IMPLEMENTATION ADVISORY GROUP MEETING

February 1, 2021

DEPARTMENT OF ECOLOGY
State of Washington
OFFICE OF CHEHALIS BASIN

MEETING AGENDA

- Continue discussion of issues regarding a floodplain acquisition program in the Chehalis Basin
- Continue discussion on potential options for structural flood protection
- Revisit potential implications and actions for floodplain management

IAG MEETING SCHEDULE

Meeting #7: February 11, 2021

- Acquisition program, erosion issues, implications and feasibility for potential structural (e.g., levees, floodwalls, etc.)
- Land use recommendations, discussion and follow-up from meetings

Meeting #8: February 22, 2021

- Joint meeting with Technical Advisory Group

FLOODPLAIN ACQUISITION PROGRAM

QUESTIONS FOR IMPLEMENTATION ADVISORY GROUP

- What conditions in the Chehalis Basin are present or not present that increase or decrease the likelihood for an opportunistic acquisition program across dispersed areas?
- What conditions in the Chehalis Basin are present or not present that increase or decrease the likelihood for an acquisition/relocation program to significantly reduce at-risk structures in strategic locations? Are there locations where the potential is greater?

POTENTIAL BENEFITS OF ACQUISITION PROGRAMS

- Move residents, businesses, and critical infrastructure out of harm's way;
- Restore natural habitat and increase ecosystem benefits, including floodplain storage (depending on whether area acquired has potential to provide ecosystem benefits);
- Reduce and/or eliminate future costs associated with flood damage or extreme weather events; and
- Increase FEMA Community Rating System credit points and reduce insurance rates.

DIFFERENT STRATEGIES FOR ACQUISITION PROGRAMS

- Whether an acquisition program approach proactively seeks acquisitions and relocation to reduce all or most at-risk structures in certain strategic areas and/or…
- Responds to acquisition requests across a dispersed area.

DRIVERS AND INCENTIVES

- The frequency, time since recent damage, and extent of damage
- Community and individual awareness and level of concern in contrast to other pressing issues of risk
- Financial incentives (in addition to purchasing a property at market value)
- Clear, tangible benefit for moving

OUTREACH, COMMUNITY ENGAGEMENT, & LEADERSHIP

- Community outreach, involvement and education critical components to determine interest and acceptance.
- Property owners need to understand risks, have a clear picture of the future, feel confident that selling/relocating will benefit them and their families, and have a stake in what their property becomes.
- Supportive and engaged leaders at every level of government and throughout the community.

IMPLEMENTATION ISSUES

- How land is managed once it's acquired will depend on the types of acquisitions.
- Requires long-standing, institutionalized programs that do not sunset unless a specific goal is achieved. The resources needed to manage an ongoing program include staff with diverse skillsets who can fill multiple needs associated with buyouts and potential relocation.

RELOCATION CONSIDERATIONS

Must plan for:

- Availability and acceptance of relocation;
- Housing opportunities;
- Discrepancies in cost of living;
- Adequate access to high-quality infrastructure and services (e.g., schools)

CHALLENGES AND BENEFITS

The challenges and benefits associated with an acquisition program vary based on:

1. Whether an acquisition program approach proactively seeks acquisitions to reduce all or most of at-risk structures in certain strategic areas and/or…
2. Responds to acquisition opportunities across a dispersed area.
3. Whether relocation is a component of the program.

OPPORTUNISTIC PROGRAM ACROSS DISPERSED AREA

- Relative ease to administer
- Current available and recent examples of acquisition in Chehalis Basin
- Uncertain when and how many property owners will be interested
- Interest surges immediately after damage, difficult to respond if damage is widespread, unless funding and administration can be scaled quickly
- Can address individual needs on a case-by-case basis across jurisdictions
- Relocation not required for success but added incentives will increase interest

REDUCE ALL OR MOST OF AT-RISK STRUCTURES IN CERTAIN STRATEGIC AREAS

- More upfront, longer process
- Requires master planning
- Requires significant engagement of landowners and residents
- Identify relocation opportunities
- Address equity issues
- Upfront costs for infrastructure
- Most significant benefits

