City of Idaho Springs Water Quality
1711 Miner Street
P.O. Box 907
Idaho Springs, CO 80452-0907
Telephone (303) 567-2400
FAX (303) 567-0124

TO: Colorado Water Conservation Board
FROM: Edward Sigward, Water Facilities Superintendent
DATE: February 14, 2025
Re: Mattie Dam Rehabilitation Project - Final report - CWCB WSRF Grant CTGG1 2024-4115

Contents:

In June 2024, the Colorado Water Conservation Board (CWCB) awarded the City a grant for $440,000, with a City match of $244,230. The City had previously completed engineering for the project and immediately posted the project for bid in March 2024. In May, the City awarded Dietzler Construction with the contract.

Thank you CWCB for your assistance and allowing us to complete this project so rapidly.

Project summary:

The Mattie Dam Rehabilitation Project was started to solve several challenges of the City's Water Treatment Facility:

1. The rock and boulder dam had become permeable due to the sand and fines being washed out from between the boulders, making it difficult to maintain a sufficient water level to supply the intake structure.
2. The current screening system was small and unserviceable.
3. Sediment removal from the intake and basin side was not reasonably possible.

The goal of the project was to solve all these challenges and to provide for the City's water supply challenges into the future. Project elements included:

1. Construct a new concrete dam structure.
2. Install a new screening system that meets the demands of the treatment facility.
3. Install a bypass sluiceway so the intake basin can be drained and the intake cleaned out.

Preconstruction efforts:

In June of 2022, the City began engineering efforts to rehabilitate the dam and intake structure. Challenges were fitting a suitable size screen in the existing intake, determining dam crest and screen elevations, and site access. Core sampling was completed to determine the stability of the ground under the dam.

Timeline:

8-7-23 Army Corps of Engineers – Nationwide permit Pre-construction Notification completed.

4-4-24 Colorado Division of Water Resources – Application for Non-Jurisdictional water impoundment structure application completed. Jim Curch, Colorado Dam Safety

7-22-24 Change order #1 – Increase cost $5,445 – To fabricate additional screen section for spare. This provided an additional screen in case of damage or cleaning activities. Only 4 sections were provided in the original plan.

8-13-24 Construction begins.

8-30-24 Field order #1 - To raise the invert of the sluiceway line to make clearance for the water stop and sluice gate frame. After pouring the footer for the headwall it was discovered that additional space was required to fit the sluice gate.

8-30-24 Field order #2 – Cut additional concrete out of intake structure to provide room for Screen and water flow. Provide additional concrete to front of intake structure for water and sediment blockage. Access to the west end of the intake was blocked by existing concrete. This was removed to provide space for installation and maintenance.

9-12-24 Field order #3 – Grading changes around upper part of intake structure. Rip rap around intake structure extended out further on site than expected. This was cut back to allow a smooth transition.

9-30-24 Field order #4 – Additional guidance for addition of concrete to front of intake structure. Because the invert of the sluiceway line was 6” higher than expected a “knee wall” was installed to prevent water from entering the intake during maintenance activities.

10-9-24 Field order #5 – Details and guidance for dam integration to rock face. Because the dam had a direct interface with the rock wall guidance was provided on the best way to tie in to the rockface on the east end of the dam.

10-9-24 Change order #2 – Increase cost $11,480 – Includes changes in Field order #2,4,5

10-18-24 Field order #6 – Details to provide additional grate where concrete was removed in intake structure. This provided walkway grate over the sections where concrete was removed to provide access in Field order #2

10-23-24 Change order #3 – Increase cost $3,805.50 – Includes changes in Field order #6

10-29-24 Field order #7 – Details to use non-shrink grout in areas around new screen frame to seal, Because the walls of the intake structure were not plumb grout was used to seal it to the walls of the intake.

10-29-24 Change order #4 – Increase cost $975.50 - Includes changes in field order #7

10-31-24 Field order #8 – Inspection after Headwall was complete it was found that no handrail was included in the initial plan. The bypass sluiceway valve is located here for safety and a handrail is required. This order provided details for a handrail around the new headwall for sluiceway.

11-5-24 Change order #5 – Increase cost $1,518.00 – Includes changes in Field order #8

11-5-24 Bypass closed, Dam and screen in service.

The existing intake was modified to accommodate the screen with concrete removal and coring for pipe entry. The dam crest elevation was determined by high flow and current dam height, The screen elevation was settled at 3” below the dam crest. Site access remained a concern, but the contractors were able to perform all necessary activities from the east side of Chicago Creek. After the excavation, it was found the ground was stable and suitable for construction.

11-7-24 Construction complete

Funding Summary:

Total cost of the project was $892,505.46, that includes engineering prior to the start date for qualified expenses for the required City match of $244,230.00. With $440,000.00 from CWCB, this leaves $452,505.46 that was paid from the City’s Water Enterprise Fund. The City will be requesting reimbursement from a $200,000.00 grant award from the Colorado Department of Local Affairs’ Energy Impact Assistance Fund.

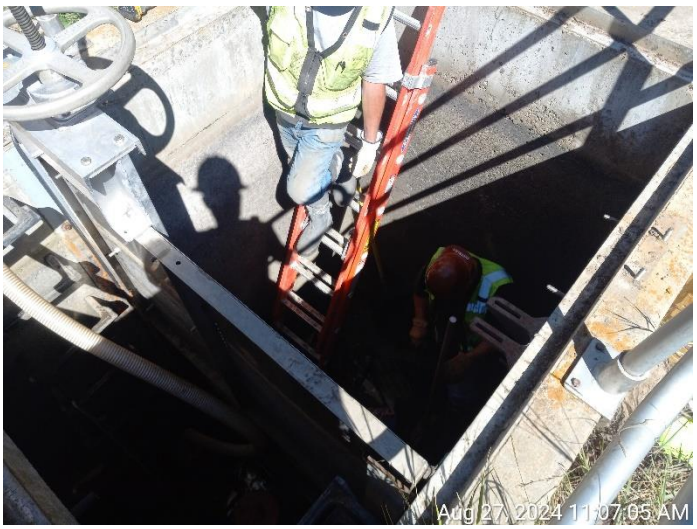
City of Idaho Springs Water Quality
1711 Miner Street
P.O. Box 907
Idaho Springs, CO 80452-0907
Telephone (303) 567-2400
FAX (303) 567-0124

Appendix 1

Began demolition of old dam structure and excavation of site.

Construction of foundation footer for headwall for sluiceway.

Demolition of old screening system and forming of sluiceway headwall. Field order #1 to change invert of sluiceway 6” higher to provide clearance for slide gate valve.



Installation of sluiceway and bypass piping.

Sluiceway and bypass piping backfill and creek diversion. Notice water encroaching on intake structure and raise level of sediment wall.

Sandbags placed to divert water from front of intake structure, Mud mat form construction.

Construction of footer for Dam training wall.

Forming of training wall and intake sediment wall.

Removal of forms and construction of Dam forms.

Dam structure concrete pour and Intake structure modification.

Dam form removal

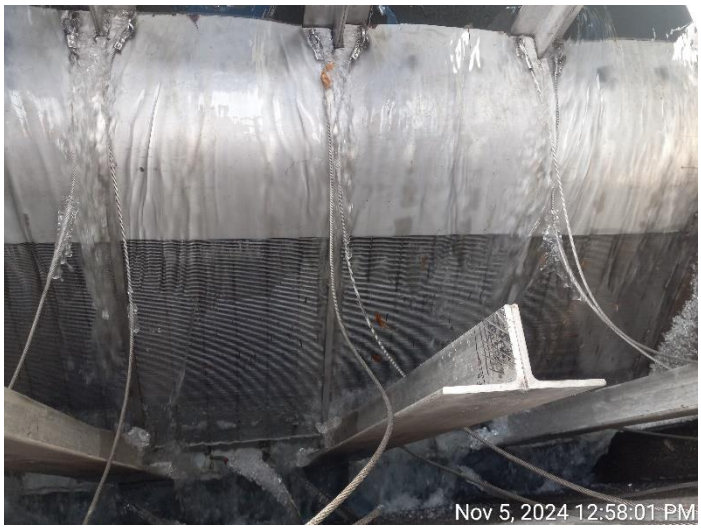
Installation of slide gate valve. Screen framing. Intake modification.

Additional grout around screen was required to seal frame to intake wall, Concrete removed to provide additional water flow to screen.

Backfill & Riprap

Removal of water diversion and startup


Nov 5, 2024 1:00:51 PM
3669 Chicago Creek Road
Idaho Springs
Clear Creek County
Colorado


Nov 5, 2024 12:58:01 PM


Nov 5, 2024 1:01:44 PM
3669 Chicago Creek Road
Idaho Springs
Clear Creek County
Colorado


Nov 7, 2024 2:00:23 PM

U.S. Army Corps of Engineers (USACE)

NATIONWIDE PERMIT PRE-CONSTRUCTION NOTIFICATION (PCN)

33 CFR 330. The proponent agency is CECW-CO-R.

Form Approved -
OMB No. 0710-0003
Expires: 02-28-2022

DATA REQUIRED BY THE PRIVACY ACT OF 1974

Authority	Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Regulatory Program of the Corps of Engineers (Corps); Final Rule 33 CFR 320-332.
Principal Purpose	Information provided on this form will be used in evaluating the nationwide permit pre-construction notification.
Routine Uses	This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of the agency coordination process.
Disclosure	Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued.

The public reporting burden for this collection of information, 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

PLEASE DO NOT RETURN YOUR RESPONSE TO THE ABOVE EMAIL.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (*see sample drawings and/or instructions*) and be submitted to the district engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (*agent is not required*)
First - Edward Middle - Last - Sigward	First - Andrea Middle - Last - Parker
Company - City of Idaho Springs	Company - AECOM
Company Title - Water Facilities Manager	E-mail Address - andrea.parker@aecom.com
E-mail Address - csigward@idahospringco.com	
6. APPLICANT'S ADDRESS	**9. AGENT'S ADDRESS**
Address- 1711 Miner Street	Address- 7595 Technology Way
City - Idaho Springs State - CO Zip - 80452 Country - USA	City - Denver State - CO Zip - 80237 Country - USA
7. APPLICANT'S PHONE NOs. with AREA CODE	**10. AGENT'S PHONE NOs. with AREA CODE**
a. Residence b. Business c. Fax d. Mobile	a. Residence b. Business c. Fax d. Mobile
303-859-6132	(720) 937-6759

STATEMENT OF AUTHORIZATION

11. I hereby authorize, AECOM (Andrea Parker) to act in my behalf as my agent in the processing of this nationwide permit pre-construction notification and to furnish, upon request, supplemental information in support of this nationwide permit pre-construction notification.

SIGNATURE OF APPLICANT — DATE: 8-7-23

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME or TITLE (*see instructions*)
Mattie Dam Rehabilitation Project

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

13. NAME OF WATERBODY, IF KNOWN (*if applicable*)
Chicago Creek

14. PROPOSED ACTIVITY STREET ADDRESS (*if applicable*)
3407 Chicago Creek Road

15. LOCATION OF PROPOSED ACTIVITY (*see instructions*)

Latitude °N	Longitude °W
39.717097	105.572039

City: Idaho Springs | State: CO | Zip: 80542

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (*see instructions*)

State Tax Parcel ID

Municipality
Idaho Springs

Section	Township	Range
NW 1/4 of S9	4S	73W

17. DIRECTIONS TO THE SITE
From I-25 in Idaho Springs, take State Highway 103 (Chicago Creek Road) south for approximately 3.3 mile towards Mount Evans. Mattie Dam is on the right just past the Idaho Springs Water Treatment Plant on the left.

18. IDENTIFY THE SPECIFIC NATIONWIDE PERMIT(S) YOU PROPOSE TO USE
Nationwide Permit 3 (Maintenance).

19. DESCRIPTION OF PROPOSED NATIONWIDE PERMIT ACTIVITY (*see instructions*)
See attached figures and engineering drawings. The replacement dam will comprise a new mass concrete overflow dam across Chicago Creek backfilled with riprap salvaged from the original structure, a reinforced concrete training wall along the right abutment of the overflow dam, and a 24-inch-diameter sluiceway located adjacent to the existing intake structure and discharging next to the existing outfall and existing channel returning flows to Chicago Creek. The new dam will not change the current operating water levels.

20. DESCRIPTION OF PROPOSED MITIGATION MEASURES (*see instructions*)
See attached Block 20 description of mitigation measures.

21. PURPOSE OF NATIONWIDE PERMIT ACTIVITY (*Describe the reason or purpose of the project, see instructions*)
The purpose is to restore the ability of Mattie Dam to divert water from Chicago Creek to the City of Idaho Springs Water Treatment Plant. The dam provides head to divert water into an intake structure that delivers water into the treatment plant. The dam was originally constructed with fines in between the stacked boulders. The fines have gradually washed out and flow now goes through the interstitial spaces. There is now not enough head to divert water to the intake structure during low stream flows.

22. QUANTITY OF WETLANDS, STREAMS, OR OTHER TYPES OF WATERS DIRECTLY AFFECTED BY PROPOSED NATIONWIDE PERMIT ACTIVITY (*see instructions*)

Acres	Linear Feet	Cubic Yards Dredged or Discharged
See Block 22	See Block 22	See Block 22

Each PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site.

23. List any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. (*see instructions*)
None

24. If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and requires pre-construction notification, explain how the compensatory mitigation requirement in paragraph (c) of general condition 23 will be satisfied, or explain why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required for the proposed activity.
Project will have no wetland impacts.

25. Is any portion of the nationwide permit activity already complete? ☐ Yes ☒ No If Yes, describe the completed work:

26. List the name(s) of any species listed as endangered or threatened under the Endangered Species Act that might be affected by the proposed NWP activity or utilize the designated critical habitat that might be affected by the proposed NWP activity. (*see instructions*)

The Project will have no effect to endangered or threatened species. A detailed analysis is provide in attached Aquatic and Biological Resources Report.

27. List any historic properties that have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic property or properties. (*see instructions*)

No known historic properties will be affected by the Project. Refer to the attached Cultural Resources Technical Memorandum.

28. For a proposed NWP activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, identify the Wild and Scenic River or the "study river":

Project does not occur in a component of the Wild and Scenic River system, or in a study river.

29. If the proposed NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, have you submitted a written request for section 408 permission from the Corps district having jurisdiction over that project? ☐ Yes ☐ No

If "yes", please provide the date your request was submitted to the Corps district:

30. If the terms of the NWP(s) you want to use require additional information to be included in the PCN, please include that information in this space or provide it on an additional sheet of paper marked Block 30. (*see instructions*)

Not applicable

31. Pre-construction notification is hereby made for one or more nationwide permit(s) to authorize the work described in this notification. I certify that the information in this pre-construction notification is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE
	8-7-23	Parker, Andrea Digitally signed by Parker, Andrea Date: 2023.07.26 18:03:44 -06'00'	2023-07-26

The pre-construction notification must be signed by the person who desires to undertake the proposed activity (applicant) and, if the statement in Block 11 has been filled out and signed, the authorized agent.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

Instructions for Preparing a

Department of the Army

Nationwide Permit (NWP) Pre-Construction Notification (PCN)

Blocks 1 through 4. To be completed by the Corps of Engineers.

Block 5. Applicant's Name. Enter the name and the e-mail address of the responsible party or parties. If the responsible party is an agency, company, corporation, or other organization, indicate the name of the organization and responsible officer and title. If more than one party is associated with the preconstruction notification, please attach a sheet of paper with the necessary information marked Block 5.

Block 6. Address of Applicant. Please provide the full address of the party or parties responsible for the PCN. If more space is needed, attach an extra sheet of paper marked Block 6.

Block 7. Applicant's Telephone Number(s). Please provide the telephone number where you can usually be reached during normal business hours.

Blocks 8 through 11. To be completed, if you choose to have an agent.

Block 8. Authorized Agent's Name and Title. Indicate name of individual or agency, designated by you, to represent you in this process. An agent can be an attorney, builder, contractor, engineer, consultant, or any other person or organization. Note: An agent is not required.

Blocks 9 and 10. Agent's Address and Telephone Number. Please provide the complete mailing address of the agent, along with the telephone number where he / she can be reached during normal business hours.

Block 11. Statement of Authorization. To be completed by the applicant, if an agent is to be employed.

Block 12. Proposed Nationwide Permit Activity Name or Title. Please provide a name identifying the proposed NWP activity, e.g., Windward Marina, Rolling Hills Subdivision, or Smith Commercial Center.

Block 13. Name of Waterbody. Please provide the name (if it has a name) of any stream, lake, marsh, or other waterway to be directly impacted by the NWP activity. If it is a minor (no name) stream, identify the waterbody the minor stream enters.

Block 14. Proposed Activity Street Address. If the proposed NWP activity is located at a site having a street address (not a box number), please enter it in Block 14.

Block 15. Location of Proposed Activity. Enter the latitude and longitude of where the proposed NWP activity is located. Indicate whether the project location provided is the center of the project or whether the project location is provided as the latitude and longitude for each of the "corners" of the project area requiring evaluation. If there are multiple sites, please list the latitude and longitude of each site (center or corners) on a separate sheet of paper and mark as Block 15.

Block 16. Other Location Descriptions. If available, provide the Tax Parcel Identification number of the site, Section, Township, and Range of the site (if known), and / or local Municipality where the site is located.

Block 17. Directions to the Site. Provide directions to the site from a known location or landmark. Include highway and street numbers as well as names. Also provide distances from known locations and any other information that would assist in locating the site. You may also provide a description of the location of the proposed NWP activity, such as lot numbers, tract numbers, or you may choose to locate the proposed NWP activity site from a known point (such as the right descending bank of Smith Creek, one mile downstream from the Highway 14 bridge). If a large river or stream, include the river mile of the proposed NWP activity site if known. If there are multiple locations, please indicate directions to each location on a separate sheet of paper and mark as Block 17.

Block 18. Identify the Specific Nationwide Permit(s) You Propose to Use. List the number(s) of the Nationwide Permit(s) you want to use to authorize the proposed activity (e.g., NWP 29).

Block 19. Description of the Proposed Nationwide Permit Activity. Describe the proposed NWP activity, including the direct and indirect adverse environmental effects the activity would cause. The description of the proposed activity should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal. Identify the materials to be used in construction, as well as the methods by which the work is to be done.

Provide sketches when necessary to show that the proposed NWP activity complies with the terms of the applicable NWP(s). Sketches usually clarify the activity and result in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed NWP activity (e.g.,a conceptual plan), but do not need to be detailed engineering plans.

The written descriptions and illustrations are an important part of the application. Please describe, in detail, what you wish to do. If more space is needed, attach an extra sheet of paper marked Block 19.

Block 20. Description of Proposed Mitigation Measures. Describe any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed NWP activity. The description of any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or additional mitigation measures.

Block 21. Purpose of Nationwide Permit Activity. Describe the purpose and need for the proposed NWP activity. What will it be used for and why? Also include a brief description of any related activities associated with the proposed project. Provide the approximate dates you plan to begin and complete all work.

