



Skagit Flood Control Zone District Dike and Drainage Technical Committee Meeting

Tuesday, April 7, 2009; 4:00 p.m. – 6:30 p.m.

Location: Dike District # 12 – 1317 Anacortes Street, Burlington

Meeting Agenda and Notes

Meeting Purpose: Conduct normal business and complete task assignments as requested at February 18th Advisory Committee meeting. 1) Review Fatal Flaw and Project Screening Criteria document and provide input; 2) Review previous application of “level 1” criteria to Skagit GI Measures; 3) identify additional potential projects; and 4) provide suggestions for alternatives.

Pre-4:00 pm Sign in

4:00 pm Introductions / Roll Call (sign-in) and Meeting Purpose

Attendees: Chuck Bennett, Dike, Drainage and Irrigation District 12; Daryl Hamburg, Dike District 17; Dave Olson, Dike District 3; Gary Jones, Dike District #3 & 22; Dave Towne, Britt Slough SFCZ District; Jason Vanderkooy and Don Moe, Dike District 1; Stan Nelson, Dike District 22; Leonard Eliason, DD # 17; David Hedlin, Dike District 9; Brian Olson, Drainage and Irrigation District 17; Tom Slocum, Skagit Conservation District; Chal Martin, City of Burlington; Mike Rutleg for Mike Shelby, Western Washington Agricultural Association; Ronald Knutzen, Dike, Drainage and Irrigation District 5; Amy Gibbons for Linda Smith, USACE; and Lorna Ellestad, County staff. was excused.

Absent: Dean Flaig, Drainage District 21; Robert Swanson, Dike, Drainage and Irrigation District 20; Cathy Desjardin, USACE; John Shultz, Dike District # 1; Annie Lohman, Agriculture Advisory Board.

4:05 pm # 1 - Approve meeting notes from March 3rd meeting. (attached)

1 - These minutes were approved below) from March 3rd meeting. In attendance: Chuck Bennet, DD #12; Ron Knutzen, DD#5; Mike Shelby WWAA; Amy Gibbons, USACE; Lorna Ellestad, SC/PW. Daryl Hamburg was excused.

Clarification of Dike and Drainage Technical Committee Level One – Screening Criteria

Green highlight is from AC meeting

Yellow highlight is the response from the DD TC

1. Does the project maintain or improve public safety and critical infrastructure protection relative to existing flood risk? In particular, does the project: *(Dike and Drainage Technical Committee: Define “maintain” and reason for including this word. AC questioned “maintain” which was interpreted to be no improvement from status quo)*

Maintain: No less than existing level of flood risk protection. No project can reduce the existing level of flood risk protection for a given area.

a. Reduce the potential for levee failures?; and/or

b. Increase conveyance efficiency of the existing levee system?; and/or

c. Reduce the risk of catastrophic failure due to inadequate interior drainage?

2. Can the project be implemented without increasing the flood risk upstream and downstream of the project area? If no, can the increased risk be addressed (redesign) and/or mitigated?

3. Can the project maintenance and operations be sustained locally. (Dike and Drainage TC – Please define “sustained”. What does this mean specifically?)

Sustained: i.e. the cost of permitting, repair, mitigation. As in “to support the weight of “permits” for maintenance”. Can the weight of the project maintenance and operation be supported locally? Programmatic resolution of ESA issues would help.

4. Does the project avoid adverse impact on soils and drainage in agricultural resource lands, except as pertains to implementation of flood hazard reduction measures (including related ecosystem restoration goals)? Get it in writing....

In writing: “Review project for consistency and eligibility for credit towards 2700 acre recovery goal. Part of the eligibility requirement would be determining the level of credit applied ie acre for acre or some other ratio of credit depending on habitat type and location. The make up of the “steering committee” is provided for in the “Skagit Delta Tide Gates.....Initiative”.

No net loss of farmland. Could Urban Growth Areas be used to balance the loss of farmland to projects?The group requested the verbiage for the 2,700 acre salmon recovery goal which was provided by Mike Rundlett below: This is a short excerpt from the Executive Summary. (Full text is available)

SKAGIT DELTA TIDEGATES AND FISH INITIATIVE SIGNATURE DRAFT - MAY 28, 2008

IMPLEMENTATION AGREEMENT/EXECUTIVE SUMMARY E - 2

A Memorandum of Understanding (MOU) has been developed between Western Washington Agricultural Association, NMFS and WDFW (Appendix E), hereafter referred to collectively as the Parties, to support the development of this Implementation Agreement. This Agreement will facilitate the achievement of functional estuarine habitat restoration within the Skagit delta area in a manner that will result in the least possible impact to established agricultural lands in the Skagit Delta, and their related drainage infrastructure. The Implementation Agreement stipulates that up to 2,700 acres of delta agricultural lands may be converted to estuarine habitat, and that such conversion, when and where appropriate, will be undertaken in a manner consistent with the objectives of the Skagit Chinook Recovery Plan, as approved and adopted by NMFS in December 2006. In addition, the Implementation Agreement will facilitate the regulatory review process required to conduct maintenance activities on tidegate and floodgates under the ownership or control of the participating Drainage, Irrigation and Diking Districts. As a means to facilitate linkage between the permitting of tidegate and floodgate maintenance activities and the achievement of estuarine habitat restoration and smolt production goals, a clearly defined credit banking process will provide a system of checks and balances to assure that mutually supportive actions will occur in a timely and cooperative manner throughout the 25-year duration of this Agreement.

4:10 pm **Public Comments** – Introduced Amy Gibbons as the new Skagit GI project manager for Corps replacing Linda Smith.

Possible discussion on Levee repairs at end of regular meeting if there is an interest in doing so. Decision was made to convene month meetings with the Corps to discuss on-going levee repair issues.

4:15 pm **# 2 - Report out from DDTC Advisory Committee representatives attending 3/16 AC meeting and instructions for task assignments (below)**

2 - Meeting notes (7/4/09) Committee members would have liked to have received the updated version of document – E with information on ring dikes and bypasses included to reference while completing the AC task assignment.

4:30 pm # 3 - Complete Task Assignments – Annotated Assignments Handout – attached.

Stan Nelson, DD # 22, provided figures from the Tide gate initiative showing the locations of tidegates and floodgates within the Coverage area. (attached)

Chuck Bennett provide an article on the 2007 “Old Stilly Gate” located near Stanwood as an example of the type of project that could be constructed in the Skagit Delta. (attached)

Gary Jones provided a letter sent to Bob Scofield, Planning Director, in 1984, summarizing what appears to have been a FEMA mapping meeting held October 26, 1984. (attached)

Chal Martin, City of Burlington PW director, provided copies of two power point slides illustrating the BFEs with an improved levee in place, comparing the extent of the inundation area using the City’s hydrology and the Corps hydrology. The group asked questions and offered suggestions on how he could better represent the information. He plans to add an additional slide illustrating FEMA’s inundation area / BFEs under the “no levee” condition to his presentation at the next AC meeting.

Tom Slocum and others have together a field trip to both the Stilly tide gate and Ferndale for April 23rd.

