

MINIMUM REQUIREMENTS DECISION GUIDE WORKBOOK

“...except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act...”

-- The Wilderness Act of 1964

Project Title: **Canyon Lake Dam Access and Rehabilitation**

MRDG Step 1: Determination

Determine if Administrative Action is Necessary

Description of the Situation

What is the situation that may prompt administrative action?

Canyon Lake Dam is owned and maintained by Canyon Creek Irrigation District (CCID). CCID needs to perform maintenance on their dam. The facility is located on Bitterroot National Forest Lands, on the Darby Ranger District, within the Selway-Bitterroot Wilderness. Canyon Lake Dam is located in the Southeast in Section 27, Township 6 North, Range 22 West, P.M., in the upper Canyon Creek drainage. Public access is via Forest Service Trail No. 525. Distance to the dam from the trailhead is approximately 5 miles. This steep trail ascends over 2400 feet in elevation and crosses a steep, rocky slope within the last mile of the dam. Trail No. 525 is not safe and not recommended for stock use.

Canyon Creek Irrigation District (CCID) requests adequate access to their easement at Canyon Lake Dam and use of motorized and mechanized equipment so that CCID may make their facilities safe, which is consistent with their responsibilities under federal and state dam safety laws and regulations. CCID is the owner of appropriated water right, recognized under state law, which authorizes the irrigation district to legally store and use their water for beneficial uses including agricultural, domestic, stock, irrigation, lawn and garden, etc. uses.

The need for this project stems from CCID’s existing rights and obligations to operate and maintain Canyon Lake Dam to meet current State and Federal Dam Safety Standards and pertinent laws and regulations governing the proponent’s use and the protection of National Forest System lands. The irrigation district is authorized to operate and maintain their dam and reservoir on National Forest Lands under a pre-Forest easement which is authorized under the Act of July 26, 1866 and the Act of March 3, 1891, granted by the Secretary of the General Land Office, Department of Interior.

Canyon Lake Dam is a century-old dam originally constructed in 1891. Canyon Lake dam is classified as a high hazard structure with the capability of causing damage to downstream property and environmental resources in the event of a failure. Canyon Lake Dam could also present a threat to public safety if the dam failed.

This project will correct deficiencies that have resulted in significant seepage through the dam embankment, which have been documented and monitored by Hydrometrics Inc. over the past several years during routine safety inspections.

In the past 12 years, three sinkholes have been repaired. Silty sand embankment soils are prone to piping (internal erosion). Localized piping and high seepage velocities can lead to development of more sinkholes and/or a total dam breach failure. The most recent sinkhole developed near the south abutment of the auxiliary spillway in 2017.

In 2004, work was completed on the dam for the purpose of increasing inadequate spillway capacity, repairing failing outlet works, and addressing surface erosion problems along the upstream embankment. However, this project did not correct embankment stability, seepage problems and internal erosion or piping potential.

Helicopter access to the dam is requested to transport bulky equipment and heavy construction materials needed to accomplish the repair work within generally accepted industry standards. It is not safe or feasible to physically pack this equipment and heavy construction materials in with stock.

According to the Canyon Creek Irrigation District's engineering representative, Hydrometrics, Inc., the repairs to the dam would involve covering the upstream embankment with an impermeable geomembrane liner and protective filter fabric and improving the intake. Installation of the liner system addresses potential problems associated with embankment stability and seepage control. Work includes temporary removal of existing riprap and existing filter fabric, preparation of the subgrade, re-installing the filter fabric, placement and welding of the geomembrane, then the addition of another filter fabric to protect the membrane, and re-placement of the riprap. Activities associated with improving the intake include lengthening the inlet pipe and moving or replacing the intake structure to the west to allow for the slope to be flattened, which would aid in the installation of the liner. Equipment likely to be used include mini-excavator, mini track loader, and construction materials (section of HDPE pipe, liner and non-woven fabric materials).

There are other variables at this remote site that may present potential problems that would require immediate, and possible, emergency response from the contractor, such as a significant summer thunderstorm in the upstream drainage basin. Thunderstorms could partially fill the reservoir during a critical time when embankment protection has been removed for repairs. Depending on the duration and intensity of the storm event, a temporary diversion barrier, or cofferdam, may need to be constructed around the intake structure to prevent erosion of the embankment, and reduce sedimentation runoff into Canyon Creek. Water in the reservoir would be diverted over the dam with a pump or two, depending on the amount of runoff.

The remote high elevation site at Canyon Lake Dam presents challenges that increase exposure and compromise construction completion within the short window between end of water delivery and winter weather: long duration, high intensity summer thunderstorm events, or freezing temperatures later in the fall. These variables would likely compromise the integrity of onsite construction materials and delay completion of the project. The magnitude of the problem is

increased at remote high elevation sites such as Canyon Lake Dam (when compared to dams with road access).

Options Outside of Wilderness

Can action be taken outside of wilderness that adequately addresses the situation?

- YES **STOP – DO NOT TAKE ACTION IN WILDERNESS**
 NO **EXPLAIN AND COMPLETE STEP 1 OF THE MRDG**

Explain:

Canyon Lake Dam is located in the Southeast in Section 27, Township 6 North, Range 22 West, P.M., in the upper Canyon Creek drainage within the Selway Bitterroot Wilderness area.

Criteria for Determining Necessity

Is action necessary to meet any of the criteria below?

A. Valid Existing Rights or Special Provisions of Wilderness Legislation

*Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that **requires** action? Cite law and section.*

- YES NO

Explain:

The proponents are responsible for operating, maintaining and repairing their dam in accordance with applicable federal or state laws and regulations for a high hazard dam. There has been an on-going federal effort to improve safety of dams nationwide, and President Carter initiated the federal guidelines for dam safety in April 1977 and the Guidelines were reprinted in April 2004. The guidelines were intended to apply to Federal practices for dams with a direct Federal interest and not intended to conflict with State or local governments responsible for safety of dams under their jurisdiction. There are other current Federal initiatives to assist States with non-Federal dam safety programs. The objective of both federal and state programs is the same: to provide water resource benefits with assurance protection of public health and safety through an effective dam safety program. In addition to the Federal Guidelines for Dam Safety (reprinted April 2004), there are other authorities through which the U.S. Forest Service regulates safety of dams including the Federal Dam Inspection Act of 1972 (P. L. 62-367), , and National Dam Safety and Security Act of 2002 (P.L. 107-310).

CCID and their engineering representative are in the process of acquiring a Montana DNRC Construction permit for high hazard dams, which will be coordinated with USFS oversight. Engineering plans and specifications must meet strict dam engineering standards, considering, amongst other things, design, and choice of materials, methods of placing materials, and addressing the risks and uncertainties inherent in the existing structure.

Both section 1323(a) of ANILCA (16 U.S.C. § 3210) and section 5(b) of the Wilderness Act (16 U.S.C. § 1134) provide for access to the dam for operation and maintenance of the facilities, within provisions of Forest Service regulations 36 CFR 251 subpart D and CFR 293.13 which implement these statutes. Based on these authorities, the Forest Service may not deny reasonable use of or access to the dam and reservoir, but may impose reasonable terms and conditions on the dam owner's use and access for the protection of the National Forest. Terms and conditions for this project have been developed to mitigate impacts to National Forest System lands.

This MRDG will be used to determine adequacy of the proposal to meet the minimum requirements of administering the area.

