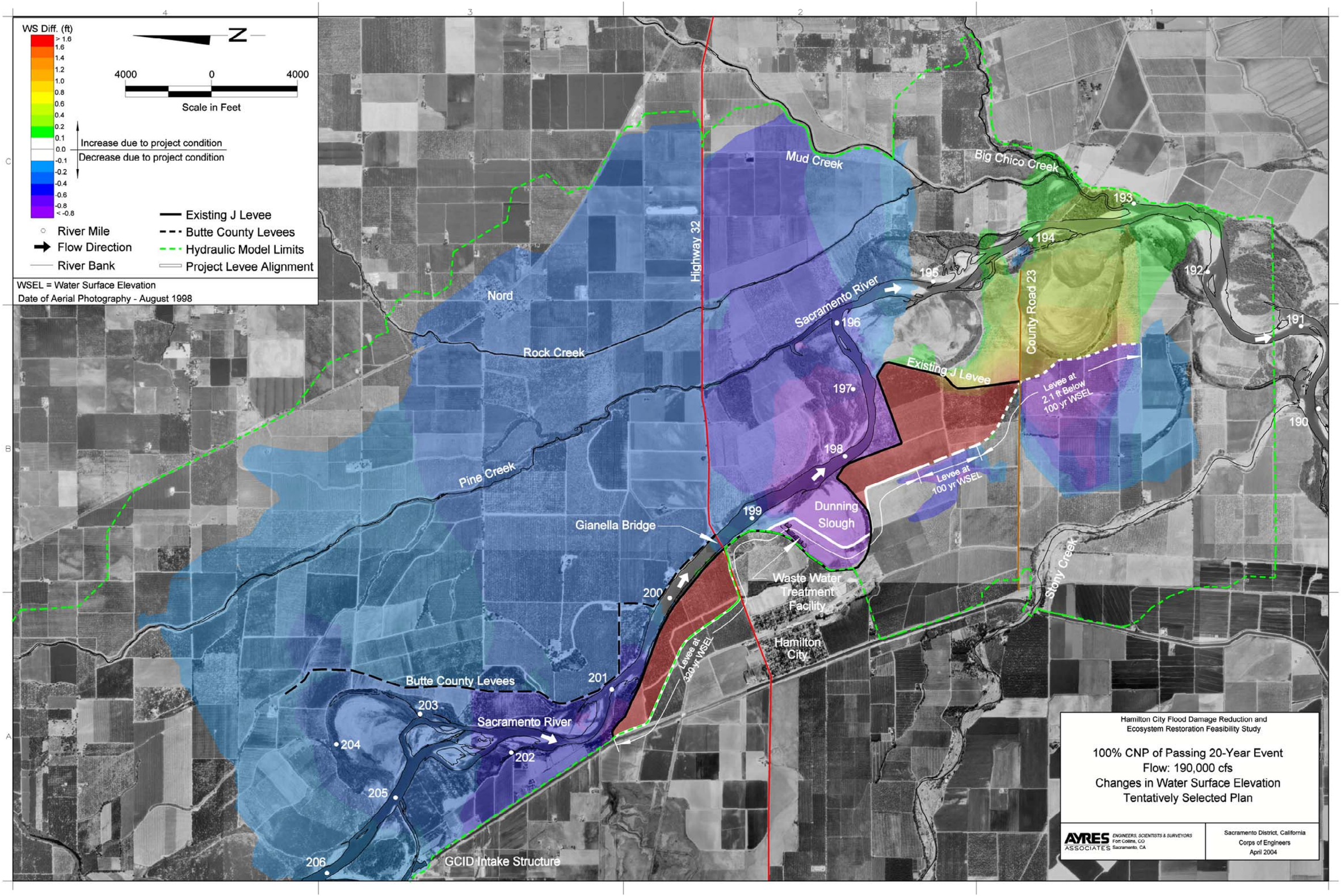
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-0.2
-0.4
-0.6
-0.8
< -0.8
N
4000
0
4000
Scale in Feet
Increase due to project condition
Decrease due to project condition
River Mile
Flow Direction
River Bank
Existing J Levee
Butte County Levees
Hydraulic Model Limits
Project Levee Alignment
WSEL = Water Surface Elevation
Date of Aerial Photography - August 1998
Mud Creek
Big Chico Creek
Highway 32
Nord
Rock Creek
Sacramento River
County Road 23
Existing J Levee
Levee at 2.1 ft Below 100 yr WSEL
Levee at 100 yr WSEL
Pine Creek
Dunning Slough
Gianella Bridge
Waste Water Treatment Facility
Hamilton City
Stony Creek
Levee at 320 yr WSEL
Butte County Levees
Sacramento River
GCID Intake Structure
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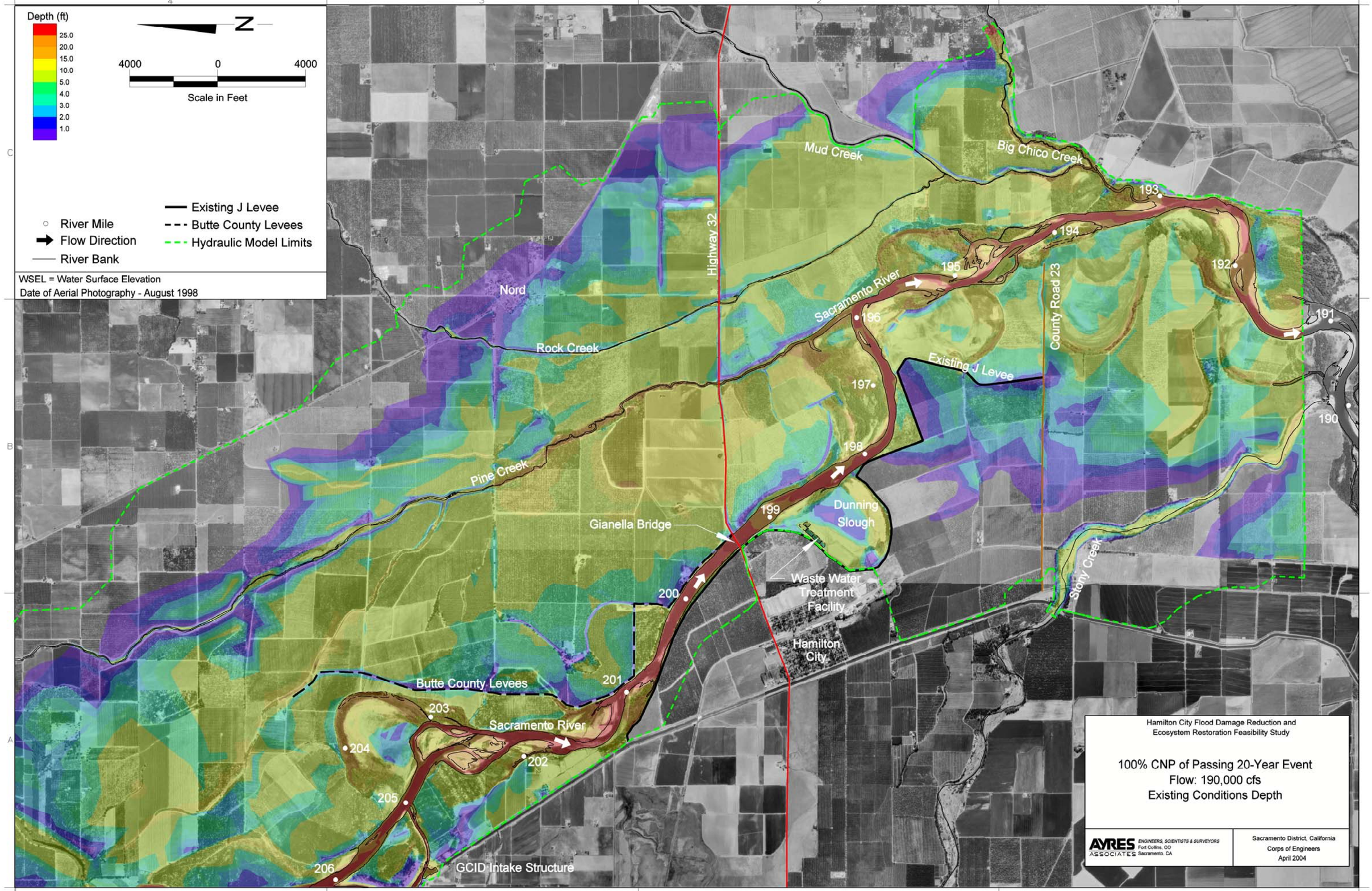
Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
100% CNP of Passing 20-Year Event
Flow: 190,000 cfs
Changes in Water Surface Elevation
Tentatively Selected Plan
AYRES ASSOCIATES
ENGINEERS, SCIENTISTS & SURVEYORS
Fort Collins, CO
Sacramento, CA
Sacramento District, California
Corps of Engineers
April 2004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Scale in Feet
River Mile
Flow Direction
River Bank
Existing J Levee
Butte County Levees
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
100% CNP of Passing 20-Year Event
Flow: 190,000 cfs
Existing Conditions Depth
AYRES ASSOCIATES
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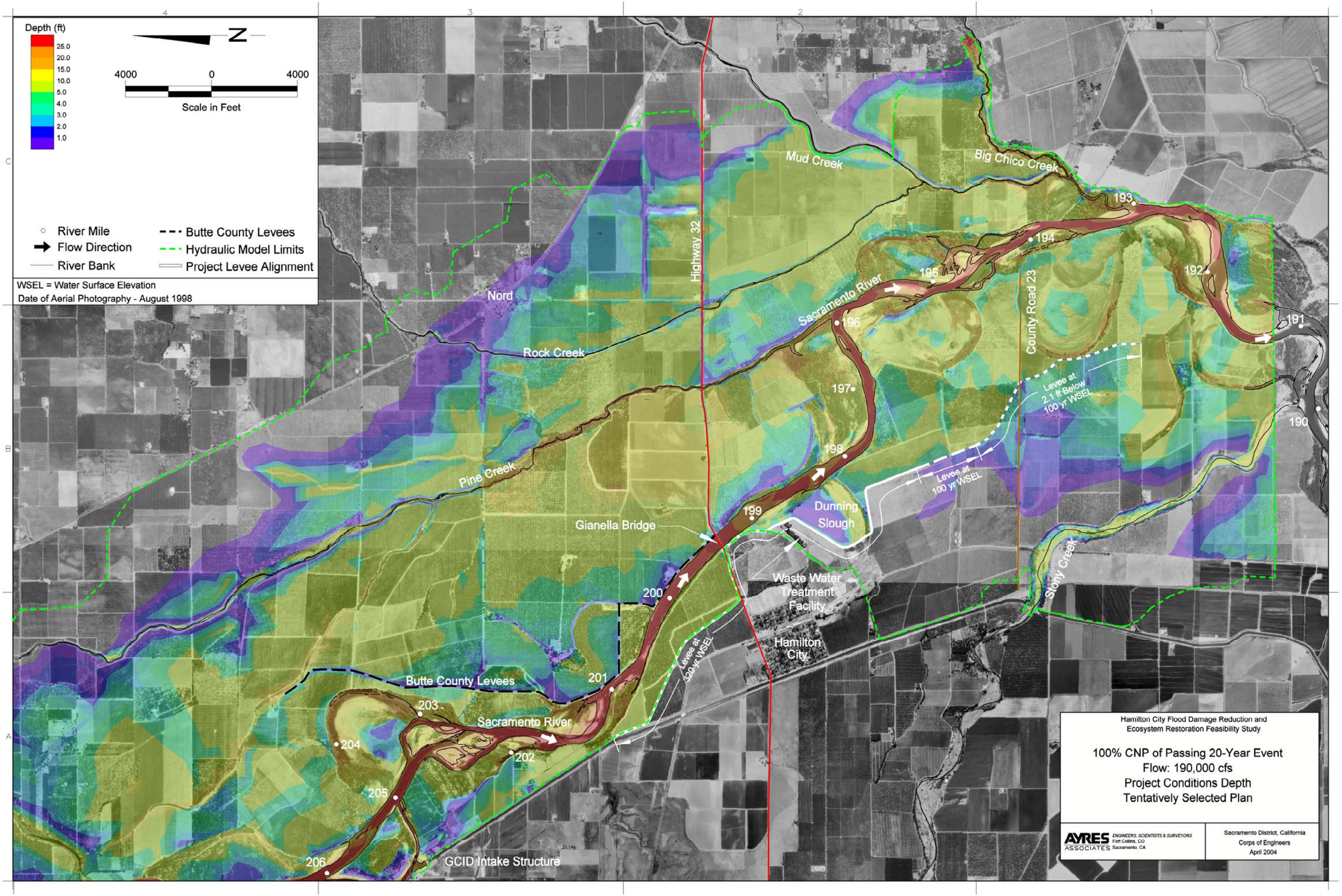
April 2004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Scale in Feet
River Mile
Flow Direction
River Bank
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Hydraulic Model Limits
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WSEL = Water Surface Elevation
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Hamilton City
Stony Creek
Levee at 2.1 ft Below 100 yr WSEL
Levee at 100 yr WSEL
Levee at 320 yr WSEL
Butte County Levees
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
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Flow: 190,000 cfs
