FUTURE FISHERIES IMPROVEMENT PROGRAM GRANT APPLICATION

All sections must be addressed, or the application will be considered invalid

I. APPLICANT INFORMATION

A. Applicant Name: Grant Williams

Mailing Address: 6255 Threemile Road

City: Helena State: MT Zip: 59602

Telephone: 303-475-4524 E-mail: aspen8magnolia@gmail.com

B. Contact Person (if different than applicant):

Address:

City: State: Zip:

Telephone: E-mail:

C. Landowner and/or Lessee Name (if different than applicant):

Mailing Address:

City: State: Zip:

Telephone: E-mail:

II. PROJECT INFORMATION

A. Project Name: Threemile Reservoir Dam Maintenance

River, stream, or lake: Threemile Reservoir

Location: Township: 11 N Range: 03 W Section: 24

Latitude: 46.6973 Longitude: -112.1821 *Within project (decimal degrees)*

County: Lewis and Clark County

B. Purpose of Project: *(high level, focus on why the project is important)*

DNRC High-Hazard Dam Program is requiring timely address of maintenance issues on the Threemile Reservoir Dam, which is at risk of revocation of the dam operating permit. We are raising funds to address the dam maintenance issues, including tree-clearing, engineering design, and excavation/compaction of soils in order to ensure continuation of the operating permit, and thus the reservoir's population of genetically-unaltered Westslope Cutthroat Trout (WCT). In the absence of this completed work, the operating permit could be revoked, resulting in the loss of viable habitat for the unique WCT population dedicated to support FWP's long-term plans for WCT re-population in the Upper Missouri River Watershed.

C. Brief Project Description (attach additional information to end of application). Please include the anticipated construction schedule:

A phased approach that systematically addresses the risks that have been created by the long-term vegetation growth is necessary to protect the long-term stability of the dam and bring the dam into compliance with current dam safety regulations in a feasible manner.

In order to mitigate the risk of opening up preferential pathways that would enable concentrated flows to exit out of the downstream embankment, the construction scope proposed will include the following Phases (see Work Plan for map details):

Phase 1 – Installation of monitoring equipment such as water level sensors, piezometers, V-notch weirs for seepage monitoring, etc.
Phase 2 – Removal of trees and bushes that do not pose a risk to the dam's stability and re-filling and compaction of those root zones (approximately 1.5 acres and ~500 trees <12" dbh and shrubs not near seepage areas), as well as other associated work (reseeding, erosion control, etc.);
Phase 3 – Design and construction of an approach to address removal of trees, bushes, and roots that potentially pose a risk to the dam (approximately 0.6 acres and ~100 trees >12" dbh and near seepage areas and dam toe). Monitoring data gathered over one to two years will help inform and refine the design for this approach. The large trees, bushes, and roots that potentially pose a risk to the dam's safety will remain until they can be safely removed. This will allow for a monitoring baseline to be established and to avoid potential dam instability risks that could occur in the near term if they are cut and/or removed without a well-informed design.

Only work activities related to Phase 1 and 2 are included in the scope of this application.

Phase 1 Activities:
(May/June 2024) – Prepare Monitoring Plan
(June – Aug 2024) – Install Monitoring Equipment
(July 2024 – Sept 2025 & ongoing) – Monitor Dam Conditions; Evaluate Monitoring Results.
(October 2025) – Prepare Monitoring Report.

Phase 2 Activities:
(August - September 2024) – Complete Phase 2 Engineering Design Work and Survey
(August - December 2024) – Phase 2 Tree Cutting and Vegetation Removal and Piling
(January - February 2025) – Burn Slash Piles
(September 2024 - February 2026) – Complete Phase 2 Excavation/Compaction Work Activities in accordance with Engineering Design and Oversight, Install erosion control fabric, and seeding native grasses.
(February 2026) Prepare Construction Summary Memorandum (i.e., Interim Technical Report); Reassess Monitoring Results from Monitoring Data Obtained During Construction and Update Monitoring Report as Needed.

Phase 3 Activities:
(October 2025) - Finalize Dam Design and Construction Plan for Phase 3 activities.
(August 2025 - May 2026) - Prepare Grant Applications and Secure Funds for Phase 3 Work (DNRC RDG Project Grant, Others TBD)
(TBD - Projected 2026/2027) Phase 3 Work Activities

D. What was the cause of habitat degradation and how will the project correct the cause?

The Threemile Reservoir WCT habitat is at risk of habitat degradation and significant impact to the WCT population as a result of potential revocation of the dam operating permit, which would reduce the reservoir capacity by half at full pool and result in full dewatering of the reservoir at the peak of irrigation season. This project will resolve the maintenance issues indicated by the DNRC High-Hazard Dam Program and ensure continuance of the dam operating permit and stable reservoir capacity to support WCT population growth.

E. Length of stream or size of lake that will be treated (project extent): 84 acre-feet
Length/size of impact, if larger than project extent (e.g., stream miles opened): _____

F. Project Budget Summary:

Grant Request (Dollars):	**$**	75,000.00
Matching Dollars:	**$**	112,400.00
Matching In-Kind Services:*	**$**	138,651.00

**salaries of government employees are not considered matching contributions*

Other Contributions (not part of this app)	**$**	
Total Project Cost:	**$**	326,051.00

G. Attach itemized (line item) budget – *see budget template*

H. Attach project location map(s) that include:

- [x] Extent of the project, including context (relation to major landmark or town)
- [x] Indication of public and private property
- [ ] Riparian buffer locations and widths (if applicable) and grazing locations

I. Attach project plans:

- [x] Detailed sketches or plan views with the location and proposed restoration
- [x] Pre-project photographs (GPS location strongly recommended)
- [ ] If water leasing or water salvage is involved, attach a supplemental questionnaire (*https://myfwp.mt.gov/getRepositoryFile?objectID=36110*)

J. Attach letters or statements of support (e.g., landowner consent, community or public support, and FWP fisheries support). List any other project partners:

Lewis and Clark County Conservation District, DNRC High-Hazard Dam Program, Hydrometrics, Last Chance Chapel, Hardie Ranch, Gehring Ranch

III. MAINTENANCE AND MONITORING (attach additional information to end of application):

A. A 20-year maintenance commitment is required*. Please confirm that you will ensure this protection and describe your approach. Attach any relevant maintenance plans. Yes [x] No [ ]

**If it is a water leasing project, describe the length of the agreement.*

Maintenance plans will be developed in partnership with DNRC High-Hazard Dam Program and established through the 2026 5-Year Dam Inspection Report. Maintenance plans and annual dam owner inspections are a requirement of the High-Hazard Dam Program's Operation Permit. Additionally, Engineering Monitoring Plan and Report will be established across 2024-2025 to ensure continued evaluation of the dam and work.

B. Will grazing be part of or adjacent to the project? If so, describe or attach land management plans, including short term and long term grazing regimes. If the landowner is not the applicant, please describe their involvement in the project. *If you want assistance with grazing plan development, note your need.*

No grazing is allowed on Threemile Reservoir.

C. Will the project be monitored to determine if goals were met? If so, what are the short-term and long-term plans to assess benefits and lessons learned? Were pre-project data collected? Will monitoring information be shared with FWP?

Dam maintenance and monitoring details are provided in III.A and is a requirement of the DNRC High-Hazard Dam Program.

Additionally, Threemile Reservoir stakeholders will partner with FWP to ensure continuation of genetic sampling and demographic monitoring of the Threemile WCT population. FWP plans to conduct demographic monitoring of WCT in the reservoir by a combination of different methods (hook-and-line, fyke netting, electrofishing) every 3-5 years. FWP plans to conduct genetic monitoring of the population every 10 years. Updated genetic and demographic data will be incorporated into the Westslope Cutthroat Trout Conservation Strategy for the Missouri River Headwaters of Southwest Montana document, which is updated on an annual basis.

IV. PROJECT BENEFITS (attach additional information to end of application):

A. What species of fish will benefit from this project?

Threemile Reservoir is home to a unique population of genetically-unaltered Westslope Cutthroat Trout, boasting uniquely large fish (18-20 inches) and multiple age classes due to the deep water habitat of the reservoir and the robust food characteristics of the reservoir. The WCT population is unique as its one of only two populations of genetically unaltered (confirmed in 2021) within the responsibility area of the Helena Area Fisheries Biologist. The population persists as genetically unaltered because of the Threemile Reservoir dam.

B. How will the project protect or enhance wild fish habitat?

The project will ensure the continued operation of the Threemile Reservoir Dam and, thus, ensure the preservation of the Threemile Reservoir WCT habitat. The Threemile WCT population offers significant potential as a brood or wild egg source for population expansion efforts and is indicated in the FWP WCT Conservation Strategy in the Upper Missouri River basin.

Adequate dam maintenance for the Threemile Creek Reservoir dam is critical to ensuring the continued safe and permitted operation of the dam. It is also required in order to maintain the capacity of the reservoir and, thus the deep water habitat and food characteristics of the reservoir to ensure this unique population of WCT. Should the dam permit be revoked, the reservoir would be drained to half of its capacity at maximum fill and would drain completely each summer irrigation season.

C. What is the expected improvement to fish populations, both short term and long term? How might the project translate to angler success?

The project will preserve the habitat of the Threemile Reservoir, allowing the WCT population to continue to flourish and grow in the short-term and long-term. Angler success is not a factor for the population - the Threemile Reservoir is a private access water body and primarily fished by congregants of the Last Chance Chapel, which has a catch and release policy for all fishing.

D. Will the project increase public fishing opportunity for wild fish and, if so, how? Is public fishing allowed onsite? Is it allowed by permission? If not, describe how the public would benefit.

The Threemile Reservoir WCT Population is primarily preserved for FWP re-population efforts in the Upper Missouri River Watershed. This will lead to the potential for public fishing of WCT in the broader region. However, there is no public fishing on the Threemile Reservoir. This is to the benefit of the WCT population, which would create severe population pressure.

E. Aside from angling, what local or large-scale public benefits will be realized from this project?

The Threemile Reservoir WCT Population is being preserved to support FWP's efforts for re-population efforts in the Upper Missouri River Watershed - leading to the potential for angling opportunities and re-establishment of native WCT populations across the region.

In addition to the reservoir's WCT population, the Threemile Reservoir provides a number of additional public benefits. It is utilized as a re-watering location for fire suppression efforts by DNRC Forestry. Additionally, the safe operation of the Threemile Dam mitigates risk of flooding including Birdseye Road, a critical emergency response roadway for hundreds of families in the West Helena Area.

F. Will the project interfere with water or property rights of adjacent landowners? (explain):

No - all water and property rights stakeholders of the Threemile Reservoir are committed to supporting this project and are in agreement with the project approach and plan.

G. Will the project result in the development of commercial recreational use on the site (including paid access)? Explain:

No

H. Is this project associated with the reclamation of past mining activity?

No

Each approved project applicant must enter into a written agreement with Montana Fish, Wildlife & Parks specifying terms and duration of the project. The applicant must obtain all applicable permits prior to project construction. A competitive bid process must be followed when using State funds.

V. AUTHORIZING STATEMENT

I (we) hereby declare that the information and all statements to this application are true, complete, and accurate to the best of my (our) knowledge and that the project or activity complies with rules of the Future Fisheries Improvement Program.

Applicant Signature: _____ Date: 5/15/2024

Submittal: **Applications must be signed and received on or before November 15 and May 15 to be considered for the subsequent funding period**. Late or incomplete applications will be rejected.

Mail to:	FWP Future Fisheries Fish Habitat Bureau PO Box 200701 Helena, MT 59620-0701	Email:	Future Fisheries Coordinator FWPFFIP@mt.gov (electronic submissions must be signed) For files over 10MB, use https://transfer.mt.gov and send to mmcgree@mt.gov

Threemile Reservoir Dam Maintenance

Invalid Budget Form. See resubmitted budget.

025-2024

ADMINISTRATION	Project Phase	Details	CDB Funds	FFIP Grant	RDG Planning Grant	In-Kind Contributions	TOTAL
DNRC Grant Administration			$461		$2,400		***$2,861***
TOTAL ADMINISTRATION			***$461***	***$0***			***$2,861***
PROJECT RELATED ACTIVTIES							
Contracted Services - Engineering	Phase 1	Initial Engineering Design and Work Plan		$16,000			***$16,000***
	Phase 2	Final Engineering Design and Work Plan			$12,000		***$12,000***
	Phase 1	Preliminary Engineering/Monitoring Report			$8,000		***$8,000***
	Phase 2	Construction Management and Engineering Support		$12,000		*$12,000*	***$24,000***
	Phase 2	Construction Permitting			$7,000		***$7,000***
Contracted Services - Vegetation Removal	Phase 2	Tree-Clearing and Vegetation Removal	$15,600			$7,500	***$23,100***
Contracted Services - Excavation, Compaction, Monitoring System, and Water Management Systems	Phase 2	Excavation - Root Extraction and Initial Compaction	$32,934	$47,000		*$36,317*	***$116,251***
	Phase 1	Monitoring Equipment Installation			$30,000	*$35,434*	***$65,434***
Project Management	Phase 1 & 2	Project Management, Contractor Coordination and Oversight, Management and Supervision Activities				*$50,400*	***$50,400***
	Phase 3	RDG Project Grant Application			$3,000	*$3,000*	
Personnel Salary & Wages	Phase 1 & 2	CD ResourceSpclst time	$871				***$871***
Personnel Travel	Phase 2	Conservation District travel ~200 miles	$134				***$134***
TOTAL ACTIVITY			$49,539	$75,000	$60,000	$144,651	$323,190
TOTAL PROJECT BUDGET			***$50,000***	***$75,000***	***$62,400***	***$144,651***	***$326,051***

SUMMARY OF MATCHING FUNDS

FUNDING SOURCE			***AMOUNT***
CDB Funds			$50,000
FFIP Grant			$75,000
RDG Planning Grant			$62,400
In-Kind Contributions			$144,651
TOTAL			***$332,051.30***

BUDGET TEMPLATE SHEET FOR FUTURE FISHERIES PROGRAM APPLICATIONS

Both tables must be completed or the application will be returned

PROJECT COSTS					CONTRIBUTIONS			
WORK ITEMS (Itemize by Category)	**NUMBER OF UNITS**	**UNIT DESCRIPTION***	**COST/UNIT**	**TOTAL COST**	**FUTURE FISHERIES REQUEST**	**MATCH (Cash or Services)****	**OTHER (Not part of this application)**	**TOTAL**
Personnel***								
CD Personnel		Grant Management	$46 & $34.83	$ 2,861.00		2,861.00		$ 2,861.00
	25	CD Resource Specialist	$34.83	$ 871.00		871.00		$ 871.00
Engineering		Preliminary Engineering Monitoring Report	Bid	$ 8,000.00		8,000.00		$ 8,000.00
		Engineering Design and Work Plan	Bid	$ 28,000.00	16,000.00	12,000.00		$ 28,000.00
		Excavation Construction Permitting	Bid	$ 7,000.00		7,000.00		$ 7,000.00
		Excavation Oversight and Construction Management	Bid	$ 24,000.00	12,000.00	12,000.00		$ 24,000.00
			Sub-Total	$ 70,732.00	$ 28,000.00	$ 42,732.00	$ -	$ 70,732.00
Travel								
Mileage	200	CD Staff Travel	$0.67	$ 134.00		134.00		$ 134.00
			Sub-Total	$ 134.00	$ -	$ 134.00	$ -	$ 134.00
Construction Materials****								
Long-Term Erosion Control	15,000 sq ft	Erosion Control Fabric, Stakes, and Grass Seed Mix	Bid	$ 4,900.00	4,900.00			$ 4,900.00
			Sub-Total	$ 4,900.00	$ 4,900.00	$ -	$ -	$ 4,900.00
Equipment, Labor, and Mobilization								
Contractor Services: Tree & Vegetation Removal	1.6 acres	Removal of all vegetation (<12" diameter), Brush Burning	Bid	$ 23,100.00		23,100.00		$ 23,100.00
Contractor Services - Excavation, Compaction & Erosion Control	11500 CY	Mobilization, Root Removal & Excavation - 11,500 CY	Bid	$ 65,426.00	24,000.00	41,426.00		$ 65,426.00
	9500 CY	Onsite-Sourced Fill & Compaction - 9,500 CY, Revegetation & Erosion Control	Bid	$ 45,925.00	18,100.00	27,825.00		$ 45,925.00
Contractor Services - Monitoring Equipment Installation	4	Piezometer Drilling and Installation	Bid	$ 30,000.00		30,000.00		$ 30,000.00
	1	Transducer Housing Installation	Bid	$ 24,000.00		24,000.00		$ 24,000.00

(Revised 5/17/2024)

	3	Seepage Weir Installation	Bid	$	5,434.00		5,434.00		$	5,434.00
	1120 hrs	Contractor Coordination, Oversight Management & Supervision Activities	$45.00	$	50,400.00		50,400.00		$	50,400.00
Project Management		RDG Project Grant Application	Engineer Bid + Hourly Rate CD Personnel ($46/hr) and Stakeholder Time ($45/hr)	$	6,000.00		6,000.00		$	6,000.00
			Sub-Total	$	250,285.00	$ 42,100.00	$ 208,185.00	$ -	$	250,285.00
			TOTALS	$	326,051.00	$ 75,000.00	$ 251,051.00	$ -	$	326,051.00

OTHER REQUIREMENTS:

All of the columns in the budget table and the matching contribution table MUST be completed appropriately or the application will be invalid. Please see the example budget sheet for additional clarification.

