



**DIVISION OF WATER
DAM SAFETY INSPECTION REPORT
NORTH BANK OF BUCKEYE LAKE DAM
FILE NUMBER: 9723-004**

LOCATION: Fairfield County, Walnut Township &
Licking County, Union Township

DATE: Wednesday, May 4, 2005

TIME: 10:30 a.m.

INSPECTORS: Mark B. Ogden, P.E., Administrator
Peter M. George, P.E., Senior Project Engineer
Thomas G. Lagucki, Construction Specialist

OTHERS PRESENT: Tim Waln, Park Manager

SITE CONDITIONS: It was sunny and about 70 degrees Fahrenheit. The ground surface was dry.

PHOTOGRAPHS: Digital photographs were taken and are on file at this office.

INSPECTION PURPOSE AND AUTHORITY:

This inspection was conducted under the provisions of Ohio Revised Code (ORC) Section 1521.062 to evaluate the condition of the dam and its appurtenances. The Dam Safety Engineering Program has the responsibility to ensure that human life, health, and property are protected from catastrophic dam failures.

DESCRIPTION:

The inspection of the North Bank began at an approximate station of 65+00 and ended at an approximate station of 213+00. This inspection included the area of North Bank that had been repaired near Mud Island to the parking lot west of Crane Lake. The stationing is referenced from the plans titled "Buckeye Lake State Park Embankment Mapping" dated April 1990, by Dodson-Lindblom Associates, Inc. A visual inspection was performed from the centerline of the dam to the sheet-pile retaining wall located on the upstream slope and along the downstream slope. The visual inspection included observation of structures such as: elevation of the fill material behind the sheet-pile retaining wall, sidewalks, and trees to observe the affects on the upstream portion of the embankment. A detailed inspection of the sheet-pile retaining wall was not performed.

Several trees varying in diameter from 0.5 foot to 3.0 feet were noted all along the North Bank. Also, some trees had been removed and depressions remained on the embankment in these locations. Some relatively new trees had been planted along the upstream slope.

The downstream slope contains residential houses. On the average houses along the downstream slope are spaced approximately 10 to 15 feet apart. Basements and foundations extend into the downstream slope almost to the centerline of the dam. Large trees (30+ inches in diameter) were noted along the downstream slope.

It was impossible to inspect many areas of the dam due to decks, patios, landscaping, and other structures.

OBSERVATIONS:

Station 65+00 to 66+00:
No problems noted.

Station 66+00 to 67+00:
No problems noted.

Station 67+00 to 68+00:
Upstream slope sheet piling wall replacement ended at station 67+62.50. A deck was noted on the remainder of this section. A digital photo was taken of this section.

Station 68+00 to 69+00:
Two large diameter trees and two new trees were noted along this section of the upstream slope. The fill material was nearly even with the sheet-pile retaining wall located along the upstream slope. A house is located in the downstream slope. A steel cap had been welded to the top of the sheet-pile retaining wall.

Station 69+00 to 70+00:
Two large diameter trees were noted along this section of the upstream slope. The fill material was nearly even with the sheet-pile retaining wall located along the upstream slope.

Station 70+00 to 71+00:
Two large diameter trees were noted along the upstream slope. The fill material was nearly even with the sheet-pile retaining wall located along the upstream slope.

Station 71+00 to 72+00:
Fill material along the upstream slope was even with the top of the sheet-pile retaining wall. One large tree was noted on the upstream slope and two small trees were noted on the downstream slope.

Station 72+00 to 73+00:
Two trees were noted along the upstream slope. The fill material was level with the top of the sheet-pile retaining wall.

Station 73+00 to 74+00:
Two large trees and one small tree were noted along the upstream slope.

Station 74+00 to 75+00:

A large tree was noted along the upstream slope. The fill material was level with the top of the sheet-pile retaining wall.

Station 75+00 to 76+00:

Two large trees were noted on the upstream slope and two large trees were noted on the downstream slope. The fill material was even with the top of the sheet-pile retaining wall.

Station 76+00 to 77+00:

Two large trees were noted on the upstream slope near the crest. No trees were noted along the downstream slope. The fill material was even with the top of the sheet-pile retaining wall.

Station 77+00 to 78+00:

A large tree was noted along the crest. The sheet-pile retaining wall cap was eliminated near station 77+50. The fill material was 3 to 4 inches below the top of the sheet-pile retaining wall.

Station 78+00 to 79+00:

Three large trees were noted along the upstream slope. Fill material was 2 inches below the top of the sheet-pile retaining wall. No trees were noted along the downstream slope.

Station 79+00 to 80+00:

Five large trees were noted along the upstream slope. Fill material was 2 inches below the top of the sheet-pile retaining wall.

Station 80+00 to 81+00:

Two large trees were noted along the upstream slope. Fill material was even with the top of the sheet-pile retaining wall.

Station 81+00 to 82+00:

One large tree was noted along the upstream slope and one large tree was noted on the downstream slope. A 1-foot-diameter depression was noted near station 81+75. Fill material was approximately 4 to 6 inches below the top of the sheet-pile retaining wall.

Station 82+00 to 83+00:

Two large trees were noted along the downstream slope and a large tree was noted near the sheet-pile retaining wall located on the upstream slope. No sidewalk was noted in this area. Fill material along the sheet-pile retaining wall was nearly even with the top.

Station 83+00 to 84+00:

Two large trees were noted along the upstream slope. Fill material along the upstream slope sheet-pile retaining wall was approximately 4 inches below the top.

Station 84+00 to 85+00:

A large tree was noted along the upstream slope. Fill material was even with the top of the sheet-pile retaining wall located along the upstream slope. Houses were noted in the downstream slope.

Station 85+00 to 86+00:

Fill material was nearly level with the sheet-pile retaining wall located along the upstream slope. Two large trees were noted along the crest. A steel cap was noted on the top of the sheet-pile retaining near station 86+00. A digital photo of this section was taken.

