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

FILE

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam Rollins Dam No. 61-21 County Nevada
Type of Dam Earth and Rock Type of Spillway Concrete Channel w/ Ogee Section
Water is 16.8 feet below spillway crest and 33.3 feet below dam crest.

Weather Conditions Sunny and warm, 85 degrees F.
Contacts Made Keane Sommers, Dar Chen, and Jerry Green w/ NID, John Onderdonk w/ FERC, Wayne Edwards and Faiz Makdisi, Independent Part 12 Consultants.
Reason for Inspection Annual Maintenance Inspection.

Important Observations, Recommendations or Actions Taken

NID has begun design of a replacement [redacted] valve for the [redacted] outlet control, as the old [redacted] valve still cannot be fully operated. Design and fabrication together may take 6-8 months, but Mr. Chen expects the new valve will be installed November 2017, during the next planned powerhouse outage. As this is an in-kind replacement, no application will be required. NID needs to notify DSOD in advance when the valve replacement will take place.

A leak in the wall of the penstock was discovered at the back of the outlet tunnel against the headwall during the recoating which took place this year. A temporary water stop was installed against the wall of the tunnel to limit leakage into the tunnel until repairs could be made. Following this inspection, I confirmed that repairs to the exterior wall of the penstock were completed in early October.

Conclusions

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

Observations and Comments

Dam

We [redacted] inspected the downstream face and visible portion of the upstream face. The dam remains in good condition, and showed no signs of instability or distress. The crest was straight, level and in satisfactory condition. The rock lining on the upstream and downstream slopes appeared to be stable and uniform, as usual. Vegetation control was excellent, and there were no signs of rodent activity.

Spillway

The spillway approach, control section, ogee weir, concrete chute, and downstream channel were clear and unobstructed. All concrete surfaces appeared to be in good condition, with no significant cracking or spalling. Spillway panels remain well-aligned, and crack sealants are holding up well. The spillway side walls showed no sign of movement, and weep holes were clear.

Outlet

[redacted]

We inspected the outlet tunnel on this date and found it to be in satisfactory condition, with typical dampness on the ceiling and walls, and minimal water along the floor. The penstock itself was recoated earlier this year and appears to be in excellent condition.

A leak in the wall of the penstock was discovered at the back of the outlet tunnel against the headwall. Mr. Chen believes that the leak was due to dielectric corrosion of the penstock wall stemming from direct contact of penstock steel with one of the brass connectors used during the penstock coating work. Frequent activity in the outlet tunnel during the coating work may have pushed one of the corroded connectors against the penstock, leading to advanced corrosion damage in just weeks. A temporary water stop was installed against the wall of the tunnel to limit

Photos taken? Yes X No
cc for Owner/Book

Inspected by A. C. Roundtree
Date of Inspection 9/26/2016
Date of Report 1/19/2017

Observations and Comments

leakage into the tunnel until repairs could be made. Following this inspection, I confirmed that repairs to the exterior wall of the penstock were completed in early October.

[redacted] valve was last fully cycled in DSOD's presence on 12/30/2014. During the same inspection, the [redacted] valve was cycled to ~65%, where it stuck.

In May 2015, NID removed the old grease which had accumulated and hardened on the barrel of the [redacted] valve and opened it to 88%, [redacted]

NID has begun design of a replacement [redacted] valve for the [redacted] outlet control, as the old [redacted] valve still cannot be fully operated. Design and fabrication together may take 6-8 months, but Mr. Chen expects the new valve will be installed November 2017, during the next planned powerhouse outage. As this is an in-kind replacement, no application will be required. NID needs to notify DSOD in advance of when the valve replacement will take place.

Seepage

The downstream face, groins, and toe of the dam were dry, as usual. The weir at the toe of the dam is no longer monitored, as it is deemed unrepresentative of dam seepage conditions due to contributions from other sources.

Instr.

Instrumentation at this dam consists of 7 crest monuments, 26 spillway monuments, and one observation well. The latest instrumentation report was submitted with an owner's letter dated April 7, 2016, and includes data for calendar year 2015.

Crest Monuments: The 7 monuments along the crest are surveyed every two years for both horizontal and vertical control. The most recent survey was completed in 2015. The maximum recorded horizontal and vertical displacements between the 2013 and 2015 surveys are [redacted] and [redacted], respectively. Maximum cumulative horizontal and vertical displacements since surveys began in 1965 are [redacted] and [redacted], respectively. These movements are considered normal for a large earth and rockfill dam over a period of 50+ years.

