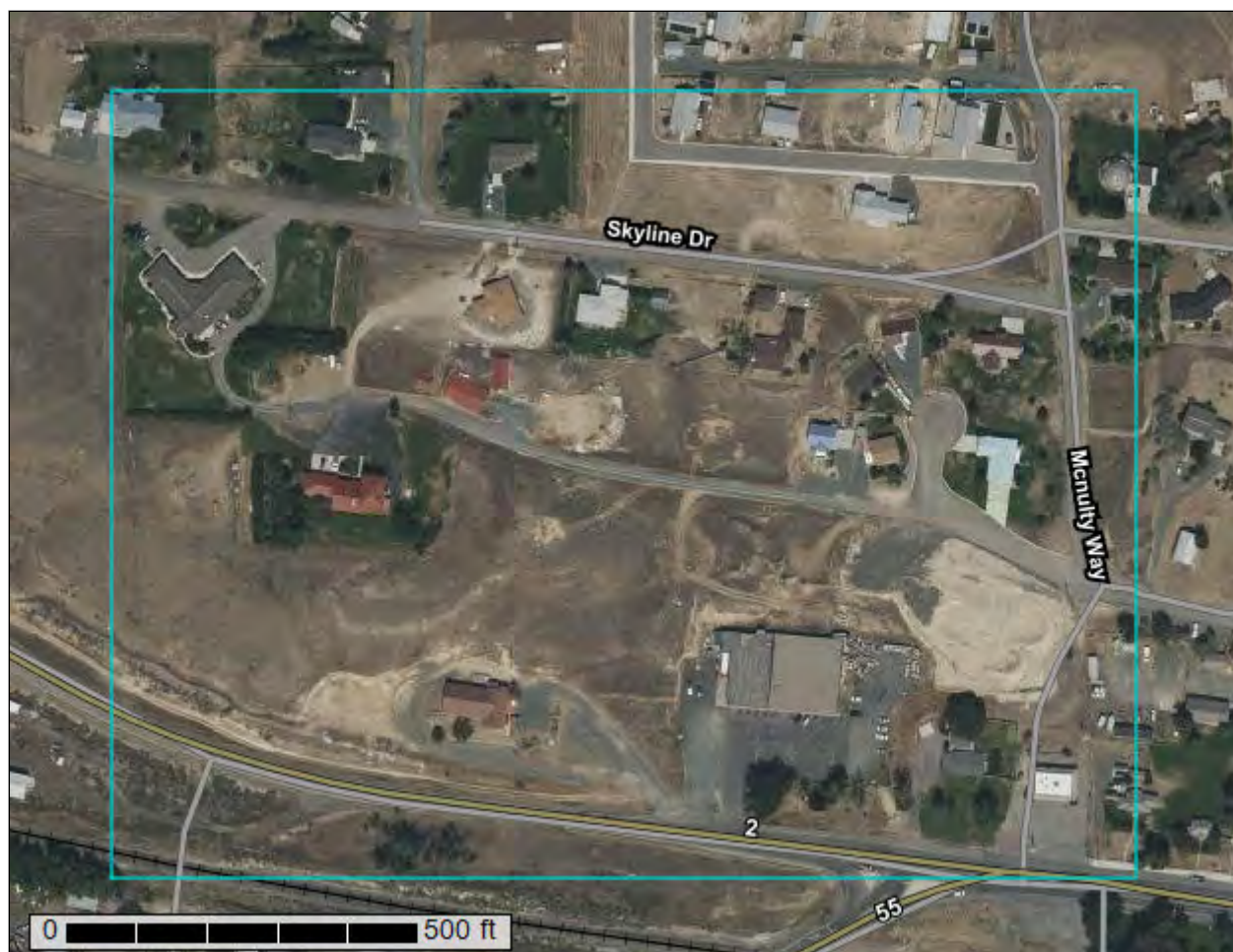
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Jefferson County Area and Part of Silver Bow County, Montana



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

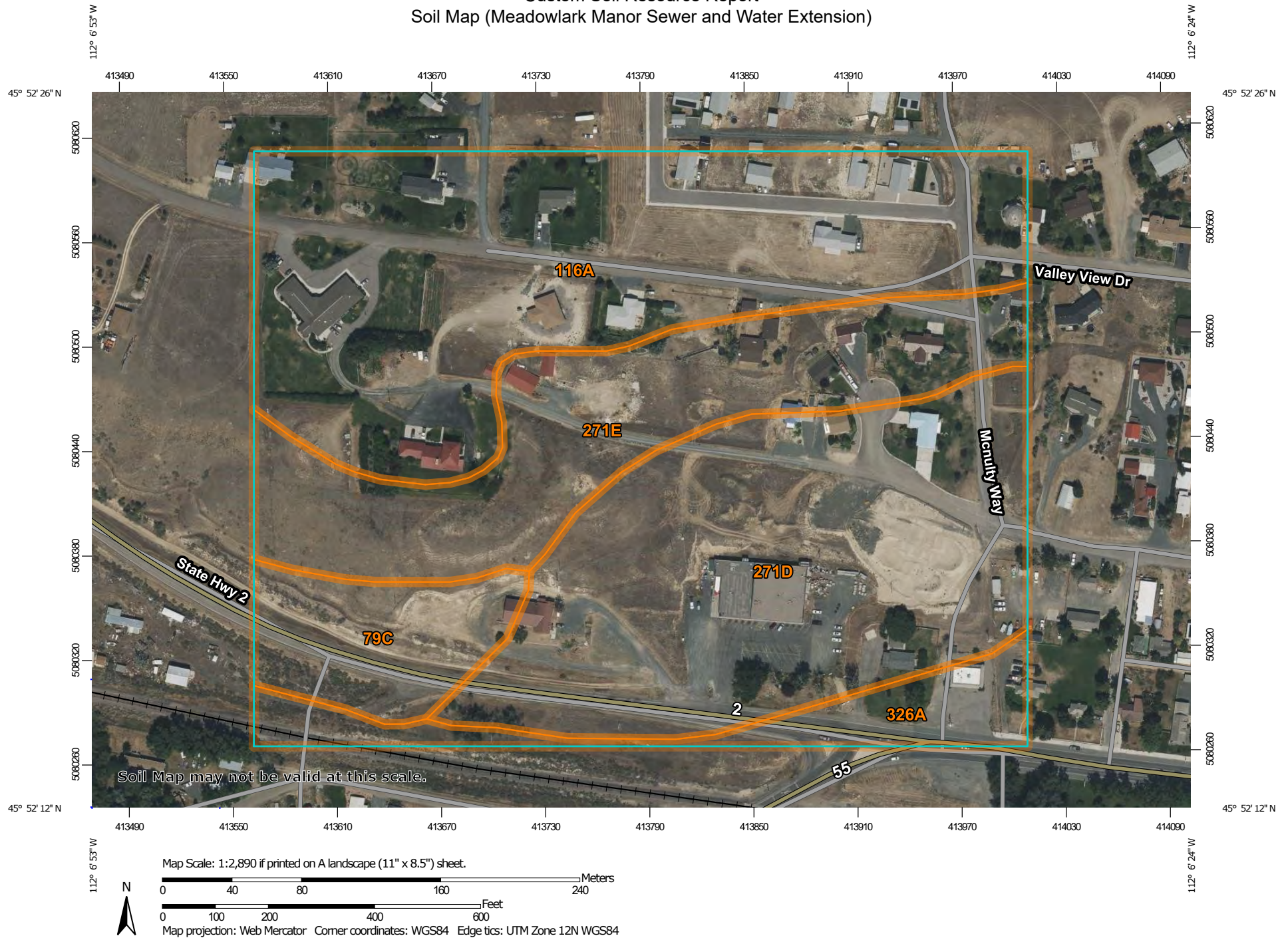
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.


Custom Soil Resource Report
Soil Map (Meadowlark Manor Sewer and Water Extension)



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)


Soils


 Soil Map Unit Polygons


 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water


 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole

 Slide or Slip


 Sodic Spot


 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals


Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Jefferson County Area and Part of Silver Bow County, Montana
Survey Area Data: Version 23, Aug 30, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 17, 2022—Aug 23, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

Custom Soil Resource Report

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

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Map Unit Legend (Meadowlark Manor Sewer and Water Extension)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
79C	Chinook sandy loam, 2 to 8 percent slopes	2.6	6.9%
116A	Amesha loam, 0 to 2 percent slopes	13.6	35.9%
271D	Bronec-Amesha complex, 8 to 15 percent slopes	11.8	31.3%
271E	Bronec-Amesha-Bronec complex, 15 to 35 percent slopes	7.5	19.7%
326A	Fairway-Moltoner complex, 0 to 2 percent slopes	2.3	6.2%
Totals for Area of Interest		37.8	100.0%

Map Unit Descriptions (Meadowlark Manor Sewer and Water Extension)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit

Custom Soil Resource Report

descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Custom Soil Resource Report

Jefferson County Area and Part of Silver Bow County, Montana

79C—Chinook sandy loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 52h5

Elevation: 3,800 to 5,000 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 90 to 115 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Chinook and similar soils: 95 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chinook

Setting

Landform: Alluvial fans, terraces, hills

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Coarse-loamy alluvium

Typical profile

A - 0 to 7 inches: sandy loam

Bw - 7 to 15 inches: sandy loam

Bk - 15 to 60 inches: sandy loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: A

Ecological site: R044BA110MT - Sandy (Sy) LRU 01 Subset A

Hydric soil rating: No

Minor Components

Raghorn

Percent of map unit: 2 percent

Landform: Knolls, hillsides, alluvial fans

Down-slope shape: Linear

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Across-slope shape: Linear
Ecological site: R044BA110MT - Sandy (Sy) LRU 01 Subset A
Hydric soil rating: No

Cozberg

Percent of map unit: 2 percent
Landform: Valley floors, terraces, alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044BA110MT - Sandy (Sy) LRU 01 Subset A
Hydric soil rating: No

Amesha

Percent of map unit: 1 percent
Landform: Knolls, plains, hillsides, alluvial fans
Landform position (two-dimensional): Footslope, toeslope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044BA030MT - Limy (Ly) LRU 01 Subset A
Hydric soil rating: No

116A—Amesha loam, 0 to 2 percent slopes**Map Unit Setting**

National map unit symbol: 51mf
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 115 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Amesha and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Amesha**Setting**

Landform: Knolls, plains, hillsides, alluvial fans
Landform position (two-dimensional): Footslope, toeslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous coarse-loamy tertiary valley fill alluvium

Typical profile

A - 0 to 4 inches: loam
Bk - 4 to 32 inches: loam
BC - 32 to 60 inches: gravelly sandy loam

Custom Soil Resource Report

Properties and qualities*Slope:* 0 to 2 percent*Depth to restrictive feature:* More than 80 inches*Drainage class:* Well drained*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high
(0.57 to 1.98 in/hr)*Depth to water table:* More than 80 inches*Frequency of flooding:* None*Frequency of ponding:* None*Calcium carbonate, maximum content:* 35 percent*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)*Available water supply, 0 to 60 inches:* High (about 9.1 inches)**Interpretive groups***Land capability classification (irrigated):* 4e*Land capability classification (nonirrigated):* 4e*Hydrologic Soil Group:* B*Ecological site:* R044BA030MT - Limy (Ly) LRU 01 Subset A*Hydric soil rating:* No**Minor Components****Kalsted***Percent of map unit:* 2 percent*Landform:* Ridges, terraces, escarpments, hillsides, alluvial fans*Down-slope shape:* Linear*Across-slope shape:* Linear*Ecological site:* R044BA110MT - Sandy (Sy) LRU 01 Subset A*Hydric soil rating:* No**Bronec***Percent of map unit:* 2 percent*Landform:* Alluvial fans, hillsides, escarpments, valley floors*Down-slope shape:* Linear*Across-slope shape:* Linear*Ecological site:* R044BA036MT - Droughty (Dr) LRU 01 Subset A*Hydric soil rating:* No**Sappington***Percent of map unit:* 1 percent*Landform:* Knolls, plains, hillsides, alluvial fans*Landform position (two-dimensional):* Footslope, toeslope*Down-slope shape:* Linear*Across-slope shape:* Linear*Ecological site:* R044BA001MT - Clayey (Cy) LRU 01 Subset A*Hydric soil rating:* No

Custom Soil Resource Report

271D—Bronec-Amesha complex, 8 to 15 percent slopes**Map Unit Setting***National map unit symbol:* 523r*Elevation:* 3,800 to 5,000 feet*Mean annual precipitation:* 10 to 14 inches*Mean annual air temperature:* 37 to 45 degrees F*Frost-free period:* 90 to 115 days*Farmland classification:* Farmland of local importance**Map Unit Composition***Bronec and similar soils:* 50 percent*Amesha and similar soils:* 30 percent*Minor components:* 20 percent*Estimates are based on observations, descriptions, and transects of the mapunit.***Description of Bronec****Setting***Landform:* Alluvial fans, hillsides, escarpments, alluvial fans, valley floors*Down-slope shape:* Linear*Across-slope shape:* Linear*Parent material:* Sandy and gravelly calcareous alluvium; sandy and gravelly calcareous slope alluvium; sandy and gravelly calcareous tertiary valley fill alluvium; sandy and gravelly colluvium**Typical profile***A - 0 to 5 inches:* cobbly loam*Bk - 5 to 35 inches:* very gravelly loam*BC - 35 to 60 inches:* very gravelly sandy loam**Properties and qualities***Slope:* 8 to 15 percent*Depth to restrictive feature:* More than 80 inches*Drainage class:* Well drained*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)*Depth to water table:* More than 80 inches*Frequency of flooding:* None*Frequency of ponding:* None*Calcium carbonate, maximum content:* 40 percent*Maximum salinity:* Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)*Sodium adsorption ratio, maximum:* 4.0*Available water supply, 0 to 60 inches:* Moderate (about 6.1 inches)**Interpretive groups***Land capability classification (irrigated):* 4e*Land capability classification (nonirrigated):* 4e*Hydrologic Soil Group:* B*Ecological site:* R044BA036MT - Droughty (Dr) LRU 01 Subset A

Custom Soil Resource Report

Hydric soil rating: No

Description of Amesha**Setting**

Landform: Knolls, alluvial fans, plains, knolls, hillsides, alluvial fans

Landform position (two-dimensional): Footslope, toeslope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Calcareous coarse-loamy tertiary valley fill alluvium; calcareous gravelly colluvium

Typical profile

A - 0 to 4 inches: gravelly loam

Bk - 4 to 29 inches: loam

BC - 29 to 60 inches: gravelly loam

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 35 percent

Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Ecological site: R044BA030MT - Limy (Ly) LRU 01 Subset A

Hydric soil rating: No

Minor Components**Sappington**

Percent of map unit: 5 percent

Landform: Knolls, alluvial fans, plains, knolls, hillsides, alluvial fans

Landform position (two-dimensional): Footslope, toeslope

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R044BA001MT - Clayey (Cy) LRU 01 Subset A

Hydric soil rating: No

Bronec, stony

Percent of map unit: 5 percent

Landform: Alluvial fans, hillsides, escarpments, alluvial fans, valley floors

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R044BA038MT - Droughty Steep (DrStp) LRU 01 Subset A

Hydric soil rating: No

Amesha, greater slope

Percent of map unit: 5 percent

Landform: Knolls, alluvial fans, plains, knolls, hillsides, alluvial fans

Custom Soil Resource Report

Landform position (two-dimensional): Footslope, toeslope

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R044BA040MT - Loamy Steep (LoStp) LRU 01 Subset A

Hydric soil rating: No

Geohrock

Percent of map unit: 5 percent

Landform: Valley floors, terraces, alluvial fans

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R044BA036MT - Droughty (Dr) LRU 01 Subset A

Hydric soil rating: No

271E—Bronec-Amesha-Bronec complex, 15 to 35 percent slopes**Map Unit Setting**

National map unit symbol: 523s

Elevation: 3,800 to 5,000 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 90 to 115 days

Farmland classification: Not prime farmland

Map Unit Composition

Bronec and similar soils: 35 percent

Amesha and similar soils: 30 percent

Bronec, very cobbly, and similar soils: 20 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bronec**Setting**

Landform: Alluvial fans, hillsides, escarpments, valley floors

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy and gravelly calcareous alluvium; sandy and gravelly calcareous slope alluvium; sandy and gravelly calcareous tertiary valley fill alluvium; sandy and gravelly colluvium

Typical profile

A - 0 to 5 inches: cobbly loam

Bk - 5 to 35 inches: very gravelly loam

BC - 35 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 15 to 35 percent

Depth to restrictive feature: More than 80 inches

Custom Soil Resource Report

Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
 (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R044BA038MT - Droughty Steep (DrStp) LRU 01 Subset A
Hydric soil rating: No

Description of Amesha**Setting**

Landform: Knolls, alluvial fans, plains, hillsides
Landform position (two-dimensional): Footslope, toeslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous coarse-loamy tertiary valley fill alluvium; calcareous
 gravelly colluvium

Typical profile

A - 0 to 4 inches: gravelly loam
Bk - 4 to 29 inches: loam
BC - 29 to 60 inches: gravelly loam

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
 (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R044BA040MT - Loamy Steep (LoStp) LRU 01 Subset A
Hydric soil rating: No

Description of Bronec, Very Cobbly**Setting**

Landform: Alluvial fans, hillsides, escarpments, valley floors
Down-slope shape: Linear

Custom Soil Resource Report

Across-slope shape: Linear

Parent material: Sandy and gravelly calcareous alluvium; sandy and gravelly calcareous slope alluvium; sandy and gravelly calcareous tertiary valley fill alluvium; sandy and gravelly colluvium

Typical profile

A - 0 to 5 inches: very cobbly loam

Bk - 5 to 35 inches: very gravelly loam

BC - 35 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 15 to 35 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 40 percent

Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: B

Ecological site: R044BA038MT - Droughty Steep (DrStp) LRU 01 Subset A

Hydric soil rating: No

Minor Components**Bronec, very stony**

Percent of map unit: 5 percent

Landform: Alluvial fans, hillsides, escarpments, valley floors

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R044BA038MT - Droughty Steep (DrStp) LRU 01 Subset A

Hydric soil rating: No

Amesha, greater slope

Percent of map unit: 4 percent

Landform: Hillsides, alluvial fans, plains, knolls

Landform position (two-dimensional): Footslope, toeslope

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R044BA040MT - Loamy Steep (LoStp) LRU 01 Subset A

Hydric soil rating: No

Sappington

Percent of map unit: 3 percent

Landform: Alluvial fans, plains, knolls, hillsides

Landform position (two-dimensional): Footslope, toeslope

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R044BA001MT - Clayey (Cy) LRU 01 Subset A

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Hydric soil rating: No

Geohrock

Percent of map unit: 2 percent

Landform: Valley floors, terraces, alluvial fans

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R044BA036MT - Droughty (Dr) LRU 01 Subset A

Hydric soil rating: No

Cabbart, very stony

Percent of map unit: 1 percent

Landform: Knolls, hills, escarpments

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R044BA136MT - Shallow Loamy (SwLo) LRU 01 Subset A

Hydric soil rating: No

326A—Fairway-Moltoner complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 5251

Elevation: 3,800 to 5,500 feet

Mean annual precipitation: 10 to 14 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 90 to 115 days

Farmland classification: Farmland of local importance

Map Unit Composition

Fairway and similar soils: 50 percent

Moltoner and similar soils: 35 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fairway