Project Conditions Depth
Tentatively Selected Plan
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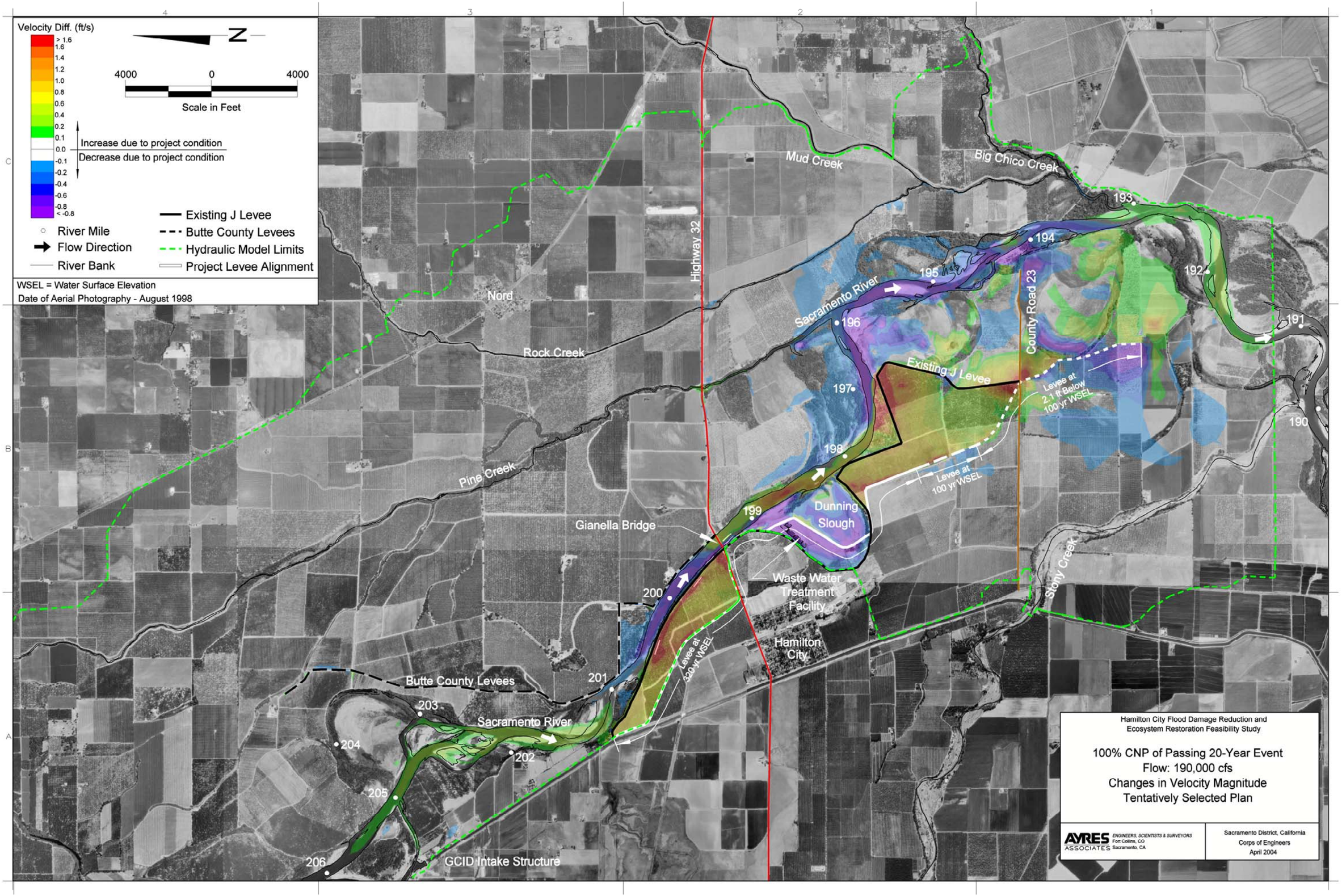
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1.6
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-0.2
-0.4
-0.6
-0.8
< -0.8
N
4000
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Scale in Feet
Increase due to project condition
Decrease due to project condition
River Mile
Flow Direction
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
100% CNP of Passing 20-Year Event
Flow: 190,000 cfs
Changes in Velocity Magnitude
Tentatively Selected Plan
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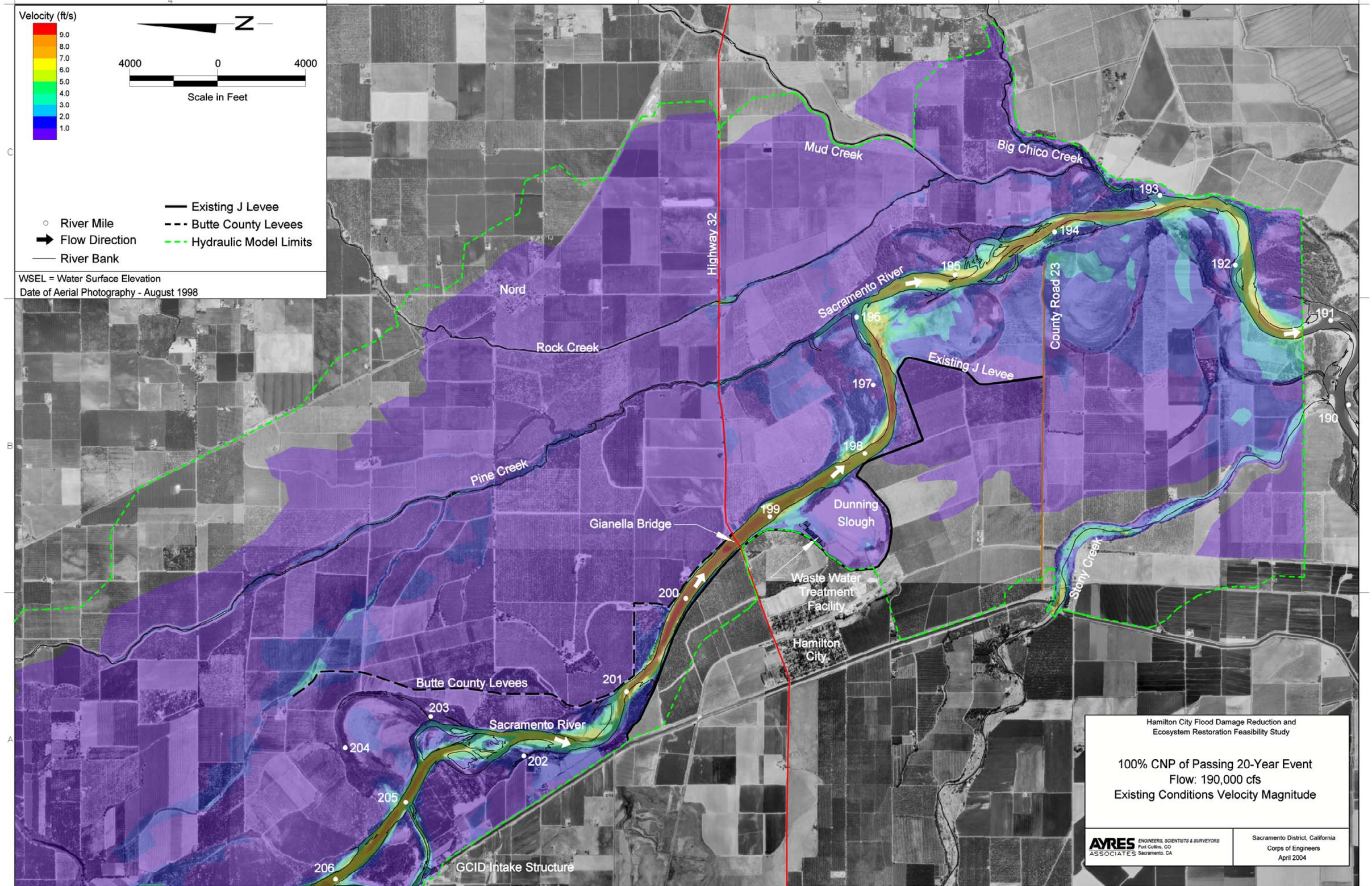
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Scale in Feet
River Mile
Flow Direction
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
100% CNP of Passing 20-Year Event
Flow: 190,000 cfs
Existing Conditions Velocity Magnitude
AYRES ASSOCIATES
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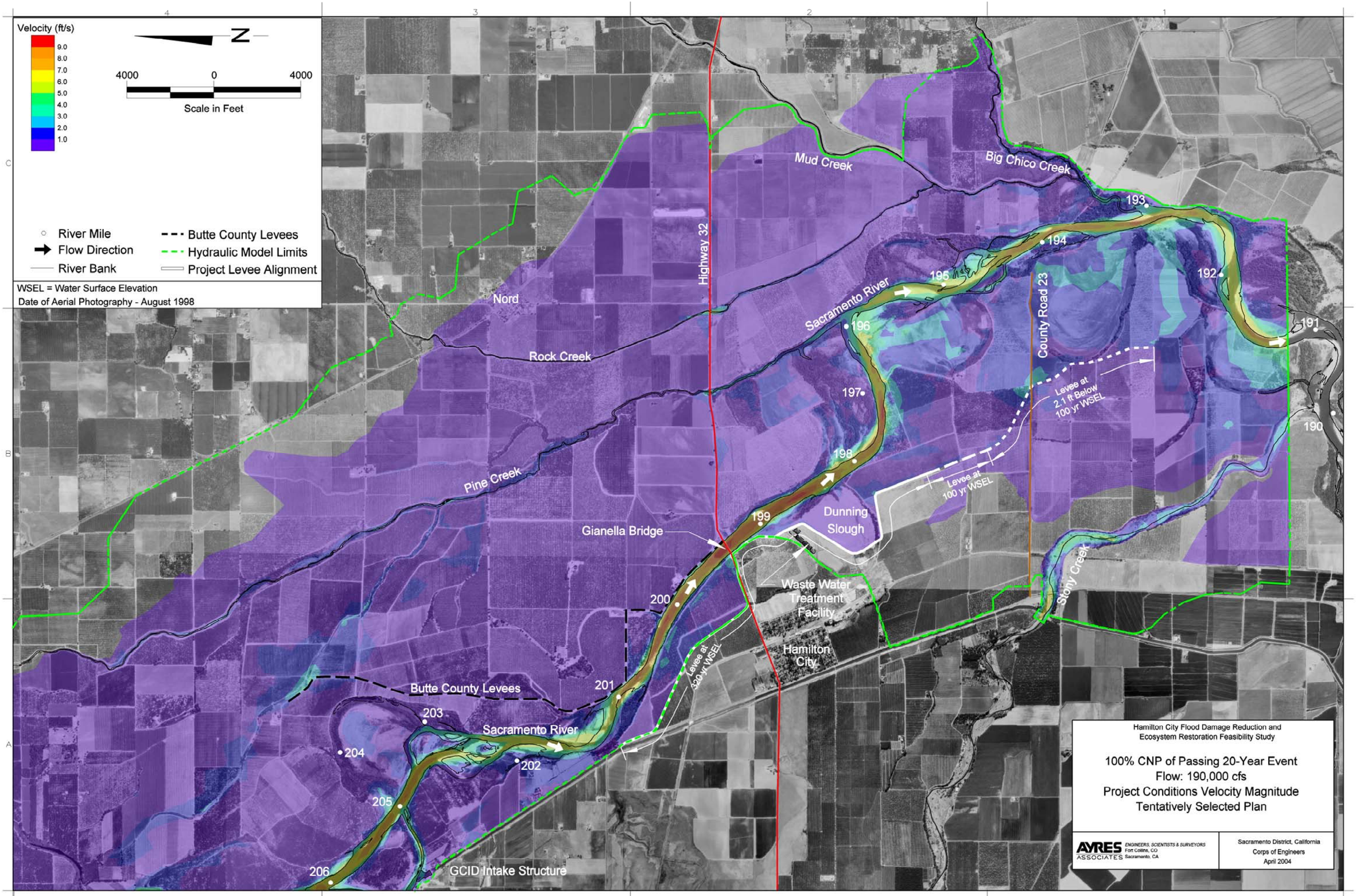
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Scale in Feet
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
100% CNP of Passing 20-Year Event
Flow: 190,000 cfs
Project Conditions Velocity Magnitude
Tentatively Selected Plan
AYRES ASSOCIATES
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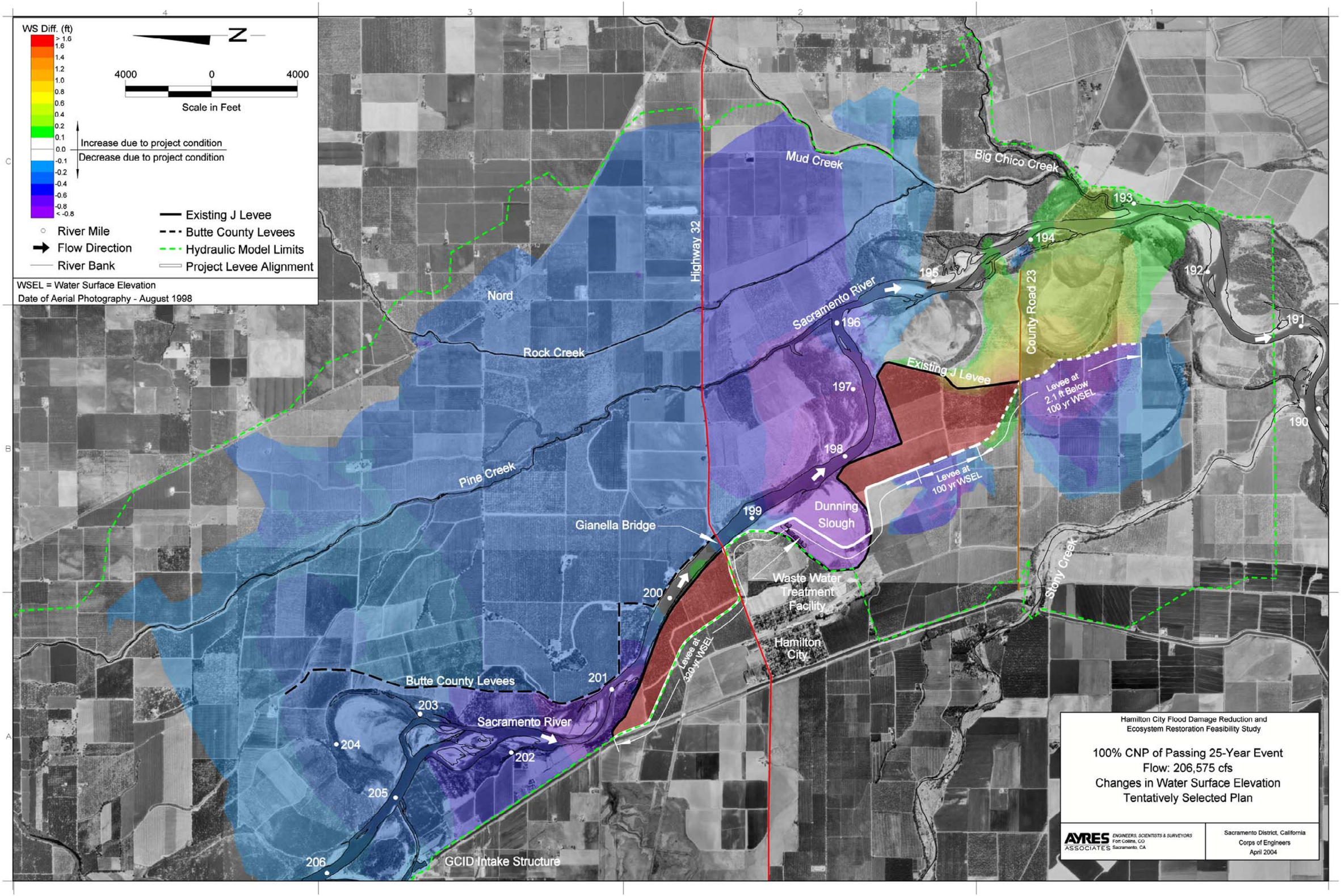
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-0.8
< -0.8
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Scale in Feet
Increase due to project condition
Decrease due to project condition
River Mile
Flow Direction
River Bank
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
100% CNP of Passing 25-Year Event
Flow: 206,575 cfs
Changes in Water Surface Elevation
Tentatively Selected Plan
AYRES ASSOCIATES
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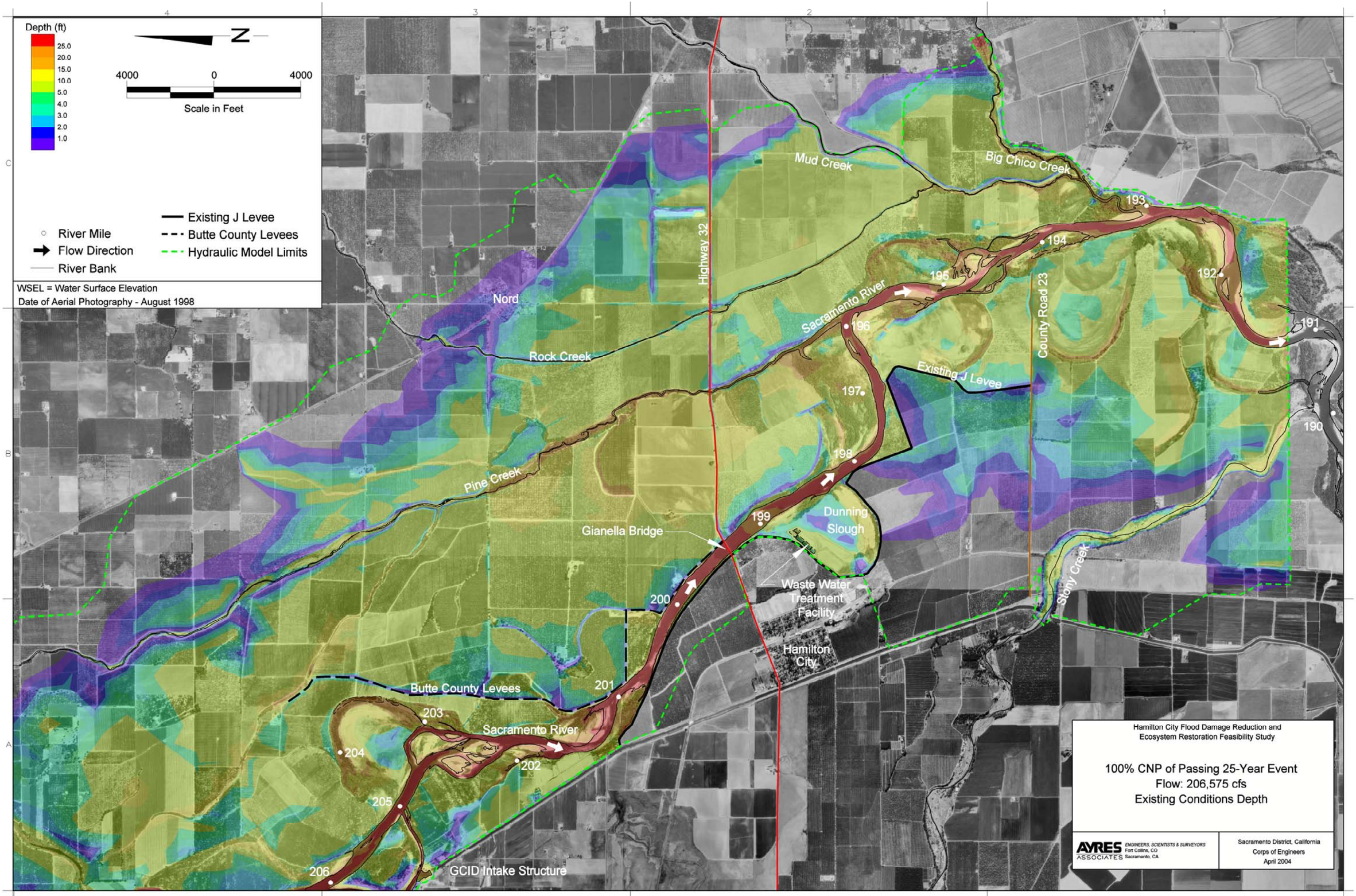
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Scale in Feet
River Mile
Flow Direction
River Bank
Existing J Levee
Butte County Levees
Hydraulic Model Limits
WSEL = Water Surface Elevation
