

# ENGINEERS INSPECTION REPORT

ARKANSAS NATURAL RESOURCES COMMISSION - DAM SAFETY BRANCH  
101 E. CAPITOL AVENUE, #350, LITTLE ROCK, AR 72201 (501) 682-3986

DAM NAME LAKE CORTEZ DAM PERMIT #178 DATE OF INSPECTION 1/8/2018  
 DAM ID AR01206 DATE OF LAST INSPECTION 1/31/2017  
 OWNER NAME HOT SPRINGS VILLAGE POA OWNER PHONE 501.922.5522  
 ADDRESS 895 DESOTO BLVD ZIP 71909  
 CONTACT NAME JASON TEMPLE CONTACT PHONE 501.209.2291  
 CLASS H CAPACITY 5840 AF SURFACE AREA 247 AC HEIGHT 80 FT CREST LENGTH 857 FT CREST WIDTH 40 FT  
 CURRENT RESTRICTION  (NO)  (YES) LEVEL \_\_\_\_\_ EAP ON FILE  (NO)  (YES)  
 INSPECTION PARTY REPRESENTING WALT MACPHEE, ANRC

**DIRECTIONS:** MARK AN X FOR CONDITIONS FOUND, GIVE LOCATION AND EXTENT WITH NUMBER REFERENCE

### FIELD CONDITIONS OBSERVED

WATER LEVEL - BELOW DAM CREST -12 FT BELOW SPILLWAY OVER -1 IN. FT GAGE ROD X  
 GROUND MOISTURE CONDITION: DRY \_\_\_\_\_ WET X SNOWCOVER \_\_\_\_\_ OTHER \_\_\_\_\_