*Units = feet, hours, inches, etc. Do not use lump sum unless there is no other way to describe the costs.

**Can include in-kind materials. Justification for in-kind labor (e.g. hourly rates used). Do not use government salaries as match. Describe here or in text.

CD Personnel costs provided by L&C CD Staff, Engineering Costs Established by Bid - Additional hourly rate costs can be provided by selected engineer - Hydrometrics, Contractor Services Costs Established by Bid Process .

***The Review Panel suggests that design and oversight costs associated with a proposed project not exceed 15% of the total project budget. If design and oversight costs are in excess of 15%, applications may require a justification or minimum of two competitive bids for the cost of undertaking the project. For projects that include a maintenance request, it must not exceed 10% of the total project cost.

****The Review Panel recommends a maximum fencing cost of $1.50 per foot. Additional costs may be the responsibility of the applicant and/or partners.

Additional details:

APPLICATION MATCHING CONTRIBUTIONS

(do not include requested funds or contributions not associated with the application)

CONTRIBUTOR	IN-KIND	CASH	TOTAL	Secured? (Y/N)
DNRC Conservation District Project Grant	$ -	$ 50,000.00	$ 50,000.00	Y
DNRC RDG Planning Grant	$ -	$ 62,400.00	$ 62,400.00	Y
Threemile Reservoir Stakeholder Contributions	$ 76,500.00	$ 62,151.00	$ 138,651.00	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
	$ -	$ -	$ -	
TOTALS	$ 76,500.00	$ 174,551.00	$ 251,051.00	

FFIP Project Details

Project Purpose and Need

The Threemile Reservoir Dam is located 10 miles NE of Helena, MT. The dam is classified as a high-hazard dam, storing up to 84 acre-feet of water along Threemile Creek, a tributary of Silver Creek feeding into Lake Helena and the Upper Missouri River Watershed. The Threemile Dam requires significant maintenance to the downslope embankment to ensure its continued operating permitted utility as an irrigation reservoir, as well as to preserve its unique native Westslope Cutthroat Trout population preservation and for fire suppression utility for wildfire management.

Three Mile Dam was originally a railroad embankment built in the late 1800s to transport mining equipment and ore between Helena and Marysville. The embankment is believed to be filled with borrowed material brought in by horses from the surrounding area. The embankment fill was probably compacted only by the horses and later the railroad traffic. A culvert was installed in the embankment to convey Three Mile Creek (MT Tech, 2007). Between 1965 and 1980, the culvert was blocked and the railroad embankment was converted to a dam to store water from Three Mile Creek for irrigation. Over the past several decades, heavy vegetation has developed on the downslope embankment, potentially compromising the integrity of the stability of the dam and resulting in seepage development on the embankment.

Three Mile Creek Dam has been classified as a High Hazard Dam by the Montana Department of Natural Resources and Conservation (DNRC). The classification is based entirely on the hazard the dam could impose on lives downstream of the dam. High Hazard Dams are required to be inspected by an engineer at least once every five years. The dam is an earth-fill dam about 63 feet high and the crest is about 450 feet long.

In November, 2023, the DNRC High-Hazard Dam Program issued a letter requiring urgent and timely address of outstanding maintenance issues with the Threemile Dam, indicating that the operating permit for the dam would be revoked if the maintenance issues were not addressed immediately. Outstanding maintenance issues include the removal of 500-1000 trees and shrubs on the downslope face of the dam, excavation of tree stumps and roots, fill and compaction of soils, long-term management/resolution of dam seepage issues, and re-establishment of native grasses for erosion control. The Dam Safety Inspection Report is attached in the supplemental documents section.

The consequence of delayed action would result in the revocation of the dam’s operating permit, which would have a number of impacts to the natural resources and benefits of the reservoir, which are provided in detail in the following section.

Public Resource Benefits

Westslope Cutthroat Trout
The Threemile Reservoir provides a critical habitat for a unique native Westslope Cutthroat Trout (WCT) population, one of two genetically unaltered populations that exist within the responsibility of the Helena Area Fisheries Biologist, and the lowest elevation population of WCT in the state of Montana. FWP has indicated the reservoir offers great potential for being a brood or wild egg source for WCT population expansion efforts in the state, as was detailed in the FWP's WCT Conservation Strategy in the Upper Missouri River Basin.

This WCT population boasts uniquely large fish (18-20 inches) due to the deep water habitat of the reservoir, which allows for deep overwinter habitat, connectivity to the upstream creek for life cycle completion, and the robust food characteristics of the reservoir.

In the event of revocation of the high-hazard classification of the Threemile Dam, the population would be eliminated due to limited overwinter habitat and disconnection to the upstream creek. Additionally, the continued irrigation pressures of downstream ranches would drain the reservoir to completion during the irrigation season, eliminating all food and habitat for the currently growing population.

High-Hazard Dam Safety
The maintenance work required on the Threemile Dam ensures public safety and health for the downstream neighbors and critical road infrastructure for emergency response, including the primary roadway for the area, Birdseye Road. The planning work and associated maintenance activities will ensure the long-term safety and stability of the dam and the Birdseye community.

Fire Suppression
The Threemile Reservoir provides an essential utility as a filling station for fire suppression along the westslope of the Continental Divide, mitigating wildfire risk for several hundred residences and structures in the Birdseye area. In the event of the reservoir's declassification as a high-hazard dam, the reservoir would cease to operate as a filling station during peak wildfire season and require wildland firefighting helicopters to travel a longer distance to access water for fire suppression, limiting efficient response to fire suppression efforts.

Legacy Ranch Preservation
The Threemile Reservoir is a vital resource for the preservation and continued operation of legacy ranches in the area, including the 3,000 acre Gehring ranch, a designated Historic District with a 150 year legacy of a fourth generation Montana ranch. In partnership with the Prickly Pear Land Trust, the Gehring ranch raises cattle and bison, and relies on the stored water of Threemile Reservoir to support its herds.

Conclusion

The Threemile Reservoir provides numerous critical natural resources and proper maintenance ensures the health and safety of the downstream area. The reservoir provides protection of hundreds of homes as a fire suppression resource. It has a robust and native WCT population critical to FWP's long-term plans for repopulation of the Upper Missouri River Basin, a region with numerous anglers and active efforts for WCT population rehabilitation. Additionally, the safe operation of the dam ensures the health and safety of the community, including protection of Birdseye Road and its utility for emergency response for hundreds of families.

Goals and Objectives

The ultimate goal of the project is to remediate the Threemile Dam face to ensure continued safe operation of the Threemile Dam and protection of its natural resource benefits.

A phased approach that systematically addresses the risks that have been created by the long term vegetation growth is necessary to protect the long-term stability of the dam and bring the dam into compliance with current dam safety regulations in a feasible manner. In order to mitigate the risk of opening up preferential pathways that would enable concentrated flows to exit out of the downstream embankment, the construction scope proposed will include the following Phases:

- Phase 1 – Installation of monitoring equipment such as water level sensors, piezometers, vee-notch weirs for seepage monitoring, etc.
- Phase 2 – Removal of trees and bushes that do not pose a risk to the dam's stability and re-filling and compaction of those root zones (approximately 1.5 acres and ~500 trees <12" dbh and shrubs not near seepage areas), as well as other associated work (reseeding, erosion control, etc.);
- Phase 3 – Design and construction of an approach to address removal of trees, bushes, and roots that potentially pose a risk to the dam (approximately 0.6 acres and ~100 trees >12" dbh and near seepage areas and dam toe).
    - Monitoring data gathered over one to two years will help inform and refine the design for this approach.
    - The large trees, bushes, and roots that potentially pose a risk to the dam's safety will remain until they can be safely removed. This will allow for a monitoring baseline to be established and to avoid potential dam instability risks that could occur in the near term if they are cut and/or removed without a well-informed design.
    - Excavation phase of work will include designed toe and chimney drain to ensure proper water management and address seepage areas for long-term stability.

The ultimate objectives of the project are:

1. To remove all vegetation from the face of the dam
2. Excavation of tree roots
3. Fill and compaction of soils

4. Re-establishment of native grasses across the dam face
5. Install and evaluate monitoring equipment to design Phase 2 excavation/compaction and long-term water management activities.

Phase 1 Activities

Goal 1 - Install and evaluate monitoring equipment to design Phase 3 excavation/compaction and long-term water management activities.

Task 1: Develop and produce comprehensive engineering design and work plan to address high-need maintenance issues with the dam. Work plan and design will include excavation and compaction design for two phases of project work, to include soil sampling, soils analysis, surveying, and evaluation of activities to manage existing seepage locations identified.

Task 2: Develop and produce a preliminary Engineering/Monitoring Report establishing plan for phased approach for monitoring equipment installation and inform long-term monitoring activities.

Task 3: Prepare construction permits for initial phase of excavation and soil compaction

Task 4: Install monitoring equipment: install temporary weirs for weekly monitoring of seepage conditions over the course of the project phase of work. Final installed weirs for long-term monitoring will be developed outside of the scope of this grant and is included in Phase 3 activities.

Task 5: Install monitoring equipment: install transducer housing and drill piezometers for weekly monitoring of reservoir level. Monitoring and evaluation of reservoir level, combined with weir monitoring, will allow for a robust evaluation of the dam's continued safety and stability.

Task 6: Develop and submit application for RDG Project Grant to execute Phases 1 and 2 of excavation and compaction activities.

Phase 2 Activities

Goal 1: Remove trees and shrubs from a 2 acre area across the downslope embankment of the dam.

Task 1: Remove all vegetation from the face of the dam (<12" in diameter).

Task 2: Pile and burn vegetation in accordance with Birdseye Fire Dept.

Goal 2: Excavate tree roots and compact native fill across the dam embankment. Re-establish native grasses across the face of the dam according to engineer design.

Task 1: Evaluate multiple bids and execute contracts with a knowledgeable and skilled excavator.

Task 2: Contract engineer to conduct excavation oversight.
Task 3: Execute work plan, including excavation and compaction of materials.
Task 4: Install jute matting and seed native grasses across the face of the dam

Three Mile Creek Dam Five-Year Inspection Photos Oct. 20, 2021

Upstream Dam Face looking west

Dam Crest looking west

Animal burrows in left downstream groin area

Vegetation on downstream face

THREE MILE DAM VEGETATION REMEDIATION PHASE 2

APRIL 22, 2024

LEWIS & CLARK COUNTY SHERIFF
TO BE CONTACTED IN THE CASE OF EMERGENCY AND NOTIFIED OF ONGOING WORK PRIOR TO CONSTRUCTION
LEO DUTTON
221 BRECKENRIDGE AVE.
HELENA, MT 59601
(406)-442-7883 (O) / 911
REESE MARTIN (DES) SAFETY OFFICER
406-447-8585

OWNER CONTACT:
THREE MILE DAM
GRANT WILLIAMS
6255 3 MILE RD
HELENA, MT 59602
(303) 475-4524

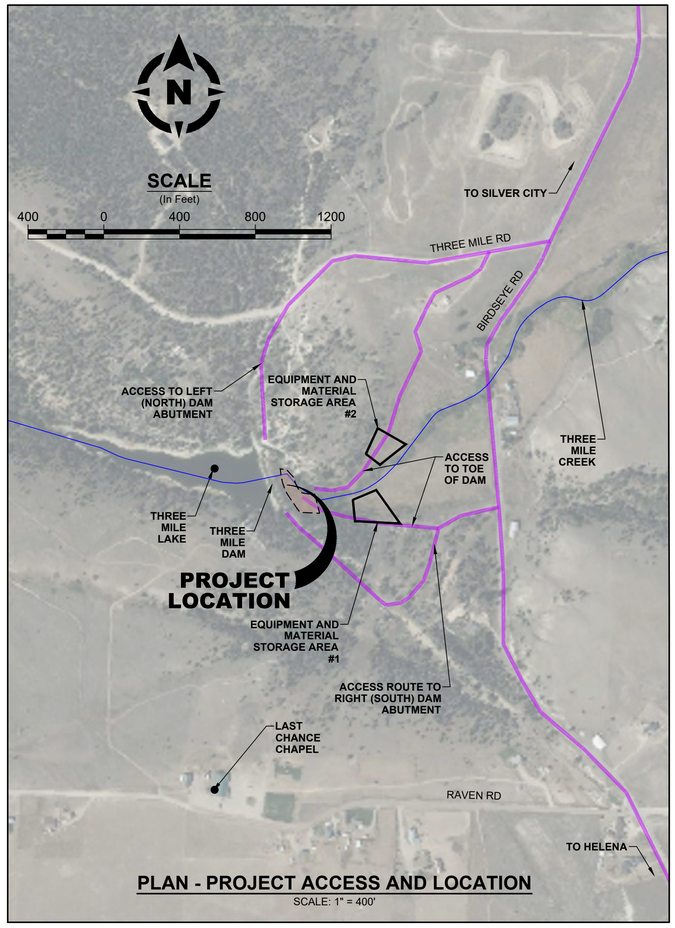
ENGINEER:
HYDROMETRICS, INC.
3020 BOZEMAN AVENUE
HELENA, MT. 59601

