DOW TOGS 3.1.3 - EMERGENCY ACTION PLANS FOR DAMS

New York State Department of Environmental Conservation

DEC Program Policy

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***** N O T I C E *****

This document has been developed to provide Department staff with guidance on how to ensure compliance with statutory and regulatory requirements, including case law interpretations, and to provide consistent treatment of similar situations. This document may also be used by the public to gain technical guidance and insight regarding how the department staff may analyze an issue and factors in their consideration of particular facts and circumstances. This guidance document is not a fixed rule under the State Administrative Procedure Act section 102(2)(a)(I). Furthermore, nothing set forth herein prevents staff from varying from this guidance as the specific facts and circumstances may dictate, provided staff's actions comply with applicable statutory and regulatory requirements. This document does not create any enforceable rights for the benefit of any party.

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I. Summary

This policy provides guidance to dam owners on the preparation of, and Department of Environmental Conservation (DEC) staff on the review of, Emergency Action Plans (EAP's) for Class C and Class B dams.

II. Policy:

This guidance represents the professional judgment of the New York State Department of Environmental Conservation's ("DEC" or "Department") staff engineers at the time of publication. The guidance conveys sound practices in an average situation. Where unusual conditions exist, it may not be appropriate to apply this guidance. It is the duty of the dam owner and engineer assess the particular circumstances related to a dam that may warrant deviation from the guidance, to request in writing that the Department consider deviation from the guidance, to provide the conditions that are believed to warrant deviation from this guidance, and to reflect the unusual conditions in the EAP.

Since this guidance governs the preparation of EAP's in an average situation, compliance with this guidance will not necessarily result in an acceptable EAP. The determination by the Department of the acceptability of the EAP will be made on a case-by-case basis. Although the Department's staff may answer questions during the preparation of the EAP, the primary responsibility for preparing an EAP rests with the owner and owner's engineer. The Department may review any EAP at any time. In reviewing an EAP, the Department will consider whether the plan is appropriate for the protection of public safety.

III. Purpose and Background:

New York State Environmental Conservation Law (ECL) and Dam Safety Regulations (6NYCRR Part 673 – "Part 673") require that the owners of all dams located in New York State operate and maintain their dams in a safe condition at all times. For Class C-High Hazard and Class B-Intermediate Hazard dams, this includes developing, maintaining and following an Emergency Action Plan (EAP) for use in the event of a developing dam failure or other uncontrolled release of stored water.

Revisions to New York's dam safety regulations became effective on August 19, 2009, including 6 NYCRR Part 673 ("Dam Safety"). "Emergency Action Plans for Dams (DOW 3.1.3)" was developed to assist Dam Safety staff in the review, and dam owners in the preparation of, an EAP in compliance with the revised regulations. EAP Instructions and templates for Class C and Class B dams are included in this guidance.

The revised regulations concerning EAP's are at 6 NYCRR Subpart 673.7 (which include specific time deadlines), and elsewhere within Part 673. The revised regulations are available on the Department's website at www.dec.ny.gov.

6 NYCRR Subpart 673.7 requires that the owner shall have the EAP for a High Hazard-Class C dam developed by a professional engineer (PE) unless the owner applies to the Director of the Department's Division of Water for a waiver of this requirement with regard to some or all of the components of the EAP, and the Department's Division of Water provides a written waiver of this requirement. A waiver application form concerning this PE requirement is provided on the

DEC website, or upon request from the Department. Owners of Intermediate Hazard-Class B dams need not retain a PE unless specifically requested to do so by the Department.

EAP's for Class B - Intermediate Hazard dams must include a Cover Page, Notification Flow Chart, and Inundation Map(s) (see "Instructions for Drafting an EAP" in this Guidance).

A Promulgation and Concurrence Form must be submitted for all EAP's to indicate that consultation with local emergency managers has been completed. For all EAP's, the contact information on the Notification Flow Chart must be confirmed at least annually, and revised as necessary.

The owner is required to be fully familiar with the entire EAP, including any components for which a PE waiver may be sought, as the owner is responsible for the implementation of the EAP in the event of an emergency. All parts of the EAP must comply with 6 NYCRR Part 673 and this guidance, regardless of whether an engineer is required for their preparation.

Subpart 673.8 requires that owners, as part of their Annual Certification, verify the retention in good order of their EAP, and submit any updated pages. Any changes made to the EAP must be distributed by the Dam Owner to the recipients required by 6 NYCRR Subpart 673.7, including the County Emergency Management Office, and to any other recipients identified within the EAP.

An EAP is useful only if it accurately reflects site conditions, is kept up-to-date, and the roles of the various participants are understood and agreed to. It is the responsibility of each dam owner to develop an EAP tailored to their dam, and to coordinate the EAP with County Emergency Managers, other emergency responders, and local officials. The dam owner should seek to work with county and local emergency managers to develop a planning team that is aware of the dam, conditions at the dam site, and the unique conditions that must be considered should a dam incident occur.

The Department may review and require changes to any part of an EAP at any time to protect life, property or natural resources. As part of such a review, the Department may require that updates to the EAP for a Class B or Class C dam be performed under the direction of, or be reviewed by, a PE retained by the owner.

Sample forms are attached to this guidance. However, the actual forms are a matter of internal Department procedures, and may change from time to time without notice. Therefore, the most current forms should be downloaded from the Department's web site or requested from the Department's Dam Safety Section.

IV. Responsibility:

The Dam Safety program within the Division of Water's Bureau of Dam Safety and Flood Protection ("DEC/DSS") will maintain and interpret this policy and provide updates as needed.

V. Procedure:

The following guidance discusses preparation of Emergency Action Plans, including review by stakeholders and the Department, and distribution of the EAP by the dam owner. Specific directions and templates for Class B and Class C Dam EAP's, and EAP-related sample forms, are attached.

A. EAP Review and Distribution

Development of the EAP for a dam must be coordinated with the assistance of the County Emergency Management Office(s) (EMO) for the County(s) which are located within the inundation areas affected by an uncontrolled release of water or dam failure. The dam owner is to provide the County EMO with inundation maps. The County EMO is not responsible for developing the EAP for the dam owner but should assist the dam owner in determining the names and contacts for the emergency response agencies in each affected municipality. The County EMO will often also be able to provide insight regarding other major stakeholders (*e.g.*, the capabilities of first responders, departments of transportation, hospitals and utilities).

All new EAP's and updates to existing EAP's must be submitted to the Department's Dam Safety Section, which may review, comment and require changes to any EAP at any time. The dam owner is to promptly revise the EAP to address Department comments (generally, within two weeks unless the Department provides a different time frame based on the complexity of the comments and their criticality to having a useful EAP).

When the Department raises a dam's hazard classification or assigns a new Class B or Class C hazard classification to a dam, development of the EAP, including submission of the Promulgation and Concurrence Form, must occur by the deadlines set in Part 673.7(c) (1 year for Class C dam, 2 years for a Class B dam, unless earlier deadlines are set by the Department).

For a new EAP or for an update that includes a change to the estimated inundation area, the dam owner is to submit calculations and/or hydraulic modeling data in support of the estimated inundation areas, on paper and electronically, to the Department, and make them available to other stakeholders for review upon request.

For a Class C dam, in developing a new EAP or after changes have been made to the inundation map, the dam owner is to coordinate an Orientation Meeting with local responders and the County EMO(s). The dam owner will make revisions to the EAP, as appropriate, based on input received at the Orientation Meeting and from the Department, and complete the Promulgation and Concurrence Form.

Because of the number of Class B dams in the state, and the limited impact area for most Class B dams, an Orientation Meeting may not always be practical or desirable. However, the dam owner is expected to, at minimum, make the effort of consulting with the appropriate emergency managers, and to document that effort by completing and submitting a Promulgation and Concurrence Form.

The dam owner is to notify the Department that the EAP has been completed by submitting the Promulgation and Concurrence Form. The EAP will then be considered "final" and the dam

owner is to distribute it to all recipients, with the normal cycle of periodic exercises, reviews, and updates to continue.

The NYS DEC contact for EAP's is the Dam Safety Section:

NYSDEC - Dam Safety Section
625 Broadway, 4th floor
Albany, New York 12233-3504

Phone: (518) 402-8185
Fax: (518) 402-9029

EAP's must be submitted in hard copy form, bound in an appropriately sized, three-ring binder, and must include all maps, figures and tables at legible scales. An electronic version of the text of the EAP and the inundation maps should be submitted as supplements to the hard copy as noted in the instructions and templates.

In addition to the recipients identified above, and in 6 NYCRR Subpart 673.7, Class C Dam EAP's must be provided to the New York State Division of Homeland Security and Emergency Management, Office of Emergency Management ("OEM") Planning Section and the appropriate NYS OEM regional office:

NYS Office of Emergency Management
ATTN: Planning Section
1220 Washington Ave, Bldg. 22
Albany, New York 12226-2251

Phone: (518) 292-2302
Fax: (518) 322-4986

A map and contact information for NYS OEM regional offices is available on NYS OEM'sweb site:
http://www.dhses.ny.gov/

B. Drafting an EAP

EAP's are generally organized into eight (8) sections, plus a cover page, table of contents, and appendices. EAP's for Class C - High Hazard dams shall include all eight sections and must be reviewed, updated, and tested at least annually. EAP's for Class C dams must be prepared by a professional engineer (P.E.) unless a waiver from the PE requirement has been applied for by the owner and accepted by the Department.

EAP's for Class B dams must include a Cover Page, Emergency Notification, and Inundation Map. All plans submitted to the Department must be accompanied by a completed Promulgation and Concurrence form to indicate the consultation with local emergency managers has occurred.

Each dam should have a unique EAP. However, EAP's may be consolidated where conditions warrant, such as for dams in series, or multiple dams or dikes on a single reservoir, that are owned/operated by the same entity.

Instructions for each type of EAP (Class C dam and Class B dam), along with templates, follow.

VI. Related References:

Forms:
The Post-Incident Report form and other Dam Safety – related forms can be found on DEC's web site:
http://www.dec.ny.gov/lands/4991.html

New York State Laws:
http://public.leginfo.state.ny.us/menugetf.cgi?COMMONQUERY=LAWS

Environmental Conservation Law 15-0507:
Structures impounding waters; structures in waters; responsibility of owner; inspection
Environmental Conservation Law 15-0503:
Protection of water bodies; permit
Executive Law Article 2-B:
State and Local Natural and Man-Made Disaster Preparedness

New York State Regulations:
http://www.dec.ny.gov/regulations/regulations.html

Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR):
Part 608 – Protection of Waters
Part 621 – Uniform Procedures (includes Emergency Authorization)
Part 673 – Dam Safety

Other Guidance Documents:

Chapter 14 ("Emergency Action Plan") of the DEC publication "Guidelines for Design of Dams, January 1989" (http://www.dec.ny.gov/docs/water_pdf/damguideli.pdf), has been superseded by Part 673 (effective August 19, 2009), and this guidance document.

Chapter 8 ("Emergency Action Plan Guidelines") of the DEC publication "An Owners Guidance Manual for the Inspection and Maintenance of Dams in New York," June 1987, http://www.dec.ny.gov/docs/water_pdf/damguideman.pdf), provides a good overview of the purpose and principals of EAP development, and is recommended reading. This "Guidance for Developing an Emergency Action Plan" is largely consistent with that chapter, but provides greater detail as well as an EAP template. A revised Dam Incident Report Form, available from The NYSDEC Dam Safety Section ("DEC/DSS") and on the DEC web site, supersedes the form in the "Owner's Guidance Manual." Where any conflicts occur, this guidance should be followed.

In developing this guidance, The Department also relied heavily on the Federal Emergency Management Agency (FEMA) document "Emergency Action Planning for Dam Owners (FEMA 64)." The purpose of this "Guidance for Developing an Emergency Action Plan" is to provide greater detail, and New York-specific guidance. Where any conflicts occur, this guidance should be followed.

The Federal Energy Regulatory Commission (FERC) "Engineering Guidelines for the Evaluation of Hydropower Projects - Emergency Action Plans, Chapter 6" located at the following website (http://www.ferc.gov/industries/hydropower/safety/guidelines/eng-guide/chap6.pdf) is also recommended reading.