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STRUCTURAL OPTIONS FOR FLOOD DAMAGE REDUCTION

BOARD DESIRED OUTCOMES

- **X percent of all structures in each county that could be flooded by the 2080 predicted 100-year flood levels in the basin would no longer be vulnerable to flood damage…** (Outcome 1: Valuable structures protected from mainstem, catastrophic flooding).
- **X percent of all critical facilities that could be flooded by 2080 predicted 100-year flood levels would no longer be vulnerable to flood damage…** (Outcome 5: Critical Facilities Protected).
- **A substantial reduction in the overtopping and closure of Interstate 5 (I-5) and the BNSF rail mainline would be achieved for 2080 predicted 100-year flood levels…** (Outcome 6A: Transportation routes protected).
- **A substantial reduction in the closures of State Highways 6 and 12 due to flooding would be achieved, and alternative routes would be available…** (Outcome 6C: Transportation routes protected)

WSDOT FLOOD REDUCTION STUDY

FLOODPLAIN MANAGEMENT RECOMMENDATIONS / LAND USE IMPLICATIONS

QUESTIONS FOR IAG

- What additional information or issues should the Chehalis Board consider in deciding to recommend the use of flood of record, modeled current 100-year flood, modeled current 500-year flood, or the 2080 flood prediction?
- Do you think more is needed to ensure new lots are not created in rural floodplain areas? If so, what?
- Do you think more is needed to ensure low densities (1/20 or 1/40) in rural floodplain areas? If so, what?
- What additional information or issues should the Chehalis Board consider in deciding to recommend use of zero rise and compensatory storage?
- What, if any, other incentives should be considered in addition to an Acquisition Program?

FLOODPLAIN MANAGEMENT PRIORITY RECOMMENDATIONS

- 2080 vs Flood of Record
- Subdivision – Prevent new lots wholly in floodplain
- Low Density Zone – Rural 1/20
- Zero Rise and Compensatory Storage
- On-site Water/Sewer in Rural Areas (further research)
- Incentives = Development Rights/Acquisitions (discussed in Acquisition Programs)

2080 VS FLOOD OF RECORD

- Flood of Record (FOR) or Current Conditions 100 year
  - FOR used by many Chehalis gov'ts, either as requirement or advice to owners/developers
  - Similar land area to 2080
- 2080
  - Difficult to sell so far out in the future
  - Use to inform (not regulate) owners/developers, consider in planning
  - May be easier to use 500 year
- Biden Executive Order
  - Science to determine future flood conditions
  - Infrastructure and buildings to be able to handle the 500-year flood

SUBDIVISION – NO NEW LOTS WHOLLY IN FLOODPLAIN

- Potential recommendation: no new lots created wholly in floodplain
- Most require buildable site on lot and discourage new lots wholly in floodplain unless subdivision is wholly in floodplain (rare in rural areas but common in existing urban)
- Buffer requirements for critical areas limit building locations
- Most allow clustering but infrequently used, also constrained by on-site water/sewer requirements, may encourage narrow lots
- Requirement of subdivision may not translate to building permit

LOW DENSITY ZONING 1/20

- Doesn’t make sense or may not be allowed in urban areas
- Three counties are predominately 1/20 or 1/40, especially ag zones in floodplains
- Zoning can change, should consider requiring property/development rights to protect ag and forest, flood damage and aquatic species (Skagit strategy used development rights)

ZERO RISE AND COMPENSATORY STORAGE

- Most require but with flexibility (how it is calculated or where the rise is)
- Need simple approach for determining if single residential or small commercial development

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QUESTIONS?

STRUCTURAL OPTIONS FOR FLOOD DAMAGE REDUCTION

USACE STUDIES

- USACE study 2003 – Authorized in 2007
- USACE design phase and re-evaluation of authorized project after 2007 and 2009 floods; provided wrap-up report in 2012 (study was terminated as it was no longer economically justified)

USACE 2003 AND 2012 BASELINE HYDROLOGY

Location	USACE 2003 Predicted 100-year flood	USACE 2012 Updated 100-year flood	WSE 2080 Predicted 100-year flood (26%)	WSE 2080 Predicted 100-year flood (50%)[1]
Chehalis near Grand Mound	74,300	77,844	102,200	128,600
Skookumchuck near mouth (or Bucoda)	13,000 (10,400)	13,200	(19,500)	(23,300)
Newaukum near Chehalis	13,800	14,995	18,500	22,000

1 – Using universal 50% increase, not spatially distributed increase (forthcoming)

