North Carolina
Department of Environmental Quality
Division of Energy, Mineral and
Land Resources

Mailing Address:
1612 Mail Service Center
Raleigh, NC 27699-1612
DamSafety@ncdenr.gov

Guidelines for Owner Completion of the Emergency Action Plan (EAP) (Template)

- Replace all highlighted text (including MAGENTA, BLUE and GREY) with appropriate names, descriptions, or phone numbers. **Once the document is final, please remove all highlighting**.

- Assistance is available from your local Emergency Management Director for the items in the template designated in GREY. A list of county Emergency Managers is available at https://www.ncdps.gov/emergency-management/em-community/directories/counties. Contact them to ensure that all addresses and contacts are current and that they have not delegated the implementation of the Emergency Action Plans in your area to a local program.

- If you need assistance in completing portions of this template highlighted in BLUE, file information may be obtained from the Division of Energy, Mineral and Land Resources at (919) 707-9220.

- Developing inundation maps are required for **all** emergency action plans:

    - Models to route the flood can be **one- or two-dimensional** or can be a combination of both. In general, as the flood plain widens or becomes non-channelized, **one-dimensional analysis becomes less reliable**. The most used models for estimating both the dam breach outflow hydrograph and routing it downstream are parametric models (HEC1, HEC-HMS, HEC-RAS, BOSS DAMBRK, FLO 2D, and Mike 21). (Source: FERC Chapter R21, Dam Breach Analysis)

    - The method used should also include **two-foot interval** (and labelled) topographic **contours**. Inundation maps developed using an engineering computer model (e.g., HEC-RAS, Geo-dam-BREACH or others) should be **sealed by a licensed Professional Engineer** in the state of North Carolina. The name and version of the engineering computer **models used** to develop the inundation **must be clearly and boldly be identified on each page of the maps.**

    - All **electronic files** and models must be **submitted each time** the EAP is updated.

    - The inundation maps should be developed under both **"sunny day"** and **"probable maximum flood"** day scenarios.

    - The inundation map should also **clearly identify all impacted** downstream infrastructure within the inundation zone, referencing each one to Table 5.2.

    - Please **provide all pertinent supporting documentation** describing the process **used** to develop your inundation map. Such documentation must **include** but not limited to the **methodology used, assumptions made, modeling software used (if any), electronic files of the models, associated inputs, legend table, topographic contours, scale size and a direction arrow**.

    - Using the 100-year flood elevations to determine "at-risk" **is not an appropriate methodology** to satisfy this requirement.

    - The North Carolina Dam Safety Program is in the process of updating EAP shell documents and guidance. Please check our web site often for updates: https://deq.nc.gov/about/divisions/energy-mineral-and-land-resources/dam-safety/planning-dam-emergency

When completed, submit one **electronic copy** to →

North Carolina Dam Safety Program
(damsafety@ncdenr.gov)
Division of Energy, Mineral and Land Resources
1612 Mail Service Center
Raleigh, North Carolina 27699-1612
Phone: (919) 707-9220

ART MUSEUM DAM

Emergency Action Plan (EAP)

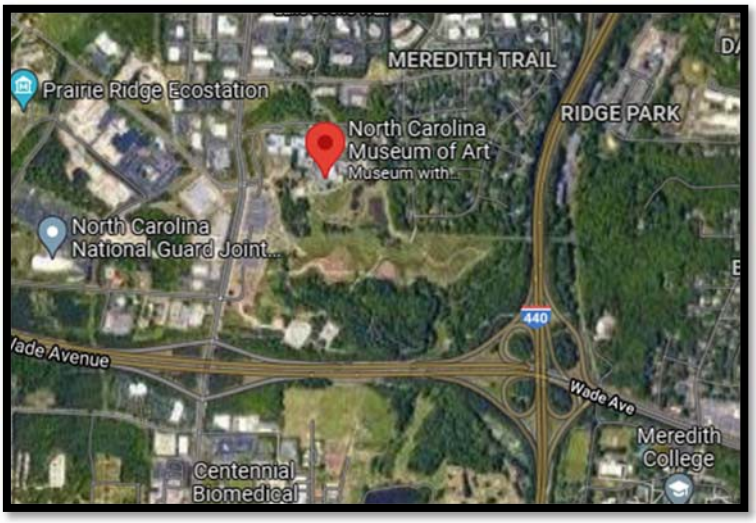
State ID: (first 5 letters of County) WAKE-366
WAKE County, North Carolina

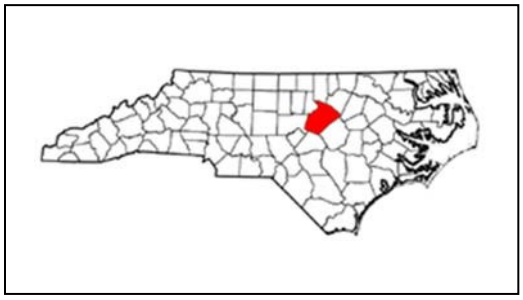
Revision Number_2_
February, 2022

Owner/Operator Information:
Katherine White – Deputy Director
2110 Blue Ridge Road, Raleigh, NC 27607

Owner Email Address: katherine.white@ncdcr.gov
Owner Day Phone: 919-664-6914
Owner 24-Hour Emergency Phone: 919-664-6914

Engineer Email Address: tlbartelt@aogroup.com
Engineer Day Phone: 919-981-0310 ext. 101
Engineer 24-Hour Emergency Phone: 919-345-7466





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Emergency Action Plan

Table of Contents

Art Museum Dam
State Inventory No: WAKE-366

Preliminary Pages

1.0 STEP 1 Event Detection and Level Determination

2.0 STEP 2 Notifications and Communication

3.0 STEP 3 Expected Actions

4.0 STEP 4 Termination and Follow-up

5.0 MAPS, FIGURES AND SUPPORTING DATA

TABLE

FIGURES

FORMS

APPENDICES

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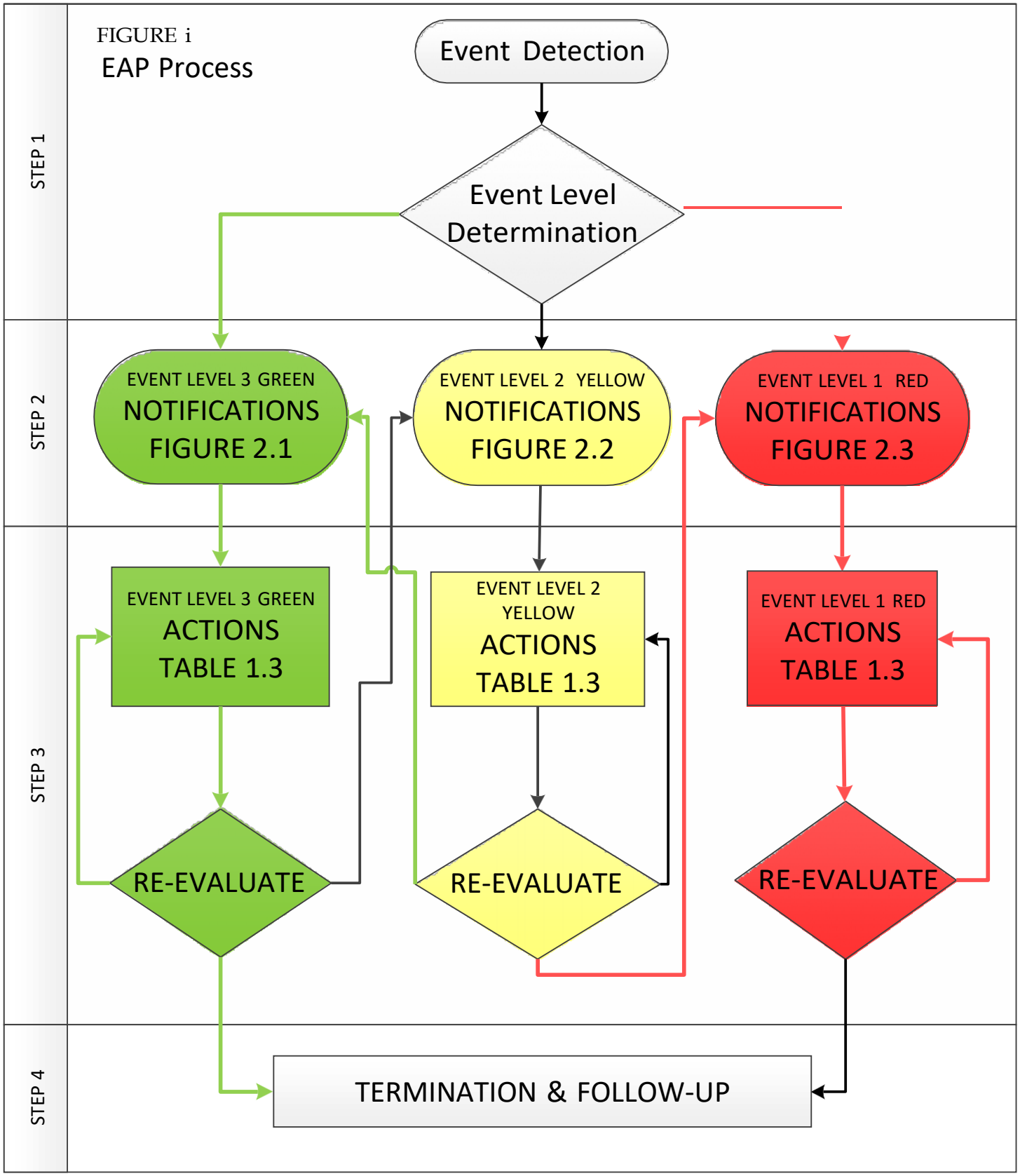
FIGURE i
EAP Process



SUMMARY OF EAP PROCESS

There are four steps that must be followed anytime an unusual or emergency event is detected at Dam *WAKE-366.* The steps are:

Step 1 Event Detection and Level Determination

During the initial step, an unusual event or emergency event is detected at the dam and classified by ***Katherine White*** into one of the following event levels (reference Table 1.3):

Event Level 3, GREEN: Unusual Event, slowly developing
Event Level 2, YELLOW: Emergency Event, potential dam failure situation, rapidly developing
Event Level 1, RED: Urgent!! Emergency Event, Dam failure imminent or is in progress

Step 2 Notification and Communication

After the event level has been determined, notifications are made in accordance with the appropriate notification flow chart provided in STEP 2 of this EAP.

Step 3 Expected Actions

After the initial notifications are made, ***Katherine White*** should refer to Table 1.3 and confer with ***Engineering Director or designee*** to develop and execute appropriate preventative actions. During this step of the EAP, there is a continuous process of taking actions, assessing the status of the situations, and keeping others informed through communication channels established during the initial notifications. The EAP may go through multiple event levels during Steps 2 and 3 as the situation either improves or worsens.

Step 4 Termination and Follow-up

Once the event has ended or been resolved, termination and follow-up procedures should be followed as outlined in Section 4 of this EAP. EAP operations can only be terminated after completing operations under Event Level 3 or 1. If Event Level 2 is declared, the operations must be designated Event Level 3 or 1 before terminating the EAP operations.

STATEMENT OF PURPOSE

1. The purpose of this plan is to prescribe procedures to be followed in the event of an emergency associated with the WAKE-366 which is caused by an unusually large flood or earthquake, a malfunction (hydraulic or structural) of the spillway, malicious human activity such as sabotage, vandalism or terrorism, or failure of the dam.

2. This Emergency Action Plan (EAP) defines responsibilities and procedures to:
   - Identify unusual and unlikely conditions that may endanger the dam.
   - Initiate remedial actions to prevent dam failure or minimize the downstream impacts of a dam failure.
   - Initiate emergency actions to warn downstream residents of impending or actual failure of the dam.

STEP 1 (DETECTION and EVENT LEVEL DETERMINATION side tab inserted)

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STEP 1: EVENT DETECTION AND LEVEL DETERMINATION

1.1 Event Detection

Daily surveillance, observation and/or instrumentation readings at the site will be the normal methods of detecting potential emergency situations. Unusual or emergency events may be detected by:

- Observations at or near the dam
- Evaluation of instrumentation data
- Earthquakes felt or reported in the vicinity of the dam
- Forewarning of conditions that may cause an unusual event or emergency event at the dam (for example, severe weather or flash flood forecast)

1.2 Emergency Level Definitions

Level 1, RED Emergency – Urgent!! Dam failure imminent or is in progress

This is an **extremely urgent situation** when a dam failure is occurring or is about to occur and cannot be prevented. When it is determined that there is no longer time available to implement corrective measures to prevent failure, an order for the evacuation of residents in potential inundation areas shall be issued by Emergency Responder (Incident Commander)

Level 2, YELLOW Emergency - Potential dam failure situation, rapidly developing

This classification indicates that a **situation is developing** that could lead to dam failure, but there is not an immediate threat of dam failure. The dam Owner/Operator should closely monitor the condition of the dam and periodically report the status of the situation. A reasonable amount of time is available for analysis before deciding on the evacuation of residents. If the dam condition worsens and failure becomes imminent, the Incident Commander must be notified immediately of the change in the emergency level to evacuate the people at risk downstream.

