Pennsylvania
Emergency Management Agency

Pennsylvania
Department of Environmental Protection

Levee Certification & Accreditation Informational Webinar

March 19, 2026

Agenda

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Levee 101

A basic understanding of levee characteristics

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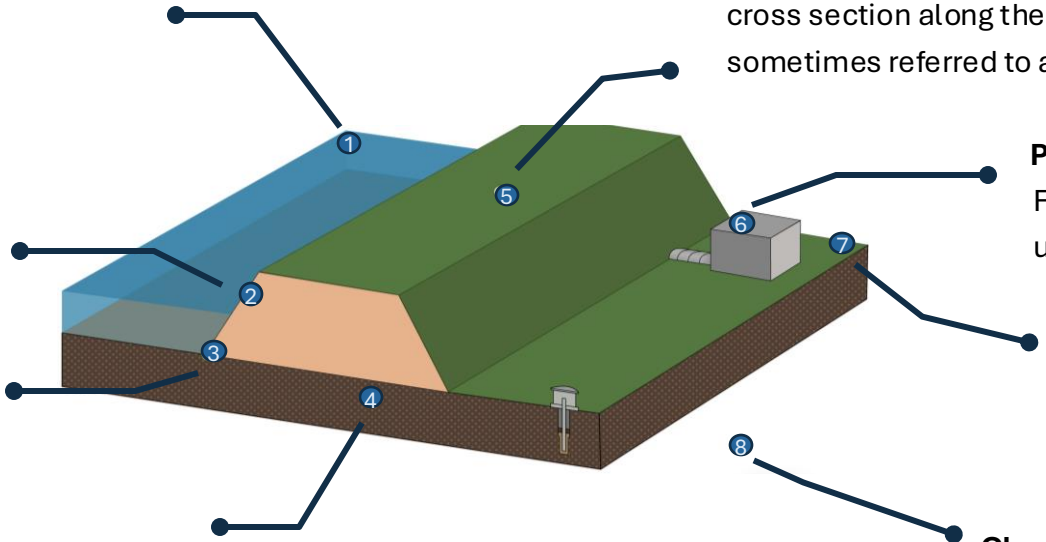
A **levee** is a human-made structure with the primary purpose to manage floodwaters and reduce flood risk. A **levee system** is a flood protection system, which consists of levee(s) and other structures, to reduce flood risk.

Waterside: The side of the levee that is nearest to the waterway.

Levee crest: The highest point at any given cross section along the levee length, sometimes referred to as "top of levee."

Embankment: An engineered earthen barrier along a waterway that creates a line of defense against flooding during storm events.



Pumps, conduits, pipes, and relief wells: Features that help water pass through, under, around, or away from a levee.

Levee toe: Where the engineered earthen embankment or concrete floodwall meets natural ground or the levee foundation.

Landside: This refers to the side of the levee that does not regularly experience or have water against it.

Levee foundation: The materials and ground upon which the levee is built. Levee foundations can be concrete, soil, rock, or other materials.

Closure structures: Most levees have closures, which are a moveable and essentially watertight barrier used during floods to close openings in a levee system.

Knowledge Check

Levee 101

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What is the primary purpose of a levee system in flood risk management?

A. Eliminate all flood risk in the protected area
B. Prevent erosion along all waterways
C. Reduce the likelihood of flooding to a portion of the floodplain
D. Replace the need for emergency planning

Knowledge Check

Levee 101

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Levee 101

Certification vs. Accreditation

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	Certification	Accreditation
	Engineering proof that a levee meets the National Flood Insurance Program (NFIP) Standard	Federal Emergency Management Agency's (FEMA) decision to recognize levee on flood maps for NFIP
What	Signed **Professional Engineer (P.E.)** technical package - sometimes aligned with **U.S. Army Corps of Engineers** (USACE) criteria - showing the levee's design and physical condition meet 44 CFR 65.10.	**FEMA's** formal determination for **Flood Insurance Rate Map (FIRM)** purposes, under the NFIP, that the levee system provides adequate risk reduction for **1% annual chance flood**
Who	Levee **owner/sponsor** and their engineers	**FEMA – Risk MAP Program**
Purpose	Determine if the levee **meets the design, maintenance, and operation standards** (e.g., freeboard, stability, seepage, closures, interior drainage)	Determine whether the levee will be shown as **providing 1% annual chance flood protection** on the FIRM
Output	**Technical basis**—analyses + O&M/inspection/closure documentation	**Official FEMA recognition of a levee's flood protection on the FIRM,** which affects insurance and floodplain management

Levee 101

How do certification and accreditation relate?

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Certification is usually a key input to accreditation, but **certification ≠ accreditation**.

You can have a **certification package** that is **incomplete for FEMA**, or FEMA may require additional items (e.g., documentation for the *entire* levee system, closures, interior drainage) before it will **accredit**.

Accreditation is **purpose-specific**: it does **not** mean "zero risk" or guarantee against overtopping/failure; it means FEMA will **map the area as meeting the NFIP levee criteria for the 1% annual chance flood.**

Knowledge Check

Levee 101

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Which statement best describes the difference between levee certification and levee accreditation?