USACE 2003 ALTERNATIVES CONSIDERED

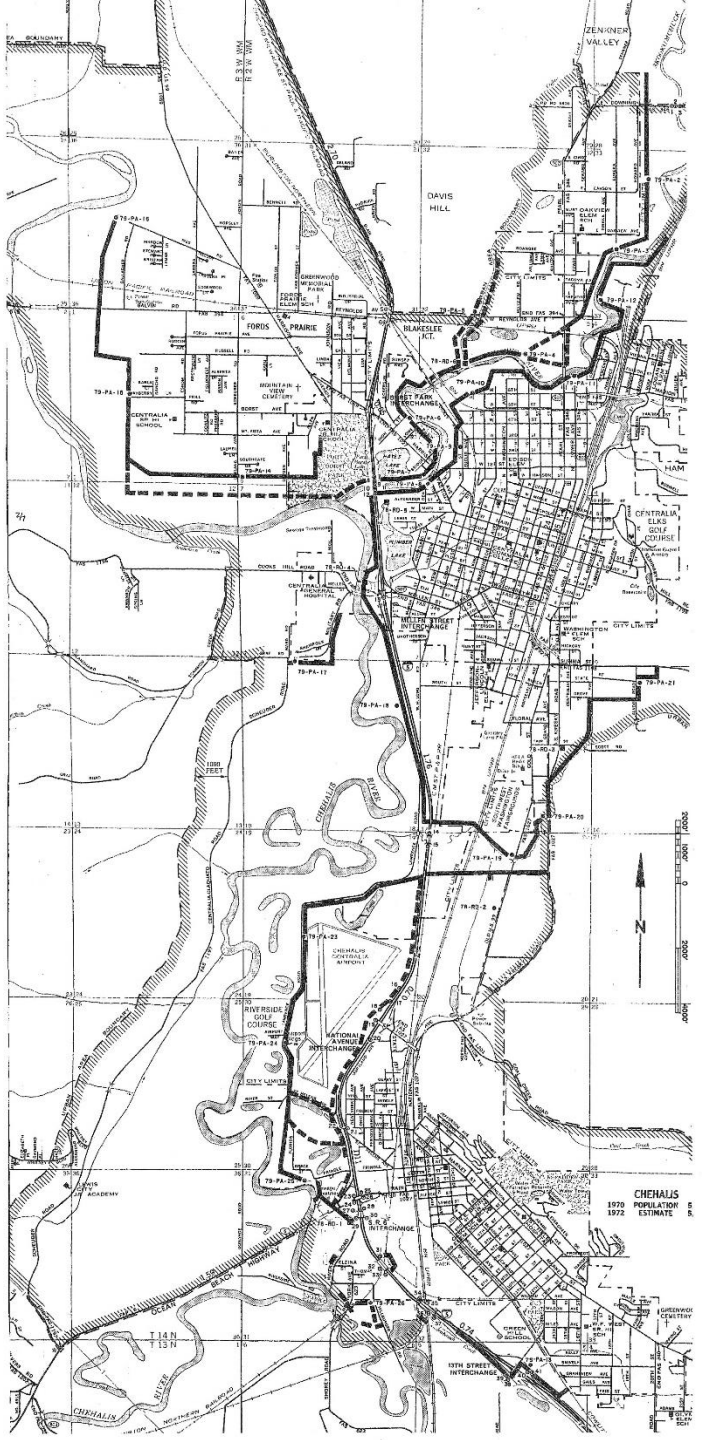
- Preliminary Alternatives
  - No- Action Alternative
  - Skookumchuck Dam Modifications Alternative (20,000 ac-ft of storage)
  - Overbank Excavation and Flowway Bypass Alternative (Hwy 6/Scheuber Ditch and Mellen Street bypasses and berm)
  - Levee System Alternative
  - Flow Restrictors Alternative (up to 20 foot high structures in one or more locations, mainstem, SF Chehalis, Lincoln, Salzer, and Stearns creeks)
  - Non-Structural Alternative
  - Interagency Alternative (floodplain regulations, flood warning system, floodplain connectivity, maintain upland vegetation cover, flood audits, stormwater management, raise roads and I-5, airport levee/culvert drainage improvements, flood storage, Hwy 6/Scheuber bypass, overbank excavation downstream of hump, Skookumchuck storage)

MORE DETAILED ALTERNATIVE ANALYSIS

- Final Alternatives
  - No- Action Alternative
  - Skookumchuck Dam Modifications Alternative (11,000 or 20,000 ac-ft of storage)
  - Overbank Excavation and Flow-way Bypass Alternative (Hwy 6/Scheuber Ditch and Mellen Street bypasses only)
  - Levee System Alternative
  - Interagency Alternative