Block 22. Quantity of Wetlands, Streams, or Other Types of Waters Directly Affected by the Proposed Nationwide Permit Activity. For discharges of dredged or fill material into waters of the United States, provide the amount of wetlands, streams, or other types of waters filled, flooded, excavated, or drained by the proposed NWP activity. For structures or work in navigable waters of the United States subject to Section 10 of the Rivers and Harbors Act of 1899, provide the amount of navigable waters filled, dredged, or occupied by one or more structures (e.g., aids to navigation, mooring buoys) by the proposed NWP activity.

For multiple NWPs, or for separate and distant crossings of waters of the United States authorized by NWPs 12 or 14, attach an extra sheet of paper marked Block 21 to provide the quantities of wetlands, streams, or other types of waters filled, flooded, excavated, or drained (or dredged or occupied by structures, if in waters subject to Section 10 of the Rivers and Harbors Act of 1899) for each NWP. For NWPs 12 and 14, include the amount of wetlands, streams, or other types of waters filled, flooded, excavated, or drained for each separate and distant crossing of waters or wetlands. If more space is needed, attach an extra sheet of paper marked Block 22.

Block 23. Identify Any Other Nationwide Permit(s), Regional General Permit(s), or Individual Permit(s) Used to Authorize Any Part of Proposed Activity or Any Related Activity. List any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. For linear projects, list other separate and distant crossings of waters and wetlands authorized by NWPs 12 or 14 that do not require PCNs. If more space is needed, attach an extra sheet of paper marked Block 23.

Block 24. Compensatory Mitigation Statement for Losses of Greater Than 1/10-Acre of Wetlands When Pre-Construction Notification is Required. Paragraph (c) of NWP general condition 23 requires compensatory mitigation at a minimum one-for-one replacement ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation is more environmentally appropriate or the adverse environmental effects of the proposed NWP activity are no more than minimal without compensatory mitigation, and provides an activity-specific waiver of this requirement. Describe the proposed compensatory mitigation for wetland losses greater than 1/10 acre, or provide an explanation of why the district engineer should not require wetland compensatory mitigation for the proposed NWP activity. If more space is needed, attach an extra sheet of paper marked Block 24.

Block 25. Is Any Portion of the Nationwide Permit Activity Already Complete? Describe any work that has already been completed for the NWP activity.

Block 26. List the Name(s) of Any Species Listed As Endangered or Threatened under the Endangered Species Act that Might be Affected by the Nationwide Permit Activity. If you are not a federal agency, and if any listed species or designated critical habitat might be affected or is in the vicinity of the proposed NWP activity, or if the proposed NWP activity is located in designated critical habitat, list the name(s) of those endangered or threatened species that might be affected by the proposed NWP activity or utilize the designated critical habitat that might be affected by the proposed NWP activity. If you are a Federal agency, and the proposed NWP activity requires a PCN, you must provide documentation demonstrating compliance with Section 7 of the Endangered Species Act.

Block 27. List Any Historic Properties that Have the Potential to be Affected by the Nationwide Permit Activity. If you are not a Federal agency, and if any historic properties have the potential to be affected by the proposed NWP activity, list the name(s) of those historic properties that have the potential to be affected by the proposed NWP activity. If you are a Federal agency, and the proposed NWP activity requires a PCN, you must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

Block 28. List the Wild and Scenic River or Congressionally Designated Study River if the Nationwide Permit Activity Would Occur in such a River. If the proposed NWP activity will occur in a river in the National Wild and Scenic River System or in a river officially designated by Congress as a "study river" under the Wild and Scenic Rivers Act, provide the name of the river. For a list of Wild and Scenic Rivers and study rivers, please visit http://www.rivers.gov/.

Block 29. Nationwide Permit Activities that also Require Permission from the Corps Under 33 U.S.C. 408. If the proposed NWP activity also requires permission from the Corps under 33 U.S.C. 408 because it will temporarily or permanently alter, occupy, or use a Corps federal authorized civil works project, indicate whether you have submitted a written request for section 408 permission from the Corps district having jurisdiction over that project.

Block 30. Other Information Required For Nationwide Permit Pre-Construction Notifications. The terms of some of the Nationwide Permits include additional information requirements for preconstruction notifications:

* NWP 3, Maintenance –information regarding the original design capacities and configurations of the outfalls, intakes, small impoundments, and canals.
* NWP 31, Maintenance of Existing Flood Control Facilities –a description of the maintenance baseline and the dredged material disposal site.
* NWP 33, Temporary Construction, Access, and Dewatering –a restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions.
* NWP 44, Mining Activities –if reclamation is required by other statutes, then a copy of the final reclamation plan must be submitted with the pre-construction notification.
* NWP 45, Repair of Uplands Damaged by Discrete Events –documentation, such as a recent topographic survey or photographs, to justify the extent of the proposed restoration.
* NWP 48, Commercial Shellfish Aquaculture Activities –(1) a map showing the boundaries of the project area, with latitude and longitude coordinates for each corner of the project area; (2) the name(s) of the species that will be cultivated during the period this NWP is in effect; (3) whether canopy predator nets will be used; (4) whether suspended cultivation techniques will be used; and (5) general water depths in the project area (a detailed survey is not required).
* NWP 49, Coal Remining Activities –a document describing how the overall mining plan will result in a net increase in aquatic resource functions must be submitted to the district engineer and receive written authorization prior to commencing the activity.
* NWP 50, Underground Coal Mining Activities –if reclamation is required by other statutes, then a copy of the reclamation plan must be submitted with the pre-construction notification.

If more space is needed, attach an extra sheet of paper marked Block 30.

Block 31. Signature of Applicant or Agent. The PCN must be signed by the person proposing to undertake the NWP activity, and if applicable, the authorized party (agent) that prepared the PCN. The signature of the person proposing to undertake the NWP activity shall be an affirmation that the party submitting the PCN possesses the requisite property rights to undertake the NWP activity (including compliance with special conditions, mitigation, etc.).

DELINEATION OF WETLANDS, OTHER SPECIAL AQUATIC SITES, AND OTHER WATERS

Each PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current wetland delineation manual and regional supplement published by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. The 45 day PCN review period will not start until the delineation is submitted or has been completed by the Corps.

DRAWINGS AND ILLUSTRATIONS

General Information.

Three types of illustrations are needed to properly depict the work to be undertaken. These illustrations or drawings are identified as a Vicinity Map, a Plan View or a Typical Cross-Section Map. Identify each illustration with a figure or attachment number. For linear projects (e.g. roads, subsurface utility lines, etc.) gradient drawings should also be included. Please submit one original, or good quality copy, of all drawings on 8½x11 inch plain white paper (electronic media may be substituted). Use the fewest number of sheets necessary for your drawings or illustrations. Each illustration should identify the project, the applicant, and the type of illustration (vicinity map, plan view, or cross-section). While illustrations need not be professional (many small, private project illustrations are prepared by hand), they should be clear, accurate, and contain all necessary information.

ADDITIONAL INFORMATION AND REQUIREMENTS

For proposed NWP activities that involve discharges into waters of the United States, water quality certification from the State, Tribe, or EPA must be obtained or waived (see NWP general condition 25). Some States, Tribes, or EPA have issued water quality certification for one or more NWPs. Please check the appropriate Corps district web site to see if water quality certification has already been issued for the NWP(s) you wish to use. For proposed NWP activities in coastal states, state Coastal Zone Management Act consistency concurrence must be obtained, or a presumption of concurrence must occur (see NWP general condition 26). Some States have issued Coastal Zone Management Act consistency concurrences for one or more NWPs. Please check the appropriate Corps district web site to see if Coastal Zone Management Act consistency concurrence has already been issued for the NWP(s) you wish to use.

Block 20 – Description of Proposed Mitigation Measures

Avoidance and Minimization

Due to the nature of the project, impacts to surface waters cannot be avoided. Work will be kept to the minimum necessary in Chicago Creek. Impacts to wetlands will be avoided by placing staging and temporary use areas outside of wetlands. Wetland areas not needed for construction will be protected by orange construction fencing and sediment control logs to prevent encroachment of construction traffic. Work will be conducted in the fall when stream flows are reduced. Work in the fall will also avoid impacts to nesting migratory birds.

Erosion control and Water Quality Protection

Best management practices (BMPs) will be implemented during all phases to reduce potential impacts from sedimentation and erosion. There will be no equipment staging, storage of materials, use of chemical or equipment refueling within 50 feet of wetlands or other water features. All stockpiled topsoil or other materials will be located away from wetlands and surface waters. Spill prevention and containment measures will be used for all storage, equipment fueling, and equipment servicing areas to contain all spills.

The following measures will be used to prevent the spread of aquatic invasive species where activities occur in open water. If vehicles or equipment have previously been used in another stream, river, lake, reservoir, pond or wetland, all accessible surfaces will be power washed prior to being used on this project, to remove all mud and organics. Washing should be at a temperature of more than 140 degrees F for at least ten minutes. Equipment shall be dry before use. Hand tools, boots and any other equipment used in the water must also be cleaned.

Vegetation Restoration

Soil preparation, soil conditioning or topsoil seeding, mulching and mulch tackifier, and seeding will be used on temporarily disturbed areas.

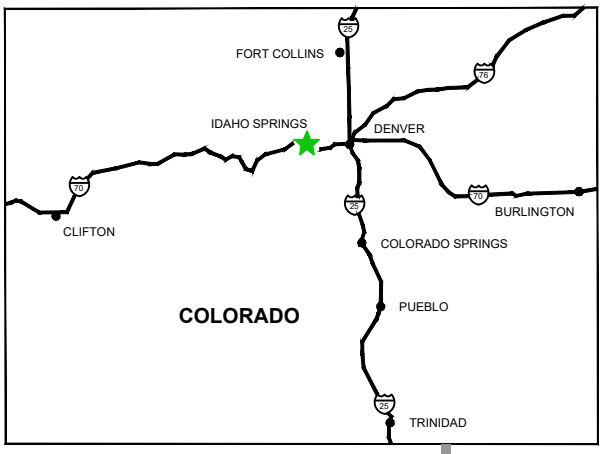
Block 22 – Acres and Linear Feet of Wetland and Surface Water Impacts

The following table presents the area of impact to Chicago Creek, the only aquatic resource affected by the Project. Permanent impacts will result from changes in substrate or grading, resulting from excavation of the existing dam, construction of a concrete dam in its place, salvage and replacement of boulders and riprap, and construction of a sluiceway with an intake gate and outfall. The impacts will occur in areas affected by previous Mattie Dam construction. Flows in Chicago Creek will be maintained and there will be no loss of surface waters.

Wetland or Surface Water	Permanent Impacts			Temporary Impacts			Total Impacts		
	Square feet	Acres	Length (feet)	Square feet	Acres	Length (feet)	Square feet	Acres	Length (feet)
Chicago Creek	841	0.019	23	2,317	0.053	57	3,158	0.072	80

Attachment A

Figures



LOCATION PLAN
SCALE NTS

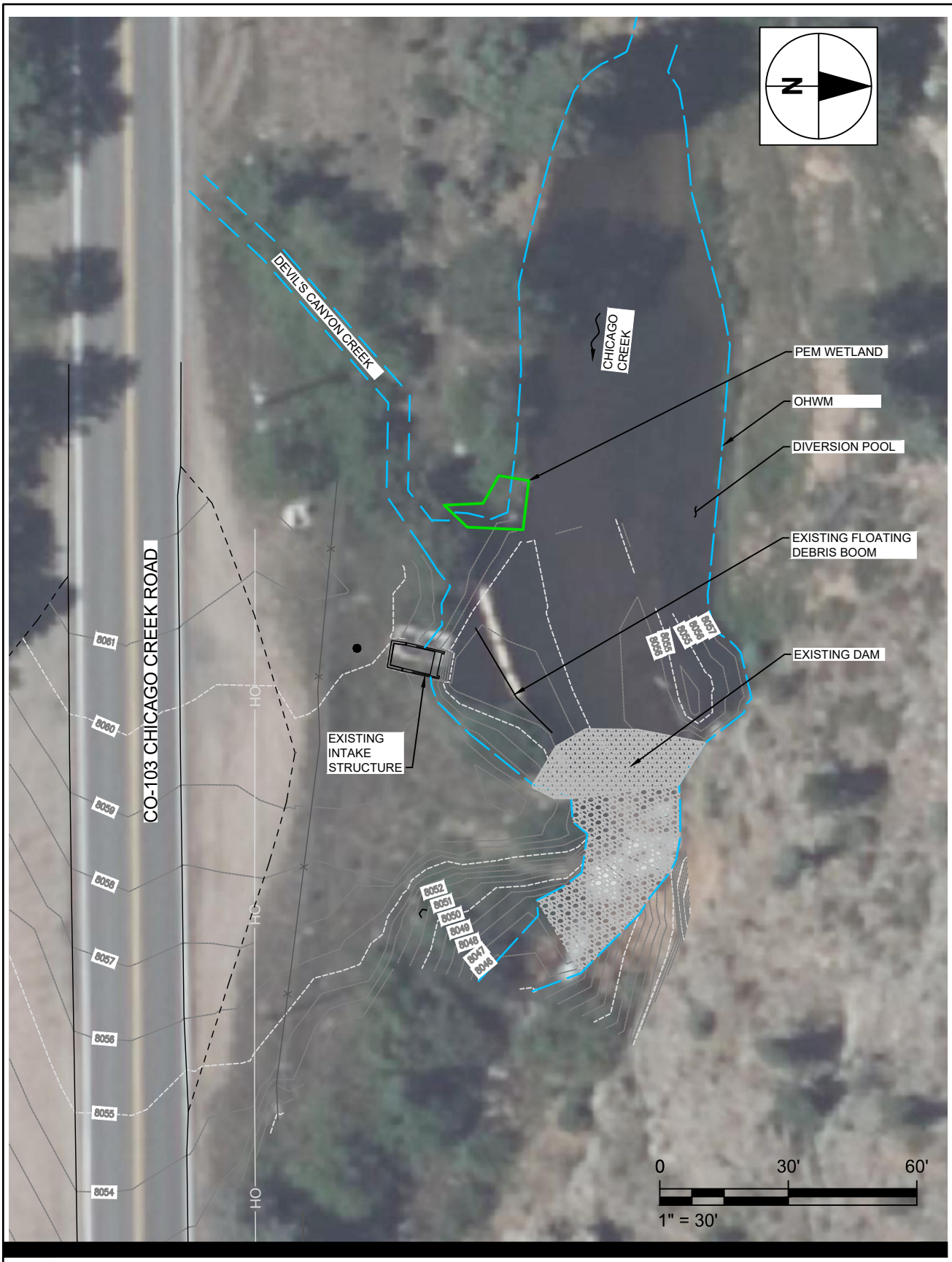
MATTIE DAM REHABILITATION
CITY OF IDAHO SPRINGS, COLORADO

PROJECT LOCATION MAP

Project No. 60685200 Date: 2023-07-20

AECOM

Figure 1.0



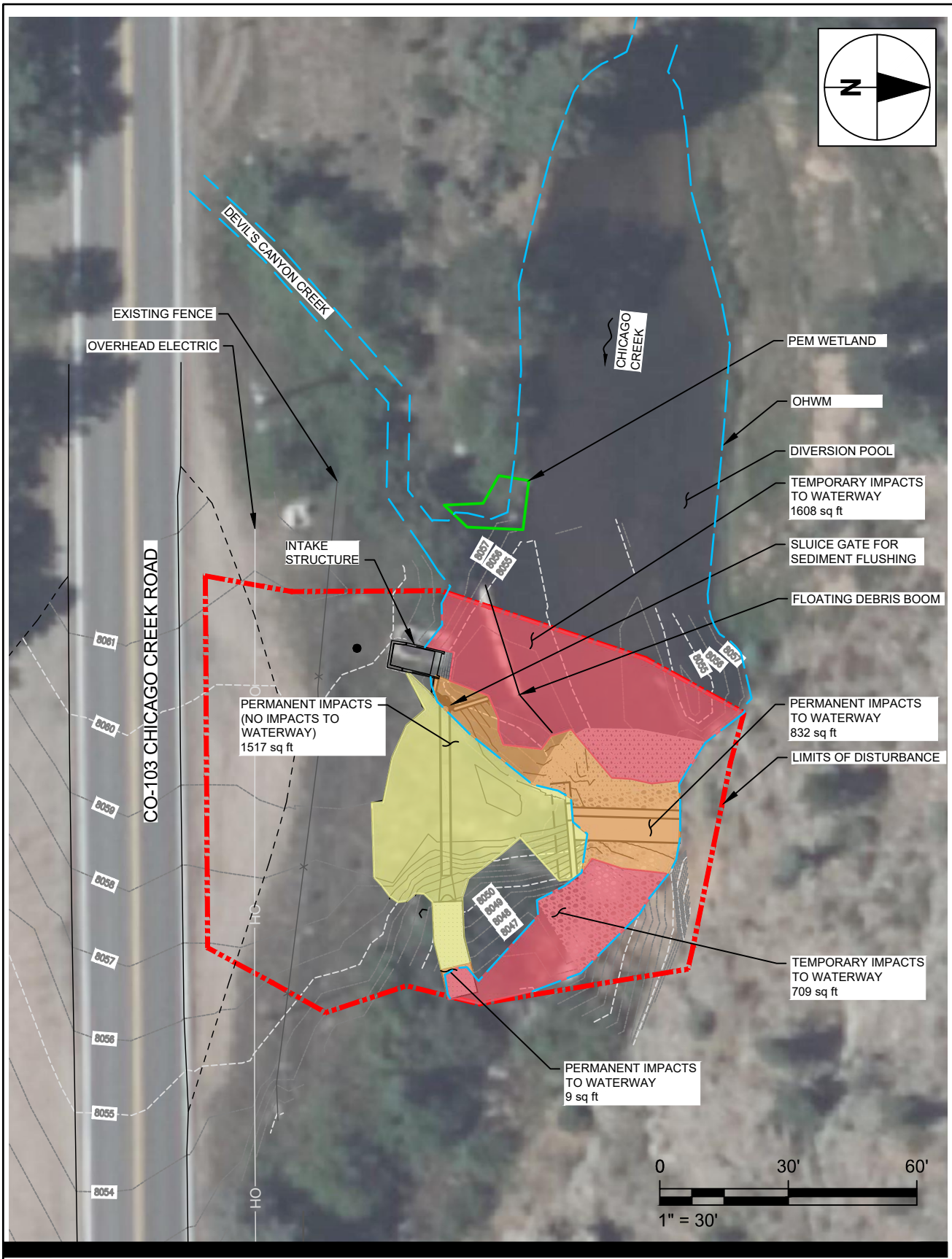
MATTIE DAM REHABILITATION
CITY OF IDAHO SPRINGS, COLORADO

Project No. 60685200 Date: 2023-07-20

WETLANDS AND SURFACE WATER

AECOM

Figure 2.0



Last saved by: CARRIERET(2023-07-27) Last Plotted: 2023-07-27
Filename: \\NA.AECOMNET.COM\LFSAMERIDENVER-USDEN06\DCS\PROJECTS\WTR\60685200_MATTIE_DAM_REHAB\900_CAD_GIS\910_CAD\30-FIGURES\WETLAND FIGURES\FIG 3.DWG
Project Management Initials: ____ Designer: JJH ____ Checked: JJH ____ Approved: ____ ISO A4 210mm x 297mm

MATTIE DAM REHABILITATION
CITY OF IDAHO SPRINGS, COLORADO

Project No. 60685200 Date: 2023-07-20

IMPACT TO WETLANDS AND SURFACE WATER

AECOM

Figure 3.0

Attachment B

Mattie Dam 60% Design Drawings

Attachment C

Mattie Dam Rehabilitation Project, Aquatic and Biological Resources Report

AECOM

Mattie Dam Rehabilitation Project
Idaho Springs, Colorado
Aquatic and Biological Resources Report

July 27, 2023

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
Jeffrey Dawson			

Revision History

Revision	Revision date	Details	Authorized	Name	Position

Distribution List

# Hard Copies	PDF Required	Association / Company Name

Prepared for:

Edward Sigward ORC CWP
Water Facilities Superintendent
City of Idaho Springs
1711 Miner Street
Idaho Springs, CO 80452

Prepared by:

AECOM
7595 Technology Way
Denver, CO 80237
aecom.com

Table of Contents

List of Tables

List of Figures

List of Attachments

List of Acronyms and Abbreviations

%	percent
AECOM	AECOM Technical Services, Inc.
BMP	Best Management Practice
CDOT	Colorado Department of Transportation
CNHP	Colorado Natural Heritage Program
CPW	Colorado Parks and Wildlife
FC	federal candidate
FE	Federally endangered
FT	Federally threatened
GASP	Groundwater Appropriators of the South Platte Basin
GIS	geographical information system
GPS	global positioning system
HUC	Hydrological Unit Code
ID	identification
N/A	Not Applicable
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
OHWM	Ordinary High Water Mark
PEM	Palustrine emergent
Project	Mattie Dam Rehabilitation Project
PSS	palustrine scrub-shrub wetlands
R3UBG	riverine, upper perennial, unconsolidated bottom, intermittently exposed
R5UBH	riverine, unknown perennial, unconsolidated bottom, permanently flooded
RCP	reinforced concrete pipe
SC	state listed species of concern
SE	state endangered
ST	state threatened
U.S.	United States
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1 Introduction

The City of Idaho Springs is planning to rehabilitate Mattie Dam to restore its ability to divert water to the City of Idaho Springs. To support design and permitting, AECOM Technical Services, Inc. (AECOM) completed a desktop and field delineation of wetlands and surface water features, and a biological reconnaissance and desktop review of other biological resources relevant to Clean Water Act Section 404 permitting. This report provides the results for the aquatic and biological resources analysis. Field work was conducted on June 8, 2023.

