

An aerial photograph of a wide, muddy river valley. The river is significantly swollen, with water reaching the tops of trees and partially submerging houses and barns. The surrounding hills are covered in dense forest with some autumn-colored trees. In the distance, a bridge spans the river, and more buildings are visible on the banks. The sky is overcast with grey clouds.

Skagit River General Investigation

***Board of County Commissioners
Status Update
11/12/13***

An aerial photograph showing a large body of water, likely a reservoir or a flooded area, with a dam structure visible on the right side. The surrounding landscape includes green fields, trees, and some buildings in the distance. The image is overlaid with a semi-transparent white box containing text.

General Investigation Presentation Outline

- Overview
- Purpose
- Corps Planning Process
- Alternative Development
- Comparison Criteria
- Next Steps

General Investigation Overview

- Phases
 - Reconnaissance
 - Feasibility
 - Pre-Construction Engineering and Design
 - Construction
 - Operation and Maintenance
- Goal
 - Reduce flood damages and risks to life safety over the 50 year project life

An aerial photograph of a river basin, showing a large dam structure across the river. The surrounding area includes green fields, residential buildings, and some industrial structures. The image is slightly faded to serve as a background for the text.

General Investigation Purpose

- Evaluate Flood Problems in the Basin
- Formulate, Evaluate, and Screen Solutions
- Recommend a Plan to Address Problems
 - Technically Viable
 - Economically Sound
 - Supported by local jurisdictions
- Integrated Feasibility Report/EIS
 - Alternative Formulation Process
 - NEPA Evaluation of Alternatives



General Investigation USACE Planning Process

- SMART Planning
 - Reset, February 2012 Memo
 - Skagit GI transitioned in August 2012
- Six-step planning process:
 1. Identify problems & opportunities
 2. Inventory & forecast conditions
 3. Formulated alternative plans
 4. Evaluate alternative plans
 5. Compare alternative plans
 6. Select a plan



General Investigation USACE Planning Process

- Phases and Milestones
 - Scoping
 - Alternatives Milestone
 - Alternative Evaluation & Analysis
 - Tentatively Selected Plan (TSP) Milestone
 - Feasibility-Level Analysis
 - Agency Decision Milestone
 - Final Report Milestone
 - **Chief's Report**
 - **Chief's Report Milestone**

General Investigation

Basin Flooding

- 1% ACE
 - 100-yr Flood
 - 225,400 cfs at Concrete Gauge
 - **Approximately 45'** at Concrete Gauge
- 4% ACE
 - 25-yr Flood
 - 165,300 cfs at Concrete Gauge
 - **Approximately 42'** at Concrete Gauge
 - Approximate level of lower basin protection
- Recent Floods (Concrete Gauge)
 - 2003 (10/21)
 - **42.21'**
 - 166,000 cfs
 - 1995 (11/29)
 - **41.57'**
 - 160,000 cfs
 - 1990 (11/10)
 - **40.20'**
 - 149,000



- | | |
|--------------------------|----------------------------------|
| Public Facilities | Infrastructure facilities |
| Airport | Petroleum |
| City Hall | Sewer |
| Emergency Services | Water |
| Fire Station | Ag Chemicals |
| Hospital | Petroleum Line |
| Police Station | Railroad |
| School | Floodzone |
| Water Lines | 100 year Flood area |

Infrastructure at Risk in Floodplain



An aerial photograph of a wide, muddy river valley. In the background, a large dam spans across the river. The surrounding landscape is a mix of green fields, trees, and some buildings, with a hazy sky above. The image is used as a background for the text.