If time permits, the Ted L. Bartelt, PE and state dam safety officials should be contacted to evaluate the situation and recommend remedial actions to prevent failure of the dam. The dam operator should initiate remedial repairs (note local resources that may be available—see Appendix C). Time available to employ remedial actions may be hours or days.

Level 3, GREEN Unusual Event - Slowly developing

This classification indicates a **situation is developing but has not yet threatened** the operation or structural integrity of the dam. The Owner's technical representative or engineer AND NC Dam Safety Office should be contacted to investigate the situation and recommend actions to take. The condition of the dam should be closely monitored, especially during storm events, to detect any development of a potential or imminent dam failure situation.

See the following pages for guidance in determining the proper emergency level for various situations.

EMERGENCY LEVELS top tab inserted

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Table 1.3
Emergency Level Determination & Action Data Sheet Index

Event	Condition	Emergency Level*	Action Data Sheet
Unexpected Failure	Dam unexpectedly and without warning begins to fail	1	#1
Earth Spillway Flow	Reservoir water surface elevation at auxiliary spillway crest or spillway is flowing with no active erosion	3	A3
	Spillway flowing with active gully erosion or flow that could result in flooding of people downstream if the reservoir level continues to rise	2	A2
	Spillway flowing with an advancing head cut that is threatening the control section or that is already flooding people downstream	1	A1
Embankment Overtopping	Reservoir level is 1 foot below the top of the dam	2	B2
	Water from the reservoir is flowing over the top of the dam	1	B1
Seepage	New seepage areas in or near the dam, water flowing clear	3	C3
	New seepage areas with cloudy discharge or increasing flow rate	2	C2
	Seepage with discharge greater than 10 gallons per minute	1	C1
Sinkholes	Observation of new sinkhole in reservoir area or on embankment	2	D2
	Rapidly enlarging sinkhole	1	D1
Embankment Cracking	New cracks in the embankment greater than ¼-inch wide without seepage	3	E3
Embankment Movement	Visual movement/slippage of the embankment slope	2	F2
	Sudden or rapidly proceeding slides of the embankment slopes	1	F1
Instruments	Instrumentation readings beyond predetermined values	3	G3
Earthquake	Measurable earthquake felt or reported near the dam and the dam appears to be stable	3	H3
	Earthquake resulting in visible damage to the dam or appurtenances	1	H1
Security Threat	Reported bomb threat, Unverified	3	I3
	Verified bomb threat that, if carried out, could result in damage to the dam Damage to dam or appurtenances with no impacts to the functioning of the dam	2	I2
	Detonated bomb that has resulted in damage to the dam or appurtenances	1	I1
	Suspected Cyber-attack of pertinent control systems, to include publicly owned,	1	I1
Sabotage/ Vandalism	Damage to or modification to the dam or appurtenances no impacts the functioning of the dam	3	J3
	Damage to dam or appurtenances that has resulted in seepage flow	2	J2
	Damage to dam or appurtenances that has resulted in uncontrolled water release	1	J1
Blocked Culverts	Debris is blocking a spillway pipe, causing lake level to rise	3	K3

1. If an event is not listed, **adapt an Action Data Sheet** to a similar type of event and event level.
2. If resources described in the Action Data Sheets are not available, **adapt available resources**.
3. Remove "event" completely if not relevant to the dam.
4. After Katherine White has determined the event level
   - See STEP 2: GREEN, YELLOW & RED Notification flowcharts the STEP 3 Referenced Action Data Sheet
   - See STEP 3: Expected Action Data Sheets for specific actions once Emergency Level determined

STEP 2 (Notifications and Communication side tab inserted)

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NOTIFICATION CHARTS top tab inserted

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UNUSUAL EVENT, SLOWLY DEVELOPING

(Can usually wait until regular business hours unless Level is elevated)

Figure 2.1

UNUSUAL EVENT LEVEL 3 GREEN

Dam Owner/Operator
Katherine White

919-664-6914 (Office)
919-664-6914 (Home)
919-664-6914 (Cell/24-hr)

(1)

Dam Owner's Engineer
Ted L. Bartelt, PE
(if applicable)

Ted L. Bartelt, PE

919-981-0310 ext. 101 (Office)
919-345-7466 (Cell/24-hr)

(2)

NC Dam Safety

BUSINESS HOURS

William Denton Regional Office Engineer

Raleigh Regional Office
919-707-9214 (Office)

Or
Raleigh Central Office
919-707-9220 (Office)

State Emergency Operations Center
24 hours
1-800-858-0368

SUGGESTED PHONE MESSAGE

- This is ***Katherine White, Deputy Director***.
- An unusual event has been detected at ***Art Museum Dam, Wake-366***
- The EAP has been activated, currently at Level 3.
- If a problem occurs, flooding along ***House Creek Tributary*** is possible.
- The situation is being monitored to determine if any evacuation warnings will be necessary.
- We will keep you apprised of the situation.
- I can be contacted at the following number ***919-664-6914.*** If you cannot reach me. Please call the following alternative number *Alt. No.*

Note:
(1), (2) denotes suggested call sequence.

Emergency Level 2 YELLOW Notifications

Potential Dam Failure Situation or Rapidly Developing

Figure 2.2

EMERGENCY LEVEL 2 YELLOW

Dam Owner/Operator

Katherine White

919-664-6914 (Office)
919-664-6914 (Home)
919-664-6914 (Cell/24-hr)

Be ready to **provide information from Figure 5.3** and directions to dam.

(1.) (2.) (3.)

Dam Operator's Engineer

Ted L. Bartelt, PE

919-981-0310 ext. 101 (Office)
919-345-7466 (Cell/24-hr)

911 Dispatch

(1.) (2.) (3.)

State Emergency Operations Center

24 hours
1-800-858-0368
Be ready to **provide information from Figure 5.3** and directions to dam.

County Emergency Management Director

Joshua Creighton

919-856-6480 (Office)
919-856-6480 (Cell/24-hr)

Local Responder / Incident Commander

(Not County EM Director)

Herbert Griffin – Fire Chief

919-996-6115 (Office)
919-996-6115 (Cell/24-hr)

(1.) (2.)

NC Dam Safety

BUSINESS HOURS

William Denton - ***Regional Office Engineer***

Raleigh Regional Office

919-707-9214 (Office)
Or

Raleigh Central Office

919-707-9220 (Office)

SERT Partners

(as needed)

See *Emergency Services Contacts* (Appendix B) for additional SERT contacts and other emergency personnel.

SUGGESTED PHONE MESSAGE

- This is ***Katherine White***
- I am making this call in accordance with the ***Art Museum Dam, Wake-366*** Emergency Action Plan
- We have an emergency condition at ***Art Museum Dam, Wake-366***
- The EAP has been activated, currently under Emergency Level 2.
- We are implementing predetermined actions to respond to a rapidly developing situation that could result in dam failure.
- The situation is being monitored to determine if any evacuation warnings will be necessary.
- Reference your copy of the EAP to prepare for possible evacuations.
- I can be contacted at the following number 919-664-6914. If you cannot reach me. Please call the following alternative number ***Alt. No.***

Note:
1., 2., etc., denotes call sequence.

Emergency Level 1, RED Notifications

FAILURE IN PROGRESS

Figure 2.3

EMERGENCY LEVEL 1 RED

Dam Owner/Operator
Katherine White
919-664-6914 (Office)
919-664-6914 (Home)
919-664-6914 (Cell/24-hr)

(1.) (2.)

911 Dispatch (3.) → **State Emergency Operations Center**
24 hours
1-800-858-0368
Be ready to **provide information from Figure 5.3** and directions to dam.
Assistance is requested.
from NCDENR – Dam Safety

(1.) (2.)

Local Responder / Incident Commander
Herbert Griffin – Fire Chief
919-996-6115 (Office)
919-996-6115 (Cell/24-hr)

County Emergency Management Director
Joshua Creighton
919-856-6480 (Office)
919-856-6480 (Cell/24-hr)

(1.) (2.)

NC Dam Safety
BUSINESS HOURS
William Denton -
Regional Office Engineer
Raleigh Regional Office
919-707-9214 (Office)
Or
Raleigh Central Office
919-707-9220 (Office)

SERT Partners
(as needed)
See *Emergency Services Contacts* (Appendix B) for additional SERT contacts and other emergency personnel.

SUGGESTED PHONE MESSAGE

- This is an EMERGENCY. This is ***Katherine White, Deputy Director***
- The ***Art Museum Dam, Wake-366*** is failing. The downstream area must be evacuated immediately. Repeat, the ***Art Museum Dam, Wake-366*** is failing.
- We have activated the Emergency Action Plan for this dam and are currently under Emergency Level 1.
- Evacuate immediately according to the evacuation map in your copy of the Emergency Action Plan.
- I can be contacted at the following number **919-664-6914**. If you cannot reach me. Please call the following alternative number ***Alt. No***.

Note:
1., 2., etc., denotes call sequence

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Step 3: Expected Actions

This Section includes Action Sheets and Emergency Event Logs **to be used during and after an emergency situation**.

3.1 Action Data Sheets

1. The Action Data Sheets are to be used **as guidance** during an emergency event**.** If an event is not included in Table 1.3, it is recommended to adopt an Action Data Sheet from a similar event and event level. Table 1.3 depicts the Action Data Sheet Index to be used according to the Event and the Emergency Level. The Action Data Sheet should be reviewed by the Ted L. Bartelt, PE when possible and time permits.

2. Recommendation for handling of the Action Data Sheets. If the Incident Command Post is not located on the Dam, then it is recommended that two people to split the following responsibilities:

    a. One person at the dam to handle on-site actions.

    b. One person who can make the notifications.

This Section includes Action Sheets and Emergency Event Logs to be used during and after an emergency situation.

The Action Data Sheets are to be used as guidance during an emergency event. If an event is not included in Table 1.3, it is recommended to adopt an Action Data Sheet from a similar event and event level. Table 1.3 shows the Action Data Sheet Index to be used according to the Event and the Emergency Level. The Action Data Sheet should reviewed by the Owner's Engineer when possible and time permits.

After the *Wake County Emergency Management* has determined the event level and has made the appropriate notifications, the *Wake County Emergency Management* shall take action, using the Action Data Sheets as a guide. Table 3.1 is an index of the Action Data Sheets.

The Action Data Sheets should be reviewed by Ted Bartelt*, PE* when possible and if time permits. If an event is not covered, adapt an Action Data Sheet of a similar event and event level. If resources described in the Action Data Sheets are not available, adapt with the available resources.

Ted Bartelt, PE shall review all reports provided by the *Wake County Emergency Management,* if time permits, and inspect areas impacted by the event. Ted Bartelt*, PE* shall determine if any additional temporary measures are necessary to prevent immediate event escalation, dam failure, downstream flooding and/or safety of emergency personnel. Contact other emergency departments and personnel appropriate for addressing the situation. Conditions shall be continually monitored and additional measures implemented if necessary to maintain the integrity of the dam. If the dam has not failed and the event has been terminated, measures shall be taken to determine the cause of the event, impacts to the dam and repairs necessary for permanent stabilization. Once the dam has failed, or the event has been terminated, refer to the follow up section for further instructions.

LEVEL: 1, RED **UNEXPECTED FAILURE**	**Sheet #1**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 1 RED notifications on Figure 2.3 using pre-scripted message.
2. Recommend to the Incident Commander **IMMEDIATE EVACUATION** downstream of the dam.
3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public.
4. **Record all information, observations, and actions on an Event Log Form (Form 3.2)**.

Owners Engineer: Ted L. Bartelt, PE

1. Provide decision support and technical support to ***Katherine White*** as appropriate.
2. Advise ***Katherine White*** of dangerous conditions at the dam.

NC Dam Safety Staff

Provide decision and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

EVALUATION / DECISION based upon Table 1.3

Evaluate conditions CONTINUOUSLY **Using Table 1.3**, determine if:

A. The event warrants downgrade if there is no longer an impending threat of dam failure with no additional rainfall occurring YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flow Chart shall be notified of downgrade to Event Level 3.

B. Event may be Terminated only when either:

- There is no longer an impending threat of dam failure with no additional rainfall occurring and it has been determined by NC Dam Safety staff to safely to impound water or;
- The dam has failed AND there is no longer a threat to the downstream public

C. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL DOWNGRADE	**B) TERMINATION**	
Monitor conditions until damage is repaired	Go to **Termination and Follow- Up** (Step 4)	

LEVEL: 3, GREEN **EARTH SPILLWAY FLOW** Defined as: "Spillway is flowing with no active erosion" (Link to Table 1.3 Level GREEN "Conditions").	**Sheet A3**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 3 GREEN notifications in Figure 2.1 have been made.
2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Monitor water levels and spillway area for erosion every two hours.
3. Monitor Off-site areas to include instrumentation. (Applicable to all Action Data Sheets with reference to Instrumentation)
4. Record all information, observations, and actions on an Event Log Form (Form 3.2).
5. Contact the ***Ted L. Bartelt, PE*** at least daily to report the latest observations and conditions. If conditions change significantly, go to **re-evaluation/decision section** and follow relevant steps immediately.