The purpose and need for the project stems from the Canyon Creek Irrigation District's existing rights and obligations to operate and maintain Canyon Lake Dam to meet current State and Federal Dam Safety Standards and pertinent laws and regulations governing the proponent's use and the protection of National Forest System lands. The irrigation district is authorized to operate and maintain their dam and reservoir on National Forest Lands under a pre-Forest easement which is authorized under the Act of July 26, 1866 (43 U.S.C. 661) and the Act of March 3, 1891 (43 U.S.C. 946-949) granted by the Secretary of the General Land Office, Department of Interior. Therefore, the authorization of adequate access to CCID for the valid use of its easements is non-discretionary.

Canyon Creek Irrigation District (CCID) requests adequate access to their easement at Canyon Lake Dam so that CCID may make their facilities safe, consistent with their responsibilities under federal and state dam safety laws and regulations consistent with their valid water rights and also their rights and responsibilities under terms of their easement.

The Forest Service proposes to authorize CCID adequate access to their facilities and to prescribe terms and conditions related to this access and subsequent work on the facilities as necessary to protect the National Forest. Adequate access is defined as, "The combination of routes and modes of travel that the Forest Service has determined will have the least-lasting impact on the wilderness resource and, at the same time, will serve the reasonable purposes for which State or private land or right is held or used" (FSM 2320.5.15). The Forest Service proposes to authorize CCID adequate use of motorized and mechanized equipment necessary to protect the National Forest. The Wilderness Act of 1964 authorizes motorized equipment and mechanical transport necessary to meet minimum requirements for the administration of the area (Wilderness Act 1964).

The Forest Service is required by both the Wilderness Act¹ and the Alaska National Interest Lands Conservation Act² (ANILCA) to authorize reasonable access to valid occupancies. a pre-Forest easement which is authorized under the Act of July 26, 1866 (43 U.S.C. 661) and the Act of March 3,

¹ Wilderness Act, Sec. 5 (b); codified at 16 U.S.C § 1134; and the implementing regulations at 36 CFR 293.13 Access to Valid Occupancies.

² ANILCA, Pub. L. 96-487, title XIII, Sec. 1323; codified at U.S.C. § 3210

Section 5(b) of the Wilderness Act (16 U.S.C. § 1134) provides for access to the dam for operation and maintenance of the facilities, within provisions of Forest Service regulations 36 CFR 251 subpart D and CFR 293.13 which implement these statutes.

In this case, the Wilderness Act also requires the Forest Service to “*prescribe the routes of travel to and from the surrounded occupancies, the mode of travel, and other conditions reasonably necessary to preserve the National Forest Wilderness*”. Based on these authorities, the Forest Service may not deny reasonable use of or access to the dam and reservoir, but may impose reasonable terms and conditions on the dam owner’s use and access for the protection of the National Forest.³

These acts prescribe a narrow scope to the Agency’s discretion, balanced between requirements to allow for the proponent’s rights and responsibilities pertaining to the use of their easement and the Agency’s responsibility to provide protections for National Forest and Wilderness values.

CCID has requested access to their Canyon Lake facility so they may perform work necessary to meet the requirements of federal dam safety standards. The Forest Service has reviewed the CCID’s preliminary technical proposal to request access and perform the repairs on the dam and has determined that:

1. The CCID’s proposed use is consistent with the purpose, terms and limits of the easement. Act of 1866, Section 9 states: “*And be it further enacted, that whenever, by priority of possession, rights to use of water for mining, agricultural, manufacturing, or other purposes, have vested and accrued, and the same are recognized and acknowledged by the local customs, laws, and decisions of the courts, the possessors and owners of such vested rights shall be maintained and protected in the same; and the right of way for the construction of ditches and canals for the purposes aforesaid is hereby acknowledged and confirmed.*” The Act of March 3, 1891 (26 State.1101, as amended; 43 U.S.C. 946-949 states: “*to the extent of the ground occupied by the water of any reservoir and of any canals, and laterals and fifty feet on each side of the marginal limits thereof, and, upon presentation of satisfactory showing by the applicant, such additional right-of-way as the Secretary of Interior may deem necessary for the proper operation and maintenance of said reservoirs, canals, and laterals; also the right to take from the public lands adjacent to the line of the canal or ditch, material, earth, and stone necessary for the construction of such canal or ditch:*”.

2. As the owner of their high hazard dam, CCID is responsible for obtaining a construction permit from Montana DNRC Dam Safety Section, which includes review of plans and specifications for the proposed dam work, prepared under the direction of an engineer experienced in dam design. Montana code (85-15-208) also requires that construction be pursued in a secure manner: “*No person may construct or cause to be constructed a dam or reservoir for the purpose of accumulating,*

³ Concomitantly, the Forest Service also has authority under its general grant from Congress to protect the National Forests (16 U.S.C. § 551) to regulate reasonably the easement in order to achieve the purposes for which the national forests were reserved, and the Selway-Bitterroot Wilderness was designated.

storing, appropriating, or diverting any of the waters of this state, **except in a thorough, secure, and substantial manner.**"⁴

3. A minimum requirements process was used to assist with the analysis of CCID's request.

B. Requirements of Other Legislation

Is action necessary to meet the requirements of other federal laws? Cite law and section.

YES NO

Explain:

Dams can pose risks to those living downstream if they are not maintained and operated in accordance with the standard of reasonable care, which has undergone enormous scrutiny over the last half century. The legal framework has been established by the courts (including both federal and state laws and regulations), and the dam owner (Canyon Creek Irrigation District, CCID) is responsible for operating, maintaining and repairing their water storage facility in accordance with specific safety standards.

Canyon Lake Dam is rated as a high hazard dam based on potential consequences if the dam were to fail, which includes overtopping a public road and flooding a downstream residence. Because Canyon Lake Dam is a high hazard privately owned dam, the dam owner has an obligation to ensure that their dam does not fail and pose a danger to others.

CCID is a responsible dam owner and they plan to obtain a construction permit from Montana DNRC Dam Safety Section, for the proposed reconstruction on this high hazard dam. Plans and specifications must be prepared under the direction of their engineering representative who is experienced in dam design and construction (Montana code, 85-15-210). Montana code (85-15-208) also requires that construction be pursued in a secure manner: *"No person may construct or cause to be constructed a dam or reservoir for the purpose of accumulating, storing, appropriating, or diverting any of the waters of this state, **except in a thorough, secure, and substantial manner.**"* This process does not allow for the general public/layperson to make design changes and direct the work on the dam with alternative or outdated methods. This regulatory oversight and review is consistent with federal dam safety laws and Agency policy (FSM 7500).

Both section 1323(a) of ANILCA (16 U.S.C. § 3210) and section 5(b) of the Wilderness Act (16 U.S.C. § 1134) provide for access to the dam for operation and maintenance of the facilities, within

⁴ Engineering plans and specifications must meet strict dam engineering standards, considering, among other things, design, and choice of materials, methods of placing materials, and the risks and uncertainties inherent in the existing structure. It is the irrigation district's responsibility to develop the engineering plans, through their engineering representative(s) who are qualified to accomplish this work.

provisions of Forest Service regulations 36 CFR 251 subpart D and CFR 293.13 which implement these statutes. Based on these authorities, the Forest Service may not deny reasonable use of or access to the dam and reservoir, but may impose reasonable terms and conditions on the dam owner's use and access for the protection of the National Forest.

C. Wilderness Character

Is action necessary to preserve one or more of the five qualities of wilderness character?

UNTRAMMELED

YES NO

Explain:

It is not necessary to take action to preserve this quality. The definition of the Untrammelled quality is the lack of manipulation or control of natural processes by humans, which if allowed to occur, would eventually affect wilderness character. This quality is preserved when no manipulation or control of natural processes occurs.