CONTACT:
KARL KINGERY, P.E.
(406) 443-4150
CELL: (406) 461-2757

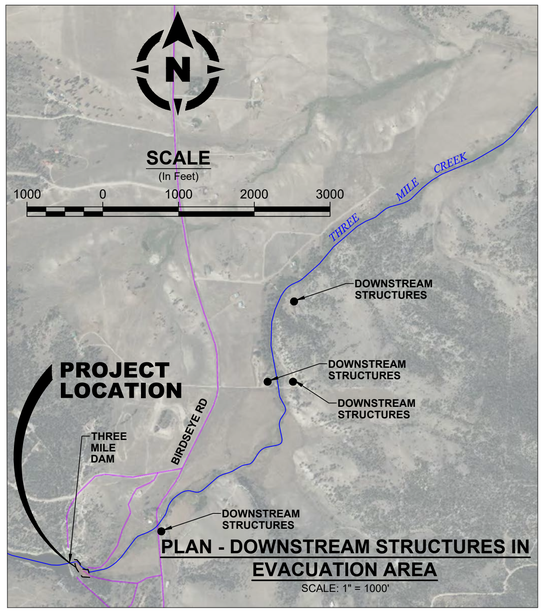
COORDINATE SYSTEM

HORIZONTAL DATUM
LOCAL COORDINATE SYSTEM BASED ON CP362 AND CP30201 COORDINATES SHOWN ON SHEET 2

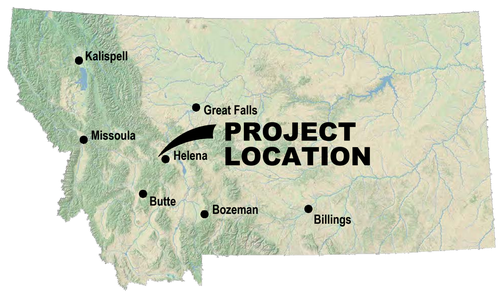
VERTICAL DATUM:
LOCAL COORDINATE SYSTEM
BASED ON CP362 AND CP30201 ELEVATIONS SHOWN ON SHEET 2

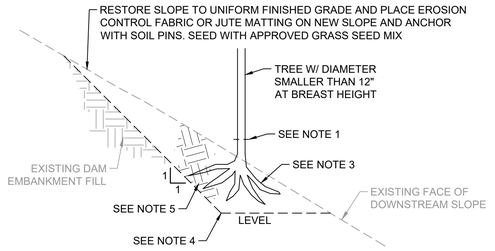


PLAN - PROJECT ACCESS AND LOCATION
SCALE: 1" = 400'



PLAN - DOWNSTREAM STRUCTURES IN EVACUATION AREA
SCALE: 1" = 1000'





TREE/STUMP REMOVAL NOTES:

1. CUT THE TREE APPROXIMATELY TWO FEET ABOVE GROUND LEVEL LEAVING A PROMINENT STUMP FOR ROOTBALL EXTRACTION.
2. CONTRACTOR TO PILE ALL CUT TREES AND SLASH IN NEAT PILES SO THAT THE PILES CAN DRY AND BE BURNED BY OWNER.
3. REMOVE THE STUMP AND ROOTBALL BY PULLING THE STUMP OR EXTRACTING WITH EQUIPMENT AFTER LOOSENING THE ROOTBALL BY PULLING ON THE STUMP FROM DIFFERENT DIRECTIONS.
4. CLEAN THE ROOTBALL CAVITY TO REMOVE LOOSE SOIL AND REMAINING ROOT SYSTEM BY EXCAVATING THE ROOTBALL CAVITY WITH A MAXIMUM 1H:1V SIDE SLOPES AND A HORIZONTAL BOTTOM. CONTRACTOR SHALL PERFORM ADDITIONAL EXCAVATION AS NECESSARY TO REMOVE ANY REMAINING ROOTS GREATER THAN 0.5" IN DIAMETER. IF EXCAVATION TO REMOVE THE ROOT IS REQUIRED BELOW AN ELEVATION OF 4445.0 FT, AS SHOWN ON THE PLANS, CONTRACTOR SHALL STOP WORK AND COORDINATE WITH ENGINEER.
5. PLACE BACKFILL IN THE ROOTBALL CAVITY IN LIFTS NOT TO EXCEED 8 INCHES IN HEIGHT. COMPACT EACH LIFT TO A MINIMUM 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698. BACKFILL MATERIAL SHALL BE SOIL MATERIAL EXCAVATED FROM THE DAM CREST AT LOCATIONS APPROVED BY THE ENGINEER, OR ANOTHER SUITABLE SOURCE, THAT IS SUBSTANTIALLY FREE OF ORGANIC MATTER, FROZEN MATERIALS, STONES LARGER THAN 6", AND OTHER DELETERIOUS MATERIALS THAT WILL PREVENT PROPER PLACEMENT. IF NECESSARY, ADDITIONAL BACKFILL SOURCE AREAS WILL BE IDENTIFIED BY THE ENGINEER.
6. TREES IN PHASE 2 TREE REMOVAL ZONE BUT OUTSIDE PHASE 3 TREE REMOVAL ZONE CAN BE REMOVED INDIVIDUALLY AS SHOWN. TREES INSIDE PHASE 3 TREE REMOVAL ZONE SHALL NOT BE REMOVED.
7. EXISTING WILLOWS ON UPSTREAM EMBANKMENT TO REMAIN.
8. CONTRACTOR SHALL COORDINATE WITH ENGINEER DURING EXCAVATION AND ROOT REMOVAL STAGE TO COORDINATE SCHEDULES SO THAT ENGINEER CAN OBSERVE ROOT REMOVAL PERIODICALLY.

GENERAL WORK PLAN

MONITORING

1. PROPOSED PIEZOMETERS, SEEPAGES WEIRS AND LAKE WATER LEVEL MONITORING EQUIPMENT SHALL BE INSTALLED AND MONITORED ACCORDING TO AN ESTABLISHED MONITORING PLAN. MONITORING SHALL EXTEND FOR A PERIOD AS DETERMINED IN THE MONITORING PLAN PRIOR TO CONSTRUCTION.
2. MONITORING SHALL CONTINUE THROUGH CONSTRUCTION AND SHALL BE ASSESSED BY ENGINEER FOLLOWING ANY CHANGES TO OBSERVED FLOW RATES AND/OR WATER LEVELS.

PERMITTING

3. OWNER SHALL RECEIVE A CONSTRUCTION PERMIT FROM DNRC, OR RECEIVE WRITTEN CONFIRMATION FROM DNRC THAT A CONSTRUCTION PERMIT IS NOT NECESSARY PRIOR TO PROCEEDING WITH CONSTRUCTION.
4. CONTRACTOR AND/OR OWNER SHALL RECEIVE ALL APPROPRIATE PERMITS (E.G. 404/310/318, CONSTRUCTION STORMWATER) PRIOR TO PROCEEDING WITH CONSTRUCTION.

CONSTRUCTION PHASING PLAN

PHASE 1

1. INSTALL PIEZOMETERS AND TRANSDUCER HOUSING PRIOR TO PROCEEDING WITH PHASE 2.
2. INSTALL WEIRS AT SEEPAGE LOCATIONS PRIOR TO PROCEEDING WITH PHASE 2.

PHASE 2

1. CUT TREES IN PHASE 2 TREE REMOVAL ZONE
2. EXCAVATE ROOT CAVITIES FOR TREES IN PHASE 2 TREE REMOVAL ZONE.
3. PLACE AND COMPACT FILL FOR TREE ROOT CAVITIES WITHIN WITHIN PHASE 2 TREE REMOVAL ZONE.
4. PLACE EROSION CONTROL (JUTE MATTING) ON EXCAVATED AND RECOMPACTED AREAS.
5. PERFORM FIRST FILL AND ASSOCIATED MONITORING.
6. MONITOR DAM SEEPAGE AND PHREATIC WATER SURFACE PRIOR TO PROCEEDING WITH PHASE 3.

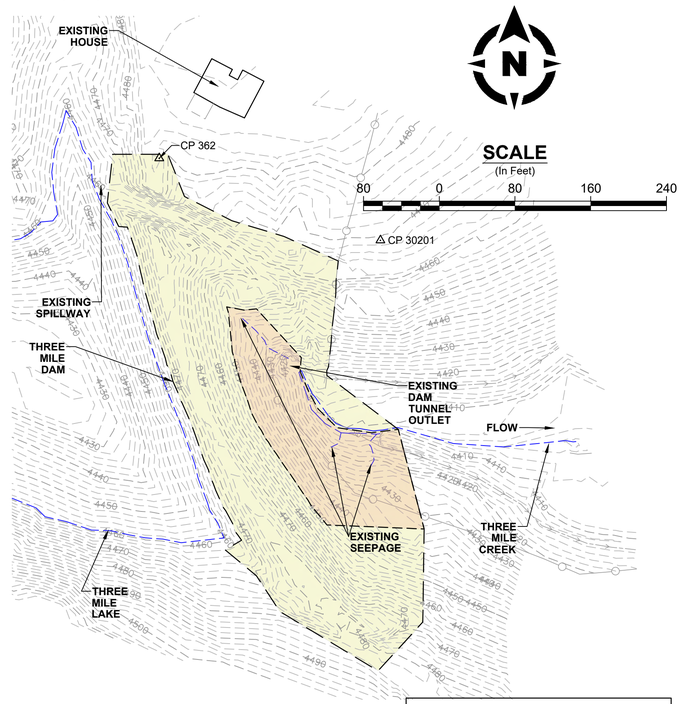
PHASE 3

7. DESIGN TO BE PERFORMED LATER.

LEGEND

- PHASE 2 TREE REMOVAL ZONE
- PHASE 3 TREE REMOVAL ZONE
- EDGE OF WATER BOUNDARY
- EXISTING FENCE
- EXISTING DITCH
- CONTROL POINT

1 - DETAIL
SCALE: 1" = 10' (H & V)
BUSH, TREE, & STUMP REMOVAL



VEGETATION REMOVAL AREAS
SCALE: 1" = 80'

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS	NO	BY	DATE	DESCRIPTION

SCALE VERIFICATION BAR IS ONE INCH ON ORIGINAL DRAWING
0 — 1
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

Project No.: 23039.10			
DRAWN BY	RKK	4/22/24	
CHECKED BY			
APPROVED BY			
SCALE: AS NOTED			

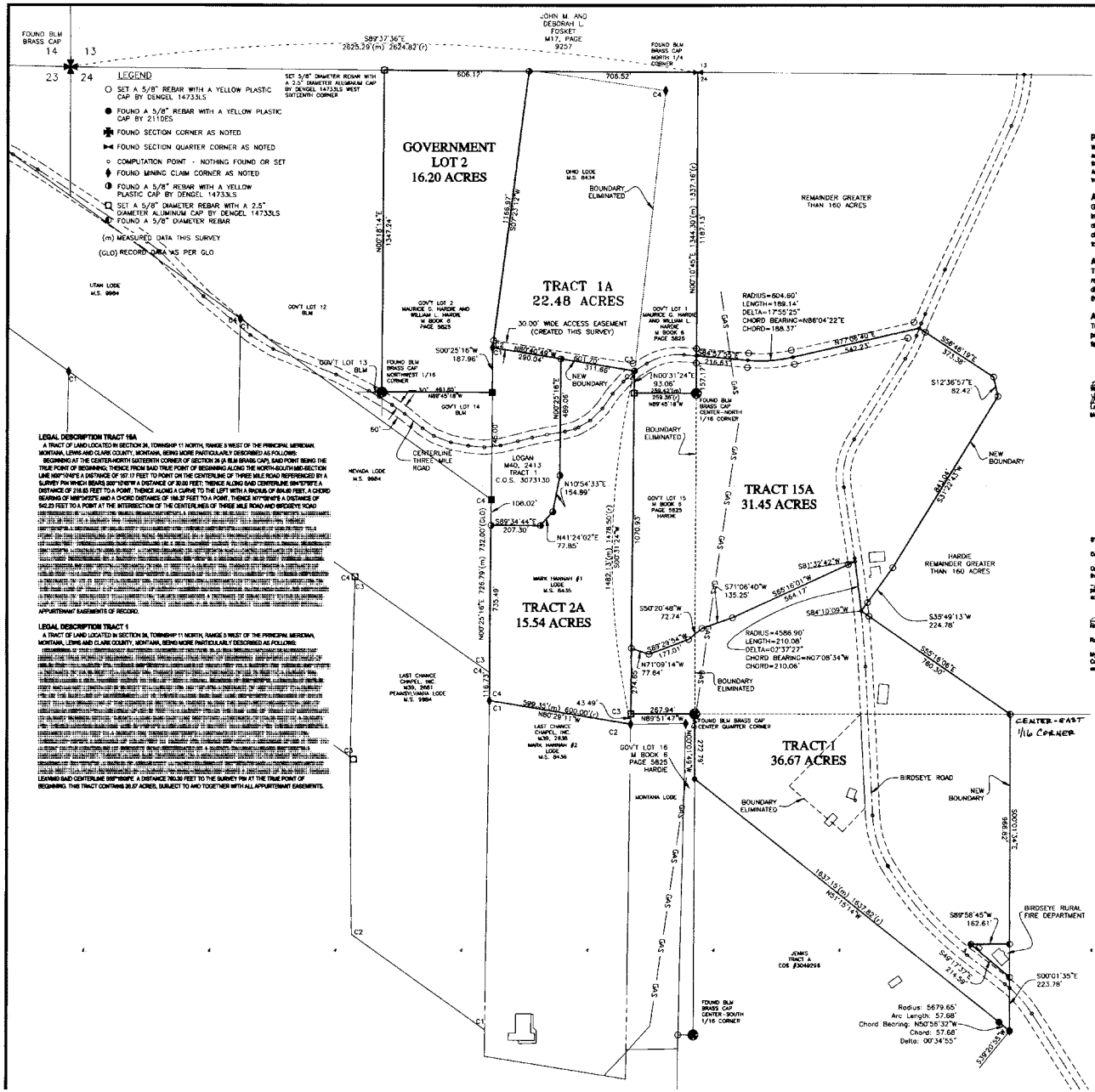
Hydrometrics, Inc.
Consulting Scientists and Engineers
Helena, Montana 59601
3020 Bozeman Avenue
(406) 443-4150

THREE MILE DAM VEGETATION REMEDIATION

PHASE 2 WORK PLAN

DRAWING FILE NUMBER
2303901H009-PHASE 2
AUTOCAD 2004 DRAWING (DWG)
SHEET NUMBER 1
REV

Updated by: kkingery 4/22/2024 6:24 PM
I:\HYDRO-H_NDS\Drafts\Land Projects\2303901 - Three Mile Dam_dwgs\2303901h009-Phase 2.dwg [COVER SHEET INDEX AND GENERAL NOTES]



CERTIFICATE OF SURVEY

RETRACEMENT AND COMMON BOUNDARY RELOCATION LOCATED IN SECTION 24, TOWNSHIP 11 NORTH, RANGE 5 WEST OF THE PRINCIPAL MERIDIAN, MONTANA, LEWIS AND CLARK COUNTY, MONTANA.

PURPOSE OF SURVEY

We hereby certify that the purpose of this survey is to relocate common boundary lines between adjoining tracts of land outside of any platted subdivision and the aggregation of lots. Therefore this survey is exempt from review as a subdivision pursuant to Section 76-3(3)(a) MCA. Another purpose of this survey is to reissue the boundaries of Government Lot 2, an existing tract of land.