Owners Engineer: Ted L. Bartelt, PE

Review all pertinent information to recommend appropriate actions to the ***Katherine White*** in conjunction with ***NC Dam Safety Staff***. Provide oversight to corrective actions or work as required. Observe conditions in site periodically and provide decision support as appropriate.

NC Dam Safety Staff

Provide decision and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

RE-EVALUATION / DECISION Based upon Table 1.3

Evaluate conditions at least daily, or when conditions change significantly. **Using Table 1.3**, determine whether:

A. The event can be terminated when spillway flows cease.
B. The event remains at the current Event Level 3 (No change in situation).
C. The event warrants escalation (when spillway flows produces active erosion of channel or spillway flow that may result in flooding of people downstream if water continues to rise (**Link to Table 1.3 Level Yellow "Conditions")**.
D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) TERMINATION	**B) EVENT LEVEL 3 (NO CHANGE)**	**C) EVENT LEVEL ESCALATION**
Go to **Termination and Follow-Up** (Step 4)	Continue recommended actions on this sheet	Go to **Event Level 2 or Event Level 1 Steps 2 & 3**

LEVEL: 2, YELLOW **EARTH SPILLWAY FLOW**

Defined as: "Spillway flowing with active gully erosion or possible flooding of people downstream" (Link to Table 1.3 Level Yellow "Conditions").

Sheet A2

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 2 YELLOW notifications in Figure 2.2 have been made using pre-scripted message.
2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Stay clear of water flows as they are very dangerous.
3. Record all information, observations, and actions on an Event Log Form (Form 3.2).
4. Monitor water levels and erosion of spillway every 2 hours for changes.
5. Monitor Off-site areas to include instrumentation. (Applicable to all Action Data Sheets with reference to Instrumentation)
6. Use "a bottom drain, installed siphon, or pumps on-site" to provide additional drawdown of the lake level. Caution must be taken to not add additional flooding to properties downstream.
7. Contact the ***Ted L. Bartelt, PE*** at least daily to report the latest observations and conditions. If conditions change significantly, go to **re-evaluation/decision section** and follow relevant steps immediately.

Owners Engineer: Ted L. Bartelt, PE

1. Review all pertinent information to recommend appropriate actions to the ***Katherine White*** in conjunction with ***NC Dam Safety Staff***.
2. Provide oversight to corrective actions or work as required.
3. Observe conditions in site periodically and provide decision support as appropriate.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

RE-EVALUATION / DECISION Based upon Table 1.3

Evaluate conditions at least twice daily, or whenever conditions change significantly. **Using Table 1.3**, determine if:

A. The event warrants downgrade to Event Level 3 if **"Spillway flows are decreasing with no additional rainfall occurring (Link to Table 1.3 Level GREEN "Conditions").** Notify all contacts on Event Level 2 Notification Flow Chart that the Event Level will be downgraded to Event Level 3.

B. The event remains at the current Event Level 2 (*No change in situation*).

C. The event warrants escalation to Event Level 1. **If Erosion of channel advancing toward the reservoir or flow is flooding people downstream (Link to Table 1.3 Level Red "Conditions").**

D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL DOWNGRADE	B) EVENT LEVEL 2 (NO CHANGE)	C) EVENT LEVEL ESCALATION
Go to **Event Level 3 Steps 2 & 3**	Continue recommended actions on this sheet	**Event Level 1 RED Steps 2 & 3**

LEVEL: 1, RED **EARTH SPILLWAY FLOW** Defined as: "Spillway flowing with an advancing head cut that is threatening the control section, or that is flooding people downstream" (Link to Table 1.3 Level RED "Conditions")	**Sheet A1**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 1 RED notifications on Figure 2.3 using pre-scripted message.
2. Recommend to the Incident Commander **IMMEDIATE EVACUATION** downstream of the dam.
3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public.
4. Record all information, observations, and actions on an Event Log Form (Form 3.2).

Owners Engineer: Ted L. Bartelt, PE

1. Provide decision support and technical support to **Katherine White** as appropriate.
2. Advise ***Katherine White*** of dangerous conditions at the dam.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

EVALUATION / DECISION based upon Table 1.3

Evaluate conditions CONTINUOUSLY **Using Table 1.3**, determine if:

A. The event warrants downgrade if spillway flows have stopped with no additional rainfall occurring YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flow Chart shall be notified of downgrade to Event Level 3.

B. The event remains at the current Event Level 1 (*No change in situation*).

C. Event may be Terminated only when either:
- Spillway flows have stopped with no additional rainfall occurring and it has been determined by NC Dam Safety staff to safely impound water or;
- The dam has failed AND there is no longer a threat to the downstream public

D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL DOWNGRADE	**B) EVENT/LEVEL REMAINS THE SAME**	**C) TERMINATION**
Monitor conditions until damage is repaired	Continue recommended actions on this sheet	Go to **Termination and Follow- up** (Step 4)

LEVEL: 2, YELLOW **EMBANKMENT OVERTOPPING** Defined as: "Reservoir is 1 foot below the top of dam" (Link to Table 1.3 Level Yellow "Conditions").	**Sheet B2**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 2 YELLOW notifications in Figure 2.2 have been made using pre-scripted message.
2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Stay clear of water flows as they are very dangerous.
3. Record all information, observations, and actions on an Event Log Form (Form 3.2).
4. Monitor water levels and erosion of spillway every 2 hours for changes.
5. Monitor Off-site areas and instrumentation. (Applicable to all Action Data Sheets with reference to Instrumentation)
6. Use "a bottom drain, installed siphon, or pumps on-site" to provide additional drawdown of the lake level. Caution must be taken to not add additional flooding to properties downstream.
7. Contact the ***Ted L. Bartelt, PE*** at least twice daily to report the latest observations and conditions. If conditions change significantly, go to **re-evaluation/decision section** and follow relevant steps immediately.

Owners Engineer: Ted L. Bartelt, PE

1. Review all pertinent information to recommend appropriate actions to the ***Katherine White*** in conjunction with ***NC Dam Safety Staff***.
2. Provide oversight to corrective actions or work as required.
3. Observe conditions in site periodically and provide decision support as appropriate.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

RE-EVALUATION / DECISION Based upon Table 1.3

Evaluate conditions at least twice daily, or whenever conditions change significantly. Using Table 1.3, determine whether:

A. The event warrants downgrade to Event Level 3 if precipitation has stopped, slowing additional inflow to the lake. All contacts on Event Level 2 Notification Flow Chart shall be notified of downgrade from Event Level 2 to Event Level 3.
B. The event remains at the current Event Level 2 (No change in situation)
C. The event warrants escalation to Event Level 1 if water begins to overtop the embankment.
D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL DOWNGRADE	**B) EVENT LEVEL 2 (NO CHANGE)**	**C) EVENT LEVEL ESCALATION**
Go to **Event Level 3 Steps 2 & 3**	Continue recommended actions on this sheet	**Event Level 1 RED Steps 2 & 3**

LEVEL 1, Red **EMBANKMENT OVERTOPPING** **Sheet B1**

Defined as: "Water from the reservoir is flowing over the top of the dam" (Link to Table 1.3 Level Yellow "Conditions").

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 1 RED notifications on Figure 2.3 using pre-scripted message
2. Recommend to the Incident Commander **IMMEDIATE EVACUATION** downstream of the dam
3. Well, vegetated embankment dams can withstand overtopping for a short amount of time. Monitor for changes in water flow as signs of the embankment eroding.
4. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public.
5. Record all information, observations, and actions on an Event Log Form (Form 3.2).

Owners Engineer: Ted L. Bartelt, PE

1. Provide decision support and technical support to ***Katherine White*** as appropriate.
2. Advise ***Katherine White*** of dangerous conditions at the dam.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

EVALUATION / DECISION Based upon Table 1.3

Evaluate the situation as events progress, or whenever conditions change. Determine whether:

A. The event warrants downgrade if spillway flows have stopped with no additional rainfall occurring YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flow Chart shall be notified of a downgrade to Event Level 3. All contacts on Event Level 1 Notification Flow Chart shall be notified of downgrade to Event Level 3.

B. The event remains at the current Event Level 1 (No change in situation).

C. Event may be Terminated only when either:
   - Spillway flows have stopped with no additional rainfall occurring and it has been determined by NC Dam Safety staff to safely impound water or;
   - The dam has failed AND there is no longer a threat to the downstream public

D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL DOWNGRADE	**B) EVENT LEVEL REMAINS THE SAME**	**C) TERMINATION**
Monitor conditions until damage is repaired	Continue recommended actions on this sheet	**Go to Termination and Follow-Up (Step 4)**

LEVEL: 3, GREEN **SEEPAGE** **Sheet C3**

Defined as: "New seepage areas in or near the dam, water flowing clear" (reference Table 1.3 Level GREEN "Condition")

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 3 GREEN notifications in Figure 2.1 have been made.
2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks** Monitor water levels and seepage points for cloudy discharge or increased flow rates every two hours.
3. If conditions permit:
   - If the inflow source of the seepage is within the reservoir, plug the flow with available material – hay bales, bentonite, or plastic sheeting
   - Place an inverted filter (layered sand and gravel) over the exit area to hold soil material in place.
   - "Use "a bottom drain, installed siphon, or pumps on-site" to provide additional drawdown of the lake level. Caution must be taken to not add additional flooding to properties downstream.
4. Monitor Off-site areas to include instrumentation. (Applicable to all Action Data Sheets with reference to Instrumentation)
5. Record all information, observations, and actions on an Event Log Form (Form 3.2).
6. Contact the ***Ted L. Bartelt, PE*** at least daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.

Owners Engineer: Ted L. Bartelt, PE

1. Review all pertinent information in order to recommend appropriate actions to the ***Katherine White*** in conjunction with ***NC Dam Safety Staff***.
2. Provide oversight to corrective actions or work as required.
3. Observe conditions in site periodically and provide decision support as appropriate.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

RE-EVALUATION / DECISION Based upon Table 1.3

Evaluate conditions at least daily, or whenever conditions change significantly. Using Table 1.3, determine whether:

A. The event can be terminated if seepage flow has been remedied and it has been determined by NC Dam Safety staff to safely impound water.
B. The event remains at the current Event Level 3 (No change in situation).
C. The event warrants escalation to Event Level determined using Table 1.3 if discharge becomes cloudy or increased flow rate.
D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) TERMINATION	**B) EVENT LEVEL 3 (NO CHANGE)**	**C) EVENT LEVEL ESCALATION**
Go to **Termination and Follow-Up (Step 4)**	Continue recommended actions on this sheet	Go to Event Level 2 or Event Level 1 Steps 2 & 3

LEVEL: 2, YELLOW **SEEPAGE** Defined as: "New seepage areas with cloudy discharge or increasing flow rate" (reference Table 1.3 Level YELLOW "Condition")	**Sheet C2**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure notifications on Figure 2.2 have been made using pre-scripted message.
2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Monitor water levels and seepage points for cloudy discharge or increased flow rates every two hours.
3. If conditions permit:
   - If the inflow source of the seepage is within the reservoir, plug the flow with available material – hay bales, bentonite, or plastic sheeting
   - Place an inverted filter (layered sand and gravel) over the exit area to hold soil material in place.
4. Use a bottom drain, installed siphon, or pumps on-site" to provide additional drawdown of the lake level. Caution must be taken to not add additional flooding to properties downstream.
5. Monitor Off-site areas to include instrumentation. (Applicable to all Action Data Sheets with reference to Instrumentation).
6. Record all information, observations, and actions on an Event Log Form (Form 3.2).
7. Contact the ***Ted L. Bartelt, PE*** at least twice daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.

Owners Engineer: Ted L. Bartelt, PE

1. Review all pertinent information in order to recommend appropriate actions to the ***Katherine White*** in conjunction with ***NC Dam Safety Staff.***
2. Provide oversight to corrective actions or work as required.
3. Observe conditions in site periodically and provide decision support as appropriate.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

RE-EVALUATION / DECISION Based upon Table 1.3

Evaluate conditions at least twice daily, or whenever conditions change significantly. Using Table 1.3, determine whether:

A. The event warrants downgrade to Event Level 3 If water level in lake is lowered below level of seepage. All contacts on Event Level 2 Notification Flow Chart shall be notified of downgrade to Event Level 3.
B. The event remains at the current Event Level 2 if no change in condition.
C. The event warrants escalation to Event Level 1 if the integrity of the dam appears to be threatened.
D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL DOWNGRADE	**B) EVENT LEVEL 2 (NO CHANGE)**	**C) EVENT LEVEL ESCALATION**
Go to **Event Level 3 Steps 2 & 3**	Continue recommended actions on this sheet	**Event Level 1 RED Steps 2 & 3**

LEVEL: 1, RED **SEEPAGE** Defined as: "Seepage with discharge greater than 10 gallons per minute" (reference Table 1.3 Level RED "Condition")	**Sheet C1**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 1 RED notifications on Figure 2.3 using pre-scripted message.
2. Recommend to the Incident Commander **IMMEDIATE EVACUATION** downstream of the dam.
3. Well, vegetated embankment dams can withstand overtopping for a short amount of time. Monitor for changes in water flow as signs of the embankment eroding.
4. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public.
5. Record all information, observations, and actions on an Event Log Form (Form 3.2).