Because the Canyon Creek Dam was pre-existing at the time the area was designated as wilderness maintenance of an existing and functioning structure would not be considered a trammeling action.

UNDEVELOPED

YES NO

Explain:

It is not necessary to take action to preserve this quality. Preserving this quality keeps areas free from "expanding settlement and growing mechanization" and "with the imprint of man's work substantially unnoticeable" and without structures, installations, temporary or permanent roads, or use of motorized equipment, mechanical transport, or landing or aircraft, as required by the Wilderness Act. The Undeveloped quality is preserved when wilderness retains its "primeval character and influence," and is essentially "without permanent improvements" or modern human occupation.

The dam was pre-existing at the time the area was designated as wilderness and is not an administrative structure or installation. The access to the dam may include the use of helicopter flights and the rehabilitation work on the dam may include the use of motorized and mechanized equipment. This would affect the undeveloped quality of Wilderness Character.

NATURAL

YES NO

Explain:

It is not necessary to take action to preserve this quality. A wilderness area is to be "protected and managed so as to preserve its natural conditions" meaning that wilderness ecological systems are substantially free from the effects of modern civilization. To preserve this quality, it may be necessary to take action to correct unnatural conditions even if they were present at the time of designation.

The existing dam has some negative impact to the Natural quality. At the time of Wilderness designation it was determined that the dam would be allowed in the SBW and maintained by the CCID.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

YES NO

Explain:

It is not necessary to take action to preserve this quality. The Wilderness Act defines wilderness as having "outstanding opportunities for solitude or a primitive and unconfined type of recreation." This quality is preserved when the *opportunity* for people to experience wilderness in terms of the visitor's sense of solitude, and their expectation for an undeveloped environment with minimal restrictions is available.

While the necessary equipment is being delivered to the dam and while work is being conducted on the dam, people's opportunities for solitude would be lowered due to the increase in activity at the dam site.

OTHER FEATURES OF VALUE

YES NO

Explain:

The Wilderness Act indicates that areas "may also contain ecological, geological, or other features of scientific, educational, scenic, or historical use" that reflect the character of this wilderness. Features, such as the presence of important geological formations, cultural resources, historical sites, or paleontological localities are included here if they are significant or integral to the wilderness. To preserve this quality, it may be necessary to take action to protect these features even if they were already at risk or degraded prior to the date of designation.

Canyon Lake dam was pre-existing at the time the area was designated as wilderness and for many is an attribute that defines the Selway Bitterroot Wilderness.

Step 1 Determination

Is administrative action necessary in wilderness?

Criteria for Determining Necessity

- | | | |
|--|---|--|
| A. Existing Rights or Special Provisions | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| B. Requirements of Other Legislation | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| C. Wilderness Character | | |
| Untrammelled | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| Undeveloped | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| Natural | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| Solitude/Primitive/Unconfined | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| Other Features of Value | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |

Is administrative action necessary in wilderness?

- YES **EXPLAIN AND PROCEED TO STEP 2 OF THE MRDG**
- NO **STOP – DO NOT TAKE ACTION IN WILDERNESS**

Explain:

This action is determined necessary for compliance with the law and valid existing rights.

MRDG Step 2

Determine the Minimum Activity

Other Direction

Is there “special provisions” language in legislation (or other Congressional direction) that explicitly **allows** consideration of a use otherwise prohibited by Section 4(c)?

AND/OR

Has the issue been addressed in agency policy, management plans, species recovery plans, or agreements with other agencies or partners?

YES

DESCRIBE OTHER DIRECTION

NO

SKIP AHEAD TO TIME CONSTRAINTS BELOW

Describe Other Direction:

The Wilderness Act of 1964 directs that wilderness be administered “... for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness...” By definition, wilderness has “outstanding opportunities for solitude or a primitive and unconfined type of recreation”.

The Wilderness Act of 1964 does not specifically address the method of access to wilderness dams. It does, however, specifically address “valid occupancies” such as Canyon Lake Dam. In Section 5(b) it states “In any case where valid mining claims or other valid occupancies are wholly within a designated forest wilderness area, the Secretary of Agriculture shall, by reasonable regulations consistent with the preservation of the area as wilderness, permit ingress and egress to such surrounding areas by means which have been or are being customarily enjoyed with respect to such other areas similarly situated.”

The Act specifically addresses motorized/mechanized prohibitions stating “...except as necessary to meet requirements for the administration of the area for the purposes of this Act there shall be no...use of motor vehicles...no landing of Aircraft, no other form of mechanical transport” [sec.4(c)].

The project is located in the Forest Plan Management Area 7c, which is the SBW. The goals for Management Area 7c are to "manage in accordance with the Wilderness Act of 1964... to ensure an enduring system of high quality Wilderness...”

Direction for the management of the Wilderness portion of the affected area is contained in the Selway-Bitterroot Wilderness General Forest Plan Management Direction (Forest Plan Amendment #7, 1992) (REC-001). This amendment established the following goals for the Selway-Bitterroot Wilderness.

- Preserve the integrity of the Selway-Bitterroot Wilderness resource to meet the purposes described in the Wilderness Act; to protect and preserve natural conditions so that the wilderness generally appears to have been affected primarily by the forces of nature, with the imprint of human work substantially unnoticeable, and has outstanding opportunities for solitude or primitive and unconfined recreation.

- Provide for limiting and distributing visitor use of specific portions in accordance with periodic estimates of the maximum levels of use that allow natural processes to operate freely and that do not impair the values for which wildernesses were created.
- Apply a Prevention of Significant Deterioration (PSD) approach to prevent a net degradation of the wilderness resource while acknowledging that wilderness, and the impacts caused therein, is dynamic.

The Bitterroot National Forest Plan notes in Amendment #7, page M-1 (REC-001) that many special use dams exist in the Wilderness, that they need to be maintained to a safe condition, and may need mechanical access and motorized equipment to maintain at least some of them.

The Bitterroot National Forest Plan specifies in Amendment #7, Section II, M-2 (REC-001): Environmental assessments or environmental statements will be prepared for all reconstruction and heavy maintenance work on reservoirs within the wilderness. These reports will include analysis of non-motorized vs. motorized means of doing work. Motorized equipment or other non-conforming activities will be authorized when it can be demonstrated that:

- It is the only feasible means of accomplishing the necessary maintenance.
- The continued existence of the reservoir is more in the public interest than its breaching.

Section II, A-1 specifies: “The minimum tool principle will be applied to the management of all resources within the Selway Bitterroot Wilderness. This means that the minimum management actions necessary to correct a given problem will be identified. These will be implemented using the methods and equipment that accomplish the objective with the least impact on the physical, biological and social characteristics of wilderness.”

As the owner of their high hazard dam, CCID is responsible for obtaining a construction permit from Montana DNRC Dam Safety Section, which includes review of plans and specifications for the proposed construction/reconstruction, prepared under the direction of an engineer experienced in dam design and construction/reconstruction. Montana code (85-15-208) also requires that construction be pursued in a secure manner: *“No person may construct or cause to be constructed a dam or reservoir for the purpose of accumulating, storing, appropriating, or diverting any of the waters of this state, **except in a thorough, secure, and substantial manner.**”*⁵

The CCID has the right to access Canyon Lake Dam for the reasonable use and enjoyment of these facilities through an easement established by the Acts of 1866 and 1891 (predating the establishment of the Bitterroot National Forest).