Two excellent recent sources of guidance on inundation analysis and hazard classification are from the Washington Dam Safety program and the Colorado Dam Safety program:

Washington State's *Dam Safety Guidelines-Technical Note 1: Dam Break Inundation Analysis and Downstream Hazard Classification* (2007) can be downloaded at:
http://www.ecy.wa.gov/programs/wr/dams/GuidanceDocs_ne.html

and Colorado's *Guidelines for Dam Breach Analysis* (2010) can be downloaded at:
http://water.state.co.us/damsafety/dams.asp

In developing this guidance, the Department benefitted greatly from the advice and guidance documents by staff at the Pennsylvania Dam Safety Program and the New Jersey Dam Safety Program, and is grateful for their assistance. EAP guidance documents from those states can be found on the Internet.

There are many other guidance documents on development of EAP's from other states, and from federal agencies, which may serve as useful references. Extensive resources are available on the Internet.

DIVISION OF WATER
BUREAU OF FLOOD PROTECTION AND DAM SAFETY
DAM SAFETY SECTION

DOW 3.1.3 – ATTACHMENT "EAP-C"

EMERGENCY ACTION PLAN

FOR

CLASS C - HIGH HAZARD DAMS

INSTRUCTIONS AND TEMPLATE

December 2012

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EAP – C INSTRUCTIONS

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I. Emergency Notification

Emergency Notification Procedures/Notification Flowchart. A pre-planned notification process is one of the most critical elements of an EAP. This process is most commonly depicted in a flowchart or flowcharts, but for some dams a contact list with calling sequence may be sufficient. This guidance will refer to the depiction of notification procedures as the "Notification Flowchart," regardless of whether it is actually a flowchart.

The Notification Flowchart in an EAP contains the information necessary for the timely notification of persons responsible for taking emergency actions to protect downstream life, property and the environment. It also lists parties who need to be aware of a dam emergency, such as the NYSDEC Dam Safety Section ("DEC/DSS"). The Notification Flowchart lists the names and contact information for those individuals to be contacted, by whom and in what order. The Emergency Notification Flowchart should include **individual names with office and confirmed 24-hour telephone numbers**. Alternate contacts and their confirmed telephone numbers should also be listed, in case the primary contact is unavailable. The County EMO's for the counties within the inundation map may be able to assist the EAP writer in identifying the necessary contacts.

The number of persons to be notified by each individual on the Notification Flowchart should be governed by what other responsibilities the person has as part of the emergency response. In general, no individual should be expected to contact more than 5 other individuals, unless that person's duty is limited to making notifications only.

The Notification Flowchart should contain the following:

- Dam owner;
- Local emergency responders (e.g. fire and police departments) and related organizations;
- County Emergency Management Offices (County EMOs);
- Appropriate state emergency management agencies (State Police, Office of Emergency Management (NYS OEM));
- Residents and property owners that are located immediately downstream of the dam within the boundary of potential inundation, where available warning time is limited;
- National Weather Service, for flood alert notifications;
- Operators of other dams or water-retention facilities which may affect or be affected by an emergency (e.g.: upstream and downstream dams);
- NYSDEC Dam Safety Section (DEC/DSS);
- EMO's of other states;
- Others, as appropriate.

The above list may not be all inclusive or represent an appropriate prioritization of those entities listed. The author of the EAP should understand that notification of the dam owner and local emergency responders are typically given top priority, and this understanding should be reflected in the flowchart.

As the communication capabilities of emergency managers increase, it may be appropriate to simplify the notification flow chart and rely more strongly on local emergency response plans. The owner needs to coordinate closely with local emergency managers regarding this issue.

The priority for contacting the NYSDEC Dam Safety Section should generally be after at least all first responders have been notified.

The Emergency Notification Flowchart should be easy to follow for each of three "Emergency Condition Levels" (more information concerning Emergency Condition Levels is located in the EAP instructions, below). Although one flowchart that represents all three Emergency Conditions Levels is preferred, for clarity it may be necessary to develop a separate flowchart for each Emergency Condition Level. Narrative information supplementing the flowchart may be provided on the page following the flowchart.

Emergency Notification Information Form. In the EAP, an Emergency Notification Information Form should follow the Emergency Notification Flowchart. The Emergency Notification Information Form is to be used whenever any of the three Emergency Condition Levels is identified. This form is intended to aid the person reporting the emergency condition in relating all pertinent information. During an emergency, callers sometimes forget to convey important details. Therefore pre-planned messages are to be drafted and included in this section in order to facilitate accurate communication during the emergency.

II. Statement of Purpose and Scope of the EAP

Include in this section of the EAP a brief statement of its **Purpose**, and **Scope**.

Purpose. In general, the purpose of an EAP is to reduce or eliminate the threat to downstream lives, property and the environment that could occur during the uncontrolled release of water impounded by a dam. Some EAP's are also designed to provide warning during non-failure conditions but potentially dangerous conditions, such as sudden changes in downstream flows due to activation of large release works such as gates, valves or fuse plugs, or natural high water events. This is generally at the dam owner's discretion, in consultation with the Dam Safety Section which implements DEC's dam safety program in the Bureau of Dam Safety and Flood Protection (DEC/DSS) and local emergency managers.

Scope. The scope of an EAP is generally limited to actions to be taken by the dam's owner, but may reflect expected actions by others as appropriate. The EAP should at minimum describe the owner's scope of responsibility and authority during a dam emergency. At a minimum, the owner is responsible for developing and maintaining the EAP, coordinating and distributing the EAP to emergency responders, and observing and reporting developing conditions at the dam. In localities with strong local emergency response plans, this may be sufficient. In some parts of the state, local capabilities are limited, and the owner is expected to work cooperatively with emergency planners to create an EAP that is sufficiently detailed to be useful in a dam emergency. The owner's responsibilities may extend beyond the minimum, depending upon the significance of the dam and the mix of owner and first responder capabilities. For instance, some owners will provide resources for the use of first responders. However, this is not the usual case. Whatever the relationship, it should be reflected in the EAP; the list of downstream residences and phone numbers may be provided in the EAP for use by the dam owner or by first responders, depending on the consensus regarding coordination which should be verified during the Orientation Meeting referred to in Appendix A of Section VIII.

III. Site Description

In this section of the EAP, describe the site-specific characteristics of the dam and its location. Include a location map(s) and figure(s) showing significant features. List and/ or depict on an area map upstream and downstream dams. List the downstream communities which would potentially be affected by a dam failure or by flooding resulting from abnormal operational releases.

IV. Emergency Detection, Evaluation, and Classification

The EAP should include a discussion of procedures for timely and reliable detection, evaluation, and classification of an existing or potential emergency condition.

The conditions, events or measures for detection of an existing or potential emergency should be listed. Procedures, aids, instruction, and provisions for evaluation of information and data to assess the severity and magnitude of any existing or potential emergency should be discussed. The Department's guidance document entitled "An Owners Guidance Manual for the Inspection and Maintenance of Dams in New York State" (see above References list) provides a good summary, including illustrations, of the problems that typically occur at a dam, and can be downloaded from the following website: http://www.dec.ny.gov/lands/4991.html

An Emergency Condition classification system is one method to describe and prioritize emergency events according to their varying levels of severity and urgency. **The following titles for Emergency Condition Levels have been selected with the intent of conveying an intuitive sense of the escalating seriousness/urgency of a developing emergency situation: *Advisory Condition*; *Warning Condition*; and *Emergency Condition*.** The below Emergency Condition Levels should be reviewed in conjunction with the Emergency Notification Flow Chart.

Advisory/ Non-failure condition (Condition C). An unusual problem or situation has occurred, but failure of the dam is not expected. Examples are:

- Flow conditions are such that flooding is expected to occur downstream and/ or upstream of the dam
- Sudden changes in downstream flows due to activation of large release works at the dam, such as gates, flash boards, or fuse plugs.
- Instrumentation readings reach pre-determined numerical limits.
- Any undocumented or unusual spring or seep.
- Any sign of possible piping.
- Any sign of slumping.
- Any sinkhole.
- Any newly detected crack.
- Any unusual wet spot or boggy area.
- Any seismic event regardless of how slight.
- Any significant obstruction in the spillway.
- Evidence of damage due to vandalism at any structure(s).
- Bomb threat.
- A civil disorder near the reservoir structure(s).
- Any aircraft accident near the reservoir structure(s).

Responses are: *[refer to EAP Template's Emergency Notification Flow Chart]*

- Notify municipal EMO;
- County EMO;
- Notify dam owner and owner's engineer;
- Notify NYSDEC-DSS;
- Investigation;
- Assessment and response.

Warning Condition (Condition B). A potential failure situation is developing, but is still considered controllable. Some amount of time is still available for further analysis and decisions to be made before dam failure is likely. Examples of a Warning Condition are:

- Water level of the lake is at an unsafe level and is rising threatening to overtop the dam.
- Water is eroding the auxiliary or emergency spillway.
- Any developing erosion, settlement, or upheaval occurring on the downstream slope or at the toe of the dam that is considered to be controllable.
- Any undocumented leakage through any dam structure considered to be controllable.

Responses are: *[refer to EAP Template's Emergency Notification Flow Chart]*

- Notify municipal EMO;
- Notify County EMO;
- Notify dam owner and owner's engineer; and
- Notify NYSDEC-DSS;
- Investigation;
- Assessment and response.

Emergency Condition (Condition A). Failure is imminent or has occurred. There is no time left to attempt corrective measures to prevent failure. Examples of an Emergency Condition are:

- Water has overtopped or will overtop any dam or dike.
- Any uncontrollable erosion, settlement or upheaval occurring on the downstream slope or at the toe of the dam.
- Any uncontrollable leakage through any dam structure.
- A dislocation or failure of any structure which allows for an expanding, uncontrollable discharge of water through the spillway, dam, or dikes indicating a breach is occurring.
- Dam is failing, about to fail or has failed.

Responses are: *[refer to EAP Template's Emergency Notification Flow Chart]*

EVERYONE LISTED ON THE NOTIFICATION FLOWCHART MUST BE CONTACTED.

V. General Responsibilities Under the EAP

In this section of the EAP, present and describe the following responsibilities in a manner that is comprehensive and easy to follow.

Dam Owner Responsibilities. In this subsection, the duties of the dam owner/operator under the EAP should be clearly described in detail. The owner/operator should be aware of the importance of the EAP and why the EAP is necessary. Specific actions that the owner/operator is to take after implementing the EAP notification procedures should be described. Instructions for the operation of the dam during the anticipated emergency should be provided. The person responsible for notification and for periodic updates should be identified. The owner/operator must submit a Post-Incident Report to the Dam Safety Section within five (5) days of activating an EAP.

Responsibility for Notification. The person(s) authorized to notify local officials should be determined and clearly identified in the EAP. If time allows in an emergency situation, onsite personnel should seek advice and assistance. However, under certain circumstances, such as when failure is imminent or has occurred, the responsibility and authority for notification may have to be delegated to the dam operator or a local official. County and local authorities should be consulted during the Orientation Meeting regarding notification procedures if the initial notification comes from a member of the public, such as a 911 call. Such situations should be specified in the EAP. The person who is responsible for disseminating information to the media and the public on a periodic basis throughout the emergency should be designated. A means to keep local authorities advised of developing conditions at the dam should be described.

EAP Coordinator Responsibilities. The dam owner should specify in the EAP the designated EAP coordinator who will be responsible for EAP related activities, including (but not limited to) the preparation of required revisions to the EAP, the establishment of training seminars, the coordination of EAP exercises (further detailed in Section VIII), etc. This person will be the EAP contact, if any involved parties need to provide information changes or have questions concerning the EAP.

Responsibility for Evacuation. Warning and evacuation planning are the responsibilities of local authorities who have the statutory obligation and authority. Under the EAP, the dam owner is responsible for notifying the appropriate emergency management officials when flooding is anticipated or a failure is imminent or has occurred. Dam owners should not take on the responsibility of government entities for evacuation.

However, there may be situations in which routine notification and evacuation will not suffice, as in the case of a resident located just below the dam. In this case, the dam owner should arrange to notify that person directly, and reflect this in the EAP. This type of arrangement requires careful coordination between the owner and government authorities, and should only be implemented after careful consideration and full input and consensus from all involved parties.

It is critical that these procedures be coordinated with the appropriate public officials and other stakeholders, prior to the development of an emergency situation.

Responsibility for Termination and Recovery. An owner's representative should be designated for monitoring the situation at the dam and keeping local authorities informed of developing conditions at the dam from the time that an emergency starts until the emergency has been terminated. This person should be responsible for declaring that the emergency at the dam site is terminated in coordination with the local emergency responders and the DEC/DSS. The applicable state or local emergency management officials are responsible for termination of the off-site emergency response activities.