Owners Engineer: Ted L. Bartelt, PE

Provide decision support and technical support to ***Katherine White*** as appropriate.
Advise ***Katherine White*** of dangerous conditions at the dam.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

EVALUATION / DECISION Based upon Table 1.3

Evaluate the situation as events progress, or whenever conditions change. Determine whether:

A. The event warrants downgrade if seepage stopped AND water level in lake is lowered below level of seepage YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flow Chart shall be notified of downgrade to Event Level 3.

B. The event remains at the current Event Level 1 (No change in situation).

C. Event may be Terminated only when either:
- The dam has failed AND there is no longer a threat to the downstream public and determined by NC Dam Safety staff to safely impound water

D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL DOWNGRADE	**B) EVENT/LEVEL REMAINS THE SAME**	**C) TERMINATION**
Monitor conditions until damage is repaired	Continue recommended actions on this sheet	**Go to Termination and Follow-Up (Step 4)**

LEVEL: 2, YELLOW **SINKHOLES** Defined as: "Observation of new sinkhole in reservoir area or on embankment" (reference Table 1.3 Level YELLOW "Condition")	**Sheet D2**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure notifications on Figure 2.2 have been made using pre-scripted message.
2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Monitor water levels and change in diameter or depth of sinkhole every two hours.
3. If conditions permit:
   a. If the inflow source of the seepage is within the reservoir, plug the flow with available material – hay bales, bentonite, or plastic sheeting
   b. Place an inverted filter (layered sand and gravel) over exit area of soil loss to hold soil material in place.
   c. Use "a bottom drain, installed siphon, or pumps on-site" to provide additional drawdown of the lake level until below bottom of a sinkhole. Caution must be taken to not add additional flooding to properties downstream.
   d. Monitor Off-site areas to include instrumentation. (Applicable to all Action Data Sheets with reference to Instrumentation)
   e. Record all information, observations, and actions on an Event Log Form (Form 3.2).
   f. Contact the ***Ted L. Bartelt, PE*** at least twice daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.

Owners Engineer: Ted L. Bartelt, PE

1. Review all pertinent information in order to recommend appropriate actions to the ***Katherine White*** in conjunction with ***NC Dam Safety Staff***
2. Provide oversight to corrective actions or work as required.
3. Observe conditions in site periodically and provide decision support as appropriate.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

RE-EVALUATION / DECISION Based upon Table 1.3

Evaluate conditions at least twice daily, or whenever conditions change significantly. Using Table 1.3, determine whether:

A. The event warrants downgrade to Event Level 3 If water level in lake is lowered below bottom level of sinkhole. All contacts on Event Level 2 Notification Flow Chart shall be notified of downgrade to Event Level 3.
B. The event remains at the current Event Level 2 if no change in condition.
C. The event warrants escalation to Event Level 1 if the sinkhole enlarges or new sinkholes begin to form
D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL DOWNGRADE	**B) EVENT LEVEL 2 (NO CHANGE)**	**C) EVENT LEVEL ESCALATION**
Go to **Event Level 3 Steps 2 & 3**	Continue recommended actions on this sheet	**Event Level 1 RED Steps 2 & 3**

LEVEL: 1, RED **SINKHOLES** Defined as: "Rapidly enlarging sinkhole or new sinkholes forming" (reference Table 1.3 "Level RED "Condition")	**Sheet D1**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 1 RED notifications on Figure 2.3 using pre-scripted message.
2. Recommend to the Incident Commander **IMMEDIATE EVACUATION** downstream of the dam.
3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public.
4. Record all information, observations, and actions on an Event Log Form (Form 3.2).

Owners Engineer: Ted L. Bartelt, PE

1. Provide decision support and technical support to ***Katherine White*** as appropriate.
2. Advise ***Katherine White*** of dangerous conditions at the dam.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

EVALUATION / DECISION based upon Table 1.3

Evaluate conditions CONTINUOUSLY **Using Table 1.3**, determine if:

A. The event warrants downgrade if there is no longer an immediate impending threat of dam failure and water level in lake is lowered below bottom level of sinkhole YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flow Chart shall be notified of downgrade to Event Level 3.

B. Event may be Terminated only when either:
- There is no longer an impending threat of dam failure with no additional rainfall occurring and it has been determined by NC Dam Safety staff to safely impound water or;
- The dam has failed AND there is no longer a threat to the downstream public as determined by NC Dam Safety staff.

C. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL DOWNGRADE	**B) TERMINATION**	
Monitor conditions until damage is repaired	Go to **Termination and Follow-Up** (Step 4)	

LEVEL: 3, GREEN **EMBANKMENT CRACKING** Defined as: "New cracks in the embankment greater than ¼-inch wide without seepage" (reference Table 1.3 Level GREEN "Condition")	**Sheet E3**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 3 GREEN notifications on Figure 2.1 have been made.
2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Monitor water levels and crack widths for movement or seepage daily.
3. Use "a bottom drain, installed siphon, or pumps on-site" to provide additional drawdown of the lake level **to relieve pressure on the embankment**. Caution must be taken to not add additional flooding to properties downstream.
4. Monitor Off-site areas to include instrumentation. (Applicable to all Action Data Sheets with reference to Instrumentation).
5. Record all information, observations, and actions on an Event Log Form (Form 3.2).
6. Contact the ***Ted L. Bartelt, PE*** at least daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.

Owners Engineer: Ted L. Bartelt, PE

1. Review all pertinent information in order to recommend appropriate actions to the ***Katherine White*** in conjunction with ***NC Dam Safety Staff***.
2. Provide oversight to corrective actions or work as required.
3. Observe conditions in site periodically and provide decision support as appropriate.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

RE-EVALUATION / DECISION Based upon Table 1.3

Evaluate conditions at least daily, or whenever conditions change significantly. Using Table 1.3, determine whether:

A. The event can be terminated if the dam is determined to no longer, pose an immediate threat to downstream by NC Dam Safety staff.
B. The event remains at the current Event Level 3 (No change in situation).
C. The event warrants escalation determined using Table 1.3 if cracks enlarging or water begins to flow from cracks.
D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) TERMINATION	**B) EVENT LEVEL 3 (NO CHANGE)**	**C) EVENT LEVEL ESCALATION**
Go to **Termination and Follow-Up** (Step 4)	Continue recommended actions on this sheet	Go to **Event Level 2 or Event Level 1 Steps 2 & 3**

LEVEL: 2, YELLOW **EMBANKMENT MOVEMENT** Defined as: "Visual movement/slippage of the embankment slope" (reference Table 1.3 Level YELLOW "Condition")	**Sheet F2**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure notifications on Figure 2.2 have been made using pre-scripted message.
2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Monitor water levels and development of new cracks or movement every two hours.
3. If conditions permit:
   - Use "a bottom drain, installed siphon, or pumps on-site" to provide additional drawdown of the lake level **to relieve pressure on the embankment**. Caution must be taken to not add additional flooding to properties downstream.
   - Stabilize slides on the downstream slope by weighting the toe area below the slide with additional soil, rock or gravel.
4. Monitor Off-site areas to include instrumentation. (Applicable to all Action Data Sheets with reference to Instrumentation)
5. Record all information, observations, and actions on an Event Log Form (Form 3.2).
6. Contact the ***Ted L. Bartelt, PE*** at least twice daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.

Owners Engineer: Ted L. Bartelt, PE

1. Review all pertinent information in order to recommend appropriate actions to the ***Katherine White*** in conjunction with ***NC Dam Safety Staff.***
2. Provide oversight to corrective actions or work as required.
3. Observe conditions in site periodically and provide decision support as appropriate.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

RE-EVALUATION / DECISION Based upon Table 1.3

Evaluate conditions at least twice daily, or whenever conditions change significantly. Using Table 1.3, determine whether:

A. The event warrants downgrade to Event Level 3 If water level in lake is lowered below level of dam embankment. All contacts on Event Level 2 Notification Flow Chart shall be notified of downgrade to Event Level 3. Event may not be terminated until repairs are made according to NC regulations.

B. The event remains at the current Event Level 2 if no change in condition.

C. The event warrants escalation to Event Level 1 if the integrity of the dam appears to be threatened by sudden or rapidly proceeding slides.

D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL DOWNGRADE	**B) EVENT LEVEL 2 (NO CHANGE)**	**C) EVENT LEVEL ESCALATION**
Go to **Event Level 3 Steps 2 & 3**	Continue recommended actions on this sheet	**Event Level 1 RED Steps 2 & 3**

LEVEL: 1, RED **EMBANKMENT MOVEMENT** Defined as: "Sudden or Rapidly proceeding slides of the embankment slopes" (reference Table 1.3 Level RED "Condition")	**Sheet F1**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 1 RED notifications on Figure 2.3 using pre-scripted message.
2. Recommend to the Incident Commander **IMMEDIATE EVACUATION** downstream of the dam.
3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public.
4. Record all information, observations, and actions on an Event Log Form (Form 3.2).

Owners Engineer: Ted L. Bartelt, PE

1. Provide decision support and technical support to ***Katherine White*** as appropriate.
2. Advise ***Katherine White*** of dangerous conditions at the dam.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

EVALUATION / DECISION based upon Table 1.3

Evaluate conditions CONTINUOUSLY **Using Table 1.3**, determine if:

A. The event warrants downgrade if there is no longer an immediate impending threat of dam failure and water level in lake is lowered below bottom level of embankment fill YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flow Chart shall be notified of downgrade to Event Level 3.

B. Event may be Terminated only when either:

- The dam has failed **AND** there is no longer a threat to the downstream public as determined by NC Dam Safety staff.

C. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL DOWNGRADE	**B) TERMINATION**	
Monitor conditions until damage is repaired	Go to **Termination and Follow-Up** (Step 4)	

LEVEL: 3, GREEN **INSTRUMENTS** Defined as: "Instrumentation readings beyond predetermined values" (reference Table 1.3 Level GREEN "Condition")	**Sheet G3**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 3 GREEN notifications on Figure 2.1 have been made.
2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Monitor water levels and instrument readings for changes or anomalies.
3. Record all information, observations, and actions on an Event Log Form (Form 3.2).
4. Contact the *Ted L. Bartelt, PE* at least daily to report the latest observations and conditions.
5. If instrumentation readings at the dam are determined to indicate a potentially dangerous situation, go to the **re-evaluation/decision section** and follow relevant steps immediately.

Owners Engineer: Ted L. Bartelt, PE

1. Review all pertinent information in order to recommend appropriate actions to the ***Katherine White*** in conjunction with ***NC Dam Safety Staff.***
2. Provide oversight to corrective actions or work as required.
3. Observe conditions in site periodically and provide decision support as appropriate.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

RE-EVALUATION / DECISION Based upon Table 1.3

Evaluate conditions at least daily, or whenever conditions change significantly. Using Table 1.3, determine whether:

A. The event can be terminated if instrumentation readings back to normal or if instrument reading determined to be invalid.
B. The event remains at the current Event Level 3 (No change in situation).
C. The event warrants escalation determined using Table 1.3 if instrumentation readings at the dam are determined to indicate a potentially dangerous situation.
D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) TERMINATION	**B) EVENT/LEVEL REMAINS THE SAME**	**C) EVENT LEVEL ESCALATION**
Go to **Termination and Follow-Up** (Step 4)	Continue recommended actions on this sheet	Go to **Event Level 2 or Event Level 1 Steps 2 & 3**

LEVEL: 3, GREEN **EARTHQUAKE** Defined as: "Measurable earthquake felt or reported and dam appears to be stable" (reference Table 1.3 Level 3 GREEN "Condition")	**Sheet H3**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 3 GREEN notifications on Figure 2.1 have been made.
2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks.** Record all information, observations, and actions on an Event Log Form (Form 3.2).
3. Be prepared for additional aftershocks.
4. Contact the ***Ted L. Bartelt, PE*** to report the latest observations and conditions.
5. If inspection has determined a potentially dangerous situation, go to the **re-evaluation/decision section** and follow relevant steps immediately.

Owners Engineer: Ted L. Bartelt, PE

1. Review all pertinent information in order to recommend appropriate actions to the ***Katherine White*** in conjunction with ***NC Dam Safety Staff***.
2. Provide oversight to corrective actions or work as required.
3. Observe conditions in site periodically and provide decision support as appropriate.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

RE-EVALUATION / DECISION Based upon Table 1.3

Evaluate conditions at least daily, or whenever conditions change significantly. Using Table 1.3 and/or Table 3.1, determine whether:

A. The event can be terminated if the dam is determined to be stable and a sufficient amount of time has passed when additional aftershocks are not expected.
B. The event remains at the current Event Level 3 until complete inspection has determined the dam to be stable.
C. The event warrants escalation if inspection has determined a potentially dangerous situation.
D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) TERMINATION	**B) EVENT/LEVEL REMAINS THE SAME**	**C) EVENT LEVEL ESCALATION**
Recommend Termination of Event **to IC**. Go to STEP 4	Continue recommended actions on this sheet	Go to **Event Level 2 or Event Level 1 Steps 2&3**

LEVEL: 1 RED **EARTHQUAKE** | **Sheet H1**

Defined as: "Earthquake resulting in visible damage to the dam or appurtenances" (reference Table 1.3 Level RED "Condition")

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 1 RED notifications on Figure 2.3 using pre-scripted message.
2. Recommend to the Incident Commander **IMMEDIATE EVACUATION** downstream of the dam.
3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public.
4. Record all information, observations, and actions on an Event Log Form (Form 3.2).