1.1 Project Location and Description

The Mattie Dam Rehabilitation Project (Project) area is located about 3 miles southwest of the City of Idaho Springs along Colorado State Highway 103 (Chicago Creek Road), in Clear Creek County, Colorado. It is in the northwest quarter of Section 9, Township 4 South, Range 73 West, on the Idaho Springs, Colorado 7.5-minute quadrangle map (USGS 1974). The dam is located at 39.717097°N, -105.572039°W. The Project area is shown on **Figures 1** and **2**.

Mattie Dam is owned and operated by the City of Idaho Springs and occurs on property owned by the City. It is utilized to divert water to the City of Idaho Springs water treatment plant. The surrounding area includes federal lands managed by the Arapaho National Forest and private land.

Mattie Dam consists of stacked boulders on Chicago Creek and an earthen embankment that was built in the late 1990's. The purpose of the dam is to provide enough head to divert water from Chicago Creek into an intake structure that delivers water into the Idaho Springs Water Treatment Plant. The dam is an overflow structure, so excess water in the creek flows over the top of the stacked boulders. The dam was originally constructed with fines in between the stacked boulders. The fines have gradually washed out and flow has migrated into the interstitial spaces between the boulders. Due to a combination of low flows and water flowing through the stacked boulders, there is not sufficient head to divert water in the City's intake structure during low stream flows. Alternatives considered to provide sufficient head included: (1) an option to grout the existing structure and foundation to reduce seepage to acceptable levels; and (2) reconstruction of the dam with a reinforced concrete wall, backfilled with material excavated for construction. The City selected the option to reconstruct Mattie Dam with a concrete cutoff to reduce seepage as the preferred alternative. One borehole will be drilled to a depth of approximately 25 feet to collect soil and rock core samples, and to identify the depth to rock prior to construction. An "aqua barrier" (a big balloon-type structure filled with water) will be utilized as a temporary coffer dam during construction. Both alternatives would maintain stream continuity, so fish should not be affected. The Project will not result in any change to storage or operations of Mattie Dam. The Project includes construction of a flushing pipe to enable flushing of sediment from the pool above the dam. This includes construction of a sluice gate near the exiting water intake, and installation of about 58 feet of 2-foot reinforced concrete pipe (RCP) at a slope of 13 percent (%).

2 Methods

AECOM completed a desktop and field delineation of wetlands and surface water features and a biological reconnaissance and desktop review of other biological resources relevant to Section 404 permitting. The Project area was determined from the 30% design drawings. The field survey area included the Project area, and a buffer of 100 to 150 feet upstream and downstream along Chicago

Creek, and north of the highway. AECOM ecologist, Jeff Dawson, walked the Project area on June 8, 2023, to formally delineate wetlands and surface water features and to assess potential habitat for federal and state listed species.

2.1 Desktop Review

Prior to conducting field reviews of the Project site, AECOM performed a desktop review of available public on-line information and Project-specific information. AECOM acquired publicly available spatial data from a variety of public agencies and geospatial data warehouses to ensure that current and accurate data were integrated into the assessment and this report. **Table 1** presents the data resources that were utilized for this assessment.

Table 1. Records Search and Evaluation for Desktop and Field Review

Data Theme	Data	Source[1]
Project Information	Mattie Dam Rehabilitation Project	• AECOM engineers
Wetlands and Surface Water Features	Streams/Rivers/ Ponds/Lakes	• USGS NHD Data (USGS 2018) • Historic and Current Aerial Imagery (Google Earth 2019, Bing Maps 2019) • USGS topo quad (USGS 1974)
	Wetlands	• USFWS NWI Data (2023a) • Historic and Current Aerial Imagery (Google Earth 2019, Bing Maps 2019)
	Soils	• Web Soil Survey (USDA Natural Resources Conservation Service 2022)
	Watersheds	• USGS 2018
Listed Species	Federal and State Listed Species	• Federal list (USFWS 2023b) • Colorado Natural Heritage Program data (CNHP 2022) • Colorado Parks and Wildlife list (CPW 2023)
	Critical Habitat	• USFWS 2023b
	Migratory Birds	• USFWS 2023b, ebird 2023

Notes:
AECOM = AECOM Technical Services, Inc.
CNHP = Colorado Natural Heritage Program
CPW = Colorado Parks and Wildlife
NHD = National Hydrography Dataset
NWI = National Wetland Inventory
USDA = United States Department of Agriculture
USFWS = United States Fish and Wildlife Service
USGS = United States Geological Survey

2.2 Delineation of Wetlands and Surface Waters

The delineation was conducted in accordance with the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) and the 2010 Western Mountains, Valleys, and Coast Region Regional Supplement (Environmental Laboratory 2010). Wetlands were identified in the field as areas having positive evidence of three environmental parameters: hydric soils, wetland hydrology, and hydrophytic vegetation. Surface water features (i.e., streams and ponds) were identified by the presence of a defined bed and bank, and evidence of an Ordinary High Water Mark (OHWM). Information recorded for each surface water feature included the average OHWM and bankfull depth, bank slope, substrate composition, source of hydrology, dominant vegetation, percent overstory, and wildlife observed. Plant species were identified using Ackerfield (2015) and other references relevant to the region. Wetland plant

species names and indicator status were obtained from the National Wetland Plants List (United States [U.S.] Army Corps of Engineers 2020). Synonyms and other standardized common names were taken from Ackerfield (2015).

The boundary of surface water features and wetlands were recorded on detailed aerial imagery. Global positioning system (GPS) was not used because of the small size of the Project area and location in a deep canyon, where satellite reception was expected to be poor. Wetlands were classified based on the Cowardin classification system (Cowardin et al. 1979, Federal Geographic Data Committee 2013), a classification accepted by the U.S. Army Corps of Engineers (USACE) and other federal agencies. The wetlands were classified into two main types; palustrine emergent wetlands (PEM) and palustrine scrub-shrub wetlands (PSS). Representative photographs were taken of each aquatic feature, its associated upland soil pit, man-made influences, and general habitats. After field surveys were complete, a map of aquatic features was created on geographical information system (GIS) and layered over the footprint of the proposed Project. Impact acreages were calculated by clipping aquatic features to the edge of the proposed Project footprint.

2.3 Other Biological Surveys

In conjunction with the delineation of aquatic features, a field reconnaissance for site characteristics and other biological resources was conducted on June 8, 2023. The following information was recorded:

- Biological habitats and dominant species
- Occurrence and distribution of noxious weed species
- Potential habitat for threatened, endangered and sensitive species, and observations of occurrence
- Migratory bird nesting habitat and concentration areas
- Occurrence of wildlife and signs, nests, burrows and dens
- Photographs were taken from representative vantage points

3 Results

3.1 Project Area Overview

The Project area is located within the Crystalline Mid-Elevation Forests section of the Southern Rockies Ecoregion (Chapman et al. 2006), characterized by forests at elevations of 7,000 to 9,000 feet in the eastern half of the Southern Rockies. Forests are dominated aspen (*Populus tremuloides*), Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*), with areas of lodgepole pine (*Pinus contorta*) and limber pine (*Pinus flexilis*). A diverse understory of shrubs, grass and wildflowers is present. Streams are high gradient with boulder, cobble, and bedrock substrates. Land uses include wildlife habitat, livestock grazing, logging, mineral extraction, and recreation, with increasing residential development.

The Project area is about 3 miles southwest of the City of Idaho Springs at an elevation of about 8,050 feet. Most of the surrounding area is undeveloped lands within Arapahoe National Forest, but private residences and recreational businesses are scattered along Chicago Creek Road. The nearest developments are the water treatment plant, located about 500 feet to the east, and a private residence located about 400 feet to the southwest. The Chicago Creek Valley is narrow and V-shaped, with the

valley bottom up to 200 feet wide. An 8-foot chain-link fence restricts access to the dam from the highway.

The Project area is located within the Chicago Creek watershed, Hydrological Unit Code (HUC) 101900040204 (USGS 2018). The dam is on Chicago Creek just below its confluence with Devils Canyon. Chicago Creek is a perennial tributary of Clear Creek, which is a perennial tributary of the South Platte River. Chicago Creek is mapped by National Wetlands Inventory (NWI) (USFWS 2023a) as R3UBG, meaning riverine, upper perennial, unconsolidated bottom, intermittently exposed. Mapping is based on 2009 imagery. Devil's Canyon Creek is classified by NWI as R5UBH, meaning riverine, unknown perennial, unconsolidated bottom, permanently flooded. Based on field observations, it is upper perennial. No wetlands are mapped by NWI in the Project vicinity.

Natural Resources Conservation Service (NRCS) soils data (USDA NRCS 2022, **Attachment B**) indicates that two soil mapping units are present in and near the Project area:

- **50 – Rock outcrop-Cathedral-Resort complex, 30 to 70% slopes**. This mapping unit occurs on mountain slopes, cliffs and ridges. It includes about 45% rock outcrop, 25% Cathedral soils, 20% Resort and similar soils, and 10% minor components. Cathedral soils are shallow, very cobbly, sandy loam, and Resort soils are very stony, sandy loams, and appear to be the native soil for the area. None of the major soils or minor components are hydric.

- **6 – Cumulic Cryoquolls, 0 to 3% slopes**. This soil type occurs along drainageways in alluvium derived from igneous and metamorphic rock. It includes loams over very gravelly sand. Soils are poorly drained, and a water table is at a depth of 6 to 18 inches. Cumulic cryoquolls are hydric.

3.2 Habitat Description

Habitats within and near the Project area include:

- **Mixed Conifer Forest.** This habitat occurs along the southwest side of Chicago Creek. Dominant species included ponderosa pine, Douglas-fir, Rocky Mountain juniper (*Juniperus scopulorum*), narrowleaf cottonwood (*Populus angustifolia*), and Scouler willow (*Salix scouleriana*). The diverse understory includes Wood's rose (*Rosa woodsia*), wax currant (*Ribes cereum*), Louisiana sagewort (*Artemisia ludoviciana*), littleleaf pussytoes (*Antennaria mircophylla*), cutleaf fleabane (*Erigeron compositus*) Virginia strawberry (*Fragaria virginiana*), fringed sage (*Artemisia frigida*), and other forbs, grasses, and shrubs.
- **Meadow.** Upland areas dominated by herbaceous vegetation are present on the south side of the dam and along the highway. The dominant species is smooth brome (*Bromus inermis*). Other species include curly dock (*Rumex crispus*), common dandelion (*Taraxacum officinale*), and Louisiana sagewort. Native grassland dominated by Rocky Mountain fescue (*Festuca saximontana*), blue grama (*Bouleloua gracilis*), cutleaf fleabane, fringed sage, and field sagewort (Artemisia campestris) is present west of Devils Canyon Creek.
- **Riparian shrub.** Mesic riparian shrub occurs along Chicago Creek below the dam and along Devils Canyon Creek. Large shrubs include Scouler willow, thinleaf alder (*Alnus incana*), and water birch (*Betula occidentalis*). Other species present include red raspberry (*Rubus idaeus*), prickly currant (*Ribes lacustre*), smooth brome, American cow-parsnip (*Heracleum maximum*), and streamside bluebells (*Mertensia ciliata*).
- **Cliff.** Cliffs are present on the north width of the dam and Chicago Creek. They have a sparse, but diverse cover of trees, shrubs, grasses and forbs, including ponderosa pine, Douglas-fir, western serviceberry (*Amelanchier alnifolia*), mountain snowberry (*Symphoricarpos rotundifolius*), Boulder

raspberry (*Rubus deliciosus*), mountain ninebark (*Physocarpos monogynus*), hairy false goldenaster (*Heterotheca villosa*), and needlegrasses (*Achnatherum* spp.).

- **Developed/disturbed.** Colorado Highway 103 (Chicago Creek Road) is adjacent to the Project area on the south. A large area of sparsely vegetated soil and gravel up to 25 feet wide is present between the road and chain-link fence.

3.3 Wetlands and Surface Waters

In total, two aquatic features were identified within or near the Project area (**Figure 2**). These included Chicago Creek, Devils Canyon Creek, and one small PEM wetland on the edge of the pool near the confluence of Devil's Canyon Creek. Detailed information is summarized in **Table 2** and the following discussion. Photographs are provided in **Attachment A**.

Table 2. Wetlands and Surface Waters in Survey Area

Feature ID or Name	Classification[1]*	Location (Latitude, Longitude)[2]	Area (acres)[2]	Stream Length (feet)	Hydrological Connectivity	Flow Frequency
Surface Waters						
Chicago Creek	R3UBG	39.717095°N 105.572215°W	0.201	385	Flows to Clear Creek	Perennial
Devil's Canyon Creek	R3UBH	39.716897°N 105.572496°W	0.014	85	Flows to Chicago Creek	Perennial
Total Surface Water Features			**0.201**	**470**		
Wetlands						
Wetland 1	PEM	39.5723114°N -105.047050°W	0.032	N/A	Adjacent to Chicago Creek	N/A
Total Wetlands			**0.032**	**N/A**		

Notes:
[1] Based on U.S. Fish and Wildlife National Wetlands Inventory (USFWS 2023a) and field evaluation.
[2] All measurements and geographic coordinates are approximate.
*Cowardin Classification (Cowardin et al. 1979)

ID = identification
PEM = Palustrine emergent
R3UBG = Riverine, upper perennial, consolidated bottom, intermittently exposed
R3UBH = Riverine, upper perennial, unconsolidated bottom, permanently flooded
N/A = Not Applicable

Chicago Creek is a natural perennial stream flowing from the southwest, from the north side of Mount Evans. Within the Project area, it flows west to east. Mattie Dam is located about 3 miles above the confluence with Clear Creek at Idaho Springs. The portion of Chicago Creek within the Project area includes part of the pool formed by the dam, and a steep drop over the boulder dam and downstream riprap. The OHWM of the creek is about 15 feet wide above the pool, widens to 40 to 70 feet at the pool, and has a width of 15 to 20 feet below the dam to the Chicago Creek Road culvert. The creek has a boulder/cobble substrate in the rapids below the dam, and a sand bottom within the pool. The top of the dam is at an elevation of about 8,057 feet, and the bottom of existing rock fill is about 8,045 feet. The creek is bordered by riparian and upland vegetation, except for one small fringe wetland. Cliffs and steep slopes occur on the north side of the creek. Chicago Creek has a watershed of about 43.7 square miles. There are no riffle-pool complexes in the Project vicinity. **(Photos 1 to 6)**

Devil's Canyon Creek is a perennial tributary of Chicago Creek that joins it on the south side of the pool, just outside the Project area. The OHWM of Devils Canyon Creek is about 5 foot wide, with a sandy bottom, between the Chicago Creek Road and the pool. On June 8, 2023, it was about 8 inches deep and had rapid flow and clear water.. It is bordered by dense, riparian shrub, principally thinleaf alder. The watershed of Devil's Canyon Creek is about 3 square miles. **(Photo 7)**

A small wetland is located on the south shore of the pool on the west side of Devil's Canyon inlet. It was not formally delineated because it is outside of the Project area. It is a PEM wetland with 20% cover of water sedge (*Carex aquatilis*), 20% cover of Kentucky bluegrass (*Poa pratensis*), and 40% cover of Nebraska sedge (*Carex nebrascensis*). It is located on a low terrace on both sides of the OHWM of the pool and occupies about 65 square feet. The adjacent shore has a 4:1 slope and is covered with American cow parsnip, Wood's rose, Kentucky bluegrass, and black twinberry (*Lonicera involucrata*). **(Photo 8)**

3.4 Threatened and Endangered Species

3.4.1 Federally Listed Species

The U.S. Fish and Wildlife Service (USFWS), Mountain-Prairie Region (Region 6) lists nine federally proposed, candidate, threatened, or endangered species or subspecies with the potential to occur or be affected by the Project (USFWS 2023b). **Table 3** describes these species and their potential for occurrence within the Project area. The Project will have no effect to federally listed endangered or threatened species.