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
100% CNP of Passing 25-Year Event
Flow: 206,575 cfs
Existing Conditions Depth
AYRES ASSOCIATES
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Sacramento District, California
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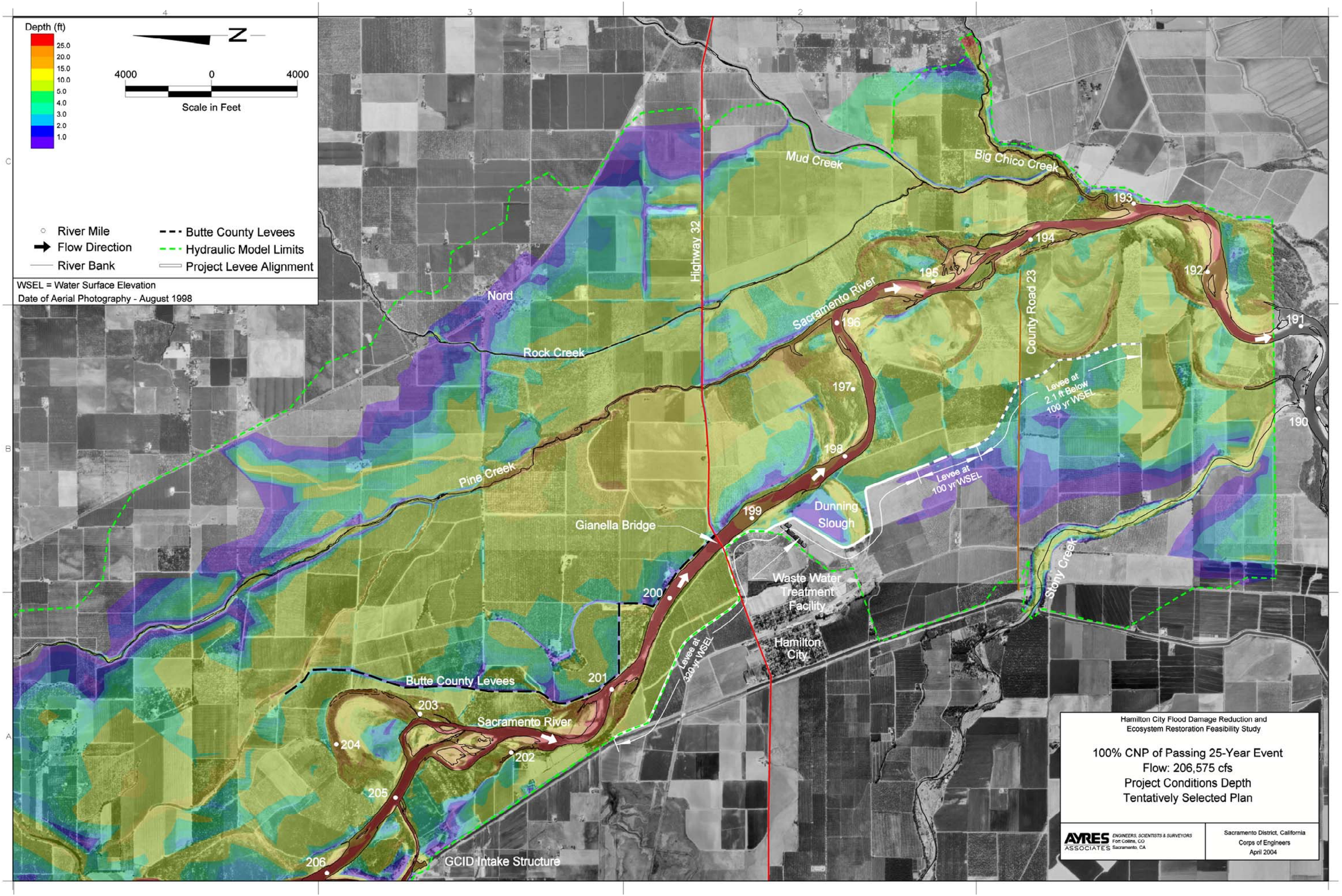
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Scale in Feet
River Mile
Flow Direction
River Bank
Butte County Levees
Hydraulic Model Limits
Project Levee Alignment
WSEL = Water Surface Elevation
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Mud Creek
Big Chico Creek
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Sacramento River
County Road 23
Nord
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Pine Creek
Gianella Bridge
Dunning Slough
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Hamilton City
Stony Creek
Butte County Levees
Sacramento River
GCID Intake Structure
Levee at 2.1 ft Below 100 yr WSEL
Levee at 100 yr WSEL
Levee at 320 yr WSEL
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
100% CNP of Passing 25-Year Event
Flow: 206,575 cfs
Project Conditions Depth
Tentatively Selected Plan
AYRES ASSOCIATES
ENGINEERS, SCIENTISTS & SURVEYORS
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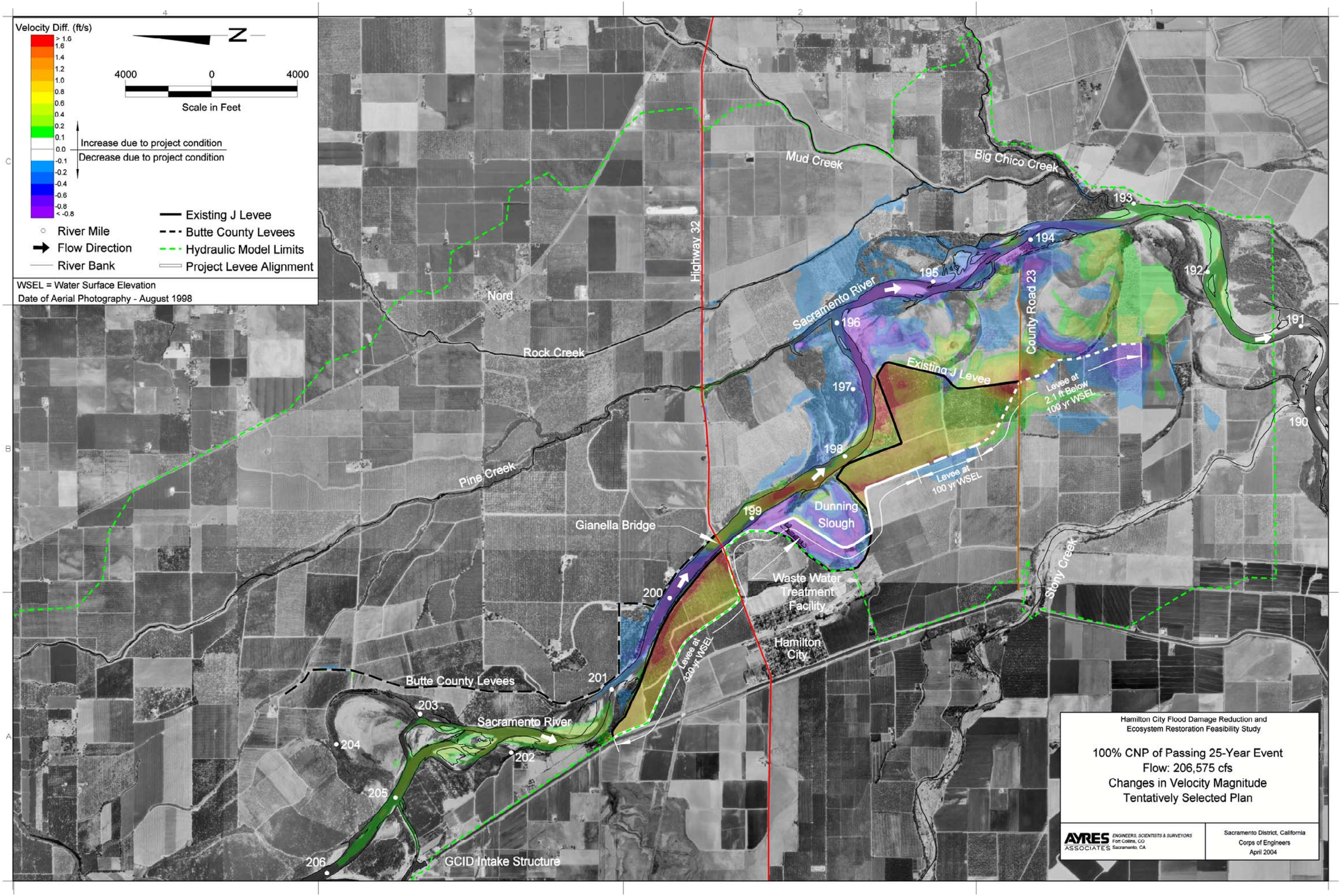
April 2004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1.4
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-0.1
-0.2
-0.4
-0.6
-0.8
< -0.8
Increase due to project condition
Decrease due to project condition
N
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Scale in Feet
River Mile
Flow Direction
River Bank
Existing J Levee
Butte County Levees
Hydraulic Model Limits
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
100% CNP of Passing 25-Year Event
Flow: 206,575 cfs
Changes in Velocity Magnitude
Tentatively Selected Plan
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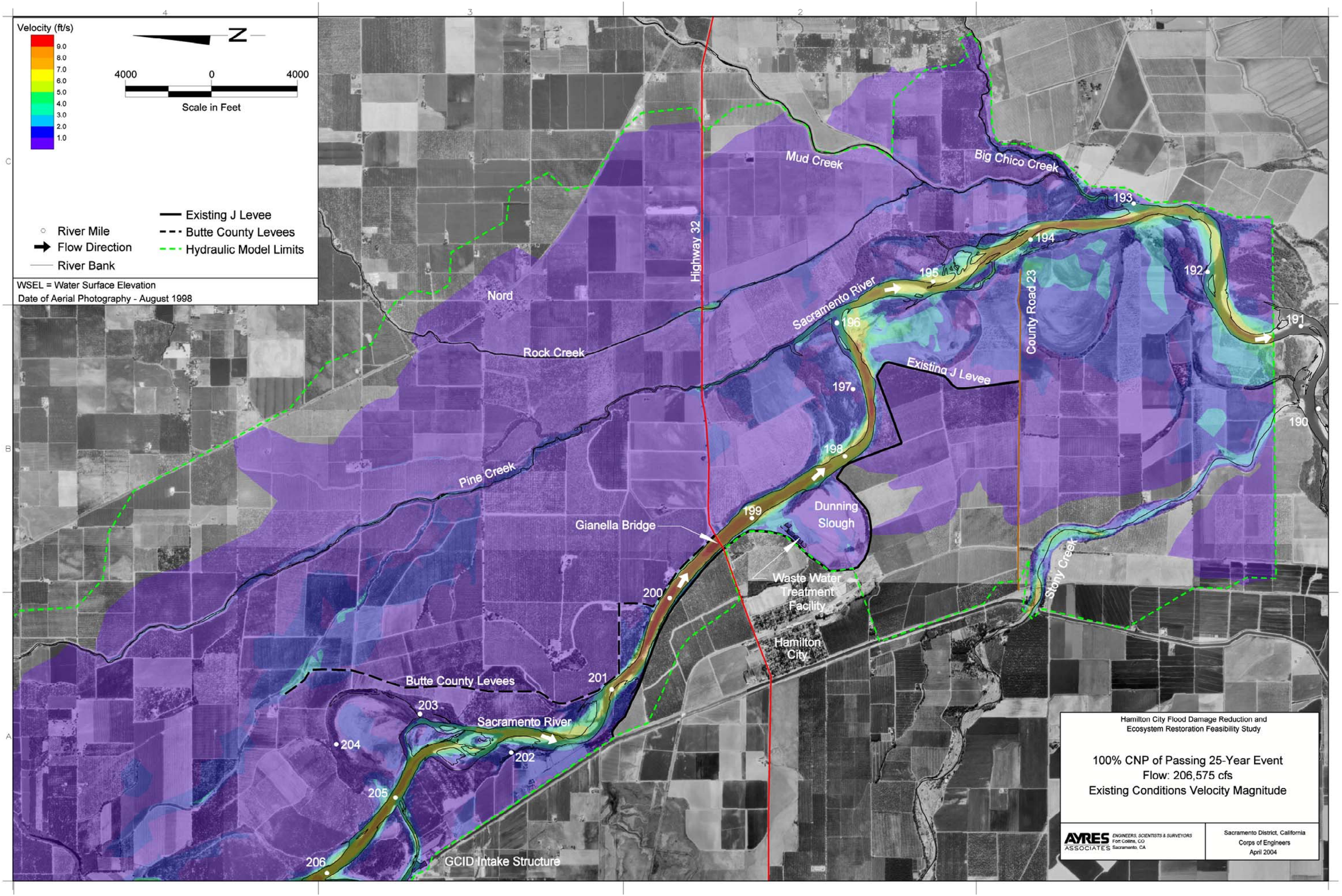
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Scale in Feet
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
100% CNP of Passing 25-Year Event
Flow: 206,575 cfs
