



Iowa Department of Natural Resources
Flood Plain Management Program

FPID# _____

Applying for a Flood Plain Permit Agricultural Levees or Dikes

To obtain a DNR Flood Plain Permit for your project, you must submit to this Department the following checklist and the supporting documentation itemized on this checklist. **Applications submitted without this information will be considered incomplete and will not be reviewed.**

- Completed DNR Form 542-1010 – “Determining if a Flood Plain Permit is Required – Agricultural Levees or Dikes”.
- Completed and signed DNR Form 36, Joint Application Form – Protecting Iowa Waters.
- Completed document - "Gaining Approval for Agricultural Levees or Dikes" – attached
- Two sets of engineering plans for the project. Please note that the plans must be prepared and certified by a professional engineer licensed in the State of Iowa.
- Completed and signed certification stating that the engineering calculations and analysis, if applicable, were prepared by a professional engineer licensed in the State of Iowa.

Reviewer's Notes:

Gaining Approval for Agricultural Levees or Dikes

Date: _____

Completed By: _____

1. Application: Completed and signed Joint Application Form Submitted (required)? Yes No

Please indicate if the project site is within the incorporated limits of a city by using the word 'in' when listing the city in Item 7 of the application. The application can be found online at the following link. <http://floodplain.iowadnr.gov/>

A copy of the application and supporting documentation must be sent to:

- Iowa DNR, Flood Plain Permit Program
- Iowa DNR, Sovereign Lands (Submit with the copy for the Flood Plain Management Program)
- U.S. Army Corps of Engineers (Submit to the address listed in the instructions)

Applicant Name:					
Location (in Quarter-Section-Tier-Range format):	Qtr.	Sec.	T	N	R
County:		Stream(s):			

2. Engineering Plans: Two sets of certified plans submitted? Yes No

Note: A pre-application consultation with the Iowa DNR to discuss the level of design necessary for your project can be scheduled by calling (866) 849-0321.

The engineering plans must be at a suitable scale for the features that they are portraying and printed on paper no smaller than 11" x 17". The plans must include the project name, the engineer's address and phone number, a north arrow, bar scale, a legend for symbols and abbreviations, and a revision box. Technical plan information should include, but is not limited to, the following information.

- Location map (Quad Maps Available at <http://ortho.gis.iastate.edu/>)
- Site plan showing the proposed levee, any existing levees, stream, adjacent bridge and roadways or other hydraulic controls, property lines, buildings and any other pertinent structures.
- Elevation reference datum: _____ (NGVD29, NAVD88, other – explain)
- Record high water elevation: _____ Date: _____
- Typical levee cross section.
- At least one plotted stream valley cross-section taken perpendicular to the direction of flow through the project area representing typical conditions. Additional cross sections may be required depending on the length of the reach to be protected and whether there are natural or artificial control sections on the flood plain. Show the cross section location(s) on the site plan.
- A table of stream valley cross section coordinates (distance – elevation).
- A site specific stream slope based on a minimum of two survey shots taken on the water surface at least 500-feet apart.
- Levee top profile and existing natural ground elevations.
- Location of the borrow area.
- Description of provisions for interior drainage.

3. Hydraulics & Hydrology:

Does the community have a detailed Flood Insurance Study (FIS)? Yes No (If "Yes" continue with Section 3.a. If "No", Skip to Section 3.b, for the situation where No Detailed FIS exists for the Stream)

a. Detailed FIS Exists for This Stream

- Does study include detailed information (floodway and 100 yr. flood) information for this stream?
 Yes No (If "No", Skip to Section 3.b, for the situation where no detailed FIS exists for the stream).
- If the proposed project is located within the floodway as delineated in the FIS, it will be necessary to provide hydraulic modeling showing that the project will not cause a rise (0.00 feet) in the 100-year flood elevation. To that end, you will have to follow the steps below for hydraulic modeling.
- Was original hydraulic model obtained from FEMA library? (For instructions on how to order study data from the FEMA Library, see http://www.fema.gov/plan/prevent/fhm/st_order.shtm)
 Yes No

If "No", Explain: _____

If "No", what is source of information? _____

When analyzing the effects of a project where a detailed Flood Insurance Study (FIS) exists, the following series of hydraulic models should normally be performed in the specified order to create a "base" condition. Please check that these runs were done in the order listed:

- Step #1) Original hydraulic model as received from FEMA.
- Step #2) Original hydraulic model with corrections made.
- Step #3) Corrected model with additional cross-section(s) located at the project site.
- Step #4) Model from Step #3 with the project included.