Station 86+00 to 87+00:

Two depressions that were approximately 2.5 feet in diameter were noted near the crest (trees were noted in these locations on the plan sheet). A new tree was noted on the upstream slope. The fill was approximately 4 to 5 inches below the top of the retaining wall.

Station 87+00 to 88+00:

Two large trees were noted along the upstream slope. A depression that was 5 feet in diameter and approximately 4 inches deep was observed. The area was soft and was located on the upstream side of the sidewalk. The fill material was approximately 6 inches below the top of the sheet-pile retaining wall.

Station 88+00 to 89+00:

An 18-inch-diameter depression was located near station 88+25 upstream of the sidewalk. Two large trees and one small tree were noted along the upstream slope. The fill material was 4 to 6 inches below the top of the sheet-pile retaining wall.

Station 89+00 to 90+00:

At approximate station 89+10 is where the embankment was upgraded during the installation of the emergency spillway system. The sidewalk located on the crest was 8 inches lower than the upstream slope.

Station 90+00 to 91+00:

This section was repaired during the installation of the emergency spillway.

Station 91+00 to 92+00:

This section was repaired during the installation of the emergency spillway.

Station 92+00 to 93+00:

This section was repaired during the installation of the emergency spillway.

Station 93+00 to 94+00:

Two large trees and two new trees were noted along the upstream slope. One tree was noted on the downstream. The fill material was 6 inches below the top of the sheet-pile retaining wall. The sidewalk was 4 to 5 inches lower than the upstream slope.

Station 94+00 to 95+00:

Two large trees were noted on the upstream slope and one tree was noted on the downstream slope. The fill material was 6 inches below the top of the sheet-pile retaining wall.

Station 95+00 to 96+00:

A large tree was noted on the upstream slope. The fill material was 6 to 9 inches below the top of the sheet-pile retaining wall.

Station 96+00 to 97+00:

Two large trees were noted on the upstream slope near station 96+75. Two small trees were noted on the crest. Fill material was 4 to 6 inches below the top of the sheet-pile retaining wall. A soft area, located near station 96+35, measured 12 inches in diameter and 3 inches deep. One large tree was noted on the downstream slope.

Station 97+00 to 98+00:

Along this section of the downstream slope, a new house had been constructed since the Division of Water's 2000 Safety Inspection. Two large trees were noted on the upstream slope and one tree was noted on the downstream slope. A low area near station 97+60 was noted that was approximately 6 feet in diameter, 3 to 4 inches deep and 12 feet from the sheet-pile retaining wall. The fill material was approximately 6 to 8 inches below the top of the sheet-pile wall. There was no sidewalk in this location.

Station 98+00 to 99+00:

Four large trees were noted along the upstream slope. Fill material was 6 to 8 inches below the top of the sheet-pile retaining wall. Dense brush was noted on the downstream slope.

Station 99+00 to 100+00:

A large tree and shrubs were noted on the upstream slope. The fill material was 2 to 4 inches below the top of the sheet-pile retaining wall.

Station 100+00 to 101+00:

Four large trees were noted along this area. The fill material was approximately 8 to 10 inches below the top of the sheet-pile retaining wall.

Station 101+00 to 102+00:

Two trees were noted along this section. The upstream slope was hummocky and the fill material was approximately 12 inches below the top of the sheet-pile retaining wall. Fill material with dense grass replaced the deteriorated concrete block wall.

Station 102+00 to 103+00:

Two large trees were noted along the upstream slope. The fill material was 6 inches below the top of the sheet-pile retaining wall. The sidewalk was uneven and sloped towards the downstream slope. Near station 102+00, a 12-inch-tall steel I-beam had been welded to the top of the sheet-pile retaining wall.

Station 103+00 to 104+00:

Two large trees were noted along the crest. The fill material varied between 4 to 6 inches below the top of the sheet-pile retaining wall. A 12-inch-tall steel I-beam was noted on the top of the sheet-pile wall.

Station 104+00 to 105+00:

Two large trees were noted on the upstream slope. Fill material along the upstream slope was below the top of the 12-inch-tall steel I - beam.

Station 105+00 to 106+00:

Three large trees were noted along the upstream slope. Fill material sloped up to the same elevation as the top of the I-beam elevation and sloped down to the crest. The sidewalk was 8 to 10 inches below the upstream slope elevation.

Station 106+00 to 107+00:

Two large trees were noted on the upstream slope. Three small trees were noted on the downstream slope. Fill material was below the top of the sheet-pile retaining wall. The sidewalk was sloped toward the downstream slope.

Station 107+00 to 108+00:

Fill material was even with the top of the sheet-pile retaining wall. The downstream slope was bare and lacked vegetal cover. A large tree still exists near station 107+50. A digital photo was taken of this section.

Station 108+00 to 109+00:

Three large trees were noted on the upstream slope and one large tree was noted on the downstream slope. Fill material was 10 inches below the top of the steel I-beam that had been placed on top of the sheet-pile retaining wall.

Station 109+00 to 110+00:

Two trees were noted along the upstream slope. Fill material was 10 inches below the top of the steel I-beam that had been placed on top of the sheet-pile retaining wall. The downstream slope had been landscaped with rock. The downstream slope lacked grass cover.

Station 110+00 to 111+00:

One large tree and two new trees, that had been recently planted, were noted along the upstream slope. Fill material was 4 inches below the top of the 12-inch-tall steel I-beam that was attached on the top of the sheet-pile retaining wall. The downstream slope lacked adequate grass cover.

Station 111+00 to 112+00:

Two large trees were noted along this section of the upstream slope. According to the park manager, a new sheet-pile retaining wall starts at an approximate station 111+65. Fill material was 4 inches below the top of the sheet-pile retaining wall. A digital photo was taken of the downstream slope.

Station 112+00 to 113+00:

A large tree was noted on the upstream slope and four trees were noted on the downstream slope. The fill material was approximately 8 inches below the sheet-pile retaining wall.

Station 113+00 to 114+00:

Three trees were noted along the upstream slope. Two large trees were noted on the downstream slope to the left of residence 3709. The fill material was 4 inches below the top of the sheet-pile wall.

