STATE OF CALIFORNIA
CALIFORNIA NATURAL RESOURCES AGEN
DEPARTMENT OF WATER RESOURCES
DIVISION OF SAFETY OF DAMS

FILE

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam Sugar Pine Dam No. 2045 County Placer
Type of Dam Earth Type of Spillway Concrete Ogee Weir and Chute
Water is 0.5 feet above spillway crest and 31.5 feet below dam crest.

Weather Conditions Sunny and warm, 85 degrees F.
Contacts Made Hank White and Ron Mills w/ Foresthill PUD.
Reason for Inspection Annual Maintenance Inspection.

Important Observations, Recommendations or Actions Taken

Vegetation control on the dam is satisfactory.

All outlet valves were fully cycled during the inspection without any problems.

According to the most recent instrumentation report, piezometers HP-1A and HP-22 are non-functional, and piezometers HP-9, HP-10, and HP-21 do not appear to be functioning correctly. The owner needs to evaluate whether replacement of these piezometers is necessary, or if the current instrumentation network is adequate.

The remaining piezometers appear to be functioning correctly, but they are nearing the end of their useful life, according to the owner's consultant. Periodic flushing of the twin-tube piezometers needs to continue to ensure the aging piezometers continue to provide reliable readings. The owner needs to prepare a plan and schedule for the replacement of aging piezometers, and submit it to DSOD for review.

Conclusions

From the known information and visual inspection, the dam, reservoir, and all appurtenances are judged safe for continued use.

Observations and Comments

Dam	The embankment crest, upstream and downstream slopes, abutment contacts, downstream groins, and toe area all appeared to be in satisfactory condition with no evidence of instability or distress. The asphalt crest road was in satisfactory condition, though some surficial cracking was evident. Rip-rap on the upstream and downstream faces was uniform and stable. Vegetation control was satisfactory, and there were no signs of rodent activity.
Spillway	The spillway approach, ogee weir control section, chute, and downstream channel were clear and unobstructed. Recent concrete repairs are holding up well, and all concrete surfaces appeared to be in satisfactory condition with no significant cracking or spalling. The walls of the concrete chute appeared straight and plumb.
Outlet	[redacted] All five valves were fully cycled during the inspection, and operated without any problems. The [redacted] valve was dry cycled to avoid the severe vibration which normally occurs above 60%.
Seepage	The downstream face and groins of the dam were dry. The downstream toe and toe weir were inundated by releases, as usual. The seepage in the rock face downstream of the right abutment was present on this date, but this is believed to be from the hillside above the rock, and unrelated to the reservoir.

Photos taken? Yes x No
cc for Owner/Book

Inspected by A. C. Roundtree
Date of Inspection 3/15/2017
Date of Report 6/13/2017

DWR 1261 (Rev. 10/09)

Name of Dam Sugar Pine Dam No. 2045

Date of Inspection 3/15/2017

Observations and Comments

Instr.

Instrumentation at this dam consists of 16 twin-tube hydraulic piezometers (4 in the foundation, 5 in the central core, 5 in the chimney drain, and 2 in the downstream shell), a single seepage weir, and 20 survey monuments. Several other instruments were discontinued per our May 11, 2007 letter. The latest instrumentation report was submitted with an owner's letter dated September 6, 2016, and includes data through June 30, 2016.

Piezometers: As of the most recent instrumentation submittal, piezometers HP-1A and HP-22 are non-functional, and piezometers HP-9, HP-10, and HP-21 do not appear to be functioning correctly. All other piezometers appear to be reading normally, or have returned to the normal range following hydraulic flushing in 2011. Core piezometers show little or no change from previous years, but foundation piezometers showed a slight drop following hydraulic flushing in 2011, indicating buildup in the tubes had been flushed out. Chimney drain and downstream shell piezometers returned to normal following flushing, and remain stable within their normal ranges, indicating the chimney drain is performing satisfactorily. Periodic flushing of the twin-tube piezometers needs to continue to ensure these aging piezometers continue to provide reliable readings.

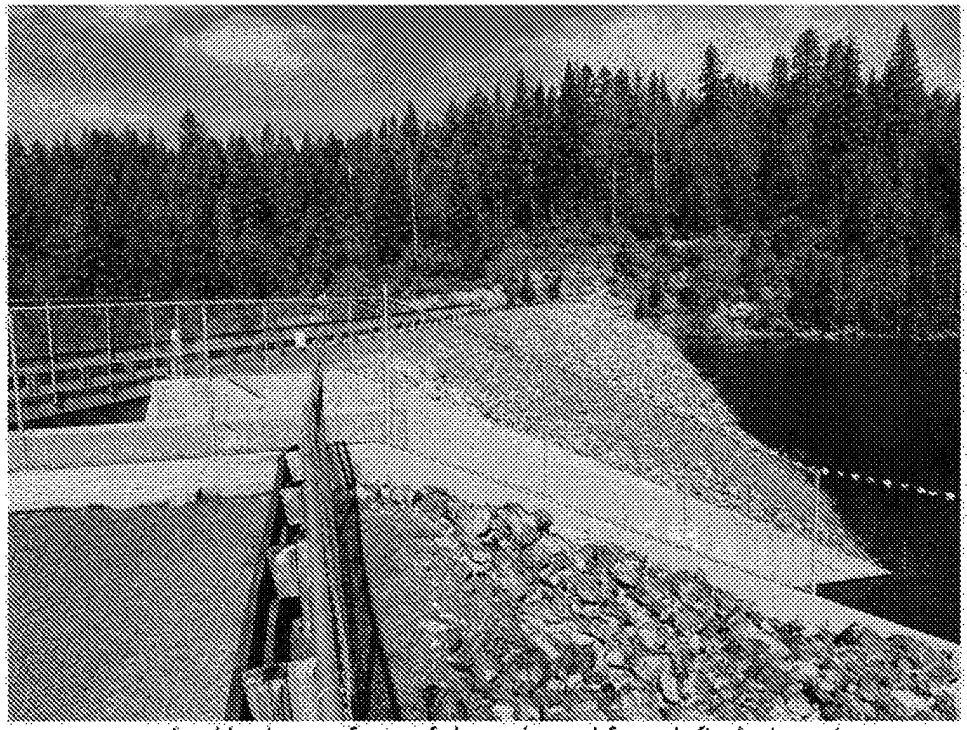
Seepage Weir: Seepage at the toe weir remained below 20 gpm for the entire reporting period. This is not surprising given the very dry years between 2013 and early 2016.

Survey Monuments: The maximum recorded horizontal and vertical movements since the previous survey in 2011 were 0.[redacted] and 0.01-foot, respectively. The largest cumulative horizontal and vertical movements are[redacted] and 0.20-foot, respectively. These movements are within normal limits for a large earthfill embankment.

Conclusion: According to the most recent instrumentation report, 5 of the dam's 16 piezometers have failed. The owner needs to evaluate whether replacement of failed piezometers is needed or if the current instrumentation network is adequate. The owner's consultant also stated in the report that the remaining piezometers are nearing the end of their useful life. The owner needs to prepare a plan and schedule for replacement of all piezometers, and submit it to DSOD for review.

Name of Dam Sugar Pine Dam No. 2045

Date of Inspection 3/15/2017

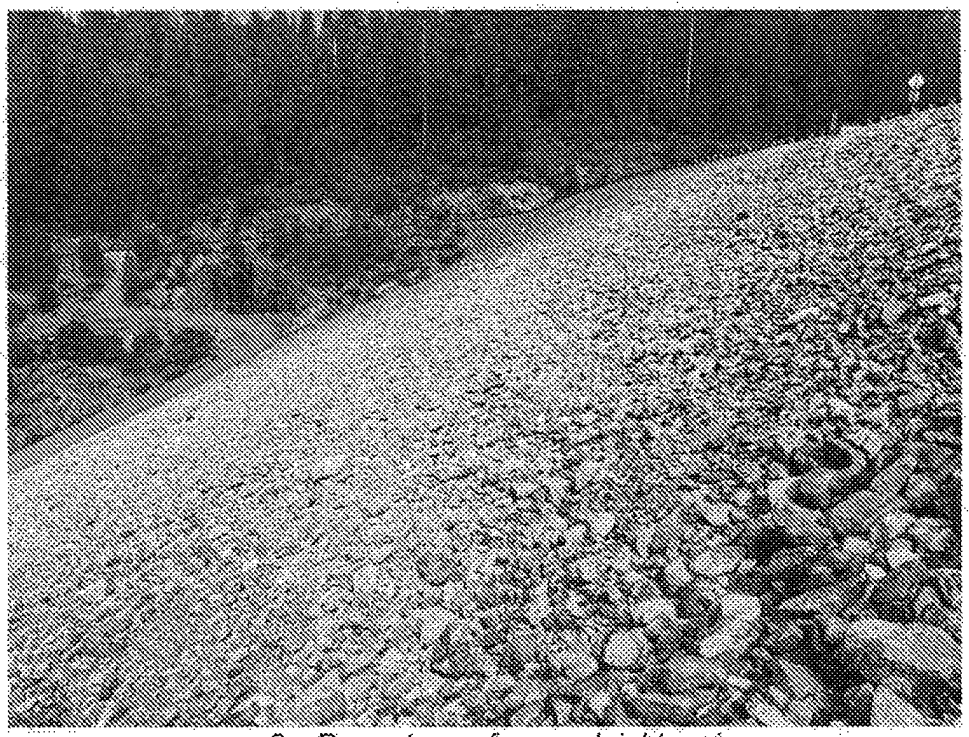


1. Upstream face of dam viewed from left abutment.

2. Spillway control section.

Name of Dam Sugar Pine Dam No. 2045

Date of Inspection 3/15/2017



3. Downstream face and right groin.

4. Overview of dam's downstream face with spillway at far right.

INSPECTI OF DAM AND RESERVOIR IN CI IFIED STATUS

Name of Dam Sugar Pine Dam No. 2045

Date of Inspection 3/15/2017

[redacted]

INSPECTI OF DAM AND RESERVOIR IN CI IFIED STATUS

Name of Dam Sugar Pine Dam No. 2045

Date of Inspection 3/15/2017

[redacted]

STATE OF CALIFORNIA
CALIFORNIA NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
DIVISION OF SAFETY OF DAMS

FILE COPY

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam: Sugar Pine Dam No.: 2045 County: Placer
Type of Dam: Earth Type of Spillway: Concrete ogee weir and chute
Water is: ~20 feet below spillway crest and ~52 feet below dam crest.