USACE PROPOSED PLAN

- Skookumchuck Dam Modifications (20,000 ac-ft)
- Chehalis River Levees (100-year protection, includes Salzer and Dillenbaugh)
- Skookumchuck River Levees (100-year protection)
- Life-cycle cost of $113 million
- *Further analysis required for interior drainage, China Creek, Skookumchuck Dam stability*



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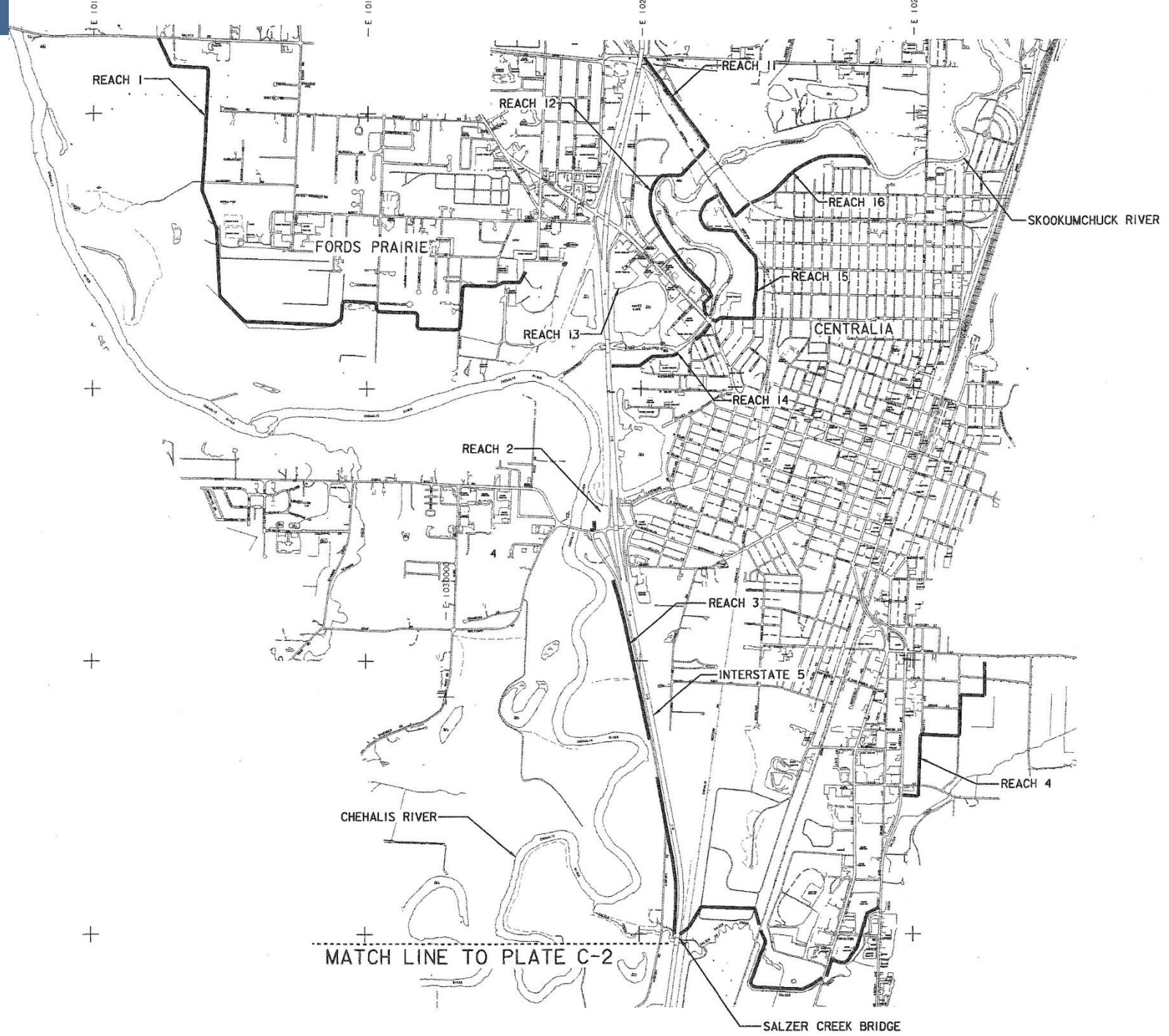