Station 114+00 to 115+00:

Two trees were noted along the upstream slope. The fill material was 8 inches below the top of the sheet-pile retaining wall.

Station 115+00 to 116+00:

One tree was noted along the upstream slope and four trees were noted on the downstream slope. Fill material was 6 to 8 inches below the sheet-pile retaining wall. A digital photo was taken of this section.

Station 116+00 to 117+00:

A tree was noted near the crest and three trees were noted on the downstream slope. The fill material was 4 inches below the top of the sheet-pile retaining wall. The sidewalk was approximately 4 inches lower than the upstream slope. House number 3765 had been removed. A digital photo was taken of this section.

Station 117+00 to 118+00:

No trees were noted along the upstream slope but a large tree was noted on the downstream slope. The fill material in this area was a couple of inches below the top of the sheet-pile retaining wall. The downstream slope lacked grass cover.

Station 118+00 to 119+00:

A low area/depression was noted approximately 8 feet from the sheet-pile retaining wall. The area was 14 feet long, 2 feet wide and 4 inches low. The sidewalk had sunken approximately 4 inches lower than the upstream slope. One tree was noted on the downstream slope. A digital photo of this section was taken.

Station 119+00 to 120+00:

An 8-foot by 8-foot area approximately 6 inches low was noted approximately 15 feet from the sheet-pile retaining wall. The fill material was approximately 3 to 4 inches below the sheet-pile retaining wall.

Station 120+00 to 121+00:

Two trees were noted on both the upstream and downstream slope. The fill material along the wall was 8 inches below the top of the sheet-pile retaining wall.

Station 121+00 to 122+00:

A large tree and a new tree were noted near the crest, and a tree was noted on the downstream slope. Fill material was approximately 4 inches below the top of the sheet-pile retaining wall.

Station 122+00 to 123+00:

Two large trees were noted on the upstream slope and one tree was noted on the crest. One tree was noted on the downstream slope. Fill material was 4 inches below the top of the sheet-pile retaining wall.

Station 123+00 to 124+00:

A large tree was noted on the upstream slope near the crest and a large tree had been removed near the sheet-pile wall. Fill material was level with the top of the sheet-pile retaining wall.

Station 124+00 to 125+00:

A large tree and a new tree were noted on the upstream slope. The fill material was even with the top of the sheet-pile retaining wall.

Station 125+00 to 126+00:

Three trees were noted along the upstream slope. The fill material was approximately 2 inches below the top of the sheet-piling wall. House number 3913 had been removed. The retaining wall on the downstream slope was leaning.

Station 126+00 to 127+00:

Two large trees were noted along the upstream slope. Four large trees were noted on the downstream slope. A low area/depression that was approximately 65 feet long, 6 feet wide and 8 inches deep was noted along the upstream slope. The fill material was approximately 8 inches below the top of the sheet-pile wall.

Station 127+00 to 128+00:

A tree was noted on the upstream slope and six large trees were noted on the downstream slope. A sinkhole 8 inches in diameter was noted near station 127+75, approximately 11 feet from the sheet-pile wall.

Station 128+00 to 129+00:

Three trees were noted on the upstream slope. The fill material was 2 to 3 inches below the top of the sheet-pile wall. Dense brush was noted on the downstream slope. The house between 127+50 and 128+00 had been removed.

Station 129+00 to 130+00:

Three trees were noted on the upstream slope. The fill material was nearly level with the sheet-pile retaining wall. Two trees were noted on the downstream slope.

Station 130+00 to 131+00:

The sidewalk was 3 to 4 inches below the upstream slope elevation. No trees were noted on the upstream or downstream slope.

Station 131+00 to 132+00:

Three trees were noted on the upstream slope and four trees were noted on the downstream slope. The fill material was 8 inches below the top of the sheet-pile retaining wall.

Station 132+00 to 133+00:

A large tree was noted on the crest and four large trees were noted on the downstream slope. The fill material was approximately 8 inches below the top of the sheet-pile retaining wall. The sidewalk was 12 inches below the upstream slope sheet pile.

Station 133+00 to 134+00:

Two large trees were noted on the upstream slope. A soft area that was approximately 3 feet by 2 feet was noted 14 feet from the sheet-pile retaining wall on the upstream slope. A portion of the old stone wall was exposed on the crest. Fill material was 8 inches below the top of the sheet-pile retaining wall. The sidewalk was 4 inches lower than the upstream slope.

Station 134+00 to 135+00:

A large tree was noted on the upstream slope and four trees were noted on the downstream slope. The fill material was approximately 3 inches below the top of the sheet-pile retaining wall. The sidewalk was lower than the upstream slope elevation and tilted toward the downstream slope.

Station 135+00 to 136+00:

Two large trees were noted on the upstream slope. The fill material was approximately 2 to 3 inches below the top of the sheet-pile retaining wall. The sidewalk was 6 to 8 inches lower than the upstream slope elevation and was tilted toward the downstream slope.

Station 136+00 to 137+00:

One tree was noted on the upstream slope. The fill material was approximately 3 inches below the top of the sheet-pile retaining wall. The sidewalk was 6 to 8 inches lower than the upstream slope and tilted toward the downstream slope.

Station 137+00 to 138+00:

One large tree was noted along the upstream slope and three trees were noted on the downstream slope. The fill material was approximately 4 inches below the top of the sheet-pile retaining wall.

Station 138+00 to 139+00:

One large tree was noted along the downstream slope. The fill material was approximately 4 inches below the top of the sheet-pile retaining wall.

Station 139+00 to 140+00:

Two trees were noted on the upstream slope. The fill material was 2 to 3 inches below the top of the sheet-pile retaining wall.

Station 140+00 to 141+00:

Three large trees were noted on the upstream slope. The fill material was 3 inches below the top of the sheet-pile retaining wall. The sidewalk had sunken 2 to 3 inches below the upstream slope elevation.