Existing Conditions Velocity Magnitude
AYRES ASSOCIATES
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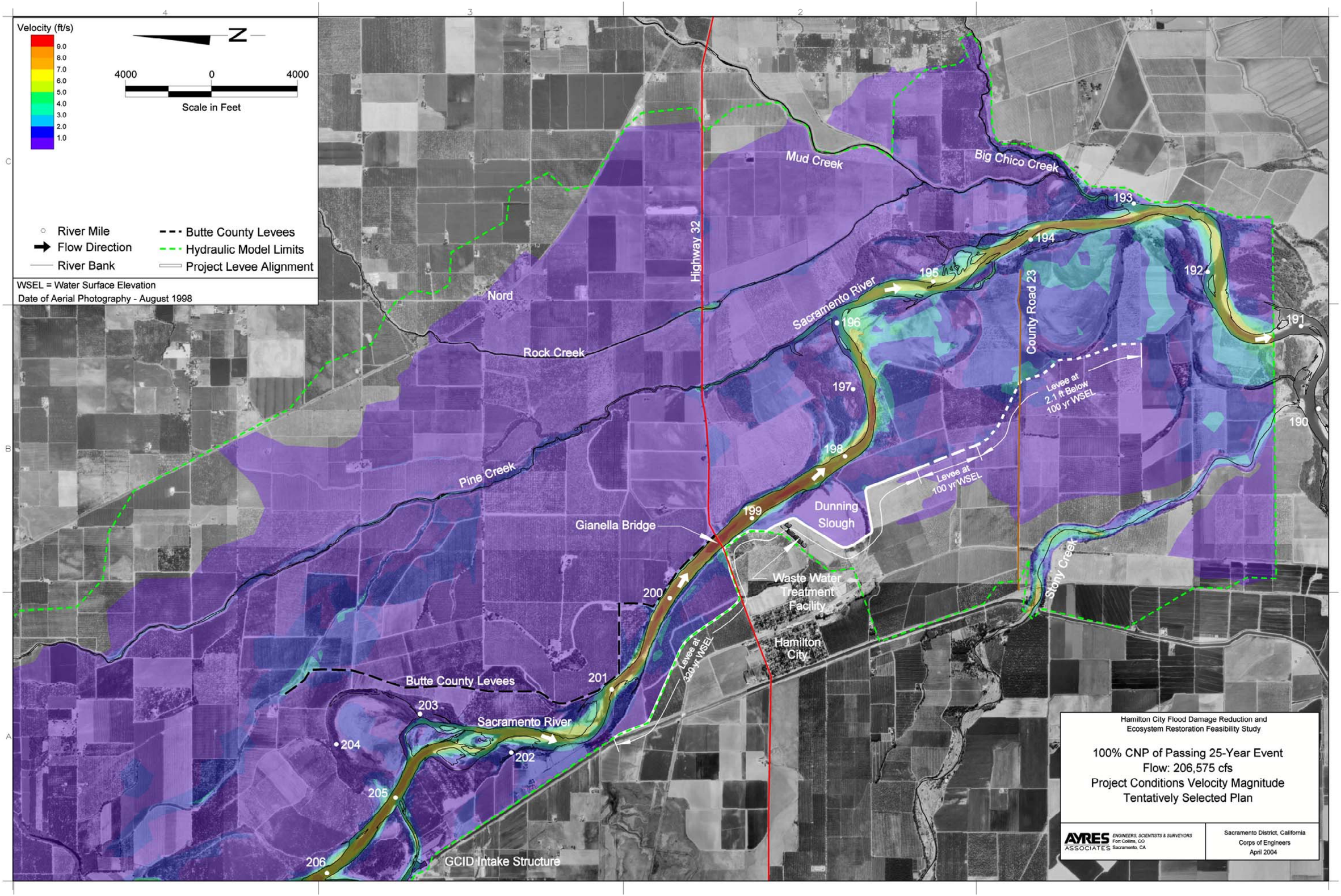
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Levee at 2.1 ft Below 100 yr WSEL
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
100% CNP of Passing 25-Year Event
Flow: 206,575 cfs
Project Conditions Velocity Magnitude
Tentatively Selected Plan
AYRES ASSOCIATES
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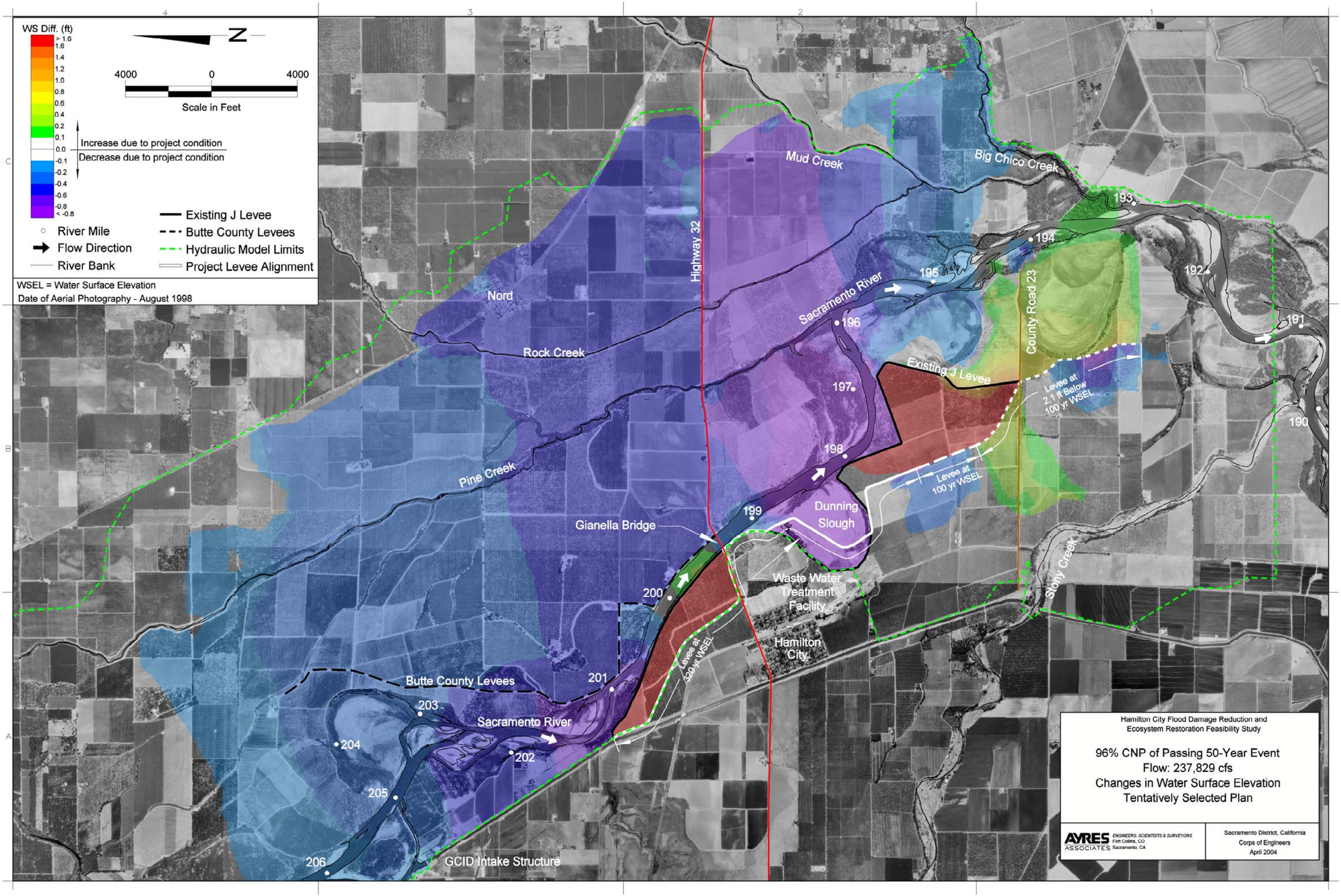
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Scale in Feet
Increase due to project condition
Decrease due to project condition
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
96% CNP of Passing 50-Year Event
Flow: 237,829 cfs
Changes in Water Surface Elevation
Tentatively Selected Plan
AYRES ASSOCIATES
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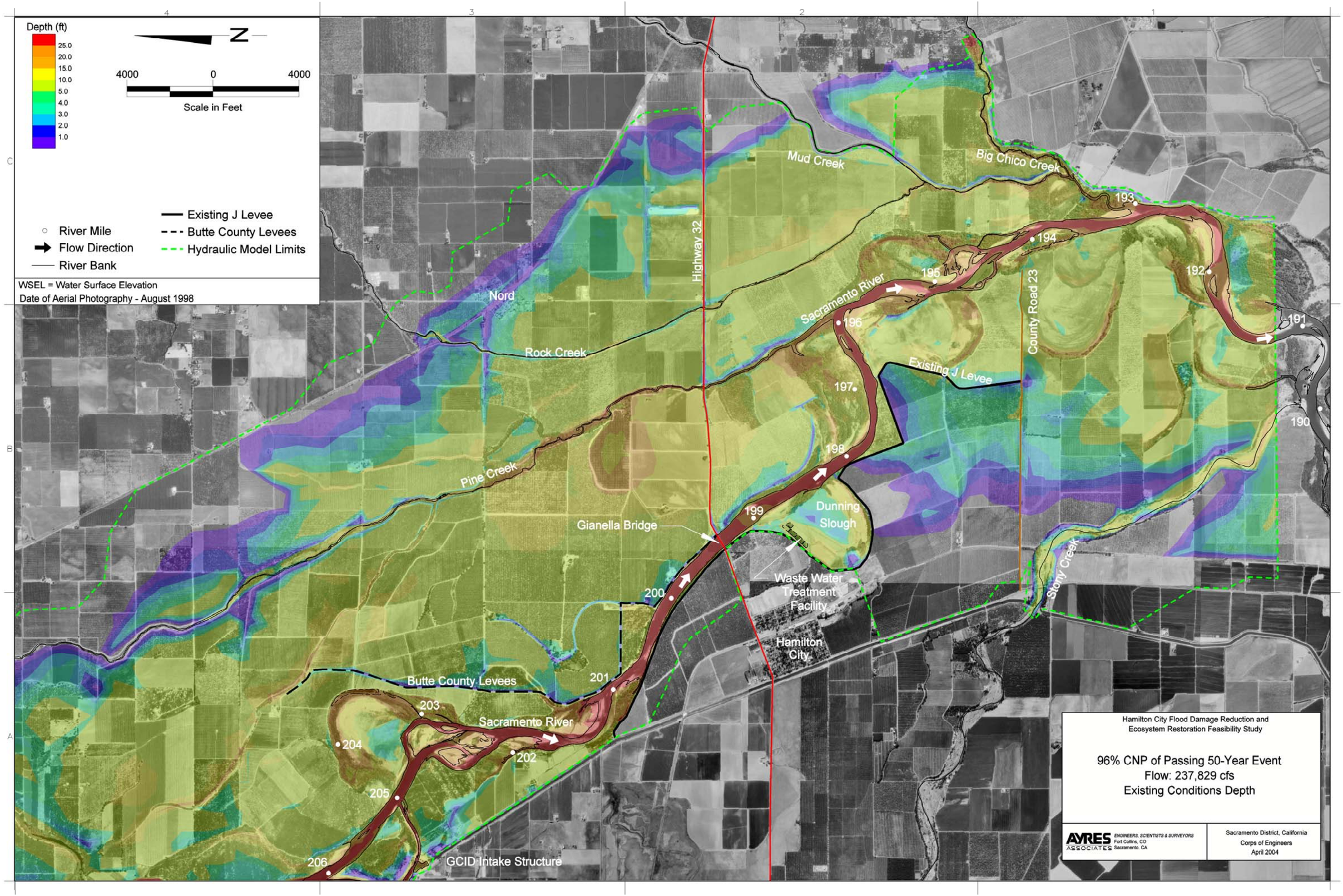
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Scale in Feet
River Mile
Flow Direction
River Bank
Existing J Levee
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
96% CNP of Passing 50-Year Event
Flow: 237,829 cfs
Existing Conditions Depth
AYRES ASSOCIATES
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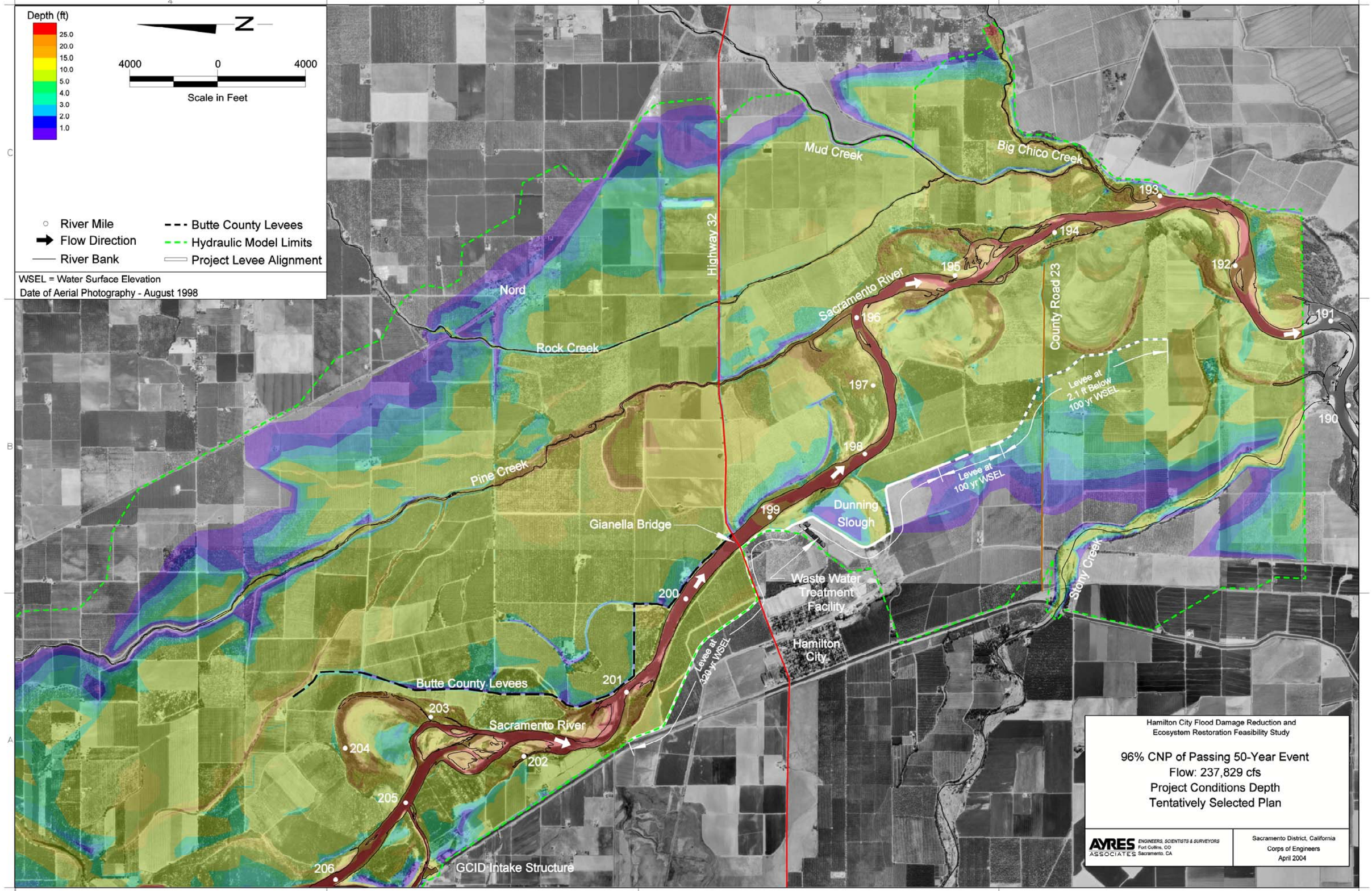
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Scale in Feet
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Levee at 2.1 ft Below 100 yr WSEL
Levee at 100 yr WSEL
Waste Water Treatment Facility
Hamilton City
Levee at 320 yr WSEL
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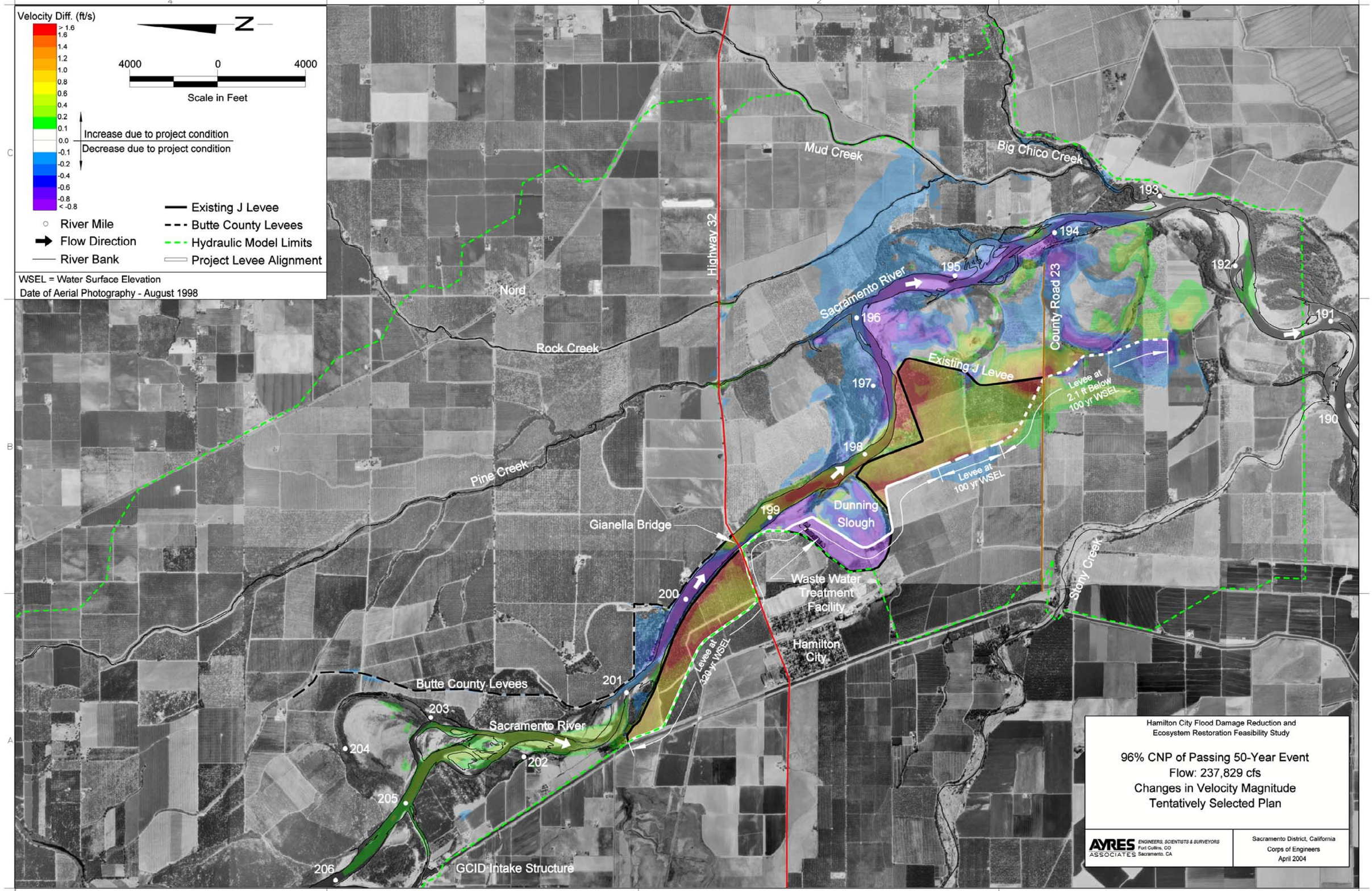
Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
96% CNP of Passing 50-Year Event
Flow: 237,829 cfs
Project Conditions Depth
Tentatively Selected Plan
AYRES ASSOCIATES
ENGINEERS, SCIENTISTS & SURVEYORS
Fort Collins, CO
Sacramento, CA
Sacramento District, California
Corps of Engineers
April 2004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-0.6
-0.8
< -0.8
Increase due to project condition
Decrease due to project condition
N
4000
0
4000
Scale in Feet
River Mile
Flow Direction