5:30 pm Comment on Committee progress to date – Chuck

5:40 pm Next meeting dates / time (Summer schedule) - Chuck

5:50 pm Action Items

- Next Meeting – Date, Time and Location TBD
 - Dependent upon committee activities. Dates will be synchronized with proposed monthly Levee repair meetings with Corps.
- Any messages to AC from the Dike and Drainage District Technical Committee

Adjourn



**SKAGIT RIVER COMPREHENSIVE FLOOD HAZARD MANAGEMENT PLAN UPDATE
DIKE AND DRAINAGE DISTRICTS TECHNICAL COMMITTEE MEETING
Tuesday, April 7, 2009**

NAME	ENTITY	SIGNATURE
Bennett, Chuck	Dike, Drainage and Irrigation District 12	<i>Charles H. Bennett</i>
Dempsey, Brian	City of Burlington	
Desjardin, Cathy	U.S. Army Corps of Engineers	
Elliason, Leonard	Dike District 17	<i>Older</i>
Flaig, Dean	Drainage District 21	
Hamburg, Daryl	Dike District 17	<i>Daryl Hamburg</i>
Hedlin, David	Dike District 9	<i>David B. Hedlin</i>
Jones, Gary	Dike District 3 & 22, Jones and Smith	<i>Gary Jones</i>
Knutzen, Ronald	Dike, Drainage and Irrigation District 5	<i>Ron Knutzen</i>
Lohman, Annie	Agricultural Advisory Board	
Martin, Chal	City of Burlington	<i>Chal Martin</i>
Nelson, Stanley	Dike District 22	<i>Stan</i>
Olson, Brian	Drainage and Irrigation District 17	<i>Brian Olson</i>
Olson, David	Dike District 3	<i>DAVID OLSON</i>
Shelby, Mike	Western Washington Agricultural Association	<i>MR (for MS)</i>
Shultz, John	Dike District 1 & 12	
Slocum, Tom	Skagit Conservation District	<i>Tom Slocum</i>
Smith, Linda	U.S. Army Corps of Engineers	removed
Swanson, Robert	Dike, Drainage and Irrigation District 20	
Towne, Dave	Britt Slough SFCZ District	<i>Dave Towne</i>
Vanderkooy, Jason	Dike District 1	<i>Jason Vanderkooy</i>
<i>MCE, Don</i>	<i>Dike District #1</i>	<i>Donald D. McE</i>
<i>GIBBONS, AMY</i>	<i>USACE</i>	
<i>LORNA KJESTAD</i>		<i>Lorna Kjestad</i>
<i>C</i>		

ADVISORY COMMITTEE ASSIGNMENT TO TECHNICAL COMMITTEES

Assignments from March 16, 2009 Advisory Committee Meeting to Technical Committees:

Meet on an as-needed basis to do the following:

1. For new measure #38 – interior drainage, provide additional project concept information including map(s), project components, project benefits and concerns, and potential costs

Response:

A) See list of documents provided (email attachment).

Name	Size	Type
08 05 27 Tidegate Fish Initiative Working draft.pdf	6,144 KB	Adobe Acrobat Doc...
1984 11 01 FEMA LTR to Bob Scofield.pdf	291 KB	Adobe Acrobat Doc...
090410 Nookachamps 09 04 07 Measure - Request to FCZD A...	85 KB	Adobe Acrobat Doc...
09 01 25 Fwd Old Stilly Gate Press Release.doc.htm	42 KB	HTML Document
09 04 09 Basic Comparison 2 Hydrologic Analyses Corps Flo-2...	4,359 KB	Microsoft PowerPoi...
~\$ 03 16 TC Assignments- Notes.doc	1 KB	Microsoft Word Doc...
09 01 25 Stillaguamish Flood Control District.doc	152 KB	Microsoft Word Doc...
09 02 18 Doc E-1 - Measures Input.doc	241 KB	Microsoft Word Doc...
09 03-09 draft of 2-18-09 AC meeting.doc	53 KB	Microsoft Word Doc...
09 03 16 TC Assignments- Notes.doc	36 KB	Microsoft Word Doc...
09 04 07 DD TC Meeting Agenda - Notes.doc	334 KB	Microsoft Word Doc...
09 04 07 Nookachamps Option - Ltr to FCZD.doc	45 KB	Microsoft Word Doc...
Next Meeting Date and Assignment for Dike and Drainage Dist...	106 KB	Outlook Item

B) Members also mentioned other studies that include:

LBS Drainage Study dated 1984

Evaluation Areas Report completed by Tetra Tech for the County / Corps – 2002

HDR report dated 2008 (no other information on this report provided)

C) Group continues to request additional modeling (where does the water go and how much) before the this question can be answered.

D) Site visit planned for April 23rd. Trip summary attached.

2. For habitat restoration projects in upper basin, new project suggested by the ETC, provide additional project concept information including map(s), project components, project benefits and concerns, and potential costs

Response: NA

3. For City of Burlington Levee Certification project, provide additional project concept information including map(s), project components, project benefits and concerns, and potential costs

Response: Burlington's AC presentation to include "09 04 09 Basic ComparisonPPT.

4. Identify any additional local projects to include in measures screening

Response: Burlington Nookachamps letter requested by DD TC.

Note: AC requests TCs to aim for level and detail of presentation of Army Corps Powerpoint presentation for the Skagit GI Measures

Assignment Due: Submit to Tom Karsh by 5:00 p.m. on April 8, 2009

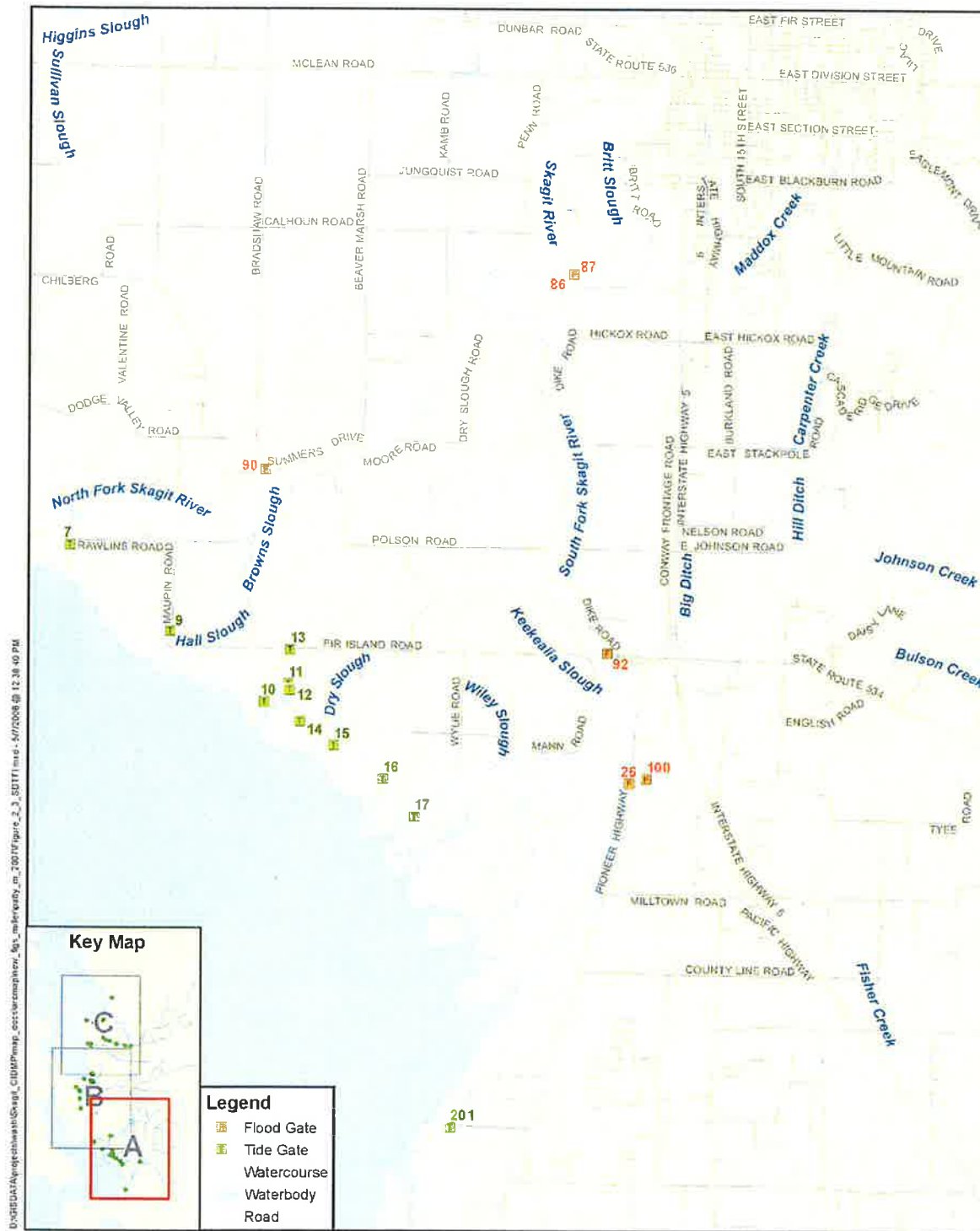
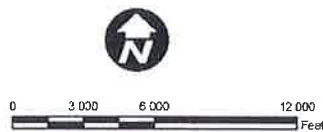


