EMERGENCY ACTION PLAN

BASIN CREEK DAMS #1 and #2

BUTTE-SILVER BOW DEPARTMENT OF PUBLIC WORKS WATER UTILITY DIVISION
124 WEST GRANITE STREET BUTTE, MONTANA 59703-0667
(406) 497-6540

January 8, 2019

If Basin Creek Dam #1 is failing or failure seems imminent, call:

Butte-Silver Bow County Sheriff.............................................911 or (406) 497-1120 Ext 1
Disaster and Emergency Services..........................................(406) 497-6295
Mr. Dan Dennehy .................................................................Home: (406) 565-0358
...............................................................................................Cel: (406) 490-5802
Mr. Mark Neary, Director of Public Works .........................Office: (406) 497-6519
...............................................................................................Home: (406) 782-2171
...............................................................................................Cel: (406) 498-5467
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I. INTRODUCTION

A. Purpose

The purpose of this emergency action plan (EAP) is primarily to safeguard the lives of and secondarily to reduce property damage to the citizens of Silver Bow County living in or near the city of Butte, along Basin Creek, Silver Bow Creek and the Clark Fork River in the event of flooding caused by a failure of Basin Creek Dam #1 and/or Basin Creek Dam #2

B. Description of Dam

**Basin Creek Dam #1** is in Silver Bow County, in Section 12, Township 1 North (T1N), Range 8 West (R8W), and located on Basin Creek, a tributary to Silver Bow Creek. It is owned by the Butte-Silver Bow Dept. of Public Works Water Utility Division, 124 West Granite Street, Butte, Montana 59701, and is used for municipal water supply for the Butte-Silver Bow area. Technical data pertaining to Basin Creek Dam #1 and its structures are shown in Appendix A.

**Basin Creek Dam #2** is in Silver Bow County, in section 18, Township 1 North (T1N), Range (R7W), and located on Basin Creek, a tributary to Silver Bow Creek. It is owned by the Butte-Silver Bow Dept. of Public Works Water Utility Division, 124 West Granite Street, Butte, Montana 59701, and is used for municipal water supply storage for the Butte-Silver Bow area. Technical data pertaining to Basin Creek Dam #2 and its structures are shown in Appendix A

C. Access to Dam

Basin Creek Dam #1 is located at the end of Basin Creek Road, about 10 miles south of Butte. Note that the county road may become flooded! The nearest telephone to the dams is at the old chlorinating building below the dam.
D. **Hazard Area**

The evacuation area extends along Basin Creek, portions of the city of Butte, along Silver Bow Creek, and portions of areas along the Clark Fork River to a point about three miles south-east of Garrison, MT, as shown in Appendix B. Hazards include the possible inundation of occupied dwellings, Montana Rail Link Railroad, and Interstate Highway 15/90. Inundation and evacuation maps are in Appendix B.

E. **Responsibility and Authority**

Pursuant to the Dam Safety Act, Chapter 15 of Title 85, MCA, the dam owner is responsible for production, coordination, maintenance, and implementation of this emergency action plan. The extent of owner implementation was defined through coordination of this plan with the county sheriff and the disaster and emergency services (DES) coordinator.

F. **Periodic Review/Update**

The owner will review/update this EAP annually. Review/update by a qualified professional engineer will be accomplished as required by the dam's operating permit, but no less than every five years.
G. Approval

By my signature, I acknowledge that I, or my representative, have reviewed this plan and agree to the tasks and responsibilities assigned herein for my department and/or agency.

______________________________
Signature                      Date

BUTTE-SILVER BOW CHIEF EXECUTIVE

______________________________
Signature                      Date

DISASTER AND EMERGENCY SERVICES

______________________________
Signature                      Date

BUTTE-SILVER BOW SHERIFF’S DEPARTMENT

______________________________
Signature                      Date

BUTTE-SILVER BOW FIRE CHIEF

______________________________
Signature                      Date

DEER LODGE COUNTY SHERIFF’S DEPARTMENT

______________________________
Signature                      Date

POWELL COUNTY SHERIFF’S DEPARTMENT
II. NOTIFICATION PROCEDURES

A. Imminent or Actual Failure

It is important that you accurately judge whether the dam is about to fail. If you aren't sure whether the dam is threatened, seek advice from a qualified engineer or call the Dam Safety Section of the Department of Natural Resources and Conservation (DNRC). If Basin Creek Dam #1 is failing, two things must be done immediately: (1) the hazard area downstream from the dam must be evacuated, and (2) any steps that might save the dam or reduce damage to the dam or hazard area downstream should be taken. (Refer to the map in Appendix B to determine the areas that are likely to be inundated if the dam fails). The evacuation will be handled according to the EAP and should be initiated as shown in Figure 1.
FIGURE 1
Basin Creek Dam #1 or #2
ACTUAL OR IMMINENT FAILURE"NOTIFICATION FLOWCHART"