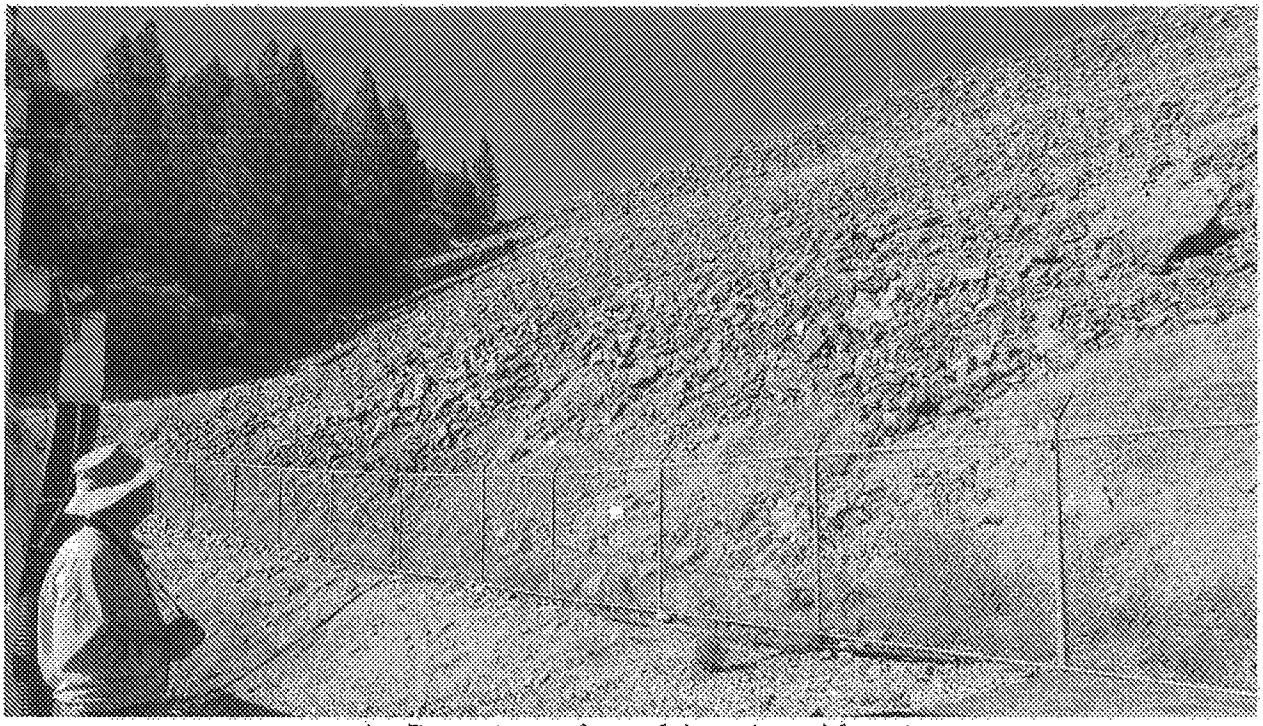
Spillway Monuments: In our 7/26/2013 letter, we notified NID that we have no objections to discontinuing monitoring of the spillway wall monuments at this time.

Observation Well: The observation well is located on the downstream edge of the crest at the maximum section of the dams. The well is downstream of the core, and readings normally fluctuate with reservoir elevation. In 2015, readings fluctuated between 1977 and 1984 feet, which is within the normal range. No adverse trends were observed, and readings continue to indicate a low and stable phreatic surface within the embankment.

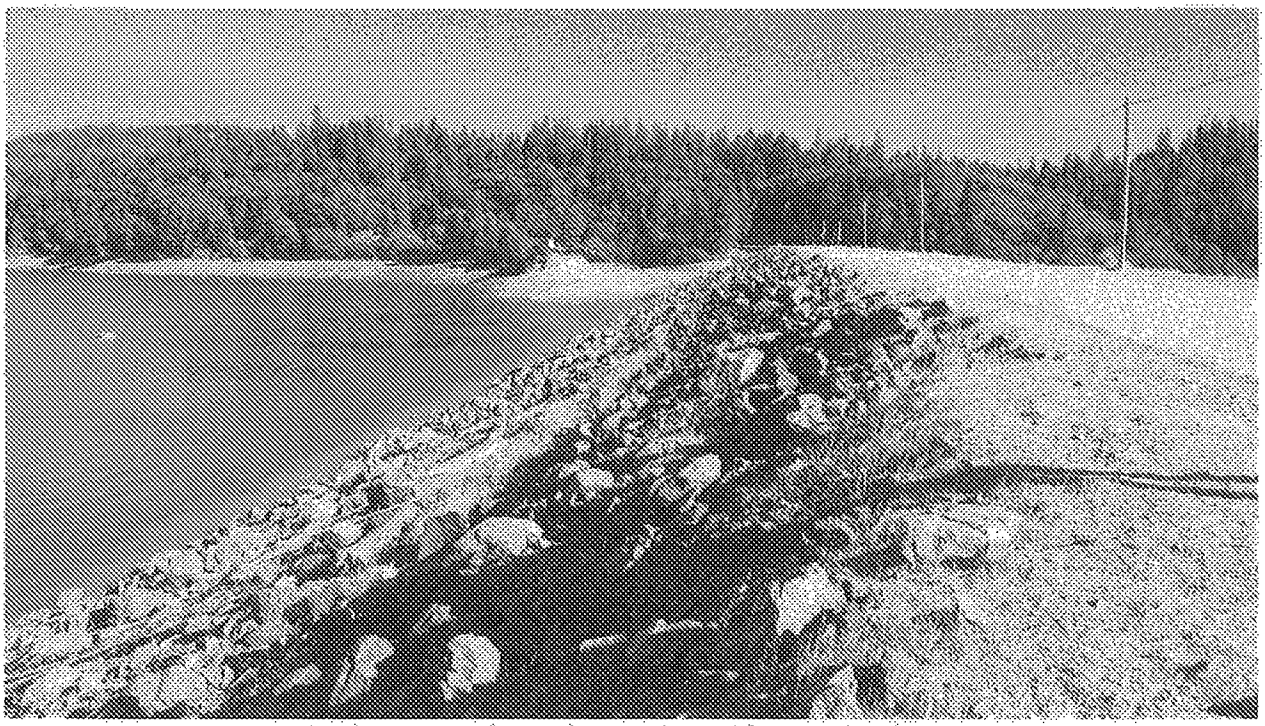
The current instrumentation network is judged to be adequate, and no additional instrumentation is deemed necessary at this time.