Figure 2-3A
Tidegates and Floodgates within the Coverage Area, By Site ID Number

May 2008
HDR



Skagit Delta Tidegates and Fish Initiative -
 Implementation Agreement May 2008

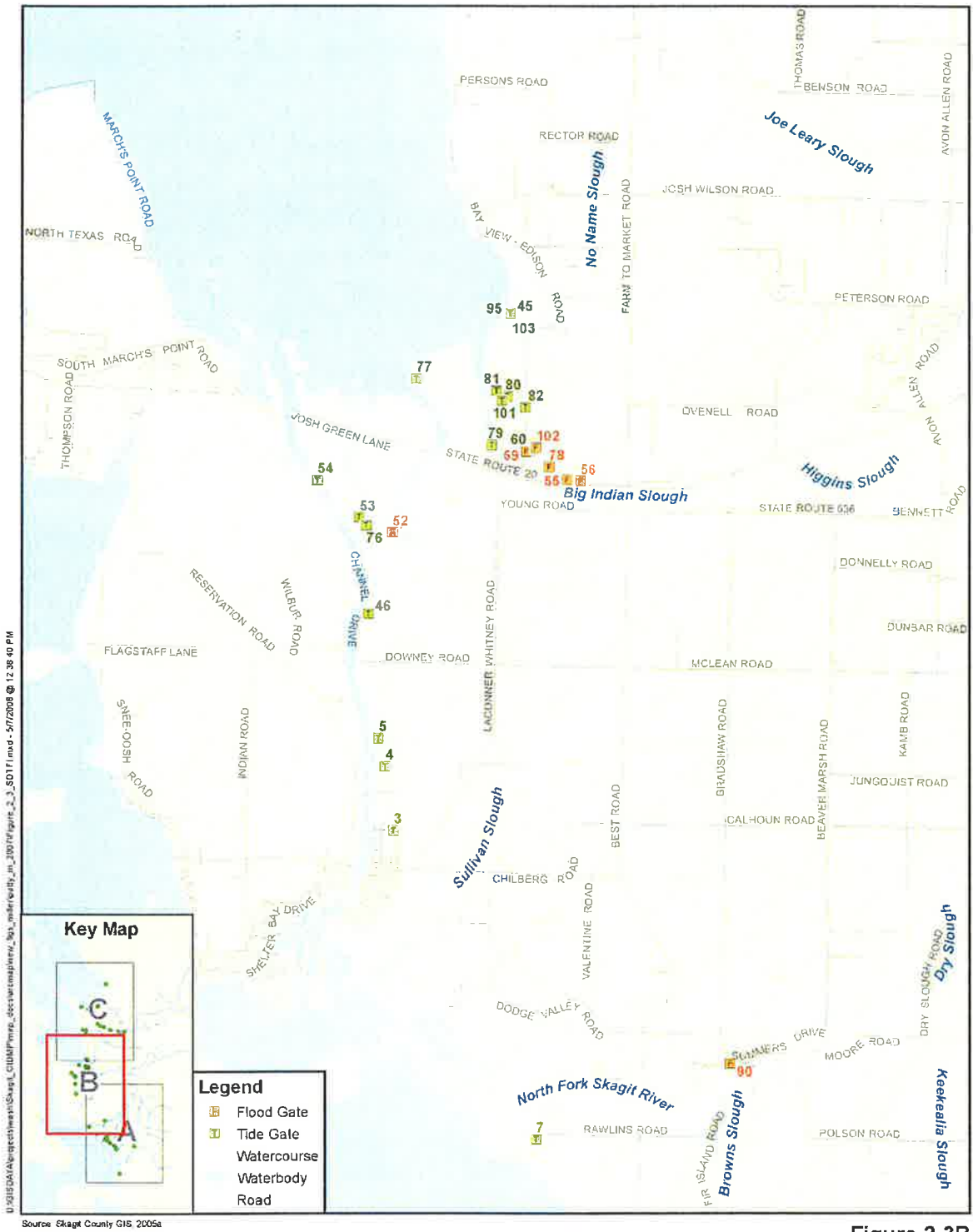
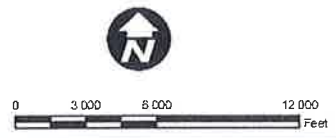