General Investigation Alternative Development

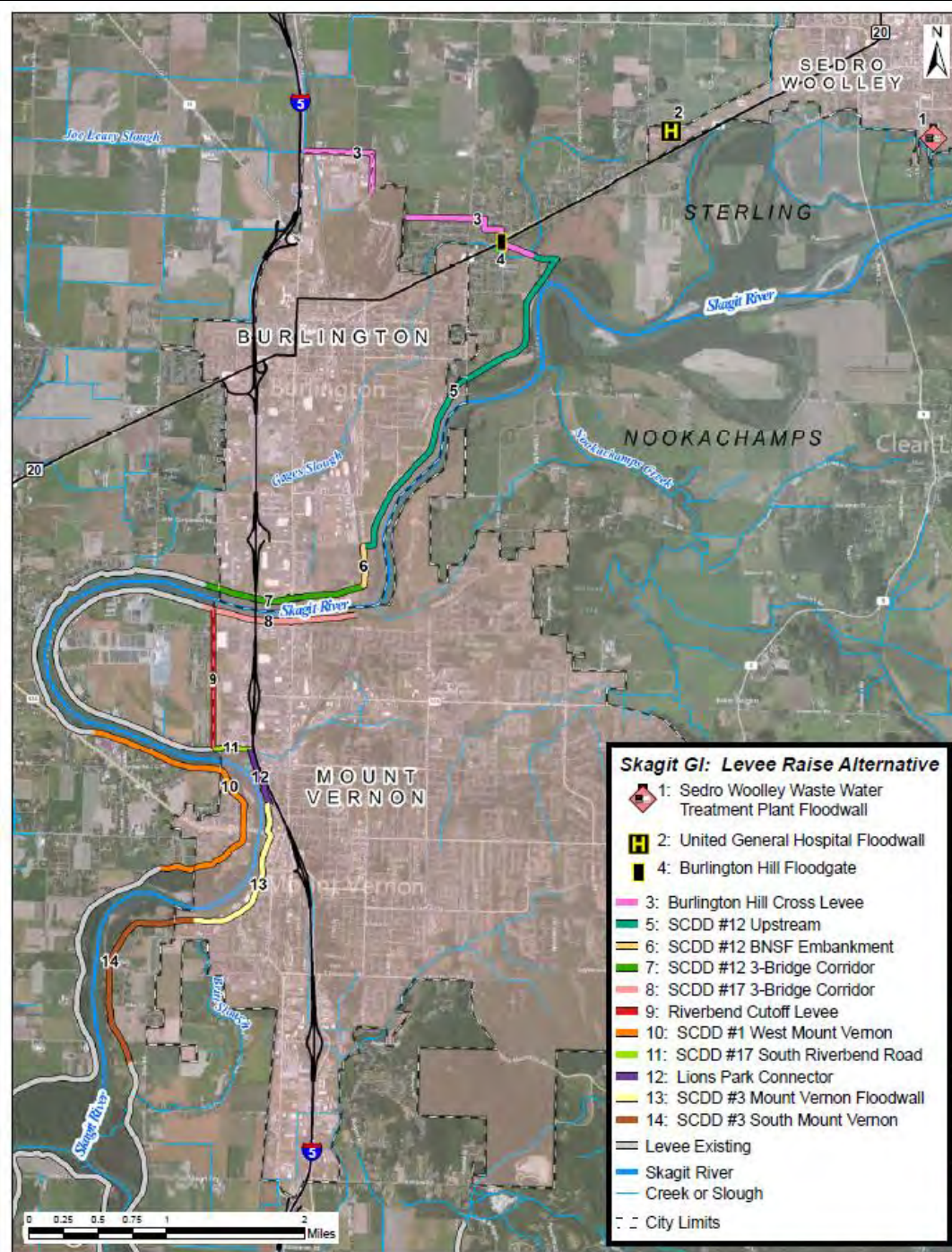
- Management Measures
- Preliminary Array of Alternatives
- Final Array of Alternatives
 - No Action
 - Swinomish Bypass
 - Joe Leary Slough Bypass
 - Comprehensive Urban Levee Improvement
- Measures in Common Amongst Alternatives
 - Baker Project Dam Storage
 - Site-specific floodwalls/levees, e.g. SWWWTP
 - Non-structural, e.g. Flood Warning, Gauges, Real Estate