River Bank
Existing J Levee
Butte County Levees
Hydraulic Model Limits
Project Levee Alignment
WSEL = Water Surface Elevation
Date of Aerial Photography - August 1998
Mud Creek
Big Chico Creek
Highway 32
Nord
Rock Creek
Sacramento River
County Road 23
Existing J Levee
Levee at 2.1 ft Below 100 yr WSEL
Levee at 100 yr WSEL
Pine Creek
Dunning Slough
Gianella Bridge
Waste Water Treatment Facility
Hamilton City
Stony Creek
Levee at 100 yr WSEL
Butte County Levees
Sacramento River
GCID Intake Structure
190
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206
Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
96% CNP of Passing 50-Year Event
Flow: 237,829 cfs
Changes in Velocity Magnitude
Tentatively Selected Plan
AYRES ASSOCIATES
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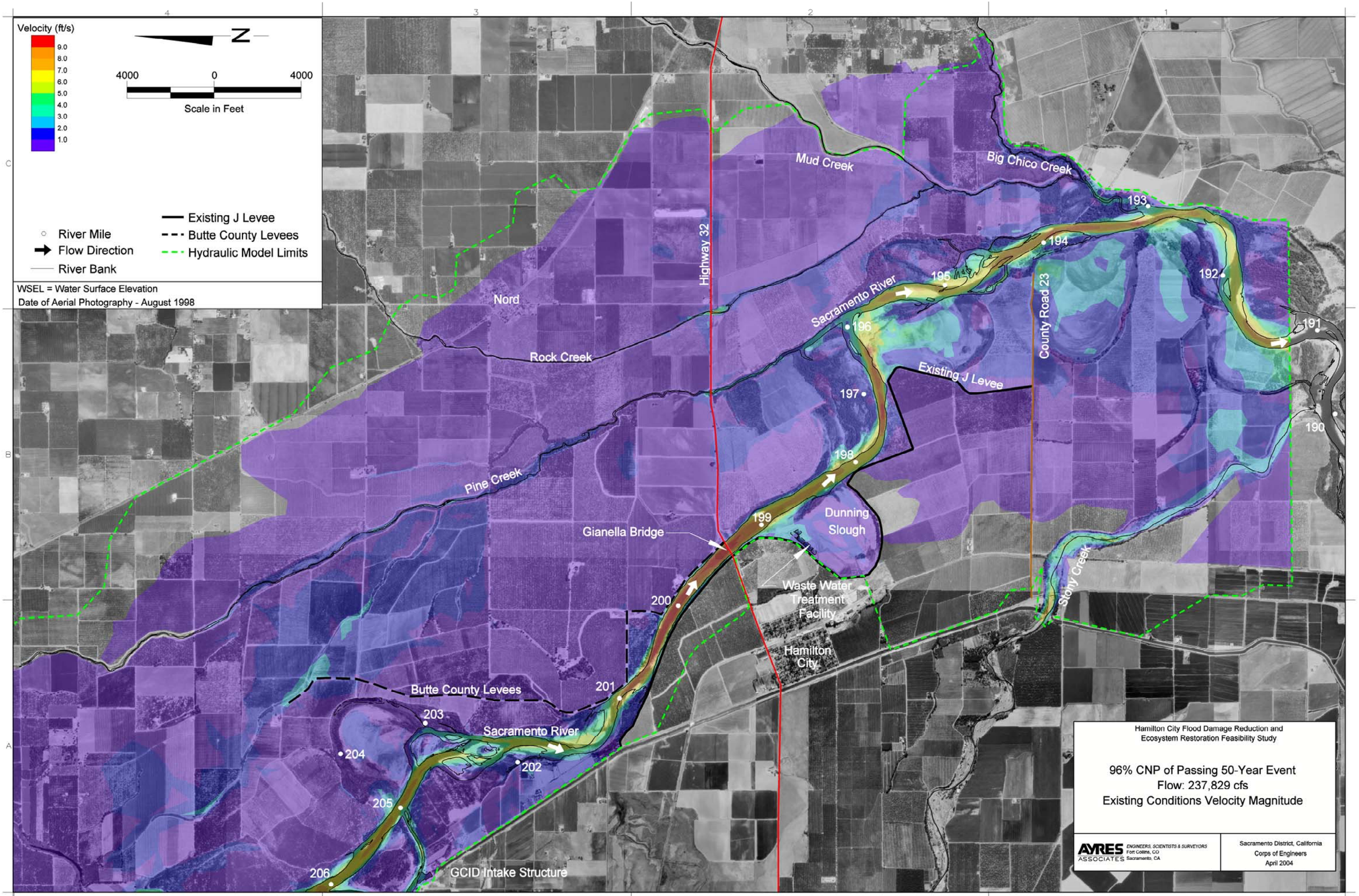
April 2004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4.0
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1.0
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0
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Scale in Feet
River Mile
Flow Direction
River Bank
Existing J Levee
Butte County Levees
Hydraulic Model Limits
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Highway 32
Nord
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Sacramento River
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
96% CNP of Passing 50-Year Event
Flow: 237,829 cfs
Existing Conditions Velocity Magnitude
AYRES ASSOCIATES
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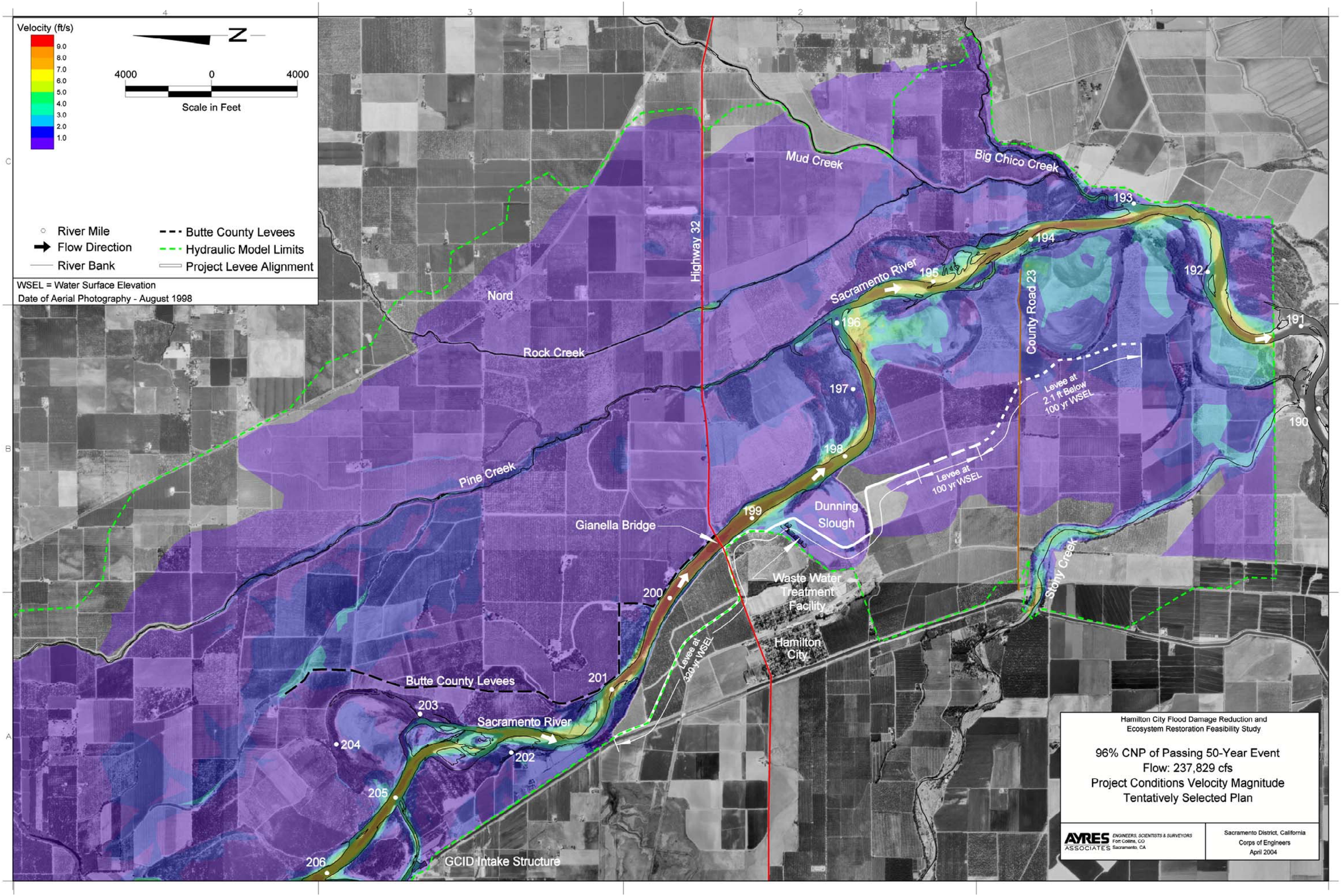
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0
4000
Scale in Feet
River Mile
Flow Direction
River Bank
Butte County Levees
Hydraulic Model Limits
Project Levee Alignment
WSEL = Water Surface Elevation
Date of Aerial Photography - August 1998
Mud Creek
Big Chico Creek
Highway 32
Nord
Rock Creek
Sacramento River
County Road 23
Levee at 2.1 ft Below 100 yr WSEL
Levee at 100 yr WSEL
Pine Creek
Dunning Slough
Gianella Bridge
Waste Water Treatment Facility
Hamilton City
Stony Creek
Levee at 320 yr WSEL
Butte County Levees
Sacramento River