⁵ The State of Montana DNRC is the agency responsible for regulating this dam under the current dam safety laws and regulations (Montana Code Annotated 2017, Title 85. Water Use Chapter 15. Dam Safety Act, Part 2. Construction, Inspection, and Repair of Dams). In their regulatory oversight role, Montana DNRC reviews and approves (or disapproves) the dam owner/irrigation district’s engineering designs, plans and specifications. The plans must meet strict dam engineering standards, considering, amongst other things, design, and choice of materials, methods of placing materials, and the risks and uncertainties inherent in the existing structure. It is the irrigation district’s responsibility to develop the engineering plans.

Time Constraints

What, if any, are the time constraints that may affect the action?

The CCID will be applying for \$500,000 in state grants and conservation project loans. This money can only be applied to repair work and not to breaching. Due to the safety issue of this being a high hazard dam and this is the third sink hole issue since 2003 there is urgency to complete the work after the irrigators have used the water and before the winter conditions set in at this high elevation site in 2020.

Components of the Action

What are the discrete components or phases of the action?

Component X: *Example: Transportation of personnel to the project site*

Component 1: Transport of equipment and materials to project site.

Component 2: Transport of personnel to project site.

Component 3: Rehabilitation work on the dam

Component 4:

Component 5:

Component 6:

Component 7:

Component 8:

Component 9:

Proceed to the alternatives.

Refer to the [MRDG Instructions](#) regarding alternatives and the effects to each of the comparison criteria.

MRDG Step 2: Alternatives

CCID proposal: Requested use of mechanized transport of motorized equipment and materials to Canyon Lake Dam would be authorized. Requested use of mechanized and motorized equipment to perform rehabilitation activities on the dam within the easement would be authorized.

Alternative 1:

Description of the Alternative

What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

Canyon Creek Irrigation District (CCID) requests adequate access to their easement at Canyon Lake Dam and use of motorized/mechanized equipment so that CCID may make their facilities safe, which is consistent with their responsibilities under federal and state dam safety laws and regulations. CCID is the owner of appropriated water right, recognized under state law, which authorizes the irrigation district to legally store and use their water for beneficial uses including agricultural, domestic, stock, irrigation, lawn and garden, etc. uses.

The need for this project stems from CCID's existing rights and obligations to operate and maintain Canyon Lake Dam to meet current State and Federal Dam Safety Standards and pertinent laws and regulations governing the proponent's use and the protection of National Forest System lands. The irrigation district is authorized to operate and maintain their dam and reservoir on National Forest Lands under a pre-Forest easement which is authorized under the Act of July 26, 1866 and the Act of March 3, 1891, granted by the Secretary of the General Land Office, Department of Interior.

Canyon Lake Dam is a century-old dam originally constructed in 1891. Canyon Lake dam is classified as a high hazard structure with the capability of causing damage to downstream property and environmental resources in the event of a failure. Canyon Lake Dam could also present a threat to public safety if the dam failed.

The project includes use of mechanized transport (helicopter) to airlift motorized equipment and heavy, bulky construction materials to repair and stabilize the embankment beginning in possibly late summer 2020.

The Forest Service is proposing to authorize adequate access which includes approximately thirty-two (32) round trip helicopter flights to allow for the work to be done on Canyon Lake Dam, safely and effectively, starting late summer 2020. These flights are estimated to take place between 8-10 days during the 4-6 week this project is ongoing. The majority of the flights will take place during the beginning and end of the project during mobilization and demobilization of motorized equipment and bulky, heavy construction materials. There may be flights to resupply materials or tools and equipment necessary to deal with unforeseen conditions to this remote site.

The total number of helicopter flights (32) needed to complete the project is based on estimates from Hydrometrics Inc. and includes the following:

- 11 flights for mobilization of equipment and materials
- 8 flights for resupply of construction materials
- 9 flights for demobilization
- 4 additional contingency flights for unforeseen problems at this remote site.

Helicopter flights will be staged on private property east of Canyon Lake Dam and National Forest System lands. The majority of flights will be concentrated at the beginning and end of the project during mobilization and demobilization

Personnel accessing the dam will go by foot up the Canyon Lake Trail# 525.

The Forest Service is proposing to authorize the use of mechanical and motorized equipment necessary to conduct the rehabilitation work on the dam to correct deficiencies that have resulted in significant seepage through the dam embankment, which have been documented and monitored by Hydrometrics Inc. over the past several years during routine safety inspections. The type of mechanical and motorized equipment that may be used include a range of equipment that can be air-lifted to the site with a medium lift helicopter (approximately 3000 to 4000 lbs.). Possible equipment that could potentially accomplish the work within the aircraft capacity at this high elevation site include a mini-excavator, mini track loader and/or similar equipment that can be transported by a medium lift helicopter.

In the past 12 years, three sinkholes have been repaired. Silty sand embankment soils are prone to piping (internal erosion). Localized piping and high seepage velocities can lead to development of more sinkholes and/or a total dam breach failure. The most recent sinkhole developed near the south abutment of the auxiliary spillway in 2017.

According to the Canyon Creek Irrigation District's engineering representative, Hydrometrics, Inc., the repairs to the dam would involve covering the upstream embankment with an impermeable geomembrane liner and improving the intake. The main activities associated with this work are:

Removal of Existing Riprap on Upstream Slope:

The first step associated with the liner installation is removing the existing riprap across the upstream face and temporarily stockpiling it. According to CCID's engineer's estimate, approximately 610 cubic yards of riprap will need to be removed and stockpiled. The existing non-woven filter fabric will also need to be removed, then the subgrade will be smoothed and graded to a uniform subgrade in preparation for both the existing underlying non-woven filter fabric (which will be re-used) and the impermeable geomembrane.

A subgrade area of approximately 1050 square yards will be smoothed and graded in preparation for the installation of the filter fabric and impermeable liner. This area does not include additional 300 square yards (approximate) that will be used to anchor the liner in anchor trenches at the perimeter of the liner, which includes key-in at the dam crest and toe along the upstream slope of the dam.

Preparing the Subgrade for the Liner:

This work includes moving fill from within the reservoir footprint, then placing soil in areas that have been impacted from prior sinkhole activity and erosion, then reshaping/leveling off the subgrade. In addition, some sections of the filter fabric may be compromised, and some sections of the exiting 16-ounce non-woven filter fabric may need to be replaced.

Preparing the subgrade includes excavating and moving source fill to the upstream embankment, which requires processing of material to remove sharp or over-sized objects. The upstream slope around the outlet will be flattened, which also requires lengthening the outlet pipe and placement/compaction of additional fill material. The flattened slope will reduce potential piping potential and facilitate installation of the liner from a constructability standpoint.

The fill source will be developed from local borrow, free from roots and other organic matter, trash, frozen materials, stones larger than 6 inches in any dimension, and other deleterious materials. Fill must be free of sharp stones and wood debris to prevent puncturing the liner. Disturbance should be minimal because the borrow source will have already been affected by fluctuating water levels within the active storage below the high water mark.

Fill will be placed in maximum of 9 inch lifts, then compacted using mechanical tampers (such as plate compactor or jumping jack). Optimum moisture conditions are necessary to meet compaction requirements. Borrow soil may be excavated and temporarily stockpiled and dried before placement.

Once the subgrade is prepared and compacted to the required density, the grade will be checked and possibly revised to meet the specifications. This work requires skilled workers who can read the plans and specifications prepared by the engineering representative.

