Successful Steps for Clean Water Act Section 404 Permitting of New Dams for Flood Risk Management
Discussion Points

- Section 404 Permitting Overview
- Challenges on New Dam Projects
- Steps for Successful Permitting
Section 404 Overview
Section 404 Overview

Where is your work?
Section 404 Overview

Section 404 of the Clean Water Act Regulates

- Section 404 of the Clean Water Act Regulates Discharge or Fill into a waters of the U.S. (40 CFR 230.3(s))

Types of Authorization Under Section 404:
- Nationwide Permits
- Individual Permits
- Also General Permits and Exempt Actions (404 (f) of the Clean Water Act)
Section 404 Overview

Individual Permits
Must:

• Alternatives Analysis (Section 404 (b)1)
• Public Interest Review
• Minimization Alternatives
• NEPA?
• Public Notice and potential Public Hearing
Section 404 Overview

Section 404 (b)1 Guidelines (40 CFR Part 230)

• Corps – water dependency test

• Practicable alternative that would have less adverse impact on the aquatic ecosystem

• Corps sequencing
  • Alternatives
  • Avoidance
  • Minimization
  • Mitigation
Section 404 Overview

- Purpose & Need Screening
  - Alternatives That Meet Criteria
    - Fail Criteria
    - Dismissed

- Practicability Screening
  - Alternatives That Meet Criteria
    - Fail Criteria
    - Dismissed

- Preliminary Screening Results

- Cost
- Logistics
- Technology
Section 404 Overview

Section 404 (b)1 Guidelines

• Environmental Analysis of practicable alternatives

Least Environmentally Damaging Practicable Alternative

LEDPA

• After LEDPA, identify minimization and mitigation
Challenges to New Dam Projects
Challenges to New Dam Projects

Achieving the LEDPA

- Flood risk reduction projects are not (always) water dependent
- Avoidance Alternatives Exist
  - Dry Dam
  - Other Flood Risk Reduction Options
    - Levees
    - Zoning
    - Easements
  - Alternative Project Location
  - Smaller Pool
  - Multiple Structures
Challenges to New Dam Projects

Achieving the LEDPA

Documentation and Coordination Avoids:
- Going backward
- Taking detours
- Running in place
Steps for Successful Permitting
Steps for Successful Permitting

Coordination Process for Section 404 Permitting

1. **Project Scoping**
   - Identify issues that could affect permit type
   - Review technical data requirements
   - Agency Scoping Meeting

2. **Define Project Purpose and Need**
   - Applicant

3. **Range of Alternatives Formulation**
   - Applicant
   - Review Agency scoping and identify alternatives that avoid or minimize impacts to Waters of U.S.

4. **Alternative Practicability Screening**
   - Applicant
   - Review Alternatives based on:
     1. Purpose and Need
     2. Practicability for cost, logistics, and technology

5. **Review Range of Alternatives**
   - EPA/USACE/Applicant
   - Also review Purpose and Need and discuss methodology for screening
   - Progress Meeting #1

6. **Review Screening**
   - EPA/USACE/Applicant
   - Discuss environmental evaluation parameters
   - Progress Meeting #2

7. **Alternative Evaluation**
   - Applicant
   - Evaluate each practicable alternative for impacts and benefits to aquatic resources, including short-term, secondary, and cumulative effects
   - Select Technically Preferred Alternative and consider minimization alternatives

8. **Review Alternative Evaluation**
   - EPA/USACE/Applicant
   - Also discuss minimization alternatives and mitigation options
   - Progress Meeting #3

9. **Finalize 404 Application**
   - Applicant

10. **Review Application**
    - USACE/Applicant

11. **Submit Application**
Steps for Successful Permitting

Coordination Process for Section 404 Permitting

<table>
<thead>
<tr>
<th>Participants</th>
<th>Project Impacts</th>
<th>Coordination</th>
</tr>
</thead>
<tbody>
<tr>
<td>USACE/Applicant</td>
<td>Are impacts significant? (Individual Permit versus Nationwide Permit)</td>
<td>Scoping Meeting</td>
</tr>
<tr>
<td>Applicant</td>
<td>Define Project Purpose and Need</td>
<td></td>
</tr>
<tr>
<td>USACE/Resource Agencies/Applicant</td>
<td>Project Scoping - Identify issues that could effect permit type - Review Technical Data Requirements</td>
<td>Agency Scoping Meeting</td>
</tr>
<tr>
<td>Applicant</td>
<td>Range of Alternatives Formulation</td>
<td>Progress Meeting #1</td>
</tr>
<tr>
<td>EPA/USACE/Applicant</td>
<td>Review Range of Alternatives Also review Purpose and Need and discuss methodology for screening</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alternative Practicability Screening</td>
<td></td>
</tr>
</tbody>
</table>
Steps for Successful Permitting