GCID Intake Structure
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
96% CNP of Passing 50-Year Event
Flow: 237,829 cfs
Project Conditions Velocity Magnitude
Tentatively Selected Plan
AYRES ASSOCIATES
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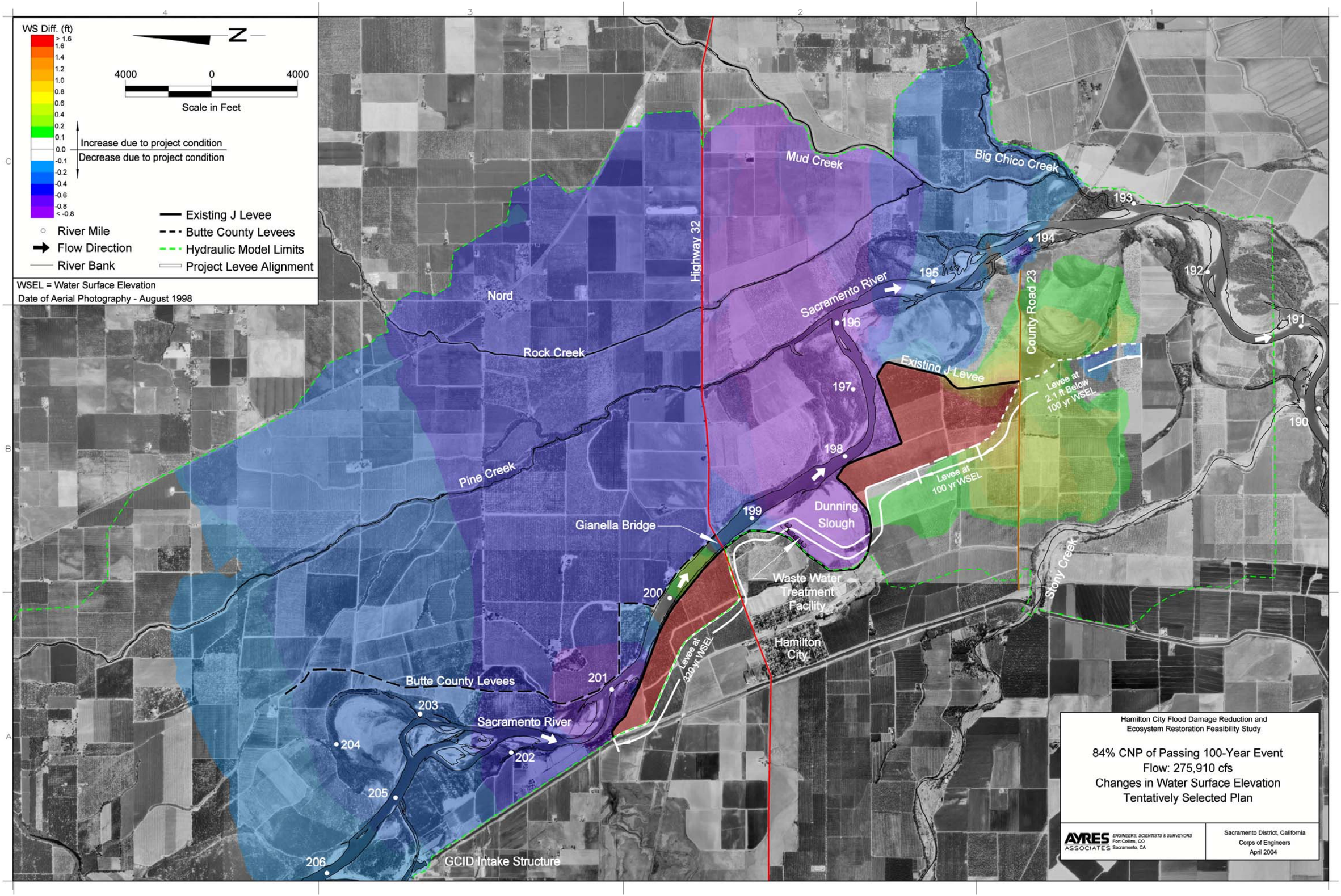
WS Diff. (ft)
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1.6
1.4
1.2
1.0
0.8
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0.4
0.2
0.1
0.0
-0.1
-0.2
-0.4
-0.6
-0.8
< -0.8
N
4000
0
4000
Scale in Feet
Increase due to project condition
Decrease due to project condition
River Mile
Flow Direction
River Bank
Existing J Levee
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Levee at 100 yr WSEL
Pine Creek
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Gianella Bridge
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Stony Creek
Levee at 320 yr WSEL
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Sacramento River
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
84% CNP of Passing 100-Year Event
Flow: 275,910 cfs
Changes in Water Surface Elevation
Tentatively Selected Plan
AYRES ASSOCIATES
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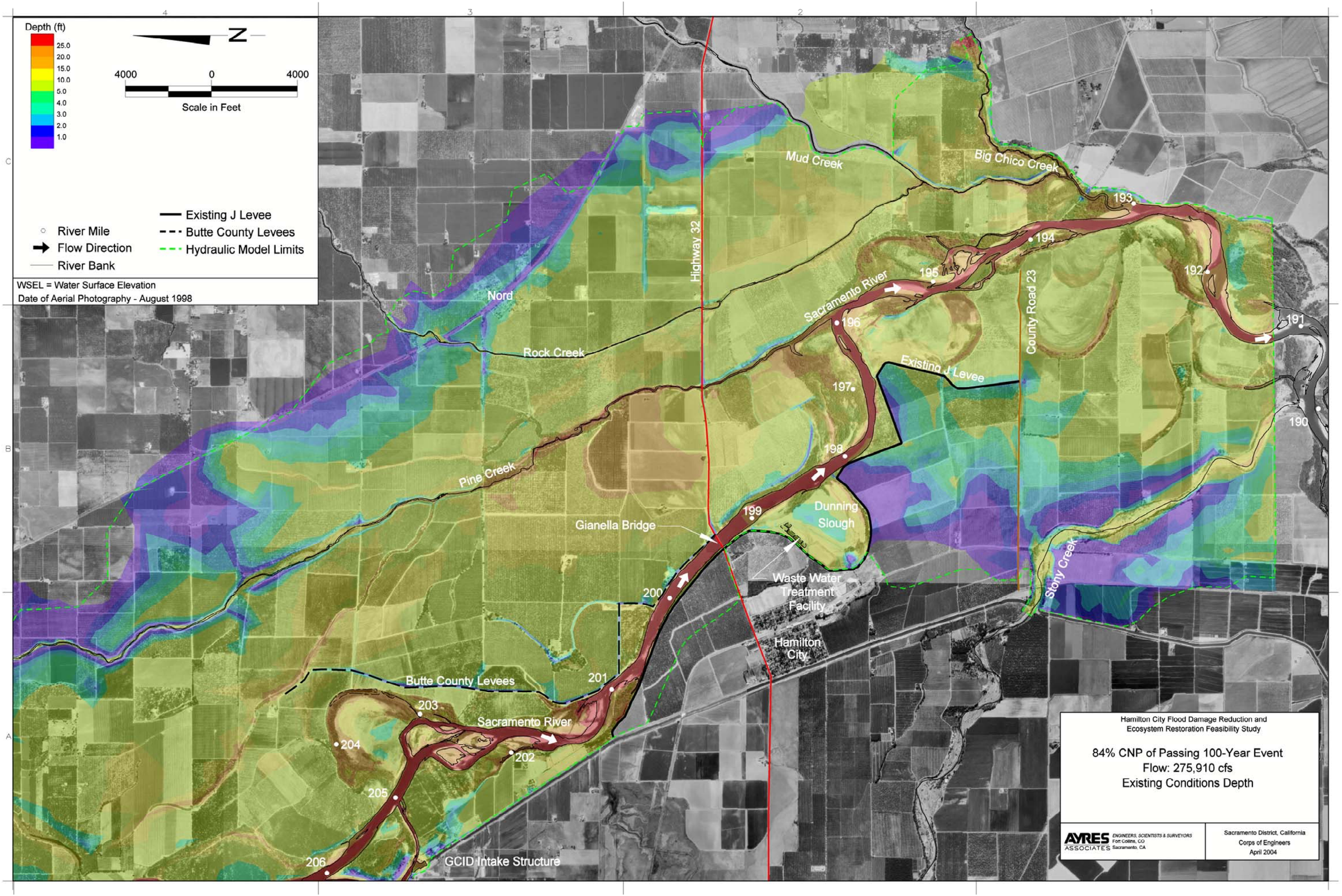
April 2004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4.0
3.0
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Scale in Feet
River Mile
Flow Direction
River Bank
Existing J Levee
Butte County Levees
Hydraulic Model Limits
WSEL = Water Surface Elevation
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Flow: 275,910 cfs
Existing Conditions Depth
AYRES ASSOCIATES
ENGINEERS, SCIENTISTS & SURVEYORS
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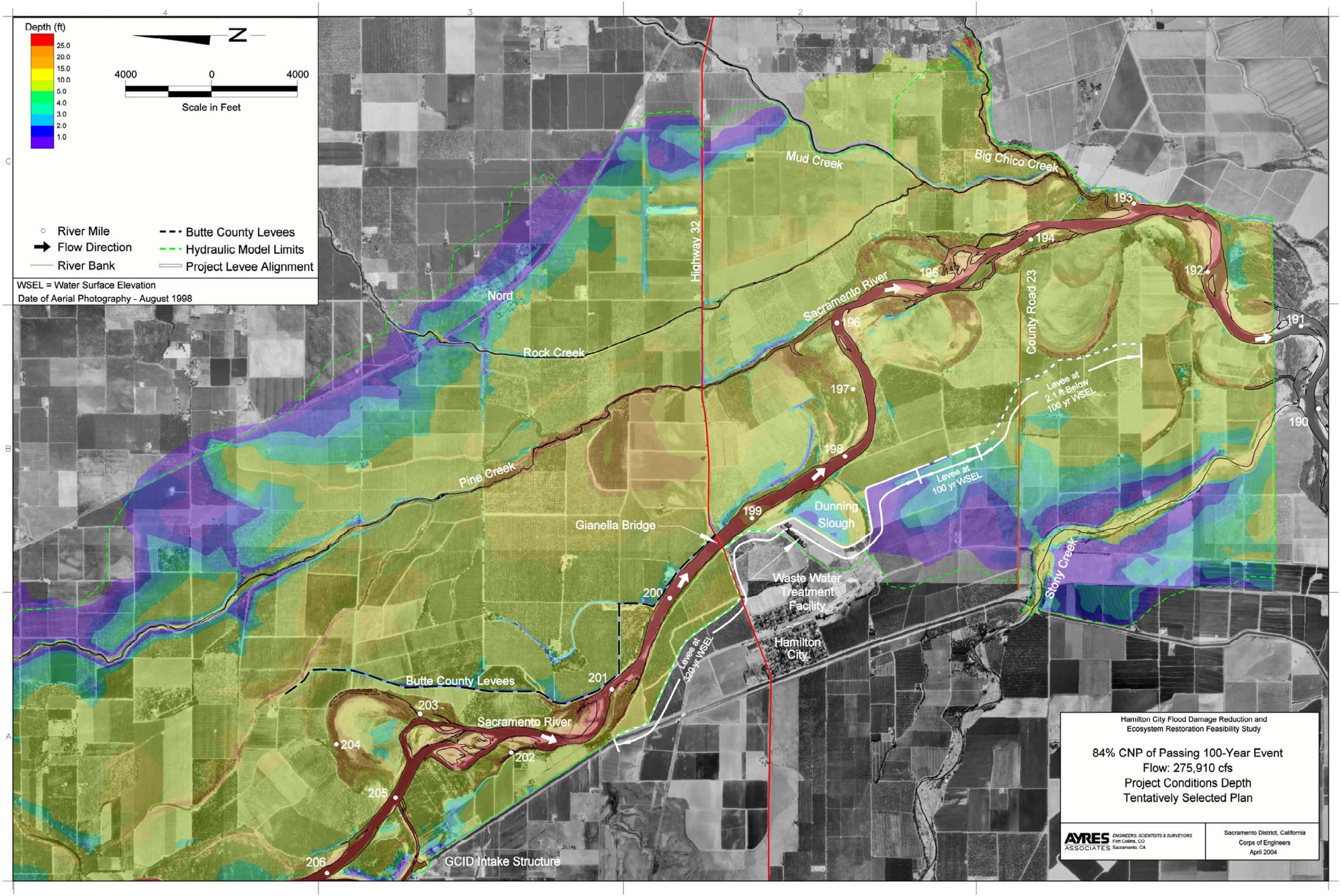
April 2004


Depth (ft)
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20.0
15.0
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4.0
3.0
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4000
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4000
Scale in Feet
River Mile
Flow Direction
River Bank
Butte County Levees
Hydraulic Model Limits
Project Levee Alignment