UPSTREAM SLOPE	PROBLEMS NOTED: <input type="checkbox"/> (0) NONE <input type="checkbox"/> (1) RIPRAP - MISSING, SPARSE, DISPLACED, WEATHERED <input type="checkbox"/> (2) WAVE EROSION-WITH SCARPS <input type="checkbox"/> (3) CRACKS WITH DISPLACEMENT <input type="checkbox"/> (4) SINKHOLE <input type="checkbox"/> (5) APPEARS TOO STEEP <input type="checkbox"/> (6) DEPRESSIONS OR BULGES <input type="checkbox"/> (7) SLIDES <input type="checkbox"/> (8) CONCRETE FACING-HOLES, CRACKS, DISPLACED, UNDERMINED <input checked="" type="checkbox"/> (9) OTHER <u>SMALL TREES AND VEGETATION</u> COMMENTS: _____ _____ _____	UPSTREAM SLOPE	<input type="radio"/> GOOD <input checked="" type="radio"/> ACCEPTABLE <input type="radio"/> POOR
CREST	PROBLEMS NOTED: <input checked="" type="checkbox"/> (10) NONE <input type="checkbox"/> (11) RUTS OR PUDDLES <input type="checkbox"/> (12) EROSION <input type="checkbox"/> (13) CRACKS - WITH DISPLACEMENT <input type="checkbox"/> (14) SINKHOLES <input type="checkbox"/> (15) NOT WIDE ENOUGH <input type="checkbox"/> (16) LOW AREA <input type="checkbox"/> (17) MISALIGNMENT <input type="checkbox"/> (18) INADEQUATE SURFACE DRAINAGE <input type="checkbox"/> (19) OTHER _____ COMMENTS: _____ _____ _____	CREST	<input type="radio"/> GOOD <input checked="" type="radio"/> ACCEPTABLE <input type="radio"/> POOR
DOWNSTREAM SLOPE	PROBLEMS NOTED: <input type="checkbox"/> (20) NONE <input type="checkbox"/> (21) LIVESTOCK DAMAGE <input type="checkbox"/> (22) EROSION OR GULLIES <input type="checkbox"/> (23) CRACKS - WITH DISPLACEMENT <input type="checkbox"/> (24) SINKHOLE <input type="checkbox"/> (25) APPEARS TOO STEEP <input type="checkbox"/> (26) DEPRESSION OR BULGES <input type="checkbox"/> (27) SLIDE <input type="checkbox"/> (28) SOFT AREAS <input checked="" type="checkbox"/> (29) OTHER <u>EXCESS VEGETATION</u> COMMENTS: _____ _____ _____	DOWNSTREAM SLOPE	<input type="radio"/> GOOD <input checked="" type="radio"/> ACCEPTABLE <input type="radio"/> POOR
SEEPAGE	PROBLEMS NOTED: <input type="checkbox"/> (30) NONE <input checked="" type="checkbox"/> (31) SATURATED EMBANKMENT AREA <input type="checkbox"/> (32) SEEPAGE EXITS ON EMBANKMENT <input type="checkbox"/> (33) SEEPAGE EXITS AT POINT SOURCE <input type="checkbox"/> (34) SEEPAGE AREA AT TOE <input type="checkbox"/> (35) FLOW ADJACENT TO OUTLET <input type="checkbox"/> (36) SEEPAGE INCREASED/MUDDY DRAIN OUTFALLS SEEN <input type="checkbox"/> NO <input checked="" type="checkbox"/> YES <input type="checkbox"/> (37) FLOW INCREASED/MUDDY <input type="checkbox"/> (38) DRAIN DRY/OBSTRUCTED <input type="checkbox"/> (39) OTHER _____ COMMENTS: _____ _____ _____	SEEPAGE	<input type="radio"/> GOOD <input checked="" type="radio"/> ACCEPTABLE <input type="radio"/> POOR
OUTLET	PROBLEMS NOTED: <input type="checkbox"/> (40) NONE <input type="checkbox"/> (41) NO OUTLET FOUND <input type="checkbox"/> (42) POOR OPERATING ACCESS <input type="checkbox"/> (43) INOPERABLE <input type="checkbox"/> (44) UPSTREAM OR DOWNSTREAM STRUCTURE DETERIORATED <input type="checkbox"/> (45) OUTLET OPERATED DURING INSPECTION <input type="checkbox"/> NO <input checked="" type="checkbox"/> YES INTERIOR INSPECTED <input checked="" type="checkbox"/> (120) NO <input type="checkbox"/> (121) YES <input type="checkbox"/> (46) CONDUIT DETERIORATED OR COLLAPSED <input type="checkbox"/> (47) JOINTS DISPLACED <input type="checkbox"/> (48) VALVE LEAKAGE DRAIN OUTFALLS SEEN <input type="checkbox"/> NO <input checked="" type="checkbox"/> YES <input type="checkbox"/> (49) OTHER _____ COMMENTS: <u>PRIMARY SPILLWAY CONDUIT VALVE WAS FULLY OPEN (BASED ON METER), BUT WATER DID NOT APPEAR TO BE FLOWING @ OUTLET, OUTLET WAS INUNDATED</u> _____ _____	OUTLET	<input type="radio"/> GOOD <input checked="" type="radio"/> ACCEPTABLE <input type="radio"/> POOR
SPILLWAY	PROBLEMS NOTED: <input checked="" type="checkbox"/> (50) NONE <input type="checkbox"/> (51) NO EMERGENCY SPILLWAY FOUND <input type="checkbox"/> (52) EROSION WITH BACKCUTTING <input type="checkbox"/> (53) CRACK - WITH DISPLACEMENT <input type="checkbox"/> (54) APPEARS TO BE STRUCTURALLY INADEQUATE <input type="checkbox"/> (55) APPEARS TOO SMALL <input type="checkbox"/> (56) INADEQUATE FREEBOARD <input type="checkbox"/> (57) FLOW OBSTRUCTED <input checked="" type="checkbox"/> (58) CONCRETE DETERIORATED/UNDERMINED <input type="checkbox"/> (59) OTHER _____ COMMENTS: <u>SOME VEGETATION GROWING IN CRACKS; MINOR CONCRETE DETERIORATION @ TOP OF SPILLWAY</u> _____ _____	SPILLWAY	<input type="radio"/> GOOD <input checked="" type="radio"/> ACCEPTABLE <input type="radio"/> POOR

MONITORING

EXISTING INSTRUMENTATION FOUND: [X] (110) NONE [ ] (111) GAGE ROD [ ] (112) PIEZOMETERS [ ] (113) SEEPAGE WEIRS/FLUMES [ ] (114) SURVEY MONUMENTS [ ] (115) OTHER
MONITORING OF INSTRUMENTATION: [ ] (116) NO [ ] (117) YES PERIODIC INSPECTIONS BY: [X] (118) OWNER [ ] (119) ENGINEER
COMMENTS:

MAINTENANCE & REPAIR

PROBLEMS NOTED: [ ] (60) NONE [ ] (61) ACCESS ROAD NEEDS MAINTENANCE [ ] (62) CATTLE DAMAGE [X] (63) BRUSH ON UPSTREAM SLOPE, CREST, DOWNSTREAM, TOE [X] (64) TREES ON UPSTREAM SLOPE, CREST, DOWNSTREAM SLOPE, TOE [ ] (65) RODENT ACTIVITY ON UPSTREAM SLOPE, CREST, DOWNSTREAM, SLOPE, TOE [X] (66) DETERIORATED CONCRETE-FACING, OUTLET, SPILLWAY [ ] (67) GATE & OPERATING MECHANISM NEED MAINTENANCE [ ] (68) OTHER
COMMENTS:

OVERALL CONDITIONS

REMARKS: CLEAR VEGETATION/TREES FROM DAM & SPILLWAY; IDENTIFY ISSUE WITH PRIMARY SPILLWAY CONDUIT

Based on this Safety Inspection and recent file review, the overall condition is determined to be:

[ ] (71) SATISFACTORY [X] (72) CONDITIONALLY SATISFACTORY [ ] (73) UNSATISFACTORY

Table with 3 rows and 3 columns. Columns: OVERALL CONDITIONS, MAINTENANCE & REPAIR, MONITORING. Rows: GOOD, ACCEPTABLE, POOR. Circles indicate status: ( ) for Good, (●) for Acceptable, (○) for Poor.

The State Engineer by providing this dam safety inspection report, does not assume responsibility for any unsafe condition of the subject dam. The sole responsibility for the safety of this dam rests with the reservoir owner or operator, who should take every step necessary to prevent damages caused by leakage or overflow of waters from the reservoir or floods resulting from a failure of the dam.

ITEMS REQUIRING ACTION BY OWNER TO IMPROVE THE SAFETY OF THE DAM

MAINTENANCE - MINOR REPAIR - MONITORING

- [ ] (80) PROVIDE ADDITIONAL RIPRAP:
[ ] (81) LUBRICATE & OPERATE OUTLET GATES THROUGH FULL CYCLE:
[X] (82) CLEAR TREES AND/OR BRUSH FROM: U/S & D/S SLOPE, SPILLWAY
[ ] (83) INITIATE RODENT CONTROL PROGRAM & PROPERLY BACKFILL EXISTING HOLES:
[ ] (84) GRADE CREST TO A UNIFORM ELEVATION WITH DRAINAGE TO THE UPSTREAM SLOPE:
[X] (85) PROVIDE SURFACE DRAINAGE FOR: PRIMARY SPILLWAY OUTLET WORKS
[ ] (86) MONITOR:
[X] (87) DEVELOP AND SUBMIT AN EMERGENCY ACTION PLAN:
[ ] (88) OTHER:
[ ] (89) OTHER:

ENGINEERING - EMPLOY AN ENGINEER EXPERIENCED IN DESIGN & CONSTRUCTION OF DAMS TO:

(Plan & Specification must be approved by State Engineer prior to construction)

- [ ] (90) PREPARE PLANS & SPECIFICATIONS FOR THE REHABILITATION OF THE DAM:
[ ] (91) PREPARE AS-BUILT DRAWINGS OF:
[ ] (92) PERFORM A GEOTECHNICAL INVESTIGATION TO EVALUATE THE STABILITY OF THE DAM:
[ ] (93) PERFORM A HYDROLOGIC STUDY TO DETERMINE REQUIRED SPILLWAY SIZE:
[ ] (94) PREPARE PLANS & SPECIFICATIONS FOR AN ADEQUATE SPILLWAY:
[ ] (95) SET UP A MONITORING SYSTEM INCLUDING WORK SHEETS, REDUCED DATA & GRAPHED RESULTS:
[ ] (96) PERFORM AN INTERNAL INSPECTION OF THE OUTLET:
[ ] (97) OTHER:
[ ] (98) OTHER:
[ ] (99) OTHER:

SAFE STORAGE LEVEL RECOMMENDED AS A RESULT OF THIS INSPECTION

- [ ] (101) FULL STORAGE
[X] (102) CONDITIONAL FULL STORAGE
[ ] (103) RECOMMENDED RESTRICTION
RESTRICTED LEVEL OFFICIAL ORDER TO FOLLOW
[ ] FT BELOW DAMS CREST
[ ] FT BELOW SPILLWAY CREST
[ ] FT GAGE HEIGHT
[ ] NO STORAGE-MAINTAIN OUTLET FULLY OPEN

REASON FOR RESTRICTION:

ACTIONS REQUIRED FOR CONDITIONAL FULL STORAGE OR CONTINUED STORAGE AT THE RESTRICTED LEVEL:

Engineer's Signature

Owner's Signature

DATE: 1/8/2018

INSPECTED BY

OWNER/OWNER'S REPRESENTATIVE

## GUIDELINES FOR DETERMINING CONDITIONS

---

### CONDITIONS OBSERVED - APPLIES TO UPSTREAM SLOPE, CREST, DOWNSTREAM SLOPE, OUTLET, SPILLWAY

---

#### GOOD

In general, this part of the structure has a near new appearance, and conditions observed in this area do not appear to threaten the safety of the dam.