A. Certification is a FEMA mapping decision; accreditation is an engineering analysis
B. Certification is an engineering/technical demonstration; accreditation is FEMA's acceptance for mapping/NFIP purposes
C. They are the same process with different names
D. Accreditation happens first, then certification

Knowledge Check

Levee 101

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Certification & Accreditation

Primary reasons communities pursue levee certification and accreditation

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Reduce mapped floodplain where justified:

If a levee meets 44 CFR 65.10, FEMA can accredit it so areas behind it may be mapped as lower risk Zone X (shaded) rather than the Special Flood Hazard Area (SFHA) for the 1%-annual-chance flood.

Lower flood insurance costs and increase public safety:

When properties are mapped out of the SFHA, or into a lower-risk zone, mandatory purchase requirements and premiums may decrease.

Enable permitting and economic development:

SFHA mapping affects building elevation requirements, mitigation costs, and lender requirements, which can materially influence redevelopment and new construction feasibility.

Support capital planning and grant positioning:

A documented, compliant levee basis helps justify maintenance, upgrades, pump reliability, closures, and resilience investments in a defensible way.

Risk transparency and liability management:

Certification forces clarity on performance, assumptions, interior drainage, and O&M (operation & maintenance)—reducing "false sense of security" risk if communicated well.

U.S. Floodplain Management Framework

A three-tier framework of shared responsibility

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2,480
NFIP-participating Pennsylvania communities

NATIONAL FLOOD INSURANCE PROGRAM

430k+
People in Pennsylvania living in flood prone areas

198
Levee systems across Pennsylvania

FEDERAL	STATE OF PENNSYLVANIA	LOCAL
➢ Administers the National Flood Insurance Program (NFIP) ➢ Sets the minimum floodplain management standards (44 CFR Parts 59-65) ➢ Issues Flood Insurance Rate Maps (FIRMs) and Letters of Map Revision (LOMRs) ➢ Reviews levee certification packages; grants accreditation via LOMR process ➢ Funds hazard mitigation through HMGP, BRIC, and FMA programs ➢ USACE constructs operates and maintains federally authorized levee systems	➢ PEMA serves as State NFIP Coordinator & State Administrative Agency (SAA) for HMA grants ➢ PA Act 166 of 1978 establishes the Floodplain Management Act framework ➢ DEP Bureau of Waterways Engineering administers Chapter 105 permits for levee modifications ➢ PA Act 167 (Stormwater Management Act) governs county watershed stormwater plans ➢ PEMA reviews ordinance compliance, conducts CAVs, and coordinates FIRM updates	➢ Must adopt and enforce NFIP-compliant floodplain management ordinance (44 CFR 60.3) ➢ Responsible for levee O&M ➢ Drives the certification process: commissions PE, assembles documentation package ➢ Submits MT-2/LOMR application through FEMA Online LOMC portal ➢ Reports annually to PEMA by February 28 (even if no permits issued) ➢ Must notify any adjacent communities before any watercourse alteration

Roles and Responsibilities

Who and when to engage

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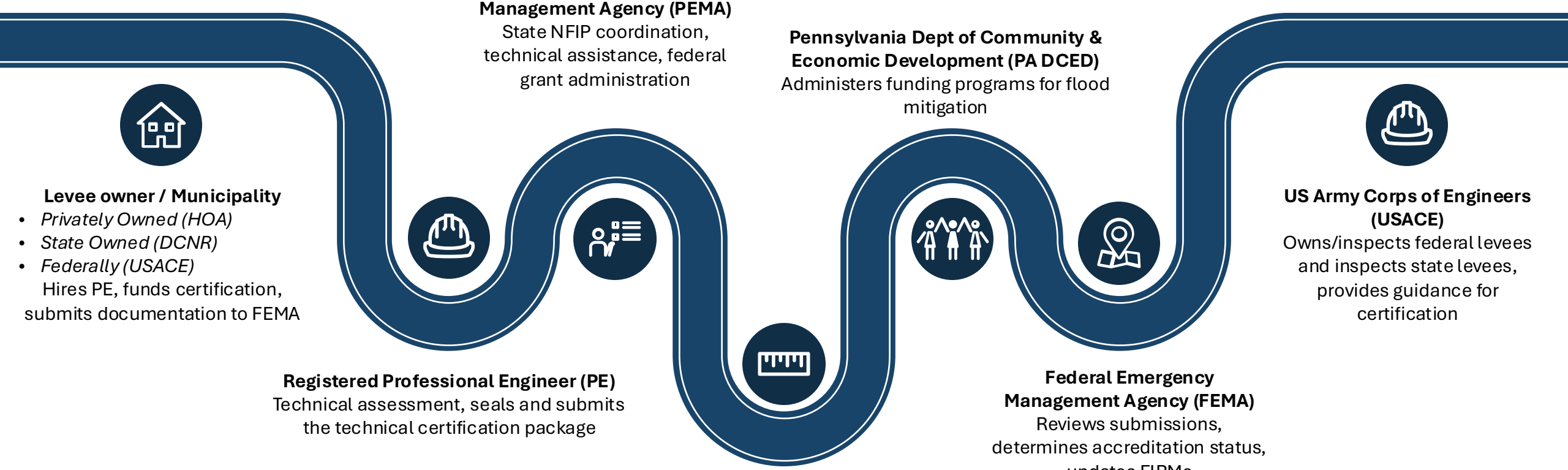