Figure 2-3B
Tidegates and Floodgates within the Coverage Area, By Site ID Number

May 2008
HDR



Skagit Delta Tidegates and Fish Initiative -
 Implementation Agreement May 2008

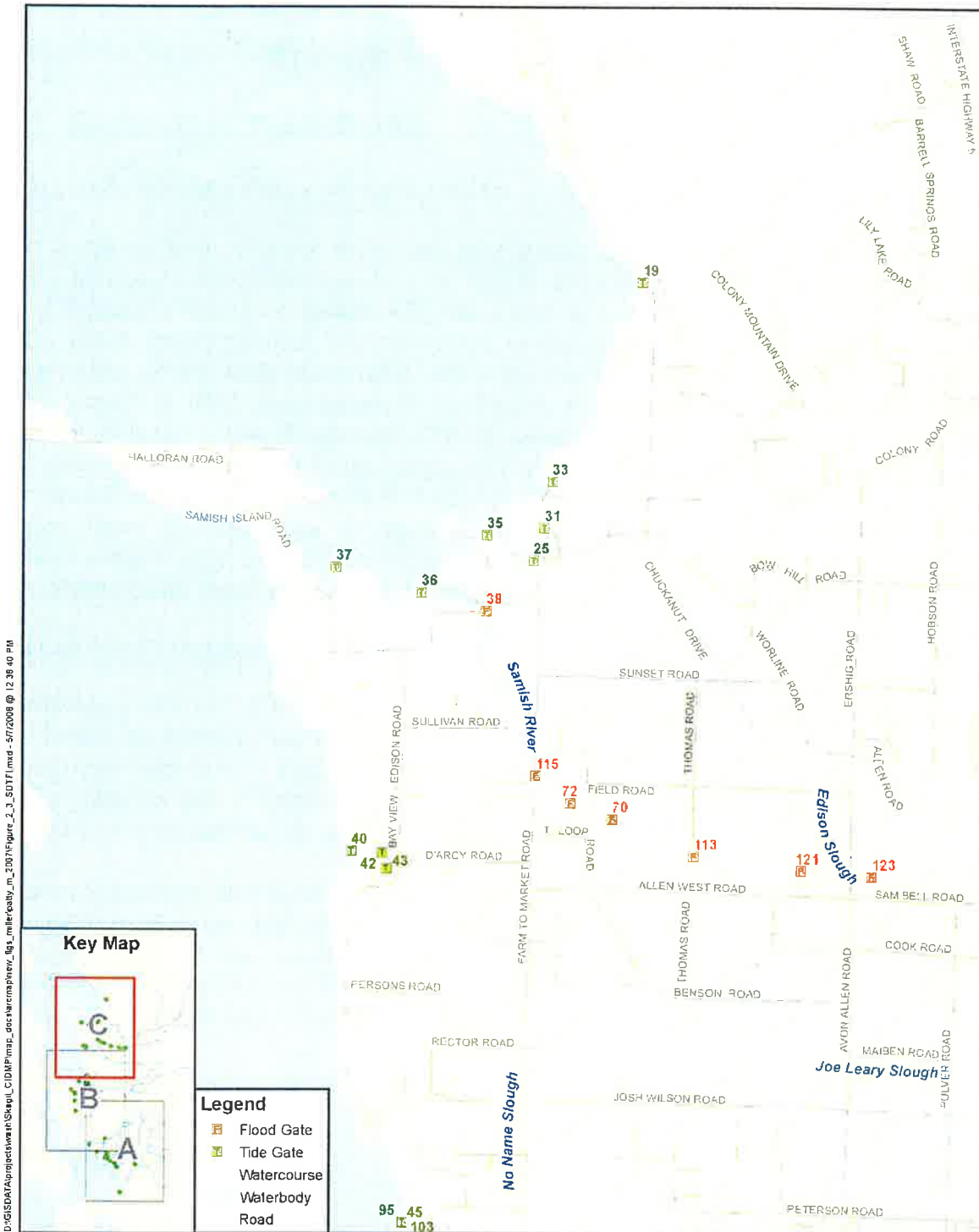
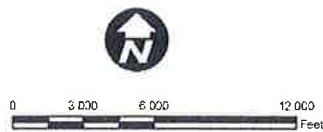


Figure 2-3C
Tidegates and Floodgates within the
Coverage Area, By Site ID Number

Skagit Delta Tidegates and Fish Initiative -
 Implementation Agreement May 2008





Federal Emergency Management Agency

Region X Federal Regional Center Bothell, Washington 98011

NOV | 1984

Bob Scofield, Director
Skagit County Planning Department
Skagit County Courthouse
205 Kincaid Street
Mount Vernon, Washington 98273

Dear Bob:

Following up our October 26, 1984 meeting in your office, enclosed are copies of three ordinances from other western Washington counties which require that new construction be built one foot above the base flood elevation. As I mentioned, most western Washington communities do make this requirement in their ordinances, and the enclosures are but a sampling of these communities. Following are reasons why the one foot of freeboard is so important:

1. Floodway/Flood Fringe Allowable Rise. The conventional analysis provided in flood insurance studies consists of a floodway and flood fringe making up the entire flood plain. Total encroachment is allowed within flood fringe areas on the condition that the floodway be kept free of encroachment, and if such encroachment in the fringe does occur, an allowable rise can also occur up to a maximum of one foot. In other words, a person building at the base flood elevation today may be subject to one additional foot of flooding in the future if and when someone encroaches on adjacent flood fringe property. The one foot of freeboard clearly accommodates this situation and has been suggested in model ordinances for the past 20 years.
2. Debris Jams and Other Unknown Blockages. Flood insurance studies do not recognize the existence of debris jams, log jams and the like, simply because they are not predictable. Because they cannot be predicted, they are not projected as conditions that would occur in a 100 year flood situation. However, as we all know they can occur and in all likelihood will occur, even though their location is not predictable. The one foot of freeboard serves to accommodate this kind of situation in many instances.
3. Flood of Greater than 100 Year Magnitude. The 100 year flood, which has been the standard not only of this agency but of virtually all Federal and State agencies through the years, is not, of course, the worst flood that can occur. Much worse floods can and often do occur; e.g., most of the damage wrought in the devastating Hurricane Agnes floods in 1972 were of a magnitude significantly greater than

the 100 year flooding that is depicted on all of our maps. If, for example, a 120 year flood were to occur along the Skagit, it is possible that significantly greater damage could occur, and the extra foot of freeboard also addresses this situation.

4. Uncertainties in Hydrologic Analyses. Although all studies such as ours, the Corps of Engineers and those of other agencies are prepared using the same basic techniques prescribed by the U.S. Water Resources Council, and are defensible as can be, they do, nevertheless, require statistical projections because of the limited years of record available anywhere in this country. The ideal situation would involve hundreds of years of records which could then be used to establish the base flood condition with a greater degree of accuracy, but obviously this cannot occur and that is why projecting flows statistically needs to be employed. Because of such uncertainties that will always be present in these studies, additional freeboard is highly recommended.

5. Lower Insurance Rates. Building new structures just one foot above the base flood elevation will result in significantly reduced insurance rates. The average rate for first layer structure coverage according to the insurance manual all agents must use, is reduced by 48% with construction elevated just one foot above the base flood level. These elevation rates are applicable in all A1-A30 zones which cover the bulk of the Skagit Delta as well as other detailed study areas of the county.

6. Unique Circumstances in the Skagit Delta. The flood plain analysis done for the Skagit River by the Corps of Engineers down to Sedro Woolley is a rather typical analysis with very predictable circumstances and results. This type of study is the norm in virtually all areas we deal with. However, the Skagit Delta analysis is anything but normal, since we had to ascribe a frequency to a flooding event that involved multiple levee failures, sheet flow conditions and uncertain flow paths. The net result is a depiction that we feel we can defend, but that may not realistically portray a flood that may occur in a particular area adjacent to a levee if that levee is overtopped or fails. Wherever a failure occurs, it is a certainty that our information will understate the hazard in the immediate area, since we did not attempt to portray levee failures along the levee system. As we have discussed at numerous past meetings, the initiative for protecting the public health and safety in this regard must be on local governments adopting ordinances, since our methodology could not accommodate such multiple levee break situations. The extra foot of freeboard is very minimal in this regard, but certainly can only serve to help those who may be affected by a levee break or overtopping.

In addition to our discussion on the extra foot of freeboard, we also discussed the need for a setback from the levees in the interest of protecting the public health and safety. Two separate types of zones were discussed, first a zone where all new construction would be prohibited and, second, a zone where special building techniques and engineering certifications would be required. In our discussions, we concluded that a 100 foot setback would be desirable and realistic in view of the real hazard posed by levees that could break at any point. Likewise, because of the possibility of such breaks, an additional setback necessitating special building techniques between 100 and 500 feet from the levees was judged to be appropriate. These techniques would involve use of post, pier, pile, or column construction, with water able to flow under the foundations, and would need to be certified by a registered engineer as being able to sustain at least overtopping velocities. These two strips would also serve as additional conveyance areas to complement that which is described in the next paragraph.

Concerning conveyance areas, we agreed that the work Bob Boudinot is doing to designate secondary drainage channels, such as the Gages Slough, as areas for which building cannot occur, as well as designating areas adjacent to such channels as areas in which buildings must be elevated using post, pier, pile, or column techniques, would be desirable and would probably comply with the encroachment provision found at Section 60.3(c)(10) when combined with the additional strip available along the levees discussed in the previous paragraph. We agreed that construction in these areas would not need to be certified against velocities as they would for the strip adjacent to the river and levees.