Station 141+00 to 142+00:

One tree was noted on the upstream slope and one tree on the downstream slope. Fill material was level with the top of the sheet-pile retaining wall. The sidewalk was 2 to 3 inches lower than the upstream slope elevation.

Station 142+00 to 143+00:

One large tree was noted on the upstream slope. The fill material was approximately 3 to 4 inches below the sheet-pile retaining wall.

Station 143+00 to 144+00:

One tree was noted on the upstream slope and three trees were noted on the downstream slope. The fill material was 3 inches below the top of the sheet-pile retaining wall.

Station 144+00 to 145+00:

Two trees were noted near the crest and a tree was noted on the downstream slope. Fill material was approximately 4 inches below the top of the sheet-pile retaining wall.

Station 145+00 to 146+00:

One large tree was noted on the upstream slope and two trees were noted on the downstream slope.

Station 146+00 to 147+00:

The fill material was approximately 2 to 3 inches below the top of the sheet-pile retaining wall.

Station 147+00 to 148+00:

Two large trees were noted along the upstream slope. The fill material was approximately 4 inches below the top of the sheet-pile retaining wall. Houses were located in the downstream slope.

Station 148+00 to 149+00:

A large tree was noted on the downstream slope. One new tree was noted on the upstream slope. Fill material was 6 to 8 inches below the top of the sheet-pile retaining wall. A digital photo was taken of this area.

Station 149+00 to 150+00:

A tree was noted on the upstream slope and downstream slope. Fill material was nearly level with the top of the sheet-pile retaining wall.

Station 150+00 to 151+00:

Two large trees were noted on the upstream slope. The fill material was nearly level with the top of the sheet-pile retaining wall.

Station 151+00 to 152+00:

Two large trees were noted along the upstream slope. Fill material was level with the top of the sheet-pile retaining wall.

Station 152+00 to 153+00:

A low area was noted near station 152+25 along the upstream slope that measured 3 feet by 3 feet and 4 inches deep. One tree was noted on the upstream slope and one tree on the downstream slope. The steel I-beam located on top of the sheet-pile retaining wall had been removed near station 153+00. Seepage on the downstream slope was estimated at less than 1 gallon per minute. A digital photo of seepage along the downstream slope was taken.

Station 153+00 to 154+00:

Two large trees were noted on the upstream slope and one large tree was noted on the downstream slope. Fill material was 2 to 4 inches below the top of the sheet-pile retaining wall.

Station 154+00 to 155+00:

A low area was noted that measured 50 feet long, 10 feet wide and 5 inches deep. Two large trees were noted along the upstream slope, and two large trees were noted on the downstream slope.

Station 155+00 to 156+00:

Two trees were noted near the crest, and two trees had recently been planted near station 155+85. One tree was noted on the downstream slope.

Station 156+00 to 157+00:

One small tree was noted on the downstream slope. Fill material was nearly level with the sheet-pile retaining wall.

Station 157+00 to 158+00:

Four trees were noted along the upstream slope, and two trees were noted on the downstream slope. The fill material was approximately 10 inches below the top of the sheet-pile retaining wall.

Station 158+00 to 159+00:

The fill material was approximately 8 inches below the top of the sheet-pile retaining wall.

Station 159+00 to 160+00:

Three trees were noted on the upstream slope, and four trees were noted on the downstream slope. Fill material was 6 inches below the top of the sheet-pile retaining wall.

Station 160+00 to 161+00:

One tree was noted on the upstream slope. A low area was noted on the upstream slope in close proximity to the sheet-pile retaining wall. The area was approximately 75 feet long, 10 feet wide, and 8 inches deep.

Station 161+00 to 162+00:

The fill material was 2 to 3 inches below the top of the sheet-pile retaining wall.

Station 162+00 to 163+00:

The fill material was 2 inches below the top of the sheet-pile retaining wall.

Station 163+00 to 164+00:

A depression was noted near station 163+25 and 13.2 feet from the upstream sheet-pile retaining wall. The depression was 16 inches in diameter and 16 to 21 inches deep. One tree was noted on the upstream slope. Fill material was 4 inches below the sheet-pile retaining wall. A digital photo of this area was taken.

Station 164+00 to 165+00:

A large tree was noted along the upstream slope. The fill material was 2 to 3 inches below the top of the sheet-pile retaining wall. A low area near station 164+75 was approximately 3 feet in diameter.

Station 165+00 to 166+00:

Two large trees were noted on the upstream slope. Fill material was 2 to 4 inches below the top of the sheet-pile retaining wall.

Station 166+00 to 167+00:

No problems noted.

Station 167+00 to 168+00:

The fill material behind the wall varied between 2 to 4 inches below the top of the sheet-pile retaining wall. One tree was noted on the upstream slope.

Station 168+00 to 169+00:

The fill material behind the wall varied between 3 to 4 inches below the top of the sheet-pile retaining wall.

Station 169+00 to 170+00:

The sidewalk was approximately 6 inches lower than the fill elevation along the upstream slope. One tree was noted along the upstream slope.

Station 170+00 to 171+00:

One tree was noted on the crest. Fill material was nearly level with the sheet-pile retaining wall.

Station 171+00 to 172+00:

Four large trees noted along the upstream slope. One tree was noted on the downstream slope.

Station 172+00 to 173+00:

No problems were noted.

Station 173+00 to 174+00:

Upstream slope fill elevation was approximately 6 inches lower than the sidewalk. One tree was noted on the downstream slope.

Station 174+00 to 175+00:

It appeared that the trees noted on the original plan sheets had been removed.

Station 175+00 to 176+00:

Two large trees were noted on the upstream slope midway between the crest and sheet-pile retaining wall.

Station 176+00 to 177+00:

Two large diameter trees were noted on the upstream slope. The sidewalk was 3 to 4 inches lower than the crest elevation.

Station 177+00 to 178+00:

Two large trees were noted on the upstream slope. A large tree had been removed from the downstream slope.

Station 178+00 to 179+00:

Three large trees were noted on the crest. A 4-foot-diameter low area/depression approximately 4 inches deep was noted near station 178+10. The fill material was 4 inches below the top of the sheet-pile retaining wall.