Excavating an Anchor Trench for the Liner:

Anchor trenches for the geomembrane and nonwoven fabric will be excavated to approximately 2 feet deep by 1.5 feet wide. This work will likely be accomplished using a mini-excavator. The excavator can be transported with medium-lift helicopter, similar to that which was air-lifted to Tin Cup Dam in 2003. Some sections of the liner will be anchored to fixed objects (such as auxiliary spillway wall, intake structure and exposed bedrock) where it is not feasible to excavate a trench.

Approximately 1050 square yards of the upstream embankment and around the outlet works will be lined. When accounting for the dam crest anchor trench and toe anchorage, the total liner area is approximately 1350 square yards. This assumes 2.5 feet of runout at the crest and 2 foot deep by 1.5 foot wide anchor trench plus two feet for the toe anchorage or runout. Small pumps may be necessary to dewater trenches if water is encountered.

Installing the Impermeable Geomembrane Liner and Overlaying Protective Non-Woven Filter Fabric:

The placement, welding and anchoring of the impermeable 40-mil thick geomembrane liner will require mechanized transport and skilled laborers to complete. The engineers estimate for the liner is approximately 1350 square yards, which weighs approximately 2500 lbs. Small equipment, such as mini skid-steer or loader will likely be necessary to lift and position the liner into place. Welding equipment used to heat treat and seam the liner will require power generator at the site. Existing filter fabric will be salvaged to the fullest extent, where practical. Care will be taken not to rip or tear the liner during the installation operations.

Relocating and Installing the Intake Structure:

Work includes installing a new intake structure on the low level outlet to accommodate slope flattening near the existing intake structure. The new intake structure will be a precast concrete square vault with pipe block-out and lifting hooks for transporting to the site by helicopter. Work also includes constructing a temporary coffer dam in the reservoir outlet channel to keep water out of the work area and protect water quality in the downstream stream channel. Excavation and compaction equipment will likely be used to level and prepare a solid base, followed by backfilling and

compaction of suitable soils around the new pipe and intake structure. Overall, approximately 62 cubic yards of embankment fill will be processed and placed.

The work area around the intake structure will likely require dewatering pumps. Water will be discharged on the reservoir shoreline (not to the downstream stream channel to reduce sedimentation). The extension to the outlet pipe will be connected by acceptable methods including butt fusion, electrofusion or mechanical joint. The new pipe section is specified as 14-inch nominal diameter HDPE pipe. Soils below and adjacent to the new precast outlet structure will be backfilled and compacted to required density.

Completing the Anchor Trench:

Backfilling and compacting the anchor trench to key-in the liner and protective filter fabric (geotextile) will likely be accomplished with a mini track loader and vibratory compaction equipment. Anchor trench backfilling operations will be limited to a maximum of 9-inch lifts, and backfill shall meet specifications including 2-inch maximum particle size. Hydrometrics engineering specifications require that anchor trench fill shall be compacted *“to a firm, unyielding surface using vibratory compaction equipment or approved equal”* and moisture content necessary to achieve maximum density. Care will be taken not to rip or tear the liner during backfill/compaction operations.

Batten strips will be installed along the liner perimeter where exposed bedrock prevents anchor trench construction. Batten strips will also be used to anchor the liner system to concrete structures (spillway and precast outlet works). The batten assembly consists of gasket strips, stainless steel batten bars and stainless steel wedge anchor bolts, 12-inch on center.

Re-Placement of Riprap on Upstream Slope:

After the geomembrane and geotextile fabric is anchored, the stockpiled riprap will be evenly placed on the upstream slope to cover and protect the liner system. Some of the riprap may be carefully placed by hand. However, larger rocks that are too heavy to lift manually will likely be placed with mini-excavator. Both methods of placement will require care to prevent puncturing the liner and ensure long term performance of the liner system.

Revegetating Specific Areas:

This work includes revegetating specified, disturbed areas. The area to be revegetated will primarily consist of the dam crest. The surface will be roughened prior to broadcasting specified seed. Seed will be broadcasted by non-motorized, non-mechanized means. Foot and equipment traffic will be minimized after seeding. All seed must meet State of Montana statutes, and certified as weed free.

Mitigation Measures/Terms and Conditions:

Terms and conditions have been established to mitigate impacts and protect the Wilderness Resource.

Wilderness Resource, Recreation, Wildlife and Air Quality
1. Whenever possible, helicopters will avoid flying directly over trails. All flights are likely to occur in August, September and October. The bulk of the helicopter flights will occur at the beginning and end of the project.
2. Helicopters should avoid operating near or over mountain goats to minimize disturbance to goats. If goats cannot be avoided due to safety concerns, flights should minimize the amount of time spent in close proximity to goats to reduce the risk and

duration of severe disturbance. Goats tend to occur on open, rocky cliffs and ridges and generally avoid forested areas.

3. Canyon Creek Trailhead will be posted by CCID at least 7 days prior to the beginning of the project to alert the public to the helicopter activity, which will start in late August or early September. Visitors passing through and camping around Canyon Creek Lake will still be allowed.

4. CCID will communicate their plans to start the project to the Forest Supervisor at least 14 days prior to commencing work on the dam, including their start date for helicopter access. CCID will report when the last helicopter flight has occurred, and when the overall project is finished.

5. CCID will schedule helicopter use and other motorized equipment use to weekdays and non-holiday days if possible.

6. All solid wastes will be removed from National Forest lands.

7. Burning of non-woody material **is prohibited**. All construction debris and other non-burnable garbage will be flown out. Flights will be scheduled to minimize helicopter trips (such as flying fuel in and flying garbage/construction debris out).

8. Camps and sanitary facilities shall follow wilderness guidelines (minimum 200' from water's edge). Latrines will be located at least 200' from water and filled in after completion of project.

9. Latrines will be used for human wastes and kitchen wastewater.

10. Food and other garbage associated with all activities on this project must be stored in a vehicle or other bear-proof container from 3/31 – 12/1.

11. A Forest Service wilderness ranger will provide additional on-site monitoring during project work to ensure wilderness and resource protection standards are met at the dam site and within the access corridor. The wilderness ranger will provide feedback to ensure access and project work meet mitigation and protection standards.

Component Activities

How will each of the components of the action be performed under this alternative?

<u>Component of the Action</u>		Activity for this Alternative
X	<i>Example: Transportation of personnel to the project site</i>	<i>Example: Personnel will travel by horseback</i>
1	Transportation of necessary equipment and materials to the project site.	Equipment and materials will be by mechanized transport (helicopter means)
2	Transportation of personnel to project site	Personnel will hike in up Trail # 525.
3	Rehabilitation work on the dam	Motorized and mechanized equipment will be used during the rehabilitation work on the dam

4		
5		
6		
7		
8		
9		

Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Equipment and materials will be by mechanized transport (helicopter means)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Personnel will hike in up Trail # 525.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Motorized and mechanized equipment will be used during the rehabilitation work on the dam	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	0	NE
<u>Untrammeled Total Rating</u>		0		

Explain:

The mechanized transport of equipment and materials and the use of mechanized and motorized equipment to conduct rehabilitation work on the dam does not represent manipulations of the natural processes on-going in wilderness and therefore are not impacts to the Untrammeled quality of the wilderness. Because the Canyon Creek Dam was pre-existing at the time the area was designated

as wilderness maintenance of an existing and functioning structure would not be considered a trammeling action.