Owners Engineer: Ted L. Bartelt, PE

1. Provide decision support and technical support to ***Katherine White*** as appropriate.
2. Advise ***Katherine White*** of dangerous conditions at the dam.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

EVALUATION / DECISION based upon Table 1.3

Evaluate conditions CONTINUOUSLY **Using Table 1.3**, determine if:

A. The event warrants downgrade if there is no longer an immediate impending threat of dam failure and water level in lake is lowered below bottom level of embankment fill YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flow Chart shall be notified of downgrade to Event Level 3.

B. Event may be Terminated only when either:

- The dam has failed AND there is no longer a threat to the downstream public as determined by NC Dam Safety staff.

C. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL 1	**B) TERMINATION**	
Continue recommended actions on this sheet	Go to **Termination and Follow-Up** (Step 4)	

LEVEL: 3, GREEN **SECURITY THREAT** Defined as: "Unverified bomb threat" (reference Table 1.3 Level GREEN "Condition")	**Sheet I3**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Notify Local Law Enforcement to help evaluate the situation.
2. Access the dam only if area has been cleared by Law Enforcement.
3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public.
4. Record all information, observations, and actions on an Event Log Form (Form 3.2).
5. If inspection has determined a potentially dangerous situation, go to the **re-evaluation/decision section** and follow relevant steps immediately.

Owners Engineer: Ted L. Bartelt, PE

1. Provide decision support and technical support to ***Katherine White*** as appropriate.
2. Advise ***Katherine White*** of dangerous conditions at the dam.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

RE-EVALUATION / DECISION Based upon Table 1.3

Evaluate conditions at least daily, or whenever conditions change significantly. Using Table 1.3 and/or Table 3.1, determine whether:

A. The event can be terminated if the dam is determined to be stable and a sufficient amount of time has passed when additional aftershocks are not expected.
B. The event warrants escalation if inspection has determined a potentially dangerous situation.
C. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) TERMINATION	**B) EVENT LEVEL ESCALATION**	
Go to **Termination and Follow-Up** (Step 4)	Go to **Event Level 2 or Event Level 1 Steps 2 & 3**	

LEVEL: 2, YELLOW **SECURITY THREAT** Defined as: "Verified bomb threat that, if carried out, could result in damage to the dam or appurtenances with no impacts to the functioning of the dam" (reference Table 1.3 Level YELLOW "Condition")	**Sheet I2**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Notify Local Law Enforcement to help evaluate the situation.
2. Access the dam only if area has been cleared by Law Enforcement.
3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public.
4. Record all information, observations, and actions on an Event Log Form (Form 3.2).
5. If inspection has determined a potentially dangerous situation, go to the re-evaluation/decision section and follow relevant steps immediately.

Owners Engineer: Ted L. Bartelt, PE

1. Provide decision support and technical support to ***Katherine White*** as appropriate.
2. Advise ***Katherine White*** of dangerous conditions at the dam.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

RE-EVALUATION / DECISION Based upon Table 1.3

Evaluate conditions at least twice daily, or whenever conditions change significantly. Using Table 1.3 and/or Table 3.1, determine whether:

A. The event warrants downgrade to Event Level 3 if threat removed YET damage to the dam or appurtenances in need of repair. All contacts on Event Level 2 Notification Flow Chart shall be notified of downgrade to Event Level 3.

B. The event remains at the current Event Level 2 if threat not yet removed.

C. The event warrants escalation to Event Level 1 if bomb is detonated or has been determined that detonation could cause sudden failure.

D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL DOWNGRADE	**B) EVENT/LEVEL REMAINS THE SAME**	**C) EVENT LEVEL ESCALATION**
Go to **Event Level 3 Steps 2 & 3**	Continue recommended actions on this sheet	**Event Level 1 RED Steps 2 & 3**

LEVEL: 1 RED **Security Threat** Defined as: "detonated bomb resulting in visible damage to the dam or appurtenances" (reference Table 1.3 Level RED "Condition")	**Sheet I1**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 1 RED notifications on Figure 2.3 using pre-scripted message.
2. Recommend to ***Herbert Griffin – Fire Chief*** IMMEDIATE EVACUATION downstream of the dam.
3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public.
4. Record all information, observations, and actions on an Event Log Form (Form 3.2).

Owners Engineer: Ted L. Bartelt, PE

1. Provide decision support and technical support to ***Katherine White*** as appropriate.
2. Advise ***Katherine White*** of dangerous conditions at the dam.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate**.**

EVALUATION / DECISION based upon Table 1.3

Evaluate conditions CONTINUOUSLY **Using Table 1.3**, determine if:

A. The event warrants downgrade if there is no longer an immediate impending threat of dam failure and water level in lake is lowered below bottom level of embankment fill YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flow Chart shall be notified of downgrade to Event Level 3.

B. Event may be Terminated only when either:

- The dam has failed AND there is no longer a threat to the downstream public as determined by NC Dam Safety staff.

C. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL 1	**B) TERMINATION**	
Continue recommended actions on this sheet	Go to **Termination and Follow-Up** (Step 4)	

LEVEL: 3, GREEN **SABOTAGE/VANDALISM** Defined as: "Damage to or modification to the dam or appurtenances with no impacts the functioning of the dam." (reference Table 1.3 Level GREEN "Condition")	**Sheet J3**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Notify Local Law Enforcement to help evaluate the situation.
2. Make sure Level 3 GREEN notifications on Figure 2.1 have been made.
3. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**
4. Record all information, observations, and actions on an Event Log Form (Form 3.2).
5. Contact the ***Ted L. Bartelt, PE*** to report the latest observations and conditions.
6. If inspection has determined a potentially dangerous situation, go to the **re-evaluation/decision section** and follow relevant steps immediately.

Owners Engineer: Ted L. Bartelt, PE

1. Provide decision support and technical support to ***Katherine White*** as appropriate.
2. Advise ***Katherine White*** of dangerous conditions at the dam.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

RE-EVALUATION / DECISION Based upon Table 1.3

Evaluate conditions at least daily, or whenever conditions change significantly. Using Table 1.3 and/or Table 3.1, determine whether:

A. The event can be terminated if the dam is determined to be stable and a sufficient amount of time has passed when additional aftershocks are not expected.
B. The event warrants escalation if inspection has determined a potentially dangerous situation.
C. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) TERMINATION	**B) EVENT LEVEL ESCALATION**	
Recommend Termination of Event to IC. Go to Step 4	Go to **Event Level 2 or Event Level 1 Steps 2 & 3**	

LEVEL: 2, YELLOW **SABOTAGE/VANDALISM** Defined as: "Damage to or modification to the dam or appurtenances that impacts the functioning of the dam" (reference Table 1.3 Level YELLOW "Condition")	**Sheet J2**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Notify Local Law Enforcement to help evaluate the situation.
2. Access the dam only if area has been cleared by Law Enforcement.
3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public.
4. Record all information, observations, and actions on an Event Log Form (Form 3.2).
5. If inspection has determined a potentially dangerous situation, go to the re-evaluation/decision section and follow relevant steps immediately.

Owners Engineer: Ted L. Bartelt, PE

1. Provide decision support and technical support to ***Katherine White*** as appropriate.
2. Advise ***Katherine White*** of dangerous conditions at the dam.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

RE-EVALUATION / DECISION Based upon Table 1.3

Evaluate conditions at least twice daily, or whenever conditions change significantly. Using Table 1.3 and/or Table 3.1, determine whether:

A. The event warrants downgrade to Event Level 3 if threat removed YET damage to the dam or appurtenances in need of repair. All contacts on Event Level 2 Notification Flow Chart shall be notified of downgrade to Event Level 3.
B. The event remains at the current Event Level 2 if threat not yet removed.
C. The event warrants escalation to Event Level 1 if has been determined that sudden failure may occur.
D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL DOWNGRADE	**B) EVENT/LEVEL REMAINS THE SAME**	**C) EVENT LEVEL ESCALATION**
Go to **Event Level 3 Steps 2 & 3**	Continue recommended actions on this sheet	**Event Level 1 RED Steps 2 & 3**

LEVEL: 1 RED **SABOTAGE/VANDALISM** Defined as: "Uncontrolled water release" (reference Table 1.3 Level RED "Condition")	**Sheet J1**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 1 RED notifications on Figure 2.3 using pre-scripted message.
2. Recommend to ***Herbert Griffin – Fire Chief*** IMMEDIATE EVACUATION downstream of the dam.
3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public.
4. Record all information, observations, and actions on an Event Log Form (Form 3.2).

Owners Engineer: Ted L. Bartelt, PE

1. Provide decision support and technical support to ***Katherine White*** as appropriate.
2. Advise ***Katherine White*** of dangerous conditions at the dam.

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

EVALUATION / DECISION based upon TABLE 1.3

Evaluate conditions CONTINUOUSLY **Using Table 1.3**, determine if:

A. The event warrants downgrade if there is no longer an immediate impending threat of dam failure and water level in lake is lowered below bottom level of embankment fill YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flow Chart shall be notified of downgrade to Event Level 3.

B. Event may be Terminated only when either:

- The dam has failed AND there is no longer a threat to the downstream public as determined by NC Dam Safety staff.

C. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) EVENT LEVEL 1	**B) TERMINATION**	
Continue recommended actions on this sheet	Go to **Termination and Follow-up** (Step 4)	

LEVEL: 3, GREEN **BLOCKED CULVERTS / SPILLWAY** Defined as: "Debris is blocking a spillway pipe, causing lake level to rise" (reference Table 1.3 Level GREEN "Condition")	**Sheet K3**

RECOMMENDED ACTIONS

Owner/EAP Coordinator: Katherine White

1. Make sure Level 3 GREEN notifications on Figure 2.1 have been made.
2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks.**
3. Record all information, observations, and actions on an Event Log Form (Form 3.2).
4. Be prepared for aftershocks.
5. Contact the ***Ted L. Bartelt, PE*** to report the latest observations and conditions.
6. If blockage cannot be removed, go to the re-evaluation/decision section and follow relevant steps immediately.

Owners Engineer: Ted L. Bartelt, PE

1. Review all pertinent information in order to recommend appropriate actions to the Katherine White in conjunction with NC Dam Safety Staff.
2. Provide oversight to corrective actions or work as required.
3. Observe conditions in site periodically and provide decision support as appropriate**.**

NC Dam Safety Staff

Provide decision support and technical support to ***Herbert Griffin – Fire Chief*** as appropriate.

RE-EVALUATION / DECISION Based upon Table 1.3

Evaluate conditions at least daily, or whenever conditions change significantly. Using Table 1.3 and/or Table 3.1, determine whether:

A. The event can be terminated once debris is removed and water level has returned to normal pool.
B. The event remains at the current Event Level 3. No change in severity - water level is not rising.
C. The event warrants escalation according to Table 1.3 if blockage cannot be removed and water level is rising.
D. Notify **all** contacts on the Notification Flow Chart to advise of current situation and anticipated strategies**.**

Based on this determination, follow the appropriate actions

A) TERMINATION	**B) EVENT/LEVEL REMAINS THE SAME**	**C) EVENT LEVEL CHANGE**
Go to **Termination and Follow-up** (Step 4)	Continue recommended actions on this sheet	Go to Table 1.3 to Re-Evaluate

FORM 3.2

Unusual or Emergency Event Log

(To be completed during the emergency)

Art Museum Dam, Wake-366: County: Wake

When and how was the event detected?

Weather conditions:

General description of the emergency situation:

Emergency Classification Level determination:

Made by (Name/Agency):

Actions and Event Progression

Date	Time	From	Action/Event Progression	Recorded By

Actions and Event Progression (continued)

Date	Time	From	Action/Event Progression	Recorded By

STEP 4 (Termination and Follow-Upside tab inserted)

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SECTION 4 TERMINATION AND FOLLOW-UP

1. We recommend you **coordinate** this Section with **local emergency management officials**. This section should be completed according to the different levels of emergency events. We are not looking for a termination and follow up procedure for each event/recommended action. The same termination and follow up procedure can be developed for Level 1 (red) and Level 2 (yellow) events, however a different response is needed for Level 3 (green) events.

2. Once EAP operations have begun under Event Level 3, 2, or 1, the EAP operations must eventually be terminated and follow-up procedures completed. As shown in Figure i, EAP operations can only be terminated after completing operations under Event Level 3 or 1. If Event Level 2 is declared, the operations must be designated Event Level 3 or 1 before terminating the EAP operations.

4.1 Termination Responsibilities

The event may be terminated following dam failure or the threat of dam failure and downstream flooding no longer exist. This condition shall be agreed upon by those parties involved in the event.