Finally, we had long discussions on types of uses adjacent to the levees and agreed that highly susceptible uses should not be allowed because of the real hazard posed by potential overtopping and breakouts. This includes uses such as hospitals, nursing homes, convalescent homes, day care centers, elderly housing projects, and similar uses where the threat to life and public safety is very high. Such provisions should be incorporated into the flood plain management ordinance or into appropriate sections of zoning ordinances.

In summary, I believe that many of the steps all jurisdictions are taking at this time to come up with safety factors in the local ordinances address the very real concerns raised by the State and others relative to protecting the public health and safety. Adoption of these measures will also comply with Federal regulations and, if adopted as described here, will most assuredly comply with the very difficult encroachment standards spelled out at Section 60.3(c)(10) of the Federal regulations.

I believe that the efforts of all local governments in the Skagit Delta have been very prudent and I look forward to continued close cooperation over the next several weeks, keeping in mind that the January 3, 1985 deadline is inviolate and extensions cannot be granted. Let me know if you have any questions concerning this summary of our meeting.

Sincerely,



Charles L. Steele, Chief
Natural and Technological
Hazards Division

Enclosure

cc: Ed Hammersmith, Dept. of Ecology
Steve West

Tom Slocum, PE
Washington Conservation Districts Northwest Region Engineer
2021 E. College Way, Suite 203
Mount Vernon, WA 98273
Tel. (360) 428-4313
Fax (360) 424-6172

Re: floodgate tour Date: Thursday 4/23 meeting at DD12's office at 12:00 noon.

DD Technical Committee members:

A while ago some members said they were interested in seeing an installation of a new type of floodgate that I worked on with Whatcom DID #4 at a site near Ferndale. This is a "muted tidal regulated" gate designed and built by Nehalem Marine Manufacturing of Nehalem Oregon.

The basic design is that it lets back flow (and fish passage) from the Nooksack River up into the creek up to a pre-set water surface elevation upstream of the gate, at which point it closes and acts like a conventional floodgate. This allows the upstream channel to retain its flood storage capacity. We retrofitted this onto an existing 5' culvert for around \$30,000 and it has worked well over the winter. I've heard that this design is being considered for the Fisher Slough project in DD3.

If anyone is interested in seeing it, I could take a group up there pretty much anytime M-F during the last two weeks of April. The trip would take about 3 hours. If you want to see it, let me know and tell me when you could go, and I'll try to set a date that fits people's schedules.

Itinerary:

1) Down to the Stanwood flood overflow, then turn around and 2) go to Ferndale. Chuck or Lorna, would you please let Jim Sullivan and Vic Jenson know. Stan, good idea to let your contact at the Stanwood district know we're coming. I'll tell Whatcom DID4 that we'll be going to their site. Lorna, if you want to cc other DD Tech. Committee people, it looks like there's still room in the van.



Figure 1 Control box

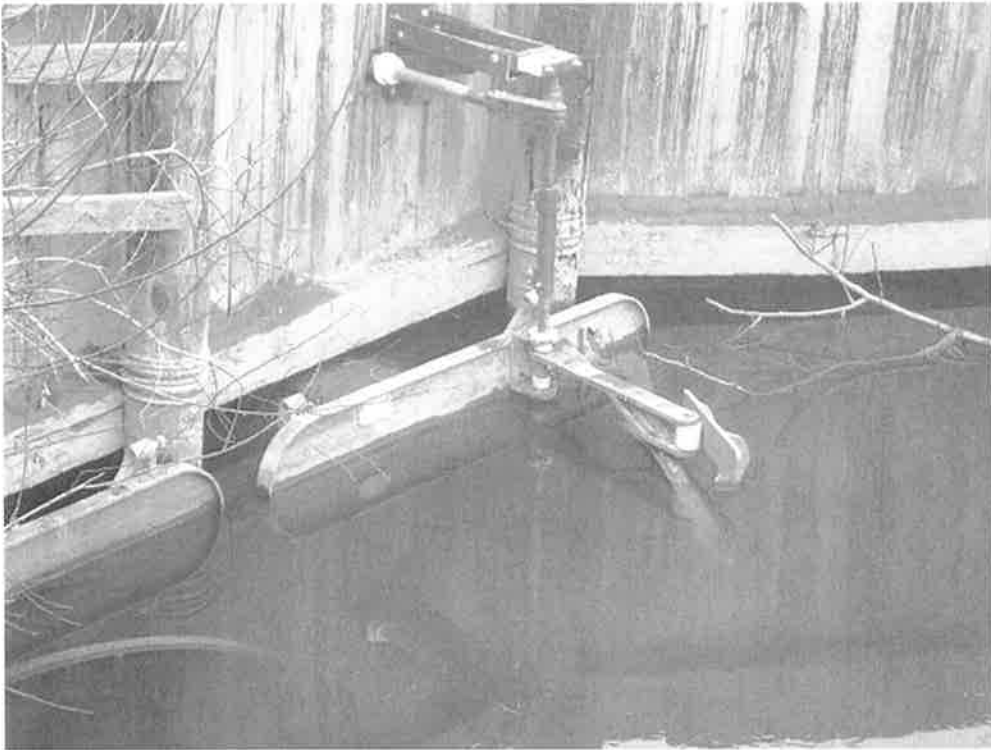


Figure 2 Inlet



Figure 3 Inlet controls

Subject: Old Stilly Gate Press Release.doc
From: "Larry Kunzler" <floodway@wavecable.com>
Date: Sun, 25 Jan 2009 18:23:56 -0800
To: "'Larry Kunzler'" <Larry@hbsslaw.com>

Stillaguamish Flood Control District

P.O.

Box 2512

STANWOOD, WA 98292

COMMISSIONERS:

(360) 652-9233

CHUCK HAZLETON, CHAIR

TRISTAN KLESICK

RICK WILLIAMS

PRESS RELEASE: New Flood Gate Passes With Flying Colors

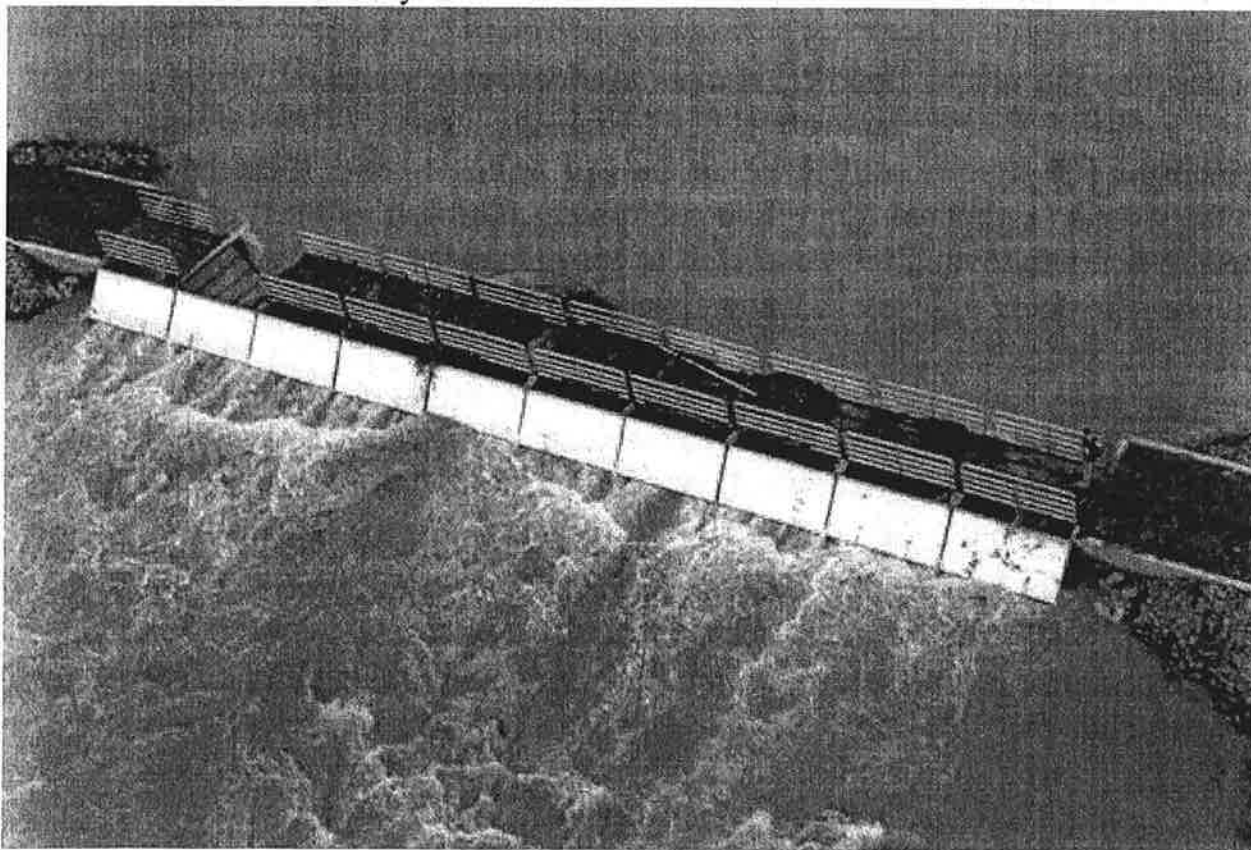
Wonder why the record flood level over Marine Drive south of Stanwood went down so fast? A new, innovative flood drainage structure let the water out. Replacing a 100-ft section of levee on the Old Stillaguamish, it discharged back into the river an estimated 80 million cubic feet (.6 billion gallons) of floodwater in just 36 hours following the flood crest at 6pm Thursday, January 8, 2009. That's a volume equivalent to 4 feet of water covering 450 acres.

The "Old Stilly Gate" was built in 2007 by the Stillaguamish Flood Control District, with a grant from the Federal Emergency Management Agency (FEMA), \$30,000 from the City of Stanwood, and technical aid from Snohomish County, for \$155,000--\$20,000 under budget. It can be seen due south of Hwy 532 at 92nd Ave. Despite flood levels that overtopped the structure and impacts from flotsam (including a sailboat with trailer) that upended a catwalk section, the new drainage structure performed as projected, dramatically reducing drainage time and helping to reopen both the BNSF railroad line and Marine Drive highway days sooner. The District hopes to do more such projects to alleviate flood impacts in the valley. For more information, call Max Albert at (425) 778-6590.

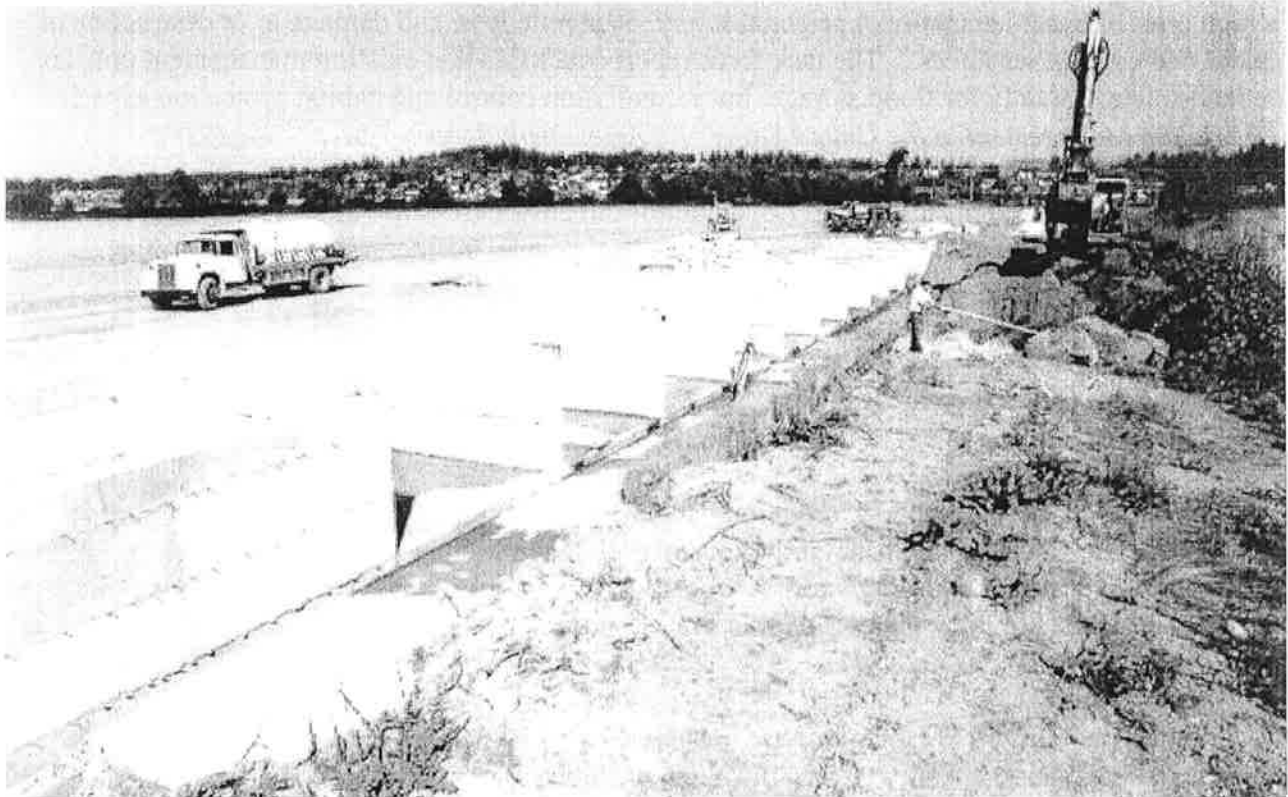




11 am, January 9 – With the flood levels already down 2 feet from crest, the lightweight, steel-and-plastic hatches are open wide, discharging floodwater at a thunderous 1500 cubic feet per second. The catwalk was easily reinstalled.



2pm Friday, January 9 – Stillaguamish Flood Control District Project Coordinator Max Albert watches the Old Stilly Gate drain away floodwater south of Stanwood. Proper drainage is the key to minimizing flood levels and damage. A lost sailboat w/trailer is lodged against the structure. [Photo courtesy of PO Michael Anderson, US Coast Guard.]



Gate construction, September 2007 – Flood District Chairman Chuck Hazleton supervises rock placement. Over 800 such volunteer hours in administration, permitting, design, and construction helped keep the project under budget.

The Stillaguamish Flood Control District (SFCD) was formed in December of 1992, to maintain the levees and drainage systems in an area of the valley lying between Silvana and Stanwood, Washington. SFCD's mission also includes the protection water quality and fish habitat.

Funded by an annual assessment within the District and project grants from state and federal agencies, the Flood District services:

- 6048 acres
- 22 miles of river levees
- 8 miles of sea dike
- 10 tide gate facilities

SFCD is governed by an unpaid, 3-member Board of Commissioners, elected by District ratepayers. Business is conducted at monthly public meetings.