EMERGENCY CONDITION

OBSERVER

Butte-Silver Bow County
SHERIFF
911 or (406) 497-1120 Ext. 1

LOCAL DES COORDINATOR
Dan Dennehy
Office: (406) 497-6295
Home: (406) 565-0358
Cel: (406) 490-5802

DEER LODGE COUNTY
SHERIFF
ANACONDA, MT
(406) 563-5241

Powell County Sheriff
Deer Lodge, MT
(406) 846-2711

DAM OWNER
Butte-Silver Bow
Department of Public Works
Water Utility Division
Director of Public Works
Mark Neary
Office: (406) 497-6519
Home: (406) 782-2171
Cel: (406) 498-4567

Dam Operators
Jim Dennehy
Office: (406) 723-9429
Cel: (406) 490-2491

Jim Keenan
Office: (406) 497-6596
Cel: (406) 475-4541

EVACUEES
(See telephone Directory Appendix C)

DNRC
Dam Safety Section
Bureau Chief – Water Ops.
Steve Story, PE
Office: (406) 444-6816
Cel: (406) 202-2728

Dam Safety Program Manager
Michele Lemieux, PE
Office: (406) 444-6613
Cel: (406) 459-3572

DNRC
National Weather Service
Missoula, MT
Office: (406) 329-4715
Info. (406) 329-4840

Regional Engineer
Currently Vacant
Office:
Home:
Cel:
As dam owner, it is your responsibility to:

1) Call the Sheriff's Dispatch Center 911 or [(406) 497-1120 Ext.1] and Disaster and Emergency Services [(406) 497-6295]. Be sure to say, "This is an emergency." They will call other authorities and the media and begin evacuation.

2) Do whatever is necessary to bring anyone in immediate danger to safety. This includes someone on the dam, directly below the dam, or boating on the reservoir, or evacuees if so directed by the sheriff.

3) Keep in frequent touch with Disaster and Emergency Services staff. They will provide non-technical advice on how to handle the emergency.

4) If all means of communication are lost:
   a. Try to find out why
   b. Try to get to another radio or telephone that works
   c. Get someone else to try to reestablish communications. If these means fail, handle the immediate problems as well as you can, and periodically try to reestablish contact with Disaster and Emergency Services.

B. Potentially Hazardous Situation

A potentially hazardous situation is an event or condition not normally encountered in the routine operation of the dam and reservoir. Among the unusual occurrences that may affect the dam are dam embankment problems, failure of the spillway or outlet works, heavy precipitation or rapid spring snow melt, landslides, earthquakes, erosion, theft, vandalism, acts of sabotage, and serious accidents. These occurrences may endanger the dam, the public, or the downstream valley and may necessitate a temporary or permanent revision of the dam's operating procedures. Help in these situations can be obtained by notifying those people shown in Figure 2.
FIGURE 2
Basin Creek Dam #1or #2
POTENTIALLY HAZARDOUS SITUATION
"NOTIFICATION FLOWCHART"

UNUSUAL OCCURRENCE

OBSERVER

DAM OWNER
Butte-Silver Bow
Department of Public Works
Water Utility Division
Director of Public Works
Mark Neary
Office: (406) 497-6519
Home: (406) 782-2171
Cel: (406) 498-4567
Dam Operators
Jim Dennehy
Office: (406) 723-9429
Cel: (406) 490-2491
Jim Keenan
Office: (406) 497-6596
Cel: (406) 475-4541

LOCAL DES COORDINATOR
(Butte-Silver Bow County)
Dan Dennehy
Office: (406) 497-6295
Home: (406) 565-0358
Cel: (406) 490-5802

LOCAL ENGINEER
Pioneer Technical Services
Mike Brown
Office: (406) 457-8252
Home: (406) N/A
Cel: (406) 498-3372