Weather Conditions: Sunny, clear, and mild
Contacts Made: Mr. Henry (Hank) White, General Manager of Foresthill PUD, before the inspection
Reason for Inspection: Periodic Maintenance Inspection

Important Observations, Recommendations or Actions Taken

The dam is generally well maintained with the exception of a few bushes and small trees growing on the downstream groins, lower downstream face, and along the spillway channel walls, which remain to be removed to within 5-10 feet of groins and walls.

Periodic flushing of the twin-tube piezometers needs to continue to ensure that the aging piezometers continue to provide reliable readings. Plans for replacement piezometers need to be implemented for those piezometers that become inoperable and are determined to be necessary for monitoring the phreatic surface within the dam.

Conclusions

From the known information and visual inspection, the dam, reservoir, and the appurtenances are judged safe for continued use.

Observations and Comments

Dam

The visible portion of the upstream face, downstream face, abutments, and crest were in satisfactory condition with no signs of instability or distress[redacted] rails were straight, except where struck by vehicles. Rock riprap on both faces was intact. Transverse and longitudinal cracks in the crest asphalt appeared superficial and some were sealed. Placer County seals the cracks periodically. The width of the cracks measured about ½-inch or less and did not appear to extend below the pavement. No cracks were noted on the unpaved portion of the roadway crest.

Vegetation control was good, with the exception of a few bushes and small trees growing near the downstream groins, lower face, and along the spillway, which remain to be removed. No rodent activity was noted.

Spillway

The approach, ogee weir control section, chute and the downstream channel were clear and unobstructed. The chute walls appeared straight. Visible concrete at the ogee and chute showed no signs of significant defects. Repairs made to spalled concrete were holding up wells. The stilling basin down below also looked in good condition.

No tree logs were piled up at the weir this time. Minor accumulated brush will wash out in a spill event. The owner is looking into replacing the upstream barrier with a conventional logboom to keep debris away from the spillway weir and chute.

Photos taken? Yes X No
cc for Owner/Book

Inspected by: A. Ordoubigian
Date of Inspection: 11/18/15 ASM
Date of Report: 1/4/16 1/7/16

AO 1/7/16

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam Sugar Pine Dam No. 2045

Date of Inspection 11/18/15

Observations and Comments

Outlet

[redacted] All [redacted] valves were cycled full travel (80% for the [redacted] valve) in my presence during the previous inspection of 12/20/12 with no problem. The owner cycles the valves throughout the year to make releases and last exercised the valves on 4/23/15. The valves need to be cycled in our presence during the next inspection.

The outlet tunnel was not walked this time, but was walked during the last inspection of 6/9/15 and the tunnel and pipe both were found in satisfactory condition.

Seepage

The downstream face and groins were dry. The downstream toe area was inundated as usual and the weir was below water.

Seepage on the right abutment, noted during my inspection of 12/20/12 to be seeping down the rock facing, was again dry this time. Staining on the rock from prolong wetness was clearly visible. The wetness was believed to be from the adjacent hillside and not from the reservoir.

Instr.

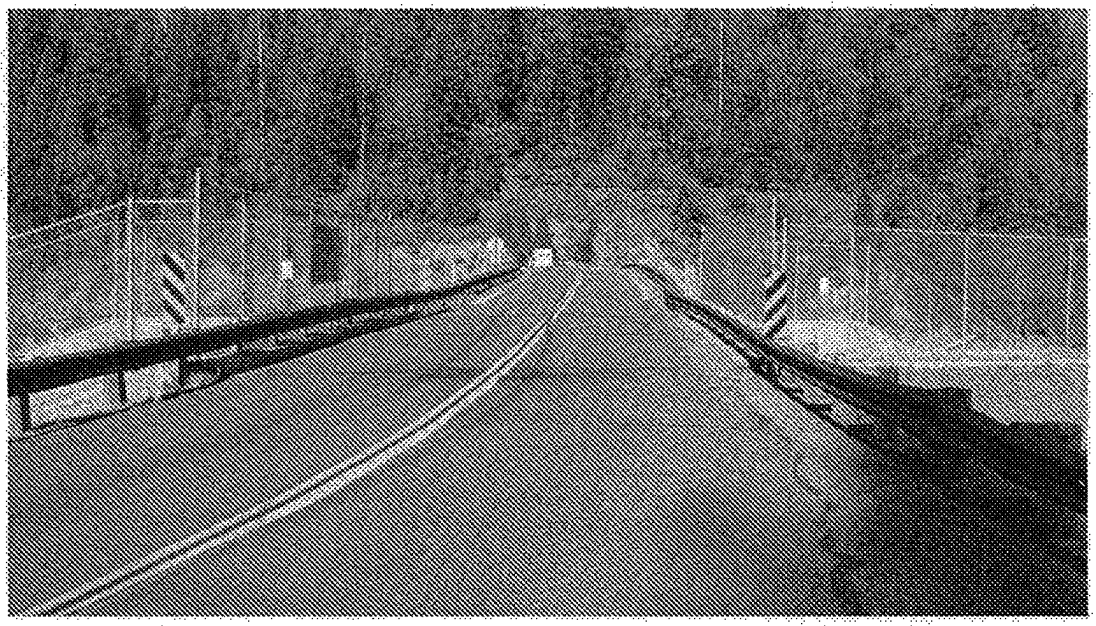
Instrumentation at this dam consists of 16 twin-tube hydraulic piezometers (4 in the foundation, 5 in the central core, 5 in the chimney drain, and 2 in the downstream shell), one seepage weir, and 20 survey monuments. The dam also has a large array of other instrumentation, but their reporting was agreed to be discontinued by our letter dated May 11, 2007. The inclinometers were required to be maintained so they can be read if excessive movements in the vicinity are detected.

The latest instrumentation report was submitted with the February 27, 2015 letter, covering data through June 30, 2014. The data was reviewed in the previous inspection report dated 6/24/15 and the dam was found to be performing satisfactorily based on the submitted data.

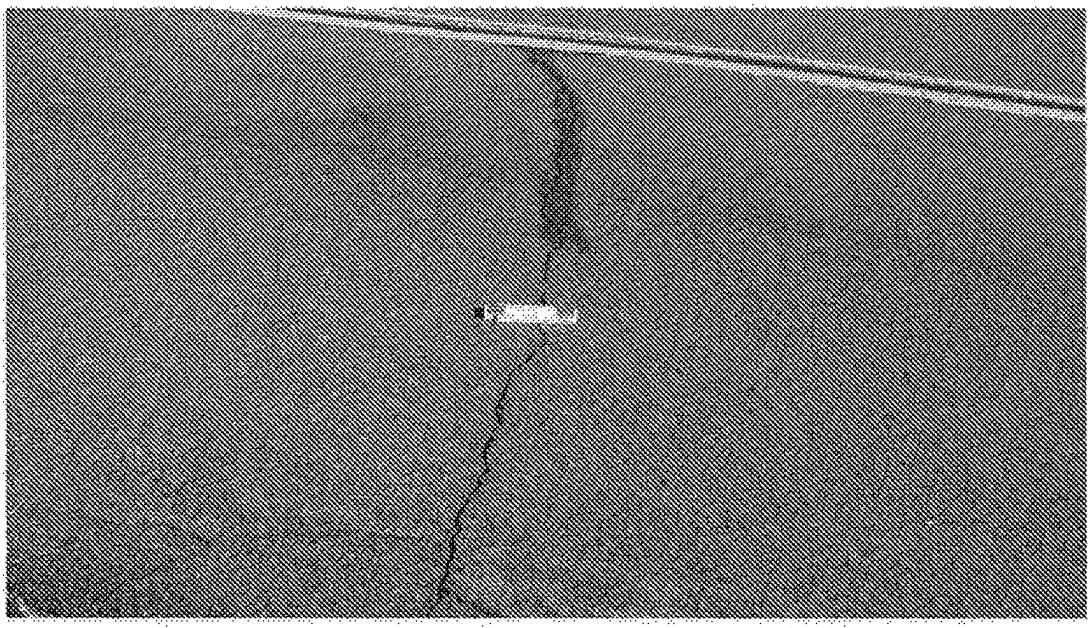
As noted under Important Observations above, and in our letter of 3/27/15, periodic flushing of the twin-tube hydraulic piezometer lines needs to continue to ensure that the aging piezometers continue to provide reliable readings. Plans for replacement piezometers need to be implemented for those piezometers that become inoperable and are determined to be necessary for monitoring the phreatic surface within the dam.