The Facts of Flooding:

* Nationally, floodplain policy is shifting its emphasis toward keeping urban development out. Such development, reports the Federal Interagency Floodplain Management Task Force, comes at "a high price extracted annually in personal injury, economic loss, and damage to or destruction of natural and cultural resources." The task force report concludes that existing management policies are inadequate, not only for flood storage, but for pollution control and habitat protection as well. (*Floodplain Management in the United States: An Assessment Report, FIA-17, May/92*)

* Taxpayer-subsidized insurance and flood control "create a false sense of security," says Scott Faber, Director of Floodplain Programs, "that may lead people, businesses, and communities to make decisions that increase the potential for large amounts of damage." (*Testimony before U.S. House of Rep. Water Resources and Environment Subcommittee, 28/JAN/98*)

* According to COE Director Brig. Gen. Stanley Genega, the best policy for limiting damage is to keep homes and businesses out of the floodplain in the first place. (*Newsday, 23/JUL/93*)

* "Every time we have a flood we are reminded how we have ignored the lessons of the past," says Gen. Gerald E. Galloway, head of the federal Floodplain Management Committee. Dr. Philip B. Williams, hydrologist and flood consultant, puts it another way: "The bottom line is that the long-term costs are borne by the taxpayer, but the short-term gainers always seem to win out." (*California's Storm Brings Rethinking of Development - New York Times, 15/JAN/95*)

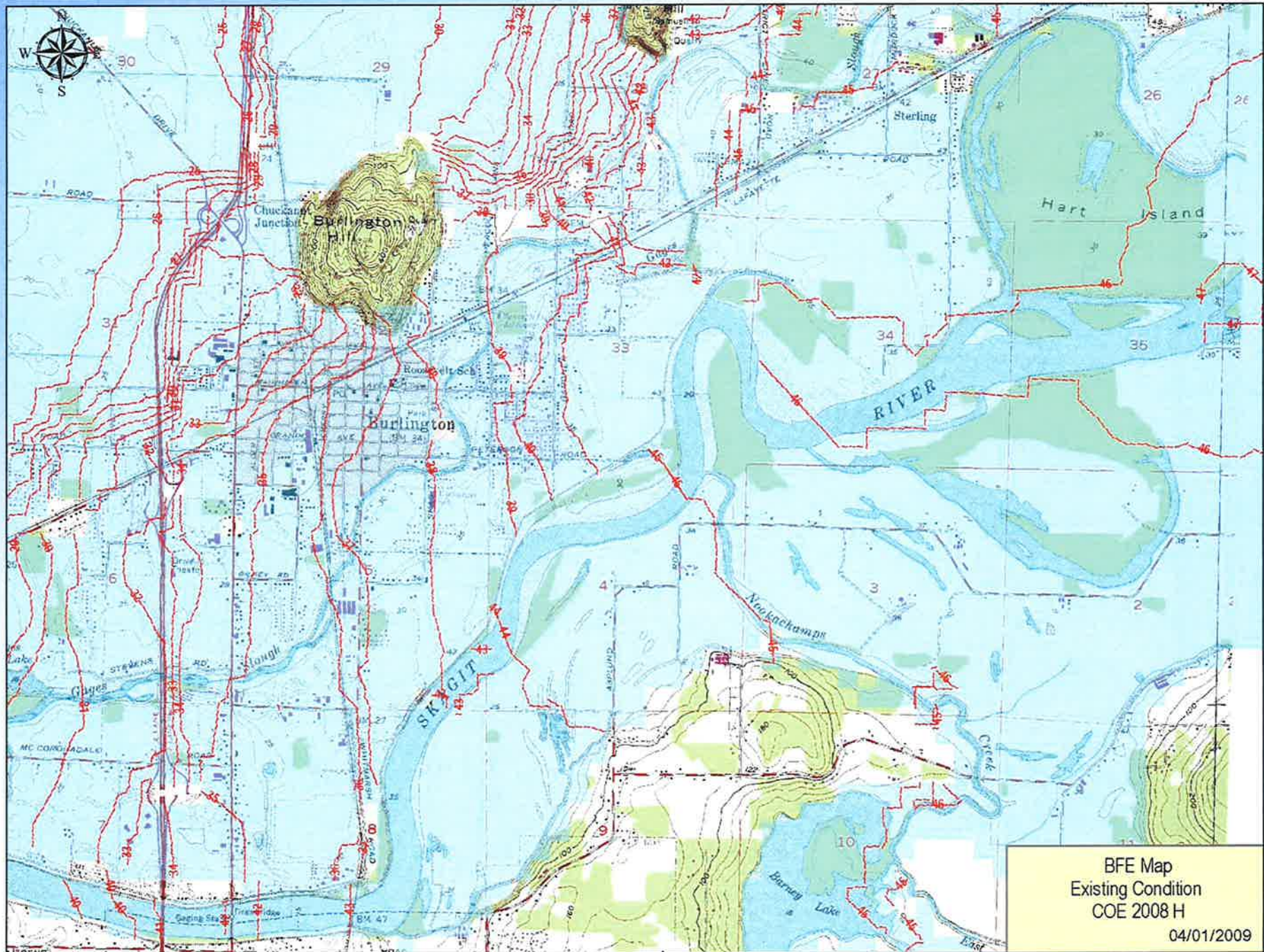
* "Flooding [in Western Washington] has been made much worse by years of inattention to floodway management, inability to curb development along the river valleys, and accelerated logging of watersheds, according to more than a dozen experts interviewed by the Post-Intelligencer." (*Seattle P-I, 12/27/90*)

* Snohomish County River Engineer, Anthony Nahajski, issued this warning after the disastrous 1990 floods: "Generally, the danger is, people don't realize that [even] these floods are not real major floods. Much heavier floods are possible." (*Everett Herald, 29/NOV/90*)

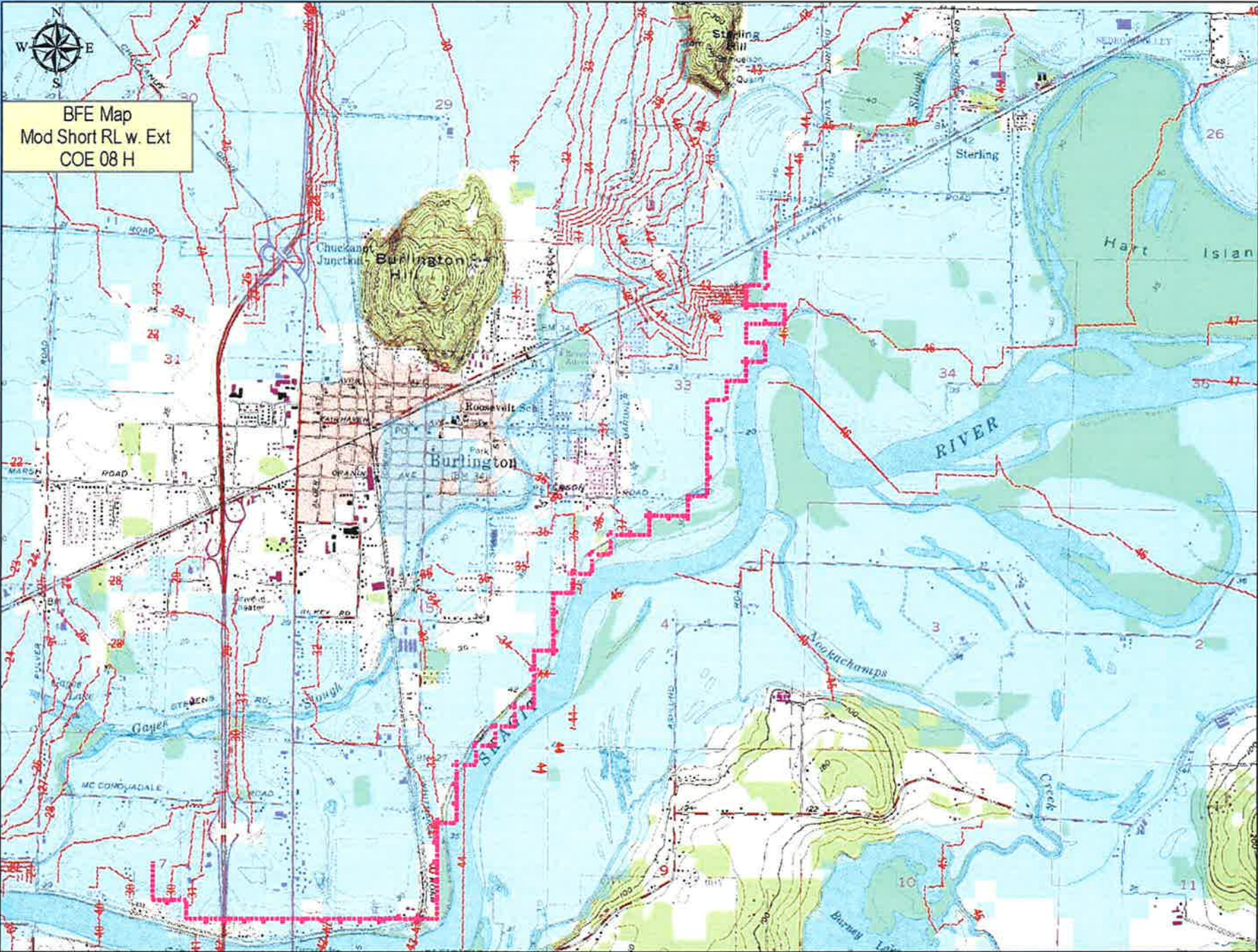
* Robert Boudinot, city engineer in Stanwood, explained his town's chronic flooding and drainage predicament. "The fundamental problem," he said, "is our forefathers chose to build on the [Stillaguamish] floodplain. That was a mistake." (*Everett Herald, 5/1/91*)