Station 179+00 to 180+00:

Three small trees were noted on the upstream slope. The fill material behind the wall was approximately 4 inches below the top of the sheet-pile retaining wall.

Station 180+00 to 181+00:

Two trees that were noted on the 1990 plan sheets had been removed from the upstream slope.

Station 181+00 to 182+00:

This section is natural ground. Trees were noted near the sheet-pile retaining wall.

Station 182+00 to 183+00:

This section is natural ground. Trees were noted near the sheet-pile retaining wall.

Station 183+00 to 184+00:

This section is natural ground.

Station 184+00 to 185+00:

This is the principal spillway section.

Station 185+00 to 186+00:

The principal spillway repair extended to station 185+50. The existing sheet-pile retaining wall was approximately 12 inches lower than the repaired section of the principal spillway. No trees were noted along this section. A digital photo of this section was taken.

Station 186+00 to 187+00:

Four large trees were noted along this section of the upstream slope. The sidewalk along the crest was 3 inches lower than the upstream slope elevation and sloped towards the downstream slope.

Station 187+00 to 188+00:

Three large trees were noted on the upstream slope midway between the crest and sheet-pile retaining wall. The sidewalk was approximately 10 inches below the upstream slope elevation. Fill material was 2 to 4 inches below the sheet-pile retaining wall.

Station 188+00 to 189+00:

Two trees were noted along the upstream slope. Fill material was approximately 3 inches below the top of the sheet-pile retaining wall.

Station 189+00 to 190+00:

Two trees were noted along the upstream slope of this section. Fill material was 3 inches below the top of sheet-pile retaining wall. A concrete cap was noted on top of the sheet-pile wall.

Station 190+00 to 191+00:

A low area/depression approximately 3 feet in diameter and 6 inches deep was noted near station 190+15. Two large trees were noted on the upstream slope.

Station 191+00 to 192+00:

A large tree was noted on the upstream slope, and one large tree was noted on the downstream slope.

Station 192+00 to 193+00:

One tree was noted on the upstream slope of this section.

Station 193+00 to 194+00:

Four trees were noted along this section of the upstream slope. A low area that measured 6 feet by 5 feet and 6 inches deep was observed near station 193+50.

Station 194+00 to 195+00:

Two large trees were noted along this section of the upstream slope. The fill material along the upstream slope was nearly level with the sheet-pile retaining wall.

Station 195+00 to 196+00:

Four large trees were noted along the upstream slope. The fill material along the upstream slope was nearly level with the sheet-pile retaining wall.

Station 196+00 to 197+00:

Two large trees were noted along the upstream slope. The fill material along the upstream slope was nearly level with the sheet-pile retaining wall.

Station 197+00 to 198+00:

No problems noted.

Station 198+00 to 199+00:

An 18-inch-diameter depression was noted on the upstream slope. It was approximately 8 inches deep.

Station 199+00 to 200+00:

Two large trees were noted on the downstream slope.

Station 200+00 to 201+00:

This section, according to park officials, failed in the 1960's. A low area on the upstream slope was noted near station 200+75 and measured 2 feet in diameter by 6 inches deep.

Station 201+00 to 202+00:

The fill material was approximately 6 inches below the top of the sheet-pile retaining wall.

Station 202+00 to 203+00:

No problems were noted along this section.

Station 203+00 to 204+00:

One tree was noted on the downstream slope. The fill material varied from 4 to 8 inches along the sheet-pile retaining wall near station 203+50.

Station 204+00 to 205+00:

A 1-foot-diameter low area was noted near station 204+25. No other problems were noted along this section of the upstream slope.

Station 205+00 to 206+00:

The old stone wall was exposed upstream of the sheet-pile retaining wall.

Station 206+00 to 207+00:

A crack in the sidewalk, located on the crest, began near station 206+25 and extended 75 feet. The crack varied from 0.4 inch to 2.0 inches in width and was approximately 8 inches deep in some locations. The upstream slope and crest were covered in concrete. A digital photo of this section was taken.

Station 207+00 to 208+00:

The upstream slope and crest were covered in concrete. No close observations could be performed.

Station 208+00 to 209+00:

The upstream slope and crest were covered in concrete. No close observations could be performed.

Station 209+00 to 210+00:

The upstream slope and crest were covered in concrete. No close observations could be performed.

Station 210+00 to 211+00:

Concrete covered the upstream slope. No close observations could be performed.

Station 211+00 to 212+00:

The upstream slope and crest were covered in concrete. No problems were noted.

Station 212+00 to 213+00:

This section of the dam is where the north embankment ties into natural ground. The upstream slope and crest are covered in concrete. No problems were noted.

Station 213+214:

The crest is covered with a concrete sidewalk. No problems were noted.

DISCUSSION:

Embankment station 203+00 to 204+00 was repaired by the ODNR, Division of Engineering in 1998. This area along the upstream slope appeared to be in good condition. Fill had settled along the wall.

Trees should not be permitted on embankment surfaces. Extensive root systems can provide seepage paths for water. Trees that blow down or fall over can leave large holes in the embankment surface that will weaken the embankment and can lead to increased erosion. Tree growth adjacent to concrete walls and structures may eventually cause damage to the concrete and should be removed. Stumps and root balls of cut trees should be removed so vegetation can be established and the surface mowed. All woody material (roots) must be removed and the cavity filled with well-compacted fill material and grass vegetation established.

Houses, docks, gazebos, and other structures should not be built into a dam. A number of residents commented about water seeping from their basement walls that face the lake. A house foundation in the downstream embankment reduces the seepage path and removes valuable fill material. Other excavations into the embankment for construction of docks, gazebos, light poles, garages, patios, and other structures also reduce the safety of the dam and make proper inspection very difficult, if not impossible. All of these issues create stability problems for the embankment that could lead to dam failure.