Levee owner / Municipality

- *Privately Owned (HOA)*
- *State Owned (DCNR)*
- *Federally (USACE)*

Hires PE, funds certification, submits documentation to FEMA

Registered Professional Engineer (PE)
Technical assessment, seals and submits the technical certification package

Pennsylvania Emergency Management Agency (PEMA)
State NFIP coordination, technical assistance, federal grant administration

Pennsylvania Dept of Environmental Protection (PA DEP)
Chapter 105 permits for levee construction/modifications, state waterway oversight and inspects State levees

Pennsylvania Dept of Community & Economic Development (PA DCED)
Administers funding programs for flood mitigation

Federal Emergency Management Agency (FEMA)
Reviews submissions, determines accreditation status, updates FIRMs

US Army Corps of Engineers (USACE)
Owns/inspects federal levees and inspects state levees, provides guidance for certification

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Levee 101

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In the roles/responsibilities summary, which tasks are explicitly assigned to the Levee/Municipality?

A. Update FIRMs and determine accreditation status
B. Hire the P.E., fund certification, and submit documentation to FEMA
C. Issue Chapter 105 permits
D. Administers funding programs

Knowledge Check

Levee 101

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C. Issue Chapter 105 permits

D. Administers funding programs

Levee Certification

Process overview

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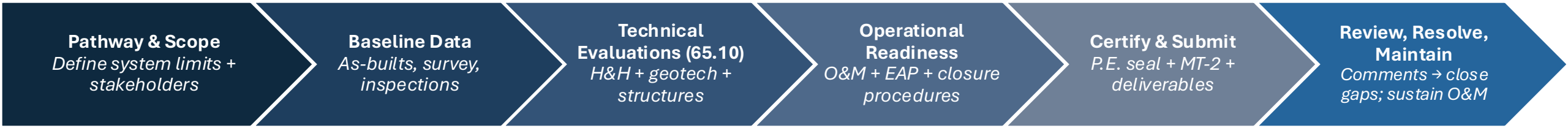
To certify a levee, the community or levee owner must work with a Pennsylvania-licensed engineer or a Federal agency responsible for levee design to develop and certify documentation that the levee meets design construction standards for at least the one-percent-annual-chance flood.



Technical

H&H/freeboard → stability/seepage/settlement → closure structures/interior drainage → mapping files

Governance/O&M

Sponsor authority → agreements → O&M program → EAP/training → inspection/deficiency tracking

Knowledge Check

Levee certification

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Which of the following are true? [Check all that apply]

- ❑ Certification requires a complete engineering analysis of the levee system.
- ❑ Sponsors must certify that levees and floodwalls provide a minimum freeboard above the 100-year flood.
- ❑ Submission must include as-built plans, an engineering survey to confirm top elevations of the levees and floodwalls, and a new hydrologic/hydraulic study utilizing state-of-the-art computer software.
- ❑ An engineering analysis of the levee's structural stability and a geotechnical analysis for evaluating potential movement, settlement or seepage through or beneath the levee are required.
- ❑ An operation and maintenance plan must also be provided.
- ❑ All technical information must be sealed by a registered Professional Engineer.

Knowledge Check

Levee certification

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Levee Certification

Requirements checklist for levee owners

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SCOPE & GOVERNANCE	ENGINEERING EVIDENCE (SIGNED/SEALED)	LEGAL, O&M, AND COMMITMENTS	QA/QC + SUBMITTAL READINESS	STAKEHOLDER ALIGNMENT
❑ System limits defined (tie-ins, closures, protected area) ❑ Identify owner/sponsor/operator and authority over the system ❑ Official briefing and documented commitment ❑ PE Procurement	❑ As-built drawings ❑ Hydrology & Hydraulics (H&H): 1% water surface, profiles, tie-ins, no bypass/overtopping pathways ❑ Geotechnical: stability/seepage/settlement as applicable ❑ Structures + appurtenances evaluated (closure structures, floodwalls, pump stations/outfalls) ❑ Interior drainage basis (gravity/pumps, criteria, capacity, O&M, & compliance with Act 167) ❑ Embankment condition documentation	❑ O&M program evidence + inspection/repair records ❑ Emergency Action Plan (inundation mapping and evacuation trigger points) ❑ Regulatory compliance documentation (DEP Chapter 105 permit, Act 167) ❑ Community concurrence letter	❑ Independent QA/QC complete; issue log closed ❑ MT-2 Form 3 completeness check ❑ Pre-submission consultation with FEMA Region 3 ❑ Administrative prerequisites confirmation (NFIP status, current annual report, FEMA processing fee confirmed)	❑ PEMA engagement ❑ State coordination (if applicable) ❑ Community NFIP alignment + outreach/adoption plan ❑ Official alignment

Levee Accreditation

Overview

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What is Accreditation?

An accredited levee system is a system that FEMA has:

- Determined meets the requirements of the National Flood Insurance Program **(**NFIP) regulations
- Recognized on a Flood Insurance Rate Map (FIRM) as reducing the flood hazards posed by a base (1% -annual-chance) flood.

FEMA accreditation of a levee system does not guarantee that the levee will provide flood hazard reduction to properties from flooding; therefore, FEMA has included a note on related FIRM panels that overtopping, or failure of an accredited levee system is possible.