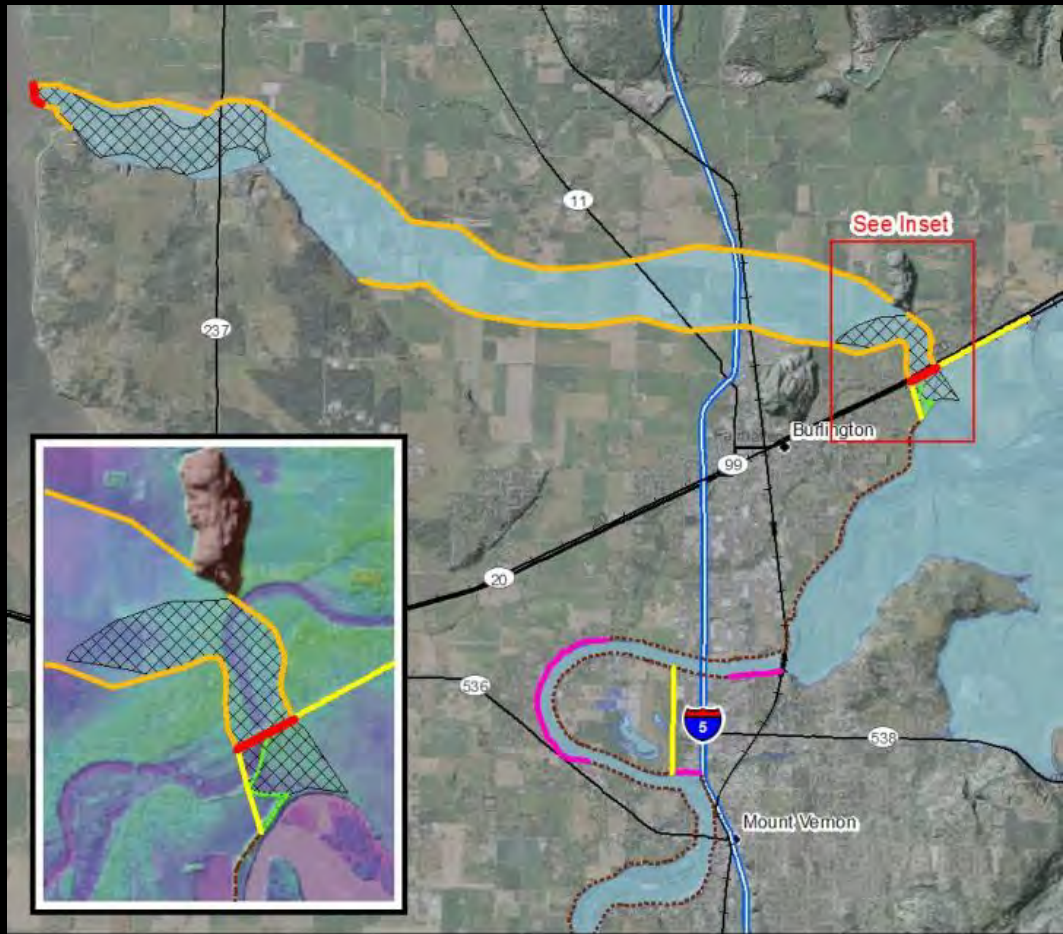


General Investigation

Baker Project Dam Storage

- Existing Hard Storage
 - 74,000 Acre Feet at Upper Baker on 11/15
- Additional Hard Storage Opportunity
 - FERC License 2008 107 (a) & 107 (b)
 - 74,000 AF at Upper Baker on 10/15
 - Up to 29,000 AF at Lower Baker on 10/1
- Annualized Cost
- Annualized Benefit





Project Elements

-  Control Structure
-  New River Levee
-  New Bypass Levee
-  Remove Existing Levee
-  Upgrade Existing Levee
-  Existing River Levee
-  Excavation Area

Joe Leary Slough Flood Bypass Channel: Wide Confinement Variant

DRAFT



Northwest Hydraulic Consultants | project no. 200074 | 03-Apr-2013

Notes: Upgrade existing levee required where flood levels are above 15% PFP elevation. Approximate 100-yr no-breach flood inundation limits shown.