For any level one termination not caused by dam failure, the dam shall be thoroughly inspected by Wake County or County representatives who are qualified. This includes, but is not limited to the emergency spillway, outlet structure, top of dam or dam embankment (downstream and above stream). Identify any areas that may need repair or attention. If a seepage or sinkhole event caused the emergency action plan, additional care should be given to evaluate the origination of the seepage/sinkhole and seek recommendations by a qualified professional to ensure the event does not return and the dam remains structurally sound.

4.2 Follow-up

Event Level 3, GREEN – Follow-up of a Level 3 event shall be completed within 30 days of termination of the event. The Owner/EAP Coordinator shall contact all parties that participated in the event within seven days to collect documentation of the event. Each participant will evaluate the EAP procedures and comment on the effectiveness of the procedures and specific recommendations on improvements to the EAP procedures. Within 30 days, the Owner/EAP Coordinator will make recommendations to be inserted into Appendix D and added to the annual EAP update and revisions.

Event Level 2, YELLOW or Level 1, RED– Follow-up of a Level 2 or 1 event shall be completed within 30 days of termination of the event. The Owner/EAP Coordinator shall contact all parties that participated in the event within seven days to collect documentation of the event. Each participant will evaluate the EAP procedures and comment on the effectiveness of the procedures and specific recommendations on improvements to the EAP procedures. Within 30 days, the Owner/EAP Coordinator will make recommendations to be inserted into Appendix D and added to the annual EAP update and revisions.

Event That Has Caused Loss of Life, Injury or Property Damage – If the event has caused loss of life, injury, or property damage, the Owner/EAP Coordinator shall arrange for an independent review of the event in addition to review of the EAP procedures described above. The independent reviewer shall be a Professional Engineer with expertise in dams and emergency procedures from either the public or private sector.

MAPS, FIGURES, SUPPORTING DATA side tab inserted

SECTION 5
MAPS, FIGURES AND SUPPORTING DATA

- Directions and Emergency Access Routes Map (Figure 5.1)
- Residents/Businesses/Roads/Infrastructure at Risk (Table 5.1)
- Downstream Inundation Map (Figure 5.2)
- Summary Information about Dam (Figure 5.3)

Include any other maps, charts or figures deemed relevant in the case of an emergency event.

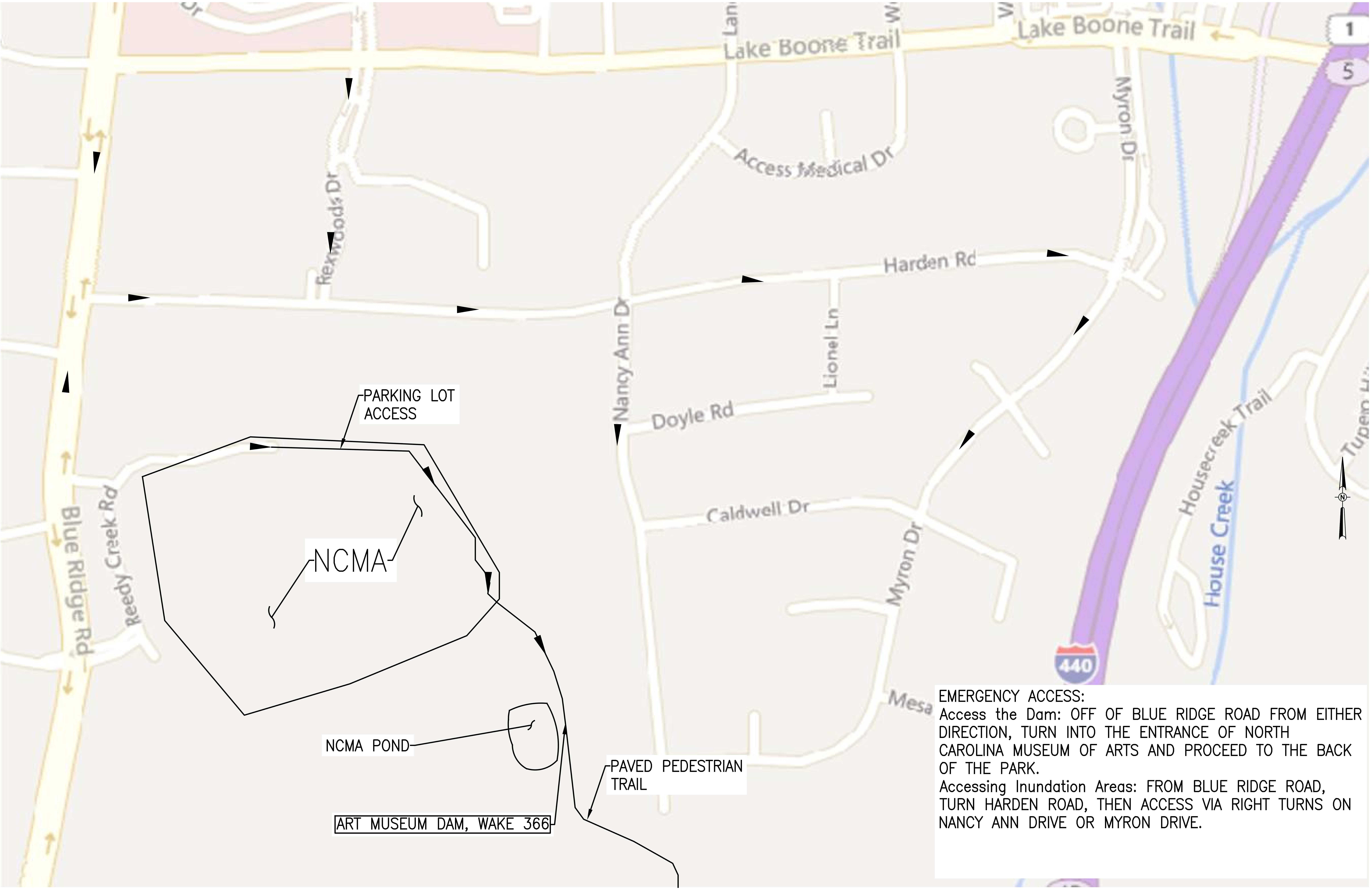
FIGURE 5.1

Directions and Emergency Access Routes Map

Insert Map visually showing safe route for responders to access the site of the dam without crossing danger zones.

(We suggest using a web-based mapping application (e.g., Google Maps) that clearly identifies the location of your dam and surrounding roads that may be used in case of an emergency, **but not affected by the anticipated inundation area.**)

Directions to dam from major intersections: See next Page



EMERGENCY ACCESS:

Access the Dam: OFF OF BLUE RIDGE ROAD FROM EITHER DIRECTION, TURN INTO THE ENTRANCE OF NORTH CAROLINA MUSEUM OF ARTS AND PROCEED TO THE BACK OF THE PARK.

Accessing Inundation Areas: FROM BLUE RIDGE ROAD, TURN HARDEN ROAD, THEN ACCESS VIA RIGHT TURNS ON NANCY ANN DRIVE OR MYRON DRIVE.

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HTTP://WWW.AOGROUP.COM
FIRM LICENSE NO. C-1684
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14455 TED L. BARTELT

Project Title: NORTH CAROLINA MUSEUM OF ART
RALEIGH, NORTH CAROLINA

Sheet Title: EMERGENCY ACCESS

Revisions: No.	Description	Date

Project No.: 2021.019
Issued For: REVIEW
Issued Date: 09/28/2021
Drawn By: CTS
Checked By: TLB
Sheet No.:

People at Risk top tab inserted

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TABLE 5.1
Residents/Businesses/Roads/Infrastructure at Risk

Summary of number of entities within hazard zone. Whenever possible, major streets, railroads, and other well-known features should be depicted on the downstream inundation map or downstream hazards map. This table is **very important** and should include: entity number, property address, resident name, and distance downstream from the dam. List all impacted downstream infrastructures within the inundation zone showed on the maps.

Entity No. on the Map	Resident/Business/Roads or other impacted entities (Ensure "all" properties impacted are listed to or No EAP Approval)	Property Address	Phone No. Include Area Code	Distance Downstream from Dam (mi)
1	NORTH CAROLINA STATE OF	STATE PROPERTY OFFICE 1321 Mail Service Center Raleigh, NC 27699	XXX-XXX-XXXX	<0.1 miles
2	HANCOCK, LINCOLN P EARLS, MARGARET R	2005 NANCY ANN DR RALEIGH NC 27607-3315	XXX	<0.1 miles
3	WILSON, MARY KATHRYN ALBIN WILSON, JAMES LAHEY	2003 NANCY ANN DR RALEIGH NC 27607-3315	XXX	<0.1 miles
4	WARD, KATE H	1901 MYRON DR RALEIGH NC 27607-3355	XXX	<0.1 miles
5	DUNN, CHARLES W DUNN, VICKIE	2008 NANCY ANN DR RALEIGH NC 27607-3353	XXX	0.12 miles
6	JONES, WAYNE W. BOWERS, BONNIE J.	2005 BEECHAM CIR RALEIGH NC 27607-3320	XXX	0.14 miles
7	HOUSE, JESSICA BETH	2006 BEECHAM CIR RALEIGH NC 27607-3321	XXX	0.15 miles
8	KEENER, ROCHELLE C	3415 NOEL CT RALEIGH NC 27607-3346	XXX	0.15 miles
9	COOPER, SCOTT D COOPER, COLBY W	3411 NOEL CT RALEIGH NC 27607-3346	XXX	0.17 miles
10	CILEM, SAMIM CILEM, ELIZABETH	2004 BEECHAM CIR RALEIGH NC 27607-3321	XXX	0.16 miles

11	PARHAM, WILLIAM G JR	3407 NOEL CT RALEIGH NC 27607-3346	XXX	0.17 miles
12	FLAHERTY, TIM FLAHERTY, JULIA VAUGHN	1927 MYRON DR RALEIGH NC 27607-3336	XXX	0.19 miles
13	MIDKIFF, STEPHEN ERIC MIDKIFF, WENDY	1923 MYRON DR RALEIGH NC 27607-3336	XXX	0.18 miles
14	RUSSELL, SEAN RUSSELL, JACQUELINE	1928 MYRON DR RALEIGH NC 27607-3337	XXX	0.22 miles
15	CHURN, DAVID K CHURN, SHEILA L	1924 MYRON DR RALEIGH NC 27607-3337	XXX	0.22 miles
16	CALIENDO, ELIZABETH M	3313 MESA CT RALEIGH NC 27607-3334	XXX	0.24 miles
17	ROBERTSON, DAVID WINFIELD	3309 MESA CT RALEIGH NC 27607-3334	XXX	0.24 miles
18	MCPHAUL, ELBERT MCPHAUL, JULENE B	3305 MESA CT RALEIGH NC 27607-3334	XXX	0.26 miles
19	EJIRE, ADE L EJIRE, ARNETTE H	3301 MESA CT RALEIGH NC 27607-3334	XXX	0.29 miles

MAPS top tab inserted

FIGURE 5.2
Inundation Study

Inundation Map vs. Evacuation Area

1. **Inundation Maps.** As required by NCGS § 143-215.31 (a1) (2)d, a downstream inundation map depicting areas affected by a dam failure and sudden release of the impoundment must be provided. Please provide the supporting methodology used to develop the inundation map including assumptions made, modeling software used, and computer files of the models and associated inputs. The inundation map should depict both Sunny-Day Breach and Rainy-Day Breach (dam breach with simultaneous spillway design flood) inundation zones. Probable Maximum Flood (PMF) breach scenario is required.) Inundation maps should be developed using an engineering computer model (e.g., HEC-RAS Unsteady Model, or other two-dimensional hydraulic analysis model, etc.), as referenced in FEMA P-946, Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures. The inundation map must depict the inundated areas superimposed on recent aerial imagery or topographic map clearly showing all impacted structures, roads, and other properties (located within the inundation zone extent) and reference each on Table 5.1.