National Weather Service
Missoula, MT
Office: (406) 329-4715
Information: (406) 329-4840
Great Falls, MT
Office: (406) 453-9642
Information: (406) 453-2081

DNRC
Dam Safety Section
Bureau Chief – Water Ops.
Steve Story, PE, CFM
Office: (406) 444-6816
Cel: (406) 202-2728
Dam Safety Engineer
Michele Lemieux, PE
Office: (406) 444-6613
Cel: (406) 459-3572

EAP Coordinator
Helena Regional Office
Regional Engineer
Chad Hill
Office: (406) 444-1358
Cel: (406) 461-0930
Vacant
Office: Cel:
1) If the dam owner discovers an unusual condition of the dam embankment that could threaten the structure:
   a) Have a qualified engineer inspect the dam as soon as possible to determine whether emergency action is necessary.
   b) Notify the county Disaster and Emergency Services Coordinator (406) 497-6295 of the potential problem.
   c) Contact the Dam Safety Section of the Department of Natural Resources and Conservation (DNRC).

2) Among the conditions the dam owner should watch for are:
   a) Overtopping of the dam by flood waters
   b) Loss of material from the dam crest due to storm wave erosion
   c) Slides on either the upstream or downstream slope of the embankment as evidenced by
      1. Sloughing
      2. Cracking
      3. Bulging
      4. Scarping
   d) Erosional flows through, beneath, or around the embankment as evidenced by
      1. Excessive seepage
      2. Discoloration of the seepage
      3. Boils on the downstream side
      4. Sinkholes
      5. Changes in the flow from drains
   e) Failure of outlets or spillways due to clogging or erosion
f) Movement of the dam on its foundation as evidenced by

1. Misalignment
2. Settlement
3. Cracking

3) When the dam owner calls either an engineer or DNRC to report a problem, use the form in Appendix D to ensure you can provide sufficient information for the engineer to analyze the problems. In addition, prepare a sketch showing the extent of the problem. Revise the sketch periodically if the problem develops further. Section III includes further guidelines for courses of action to take to mitigate the effect of many problems.

C. Posting of the Notification Flowchart and Distribution of the EAP.

The Notification flowchart is posted at the dam of Basin Creek Dam #1 and a copy of the EAP is in the chlorination building just below the dam of the Basin Creek #1. The Butte-Silver Bow County Sheriff’s Office and the Silver Bow County DES Coordinator have copies of the plan.
III. MITIGATION ACTIONS

Besides normal monitoring of the dam's condition, which is done at least monthly, the owner will provide continuous monitoring and inspection during and after extreme events such as storms and earthquakes. Information on the magnitude of an earthquake or storm can be obtained from the National Weather Service. Actions are suggested below to mitigate problems that may develop, but those actions should never be continued at the risk of injury or at the expense of lessening efforts related to evacuation. Monitoring should identify any of the following potential problems.

A. Potential Problems and Immediate Response Actions

1) OVERTOPPING BY FLOOD WATERS
   a) Open outlet to its maximum safe capacity.
   b) Place sandbags along the crest to increase freeboard and force more water through the spillway and outlet.
   c) Provide erosion-resistant protection to the downstream slope by placing plastic sheets or other materials over eroding areas.
   d) Divert flood waters around the reservoir basin, if possible.
   e) Create additional spillway capacity by making a controlled breach in a low embankment or dike section where the foundation materials are erosion-resistant.

2) LOSS OF FREEBOARD OR DAM CROSS SECTION DUE TO STORM WAVE EROSION
   a) Place additional riprap or sandbags in damaged areas to prevent further embankment erosion.
   b) Lower the water level to an elevation below the damaged area.
3) SLIDES IN THE UPSTREAM OR DOWNSTREAM SLOPE OF THE EMBANKMENT
   a) Lower the water level at a rate and to an elevation considered safe, given the slope condition. If the outlet is damaged or blocked, pumping, siphoning, or a controlled breach may be required.
   b) Stabilize slides on the downstream slope by
4) Weighting the toe area with additional soil, rock, or gravel, and then
5) Restoring lost freeboard by placing sandbags at the crest.
6) EROSIONAL FLOWS THROUGH THE EMBANKMENT, FOUNDATION, OR ABUTMENTS
   a) Plug the flow with whatever material is available (hay bales, bentonite, or plastic sheeting if the entrance to the leak is in the reservoir basin).
   b) Lower the water level until the flow decreases to a non-erosive velocity or stops.
   c) Place a protective sand-and-gravel filter or boil ring over the exit area to hold materials in place.
7) FAILURE OF APPURTENANT STRUCTURES SUCH AS OUTLETS OR SPILLWAYS
   a) Implement temporary measures to protect the damaged structure, such as closing an outlet or protecting a damaged spillway with riprap.
   b) Lower the water level to a safe elevation. If the outlet is inoperable, pumping, siphoning, or a controlled breach may be required.
8) MASS MOVEMENT OF THE DAM ON ITS FOUNDATION (SPREADING OR MASS SLIDING FAILURE)
   a) Immediately lower the water level until excessive movement stops.
9) EXCESSIVE SEEPAGE AND HIGH LEVEL SATURATION OF THE EMBANKMENT
a) Lower the water to a safe level.