A follow-up evaluation after an emergency by all participants should be specified.

The results of the evaluation must be documented by the owner/operator in a written Incident Report, which must be submitted to the DEC/DSS (see Sample Incident Report Form. The latest copy of the form is available from DEC/DSS).

VI. Preparedness

Preparedness actions are taken to help reduce or eliminate the adverse occurrence or effects of a dam failure or large or abnormal operational releases and to facilitate response to emergencies. Examples of the preparedness actions that a dam owner may take include providing emergency flood operating instructions and arranging for equipment, labor, and materials for use in emergency situations.

This section of the EAP should describe the preparedness actions that are to be taken both prior to and following the onset of any of the three Emergency Condition Levels discussed in Section IV, above. Preparedness actions involve the installation of equipment or the establishment of procedures for one or more of the following purposes:

- Preventing emergency conditions from developing;
- Warning of the onset of emergency situations;
- Facilitating the operation of the dam in an emergency situation;
- Minimizing the extent of damage resulting from any emergency situations that do develop.

The need for timely action in an emergency situation cannot be overemphasized. The EAP should contain a discussion of provisions for monitoring and evaluating an emergency situation and should clearly indicate how emergency response procedures can be implemented in a timely manner. An important factor in the effectiveness of the EAP is the prompt detection and evaluation of information obtained from instrumentation and/or physical inspection procedures. The Inspection and Maintenance Plan (I&M Plan) for a dam is a critical element in the preparedness actions to be taken by the dam owner.

There are several types of preparedness actions that should be considered when developing an EAP, and effectively incorporated into the Preparedness section of the EAP. These actions include the following:

- Monitoring conditions at the dam and in the downstream inundation area.
- Preparing for responses during adverse times such as darkness, weekends, holidays and bad weather, and power outage.
- Providing for access to the dam and downstream crossings.

- Providing for alternative systems of communication, such as land lines, cell phones, walkie-talkies and radios.
- Locating and ensuring the availability of emergency supplies, equipment, information and services.
- Providing for security measures at the dam during the emergency.

Development and annual updating of the EAP are ideal times to review preparedness measures and evaluate whether they are adequate.

Emergency Notification Directory. The Preparedness section of the EAP is to contain a directory of all pertinent personnel and response authorities who are to be notified pursuant to the EAP, including the business, home and/or confirmed cell phone numbers for each contact on the list. The directory also describes in more detail the roles of individuals depicted on the Notification Flowchart.

Emergency Operations Center (EOC). This section of the EAP must reflect that arrangements have been made, including written agreements if necessary, whereby an EOC is designated, which is the location where personnel will be coordinated and updated during an emergency. The EOC is to be specified by name and street address, and should be shown on a map. The location and directions to the EOC from the nearest State or County highway should be provided. The EAP template includes sample EOC pages. **The EOC is to be located upstream of the dam or away from any potential inundation area, in a location accessible in the event of a dam failure. In some cases, the commonly used local EOC is not appropriate.**

Monitoring. The owner of an intermediate hazard (Class B) or high hazard (Class C) dam is required to have a plan for the regular inspection and maintenance of the dam (an Inspection and Maintenance or I&M Plan.) See the Department's dam safety regulations at 6 NYCRR Subpart 673.6. An I&M Plan is to contain provisions for the monitoring, detection and evaluation of conditions at the dam, including any deficiencies and potential deficiencies, on a routine basis. Activities undertaken under the I&M Plan should also trigger the activation of the EAP in a manner that is consistent with the EAP and this guidance document (according to the EAP's procedures for detection, evaluation, and classification of an existing or potential emergency condition). The I&M Plan and the EAP documents work together and each should appropriately cross-reference and summarize the other. The development and review of the EAP provides an opportunity to evaluate whether the monitoring provisions in the I&M Plan are adequate. When a dam is not normally continuously attended and dam failure, high water events, overtopping, or abnormal operational releases would endanger human life or cause significant property damage, it is imperative that procedures be developed to monitor the dam and its appurtenant works when these types of events are likely, or when this is not possible, as soon after such an event as possible. The I&M Plan should include such procedures in order to ensure that the dam owner can quickly detect an EAP-initiating event. The EAP should cross-reference and summarize the inspection provisions in the I&M Plan. An I&M Plan template is available on the Department's web site, or upon request from the DEC/DSS.

The EAP is to contain provisions for the enhanced monitoring of the dam during any of the above-listed three Emergency Condition Levels (see Section IV, above). Enhanced monitoring provisions should address such issues as:

- Ensuring adequate personnel are available to tend the dam during an emergency
- Identification of supplies such as emergency lighting
- Identification of monitoring devices such as flow and water level measuring equipment

Emergency Supplies. The Preparedness section of the EAP is to include planning and organizational measures to allow the dam owner and local officials manage an emergency situation more safely and effectively. These measures may include stockpiling or identifying ready sources of materials and equipment for emergency use (such as: generators to supply power for spillway gate operation; pumps and siphons to assist in draining the reservoir; materials and equipment commonly needed for emergency repairs of dams; and construction equipment necessary to conduct a controlled breach of the dam).

Other Site-Specific Actions. Describe in the Preparedness section any other site-specific actions devised to moderate or alleviate the extent of potential emergencies, such as the timely dissemination of relevant information.

VII. Inundation Maps

Inundation mapping is one of the most critical components of an EAP. The level of detail, accuracy of input data, and analysis effort, should be appropriate to the downstream conditions and consequences of dam failure.

Inundation maps should be developed by the dam owner and his/her engineer, and in coordination with the appropriate State and local emergency management agencies. Since those agencies will rely heavily on the inundation maps during an emergency, it is important that the maps contain the information needed to support emergency response and evacuation efforts, including, but not limited to the following items.

Inundation maps are to depict the downstream area that is expected to be flooded if the dam were to fail. The inundation area(s) depicted are to be based on the results of an acceptable dam break analysis, performed by a professional engineer registered in NYS, and using acceptable engineering tools and techniques. The inundation map for an EAP is a planning tool that will be used to define notification and evacuation areas. As such, it will generally require a less detailed analysis than inundation mapping for other purposes such as hazard classification or Inflow Design Flood development.

Guidance for performing dam break analyses can be found in Appendix II-A of Chapter 2 of the *FERC Engineering Guidance for the Evaluation of Hydropower Projects*, which can be downloaded from the following website: http://www.ferc.gov/industries/hydropower/safety/guidelines/eng-guide.asp#skipnavsub. Table 1, which contains guidance on breach parameters, is particularly helpful.

Prior to proceeding with the dam break analysis and inundation mapping, the dam owner's engineer may wish to contact the DEC/DSS to discuss any special project considerations.

For a new EAP or for an update that includes a change to the estimated inundation area, the dam owner is to submit calculations and/or hydraulic modeling data in support of the estimated inundation areas, on paper and electronically, to the Department, and make them available to other stakeholders for review upon request.

Sources of information when developing inundation analyses. Often FEMA has developed Flood Insurance Studies (FIS) and Flood Insurance Rate Maps (FIRMS) that may be

of use in developing inundation mapping. If the Special Flood Hazard Areas (SFHA's) depicted on the FIRM include base flood elevations (BFE's), then the hydrological basis of the study will be available in the FIS (including estimated 10-, 50-, 100- and 500-yr flow rates). In addition, the associated hydraulic model of the stream, with cross-section geometry and stream roughness n-values should be available, either from the NYSDEC Floodplain Management Section, or the FEMA Map Service Center. If it can be shown that the estimated dam break flows are less than the flows in the FIS/FIRM, then the appropriate SFHA limits (e.g. 100-yr or 500-yr) can be used to estimate or supplement the flood extents for EAP inundation mapping. Even if the dam break flows are higher than listed in the FIS/FIRM, it may still be appropriate, and cost-effective, to use the channel geometry from the FEMA hydraulic model.

If no previous study of the inundation area can be located, the owner's engineer will have to independently analyze the downstream area. Generally this approach would require the engineer to extract cross-sections from USGS topographic maps or local data sources, and supplement those sections with field measurements and/or as-built drawings at features such as road crossings, dams, and in some cases individual homes. As part of recent FEMA flood map modernization efforts, part of the state has been mapped using LIDAR (Light Detection And Ranging). Where available, this mapping should be used, as it is significantly better than USGS topographic map contour data. As-built plans of dams may be available from the DEC/DSS.

When utilizing outside information from sources such as FEMA or the USGS, care must be taken to assure that the elevation data are compatible and where necessary are properly converted to a common datum.

Special Conditions. Flooding will often mobilize significant quantities of ice and/or debris, which can accumulate and obstruct culverts, small bridges and spillways. These obstructions may significantly impact flood mapping. As such, each of these features should be assessed to estimate whether obstruction will be likely during the flood/dam breach conditions being modeled, and if so, then appropriate assumptions should be made in the analysis (e.g. culvert plugged, road embankment overtops). The likelihood of the failure of such downstream features in series ("cascade failure") should also be included in the assessment.

Where the failure of different components of a dam and its appurtenant works (such as an impoundment with a separate dam and closure dike) can result in the inundation of different areas, then separate evaluations and maps for each particular component should be considered, to assist emergency responders in tailoring their response to the specific conditions that are occurring, rather than having a single all-encompassing inundation area, which could needlessly expand the scope or misdirect response efforts.

Generally, inundation mapping will have to depict a "sunny-day" dam failure (reservoir elevation at normal pool, base flow in downstream reach), and a "rainy-day plus dam break" dam failure (Reservoir at design high water, spillway design outflow in downstream reach). When assessing the rainy-day and rainy-day plus dam break scenarios, it may not be necessary to apply the full design event on sub-basins downstream of the dam. For example, when assessing an existing Class C - High Hazard dam, it is usually sufficient to apply the 100-yr rainfall to downstream sub-basins while using the design storm up to the full PMF (Probable Maximum Flood) as inflow to the dam. This approach should enhance the distinction between the consequences of a rainy-day plus dam break versus the rainy-day scenario. For a discussion of PMP and PMF, refer to the Department's "Guidelines for Design of Dams."

Presenting the Results of a Dam Break Analysis in the Inundation Map. The results of a dam break analysis should be depicted in the Inundation Map. A narrative description should accompany the map, as indicated below, to identify unusual conditions.

Inundation should be depicted on suitable base maps, such as USGS topographic quadrangles, orthophotos, or equivalent, and should extend downstream of the dam to a point where the projected or estimated increase in water level due to dam failure, as derived from a dam break analysis, would no longer present a danger to life or property. The most recent orthophoto coverages of the area that are available, with streets names overlaid, are the preferred base maps. Orthophotos of small areas are readily available for free on the internet. Orthophotos for the entire state are available through the NYS GIS Clearinghouse at: http://www.nysgis.state.ny.us.

The inundation map should be presented at a scale sufficient to be used for identifying downstream inhabited areas subject to possible danger. Potential inundation areas should be clearly identified. It may be appropriate to supplement the inundation maps with water surface profiles showing the depth and/or elevation prior to failure, the peak water surface depth/elevation after failure, and the depth/elevation of structures at critical locations.

Inundation areas should be clearly marked for sunny day dam failure, spillway design flood, and spillway design flood plus dam failure, unless the extent of inundation is not appreciably different, in which case a note to that effect should be added.

The following information should be reflected on the map (or on an accompanying data chart), as derived from the dam break analysis, at each critical location:

- Distance downstream from the dam to the nearest tenth of a mile;
- Time of arrival of the first flood waters at that point. The time should be reflected in hours and minutes;
- Time of arrival of the peak flood level at that point. The time should be reflected in hours and minutes;
- Depth of water measured from easily referenced features, such as road elevations, to the maximum inundation elevation along with the corresponding flow rate.

A narrative description of the areas affected by the dam break is to be included to clarify unusual conditions. The narrative should describe the specific area threatened and include information on the extent of expected flooding relating it to known landmarks and historical flood heights. The narrative should also include a brief summary of analysis techniques and engineering assumptions that were used to generate the inundation maps.

Whenever possible, major streets, railroads, and other well known features should be indicated. The map lines delineating the potential inundation areas should be drawn in such thickness or form (solid line, dashed line, dotted line) to identify the inundation limits as the main feature of the map but not mask the location of houses or features which are to be shown as being inundated. Clarity is critically important.