The model resulting from Step #3 will be the "base" condition and will be used to determine the effects of the project on flood stages (e.g., backwater). (Note: The hydraulic models specified above are the minimum needed to analyze the effects of the project on flood stages when a project is located within the delineated floodway. Additional modeling may be required.)

Have all of the referenced hydraulic models been submitted on disk or electronically?

- Yes No

After completion of the Above Section, Skip to Section 4, "Approval"

b. If No Detailed FIS Exists for This Stream

Hydrology: Design flood, e.g., 10-yr or 25-yr flood, other

Frequency _____ Discharge _____

Source of discharge information (Check One):

- USGS Regional Equations Report 87-4732
- USGS Regional Equations Report 00-4233
- Corps Study
- WRC 17B analysis of Gage Data
- Nearby Flood Insurance Study
- Other (Explain) _____

Stream Slope: _____ ft. /ft. _____ ft. /mi.

Source (topo map, *survey, other): _____

*If a surveyed profile is used to determine stream slope, the profile should be of sufficient length (at least 500 feet) to represent the stream slope within the reach.)

Method of Hydraulic Analysis (Check One):

- HEC-RAS/HEC2 (Disk with input/output included? Yes No)
- Iowa DOT Bridge Backwater (Disk with input/output included? Yes No)
- Other (list) _____
- Rating curve included? Yes No

Backwater (surcharge) calculations included? Yes No

Typical Mannings "n" Value Used:

Channel _____ Left Overbank _____ Right Overbank _____

(Typical "n" Values are listed on Page 6)

Photographs included to verify "n" values? Yes No

4. Approval:

As outlined in Iowa Administrative Code 567-72.4, an agriculture levee or dike must be designed to meet the following criteria.

- a. *Level of protection.* The permanent height of agricultural levees or dikes normally shall be limited so that overtopping will occur due to discharges from a 10-year flood (Q10) to 25-year flood (Q25) with the more comprehensive levee system being permitted the greater degree of protection.
- b. *Additional protection.* Where it can clearly be shown that loss of valley storage caused by construction of the levee will not increase peak flood stages and discharges, the level of protection provided by the agricultural levee or dike may be increased beyond the Q10 to Q25 range.
- c. *Alignment.* The location and alignment of agricultural levees or dikes shall be compatible with existing encroachment limits so that minimum flood protection levels will not be increased and said levee or dike alignment otherwise shall be consistent with the rules governing the location of encroachment limits set out in 567—75.4(455B).
- d. *Maximum effect.* The maximum increase in the flood profile resulting from the construction, operation, and maintenance of an agricultural levee or dike shall be 1 foot. Equal and opposite conveyance as defined in 567—Chapter 70 shall be used in determining the maximum increase in flood profile resulting from such levees or dikes.
- e. *Interior drainage.* All agricultural levees or dikes shall be provided with adequate interior drainage facilities.
- f. *Offset.* The minimum offset from the top of the streambank to the riverward toe of the levee is dictated by paragraph "c" or "d." noted above, except that a minimum offset equal to 100 feet or twice the width of a river or stream measured from top of bank to top of bank, whichever distance is less, is required for all agricultural levees and dikes.

Does Levee Project Satisfy All Criteria? Yes No

Additional Approval Criteria:

NFIP "No-Rise" Certification Criteria:

On a stream with a detailed FIS, FEMA requires that any structure, obstruction or deposit that is located within the delineated floodway must result in "no-rise" (i.e., 0.00 feet increase) in the "100 year" flood profile when compared to the "base condition" model (see modeling process previously outlined in Section 3.a.). A certification of "no-rise" must be included in with the application if the project is within the delineated floodway.

Summary of Engineering Data - Dams and Impounding Structures

Applicant(s): _____

Location: Qtr _____ Sec _____ T _____ N _____ R _____ County _____

Stream: _____

Drainage Area: _____ sq. mi.

Stream Slope and Source: Reach _____ ft/ft

Main Channel Slope _____ ft/mi

Elevation Data: (ft., _____)

Channel Bottom _____

Top of Bank _____

Average Flood Plain _____

Top of Levee _____

Upstream End _____

Downstream End _____

Flood Frequency Data:

Design Frequency _____ yr.

Discharge* _____ cfs

Natural Stage _____ ft

Encroached State _____ ft

Backwater Due to Levee _____ ft

Freeboard (if applicable) _____ ft

Offsets:

Minimum Calculated _____ ft

Minimum Proposed _____ ft

Levee Information

Top Width _____ ft

Side Slopes _____

Height _____ ft

Length _____ ft

*Source of Discharge Information (check one):

USGS Regional Equations Report 87-4732

USGS Regional Equations Report 00-4233

COE Study

WRC 17B analysis of stream gage data

Nearby flood insurance study

Other (explain) _____