Setting

Landform: Flood plains, terraces, flood-plain steps

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Fine-loamy alluvium

Typical profile

A - 0 to 13 inches: clay loam

Bk - 13 to 25 inches: silty clay loam

Bg - 25 to 60 inches: stratified fine sandy loam to silty clay loam

Custom Soil Resource Report

Properties and qualities*Slope:* 0 to 2 percent*Depth to restrictive feature:* More than 80 inches*Drainage class:* Somewhat poorly drained*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.57 in/hr)*Depth to water table:* About 24 to 42 inches*Frequency of flooding:* NoneRare*Frequency of ponding:* None*Calcium carbonate, maximum content:* 15 percent*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)*Available water supply, 0 to 60 inches:* High (about 10.3 inches)**Interpretive groups***Land capability classification (irrigated):* 3w*Land capability classification (nonirrigated):* 3w*Hydrologic Soil Group:* C*Ecological site:* R044BP815MT - Subirrigated Grassland*Hydric soil rating:* No**Description of Moltoner****Setting***Landform:* Flood-plain steps, flood plains, drainageways*Down-slope shape:* Linear*Across-slope shape:* Linear*Parent material:* Saline and sodic fine-loamy stratified recent alluvium**Typical profile***Az - 0 to 5 inches:* silty clay loam*Cz - 5 to 27 inches:* silt loam*Czg - 27 to 49 inches:* loam*Cg - 49 to 60 inches:* loam**Properties and qualities***Slope:* 0 to 2 percent*Depth to restrictive feature:* More than 80 inches*Drainage class:* Poorly drained*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.57 in/hr)*Depth to water table:* About 12 to 24 inches*Frequency of flooding:* NoneRare*Frequency of ponding:* None*Calcium carbonate, maximum content:* 20 percent*Maximum salinity:* Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)*Sodium adsorption ratio, maximum:* 30.0*Available water supply, 0 to 60 inches:* Moderate (about 6.7 inches)**Interpretive groups***Land capability classification (irrigated):* 6s*Land capability classification (nonirrigated):* 7s*Hydrologic Soil Group:* C/D*Ecological site:* R044BP813MT - Subirrigated Saline-Sodic Grassland*Hydric soil rating:* Yes

Custom Soil Resource Report

Minor Components

Faith

Percent of map unit: 5 percent
Landform: Drainageways, terraces, flood-plain steps, alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044BA032MT - Loamy (Lo) LRU 01 Subset A
Hydric soil rating: No

Nestley

Percent of map unit: 4 percent
Landform: Flood-plain steps, flood plains, drainageways
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044BP815MT - Subirrigated Grassland
Hydric soil rating: No

Mckenton

Percent of map unit: 3 percent
Landform: Flood-plain steps, flood plains, drainageways
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R044BP815MT - Subirrigated Grassland
Hydric soil rating: Yes

Ledger

Percent of map unit: 3 percent
Landform: Flood-plain steps, flood plains, drainageways
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R043BP814MT - Subirrigated Saline-Sodic Shrubland Group
Hydric soil rating: No

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**DEPARTMENT OF ENVIRONMENTAL QUALITY
MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM**

Fact Sheet

Permittee:	Town of Whitehall
Permit No.:	MT0020133
Receiving Water:	Big Pipestone Creek
Facility Information:	
Name	Town of Whitehall Domestic Wastewater Treatment Facility
Location	Township 1N, Range 4W, Section 2, Jefferson County
Facility Contact:	Kory Klapan, Public Works Director P.O. Box 529 Whitehall, MT 59759
Fee Information:	
Type	Minor Publicly Owned Treatment Works
Type of Outfall	001 – Facility Discharge

I. Permit Status

This is a renewal of Montana Pollutant Discharge Elimination System (MPDES) permit MT0020133. The 2009-issued permit became effective March 1, 2009 and expired February 28, 2014. The Montana Department of Environmental Quality (DEQ) received an application and fees from the Town of Whitehall (Whitehall) for renewal of MT0020133 on July 22, 2013. DEQ replied with a notice of deficiency on August 9, 2013 and a final notice of deficiency on April 24, 2014. DEQ received updated application information from the Town on May 12, 2014, deemed the application complete, and the 2009-issued permit was administratively extended (ARM 17.30.1313) in a letter dated May 21, 2014.

II. Facility Information

A. Facility Description

Whitehall Wastewater Treatment Facility (WWTF) is a three-celled facultative lagoon system classified as a minor publicly owned treatment works (POTW). The WWTF was originally built in the late 1950's, upgraded in 1988, and significantly upgraded in 2012 to a system with one primary treatment cell, two secondary storage cells, an irrigation pump, and a center pivot irrigation system for effluent disposal by land application. A schematic of the upgraded facility is included in Figure 1. Average daily design flow is 0.16 million gallons per day (mgd). The cells are lined with a high density polyethylene (HDPE) geomembrane liner with rip rap on slopes, and sized to provide approximately 237 days of total hydraulic detention time. The primary treatment cell has a treatment capacity of 6.7 million gallons (MG) and the storage cells have a storage capacity of 15 MG and 11.9 MG, respectively. The facility can be operated in series or parallel.

Since September 2012, there has been no discharge to Big Pipestone Creek, and treated wastewater is land applied via the center pivot irrigation system. However, the facility is maintaining permit coverage in the case that there is a want or need to discharge effluent to Big Pipestone Creek. Discharge, if necessary, is directed by pumping from lagoon 2 or 3 to outfall 001 into Big Pipestone Creek through a V-notch weir with a staff gage and ultraviolet (UV) light housing. UV disinfection is not used for land application of effluent, but is available during a discharge event. **Table 1** summarizes the current WWTF design criteria.

Table 1: Current Design Criteria Summary	
Facility Description: Three-cell facultative lagoon system, total retention/periodic discharge with intermittent land application, UV disinfection.	
Construction Date: late 1950's, operational 1960 ⁽¹⁾	Modification Date: 1988, 2012
Design Population: 1,038 ⁽²⁾	Current Population: 1,100 (2013 application material)
Design Flow, Average (mgd): 0.16 ⁽²⁾	Design Flow, Maximum Day (mgd): unknown
Primary Cells: 1	Secondary Cells: 2
Number Aerated Cells: 0	Minimum Detention Time Total System (days): 237 ⁽²⁾
Design BOD ₅ Removal (%): unknown	Design BOD ₅ Load (lb/day): 276 ⁽²⁾
Design TSS Removal (%): unknown	Design TSS Load (lb/day): unknown
Collection System Combined [] Separate [X]	Estimated I/I: negligible
Sanitary Sewer Overflow (SSO) Events (Y/N): Y July, 2009 ⁽³⁾	Bypass Events (Y/N): unknown
Disinfection (Y/N): Y	Type: UV ⁽⁴⁾
Footnotes:	
(1) Great West Engineering, 2006 PER	
(2) Great West Engineering, 2011 Whitehall Wastewater Improvements Project Design Memorandum	
(3) Administrative Order on Consent Docket No. WQ-10-24	
(4) Personal communication with Dale Davis, Mayor, and Kory Klapan, Public Works Director, on Oct. 03, 2016	

Wastewater from the gravity flow collection system flows into a lift station and is then pumped to the inlet bypass structure for discharge into the primary treatment cell, and then to the storage cell 2, and finally storage cell 3 if cell 2 has reached capacity. If necessary, the storage cells may be dewatered to the sludge storage depth in the fall for maximum storage during winter months. In the summer months, wastewater is pumped from the storage cells to a center pivot sprinkler system for land-applied irrigation. Some areas of the collections system were constructed in 1915 and others in 1960 with recent upgrades. In 2012, approximately 11,000 feet of gravity sewer main was rehabilitated with approximately 2,610 feet of transmission main abandoned in place. A new package lift station was installed and an 8 inch forcemain was constructed from the lift station to the lagoons. The DEQ August 4, 2016 Lagoon Operation and Maintenance (O&M) Report observes an average flow of 0.06 mgd for a population of approximately 1100, equating to 55 gpcd. Therefore, I/I flows are estimated to be negligible.

A sludge removal project for the abandoned east lagoon was scheduled as part of facility upgrades and was completed by 2013. Actual detention time in the lagoon system may be impacted by sludge build up in the cells. Lagoons 1 (primary treatment), 2 (storage), and 3 (storage) have a maximum sludge depth of 2.0 ft, 1.0 ft, and 1.0 ft, respectively. The August 2016 Lagoon O&M Report recommends sludge levels be checked in 2017 or 2018. Storage and application of sludge, as needed, shall meet requirements of EPA regulations (40 CFR 503).

B. Effluent Characteristics

Effluent characteristic data as reported on discharge monitoring reports (DMRs) for a period of record (POR) from January 2011 through August 2012 are provided in **Table 2**. The Whitehall WWTF has not discharged since August, 2012 when land application of effluent began. Therefore, no self-monitoring effluent data representative of the current upgraded system exist.

Table 2: DMR Effluent Characteristics ⁽¹⁾ – January 2011 through August 2012

Parameter	Location	Units	2009 Permit Limit	Minimum Value	Maximum Value	Average Value	Number of Records
Flow, Daily Average	Effluent	mgd	⁽²⁾	0.087	0.104	0.095	15
5-Day Biochemical Oxygen Demand (BOD ₅)	Influent	mg/L	⁽²⁾	8.7	195	132	16
	Effluent	mg/L	45/65 ⁽³⁾	1.0	39	14	14
	NA	% removal ⁽⁴⁾	65	46	100	89	15
	Effluent	lb/day	136/94 ⁽³⁾	0.83	31.2	11.0	14
Total Suspended Solids (TSS)	Influent	mg/L	⁽²⁾	15	158	89	16
	Effluent	mg/L	45/65 ⁽³⁾	4.0	40	13	14
	NA	% removal ⁽⁴⁾	65	66	100	88	15
	Effluent	lb/day	136/94 ⁽³⁾	2.9	32.4	10.3	14
<i>Escherichia coli</i> ⁽⁴⁾⁽⁵⁾	Effluent	cfu/100mL	252/126 ⁽³⁾	1.7	296	131	9
<i>Escherichia coli</i> ⁽⁴⁾⁽⁶⁾	Effluent	cfu/100mL	1,260/630 ⁽³⁾	4.3	24200	1578	6
pH	Effluent	s.u.	6.0-9.0	7.5	9.0	7.9	30
Temperature	Effluent	°C	⁽²⁾	5.33	25.3	14.6	15
Ammonia, total as N	Effluent	mg/L	⁽²⁾	0.35	24.7	12.3	15
Total Kjeldahl Nitrogen	Effluent	mg/L	⁽²⁾	0.683	27.2	16.7	15
Nitrate + Nitrite, as N	Effluent	mg/L	⁽²⁾	0.003	1.26	0.32	14
Total Nitrogen as N	Effluent	mg/L	⁽²⁾	0.807	27.3	17.0	15
		lb/day	⁽²⁾	0.693	22.0	13.3	15
		mg/L	⁽²⁾	8.01 ⁽⁷⁾	22.0 ⁽⁷⁾	14.4 ⁽⁷⁾	4 ⁽⁷⁾
Total Phosphorus as P	Effluent	mg/L	⁽²⁾	0.166	5.21	2.75	15
		lb/day	⁽²⁾	0.143	4.21	2.14	15
		mg/L	⁽²⁾	1.18 ⁽⁷⁾	5.21 ⁽⁷⁾	3.06 ⁽⁷⁾	4 ⁽⁷⁾
Oil and Grease	Effluent	mg/L	⁽²⁾	1.0	5.6	2.57	10
Arsenic, total recoverable ⁽⁸⁾	Effluent	µg/L	NA	5	5	5	1

Footnotes: ND = Not Detected, NA = Not Available, Data reported as ND is assumed to be the reporting limit.

(1) Statistical values based on individual values reported on DMRs when available. Average or maximum reported values used when no others available.

(2) No limit in 2009 permit; monitoring requirement only.

(3) Average Weekly Limit/Average Monthly Limit.

(4) Geometric average.

(5) Sample period is April 1 to October 31.

(6) Sample period is November 1 through March 31.

(7) Sample period is July 1 to September 30.

(8) Sample collected October 16, 2009; sourced from *Town of Whitehall Land Application Evaluation and Irrigation Plan for Treated Municipal Wastewater Effluent*

Compliance History

DEQ performed two MPDES compliance inspections between 2009 and 2016 (July 23, 2010 and March 14, 2014). The 2010 inspection took place prior to any upgrades, and the 2014 inspection took place after some upgrades, but before all upgrades were complete.

Several numeric limit exceedances were documented for the period of April, 2008 through the inspection date, July 23, 2010:

- Six for Total Suspended Solids (TSS) in 2008, 2009, and 2010
- Three for Biochemical Oxygen Demand (BOD₅) in 2010
- Three for pH in 2009
- Six for *Escherichia coli* (*E. coli*) in 2009 and 2010

The 2010 compliance inspection report notes that exceedances of BOD₅ and TSS coincide with spring turnover, pH exceedances are a result of improper use of a newly purchased meter, and *E. coli* exceedances are the result of turning off the UV disinfection system during March 2009 and December 2009 through April 2010.

Additional items of noncompliance documented in the 2010 compliance inspection were:

- Failures to complete sample analysis and report accurate results within the required timeframes
- Failure to maintain records of sampling equipment calibration
- Failure to report incidents of noncompliance which may seriously endanger health and the environment (SSO event)

A SSO occurred in July 2009 when approximately five gallons of sewage overflowed at the clean out area of a service line for an A&W restaurant.

At the time of the March 14, 2014 inspection, the WWTF was not discharging and consisted of the contemporary three-celled synthetic lined lagoon system with a UV system east of the third cell, but lacking electricity or plumbing to the system. A bypass system leading to the UV system was in place. The land application pivot system was complete and operational. Documented violations were:

- Failure to calibrate pH meter before each use, failure to maintain a pH calibration log, and failure to have current pH standards
- Failure to report effluent monitoring results on a DMR Form

The permittee entered into an Administrative Order on Consent (AOC), Docket No. WQ-10-24, with DEQ on January 13, 2011 to address violations due to exceedance of permit effluent limits and DMR violations. The compliance plan included treatment and storage wastewater improvements, collection system improvements such as sewer main lining, irrigation system implementation, and land application of municipal sludge from the abandoned east lagoon. In a letter dated February 2, 2016, DEQ acknowledged the permittee fulfilled all the requirements of the AOC and that the enforcement case would be closed.

III. Technology-based Effluent Limits

Federal regulations (40 (Code of Federal Regulations) CFR 133) define minimum requirements for secondary treatment, or the equivalent, for POTWs (ARM 17.30.1209). Secondary treatment is defined in terms of effluent quality as measured by pH, 5-Day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), and percent removal of BOD₅ and TSS.

The proposed technology-based effluent limits (TBELs) found in **Table 3** are based on national secondary treatment standards (NSS) and treatment equivalent to secondary (TES). Federal regulations allow for the application of TES effluent limits for BOD₅ and TSS, or Alternative State Requirements (ASR) for TSS to facilities that meet specific criteria 40 CFR 133.105.

The 2009-issued permit effluent limits were set at TES for BOD₅ and TSS (65 mg/L average weekly, and 45 mg/L average monthly) with 65 percent removal year round for both parameters. Whitehall WWTF has been updated significantly since previous permit TBELs were established. The facility has been modified from a two-celled facultative lagoon system with continuous discharge to a three-celled facultative lagoon system designed for total retention and land application of effluent. DEQ finds that the new facultative lagoon system should consistently achieve NSS for BOD₅ (45 mg/L average weekly, and 30 mg/L average monthly) and TES for TSS, with 85% removal of BOD₅ and 65% removal of TSS.

Effluent limits must be expressed in terms of mass (mass/time), except for certain conditions, such as pH or temperature (ARM 17.30.1345) [40 CFR 122.45(f)(1)]. For municipal treatment plants, mass-based limits are based on average daily design flow for the facility.

The mass-based limits for the Town of Whitehall WWTF are calculated as follows:

$$\text{Load (lbs/day)} = \text{Design Flow (mgd)} \times \text{Concentration (mg/L)} \times 8.34 \text{ (lb} \cdot \text{L)} / (\text{mg} \cdot \text{gal})$$

BOD₅ mass-based limitation:

$$\text{Average Weekly} = 0.16 \text{ mgd} \times 45 \text{ mg/L} \times 8.34 \text{ (lb} \cdot \text{L)} / (\text{mg} \cdot \text{gal}) = 60 \text{ lb/day}$$

$$\text{Average Monthly} = 0.16 \text{ mgd} \times 30 \text{ mg/L} \times 8.34 \text{ (lb} \cdot \text{L)} / (\text{mg} \cdot \text{gal}) = 40 \text{ lb/day}$$

TSS mass-based limitation:

$$\text{Average Weekly} = 0.16 \text{ mgd} \times 65 \text{ mg/L} \times 8.34 \text{ (lb} \cdot \text{L)} / (\text{mg} \cdot \text{gal}) = 87 \text{ lb/day}$$

$$\text{Average Monthly} = 0.16 \text{ mgd} \times 45 \text{ mg/L} \times 8.34 \text{ (lb} \cdot \text{L)} / (\text{mg} \cdot \text{gal}) = 60 \text{ lb/day}$$

Table 3: Town of Whitehall WWTF Outfall 001 Proposed TBELs				
Parameter	Units	Average Monthly Limit	Average Weekly Limit	Rationale
5-Day Biochemical Oxygen Demand (BOD ₅)	mg/L	30	45	40 CFR 133.102(a)
	lb/day	40	60	
	% removal	85 ⁽¹⁾	NA	
Total Suspended Solids (TSS)	mg/L	45	65	40 CFR 133.105(b)
	lb/day	60	87	
	% removal	65 ⁽²⁾	NA	
pH	s.u.	6.0-9.0 (instantaneous)		40 CFR 133.102(c)
Footnotes:				
(1) The arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 15% of the arithmetic mean of the values for influent samples collected at approximately the same time during the same period (85% removal).				
(2) The arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 15% of the arithmetic mean of the values for influent samples collected at approximately the same time during the same period (65% removal).				

B. Nondegradation

Nondegradation load allocations calculated in the 2009-issued permit are given in **Table 4** for BOD₅ and TSS. Actual BOD₅ and TSS discharge loads from self-monitoring data were calculated and compared to the nondegradation loads in **Table 4**. These allocations define baseline allocated loads for the WWTF and any increase above this amount is subject to the provisions of Montana's Nondegradation Policy 75-5-303, Montana Code Annotated (MCA) and Administrative Rules of Montana (ARM) 17.30.705, *et seq.* The permit does not authorize a new or increased discharge.

In the 2009-issued Permit's Statement of Basis (SOB), DEQ continued the mass-based load allocations for BOD₅, TSS, total nitrogen (TN) and total phosphorus (TP) that were originally developed in the 1996 permit renewal. However, DEQ finds the TN and TP nondegradation allocated loads are not applicable since these loads were calculated using the Department of Health and Environmental Sciences (DHES) memorandum (DHES, 1994). These calculated allocated loads were not based on either the criteria in ARM 17.30.715 or on the water quality standards in Circular DEQ-7 (DEQ, 2012). Therefore, the TN and TP load allocations are not included in this permit renewal. Removing the TN and TP nondegradation allocations will not cause a decline in water quality since these parameters are reviewed under the Water Quality-based Effluent Limit (WQBEL) section and appropriate limits developed if needed.

Table 4: Calculated Nondegradation Allocated and Actual Annual Loads							
Parameter	Allocated Load⁽¹⁾ (lb/day)	Actual 30-Day Average Loads (lb/day)					
		2011	2012 (Jan 1 – Aug 31) ⁽²⁾	2013 ⁽²⁾	2014 ⁽²⁾	2015 ⁽²⁾	2016 ⁽²⁾
5-Day Biochemical Oxygen Demand (BOD ₅)	94	11.1	10.9	--	--	--	--
Total Suspended Solids (TSS)	94	9.5	11.6	--	--	--	--
Footnotes:							
(1) Original allocated loads from SOB dated October 31, 2008.							
(2) No data available; facility discontinued discharging and began land application of effluent in September, 2012.							

Loading limits for the technology-based parameters of concern will be maintained at the more stringent values of either nondegradation allocations or mass-based loading limits, and will apply to the effluent.

IV. Water Quality-based Effluent Limits (WQBELs)

A. Scope and Authority

Permits are required to include water quality-based effluent limits (WQBELs) when TBELs are not adequate to protect state water quality standards (40 CFR 122.44 and ARM 17.30.1344). Montana water quality standards require that no wastes may be discharged that can reasonably be expected to violate any state water quality standards (ARM 17.30.637(2)). Montana water quality standards also define both water use classifications for all state waters and numeric and narrative standards that protect those designated uses (ARM 17.30.601, *et seq.*).