What is Accreditation based on?

Accreditation is based on a submittal, by or on behalf of a community, which includes 44 CFR 65.10:

- ✓ Compliant design data and documentation
- ✓ Certification by a registered Professional Engineer (P.E.)
- ✓ Operations and maintenance documentation under the appropriate jurisdiction

Non-Accredited Levees can still reduce risk

Even if a levee isn't FEMA-accredited under NFIP (44 CFR 65.10), it can still provide real benefits to the community—like reducing flooding in more frequent events.

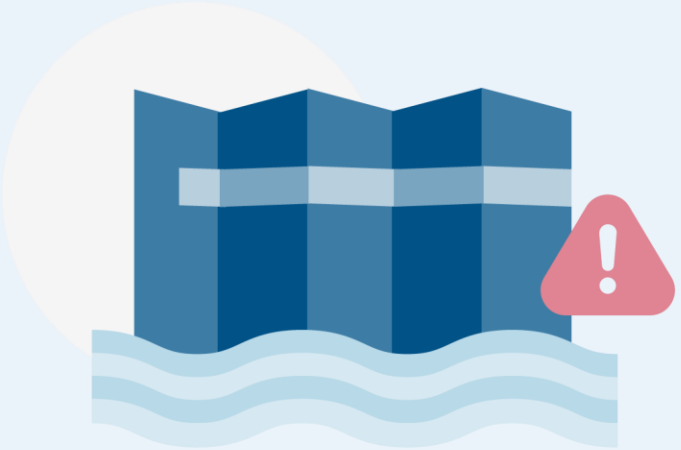
- Since 2013, and especially with today's better data and hydrologic and hydraulic modeling, FEMA uses more refined procedures that map areas on the landward side of non-accredited levee systems that are shown on FIRMs

Flood Insurance Rate Map (FIRM)

FIRM is FEMA's official map for a community under the NFIP that shows flood hazard areas and related information used for floodplain management and flood insurance rating.

In practice, a FIRM typically identifies:

- Special Flood Hazard Areas (SFHAs) (e.g., areas with a 1% annual chance flood risk)
- Flood zones (e.g., AE, A, X) and Base Flood Elevations (BFEs) where provided
- Sometimes floodways, coastal features, and other map panels/indexing used for regulation and insurance



Levee Accreditation

Defining levee status

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Accredited Levee

- FEMA determines the system meets NFIP requirements in 44 CFR 65.10 and recognizes it on the FIRM as reducing base (1% annual-chance) flood hazard
- Based on a community submittal with 65.10-compliant design data/documentation, certified by a registered P.E., plus O&M documentation under the appropriate jurisdiction
- Residual risk remains: FEMA notes on FIRM panels that overtopping/failure is possible; flood insurance and mitigation (e.g., floodproofing) are still encouraged

Provisionally Accredited Levee (PAL)

- If a mapped area is being remapped, FEMA may request updated documentation showing the levee still meets 44 CFR 65.10
- PAL allows mapping to proceed while giving time to compile the package
- Levee owner/community signs an agreement to submit required 65.10 documentation within 24 months (counted from the 91st day after FEMA's initial notification letter)
- FEMA adds a FIRM note that the accreditation and any Zone X (shaded) flood-hazard reduction areas landward of the levee are provisional

Non-accredited Levee

- Does not meet 44 CFR 65.10 requirements and is not recognized on the FIRM as reducing base flood hazard
- FEMA still considers the levee in flood risk analysis and uses non-accredited levee mapping procedures to analyze hazards landward of the system

Levee Accreditation

Levee accreditation submittal checklist (44 CFR 65.10 / MT-2)

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Community Eligibility

- ❑ NFIP participation in good standing
- ❑ Local hazard mitigation plan (opt. for Grant Funding)
- ❑ Compliant floodplain management ordinance

MT-2 Submission Package

- ❑ MT-2 Form 1 – Overview & Concurrence Form
- ❑ MT-2 Form 3 – Riverine Structure Form

Geometry + Survey

- ❑ As-builts (plan/profile/sections)
- ❑ Crest/low-point table + datum-controlled survey

Hydrology & Hydraulics (H&H)

- ❑ Hydrology basis + 1% WSELs
- ❑ Hydraulic models/files + freeboard demonstration
- ❑ Tie-ins/transitions/overtopping checks

Interior Drainage

- ❑ Ponding/runoff analysis behind levee
- ❑ Gravity outlets/backflow prevention
- ❑ Pump capacity/reliability (power, redundancy)

Geotechnical + Performance

- ❑ Subsurface data + stability analyses
- ❑ Seepage / underseepage + mitigation features
- ❑ Settlement allowance + erosion/scour protection

Structures + Appendages

- ❑ Closures (gates/stoplogs/floodwalls) calcs/details
- ❑ Penetrations/utilities/outfalls details + condition

O&M + Emergency Preparedness

- ❑ O&M manual + inspection program
- ❑ Emergency Action Plan (EAP) + flood-fight plan
- ❑ Training/drills + deficiency tracking

Knowledge Check

Levee accreditation

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Sequence the following steps for accreditation.