Name of Dam Sugar Pine Dam No. 2045

Date of Inspection 11/18/15



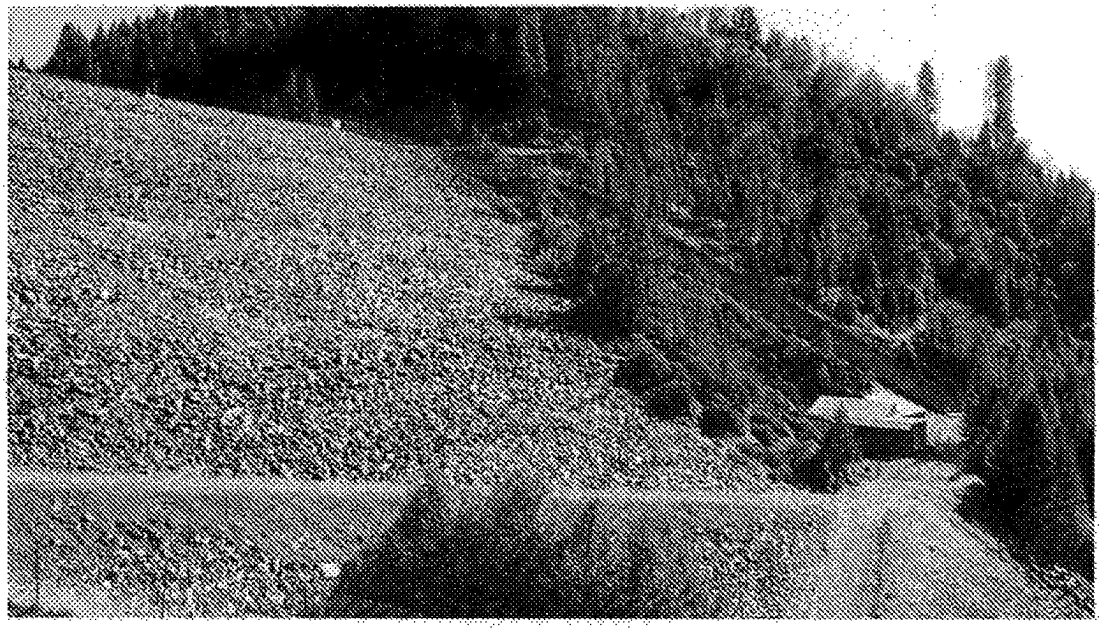
1. The crest of the dam, looking right from the left abutment.



2. Typical transverse crack in the crest asphalt.

Name of Dam Sugar Pine Dam No. 2045

Date of Inspection 11/18/15

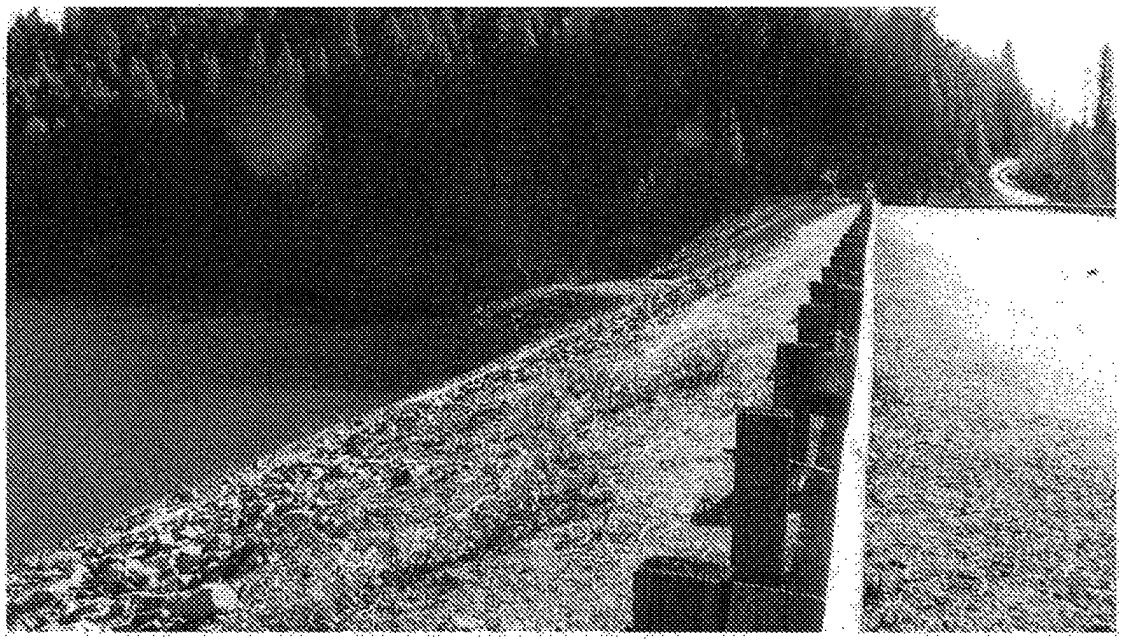


3. The upper left portion of the downstream face, looking left toward the spillway and the valve house. Vegetation along the spillway channel wall needs to be removed.

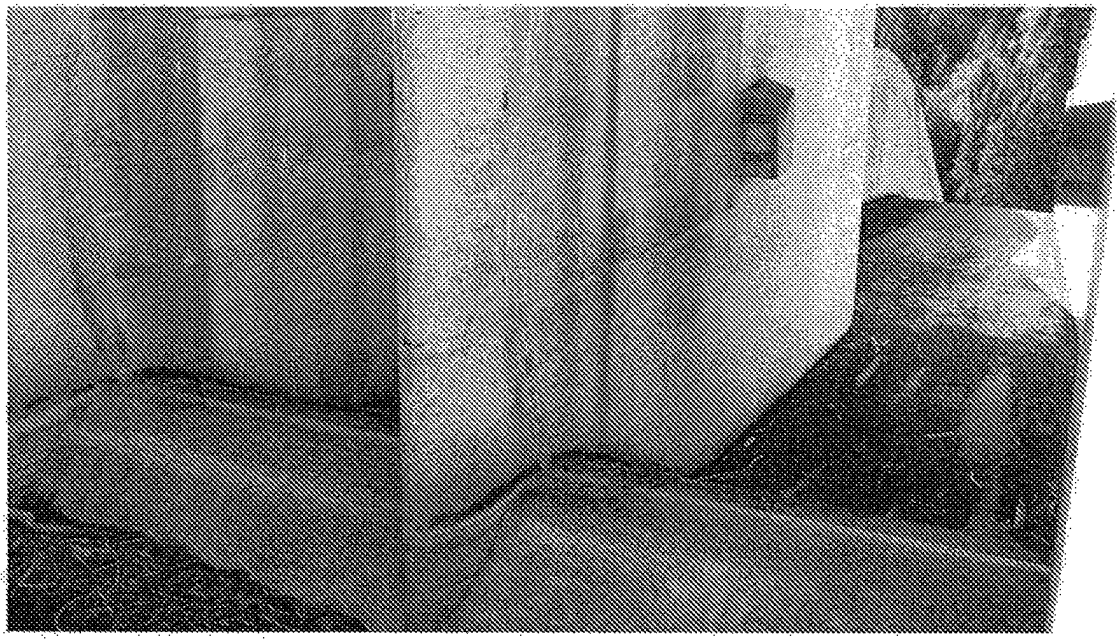
4. Looking down the right outlet channel wall, free of undesirable vegetation.

Name of Dam Sugar Pine Dam No. 2045

Date of Inspection 11/18/15



5. The left portion of the upstream face, showing the spillway approach in the background.



6. The spillway control section and ogee weir, looking downstream.

STATE OF CALIFORNIA
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DIVISION OF SAFETY OF DAMS

FILE

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam Sugar Pine Dam No. 2045 County Placer
Type of Dam Earth Type of Spillway Concrete Ogee Weir and Chute
Water is 15.1 feet below spillway crest and 46.9 feet below dam crest.

Weather Conditions Clear and warm
Contacts Made Hank White and Ron Mills with Foresthill PUD
Reason for Inspection Annual Maintenance Inspection

Important Observations, Recommendations or Actions Taken

The dam is overall well maintained and the owner continues to make good progress with requested vegetation control. Woody vegetation needs to continue to be removed at least 5-10 feet off the groins of the dam and at least 5-10 feet off the spillway and outlet channel walls. Additionally, sporadic woody vegetation observed on the lower downstream face also needs to be removed.

As stated in our letter dated March 27, 2015, we agree that Piezometer HP-22 appears to be malfunctioning at this time and recommended the owner continue flushing and testing the aging piezometers to ensure their functionality. Plans for the replacement piezometers need to be implemented for those piezometers that become inoperable and are determined to be necessary for monitoring the phreatic surface within the dam.

Conclusions

From the known information and visual inspection, the dam, reservoir, and all appurtenances are judged safe for continued use.

Observations and Comments

Dams

I walked along the crest, portions of the upstream and downstream groins, and the along the toe of the dam. Both faces exhibited no signs of distress or instability. The riprap protection along both faces remains stable and intact. The paved roadway crest was in satisfactory condition with typical longstanding superficial transverse and longitudinal cracking observed. The County maintains the road and periodically seals the cracks. Vegetation control was overall good. I requested vegetation be removed at least 5 to 10-feet off the groins of the dam. Specifically a willow along the upstream left groin needs to be removed and vegetation along downstream left groin along the fence line. Additionally, I requested the sporadic maple and pine tree growth on the lower downstream face also be removed. No rodent activity was observed.