B. Receiving Water

Wastewater is discharged from Outfall 001 to Big Pipestone Creek within a mile of the confluence with Jefferson Slough, associated with the Jefferson River, according to data available in Montana's Clean Water Act Information Center. Big Pipestone Creek is located within the Jefferson River watershed as identified by the U.S. Geological Survey (USGS) Hydrological Unit Code (HUC) 10020005 and Montana Assessment Unit MT41G002_010. The receiving water is classified as B-1. Waters classified B-1 are to be maintained suitable for drinking, culinary, and food processing purposes after conventional treatment; bathing, swimming, and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl, and furbearers; and agricultural and industrial water supply. Brook trout, rainbow trout, and brown trout are present year round in Big Pipestone Creek, based on 2011 fishing logs and additional information available on MT Fish, Wildlife, and Parks (FWP) Montana Fisheries Information System (MFISH) database.

The Big Pipestone Creek assessment unit to which the facility discharges is listed as impaired in DEQ's Draft 2016 and the Final 2014 *Water Quality Integrated Reports* (Clean Water Act Information Center, CWAIC). This assessment unit does not fully support aquatic life, primary contact recreation, or drinking water uses due to the following probable causes:

physical substrate habitat alterations and alteration in stream-side or littoral vegetative covers, arsenic, nitrogen, phosphorous, sedimentation/siltation, temperature, and TSS. The 2014 and Draft 2016 assessment summaries for this stream segment specifically associate municipal point sources with impairment for TN, TP, water temperature, and TSS. The probable source of arsenic is unknown.

DEQ has completed sediment and arsenic Total Maximum Daily Loads (TMDL) for Big Pipestone Creek. The Whitehall WWTF arsenic wasteload allocation established by the 2014 *Jefferson River Metals Project Area TMDLs and Water Quality Improvement Plan* is 0.021 lb/day as a monthly average, calculated from the previous WWTF design flow of 0.251 mgd. This value is based on achieving the arsenic human health standard (10 µg/L). The Whitehall WWTF TSS wasteload allocation established by the 2009 *Upper Jefferson River Tributary Sediment TMDLs and Framework Water Quality Improvement Plan* is 17.1 tons/year or 94 lb/day, equivalent to the average monthly TBEL of the 2009-issued permit. Big Pipestone Creek is currently on the 303(d) list due to nutrients (TN and TP) and temperature.

Critical flow values were developed by DEQ. Flow data collected between 2004 and 2013 were analyzed for low flow statistics and compared to three other similar streams in Montana. Except for TN and TP, the critical upstream flow value is the 7-day average expected to occur every 10 years (7Q10), estimated to be 5.6 cubic feet per second (cfs), which is equivalent to 3.6 mgd. DEQ uses the seasonal 14-day average expected to occur every five years (14Q5) for TN and TP. The proxy seasonal 14Q5 (July – October) used for the purposes of this permit renewal is 7.8 cfs, which is equivalent to 5.0 mgd.

Ambient Water Quality Data

Table 5 provides a summary of the ambient water quality data used in assessing Reasonable Potential (RP) to exceed the water quality standards in Big Pipestone Creek, and to develop any necessary effluent limits designed to protect these standards.

The most conservative numeric value, the limit under which the sample was not quantified, was used for nondetect records. Twelve upstream samples were reported nondetect for ammonia below the reporting limit of 0.05 mg/L; DEQ will assume the ammonia concentration of these samples is the reporting limit. Two upstream ammonia samples were reported nondetect for ammonia below the method detection limit of 0.014 mg/L; DEQ will assume the ammonia concentration of these samples is the method detection limit. Two upstream samples for nitrate + nitrite were reported non-detect, one below the method detection limit of 0.003 mg/L, and one below the reporting limit of 0.01 mg/L. DEQ will assume the nitrate + nitrite concentration of these samples is 0.003 mg/L and 0.01 mg/L, respectively.

All ambient water quality data was collected by Whitehall at a location upstream of the influence of Outfall 001 and downstream of any tributary or irrigation return flow. Total recoverable arsenic ambient data was obtained from DEQ monitoring sites MDEQ_WQ_WQX-M08BGPSC04, approximately 1.5 miles upstream of the WWTF, and MDEQ_WQ_WQX-M08BGPSC03, near the confluence with Jefferson Slough, downstream of the WWTF beyond the mixing zone established in the 2009-issued permit.

Table 5. Big Pipestone Creek Ambient Water Quality Data for January 2012 – September 2016

Parameter	Units	75 th Percentile ⁽¹⁾	Number of Samples	Monitoring Data Source
pH	s.u.	8.04 ⁽²⁾	38	Whitehall WWTF
Temperature	°C	16.0	30	Whitehall WWTF
Ammonia, total as N	mg/L	0.40 ⁽³⁾	56	Whitehall WWTF
Nitrate + Nitrite as N	mg/L	0.24	25	Whitehall WWTF
Total Nitrogen as N (summer)	mg/L	1.70	11 ⁽⁴⁾	Whitehall WWTF
Total Phosphorus a P (summer)	mg/L	0.182	11 ⁽⁵⁾	Whitehall WWTF
Arsenic, total recoverable	µg/L	11 ⁽⁶⁾	3	MDEQ_WQ_WQX - Montana DEQ WQPB

Footnote:

- (1) 75th percentile determined using rank calculated as $x = p(N+1)$, where x =rank, p =percent rank, N =sample size
(2) Mean; used because number of samples is >30
(3) 95% upper confidence limit of the mean; used because number of samples is >30.
(4) The 75th percentile of TN results for 11 samples during the summer months of July-September was 1.70 mg/L. The 75th percentile of 37 samples January – December was 1.65 mg/L.
(5) The 75th percentile of TP results for 11 samples during summer months of July-September was 0.182 mg/L. The 75th percentile of 37 samples January – December was 0.168 mg/L.
(6) Samples collected October, 2012 – May, 2013.

C. Applicable Water Quality Standards

Discharges to surface waters classified B-1 are subject to the specific water quality standards of ARM 17.30.623, Department Circulars DEQ-7 (Numeric Water Quality Standards) and 12A (Base Numeric Nutrient Standards), and the general provisions of ARM 17.30.635 through 637. In addition to these standards, dischargers are subject to ARM 17.30 Subchapter 5 (Mixing Zones) and Subchapter 7 (Nondegradation).

D. Mixing Zone

A mixing zone is an area where effluent mixes with the receiving water and certain water quality standards may be exceeded. Mixing zones must have the smallest practicable size, a minimum practicable effect on water uses, and definable boundaries. DEQ will determine the appropriateness of a mixing zone and will grant a mixing zone, deny the mixing zone, or grant an alternative or modified mixing zone. Rules governing the granting of mixing zones are found in Montana Code Annotated (MCA) 75-5-301 and in ARM 17.30.501 *et seq.*

Mixing zones allowed under a permit issued prior to April 29, 1993, will remain in effect unless there is evidence that previously allowed mixing zones will impair existing or anticipated uses. A standard mixing zone may be granted for facilities which discharge less than 1 mgd, however, mixing zones are granted on a parameter-by-parameter basis. No

mixing zone will be granted that will impair beneficial uses. Aquatic life-chronic, aquatic life-acute and human health standards may not be exceeded outside of the mixing zone. Facilities that discharge a mean annual flow of less than 1 mgd to a stream segment with a dilution ratio less than 100:1 qualify for a standard mixing zone with 25% of the 7Q10 for chronic aquatic life and human health standards. A standard mixing zone with 25% dilution addresses only chronic aquatic life standards. Acute standards for aquatic life may not be exceeded in the mixing zone, unless DEQ finds that allowing minimal dilution will not threaten or impair existing beneficial uses. Dilution with 2.5% of the 7Q10 will be allowed for the acute ammonia aquatic life standard. DEQ finds this appropriate in the case of Whitehall WWTF, as discharge is not planned, and any planned discharge will be infrequent and for short intervals.

The dilution ratio for Whitehall WWTF is calculated as:

7Q10 : average daily design flow of the facility

3.6 mgd (7Q10): 0.16 mgd

= 22.5:1

The length of a standard mixing zone, with non-instantaneous mixing, must not extend downstream more than the one-half mixing width distance or more than ten times the stream width, whichever is more restrictive [ARM 17.30.516(4)]. In the 1997 USGS mixing zone study, *Effluent Mixing Characteristics below Four Wastewater-Treatment Facilities in Southwestern Montana, 1997*, the one-half mixing width distance was calculated to be 46 feet at stream flows approximating the 7Q10 for the purpose of the study. The standard mixing zone of 10 times the stream width is 95 feet in length. Therefore, the standard mixing zone length will be the more restrictive 46 feet downstream from the point of discharge. The chronic mixing zone dimensions will be 46 feet in length and the average stream width of 9.5 feet in width. The acute mixing zone dimensions will be 10% of the chronic mixing zone dimensions; equivalent to 4.6 feet in length, and 1 foot in width.

Reasonable potential analysis and discharge limits will be based on a standard mixing zone allowance of dilution with 25% of the 7Q10 for ammonia using aquatic life standards, and nitrate + nitrite and arsenic using human health standards [17.30.516(3)(b)]. Reasonable potential and discharge limitations for nutrients (TN and TP) will be based on dilution with 100% of the 14Q5, as specified in Circular DEQ-12A.

E. Basis for Water Quality-Based Effluent Limits (WQBELs)

MPDES permit limitations must control all pollutants which will cause, or have RP to cause or contribute to an excursion above any state water quality standard, including narrative criteria. Parameters typically present in municipal wastewater that may cause or contribute to a violation of water quality standards include: conventional pollutants such as biological material (as measured by BOD₅), TSS, pH, oil & grease, and pathogenic bacteria, and non-conventional pollutants such as nitrate + nitrite, nutrients, total ammonia, and metals.

DEQ uses a mass balance equation (see *Equation 1* and *Equation 2*) to determine RP and develop WQBELs, based on *EPA's Technical Support Document for Water Quality-based Toxics Control, March 1991* (TSD), EPA/505/2-90-001.

$$C_r = \frac{C_d Q_d + C_s Q_s}{Q_d + Q_s} \quad (\text{Equation 1})$$

Given:

C_r = the resulting receiving water concentration

Q_d = critical discharge rate (POTW average daily design flow)

Q_s = instream flow available for dilution (critical low flow x available % for dilution)

C_d = critical effluent pollutant concentration (maximum discharge concentration x TSD multiplier)

C_s = critical upstream ambient pollutant concentration (75th percentile concentration, or 95% upper confidence limit of the mean)

RP for the WWTF discharge to cause exceedances of water quality standards for Big Pipestone Creek is evaluated using *Equation 1*, and presented in **Attachment A**. The critical effluent concentration (C_d) is obtained following the method recommended by the EPA's TSD. A multiplier is determined using TSD methods, based on the dataset statistics.

WQBELs must be developed for any parameter for which there is RP to cause or contribute to exceedances of instream numeric or narrative water quality standards. To establish WQBELs for an existing discharger DEQ first calculates wasteload allocations (WLAs). As shown in *Equation 2*, the mass-balance equation can be arranged to calculate the WLA (C_{WLA}) so that the discharge does not cause or contribute to an exceedance of the applicable water quality standard under critical conditions.

$$C_{WLA} = \frac{Q_r C_r + Q_s C_s}{Q_d} \quad (\text{Equation 2})$$

Given:

C_{WLA} = calculated wasteload allocation necessary to achieve instream water quality standard

Q_d = critical discharge rate (POTW average daily design flow)

$Q_r = Q_d + Q_s$

C_r = water quality standard

Q_s = instream flow available for dilution (critical low flow x available % for dilution)

C_s = critical upstream ambient pollutant concentration (75th percentile concentration, or 95% upper confidence limit of the mean)

The WLAs are then translated into average monthly limitations (AMLs) and maximum daily limitations (MDLs) using TSD multipliers. Calculations are presented in **Attachment B**.

The following subsections discuss the basis for the RP and WQBELs in this permit.

1. Conventional Pollutants

BOD₅, TSS, and pH: These parameters are typical effluent quality indicators for municipal wastewater treatment facilities and are regulated as TBELs (see section III of this Fact

Sheet). The TSS WLA calculated in the 2009 *Upper Jefferson River Tributary Sediment TMDLs and Framework Water Quality Improvement Plan* as 17.1 tons/year or 94 lb/day, equivalent to the average monthly mass-based limit of the 2009-issued permit. The TSS TBEL established in this permit renewal is more conservative, at 40 lb/day as an average monthly limit and 60 lb/day as an average weekly limit. The facility provides a significant amount of control for biological material, solids, and pH through secondary treatment meeting NSS and TES, and no additional limits are necessary for these parameters.

Oil and Grease: Montana regulations require state waters be free from substances attributable to municipal discharges that will result in concentrations of oil and grease at or in excess of 10 mg/L. The 2009-issued permit included an oil and grease quarterly monitoring requirement. Semiannual oil and grease monitoring will also be required in the proposed permit (see section VI of this Fact Sheet).

Reasonable potential for the WWTF discharge to cause exceedances of the oil and grease water quality standards for Big Pipestone Creek were evaluated using the following values in *Equation 1*, and presented in **Attachment A**.

Given:

$Q_d = 0.16$ mgd average daily design flow

$Q_s = 0$ mgd (7Q10 x available chronic dilution of 0%)

$C_d = 9.5$ mg/L (maximum observed (5.6 mg/L) x TSD multiplier (1.7))

$C_s = 0$ mg/L

Calculated Result:

$C_r = 9.5$ mg/L oil and grease

Using the above calculated critical effluent concentration (C_d) and receiving water concentration (C_s), average daily design flow (Q_d) and low flow rate based on 0% of the 7Q10 (Q_s) in *Equation 1*, the resulting downstream pollutant concentration (C_r) is calculated as 9.5 mg/L. C_r is less than the water quality standard, therefore DEQ finds that the WWTF does not have RP to exceed the oil and grease standard and no effluent limit is required (see **Attachment A**).

***Escherichia coli* (*E. coli*) Bacteria:** Pathogens are known municipal wastewater contaminants. The average monthly and average weekly *E. coli* limits will be maintained at the standards in the 2009-issued permit. The State has promulgated *E. coli* standards to protect the beneficial uses of receiving waters from pathogens. The standards for B-1 classified waters from [17.30.623(2)(a)] are:

April 1 through October 31 of each year – the geometric mean number of *E. coli* must not exceed 126 cfu per 100 mL and 10% of the total samples may not exceed 252 cfu per 100 mL during any 30-day period; and

November 1 through March 31 of each year – the geometric mean number of *E. coli* must not exceed 630 cfu per 100 mL and 10% of the total samples may not exceed 1,260 cfu per 100 mL during any 30-day period.

These standards will be included in the proposed permit average monthly and average weekly limits along with regular monitoring (see section VI of this Fact Sheet).

2. Non-conventional Pollutants

Total Ammonia as N: Circular DEQ-7 includes ammonia aquatic life standards based on pH and temperature of the receiving stream, the presence or absence of salmonid fish species, and the presence or absence of fish in early life stages. DEQ reviewed upstream data in order to evaluate the ambient year round pH and temperature of the river (see **Table 6**). Big Pipestone Creek in the vicinity of the Whitehall WWTF discharge is classified as B-1 water, which is suitable for growth and propagation of salmonid fishes.

Table 6 summarizes the development of the ammonia water quality standards for Big Pipestone Creek in this area:

Table 6: Total Ammonia-Nitrogen Water Quality Standards for Big Pipestone Creek						
Condition	Period	Salmonids Present	Early Life Stages	Ambient Conditions		Water Quality Standard (mg/L) ⁽³⁾
				pH ⁽¹⁾ (s.u.)	Temperature ⁽²⁾ (°C)	
Acute Criterion	Annual	Yes	NA	8.04	NA	5.21
Chronic Criterion	Annual	NA	Yes	8.04	16	2.08
Footnotes: NA – Not Applicable						
(1) Based on the mean of pH data (n=38, January 2012 - September 2016).						
(2) Based on the 75 th percentile of temperature data (n=30, January 2012 - September 2016).						
(3) Acute and chronic aquatic life standards based on Department Circular DEQ-7 (August, 2012)						

Reasonable potential for the WWTF discharge to cause exceedances of the ammonia water quality standards for Big Pipestone Creek were evaluated using the following values in *Equation 1*, and presented in **Attachment A**.

Given:

$$Q_d = 0.16 \text{ mgd average daily design flow}$$

$$Q_s = 0.90 \text{ mgd (7Q}_{10} \text{ x available chronic dilution of 25\%)}$$

$$C_d = 37 \text{ mg/L (maximum observed (24.7 mg/L) x TSD multiplier (1.5))}$$

$$C_s = 0.40 \text{ mg/L (95\% upper confidence limit of upstream data as described below)}$$

Calculated Result:

$$C_r = 6 \text{ mg/L ammonia}$$

Using the above calculated critical effluent concentration (C_d) and receiving water concentration (C_s), average daily design flow (Q_d) and low flow rate based on 25% of the 7Q₁₀ (Q_s) in *Equation 1*, the resulting downstream pollutant concentration (C_r) is calculated as 6 mg/L. C_r is greater than both the acute and chronic ammonia standards developed in **Table 6**, therefore DEQ finds that the WWTF has RP to exceed the ammonia standards and a WQBEL is required (see **Attachment A**).

Wasteload allocations (C_{WLA}) were calculated using the following values in *Equation 2*, so that the discharge does not cause or contribute to an exceedance of applicable water quality standards (acute and chronic aquatic life standards) under critical conditions (see **Attachment B**).

Given:

$$Q_d = 0.16 \text{ mgd average daily design flow}$$

$$Q_{s \text{ acute}} = 0.09 \text{ mgd (7Q10 x available acute dilution of 2.5\%)}$$

$$Q_{s \text{ chronic}} = 0.90 \text{ mgd (7Q10 x available chronic dilution of 25\%)}$$

$$Q_{r \text{ acute}} = 0.25 \text{ mgd}$$

$$Q_{r \text{ chronic}} = 1.06 \text{ mgd}$$

$$C_s = 0.40 \text{ mg/L}$$

$$C_{r \text{ acute}} = 5.21 \text{ mg/L (water quality standard)}$$

$$C_{r \text{ chronic}} = 2.08 \text{ mg/L (water quality standard)}$$

Calculated Results:

$$C_{WLA \text{ acute}} = 2.54 \text{ mg/L ammonia}$$

$$C_{WLA \text{ chronic}} = 9.0 \text{ mg/L ammonia}$$

The WLAs were then translated into a minimum long-term average, and then a maximum daily limitation (MDL) and average monthly limitation (AML) using TSD multipliers. Proposed ammonia limits are 3.9 mg/L AML and 7.9 mg/L MDL. Calculations of AML and MDL based on TSD method are presented in **Attachment B**.

Nitrate plus Nitrite (N+N): Nitrate and nitrite are toxic components of total nitrogen, which is a common constituent of municipal wastewater. The applicable water quality standard for N+N is the human health standard (HHS), 10 mg/L. WQBELs for N+N were not established in the 2009-issued permit, but monthly monitoring was required. The effluent dataset for N+N for the POR contains 14 quantified values.

Reasonable potential for the WWTF discharge to cause exceedances of the N+N water quality standards for Big Pipestone Creek were evaluated using the following values in *Equation 1*, and presented in **Attachment A**.

Given:

$$Q_d = 0.16 \text{ mgd average daily design flow}$$

$$Q_s = 0.90 \text{ mgd (7Q10 x available chronic dilution of 25\%)}$$

$$C_d = 2.7 \text{ mg/L (maximum observed (1.26 mg/L) x TSD multiplier (2.1))}$$

$$C_s = 0.24 \text{ mg/L}$$

Calculated Result:

$$C_r = 0.61 \text{ mg/L N+N}$$

Using the above calculated critical effluent concentration (C_d) and receiving water concentration (C_s), average daily design flow (Q_d) and low flow rate based on 25% of the 7Q10 (Q_s) in *Equation 1*, the resulting downstream pollutant concentration (C_r) is calculated as 0.61 mg/L. C_r is less than the HHS, therefore DEQ finds that the WWTF does not have RP to exceed the N+N standard and no effluent limit is required (see **Attachment A**).