ACKNOWLEDGED CERTIFICATION GOVERNMENT LOT 2

Government Lot 2 is a Tract of Record meaning an individual parcel of land, irrespective of ownership, that can be identified by legal description, independent of any other parcel of land, using documents on file in the records of the county clerk and recorder's office, and therefore is exempt from review by DEQ pursuant to section 76.3.103(10)(a), MCA.

ACKNOWLEDGED CERTIFICATION TRACTS 1, 1A AND 15A

Tracts 1, 1A and 15A all exceed 20 acres; therefore they are exempt from DEQ review pursuant to Section 76-4-102(16), which states: "Subdivision "means a division of land or land so divided that creates one or more parcels containing less than 20 acres, exclusive of roadways, in order that title.....

ACKNOWLEDGED CERTIFICATION TRACT2 2A

Tract 2A is exempt from DEQ review pursuant to 17.36.605(2)(a) which states: a parcel that has no existing facilities for water supply, wastewater disposal, if no facilities will be constructed .....

William L. Hardie
Kelley S. Hardie
Larry E. Hicks as Pltr
Hardie Hardie Estate

STATE OF MONTANA)
: ss
County of Lewis and Clark)

On this 1st day of July, 2010, before me, a Notary Public for the State of Montana, personally appeared Kelley S. Hardie known to me to be the person(s) whose names are subscribed to the within instrument and acknowledged to me that they executed the same.

Notary Public for the State of Montana
Residing at:
My Commission expires:

(SEAL)

COUNTY TREASURER

I CERTIFY PURSUANT TO SECTION 15-3-207(3), MCA, THAT ALL REAL PROPERTY TAXES AND SPECIAL ASSESSMENTS ASSESSED AND LEVIED ON THE LAND ENCOMPASSED BY THIS CERTIFICATE OF SURVEY HAVE BEEN PAID.

GEO-CODE: 18932402030000
GEO-CODE: 18932401203000
GEO-CODE: 18932402020000
GEO-CODE: 18932401701000

Paulette DeHart/MK 7/21/2010
LEWIS & CLARK COUNTY TREASURER

BASIS OF BEARINGS:

THE SOUTH LINE OF THE SOUTHEAST QUARTER OF SECTION 14 WHICH IS S89°37'36"E PER DOCUMENT NUMBER 3189927 OF THE LEWIS AND CLARK COUNTY RECORDS.

CERTIFICATE OF EXAMINING LAND SURVEYOR

REVIEWED FOR ERRORS AND OMISSIONS IN CALCULATIONS AND DRAFTING THIS 21 DAY OF July, 2010 PURSUANT TO SECTION 76-3-611 (2)(d), MCA.

EXAMINING LAND SURVEYOR
LICENSE NO. 9962 - LS

Ownership Information:

Deeds recorded in M Book 6 on Page 5825 and M Book 26 on Page 2291 of the Lewis and Clark County, Montana records.

LEGAL DESCRIPTION TRACT 15A

A TRACT OF LAND LOCATED IN SECTION 24, TOWNSHIP 11 NORTH, RANGE 5 WEST OF THE PRINCIPAL MERIDIAN, MONTANA, LEWIS AND CLARK COUNTY, MONTANA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE CENTER-NORTH SIXTEENTH CORNER OF SECTION 24 (A BLM BRASS CAP), SAID POINT BEING THE TRUE POINT OF BEGINNING; THENCE FROM SAID TRUE POINT OF BEGINNING ALONG THE NORTH-SOUTH MID-SECTION LINE N00°18'14"E A DISTANCE OF 157.17 FEET TO POINT ON THE CENTERLINE OF THREE MILE ROAD REFERENCED BY A SURVEY PIN WHICH BEARS S00°18'14"W A DISTANCE OF 30.00 FEET; THENCE ALONG SAID CENTERLINE S84°57'55"E A DISTANCE OF 216.65 FEET TO A POINT; THENCE ALONG A CURVE TO THE LEFT WITH A RADIUS OF 504.60 FEET, A CHORD BEARING OF N86°04'22"E AND A CHORD DISTANCE OF 188.37 FEET TO A POINT; THENCE N77°06'40"E A DISTANCE OF 542.25 FEET TO A POINT AT THE INTERSECTION OF THE CENTERLINES OF THREE MILE ROAD AND BIRDSEYE ROAD

APPURTENANT EASEMENTS OF RECORD.

LEGAL DESCRIPTION TRACT 1

A TRACT OF LAND LOCATED IN SECTION 24, TOWNSHIP 11 NORTH, RANGE 5 WEST OF THE PRINCIPAL MERIDIAN, MONTANA, LEWIS AND CLARK COUNTY, MONTANA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LEAVING SAID CENTERLINE S00°18'14"E A DISTANCE 760.30 FEET TO THE SURVEY PIN AT THE TRUE POINT OF BEGINNING. THIS TRACT CONTAINS 36.67 ACRES, SUBJECT TO AND TOGETHER WITH ALL APPURTENANT EASEMENTS.

LEGAL DESCRIPTION TRACT 1A

A TRACT OF LAND LOCATED IN THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 24, TOWNSHIP 11 NORTH, RANGE 5 WEST OF THE PRINCIPAL MERIDIAN, MONTANA, LEWIS AND CLARK COUNTY, MONTANA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE QUARTER CORNER COMMON TO SECTIONS 13 AND 24 (A BLM BRASS CAP), SAID POINT BEING THE TRUE POINT OF BEGINNING; THENCE FROM SAID TRUE POINT OF BEGINNING ALONG THE NORTH-SOUTH MID-SECTION LINE S00°25'16"W A DISTANCE OF 1344.30 FEET TO A BLM BRASS CAP AT THE CENTER-NORTH SIXTEENTH CORNER;

OF RECORD

LEGAL DESCRIPTION TRACT 2A

A TRACT OF LAND LOCATED WITHIN THE MARK HANNAH #1 LODE, M.S. 8435 AND BEING A PORTION OF C.O.S.#3073130 OF THE LEWIS AND CLARK COUNTY RECORDS AND BEING IN THE WEST HALF OF SECTION 24, TOWNSHIP 11 NORTH, RANGE 5 WEST OF THE PRINCIPAL MERIDIAN, MONTANA, LEWIS AND CLARK COUNTY, MONTANA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

SURVEY PIN ON COURSE 2 3-9 OF THE OHIO LODE, M.S. 8434, THENCE ALONG SAID COURSE S89°45'48"E A DISTANCE OF 311.88 FEET TO A SURVEY PIN AT CORNER 3 OF THE OHIO, M.S. 8434 AND SAID CORNER BEING IDENTICAL TO CORNER 2 OF THE MARK HANNAH #1, M.S. 8435; THENCE ALONG COURSE 2-3 OF THE MARK HANNAH #1 S89°31'24"W A DISTANCE OF 1852.43 FEET TO THE STONE AT THE TRUE POINT OF BEGINNING, THIS TRACT CONTAINS 15.54 ACRES, SUBJECT TO AND TOGETHER WITH ALL APPURTENANT EASEMENTS OF RECORD.

LEGAL DESCRIPTION GOVERNMENT LOT 2

A TRACT OF LAND LOCATED IN THE NORTHWEST QUARTER OF SECTION 24, TOWNSHIP 11 NORTH, RANGE 5 WEST OF THE PRINCIPAL MERIDIAN, MONTANA, LEWIS AND CLARK COUNTY, MONTANA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE WEST SIXTEENTH CORNER ON THE NORTH LINE OF SECTION 24 (A 5/8" DIAMETER BY 30" LONG REBAR WITH A 2.5" DIAMETER ALUMINUM CAP BY DENGEL 14733LS), SAID POINT BEING THE TRUE POINT OF BEGINNING; THENCE FROM SAID TRUE POINT OF BEGINNING ALONG SAID NORTH LINE S89°37'36"E A DISTANCE OF 606.12 FEET TO A SURVEY PIN AT THE INTERSECTION WITH THE WEST LINE OF THE OHIO LODE, M.S. 8434; THENCE ALONG SAID WEST LINE S00°25'16"W A DISTANCE OF 1185.97 FEET TO A SET STONE AT CORNER 2 OF SAID OHIO LODE, WHICH CORNER IS IDENTICAL WITH CORNER 1 OF THE MARK HANNAH #1 LODE, M.S.8435; THENCE ALONG THE WEST LINE OF THE MARK HANNAH #1 S00°25'16"W A DISTANCE OF 547.88 FEET TO A SURVEY PIN; THENCE N89°45'18"W A DISTANCE OF 691.88 FEET TO A BLM BRASS CAP AT THE NORTHWEST SIXTEENTH CORNER; THENCE N00°18'14"E A DISTANCE OF 1,347.24 FEET TO THE SURVEY PIN AT THE TRUE POINT OF BEGINNING. THIS TRACT CONTAINS 16.20 ACRES, SUBJECT TO AND TOGETHER WITH ALL APPURTENANT EASEMENTS OF RECORD.

CERTIFICATE OF SURVEYOR

I, DANIEL E. DENGEL, A LICENSED PROFESSIONAL LAND SURVEYOR IN THE STATE OF MONTANA, DO HEREBY CERTIFY THAT THIS IS A TRUE REPRESENTATION OF A SURVEY MADE UNDER MY DIRECT SUPERVISION.

DANIEL E. DENGEL, MONTANA REG. NO. 14733LS

MONTANA DANIEL E. DENGEL 14733LS LICENSED LAND SURVEYOR

3189927
Lewis & Clark County

DENGEL SURVEYING
HELENA, MONTANA

Scale: 0 100 200 400

1/4	Sec.	T.	R.
☒	24	11N	5W

Date: March 26, 2010

MONTANA FISH, WILDLIFE & PARKS

Future Fisheries Improvement Program

Appendix: FWP Statement

Project Title: Threemile Creek Reservoir High Hazard Dam Project

Please describe the potential impact of the project, including the priorities of the Fisheries Division and the importance to Montana's anglers.

Threemile Creek contains one of 20 remaining unaltered populations of westslope cutthroat trout (WCT) in the Upper Missouri subbasin. This project would help protect this population from nonnative fish and dewatering of highly productive lentic habitat by addressing the current dam deficiencies. Originally constructed as part of the Northern Pacific Railroad's line to Marysville and later retrofitted to the earthen dam present today, the Threemile Creek Reservoir Dam has isolated the WCT population in Threemile Creek since at least 1887. This structure has successfully prevented the upstream movement of nonnative rainbow and brook trout for over 100 years while nearby streams with no such protections have lost their native WCT populations through competition and hybridization. The reservoir created by the dam provides highly productive habitat which allows WCT to reach large body sizes (18 to 20 inches) rarely seen in other conservation populations. This aspect makes the Threemile Creek WCT population an important brood source for other conservation actions in the Upper Missouri subbasin.

In the upper Missouri River drainage of southwest Montana, FWP and its partners have a conservation goal to restore WCT to 20% of their historically occupied tributary habitat. The primary threat to the species is the presence of nonnative trout such as brook and rainbow trout. Of utmost importance are the remaining nonhybridized populations such as the one found in Threemile Creek. It is essential to preserve as many of these populations, as each one contains a unique part of the species' genetic legacy. The Threemile Creek Reservoir High Hazard Dam Project proposal, submitted by the Grant Williams, is consistent with efforts to secure WCT.

Name of FWP Biologist Alex Poole Date: 04/24/2024

Please attach to the FFIP application and materials and submit according to listed deadlines.

Last Chance Chapel

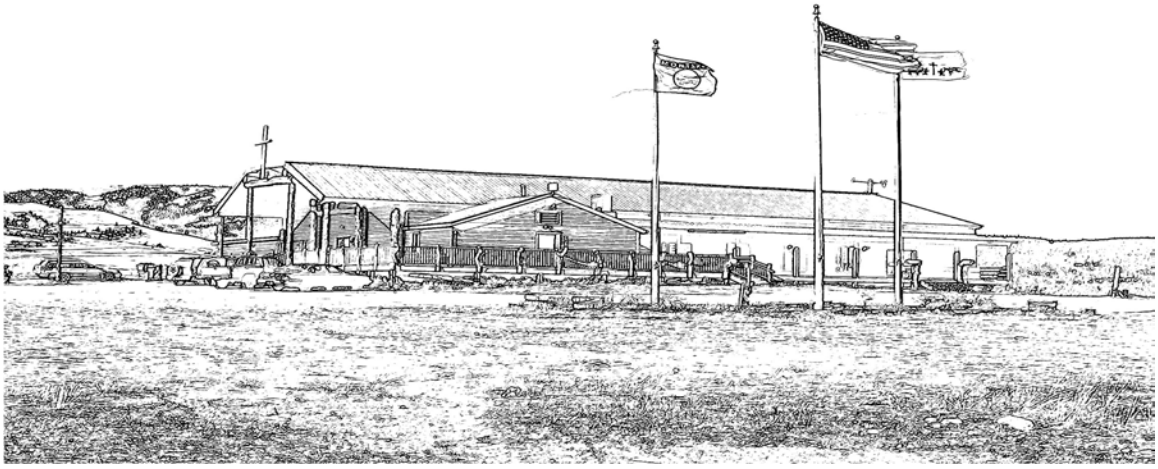
Wednesday, March 13, 2024

To Whom It May Concern:

Our church property includes a portion of the Three Mile Reservoir which our congregation of three hundred members uses extensively for Baptisms and recreational purposes. We are willing to help with volunteer efforts to help maintain keeping it up date. Our Birdseye community would appreciate any help in keeping this landmark in tack for future generations. Thank you for this consideration.

Sincerely,

Pastor John Cathcart



Pastor
John and Gloria Cathcart

Elders:
Don Howard
Ed Meardon
Cliff Higgins

Last Chance Chapel, Inc.
6240 Raven Road
Helena, Montana 59602
406-495-9250
www.lastchancechapel.org

DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION
Conservation and Resource Development Division

STEVE BULLOCK, GOVERNOR
1539 ELEVENTH AVENUE

STATE OF MONTANA

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

April 26, 2024

Jeff Ryan
Lewis and Clark Conservation District
790 Colleen Street
Helena, MT 59601

RE: Threemile Project

Grant Contract: CDG-24-3806

Dear Jeff Ryan,

The Conservation Districts Bureau (CDB) is pleased to approve Lewis and Clark Conservation District Threemile Project grant request in the amount of $50,000.00.

Before any work begins on your project for which you will need to use CDB grant funds, a grant agreement must first be prepared and signed by both parties. Please submit an updated scope, schedule, and budget for the contract if you have any changes to the project since submitting your application.

Please take some time to visit our website and resources and training page where you will find additional information and resources for managing a grant including an FAQ for grantees, template for progress reports, guide to filling out a vendor invoice, and other resources.

We recognize the work involved in putting together an application and appreciate your contributions to restore and protect our natural resources. Please don't hesitate to contact me if you have any questions about your recent application or future ones.

Sincerely,

Mary Hendrix

Mary Hendrix
Conservation District Specialist
406-431-2639
mary.hendrix@mt.gov

To Whom It May Concern,

As a water rights user and proud fourth generation rancher, I am writing to indicate my support for the FWP Future Fisheries Improvement Program Grant and the continued safe operation of the Threemile Reservoir.

In addition to the reservoirs benefits for firefighting and preserving a unique cutthroat trout population, the reservoir provides the Gehring ranch with vital water resources to support my cattle and bison herds.

The legacy of our ranching operation is deeply intertwined with the Threemile Reservoir. My father and grandfather were integrally involved in the development and maintenance of the dam to support our ranch. I am grateful for the interest and support of the Conservation District and the FWP to help us to continue operating the dam and addressing the extensive maintenance needs, for which the costs are far beyond our ability to address from our ranch operations.