Spillway

The spillway approach, ogee weir control section, chute, and downstream channel were clear and unobstructed. The spillway channel was observed from the approach channel, the overhead spillway bridge, portions along the right spillway wall, and from the exit. The concrete surfaces appeared to remain in satisfactory condition with no significant cracking or spalling observed. I requested vegetation continue to be removed at least 5-10 feet off the spillway walls. Pine trees near the downstream end of the channel growing next to the spillway walls need to be removed.

Minimal woody debris was observed at the spillway approach channel. The owner has done a satisfactory job keeping large debris out of the approach, as requested. Debris logs can damage the concrete at the spillway chute and basin below, as mentioned in our last inspection report.

TJ 6/25/15

Photos taken? Yes x No
cc for Owner/Book

Inspected by T. Jimenez AM 6/25/15
Date of Inspection 6/9/2015
Date of Report 6/24/2015

Name of Dam Sugar Pine Dam No. 2045

Date of Inspection 6/9/2015

Observations and Comments

Outlet

[redacted] The valves were last cycled in DSOD's presence on 12/20/2012, with no reported problems. The owner last exercised the valves on 4/23/2015. The downstream concrete outlet channel appeared to remain in good condition. Woody vegetation needs to be kept at least 5-10 feet off the concrete outlet channel walls.

[redacted] The pipe is covered with plastic sheeting and appears to remain in satisfactory condition. The concrete surfaces appeared in good condition with no significant cracking or spalling observed. Minor calcification was observed along the tunnel joints. Minimal moisture was observed along the tunnel floor and construction joints, mainly near the upstream end of the tunnel. The weepholes appeared clear. No live flows were observed. The tunnel conditions appeared normal and consistent with our previous reports.

Seepage

No seepage was observed on the downstream face or groins of the dam. The downstream toe was inundated, as usual. The seepage at the downstream toe is measured by a 90° v-notch seepage weir. The weir read 0.17' (~13.8 gpm) during this inspection. The conditions are considered normal for the low reservoir level.

Instr.

Instrumentation at this dam consists of 16 twin-tube hydraulic piezometers (4 in the foundation, 5 in the central core, 5 in the chimney drain, and 2 in the downstream shell), 1 seepage weir, and 20 survey monuments. All other instrumentation at the dam was agreed to be discontinued by our letter dated May 11, 2007. The letter required the owner to read all piezometers and keep records, because not all of the 16 piezometers currently monitored were yielding reasonable readings at that time. The inclinometers were required to also be maintained so they can be read if excessive movements in the vicinity were detected.

The latest instrumentation report was submitted with an cover letter dated February 27, 2015, covering data through June 30, 2014.

Piezometers: The hydraulic piezometers were all flushed in 2011.

- *Foundation*: Since 2011, the foundation piezometers HP-2A, 3A, and 4A each displayed a drop in piezometric readings and continue to behave normally at this time. Piezometer HP-1A, located upstream of the centerline of the dam, continues to fluctuate with reservoir levels and follow historic trends.
- *Central Core*: The 2011 piezometer flushing had little to no effect on the central core piezometers. The piezometers continue to behave normally and show no adverse trends. Data depicts expected phreatic levels.
- *Chimney Drain*: The 2011 piezometer flushing improved the performance of the chimney drains and they now read dry as expected, with exception to piezometer HP-14. Piezometer HP-14 initially read dry following the 2011 flushing, but since that time piezometric levels have returned to the pre-flush level rising approximately [redacted] As recommended in the report, the piezometer needs to be closely monitored at this time.
- *Downstream Shell*: The 2011 piezometer flushing improved the functionality of both downstream shell piezometers, but since that time both have recorded positive piezometric

Observations and Comments

readings, most notably in piezometer HP-22. The downstream shell piezometers are located downstream of the chimney drain and should read dry. As noted in the report, Piezometer HP-22 appears to be malfunctioning at this time.

The functioning piezometers have followed normal trends, displayed a functioning downstream chimney drain, and the data has portrayed expected phreatic levels. However, we agree that Piezometer HP-22 appears to be malfunctioning at this time and recommended the owner continue flushing and testing the aging piezometers to ensure their functionality.

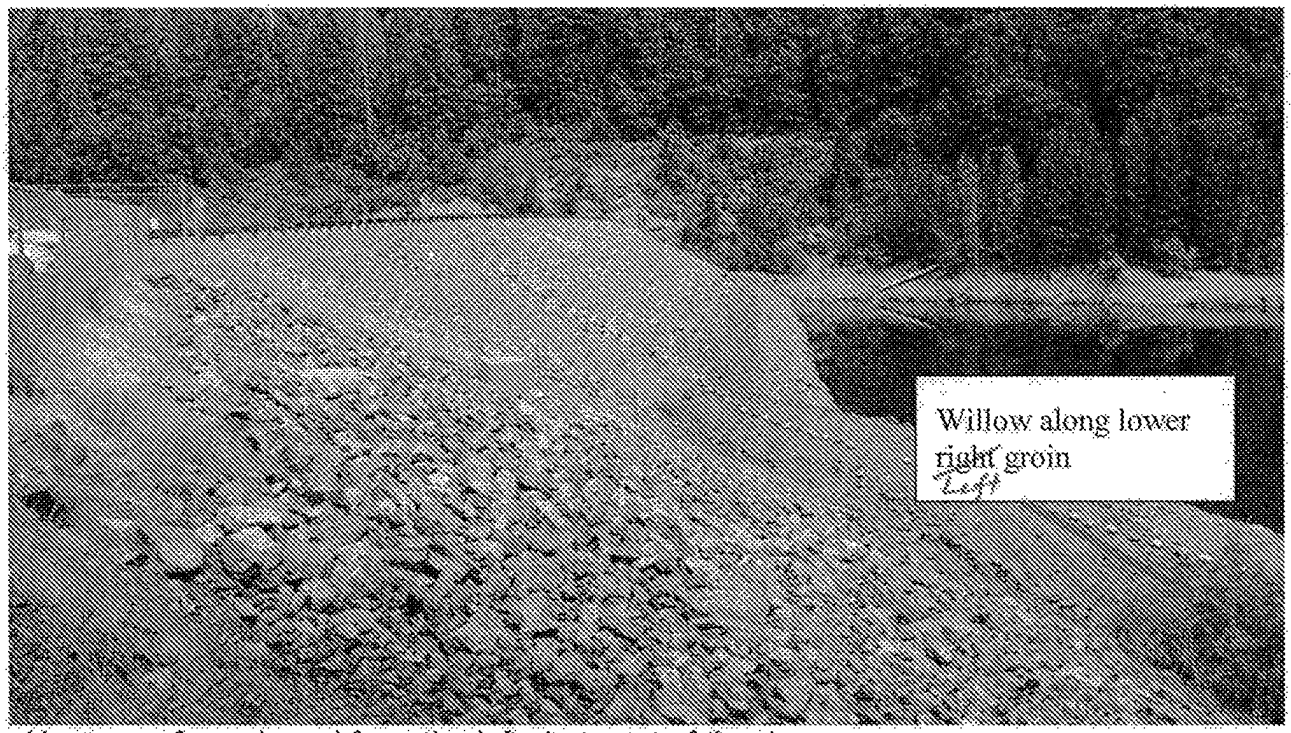
Seepage: Seepage data is recorded downstream of the dam toe at a 90° v-notch seepage weir. Data has been recorded since the early 1980s. Data over the last decade has ranged between 10 and 70 gpm. Over the reporting period seepage ranged between 10 and 30 gpm. The seepage values appear to fluctuate with changes in the reservoir level. No concerning trends are observed and conditions appear normal.

Survey Monuments: The required monument survey frequency is every 5 years. The last survey was performed in 2013, and the data was evaluated in our last inspection report. Movement data was determined to be minimal in both the horizontal and vertical direction. The next survey is due in 2018.

Conclusion: The submitted data indicates that the dam is performing satisfactorily. As stated in our letter dated March 27, 2015, we agree that Piezometer HP-22 appears to be malfunctioning at this time and recommended the owner continue flushing and testing the aging piezometers to ensure their functionality. Plans for the replacement piezometers need to be implemented for those piezometers that become inoperable and are determined to be necessary for monitoring the phreatic surface within the dam.