Total Nitrogen: Total nitrogen (TN) is a nutrient which can lead to excessive algal and aquatic vegetation growth and is a common constituent of municipal wastewater. From Table 12A-1 for Wadeable Streams, The Department Circular DEQ-12A base numeric nutrient standard for TN in Big Pipestone Creek is 0.300 mg/L (Level III ecoregion 17 – Middle Rockies, applied only July 1 – September 30). The seasonal (July 1 – September 30) effluent data set for TN for the POR contains four quantified values.

Reasonable potential for the WWTF discharge to cause exceedances of the seasonal TN water quality standard for Big Pipestone Creek was evaluated using the following values in *Equation 1*, and presented in **Attachment A**.

Given:

$$Q_d = 0.16 \text{ mgd average daily design flow}$$

$$Q_s = 5.0 \text{ mgd (seasonal 14Q5 x available dilution of 100\%)}$$

$$C_d = 57 \text{ mg/L (maximum observed (22.0 mg/L) x TSD multiplier (2.6))}$$

$$C_s = 1.70 \text{ mg/L}$$

Calculated Result:

$$C_r = 3.4 \text{ mg/L TN}$$

Using the above calculated critical effluent concentration (C_d) and receiving water concentration (C_s), average daily design flow (Q_d) and low flow rate based on 100% of the seasonal 14Q5 (Q_s) in *Equation 1*, the resulting downstream pollutant concentration (C_r) is calculated as 3.4 mg/L. C_r is greater than the applicable water quality standard, therefore DEQ finds that the WWTF has RP to exceed the TN standard and a WQBEL is required (see **Attachment A**). Seasonal monthly effluent monitoring will be required in the proposed permit (see section VI of this Fact Sheet).

A WLA (C_{WLA}) was calculated using the following values in *Equation 2* so that the discharge does not cause or contribute to an exceedance of applicable water quality standard (base numeric nutrient standard) under critical conditions. Because the critical receiving water concentration (C_s) is greater than the water quality standard, the WLA is set at the water quality standard (0.300 mg/L) at the end-of-pipe.

Given:

$$C_s = 1.70 \text{ mg/L}$$

$$C_r = 0.300 \text{ mg/L (water quality standard)}$$

Calculated Result:

$$C_{WLA} = 0.300 \text{ mg/L TN}$$

The WLA is then translated into an AML based on the end-of-pipe WLA equal to the water quality standard. Total nutrient WQBELs do not require a MDL. The AML is also set at 0.300 mg/L TN. The calculation of the proposed TN limit of 0.300 mg/L AML based on TSD method is presented in **Attachment B**.

Total Phosphorus: Total phosphorus (TP) is a nutrient which can lead to excessive algal and aquatic vegetation growth and is common constituent of municipal wastewater. From Table 12A-1 for Wadeable Streams, The Department Circular DEQ-12A base numeric nutrient

standard for TP in Big Pipestone Creek is 0.030 mg/L (Level III ecoregion 17 – Middle Rockies, applied only July 1 – September 30). The seasonal (July 1 – September 30) effluent data set for TP for the POR contains 4 quantified values.

Reasonable potential for the WWTF discharge to cause exceedances of the seasonal TP water quality standard for Big Pipestone Creek was evaluated using the following values in *Equation 1*, and presented in **Attachment A**.

Given:

$Q_d = 0.16$ mgd average daily design flow

$Q_s = 5.0$ mgd (seasonal 14Q5 x available dilution of 100%)

$C_d = 13$ mg/L (maximum observed (5.21 mg/L) x TSD multiplier (2.6))

$C_s = 0.182$ mg/L

Calculated Result:

$C_r = 0.59$ mg/L TP

Using the above calculated critical effluent concentration (C_d) and receiving water concentration (C_s), average daily design flow (Q_d) and low flow rate based on 100% of the seasonal 14Q5 (Q_s) in *Equation 1*, the resulting downstream pollutant concentration (C_r) is calculated as 0.59 mg/L. C_r is greater than the applicable water quality standard, therefore DEQ finds that the WWTF has RP to exceed the TP standard and a WQBEL is required (see **Attachment A**). Seasonal monthly effluent monitoring will be required in the proposed permit (see section VI of this Fact Sheet).

A WLA (C_{WLA}) was calculated using the following values in *Equation 2* so that the discharge does not cause or contribute to an exceedance of applicable water quality standard (base numeric nutrient standard) under critical conditions. Because the critical receiving water concentration (C_s) is greater than the water quality standard, the WLA is set at the water quality standard (0.030 mg/L) at the end-of-pipe.

Given:

$C_s = 0.182$ mg/L

$C_r = 0.030$ mg/L (water quality standard)

Calculated Result:

$C_{WLA} = 0.030$ mg/L TP

The WLA is then translated into an AML based on the end-of-pipe WLA equal to the water quality standard. Total nutrient WQBELs do not require a MDL. The AML is also set at 0.030 mg/L TP. The calculation of the proposed TP limit of 0.030 mg/L AML based on TSD method is presented in **Attachment B**.

3. Toxic Pollutants

Arsenic: The aquatic life chronic and acute standards for arsenic (As) are 150 µg/L and 340 µg/L, respectively. The human health standard for arsenic in surface water is 10 µg/L. Sample results indicate a maximum effluent concentration below the analytical method

detection limit of 5 µg/L of arsenic was detected for one sample taken October 16, 2009. The critical instream concentration calculated using TSD methods is greater than the HHS of 10 µg/L, indicating there is no assimilative capacity. A review of the facility's source water finds that public water supply (PWS) wells are unlikely to contribute arsenic to the WWTF in any amount that would affect water quality. Data were reviewed from two PWS wells with datasets of 11 and 6 samples, respectively, taken from February, 2011 through July, 2016. Both the 75th percentile and the 95% upper confidence limit are less than 10 µg/L for both wells. There are no process-based contributions of arsenic to the effluent, and lagoon cells are lined to prevent groundwater infiltration. Available information indicates the WWTF is unlikely to exceed the HHS of 10 µg/L.

Quarterly effluent monitoring for arsenic will be required to ensure the WWTF meets the intent of the 2014 TMDL.

Whole Effluent Toxicity (WET) – The proposed facility is a small POTW discharging less than 0.1 mgd. There are no identified industrial contributions as listed in 40 CFR 122 Appendix A, and the facility will not receive discharge from significant industrial users subject to pretreatment requirements. WET testing is not required.

Table 7: Outfall 001 Proposed WQBELs⁽¹⁾				
Parameter	Units	Average Monthly	Average Weekly	Maximum Daily
<i>Escherichia coli</i> (<i>E. coli</i>) Bacteria, April- October	cfu/100 mL	126 ⁽²⁾	252	--
<i>Escherichia coli</i> (<i>E. coli</i>) Bacteria, November - March	cfu/100 mL	630 ⁽²⁾	1,260	--
Ammonia, total as N	mg/L	3.9	--	7.9
	lb/day	5.3	--	--
Total Nitrogen as N ⁽³⁾	mg/L	0.300	--	--
	lb/day	0.400	--	--
Total Phosphorus as P ⁽³⁾	mg/L	0.030	--	--
	lb/day	0.040	--	--
Footnotes: cfu = colony forming unit.				
(1) See Definition section at end of permit for explanation of terms.				
(2) Report Geometric Mean if more than one sample is collected in the reporting period.				
(3) Effective July 1 through September 30.				

V. Final Effluent Limits

Effluent limitations or conditions in reissued permits must be at least as stringent as those in the existing permit, with certain exceptions. Federal regulations require permits to contain the more stringent TBEL or WQBEL limitation applicable to an individual pollutant. DEQ considered the proposed permit limits to ensure that they were as stringent as previous limits, or met the anti-backsliding requirements.

Beginning on the effective date and lasting through the term of the permit, the discharge from Outfall 001 shall, at a minimum, meet the effluent limits presented in **Table 8**:

Table 8: Proposed Final Effluent Limits					
Parameter	Units	Effluent Limitations ⁽¹⁾			
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Instantaneous Maximum Limit
5-Day Biochemical Oxygen Demand (BOD ₅)	mg/L	30	45	--	--
	lbs/day	40	60	--	--
	% removal	85	--	--	--
Total Suspended Solids (TSS)	mg/L	45	65	--	--
	lbs/day	60	87	--	--
	% removal	65	--	--	--
pH ⁽²⁾	s.u.	--	--	--	6.0 – 9.0
<i>Escherichia coli</i> (<i>E. coli</i>) Bacteria –summer ⁽³⁾⁽⁵⁾	cfu/100ml	126	252	--	--
<i>Escherichia coli</i> (<i>E. coli</i>) Bacteria –winter ⁽⁴⁾⁽⁵⁾	cfu/100ml	630	1,260	--	--
Ammonia, total as N	mg/L	3.9	--	7.9	--
Total Nitrogen as N ⁽⁶⁾	mg/L	0.300	--	--	--
	lb/day	0.400	--	--	--
Total Phosphorus as P ⁽⁶⁾	mg/L	0.030	--	--	--
	lb/day	0.040	--	--	--
Footnotes: cfu = colony forming unit. (1) See definitions in the permit. (2) Effluent pH shall remain between 6.0 and 9.0 (instantaneous minima and maxima). For compliance purposes, any single analysis and/or measurement beyond this limitation shall be considered a violation of the conditions of this permit. (3) This limit applies from April 1 through October 31. (4) This limit applies from November 1 through March 31. (5) The geometric mean of the samples taken for the sample period (monthly or weekly) may not exceed these values. (6) Effective July 1 through September 30.					

There shall be no discharge of floating solids or visible foam in other than trace amounts. There shall be no discharge which causes visible oil sheen in the receiving stream [ARM 17.30.637(1)(b)].

VI. Monitoring Requirements

Samples shall be collected, preserved and analyzed in accordance with approved procedures listed in 40 CFR 136 and the analysis must meet any RRVs listed in Circular DEQ-7 unless otherwise specified.

Monitoring location for influent must be after the last sewer connection and before discharge into the treatment facility. Monitoring of influent is required only during periods of discharge into Big Pipestone Creek other than as required under Part VII Special Conditions.

Monitoring of the effluent must be representative of the volume and nature of the discharge. During discharge events, Monitoring and effluent limits apply at the sample tap after UV treatment, prior to discharge to Big Pipestone Creek. If the facility does have a controlled discharge event, monitoring is required at the time of discharge. Effluent and influent monitoring requirements are presented in **Table 9**. Monitoring during land application is discussed below in Part VII.

Influent and effluent monitoring results must be reported within a Discharge Monitoring Report (DMR). Monitoring results must be submitted electronically (NetDMR web-based application) no later than the 28th day of the month following the end of the monitoring period. If no discharge into Big Pipestone Creek is observed during the reporting period, “no discharge” shall be reported on the Net DMRs.

A. Influent/Effluent Monitoring

Table 9: Outfall 001 Monitoring and Reporting Requirements						
Parameter	Units	Sample Location	Minimum Sample Frequency ⁽¹⁾	Sample Type ⁽²⁾	Reporting Requirements	Required Reporting Value
Effluent Flow	mgd	Effluent	3/Week	Instantaneous	Weekly Average	NA
5-Day Biochemical Oxygen Demand (BOD ₅)	mg/L	Influent	Monthly	Grab	Monthly Average	NA
	mg/L	Effluent	Weekly	Composite	Weekly Maximum Monthly Average	
	lb/day	NA	Weekly	Calculated	Weekly Maximum Monthly Average	
BOD ₅ Percent Removal	%	NA	Monthly	Calculated	Monthly Average	
Total Suspended Solids (TSS)	mg/L	Influent	Monthly	Grab	Monthly Average	NA
	mg/L	Effluent	Weekly	Composite	Weekly Maximum Monthly Average	
	lb/day	NA	Weekly	Calculated	Weekly Maximum Monthly Average	
TSS Percent Removal ⁽³⁾	%	NA	Monthly	Calculated	Monthly Average	
pH	s.u.	Effluent	Weekly	Instantaneous	Monthly Maximum Monthly Minimum	NA
<i>Escherichia coli</i> (<i>E. coli</i>) Bacteria ⁽⁴⁾	cfu/ 100 ml	Effluent	3/Week	Grab	Monthly Average Weekly Average	NA

Table 9: Outfall 001 Monitoring and Reporting Requirements

Parameter	Units	Sample Location	Minimum Sample Frequency ⁽¹⁾	Sample Type ⁽²⁾	Reporting Requirements	Required Reporting Value
Oil and Grease ⁽⁵⁾	mg/L	Effluent	Weekly	Grab	Monthly Average Weekly Average	NA
Ammonia, total as N	mg/L	Effluent	Monthly	Composite	Monthly Average Weekly Average	0.070
Nitrate + Nitrite, as N	mg/L	Effluent	Monthly ⁽⁶⁾	Composite	Monthly Average Weekly Average	0.05
Total Kjeldahl Nitrogen, as N	mg/L	Effluent	Monthly ⁽⁶⁾⁽⁷⁾	Composite	Monthly Average Weekly Average	0.225
Total Nitrogen as N ⁽⁶⁾	mg/L	Effluent	Monthly ⁽⁷⁾	Calculated/ Composite	Monthly Average Weekly Average	NA
	lb/day	NA	Monthly	Calculated	Monthly Average Weekly Average	
Total Phosphorus as P	mg/L	Effluent	Monthly ⁽⁷⁾	Calculated/ Composite	Monthly Average Weekly Average	0.01
	lb/day	NA	Monthly	Calculated	Monthly Average Weekly Average	NA
Arsenic, total recoverable ⁽⁸⁾	µg/L	Effluent	Quarterly	Composite	Monthly Average	1

Footnotes: NA = Not applicable. cfu = colony forming unit.

(1) Minimum sample frequency applies to periods of discharge to Big Pipestone Creek.

(2) See Definition section at end of permit for explanation of terms.

(3) Percent (%) removal shall be calculated using the monthly average values.

(4) Report Geometric Mean if more than one sample is collected in the reporting period.

(5) Use EPA Method 1664, Revision A: N-Hexane Extractable Material (HEM).

(6) The total nitrogen concentration calculated as the sum of total Kjeldahl nitrogen plus nitrate + nitrite

(7) Nutrient monitoring only required from July 1 – September 30.

(8) Metals shall be analyzed as total recoverable; use EPA method (Section) 4.1.4 [EPA 600/4-79-020, March 1983] or equivalent.

B. Instream MonitoringInstream monitoring will be required in the proposed permit as found in **Table 10**.

Monitoring must take place at a consistent location upstream and outside the influence of Outfall 001 with the sample type, frequency, and RRV as identified below. Instream ambient water quality monitoring is required only in the last two years of the permit cycle.

Instream monitoring results must be reported within a Discharge Monitoring Report (DMR). Monitoring results must be submitted electronically (NetDMR web-based application) no later than the 28th day of the month following the end of the monitoring period.

Table 10. Big Pipestone Creek Ambient Monitoring and Reporting Requirements⁽¹⁾					
Location	Parameter	Units	Sample Frequency	Sample Type ⁽²⁾	Required Reporting Value ⁽³⁾
Big Pipestone Creek: Upstream of discharge at Outfall 001 and downstream of any tributary or irrigation return flow.	pH	s.u.	Quarterly	Instantaneous	NA
	Temperature	°C	Quarterly	Instantaneous	NA
	Ammonia, total as N	mg/L	Quarterly	Grab	0.070
	Nitrate + Nitrite, as N	mg/L	Quarterly	Grab	0.020
	Nitrate + Nitrite, as N – summer ⁽⁴⁾⁽⁵⁾	mg/L	Monthly	Grab	
	Total Kjeldahl Nitrogen, as N ⁽⁴⁾⁽⁵⁾	mg/L	Monthly	Grab	0.225
	Total Nitrogen as N ⁽⁴⁾⁽⁵⁾	mg/L	Monthly	Grab/Calculated	0.070 ⁽⁶⁾
	Total Phosphorus as P ⁽⁵⁾	mg/L	Monthly	Grab	0.003
	Arsenic, total recoverable	µg/L	Quarterly	Grab	1
Footnote: NA = Not applicable.					
(1) Ambient water quality monitoring is required only in the third and fourth years of the permit cycle (2019 and 2020).					
(2) See Definition section at end of permit for explanation of terms.					
(3) See Circular DEQ-7 or DEQ-12A for more information on RRVs. Analysis must achieve these, or lower, reporting limits.					
(4) The total nitrogen concentration may be analyzed by either persulfate digestion, or by the sum of total Kjeldahl nitrogen plus nitrate+nitrite; If persulfate digestion is used, the Permittee is not required to conduct the weekly summer sampling for nitrate+nitrite or total Kjeldahl nitrogen .					
(5) Nutrient monitoring only required from July 1 – September 30.					
(6) The total nitrogen RRV of 0.070 mg/L applies only to total nitrogen determined by persulfate digestion.					

VII. Special Conditions

Land Application of Effluent Monitoring

Semiannual effluent monitoring is required for the purpose of effluent characterization, and occurs during periods of land application of effluent in lieu of discharge to Big Pipestone Creek. The monitoring location for effluent during land application of effluent is at a sample tap installed in the pivot system at the pressure gage location. Land application of effluent monitoring requirements are presented in **Table 11**. Land application of effluent monitoring results must be reported within an annual report. Whitehall is required to submit the results by no later than January 28th of the year following the monitoring period.

Table 11: Land Application of Effluent Monitoring and Reporting Requirements

Parameter	Units	Sample Location	Minimum Sample Frequency ⁽¹⁾	Sample Type ⁽²⁾	Reporting Requirements	Required Reporting Value
5-Day Biochemical Oxygen Demand (BOD ₅)	mg/L	Influent	Semiannually	Grab	Monthly Average	NA
	mg/L	Effluent	Semiannually	Composite	Monthly Average	
Total Suspended Solids (TSS)	mg/L	Influent	Semiannually	Grab	Monthly Average	NA
	mg/L	Effluent	Semiannually	Composite	Monthly Average	
pH	s.u.	Effluent	Semiannually	Instantaneous	Monthly Maximum Monthly Minimum	NA
<i>Escherichia coli</i> (<i>E. coli</i>) Bacteria ⁽³⁾	cfu/ 100 ml	Effluent	Semiannually	Grab	Monthly Average	NA
Oil and Grease ⁽⁴⁾	mg/L	Effluent	Semiannually	Grab	Max Daily	NA
Ammonia, total as N	mg/L	Effluent	Semiannually	Composite	Monthly Average	0.070
Nitrate + Nitrite, as N	mg/L	Effluent	Monthly ⁽⁵⁾⁽⁶⁾	Composite	Monthly Average	0.05
Total Kjeldahl Nitrogen, as N	mg/L	Effluent	Monthly ⁽⁵⁾⁽⁶⁾	Composite	Monthly Average	0.225
Total Nitrogen as N ⁽⁵⁾	mg/L	NA	Monthly ⁽⁶⁾	Calculated/ Composite	Monthly Average	NA
Total Phosphorus as P ⁽⁶⁾	mg/L	Effluent	Monthly	Composite	Monthly Average	0.01
Arsenic, total recoverable	µg/L	Effluent	Quarterly	Composite	Monthly Average	1

Footnotes: NA = Not applicable. cfu = colony forming unit.

- (1) Minimum sample frequency applies to periods of land application of effluent in lieu of discharge to Big Pipestone Creek. If Whitehall WWTF discharges effluent to Big Pipestone Creek, monitoring must occur as described in Part VI. Monitoring Requirements.
- (2) See Definition section at end of permit for explanation of terms.
- (3) Report Geometric Mean if more than one sample is collected in the reporting period.
- (4) Use EPA Method 1664, Revision A: N-Hexane Extractable Material (HEM).
- (5) The total nitrogen concentration is calculated as the sum of total Kjeldahl nitrogen plus nitrate + nitrite.
- (6) Nutrient monitoring only required from July 1 – September 30.