Table 3. Federally Listed Species with Potential to Occur Within the Project Area or Be Affected by the Project

Common Name	Scientific Name	Status[1]	Habitat Description[2]	Potential for Occurrence in Project Area[3]	Conclusion
Birds					
Mexican spotted owl	*Strix occidentalis lucida*	FT	Rock canyons or forested mountains below 9,500 feet. Mature or old growth forests with high closed canopies.	Not likely, no records of occurrence, no suitable habitat in Project area. Not in critical habitat.	*No effect*
Piping plover	*Charadrius montanus*	FT	Shorelines along large reservoirs and riparian areas. Primarily relevant to projects in Colorado that involve water depletions to the Platte River System.	Not likely, no suitable habitat. The Project would not result in depletions that could impact Platte River species in Nebraska.	*No effect. See text on Platte River species.*
Whooping crane	*Grus americana*	FE	Migrates through central Nebraska. Relevant to projects in Colorado that involve water depletions to the Platte River System.	No suitable habitat in study area. The Project would not result in depletions that could impact Platte River species in Nebraska.	*No effect. See text on Platte River species.*
Mammals					
Canada lynx	*Lynx canadensis*	FT	Boreal and montane regions dominated by coniferous or mixed forest with thick undergrowth.	Not likely, Project area is outside the area of Lynx habitat use in Colorado 1999-2011 (CPW 2014) and is below typical elevation range.	*No effect*
Gray wolf	*Canis lupus*	FE	From IPAC: Lone, dispersing gray wolves may be present throughout the State of Colorado. Gray wolf only needs to be considered for projects involving predator control.	Gray wolf is not known to occur; Project does not involve predator control. Project area is not in critical habitat.	*No effect*

Table 3. Federally Listed Species with Potential to Occur Within the Project Area or Be Affected by the Project

Common Name	Scientific Name	Status[1]	Habitat Description[2]	Potential for Occurrence in Project Area[3]	Conclusion
Fishes					
Greenback cutthroat trout	*Oncorhynchus*	FT	Warmwater species, main stem rivers in or near swift currents.	Project area is within historic range and has suitable habitat but species is not currently present. No critical habitat has been designated. Has been reintroduced to Herman Gulch and West Clear Creek, west of the Project area.	*No effect*
Pallid sturgeon	*Scaphirhynchus albus*	FE	Floodplains, backwaters, chutes, sloughs, islands, sandbars, and main channel waters. Relevant to projects in Colorado that involve water depletions to the Platte River System.	No suitable habitat. The project would not result in depletions that could impact Platte River species in Nebraska.	*No effect, see text on Platte River species*
Invertebrates					
Monarch butterfly	*Danaus plexippus*	FC	Breeds in open areas such as pastures and meadows, roadsides, prairies, gardens, wetlands and other areas where caterpillar host plants (milkweeds) are found, from foothills to alpine in Colorado. Adults feed on additional species including dogbane and sunflower. Adults in Colorado migrate to Mexico in the fall and return in the spring.	Unlikely to occur during breeding. No milkweeds were observed.	*No effect*
Flowering Plants					
Western prairie fringed orchid	*Platanthera praeclara*	FT	Unplowed, calcareous tall grass prairies and sedge meadows. Relevant to projects in Colorado that involve water depletions to the Platte River System.	No suitable habitat in study area. The project would not result in depletions that could impact Platte River species in Nebraska.	*No effect*

Source: USFWS 2022b
[1]FE = federally endangered
FT = federally threatened
FC = federal candidate
[2] Habitat information source: USFWS 2018. No Critical Habitat is designated within the Project area for any of the species listed above (USFWS 2023b).
[3]Potential for occurrence is based on habitat surveys and desktop analysis.

Platte River Species. It is AECOM's understanding that the Project will have no effects to endangered species present downstream along the Platte River in Nebraska, based on a signed agreement between the City of Idaho Springs and GASP (Groundwater Appropriators of the South Platte Basin) for replacement water, as documented in the 1998 Biological Opinion for a previous rehabilitation project (Attachment C).

3.4.2 State Listed Species

The Colorado Natural Heritage Program (CNHP) and Colorado Parks and Wildlife (CPW) list ten state threatened, endangered or state listed species of concern that are known to occur within Clear Creek County, Colorado (CNHP 2023). Three of these species are both federally and state listed, including Canada lynx, gray wolf, and greenback cutthroat trout. **Table 4** describes these species and their potential for occurrence within the Project area.

Table 4. State Listed Species with Potential to Occur or be Affected by Projects Within Clear Creek County, Colorado

Common Name	Scientific Name	Status[1]	Habitat Description[2]	Potential For Occurrence in Project Area[3]	Conclusion
Amphibians					
Boreal toad	*Anaxyrus boreas*	SE	Mountain lakes, ponds, meadows, and wetlands in subalpine forest (Spruce, fir, lodgepole pine, aspen), 7,500-12,000 feet. Distribution is restricted to areas with suitable breeding habitat, including ponds, marshes, lakes, and bogs in spruce-fir forests and alpine meadows.	May occur but primary habitat not present.	*No effect*
Northern leopard frog -	*Lithobates pipiens*	SC	Wet meadows and banks and shallows of marshes, ponds, beaver ponds, lakes, reservoirs, streams and irrigation ditches.	Within historic range but no suitable habitat.	*No effect*
Birds					
American peregrine falcon	*Falco peregrinus anatum*	SC	In Colorado, nest in cliff sites between 4,500 to 10,650 feet. Open spaces usually associated with high cliffs and bluffs overlooking rivers and coasts. Recently, many cities with tall buildings have become home to some peregrines.	CPW data shows no known or potential nesting areas in Project vicinity. Cliffs are adjacent to site, but habitat likely unsuitable because of high forest cover. No ebird records in Project vicinity.	*No effect*
Bald eagle	*Haliaeetus leucocephalus*	SC	Breeding habitat commonly includes area close to coastal areas, bays, rivers, lakes, reservoirs. Nests are usually in tall trees or on pinnacles or cliffs near water.	Project area is not within CDOT mapped bald eagle range. Nearest area is Clear Creek Valley near Idaho Springs.	*No effect*
Fishes					
Greenback cutthroat trout	*Oncorhynchus clarki stomias*	ST	**See Table 2**		
Mammals					
Canada Lynx	*Lynx canadensis*	FT, SE	See **Table 2**		
Gray Wolf	*Canis lupus*	FE, SE	See **Table 2**		
River otter	*Lontra canadensis*	ST	Riparian habitats along major streams. Usually live in bank dens abandoned by beavers and active mostly at dawn and dusk.	Project area is not within known range (CPW 2022)	*No effect*
Townsend's big-eared bat	*Corynorhinus townsendii pallescens*	SC	Uses mines, caves, and structures for roosting and hibernacula; occurs in semi-desert shrublands, pinyon-juniper, and open montane forests.	May occur during foraging. Unlikely to be adversely affected because roosting and hibernation habitat would not be affected.	*Not likely to adversely affect*
Wolverine	*Gulo*	SE	Tundra, taiga, boreal and alpine biomes. Generally, persist in areas with short growing seasons where snow persists into the summer.	Project area does not have suitable habitat. Extremely rare. First officially documented wolverine in the state identified in spring 2009.	*No effect*

Source: CNHP 2022

[1]FT = federally threatened, SC = state listed species of concern, SE = state endangered, ST = state threatened

[2] Habitat information sources: Andrews and Righter 1992, Armstrong et al. 2011, Colorado Bird Atlas Committee 2016, CPW 2020, CPW 2022, Hammerson 1999.

[3]Potential for occurrence is based on habitat surveys and desktop analysis.

CDOT = Colorado Department of Transportation

CPW = Colorado Parks and Wildlife

3.5 Migratory Birds

All the vegetated habitats in the Project area are suitable nesting habitat for migratory birds. Only three bird species were observed during the field survey on June 8, 2023, song sparrow (*Melospiza melodia*), American robin (*Turdus migratorius)* and violet-green swallow (*Tachycineta thalassina*). Bird songs were difficult to hear because of the noise from high flows in the creek within the narrow canyon. No raptor nests were observed during the field survey. No breeding birds of conservation concern were observed.

USFWS 2023b provides a list of migratory bird species of particular concern for the Project area, based on the USFWS Birds of Conservation Concern list and potential occurrence in the Project area. These species are listed in **Table 5**, along with an assessment of their potential for occurrence. Several of these species may occur.

Table 5. Migratory Birds of Conservation Concern

Name	Species	Breeding Season	Breeding Habitat	Potential for Nesting in Project Area
Black rosy-finch	*Leucosticte atrata*	June 15 to August 31	Not known to breed in Colorado.	Breeding habitat not present. May occur in winter.
Brown-capped rosy-finch	*Leucosticte australis*	June 15 to September 15	Above timberline in sheltered places such as cliffs and rock outcrops.	Breeding habitat not present. May occur in fall and winter.
Cassin's finch	*Carpodacus cassinii*	May 15 to July 15	Breeds mostly in higher elevation conifer forests in Colorado (8,000 to 11,000 feet).	Likely to occur, not observed.
Clark's nutcracker	*Nucifraga columbiana*	January 15 to July 15	Breeds in conifer and aspen forests in the mountains in Colorado.	Likely to occur, not observed.
Evening grosbeak	*Coccothraustes vesperitinus*	May 15 to August 20	Breeds in open conifer forest, mostly in the montane zone (5,500 to 8,000 feet).	Likely to occur, not observed.
Long-eared owl	*Asio otus*	March 1 to July 15	Nests in trees or dense shrubs next to open areas, at elevations up to 11,000 feet. Relatively rare.	Unlikely to occur.
Virginia's warbler	*Vermivora virginiae*	May 1 to July 31	Primarily nests in dense montane shrubland, oak and riparian shrub.	May occur, not observed.

Federal regulations prohibit construction activities that would result in take of bird species, eggs, young, and/or active bird nests protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. In the U.S., the USFWS is the lead agency for managing migratory birds and eagles. To prevent unauthorized take of migratory bird nests, tree removal and vegetation clearing should be done outside the breeding bird season of about May 1 to August 15. In addition, some species of raptors initiate nesting as early as February. If vegetation clearing would occur within the migratory bird breeding season, nesting bird pre-construction surveys should be conducted no earlier than one week prior to initiating construction activities. If an active migratory bird nest is observed within or up to 25 feet from Project activities, or an active raptor nest is observed near the construction area, USFWS and CPW

should be contacted to determine any further avoidance measures for each actively nesting species. Alternatively, construction could be postponed until young have fledged.

4 Impacts and Section 404 Permitting

4.1 Wetlands and Surface Waters

The Project will affect portions of Clear Creek at the dam and pool but will not affect any wetlands. Impacts have not been determined at this time and will be reported in the Preconstruction Notification that will be submitted to the USACE for Section 404 permitting.

4.2 Clean Water Act Section 404 Permitting

This Project was discussed in a virtual meeting between AECOM, Cody Wheeler of the USACE and City of Idaho Springs on November 7, 2022.

Chicago Creek is a perennial stream tributary to Clear Creek and is jurisdictional under Clean Water Act Section 404. Previous rehabilitation work at Mattie Dam and the water intake structures in 1997 was covered under Nationwide Permits #3 and #12. The current Project is likely to be authorized under Nationwide Permit #3 – Maintenance. A pre-construction notification is expected to be required under regional conditions that require notification for projects involving open trenching in streams and use of non-native material, such as grout. The Project must comply with all nationwide permit general and regional conditions.

4.3 Avoidance, Minimization, and Compensation

After construction is complete, all temporarily impacted aquatic features will be restored to preconstruction contours and all disturbed areas will be reseeded with species indigenous to the site. Avoidance and minimization measures will be used during construction, including the following:

- Best Management Practices (BMPs) will be used during all phases of construction to reduce impacts from sedimentation and erosion, including the use of berms, brush barriers, check dams, erosion control blankets, filter strips, sandbag barriers, sediment basins, silt fences, straw-bale barriers, surface roughening, and/or diversion channels (as appropriate).
- Erosion and sedimentation will be controlled by temporary erosion control devices until erosion potential ceases. The construction Contractor will comply with all erosion control, as outlined in the engineering drawings, and with the provisions of the Section 404 Nationwide Permit. The Contractor will install erosion and sediment control devices to minimize downstream sedimentation within the Blue River, as described in the construction drawings and Specifications. All erosion devices would remain in place until released by the inspector.
- No equipment staging or storage of construction materials will occur within 100 feet of waters of the U.S.
- The use of chemicals, such as soil stabilizers, dust inhibitors, and fertilizers within 100 feet of waters of the U.S. will be prohibited.
- Equipment will be refueled in designated contained areas, a minimum of 100 feet from waters of the U.S.
- Stockpiled or other fill material will be stored in upland areas.

- Equipment will be cleaned prior to and after construction activities in waters of the U.S. to prevent spread of invasive and/or nuisance aquatic organisms.

4.4 Compensatory Mitigation

Compensatory mitigation is not expected to be required since the Project would not impact wetlands. While there will be permanent changes within Chicago Creek, impacts will be within areas previously disturbed areas and will not result in loss of surface waters.

4.5 Endangered Species Act Compliance

The Project is expected to have no effect to federally listed, threatened or endangered species. Impacts to endangered species downstream in Nebraska from water depletions were previously addressed in 1998 by a signed agreement between the City of Idaho Springs and GASP for replacement water, as documented in the 1998 Biological opinion for a previous rehabilitation project.

5 Conclusion

The City of Idaho Springs is planning to rehabilitate Mattie Dam to restore its ability to divert water to the City of Idaho Springs. This report provides an evaluation of biological resources based on a desktop evaluation and field work conducted June 8, 2023, for aquatic resources and for federally and state-listed threatened, endangered, and sensitive species.

The only aquatic resource present in the Project area is Clear Creek, including a wider pool above the dam and flowing creek over the dam and downstream. A total of 0.201 acre of Clear Creek is present within the Project area.

The Project will have no effects to federal or state listed endangered or threatened species. Several migratory birds of concern could occur in the Project area, and vegetation clearing should be timed to avoid impacts to nesting migratory birds.

The information provided in this report is current as of July 19, 2023. Information on sensitive resources may change in the future. Therefore, the information contained in this report should be checked and updated, as needed, prior to Project initiation.

6 References

Ackerfield, Jennifer. 2015. Flora of Colorado. Botanical Research Institute of Texas Press, Fort Worth, Texas.

Andrews, Robert, and Robert Righter. 1992. Colorado Birds. A Reference to Their Distribution and Habitat. Denver Museum of Natural History.

Armstrong, D.M., J.P. Fitzgerald, and C.A. Meaney. 2011. Mammals of Colorado, second edition. Denver Museum of Nature and Science and University Press of Colorado, Boulder, 620 pp.

Bing Maps – Internet Map Service. 2019. Cartography by Microsoft Corporation and Microsoft.

Chapman, S.S., G.E. Griffith, J.M. Omernik, A.B. Price, J. Freeouf, and D.I. Schrupp. 2006. Ecoregions of Colorado (color poster with map, descriptive text, summary tables and photographs). Reston, Virginia. U. S. Geological Survey (map scale 1:1,200,000).

Colorado Bird Atlas Committee. 2016. The Second Colorado Breeding Bird Atlas. Colorado Bird Atlas Partnership and Colorado Parks and Wildlife.

Colorado Natural Heritage Program (CNHP). 2022. CNHP Conservation Status Handbook (Tracking Lists) for Clear Creek County and Idaho Springs Quad. Available at: http://www.cnhp.colostate.edu/download/list.asp. November 2019 update. Last accessed: June 13, 2023.

Colorado Parks and Wildlife (CPW). 2023. CPW Threatened and Endangered List. Available at: http://cpw.state.co.us/learn/Pages/SOC-ThreatenedEndangeredList.aspx. Last Accessed: June 14, 2023.

_____. 2022. KMZ Maps for wildlife species. http://cpw.state.co.us/learn/Pages/KMZ-Maps.aspx. Last accessed June 14, 2023.

_____. 2020. Species Profiles. http://cpw.state.co.us/learn/Pages/SpeciesProfiles.aspx. Accessed July 27, 2020.

_____. 2014. Lynx Reintroduction Fact Sheet. http://cpw.state.co.us/Documents/Research/Mammals/LynxFactSheet.pdf

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. Department of the Interior, Fish and Wildlife Service, FWS OBS-79/31.

Ebird. 2023. Database of Bird Observations. Cornell Lab or Ornithology. https://ebird.org/explore

Environmental Laboratory. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0). ELTR-10-3. May.

Environmental Laboratory. 1987. *Corps of Engineers Wetland Delineation Manual*. Wetlands Research Program Technical Report Y-87-1. U.S. Army Corps of Engineers Waterways Experiment Station. January.

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, DC.

Google Earth. 2019. *Historic and current aerial photography*. Latest Imagery date October 6, 2019. Accessed multiple dates.

Hammerson, Geoffrey A. 1999. Amphibians and Reptiles in Colorado. Second edition.

U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2022. Web Soil Survey: Custom Soil Resource Report for Arapaho-Roosevelt National Forest Area, Colorado, Parts of Boulder, Clear Creek, Gilpin, Grand, Park and Larimer Counties; and Georgetown Area, Colorado, Parts of Clear Creek, Gilpin and Park Counties. Arapaho -Roosevelt National Forest Area - Version 10, September 8, 2022, and Georgetown Area – Version 16, September 8, 2022 . Accessed at http://websoilsurvey.nrcs.usda.gov/app/HomePage.html. Report created June 6, 2022.

U.S. Army Corps of Engineers (USACE). 2020 National Wetland Plant List. Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH. http://wetland-plants.usace.army.mil/

U.S. Fish and Wildlife Service (USFWS). 2023a. *National Wetlands Inventory* (Online Mapper). Available at: https://www.fws.gov/wetlands/data/mapper.html. Accessed: June 6, 2023.

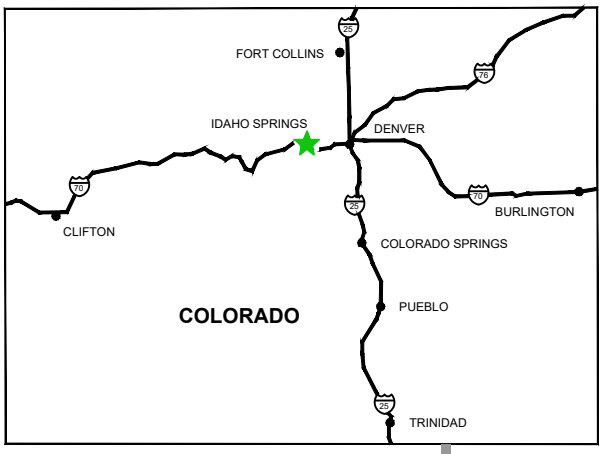
_____. 2023b. IPaC Resource List. Colorado Ecological Service Field Office, Lakewood, CO. http://ecos.fws.gov/ipac/. Accessed July 6, 2023.

_____. 2018. Species Descriptions in Endangered Species, Mountain-Prairie Region website. Available at https://www.fwslgov/mountain-prairie/es/endangered.php

U.S. Geological Survey (USGS). 2018. *National map Viewer* (Online Mapper). Available at: https://apps.nationalmap.gov/viewer/. Page last modified October 22, 2018. Accessed: June 6, 2023.