When plotting inundation limits between cross sections used for analysis, the lines should reasonably reflect the change in water levels with consideration given to topographic patterns and both natural and manmade features. When inundation lines enter the area of an existing lake or reservoir, they should be drawn to represent an increase in the water level of the lake or reservoir. Often this is a logical place to end the analysis. Should this increased water level

overtop a downstream dam, the inundation mapping might need to be continued, and the likelihood of a cascade failure should be accounted for. The inundation analysis should be extended downstream until flooding no longer poses a threat to life and or property, and should continue as necessary even if the flood wave crosses county or state lines. The area between the inundation lines representing the water level may be shaded to distinguish the area of inundation. Care should be taken to select shading which will not mask the base information shown on the map.

The accuracy and limitation of the information supplied on the inundation maps and how best to use the maps should be described. Since local officials are likely to use the maps for evacuation purposes, a note should be included on the map to advise that, because of the method, procedures, and assumptions used to develop the flooded areas, the limits of flooding shown and flood wave travel times are approximate and should be used only as a guideline for establishing evacuation zones. Actual areas inundated will depend on actual failure or flooding conditions that occur and will likely differ from areas shown on the maps.

The owner should review the inundation maps with the local jurisdictions to identify areas of special consideration. If homes or other critical structures (such as hospitals, communications hubs, etc.) outside of the inundation areas can be isolated by a dam break flood, then these areas should be depicted and special consideration or provisions for these areas should be noted.

If inundation maps are to be shown on several pages, a map index should be included to orient the reader.

Inundation maps are to be reviewed and updated annually, and more frequently as necessary to reflect changes in downstream areas and any pertinent information resulting from coordination with appropriate emergency management authorities.

A sample inundation map is included in the template.

For Class C – High Hazard dams the inundation limit information must also be submitted in a standard geo-referenced format. This includes Computer Aided Design drawings (.DWG and .DXF formats with measurements in a real-world absolute system as expressed below) and shapefile (.SHP format), or ESRI TIN. The inundation line for the sunny day, spillway design flood (SDF) and the SDF with failure should each be in a separate layer (.DXF, .DWG or TIN) or all three lines submitted as one shapefile with appropriate attributes to discriminate each of them. The submitted files must be geo-referenced using the UTM zone 18 projection, meters, NAD83 horizontal datum and NAVD88 vertical datum coordinate system.

Also, the data submitted must be in compliance with acceptable Digital Data Standards (such as FEMA cartographic standards). Please do not submit the base maps electronically; only the inundation limits should be submitted to the Department. Please note this requirement may also be waived based on projected downstream population impacts and consultation with the Department's Dam Safety Section.

VIII. The Appendices to an EAP

Following the main body of the EAP, an appendix section should be included that contains information that supports and supplements the basic EAP. All appendices are to be submitted to

the Department's Dam Safety Section. Not all EAP recipients need all the appendices. The EAP writer should consult with individual recipients to determine what sections they require.

Appendix A - Plans for Training, Exercising, Updating and Posting

The following offers guidance to those drafting the four important subsections in Appendix A to an EAP: training, exercising, updating and posting. The EAP is to provide for appropriate training concerning the activation and implementation of the EAP. Exercises associated with that training, including the Orientation Meeting with local responders and stake holders, are to be regularly carried out in order to solicit input, establish roles during an emergency situation, and facilitate reliable responses to emergencies. Based on these training and exercising activities, and any other information obtained, the EAP is to be updated at least annually, and more frequently as necessary in order to accurately reflect conditions in and near the dam. Finally, the Notification Flowchart is to be posted in appropriate locations in order to provide ready access to it during an emergency situation.

In general, administrative, simple or other minor updates to the EAP for a Class C dam can be completed by the dam owner, and do not require the services of a PE. Examples of updates that would not generally require the services of a PE include:

- Administrative updates to names and phone numbers in the notification flow chart;
- Administrative or other simple updates, changes, or enhancements to, preparedness provisions;
- Simple or minor updates to the inundation map or evacuation map which <u>do not</u> result in a change to the inundation area, such as the addition of one new home in a residential area that is already on the inundation map.

The dam owner may seek a determination from the Department's Dam Safety Section regarding whether an update to an EAP needs to be developed by a PE. In any event, updates must be submitted by the applicable regulatory deadline (see 6 NYCRR Subpart 673.7).

The Department's Dam Safety Section may review and require changes to any part of an EAP at any time to protect life, property or natural resources. As part of such a review, the Department may require that updates to the EAP for a Class C dam be performed under the direction of, or be reviewed by, a PE retained by the owner.

Training. Training of personnel involved in implementation of the EAP should be conducted to ensure that they are thoroughly familiar with all elements of the plan, emergency operation of the dam, the availability of equipment, and their responsibilities and duties under the plan. Appendix A to an EAP is to consist of a training plan that provides for technically qualified personnel to be trained in monitoring the dam (which may cross-reference the relevant part of the dam's I&M Plan), problem detection and evaluation, appropriate remedial (emergency and non-emergency) measures, communication provisions within the EAP, and any other aspects of the plan. A sufficient number of people should be trained to ensure adequate coverage at all times.

Cross-training in more than one responsible position for each individual is advisable in order to provide alternates. A careful record by roster should be kept of training completed and refresher training conducted. The Department may request training records.

Exercising. Exercises simulating emergency conditions are excellent mechanisms for ensuring readiness. Appendix A to an EAP is to include a section devoted to preparedness exercises. This appendix should provide for the preparation of practice scenarios for the various emergency conditions, including the three Emergency Condition Levels identified in Section IV, above, and the testing of the state of training and readiness of key personnel responsible for actions during an emergency. In developing such test scenarios, include consideration of any special procedures required for nights, weekends, and holidays.

The goal of such exercises is to guarantee an understanding of the procedures to be followed and actions required. The exercises should involve an annual drill and periodic comprehensive (functional or full-scale) exercises. The exercises should also call for the testing of remote sensing equipment at unattended dams. It is critical that the program of exercises include coordination and consultation with state and local emergency management officials and other organizations. Their involvement will help perfect the close coordination necessary for a successful execution of emergency procedures during an actual emergency. The exercises should include participation by both the dam owner and the affected state and local emergency management officials.

The exercises should range from simple to complex and from low to high realism. The extent of the exercise program should be appropriate to the downstream consequences of dam failure and the capabilities of local emergency responders.

The outcome of the exercises should be promptly discussed and evaluated, and the findings and conclusions are to be promptly memorialized in Reports on EAP Exercises, which reports should be maintained in good order. The EAP, I&M Plan, or both, are to be revised as necessary in order to address or correct any deficiencies in preparedness that are noted.

The five standard types of exercises that are generally to be included in Appendix A to an EAP are: Orientation Meeting, Annual Test, Tabletop Exercise, Functional Exercise, and Full Scale Exercise.

The following is a brief discussion of each:

- **Orientation Meeting.** An Orientation Meeting is where the dam owner introduces a new or significantly revised EAP to local officials and emergency responders, and provides those entities the opportunity to review and comment on the document and on their respective roles. The dam owner should be prepared to revise the EAP based on these comments. Please see the additional guidance concerning the Orientation Meeting in Section 1 to the Introduction herein, and in Sections II and V of this "Attachment EAP-C."

- **Annual Test.** An Annual Test involves, at a minimum, the calling of the numbers provided in the Notification Flow Chart, and the subsequent updating of the EAP, as appropriate. The Annual Test may include the distribution of a specific test scenario with recipients mailing back response forms, to confirm that accurate information can be disseminated in a timely manner. The primary purpose of an annual test is to update on-site and off-site notification information to keep it accurate. A secondary purpose is to remind all stakeholders to review the EAP.

- **Tabletop Exercise.** A Tabletop Exercise has the following components and characteristics:

- Higher level exercise than an Annual Test;
- Involves various levels of personnel;
- Is held in an informal conference room environment;
- Low stress, no time constraints;
- Actions are taken and discussion is based on a described emergency situation, plus a series of messages to participants;
- Provides an opportunity to discuss the EAP and response procedures, and to resolve questions throughout the exercise;
- Allows for the practice of problem-solving for an emergency situation;
- Participants practice a coordinated, effective response.

A tabletop exercise should be held every 3-5 years, depending on a dam's significance and the owner's and emergency managers' capabilities.

- **Functional Exercise.** A Functional Exercise has the following components and characteristics:

- Involves various levels of personnel without full activation of field personnel;
- Simulates emergency operations center environment;
- Stressful, with time constraints;
- Simulates dam failure and response;
- Participants act out their roles;
- Tests both dam owner and agency responses, including coordination.

A functional exercise should also be held every 3-5 years, depending on a dam's significance and the owner's and emergency managers' capabilities.

- **Full Scale Exercise.** A Full Scale Exercise has the following components and characteristics:

- Interactive, stressful, with time constraints;
- Actual mobilization of personnel and resources;
- Adds a field component that interacts with a functional exercise through simulated messages;
- Tests deployment capabilities.

This type of exercise requires great time and expense and cooperation from many entities, both public and private, and is very resource intense. A full scale exercise of a dam EAP is rarely conducted, but may be a component of a larger full scale exercise, or may be initiated by emergency managers or the dam owner to thoroughly test their emergency response plans.

Updating. A regular review of the adequacy of the EAP should be conducted at intervals not to exceed one year, and should be coordinated with the Annual Test. The review should evaluate the accuracy of the EAP's notification flow charts, flood inundation area, depictions of downstream development, and the EAP text. The review should determine whether any revisions to the current EAP are necessary. If, as a result of the annual review, no revisions are

necessary, a written statement to this effect should be provided to each recipient of the original EAP, including the DEC's DSS. The EAP should be updated and the updates should be distributed promptly when changes are required. EAP personnel or telephone number changes should be recorded and distributed as they occur.

Posting of the Notification Flowchart. An up-to-date copy of the Notification Flowchart should be posted in prominent locations at the dam site and local emergency operation centers (essential for unattended dams). The flowchart should be posted at each phone and radio transmitter at the dam, powerhouse (if applicable), and at all other desirable locations. The locations of the posted flowcharts should be indicated in the EAP.

Appendix B - Definitions

The EAP is to include definitions of the terms and acronyms used in the EAP.

Definitions used should be consistent with the definitions in 6NYCRR Parts 673, 608, and 621, and the Department's "Guidelines for Design of Dams." Another source of definitions is the FEMA document "Federal Guidelines for Dam Safety; Glossary of Terms," (FEMA 148, April 2004). Where conflicts occur, definitions should be consistent with New York statute, regulations and guidance.

Appendix C - Approval and Distribution of the EAP

Any revisions to the EAP should be furnished to all individuals and entities to whom the original EAP was distributed, including the DEC/DSS. Each party receiving an EAP should be provided with a receipt form to return to the distributor (owner/operator or EAP Coordinator) of the EAP. The signed receipt should be phrased in a manner that will help assure that all parties are aware of and understand the EAP and agree to their assigned roles should an emergency occur. A standard distribution letter and receipt form are included for reference in the Samples.

The Promulgation and Concurrence Form is also to be completed or revised when the dam owner makes revisions to the EAP. When a new EAP is developed, or new inundation maps are issued, or the Notification Flowchart is modified to add parties, the dam owner is to notify DEC/DSS that the new or revised EAP has been completed by submitting a new Promulgation and Concurrence Form (see form in the "Samples" section).