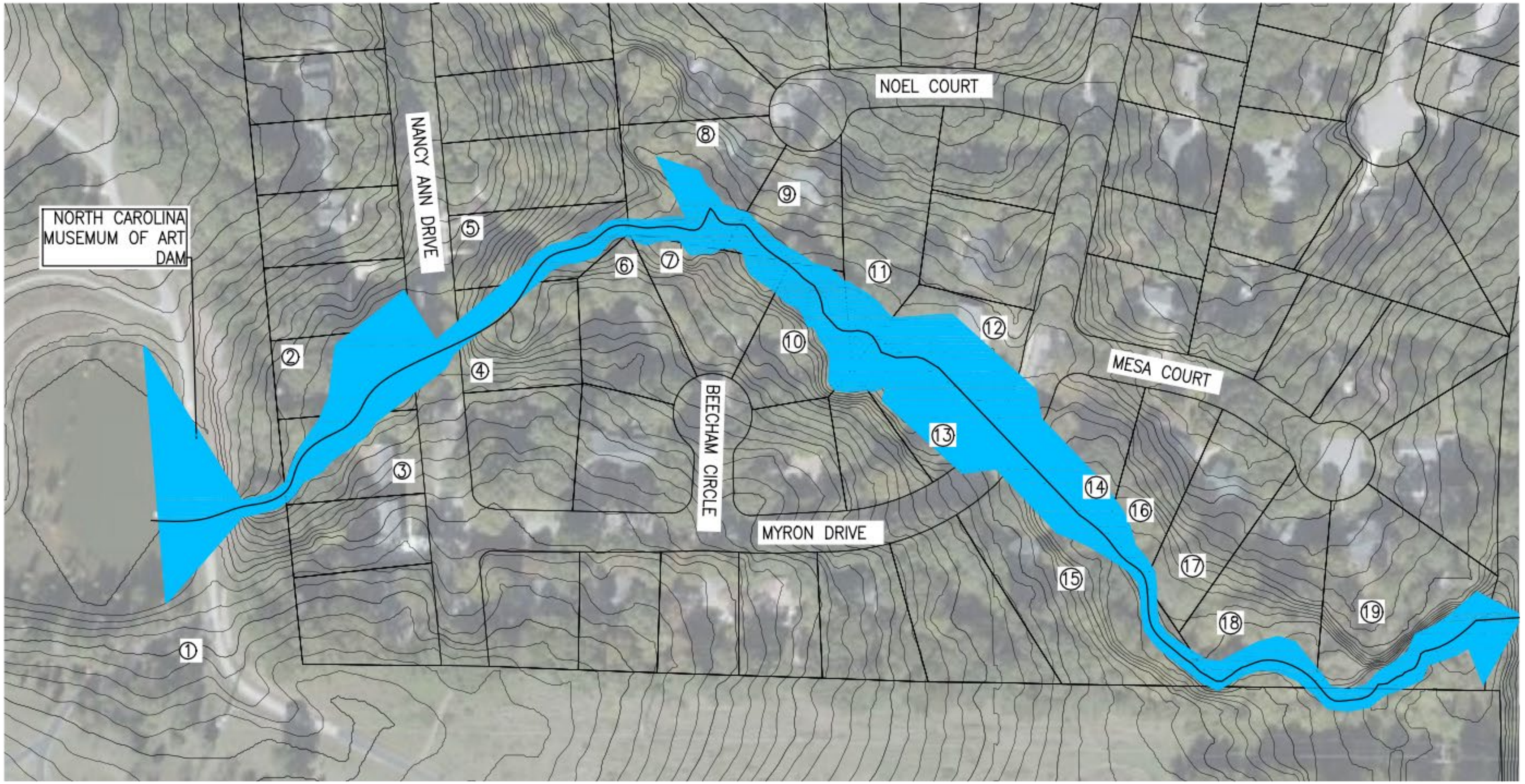
2. For this emergency action plan, **inundation maps** have been developed from best available information using reasonable assumptions and standardized methods. They are approximations of the maximum water surface extents resulting from a complete dam breach and draining of the full reservoir. Inundation maps are empirical hydrologic and hydraulic simulations that can only be field verified in the event of an actual breach. **Evacuation areas and call lists** should take into consideration the anticipated local impacts of flooding; knowledge of local infrastructure, both occupancy and ownership; and potentially interrupted services or cut-off access, which would be caused by dam failure. Depending upon actual circumstances, appropriate alert and evacuation areas could be more or less extensive than the simulated inundation zones.

3. **Documentation of Map Preparation.** Please provide all pertinent supporting documentation, describing the process used to develop the inundation map. This may include methodology used, assumptions made, modeling software (if any), associated inputs, legend table, topographic contours, and scale size. Inundation maps developed using an engineering computer model (e.g., HEC-RAS, HEC-HMS, GeoDam-BREACH, etc.) must be sealed by a licensed Professional Engineer in the state of North Carolina and electronic model files be submitted with EAP.

4. **Before submitting** your Inundation Maps with your EAP, please ensure the following is addressed:

Modeling Software: What modeling Software was used to develop inundation maps? *HecRAS 5.0.7*
Inundation Map: How was inundation map developed? *1D-Unsteady Flow for Sunny Day and 1/3 PMP events*.
Methodology: What methodology was used? (should include 2-foot interval topographical countours) *combination of As-built Data and GIS Contours to create a Terrain in Geo-HecRAS*
Assumptions: What assumptions were made? *Manning's n: 0.1 overbanks; 0.065 channel;*
Impacted Areas: Were ALL impacted downstream infrastructures on inundation area identified on map? *yes*
Were ALL impacted downstream infrastructures on inundation map included **on Table 5.2 listed**. *yes*
Map Attributes: Does your EAP Inundation Map have the following:
-Legend? *yes*
-Contours? *yes*
-Scale of the maps? *yes*
-Directional Arrows? *yes*
Sealed: Is there a Signed and stamped Seal by a licensed Professional Engineer in the state of NC: *yes*

***Each time an EAP is submitted, all electronic related files used to develop the EAP inundation map are required.



INUNDATION MAP SHEET CREATED IN AUTOCAD CIVIL 3D 2018.

CIVIL GEO – Geo-HecRAS WAS USED TO DEVELOP THE INUNDATION FLOOD EXTENTS FOR THE SUNNY DAY AND PROBABLE MAXIMUM FLOOD DAY SCENARIOS USING HEC-RAS ENGINE 5.0.7.

LEGEND

- RIVER REACH
- FLOOD INUNDATION
- PARCEL BOUNDARIES
- 2ft CONTOURS

SCALE: HORIZONTAL 1" = 60'

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SEAL
Ted L. Bartelt, PE
2022.02.17
11:11:42 -05'00'

Project Title:
NORTH CAROLINA MUSEUM OF ART
RALEIGH, NORTH CAROLINA

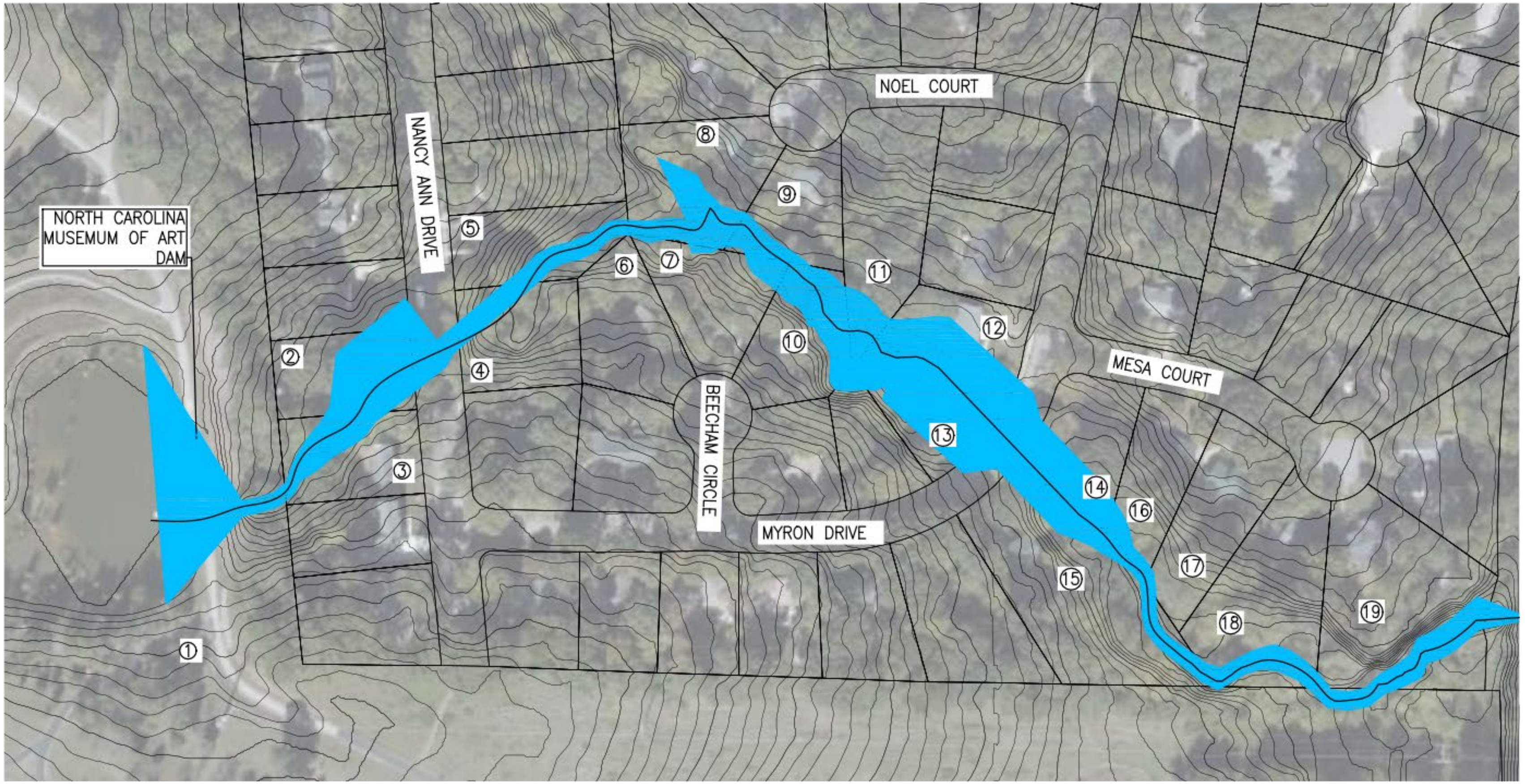
Sheet Title:
⅓ SEASONAL PMP INUNDATION MAPPING

Revisions:
No. Description Date

Project No.: 2021.019
Issued For: REVIEW
Issued Date: 09/28/2021

Drawn By: CTS
Checked By: TLB

Sheet No.: 1/2



INUNDATION MAP SHEET CREATED IN AUTOCAD CIVIL 3D 2018.

Geo-HecRAS WAS USED TO DEVELOP THE INUNDATION FLOOD EXTENTS FOR THE SUNNY DAY AND PROBABLE MAXIMUM FLOOD DAY SCENARIOS USING HEC-RAS ENGINE 5.0.7.

LEGEND

- RIVER REACH
- FLOOD INUNDATION
- PARCEL BOUNDARIES
- 2ft CONTOURS

0 60 120 180
SCALE: HORIZONTAL 1" = 60'

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2022.02.17
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Project Title:
NORTH CAROLINA MUSEUM OF ART
RALEIGH, NORTH CAROLINA

Sheet Title:
SUNNY DAY EVENT INUNDATION MAPPING

Revisions:
No. Description Date

Project No.: 2021.019
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Issued Date: 09/28/2021

Drawn By: CTS
Checked By: TLB

Sheet No.: 2/2

Wake 366 - Inundation Maps

FIGURE 5.3
NC Dam Inventory Data

North Carolina Department of Environment and Natural Resources
Division of Land Resources

June 21, 2021 — Land Quality Section

Art Museum Dam, WAKE-366-High

General Information

Alternate names:	
*Status:	IMPOUNDING
*Dam Type:	Earth
Dam Purposes:	Flood Control, WQ or SWDP
Year Constructed:	
Region:	Raleigh Regional Office
*Quadrangle:	Raleigh West
*Latitude:	35.80883
*Longitude:	-78.7
River or Stream:	House Creek-Tr
*River Basin:	Neuse
Nearest City/Town:	Nancy Ann Drive
Distance Downstream:	0.0

Inspection Information

*Last Inspection Date: 12/10/2020
*Type Inspection: Periodic
*Inspector(s): Norberg, Natalie
*Next Routine Inspection: 12/10/2022
Comments:
Trees/bushes at toe. Few animal activity present.

Details

*Structural Height (ft):	15
Normal Freeboard (ft):	
*Hydraulic Height (ft):	0
*Crest Length (ft):	0
*Crest Width (ft):	0
*Upstream Slope XH:1V:	0
*Downstream Slope:	0
*Low Flow Requirement (cfs):	0
*Max Spillway Capacity (cfs):	
*Normal Pool Elevation:	
*Drainage Area (ac):	
Surface Area (ac):	
Normal Pool Capacity (ac-ft):	
*Max Pool Capacity (ac-ft):	10
Bottom Drain?	N
Bottom Drain Operable?	U

Enforcement

NOD
Deadline
Resolved?

DSO
Deadline
Resolved?

EAP? N
EAP Date

Hazard Information

*Hazard Class High
*Hazard Description Unknown

Spillways

Contacts

Emergency	Wake County Emergency Management Joshua Creighton	Post Office Box 550 Raleigh, NC 27602	(919) 856-6480
Owner	State of North Carolina Ms Rachel Woods	4630 Mail Service Center Raleigh, NC 27699	(812) 327-0200

Directions:

Insert side tab for

APPENDICES

APPENDIX A
Roles and Responsibilities

Dam Owner/Operator (Katherine White)

- As soon as an unusual or emergency event is observed or reported, immediately determine the emergency level (see Emergency Levels tab).
  - Level 1, RED Emergency: Urgent!! Dam failure appears imminent or is in progress
  - Level 2, YELLOW Emergency: potential dam failure situation, rapidly developing
  - Level 3, GREEN Unusual Event: slowly developing
- Immediately notify the personnel in the order shown on the notification chart for the appropriate level (see Notification Charts tab).
- Provide updates of the situation to the Incident Commander dispatcher to assist them in making timely and accurate decisions regarding warnings and evacuations.
- Provide leadership to assure the EAP is reviewed and updated annually and copies of the revised EAP are distributed to all who received copies of the original EAP.