Name of Dam Rollins Dam No. 61-21

Date of Inspection 9/26/2016



1. Downstream face of dam viewed from toe.

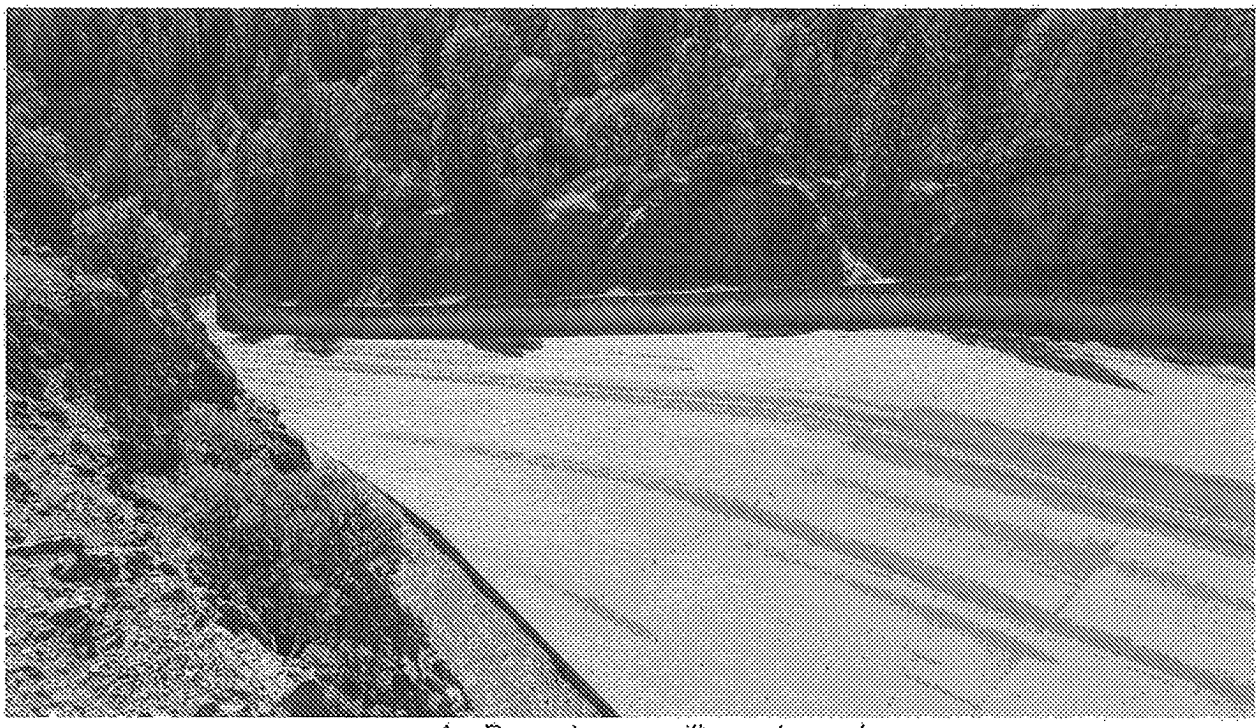


2. Upstream face of dam viewed from right abutment.

Name of Dam Rollins Dam No. 61-21

Date of Inspection 9/26/2016

3. Upper spillway channel and ogee weir viewed from hilltop.



4. Downstream spillway channel.

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

FILE

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam Rollins Dam No. 61-21 County Nevada
Type of Dam Earth and Rock Type of Spillway Concrete Channel w/ Ogee Section
Water is 14.9 feet below spillway crest and 31.4 feet below dam crest.

Weather Conditions Clear and cool, 65 degrees F.
Contacts Made Dar Chen and Jerry Green w/ Nevada Irrigation District.
Reason for Inspection Annual Maintenance Inspection.

Important Observations, Recommendations or Actions Taken
In May 2015, NID removed the old grease which had accumulated and hardened on the barrel of the [redacted] valve and opened it to 88%, [redacted]

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

Observations and Comments

Dam — We [redacted] inspected the downstream face and visible portion of the upstream face. The dam was in good condition, and showed no signs of instability or distress. The crest was straight, level and in satisfactory condition. The rock lining on the upstream and downstream faces appeared to be stable, uniform and in satisfactory condition. Vegetation control was excellent, and there were no signs of rodent activity.

Spillway — The spillway approach, control section, ogee weir, concrete chute, and downstream channel were clear and unobstructed. All concrete surfaces appeared to be in good condition, with no significant cracking or spalling. Spillway panels remain well-aligned, and crack sealants are holding up well. The spillway side walls showed no sign of movement, and weep holes were clear.

Outlet — [redacted]
I inspected the rock [redacted] on this date and found it to be in satisfactory condition, with typical dampness on the ceiling and walls, and minimal standing water along the floor. The pipe coating is beginning to deteriorate, and the District plans to have it recoated in the next few years.

[redacted] valves are cycled annually by NID each spring. The [redacted] was last fully cycled in DSOD's presence on 12/30/2014. During the same inspection, the [redacted] valve was cycled to ~65%, [redacted]

In May 2015, NID removed the old grease which had accumulated and hardened on the barrel of the [redacted] valve and opened it to 88%, [redacted]

ACR 11/23/15

Photos taken? Yes X No
cc for Owner/Book

Inspected by A. C. Roundtree ACR 11/30/15
Date of Inspection 9/30/2015 ACR
Date of Report 11/23/2015 11/30/15

Name of Dam Rollins Dam No. 61-21

Date of Inspection 9/30/2015

Observations and Comments

Seepage

The downstream face, groins, and toe of the dam were dry, as usual. The weir at the toe of the dam is no longer monitored, as it is deemed unrepresentative of dam seepage conditions due to contributions from other sources.

Instr.

Instrumentation at this dam consists of 7 crest monuments, 26 spillway monuments, and one observation well. The latest instrumentation report was submitted with an owner's letter dated April 2, 2015, and includes data for calendar year 2014.

Crest Monuments: The 7 monuments along the crest are surveyed every two years for both horizontal and vertical control. The most recent survey was completed in 2013, and was reviewed in the previous inspection report. The next monument survey is due in 2015.