Samples

CLASS C DAM EAP TEMPLATE

[cover page]

EMERGENCY ACTION PLAN

For

_____ Dam

NYSDEC Dam I.D. Number:_____

Dam location (latitude/ longitude)_____

Dam Location: (Nearest road address)_____

Town/County: _____

River: _____

Owner/Operator: _____

Address: _____

_____

_____

Prepared By: _____

Address: _____

Date: _____

Revision Dates:*

1st Revision:_____

2nd Revision:_____

3rd Revision: _____

*** THE DAM OWNER/OPERATOR IS RESPONSIBLE FOR THE ANNUAL REVIEW AND UPDATING OF THE EAP.**

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Contents: **Page**

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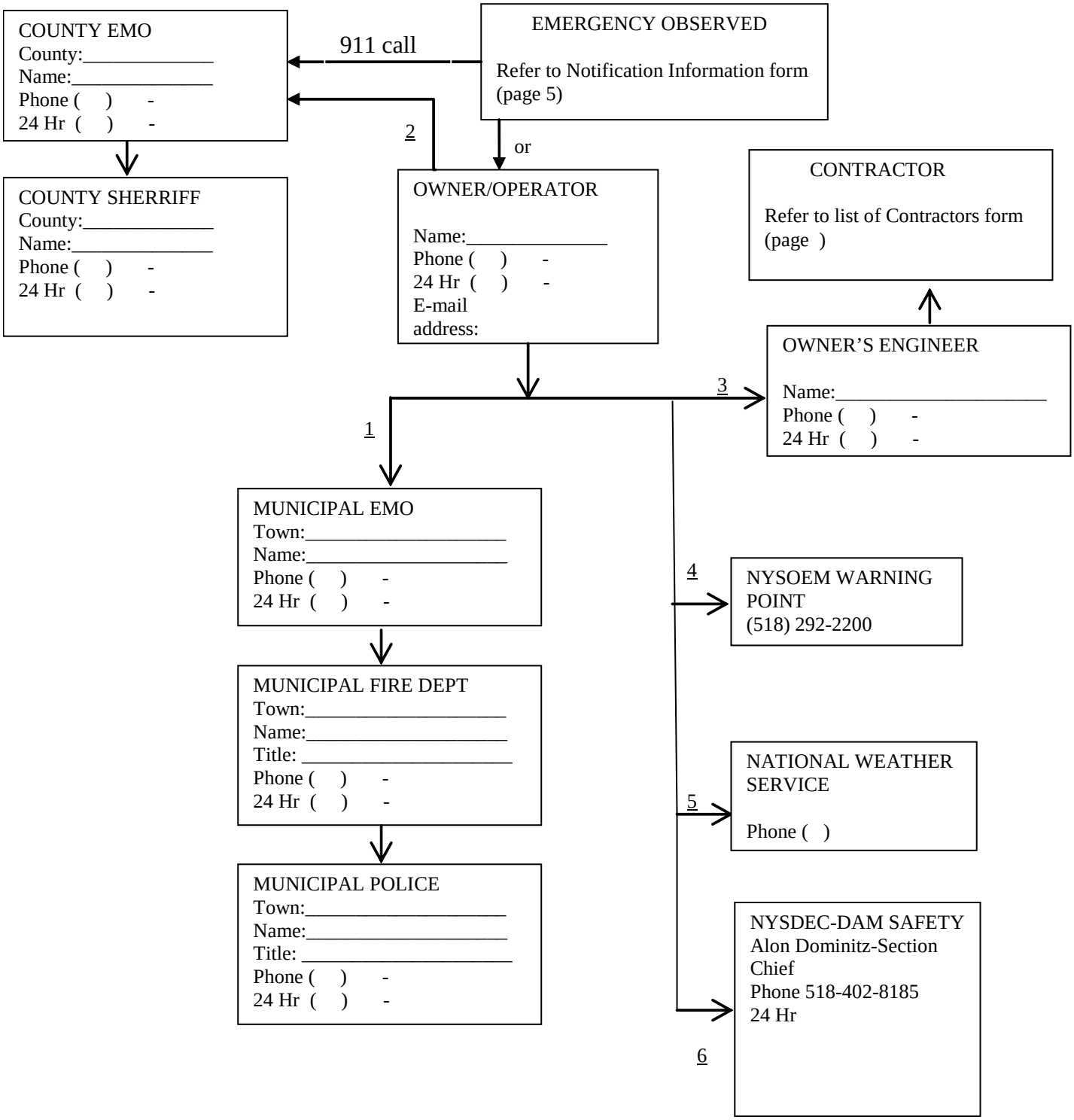
I. Emergency Notification

SAMPLE EMERGENCY NOTIFICATION FLOWCHART



(This page should be printed on colored paper for ease of use)

Notification Information:

Dam Emergency Information for the Emergency Condition Level (Advisory, Warning, Emergency)

Name of person reporting the emergency: _____

Affiliation: _____

Phone Number: _____

Dam Name & NYS-DEC ID #: _____

Location of dam:

County: _____

Municipality: _____

Stream: _____

Road(s): _____

Time and Date of Dam Emergency: _____

Type of Emergency: _____

Phone appropriate parties: *[refer to the Emergency Notifications Flow Chart, page #]*

"This is (your name, title & affiliation).
You are being contacted per the Emergency Action Plan for the (name of dam).
Please be advised: A Dam (Advisory, Warning, or Emergency) Condition has been identified at (name of dam).
Observation was at (time and date).
The situation is (briefly explain the condition)."
[Refer to Site Description, page #, for directions to the dam or EOC]

****

Important !!! If you cannot contact an organization or individual promptly, proceed to the next contact on the Notification Flowchart. Try to re-contact the unavailable or busy number after you have contacted all others.

II. Statement of Purpose and Scope

Purpose: To establish procedures necessary to protect life and property in areas affected by the failure of a dam or the uncontrolled release of stored water.

Scope:

This Emergency Action Plan:

- Identifies a routine monitoring system which can activate the EAP, consistent with the I&M Plan for the dam;
- Identifies the officials, organizations, agencies, and their respective responsibilities for implementing the plan;
- Identifies those areas, residences, facilities and roads which might be affected by a dam failure.

III. Site Description

Dam Site Description:

Dam Name: _____ Hazard Classification: _____

NYSDEC-ID #: _____ Federal ID (NID): NY_____

City/Town: _____ County: _____

Location & Access (provide a location map & directions to the dam from a major highway):

_____

_____

Lot No: _____ Block No: _____

Latitude: _____ Longitude: _____

River/Stream: _____

Quad Sheet: _____ Nearest City/Town: _____

Height (ft): _____ Normal Surface (ac): _____

Length (ft): _____ Normal Capacity (ac-ft): _____

Dam Type: _____ Maximum Capacity (ac-ft): _____

Spillway: _____ Spillway Capacity (cfs): _____

Dike: _____ Drainage Area (sqr mls): _____

Outlet other than spillway: _____

Purpose/Operation of Dam (attach additional sheets if necessary): _____

_____

Instrumentation (if any): _____

_____

Significant upstream or downstream dams (if any): _____

_____

Overview of Inundation Area: _____

_____

_____

Method of emergency drawdown: _____

_____

***PROVIDE/ATTACH DAM SITE DRAWINGS. (**Page 8**)**

IV. Emergency Detection, Evaluation, and Classification

Emergency Condition Identification:

Since the goal of dam emergency planning is to protect lives and property, the timely identification of emergency conditions by trained personnel becomes paramount. Three (3) dam emergency conditions of varying severity have been identified and are described below.

Advisory/ Non-failure condition (Condition C). An unusual problem or situation has occurred, but failure of the dam is not expected. Examples are:

- Flow conditions are such that flooding is expected to occur downstream and/ or upstream of the dam
- Sudden changes in downstream flows due to activation of large release works at the dam, such as gates, flash boards, or fuse plugs.
- Instrumentation readings reach pre-determined numerical limits.
- Any undocumented or unusual spring or seep.
- Any sign of possible piping.
- Any sign of slumping.
- Any sinkhole.
- Any newly detected crack.
- Any unusual wet spot or boggy area.
- Any seismic event regardless of how slight.
- Any significant obstruction in the spillway.
- Evidence of damage due to vandalism at any structure(s).
- Bomb threat.
- A civil disorder near the reservoir structure(s).
- Any aircraft accident near the reservoir structure(s).

Required responses are: *[refer to Emergency Notification Flow Chart, page #]*

- Notify municipal EMO.
- Notify county EMO
- Notify dam owner and their Engineer.
- Notify NYSDEC-DSS.
- Investigation.
- Assessment and response.

Warning Condition (Condition B). A potential failure situation is developing, but is still considered controllable. Some amount of time is still available for further analysis and decisions to be made before dam failure is likely. Examples of a Warning Condition are:

- Water level of the lake is at an unsafe level and is rising threatening to overtop the dam.
- Water is eroding the auxiliary or emergency spillway.
- Any developing erosion, settlement, or upheaval occurring on the downstream slope or at the toe of the dam that is considered to be controllable.
- Any undocumented leakage through any dam structure considered to be controllable.

Responses are: *[refer to EAP Template's Emergency Notification Flow Chart]*

- Notify municipal EMO;
- Notify County EMO;
- Notify dam owner and owner's engineer; and
- Notify NYSDEC-DSS;
- Investigation;
- Assessment and response.

Emergency Condition (Condition A). Failure is imminent or has occurred. There is no time left to attempt corrective measures to prevent failure. Examples of an Emergency Condition are:

- Water has overtopped or will overtop any dam or dike.
- Any uncontrollable erosion, settlement or upheaval occurring on the downstream slope or at the toe of the dam.
- Any uncontrollable leakage through any dam structure.
- A dislocation or failure of any structure which allows for an expanding, uncontrollable discharge of water through the spillway, dam, or dikes indicating a breach is occurring.
- Dam is failing, about to fail or has failed.

Required responses are: *[refer to Emergency Notification Flow Chart, page #.]*

EVERYONE LISTED ON THE NOTIFICATION FLOWCHART MUST BE CONTACTED.

V. General Responsibilities under the EAP

Dam Owner/Operator Responsibilities:

During an emergency condition:

- Identification of the emergency condition.
- Notification of *[refer to the Emergency Notification Flow Chart on page #]*

Person responsible for the notification: _____

- Implementation and direction of emergency repairs.
- Update the emergency status to the local emergency officials.

Person responsible for the updates: _____

- Provisions for security measures at the dam.
- Provision of technical assistance to local emergency officials, when necessary.
- Reporting termination of emergency situation on-site at the dam.

During non-emergency conditions, owner/operator must also provide for:

- Routine maintenance and operations of the dam.
- Routine program of surveillance of the dam.
- Annual review, updating, and distribution of the EAP.

Owner/Operators EAP Coordinator Responsibility:

Once the dam owner/operator has designated an EAP Coordinator, that person shall be responsible for EAP related activities including:

- Inclusion and distribution of document revisions.
- Establish training seminars.
- Coordinate EAP exercises.
- Contact person for any EAP related inquiries.

  EAP Coordinator Name: _____

  Phone Number: _____

Local Municipality, Emergency Fire and Police Responsibilities:

- Warn the public of emergency conditions at the dam as appropriate.
- Implement and direct required evacuations of threatened areas.
- Establish reception centers for evacuated people.
- Secure and control access to evacuated areas.
- Conduct rescue and recovery operations as required.
- Determination and declaration of termination of the emergency/disaster response activities off-site.

County EMO Responsibilities:

Provide overall coordination and resource management of county response activities in support of local and county government, as appropriate. For example, this could include:

- Pass warning of emergency conditions at the dam to all affected municipalities.
- Provide assistance to municipalities to help fulfill the emergency responsibilities.

NYS OEM Responsibilities:

Provides overall coordination of state response activities, which are supplement to local efforts, as appropriate. For example, such efforts could include:

- Provision of assistance to the affected municipalities and counties (when requested and beyond local authority capabilities).
- Coordination of specialized assistance.
- Notification of appropriate State agencies.

NYSDEC-DSS Responsibilities:

- Provide technical assistance to the dam owner/ operator.
- Assist in the evaluation and resolution of potential emergency conditions.
- Has the authority to direct the owner/operator to take necessary safety measures.

Termination:

The **owner/operator** is responsible for evaluating a declared emergency condition and should consult with the NYSDEC-DSS that an emergency condition no longer exists on-site at the dam.

Recovery:

The basic goal of the recovery phase is to demobilize and return to the pre-emergency situation. The **owner/operator** is responsible for implementing all actions necessary to achieve this goal on-site at the dam.

The Owner/Operator is responsible for directing all on-site recovery activities. The basic recovery actions common to the four dam emergency conditions are:

- Secure access to emergency site;
- Restore basic facilities and services;
- Assess damage;
- Long term remedial measures which may require permits may be needed;
- A Post Incident Report describing the conditions which led to the emergency must be submitted to the NYSDEC-DSS within five (5) days. (See Attachment D or http://www.dec.ny.gov/lands/4991.html)

VI. Preparedness

Emergency Notification Directory:

1. Dam Owner: _____

   Contact Person: _____

   Address: _____

   Phone No.: _____ 24-Hr No.: _____ E-mail address: _____

2. Dam Operator: _____

   Address: _____

   Phone No.: _____ 24-Hr No.: _____ E-mail address: _____

3. EAP Development Crew

   Coordinator: _____

   Phone No.: _____ _____

   Crew Phone No.

   _____

   _____

   _____

4. Maintenance & Operations Crew

   Supervisor: _____

   Phone No.: _____ _____

   Crew Phone No.

   _____

   _____

   _____

5. Inspectors

   Name Phone No.