WP5 Project

- Drainage Area – 400 sq. mi.
- 134 acre surface area
- 1,750 ac-ft flood storage capacity

Impacts

- 0.6 acres of wetland impact
- 855 ft of channel fill
- 14,000 ft of channel inundation
Steps for Successful Permitting

Coordination Process for Section 404 Permitting

<table>
<thead>
<tr>
<th>Participants</th>
<th>Project Impacts</th>
<th>Coordination</th>
</tr>
</thead>
<tbody>
<tr>
<td>USACE/Applicant</td>
<td>Are impacts significant? (Individual Permit versus Nationwide Permit)</td>
<td>Scoping Meeting</td>
</tr>
<tr>
<td>Applicant</td>
<td>Define Project Purpose and Need</td>
<td></td>
</tr>
<tr>
<td>USACE/Resource Agencies/Applicant</td>
<td>Project Scoping - Identify issues that could effect permit type - Review Technical Data Requirements</td>
<td>Agency Scoping Meeting</td>
</tr>
<tr>
<td>Applicant</td>
<td>Range of Alternatives Formulation</td>
<td>Review Agency scoping and identify alternatives that avoid or minimize impacts to Waters of U.S.</td>
</tr>
<tr>
<td>EPA/USACE/Applicant</td>
<td>Review Range of Alternatives</td>
<td>Also review Purpose and Need and discuss methodology for screening</td>
</tr>
<tr>
<td></td>
<td>Alternative Viable Alternatives</td>
<td></td>
</tr>
</tbody>
</table>
Steps for Successful Permitting

WP5 Purpose - Flood protection for the 100-year build out

WP5 Need – Documented past and potential flood damage
Steps for Successful Permitting

Coordination Process for Section 404 Permitting

<table>
<thead>
<tr>
<th>Participants</th>
<th>Project Impacts</th>
<th>Coordination</th>
</tr>
</thead>
<tbody>
<tr>
<td>USACE/Applicant</td>
<td>Are impacts significant? (Individual Permit versus Nationwide Permit)</td>
<td>Scoping Meeting</td>
</tr>
<tr>
<td>Applicant</td>
<td>Define Project Purpose and Need</td>
<td></td>
</tr>
<tr>
<td>USACE/Resource Agencies/Applicant</td>
<td>Project Scoping</td>
<td>Agency Scoping Meeting</td>
</tr>
<tr>
<td></td>
<td>- Identify issues that could effect permit type</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Review Technical Data Requirements</td>
<td></td>
</tr>
<tr>
<td>Applicant</td>
<td>Range of Alternatives Formulation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Review Agency scoping and identify alternatives that avoid or minimize impacts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>to Waters of U.S.</td>
<td></td>
</tr>
<tr>
<td>EPA/USACE/Applicant</td>
<td>Review Range of Alternatives</td>
<td>Progress Meeting #1</td>
</tr>
<tr>
<td></td>
<td>Also review Purpose and Need and discuss methodology for screening</td>
<td></td>
</tr>
</tbody>
</table>
Steps for Successful Permitting
Steps for Successful Permitting

NEBRASKA STREAM CONDITION ASSESSMENT PROCEDURE (NeSCAP) (Interim)
Steps for Successful Permitting