VIII. Public Participation

a. Public Notice

In accordance with ARM 17.30.1372, DEQ issued Public Notice No. MT-17-1 dated January 3, 2017. The public notice states that a tentative decision has been made to issue an MPDES permit to the Permittee and that a draft permit, fact sheet and environmental assessment (EA) have been prepared. Public comments are invited any time prior to the close of the business on February 2, 2017. Comments may be directed to:

Department of Environmental Quality
Water Protection Bureau
PO Box 200901
Helena, MT 59620

or

DEQWPBPublicComments@mt.gov

All comments received or postmarked prior to the close of the public comment period will be considered in the formulation of the final permit. DEQ will respond to all substantive comments and issue a final decision within sixty days of the close of the public comment period or as soon as possible thereafter.

All persons, including the applicant, who believe any condition of a draft permit is inappropriate or that DEQ's tentative decision to deny an application, terminate a permit, or prepare a draft permit is inappropriate, shall raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period (including any public hearing) under ARM 17.30.1372.

b. Notification of Interested Parties

Copies of the public notice were mailed to the discharger, state and federal agencies and interested persons who have expressed an interest in being notified of permit actions. A copy of the distribution list is available in the administrative record for this permit. In addition to mailing the public notice, a copy of the notice and applicable draft permit, fact sheet and EA were posted on DEQ's website for 30 days.

Any person interested in being placed on the mailing list for information regarding this MPDES permit should contact DEQ, reference this facility, and provide a name, address, and email address.

c. Public Hearing

During the public comment period provided by the notice, DEQ will accept requests for a public hearing. A request for a public hearing must be in writing and must state the nature of the issue proposed to be raised in the hearing (ARM 17.30.1373).

d. Permit Appeal

After the close of the public comment period DEQ will issue a final permit decision. A final permit decision means a final decision to issue, deny, modify, revoke and reissue, or, terminate a permit. A permit decision is effective 30 days after the date of issuance unless a later date is specified in the decision, a stay is granted pursuant to ARM 17.30.1379, or the applicant files an appeal pursuant to 75-5-403, MCA.

The Applicant may file an appeal within 30 days of DEQ's action to the following address:

Secretary, Board of Environmental Review
Department of Environmental Quality
1520 East Sixth Avenue
PO Box 200901
Helena, Montana 59620-0901

e. Additional Information

Requests for additional information or questions regarding this permit should be directed to the Water Protection Bureau at 406-444-3080.

IX. Information Sources

Administrative Rules of Montana Title 17 Chapter 30 - Water Quality

Subchapter 2 – Permit Application, Degradation Authorization, and Annual Fees.

Subchapter 5 – Mixing Zones in Surface and Ground Water.

Subchapter 6 – Surface Water Quality Standards and Procedures.

Subchapter 7 – Nondegradation of Water Quality.

Subchapter 12 – MPDES-Effluent Limitations and Standards, Standards of Performance, and Treatment Requirements.

Subchapter 13 – MPDES Permits.

CWAIC: Clean Water Act Information Center, Montana DEQ,
<http://deq.mt.gov/Water/WQPB/cwaic> (accessed 2016)

Great West Engineering. 2006. *Preliminary Engineering Report (PER) Wastewater System Improvements prepared for the Town of Whitehall* (March 2006)

Great West Engineering. 2011. *Final Whitehall Wastewater Improvements Design Memorandum* (July 2011)

Great West Engineering. 2011. *Town of Whitehall, Montana Land Application Evaluation and Irrigation Plan for Treated Municipal Wastewater Effluent* (February 2011)

Great West Engineering. 2014. *Town of Whitehall Wastewater System Improvements O&M Manual*

Montana Code Annotated (MCA), Title 75-5-101 *et seq.*, “Montana Water Quality Act”

Montana DEQ. 2014. *Final Water Quality Integrated Report* (May 2014)

Montana DEQ. 2009. *Upper Jefferson River Tributary Sediment TMDLs and Framework Water Quality Improvement Plan*. Helena, MT: Montana Dept. of Environmental Quality.

Montana DEQ. 2014. *Jefferson River Metals Project Area TMDLs and Water Quality Improvement Plan*. Helena, MT: Montana Dept. of Environmental Quality.

MFISH: Montana Fisheries Information System, Montana Fish, Wildlife, and Parks, <http://fwp.mt.gov/fishing/mFish/> (accessed 2016)

Montana Department of Environmental Quality. Circular DEQ-7: Montana Numeric Water Quality Standards (October 2012)

Montana Department of Environmental Quality. Circular DEQ-12A: Montana Base Numeric Nutrient Standards (July 2014)

Montana Department of Environmental Quality. Circular DEQ-12B: Nutrient Standards Variance (July 2014)

Montana Department of Fish Wildlife and Parks. 2001. *Spawning Times of Montana Fishes* (March 2001)

Montana Pollutant Discharge Elimination System (MPDES) Permit Number MT0020133

- a. Administrative Record
- b. Renewal Application Forms DEQ-1 and EPA Form 2A, 2014
- c. Additional application information, 2016

Montana DEQ. 2016. Lagoon O&M Report, Town of Whitehall Wastewater Treatment Facility (August, 2016)

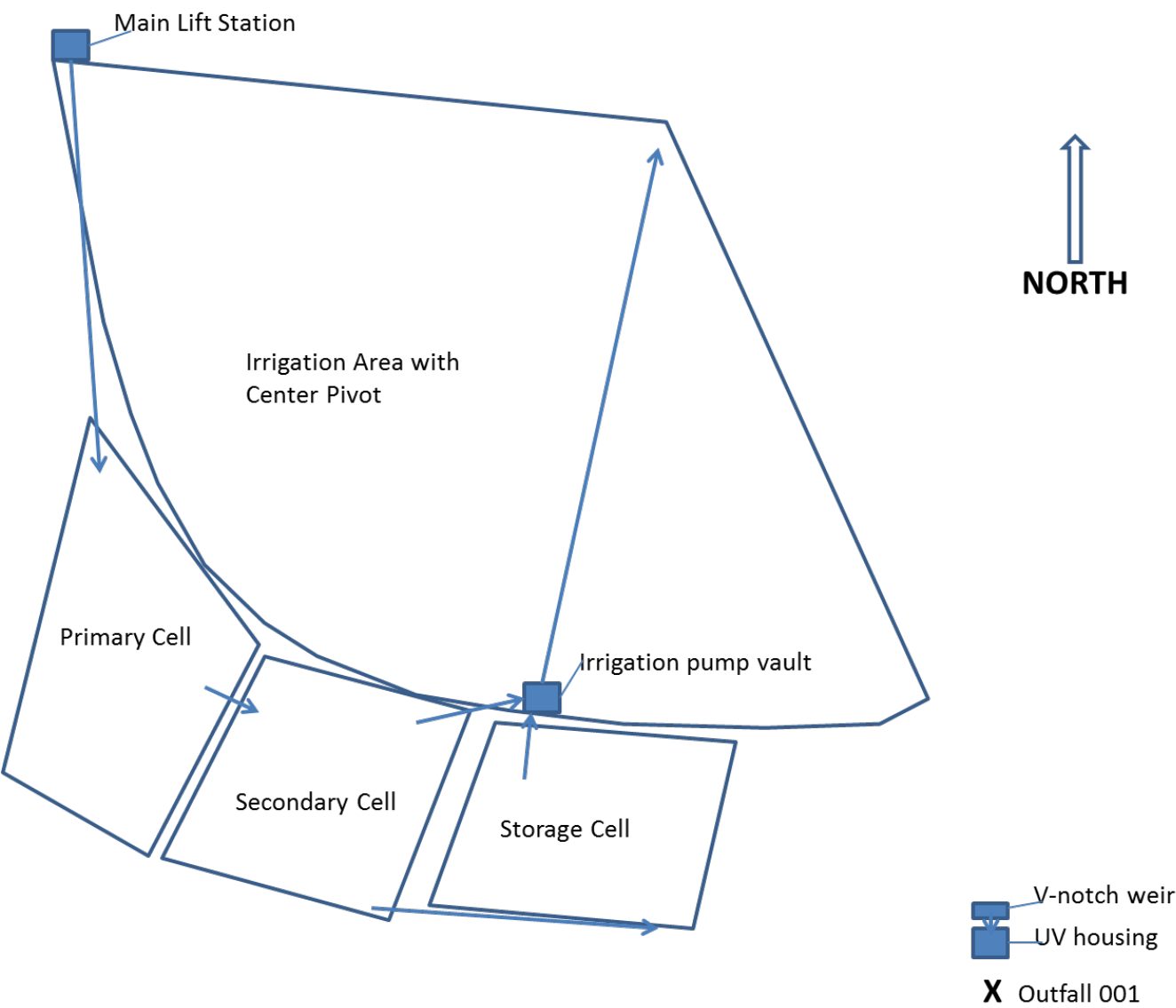
S & A Engineers .1988. *Wastewater Treatment Facility Operation and Maintenance Manual, Town of Whitehall, Montana* (July 1988)

Town of Whitehall Wastewater Improvements Schedule Summary (February 2011)

Town of Whitehall Administrative Order on Consent, Docket No. WQ-10-24 (January 2011)

Fact Sheet prepared: December 2016 by Emilie Erich Hoffman

Figure 1. Diagram of Whitehall WWTF Lagoon System with Land Application of Effluent

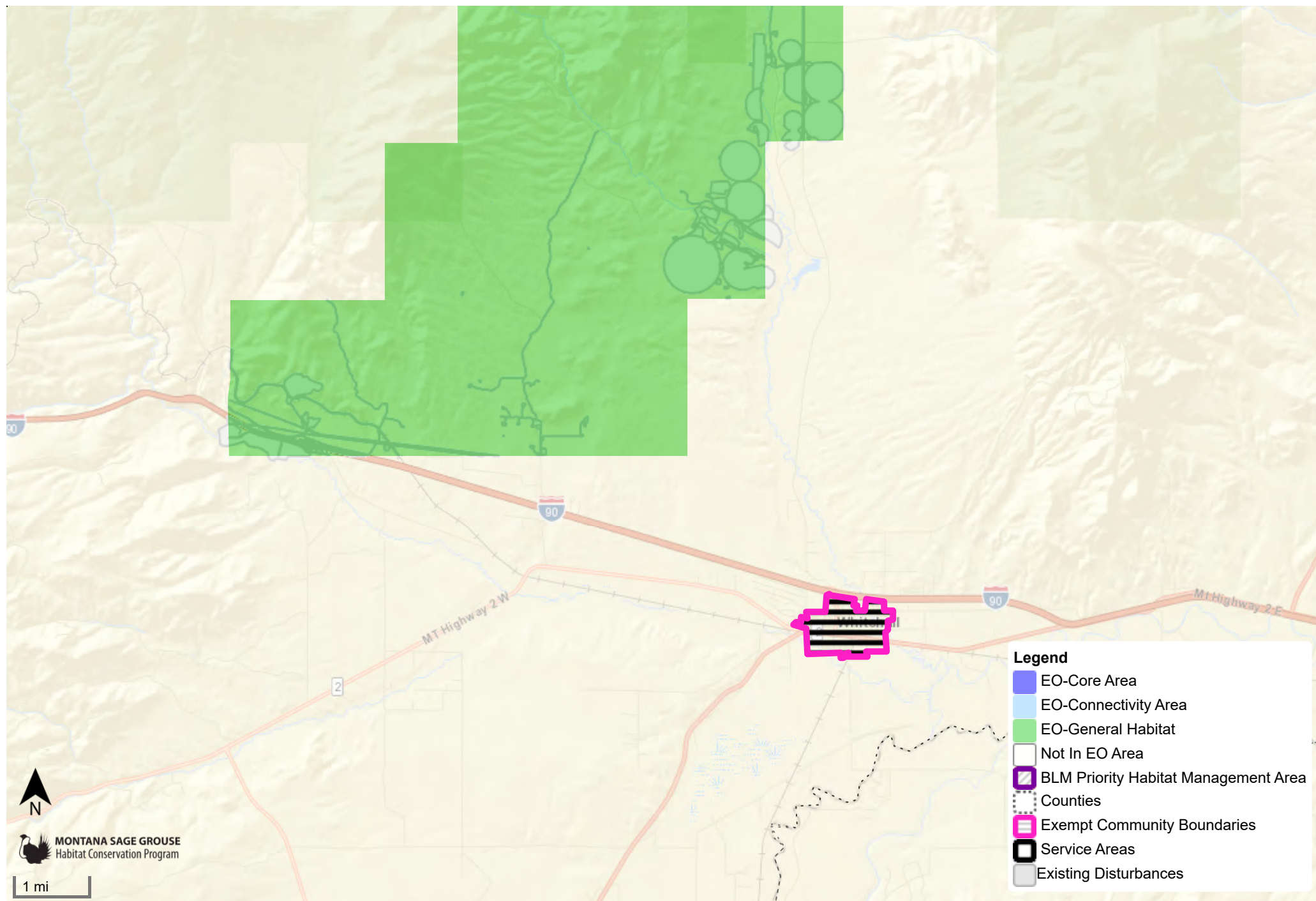


Attachment A: Whitehall WWTP Reasonable Potential Analysis (December 2016)

			<u>Oil and Grease</u>	<u>Ammonia (Chronic)</u>	<u>N+N (HHS)</u>	<u>Nitrogen, total (TN) Seasonal</u>	<u>Phosphorus, total (TP) Seasonal</u>
Flow							
critical stream flow	7Q10 or seasonal 14Q5	mgd	3.6	3.6	3.6	5.0	5.0
% of critical stream flow for dilution	as decimal	%	0	0.25	0.25	1.00	1.00
Q_s	instream flow available for dilution $Q_s = (\text{critical stream flow for dilution}) * (\% \text{ of critical stream flow provided})$	mgd	0.00	0.90	0.90	5.00	5.00
Q_d	critical effluent flow (avg. daily design flow)	mgd	0.16	0.16	0.16	0.16	0.16
Q_r	downstream flow ($Q_s + Q_d$)	mgd	0.16	1.06	1.06	5.16	5.16
Concentrations							
C_{max}	maximum effluent concentration for POR (from application or DMR data)	mg/L	5.6	24.7	1.26	22.0	5.21
n	number of samples in effluent data set		10	15	14	4	4
CV	0.6 if $n < 10$ calculated as $\sigma_{effluent} / \mu_{effluent}$ if $n \geq 10$		0.6	0.557	1.24	0.6	0.6
P_n	%tile for n samples at 95% confidence level		0.74	0.82	0.81	0.47	0.47
Z_{Pn}	Z-score for P_n		0.65	0.91	0.87	-0.075	-0.068
TSD	calculated TSD multiplier (should be close to Table 3-2 value)		1.7	1.5	2.1	2.6	2.6
C_d	critical effluent concentration - 95%tile (=max. effluent concentration * TSD multiplier)	mg/L	9.7	37	2.7	57	13
C_s	critical instream concentration (75%tile if $n \leq 30$, 95% UCL if $n > 30$)	mg/L	0.00	0.40	0.24	1.70	0.182
C_r	resulting or downstream pollutant concentration $C_r = (C_d Q_d + C_s Q_s) / (Q_d + Q_s)$	mg/L	9.7	6	0.61	3.4	0.59
WQS	water quality standard	mg/L	10	2.08	10	0.300	0.030
Reasonable Potential			no	yes	no	yes	yes

Attachment B: Whitehall WWTP WQBELs Development (December 2016)

		Ammonia		Nitrogen, total (TN)	Phosphorus, total (TP)
		acute	chronic	seasonal	seasonal
critical stream flow	7Q10 or seasonal 14Q5	3.6		5.0	5.0
% of critical stream flow for dilution		2.5	25	100	100
Q_s	instream flow available for dilution	0.09	0.90	5.0	5.0
Q_d	design flow (POTW)	0.16		0.16	0.16
Q_r	downstream flow, Q _r = Q _s + Q _d	0.25	1.06	5.16	5.16
C_r	water quality standard	5.21	2.08	0.300	0.030
C_s	critical instream concentration: 75 th percentile if n ≤ 30 95% upper confidence limit if n > 30	0.40		1.70	0.182
C_d or WLA	C _d = [(Q _r C _r) - (Q _s C _s)]/Q _d WLA = WQS if C _s > WQS	7.9	11.5	0.300	0.030
number of effluent samples per month	must use ≥ 4 for calculations	4		4	4
CV of effluent dataset	0.6 if n < 10 calculated as $\sigma_{\text{effluent}}/\mu_{\text{effluent}}$ if n ≥ 10	0.557		0.6	0.6
LTA_a , LTA_c	acute, chronic long term average (99 th percentile)	2.54	9.0	0.096	0.010
Most conservative LTA	minimum of LTA _a , LTA _c	2.54		NA	NA
Maximum Daily Limit	99 th percentile MDL = WQS if calculated 99 th percentile < WQS	7.9		NA	NA
Average Monthly Limit	95 th percentile MDL = WQS if calculated 95 th percentile < WQS		3.9	0.300	0.030



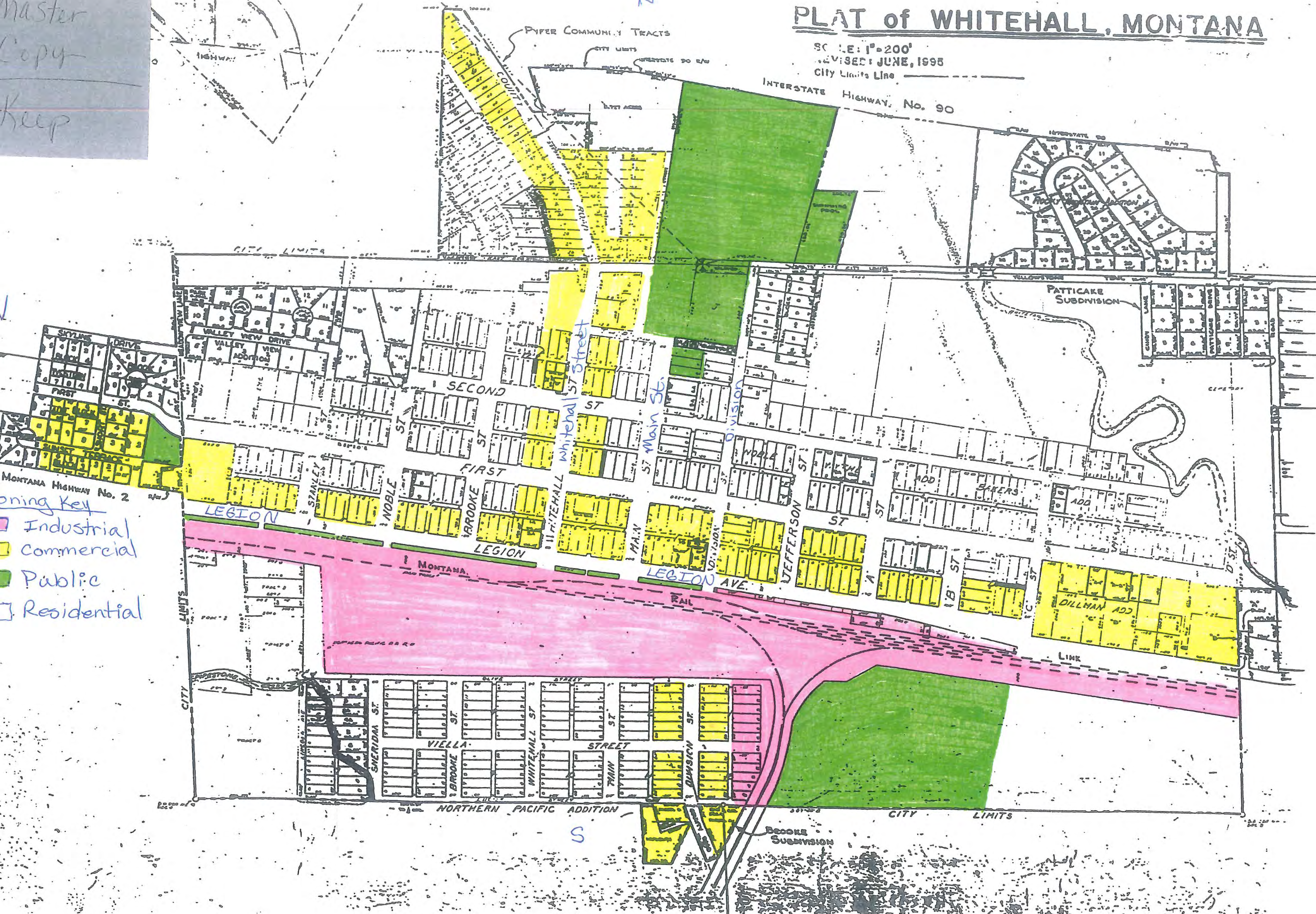
Master
Copy
Keep

Coloring Key
Industrial
Commercial
Public
Residential

PLAT of WHITEHALL, MONTANA

SCALE: 1"=200'
REVISED: JUNE, 1995
City Limits Line

INTERSTATE Highway No. 90



MEADOW LARK MANOR SEWER & WATER MAIN EXTENSION

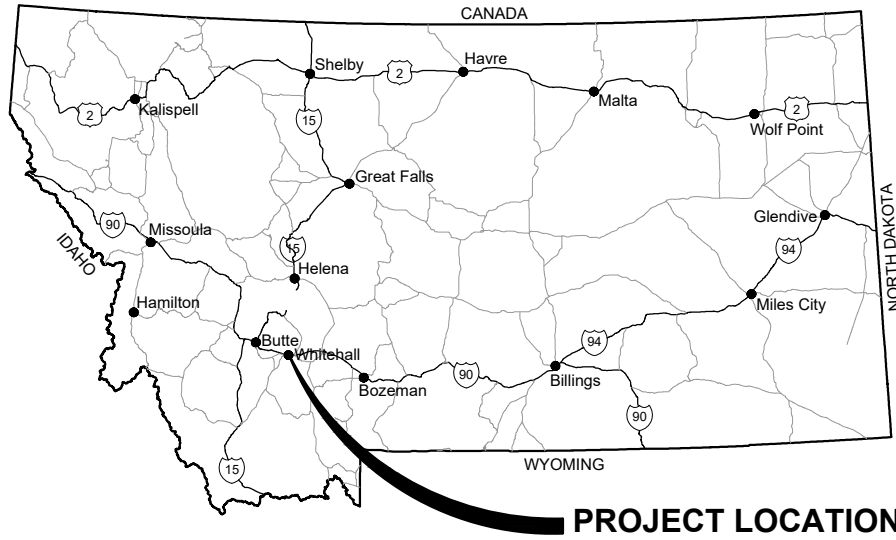
WHITEHALL, MONTANA

JULY 2022

SHEET INDEX

PAGE	DESCRIPTION
G1	COVER
G2	GENERAL NOTES
W1	WATER MAIN PLAN & PROFILE
W2	WATER MAIN PLAN & PROFILE
W3	WATER MAIN PLAN & PROFILE
WW1	SANITARY SEWER MAIN PLAN & PROFILE
WW2	SANITARY SEWER MAIN PLAN & PROFILE
WW3	SANITARY SEWER MAIN PLAN & PROFILE

VICINITY MAP



PROJECT LOCATION

WHITEHALL, MONTANA



BASIS OF SURVEY

ALL CONTOURS, ELEVATIONS, AND COORDINATES FOR THE PROJECT ARE BASED ON A LOCAL COORDINATE SYSTEM.