UNDEVELOPED

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Equipment and materials will be by mechanized transport (helicopter means)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Personnel will hike in up Trail # 525.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Motorized and mechanized equipment will be used during the rehabilitation work on the dam	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	2	NE
<u>Undeveloped Total Rating</u>		-2		

Explain:

Use of mechanized transport (helicopter) to move heavy equipment and materials to the dam site and use of mechanized, motorized equipment to perform work on the dam have a negative impact on the undeveloped quality. USFS policy considers an air drop as equal to an aircraft landing which has a negative effect on wilderness character. The use of mechanized transport (helicopter) would be utilized to the minimum extent necessary to complete the task to transport equipment and materials to the site and would contribute to short term negative effects to undeveloped quality. "Section 4c prohibited uses," that is, the presence of modern structures, Installations, habitations, and use of motor vehicles, motorized equipment, or mechanical transport.

The effects of Hiking of personnel up Trail #525 has no effect on the undeveloped quality.

NATURAL

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1	Equipment and materials will be by mechanized transport (helicopter means)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Personnel will hike in up Trail # 525.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Motorized and mechanized equipment will be used during the rehabilitation work on the dam	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	2	NE
Natural Total Rating		-2		

Explain:

The natural quality refers to “protection, impairment, or restoration of natural conditions (i.e. air, water, soil, wildlife, fish, plants, etc.) including endangered, threatened, or rare species, natural biological diversity, and self-regulating ecosystems.” There may be the risk of negative impacts to the natural quality when it comes to the potential for the spread of noxious weeds but also potential negative impact to the aquatic life in the lake and downstream. However, mitigation measures will be established in the Environmental Assessment and Decision Notice to reduce or possibly eliminate the impacts.

Visitor expectations of apparent naturalness would be impacted by the sight and sound of the helicopter and its landing at the lake and the use of mechanized and motorized equipment. Apparent naturalness is indicated by how the environment looks to most people using the area. The Canyon Lake dam pre-exists the Wilderness act and while it may be something folks are accustomed to for others it can have some effect to natural conditions due to the continued presence of the dam within wilderness. Apparent naturalness would be directly affected by the sight and sound of helicopters and motorized/mechanized equipment, ground transport of supplies and personnel up Trail #525 and those activities associated with the actual repair of the dam. Effects of helicopter noise and visibility would occur during the transport phases of the project. Repair and maintenance activities at the dam site will have short term effects on sight and sound.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Equipment and materials will be by mechanized transport (helicopter means)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

2	Personnel will hike in up Trail # 525.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Motorized and mechanized equipment will be used during the rehabilitation work on the dam	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	2	NE
<u>Solitude or Primitive & Unconfined Rec. Total Rating</u>		-2		

Explain:

Solitude or primitive and unconfined quality is a personal, subjective value defined as an isolation from the sights, sounds, presence of others and the developments of man. The presence of workers and equipment and the resulting noise will affect the feeling of solitude of the area during the repair work.

The largest negative effect would result from the noise and sights of the activities directly associated with repair of the dam. Repair and maintenance activities at the dam site will have short-term effects on sight and sound perception of visitors. Remoteness is a perceived condition of being secluded, inaccessible, and out of the way. Sights and sounds of the repair work will be apparent near the dam and reservoir, affecting the feeling of remoteness for people actually in the drainage at the time of activities. Repair and maintenance activities at the dam site and ground transport of personnel up Trail #525 will have short-term effects on sight and sound.

Possible displacement of users and opportunities for solitude and unconfined recreation would increase during maintenance efforts.

The wilderness experience of some visitors using the Canyon Creek Trail #525 would be negatively impacted by the potential temporary area and trail closures during the helicopter flights.

OTHER FEATURES OF VALUE

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Equipment and materials will be by mechanized transport (helicopter means)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Personnel will hike in up Trail # 525.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

3	Motorized and mechanized equipment will be used during the rehabilitation work on the dam	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	0	NE
<u>Other Features of Value Total Rating</u>		0		

Explain:

Neither the worker activities, tools, equipment, nor transport of materials will have an effect on this quality.

Summary Ratings for Alternative 1

Wilderness Character	
<u>Untrammeled</u>	0
<u>Undeveloped</u>	-2
<u>Natural</u>	-2
<u>Solitude or Primitive & Unconfined Recreation</u>	-2
<u>Other Features of Value</u>	0
Wilderness Character Summary Rating	-6

RDG Step 2: Alternatives

MRDG Step 2: Alternatives Not Analyzed

Alternatives Not Analyzed

What alternatives were considered but not analyzed? Why were they not analyzed?

1) **No Action Alternative** – This alternative would have no effect in the short term. However, in the long term if the dam is not repaired there is internal piping within the embankment, which could lead to a dam failure. Consequences could include loss of life, economic loss to residents and property owners, and damage to public and private natural and economic resources. This alternative would deny CCID of the use and enjoyment of their valid occupancy, recognized under the Act of 1866 and the Act of 1891 granted by the Secretary of the General Land Office/Department of Interior, and their adjudicated water right recognized under Montana state law. The Forest Service is required by both the Wilderness Act and the Alaska National Interest Lands Conservation Act (ANILCA) to authorize access to valid occupancies such as these easements held by CCID. Therefore, this alternative is beyond Forest Service discretion.

2) **Non-Mechanical and Non-Motorized Alternative** – This alternative was considered but was determined not to be feasible and unacceptable to implement. Per the instructions for completing an MRDG: “Valid reasons for deciding that an alternative is unacceptable or not feasible should be limited to: 1) actions that are impossible to accomplish by any means or, 2) actions that are possible to accomplish but implementation would cause unacceptably greater negative impacts to wilderness character or, 3) actions that would cause an unacceptable safety risk to workers or the public which cannot be mitigated.” The feasibility of using non-mechanical transport of equipment and materials to the dam and using non-mechanical and non-motorized equipment to conduct the rehabilitation work on the dam was evaluated.

Non-Mechanical Transport:

The Canyon Creek Trail #525 is the only trail in the Canyon Creek drainage. It follows the canyon and then climbs a “headwall” at the west end of the drainage which Canyon Lake is perched. The trail climbs steep side slopes in the 60-70% side slope range giving stock users pause. It is one of the few trails on the Bitterroot Forest that we do not recommend to stock users. There are rockslides with mixed size rocks including refrigerator-sized and Volkswagen sized boulders, with large voids in between. Rock ribs run on the fall line on these steep slopes. Slick rock outcrops also characterize these headwall slopes. Often the trail is climbing between sections of rock and /or rock ribs. Two of these sections below the lake that climb through a rough boulder area are hazardous to stock and few users are willing to negotiate these sections with their trail stock.

Due to the nature of the trail’s location in a very challenging landscape, visitor use on Canyon Creek Trail #525 is primarily hiking, most often as day use in the first 2-3 miles. The trail is managed as a mainline route and maintained to the lake annually to accommodate heavy foot traffic during summer use season. Typically, maintenance is done by Forest crews rather than by contract to allow for flexibility in clearing the route to the dam. The trail receives “custodial” trail maintenance annually, so that existing drainage is cleaned, downed and leaning trees removed and loose debris on trail tread cleared to specified sizes.

In 2003, FS and MCC crews did some work to better accommodate pack support for Canyon Lake Reconstruction project. One section of trail was relocated w/ 2 switchbacks constructed to avoid a really steep pitch; another section they built log steps pinning them on slick rock slab sections. This work was determined to not be a successful and safe route for stock. Other years (98- 99) work was identified but not done due to other forest priorities.