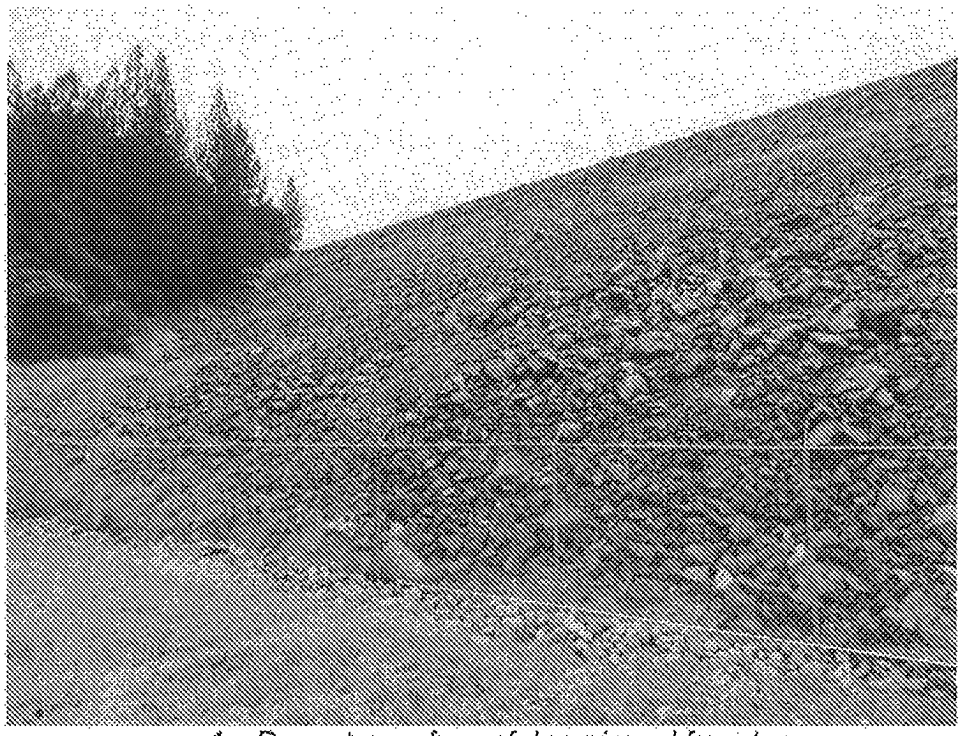
Spillway Monuments: In our 7/26/2013 letter, we notified NID that we have no objections to discontinuing monitoring of the spillway wall monuments at this time.

Observation Well: The observation well is located on the downstream edge of the crest at the maximum section of the dams. The well is downstream of the core, and readings normally fluctuate with reservoir elevation. In 2014, readings fluctuated between 1980 and 1985 feet, which is within the normal range. No adverse trends were observed, and readings continue to indicate a low and stable phreatic surface within the embankment.

The current instrumentation network is judged to be adequate, and no additional instrumentation is deemed necessary at this time.

Name of Dam Rollins Dam No. 61-21

Date of Inspection 9/30/2015

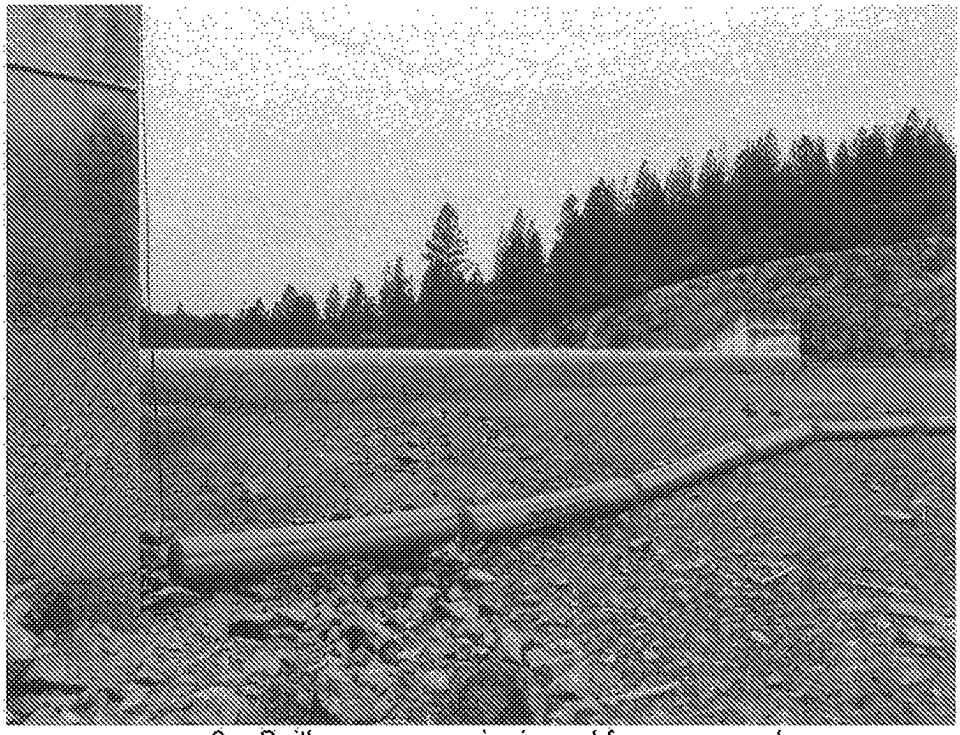


1. Downstream face of dam viewed from toe.

2. Upstream face of dam viewed from spillway approach.

Name of Dam Rollins Dam No. 61-21

Date of Inspection 9/30/2015



3. Spillway ogee weir viewed from approach.

4. Spillway ogee weir viewed from left spillway side wall.

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

FILE

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam Rollins Dam No. 61-21 County Nevada
Type of Dam Earth and Rock Type of Spillway Concrete Channel w/ Ogee Section
Water is 7.2 feet below spillway crest and 23.7 feet below dam crest.

Weather Conditions Cold, 35 degrees F.
Contacts Made Dar Chen w/ Nevada Irrigation District.
Reason for Inspection Outlet Cycling Inspection.

Important Observations, Recommendations or Actions Taken
The owner was unable to cycle the [redacted] valve beyond 65%, and plans to investigate the cause of binding and restore the valve to full functionality in 2015.