1. Identify the responsible levee owner/sponsor and compile existing records
2. FEMA reviews and, if acceptable, reflects the levee status in mapping/products
3. Submit the certification/accreditation package through the appropriate channels
4. Complete technical evaluation and address gaps (e.g., analyses, documentation, O&M)

A. 1 → 2 → 3 → 4

B. 4 → 3 → 1 → 2

C. 3 → 1 → 4 → 2

D. 1 → 4 → 3 → 2

Knowledge Check

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Updating A Levee

Overview – bringing your levee into compliance

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Compliance Criteria

To be shown as protecting against the **1% annual chance (base) flood on FEMA FIRMS,** a levee system must meet and continuously maintain the design, operations and maintenance standards in the 44 CFR 65.10, supported by PE certifications and complete documentation.

Records Review

Most levees fail certification not because the earthwork is deficient – but because the **documentation was never created or has been lost**. Start with records recovery before assuming construction is needed.

Gaps + Solutions

Start Here: Before any work begins, assess your levee condition. Second, **a PA-licensed PE must evaluate your levee against all federal certification criteria** and identify exactly what is deficient. This gap analysis is the foundation of everything that follows – skipping it may waste time and money.

Complete Gap Analysis

A. Deficiency is due to DOCUMENTATION ONLY

Update/create records, manuals, and studies

B. Deficiency requires PHYSICAL MODIFICATION

1. **Design**
2. **DEP Chapter 105 Permit**
3. **Construct**

Updating A Levee

Lifecycle

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1. Establish Current Status

- Check National Levee Database (NLD) for your levees current condition rating
- Check the FEMA Region 3: Levee Status Viewer to assess mapping status of levees
- Assess whether levee is part of current USACE project or if USACE operates/maintains the levee system

2. Engage PA DEP Early

- Any physical improvement to the levee requires a Chapter 105 Permit from PA DEP's Bureau of Waterways Engineering and Wetlands under the Dam Safety and Encroachments Act
  - Raising
  - Armoring
  - Drainage structure modification closure replacement
- [State-Owned Levees] Contact DEP's Division of Project Inspection early to determine whether a standard or joint permit application is needed and what technical studies DEP will require in parallel
- [Privately-Owned and Federal Levees] should coordinate with DEP Regional Offices and USACE (as necessary)

3. Retain a Qualified PE to Complete Technical Analysis

- Certification that a levee meets the requirements of 44 CFR 65.10 must be performed before the levee can be accredited by FEMA. The certifying engineer must be a **Registered Professional Engineer licensed in Pennsylvania**
- PE should conduct a preliminary gap analysis against all 44 CFR 65.10 design criteria to identify what improvements, documentation, and analyses are lacking before any formal submission

4. Conduct Necessary Physical Upgrades

- Physical improvements identified in the gap analysis must be designed, permitted under Chapter 105, and constructed before a final certification can be sealed
- Note: A CLOMR from FEMA indicates whether a project, if built as proposed, would be recognized by FEMA. For large capital improvements, a CLOMR is strongly advised

Updating A Levee

Lifecycle

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5. Compile the Certification Package

- The community submits an Accreditation Request Package, and FEMA then determines if the levee is accredited and maps accordingly, using a completeness check to ensure that all date demonstrating compliance with 44 CFR 65.10 is submitted
- Documentation gaps can prevent levee accreditation, triggering SFHA mapping, rework, FEMA-driven delays, and interim determinations that shift zones and stakeholder requirements.
- Pre-submission consultation with FEMA Region III

6. Submit the MT-2 (LOMR) to FEMA

- Submit an MT-2 application through FEMAs Online LOMC portal (or by mailing package to FEMA Region III).
- A Letter of Map Revision (LOMR) updates the FIRM to reflect changes to floodplains, floodways or flood elevations

7. FEMA Completeness Check and Technical Review

- FEMA conducts initial completeness check to confirm all 44 CFR 65.10 elements are included before starting technical evaluation. If info is missing, FEMA issues a data request and pauses review until the response is received
- Once complete, FEMA performs an independent hydraulic and mapping analysis using the submitted models and surveys.
- Determinations are issued after documentation and payment are accepted

8. FIRM Panel Update and Accreditation

- Upon successful technical review:
  - FEMA issues the LOMR, officially revising the FIRM to show the levee-protected area as Zone X (shaded)
  - The LOMR becomes effective 6 months after issuance to allow affected communities time to adopt any needed ordinance changes
  - Engage insurance community and residents of the map change

Continued Obligations

What to do after you are certified and accredited

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Maintain & Track Data

- Follow the 44 CFR 65.10 checklist to ensure you Levee remains compliant.
- Complete the annual inspection and submit floodplain management activities to PEMA.

Update Package & Re-Submit

- Resubmit the supporting documentation when:
  - Physical changes occur
  - Conditions degrade
  - Loading changes
  - Administrative updates are needed

Re-Certify

- Obtain a new professional engineer certification when:
  - The levee no longer clearly meets FEMA criteria
  - Major modification or rehabilitation occur
  - FEMA/ community mapping actions require

The failure to maintain standards can result in de-accreditation and remapping.

Knowledge Check

General

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According to the FEMA Region 3: Levee Status Viewer, how many levees are in the Commonwealth of Pennsylvania?

A. 198

B. 300

C. 75

D. 231

Knowledge Check

General

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5-minute Break

Common Pitfalls

Avoiding the gaps

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The most common cause of delay is **incomplete documentation at submission**. Gaps in analyses and official plans pauses review until data request needs are met.

