

“He who fails to plan is planning to fail” ...Winston Churchill

A renewed national awareness along with recent unprecedented flooding events in the State that caused damage to many high hazard dams, has drawn attention to the need for Incident and Emergency Action Plan (IEAP) development in Indiana.

Of the 1,100 state regulated dams in Indiana, approximately 250 are high hazard dams. Of those, roughly 70% are privately owned, and less than 20% have IEAPs. Indiana is one of the many states which does not have a “dam owner produced IEAP” requirement. In states without IEAP requirements there is typically about a 30% completion rate.

Proactive planning is essential for preventing dam failures and resulting damages. Dam IEAPs allow for proactive planning to both the dam owner and emergency officials. IEAPs can help raise awareness that:

- 1) dams pose risks to downstream property owners,
- 2) dam failures are preventable disasters, and
- 3) timely dam owner response to incidents can help limit future emergency events.

IEAPs identify potential emergency conditions at a dam and preplanned actions to minimize loss of life and property damage. IEAPs also provide essential information and data to emergency personnel in the event that they must respond to a dam failure.

IEAPs are plans for unlikely but reasonably possible situations. IEAPs are very strongly recommended for all Indiana dams, especially those classified as “High” hazard.

Potential damages/losses from a failure:

- Loss of life
- Personal injury
- Emotional distress
- Disaster relief
- Revenue loss
- Loss of use of facility
- Health and Sanitation
- Repair and reconstruction costs
- Clean up and recovery costs
- Environmental damages
- Infrastructure loss
- Cultural resources
- Utility services
- Loss of beneficial users of the reservoir
- Insurance

Prevention is the best approach, but if an emergency occurs, an IEAP may minimize the impacts, mitigate the consequences, and facilitate recovery.

The ease of preparing, testing, and periodically updating an IEAP often outweighs the risk of not doing so.

What is included in an IEAP?

Step 1: Event Detection and Level Determination

Step 2: Notification and Communication

Step 3: Expected Actions

Step 4: Termination and Follow-up

All IEAPs must include dam breach inundation mapping to show the estimated area that would be affected by a dam breach condition.

A Sample Template for IEAPs can be found here:

http://www.in.gov/dnr/water/files/Part-4-Appendix_A_IEAP_Template2.pdf (pdf version)

http://www.in.gov/dnr/water/files/Part-4-Appendix_A_IEAP_Template2.docx (MSWord version)

To create the technical portions of the IEAP, including the event detection and level determination, and the dam breach inundation mapping, the services of an Engineering Consultant with experience in dam safety and hydrologic/hydraulic modeling must be obtained.

IEAP development must be coordinated with your local Emergency Management Official. In the case of an emergency condition at your dam, it is essential that your Emergency Management Official has access to and is familiar with the information and data in your IEAP.

A listing of City/County Emergency Management Directors can be found here:

http://www.in.gov/dhs/files/sanitized_compact_directory.pdf

Creating Dam Breach Inundation Maps:

Useful dam breach inundation maps can often be created even when resources are limited. The Department of Natural Resources/Christopher Burke Engineering Simplified Methodology for estimating approximate dam breach inundation areas has been successfully implemented for several dams in Indiana to produce maps with reasonable accuracy to establish warning and evacuation zones and also to help determine hazard classification. The use of the Excel Spreadsheet and an approximate HEC-RAS model has shown to be less time consuming than performing a detailed study, on the order of days, perhaps weeks for more complex situations. This results in a potential cost savings of several thousand dollars and has enabled the development of approximate inundation maps for dams where a detailed study was cost-prohibitive.

It should be noted, however, that the simplified methodology may not be applicable to all dams and valleys (such as where there is split flow or extremely flat or wide valleys) and may not deliver acceptable accuracy for a given study such as in highly urban areas, where there are critical facilities, or when an incremental hazard analysis is being performed. Engineering judgment should be used when selecting the methodology most appropriate for a particular dam.

Information on the Simplified Dam Breach Inundation Maps can be found here:

- [Simplified Procedure for Estimating Approximate Dam Breach Inundation Area for EAP Light Studies Summary](#)
- [Simplified Procedure for Estimating Approximate Dam Breach Inundation Area for EAP Light Studies Spreadsheet](#)