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

Observations and Comments

Outlet

Due to an electric systems malfunction, the owner was unable to cycle the [redacted] valve and [redacted] valve during my September 2014 inspection as scheduled. I returned to the site on this date to witness the full cycling of these two valves.

The [redacted] valve was fully cycled without any problems.

The [redacted] valve was cycled to ~65%, where it stuck. After trying several different methods to free the valve following my inspection, the owner contacted me by email and said they were unable to open it beyond this point. The owner plans to investigate the cause of binding and restore the valve to full functionality in 2015.

ACR 3/2/15
AO 3/5/15
ASR 3/5/15

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

Inspected by A. C. Roundtree
Date of Inspection 12/30/2014
Date of Report 3/2/2015

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

FILE

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam Rollins Dam No. 61-21 County Nevada
Type of Dam Earth and Rock Type of Spillway Concrete Channel w/ Ogee Section
Water is 6.1 feet below spillway crest and 22.6 feet below dam crest.

Weather Conditions Clear and sunny, 85 degrees F.
Contacts Made Dar Chen and Jerry Green w/ Nevada Irrigation District.
Reason for Inspection Annual Maintenance Inspection.

Important Observations, Recommendations or Actions Taken
Large woody debris had been removed from the upstream face of the dam, as requested.

Erosion rills near the outside edge of the left spillway wall have been repaired, as requested.

Due to an electric systems malfunction, the owner was unable to cycle the two outlet valves as scheduled. Arrangements need to be made to fully cycle the [redacted] fly valve and [redacted] fixed cone valve during the next maintenance inspection.

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

Observations and Comments

Dam

We [redacted] the downstream face and visible portion of the upstream face. The dam remains in satisfactory condition, and showed no signs of instability or distress. The crest was straight, level and in good condition. Both abutment contacts appear to be sound. The rock lining on the upstream and downstream faces appeared to be stable, uniform and in satisfactory condition. Large woody debris noted on the upstream face during the previous inspection had been removed, as requested. Vegetation control was excellent, and there were no signs of rodent activity.

Spillway

The spillway approach, control section, ogee weir, concrete chute, and downstream channel were clear and unobstructed. All concrete surfaces appeared to be in good condition, with no significant cracking or spalling. Spillway panels appeared to be well-aligned, and spillway side walls appeared to be straight, with no sign of movement or instability. NID continues to monitor the crack gage on the left spillway wall at the second expansion joint downstream of the ogee section, but reports no significant movement. Cracks in the spillway ogee and invert had been recently sealed, and weep holes were recently blown clear of debris.

Outlet

[redacted] valves are cycled annually by NID in the spring, and both were last fully cycled in DSOD's presence on 1/27/2011, without any problems. Due to an electric systems malfunction, the owner was unable to cycle the two outlet valves during the inspection, as scheduled. Arrangements need to be made to fully cycle the [redacted] valve and [redacted] valve during the next maintenance inspection.

ACR 10/14/14

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

Inspected by A. C. Roundtree ACR 10/24/14
Date of Inspection 9/17/2014 ACR
Date of Report 10/14/2014 10/20/14

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam Rollins Dam No. 61-21

Date of Inspection 9/17/2014

Observations and Comments

Seepage

The downstream face, groins, and toe of the dam were dry, as usual. The weir at the toe of the dam is no longer monitored, as it is deemed unrepresentative of dam seepage conditions due to contributions from other sources.

Instr.

Instrumentation at this dam consists of 7 crest monuments, 26 spillway monuments, and one observation well. The latest instrumentation report was submitted with an owner's letter dated March 31, 2014, and included data through calendar year 2013.

Crest Monuments: The 7 monuments along the crest are surveyed every two years for horizontal and vertical control, most recently in 2013. Between the 2011 and 2013 surveys, maximum vertical and horizontal movements were [redacted] and [redacted], respectively. Between the initial survey in 1965 and the 2013 survey, cumulative settlement and deflection were [redacted] and [redacted], respectively. These movements are small for a large earth and rock dam over such a long period.

Spillway Monuments: The last spillway monument survey was conducted in 2013, and showed spillway wall movements of less than [redacted] both toward and away from the spillway centerline. This oscillating movement is normal, and has been noted in several previous reports. The greatest cumulative inward movement was [redacted] @ monument 11 on the left wall in 2009. In DSOD's July 26, 2013 letter to the owner, we had no objections to the owner discontinuing monitoring of the spillway wall monuments.

Observation Well: The observation well is located on the downstream edge of the crest at the maximum section of the dams. The well is downstream of the core, and readings normally fluctuate with reservoir elevation. Since the well casing was cleaned in 2008, readings have fluctuated between 1970 and 1992 feet, which is consistent with data dating back to 1968. No adverse trends were observed, and readings continue to indicate a low and stable phreatic surface within the embankment.

I found no irregularities or anomalies in the data to indicate any problems or dam safety concerns. The current instrumentation network is judged to be adequate, and no additional instrumentation is deemed necessary at this time.

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

FILE

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam Rollins Dam No. 61-21 County Nevada
Type of Dam Earth and rock Type of Spillway Ogee weir and concrete channel
Water is 20 feet below spillway crest and 36.6 feet below dam crest.

Weather Conditions Clear and cool
Contacts Made Keane Sommers, Jerry Green, and Todd Jordan with NID
Reason for Inspection Annual Maintenance Inspection

Important Observations, Recommendations or Actions Taken

The following maintenance items require the owner's attention:

1. Remove the large woody debris off the upstream face of the dam.
2. Backfill and compact erosion rills observed along the outside of the left spillway wall.

As stated in DSOD's July 26, 2013 letter to the owner, we have no objections to discontinuing monitoring of the spillway wall monuments at this time.

Conclusions

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

Observations and Comments

Dams [redacted] The crest was straight, level, and in good condition. Both faces exhibited no signs of instability or distress. The rock faces remained stable and intact. Vegetation control was good with the exception to the large woody debris observed sporadically along the upstream face. I requested the debris be removed off of the dam. No rodent activity was observed.