Reservoirs like Threemile Reservoir ensure the continued viable operation of legacy ranches in the region. In the face of development pressures and spiking land real estate costs, reservoirs like this one allows for ranching operations and the agricultural legacy of Montana to sustain itself.

I am glad to continue to work with the Conservation District and conservation partners in the Helena Community. The Conservation District and the Prickly Pear Land Trust have been vital to our efforts to ensure the preservation for our lands through the establishment of a conservation easement on our lands. I hope to continue to be an effective partner in these efforts.

Thanks for your consideration,

Bill Gehring

DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION
Water Resources Division
1424 9th Ave, Helena, MT 59601-4503 Phone: (406) 444-6601 Fax: (406) 444-0533

GREG GIANFORTE, GOVERNOR
1539 ELEVENTH AVENUE

STATE OF MONTANA

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

May 10, 2024

Re: Three Mile Dam Future Fisheries Grant Application

Dear Future Fisheries Grant Evaluation Team,

The purpose of this letter is to express the Montana Dam Safety Program's support for the Three Mile Dam Future Fisheries Grant application.

Recent inspections have highlighted the need for rehabilitation of Three Mile Dam. Facilitating engineering and construction activities through this Montana Fish, Wildlife, and Parks program helps meet the state's mission of keeping the public safe and meets the Montana Drought Management Plan's drought management recommendation number one, 'Maximize water supply, storage, and delivery by enhancing existing built storage, expanding natural storage, and assessing infrastructure.

We look forward to working with the dam owners throughout every stage of this project. Thank you for your consideration of their application.

Sincerely,

John Connors, P.E.
Water Operations Bureau Chief
DNRC Water Resource Division
jhconnors@mt.gov

Lewis and Clark Conservation District

790 Colleen Street, Helena MT 59601 406.389.3895 https://lewisandclarkcd.org

March 19, 2024

Future Fisheries Improvement Program

RE: Threemile Reservoir Rehabilitation Project

Dear Committee:

Lewis & Clark Conservation District (LCCD) supports the grant application for the Threemile Reservoir Rehabilitation Project, in Lewis and Clark County, Montana. LCCD staff have been working closely with Grant Williams to identify funding sources to complete the various phases of this very important project.

This project is important in many ways: 1) the dam for this reservoir is classed as a High Hazard Dam and this project would ensure public safety and health for downstream neighbors and critical road infrastructure for emergency response, including the primary roadway for the area, Birdseye Road; 2) This project would secure the habitat for a unique native Westslope Cutthroat Trout population, one of two genetically unaltered populations that exist within the responsibility of the Helena Area Fisheries Biologist, and is the lowest elevation population of this species in the State of Montana. FWP has indicated that the reservoir offers great potential for being a brood, or wild egg, source for Westslope Cutthroat Trout population expansion efforts in the state. If the dam classification is revoked, the population would be eliminated due to limited over-winter habitat and disconnection to the upstream creek; 3) Fire suppression-this reservoir provides an essential resource as a filling station for fire suppression along the west slope of the Continental Divide, and other potential fires in the area. If the dam is declassified, it will be drained, and will cease to be that resource.

Please contact me if you have any specific questions regarding our support of this project proposal. You may contact me at 406-389-3884 or by email at chris@lewisandclarkcd.org. Thank you.

Respectfully,
LEWIS & CLARK CONSERVATION DISTRICT

Chris Evans
District Administrator

BIRDSEYE RURAL FIRE DISTRICT
5316 Birdseye Road
Helena, Montana 59602
406-495-0230

Re: Threemile Reservoir Dam

This letter is an acknowledgement of my support of the Threemile Reservoir project to ensure continued safe operation of the dam and address the extensive maintenance issues detailed by the DNRC High-Hazard Dam Program.

In my role as Chief of the Birdseye Rural Fire District, I understand the importance of preserving the Threemile Reservoir and its utility for fire suppression and wildland firefighting.

The Threemile Reservoir serves as a dip pond for aerial firefighting, helping to suppress and contain fires in the West Helena Valley, and along the eastern slope of the continental divide. Aerial firefighting facilitates a rapid and targeted response that can drastically reduce the spread of fire. The reservoir provides an efficient means to provide thousands of gallons of water – a critical resource during the dry fire season. Maintaining the reservoir as a fire pond safeguards lives, homes, natural resources and property in the Birdseye area and along the Continental Divide.

Most recently, in the summer of 2022, a wildland fire initiated along Threemile Road and posed a serious threat to several residences immediately. Within a few hours, the fire was effectively managed because of the use of the Threemile Reservoir for DNRC Aviation working alongside our fire fighting personnel.

For the continued benefit of the public health and safety of our unique community, I support the preservation of the Threemile Reservoir and the respective work required to ensure continued maintenance and safe operation of the Threemile Dam.

If there are any questions, please feel free to reach out to me at the information below.

Kyle Sturgill-Simon

Chief – Birdseye Rural Fire

birdseyerfd@gmail.com

406.465.6825

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
Conservation and Resource Development Division

GREG GIANFORTE, GOVERNOR
1539 ELEVENTH AVENUE

STATE OF MONTANA

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

May 16, 2024

Jeff Ryan
Chair, Lewis & Clark Conservation District
790 Colleen Street
Helena, MT 59601

RE RDG Planning Grant: Threemile Dam Planning Project

Dear Jeff Ryan,

The Reclamation and Development Grants Program (RDGP) recently completed review of the planning grant application submitted March 21, 2024. We received 8 applications with a total request of $484,667.50. Seven applications were approved for funding.

I am happy to inform you that your request for planning funds from the RDGP was recently approved for $62,400.00. A grant agreement must first be signed by both you and DNRC before any work begins on your project for which you will use RDGP funds. DNRC will be using Submittable for contract management, including invoicing and reporting. Please visit our website (https://dnrc.mt.gov/Conservation/Training-and-Education/) to find additional information and help on managing a reclamation and development grant including an FAQ for grantees, template for progress reports, guide to filling out a vendor invoice, Submittable tips, and other resources.

We recognize the work involved in putting together an application and appreciate your contributions to protect Montana's natural resources. Please don't hesitate to contact Samantha Treu (406-422-3369; samantha.treu@mt.gov) if you have any questions about your recent application.

Sincerely,

Samantha Treu
Reclamation and Development Grants Program Manager

CC: Chris Evans, Karl Kingery, Grant Williams

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

Water Resources Division
1424 9th Ave, Helena, MT 59620-1601 Phone: (406) 444-6601 Fax: (406) 444-0533

GREG GIANFORTE, GOVERNOR 1539 ELEVENTH AVENUE

STATE OF MONTANA

DIRECTOR'S OFFICE: (406) 444-2074
FAX: (406) 444-2684

PO BOX 201601
HELENA, MONTANA 59620-1601

April 12, 2022

Darcy Alm
6090 Lone Pine Road
Helena, MT 59602
DAlm@mt.gov

RE: Operation Permit Approval for Three Mile Dam, MT00865

Dear Darcy:

Enclosed is an approved Operation Permit for Three Mile Dam. This permit is subject to the condition(s) and requirement(s) outlined below. The next formal engineer's inspection must be completed by October 20, 2026, which is five years from your last inspection. We must receive a report of the inspection within 90 days of the inspection.

State law requires a formal engineer's inspection at least once every five years. Failure to complete the inspection on time will result in a revocation of your operation permit.

PERMIT CONDITIONS

Your Operation Permit is conditioned on the following:

Condition 1: Repair the U-bolt connections between the wheel and cable and the operating gate stem
Due Date: Before spring 2022 operation
All of the U-bolt connections except for one have failed; if the remaining U-bolt fails, the gate would be inoperable or require entry into the conduit confined space to operate the gate at the wooden bulkhead.

Condition 2: Implement the vegetation removal and management plan under the guidance of your licensed engineer
Due Date: 12/31/2022
Vegetation ranging from thick willows and shrubs to large, mature trees covers much of the dam embankment. Roots create preferential pathways for seepage and can be a serious dam safety concern. Thick vegetation makes visual of the dam difficult and can obscure developing problems. The 2016 engineer's inspection made this same recommendation, but it does not appear that any work has been completed. The degree of vegetation covering the dam is unacceptable, and progress is needed to control the vegetation.

Your engineer recommended a specific plan to remove large vegetation. Given the large size of much of the vegetation, the work required may be substantial, and it must be completed under the guidance of a licensed engineer.

The following references provide good guidance on vegetation removal and control:

- ASDSO guidance on trees and brush: https://damsafety.org/dam-owners/trees-and-brush
- FEMA Dam Owner's Guide to Plant Impacts on Earthen Dams: https://www.fema.gov/sites/default/files/2020-08/fema_l263_dam_owners_guide_plant_impact_earthen_dams.pdf
- FEMA Technical Manual for Dam Owners – Impacts of Plants on Earthen Dams: https://www.fema.gov/sites/default/files/2020-08/fema-534.pdf

Please notify DNRC when you have completed your Permit Conditions.

Failure to meet Operation Permit Conditions may result in revocation of the permit.

PERMIT REQUIREMENTS

Your Operation Permit is contingent on meeting the following requirements:

Requirement 1: Complete an annual owner's inspection
Due Date: Annually
It is the responsibility of the owner to inspect the dam annually. Please continue performing these annual inspections and sending the results to DNRC.

Requirement 2: Annual updates of the Emergency Action Plan (EAP)
Due Date: Annually
You are responsible for updating your EAP annually. EAPs must be reviewed at least once a year to assure contact information is current. Please also verify that key players have a current version of the plans.

Requirement 3: Address the rodent burrows observed by the seepage pipe intake under the guidance of your licensed engineer
Due Date: 12/31/2022
Fresh spoils from rodent burrows were observed in the area around the seepage pipe intake. When your engineer is on-site to supervise the vegetation removal, inspect the rodent burrows. Excavate and recompact these burrows, as appropriate. Implement methods to eradicate rodents from the dam embankment area.

Requirement 4: Review and revise the Operation and Maintenance (O&M) Manual
Due Date: 12/31/2022
Three Mile Dam's current O&M manual dates from 1990 and is 32 years old. An up-to-date O&M manual is required for high-hazard dams. Please review and update the O&M manual. DNRC recommends updating your O&M manual to the template available on our website at the link below:
http://dnrc.mt.gov/divisions/water/operations/dam-safety/dam-owners/dam-maintenance

Requirement 5: Have your engineer complete a comprehensive assessment of the condition of the outlet works and develop a plan for rehabilitation
Due Date: 1/18/2027 (90 days after your next engineer's inspection)

As part of your next operation permit renewal and engineer's comprehensive inspection report, have your engineer complete a comprehensive assessment of the condition of the outlet works and, if necessary, develop a plan for rehabilitation.

PERMIT RECOMMENDATIONS

We also have a couple recommendations:

Recommendation 1: Install a means to measure reservoir water surface elevation
Knowing the reservoir water elevation not only facilitates accurate administration and distribution of the stored water, but also provides valuable operational information about your dam and is needed to evaluate portions of your monitoring program (like the seepage collection pipe). DNRC records indicate that a benchmark and reservoir stakes were installed on the left abutment – efforts could be made to find these. If a new benchmark is needed, we recommend coordinating when your engineer is on-site for the vegetation removal and rodent burrow projects.

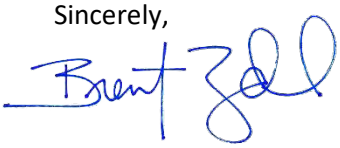
Recommendation 2: Improve the seepage collection pipe
Clear adjacent vegetation from around the seepage collection pipe. Improve the intake to collect seepage flows more effectively. Install a measurement device – a manually read device, e.g., a flume or weir, on the downstream end of the pipe could be read each time someone visits the dam. Monitor the ground around the seepage intake.

CONCLUSION

DNRC Dam Safety has developed extensive resources on funding for dam owners. The website below contains information that may be helpful to you:
http://dnrc.mt.gov/divisions/water/operations/dam-safety/funding-resources

Once you have had time to review this letter, we would like to set up a meeting to discuss the conditions, requirements, and recommendations. Please contact me with any questions.

Sincerely,



Brent Zundel, PE, CFM
DNRC Regional Engineer
406-556-4508
BZundel@mt.gov

CC via email: Steve Story, PE, CFM, DNRC Water Operations Bureau Chief
Michele Lemieux, PE, DNRC Dam Safety Program Manager
Joslyn Hunt, DNRC Legal Counsel
Jenn Daly, DNRC Helena Regional Manager
Joe Souther, PE, Senior Geotechnical Engineer, Wood PLC
Randy Huffsmith, PE, BCEE, Vice President, Wood PLC
Bill Gehring, Three Mile Dam, milynn@usa.com
LaRay Jenks, Three Mile Dam, kidsnhorses1@gmail.com
Grant and Jenny Williams, landowners, aspen8magnolia@gmail.com
Alexa Noruck, Lewis & Clark County Disaster and Emergency Services Coordinator

IMPORTANT OPERATION PERMIT DEFINITIONS

Approved Operation Permit – DNRC's assurance to the public that the dam poses a reasonable and acceptable level of risk to life and property downstream.

Operation Permit *Condition*

- Significant actions are needed to minimize risk to life and property downstream.
- Failure to comply with a Condition impedes DNRC's ability to offer reasonable assurance that the dam poses an acceptable risk to the public. As a result, the Operation Permit may be revoked. Revocation of the permit could involve a reservoir level restriction, notification of local officials and downstream public, increased emergency planning, intervention planning, a civil penalty, and/or breach of the dam.

Operation Permit *Requirement*

- Action needed to maintain a dam in acceptable operating condition with proper emergency notification procedures.
- Requirements includes minor repairs, increase in monitoring, annual inspections, annual Emergency Action Plan updates, and studies to evaluate concerns at the dam.
- Failure to comply with a Requirement could result in elevation to a Permit Condition.

Operation Permit *Recommendation*

- General maintenance, monitoring, communication, and other activities important for continued safe operation of dam.
- Failure to comply with a Recommendation could result in elevation to a Permit Requirement.

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
Water Resources Division
1424 9th Ave, Helena, MT 59620-1601 Phone: (406) 444-6601 Fax: (406) 444-0533

GREG GIANFORTE, GOVERNOR 1539 ELEVENTH AVENUE

STATE OF MONTANA

DIRECTOR'S OFFICE: (406) 444-2074
FAX: (406) 444-2684

PO BOX 201601
HELENA, MONTANA 59620-1601

Monday, November 13, 2023

Sent Via Email & Certified Mail

Grant & Jenny Williams
1025 STRAWBERRY DR
HELENA, MT 59601-5463
aspen8magnolia@gmail.com

Bill Gehring
Jack B. Gehring
5488 LINCOLN RD W
HELENA MT 59602-4601
milynn@usa.com

Darcy Alm
6090 Lone Pine Road
Helena, MT 59602
Dalm@mt.gov

Cc:

Tracy Gehring
5601 W LINCOLN RD
HELENA MT 59602-9419

Darryl Hardie
6175 THREEMILE RD
HELENA MT 59602-8291

Loretta Thomas
5760 BIRDSEYE RD
HELENA MT 59602-7925

LaRay Jenks
5845 BIRDSEYE RD
HELENA MT 59602-7926
kidsnhorses1@gmail.com

Last Chance Chapel
6240 Raven Rd.
Helena, MT 59602

Laurice St. Germaine
6112 RAVEN RD
HELENA MT 59602-9495

The purpose of this letter is to provide formal notification that you are in violation of the conditions of the Three Mile Dam Operating Permit.