Project Elements

- Control Structure
- Improve Existing Levee
- New Bypass Levee
- New Sea Dyke
- - - - Remove Existing Levee
- New Burlington Horseshoe Levee
- Restoration Area
- · - · - Existing Levee

**Swinomish Flood Bypass:
Wide Variant**

DRAFT



Northwest Hydraulic Consultants

project no. 200074

16-Apr-2013

An aerial photograph of a river system, likely the Mississippi River, showing a mix of urban development, agricultural fields, and natural vegetation. The river flows through the center, with various structures and roads visible on both banks. The image is used as a background for the presentation slide.

General Investigation Alternative Comparison Criteria

- Life Safety Risk Reduction
 - All three action alternatives provide equal level
- Economic Damage Reduction
 - All three action alternatives designed for 1% ACE protection to urban areas
- Least Impacts to Agricultural Resources
- Least Impacts to Environmental Resources
- Construction and O&M Costs
- Acceptability to Sponsor and Public

An aerial photograph of a wide river, likely the Mississippi River, with a large bridge spanning across it. The surrounding area includes urban development, green fields, and some industrial structures. The image is slightly faded to serve as a background for the text.

General Investigation Alternative Comparison

- No Action Alternative
 - Future Without Project Condition
 - Does not reduce risks to life safety
 - Does not reduce economic damages
 - Least construction costs
 - No transfer of risk
 - Required by NEPA
 - Baseline to compare action alternatives against



General Investigation Alternative Comparison

- Comprehensive Urban Levee Improvement
 - Requires approx. 3 miles of new levee
 - Improvements of approx. 8 miles of existing levee
 - Raising and Widening
 - Requires the least amount of construction materials
 - Least amount of real estate acquisition
 - Lowest impact to agricultural lands

An aerial photograph showing a slough bypass project. A road, likely I-5, runs horizontally across the middle of the image. Below the road, a waterway flows. To the right of the road, there are several buildings and a parking lot. The background shows a large body of water, possibly Padilla Bay, and some distant structures. The overall scene is a mix of natural waterways and developed land.

General Investigation

Alternative Comparison

- Joe Leary Slough Bypass
 - Diverts RB upstream of Burlington to Padilla Bay
 - Approx. 2,000 ft wide, 9 mi long, 18 mi new levee
 - 4% chance of being used any given year
 - Mechanical and fuse-plug gate inlet at Sterling
 - Most impact to agricultural land
 - Highest cost compared to other alternatives
 - Major crossings: I-5, SR-20/11, BNSF, Pipelines



General Investigation Alternative Comparison

- Swinomish Bypass
 - Diverts RB d/s of Burlington to Swinomish Slough
 - Approx. 2,000 ft wide, 7 mi long, 14 mi new levee
 - Spill continues at Sterling
 - 4% chance of being used any given year
 - Mechanical and fuse-gate inlet at Riverbend
 - Less impact to Agricultural land than JLS
 - Less cost of construction than JLS
 - Major Crossings: SR-536, Pipeline



General Investigation Timeline

- Fall 2013 Alternative Analysis
- Fall/Winter 2013: Tentatively Select Plan
- Winter/Spring 2014: Public Review
 - NEPA Formal Comment Period (45 days)
- Spring/Summer 2014: Agency Decision Milestone
- Fall 2014: Submit Final Draft Integrated FR/EIS
 - Feasibility-Level Design
- **Spring 2015: Chief's Report**
 - Congressional Project Authorization