Spillway The spillway approach, control section ogee weir, and concrete channel were clear and unobstructed. We observed the spillway channel while walking along the left spillway wall. The concrete remains in good condition with no significant cracking or spalling observed. The spillway walls appeared to be straight and level, and they showed no signs of movement. NID continues to monitor the crack measuring device located on the left spillway wall between the wall panels at the second joint downstream of the ogee section. The device was observed during this inspection and continues to show little signs of movement.

Erosion rills along the outside left channel wall still exist and are an on-going maintenance item at the dam. The rills are no deeper than [redacted] and are sporadically located along the entire length of the wall. I requested they be compacted and backfilled. As stated in past inspection reports, the longstanding slides above both spillway walls are not believed to be deep seated, and they do not cause a dam safety concern at this time. The slide above the left spillway wall was visible during this inspection. Slide material is kept piled off the spillway wall.

Outlet [redacted]

Photos taken? Yes X No
cc for Owner/Book

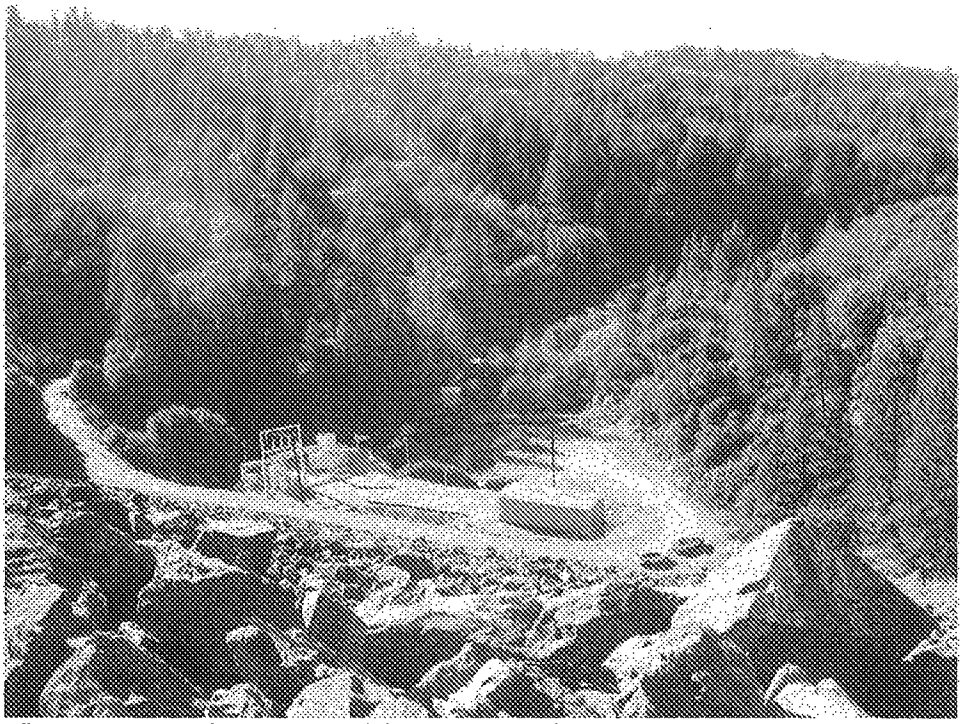
Inspected by T. Jimenez TJ 11/8/13
Date of Inspection 10/31/2013 AS 11/13/13
Date of Report 11/7/2013 ATM 11/14/13

Observations and Comments

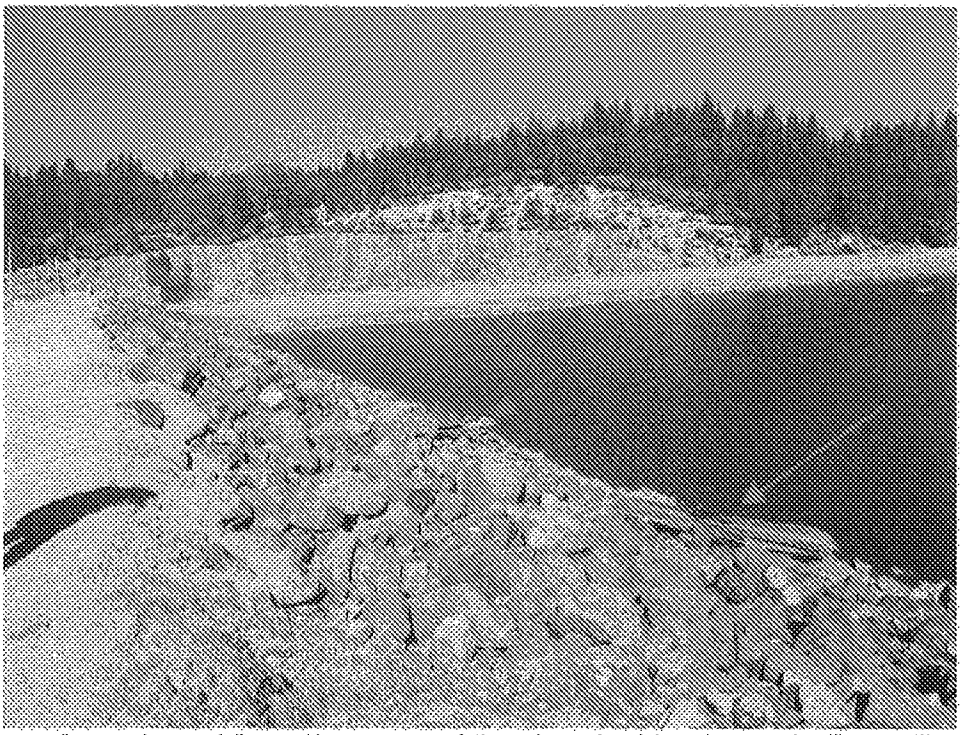
	Both valves were fully cycled in DSOD's presence on 1/27/2011, with no reported problems. NID cycles the valves annually and last cycled them in the Spring of 2013.
	We walked the [redacted] and branched section leading to the [redacted] controls during this inspection. The [redacted] remains tight and sound with minimal wetness observed along the tunnel floor. The [redacted] plug was dry with no signs of leakage. The branched section housing the [redacted] controls was in good condition. The plug in the branched section was dry with no signs of leakage.
	Arrangements to walk the [redacted] tunnel and cycle both valves need to be made during the next inspection. DSOD last observed the [redacted] tunnel on 1/27/2011.
Seepage	No seepage was observed on the downstream face, groins, or toe of the dam. The weir at the toe of the dam is no longer monitored since it is influenced by other sources and does not represent seepage from the dam.
Instr.	Instrumentation at the dam consists of 7 crest monuments, 26 spillway monuments, and one observation well. The latest surveillance report was submitted with an owner's letter dated July 1, 2013.
	Crest Monuments: Monuments are surveyed every two years for horizontal and vertical control. Monuments were last surveyed in 2011. Data was reviewed in the 10/5/2012 inspection report. All movements were found to be minimal. The next survey is due in 2013.
	Spillway Monuments: The spillway has a total of 14 monuments along the left wall and 12 monuments along the right wall. The monuments were installed in 2005 to measure deflection and are surveyed annually. Both walls continue to show oscillating movement toward and away from the center line on the spillway. These movements are considered minimal. The greatest inward movement along the right wall is [redacted] and the greatest inward movement along the left wall is [redacted]. Since 2005, there has been no indication that the slides observed above both spillway walls are deflecting the walls inward.
	In the report NID recommended discontinuing monitoring of the spillway walls as they do not consider these readings to be a serious risk to dam safety. In DSOD's July 26, 2013 letter to the owner, we had no objections to the owner discontinuing monitoring of the spillway wall monuments.
	Observation Well: The observation well is located on the downstream edge of the crest at the maximum section of the dam, downstream of the core. Readings are recorded monthly. The well tip elevation is [redacted] (measurement taken in field during this inspection). The crest elevation is [redacted]. The readings fluctuate with changes in the reservoir level. Since the well casing was cleaned in 2008, readings have fluctuated between 1970 and [redacted]. This is consistent with data dating back to 1968. No adverse trends are observed and the readings continue to indicate a low and stable phreatic surface.
	The current instrumentation network is judged to be adequate, and no additional instrumentation is deemed necessary at this time.