Coordination Process for Section 404 Permitting

<table>
<thead>
<tr>
<th>Participants</th>
<th>Coordination</th>
</tr>
</thead>
<tbody>
<tr>
<td>USACE/Applicant</td>
<td>Scoping Meeting</td>
</tr>
<tr>
<td><strong>Project Impacts</strong></td>
<td></td>
</tr>
<tr>
<td>Are impacts significant?</td>
<td></td>
</tr>
<tr>
<td>(Individual Permit versus Nationwide Permit)</td>
<td></td>
</tr>
<tr>
<td>Applicant</td>
<td></td>
</tr>
<tr>
<td><strong>Define Project Purpose and Need</strong></td>
<td></td>
</tr>
<tr>
<td>USACE/Resource Agencies/Applicant</td>
<td></td>
</tr>
<tr>
<td><strong>Project Scoping</strong></td>
<td></td>
</tr>
<tr>
<td>- Identify issues that could affect permit type</td>
<td></td>
</tr>
<tr>
<td>- Review Technical Data Requirements</td>
<td></td>
</tr>
<tr>
<td>Agency Scoping Meeting</td>
<td></td>
</tr>
<tr>
<td>Applicant</td>
<td></td>
</tr>
<tr>
<td><strong>Range of Alternatives Formulation</strong></td>
<td></td>
</tr>
<tr>
<td>Review Agency scoping and identify alternatives</td>
<td></td>
</tr>
<tr>
<td>that avoid or minimize impacts to Waters of U.S.</td>
<td></td>
</tr>
<tr>
<td>Applicant</td>
<td></td>
</tr>
<tr>
<td><strong>Review Range of Alternatives</strong></td>
<td></td>
</tr>
<tr>
<td>Also review Purpose and Need and discuss</td>
<td></td>
</tr>
<tr>
<td>methodology for screening</td>
<td></td>
</tr>
<tr>
<td>EPA/USACE/Applicant</td>
<td></td>
</tr>
<tr>
<td>Progress Meeting #1</td>
<td></td>
</tr>
</tbody>
</table>
Steps for Successful Permitting

WP5 Avoidance Alternatives

- Zoning
- Floodplain Acquisition
- Current Conservation Measures
- Future Conservation Measures
- Wetland Storage
- Stream Restoration
- Inflatable Dam
- Conveyance Improvements
- Levee and Bridge Raise
Steps for Successful Permitting

Coordination Process for Section 404 Permitting

<table>
<thead>
<tr>
<th>Participants</th>
<th>Coordination</th>
</tr>
</thead>
<tbody>
<tr>
<td>USACE/Applicant</td>
<td>Scoping Meeting</td>
</tr>
<tr>
<td>Applicant</td>
<td></td>
</tr>
<tr>
<td>Define Project Purpose and Need</td>
<td>Agency Scoping Meeting</td>
</tr>
<tr>
<td>USACE/Resource Agencies/Applicant</td>
<td></td>
</tr>
<tr>
<td>Project Scoping</td>
<td></td>
</tr>
<tr>
<td>- Identify issues that could affect permit type</td>
<td></td>
</tr>
<tr>
<td>- Review Technical Data Requirements</td>
<td></td>
</tr>
<tr>
<td>Applicant</td>
<td></td>
</tr>
<tr>
<td>Range of Alternatives Formulation</td>
<td>Progress Meeting #1</td>
</tr>
<tr>
<td>Review Range of Alternatives</td>
<td></td>
</tr>
<tr>
<td>- Also review Purpose and Need and discuss methodology for screening</td>
<td></td>
</tr>
<tr>
<td>EPA/USACE/Applicant</td>
<td></td>
</tr>
<tr>
<td>Alternative Practicability Screening</td>
<td></td>
</tr>
<tr>
<td>- Review Alternatives based on:</td>
<td></td>
</tr>
<tr>
<td>1. Purpose and Need</td>
<td></td>
</tr>
<tr>
<td>2. Practicability for cost, logistics, and technology</td>
<td></td>
</tr>
</tbody>
</table>
Steps for Successful Permitting

Progress Meeting #1 Discussion Points:

• Review Purpose and Need – changes since scoping

• Review Range of Alternatives

• Discuss Screening Methodologies
Steps for Successful Permitting

3. Project Scoping
   - Identify issues that could affect permit type
   - Review Technical Data Requirements

4. Range of Alternatives Formulation
   Review Agency scoping and identify alternatives that avoid or minimize impacts to Waters of U.S.

5. Review Range of Alternatives
   Also review Purpose and Need and discuss methodology for screening

6. Alternative Practicability Screening
   Review Alternatives based on:
   1. Purpose and Need
   2. Practicability for cost, logistics, and technology

7. Review Screening
   Discuss environmental evaluation parameters

8. Alternative Evaluation
   Evaluate each practicable alternative for impacts and benefits to aquatic resources, including short-term, secondary, and cumulative effects
   Select Technically Preferred Alternative and consider minimization alternatives
### Steps for Successful Permitting