Depressions are sunken areas of the embankment surface. They may be created during construction, or may be caused by decay of buried organic material (tree roots), internal erosion of the embankment, or settlement (consolidation) of the embankment or its foundation. Internal erosion and excessive settlement can lead to dam failure.

The location of a number of the low areas and their proximity to the stone and masonry wall indicates that loss of embankment fill due to erosion has taken place in a number of areas. Continued loss of this earthfill could lead to failure of the wall and the dam.

Seepage of earthen dams is a concern that should always be monitored. Seepage from the dam must be controlled to prevent stability and maintenance problems. The location of a number of the low areas and their proximity indicates that internal erosion has taken place in a number of areas. Internal erosion that is not corrected will weaken the embankment and could possibly lead to failure of the embankment. See the "Seepage Through Earthen Dams" fact sheet included in this section for additional information.

REQUIREMENTS:

1. This dam must have an operation, maintenance, and inspection manual (OM&I) and an emergency action plan (EAP) in accordance with OAC Rule 1501:21-21-04. Prepare an OM&I and an EAP including an inundation map. Guidelines for the preparation of these documents can be downloaded from the Division of Water's web site, or a copy can be mailed to you upon request.
2. Investigate the integrity of the sheet-pile retaining wall above and below the normal pool level. Repair the sheet-pile retaining wall as necessary. Replenish the fill material behind the sheet-pile retaining wall to a consistent elevation along the north embankment.
3. Reestablish the crest elevation, repair the noted low areas/depressions, and establish a dense grass cover where needed. See the "Ground Cover" fact sheet included in this section for additional information.
4. Monitor the depressions (low areas) along the upstream portion of the embankment for additional signs of settlement until repairs are made and following the repairs.
5. Remove the trees and root systems along the upstream slope and the crest. Repair the voids in the embankment with compacted fill material and establish a dense grass cover. See the "Trees and Brush" fact sheet included in this section for additional information.
6. Remove all landscaping and structures from the state-owned portion of the dam. This will facilitate proper inspection and maintenance of the earthfill embankment. See the "Trees and Brush" fact sheet included in this section for additional information.



Mark B. Ogden, P.E. 1/31/06
Administrator Date
Water Management Section
Division of Water



Peter M. George, P.E. 1/31/06
Senior Project Engineer Date
Dam Safety Engineering Program
Division of Water

BUCKEYE LAKE DAM

File Number: 9723-004, North Bank Inspection

May 4, 2005



Station 107+00 to 108+00



Station 115+00 to 116+00



Station 116+00 to 117+00



Station 118+00 to 119+00



Station 148+00 to 149+00



Station 152+00 to 153+00

BUCKEYE LAKE DAM

File Number: 9723-004, North Bank Inspection

May 4, 2005



Station 163+00 to 164+00



Station 173+00 to 174+00



Station 185+00 to 186+00



Station 205+00 to 206+00



Station 207+00 to 208+00



Station 213+00 to 214+00



**DIVISION OF WATER
DAM SAFETY INSPECTION REPORT
WEST BANK OF BUCKEYE LAKE DAM
FILE NUMBER: 9723-004**

LOCATION: Fairfield County, Walnut Township

DATE: Wednesday, May 4, 2005

TIME: 8:00 a.m.

INSPECTORS: Mark B. Ogden, P.E., Administrator
Peter M. George, P.E., Senior Project Engineer
Thomas G. Lagucki, Construction Specialist

OTHERS PRESENT: Tim Waln, Park Manager

SITE CONDITIONS: It was sunny and about 70 degrees Fahrenheit. The ground surface was dry.

PHOTOGRAPHS: Digital photographs were taken and are on file at this office.

INSPECTION PURPOSE AND AUTHORITY:

This inspection was conducted under the provisions of Ohio Revised Code (ORC) Section 1521.062 to evaluate the condition of the dam and its appurtenances. The Dam Safety Engineering Program has the responsibility to ensure that human life, health, and property are protected from catastrophic dam failures.

DESCRIPTION:

The inspection of the West Bank began at an approximate station of 10+00 (residential address of 12472) and ended at an approximate station of 64+00 (residential address of 13322). This is the area from Leibs Island to Mud Island. The stationing is referenced from the plans titled "Buckeye Lake State Park Embankment Mapping" dated April 1990, by Dodson-Lindblom Associates, Inc. A visual inspection was performed from the centerline of the dam to the stone and masonry wall located on the upstream slope and on the downstream slope. The visual inspection included observation of structures such as the stone and masonry wall, sidewalks, trees, decks, and docks to observe the affects on the dam.

The observed portion of the stone wall located on the upstream slope was deteriorated. There were several areas with displaced stones and several areas where the wall was leaning toward the lake. A portion of the stone and masonry wall had been capped with concrete.

The downstream slope contains residential houses. On the average, houses along the downstream slope are spaced approximately 10 to 15 feet apart. Basements and foundations extend into the downstream slope almost to the centerline of the dam. Large trees (30+ inches in diameter) were noted along the downstream slope.

Several trees varying in diameter from 0.5 foot to 3.0 feet were noted all along the West Bank. Also, some trees had been removed and depressions remained on the embankment in these locations.

It was impossible to inspect many areas of the dam due to decks, patios, landscaping, and other structures.

OBSERVATIONS:

Station 10+00 to 11+00:

A low area/sink hole approximately 1 foot in diameter was noted near station 10+25.

Station 11+00 to 12+00:

A large tree still existed near station 11+90. The upstream stone wall was leaning towards lakeside.

Station 12+00 to 13+00:

A low area next to the stone wall was noted at station 12+75. The area was approximately 18 inches in diameter and 4 inches deep. Two trees noted on the 1990 drawings had been removed.

Station 13+00 to 14+00:

Three trees that were noted on the 1990 Dodson-Lindblom plans had been removed. Three digital photos were taken.

Station 14+00 to 15+00:

The upstream embankment behind the stone wall was 0.5 foot lower than the top of the wall between stations 14+25 and 14+65. A tree along the wall had been removed.