_____. 1974. Idaho Springs, Colorado, 7.5 minute quadrangle map. U.S. Department of the Interior. 1pg.

Figures



LOCATION PLAN
SCALE NTS

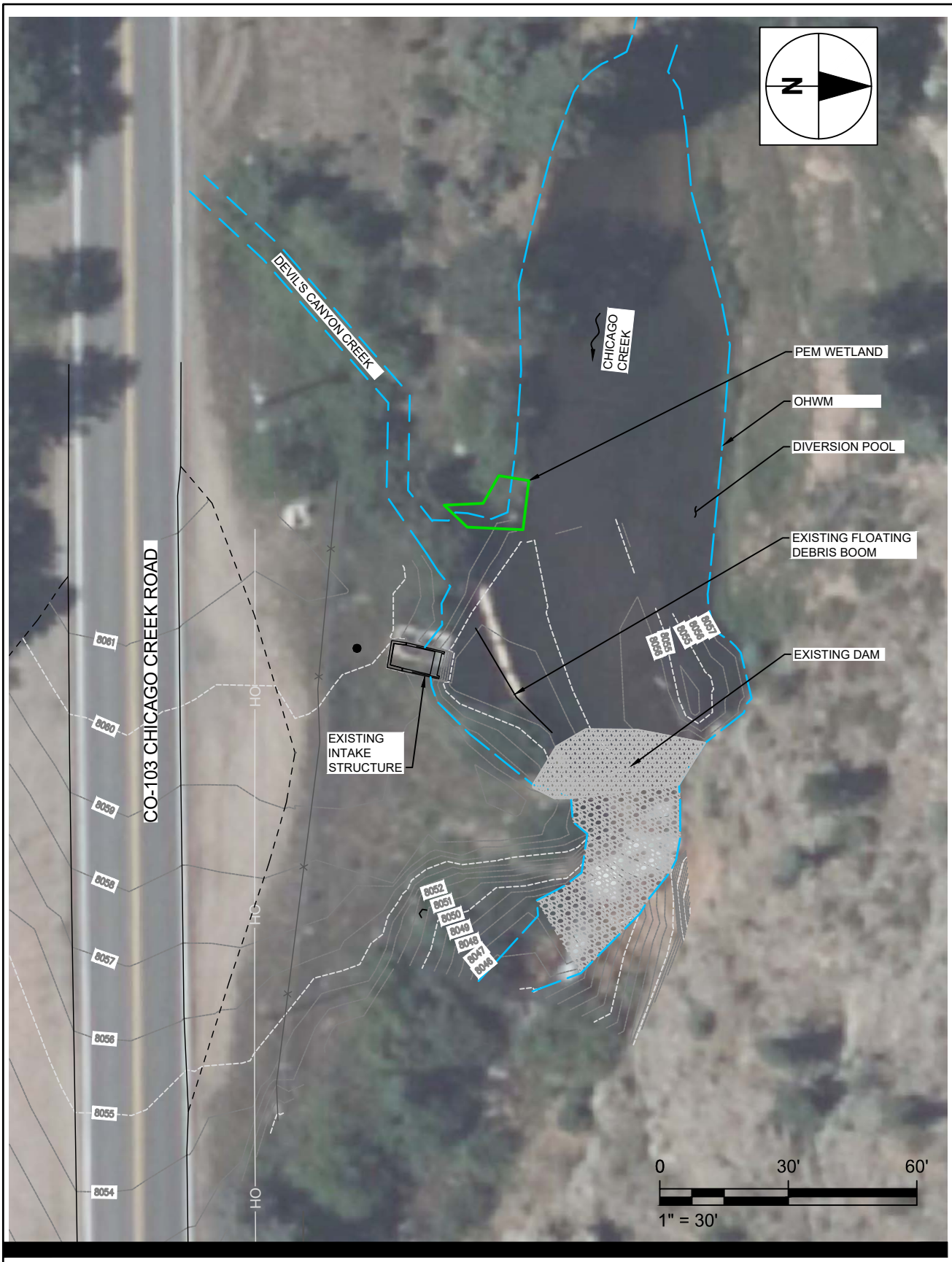
MATTIE DAM REHABILITATION
CITY OF IDAHO SPRINGS, COLORADO

PROJECT LOCATION MAP

Project No. 60685200 Date: 2023-07-20

AECOM

Figure 1.0



MATTIE DAM REHABILITATION
CITY OF IDAHO SPRINGS, COLORADO

Project No. 60685200 Date: 2023-07-20

WETLANDS AND SURFACE WATER

AECOM

Figure 2.0

Attachment A
Photographic Log

1. Overview of Mattie Dam, looking downstream. Stream overflow structure is just left of willow in center. Water intake structure is on right.

2. Chicago Creek flowing over Mattie Dam.

3. Chicago Creek just downstream of dam crest, in area stabilized with riprap.

4. Pool formed by Mattie Dam, looking upstream. Stream gauge in background.

5. View of entire pool, looking downstream to dam.

6. Chicago Creek at State Highway 103 crossing downstream of Mattie Dam, looking upstream.

7. Devil's Canyon Creek flowing into Mattie Dam pool.

8. Small wetland along shore, not in Project area.

Attachment B
Soil Survey

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 Arapaho-Roosevelt National Forest Area, Colorado, Parts of Boulder, Clear Creek, Gilpin, Grand, Park and Larimer Counties; and Georgetown Area, Colorado, Parts of Clear Creek, Gilpin, and Park Counties

June 6, 2023

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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

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

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.

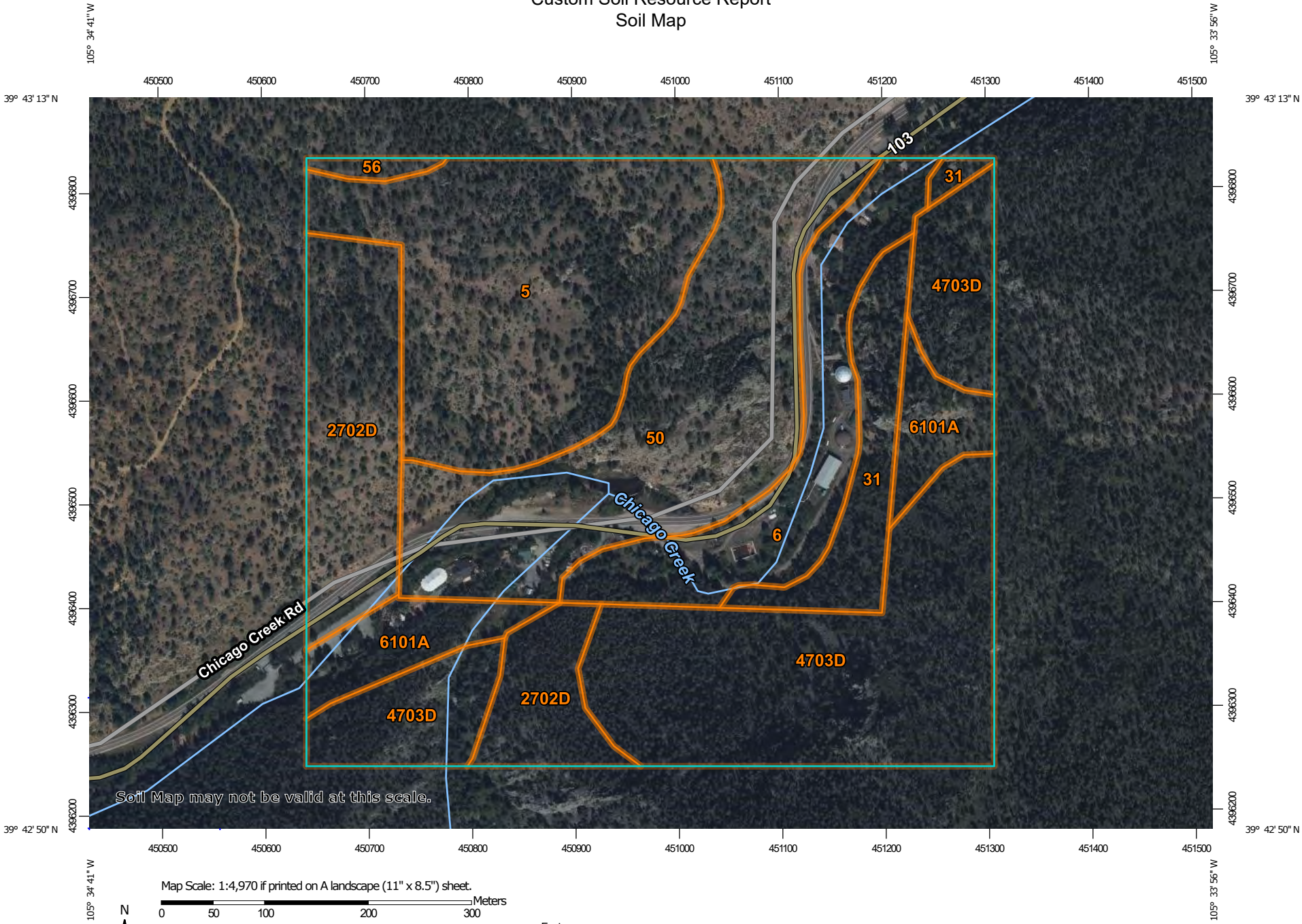
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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



Map Scale: 1:4,970 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

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: Arapaho-Roosevelt National Forest Area, Colorado, Parts of Boulder, Clear Creek, Gilpin, Grand, Park and Larimer Counties
Survey Area Data: Version 10, Sep 8, 2022

Soil Survey Area: Georgetown Area, Colorado, Parts of Clear Creek, Gilpin, and Park Counties
Survey Area Data: Version 16, Sep 8, 2022

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil

MAP LEGEND

MAP INFORMATION

properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Aug 25, 2021—Sep 5, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2702D	Cathedral family-Rock outcrop complex, 40 to 150 percent slopes	12.0	12.4%
4703D	Bullwark-Catamount families-Rock outcrop complex, 40 to 150 percent slopes	25.3	26.1%
6101A	Cryaquolls-Gateview family complex, 0 to 15 percent slopes	5.4	5.6%
Subtotals for Soil Survey Area		**42.7**	**44.1%**
Totals for Area of Interest		**96.8**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
5	Cathedral-Rock outcrop complex, 30 to 70 percent slopes	19.9	20.6%
6	Cumulic Cryaquolls, 0 to 3 percent slopes	9.4	9.7%
31	Mammoth-Ohman-Bendemeere complex, 30 to 60 percent slopes	5.2	5.3%
50	Rock outcrop-Cathedral-Resort complex, 30 to 70 percent slopes	19.1	19.8%
56	Tahana-Legault-Rock outcrop complex, 30 to 70 percent slopes	0.6	0.6%
Subtotals for Soil Survey Area		**54.1**	**55.9%**
Totals for Area of Interest		**96.8**	**100.0%**

Map Unit Descriptions

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 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.

Arapaho-Roosevelt National Forest Area, Colorado, Parts of Boulder, Clear Creek, Gilpin, Grand, Park and Larimer Counties

2702D—Cathedral family-Rock outcrop complex, 40 to 150 percent slopes

Map Unit Setting

National map unit symbol: tlxj
Elevation: 7,000 to 9,500 feet
Mean annual precipitation: 16 to 25 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 70 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Cathedral family and similar soils: 60 percent
Rock outcrop: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cathedral Family

Setting

Landform: Mountain slopes
Parent material: Residuum weathered from igneous and metamorphic rock

Typical profile

Oi - 0 to 0 inches: slightly decomposed plant material
A - 0 to 6 inches: very stony sandy loam
Bw - 6 to 11 inches: extremely stony sandy loam
C - 11 to 17 inches: extremely stony sandy loam
R - 17 to 26 inches: bedrock

Properties and qualities

Slope: 40 to 75 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.01 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Hydrologic Soil Group: D
Other vegetative classification: Ponderosa pine/antelope bitterbrush (PIPO/PUTR2) (C1120), Ponderosa pine/true mountain mahogany (PIPO/CEMO2) (C1107)
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Mountainflank

Typical profile

R - 0 to 60 inches: bedrock

Properties and qualities

Slope: 60 to 150 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Bullwark family

Percent of map unit: 5 percent
Hydric soil rating: No

Ratake family

Percent of map unit: 5 percent
Hydric soil rating: No

4703D—Bullwark-Catamount families-Rock outcrop complex, 40 to 150 percent slopes

Map Unit Setting

National map unit symbol: 28sk8
Elevation: 8,000 to 9,500 feet
Mean annual precipitation: 20 to 30 inches
Mean annual air temperature: 39 to 43 degrees F
Frost-free period: 50 to 70 days
Farmland classification: Not prime farmland

Map Unit Composition

Bullwark family and similar soils: 50 percent
Catamount family and similar soils: 25 percent
Rock outcrop: 15 percent
Minor components: 10 percent

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

Description of Bullwark Family

Setting

Landform: Mountain slopes
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium and/or residuum derived from igneous and metamorphic rock

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 3 inches: very cobbly sandy loam
E - 3 to 11 inches: very gravelly sandy loam
EB1 - 11 to 20 inches: very cobbly sandy loam
EB2 - 20 to 24 inches: extremely cobbly sandy loam
E and Bt - 24 to 32 inches: extremely stony sandy loam
E and Bt - 32 to 40 inches: extremely stony sandy clay loam
C - 40 to 49 inches: extremely stony sandy loam
R - 49 to 59 inches: bedrock

Properties and qualities

Slope: 40 to 75 percent
Surface area covered with cobbles, stones or boulders: 4.0 percent
Depth to restrictive feature: 20 to 60 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.01 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Hydrologic Soil Group: B
Ecological site: F048AY908CO - Mixed Conifer
Other vegetative classification: Douglas-fir/Ross sedge (PSME/CARO5) (C1204), Lodgepole pine/common juniper (PICO/JUCO6) (C0905), Douglas-fir/kinnikinnick-common juniper (PSME/ARUV-JUCO6) (C1219)
Hydric soil rating: No

Description of Catamount Family

Setting

Landform: Mountain slopes
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from igneous and metamorphic rock

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A1 - 1 to 2 inches: gravelly loam
A2 - 2 to 5 inches: very gravelly sandy loam
Bw - 5 to 11 inches: extremely gravelly sandy loam

C - 11 to 15 inches: extremely gravelly sandy loam
Cr - 15 to 26 inches: bedrock
R - 26 to 36 inches: bedrock

Properties and qualities

Slope: 40 to 75 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock; 20 to 40 inches to lithic bedrock
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.01 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Hydrologic Soil Group: D
Ecological site: F048AY912CO - Lodgepole Pine
Other vegetative classification: Lodgepole pine/kinnikinnick (PICO/ARUV) (C0901), Lodgepole pine/common juniper (PICO/JUCO6) (C0905)
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Mountainflank

Typical profile

R - 0 to 60 inches: bedrock

Properties and qualities

Slope: 60 to 150 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Frisco family, dry

Percent of map unit: 5 percent
Hydric soil rating: No

Cathedral family

Percent of map unit: 5 percent
Hydric soil rating: No

6101A—Cryaquolls-Gateview family complex, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: tqlh
Elevation: 8,000 to 9,500 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 36 to 45 degrees F
Frost-free period: 30 to 70 days
Farmland classification: Not prime farmland

Map Unit Composition

Cryaquolls and similar soils: 50 percent
Gateview family and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cryaquolls

Setting

Landform: Drainageways, flood plains
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Gravelly alluvium and glaciofluvial deposits derived from igneous, metamorphic and sedimentary rock

Typical profile

Oe - 0 to 4 inches: moderately decomposed plant material
A1 - 4 to 16 inches: silt loam
A2 - 16 to 24 inches: silt loam
A3 - 24 to 30 inches: silt loam
2Cg - 30 to 40 inches: sandy loam
2Agb - 40 to 64 inches: silt loam

Properties and qualities

Slope: 0 to 15 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: Occasional
Available water supply, 0 to 60 inches: High (about 11.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Hydrologic Soil Group: B/D
Other vegetative classification: Booth's willow-willow/Northwest Territory sedge (SABO2-SALIX/CAUT) (S1417), Booth's willow-willow/reedgrass (SABO2-SALIX/CALAM) (S1498)
Hydric soil rating: Yes

Description of Gateview Family

Setting

Landform: Alluvial fans, terraces
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Gravelly alluvium and/or gravelly glaciofluvial deposits derived from igneous, metamorphic and sedimentary rock

Typical profile

A1 - 0 to 3 inches: loam
A2 - 3 to 11 inches: gravelly sandy loam
A3 - 11 to 22 inches: gravelly sandy loam
Bw1 - 22 to 34 inches: very gravelly sandy loam
Bw2 - 34 to 54 inches: extremely gravelly sandy loam
C - 54 to 62 inches: extremely gravelly sandy clay loam

Properties and qualities

Slope: 5 to 15 percent
Surface area covered with cobbles, stones or boulders: 2.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Hydrologic Soil Group: B
Ecological site: F048AY449CO - Aspen Woodland
Other vegetative classification: Quaking aspen/kinnikinnick (POTR5/ARUV) (D0521), Quaking aspen/Fendler's meadowrue (POTR5/THFE) (D0512), Thurber's fescue - Idaho fescue (FETH-FEID) (G2201)
Hydric soil rating: No

Minor Components

Haplustolls

Percent of map unit: 5 percent
Hydric soil rating: No

Cryohemists

Percent of map unit: 5 percent
Landform: Bogs, depressions, drainageways
Hydric soil rating: Yes

Georgetown Area, Colorado, Parts of Clear Creek, Gilpin, and Park Counties

5—Cathedral-Rock outcrop complex, 30 to 70 percent slopes

Map Unit Setting

National map unit symbol: k6gy
Elevation: 7,000 to 8,200 feet
Mean annual precipitation: 17 to 20 inches
Mean annual air temperature: 43 to 46 degrees F
Frost-free period: 70 to 100 days
Farmland classification: Not prime farmland

Map Unit Composition

Cathedral and similar soils: 65 percent
Rock outcrop: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cathedral

Setting

Landform: Mountain slopes, ridges
Landform position (two-dimensional): Backslope, shoulder
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Micaceous residuum weathered from igneous and metamorphic rock

Typical profile

A - 0 to 3 inches: very cobbly coarse sandy loam
AB - 3 to 6 inches: very gravelly sandy loam
Bw - 6 to 11 inches: very gravelly sandy loam
R - 11 to 15 inches: unweathered bedrock

Properties and qualities

Slope: 30 to 70 percent
Surface area covered with cobbles, stones or boulders: 8.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 0.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R048AY237CO - Stony Loam
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Ridges, mountain slopes, cliffs
Landform position (two-dimensional): Shoulder, backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 30 to 70 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Breece

Percent of map unit: 5 percent
Landform: Mountain slopes, drainageways, alluvial fans
Landform position (two-dimensional): Toeslope
Ecological site: R048AY222CO - Loamy Park
Hydric soil rating: No

Trag

Percent of map unit: 4 percent
Landform: Mountain slopes
Landform position (two-dimensional): Toeslope
Ecological site: R048AY228CO - Mountain Loam
Hydric soil rating: No

Lininger

Percent of map unit: 3 percent
Landform: Ridges, mountain slopes
Landform position (two-dimensional): Backslope
Ecological site: R048AY228CO - Mountain Loam
Hydric soil rating: No