   _____

   _____

   _____

6. Owner's Engineer

Name: _____

Contact Person: _____

Address: _____

Phone No.: _____ 24-Hr No.: _____

7. Municipalities

Municipality	Phone No.	Police No.

8. Counties

County EMO	Phone No.

9. State Agencies

Agency	Phone No.	24-Hr No.
NYS OEM		(518) 292-2200
NYS-POLICE	_____	
NYSDEC-DSS	(518) 402-8185	(Contact Dam Safety for 24-hr number)

10. National Weather Service _____

11. List remaining contacts listed on the Notification Flowchart entries.

_____

_____

_____

_____

_____

Emergency Operation Center (EOC):

***EOC should be located upstream of the dam ***

Address: _____

_____

_____

Phone No.**:** _____

Direction to the Emergency Operations Center from the nearest State or County highway:

_____

_____

_____

_____

_____

_____

_____

Emergency Operation Center Location Map:

Refer to Attachment B for a sample EOC location map.

INCLUDE EOC LOCATION MAP HERE

(This map may also include the location of the dam)

Surveillance Checklist For Enhanced Monitoring During an Emergency:

The surveillance checklist must be specific to the site conditions of the dam and must be prepared by the Owner's Engineer.

The surveillance checklist should be utilized by the Inspectors listed on the Emergency Notification Directory during their inspections. A record of these inspections and their findings should be kept by the owner/operator for ready reference.

List of Contractors:

It will be the responsibility of the owner to keep current the list of contractors that may be contacted during an emergency condition for equipments, materials, and repairs.

For each contractor on the list, the following must be provided:

- *Contractor name.*
- *Contact person.*
- *Address.*
- *Phone number.*
- *Scope of its contracted services.*

1. Contractor: _____

   Contact person: _____ Phone No.: _____

   Address: _____

   Services contracted for: _____

   _____

2. Contractor: _____

   Contact person: _____ Phone No.: _____

   Address: _____

   Services contracted for: _____

   _____

3. Contractor: _____

   Contact person: _____ Phone No.: _____

   Address: _____

   Services contracted for: _____

   _____

Available On-Site Materials:

Material	Location	Quantity

Available On-Site Equipment:

Equipment	Location	Quantity

Available Off-Site Materials:

Material	Company & Location	Phone No.	Approximate Arrival Time to Dam (Min)

Available Off-Site Equipment:

Material	Company & Location	Phone No.	Approximate Arrival Time to Dam (Min)

VII. Inundation Maps

Description of Inundated Area:

Provide a narrative description of the inundated area, and a brief discussion of the analysis techniques and engineering assumptions and methods that were used to generate the inundation maps.

Map Index:

If inundation maps are to be shown on several pages, a map index should be included to orient the reader.

Inundation Maps:

This section will contain detailed map(s) of inundated areas, including dwellings if applicable, and the precise location of the dam.

The final inundation map to be included in the EAP should be, whenever possible, no larger than 11 inches by 17 inches, the best available map, and must be a fold out. As such, it may be necessary to reduce the mapping once the inundated areas are identified.

Appendices

Appendix A. Plans for Training, Exercising, Updating & Posting

Training:

Exercising:

Updating:

Posting of the Notification Flowchart:

1.
2.
3.

Appendix B. Definitions

The words and terms listed below, as used in this plan, shall have the following meanings, unless the context clearly indicates otherwise. *(optional)*

Definitions used should be consistent with the definitions in 6NYCRR Parts 673, 608, and 621, and the Department's "Guidelines for Design of Dams." Another source of definitions is the FEMA document "Federal Guidelines for Dam Safety; Glossary of Terms," (FEMA 148, April 2004). Where conflicts occur, definitions should be consistent with New York statute, regulations and guidance.

Appendix C. Approval & Distribution of the EAP

Approval & Document Distribution:

Controlled Document Holder	Document Number
NYSDEC-DSS	_____

Sample Distribution Letter & Receipt

(Date)

(Name of EAP document holder)
(Company or affiliation)
(mailing address)

Re: EMERGENCY ACTION PLAN for (name of dam) Dam
NYSDEC I.D. # (XXX-XXXX)

Dear (Name of EAP holder):

(Name of the owner/operator or their group) has (prepared or revised) the Emergency Action Plan (EAP) for (name of the dam) Dam located within (name of township), (name of county) County. The EAP is a public safety regulatory required document. The (year) revisions are described in the REVISION SUMMARY.

Please insert the new material with the revision date in your controlled copy and remove the obsolete material (the effective dates generally are printed at the lower right corner of the pages). Please acknowledge your receipt of your controlled copy distribution by returning the obsolete pages to the undersigned along with this letter, acknowledged, signed and dated by you. Please retain a copy of this letter, as signed and acknowledged by you, for your records.

We appreciate your continued cooperation in the revisions of the EAP. Should you have any recommendations or questions regarding the EAP, please do not hesitate to contact the undersigned.

Sincerely,

(Your name)
(Affiliation)

I acknowledge receipt of the (revision date) revision to the (name of dam) EAP and have inserted the revision pages in my controlled copy. This EAP will be maintained at the designated location for use in the event of a drill or actual emergency.

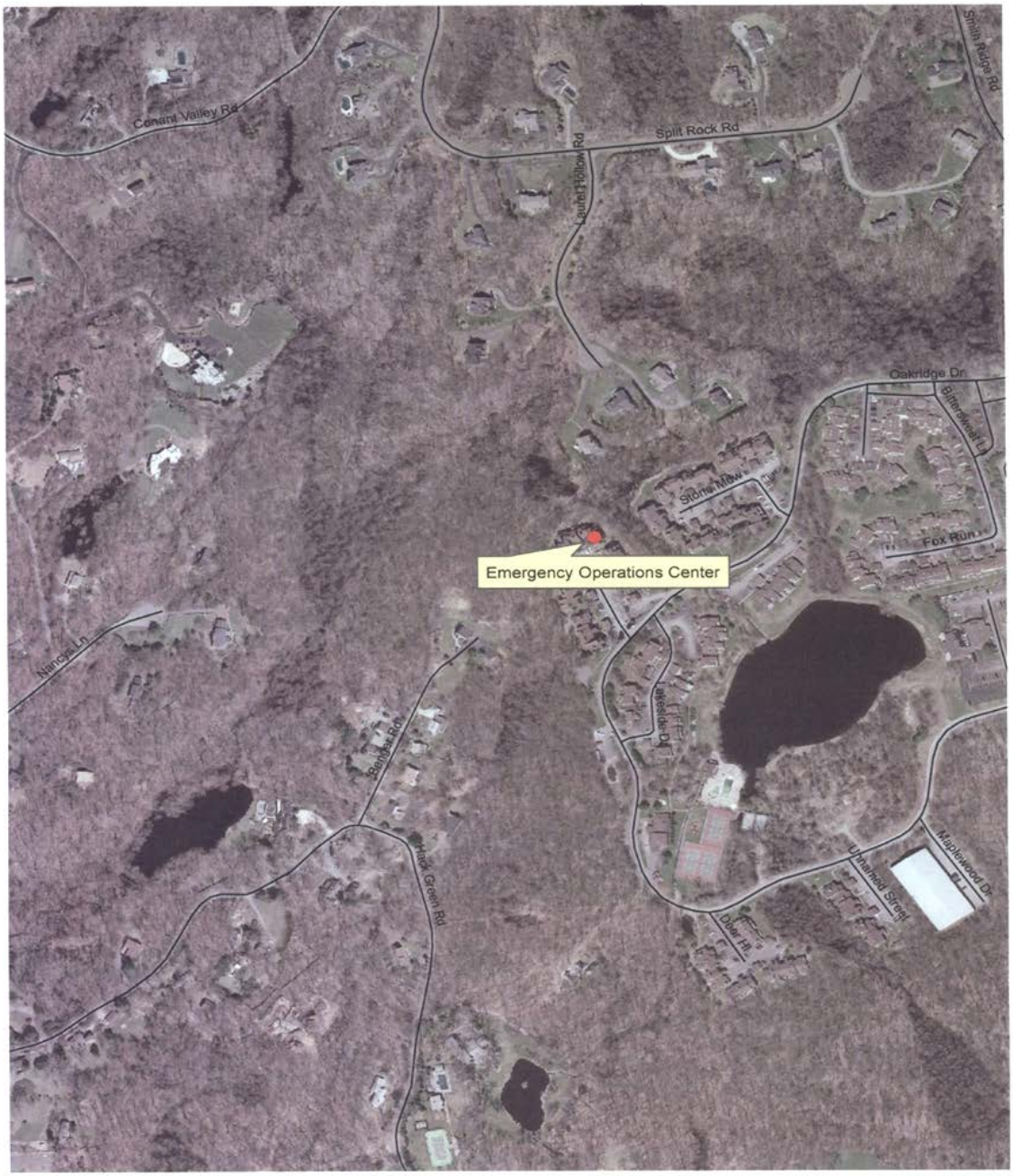
Controlled Document Holder Name: _____ Document No.: _____

Signature: _____ Date: _____

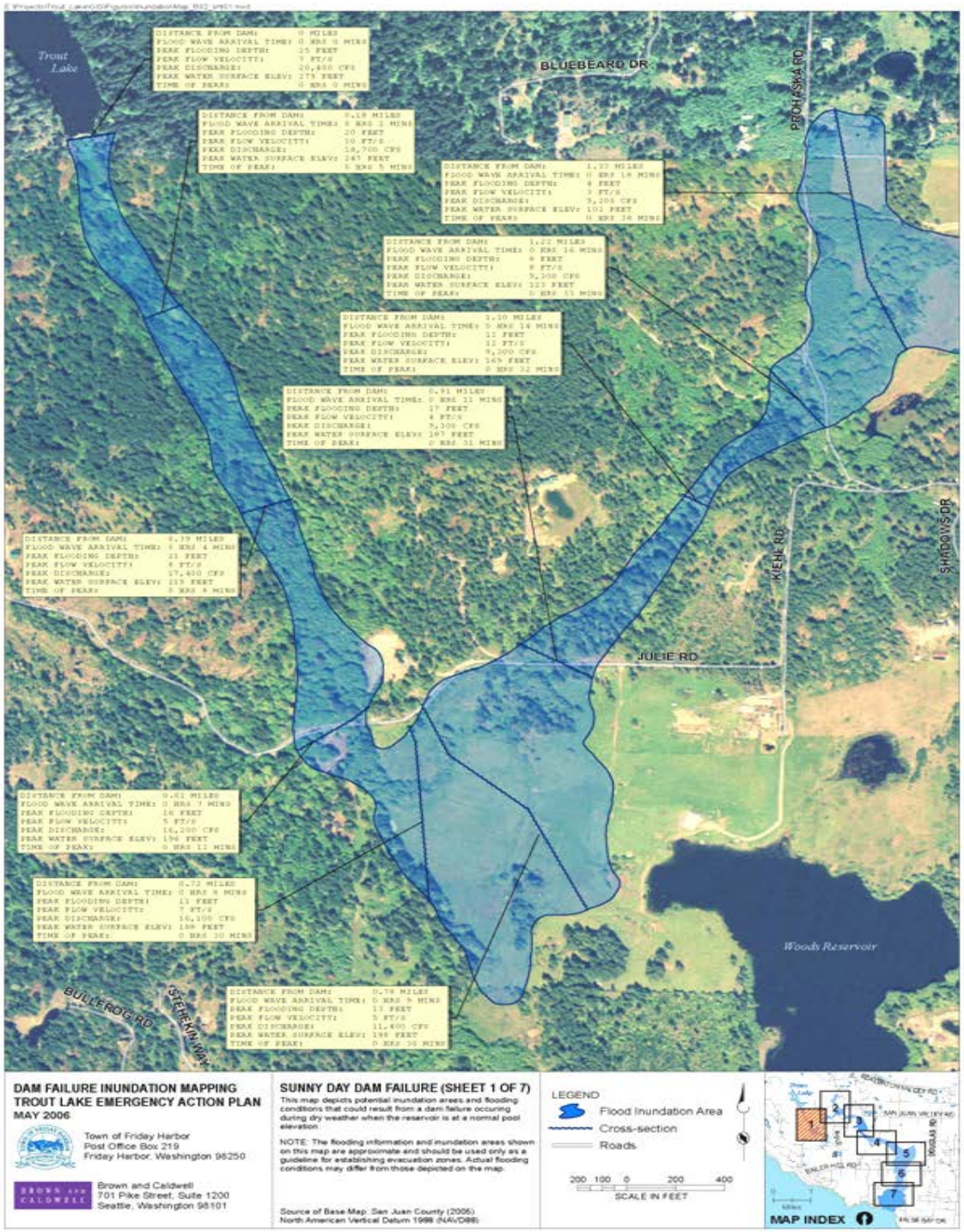
Company or Affiliation: _____

Samples

Sample Emergency Operations Center (EOC) Location Map



Sample Inundation Map



Sample Post-Incident Report

New York State Department of Environmental Conservation
Division of Water
Bureau of Flood Protection and Dam Safety, 4th Floor
625 Broadway, Albany, New York 12233-3504
Phone: (518) 402-8185 • **FAX:** (518) 402-9029
Website: www.dec.ny.gov