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Pine Creek
Gianella Bridge
Dunning Slough
Waste Water Treatment Facility
Hamilton City
Stony Creek
Levee at 2.1 ft Below 100 yr WSEL
Levee at 100 yr WSEL
Levee at 500 yr WSEL
Butte County Levees
Sacramento River
GCID Intake Structure
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
84% CNP of Passing 100-Year Event
Flow: 275,910 cfs
Project Conditions Depth
Tentatively Selected Plan
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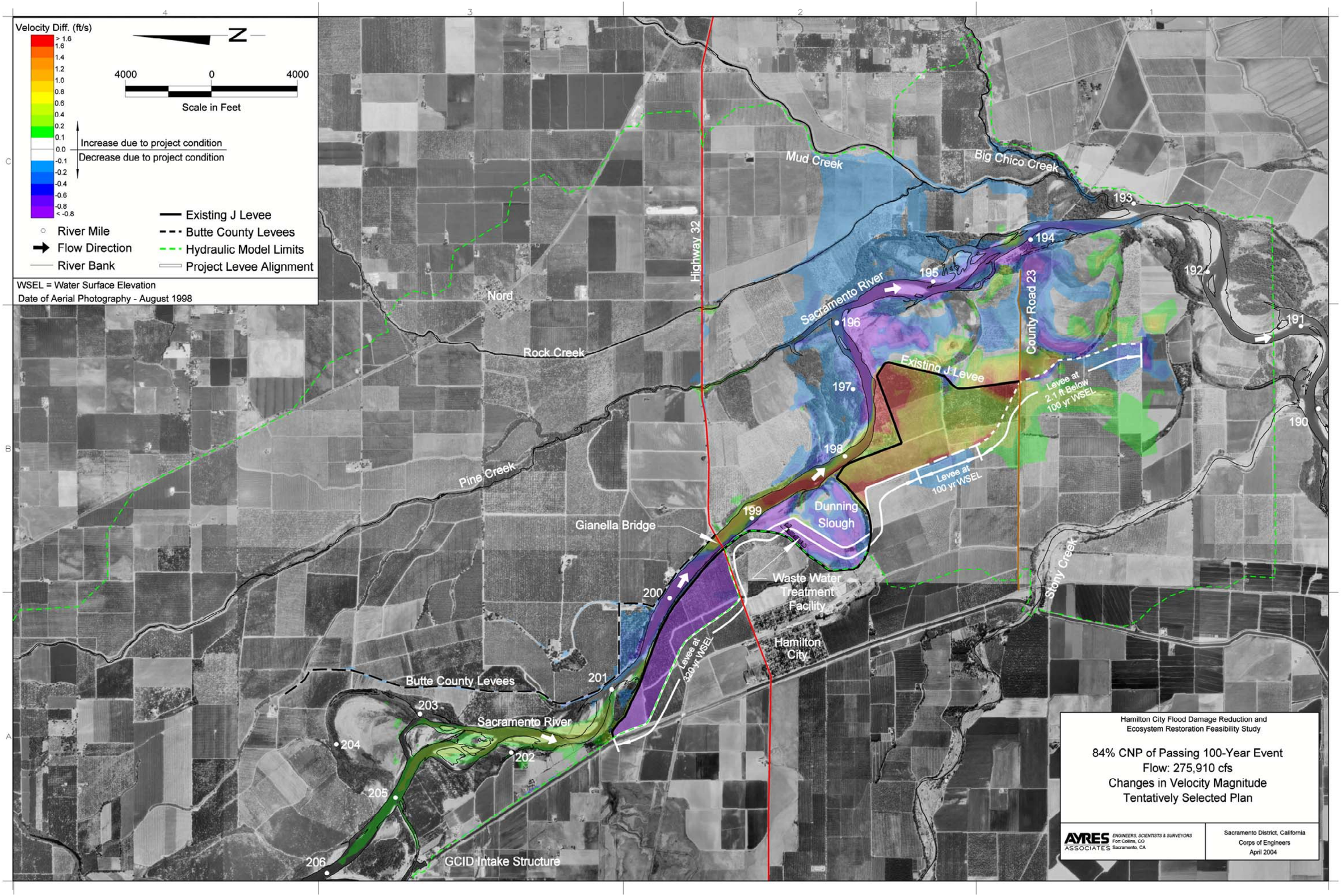
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-0.1
-0.2
-0.4
-0.6
-0.8
< -0.8
N
4000
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4000
Scale in Feet
Increase due to project condition
Decrease due to project condition
River Mile
Flow Direction
River Bank
Existing J Levee
Butte County Levees
Hydraulic Model Limits
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Levee at 100 yr WSEL
Pine Creek
Dunning Slough
Gianella Bridge
Waste Water Treatment Facility
Hamilton City
Stony Creek
Levee at 320 yr WSEL
Butte County Levees
Sacramento River
GCID Intake Structure
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
84% CNP of Passing 100-Year Event
Flow: 275,910 cfs
Changes in Velocity Magnitude
Tentatively Selected Plan
AYRES ASSOCIATES
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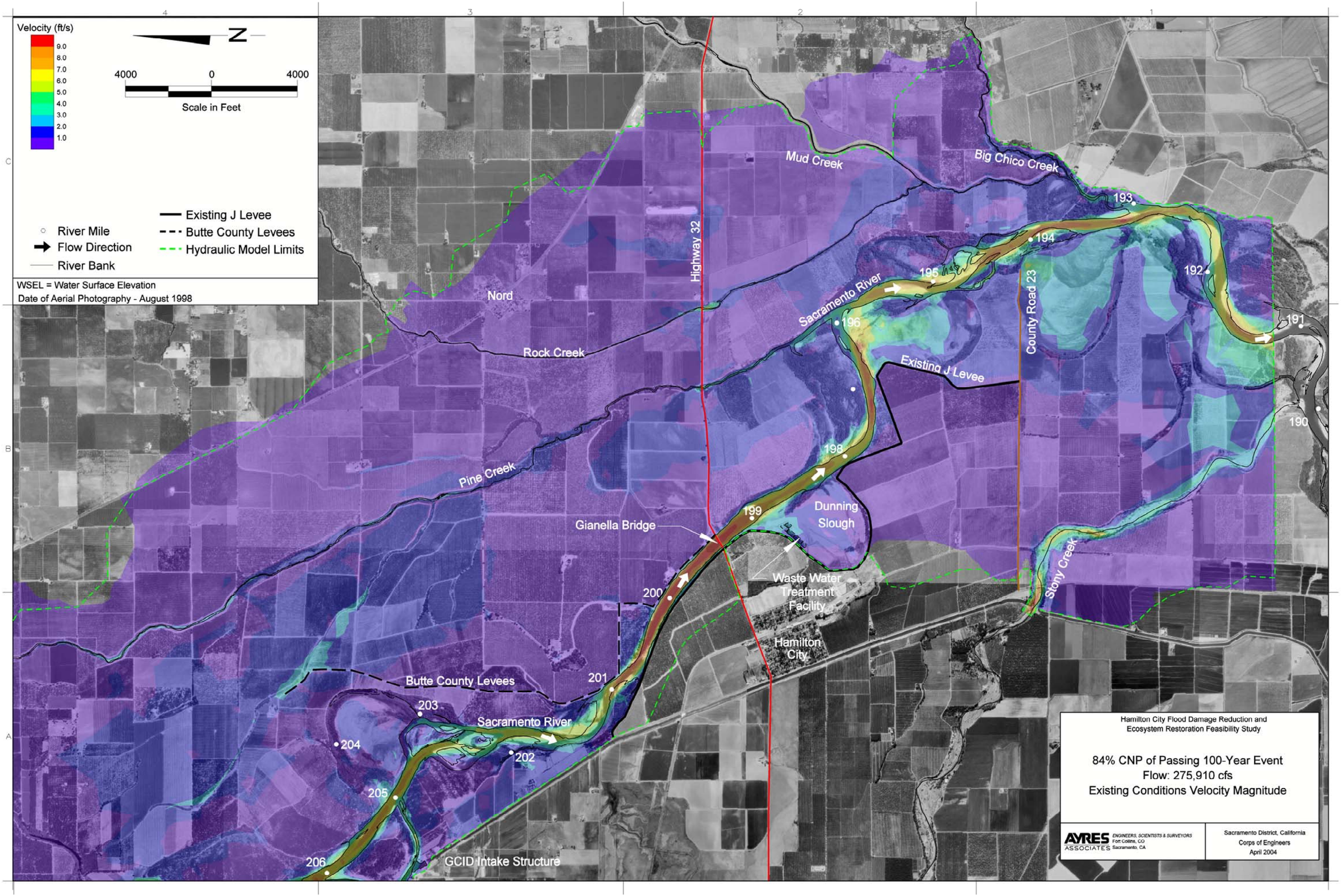
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Scale in Feet
River Mile
Flow Direction
River Bank
Existing J Levee
Butte County Levees
Hydraulic Model Limits
WSEL = Water Surface Elevation
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Mud Creek
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Dunning Slough
Gianella Bridge
Waste Water Treatment Facility
Hamilton City
Stony Creek
Butte County Levees
Sacramento River
GCID Intake Structure
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
84% CNP of Passing 100-Year Event
Flow: 275,910 cfs
Existing Conditions Velocity Magnitude
AYRES ASSOCIATES
ENGINEERS, SCIENTISTS & SURVEYORS
Fort Collins, CO
Sacramento, CA