Attached is a copy of the Operating Permit approval letter dated April 12, 2022, which outlines the conditions and requirements of your Operating Permit. Specifically, the DNRC believes you have violated the following conditions of your Operating Permit:

> Condition 1: required repair of a U-bolt connection on the gate structure. The gate is at risk of failure impacting the ability to drawdown the reservoir in an emergency. This repair should have been completed before reservoir use in the spring of 2022.
>
> Condition 2: required vegetation removal on the dam under the direction of a licensed engineer. This has long been a recommendation of dam inspectors and during the five-year inspection it was identified as a serious threat to the safety of the dam. Removal of stumps and roots of larger trees requires excavating into the embankment and licensed engineer oversight. Vegetation removal should have been completed by December 31, 2022.

Additionally, you have failed to meet operating permit requirements #1 through #4, described in the attached letter. These requirements are considered the Standard of Care for responsible dam ownership.

To prevent the cancelation of your Operating Permit, you are hereby required to complete the following actions by December 31, 2023:

1. Hire a licensed engineer to review and concur that condition #1 and #2 have been met. If your licensed engineer cannot make this assurance, develop a plan in coordination with your engineer to meet conditions no later than April 15, 2024. Submit this plan to DNRC for review and concurrence.
2. Update your emergency action plan and submit to DNRC and the county for review and concurrence.
3. Develop an updated operation and maintenance plan for the dam in coordination with your engineer.
4. Complete and document your 2023 annual owner inspection.

Failure to do so will result in the cancelation of your Operating Permit, which may include the following:

1. DNRC will notify downstream residents and elected county officials of the hazards posed by your dam and your failure to promptly act to mitigate those hazards.
2. DNRC may use our authority under ARM 36.14.703 and MCA 85-15-215 to hire a contractor to complete required work. All costs incurred by DNRC in taking this action must be paid by the owners of the dam, per MCA 85-15-215 (2).
3. DNRC may order a reservoir storage restriction, or the reservoir drained until measures are taken to assure the dam poses an acceptable level of risk to the downstream public.

Pursuant to MCA 85-15-503, dam owners may be subject to a civil penalty of up to $1,000.00 per day for noncompliance with the Dam Safety Act and associated regulations, including operation of a regulated dam or reservoir without an Operating Permit.

If you have already satisfied the conditions and requirements of your operating permit, please provide us appropriate documentation.

Looking forward to your prompt attention to these matters.

Michele Lemieux, PE
DNRC Dam Safety Section Supervisor
mlemieux@mt.gov; 406-444-6613

Attachments

C: Lewis & Clark County DES
DNRC Legal Counsel
Peri Turk, EI, DNRC Helena Regional Office Engineer
John Connors, PE, DNRC Water Operations Bureau Chief
Brent Zundel, PE DNRC Regional Engineer Supervisor

RECEIVED
APR 07 2022
DNRC
Bozeman Water Resources

High Hazard Dam Owner's Plan to Meet Engineer's Report Recommendations

*To be signed by dam owner and submitted to DNRC along with engineer's inspection report within 90 days of inspection.

Dam Name: Three Mile **Inspection Date:** 10/20/2021

Dam Owner: Grant Williams Operated by Darcy Aim, William Gehring et al

Dam Inspection

Engineer's Recommendation	Recommended Completion Date	Owner's Plan to Address Engineer's Recommendation	Date to be Completed
Repair Gate Valve Operating System	Prior to next use	Investigate repairs needed and complete	Spring 2022
Vegetation Removal for crest, Downstream Face and Toe areas remove brush with stalk diameter of 2" or less.	2022	remove brush as recommended	Fall 2022
remove roots of '22 cut brush cut down remaining, larger brush	2023	remove brush as recommended	Fall 2023

*The engineer shall deliver the report and discuss it with the owner within 60 days of the investigation. (ARM 36.14.601) Within 90 days of the inspection, the owner shall send a copy of the report to the Department, together with a statement of the owner's plans to repair or correct deficiencies or unsafe conditions identified by the report, and a time schedule to complete the actions. (ARM 36.14.601)

Dam Inspection

Engineer's Recommendation	Recommended Completion Date	Owner's Plan to Address Engineer's Recommendation	Date to be Completed
remove roots of '23 cut brush Cut down trees and remove roots. Backfill and compact as necessary plant suitable grass	2024	complete as recommended	Fall 2024
control brush growth	ongoing	control brush growth	ongoing

Operation and Maintenance Manual Review

Engineer's Recommendation	Recommended Completion Date	Owner's Plan to Address Engineer's Recommendation	Date to be Completed
Update SOP to reflect ownership changes	ASAP	find and update	?

Emergency Action Plan Review

Engineer's Recommendation	Recommended Completion Date	Owner's Plan to Address Engineer's Recommendation	Date to be Completed
update contacts, phone numbers and addresses	ASAP	updated	complete

General Comments

By signing this document, you agree to diligently pursue remedies to your engineer's recommendations.

Signature – Dam Owner: Operator _____ **Date:** 3/28/22

William Gehring 4-04-22

wood.

Wood Environment & Infrastructure Solutions, Inc.
825 Great Northern Boulevard, Suite 304
Helena, Montana 59601
USA
T: 406-448-0860
www.woodplc.com

January 27, 2022

Ms. Darcy Alm
5845 Birdseye Road
Helena, MT 59602

Three Mile Creek Dam
Lewis and Clark County
Five-Year Inspection Report (Final)

Dear Ms. Alm,

Attached please find the Final Dam Safety Inspection Draft Report for the Three Mile Creek Dam. The dam is classified as a High Hazard Dam by the Montana Department of Natural Resources and Conservation (DNRC). As such, according to the Administrative Rules of Montana (ARM 36.14.602), owners of high hazard dams must conduct inspections over no more than a 5-year period. The following report is intended to satisfy this requirement. A draft report dated December 17, 2021, was submitted to DNRC Dam Safety for their review. This final report incorporates their comments. A copy of this report is also being sent to DNRC.

A field inspection was conducted on October 20, 2021, accompanied by you and Bill Gehring, Brent Zundel of DNRC, and Wood engineers, Joe Souther and Randy Huffsmith. During the inspection, it was evident that many of the recommendations from the previous 5-year inspection had not been implemented. As such, the inspection was limited due to the heavy vegetation which has continued to grow on the upstream and downstream slopes of the dam. In addition, the inspection revealed that the wheel connection to the operator (gate valve handle) is broken in 5 of 6 locations.

Based on the inspection, there are two primary recommendations that should be implemented as soon as possible. These are removal and management of nuisance vegetation and repair of the gate valve operating system. Wood can work with you to implement the recommendations in order to remain in compliance with the DNRC rules.

DNRC requires that an owner prepare a "High Hazard Dam Owner's Plan". We have prepared and partially competed the Plan; it has been sent to you under separate cover. Please complete, sign the Form and submit to DNRC by mail or email to the attention of Brent Zundell. Once DNRC has the final report and owner's plan, they have 90 days to issue the operation permit.

Respectfully Submitted,
Wood Environment & Infrastructure Solutions, Inc.

MONTANA
JOSEPH T. SOUTHER
1/27/22
No. 12014 PE
REGISTERED PROFESSIONAL ENGINEER

J. T. Souther

Joseph T. Souther, P.E.
Senior Geotechnical Engineer

Randy L. Huffsmith, P.E., BCEE
Vice President

Three Mile Creek Dam
Lewis and Clark County
Five-Year Inspection Report (Final)
January 27, 2022

1. Introduction

Three Mile Creek Dam, on the Hardie Ranch northeast of Helena, has been classified as a High Hazard Dam by the Montana Department of Natural Resources and Conservation (DNRC). The classification is based entirely on the hazard the dam could impose on lives downstream of the dam. High Hazard Dams are required to be inspected by an engineer at least once every five years. The dam is an earth-fill dam about 63 feet high and the crest is about 450 feet long. This report describes the 2021 inspection and provides recommendations for maintenance and operation. A site location map (Figure 1) is presented in Appendix A.

2. Review and Analysis

2.1 Past Reports

Reports reviewed for this inspection report included the following:

- Bondy, Richard L., P.E. 2017. *Three Mile Creek Dam, Five-Year Inspection*, February 2.
- Hardie Brothers Ranch, 1990. *Standard Operating Procedures, Three Mile Creek Dam*, William and Maurice Hardie, October.
- Hardie Brothers Ranch, 2007-2012. *Dam Owners Emergency Action Plan Audit Checklists*, Bill Hardie.
- Montana DNRC, 2002. *Three Mile Dam Spillway Assessment*, Terry Voeller, January 2.
- Montana DNRC, 2019. *Emergency Action Plan, Three Mile Dam*, June 18.
- Montana Tech, 2007. *Three Mile Dam Stability & Seepage Analysis*, Sara Morrison et al., December 3.

2.2 Standard Operating Procedures

The SOP (Hardie Brothers Ranch, 1990) should be updated to reflect the current owner and operator of the dam. The seepage monitoring, and operating and maintenance logs should be maintained.

2.3 Emergency Action Plan (EAP)

A recent EAP (MT DNRC, 2019) and EAP Audit checklists (Hardie Brothers Ranch, 2007-2012) were reviewed. They require updates to contact phone numbers and addresses. New adjacent landowners should also be included. A recent map of downstream owners (Figure 2) is presented in Appendix A.

2.4 Instrumentation

There is no instrumentation on the Three Mile Dam.

2.5 Owner's Inspection Procedures

No owner's inspection reports were provided.

2.6 Reservoir Operation

No reservoir operation elevations were provided.

2.6.1 Benchmark

The previous inspection found a benchmark pin on the downstream side of the dam crest to the left of the spillway. This benchmark was not found during the current inspection.

2.6.2 Reservoir level measuring pin

No reservoir level measuring pins were located, as such the reservoir level cannot be determined. The reservoir has an estimated storage capacity of 150 acre-feet at the top of the dam and 84 acre-feet at the spillway crest. (MT DNRC, 2002)

2.7 Evaluation of General Conditions

2.7.1 Embankment

Three Mile Dam was originally a railroad embankment built in the late 1800s to transport mining equipment and ore between Helena and Marysville. The embankment is believed to be filled with borrow material brought in by horses from the surrounding area. The embankment fill was probably compacted only by the horses and later the railroad traffic. A culvert was installed in the embankment to convey Three Mile Creek (MT Tech, 2007). Between 1965 and 1980, the culvert was blocked and the railroad embankment was converted to a dam to store water from Three Mile Creek for irrigation (Jim Beck, 2007 ref. in MT Tech, 2007).

The main issue with the embankment during its use as a dam is heavy vegetation that has been allowed to grow on the upstream and downstream slopes. This heavy vegetation both compromises the integrity of the slopes and prevents observation of potential issues such as slumping erosion and seepage.

Embankment Stability

The only stability analysis of the embankment was conducted by Montana Tech as an undergraduate research project. (MT Tech, 2007). This analysis, based on limited soil and groundwater data, found that the static stability of the embankment varied from about 1.25 to 1.50. These values are at the lower range recommended by DNRC.

The seismic stability factors of safety for horizontal ground accelerations ranging from 0.1 to 0.3 g were calculated to be less than 1.0, meaning that the dam could fail if the reservoir is full during a design earthquake. However, this calculation is based on conservative estimates of the dam's soil strength.

Further investigations were recommended to determine the embankment soils and groundwater conditions and more accurately evaluate the embankment’s static and seismic stability.

According to the last inspection (Bondy, 2017), sudden drawdown would only be a concern if the bulkhead in the outlet tunnel failed catastrophically. The relatively small outlet works (12-in. diameter) are thought to be incapable of drawing the reservoir down rapidly enough to create stability issues on the upstream face of the dam. Furthermore, the apparent high permeability of the embankment soils reduce the likelihood of a rapid drawdown failure. On the other hand, the steep upstream slope was thought to increase the risk. MT Tech (MT Tech, 2007) did not evaluate a rapid drawdown condition.

Piping

There has been no formal analysis of piping potential through the dam. Due to the granular soils, the high seepage rates through the dam, and the large vegetation on both dam faces, piping is a possibility.

Crest Elevation

The crest is slightly lower at the deepest section of the dam than at either end, possibly due to poor initial compaction. The dam may have settled under the weight of the fill and the passage of heavy rail cars over the dam. To the right of the center of the dam, the crest curves slightly in the downstream direction (toward the east.) At the east end of the curve, the crest slopes up. The alignment was probably designed to conform to the railroad grade south of the dam.

2.7.2 Low Level Outlet Hydraulic and Structural Adequacy

History

The low-level outlet was installed in the conduit installed in the original fill for a railroad. During conversion of the railroad embankment into a dam a wood timber bulkhead was placed in the culvert at or near its upstream end (refer to description in Section 7.1).

Description
The outlet works consist of a valve and pipe system installed within a 6-ft high cast-in-place concrete arch conduit through the dam. The valve and pipe system is attached to a timber bulkhead at or near the upstream end of the large culvert. The bulkhead is penetrated by three pipes, the one (12-in. diameter) used as the outlet works and two others (4-in. and 7-in. diameter) that have been abandoned. All three pipes have gate valves just downstream of the bulkhead. The valve for the primary outlet pipe is operated from the downstream end of the tunnel using a cable and pulley system. Operation of the other two valves can only be done at the valves at the upper end of the large outlet conduit. Since the outlet works cannot be operated except by access in the conduit, consideration should be made to install a gate valve that can be operated from the top of the dam.

2.7.3 Primary Spillway

Structural Adequacy of Primary Spillway
The spillway is an excavated channel in the left abutment adjacent to the dam. The base of the spillway is into bedrock, a weathered shale. The shale has eroded during past flows through the spillway, and the erosion has been patched with concrete along a portion of the right side and floor of the spillway. This erosion will probably continue to occur, so patching will be a continuing maintenance need.

Spillway Hydraulic Adequacy
A hydraulic assessment of the spillway and loss of life evaluation were conducted by DNRC (MT DNRC, 2002). An assessment follows.

The reservoir has an estimated storage capacity of 150 acre-feet at the top of the dam and 84 acre-feet at the spillway crest (normal operating level). The 66 acre-feet of storage above the spillway crest is insignificant compared to the estimated flood flow during the regulatory storm, which is a 2,000-year flood. The calculated peak flow through the spillway during a 2,000-year flood is 1,850 cfs. The calculated capacity of the spillway is 2,600 cfs. For the design flow of 1,850 cfs, the reservoir reaches 2.5 feet below the top of the dam.

Although, this evaluation has not been updated, the basis and data used for the analysis has not substantially changed enough to warrant a new analysis. The spillway (2,600 cfs capacity) remains capable of accommodating the 2,000-year flood event (1,850 cfs).

Loss of Life Prediction
The loss of life prediction was based on the house downstream of the dam (MT DNRC, 2002). Using the standard method, the predicted loss of life is two (2) people. This results in a spillway capacity requirement of a 2000-year flood, or a flood that has a 0.05% chance of occurring each year.

2.7.4 Right Abutment Spillway

A low area exists near the right (south) end of the dam. Any flows passing over this low area would be directed into a channel in the right abutment. However, since the "low area" is higher than the dam crest, at its present elevation it is not an effective deterrent to a flood induced dam failure.