Certification often reveals **deficiencies requiring physical upgrades**. Communities sometimes begin engineering without securing funding for necessary construction corrections.

Complex levee reviews frequently take longer than anticipated due to FEMA technical review cycles, additional data requests, environmental compliance, and engineering redesigns. Communities often underestimate the timeline from study initiation to final accreditation.

Levee certification processes frequently span multiple municipal administrations. As elected official leave office, engineers retire, and floodplain administrators move on, **critical knowledge about certifications and O&M obligations can be lost**.

For projects tied to federal funding (e.g., FEMA grants), **lack of alignment with approved mitigation plans** and funding windows can derail funding eligibility.

Grant Funding

The federal landscape

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	Flood Mitigation Assistance	Hazard Mitigation Grant Program	Building Resilient Infrastructure & Communities*
Summary	Provides funding to reduce or eliminate flood damage to NFIP-insurable buildings—especially repetitive loss and severe repetitive loss properties.	Provides grants to states for implementing mitigation measures post-disaster and provides funding for previously identified mitigation measures to reduce future damage and loss of life.	Pre-disaster competitive mitigation grant established under Disaster Recovery Reform Act of 2018. Supports large scale infrastructure projects.
Cost Share	75% federal / 25% local 90% federal/ 10% local for RL properties 100% federal/ for SRL properties	75% federal / 25% local	75% federal / 25% local 90% federal/ 10% local for small and impoverished communities
Eligible Activities	Project scoping / advance assistance to help develop engineering studies or designs Levee rehabilitation & modifications if the work helps achieve or maintain NFIP compliance/certification	Project scoping / advance assistance to help develop engineering studies or designs Mitigation construction such as levee repairs or upgrades that reduce future flood risk	Engineering studies, H&H analysis, and geotechnical investigation Levee construction, modification, and rehabilitation Flood warning systems and emergency operations capabilities
Best Use Case	NFIP-aligned levee studies or upgrades framed around flood loss reduction	Levee upgrades when post-disaster funding becomes available	Ideal for large-scale levee capital improvement projects, particularly those requiring freeboard improvements

Grant Funding

The Pennsylvania landscape

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	PA Flood Mitigation Program	H2O PA – Flood Control Projects
Summary	Administered by the Pennsylvania Dept of Community & Economic Development, this program funds flood mitigation projects including eligible engineering studies needed for levee certification up to $500K.	Provides single- or multi-year grants of $500K–$20M for flood-control infrastructure, including the improvement and rehabilitation of flood-control systems such as levee upgrades.
Cost Share	15% local match	Typically required
Eligible Activities	Engineering studies required for levee certification (including HEC-RAS hydrologic/hydraulic studies) Construction, improvement, repair, or expansion of flood control infrastructure	Engineering and design studies tied to construction Construction, improvement, or repair of all or part of a flood control system – including levees
Best Use Case	Smaller scale certification studies or targeted levee repairs. Additionally as a non-federal cost share vehicle for HMGP/BRIC sub-application	Major levee rehabilitation needed to achieve FEMA accreditation

Grant Funding

Competitive application tips

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Frame the Project as Risk Reduction

Funders prioritize measurable risk reduction, not regulatory compliance.

Demonstrate Strong Benefit-Cost Performance

Strong data and clean assumptions significantly improve scoring

Show Project Readiness

Competitive applications demonstrate that the project can move quickly

Align with Hazard Mitigation Plans

For FMA and HMGP, ensure that the project is included in the county and state Hazard Mitigation Plan

Highlight Consequence of Inaction

Clearly articulate what happens if certification fails to strengthen urgency and policy relevance

Understand Current Program Environment

Ensure applications are framed in language aligned with current program priorities

Engage Early with State Contacts

Before submission, coordination with PEMA and DEP staff for early technical feedback to improve and prevent eligibility issues

Use clear visuals and tell a cohesive story

The strongest applications provide visual clarity and clearly connect all the dots from problem to long-term resilience

Knowledge Check

General

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According to the Region 3: Levee Status Viewer, how many accredited levee’s does Pennsylvania have?

A. 22

B. 14

C. 54

D. 70

Featured Pennsylvania Municipalities

Case Studies

Pennsylvania Emergency Management Agency

Pennsylvania Department of Environmental Protection

Sunbury
(Northumberland County)

Levee Status: Accredited – FIRM Matches

Ordinance centers on floodplain permitting and compliance.

Sunbury's floodplain ordinance is positioned around public safety, minimizing flood damage, and requiring permits for development in identified floodplain areas (administered by a Floodplain Administrator).

Governance clarity enables accreditation readiness.

Sunbury's maintaining agency model clarifies levee system ownership, operations & maintenance (O&M) accountability, and funding/asset reinvestment pathways—foundational elements FEMA looks for when accrediting or re-accrediting levees for flood mapping. By consolidating day-to-day responsibility with the Sunbury Municipal Authority, the City strengthens continuity for inspections, documentation, and long-term system performance.

Wilkes-Barre + Hanover Township
(Luzerne County)

Levee Status: Accredited via LOMR - FIRM Matches

Consistent flood mitigation activities make a difference.