Name of Dam Rollins Dam No. 61-21

Date of Inspection 10/31/2013



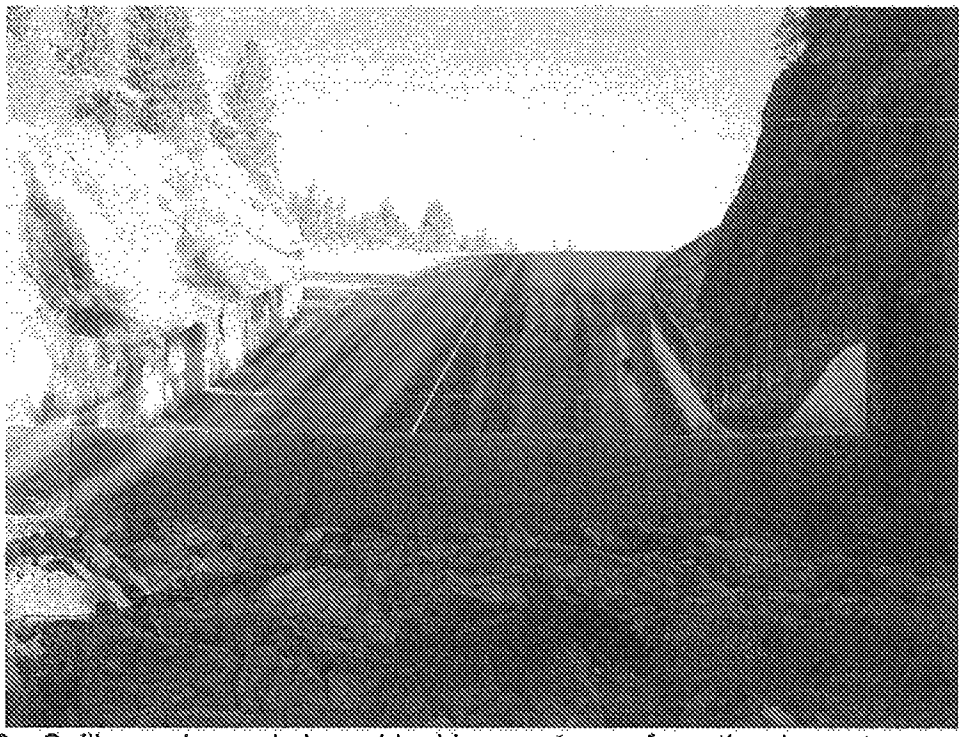
1. Downstream face viewed from crest of the dam at the maximum section.