b) Continue frequent monitoring for signs of slides, cracking or concentrated seepage.

10) SPILLWAY BACKCUTTING, THREATENING RESERVOIR EVACUATION

a) Reduce the flow over the spillway by fully opening the main outlet.

b) Provide temporary protection at the point of erosion by placing sandbags, riprap materials, or plastic sheets weighted with sandbags.

c) When the inflow subsides, lower the water to a safe level.

11) EXCESSIVE SETTLEMENT OF THE EMBANKMENT

a) Lower the water level by releasing it through the outlet pumping, siphoning, or a controlled breach.

b) If necessary, restore freeboard, preferably by placing sandbags.

B. Emergency Supplies and Resources

There is a supply of granular and clay types of soils located above and below the dam.

C. Local Contractors and Engineers

Local Contractors:

Jim Gilman Excavating Inc, .................................................................(406) 723-8234

In case of extreme emergency, the following: end loaders, dozers, and other heavy equipment are available from:

Silver Bow County Maintenance Shop, Butte.............................................(406) 497-6565

Ask for Jocko Stajcar.................................................................(406) 497-6569

Jocko Stajcar (Cel).................................................................(406) 560-7895
Pioneer Engineer: Mike Brown, P.E.  Helena, MT
Office............................................................................................................(406) 457-8252
Home.............................................................................................................(406) N/A
Cel:..............................................................................................................(406) 498-3372

Pioneer Engineer: Brad Archibald, P.E.  Butte, MT
Office............................................................................................................(406) 782-5177
Home.............................................................................................................(406) 494-6549
Cel:..............................................................................................................(406) 490-3032
APPENDICES
APPENDIX A

TECHNICAL DATA

FOR

DAMS #1 AND #2
Technical Data for Basin Creek Dam #1

Maximum Reservoir Capacity to the Crest of the Dam: ........................................... 1,170 acre feet

Normal Reservoir Capacity Measured to:

   Emergency Spillway Crest: .............................................................. 1,115-acre feet (gate up)
   ........................................................................................................... 930 acre feet (gate down)

Normal Water Depth Measured from:

   Streambed to the Crest of the Emergency Spillway ......................... 79 feet (gate up)
   ........................................................................................................... 75.5 feet (gate down)

Dam HeightMeasured from the Streambed to the Crest of the Dam: .................. 80 feet

Dam Crest Width: ............................................................................................................ 5 feet

Dam Width at Base: ........................................................................................................ 120 feet

Length of Dam Crest: ..................................................................................................... 275 feet

Outlet Capacity (Blow Off): ........................................................................... 60 cubic feet per second

Design Capacity (Distribution Pipes) ............................................................ 15 cubic feet per second

Spillway Capacity ................................................................. (gate up) 23 cubic feet per second

Spillway Capacity ............................................................... (automatic gate) 203 cubic feet per second

Date Constructed.......................................................................................................... 1897

Slope of Upstream Face of Dam (Horizontal to Vertical) ........................................... vertical

Slope of Downstream Face of Dam (Horizontal to Vertical) ........................................ 1.75:1
Technical Data for Basin Creek Dam #2

Maximum Reservoir Capacity to the Crest of Dam.................................................... 290 acre feet

Capacity Measured to the Emergency Spillway before breach .............................. 196 acre feet

Normal Capacity Measured at Crest of Breech Channel ............................................. 120 acre feet

Water Depth Measured from the Streambed to the Crest of the emergency spillway.... 40 feet

Normal Water Depth Measured to Breech ................................................................. 35 feet