Wilkes-Barre is described as holding a Community Rating System (CRS) Class 6 rating (with associated premium flood insurance discounts, including in areas protected by levees).

Accreditation documentation governance is multi-entity.

Public reporting indicates that the USACE completed a Semi-Qualitative Risk Assessments (SQRA) in 2023 on the Williamsport levee system and recommended it be accredited through the NFIP. The recommended accreditation was the result of an appeal by the City of Wilkes-Barre, the adjoining municipalities, and the Luzerne County Flood Protection Authority, of an initial negative assessment, which would have precipitated significant increases in City property flood insurance premiums.


Live Interview

Interview with Joseph Bellini, PE, PH, D.WRE, CFM

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- Joe is a civil and water resources engineer with over three decades of experience specializing in hydrologic, hydraulic, sediment transport, and dam break modeling; dam engineering; spillway hydraulics and design; levee design and evaluation; probabilistic flood hazard studies; and flood control planning and design.
- His experience also includes stormwater management planning and design; bridge hydraulics and scour analyses; urban drainage modeling and design; highway drainage & stormwater systems; erosion and sediment control design; roadway design; water distribution design and modeling; and wetland mitigation design.
- Much of Joe's career has involved supporting the NRCS and USACE dam and levee safety programs and FEMA's National Flood Insurance and levee certification programs.
- Between 2011 and 2016, Joe also supported the nuclear industry in its regulatory response to the Fukushima Dai-ichi accident, both as the Flooding Subject Matter Expert for Exelon's nuclear fleet as well as an integral part of the NEI Fukushima Flooding Task Force.
- Since 2006, he has been an Adjunct Professor at the University of Pennsylvania teaching "Surface Water Hydrology" (2006-2011) and Villanova University teaching "Open Channel Hydraulics" (2018) and "River Mechanics and Engineering" (2006-present).

Key Takeaways and Next Steps

Points to remember

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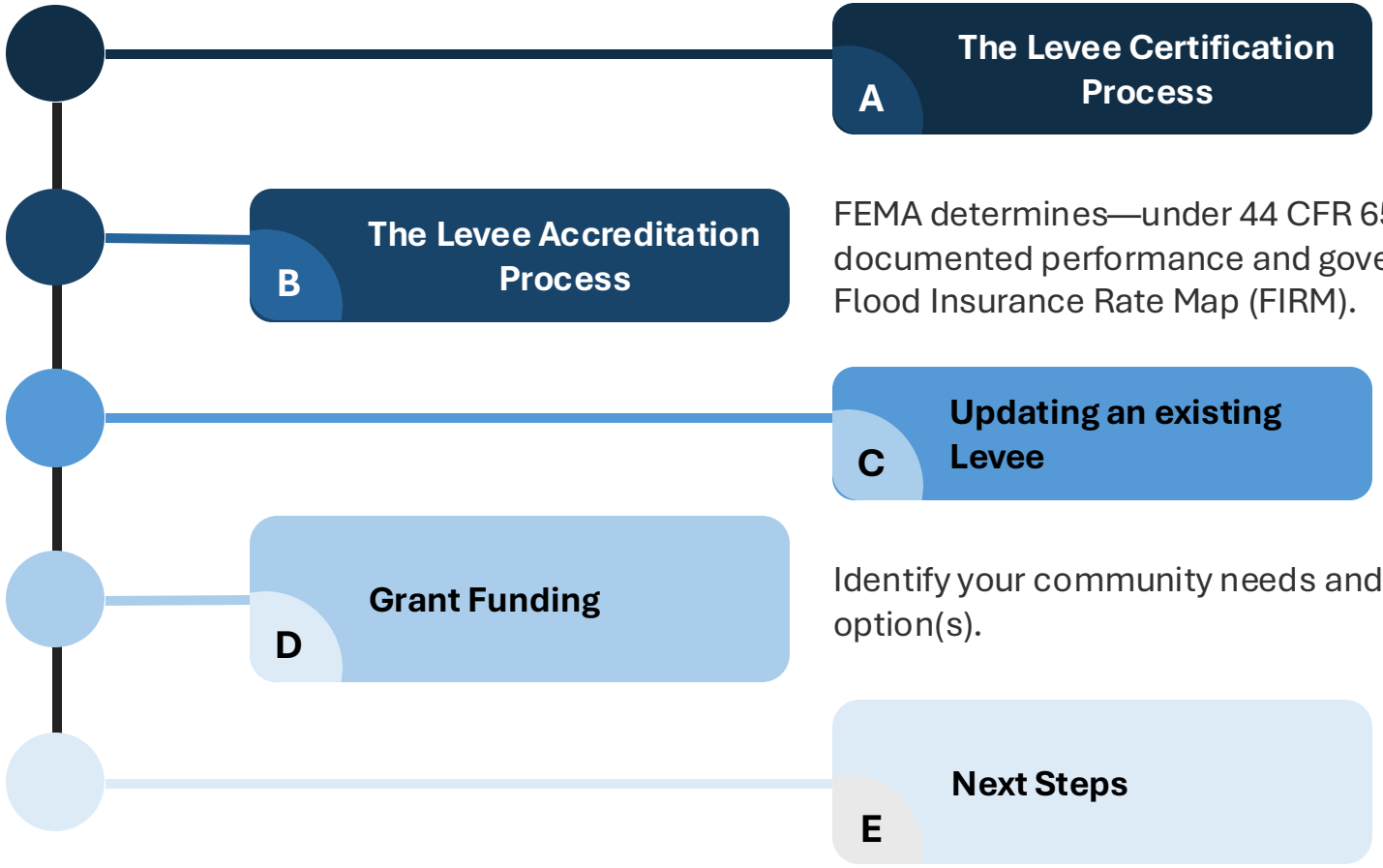

A The Levee Certification Process

A registered Professional Engineer (P.E.) certifies—based on complete technical and O&M evidence—that the levee meets required performance criteria.