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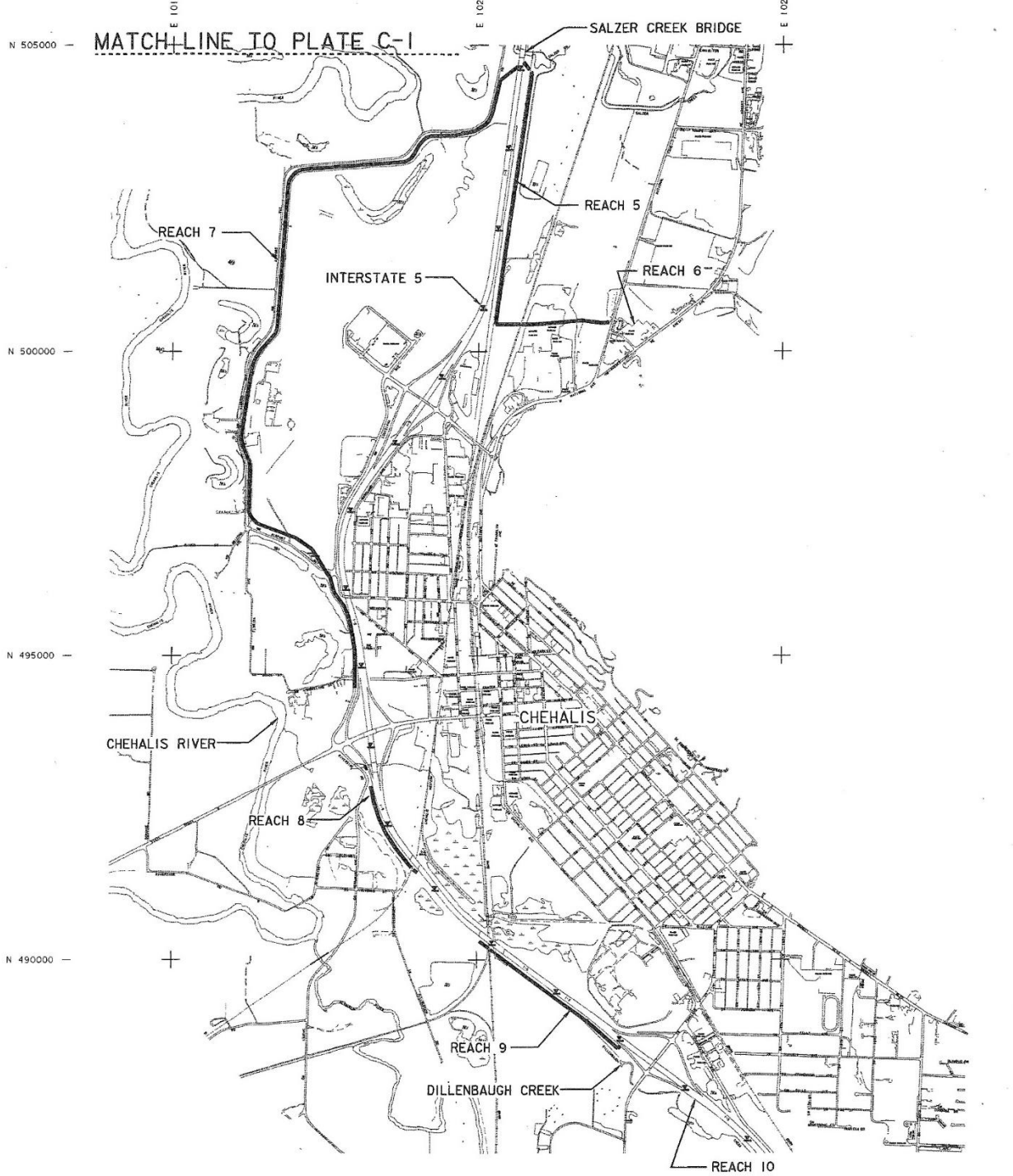

2011/2012 USACE EFFORT

- Design phase
  - Updated hydrology after 2007, 2009 floods
  - New economic analysis
  - Plan did not provide 100-year protection for I-5 with sufficient certainty, but did not estimate additional costs required to protect I-5
  - Levees and floodwalls would need to be higher (~20% greater volume of material)
  - Would have increased flooding upstream and downstream to many more structures and properties
  - Some proposed levees could be realigned to minimize wetland and other impacts
  - Determined that cost:benefit ratio was no longer greater than 1
  - Rejected by local community
  - Study was terminated in 2012