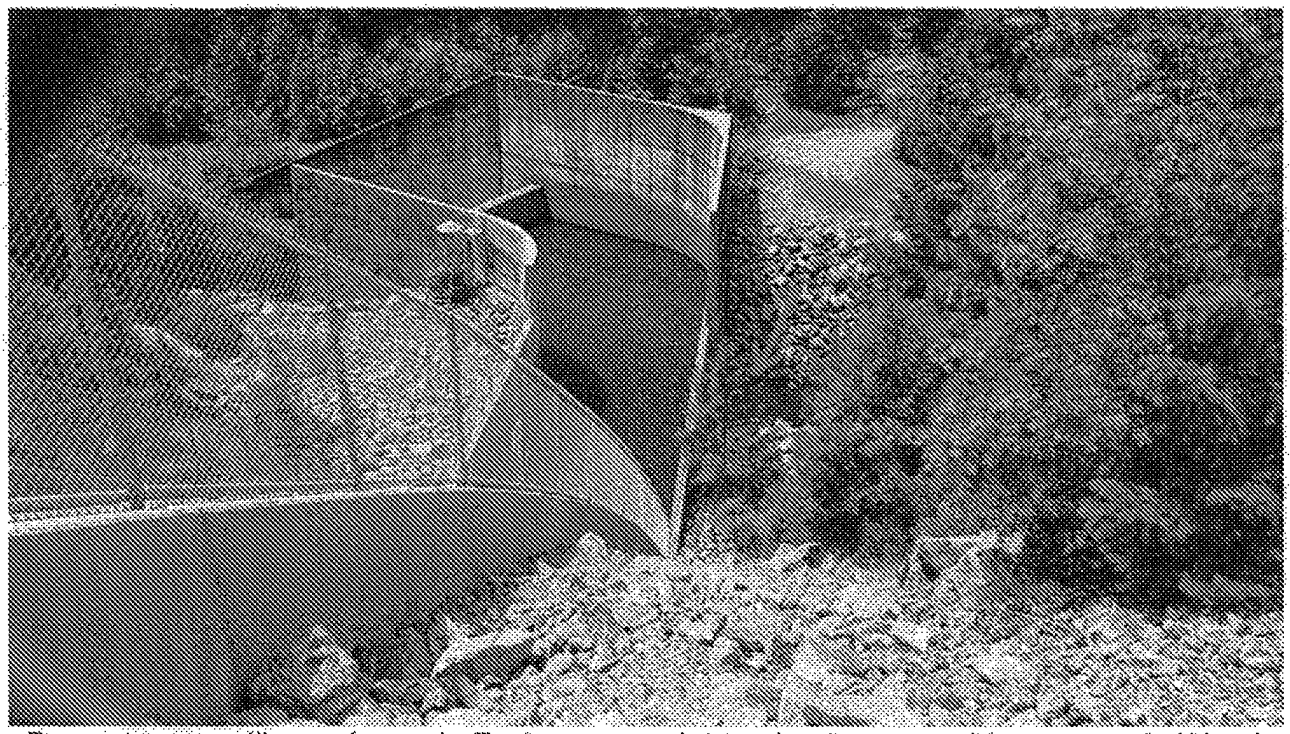
Name of Dam Sugar Pine Dam No. 2045

Date of Inspection 6/9/2015



1. Upstream face viewed from the left abutment of the dam.

2. Upper left downstream groin. I requested woody vegetation be removed at least 5-10 feet off the groin.



3. Downstream spillway channel. Red arrows point to pine trees requiring removal. Woody vegetation needs to be kept at least 5-10 feet off the spillway walls.

4. Lower downstream face viewed near the left end of the toe. Sporadic woody vegetation needs to be removed.

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DIVISION OF SAFETY OF DAMS

FILE COPY

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam: Sugar Pine Dam No.: 2045 County: Placer
Type of Dam: Earth Type of Spillway: Concrete ogee weir and chute
Water is: 0.2 feet below spillway crest and 32.0 feet below dam crest.

Weather Conditions: Sunny, clear, and mild
Contacts Made: Mr. Henry (Hank) White, General Manager of Foresthill PUD
Reason for Inspection: Periodic Maintenance Inspection

Important Observations, Recommendations or Actions Taken

The dam is well maintained. Concrete defects in the spillway chute were repaired as requested. Bushes and small trees growing on the downstream groins were requested to be removed.

Flushing of the twin-tube hydraulic piezometers in 2011 has improved their functionality and the piezometers are now providing reasonable readings. Periodic flushing of the hydraulic lines is warranted to ensure that these aging piezometers continue to provide reliable readings.

Conclusions

From the known information and visual inspection, the dam, reservoir, and the appurtenances are judged safe for continued use.

Observations and Comments

Dam

The visible portion of the upstream face, downstream face, abutments, and crest were in satisfactory condition with no signs of instability or distress [redacted] rails were straight, except where struck by vehicles. Rock riprap on both faces was intact. Transverse and longitudinal cracks on the crest asphalt appeared superficial and some were sealed. Placer County reportedly seals the cracks periodically. The width of the cracks measured about ½-inch or less and did not appear to extend below the pavement. No cracks were noted on the unpaved portion of the roadway crest.

Vegetation control was excellent, with the exception of a few bushes and small trees growing near the downstream groins, which I requested them be removed. No rodent activity was noted.

Spillway

The approach, ogee weir control section, chute and the downstream channel were clear and unobstructed. The chute walls appeared straight. Visible concrete at the ogee and chute showed no signs of significant defects. The spalled areas at the chute invert were repaired satisfactorily as requested during the previous inspection. The patched area looked tight and I commended Hank for accomplishing the task. The stilling basin down below also looked to be in good condition.

A few logs were again piled up just upstream of and on the ogee weir, which will wash down the chute during the next spills. These logs get passed through the upstream barrier, which is more like a floatation barrier to warn the boaters and is not a logboom to keep debris away. Hank reported that the District is looking into either installing a logboom to keep the logs away from the spillway, or removing the logs from the reservoir shoreline by a boat. The owner should follow

Photos taken? Yes X No
cc for Owner/Book

Inspected by: A. Ordoubigian AO 6/11/14
Date of Inspection: 5/28/14 AOm
Date of Report: 6/6/14 6/11/14

Observations and Comments

through with one of these alternatives because the logs can damage the concrete at the spillway chute and basin below.

Outlet

[redacted] All gate valves were cycled full travel (80% for the [redacted] valve) in my presence during the previous inspection of 12/20/12 with no problem. The owner cycles the valves throughout the year to make releases. Intake No. 2 was open during this inspection. The fish release valve was also open, releasing 2 cfs according to Hank.

[redacted] The pipe's coal tar coating, covered by plastic sheeting, appeared in good condition. The tunnel was also in good condition with no significant offsets or cracks in the tunnel walls or floor. Minor calcification and mineral buildup were present as before. Weepholes were mostly dry with some trickling. The owner cleans out the weepholes periodically. Minor seepage along the construction joints further upstream was present, but no live flow was noted. These conditions are longstanding and have been noted in the previous inspection reports.

Seepage

The downstream face and groins were dry. The downstream toe area was inundated as usual, but the weir was above water and read 0.22 feet or 26 gpm.

Seepage on the right abutment, noted during the last inspection to be seeping down the rock facing, was dry this time. Staining on the rock from prolong wetness was clearly visible. The wetness is believed to be from the adjacent hillside and not from the reservoir.

Instr.

Instrumentation at this dam consists of 16 twin-tube hydraulic piezometers (4 in the foundation, 5 in the central core, 5 in the chimney drain, and 2 in the downstream shell), one seepage weir, and 20 survey monuments. The dam also has a large array of other instrumentation, but their reporting was agreed to be discontinued by our letter dated May 11, 2007. The letter required the owner to read all piezometers and keep records, because not all the 16 piezometers currently monitored were yielding reasonable readings at that time. The inclinometers were required to also be maintained so they can be read if excessive movements in the vicinity are detected.

The latest instrumentation report was submitted by the January 23, 2014 letter, covering the July-2012 to June-2013 period. We conveyed our comments to the owner by the 2/7/14 letter.

Piezometers – The hydraulic lines to the twin-tube piezometers were flushed in 2011:

Foundation Piezometers – Include HP-1A, HP-2A, HP-4A, and HP-5A. Piezometer HP-1A, located upstream of the centerline, followed past trends and tracked the reservoir fluctuations. The other piezometers dropped by as much as 15 to 30 feet following the flushing operation in 2011, which is a return to historical levels, indicating that flushing improved their functionality. The piezometers are again establishing new trends.

Central Core Piezometers – Include HP-9, HP-12, HP-17, HP-19, and HP-24. All piezometers fluctuated little and followed past trends. The phreatic surface shown by these piezometers depict a low surface, indicating that the chimney drain is functioning properly. Flushing of these piezometers in 2011 did not seem to have a significant effect on the readings for the time being.

Chimney Drain Piezometers – Include HP-10, HP-14, HP-15, HP-20, and HP-21. The lowest

Observations and Comments

piezometer HP-10 continues to read near dry. Piezometers HP-20 and HP-21 have returned to their pre-1998 reading by jumping about 30 and 50 feet, respectively, following their flushing in 2011; significantly improving their reliability. Piezometers HP-14 and HP-15 have also re-adjusted following the flushing operation and are setting new trends that are closer to their pre-1998 readings. The readings show that the chimney drain is functioning properly.

Downstream Shell Piezometers – Include HP-16 and HP-22. Flushing in 2011 has improved their functionality. HP-22 has risen by about 70 feet to its pre-1996 levels, which is near its tip elevation indicating dry conditions. HP-16 has also dropped by 8 feet to near its tip elevation, indicating near dry conditions. These piezometers are expected to be dry, since they are located downstream of the chimney drain.

The submitted report concluded on page 3 that "Piezometers HP-16 and HP-22 appear to not be operating correctly". I believe these piezometers are now yielding reasonable readings (dry with occasional nuisance water of a few feet) and should continue to be monitored.

Seepage – Seepage is measured by a 90-degree v-notch weir at the downstream toe, when it's not inundated due to weather or spills. Seepage flows range between 10 and 70 gpm. During this review period, seepage remained near 20 gpm, which is consistent with past trends.