CERTIFICATION

I HEREBY CERTIFY THAT THE ATTACHED PLANS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF MONTANA.



KRISTA J HANSON, P.E.



CIVIL-SITE GENERAL NOTES

1.

THESE NOTES ARE FOR GENERAL REFERENCE IN CONJUNCTION WITH, AND AS A SUPPLEMENT TO THE WRITTEN NOTES AND DETAILS INCLUDED ON INDIVIDUAL DRAWINGS. ALL WORK FOR THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH THE MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS (MPWSS), APRIL 2021, SEVENTH EDITION. THE FOLLOWING SECTIONS OF MPWSS INCLUDE SPECIFIC TECHNICAL SPECIFICATIONS FOR THE WORK INCLUDED IN THIS PROJECT.

DIVISION I - GENERAL REQUIREMENTS

SECTION 01400: CONTRACTOR QUALITY CONTROL AND OWNER QUALITY ASSURANCE

SECTION 01570: CONSTRUCTION TRAFFIC CONTROL

02100 SITE PREPARATION

SECTION 02112: REMOVAL OF EXISTING PAVEMENT, CONCRETE CURB, SIDEWALK, DRIVEWAY AND/OR STRUCTURES

02200 EARTHWORK

SECTION 02221: TRENCH EXCAVATION AND BACKFILL FOR PIPELINES AND APPURTENANT STRUCTURES

SECTION 02230: STREET EXCAVATION, BACKFILL, AND COMPACTION

SECTION 02235: CRUSHED BASE COURSE

02500 PAVING AND SURFACING

SECTION 02510: ASPHALT CONCRETE PAVEMENT

02600 - WATER DISTRIBUTION

SECTION 02660: WATER DISTRIBUTION SYSTEMS

02700 - SEWERAGE AND DRAINAGE

SECTION 02730 - SANITARY SEWER COLLECTION SYSTEMS

02900 - LANDSCAPING

SECTION 02910: SEEDING
2.

THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS AND PAYING ASSOCIATED FEES.
3.

THE LOCATION OF EXISTING UTILITIES HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. UNDERGROUND LOCATES SHALL BE MADE USING THE "ONE CALL" NUMBER 1-800-424-5555. ALL EXISTING UTILITIES WHICH NEED TO BE REMOVED, RELOCATED AND/OR ADJUSTED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
4.

THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION. IF THE SITE IS FOUND TO BE DIFFERENT THAN THE CONSTRUCTION PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF THE DISCREPANCY.
5.

THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS TO SURFACING (ASPHALT, CONCRETE, GRAVEL, SIDEWALKS, LANDSCAPING, ETC.) BEYOND THE PROJECT LIMITS DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES; THIS INCLUDES SURFACING REPAIR ON HAUL ROUTES. ANY DAMAGE SUSTAINED TO HAUL ROADS AND PROPERTY SHALL BE RESTORED TO EXISTING CONDITION OR BETTER AT THE EXPENSE OF THE CONTRACTOR. REMEDIATION OF THE DAMAGE WILL BE ALLOWED AFTER THE MAJORITY OF HAULING ACTIVITIES HAS BEEN COMPLETED, UNLESS OTHERWISE DIRECTED BY THE OWNER, ENGINEER OR GOVERNING AUTHORITY. IF THE DAMAGE POSES A SAFETY RISK, IT SHALL BE REPAIRED IMMEDIATELY.
6.

CONTRACTOR SHALL BE RESPONSIBLE FOR QUALITY CONTROL TO ASSURE THAT ALL ASPECTS OF THE PROJECT ARE CONSTRUCTED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
7.

THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL ASPHALT, CONCRETE, GRAVEL AND REFUSE MATERIAL OFFSITE AS REQUIRED TO COMPLETE THE PROJECT.
8.

ALL WATER MAIN VALVES, HYDRANTS, AND FITTINGS INCLUDING TEES, CROSSES, CAPS, PLUGS, REDUCERS AND ELBOWS SHALL BE RESTRAINED THROUGH THE USE OF THRUST BLOCKS IN ACCORDANCE WITH MPWSS STANDARD DETAILS 02660-1 AND 02660-3 OR THE USE OF MECHANICAL THRUST RESTRAINTS AS APPROVED BY THE ENGINEER.
9.

ALL WATER MAINS WITH LESS THAN 6.5' OF COVER SHALL BE INSULATED WITH A 4'-WIDTH OF EXTRUDED POLYSTYRENE INSULATION AT A THICKNESS OF 1" FOR EACH FOOT (OR PORTION THEREOF) OF INSUFFICIENT DEPTH.
10.

WHEN THE NEW WATER MAIN CROSSES AN EXISTING SEWER OR STORM WATER MAIN, ONE STANDARD LENGTH OF NEW PIPE MUST BE CENTERED AT APPROXIMATELY A 90-DEGREE ANGLE WITH RESPECT TO THE OTHER PIPE, AND THE WATER MAIN MUST BE LAID WITH A MINIMUM VERTICAL SEPARATION DISTANCE OF 18 INCHES BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SEWER.
11.

ALL NEW SYSTEM COMPONENTS SHALL BE INSTALLED WITH A 5 FOOT (MINIMUM) SEPARATION FROM OTHER SYSTEM COMPONENTS (HYDRANTS, VALVES, TEES, BENDS, ETC.). COORDINATE WITH THE ENGINEER TO REQUEST DEVIATION FROM THIS REQUIREMENT.
12.

INSTALL POLYETHYLENE ENCASEMENT ON ALL FITTINGS IN ACCORDANCE WITH MPWSS SECTION 02600, PART 2.12.
13.

FURNISH ALL WATER MAIN PIPE, FITTINGS, VALVES AND ALL OTHER APPURTENANCES IN ACCORDANCE WITH THE AWWA STANDARDS LISTED IN MPWSS.
14.

PERFORM ALL TESTING, CLEANING & DISINFECTION IN ACCORDANCE WITH MPWSS SECTION 02600, PART 3.4.

GRADING & EROSION CONTROL

13.

ALL CONSTRUCTION ACTIVITIES SHALL BE CONDUCTED IN A LOGICAL SEQUENCE SO AS TO MINIMIZE THE AMOUNT OF BARE SOIL EXPOSED AT ANY ONE TIME. THE CONTRACTOR SHALL MAINTAIN EXISTING SITE VEGETATION OR GROUND COVER TO THE EXTENT AND LONGEST TIME POSSIBLE.
14.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MINIMIZING TRACKING OF SOIL AND DEBRIS ONTO ADJACENT PROPERTIES AND ROADWAYS. TRACKING MUST BE RESTORED BY THE END OF EACH DAY.
15.

ALL WASTE AND UNUSED MATERIALS SHALL BE PROPERLY DISPOSED OF AND NOT ALLOWED TO BE CARRIED OFF SITE BY RUNOFF OR WIND.
16.

TOPSOIL SHALL BE STRIPPED TO FULL DEPTH FROM AREAS REQUIRING GRADING AND STOCKPILED FOR REPLACEMENT ONCE THE CONSTRUCTION ACTIVITY HAS BEEN COMPLETED. SEED ALL DISTURBED AREAS FOLLOWING CONSTRUCTION WITH A NATIVE SEED MIX. SUBMIT THE SEED MIX TO THE ENGINEER FOR APPROVAL.

SURVEY INFORMATION

17.

ALL CONTOURS, ELEVATIONS, AND COORDINATES FOR THE PROJECT ARE BASED ON A LOCAL COORDINATE SYSTEM.
18.

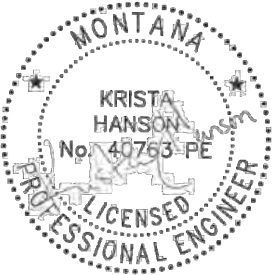
THE OWNER AND ENGINEER ARE NOT RESPONSIBLE FOR STAKES THAT ARE DISTURBED OR DESTROYED. MARK AND PROTECT EXISTING PROPERTY PINS AND/OR STREET MONUMENTS. HIRE A LICENSED LAND SURVEYOR TO REPLACE ALL PROPERTY CORNERS OR OTHER MONUMENTS THAT ARE DESTROYED DURING CONSTRUCTION.

QUALITY CONTROL TESTING		
EARTHWORK		
TEST SPECIFICATION/MATERIAL	TEST METHOD	MINIMUM FREQUENCY
TRENCH BACKFILL	MOISTURE-DENSITY LAB TEST PER SECTION 02221	1 SUBMITTAL/SOIL TYPE ENCOUNTERED 1 SUBMITTAL/BORROW SOURCE
TRENCH COMPACTION		
TYPE A (IMPROVED ROAD CORRIDORS)	LIFT DEPTH, DENSITY & MOISTURE (8" LIFTS, 95% MDD & 3%± OPT.)	2 TESTS UNDER ASPHALT & 2 TESTS UNDER GRAVEL/2.5 FT OF VERTICAL DEPTH BEGINNING 2 FT ABOVE CROWN OF PIPE
TRENCH COMPACTION (LATERALS, STRUCTURES, VALVES, HYDRANTS AND MANHOLES)	IN PLACE DENSITY (95% MIN.)	1 TEST/2.5 FT OF VERTICAL DEPTH BEGINNING 1.5 FT ABOVE CROWN OF PIPE WITHIN 2 FT FROM EDGE OF STRUCTURE, VALVE, HYDRANT, OR MANHOLE
PIPE BEDDING	TYPE I BEDDING GRADATION & PLASTICITY INDEX / TYPE II BEDDING GRADATION	1 SUBMITTAL

ABBREVIATIONS

FOLLOWING WORDS MAY BE ABBREVIATED THROUGHOUT THE PLAN SET:

CMP	=	CORRUGATED METAL PIPE	OC	=	ON CENTER
CONC.	=	CONCRETE	PROP.	=	PROPOSED
CY	=	CUBIC YARD	PVC	=	POLYVINYL CHLORIDE
EA	=	EACH	RCP	=	REINFORCED CONCRETE PIPE
EX.	=	EXISTING	RT	=	RIGHT
GALV.	=	GALVANIZED	SDR	=	STANDARD DIMENSION RATIO
LF	=	LINEAL FOOT	SF	=	SQUARE FOOT
LS	=	LUMP SUM	SY	=	SQUARE YARD
LT	=	LEFT	TYP	=	TYPICAL
MAX.	=	MAXIMUM			
MDD	=	MAXIMUM DRY DENSITY			
MIN.	=	MINIMUM			
MJ	=	MECHANICAL JOINT			
MPWSS	=	MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS			



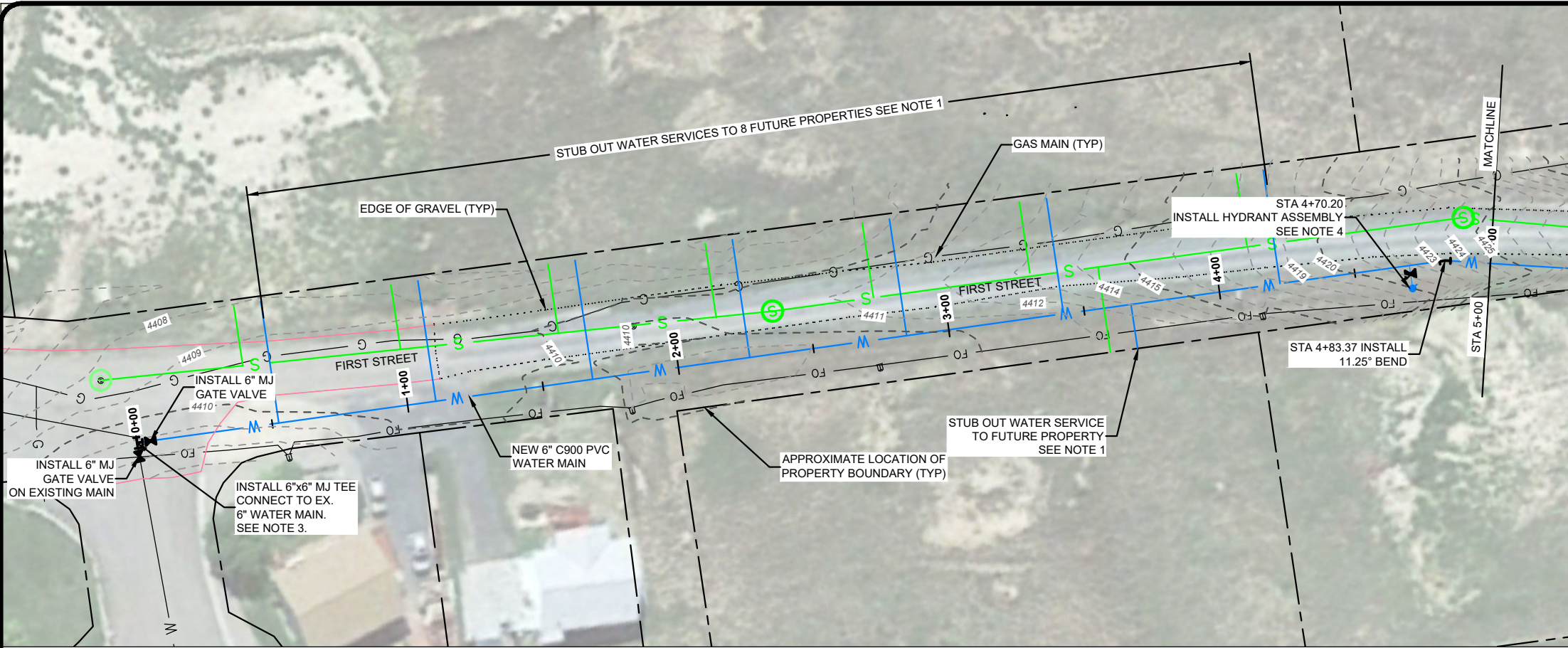
REVISIONS	
DATE	DESCRIPTION

MEADOWLARK MANOR SEWER AND WATER EXTENSION

TOWN OF WHITEHALL
WHITEHALL, MONTANA

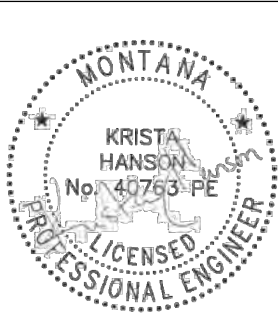
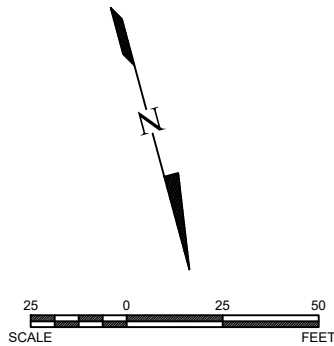
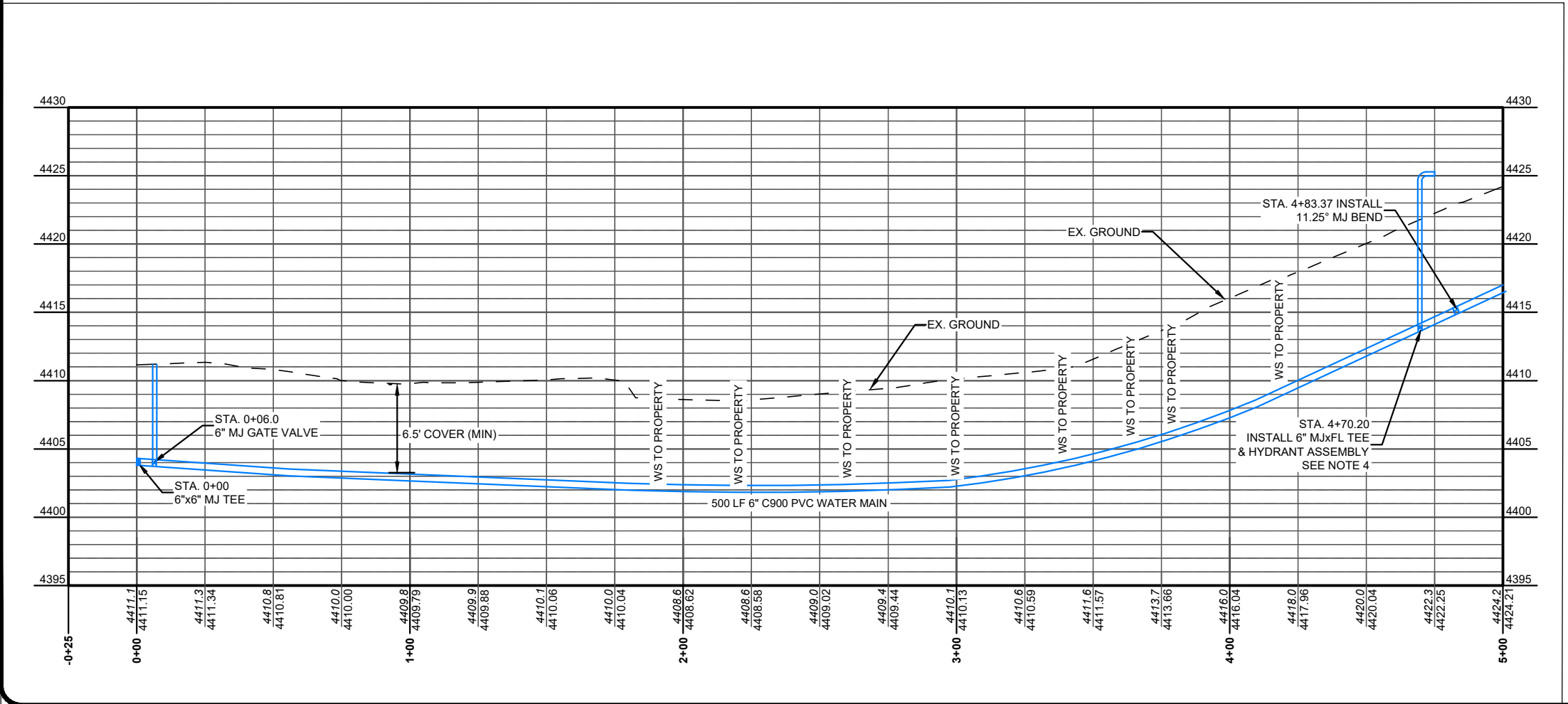
GENERAL NOTES

PROJECT #:	21-82	KJH	JRC	6/23/2022
DRAFTED BY:				
CHECKED BY:				
DATE:				
SHEET				
G2				



CONSTRUCTION NOTES

1. NEW SERVICE LINE LENGTHS AND LOCATIONS HAVE BEEN ESTIMATED AND MAY BE ADJUSTED IN THE FIELD AS REQUIRED. CONTRACTOR TO INSTALL NEW CURB STOPS FOR ALL PROPOSED AND EXISTING PROPERTIES AT THE EDGE OF THE ROAD RIGHT-OF-WAY WHERE POSSIBLE.
2. CONTRACTOR TO VERIFY SERVICE LINE LOCATIONS WITH HOMEOWNERS.
3. THE LOCATION OF THE EXISTING WATER MAIN IS AN APPROXIMATE LOCATION. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL DEPTHS AND LOCATIONS OF PROPOSED UTILITY TIE-INS, AS WELL AS UTILITY SIZE AND MATERIAL PRIOR TO INSTALLATION OF ANY PIPING OR APPURTENANCES.
4. REFER TO MPWSS FOR DETAIL DRAWINGS.