Dam – Incident Report Form

6 NYCRR Part 673 requires Dam Owners to submit a written Incident Report to NYSDEC when either of the following incidents occurs at a Class C - High Hazard or a Class B - Intermediate Hazard dam:

1) Activation of the Emergency Action Plan (Part 673.7(h)); or
2) Flow through an erodible auxiliary spillway (Part 673.9);

Submit the completed form within 5 days of the end of the incident to:

NYSDEC - Dam Safety Section
625 Broadway, 4th floor
Albany, NY 12233-3504
phone: (518) 402-8185
fax: (518) 402-9029

NYS Dam ID No. : _____ **Hazard Class: (circle one):** B – Intermediate C – High

Dam Name: _____ **Reservoir/Impoundment Name:** _____

Dam Location: Street Address: _____
Town/City: _____ County: _____
Latitude: _____ Longitude: _____

Description of incident and cause(s): (Please Continue on Additional Pages as Necessary) _____
_____
_____

Start date, time of incident: ___/___/___, ___:___ (AM) (PM)

Was the Emergency Action Plan activated? (Yes) (No) **If so, when?** ___/___/___, ___:___ (AM) (PM)
Has the emergency ended? (Yes) (No) **If so, when?** ___/___/___, ___:___ (AM) (PM)

Did flow pass through an erodible Auxiliary Spillway? (Yes) (No)
Depth and Duration of Auxiliary Spillway flow: _____
Spillway/Auxiliary Spillway condition (did any damage occur?): _____
_____

Immediate responses to incident: _____
_____

Long term response to incident: _____
_____

Contact Information

Dam Owner Name: _____ **Form Prepared By:** _____
Dam Owner Address: _____ **Form Preparer's Phone:** _____
_____ **Form Preparer's Fax:** _____
_____ **Form Preparer's Email:** _____
Dam Owner Phone: _____

Attach additional sheets, including maps, sketches or photos as necessary to fully describe the incident.

DS-IR-1 (4/2010)

Sample Promulgation and Concurrence Form

PROMULGATION AND CONCURRENCE

I, the undersigned, on the date indicated, have reviewed the Emergency Action Plan (EAP) for the Dam, State Dam ID_____. I have received the concurrence of the necessary emergency managers, who are listed below.

Name	Title	Organization	Date
Name	Director	County Emergency Management	

Date of most recent Orientation Meeting: _____

Certification of Promulgation and Concurrence:

I certify under penalty of law that the answers and information provided in and with this Promulgation and Concurrence Form were prepared by me or under my direction or supervision. The answers and information I submit are, to the best of my knowledge and belief, true, accurate, and complete.

This Certification must be signed by an individual who is the EAP coordinator, on his or her own behalf.

Name:_____

Title:_____

Company:_____

Signature:_____ Date:_____

DIVISION OF WATER
BUREAU OF FLOOD PROTECTION AND DAM SAFETY
DAM SAFETY SECTION

DOW 3.1.3 – ATTACHMENT "EAP-B"
EMERGENCY ACTION PLAN
FOR
CLASS B - INTERMEDIATE HAZARD DAMS
INSTRUCTIONS AND TEMPLATE

December 2012

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Sample Promulgation and Concurrence Form 7

I. Emergency Notification

Emergency Notification Procedures/Notification Flowchart.

A pre-planned notification process is one of two critical EAP elements. This is most commonly depicted in a flowchart or flowcharts. For some dams a contact list with calling sequence may be sufficient. This guidance will refer to the depiction of notification procedures as the "Notification Flowchart," regardless of whether it is actually a flowchart.

The EAP Notification Flowchart contains the information necessary for the timely notification of persons responsible for taking emergency actions to protect downstream life, property and the environment. It lists the names and contact information for those individuals to be contacted, by whom and in what order. The Emergency Notification Flowchart should include **individual names with office and confirmed 24-hour telephone numbers**.

The Notification Flowchart for Class B-Intermediate Hazard dams should contain the following:

- Dam owner;
- Local emergency responders (e.g. fire and police departments) and related organizations;
- County Emergency Management Offices (County EMOs);
- Residents and property owners that are located immediately downstream of the dam within the boundary of potential inundation, where available warning time is limited;
- Operators of other dams or water-retention facilities which may affect or be affected by an emergency (e.g.: upstream and downstream dams);
- NYSDEC Dam Safety Section ("DSS");

The above list may not be all inclusive or represent an appropriate prioritization of those entities listed. The author of the EAP should understand that notification of the dam owner and local emergency responders are typically given top priority, and this understanding should be reflected in the flowchart. The priority for contacting the Dam Safety Section should generally be after at least all first responders have been notified.

Emergency Notification Information Form. In the EAP, an Emergency Notification Information Form should follow the Emergency Notification Flowchart. The Emergency Notification Information Form is to be used whenever an emergency is identified. A list of different emergencies for which the EAP should be activated is on the back of the form. This form is intended to aid the person reporting the emergency condition in relating all pertinent information. During an emergency, callers sometimes forget to convey important details.

Updating. A regular review of the adequacy of the EAP should be conducted at intervals not to exceed one year. The review should evaluate the accuracy of the EAP's notification flow charts, flood inundation area, depictions of downstream development, and the EAP text. The review should determine whether any revisions to the current EAP are necessary. If, as a result of the annual review, no revisions are necessary, a written statement to this effect should be provided to each recipient of the original EAP, including the Department's DSS. The EAP should be updated and the updates should be distributed promptly when changes are required. EAP personnel or telephone number changes should be recorded and distributed as they occur.

Posting of the Notification Flowchart. An up-to-date copy of the Notification Flowchart should be posted in prominent locations at the dam site and local emergency operation centers

(essential for unattended dams). The flowchart should be posted at each phone and radio transmitter at the dam, powerhouse (if applicable), and at all other desirable locations.

II. Inundation Maps

Inundation mapping is the second critical component of an EAP. The level of detail, accuracy of input data, and analysis effort, should be appropriate to the downstream conditions and consequences of dam failure.

Inundation maps should be developed by the dam owner and/or his/her engineer, and in coordination with the appropriate local emergency management agencies. The maps must contain the information needed to support emergency response and evacuation efforts.

Inundation maps must include those portions of USGS topographic quadrangles and/or aerial photos that will likely be inundated by a "rainy-day" dam break – generally those areas that would be flooded if the dam failed during 150% of the 100-year flood. Features most likely at risk, such as road crossings and low-lying homes, should be clearly shown on the map. If information is available, estimated inundation areas should be drawn on the maps. Flood Insurance Rate Maps (FIRMs) and/or simple calculations are useful for estimating inundation areas. See "Sources of Information when developing inundation analyses" below for a discussion of FEMA FIRM's. This level of inundation mapping is expected to be sufficient for most Class B-Intermediate Hazard dams. However, in some cases a more sophisticated analysis may be necessary

Sources of information when developing inundation analyses.

Often FEMA has developed Flood Insurance Studies (FIS) and FIRMS that may be of use in developing inundation mapping. If the Special Flood Hazard Areas (SFHAs) depicted on the FIRM include base flood elevations (BFEs), then the hydrological basis of the study will be available in the FIS (including estimated 10-, 50-, 100- and 500-yr flow rates). If it can be shown that the estimated dam break flows are less than the flows in the FIS/FIRM, then the appropriate SFHA limits (e.g. 100-yr or 500-yr) can be used to estimate or supplement the flood extents for EAP inundation mapping.

Presenting the Results of an Inundation Evaluation on the Inundation Map

The results of an inundation analysis should be depicted on the Inundation Map. A narrative description should accompany the map, as indicated below, to identify unusual conditions.

The inundation map should be presented at a scale sufficient to be used for identifying downstream inhabited areas subject to possible danger. Whenever possible, major streets, railroads, and other well known features should be indicated. Potential inundation impact areas should be clearly identified. The most recent orthophoto coverages of the area that are available, with streets names overlaid, are the preferred base maps as long as they can be produced with sufficient clarity. Orthophotos of small areas are readily available for free on the internet. Orthophotos for the entire state are available through the NYS GIS Clearinghouse at: http://www.nysgis.state.ny.us. **Clarity is important.**

Inundation mapping should extend downstream of the dam to a point where the projected or estimated increase in water level due to dam failure, as derived from an inundation evaluation, would no longer present a danger to life or property.

When plotting inundation limits the lines should reasonably reflect the change in water levels with consideration given to topographic patterns and both natural and manmade features. When inundation lines enter the area of an existing lake or reservoir, they should be drawn to represent an increase in the water level of the lake or reservoir. Often this is a logical place to end the analysis. Should this increased water level overtop a downstream dam, the inundation mapping might need to be continued, and the likelihood of a cascade failure should be accounted for. The inundation evaluation should be extended downstream until flooding no longer poses a threat to life and or property.

The accuracy and limitation of the information supplied on the inundation maps and how best to use the maps should be described. Since local officials are likely to use the maps for evacuation purposes, a note should be included on the map to advise of the method, procedures, and assumptions used to develop the inundation areas.

The owner should review the inundation maps with the local jurisdictions and resolve any problems. If homes or other critical structures (such as hospitals, communications hubs, etc.) outside of the inundation areas can be isolated by a dam break flood, then these areas should be depicted and special considerations noted.

If inundation maps are to be shown on several pages, a map index should be included to orient the reader.

A sample inundation map is included in the template.

EMERGENCY ACTION PLAN TEMPLATE

(Class B – Intermediate Hazard Dams)