Movement – Horizontal and vertical movements are surveyed at 20 monuments; five located on the upstream face (114 feet upstream of the crest centerline), seven on the crest (25 feet upstream of the centerline), five on the downstream face (114 feet downstream of the centerline), and the remaining three further downstream on the downstream face (278 feet downstream of the crest centerline). The five monuments on the upstream face are normally not surveyed, which is acceptable considering their location.

The last two consecutive surveys were conducted on August 14, 2013 and on January 12, 2011. The maximum horizontal movement between these two surveys was an upstream movement of 0.030 foot at station 4+75 feet on the downstream face, along the line of 278 feet downstream of centerline. The maximum vertical movement between these two surveys was a settlement of 0.010 foot at station 4+50 on the crest, along the line of 25 feet upstream of the centerline. These movements are considered minimal for a 251-foot-high earth dam, over a period of 2 ½ years.

Total movements from 2001 to 2011 surveys, a period of ten years, were also minimal. The maximum horizontal movement was 0.022 foot toward downstream (at sta. 5+25 on the crest, 25 feet upstream of centerline), and the maximum vertical movement was a settlement of 0.003 foot (also at the crest monuments).

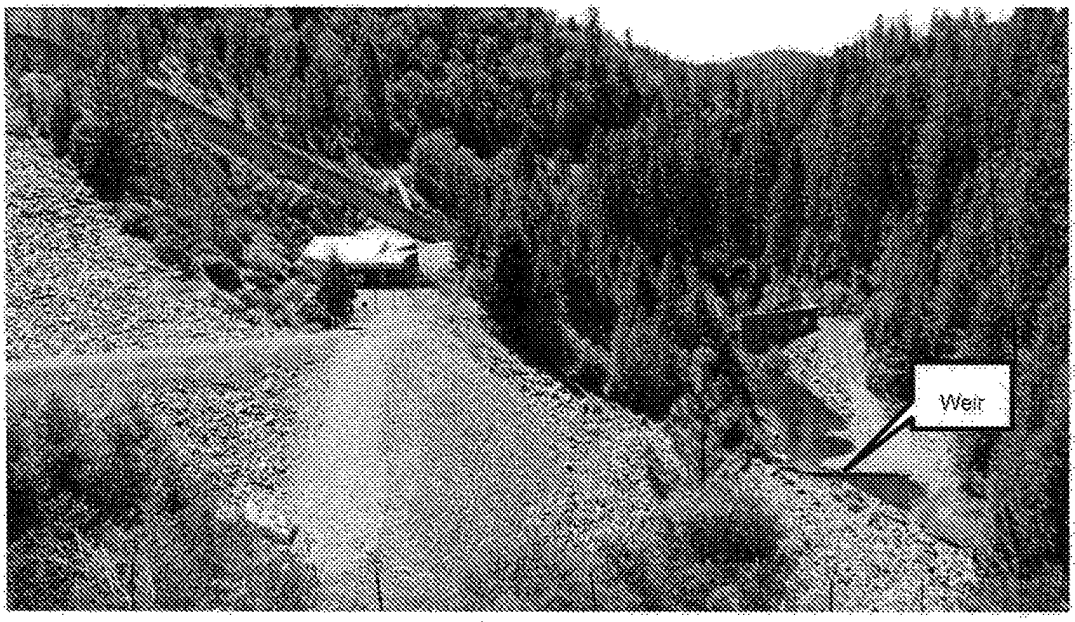
The monuments have not been surveyed on a regular basis in the past. The last three surveys were conducted in 2001, 2011, and 2013. The required frequency is every five years, as noted in our letter of January 7, 2010. This survey frequency is reasonable considering the small movements and should be adhered to regularly. The next survey will therefore need to be conducted in 2018. Interim surveys will be required following a major spill event or if there is a "felt" earthquake at the dam.

The submitted data indicates that the dam is performing satisfactorily. The instrumentation network is deemed adequate and no additional instrumentation is needed at this time.