**Avoidance Alternative Practicability Screening**

<table>
<thead>
<tr>
<th>Alternative</th>
<th>P&amp;N</th>
<th>Logistics</th>
<th>Tech.</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoning</td>
<td>No</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Floodplain Acquisition</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Current Conservation</td>
<td>No</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Future Conservation</td>
<td>No</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Wetland Storage</td>
<td>No</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Stream Restoration</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Inflatable Dam</td>
<td>Yes</td>
<td>No</td>
<td>*No</td>
<td>--</td>
</tr>
<tr>
<td>Conveyance</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Raise Existing Levee/Bridges</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Steps for Successful Permitting

1. Review Range of Alternatives
   - Also review Purpose and Need and discuss methodology for screening
   - EPA/USACE/Applicant
   - Progress Meeting #1

2. Alternative Practicability Screening
   - Review Alternatives based on:
     1. Purpose and Need
     2. Practicability for cost, logistics, and technology
   - Applicant

3. Review Screening
   - Discuss environmental evaluation parameters
   - EPA/USACE/Applicant
   - Progress Meeting #2

4. Alternative Evaluation
   - Evaluate each practicable alternative for impacts and benefits to aquatic resources, including short-term, secondary, and cumulative effects
   - Select Technically Preferred Alternative and consider minimization alternatives
   - Applicant

5. Review Alternative Evaluation
   - Also discuss minimization alternatives and mitigation options
   - EPA/USACE/Applicant
   - Progress Meeting #3

6. Finalize 404 Application
   - Applicant

7. Review Application
   - USACE/Applicant
   - Progress Meeting #4
Steps for Successful Permitting

6. **Alternative Practicability Screening**
   - Review Alternatives based on:
     1. Purpose and Need
     2. Practicability for cost, logistics, and technology

7. **Review Screening**
   - Discuss environmental evaluation parameters
   - Progress Meeting #2

8. **Alternative Evaluation**
   - Evaluate each practicable alternative for impacts and benefits to aquatic resources, including short-term, secondary, and cumulative effects
   - Select Technically Preferred Alternative and consider minimization alternatives

9. **Review Alternative Evaluation**
   - Also discuss minimization alternatives and mitigation options
   - Progress Meeting #3

10. **Finalize 404 Application**
    - Applicant

11. **Review Application**
    - USACE/Applicant
    - Progress Meeting #4

12. **Submit Application**
    - Applicant
### Steps for Successful Permitting

#### Environmental Screening for Two Practicable Alternatives – ID the LEDPA

<table>
<thead>
<tr>
<th>Resource</th>
<th>Raise Levee/Bridges</th>
<th>WP5 Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetlands/Waters of U.S.</td>
<td>0.15 ac. wetlands 114 linear ft.</td>
<td>0.6 ac. Wetland 855 linear ft.</td>
</tr>
<tr>
<td>Floodplain</td>
<td>Allows for cumulative changes</td>
<td>Utilization of historic floodplain</td>
</tr>
<tr>
<td>Fish and Wildlife</td>
<td>No change</td>
<td>Conversion of poor stream to high quality lake habitat</td>
</tr>
<tr>
<td>T&amp;E</td>
<td>No change</td>
<td>No change</td>
</tr>
<tr>
<td>Regulated Materials</td>
<td>No change</td>
<td>No change</td>
</tr>
</tbody>
</table>
Steps for Successful Permitting

7. Review Screening
   Discuss environmental evaluation parameters

8. Alternative Evaluation
   Evaluate each practicable alternative for impacts and benefits to aquatic resources, including short-term, secondary, and cumulative effects. Select Technically Preferred Alternative and consider minimization alternatives.

9. Review Alternative Evaluation
   Also discuss minimization alternatives and mitigation options

10. Finalize 404 Application

11. Review Application

12. Submit Application

Progress Meeting #2

Progress Meeting #3

Progress Meeting #4
Steps for Successful Permitting

Assessing Aquatic Benefits:

- 404(b)1 intent is to make aquatic ecosystem better (or minimally, no worse)
- Should not preclude naturally occurring project benefits in determining LEDPA
- No Corps Policy on how to do this – closest is Corps General Regulation Policy (33 CFR 320.4) that state environmental benefits are to be considered as well as project detriments
Steps for Successful Permitting

Assessing Aquatic Benefits
Stream Functional Assessment

Six Variables

• Hydraulic Conveyance and Sediment Dynamics
• Instream Habitat/Available Cover
• Floodplain Interaction – Connectivity
• Riparian Vegetation Composition
• Riparian Buffer Continuity and Width
• Riparian Land Use