3. Inspection

A field inspection was conducted on October 20, 2021, accompanied by Darcy Alm and Bill Gehring, operator and water users, Brent Zundel of DNRC, and Wood engineers, Joe Souther and Randy Huffsmith. It should be noted that the inspection was limited due to the heavy vegetation which has continued to grow on the upstream and downstream slopes of the dam. The inspection included the embankment, the area immediately downstream of the dam, the spillway, the abutments, and the outlet works. These areas were inspected by walking over both abutments, the downstream face of the dam, and along the crest, walking up the outlet tunnel with Mr. Zundel, and walking up and down the spillway. The upstream face was observed from the crest and from the north shore of the reservoir. A visual inspection of the reservoir area was also conducted, but primarily from the top of the dam.

A summary of the inspection is presented in DNRC Form “Dam Safety Inspection Report” (Appendix B). Representative photos are presented in Appendix C. Recommendations and concerns were discussed with the operator, Darcy Alm.

3.1 Embankment

3.1.1 Vegetation

As noted in the last inspection (Bondy, 2017) there is heavy vegetation on the upstream and downstream embankment slopes. The vegetation includes brush and mature trees. The vegetation severely limited the ability to observe the embankment slopes.

3.1.2 Upstream Slope Protection

There is no slope protection on the upstream face. The thick vegetation may be providing protection. Observing any slumping and settlement was limited by the vegetation.

3.1.3 Downstream Slope

The downstream slope is irregular, probably due to original construction methods. Observing any slumping and settlement was limited by the vegetation.

Surface irregularities
The downstream slope is irregular, probably due primarily to original construction methods. However, settlement was observed in the left groin seepage area possibly due to damp soil conditions. There are also some surface irregularities near the middle of the upstream face that appear to be caused by animal and human traffic.

Animal Burrows
Animal burrows were observed on the embankment. Especially in the left groin seepage area.

Seepage
The left groin was observed to be damp and grass covered. However, seepage flow was not observed in the drainpipe. Seepage was noted in this area in the last inspection.

Traffic Damage
There are a few trails on the embankment that have been created by pedestrians and animals. These trails did not appear to be a serious issue, but they should be checked during annual and high reservoir inspections.

3.2 Reservoir

No irregularities were observed along the banks of the reservoir. The far upstream end was not visible from the observation points.

3.3 Outlet Conduit

The cast-in-place concrete tunnel is about 200 feet long (SOP, Oct. 1990 and Nov. 2021 field observation). Cracking was observed on about the lower third of the walls (probably where most of the flow occurs). Cracking was observed around entire tunnel at 79 ft from the entrance. Spalling was observed on walls at about 58 ft and 72 ft from the tunnel entrance. From about 100 feet to 200 feet (tunnel end) spalling is more frequent in the lower walls. The concrete lining on lower third of tunnel has eroded due to water flow. A prominent hole was observed at 125 ft. Minor leakage was observed toward tunnel end (200 ft). Calcium deposits were observed on the wall at 103 ft and 100 ft, then occasionally to tunnel end (200 ft). No obvious signs of displacement were observed. Sediment on tunnel bottom 0 to 12 inches thick.

3.4 Gate Valve and Operating System

There is no access to the outlet works except through the conduit. The gate valve for the primary outlet 12-in. diameter pipe is operated from the downstream end of the tunnel using a cable and pulley system. The system was operated and observed. The valve appears to be operating properly, however, the wheel connection to operator (gate valve handle) has broken in 5 of 6 locations. Repairs should be made prior to the next operation. Water was observed leaking around the valve stem. The valve housing is rusty and encrusted with corrosion. The gate valve leaks in the closed position; flow is estimated at 1 to 2 gpm. Two abandoned outlet pipes are 4-in and 7-in. diameter.

3.5 Spillway Concrete and Rock Foundation

The spillway Is somewhat protected from erosion by thin, unfinished concrete over much of the right half of the spillway and by bedrock under most of the rest of the spillway. There is considerable vegetation along the right edge of the spillway as it passes through the embankment. This protection is prone to erosion by high velocity flows that can occur in the spillway.

3.6 Downstream development

The last inspection (Bondy, 2017) identified three classes of development downstream of the dam that could affect the hazard designation.

- A house about 1/4-mile downstream of the dam formerly occupied by the brother of the dam owner. This house has recently been abandoned and is now used only for storage. The owner is planning to remove the house, but it was being used for storage at the time of the inspection.
- Birdseye Road, about 1/4-mile downstream of the dam. This is a paved road and would influence the hazard designation. An analysis of this influence is not included in any of the previous reports nor was one performed as a part of this inspection.
- Other houses. There is one house about 1/4-mile downstream of the dam that is apparently above the water surface elevation of a dam failure caused flood since it was not included in Spillway Assessment (DNRC, 2002). Another house that looks fairly new is about 3/4-mile downstream of the dam. It appears to be higher than the other house described in this paragraph, but access to the house could be impassable if a large flood occurs. From this house, it is several miles to the next possibly affected house, which is located along Silver Creek near the Lincoln Road in the northern Helena valley.

4. Recommendations

There are two (2) primary recommendations that should be implemented as soon as possible. The other important recommendations should be accomplished during the course of operation or when the primary tasks are completed. The primary recommendations are repair of the gate valve operating system, and removal and management of vegetation.

4.1 Repair Gate Valve Operating System

- Repair the wheel connection to the operator (gate valve handle) which is broken in 5 of 6 locations. Make repairs prior to the next operation.
- Since the conduit is a confined space, we recommend that a minimum of two people be onsite during outlet works operation, repairs or maintenance. One of these people should remain at the outside of the conduit to affect retrieval and call emergency services, if required.

4.2 Remove and Manage Vegetation

- Remove brush and trees on crest, downstream face and toe area below the dam in accordance with the plan described below.
- Remove brush on upstream face of dam in accordance with the plan described below.

4.3 Vegetation Removal Plan for Crest, Downstream Face and Toe areas

Year	Task
2021-2022	Cut off, near the ground, all brush that has a stalk diameter of two (2) inches or less.
2023	Cut off, a few inches from the ground, all other brush. Remove roots next year.
2024	Cut down all trees and remove the roots. Remove brush roots from the prior year. Install compacted fill in all areas where roots where removed. The fill must be at least as permeable as the soil beneath the fill, and testing may be needed to determine the permeability of both materials. Plant suitable grass on all disturbed areas. In areas of high seepage, other stabilization methods may be required.
2025+	Control brush growth on dam annually.

Notes:

Conduct plan on the crest, downstream dam face, and downstream toe area to about one-half of the height of the dam.

Remove or chip brush and trees that are cut down.

4.4 Vegetation Control Plan for Upstream Face

Past inspections have noted that the vegetation on the upstream face may be providing valuable slope protection. Since there is no other slope protection on the upstream face, and there is also no sign of significant erosion on the upstream face. Therefore, it is reasonable to conclude that the vegetation is indeed providing slope protection.

However, the brush is now so thick that inspection of the upstream face is impossible. A plan would be to first remove dead vegetation. Then remove very large brush or trees of any size over a period of time, depending on whether there is other vegetation offering erosion protection of the area.

4.5 Embankment

4.5.1 Inspect and Monitor

- When the vegetation removal allows, inspect the embankment, abutments, and toe area for seepage, depressions, and slumps next time the reservoir is nearly full. Repeat these inspections every year when the reservoir level is at or near its maximum level for the year. Monitor these areas weekly during high reservoir levels and annually during the owner inspections. Also repeat the inspection soon after the reservoir first begins to drop if the reservoir has been high for an extended period (two weeks or more.) Record the inspection findings.
- Monitor the apparent animal trail near the middle of the downstream during high reservoir levels and during normal inspections. Monitor other trails during annual inspections.
- Monitor and assess animal burrows. Determine if they should be removed and repaired when the tree roots are removed, and the downstream face is repaired.
- Re-position the pipe leading from the seepage area in the left groin so that it picks up more of the seepage flows. Route the downstream end into a system where flows can be easily measured. Once this is done, measure and record seepage flow each time the seepage areas are inspected, especially when the reservoir level is high.
- Inspect all seepage areas daily whenever the reservoir is within one foot of elevation of the spillway crest. Monitor and photograph these areas.

- The bare areas near the top of the embankment on both the upstream and downstream sides should be watched regularly whenever the reservoir rises to an elevation that is during each inspection. These areas are near the seepage area on the left side of the dam.

4.6 Outlet Works

- Next time the reservoir is empty, inspect the upstream end of the outlet works including the bulkhead and the outlet tunnel. Minimize the time the bulkhead is dry by planning the inspection when significant rain is predicted. Keep the bulkhead wet at all times with a pump, hose, and sprinkler or similar setup. Record the inspection findings.
- Access to the outlet works can only be done in the conduit, which is a confined space, and the gate valve was observed to leak. As such, during the next period of maintenance of the outlet works, it is strongly recommended that the gate valve be replaced with a new one that can be operated from the top of the dam.

4.7 Spillway

- The annual owner inspection should include a careful inspection of the spillway protection system. Any needed repairs should be made prior to spring runoff.
- Inspect the spillway after each spillway flow. Needed repairs should be made quickly in case the reservoir overtops the spillway again that season.
- Repair, add to, and modify the spillway concrete as necessary annually and after each use of the spillway.
- Observe and document every spillway operation.
- Maintain an observer with a cell phone at the dam continuously whenever the spillway is operating. Observations should include frequent checks for:
    - Spillway erosion, particularly at the upper end of the spillway where it passes through the dam.
    - Muddy water in seepage coming through the dam.
    - Muddy water near the downstream toe of the embankment. Slumps and slides of any part of the embankment.

4.8 Reservoir Level Measurement System and Elevation Marker

A common system for determining the reservoir surface elevation is a pin at the upstream crest of the dam that has a known elevation and a straight, clear path directly to the reservoir. The elevation of the pin may be assumed, but next time a surveyor is at the project, the elevation should be determined by a survey from a nearby benchmark or with a survey grade GPS. From the pin, a tape is run down the upstream face directly to the reservoir water surface, and the distance is recorded. A table can be developed that relates slope measurements to reservoir surface elevation.

4.9 Standard Operating Procedures

The SOP (Hardie Brothers Ranch, 1990) should be updated to reflect the current owner and operator of the dam. The seepage monitoring, operating and maintenance logs should be maintained.

4.10 Emergency Action Plan

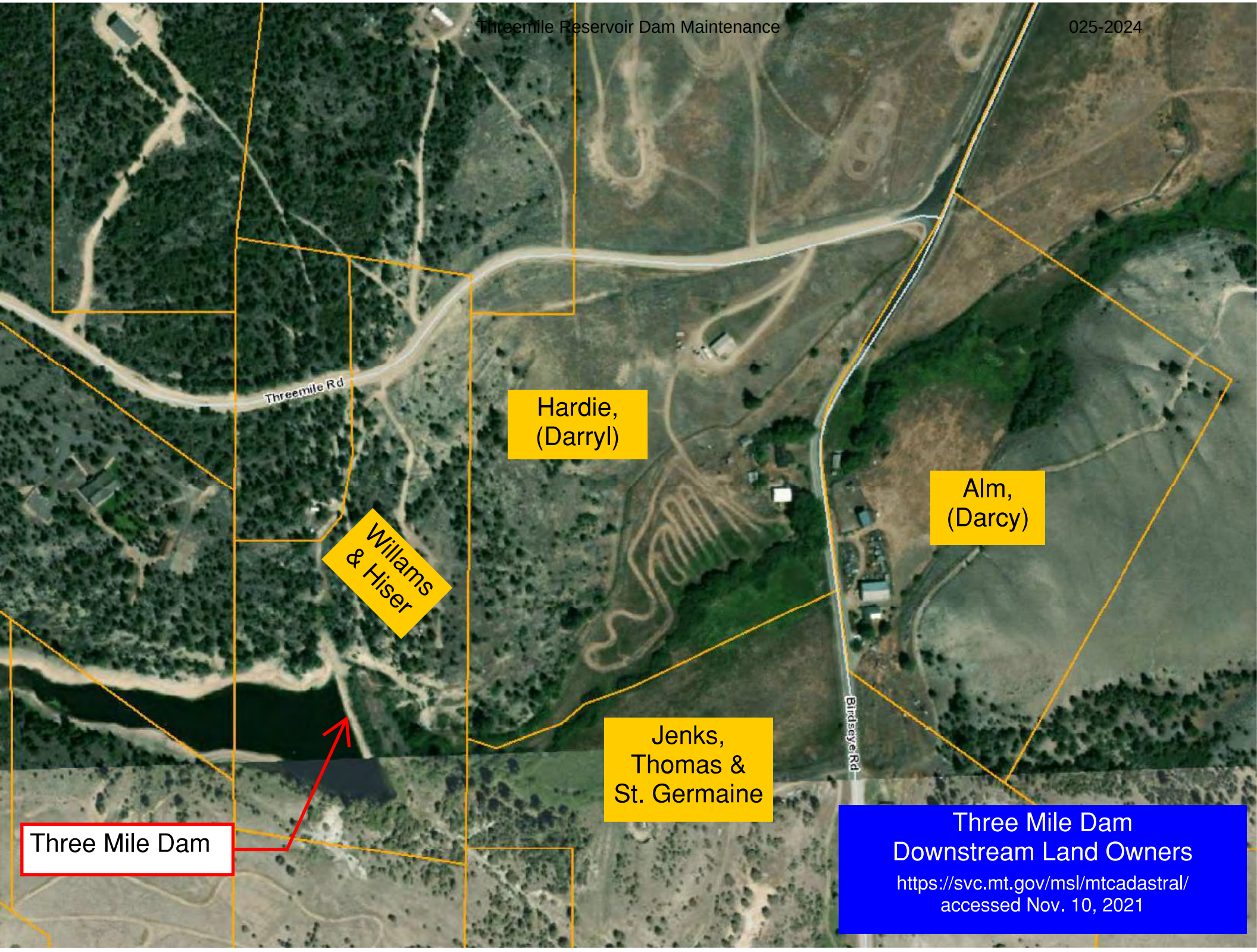
The EAP and audit checklists require updates to contact phone numbers and addresses. New adjacent landowners should also be included.

Appendix A

Three Mile Creek Dam

Location Map. Google Earth July 2014

Figure 1
Three Mile Creek Dam
Lewis and Clark County, Mont.


Threemile Rd
Hardie,
(Darryl)
Alm,
(Darcy)
Willams
& Hiser
Jenks,
Thomas &
St. Germaine
Birdseye Rd
Three Mile Dam
Three Mile Dam
Downstream Land Owners
https://svc.mt.gov/msl/mtcadastral/
accessed Nov. 10, 2021

Appendix B

DAM SAFETY INSPECTION REPORT
NAME OF DAM: Three Mile Creek
DATE: Oct. 20, 2021

Dam Inspected By: Joe Souther & Randy Huffsmith (Wood), Brent Zundel, DNRC

Owner Representative: Darcy Alm

Weather: Overcast 35-55 deg.