Name of Dam Sugar Pine Dam No. 2045

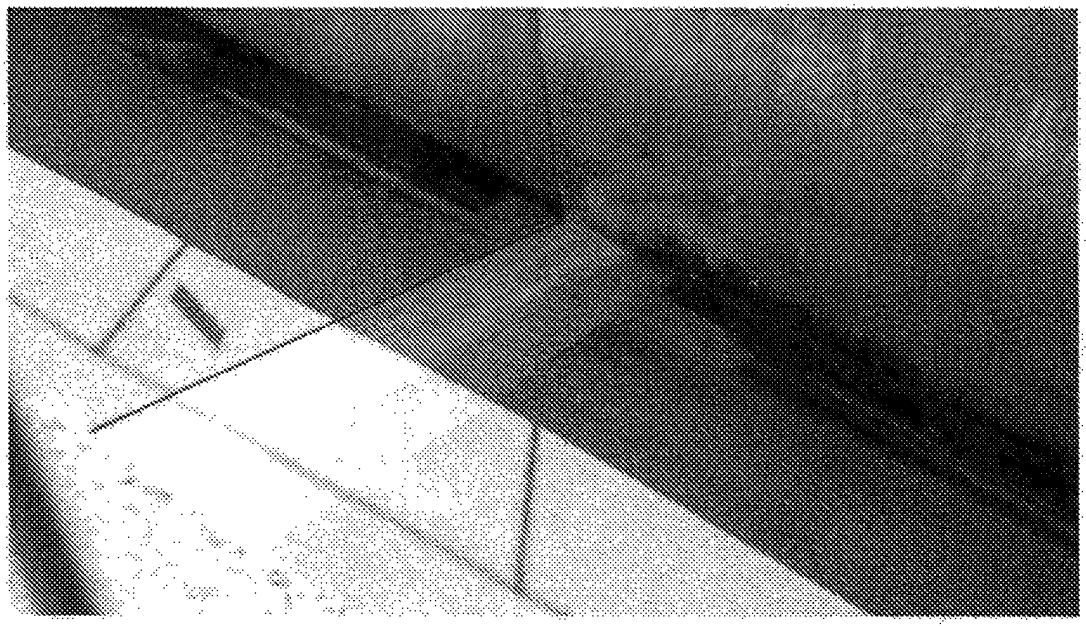
Date of Inspection 5/28/14

1. The upper portion of the downstream face, looking toward the left abutment and the spillway.

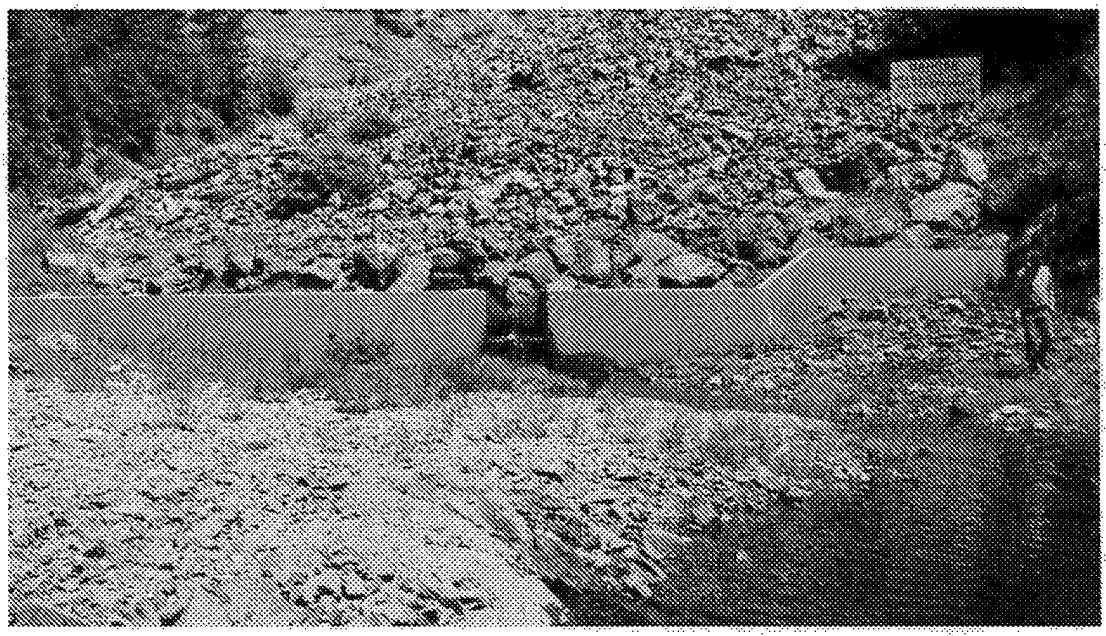


2. The lower portion of the downstream face and the toe, looking left toward the spillway chute and the stilling basin.

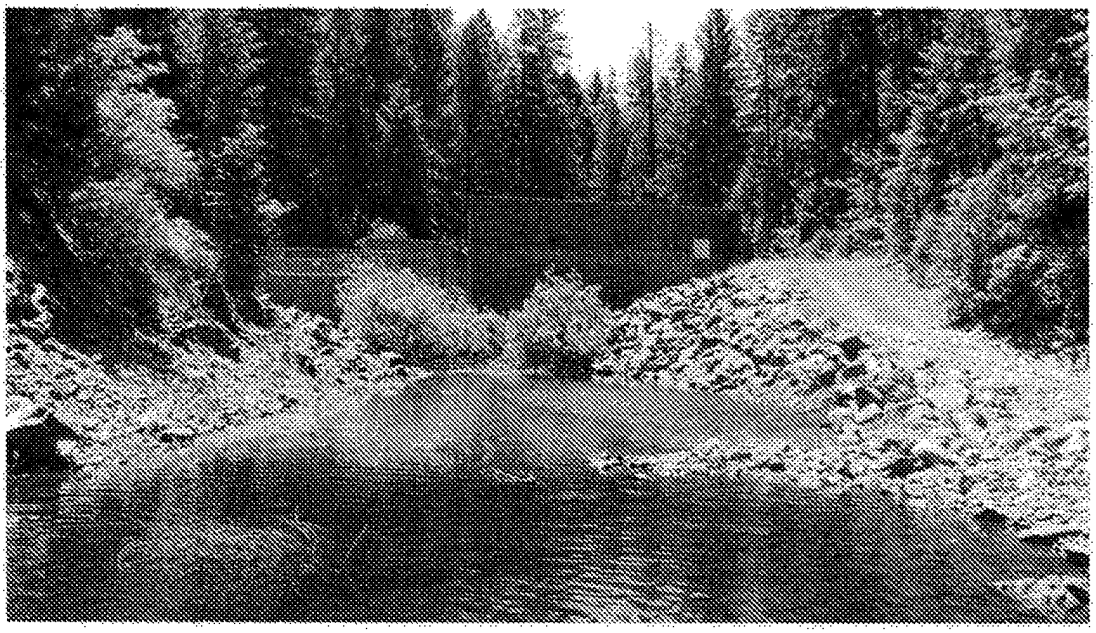
3. The left side of the spillway chute, looking down toward the stilling basin.



4. Concrete repair area in the spillway chute invert, performed last year to repair spalled concrete.



5. The seepage weir at the toe of the dam, looking right toward the right abutment.



6. The downstream toe, looking left toward the stilling basin from the weir section shown above.

STATE OF CALIFORNIA
CALIFORNIA NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
DIVISION OF SAFETY OF DAMS

FILE COPY

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam: Sugar Pine Dam No.: 2045 County: Placer
Type of Dam: Earth Type of Spillway: Concrete ogee weir and chute
Water is 0.2 feet above spillway crest and 31.6 feet below dam crest.

Weather Conditions: Sunny, clear, and cold
Contacts Made: Chad Odell, Joe Anderson, (and George Shaw in the office before insp.) with Foresthill PUD
Reason for Inspection: Periodic Maintenance Inspection

Important Observations, Recommendations or Actions Taken

The dam is well maintained. I requested the following items be accomplished:

1. Repair concrete spalls in the spillway chute. Those with exposed rebar should be repaired within a year.
2. Remove piled up logs at the spillway weir. The owner needs to consider installing a logboom.
3. Measure the piezometer and weir readings monthly instead of quarterly.
4. Submit an updated instrumentation report addressing our comments in the 5/27/11 letter (Mr. George Shaw reported on 3/8/13 that a new instrumentation report has been completed and will be mailed out to DSOD shortly).

Conclusions

From the known information and visual inspection, the dam, reservoir, and the appurtenances are judged safe for continued use.

Observations and Comments

Dam

The visible portion of the upstream face, downstream face, abutments, and crest were in satisfactory condition with no signs of instability. [redacted] rails were straight, except where struck by vehicles. Rock riprap on both faces was intact. Transverse and longitudinal cracks on the crest asphalt appeared superficial and some were sealed. Chad reported that the County seals the cracks periodically. The width of the cracks measured about ½-inch or less and did not appear to extend below the pavement. No cracks were noted on the unpaved portion of the roadway crest.

Vegetation control was excellent. No rodent activity was noted.

Spillway

The reservoir was spilling by about 2 inches. The approach, ogee weir control section, chute and the downstream channel were clear and unobstructed. The chute walls appeared straight with no significant defects. Concrete at the ogee and chute invert was not visible due to spills, but rooster tails were noted along the chute, indicating the presence of spalls or discontinuities under water. Spalls along the concrete chute have been reported in the past and are reportedly still there. I requested Chad to repair the spalls that show exposed rebar within a year, and monitor the rest with repairs performed as needed.

I noted logs piled up just upstream of and on the ogee weir. I requested the logs, which are not an immediate safety problem, be removed weather permitting, if they don't get washed down the chute. These logs get passed through the upstream barrier, which is more like a floatation barrier

Photos taken? Yes X No
cc for: Owner/Book

Inspected by: A. Ordoubigian AO 3/8/13
Date of Inspection: 12/20/12 AO
Date of Report: 3/8/13 3/8/13

Observations and Comments

to warn the boaters and is not a logboom to keep debris away. The District needs to look into installing a logboom so the logs do not cause damage to or obstruct the spillway.

Outlet

[redacted]. All [redacted] valves were cycled full travel during this inspection with no problem. The [redacted] valve was opened by about 80% (40 inches) and then closed. Operation procedures allow the [redacted] valve to be only opened partially due to excessive vibrations.

We walked the outlet tunnel. The pipe's coal tar coating, covered by plastic sheeting, appeared in good condition. The tunnel was also in good condition with no significant offsets or cracks in the tunnel walls or floor. Minor calcification and mineral buildup were present as before. Weepholes were mostly dry with some trickling. Chad cleans out the weepholes periodically. Minor seepage along the construction joints further upstream was present, but no live flow was noted. These conditions are longstanding and have been noted in the previous inspection reports.

Seepage

The downstream face and groins were dry. The downstream toe area and weir were inundated. The weir remains inundated during the winter and spring months, and is only read during the summer and fall months, when the toe pool drains out. We discussed relocating the weir or raising its elevation to be able to read it year around. The District will look into this issue in the future.

I noted seepage on the right abutment, seeping down the rock facing (see photo). Chad believed the seepage was rain related and was coming from the adjacent hill side.

Instr.

The dam has a large array of instrumentation, but the owner currently reads only the piezometers and the seepage weir. The dam also has survey monuments, but no survey data has been submitted since 2002. The latest instrumentation report was submitted by the April 25, 2011 letter, covering the 2010 calendar year. We conveyed our comments to the owner by the 5/27/11 letter, which again requested survey data be submitted. The letter also required the owner to, among other items, address the unreliable hydraulic piezometer readings.

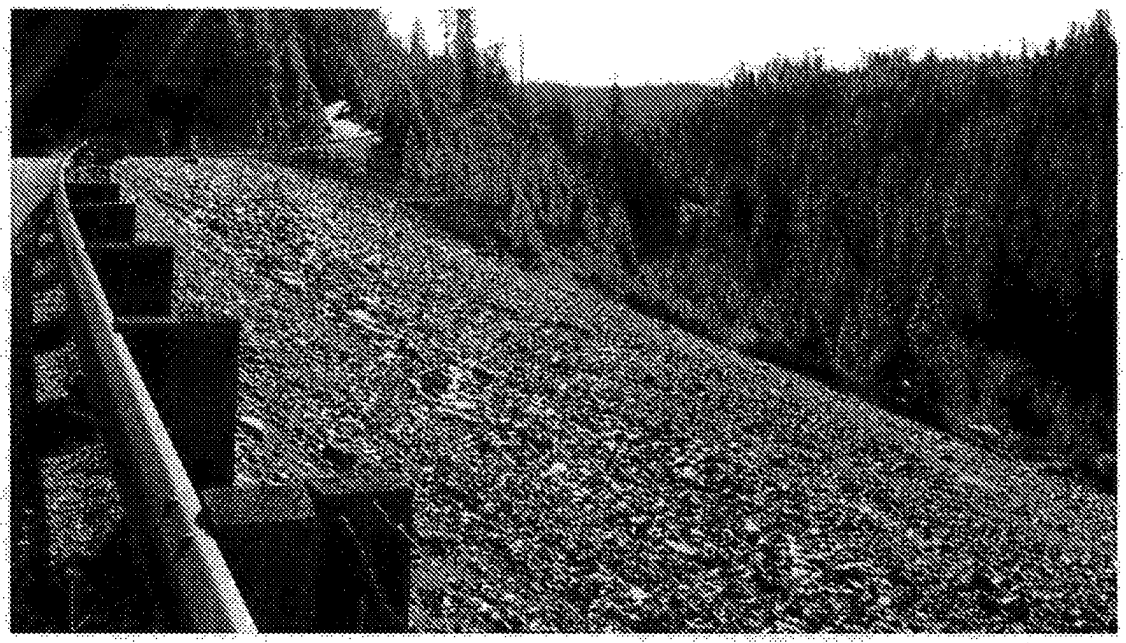
Mr. George Shaw, the interim General Manager of the District, notified me on 3/8/13 that a new and improved instrumentation report has been prepared and will be submitted to DSOD shortly. In lieu of reviewing the old incomplete report, I will review the new report when received in the next week or so.

Name of Dam Sugar Pine Dam No. 2045

Date of Inspection 12/20/12

Observations and Comments

1. The crest and upstream face of the dam, looking toward the left abutment. The spillway approach is visible in the background.