Arents

Percent of map unit: 3 percent
Landform: Mountain slopes
Landform position (two-dimensional): Footslope, toeslope
Hydric soil rating: No

6—Cumulic Cryaquolls, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: k6h0
Elevation: 7,400 to 10,660 feet
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 36 to 46 degrees F
Frost-free period: 70 to 100 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Cumulic cryaquolls and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cumulic Cryaquolls

Setting

Landform: Drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Alluvium derived from igneous and metamorphic rock

Typical profile

A - 0 to 6 inches: loam
Ag1 - 6 to 14 inches: loam
Ag2 - 14 to 21 inches: loam
2C - 21 to 64 inches: very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Ecological site: R048AY241CO - Mountain Meadow
Hydric soil rating: Yes

Minor Components

Lininger
Percent of map unit: 5 percent
Landform: Ridges
Ecological site: R048AY228CO - Mountain Loam
Hydric soil rating: No

Trag
Percent of map unit: 4 percent
Landform: Mountain slopes
Landform position (two-dimensional): Toeslope
Ecological site: R048AY228CO - Mountain Loam
Hydric soil rating: No

Typic cryaquents
Percent of map unit: 3 percent
Landform: Flood plains, oxbows
Other vegetative classification: POAN3/SAEX-BEFO (narrowleaf cottonwood/ coyote willow-river birch) (null_26)
Hydric soil rating: Yes

Breece
Percent of map unit: 3 percent
Landform: Drainageways, alluvial fans, mountain slopes
Landform position (two-dimensional): Toeslope
Ecological site: R048AY222CO - Loamy Park
Hydric soil rating: No

31—Mammoth-Ohman-Bendemeere complex, 30 to 60 percent slopes

Map Unit Setting
National map unit symbol: k6ht
Elevation: 7,800 to 10,500 feet
Mean annual precipitation: 20 to 32 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 25 to 75 days
Farmland classification: Not prime farmland

Map Unit Composition
Mammoth and similar soils: 40 percent
Ohman and similar soils: 35 percent
Bendemeere and similar soils: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mammoth

Setting
Landform: Mountain slopes

Landform position (two-dimensional): Footslope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Micaceous colluvium derived from igneous and metamorphic rock

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
E - 1 to 10 inches: very gravelly sandy loam
E and Bt1 - 10 to 16 inches: gravelly loam
E and Bt2 - 16 to 22 inches: very gravelly loamy sand
E and Bt3 - 22 to 32 inches: very gravelly sandy loam
E and Bt4 - 32 to 59 inches: very gravelly sandy loam
C - 59 to 67 inches: stony loamy coarse sand

Properties and qualities

Slope: 30 to 60 percent
Surface area covered with cobbles, stones or boulders: 1.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F048AY912CO - Lodgepole Pine
Hydric soil rating: No

Description of Ohman

Setting

Landform: Ridges, mountain slopes
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Micaceous colluvium over residuum weathered from igneous and metamorphic rock

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: very stony sandy loam
E - 5 to 13 inches: very gravelly sandy loam
E and Bt1 - 13 to 21 inches: very gravelly sandy loam
E and Bt2 - 21 to 35 inches: extremely gravelly sandy loam
Cr - 35 to 39 inches: weathered bedrock

Properties and qualities

Slope: 30 to 60 percent
Surface area covered with cobbles, stones or boulders: 5.0 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained

Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: F048AY918CO - Spruce-Fir Woodland
Hydric soil rating: No

Description of Bendemeere

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Footslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Micaceous colluvium derived from igneous and metamorphic rock

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 3 inches: very cobbly sandy loam
E - 3 to 10 inches: gravelly coarse sandy loam
E and Bt1 - 10 to 21 inches: very cobbly coarse sandy loam
E and Bt2 - 21 to 30 inches: very gravelly loamy coarse sand
Bt and E1 - 30 to 42 inches: very gravelly loamy sand
Bt and E2 - 42 to 50 inches: gravelly loamy sand
BC - 50 to 62 inches: very gravelly coarse sandy loam

Properties and qualities

Slope: 30 to 60 percent
Surface area covered with cobbles, stones or boulders: 5.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: F048AY912CO - Lodgepole Pine
Hydric soil rating: No

Minor Components

Legault

Percent of map unit: 5 percent
Landform: Ridges, mountain slopes
Landform position (two-dimensional): Backslope, shoulder
Other vegetative classification: PICO/JUCO (lodgepole pine, common juniper) (null_15)
Hydric soil rating: No

Rock outcrop

Percent of map unit: 3 percent
Landform: Ridges, mountain slopes, cliffs
Landform position (two-dimensional): Shoulder, backslope
Hydric soil rating: No

Arents

Percent of map unit: 2 percent
Landform: Mountain slopes
Landform position (two-dimensional): Footslope, toeslope
Hydric soil rating: No

50—Rock outcrop-Cathedral-Resort complex, 30 to 70 percent slopes

Map Unit Setting

National map unit symbol: k6jf
Elevation: 7,000 to 9,500 feet
Mean annual precipitation: 16 to 25 inches
Mean annual air temperature: 36 to 46 degrees F
Frost-free period: 25 to 100 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 45 percent
Cathedral and similar soils: 25 percent
Resort and similar soils: 20 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Setting

Landform: Mountain slopes, cliffs, ridges
Landform position (two-dimensional): Shoulder, backslope
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 30 to 70 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Cathedral

Setting

Landform: Mountain slopes, ridges
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Micaceous residuum weathered from igneous and metamorphic rock

Typical profile

A - 0 to 3 inches: very cobbly sandy loam
AB - 3 to 6 inches: very gravelly sandy loam
Bw - 6 to 11 inches: very gravelly sandy loam
R - 11 to 15 inches: unweathered bedrock

Properties and qualities

Slope: 30 to 70 percent
Surface area covered with cobbles, stones or boulders: 3.0 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 0.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R048AY237CO - Stony Loam
Hydric soil rating: No

Description of Resort

Setting

Landform: Ridges, mountain slopes
Landform position (two-dimensional): Shoulder
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Micaceous sandy residuum weathered from igneous and metamorphic rock

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A1 - 1 to 6 inches: very stony sandy loam
A2 - 6 to 14 inches: extremely cobbly loamy sand
Cr - 14 to 18 inches: weathered bedrock

Properties and qualities

Slope: 30 to 70 percent
Surface area covered with cobbles, stones or boulders: 1.0 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 0.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R048AY237CO - Stony Loam
Hydric soil rating: No

Minor Components

Tolvar

Percent of map unit: 5 percent
Landform: Mountain slopes
Landform position (two-dimensional): Toeslope, footslope
Other vegetative classification: ABLA-PIEN/VAMY (subalpine fir, Engelmann's spruce, Rocky Mountain whortleberry) (null_5)
Hydric soil rating: No

Lininger

Percent of map unit: 3 percent
Landform: Ridges, mountain slopes
Landform position (two-dimensional): Backslope
Ecological site: R048AY228CO - Mountain Loam
Hydric soil rating: No

Lone rock

Percent of map unit: 2 percent
Landform: Mountain slopes, alluvial fans
Landform position (two-dimensional): Footslope

Ecological site: R048AY228CO - Mountain Loam
Hydric soil rating: No

56—Tahana-Legault-Rock outcrop complex, 30 to 70 percent slopes

Map Unit Setting

National map unit symbol: k6jm
Elevation: 7,400 to 9,500 feet
Mean annual precipitation: 17 to 25 inches
Mean annual air temperature: 37 to 41 degrees F
Frost-free period: 25 to 75 days
Farmland classification: Not prime farmland

Map Unit Composition

Tahana and similar soils: 40 percent
Legault and similar soils: 30 percent
Rock outcrop: 25 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tahana

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Micaceous sandy colluvium over residuum weathered from igneous and metamorphic rock

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
Oa - 1 to 2 inches: moderately decomposed plant material
Bw - 2 to 8 inches: gravelly sandy loam
BC - 8 to 20 inches: very gravelly loamy sand
C - 20 to 24 inches: extremely gravelly loamy sand
Cr - 24 to 28 inches: weathered bedrock

Properties and qualities

Slope: 30 to 70 percent
Surface area covered with cobbles, stones or boulders: 8.0 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: F048AY908CO - Mixed Conifer
Hydric soil rating: No

Description of Legault

Setting

Landform: Ridges, mountain slopes
Landform position (two-dimensional): Backslope, shoulder
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Micaceous sandy residuum weathered from igneous and metamorphic rock

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 6 inches: very gravelly loamy sand
AC - 6 to 19 inches: very gravelly sand
Cr - 19 to 23 inches: weathered bedrock

Properties and qualities

Slope: 30 to 70 percent
Surface area covered with cobbles, stones or boulders: 6.0 percent
Depth to restrictive feature: 8 to 20 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 0.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: F048AY912CO - Lodgepole Pine
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Ridges, mountain slopes, cliffs
Landform position (two-dimensional): Shoulder, backslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Igneous and metamorphic rock

Typical profile

R - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 30 to 70 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Tolland

Percent of map unit: 5 percent
Landform: Mountain slopes
Landform position (two-dimensional): Footslope
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Attachment C
Endangered Species Information

Received
5/11/98

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
TRI-LAKES PROJECT OFFICE, 9307 STATE HWY 121
LITTLETON, COLORADO 80128-6901

REPLY TO
ATTENTION OF

May 6, 1998

Mr. Bruce Snyder
Parsons Engineering Science, Inc.
1700 Broadway, Suite 900
Denver, Colorado 80290

RE: Mattie Dam Rehabilitation and Water Intake Structures, City of Idaho Springs, Nationwide Permit File #199780653

Dear Mr. Snyder:

Please see the attached U. S. Fish & Wildlife Service Biological Opinion dated April 6, 1998. This letter is an amendment to Nationwide permit 199780653, which requires that the City of Idaho Springs abide by the attached Biological Opinion rather than purchase augmentation water as previously stated in the Nationwide permit conditions.

If there are any questions concerning this matter, please feel free to contact Mr. Terry McKee at (303) 979-4120, and reference Corps file #199780653.

Sincerely,

Timothy T. Carey
Project Manager

PARSONS ENGINEERING SCIENCE, INC. • SUITE 900 • 1700 BROADWAY • DENVER, CO 80290 • USA

FACSIMILE COVER SHEET

To: Bill Macy and Jim White
Ray Petros
Jim Mullen
Company: City of Idaho Springs
Petros and White
R.P. Arber and Assoc.
Phone: 303-573-1510
303-825-1980
303-831-4700
Fax: 303-567-4955
303-825-1983
303-831-0290

From: Bruce Snyder
Company: PARSONS ENGINEERING SCIENCE, INC.
Phone: (303) 831-8100
Fax: (303) 831-8208
Job No.: 730138.06000

Date: 12/18/97
Pages including this cover page: 3

Comments:

Please see attached letter from the Corps regarding Section 7 consultation conclusion and authorization for City to proceed with construction of the Mattie area projects.

Better copies of the letters will be forwarded once I receive them.

US Army Corps of Engineers

OMAHA DISTRICT
Tri-Lakes Project Office
9307 State Highway 121
Littleton, CO 80128-6901

PHONE: (303) 979-4120
FAX: (303) 979-0602

FAX TRANSMITTAL

TO: Bruce Snyder
Parsons Engr.

DATE: 12/18/97

FAX NO. 831-8208

RE: Original to follow in the mail.

TOTAL PAGES SENT (including header sheet) 2

RELEASER'S SIGNATURE Tim Carey

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
TRI-LAKES PROJECT OFFICE, 9307 STATE HWY 121
LITTLETON, COLORADO 80128-6901

REPLY TO
ATTENTION OF

December 18, 1997

Mr. Bruce Snyder
Parsons Engineering Science, Inc.
1700 Broadway, Suite 900
Denver, Colorado 80290

RE: Mattie Dam Rehabilitation and Water Intake Structures, City of Idaho Springs, Nationwide Permit File No. 199780653

Dear Mr. Snyder:

Please reference the attached letter from the U.S. Fish and Wildlife Service (USFWS) and my October 10, 1997 letter to you, same subject as above.

In my October 10th letter I stated that in order for the Nationwide Permit verification to be valid, Section 7 consultation under the Endangered Species Act must be completed. After I sent this letter I received a copy of a signed lease agreement between the City of Idaho Springs and GASP (Groundwater Appropriators of the South Platte River Basin) for replacement water. I then forwarded the lease agreement to the USFWS and asked for concurrence with my determination that through implementation of the agreement there would be no affect to Platte River System endangered species by our permitting the above project. The attached USFWS letter provides that concurrence.

Based on this "no affect" determination, the above referenced Nationwide Permit verification is now valid and the City may proceed with construction. Also, at the request of the City, I am reinitiating formal Section 7 consultation with the USFWS, as outlined in the USFWS letter. If you have any questions regarding this matter, please contact me at 979-4120.

Sincerely,

Timothy T. Carey
Operations Project Manager

CF:
Mr. LeRoy Carlson
U.S. Fish and Wildlife Service

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Colorado Ecological Services Field Office
Denver Federal Center
P.O. Box 25486
Denver, CO 80225-0486
Phone: (303) 236-4773 Fax: (303) 236-4005

In Reply Refer To:
Project Code: 2023-0108092
Project Name: Mattie Dam Rehabilitation Project

July 24, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Colorado Ecological Services Field Office
Denver Federal Center
P.O. Box 25486
Denver, CO 80225-0486
(303) 236-4773

PROJECT SUMMARY

Project Code: 2023-0108092
Project Name: Mattie Dam Rehabilitation Project
Project Type: Dam - Maintenance/Modification
Project Description: requested, here's a brief project summary:
Mattie Dam is an existing dam located on Chicago Creek approximately 4 miles southwest of Idaho Springs, Colorado. The purpose of the dam is to provide enough head to divert water from Chicago Creek into an intake structure that delivers water into the Idaho Springs Water Treatment Plant. The dam is an overflow structure, so excess water in the creek flows over the top of the dam. Due to a combination of low flows and water flowing through the existing dam there is not sufficient head to divert water into the City's intake structure, therefore, a new dam will be constructed. The replacement dam will comprise a new mass concrete overflow dam across Chicago Creek backfilled with riprap salvaged from the original structure, a reinforced concrete training wall along the right abutment of the overflow dam, and a 24-inch-diameter sluiceway located adjacent to the existing intake structure and discharging next to the existing outfall and existing channel returning flows to Chicago Creek. The new dam will not change the current operating water levels.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.71585265,-105.57244009933817,14z

Counties: Clear Creek County, Colorado

ENDANGERED SPECIES ACT SPECIES

There is a total of 9 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 3 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. 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.

MAMMALS

NAME	STATUS
Canada Lynx *Lynx canadensis* Population: Wherever Found in Contiguous U.S. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened
Gray Wolf *Canis lupus* Population: U.S.A.: All of AL, AR, CA, CO, CT, DE, FL, GA, IA, IN, IL, KS, KY, LA, MA, MD, ME, MI, MO, MS, NC, ND, NE, NH, NJ, NV, NY, OH, OK, PA, RI, SC, SD, TN, TX, VA, VT, WI, and WV; and portions of AZ, NM, OR, UT, and WA. Mexico. There is **final** critical habitat for this species. This species only needs to be considered under the following conditions: ▪ Lone, dispersing gray wolves may be present throughout the state of Colorado. If your activity includes a predator management program, please consider this species in your environmental review. Species profile: https://ecos.fws.gov/ecp/species/4488	Endangered

BIRDS

NAME STATUS

Mexican Spotted Owl *Strix occidentalis lucida* Threatened

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/8196

Piping Plover *Charadrius melodus* Threatened

Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered.
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
This species only needs to be considered under the following conditions:

- Project includes water-related activities and/or use in the N. Platte, S. Platte, and Laramie River Basins which may affect listed species in Nebraska.

Species profile: https://ecos.fws.gov/ecp/species/6039

Whooping Crane *Grus americana* Endangered

Population: Wherever found, except where listed as an experimental population
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/758

FISHES

NAME STATUS

Greenback Cutthroat Trout *Oncorhynchus clarkii stomias* Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/2775

Pallid Sturgeon *Scaphirhynchus albus* Endangered

No critical habitat has been designated for this species.
This species only needs to be considered under the following conditions:

- Project includes water-related activities and/or use in the N. Platte, S. Platte, and Laramie River Basins which may affect listed species in Nebraska.

Species profile: https://ecos.fws.gov/ecp/species/7162

INSECTS

NAME STATUS

Monarch Butterfly *Danaus plexippus* Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

FLOWERING PLANTS

NAME STATUS

Western Prairie Fringed Orchid *Platanthera praeclara* Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/1669

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: AECOM
Name: Jeff Dawson
Address: 7595 Technology Way
City: Denver
State: CO
Zip: 80237
Email jeffrey.dawson@aecom.com
Phone: 6294313899

Attachment D

Class II Survey of the Rehabilitation of Mattie Dam in the City of Idaho Springs in Clear Creek County, CO

AECOM
7595 Technology Way
Denver, CO 80237

T: +1 (303) 694 2770
F: +1 (303) 694 3946
aecom.com

Project name:
Mattie Dam Rehabilitation

Project No.: 6068520

Date:
July 28, 2023

DRAFT

To: Edward Sigward
City of Idaho Springs
Water Facilities Superintendent
1711 Miner Street
Idaho Springs, CO 80452

CC: Project File

From: Thomas Carr, Sr. Archaeologist (AECOM)

Memo

Subject: Class III Survey of the Rehabilitation of Mattie Dam in the City of Idaho Springs in Clear Creek County, Colorado

Introduction

Mattie Dam is an existing non-jurisdictional dam located on Chicago Creek approximately 4 miles southwest of Idaho Springs, Colorado. The purpose of the dam is to provide enough head to divert water from Chicago Creek into an intake structure that delivers water into the Idaho Springs Water Treatment Plant. The dam is an overflow structure, so excess water in the creek flows over the top of the dam. Due to a combination of low flows and water flowing through the existing dam, there is not sufficient head to divert water into the City's intake structure; therefore, a new dam will be constructed. The replacement dam will comprise a new mass concrete overflow dam across Chicago Creek backfilled with riprap salvaged from the original structure, a reinforced concrete training wall along the right abutment of the overflow dam, and a 24-inch-diameter sluiceway located adjacent to the existing intake structure and discharging next to the existing outfall and existing channel returning flows to Chicago Creek. The new dam will not change the current operating water levels and will remain classified as a non-jurisdictional dam.