LOCAL STRUCTURAL FLOOD DAMAGE REDUCTION ACTIONS

EXPANDED LIST OF PRIORITY AREAS FOR CONSIDERATION

1. Adna
2. Lower Newaukum
3. Airport Levee/Chehalis
4. Centralia
5. West Centralia
6. Military Road
7. Galvin
8. Independence Road and north floodplain
9. Oakville
10. Elma (south and west, Monte-Elma Road)
11. South Aberdeen Levee Area
12. East Aberdeen
13. Bucoda
14. Grand Mound

RANKING ELEMENTS FOR PRIORITY AREAS

1. How many structures could potentially be protected by a local facility?
   - High = >200;
   - Medium = 50-199;
   - Low = <50
2. Is there any major infrastructure or critical infrastructure present in the priority area?
   - High = Yes;
   - Medium or Low = No (in concert with number of structures)
3. What is the relative number of structures protected per mile of facility such as a levee?
   - High = > 100/mile (<50/mile if significant number of businesses);
   - Medium = 25-100/mile;
   - Low = <25/mile
4. What are the relative number of structures that might be negatively impacted by a local flood protection facility, and would need floodproofing or relocation?
   - Low = <20;
   - Medium = 20-99;
   - High = >100

RANKING ELEMENTS (CONT.)

5. Is there a high likelihood of adverse direct impacts to wetlands, waterbodies or other natural habitats from a local facility (e.g., if filling in a wetland were required)?
    - Low = None or semi-developed (e.g., agricultural, etc.);
    - Medium = Riparian or shoreline, or low-quality wetlands;
    - High = Known moderate-high quality wetlands or waterbodies, plus other habitats such as riparian

6. What else could be affected upstream or downstream from actions taken in this reach? (no rating, to be determined what else could be affected)

LOCATION	NUMBER OF STRUCTURES IN SELECTED AREA[1]	MAJOR/CRITICAL INFRASTRUCTURE PRESENT IN MODELED 2080 FLOODPLAIN?[2]	STRUCTURES AFFECTED OUTSIDE PROTECTED AREA	IMPACTS TO NATURAL ENVIRONMENT	RELATIVE BENEFIT PER MILE OF FACILITY	RATING
3. Airport Levee and Chehalis	High (215)	I-5, airport Washington State Patrol	High (>100)	Medium (wetlands, Dillenbaugh Cr.)	High (~4 miles [>1 mile existing])	**High**
4. Centralia	High (5,527)	Radio stations Valley View Health Center Washington Elementary School Centralia Community College Centralia Police Centralia City Light BPA Power Plant	High (>100)	High (wetlands, Skookumchuck and Salzer riparian)	High (~5 miles)	**High**
5. West Centralia	642 (High)	Centralia High School	Medium (>25)	Low (agricultural, park)	High (~2 miles)	**High**
11. South Aberdeen	High (1,203)	Stevens Elementary School	Low (<20)	Low (existing levee raise, pump station)	High (~2 miles existing)	**High**
13. Bucoda	High (260)	Water supply infrastructure	Low (<20)	Medium (Skookumchuck riparian)	High (~1 mile)	**High**
1. Adna	Medium (83)	High school Lewis County special education Highway 6	Low (<20)	Medium (Chehalis riparian)	Medium (~1.5 miles)	**Medium**
7. Galvin	Medium (87)	None identified	Medium (>25)	Low (agricultural, residential)	Medium (~1.5 miles)	**Medium**
9. Oakville	Medium (172)	None identified	Low (<20)	Low (residential)	Medium (~1 mile)	**Medium**
10. West Elma	Medium (148)	Highway 8 Elma High School	Low (<20)	Low (highway raise)	Medium (~2 miles)	**Medium**
12. East Aberdeen	Low (4; all commercial)	Highway 101	Low (<20)	Medium (Estuary shoreline)	Medium (~1 mile)	**Medium**
14. Grand Mound	Medium (168)	None identified	Low (<20)	High (wetlands, oxbows)	Medium (~2 miles)	**Medium**
2. Lower Newaukum	Low (20)	None identified	Low (<20)	Low (agricultural, residential)	Low (~1 mile)	**Low**
6. Military Road	Low (34)	Providence Centralia Hospital Valley View Health Center	Medium (>25)	Low (residential)	Low (~2 miles)	**Low**
8. Independence Road / north	High (306)	Highway 12	High (>100)	High (wetlands, oxbows)	Medium (~4 miles)	**Low**