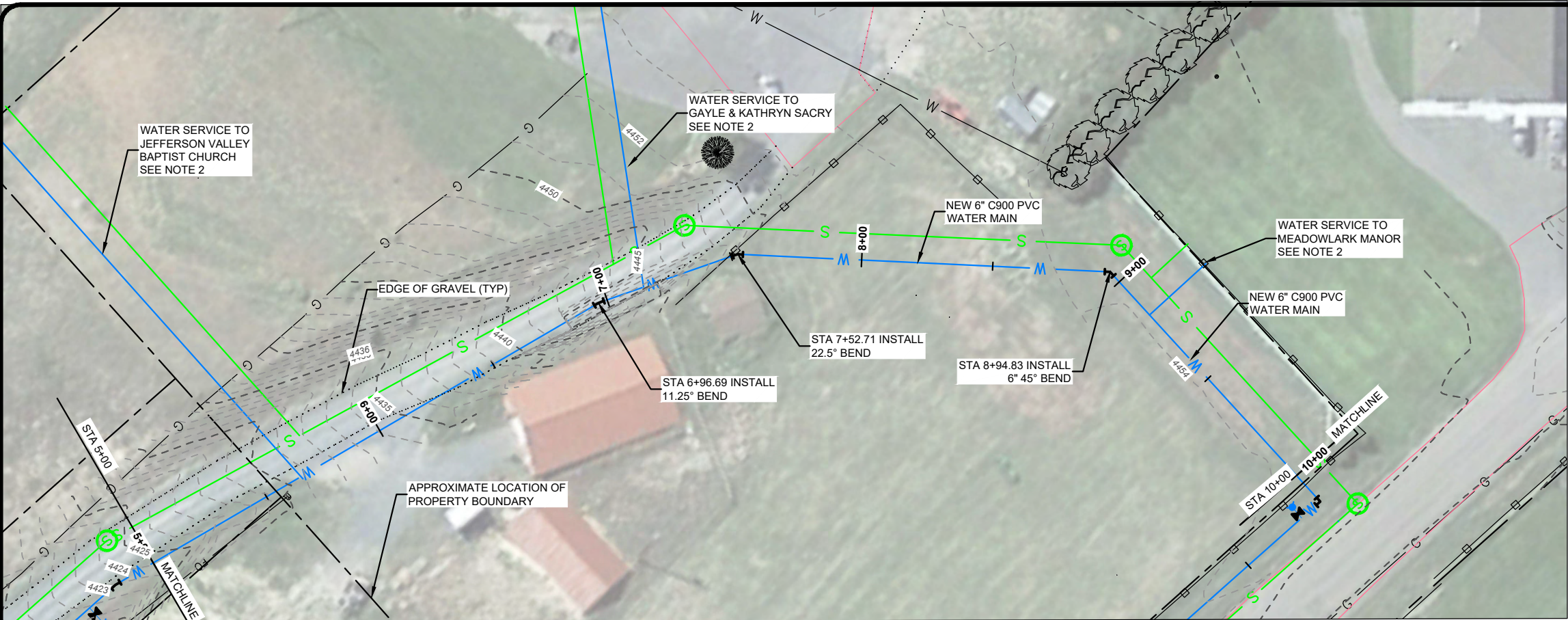
MEADOWLARK MANOR SEWER AND WATER EXTENSION

TOWN OF WHITEHALL
WHITEHALL, MONTANA

WATER MAIN PLAN & PROFILE STA 0+00 TO 5+00

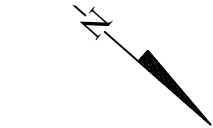
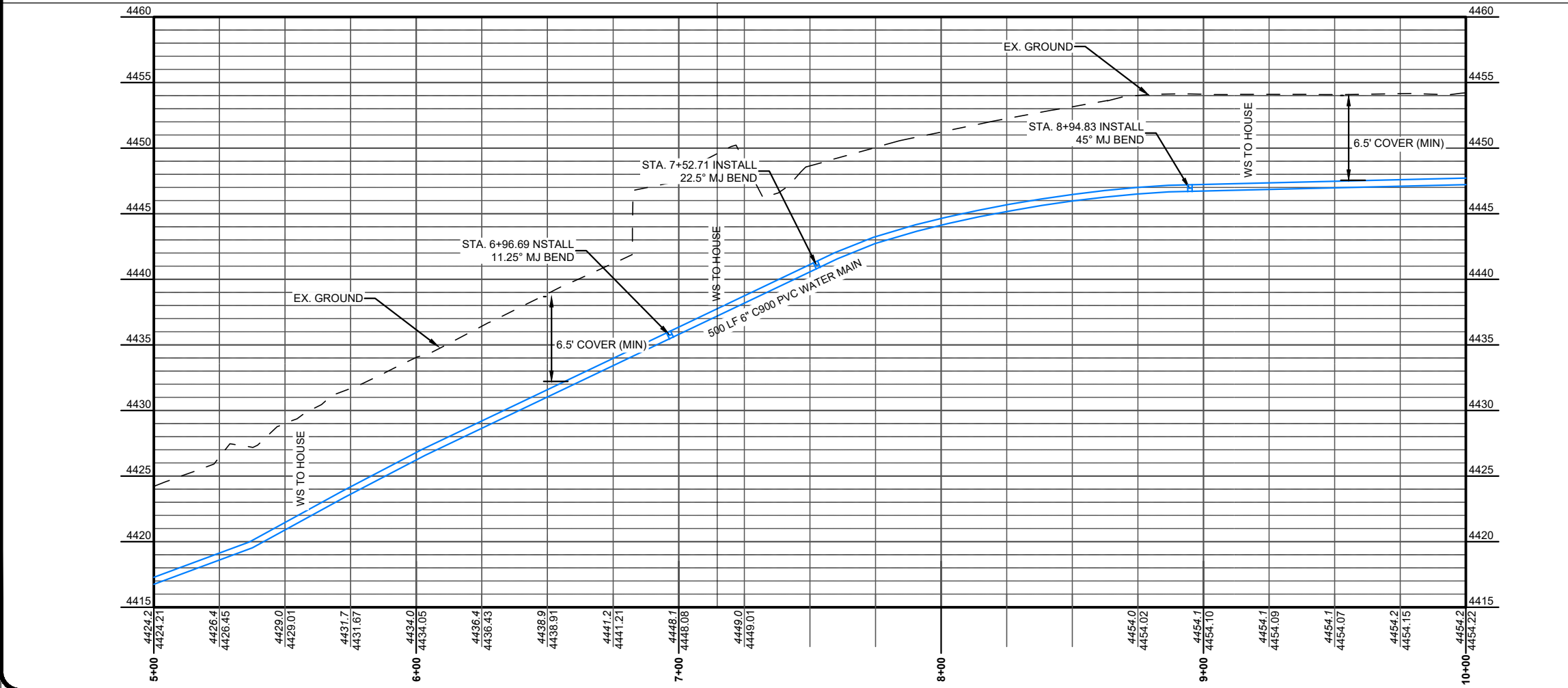
REVISIONS	
DATE	DESCRIPTION

PROJECT #:	21-82
DRAFTED BY:	KJH
CHECKED BY:	JRC
DATE:	6/23/2022
SHEET	
W1	



CONSTRUCTION NOTES

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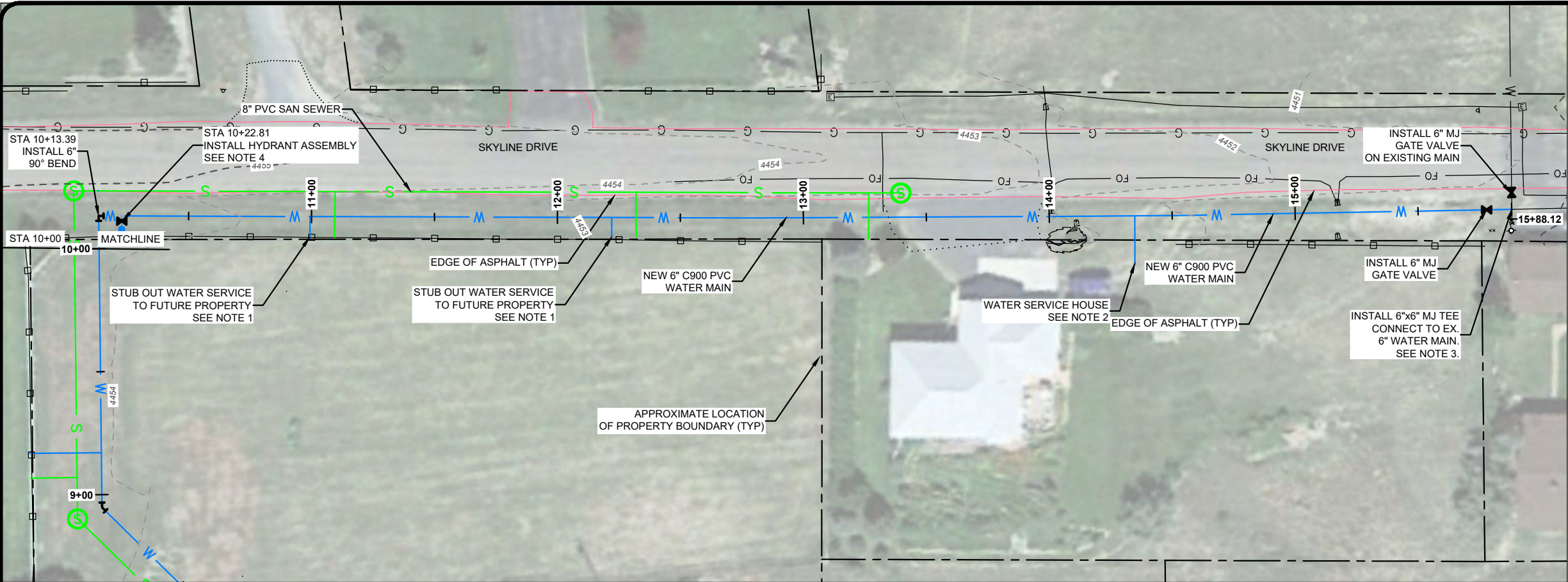
REVISIONS	
DATE	DESCRIPTION

MEADOWLARK MANOR SEWER AND WATER EXTENSION

TOWN OF WHITEHALL
WHITEHALL, MONTANA

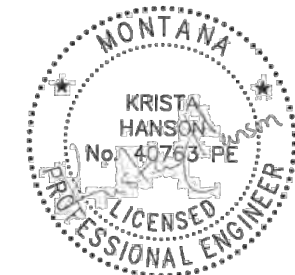
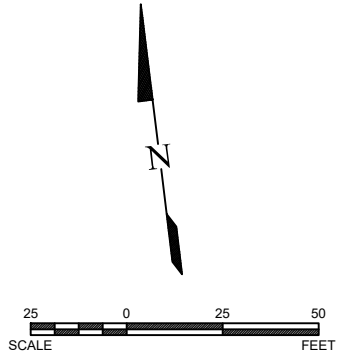
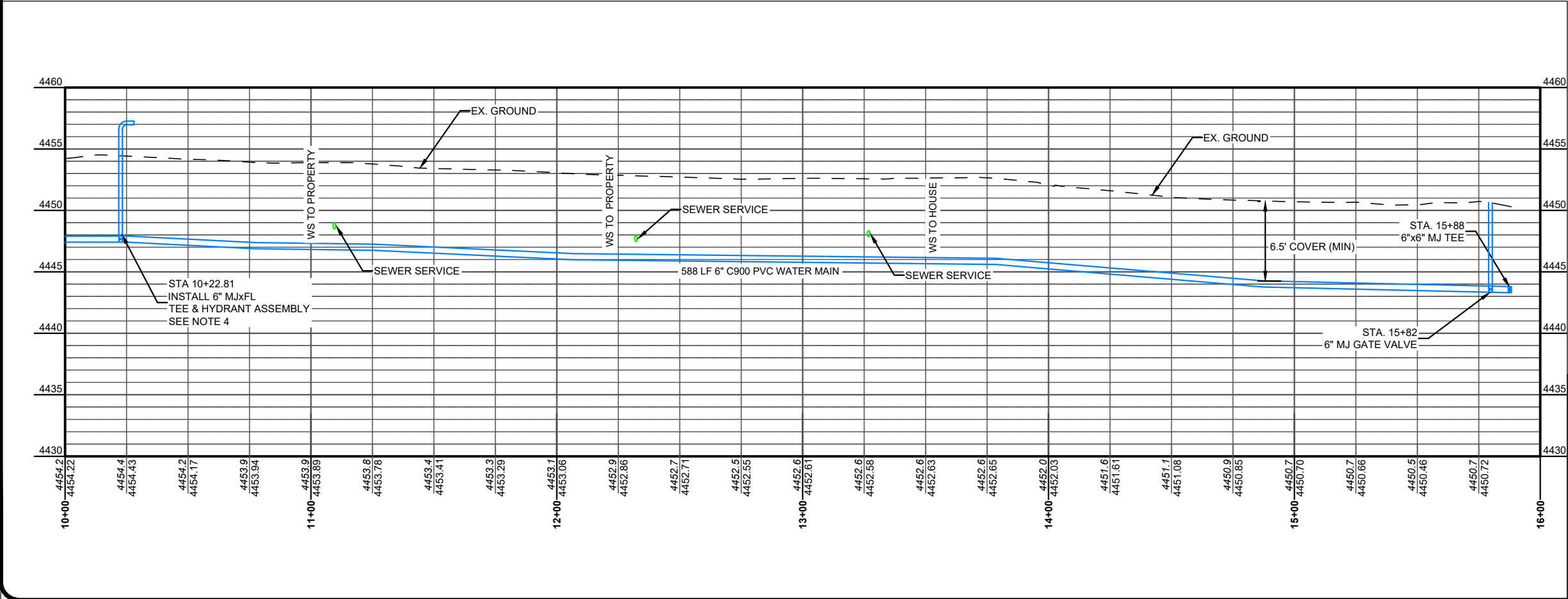
WATER MAIN PLAN & PROFILE STA 5+00 TO 10+00

PROJECT #:	21-82
DRAFTED BY:	KJH
CHECKED BY:	JRC
DATE:	6/23/2022
SHEET	
W2	



CONSTRUCTION NOTES

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- 4. REFER TO MPWSS FOR DETAIL DRAWINGS.



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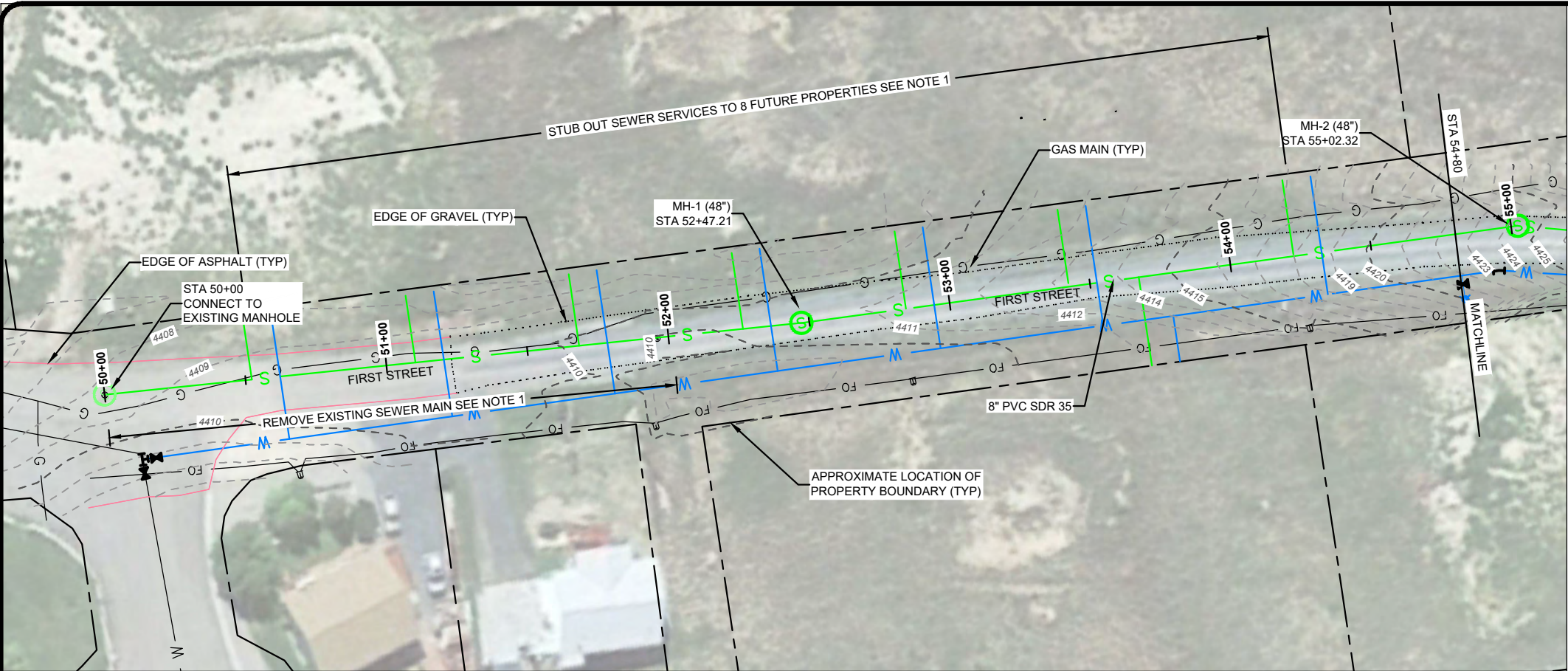
REVISIONS	
DATE	DESCRIPTION