AECOM Technical Services, Inc. (AECOM) is providing planning and design engineering services for the Project described above. Based on a meeting with the United States Army Corps of Engineers (USACE) on November 7, 2022, a Clean Water Act Section 404 nationwide permit is required to construct and operate the proposed project that triggers compliance with Section 106 of the National Historic Preservation Act (NHPA). In support of these services, AECOM is conducting environmental studies to assess potential effects to resources that will be documented in a pre-construction notification (PCN) that will be submitted to the USACE to request authorization under Nationwide Permit #3 Maintenance. The environmental studies include an assessment of cultural (archaeological and historical) resources within the area of potential effect (APE). The APE is generally defined as the area of ground disturbance associated with construction and staging activities. Sites that have been previously recorded and/or listed in the National Register of Historic Places (NRHP) or State Register of Historic Properties (SRHP) (i.e., historic properties) will be identified. Although it is unlikely that the Project will directly affect any historic properties, should any of those properties require alteration or demolition, a pedestrian survey will be required to determine the site's official NRHP/SRHP eligibility.

This memo documents the results of the cultural resources study conducted for the Project. It summarizes the results of a cultural resources records review conducted to identify prior cultural resource investigations, previously recorded cultural resources, and any historic site (older than 1978) within a buffer with a half mile radius around the APE. A Class III survey was also conducted on June 8, 2023. **Figure 1** shows the Project location, as well as the previous surveys and cultural resources located in the vicinity of the project APE.

Cultural Resources Record Review

Several Sources of information were examined to identify previous studies and known cultural resources within the APE. These sources include the following:

- COMPASS, Colorado's Online Cultural Resource Database (History Colorado 2023)
- Bureau of Land Management (BLM) - General Land Office (GLO) Records (BLM 2023)
- United State Geological Survey (USGS) Historic Topographic Quadrangle Maps (USGS 2023)

Previous Investigations

The files maintained by the Office of Archaeology and Historic Preservation (OAHP) at History Colorado (COMPASS 2023) were reviewed to identify prior surveys and previously recorded cultural resources within a half-mile buffer of the APE. Three cultural resource surveys have been previously completed within the search area, as described in **Table 1**.

Table 1. Previous Investigations within a Half-Mile Buffer of the Project APE

SURVEY ID	TITLE	AUTHOR(S)	AGENCY	DATE
CC.FS.R5	A Cultural Resource Survey of The Devils Canyon Timber Sale, Clear Creek County, Colorado	Gleichman, Peter J.	Native Cultural Services for Clear Creek Ranger District	09/28/1989
CC.FS.NR30	City of Idaho Springs Waterline, Clear Creek County, Colorado	Overturf, Jeff	Arapaho and Roosevelt National Forests	11/27/1998
CC.FS.NR60	A Class III Cultural Resources Inventory of the Xcel Highway 103 Power Pole Replacement Project, Clear Creek County, Colorado	Snyder, Dan	Arapaho and Roosevelt National Forests	02/01/2022

Known Cultural Resources

According to COMPASS (2023), no cultural resources (sites or isolated finds) have been previously recorded within the APE for direct project effects. Seven sites have been previously recorded within the half-mile buffer of the APE. None of these sites are within the APE and are summarized in **Table 2**.

Table 2. Previously Recorded Sites within a Half-Mile Buffer of APE

SITE ID	SITE NAME	ORIGINAL RECORDING DATE	DESCRIPTION	ERA	DATE(S)	NRHP ELIGIBILITY (DATE)
5CC.1151	Mt. Evans Road ~State Highway 103 - Segment	2013	Historic Road	H	1927-1929	Not Accessed in this vicinity
5CC.499	King Solomon and Grace M.	1991	Historic Mine	H	1895-1920	ONE 04/05/1992
5CC.500	Arthur, Shellbark or K.P.	1991	Historic Mine	H	1880-1926	ONE 04/05/1992

Table 2. Previously Recorded Sites within a Half-Mile Buffer of APE

SITE ID	SITE NAME	ORIGINAL RECORDING DATE	DESCRIPTION	ERA	DATE(S)	NRHP ELIGIBILITY (DATE)
5CC.501	Dorit or King Solomon	1991	Historic Mine	H	1895-1910	ONE 04/05/1992
5CC.502	Selma	1991	Historic Mine	H	1895-1920	ONE 04/05/1992
5CC.1795	Historic Mining Resource	2008	Historic Archaeology	H	None given	FNE 09/30/2008
5CC.1796	Historic Mining Resource	2008	Historic Archaeology	H	None given	FNE 09/30/2008

Notes:
Era: H, historic
National Register of Historic Places (NRHP) Eligibility: FNE, field not eligible; ONE, officially not eligible; U, unevaluated

Historic Topographic Maps

Historic topographic maps from the late 18th century to the mid-19th century document light development of the Project area. They are useful for identifying any historic structures or features that remain in or near the APE. The following maps were inspected, and three historic structures were noted. The 1883 BLM GLO plat map for Township 4S Range 73W (**Figure 2**) shows the Mt. Evans Road/State Highway 103. The road and a number of unnamed mines are visible in the 1903 *Georgetown, Colorado* 30-minute USGS topographic quadrangle map (**Figure 3**). The 1957 *Idaho Springs, Colorado.* 7.5' topographic quadrangle shows the road abandoned mines including the Golden Glen, Dorit, and King Solomon mines, as well as structures at the historic Blackstone Ranch located across the highway and southwest of the Project area (**Figure 4**). The maps also show some of the early structures at the Idaho Springs Water Treatment Facility.

Intensive Pedestrian Survey

An intensive pedestrian survey of the Project APE was conducted by AECOM Senior Archaeologist, Thomas Carr on June 8, 2023. The majority of the survey area is comprised of the reservoir behind Mattie Dam. **Figure 5** shows the reservoir facing the dam to the east. An intensive survey of this area resulted in no discoveries of cultural resources. The only cultural features are the dam and the 2002 sluice intake. The historic Mt. Evans Road ~State Highway 103 (5CC.1151) is located south of the project APE. The presence of a historic stone bridge in the vicinity (**Figure 6**). A historic stone bridge from the 1800s was a section of the original road; however, it is located southeast of the APE and separated from the APE by the modern highway. This segment of 5CC.1151 has not been inventoried and the bridge has not been formally recorded. Since it is outside of the project APE, it is not within the scope of this survey. The bridge and historic road segment are on the property owned by the City of Idaho Springs Water Treatment Facility. **Figure 7** shows the original building associated with the treatment facility (circa early 1900s), and **Figure 8** shows the 1969 facility. The current facility was built in 2002. The full inventory of structures associated with the facility are shown as blue polygons in **Figure 1**. For Section 106 compliance purposes, as Limited-results Cultural Resource Inventory Form (OAHP #1420) was completed and is attached to this memo as **Appendix A**.

Effects

The Project will result in no direct, indirect, or cumulative adverse effects to any historic properties. Therefore, a finding of **no historic properties adversely affected** would be appropriate for this Project. However, as with all development Projects, if any cultural resources are encountered during construction, activities should cease until a qualified archaeologist or historian has had an opportunity to evaluate the significance of the find(s).

References Cited

Bureau of Land Management (BLM)

2023 General Land Office Records. Electronic document, https://glorecords.blm.gov/default.aspx, accessed on 7/10/2023

1883 – GLO plat map for Township 4S Range 73W

History Colorado

2023 COMPASS, Colorado's On-line Cultural Resource Database. Electronic database, https://gis.colorado.gov/compass/, accessed 7/10/2023 and 7/11/2023.

United States Geological Survey (USGS), Washington, D. C.

2023 Topoview Maps. Available at: https://ngmdb.usgs.gov/topoview/, accessed on 7/10/2023

1903 *Georgetown, Colorado* 30 minute topographic quadrangle

1957 *Idaho Springs, Colorado.* 7.5' topographic quadrangle

Figures

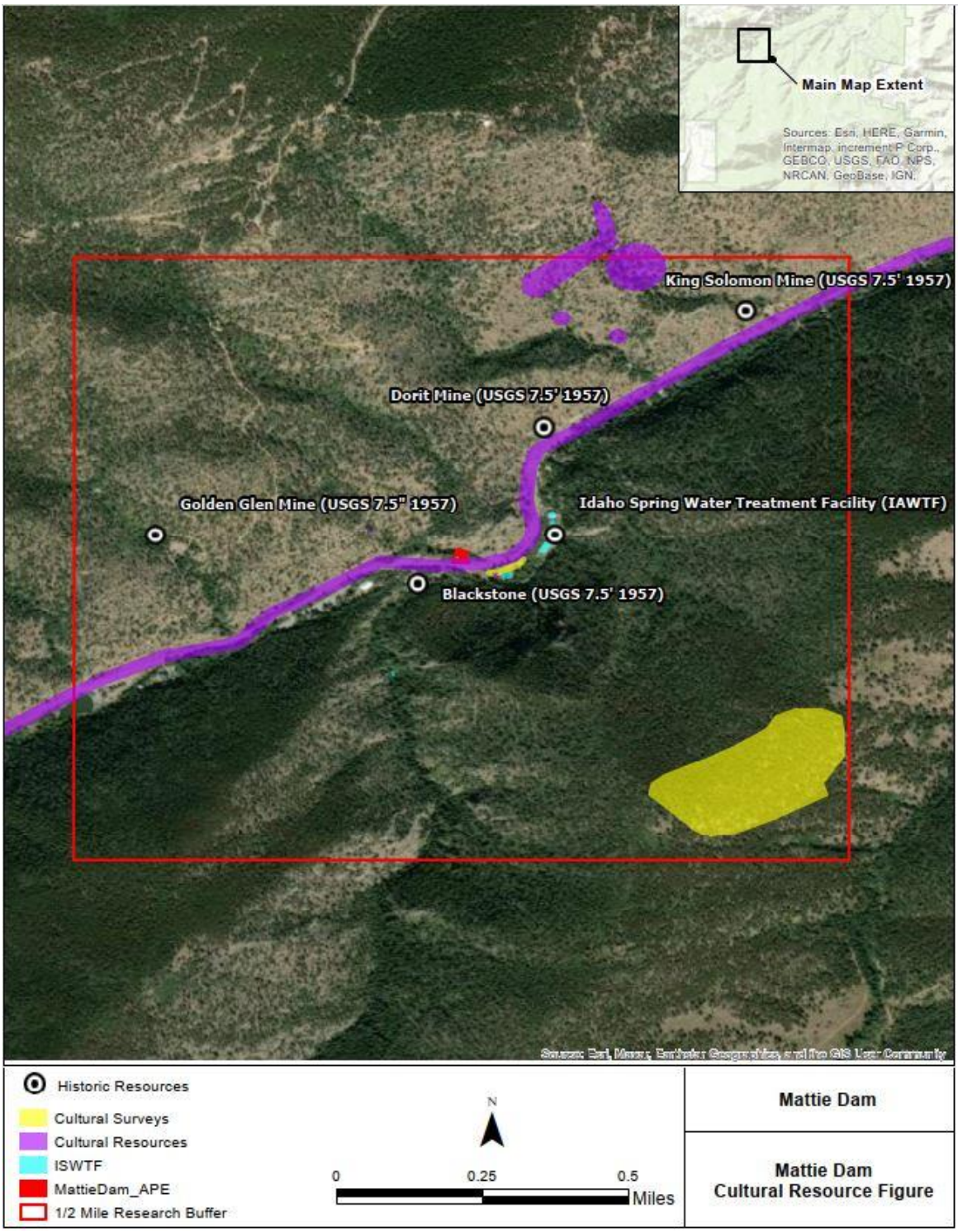


Figure 1 – The portion of the Project area that was surveyed for potential cultural resources is shown in red. The previously surveyed area is shown in yellow and the previously identified cultural resources are shown in purple. The water treatment facility is shown in teal.

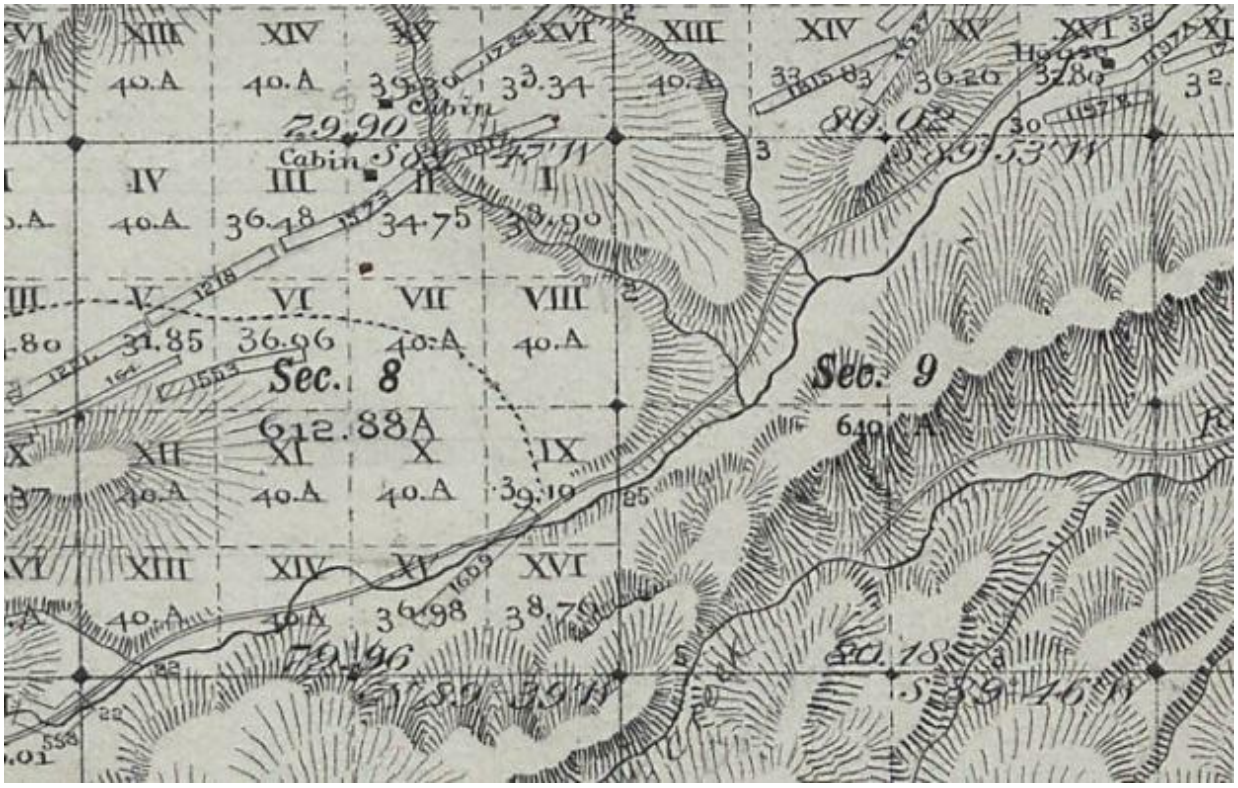


Figure 2 – 1883 – GLO plat map for Township 4S Range 73W showing the historic Mt. Evans Road ~State Highway 103 in the vicinity of the project.

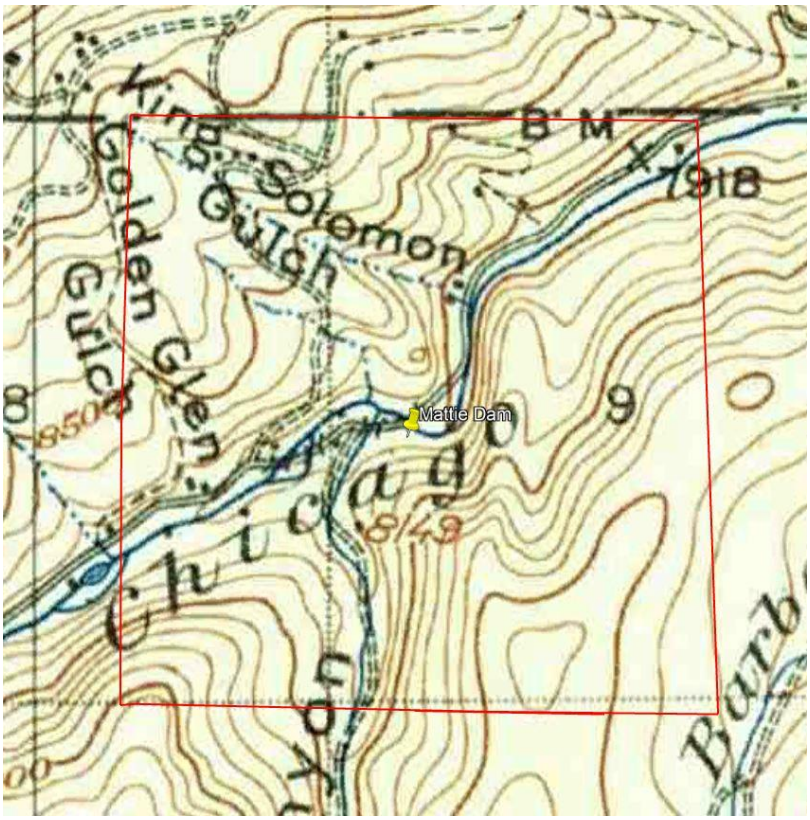


Figure 3 – 1903 Georgetown, Colorado 30 minute topographic quadrangle showing several historic roads and structures in the vicinity of the project.

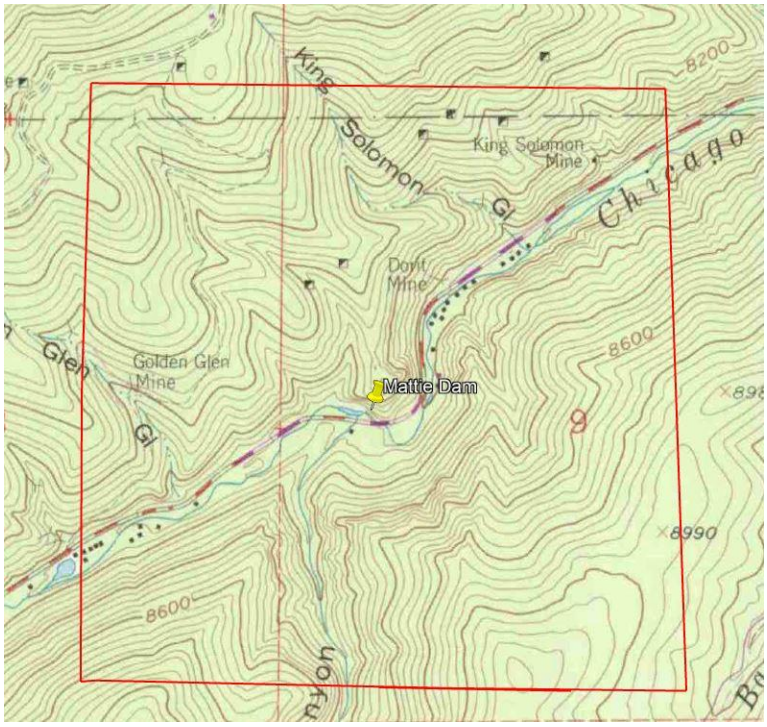


Figure 4 – 1957 Idaho Springs, Colorado. 7.5' topographic quadrangle showing several historic mines and structures in the vicinity of the project area.

Figure 5 – Mattie dam reservoir facing east.

Figure 6 – Historic stone bridge located across State Highway 103 and possibly associated with 5CC.1151, facing northwest.

Figure 7 – Original structure (circa early 1900s) at the City of Idaho Springs Water Treatment Facility, facing southeast.