Inventory No:
Hazard Category: High
Type of Dam: Earthfill
Year Built: varies
Year Rehabilitated: N/A

Owner:
Operator: Darcy Alm
Stream(s): Three Mile Creek
Drainage Area: 5.63 mi^2 (DNRC, 2002)

RESERVOIR STORAGE STATUS		
	Water Surface Elevation (feet)	Storage (acre-feet)
At Time of Inspection:	8.05 ft below spillway crest	unknown
At Spillway Crest:		84 (from previous reports)
At min. Dam Crest Elevation:		

1. Embankment

A. Crest

Height: 63 ft Width: 8+/- ft

Length: 450 ft Surface: Soil, rock, vegetation

#	ITEM	YES	NO	REMARKS
1	Settlement	☒	☐	Left crest is 20+/- ft above spillway crest. Dam at mid-crest is 5.4+/- ft below left crest.
2	Misalignment	☐	☐	Unknown
3	Transverse Cracking	☐	☐	Not observed
4	Longitudinal Cracking	☐	☐	Not observed
5	Traffic or Roadway Damage	☐	☐	Not observed
6	Animal Damage	☐	☐	Not observed
7	Erosion	☐	☐	Not observed
8	Nuisance Vegetation	☒	☐	Sagebrush, low bushes
9	Other	☐	☐	

B. Upstream Face

Upper Slope Ratio: 2.1H:1V (MT Tech, 2007) Lower Slope Ratio:

#	ITEM	YES	NO	REMARKS
1	Erosion	☐	☐	Unable to observe due to vegetation cover
2	Longitudinal Cracks	☐	☐	Unable to observe due to vegetation cover
3	Transverse Cracks	☐	☐	Unable to observe due to vegetation cover
4	Adequate Riprap Protection	☐	☐	No rip rap observed
5	Riprap Deterioration	☐	☐	N/A
6	Settlement/Depressions	☐	☐	Unable to observe due to vegetation cover
7	Slumps/Sloughs	☐	☐	Unable to observe due to vegetation cover
8	Nuisance Vegetation	☒	☐	Heavily covered with willows and brush especially on the lower 2/3 of the slope
9	Animal Damage	☐	☐	Unable to observe due to vegetation cover
10	Debris	☒	☐	Minor pieces of debris from reservoir flotsam
11	Other	☐	☐	

C. Downstream Face

Slope Ratio: 1.8H:1V (MT Tech, 2007)

#	ITEM	YES	NO	REMARKS
1	Erosion	☐	☐	Unable to observe due to vegetation cover
2	Longitudinal Cracks	☐	☐	Unable to observe due to vegetation cover
3	Transverse Cracks	☐	☐	Unable to observe due to vegetation cover
4	Settlement/Depressions	☐	☐	Unable to observe due to vegetation cover
5	Slumps/Sloughs	☐	☐	Unable to observe due to vegetation cover
6	Seepage	☒	☐	The left groin was observed to be damp and grass covered. No seepage flow was observed in the drainpipe.

7	Adequate Vegetation Cover	☐	☒	Minimal grass cover due to extensive vegetation (trees and bushes).
8	Nuisance Vegetation	☒	☐	Heavily covered with trees, willows and brush
9	Animal Damage	☒	☐	Numerous animal borrows observed especially on the left groin and lower slope face.
10	Debris	☐	☒	
11	Other	☐	☐	

2. Abutment and Toe

A. Downstream Toe

#	ITEM	YES	NO	REMARKS
1	Seepage	☒	☐	
2	Depressions/Bulges	☐	☒	
3	Boils	☐	☒	
4	Toe Drain in Good Condition	☐	☐	N/A
5	Toe Drain Flowing	☐	☐	N/A
6	Relief Wells Flowing	☐	☐	N/A
7	Erosion	☐	☒	
8	Animal Damage	☒	☐	Numerous animal borrows observed especially on the left groin.
9	Nuisance Vegetation	☒	☐	Heavily covered with trees, willows and brush.
10	Other	☐	☐	

B. Upstream Abutment

#	ITEM	YES	NO	REMARKS
1	Erosion	☐	☒	
2	Cracking	☐	☒	
3	Slides/Depressions	☐	☒	
4	Sinkholes	☐	☒	
5	Nuisance Vegetation	☒	☐	Heavily covered with trees, willows and brush.
6	Animal Damage	☐	☒	
7	Debris	☐	☒	
8	Other	☐	☐	

C. Downstream Abutment

#	ITEM	YES	NO	REMARKS
1	Erosion	☐	☐	Unable to observe due to vegetation cover
2	Cracking	☐	☐	Unable to observe due to vegetation cover
3	Slides/Depressions	☐	☐	Unable to observe due to vegetation cover
4	Seepage	☒	☐	The left groin was observed to be damp and grass covered. No seepage flow was observed in the drainpipe.
5	Drains Flowing	☐	☒	Seepage not observed in the drainpipe.
6	Nuisance Vegetation	☒	☐	Heavily covered with trees, willows and brush.

7	Animal Damage	☒	☐	Numerous animal borrows observed especially on the left groin.
8	Debris	☐	☒	
9	Other	☐	☐	

3. Outlet Works

Location: Mid-dam Maximum Discharge: 8 cfs (per previous reports)

A. Intake Structure

Visible: No Date Last Inspected: unknown Type: unknown

#	ITEM	YES	NO	REMARKS
1	Settlement	☐	☐	Intake Structure is inaccessible and was not observed.
2	Concrete Cracking	☐	☐	
3	Concrete Spalling	☐	☐	
4	Concrete Erosion	☐	☐	
5	Exposed Reinforcement	☐	☐	
6	Joint Displacement	☐	☐	
7	Problems with Trash Rack	☐	☐	
8	Corrosion of Trash Rack	☐	☐	
9	Erosion Around Intake	☐	☐	
10	Deposition Around Intake	☐	☐	
11	Other	☐	☐	

B. Upstream Conduit

Accessible: No Type: unknown Size: unknown

#	ITEM	YES	NO	REMARKS
1	Concrete Cracking	☐	☐	Upstream conduit is inaccessible and was not observed.
2	Concrete Spalling	☐	☐	
3	Concrete Erosion	☐	☐	
4	Exposed Reinforcement	☐	☐	
5	Joint Displacement	☐	☐	
6	Loss of Joint Material	☐	☐	
7	Open Joints or Holes in the Wall	☐	☐	
8	Leakage	☐	☐	
9	Calcium Deposits	☐	☐	
10	Corrosion of Metal	☐	☐	
11	Wear of Protective Coatings	☐	☐	
12	Misalignment of Conduit	☐	☐	
13	Material Deposition	☐	☐	
14	Other	☐	☐	

C. Downstream Conduit

Accessible: Yes Type: Concrete masonry Size: 6 ft arch tunnel

#	ITEM	YES	NO	REMARKS
1	Concrete Cracking	☒	☐	Cracking observed on about the lower third of the walls (probably where most of the flow occurs). Cracking observed around entire tunnel at 79 ft from entrance.
2	Concrete Spalling	☒	☐	Spalling observed on walls at about 58 ft and 72 ft from the tunnel entrance. From about 100 feet to 200 feet (tunnel end) spalling is more frequent in the lower walls.
3	Concrete Erosion	☒	☐	Concrete lining on lower third of tunnel has eroded due to water flow.
4	Exposed Reinforcement	☐	☒	
5	Joint Displacement	☐	☒	
6	Loss of Joint Material	☐	☒	
7	Open Joints or Holes in the Wall	☒	☐	Prominent hole at 125 ft
8	Leakage	☒	☐	Minor leakage observed toward tunnel end (200 ft).
9	Calcium Deposits	☒	☐	On wall at 103 ft and 100 ft, then occasionally to tunnel end (200 ft)
10	Corrosion of Metal	☐	☒	N/A
11	Wear of Protective Coatings	☐	☒	N/A
12	Misalignment of Conduit	☐	☒	No obvious signs of displacement
13	Material Deposition	☒	☐	Sediment on tunnel bottom 0 to 12 inches thick. Believed to be from outlet water.
14	Other (Notes)	☐	☐	Conduit tunnel is about 200 feet long (SOP, Oct. 1990) and Nov. 2021 field observation.

D. Operating Gate

Inspected current year: yes Type: Gate Valve

Not inspected current year: no Size: 12 in.

Stem, pre-inspected, in.: Stem, during inspection, in.:

Stem, during guard gate operation, in.: Stem, post-inspection, in.:

#	ITEM	YES	NO	REMARKS
1	Operator Operational	☒	☐	The valve for the primary outlet pipe is operated from the downstream end of the tunnel using a cable and pulley system. The wheel connection to operator (valve handle) has broken in 5 of 6 locations. Requires immediate repair.
2	Operator Lubricated	☒	☐	
3	Stem in Good Condition	☐	☒	Water observed to leak around stem.
4	Gate Housing in Good Condition	☐	☒	Housing is rusty and encrusted with corrosion.

5	Leakage from Flanges	☐	☐	unknown
6	Leakage from Cylinder	☐	☐	unknown
7	Leakage from Gate	☒	☐	In closed position flow occurs. Estimate 1-2 gpm.
8	Gate Leaf in Good Condition	☐	☒	Gate valve leaks in closed position.
9	Air Vent in Good Condition	☐	☐	unknown
10	Cavitation Damage	☐	☒	
11	Other	☐	☐	Two abandoned outlet pipes are 4-in and 7-in. diam.

E. Outlet and Stilling Basin

Type: Excavated Rock Dewatered for inspection: Yes

#	ITEM	YES	NO	REMARKS
1	Concrete Cracking	☐	☐	N/A
2	Concrete Spalling	☐	☐	N/A
3	Concrete Erosion	☐	☐	N/A. Rock is competent but is eroded by the outlet flow.
4	Exposed Reinforcement	☐	☐	N/A
5	Exposed Water Stops	☐	☐	N/A
6	Displacement or Offset of Joints	☐	☐	N/A
7	Seepage	☐	☐	N/A
8	Debris	☐	☐	N/A
9	Riprap Protection Stable	☐	☐	N/A
10	Other	☐	☐	

F. Downstream Channel

Type: Excavated Rock with Headgate Dewatered for inspection: Yes

#	ITEM	YES	NO	REMARKS
1	Seepage	☐	☒	
2	Erosion	☒	☐	Rock is competent but is eroded by the outlet flow.
3	Riprap Protection Stable	☐	☐	N/A
4	Deterioration of Riprap	☐	☐	N/A
5	Nuisance Vegetation	☐	☒	
6	Debris	☐	☒	
7	Overtopping	☐	☐	N/A
8	Grade Problems	☐	☐	Unknown
9	Other	☐	☐	

4. Primary Spillway

Location: Left abutment
Operating: no
Type: Excavated channel
Maximum Discharge: 2,600 cfs (per DNRC, 2002)
At Res. El.: Dam crest

A. Approach Area

Visible During Inspection: yes

#	ITEM	YES	NO	REMARKS
1	Deposition/Debris	☒	☐	Minor erosion and rock debris.
2	Nuisance Vegetation	☒	☐	
3	Obstructions	☐	☒	
4	Other	☐	☐	

B. Downstream Channel

Accessible: yes
Width: 26 ft (DNRC, 2002)
Length: 213 ft (DNRC, 2002)

#	ITEM	YES	NO	REMARKS
1	Erosion	☒	☐	The spillway is an excavated channel in the left abutment adjacent to the dam. The base of the spillway is into weathered shale bedrock. The shale has eroded during past flows through the spillway, and the erosion has been patched with concrete along a portion of the spillway's right side and floor.
2	Nuisance Vegetation	☒	☐	Minor brush
3	Debris	☐	☒	
4	Seepage	☐	☒	
5	Notes	☐	☐	

5. Auxiliary Spillway

Location: Right abutment
Type: Excavated earth and rock
Maximum Discharge: N/A
At Res. El.:

A. Chute

#	ITEM	YES	NO	REMARKS
1	Description	☐	☐	A low area exists near the right (south) end of the dam. Based on visual inspection, its elevation is higher than the dam crest.
2	Settlement	☐	☐	
3	Excessive Crest Grade	☐	☐	
4	Nuisance Vegetation	☒	☐	
5	Obstructions	☐	☐	
6	Debris	☐	☐	
7	Other	☐	☐	

6. Reservoir Control

A. Development and Changes

#	ITEM	YES	NO	REMARKS
1	Recent Upstream Development	☐	☒	
2	Recent Downstream Development	☐	☒	
3	Slides in Reservoir Area	☐	☒	None observed
4	Changes in Basin Hydrology	☐	☐	Unknown
5	Change in Reservoir Operation	☐	☒	
6	Large Impoundment Upstream	☐	☒	
7	Significant Debris in Reservoir	☐	☒	
8	Other	☐	☐	

7. Downstream Condition

A. Downstream Land Use

Downstream development

1. A house about 1/4-mile downstream of the dam formerly occupied by the brother of the dam owner. This house appears to be used only for storage.

2. Birdseye Road, about 1/4-mile downstream of the dam. This is a paved county road.

3. Other houses. There is one house about 1/4-mile downstream of the dam that is apparently above the water surface elevation of a dam failure caused flood since it was not included in the "Three Mile Dam Spillway Assessment" report. Another house is about 3/4-mile downstream of the dam. It appears to be higher than the other house described in this paragraph, but access to the house could be impassable if a large flood occurs. From this house, it is several miles to the next possibly affected house, which is located along Silver Creek near the Lincoln Road in the northern Helena valley.

Appendix C

Three Mile Creek Dam Five-Year Inspection Photos Oct. 20, 2021

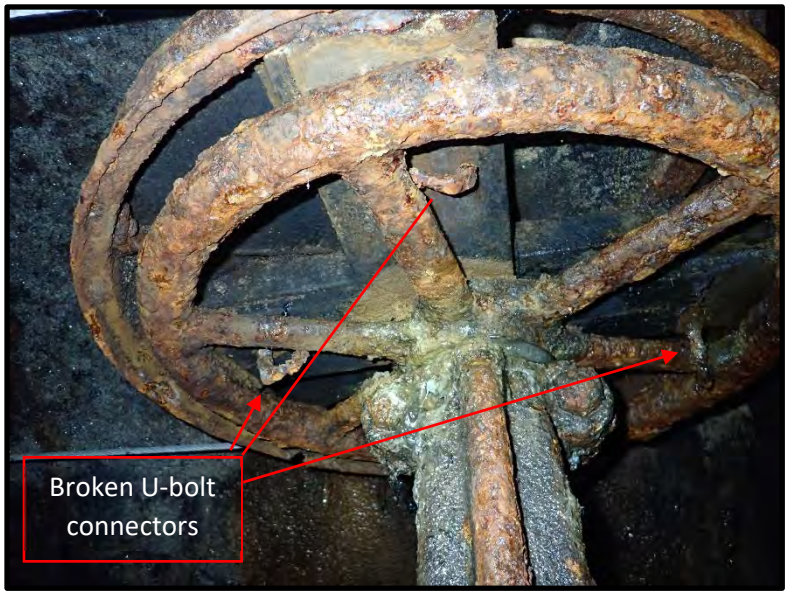
Seepage collection pipe on left groin.

Seepage pipe inlet

Conduit entrance, outlet pipe pulley and cable

Concrete spalling on conduit wall

Three Mile Creek Dam Five-Year Inspection Photos Oct. 20, 2021



Outlet Conduit near bulkhead showing cable and wheel on top of valve operator. Valve operator broken connections (5 of 6 are broken).

Outlet channel and irrigation headgate

Drainage pipe discharge into outlet channel

Three Mile Creek Dam Five-Year Inspection Photos Oct. 20, 2021

Primary spillway entrance

Primary spillway channel; concrete patching on right side

Primary spillway descends towards outlet channel

Auxiliary spillway location