MEADOWLARK MANOR SEWER AND WATER EXTENSION

TOWN OF WHITEHALL
WHITEHALL, MONTANA

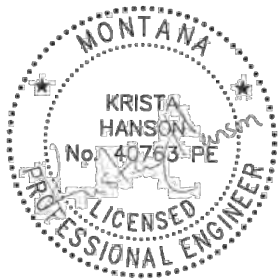
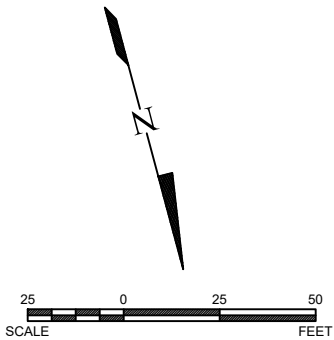
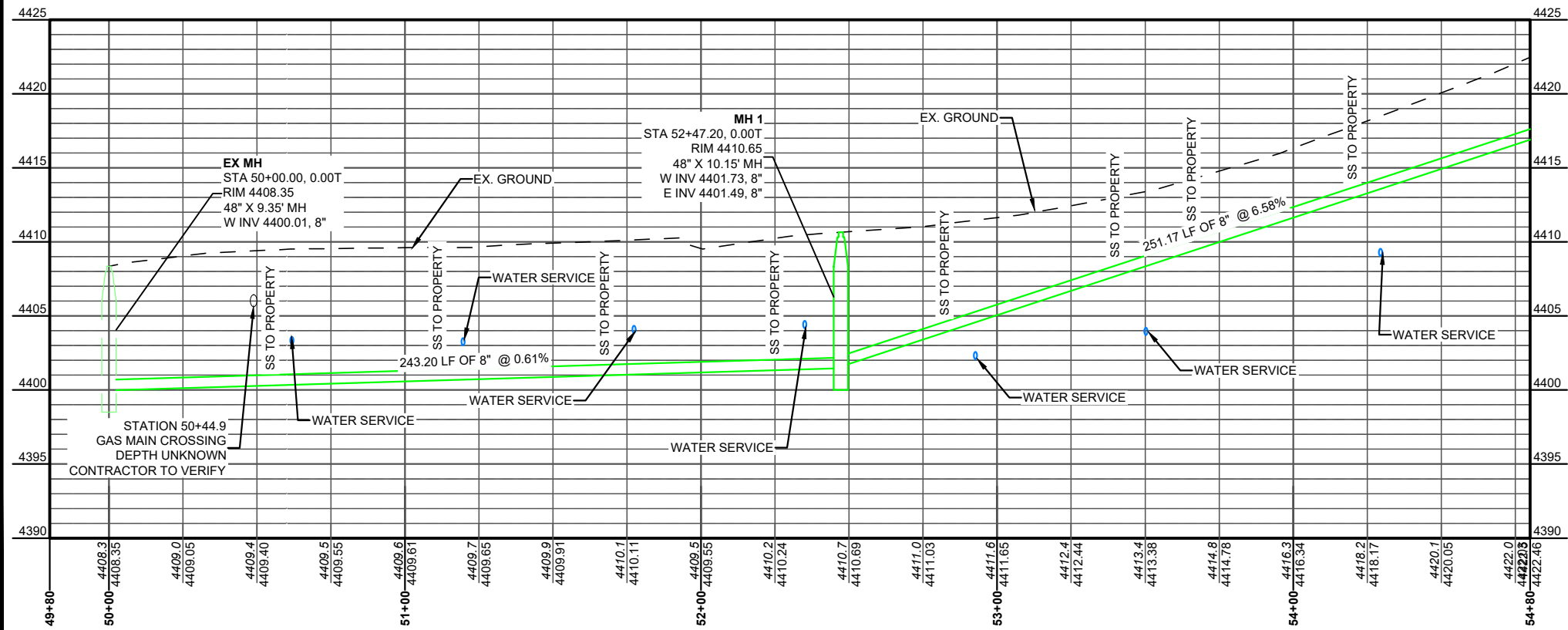
WATER MAIN PLAN & PROFILE STA 10+00 TO 15+88

PROJECT #:	21-82
DRAFTED BY:	KJH
CHECKED BY:	JRC
DATE:	6/23/2022
SHEET	
W3	



CONSTRUCTION NOTES

1. NEW SERVICE LINE LENGTHS AND LCOATIONS HAVE BEEN ESTIAMTED AND MAY BE ADJUSTED IN THE FIELD AS REQUIRED. COORDINATE WITH HOMEONWER TO VERIFY SERVICE LINE LOCATIONS. FOR FUTURE PROPERITES, STUB OUT SERVICE LINES AT PROPERTY LINES AND IN ACCORDANCE WITH MPWSS STANDARD DRAWING NO. 02730-2
2. REFER TO MPWSS FOR DETAIL DRAWINGS
3. PIPE LENGTHS AND SLOPES SHOWN ON THE PROFILE ARE CALCULATED FROM THE INSIDE FACE OF MANHOLE TO INSIDE FACE OF MANHOLE. STATIONING IS FROM CENTER OF MANHOLE TO CENTER OF MANHOLE
4. INSTALL CLEANOUTS AT ALL SERVICE LINE BENDS AND NO LESS THAN 50 FEET APART.



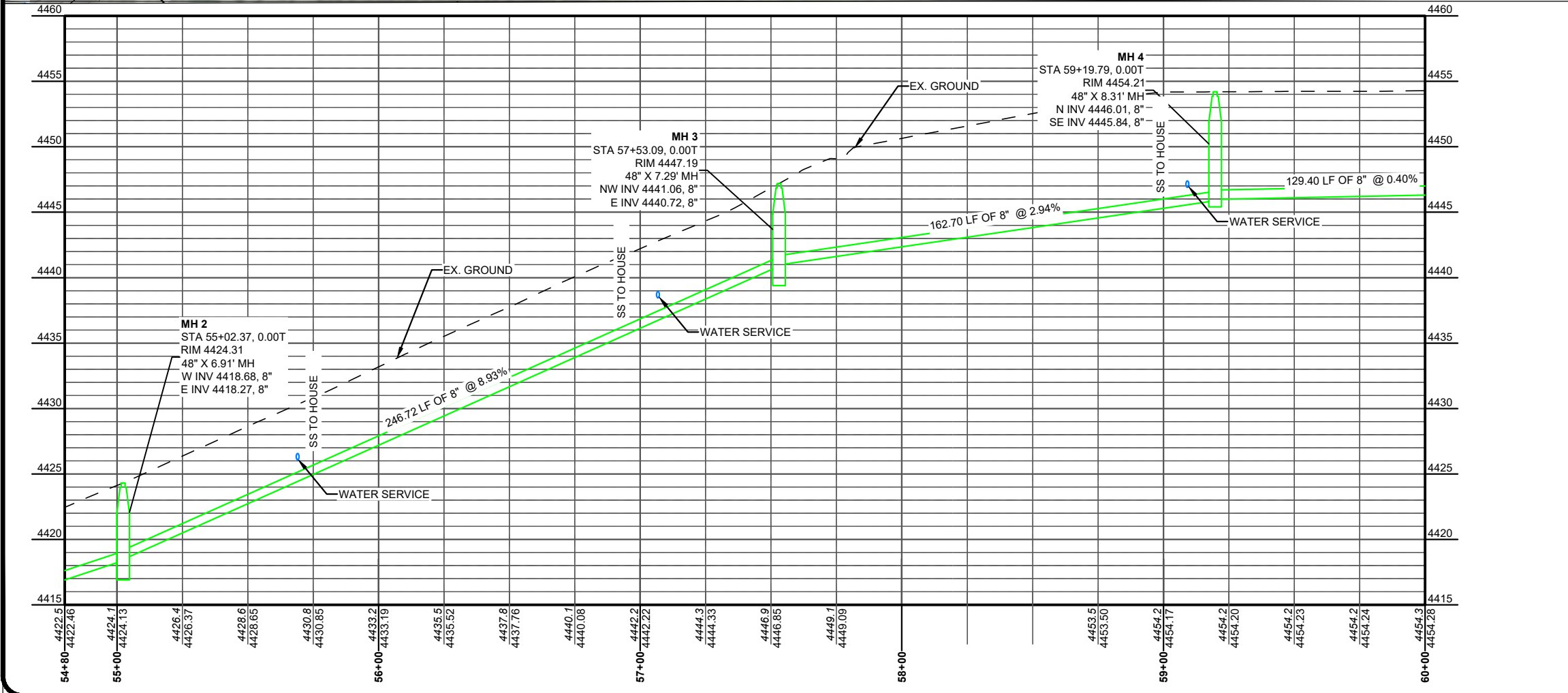
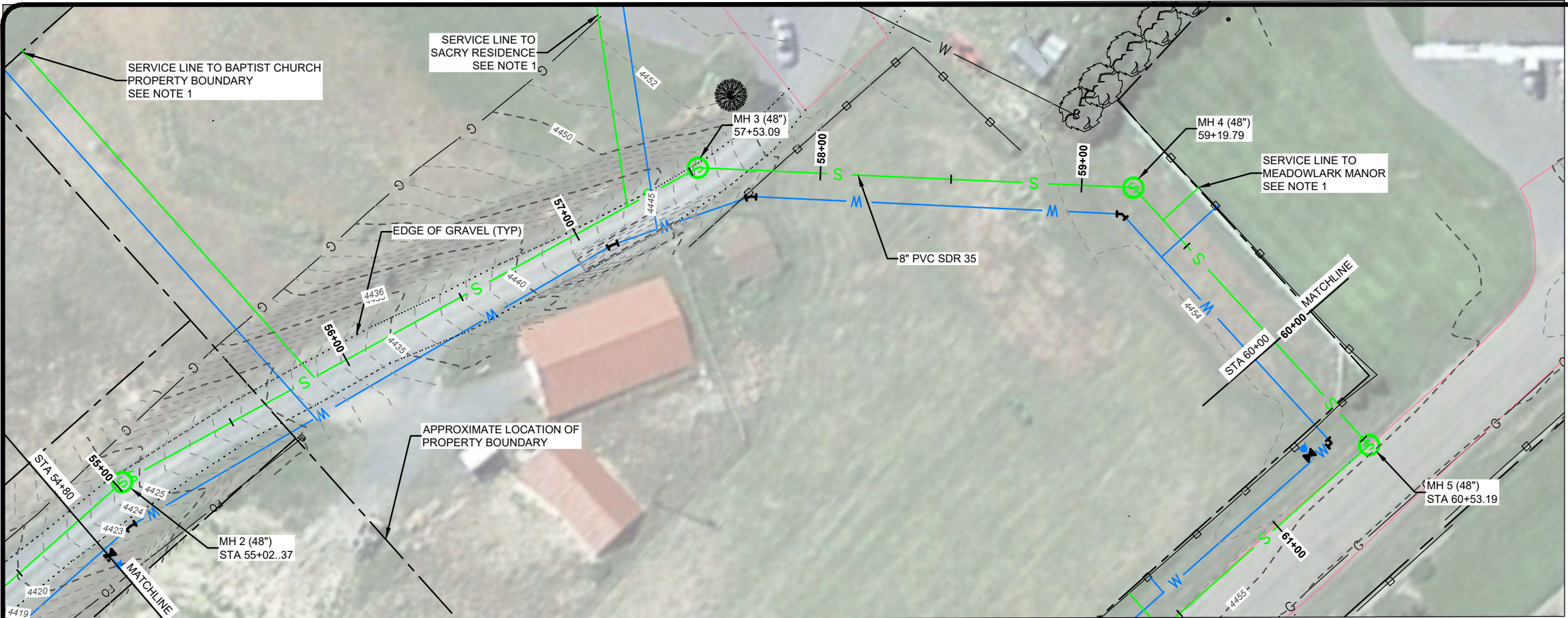
MEADOWLARK MANOR SEWER AND WATER EXTENSION

TOWN OF WHITEHALL
WHITEHALL, MONTANA

SANITARY SEWER MAIN PLAN & PROFILE STA 50+00 TO 55+00

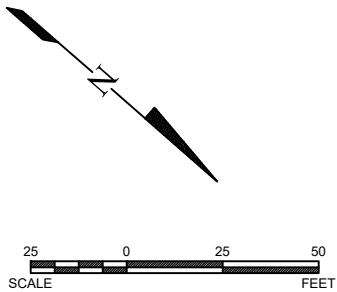
REVISIONS	
DATE	DESCRIPTION

PROJECT #:	21-82
DRAFTED BY:	KJH
CHECKED BY:	JRC
DATE:	6/23/2022
SHEET	
WW1	



CONSTRUCTION NOTES

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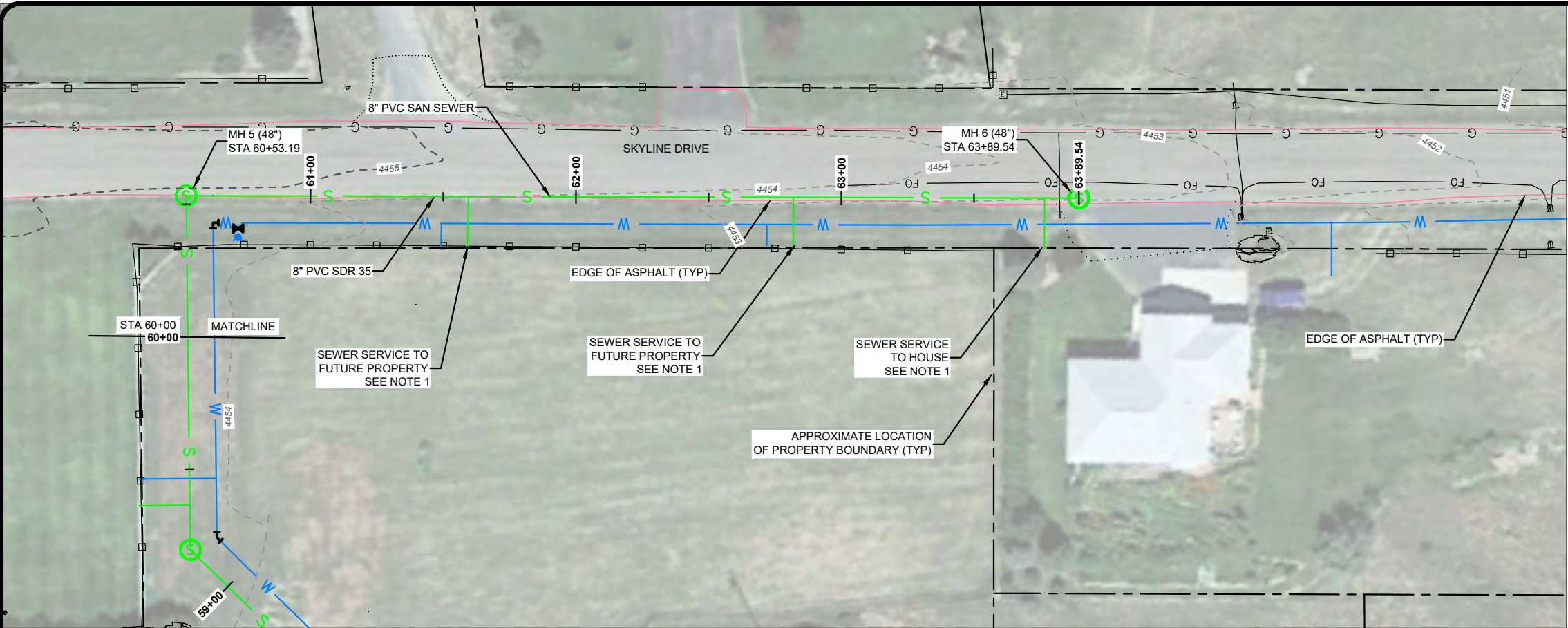


REVISIONS	
DATE	DESCRIPTION

MEADOWLARK MANOR SEWER AND WATER EXTENSION
TOWN OF WHITEHALL
WHITEHALL, MONTANA

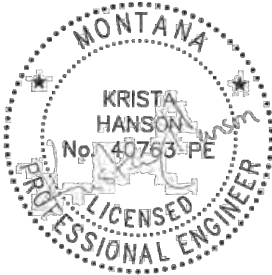
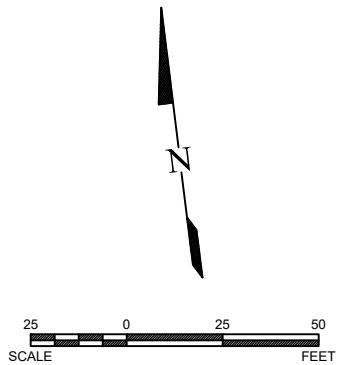
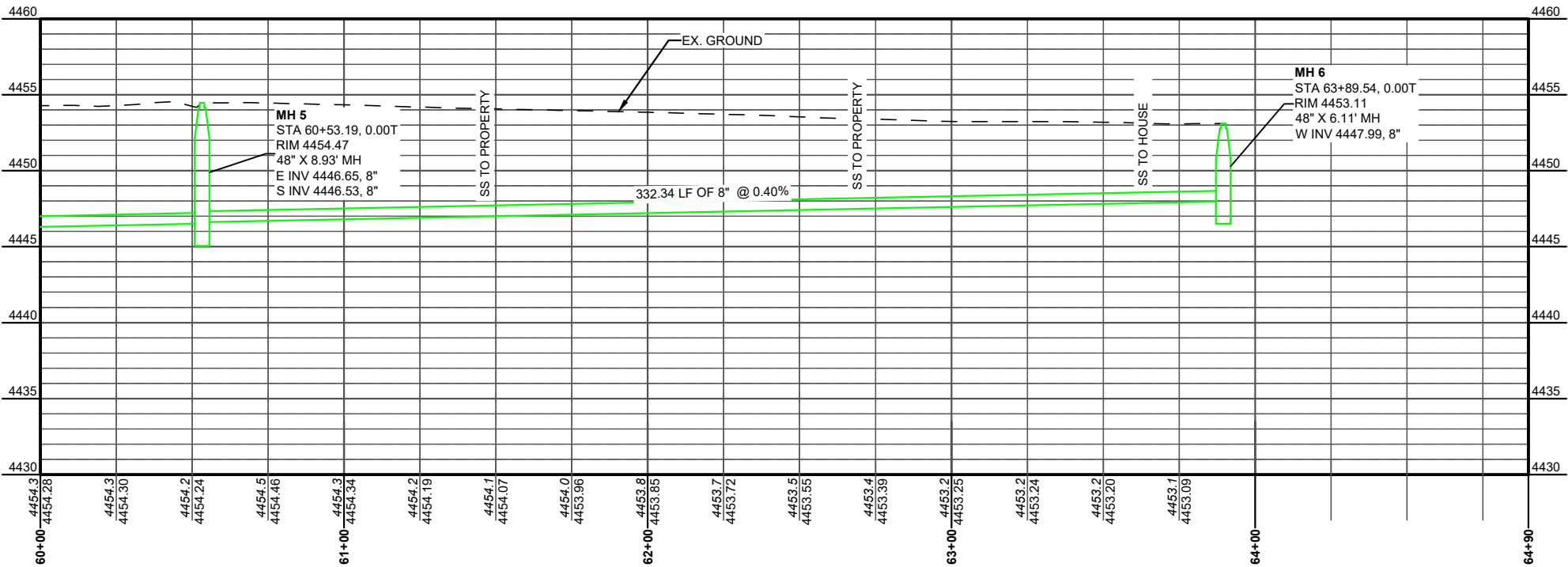
SANITARY SEWER MAIN PLAN & PROFILE STA 55+00 TO 60+00

PROJECT #:	21-82
DRAFTED BY:	KJH
CHECKED BY:	JRC
DATE:	6/23/2022
SHEET	
WW2	



CONSTRUCTION NOTES

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2. REFER TO MPWSS FOR DETAIL DRAWINGS
3. PIPE LENGTHS AND SLOPES SHOWN ON THE PROFILE ARE CALCULATED FROM THE INSIDE FACE OF MANHOLE TO INSIDE FACE OF MANHOLE. STATIONING IS FROM CENTER OF MANHOLE TO CENTER OF MANHOLE
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MEADOWLARK MANOR SEWER AND WATER EXTENSION

TOWN OF WHITEHALL
WHITEHALL, MONTANA

SANITARY SEWER MAIN PLAN & PROFILE STA 60+00 TO 63+89

REVISIONS	
DATE	DESCRIPTION

PROJECT #:	21-82
DRAFTED BY:	KJH
CHECKED BY:	JRC
DATE:	6/23/2022
SHEET	
WW3	