EAP Coordinator (Katherine White)

- Owner may designate responsibilities above to an EAP coordinator

Local Emergency Management (Joshua Creighton)

- EAP preparation - Coordinate with local responders and dispatchers to ensure each has an opportunity for input into the EAP and each has a copy and is aware of their responsibilities.
- Assist in determination of who would be the Incident Commander for this dam.
- During an event, maintain communication with NC Dam Safety staff via the State EOC (1-800-858-0368)
- Assist owners in preparation of *Emergency Access Routes Map (Figure 5.1)*
- Maintain communication with media when necessary.
- When a Level 2 situation occurs:
  - Prepare response personnel for possible evacuations that may be needed if a Level 1 situation occurs.
  - Alert the public as appropriate.
- When a Level 1 situation occurs:
  - Alert the public.
  - Immediately close roads and evacuate people within and possibly adjacent to the inundation area.
- Participate in an annual review and update of the EAP.

Incident Commander (Herbert Griffin)

- Serve as the primary contact person responsible for coordination of all emergency actions.
- When a Level 2 situation occurs: Prepare responders for possible evacuations that may be needed if a Level 1 situation occurs.
- When a Level 1 situation occurs:
  - Initiate warnings and order evacuation of people at risk downstream of the dam.
  - Notify local emergency management services to carry out the evacuation of people and close roads within the inundation area
- Decide when to terminate the emergency.
- Participate in an annual review and update of the EAP.

Dam Operator's Technical Representatives (Ted L. Bartelt, PE)

- Advise the dam owner/operator of the emergency level determination if time permits.
- Advise the dam owner/operator of remedial actions to take if Level 2 event occurs, if time permits.
- Assist the dam Owner in preparation of *Action Data Sheets* – Table 3.1

NC State Dam Safety

- Advise the Incident Commander of the emergency level determination if time permits.
- Provide technical and other assistance to the Incident Commander as needed.
- Advise the dam owner/operator of remedial actions to take if Level 2 event occurs, if time permits.

OTHER RESPONSIBLE PARTIES AS DEFINED

APPENDIX B
Emergency Services Contacts

Agency / Organization	Principal Contact	Address	Office Phone No. with Area Code	Alternate Telephone Numbers	Agency Website/email address?
NC Emergency Operations Center (After hours contact for NC Dam Safety)			1-800-858-0368	N/A	
Local 911 Call Center			911	XXX-XXX-XXXX	
County Emergency Management Deputy Director	Joshua Creighton	Post Office Box 550, Raleigh, NC 27602	919-856-6485	919-878-3561 (24-hr)	
Owner/Representative of Art Museum Dam, WAKE-366	Katherine White	2110 Blue Ridge Road, Raleigh, NC 27607	919-664-6914	919-664-6914 (24-hr)	Katherine.white@ncdcr.gov
Museum of Art Safety Director	Joe Perry	2110 Blue Ridge Road, Raleigh, NC 27607	919-814-6686		Joseph.perry@ncdcr.gov
DOA Facility Management	Chad Bouffiou	1313 Mail Service Center, Raleigh, NC 27699-1313	984-236-0400		Chad.bouffiou@doa.gov
Wake County Sheriff	Gerald Baker	330 S Salisbury Street. Raleigh, NC 27601	919-856-6911	XXX-XXX-XXXX ©	
Local Fire Department	Station 14	4220 Lake Boone Trail, Raleigh, NC 27607	911		
Local Police	State Capital Police	417 N Salisbury St, Raleigh, NC, 27607	919-733-3333		
Local Highway Patrol	District III	1831 Blue Ridge Road, Raleigh, NC 27067	919-733-4400		

North Carolina State Dam Safety Program (NCDENR, Division of Energy, Mineral, and Land Resources)	Any Land Quality – Dam Safety staff		Central office 919-707-9220 Raleigh Regional Office 919-791-4200	NC Emergency Operations Center 1-800-858-0368	
National Weather Service	Centennial Campus Raleigh, NC	1005 Capability Drive, Suite 300 Raleigh, NC 27601	919-326-1042		
NC Department of Transportation		1 S Wilmington St, Raleigh, NC 27601	877-368-4968		
Natural Resources Conservation Service (For NRCS Dams only)	State Engineer or District Engineer Jim Kjelgaard	4407 Bland Road, Suite 117 Raleigh NC 27609	919-873-2100	919-250-1070	
WRAL		2619 Western Blvd, Raleigh, N.C. 27606	919-821-8600	800-532-5343 (Switch Board)	
Local Radio Station FM 94.7 WQDR		3012 Highwoods Blvd. – Ste 201 Raleigh, NC 27604	919-878-1724		

APPENDIX C

LOCALLY AVAILABLE RESOURCES (EQUIPMENT, LABOR, AND MATERIALS)
3109 Gresham Lake Rd, Raleigh, NC 27615

Locally available resources include: (if not available nearby, provide the nearest contacts)

Heavy Equipment Service and Rental Company	ADDRESS	PHONE NUMBER	WEBSITE
Gregory Poole Equipment Company	4807 Beryl Road Raleigh NC 27606	919-828-0641	www.gregorypoole.com
Sunbelt	5701 Chapel Hill Road Raleigh, NC 27607	919-233-4692	www.sunbeltrentals.com

Sand and Gravel Supply	ADDRESS	PHONE NUMBER	WEBSITE
Dirt Cheap	2109 Simpkins Road Raleigh, NC 27603	919-779-0002	www.dirtcheapnc.com
Triangle Landscape Supply	10706 Chapel Hill Road Morrisville, NC 27560	919-460-4410	www.trianglelandscapesupplies.com

Ready-mix Concrete Supply	ADDRESS	PHONE NUMBER	WEBSITE
Agri Supply Company	409 US HWY 70 East PO Box 387 Garner, NC 27529	919-772-0865	www.agrisupply.com
Lowes Hardware	4831 Grove Barton Road Raleigh, NC 27613	919-510-9667	www.lowes.com

Pumps	ADDRESS	PHONE NUMBER	WEBSITE
Agri Supply Company	409 US HWY 70 East PO Box 387 Garner, NC 27529	919-772-0865	www.agrisupply.com
Site One Landscape Supply store #187	151 S. New Hope Rd Raleigh NC #187, NC 27610-0008	919-250-3338	www.siteone.com

Diving Service	ADDRESS	PHONE NUMBER	WEBSITE

Sandbags	ADDRESS	PHONE NUMBER	WEBSITE
ULINE		**1-800-295-5510**	**www.uline.com**

APPENDIX D
EAP REVIEW, REVISION AND PERIODIC TEST

It is extremely imperative this EAP be reviewed annually, then updated before finally submitting it to NCDEQ Dam Safety to stay current. Equally as important is, who will be Coordinating EAP reviews (conducted Annually) and EAP Periodic test of the EAP (recommended every 5 years).

EAP Annual Review:

The Owner's Engineer shall be responsible for an annual review. The reviewer shall verify, and update if necessary, the properties or persons impacted by an emergency event, contact information for emergency personnel, suppliers and their contact information and that all access roads to/from the dam are still applicable. The dam shall be visually reviewed to ensure proper maintenance and that there have been no obvious changes in the system. Once completed, a Review Verification Statement shall be completed.

At a minimum this individual will be responsible for:

1. Determining if downstream hazard changed and **updating** Table 5.1 (Residents, Businesses, Roads, Infrastructure at Risk) accordingly.
2. **Contacting** all individuals on the Emergency Level Call Trees to verify or **updating** proper names, phone numbers, and specified positions.
3. **Contacting** and **updating** the information on Appendix B (Emergency Services Contact)
4. **Contacting** and **updating** the information on Appendix C (Locally Available Resources)

EAP Periodic Test:

An EAP Periodic Test shall be initiated by the EAP Coordinator. The test shall be defined as a Level 2 (yellow emergency) event, less contacting 911 dispatch and potentially impacted persons. Prior to such test, 2-3 days of notification shall be given to each individual/department for anticipation of the Periodic Test. All those contacted shall be prepared to meet at the dam site following the accessible route provided above. Following the test, the time taken to notify those necessary and time of response shall be evaluated to determine ways (if any) to improve the coordinating/response time. Any agreed upon adjustments shall be made to the EAP Document.

At a minimum this individual will be responsible for:

1. Inviting all agencies involved within the EAP
2. Coordinating the development of an Exercise (develop objectives, scenario, messages, after action review.
3. Hosting and Facilitating a tabletop exercise (periodic test)

Revision:

The most current (master) EAP manual shall be held by the Museum of Art Safety Director. It shall be their responsibility that all those in need of the EAP Manual own a copy identical to the master set held by the Museum of Art. Revisions shall be made by the Museum of Art and the Owner's Engineer following annual or periodic test reviews. Revisions will be submitted to the Wake County Emergency Management Department for proper distribution.

APPENDIX E

RECORD OF REVISIONS AND UPDATES

Revision No.	Date	What Revisions Made
1	September, 2021	Page and Section of (Month/Year) EAP Revision
2	February. 2022	Comments from NCDEQ

APPENDIX F

EAP DISTRIBUTION AND ACCEPTANCE

By my signature, I acknowledge that I, or my representative, have reviewed this plan and concur with the tasks and responsibilities assigned herein for my organization and me.

Copy Number	Organization	ACCEPTANCE SIGNATURE
1	State Property Office Department of Administration 1321 MAIL SERVICE CTR, RALEIGH NC 27699-1321 Fady Wahby, PEM Building System Engineer 984-236-5448 (Office) 984-236-5400 (Main) 919-441-7132 (Mobile)	
2	Joshua Creighton Post Office Box 550 Raleigh, NC 27602 919-856-6480 Joshua.creighton@wakegov.com	
3 And 4	North Carolina Dam Safety Program 1612 Mail Service Center Raleigh, North Carolina 27699-1612 (919)707-9220	
5	Ted L. Bartelt, PE 4601 Lake Boone Trail Raleigh, NC 27607 919-981-0310 ext. 101	Ted L. Bartelt, PE 2022.02.17 11:13:10 -05'00'
6	Raleigh Police 911	
7	State Capital Police 919-733-3333	

8	North Carolina Museum of Art Katherine White Deputy Director 4630 Mail Service Center, Raleigh, NC 27699 919-664-6914 Katherine.white@ncdcr.gov	
9	North Carolina Museum of Art Joseph Perry DNCR Safety Director 4630 Mail Service Center, Raleigh, NC 27699 919-814-6686 Erin.lawrence@ncdcr.gov	
10	State Property Office Department of Administration 1321 MAIL SERVICE CTR, RALEIGH NC 27699-1321 Chad Bouffiou Facility Management Director Chad Bouffiou@doa.nc.gov 919-733-3514 (Office) 919-480-5951 (Mobile)	

APPENDIX G

ENGINEERING DOCUMENTS

Engineering Records (if available)

- Reservoir Area – Capacity Curve
- Principal Spillway Rating Curve
- Emergency Spillway (Top of Dam) Rating Curve
- Annotated Site Pictures
- Plan View of the Dam

Appendix H

Glossary

Abutment	The part of the valley side against which the dam is constructed. The left and right abutments of dams are defined with the observer looking downstream from the dam.
Appurtenances	Structures incident to or annexed to dams essential to the proper operation, maintenance or functioning of the dam. This includes such structures as spillways, low-level outlet works and water conduits, such as tunnels, pipelines or penstocks, either through a dam or its abutments.
Breach	An opening through the dam that allows draining of the reservoir. A controlled breach is an intentionally constructed opening. An uncontrolled breach is an unintended failure of the dam.
Control section	A usually level segment in the profile of an open channel spillway above which water in the reservoir discharges through the spillway.
Dam	An artificial barrier generally constructed across a watercourse to impound or divert water.
Emergency spillway	The appurtenant structure that provides the controlled conveyance of excess water through, over, or around the dam.
Incident Commander	(IC) is responsible for directing and/or controlling resources under explicit legal, agency, or delegated authority. The individual responsible for the overall management of the response is called the Incident Commander. For responses under the National Response System (NRS), the pre-designated On-Scene Coordinator (OSC) generally assumes the role of Incident Commander.
Instrumentation	An arrangement of devices installed into or near dams that provide measurements to evaluate the structural behavior and other performance parameters of the dam and spillway structures. Examples include seepage measuring weirs, piezometers, inclinometers and survey monuments.
Low-level outlet works	An appurtenant structure, usually consisting of a pipe through the embankment or principal spillway structure equipped with a valve, whose purpose is to allow lowering the lake level.
Principal spillway	The appurtenant structure that conveys normal inflow through or around the embankment.
Reservoir	The body of water impounded or potentially impounded by the dam.
Seepage	The natural movement of water through the embankment, foundation, or abutment of the dam.
SERT	State Emergency Response Team, Collection of State Agencies, Non-profit and voluntary organizations which provide support to local government agencies in their response, recovery, preparedness & mitigation of natural & technological hazard.
Unusual Event	An event which takes place, or a condition which develops, that is not normally encountered in the routine operation of the dam and reservoir or necessitates a variation from the operating procedures.