Dam Height Measured from the Streambed to the crest of dam.................................. 45 feet

Dam Crest Width ......................................................................................................... 17 feet

Dam Width at Base ...................................................................................................... 275 feet

Length of Dam Crest .................................................................................................... 320 feet

Outlet Capacity ............................................................................................................. 10 cubic feet per second

Spillway capacity ......................................................................................................... 15.6 cubic feet per second

Date Constructed .......................................................................................................... 1907

Slope of Upstream Face of dam (Horizontal to Vertical) ............................................ 1: (upper) ; 2:1 (lower)

Slope of Downstream face of Dam (Horizontal to Vertical) ......................................... 3:1
APPENDIX B

INUNDATION AND EVACUATION MAPS
AT THIS POINT THE CLEAR WEATHER BREACH DISCHARGE FALLS BELOW 100-YEAR FLOOD LEVELS
FLOOD BOUNDARY KEY

CLEAR WEATHER BREACH
PMF WITH BREACH
PROVISONAL MAP
Produced from original manuscript drawings. Information shown as of date of field check.

There may be private inholdings within the boundaries of any Federal and State Reservations shown on this map. Public Land Survey System is shown as published in 1959 and verified or supplemented in 1987. Grey tint indicates areas in which selected buildings are shown.
APPENDIX C

TELEPHONE DIRECTORY
**Telephone Directory**

A. **Priority One**

1. **EMERGENCY NUMBER**
   
   SHERIFF Silver Bow County .......... 911 or (9:00 A.M. - 5:00 P.M.) (406) 497-1120 Ext. 1

2. **DISASTER AND EMERGENCY SERVICES**

   Silver Bow County................................................................. Office: (406) 497-6295
   
   EMERGENCY NUMBER.................................................................911
   
   Mr. Dan Dennehy ................................................................. Home: (406) 565-0358
   
   .......................................................................................... Cel: (406) 490-5802
   
   Montana Disaster and Emergency Services Division (Helena)..............(406) 841-3911

3. **EVACUEES**

   a. Basin Creek Residents in the flood plane area. Evacuees will be encouraged to sign up for NIXEL First Alert System to be notified electronically if required. Local authorities (First Responders, Police, etc.) will setup barricades and go door – to – door to notify residents.

B. **Priority Two**

4. **LOCAL ENGINEERS**

   Pioneer Technical, Helena .........................................................(Office) (406) 457-8252
   
   Mike Brown, P.E................................................................. (Home) (406) N/A
   
   .......................................................................................... (Cel) (406) 498-3372
   
   Pioneer Technical, Butte .........................................................(Office) (406) 782-5177
   
   Brad Archibald, P.E. .................................................................(Home) (406) 494-6549
   
   .......................................................................................... (Cel) (406) 490-3032

5. **MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION**

   a. Dam Safety Section Engineers: ............................(Office) (406) 444-6613
   
   b. Michele Lemieux Supervisor............................................. (Home) N/A
c. Chad Hill ..................................................................................Office: (406) 444-1358
........................................................................................................Cel: (406) 461-0930

d. Water Operations Bureau.........................................................(Office) (406) 444-6816
Laurence Siroky, Bureau Chief ..............................................(Home) (406) 442-2806
........................................................................................................(Cel) (406) 431-7475

e. Vacant, (Helena Regional Office).................................................Home: N/A
........................................................................................................Office: N/A
........................................................................................................Cel: N/A

6. NATIONAL WEATHER SERVICE
Missoula, MT ..............................................................................(406) 329-4715
Information............................................................................(406) 329-4840

7. BUTTE-SILVER BOW DEPARTMENT OF PUBLIC WORKS WATER UTILITY DIVISION
Director of Public Works: Mr. Mark Neary.................................Office: (406) 497-6519
........................................................................................................Home: (406) 782-2171
........................................................................................................Cel: (406) 498-4567
Dam Operations: Jim Dennehy.................................................Office: (406) 723-9429
........................................................................................................Home: N/A
........................................................................................................Cel: (406) 490-2491

8. BUREAU OF LAND MANAGEMENT ..............................................(406) 533-7600

9. MONTANA DEPARTMENT OF STATE LANDS (DNRC) ................(406) 444-2074

10. U.S. FOREST SERVICE, REGIONAL ENGINEERING OFFICE ..............(406) 494-2147
APPENDIX D

DAM INCIDENT REPORT FORM