Steps for Successful Permitting

Assessing Aquatic Benefits

- **WP5 Stream Functional Assessment**
  - Pre-Project Baseline – 249,315 units
  - Post-Project – 294,140 units
  - **Net gain of 44,825 units**

- **Raise Levee/Bridges Stream Functional Assessment**
  - Pre-Project Baseline – 289,275 units
  - Post-Project – 247,950
  - **Net Loss of 41,325 units**

- **Equivalent Units**
  - 0.061 units/sq ft for WP5
  - -0.025 units/sq ft for Raise Levee/Bridges
Steps for Successful Permitting

Assessing Aquatic Benefits

Fisheries Biomass - Mass of fisheries (per unit area)
Steps for Successful Permitting

Assessing Aquatic Benefits
Fisheries Biomass - Tributary Comparison
Steps for Successful Permitting

Assessing Aquatic Benefits
Fisheries Biomass Associate with Papio Creek Tributary

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Number Collected</th>
<th>Average Estimated Weight (oz)</th>
<th>Total Biomass (No. x Avg. Wgt.) (ounces)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creek Chub</td>
<td>Semotilus atromaculatus</td>
<td>20</td>
<td>8</td>
<td>160</td>
</tr>
<tr>
<td>Large Mouth Bass</td>
<td>Micropterus salmoides</td>
<td>4</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Carp</td>
<td>Cyprinus carpio</td>
<td>3</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Bluegill</td>
<td>Lepomis macrochirus</td>
<td>14</td>
<td>2</td>
<td>28</td>
</tr>
</tbody>
</table>

**TOTALS** 41   212 (13.3 lbs)

95 lbs per acre of WP5 unnamed tributary
Steps for Successful Permitting

Assessing Aquatic Benefits
Fisheries Biomass – WP5 Project Comparison

WP5 design coordination with Nebraska Game and Parks for fishery habitat:

- Shoals
- Vegetative Barriers
- Scallops
Steps for Successful Permitting
Assessing Aquatic Benefits
Fisheries Biomass – WP5 Project Comparison

- WP5 design with Nebraska Game and Parks for Fishery Habitat
- Conservative estimate that WP5 lake will support 800 lbs per acre
Steps for Successful Permitting

Preliminary LEDPA Determination:

WP5 Project:
Slightly higher direct impacts, but, considering the resource impacted:

• Net positive stream function gain
• Net increase in fishery biomass

Next – Complete Sequencing
Steps for Successful Permitting

Minimization Options

• Smaller Structures
  • Similar impacts
  • Less stream function increase and biomass production
  • More aquatic passage barriers

• Smaller Pool
  • Similar direct impacts
  • Less stream function increase and biomass production

• Dry Dam
  • Fewer direct impacts
  • No secondary stream channel impact
  • Limited stream function increase
  • No change in biomass production
Steps for Successful Permitting

1. **Applicant**
   - **Alternative Evaluation**: Evaluate each practicable alternative for impacts and benefits to aquatic resources, including short-term, secondary, and cumulative effects. Select Technically Preferred Alternative and consider minimization alternatives.

2. **EPA/USACE/Applicant**
   - **Review Alternative Evaluation**: Also discuss minimization alternatives and mitigation options. Progress Meeting #3

3. **Applicant**
   - **Finalize 404 Application**

4. **USACE/Applicant**
   - **Review Application**. Progress Meeting #4

5. **Submit Application**
Steps for Successful Permitting

8. **Alternative Evaluation**
   - Evaluate each practicable alternative for impacts and benefits to aquatic resources, including short-term, secondary, and cumulative effects.
   - Select Technically Preferred Alternative and consider minimization alternatives.

9. **Review Alternative Evaluation**
   - Also discuss minimization alternatives and mitigation options.

10. **Finalize 404 Application**

11. **Review Application**

12. **Submit Application**

**Progress Meeting #3**

**Progress Meeting #4**
Steps for Successful Permitting

1. Review Alternative Evaluation
   Also discuss minimization alternatives and mitigation options

2. Finalize 404 Application

3. Review Application

4. Submit Application

Progress Meeting #3
Progress Meeting #4
Steps for Successful Permitting

Lessons Learned:

• Early and Often Coordination
• Consider Impacted Resource Condition (function)
• Equal Comparisons Between Alternatives

Potential Considerations:

• Functional assessment availability
• Flexibility in project design
Questions?

Successful Steps for Clean Water Act Section 404 Permitting of New Dams for Flood Risk Management

Matt Pillard, AICP