#### ACCEPTABLE

Although general cross-section is maintained, surfaces may be irregular, eroded, rutted, spalled, or otherwise not in new condition. Conditions in this area do not currently appear to threaten the safety of the dam.

#### POOR

Conditions observed in this area appear to threaten the safety of the dam.

---

### CONDITIONS OBSERVED - APPLIES TO SEEPAGE

---

#### GOOD

No evidence of uncontrolled seepage. No unexplained increase in flows from designed drains. All seepage is clear. Seepage conditions do not appear to threaten the safety of the dam.

#### ACCEPTABLE

Some seepage exists at areas other than the drain outfalls, or other designed drains. No unexplained increase in seepage. All seepage is clear. Seepage conditions observed do not currently appear to threaten the safety of the dam.

#### POOR

Seepage conditions observed appear to threaten the safety of the dam. Examples:  
 1) Designed drain or seepage flows have increased without increase in reservoir level.  
 2) Drain or seepage flows contain sediment, i.e., muddy water or particles in jar samples.  
 3) Widespread seepage, concentrated seepage or ponding appears to threaten the safety of the dam.

---

### CONDITIONS OBSERVED - APPLIES TO MONITORING

---

#### GOOD

Instrumentation and monitoring described under acceptable are being exceeded, as described under comments in the report.

#### ACCEPTABLE

Instrumentation is provided in accordance with the rules. Special instrumentation and monitoring deemed necessary is provided. The owner monitors the dam and records data in accordance with the rules, and submits the data annually or more frequently if required.

#### POOR

Required instrumentation and monitoring are not provided or required periodic readings are not being made or unexplained changes in readings are not reacted to by the owner.

---

### CONDITIONS OBSERVED - APPLIES TO MAINTENANCE AND REPAIR

---

#### GOOD

Owner has a plan for annual maintenance. Dam consistently receives effective on-going maintenance and repair.

#### ACCEPTABLE

Dam receives maintenance in accordance with a plan, but some maintenance items need to be addressed. No major repairs are required.

#### POOR

No annual maintenance plan in effect. Dam does not appear to receive adequate maintenance. One or more items needing maintenance or repair have begun to threaten the safety of the dam. Lack of maintenance prevents thorough inspection.

---

### OVERALL CONDITIONS

---

#### SATISFACTORY

The safety inspection indicates no conditions that appear to threaten the safety of the dam and the dam is expected to perform satisfactorily under all design loading conditions.

#### CONDITIONALLY SATISFACTORY

The safety inspection indicates symptoms of structural distress (excessive seepage, evidence of major displacements, etc.) which if conditions worsen, could lead to the failure of the dam. Essential monitoring, inspection and maintenance must be performed as a requirement for continued full storage in the reservoir or storage at a reduced level. There are no requirements if maintained at the restricted level.

#### UNSATISFACTORY

No annual maintenance plan in effect. Dam does not appear to receive adequate maintenance. One or more items needing maintenance or repair have begun to threaten the safety of the dam. Lack of maintenance prevents thorough inspection.

---

### SAFE STORAGE LEVEL

---

#### FULL STORAGE

Dam may be used to full capacity with no conditions attached.

#### CONDITIONAL FULL STORAGE

Dam may be used to full storage if certain monitoring, maintenance or operational conditions are met.

#### RESTRICTION

Dam may not be used to full capacity, but must be operated at some reduced level in the interest of public safety.

---

### CLASSIFICATION OF DAMS

---

- CLASS 1 - Loss of human life is expected in the event of failure of the dam.
- CLASS 2 - Significant damage is expected in the event of failure of the dam, but no loss of human life is expected.
- CLASS 3 - A small amount of damage is expected. Loss of human life and significant damage are not expected.
- CLASS 4 - No loss of human is expected and damage will occur only to the dam owner's property.