B The Levee Accreditation Process

FEMA determines—under 44 CFR 65.10—whether the levee's documented performance and governance support its treatment on the Flood Insurance Rate Map (FIRM).

C Updating an existing Levee

Start workstreams in parallel. Manage them as a unified program.

D Grant Funding

Identify your community needs and apply for strongest aligning grant option(s).

E Next Steps

Assess your accreditation status and potential gaps on the FEMA Region 3: Levee Status Viewer. Explore more resources on the Levee Safety page at PA.gov.

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Q&A

Resources

For more information explore the resources below

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- 44 CFR § 65.10 - Mapping of areas protected by levee systems
- Code of Federal Regulations
- Guidance for Flood Risk Analysis and Mapping: Levees
- Is your home safe from the next flood?
- Levee Certification vs. Accreditation
- Meeting the Criteria for Accrediting Levee Systems on Flood Insurance Rate Maps
- National Levee Database
- Pennsylvania Flood Mitigation Program
- Provisionally Accreditation Levees
- Region 3: Levee Status Viewer

Glossary (1/2)

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- **1% Annual Chance Flood**: A flood having a one percent chance of being equaled or exceeded in any given year. This is the regulatory standard also referred to as the "100-year flood."
- **Base Flood**: The 1% annual chance flood event (often called the “100-year flood”). The base flood is the national standard used by the National Flood Insurance Program (NFIP) and all Federal agencies for the purposes of requiring the purchase of flood insurance and regulating new development.
- **Base Flood Elevation (BFE):** Water-surface elevation of the base flood at a given location.
- **Breach**: A rupture/opening in the levee embankment causing uncontrolled flooding.
- **Closure Structure**: Feature (e.g., floodgate, stoplogs) that closes an opening in a levee alignment during flooding.
- **Community (NFIP term):** A local government that adopts/enforces floodplain management regulations to participate in NFIP.
- **Conditional Letter of Map Revision (CLOMR):** FEMA’s review of a proposed project’s future effect on flood mapping (before construction).
- **Flood Insurance Rate Map (FIRM):** FEMA’s official map showing flood hazard zones used for insurance and regulation.
- **Floodplain Administrator**: Local official responsible for administering floodplain regulations and permits.
- **Freeboard**: Extra height above the BFE/base flood level used for safety margin in design and evaluation.
- **HEC-RAS**: U.S. Army Corps of Engineers software widely used to model river hydraulics and flood elevations.
- **Hydrologic and Hydraulic (H&H) Analysis**: Modeling to estimate flood flows (hydrology) and water levels/velocities (hydraulics).
- **Inspection and Maintenance Program**: Scheduled inspections, defect tracking, and corrective actions supporting long-term performance.
- **Interior Drainage**: Rainfall/runoff that collects behind a levee during high river stages and must be conveyed/pumped out.
- **Levee Accreditation (FEMA):** FEMA’s acceptance of a levee system as providing base-flood protection for mapping purposes (shown on the FIRM).
- **Levee Certification (44 CFR 65.10):** Engineering certification—sealed by a registered professional engineer—demonstrating the levee meets FEMA’s regulatory criteria.
- **Levee System**: The full set of flood protection features (levee embankments plus structures like gates/pumps/interior drainage) that function together.
- **Letter of Map Revision (LOMR):** FEMA’s official update to flood maps after changes (e.g., completed projects or new analyses).
- **Mapping Partner**: Entity (often state/local) coordinating with FEMA on flood risk mapping.
- **National Flood Insurance Program (NFIP):** Federal program that sets floodplain management standards and enables flood insurance in participating communities.

Glossary (2/2)

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- **Operations & Maintenance (O&M) Plan**: Documented procedures and responsibilities to inspect, maintain, and operate the levee system.
- **Overtopping**: Water flowing over the levee crest, potentially leading to rapid erosion and failure.
- **Pennsylvania Flood Mitigation Program (FMP):** Commonwealth funding program that can support flood mitigation planning/engineering and projects (often cited for HEC-RAS and related studies).
- **Provisionally Accredited Levee (PAL):** Temporary mapping status that can allow a levee to be treated as accredited while required documentation is being completed (time-limited).
- **Residual Risk**: Flood risk that remains even when a levee is accredited (e.g., events exceeding design or system failure).
- **Seepage / Underseepage**: Water movement through/under the levee that can cause piping or instability.
- **Settlement**: Long-term lowering of the levee crest due to soil consolidation or material behavior.
- **Slope Stability**: Evaluation of embankment stability under various loading and water conditions.
- **Special Flood Hazard Area (SFHA):** High-risk flood zone (typically the 1% annual chance floodplain) where mandatory insurance rules can apply.