Station 15+00 to 16+00:

Near station 15+05, a 2-foot depression was noted next to the wall. Brick pavers were noted along the upstream slope. The embankment around the perimeter of the pavers was low. A digital photo of this area was taken.

Station 16+00 to 17+00:

A new house had been constructed on the downstream slope. Two digital photos were taken along the downstream slope.

Station 17+00 to 18+00:

A wet area approximately 4 feet in diameter was observed 12 to 15 feet beyond the downstream toe near station 18+00. According to the plans, a tree had been located in this area.

Station 18+00 to 19+00:

Between station 18+00 and 18+50, a new house had been constructed on the downstream slope. Two trees near station 18+50 had been removed. A digital photo was taken along the downstream slope.

Station 19+00 to 20+00:

A 4-inch-diameter water well was noted on the downstream slope. Iron deposits were noted on the well casing. A digital photo was taken along the downstream slope during the inspection.

Station 20+00 to 21+00:

At station 20+50 (house number 126360), the resident stated that considerable fill material had been placed in front of their house to raise the elevation of the upstream portion of the slope in 2000. A tree had been removed near station 20+25 and a stump remained. An 18-inch-diameter depression was observed near station 20+50.

Station 21+00 to 22+00:

A digital photo was taken along this area.

Station 22+00 to 23+00:

A tree was noted at station 22+90.

Station 23+00 to 24+00:

A tree had been removed near station 23+45.

Station 24+00 to 25+00:

A large deck covered the upstream slope from station 24+60 to 24+85. A concrete cap was noted on the upstream stone wall.

Station 25+00 to 26+00:

Along this section of the downstream slope, two trees had been removed near station 25+50.

Station 26+00 to 27+00:

Trees were noted along station 26+25 & 26+50. A tree had been removed at station 26+25.

Station 27+00 to 28+00:

A low area that was 1.0 foot in diameter and 0.5 foot low was observed near station 27+50 and adjacent to the stone wall. A concrete wall observed on the downstream slope at station 27+75 was leaning away from the dam. A digital photo was taken of this area.

Station 28+00 to 29+00:

A digital photo was taken of the upstream embankment.

Station 29+00 to 30+00:

A 6-inch-diameter hole was observed adjacent to the stone wall. A hole depth of 41 inches was noted, and water was observed at the bottom. A low area of 6 inches below the top of the wall was noted near station 29+50. Two trees were noted on the upstream slope that were not noted on the 1990 Dodson-Lindblom plans.

Station 30+00 to 31+00:

Near station 30+50, a low area was noted approximately 1 foot in diameter and 6 to 8 inches deep. Another low area, noted at station 30+75, was 7 feet from the upstream wall, approximately 3 feet in diameter, and 14 inches deep.

Station 31+00 to 32+00:

Near station 31+75, a hole less than 1 foot in diameter was observed next to the stone and masonry wall. Sinkholes less than 0.5 foot in diameter were observed near station 31+25. Rodent burrows were noted on the downstream slope.

Station 32+00 to 33+00:

A 2-foot-diameter low area was noted along this section of the upstream embankment next to the stone wall. It was located near station 31+50.

Station 33+00 to 34+00:

Three new trees had been planted along the crest in this section.

Station 34+00 to 35+00:

No changes along this section.

Station 35+00 to 36+00:

A new house had been constructed along the downstream slope. Large trees were noted on the upstream slope of the embankment. At approximate station 35+60, the elevation of the upstream embankment was a 0.5 foot below the top of the stone wall. Sinkholes were observed near station 35+85 in the upstream embankment adjacent to the stone wall.

Station 36+00 to 37+00:

Fill on the upstream slope was approximately 6 inches lower than the stone wall. Voids were observed under the concrete slab on the downstream slope near station 36+25. A digital photo was taken of the downstream slope along this station.

Station 37+00 to 38+00:

A number of trees were noted on the upstream and downstream slope.

Station 38+00 to 39+00:

Four trees were noted along this section. A concrete slab near station 38+50 prevented a close inspection of the entire upstream slope.

Station 39+00 to 40+00:

Trees and docks lined this section of the upstream slope.

Station 40+00 to 41+00:

A resident located near station 40+00 (house number 12938) stated that the area near the stone wall (upstream embankment) drops in elevation every year. Also, the resident stated that material is added each year to retain the elevation of the stone wall.

Station 41+00 to 42+00:

Near station 41+45, a tree had been removed. The upstream stonewall was leaning towards the lake. A small sinkhole was noted along the upstream slope at approximate station 41+50.

Station 42+00 to 43+00:

Trees and a deck were noted on the slope.

Station 43+00 to 44+00:

Fill was approximately 8 inches below the upstream wall. A digital photo was taken of this station.

Station 44+00 to 45+00:

A new house was constructed at station 44+00. A low area, 18 inches deep, was noted along the stone wall. A tree had been removed near station 44+50.

Station 45+00 to 46+00:

Two trees and a deck were noted along this section of the upstream slope. A depression was noted along the stone wall at station 45+75.

Station 46+00 to 47+00:

Two trees were noted along this station. Sinkholes less than 0.5 foot in diameter were observed adjacent to the stone wall at station 46+50.

Station 47+00 to 48+00:

A sinkhole was observed along the stone wall at station 47+25. A number of trees were noted in this area.

Station 48+00 to 49+00:

A large tree was noted on the downstream slope at station 49+00.

Station 49+00 to 50+00:

A deck covered a large portion of this area. An addition had been added to the house at station 49+25.

Station 50+00 to 51+00:

A depression 0.5 foot deep was observed along the stone wall at station 50+25. A tree had been removed near station 50+50. Two survey monuments were observed on the downstream slope near station 50+80.

Station 51+00 to 52+00:

A recently constructed sidewalk was observed. A large tree was noted near station 51+50 on the downstream slope.

Station 52+00 to 53+00:

Two large trees were noted on the upstream portion of the embankment.

Station 53+00 to 54+00:

Decks covered over half of this station. Two trees were also noted on the upstream slope. A digital photo of the section was taken.