Figure 8 – 1969 structure at the City of Idaho Springs Water Treatment Facility, facing north/northwest.

APPENDIX A
LIMITED-RESULTS CULTURAL RESOURCE SURVEY FORM

LIMITED-RESULTS CULTURAL RESOURCE SURVEY FORM

This form (#1420) is for small scale limited results projects - block surveys less than 160 acres with linear surveys under four miles. Additionally, there should be no sites and a maximum of four Isolated Finds. This form must be typed.

I. IDENTIFICATION

1. Report Title (include County): Class III Survey of the Rehabilitation of Mattie Dam in the City of Idaho Springs in Clear Creek County, Colorado
2. Date of Field Work: June 8, 2023
3. Form completed by: Aubrey Chambers Date: 7/10/23
4. Survey Organization/Agency: AECOM Technical Services, INC.
   Principal Investigator: Thomas Carr
   Principal Investigator's Signature: _____
   Address: 7595 Technology Way, Denver, CO 80237
5. Lead Agency / Land Owner: City of Idaho Springs
   Contact: Edward Sigward
   Address: 1711 Miner Street, Idaho Springs, CO 80452
6. Client: City of Idaho Springs
7. Permit Type and Number: State of Colorado Archaeological Permit # 80922
8. Report / Contract Number: 60685200
9. Comments: _____

II. DESCRIPTION OF UNDERTAKING / PROJECT

10. Type of Undertaking: Dam Rehabilitation Project
11. Size of Undertaking (acres): .25 Size of Project (if different) _____
12. Nature of the Anticipated Disturbance: Erosion along the banks of the Dam, wind and water erosion may lead to future rockslides on the slope bordering the Dam.
13. Comments: _____

III. PROJECT LOCATION

Please attach a photocopy of USGS Quad. clearly showing the project location. The Quad. should be clearly labeled with the Prime Meridian, Township, Range, Section(s), Quad. map name, size, and date. Please do not reduce or enlarge the photocopy.

14. Description: Near Idaho Springs along CO-103 Chicago Creek Road.

15. Legal Location: Quad. Map: Idaho Springs, Colorado

_____ Date(s): 1957 Principal Meridian: 6th

NOTE: Only generalized subdivision ("quarter quarters") within each section is needed

Township: 4 South Range: 73 West Sec.: 9 ¼ ¼ , ¼ ;

If section(s) is irregular, explain alignment method:

16. Total number of acres surveyed: .25

17. Comments: _____

IV. ENVIRONMENT

18. General Topographic Setting: Front Range of the Central Rocky Mountains

Current Land Use: Dam was constructed 0.4 km adjacent to the Mattie Mine and retains overflow water from the Idaho Springs Reservoir

19. Flora: Montane ecological zone characterized by Ponderosa Pine forests

20. Soils/Geology: The APE is located fully within the Cathedral-Resort complex, an igneous and metamorphic rock outcrop area with thin very stony sandy loam top soils.

21. Ground Visibility: good – 30-80%

22. Comments: _____

V. LITERATURE REVIEW

23. Location of File Search: COMPASS, Colorado's Online Cultural Resource Database

Date: 7/10/23

24. Previous Survey Activity - In the project area: There have been no surveys previously conducted within the project area.

V. LITERATURE REVIEW (continued)

In the general region: There have been three cultural resource surveys conducted within ½-mile of the project area. These are CC.FS.R5, CC.FS.NR30, and CC.FS.NR60 – all for the USFS and associated with timber sales, a waterline, and power pole replacements.

25. Known Cultural Resources - In the project area: None

In the general region (summarize): Seven previously documented sites are located within 0.5 miles of the project area: 5CC.1151, historic road; 5CC.499, historic mine/adit; 5CC.500, historic mine with two prospect pits/mine shafts, two prospect pits, and one adit/prospect pit; 5CC.501, historic mine shaft; 5CC.502, historic mine adit, 5CC.1795, historic waste rock pile/prospect shaft; 5CC.1796, historic mine waste rock pile/adit. There is also a historic stone bridge from the 1800s and a historic ranch within 0.5 miles of the project area.

26. Expected Results: Potential materials/features associated with historic road

VI. STATEMENT OF OBJECTIVES

27. The purpose of this survey was to complete a Class III survey of the cultural resources inventory of the project APE and identify any cultural resources 50 years or older within the APE, evaluate the eligibility of these resources for listing in the National Register of Historic Places (NRHP), and assess the likelihood of adverse effects on any historic properties (i.e., NRHP-eligible resources).

VII. FIELD METHODS

28. Definitions: **Site** - Five or more prehistoric or historic artifacts in close proximity (10 meters or less) or a cultural feature. **IF** - four of fewer artifacts in close proximity (10 meters or less).

29. Describe Survey Method: One archaeologist was able to conduct a 100% pedestrian survey of the APE.

VIII. RESULTS

30. List IFs if applicable. Indicate IF locations on the map completed for Part III.

No results.

A. Smithsonian Number: _____ Description: _____

B. Smithsonian Number: _____ Description: _____

C. Smithsonian Number: _____ Description: _____

D. Smithsonian Number: _____ Description: _____

31. Using your professional knowledge of the region, why are there none or very limited cultural remains in the project area? Is there subsurface potential?

The area is almost fully situated on bedrock with a very thin topsoil. Additionally, the area is highly disturbed due to the construction of the highway and the dam. There is extremely low potential for any sub-surface remains.

COLORADO
Division of Water Resources
Department of Natural Resources
dwr.colorado.gov P 303.866.3581

NON-JURISDICTIONAL WATER IMPOUNDMENT STRUCTURE[1]

This notice is required per Section 37-87-125, C.R.S. (1998) and
must be submitted to the Division Engineer's Office a minimum of 45 days prior to construction.

OWNER INFORMATION

Name: City of Idaho Springs Telephone/E-Mail: (303) 859-6132 / esigward@idahospringsco.com

Address: 1711 Miner Street (Street / P.O. Box/ Rural Route) Idaho Springs (City) CO (State) 80452 (Zip Code)

Responsible Person: Edward Sigward Telephone/E-Mail: (720) 937-6759 / esigward@idahospringsco.com

Address: 1711 Miner Street (Street / P.O. Box/ Rural Route) Idaho Springs (City) CO (State) 80452 (Zip Code)

Contractor: To be advised following award (anticipated May 2024) Telephone/E-Mail: (____) _____ / _____

STRUCTURE INFORMATION

Name of Dam: Mattie Dam Water Division: 1 Water District: 07

Location: *(Provide Section, Township, Range, **and** GPS Point taken at crest of dam above streamline/outlet)*

- Section: NW 1/4 of S9, Township: 4S, Range: 73W, ___ P.M.

- Northing 39.717097 meters, Easting 105.572039 meters (*Datum should be UTM, NAD 83)*

Dam Dimensions:

- Vertical Height[2]: 6.0 ft., Length: 50 ft., Crest Width: 10 ft., Slopes: U/S: 1.7 (H:1V), D/S 1.5 (H:1V)

Reservoir:

- Surface Area[1]: 0.20 acres, Capacity[1]: 0.5 acre-feet, Drainage Area*: 31,200 acres
(If drainage area is unknown leave blank and a spillway size will be assigned):

Emergency Spillway: *(See Table 1, Spillway Sizing Guidelines)* N/A

- Bottom Width: 25 ft., Side Slopes: 0 H:1V, Freeboard[3]: 2 ft

Outlet Conduit Type: PVC PIPE, Size: 24 inches, Location: Right Abutment

Stream Name or Water Source[4]: Chicago Creek Proposed Water Use: diversion for City potable water supply

Water Court Case **or** WDID : 41340
(Water District Identification Number)

Signature of Owner 4/24/24 Date

Office Use Only

DIVISION ENGINEER'S REQUIREMENTS: _____

_____

_____

Dam I.D. 070141 Signature of Division Engineer Date

[1] A "Non-Jurisdictional Structure" is a dam creating a reservoir with a capacity of 100 acre-feet or less *and* a surface area of 20 acres or less *and* a vertical height (footnote 2) of 10 feet or less. Non-jurisdictional size dams are regulated and subject to the authority of the State Engineer consistent with sections 37-87-102 and 37-87-105 C.R.S.

[2] "Vertical Height" is measured from the elevation of the lowest point of the natural surface of the ground or the invert of the outlet conduit (whichever is lower) where that point occurs along the longitudinal centerline of the dam up to the crest of the emergency spillway of the dam.

[3] "Freeboard" is the vertical distance from the bottom of spillway to the crest of the dam. Minimum Freeboard is 3 feet.

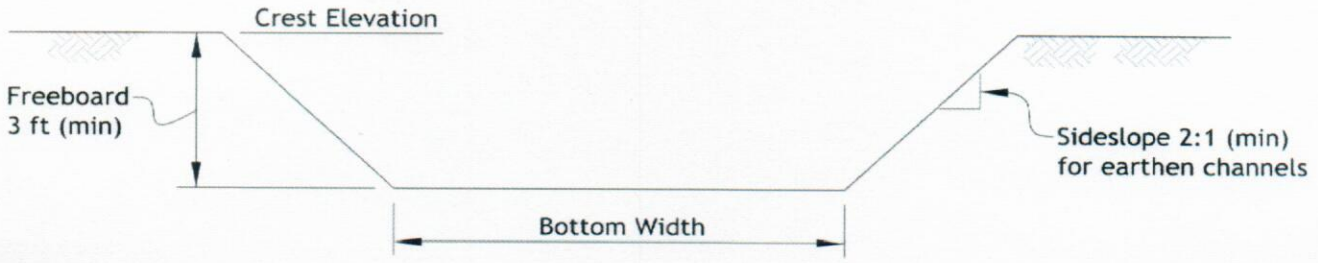
[4] If construction in reservoir intercepts groundwater, a well permit is required. (Well permit applications can be found at dwr.colorado.gov)

COLORADO
Division of Water Resources
Department of Natural Resources

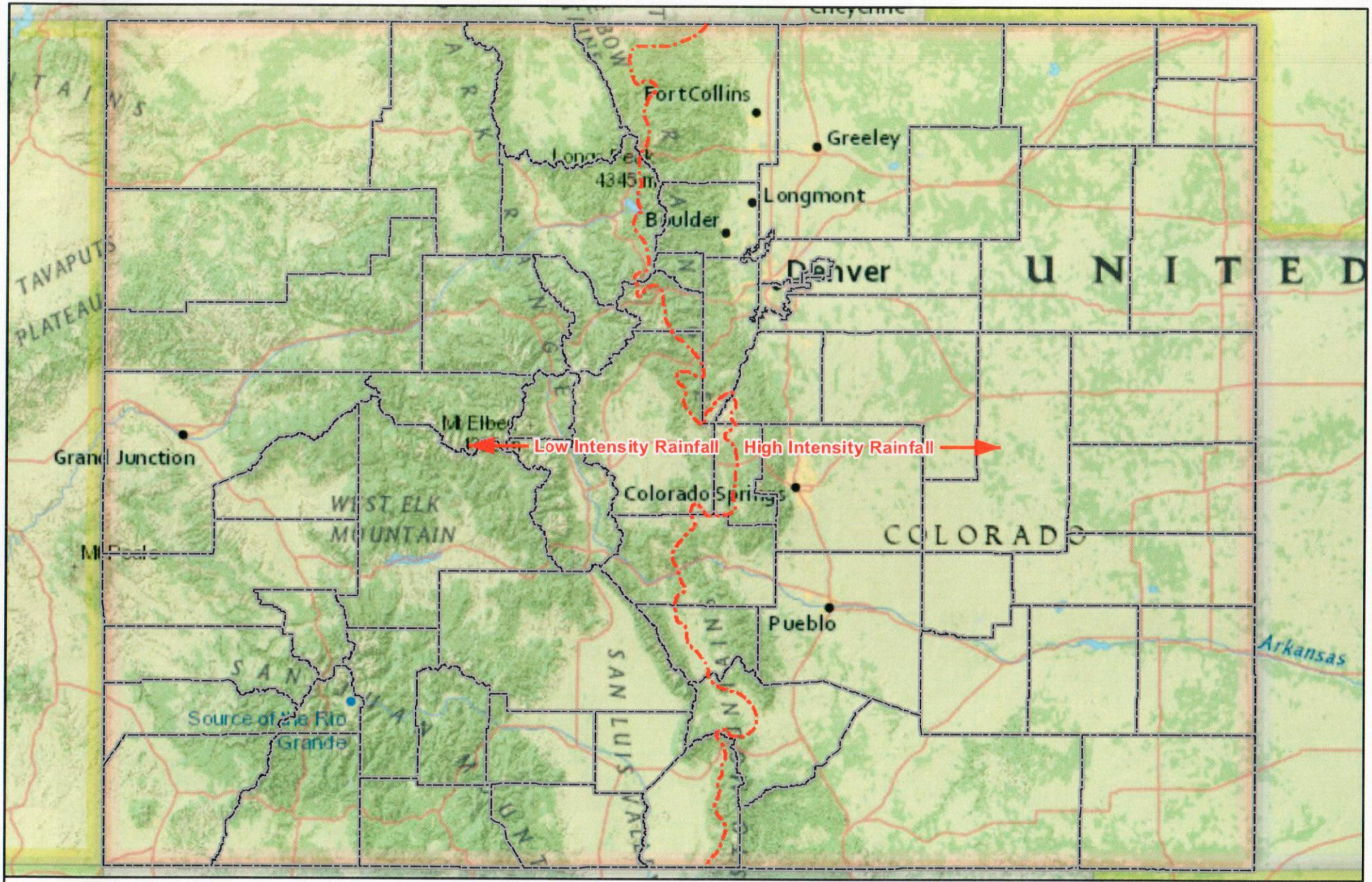
Table 1 DAM SAFETY BRANCH Spillway Sizing Guidelines for Non-Jurisdictional Dams

Drainage Area (Acres)	Minimum Recommended Bottom Width[1] (Feet) Low Intensity Rainfall Zone	Minimum Recommended Bottom Width[1] (Feet) High Intensity Rainfall Zone
175	8	8
225	8	10
275	8	12
325	8	15
375	10	17
425	11	19
475	12	21
525	13	24
575	15	26
625	16	28
675	17	30
725	19	33
775	20	35
825	21	37
875	22	39
925	24	42
975	25	44
1025	26	46
1075	28	48
1125	29	51
1175	30	53
1225	31	55
1275	33	57
1325	34	59
1375	35	62
1425	37	64
1475	38	66

[1]Minimum recommended bottom width for drainage areas less than 175 acres is 8 feet



Spillway Section



COLORADO
Division of Water Resources
Department of Natural Resources

Rainfall Intensity Zones for Non-Jurisdictional Dam Spillway Sizing

COLORADO
Division of Water Resources
Department of Natural Resources

DAM SAFETY BRANCH Specifications for Construction of Non-Jurisdictional Dams

- Site Selection:
  - Foundation soils should be firm to provide adequate support for the embankment and should have low permeability to allow for water retention. Site selection should consider potential downstream property damage in the event of a dam failure. Construction of dams in boggy areas, areas with non-uniform fractured rock, or sands/gravels is not recommended and an engineer should be hired to evaluate the site conditions. Any part of the reservoir basin excavated below grade cannot expose groundwater.

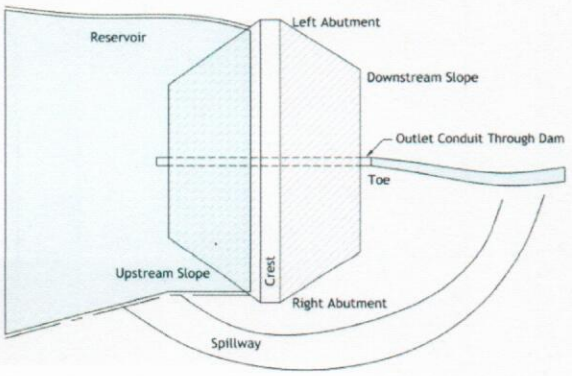
- Embankment Design:
  - Backfill material to be used for construction of the cutoff trench and embankment should be a suitable clay material and contain no material larger than 6 inches in diameter.
  - The upstream slope should be constructed with a slope no steeper than 3:1, and the downstream slope should be no steeper than 2:1 (see cross section below). The dam crest should have a minimum width of 10 feet and the surface should be graded with positive drainage toward the reservoir basin.
  - It is recommended that rock rip rap or other suitable material be placed on the upstream slope of the embankment to protect it from wave action. A suitable gravel or geosynthetic material should be placed under the rip rap to prevent fine material from washing out from behind the larger rock.
  - The embankment should be fenced to restrict livestock from accessing the dam since they damage the protective vegetation and increase erosion.

- Embankment Construction
  - The topsoil and all organic material should be removed from the foundation of the proposed dam site. Organic soil should only be reused for placement on the completed embankment to promote the re-growth of vegetation.
  - A cutoff trench should be excavated under the full length of the centerline of the dam with sloping sides (1:1 min.), a minimum bottom width of 3 feet and a depth of 3 feet.
  - The foundation of the dam should be scarified/ripped to a depth of 6-inches to provide proper contact between the native foundation and embankment. This surface should then be moisture treated before placement of fill.
  - Fill material should be placed in layers not exceeding 12 inches in thickness prior to compaction. Suitable backfill material should have enough clay and moisture content to roll a small ball by hand. If this cannot be done, the soil is likely too dry or does not have adequate clay content.
  - Each lift should be thoroughly compacted using a sheeps foot compactor. Care should be taken not to allow the top layers of the soil to dry out between placement of lifts.
  - Fill should be placed in uniform lifts that cover the entire embankment length and width.

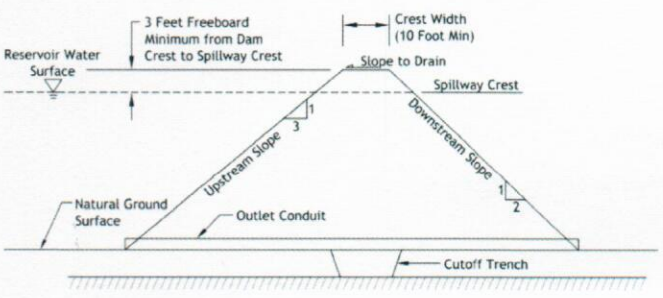
- Outlet
  - Unless a waiver is granted in writing by the Division Engineer, all non-jurisdictional dams require an outlet conduit positioned at the natural low point of the reservoir basin. A minimum diameter of 12 inches is recommended and should be controlled at the upstream end by a valve and trash rack.

- Emergency Spillway
  - The spillway should have sufficient width to provide capacity to route the runoff from the drainage basin above the dam during rainfall/runoff events.
  - The emergency spillway should be located on natural ground far enough away to prevent erosion of the dam embankment. A spillway over the dam embankment is not acceptable.
  - A minimum of 3 feet of freeboard is required from the bottom of the emergency spillway to the top of the dam.
  - To determine the minimum spillway width, see the attached table for your area and drainage basin size.

- Example Plan View and Cross Section



Plan View



Cross Section Through Dam at Outlet