When built, this trail was not professionally surveyed and engineered to create a well laid out and sustainable trail, with appropriate grades averaging 10 – 15%. Instead, it was established by the dam workers in places that “worked” in this very difficult terrain sometimes having grades reach 45% on slick rock. To fix the current steep climb which begins at the 3.5 mile point and is approximately 1 mile in length with side-slope of 70% and create a better trail with sufficient grades for horse travel, the section of trail would need to be lengthened/rerouted by approximately 3 miles. This new construction would need to occur over multiple seasons which would delay work on the dam for years and increase the danger of possible failure of the dam. There are also many other locations on the trail, before the steep climb that would need to be fixed. Big steps and steep grades are just a few. This would need reconstruction and lengthy reroutes. Some of this rerouted area would go into Opportunity Class 1. The SBW General Management Direction indicates that Opportunity Class 1 areas within the Selway Bitterroot Wilderness, should have no new trail construction.

See detailed Trail Condition Surveys dated 6/29/2004, (REC-002) Trail review dated 1/21/2009, (REC-003) and Canyon Creek Trail survey dated 06/26/2018, (REC-004) for more in depth trail condition information.

Visitor use numbers are primarily estimates including tallies coming from a registration box at the trailhead. Once high water recedes and summer begins, Trail #525 sees its highest use. Daily fishing outings, swimming and hikes occur. Overnight backpacking trips seem popular. There is no system trail leading up to Wyant Lake but it is a popular destination for hikers. Weekend use is typically heaviest during summer months. The trailhead does not have a stock ramp and has limited turning space or parking for stock trailers.

Use of Non-Mechanical and Non-Motorized Equipment to Conduct the Dam Rehabilitation Work:

The rehabilitation work on the dam is needed to correct deficiencies that have resulted in significant seepage through the dam embankment, which have been documented and monitored by Hydrometrics Inc. (the Canyon Creek Irrigation District’s engineering representative) over the past several years during routine safety inspections. According to Hydrometrics, Inc., the rehabilitation of the dam would primarily involve 8 steps. These steps have been evaluated based on the feasibility of utilizing non-motorized, non-mechanized means:

Removal of Existing Riprap on Upstream Slope:

In regards to utilizing non-motorized/non-mechanized methods (livestock), it is not reasonable to incorporate them because of the steep, riprap-armored embankment that presents risk of injuries to stock (broken legs) while navigating the existing armored embankment. Once the rocks and fabric are removed, then the embankment surface needs to be smoothed out and leveled in preparation for the liner. Livestock can also reduce the stability of the exposed

embankment through trampling, hoof-shearing, and hoof-sliding (Allen-Diaz et al. 1999, Burton et al. 2011). Livestock could also puncture/damage the existing non-woven filter fabric.

Existing riprap varies in size from approximately 8 inches to 30 inches. It is not reasonable or feasible to remove and stockpile the riprap with manual labor within the limited timeframe. The overall project requires skilled labor to weld the geomembrane seams, batten the liner, relocate the intake structure and install the extension to the outlet pipe, etc. By utilizing non-mechanized, non-motorized equipment, there could be inconsistencies in production rates and an increased risk of serious injuries to workers and animals.

Outdated construction methods used in the early 1900's (including extensive labor and livestock over several field seasons) adds unnecessary risk of exposure by introducing variable or unpredictable production rates, which increases liability to the dam owner.

Preparing Subgrade for the Liner:

It is not reasonable or feasible to incorporate stock because of the steep, rocky embankment slope and livestock may reduce the stability of the exposed embankment through trampling, hoof-shearing, and hoof-sliding. Requiring additional labor crews to try and complete this work within the short window between end of water delivery and winter weather would require additional oversight from the engineering representative and contractor, which imposes ineffective and unreasonable demands on the dam owner, their engineering representative and contractor(s).

More important, it is not feasible to achieve optimum moisture content and soil density requirements using non-mechanized means on the upstream embankment at Canyon Lake Dam. Construction practices associated with modern dams have evolved beyond trial and error techniques that were utilized around the turn of the last century and early 1900's. State of the art construction practices are much more reliable and predictable. Use of modern motorized compaction equipment is essential to decrease voids, increase density and achieve load bearing strength. Primitive techniques are no longer utilized in the construction of critical elements of dams, which include compaction of soils to a required, consistent and verifiable density.

Excavate Anchor Trench for Liner:

After the riprap and filter fabric are removed from the upstream embankment, the erosive underlying materials will be exposed. The mini-excavator will provide reliable performance capabilities, which is essential if unforeseen problems are encountered. There is a high probability of encountering water-logged woody debris or rock in the trench. It is important that a backup option be considered in the event that unforeseen problems are encountered, or if the work falls behind schedule. This portion of the work is also critical in relation to other activities that need to be completed before the end of the season as the embankment must be repaired and armored before winter and next spring's spring run-off and snowmelt.

It is important to note that rock was encountered during the excavation operations for the new outlet pipe during trenching on the upstream side of the concrete core wall during the Canyon Dam Rehabilitation (2003 and 2004). Trenching operations were switched from the Montana Conservation Corps to a small Bobcat to complete a critical phase under an expedited schedule before winter conditions arrived. The work on the upstream embankment requires reliable, verifiable construction methods necessary to meet the duty of reasonable care. Utilizing non-motorized manual labor for this task does not meet the standard of care, skill and diligence

demanded by state of practice construction techniques and reasonable foreseeable conditions expected at this remote, high elevation site. Outdated construction methods used in the early 1900's (including extensive labor and livestock over several field seasons) adds unnecessary risk of exposure by introducing variable or unpredictable production rates, which increases liability to the dam owner.

Installation of the Impermeable Geomembrane and Overlying Protective Non-Woven Filter Fabric:

The roll of liner, filter fabric and mini loader will be transported by helicopter to the site as it is not feasible, reasonable or effective to cut the roll of liner or filter fabric into pieces small enough to accommodate transport with pack stock. The number of seams, or welds, should be minimized in the membrane in order to improve long term reliability and reduce potential for human error that would occur if unnecessary work is added to the welding process. This extra work would not only severely compromise the integrity of the impermeable membrane, but also add several days to the project.

This work will likely be accomplished using specialized personnel or crew with experience. Requiring additional labor crews to try and complete this work within the short window between end of water delivery and winter weather would require additional oversight from the engineering representative and contractor, which imposes ineffective and unreasonable demands on the dam owner, their engineering representative and contractor(s).

Outdated construction methods used in the early 1900's (including extensive labor and livestock over several field seasons) adds unnecessary risk of exposure by introducing variable or unpredictable production rates, which increases liability to the dam owner. New construction materials are available to improve the long term performance of the dam, and modern equipment and tools are essential to meet quality control measures.

Relocate and Install Intake Structure:

It is not feasible, reasonable or safe to transport the pre-cast concrete intake structure by stock up the hazardous trail. Dewatering pump(s), compaction equipment and generator will likely be utilized to accomplish the work. State of the art construction practices are much more reliable and predictable. Use of motorized, modern compaction equipment and dewatering pumps are consistent with the standard of care, construction methods and quality control practices associated with on-going maintenance and repair of high hazard dams.

Anchor Trench Completion:

It is not feasible, reasonable or safe to transport mini-loader and compaction equipment by stock on the hazardous trail. Use of modern motorized compaction equipment is essential to decrease voids, increase density and achieve load bearing strength. Primitive techniques are no longer utilized in the construction of critical elements of dams, which include compaction of soils to a required, consistent and verifiable density.