Station 54+00 to 55+00:

Near station 54+50, the stone wall was observed to be tilting towards the lake. A depression was noted at station 54+75 on the downstream slope.

Station 55+00 to 56+00:

At an approximate station of 55+50, a depression of 0.5 foot deep was observed along the stone wall. Fill material was approximately 6 inches below the top of the stone wall, and three trees were noted along the slope.

Station 56+00 to 57+00:

A 2-foot-diameter by 8-inch-deep depression was noted at station 57+75 adjacent to the stone wall. This section contained voids less than 0.5 foot in diameter along the stone wall. Three large trees were noted along this portion of the upstream slope.

Station 57+00 to 58+00:

A 2-foot-diameter by 1-foot-deep depression was observed near station 57+85. Another low area approximately 1 foot in diameter was observed near station 57+75. A digital photo was taken of this area.

Station 58+00 to 59+00:

Fill was 6 inches below the top of the stone wall. Two large trees were noted along this section.

Station 59+00 to 60+00:

The upstream embankment contained low areas all along the stone wall. A section of the stone wall was broken and displaced near station 59+40. The sidewalk (station 59+10) that extended from the crest to the stone wall was broken and displaced. Digital photographs were taken of this area.

Station 60+00 to 61+00:

Three trees were noted on the upstream slope. The upstream embankment contained a low area (0.5 foot deep) near the stone wall at an approximate station of 60+15.

Station 61+00 to 62+00:

Large trees were noted along the upstream slope. Large decks prevented a close inspection of the upstream slope.

Station 62+00 to 63+00:

Trees and desks were noted along this section upstream slope.

Station 63+00 to 64+00

Some trees had been removed. A portion of the sheet-pile wall had been replaced.

Station 64+00 to 65+00

No problems were noted. New sheet piling had been installed along the upstream slope. A digital photo taken at station 68+00 shows this section.

DISCUSSION:

Trees should not be permitted on embankment surfaces. Extensive root systems can provide seepage paths for water. Trees that blow down or fall over can leave large holes in the embankment surface that will weaken the embankment and can lead to increased erosion. Tree growth adjacent to concrete walls and structures may eventually cause damage to the concrete and should be removed. Stumps and root balls of cut trees should be removed so vegetation can be established and the surface mowed. All woody material (roots) must be removed and the cavity filled with well-compacted fill material and grass vegetation established.

Houses, docks, gazebos, and other structures should not be built into a dam. A number of residents commented about water seeping from their basement walls that face the lake. A house foundation in the downstream embankment reduces the seepage path and removes valuable fill material. Other excavations into the embankment for construction of docks, gazebos, light poles, garages, patios, and other structures also reduce the safety of the dam and make proper inspection very difficult, if not impossible. All of these issues create stability problems for the embankment that could lead to dam failure.

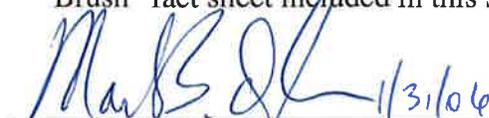
Depressions are sunken areas of the embankment surface. They may be created during construction, or may be caused by decay of buried organic material (tree roots), internal erosion of the embankment, or settlement (consolidation) of the embankment or its foundation. Internal erosion and excessive settlement can lead to dam failure.

The location of a number of the low areas and their proximity to the stone and masonry wall indicates that loss of embankment fill due to erosion has taken place in a number of areas. Continued loss of this earthfill could lead to failure of the wall and the dam.

Seepage of earthen dams is a concern that should always be monitored. Seepage from the dam must be controlled to prevent stability and maintenance problems. The location of a number of the low areas and their proximity indicates that internal erosion has taken place in a number of areas. Internal erosion that is not corrected will weaken the embankment and could possibly lead to failure of the embankment.

REQUIREMENTS:

1. This dam must have an operation, maintenance, and inspection manual (OM&I) and an emergency action plan (EAP) in accordance with OAC Rule 1501:21-21-04. Prepare an OM&I and an EAP including an inundation map. Guidelines for the preparation of these documents can be downloaded from the Division of Water's web site, or a copy can be mailed to you upon request.
2. The dam's discharge/storage capacity must be sufficient to safely pass the required design flood. Prepare plans and specifications as necessary to increase the discharge/storage capacity to pass the required design flood. In accordance with OAC Rule 1501:21-13-02, the minimum design flood for Class I dams is 100% of the Probable Maximum Flood or the critical flood.
3. Repair the stone wall along the entire West Bank from Mud Island to Leibs Island. Also, repair the noted sinkholes and low areas with compacted clay material and establish a dense grass cover. Remedial measures must be taken immediately to stabilize the largest hole observed at station 53+80. See the "Ground Cover" fact sheet included in this section for additional information.
4. Monitor the depressions (low areas) along the upstream portion of the embankment for additional signs of settlement until repairs can be made.
5. Remove the trees and root systems along the upstream portion of the embankment. Replace the voids in the embankment with compacted fill material and establish a dense grass cover. See the "Trees and Brush" fact sheet included in this section for additional information.
6. Remove all landscaping and structures from the state-owned portion of the dam. This will facilitate proper inspection and maintenance of the earthfill embankment. See the "Trees and Brush" fact sheet included in this section for additional information.



Mark B. Ogden, P.E. Date
Administrator
Water Management Section
Division of Water



Peter M. George, P.E. Date
Senior Project Engineer
Dam Safety Engineering Program
Division of Water

BUCKEYE LAKE DAM

File Number: 9723-004, West Bank Inspection

May 4, 2005



Station 13+50 to 11+00



Station 15+00 to 16+00



Station 19+00 to 18+00



Station 22+00 to 21+00



Station 29+00 to 30+00



Station 33+00 to 32+00

BUCKEYE LAKE DAM

File Number: 9723-004, West Bank Inspection

May 4, 2005



Station 43+00 to 44+00



Station 54+00 to 53+00



Station 58+00 to 57+00



Station 59+00 to 60+00



Station 68+00 to 67+00