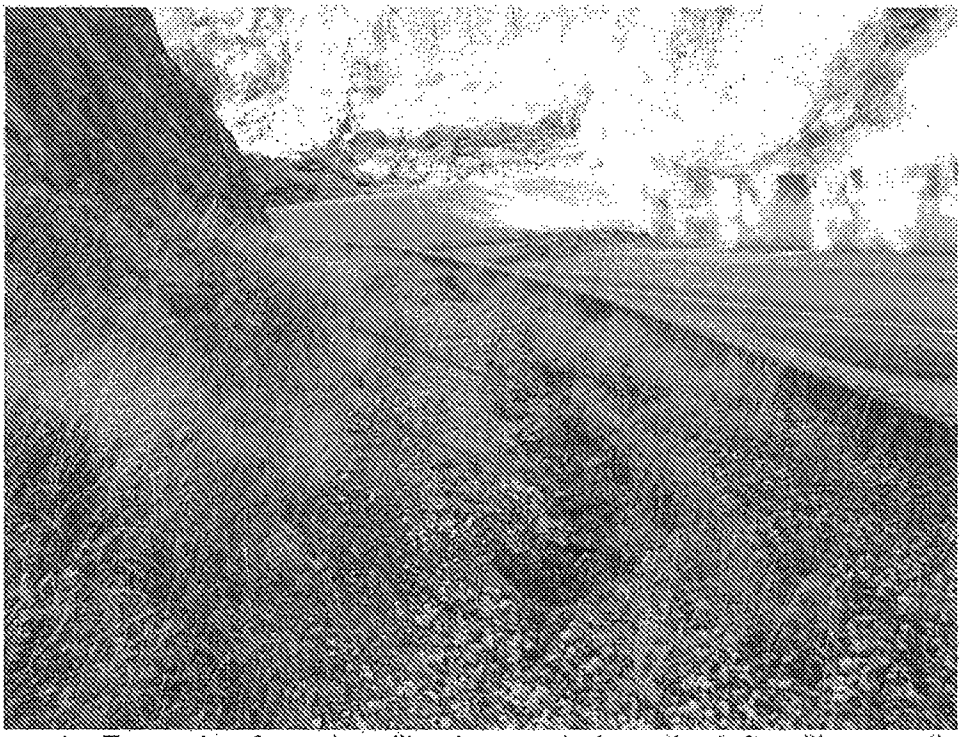
2. Upstream face viewed from the crest of the dam looking towards the spillway approach. Example of the large woody debris that needs to be removed.

Name of Dam Rollins Dam No. 61-21

Date of Inspection 10/31/2013



3. Spillway channel viewed looking upstream from the downstream end.



4. Example of erosion rills observed along the left spillway wall.

STATE OF CALIFORNIA
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DIVISION OF SAFETY OF DAMS

FILE

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam Rollins Dam No. 61-21 County Nevada
Type of Dam Earth and rock Type of Spillway Ogee weir an concrete channel
Water is 2.9 feet Below spillway crest and 19.4 feet Below dam crest.

Weather Conditions Clear and sunny
Contacts Made Travis Harrison with NID
Reason for Inspection Annual Maintenance Inspection

Important Observations, Recommendations or Actions Taken

The owner needs to continue to backfill and compact erosion observed along the outside left spillway channel wall.

Conclusions

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

Observations and Comments

Dams

[redacted] The crest was straight, level, and in good condition. Both faces exhibited no signs of instability or distress. The riprap on both faces was intact. Vegetation control was excellent. No rodent activity was observed.

Spillway

The spillway approach, control section ogee weir, and concrete channel were clear and unobstructed. We observed the spillway channel from along the left channel wall. The concrete remains in satisfactory condition with no significant cracking or spalling. The left wall was viewed to be straight and level, with no signs of movement. NID continues to monitor the crack measuring device installed on the left channel wall. The device has shown no movement since I observed it last year and minimal movement historically. All weep holes were observed to be clear.

The erosion rills along the left channel wall were again observed. The erosion appears to be further downstream than the erosion that was previously repaired last year; however, this observed section of erosion has also previously been repaired. Runoff water down the outside of the channel appears to be the cause. NID needs to continue to fill and compact the observed erosion as needed.

Outlet

[redacted] valves were fully cycled in DSOD's presence on 1/27/2011 with no problems. NID cycles the valves annually and last cycled each valve on 5/9/2012.

We walked the [redacted] and branched section leading to the outlet controls during this inspection. The tunnel remains in satisfactory condition. The penstock [redacted] was observed to be dry. The outlet [redacted] was slightly moist with no live flow. The outlet tunnel was last inspected by DSOD on 1/27/2011. The tunnel was reportedly in satisfactory condition, with minor calcification observed throughout the tunnel.

To 10/5/12

Photos taken? Yes ____ No x
cc for Owner/Book

Inspected by T. Jimenez
Date of Inspection 9/10/2012
Date of Report 10/5/2012
10/5/12

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam Rollins Dam No. 61-21

Date of Inspection 9/10/2012

Observations and Comments

Seepage	No seepage was observed on the downstream face, groins, or toe of the dam. The weir at the toe is no longer monitored since it is influenced by other sources and does not represent seepage from the dam.
Instr.	Instrumentation at this dam consists of 7 crest monuments, 26 spillway monuments, and one observation well. The latest surveillance report was submitted with an owner's letter on April 30, 2012, for calendar year 2011. *Crest Monuments:* The 7 crest monuments (2-9) are survey every two years for horizontal and vertical control. Monument 3 was destroyed in 1965, and is no longer surveyed. The latest survey was performed in 2011. Since the last survey, maximum horizontal and vertical movements have been 0.016' downstream (monument 9) and 0.004' settlement (monument 5). Historically the maximum horizontal and vertical movements have been 0.26' downstream (monument 5) and 0.17' settlement (monument 5). This amount of movement is considered minimal for a rockfill dam of this size. *Spillway Monuments:* The dam has a total of 26 spillway monuments, 14 along the left wall and 12 along the right wall, established in 2005. Monuments are surveyed annually for deflection. Since the 2010 survey, many of the monuments which measured large increases away from the center line returned back toward the centerline. The right wall has measured a maximum deflection of 0.016' toward the center line and the left wall has measured a maximum deflection of 0.055' toward the center line since initial surveys began. These movements are considered relatively small and do not pose a dam safety concern at this time. *Observation Well:* Observation well readings are recorded monthly. In 2011, readings ranged from 1973' to 1991'. Data continues to fluctuate with precipitation and changes in the reservoir level. Since the well casing was cleaned in 2008, a spike in the data was observed, reading approximately 8-10 higher on average. Measurements have consistently ranged between 1970' and 1990' since that time. Historical data shows measurements ranging from approximately 1960' to 1998' dating back to 1968. The readings are considered normal and indicate a low and stable phreatic surface.