Placement of Riprap on Upstream Slope:

This work will be completed near the end of the project, and a combination of equipment and manual placement of the riprap may be utilized. However, if there is accidental damage or puncture of the liner system during this final phase, then expedited response to repair the damaged membrane will be necessary. By optimizing use of mechanized equipment and powered equipment to weld damaged sections of the liner system, the repair work would be

accomplished with the most efficient available means (using onsite equipment and tools) to complete critical work before winter weather conditions arrive. It is essential that the upstream embankment protection be replaced before the following spring snowmelt and runoff occurs.

Revegetate Specified Areas:

This work is feasible to accomplish with non-motorized, non-mechanized means and will be incorporated into the proposed action.

3) Moving or permanently breaching Canyon Lake Dam Alternative - Another alternative not given detailed study considers the permanent breach of Canyon Dam and construction of another dam outside of wilderness. Canyon Dam is authorized through an easement under the Act of 1866 and 1891 granted by the Secretary of the General Land Office, Department of Interior. As long as valid land use occupancies and water rights exist, the right to maintain and reconstruct these facilities to applicable standards shall be allowed.

It should be noted, that the Forest Service cannot decide for or direct CCID to permanently breach or move the Canyon Dam. That decision lies solely with CCID, as that decision affects their basic rights under their valid occupancy. This alternative was dismissed from further analysis.

MRDG Step 2: Alternative Comparison

Alternative 1: CCID proposal: Requested use of mechanized transport of equipment and materials to Canyon Lake Dam. Requested use of mechanized and motorized equipment to perform rehabilitation activities on the dam would be authorized.

Alternative 2:

Alternative 3:

Alternative 4:

Wilderness Character	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	+	-	+	-	+	-	+	-
Untrammeled		0						
Undeveloped		-2						
Natural		-2						
Solitude/Primitive/Unconfined		-2						
Other Features of Value		0						
Total Number of Effects		6						
Wilderness Character Rating	-6							

MRDG Step 2: Determination

Refer to the [MRDG Instructions](#) before identifying the selected alternative and explaining the rationale for the selection.

Selected Alternative	
<input checked="" type="checkbox"/>	<p>Alternative 1: CCID proposal: Requested use of mechanized transport of equipment, and materials to Canyon Lake Dam would be authorized. Requested use of mechanized and motorized equipment to perform rehabilitation activities on the dam would be authorized.</p>
<input type="checkbox"/>	Alternative 2:
<input type="checkbox"/>	Alternative 3:
<input type="checkbox"/>	Alternative 4:
<input type="checkbox"/>	Alternative 5:
<input type="checkbox"/>	Alternative 6:
<input type="checkbox"/>	Alternative 7:
<input type="checkbox"/>	Alternative 8:

Explain Rationale for Selection:

A complete range of Alternatives was considered but was deemed to be infeasible and unacceptable to implement (see the Alternatives Not Analyzed section).

Alternative 1 most quickly meets the Federal and State Dam Safety requirements for a high hazard dam (an area of high concern) and would affect visitor experience and Wilderness character for the shortest amount of time (although this would be offset by effects of motorized and mechanized use).

This alternative would allow the CCID use of their valid occupancy, recognized under the Act of 1866 and the Act of 1891 granted by the Secretary of the General Land Office/Department of Interior, and their adjudicated water right recognized under Montana state law. The Forest Service is required by both the Wilderness Act and the Alaska National Interest Lands Conservation Act (ANILCA) to authorize access to valid occupancies such as these easements held by CCID.

This authorization would facilitate timely repair work on Canyon Lake Dam which itself would reduce the risk of severe and long lasting adverse effects to wilderness and other aspects of the human environment, including public safety, in the long term without risking significant adverse effects in the

short term. The individual and overall impacts of the selected alternative will have no significant adverse impacts.

The minimum requirements process was not intended to restrict dam owner and their engineering representatives to the methods and tools utilized 100 years ago. From our current dam safety perspective, these methods no longer meet the intent of dam safety laws. Requiring that dam owners comply with unreasonable and infeasible methods introduces unnecessary risk which would likely compromise long term performance of critical elements of this high hazard dam. The dam owner must exercise their duty of reasonable care.

The non-mechanical and non-motorized alternative that was considered but not analyzed would require major trail construction/reconstruction of over 3 miles to accommodate stock use into Canyon Lake. This use and these trail "improvements" would substantially affect wilderness character- both short and long term. While it is possible to obliterate trail "improvements" after project work is complete, there would be pressure from the public and the CCID to leave these trails for stock use. On-going stock use, where there used to be none, would accelerate degradation of campsites in an area that already exceeds Forest Plan standards for campsites impacts. Natural integrity would be most threatened by the probable introduction of noxious weeds associated with a new trail. Some of this new construction would overlap into Opportunity Class 1. The SBW General Management Direction indicates that Opportunity Class 1 areas within the Selway Bitterroot Wilderness should have no new trail construction, thus, Forest Plan standards would be exceeded. Using non-mechanized and non-motorized equipment to complete the dam rehabilitation work is not entirely feasible, could result in unnecessary risks of injuries to personnel and stock, delay the length of time to complete the project, and could compromise the long term performance of critical elements of this high hazard dam. Alternative 2 would also require a longer period of time to complete the project which would lengthen the negative impacts to the wilderness character.

Outdated construction methods used in the early 1900's (including extensive labor and livestock over several field seasons) adds unnecessary risk of exposure by introducing variable or unpredictable production rates, which increases risk to the downstream public and liability to the dam owner.

Describe Monitoring & Reporting Requirements:

A Forest Service wilderness ranger will provide additional on-site monitoring during project work to ensure wilderness and resource protection standards are met at the dam site and within the access corridor. The wilderness ranger will provide feedback to ensure access and project work meet mitigation and protection standards.

Approvals

Which of the prohibited uses found in Section 4(c) of the Wilderness Act are approved in the selected alternative and for what quantity?

<u>Prohibited Use</u>	<u>Quantity</u>
<input checked="" type="checkbox"/> Mechanical Transport:	The estimated number of round-trip helicopter flights is 32 (11 for mobilization, 8 for resupply, 9 for demobilization, and 4 for contingency flights for unforeseen problems). A medium helicopter is anticipated for mobilization/demobilization and a light helicopter is anticipated for resupply.
<input checked="" type="checkbox"/> Motorized Equipment:	The type of mechanical and motorized equipment that may be used include a range of equipment that can be air-lifted to the site with a medium lift helicopter (approximately 3000 to 4000 lbs.). Possible equipment that could potentially accomplish the work within the aircraft capacity at this high elevation site include a mini-excavator, mini track loader and/or similar equipment that can be transported by a medium lift helicopter.
<input type="checkbox"/> Motor Vehicles:	
<input type="checkbox"/> Motorboats:	
<input checked="" type="checkbox"/> Landing of Aircraft:	USFS policy considers an air drop as equal to an aircraft landing, therefore, the estimated number of landings is 32
<input type="checkbox"/> Temporary Roads:	
<input type="checkbox"/> Structures:	
<input type="checkbox"/> Installations:	

Record and report any authorizations of Wilderness Act Section 4(c) prohibited uses according to agency policies or guidance.

Refer to agency policies for the following signature authorities:

Prepared	Name	Position	
	Terri Anderson Erica Strayer Deb Gale	Civil Engineer Acting Wilderness/Trails/Recreation Manager Wilderness/Trails/Recreation Manager (retired)	
	Signature		Date
	s/s <i>Debra D. Gale</i>		11/23/2018
Recommended	Name	Position	
	Eric Winthers	Darby/Sula District Ranger	
	Signature		Date
Recommended	Name	Position	
	Signature		Date
Approved	Name	Position	
	Matthew D. Anderson	Forest Supervisor	
	Signature		Date