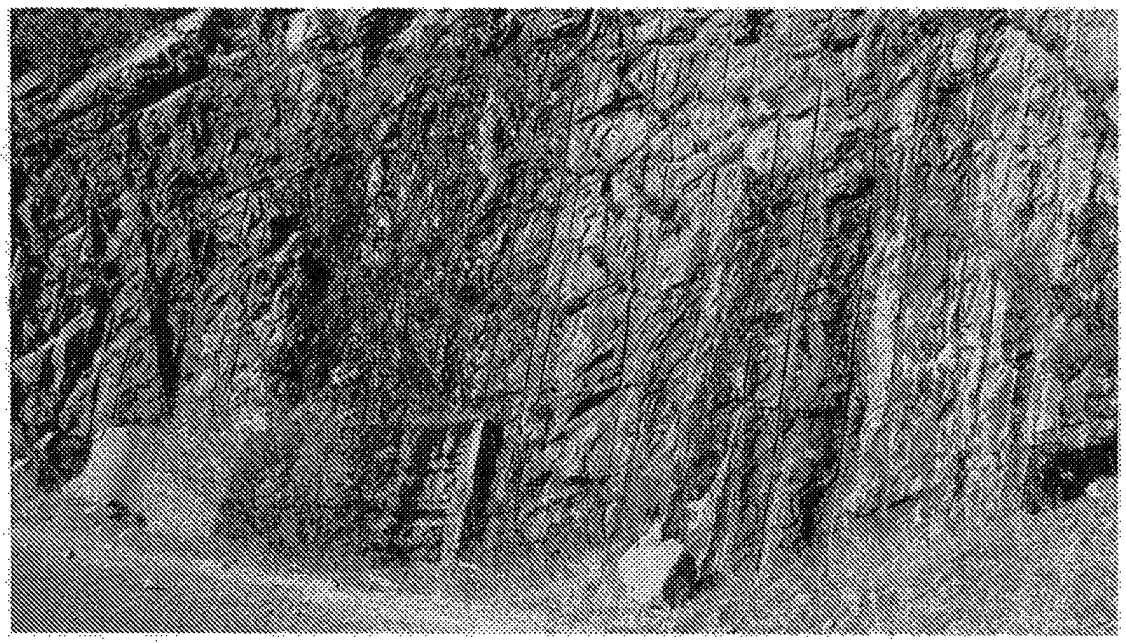
2. The downstream face of the dam, looking toward the left abutment.

3. Longstanding transverse crack of about ½-inch wide in the crest asphalt.

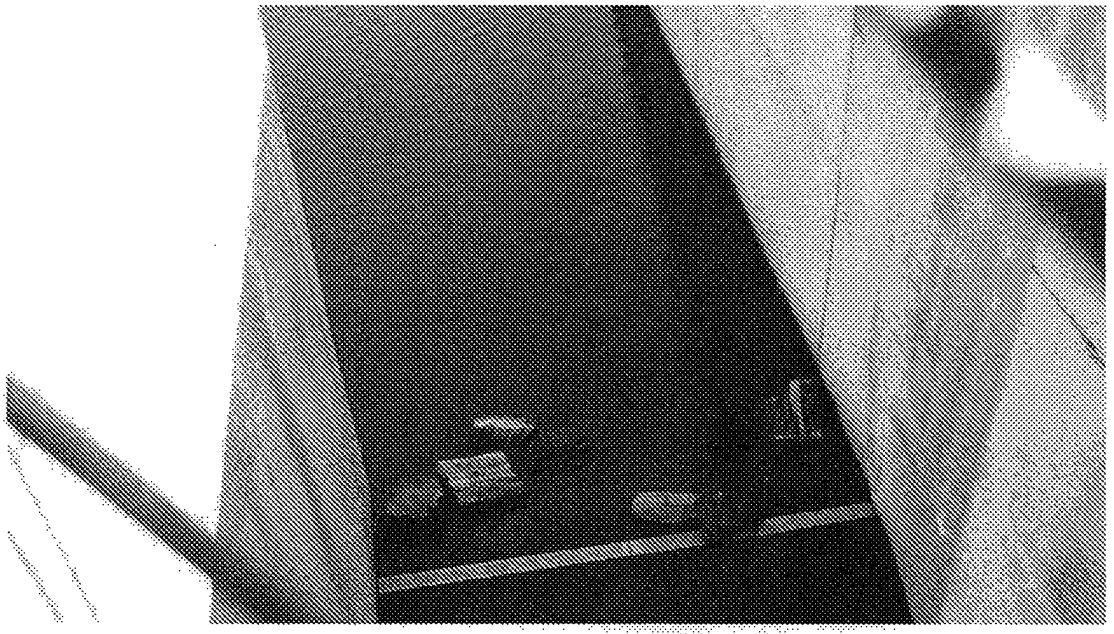
Name of Dam Sugar Pine Dam No. 2045

Date of Inspection 12/20/12

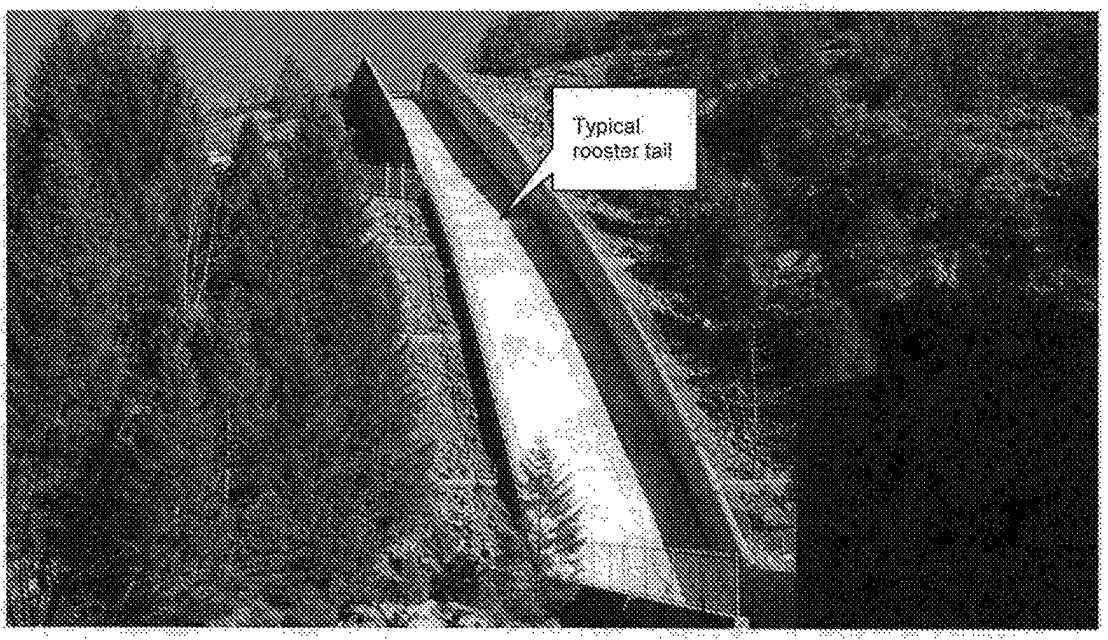
[redacted]



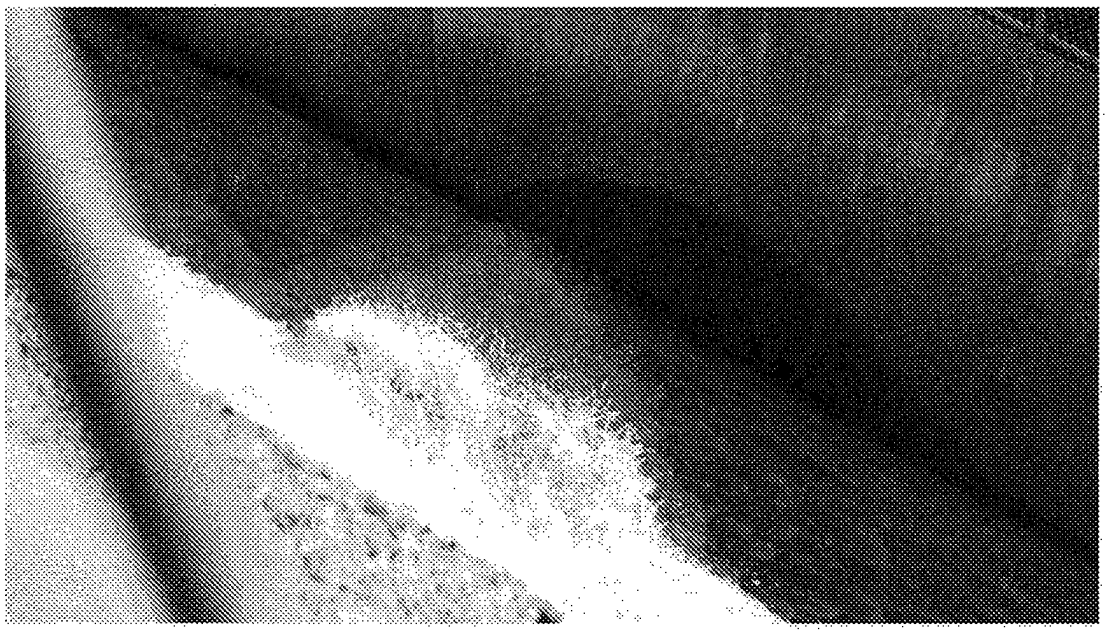
5. Seepage through the right abutment rock, believed to have been originated from the adjacent hillside.



6. Tree logs piled up at the spillway control section (ogee weir).



7. The spillway chute with rooster tails along the way, indicating the presence of spalls or discontinuities under water.



8. Close up view of the rooster tail shown above.

[redacted]

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam Sugar Pine Dam No. 2045

Date of Inspection 12/20/12

[redacted]

INSPECTION OF DAM AND RESERVOIR IN CERTI..D STATUS

Name of Dam Sugar Pine Dam No. 2045

Date of Inspection 12/20/12