EMERGENCY ACTION PLAN
For

_____ Dam

NYSDEC Dam I.D. Number:_____
Dam location (latitude/ longitude):_____

Dam Location: (Nearest road address) _____

Town/County: _____

River: _____

Owner/Operator: _____

Address: _____

_____

_____

Prepared By: _____

Address: _____

Date:_____
Revision Dates:*

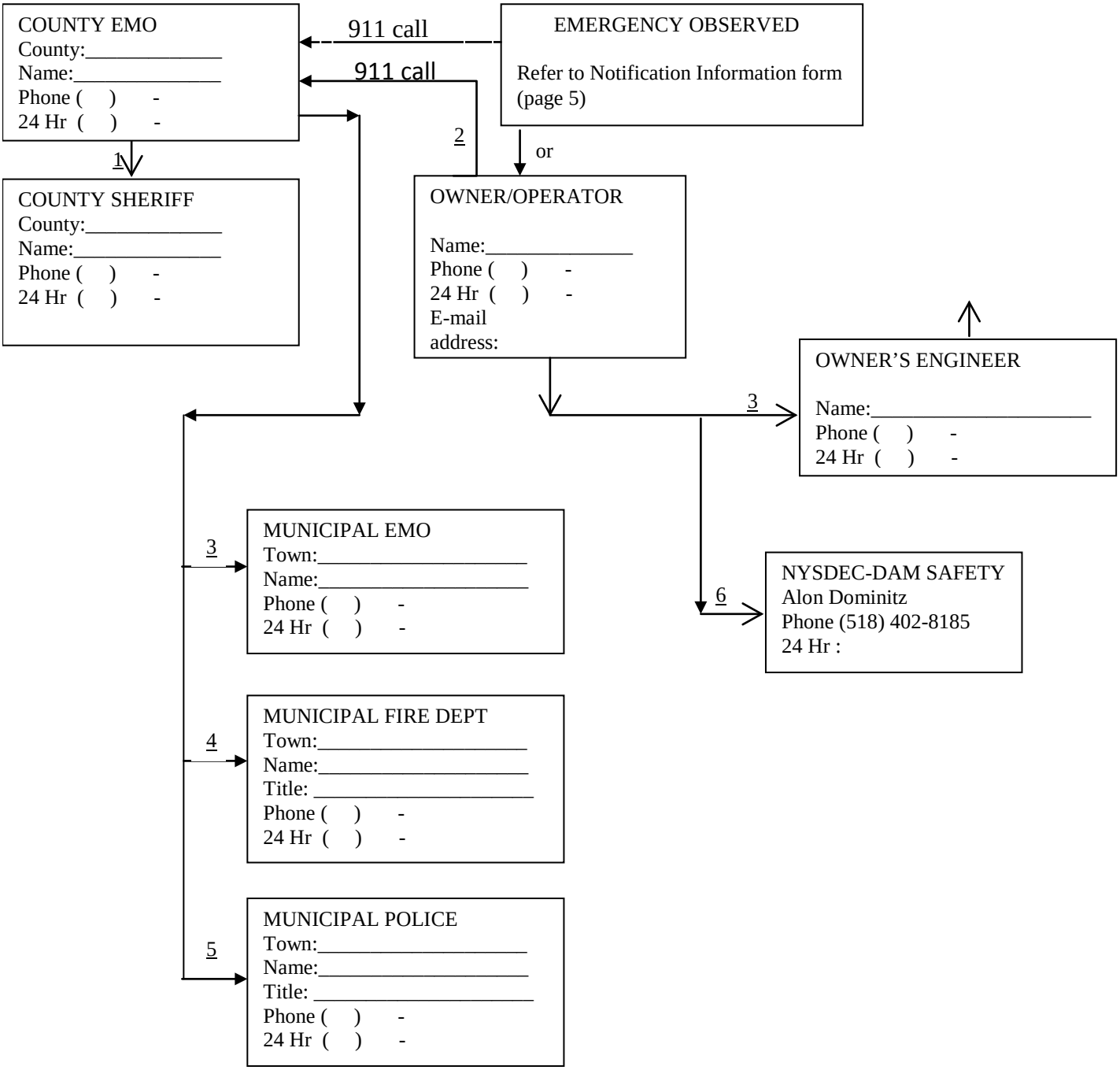
1st Revision: _____

2nd Revision:_____

3rd Revision: _____

*** THE DAM OWNER/OPERATOR IS RESPONSIBLE FOR THE ANNUAL REVIEW AND UPDATING OF THE EAP.**

EMERGENCY NOTIFICATION FLOWCHART



(This page should be printed on colored paper for ease of use)

Notification Information:

Dam Emergency Information for the Emergency

Name of person reporting the emergency: _____

Affiliation: _____

Phone Number: _____

Dam Name & NYS-DEC ID #: _____

Location of dam:

County: _____

Municipality: _____

Stream: _____

Road(s): _____

Time and Date of Dam Emergency: _____

Type of Emergency: (see back of form): _____

Phone appropriate parties: *[refer to the Emergency Notifications Flow Chart, page #]*

"This is (your name, title & affiliation).
You are being contacted per the Emergency Action Plan for the (name of dam).
Please be advised: A Dam (Advisory, Warning, or Breach) Condition has been identified at (name of dam).
Observation was at (time and date).
The situation is (explain the condition)."
[Refer to Site Description, page #, for directions to the dam]

****

Important !!! If you cannot contact an organization or individual promptly, proceed to the next contact on the Notification Flowchart. Try to re-contact the unavailable or busy number after you have contacted all others.

TYPES OF DAM SAFETY EMERGENCIES THAT MIGHT BE EXERIENCED

Advisory/ Non-failure condition (Condition C). An unusual problem or situation has occurred, but failure of the dam is not expected. Examples are:

- Flow conditions are such that flooding is expected to occur downstream and/ or upstream of the dam, including sudden changes due to activation of large release works at the dam.
- Any undocumented or unusual spring or seep.
- Any sign of possible piping.
- Any sign of slumping.
- Any sinkhole.
- Any newly detected crack.
- Any unusual wet spot or boggy area.
- Any seismic event regardless of how slight.
- Any significant obstruction in the spillway.
- Evidence of damage due to vandalism at any structure(s).
- Bomb threat.
- A civil disorder near the reservoir structure(s).
- Any aircraft accident near the reservoir structure(s).

Warning Condition (Condition B). A potential failure situation is developing, but is still considered controllable. Some amount of time is still available for further analysis and decisions to be made before dam failure is likely. Examples of a Warning Condition are:

- Water level of the lake is at an unsafe level and is rising threatening to overtop the dam.
- Water is eroding the auxiliary or emergency spillway.
- Any developing erosion, settlement, or upheaval occurring on the downstream slope or at the toe of the dam that is considered to be controllable.
- Any undocumented leakage through any dam structure considered to be controllable.

Emergency Condition (Condition A). Failure is imminent or has occurred. There is no time left to attempt corrective measures to prevent failure. Examples of an Emergency Condition are:

- Water has overtopped or will overtop any dam or dike.
- Any uncontrollable erosion, settlement or upheaval occurring on the downstream slope or at the toe of the dam.
- Any uncontrollable leakage through any dam structure.
- A dislocation or failure of any structure which allows for an expanding, uncontrollable discharge of water through the spillway, dam, or dikes indicating a breach is occurring.
- Dam is failing, about to fail or has failed.

II. Inundation Maps

Description of Inundated Area:

Provide a narrative description of the inundated area, and a brief discussion of the analysis techniques and any engineering assumptions and methods that were used to generate the inundation maps.

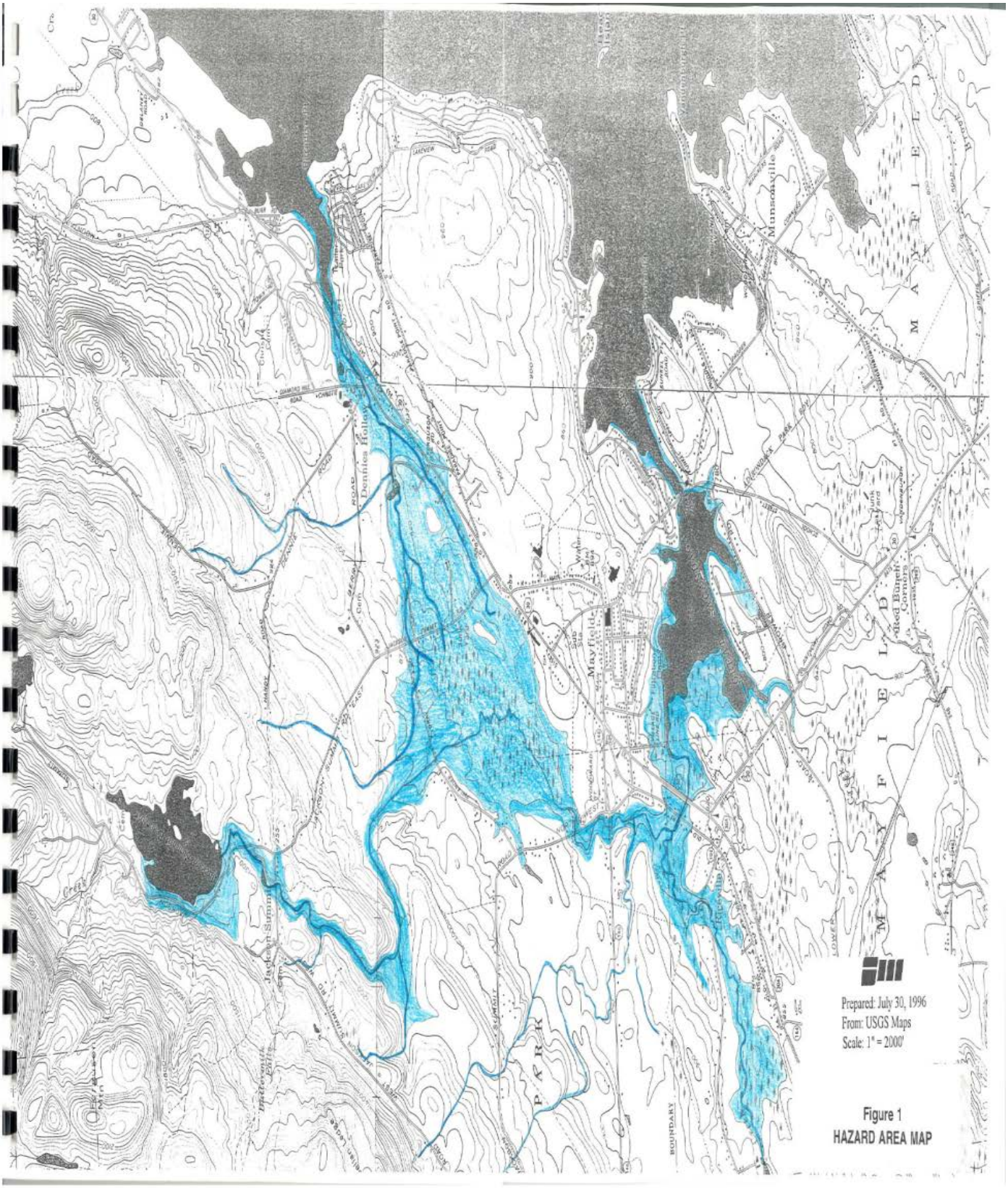
Inundation Maps:

This section will contain detailed map(s) of inundated areas, including dwellings if applicable, and the precise location of the dam.

The final inundation map to be included in the EAP should be, whenever possible, no larger than 11 inches by 17 inches, the best available map, and must be a fold out. As such, it may be necessary to reduce the mapping once the inundated areas are identified. If the inundation area is depicted on multiple maps, a map index must be included.

Samples

Sample Inundation Map



Sample Post Incident Report

New York State Department of Environmental Conservation
Division of Water
Bureau of Flood Protection and Dam Safety, 4th Floor
625 Broadway, Albany, New York 12233-3504
Phone: (518) 402-8185 • **FAX:** (518) 402-9029
Website: www.dec.ny.gov

Dam – Incident Report Form

6 NYCRR Part 673 requires Dam Owners to submit a written Incident Report to NYSDEC when either of the following incidents occurs at a Class C - High Hazard or a Class B - Intermediate Hazard dam:

1) Activation of the Emergency Action Plan (Part 673.7(h)); or
2) Flow through an erodible auxiliary spillway (Part 673.9);

Submit the completed form within 5 days of the end of the incident to:

NYSDEC - Dam Safety Section
625 Broadway, 4th floor
Albany, NY 12233-3504
phone: (518) 402-8185
fax: (518) 402-9029

NYS Dam ID No. : _____ **Hazard Class: (circle one):** B – Intermediate C – High

Dam Name: _____ **Reservoir/Impoundment Name:** _____

Dam Location: Street Address: _____
Town/City: _____ County: _____
Latitude: _____ Longitude: _____

Description of incident and cause(s): (Please Continue on Additional Pages as Necessary) _____
_____
_____

Start date, time of incident: ___/___/___, ___:___ (AM) (PM)

Was the Emergency Action Plan activated? (Yes) (No) **If so, when?** ___/___/___, ___:___ (AM) (PM)
Has the emergency ended? (Yes) (No) **If so, when?** ___/___/___, ___:___ (AM) (PM)

Did flow pass through an erodible Auxiliary Spillway? (Yes) (No)
Depth and Duration of Auxiliary Spillway flow: _____
Spillway/Auxiliary Spillway condition (did any damage occur?): _____
_____

Immediate responses to incident: _____
_____

Long term response to incident: _____
_____

Contact Information

Dam Owner Name: _____ **Form Prepared By:** _____
Dam Owner Address: _____ **Form Preparer's Phone:** _____
_____ **Form Preparer's Fax:** _____
_____ **Form Preparer's Email:** _____
Dam Owner Phone: _____

Attach additional sheets, including maps, sketches or photos as necessary to fully describe the incident.

DS-IR-1 (8/09) DRAFT

Sample Promulgation and Concurrence Form

PROMULGATION AND CONCURRENCE

I, the undersigned, on the date indicated, have reviewed the Emergency Action Plan (EAP) for the Dam, State Dam ID_____. I have received the concurrence of the necessary emergency managers, who are listed below.

Name	Title	Organization	Date
Name	Director	County Emergency Management	

Date of most recent Orientation Meeting (if held): _____

Certification of Promulgation and Concurrence:

I certify under penalty of law that the answers and information provided in and with this Promulgation and Concurrence Form were prepared by me or under my direction or supervision. The answers and information I submit are, to the best of my knowledge and belief, true, accurate, and complete.

This Certification must be signed by an individual who is the EAP coordinator, on his or her own behalf.

Name:_____

Title:_____

Company:_____

Signature:_____ Date:_____