* "Valley residents should never lose sight of the fact that the floodplain can only be borrowed; basically, it belongs to the river, which in accordance to physical laws, may demand its return at any time." (*Stillaguamish River Flood Information Study - U.S. Army Corps of Engineers*)

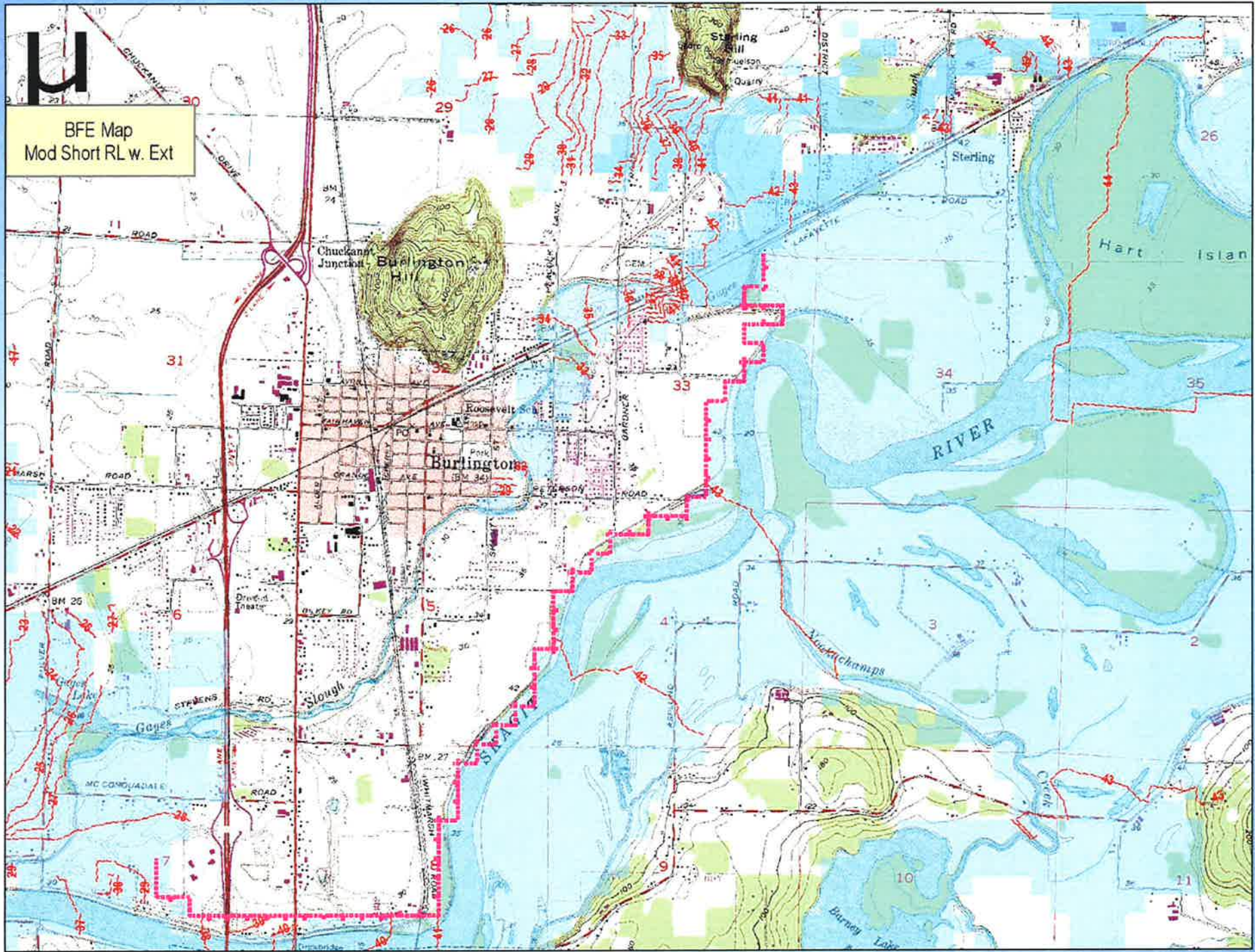
BFE Map – Uncertified Existing Levee (using COE hydrology)



BFE Map – Proposed Certified Levee (using COE hydrology)



BFE Map – Certified Levee with Backwater Levee on City Boundary





April 10th, 2009

To: Flood Control Zone District Advisory Committee

From: Chal Martin, Public Works Director

Re: Nookachamps Storage / Levee Measure

Dear Committee Members,

I am writing this letter at the request of the Dike and Drainage Technical Committee.

The Nookachamps storage / levee measure has not gained much support from the Committee and there are good reasons for that. However, from my perspective in looking at future flood risk reduction for the system as a whole, I would hope to see the Nookachamps concept remain in the mix for now. Upstream flood storage is critically important to reduce flood risk for nearly every downstream jurisdiction. The Nookachamps basin provides significant storage capacity and typically reduces high flows 15,000 to 25,000 cfs for a period of time. By delaying the timing of the available storage, this reduction could become effective "peak flow" reduction downstream. In this case, there is potential for the "storage" feature to also be a "levee" feature which would reduce the frequency of spring flooding in the Nookachamps basin on a nearly annual basis.

I believe the Nookachamps area also holds promise for ecosystem restoration as part of a Corps of Engineers project. For example, there has been discussion of restoring a more natural channel for the Nookachamps outlet; possibly connecting some of the major slough channels back to the river, while retaining important refuge features to help fish during high water events. There may be other restoration possibilities.

It could well turn out there is no environmentally or economically beneficial way to put this measure in place; and it will cost money to study the issue further. Still, it seems to me that, on balance, there is enough promise remaining in this concept that it should be retained for now.

Thank you for considering this request.