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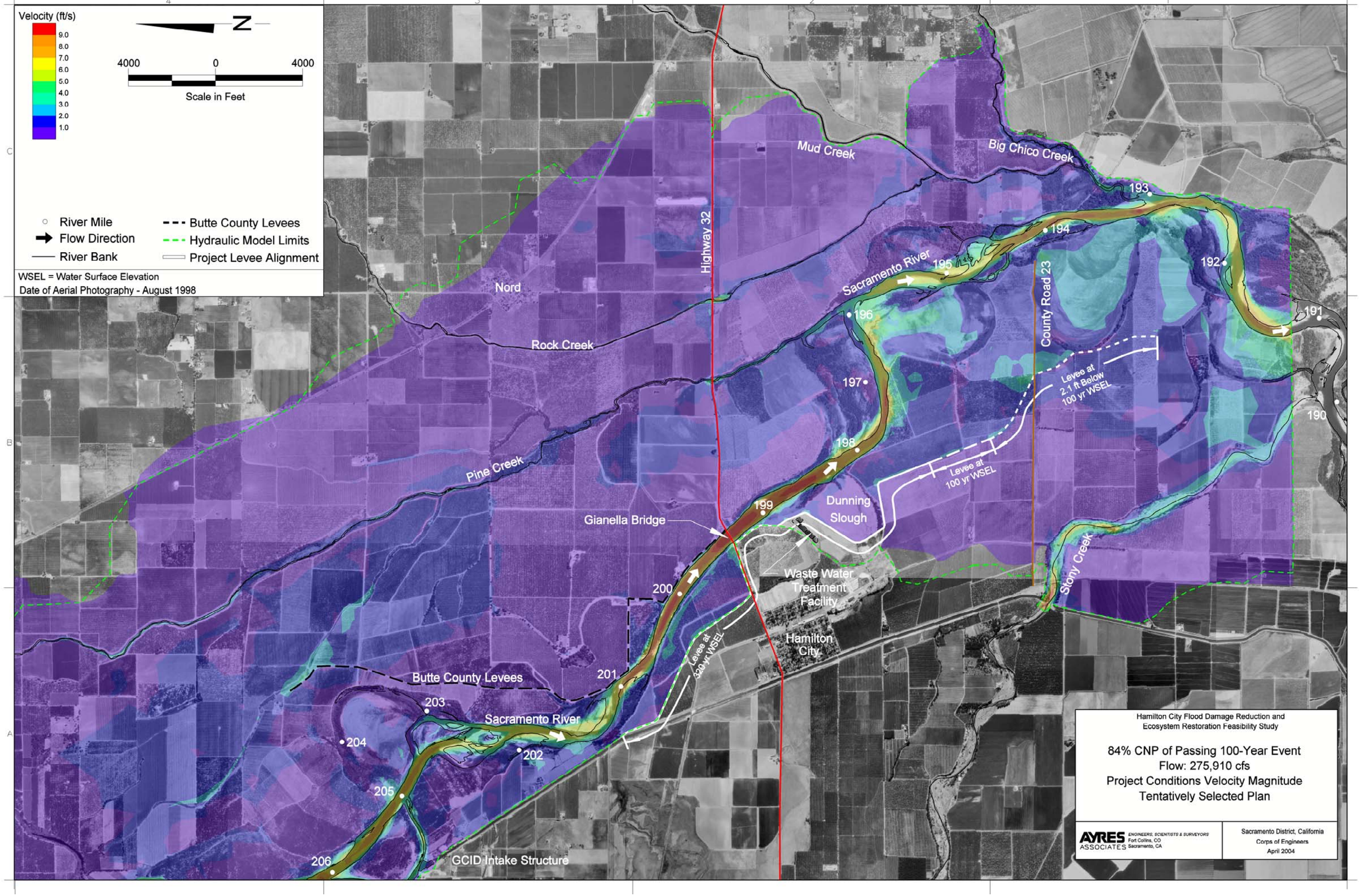
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4000
Scale in Feet
River Mile
Flow Direction
River Bank
Butte County Levees
Hydraulic Model Limits
Project Levee Alignment
WSEL = Water Surface Elevation
Date of Aerial Photography - August 1998
Mud Creek
Big Chico Creek
Highway 32
Sacramento River
County Road 23
Nord
Rock Creek
Pine Creek
Gianella Bridge
Dunning Slough
Waste Water Treatment Facility
Hamilton City
Story Creek
Butte County Levees
GCID Intake Structure
Levee at 2.1 ft Below 100 yr WSEL
Levee at 100 yr WSEL
Levee at 500-yr WSEL
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
84% CNP of Passing 100-Year Event
Flow: 275,910 cfs
Project Conditions Velocity Magnitude
Tentatively Selected Plan
AYRES ASSOCIATES
ENGINEERS, SCIENTISTS & SURVEYORS
Fort Collins, CO
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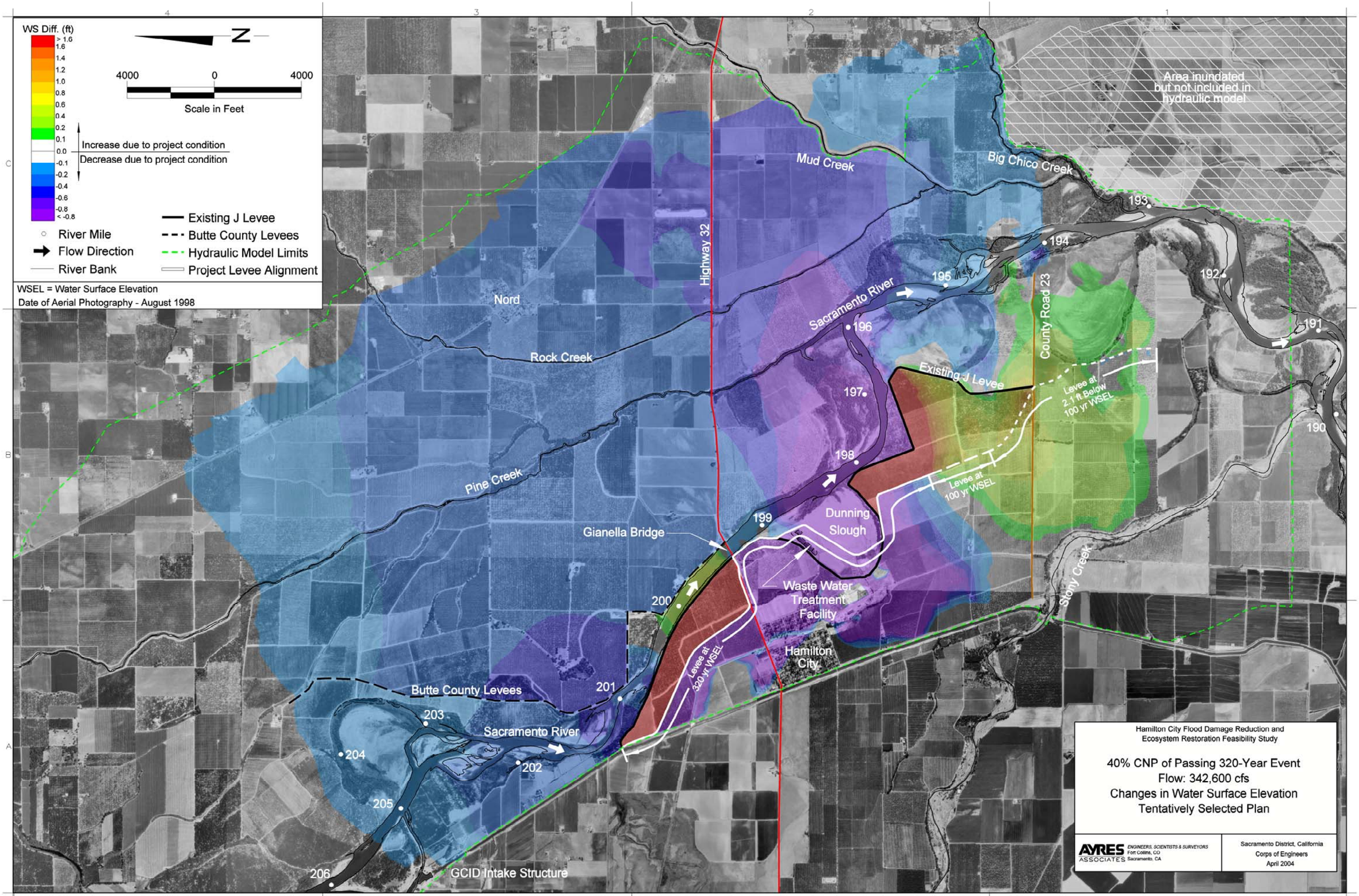
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N
4000
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Scale in Feet
Increase due to project condition
Decrease due to project condition
River Mile
Flow Direction
River Bank
Existing J Levee
Butte County Levees
Hydraulic Model Limits
Project Levee Alignment
WSEL = Water Surface Elevation
Date of Aerial Photography - August 1998
Area inundated but not included in hydraulic model
Mud Creek
Big Chico Creek
Highway 32
Nord
Rock Creek
Sacramento River
County Road 23
Existing J Levee
Levee at 2.1 ft Below 100 yr WSEL
Levee at 100 yr WSEL
Pine Creek
Dunning Slough
Gianella Bridge
Waste Water Treatment Facility
Hamilton City
Levee at 320 yr WSEL
Stony Creek
Butte County Levees
Sacramento River
GCID Intake Structure
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
40% CNP of Passing 320-Year Event
Flow: 342,600 cfs
Changes in Water Surface Elevation
Tentatively Selected Plan
AYRES ASSOCIATES
ENGINEERS, SCIENTISTS & SURVEYORS
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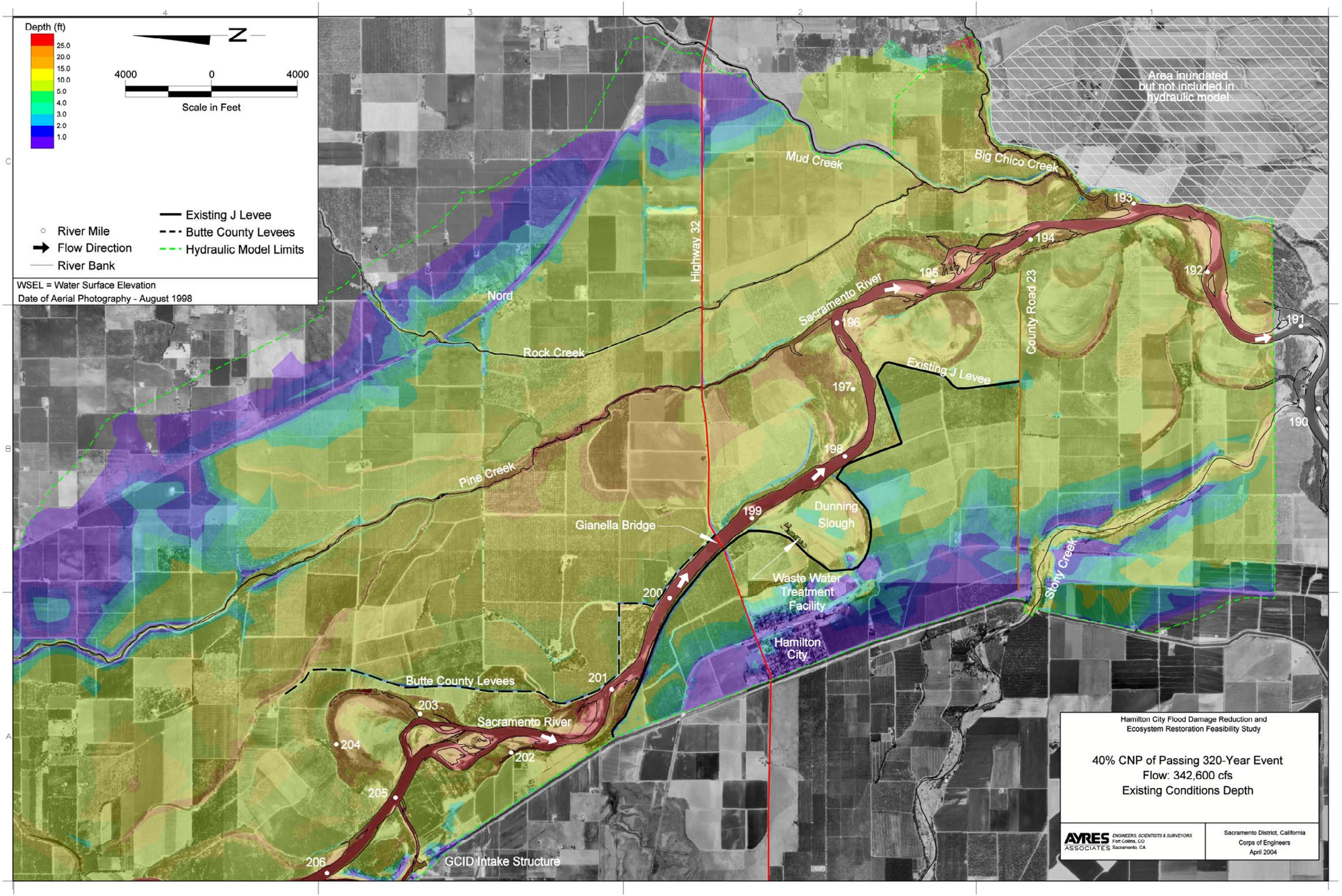
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Scale in Feet
River Mile
Flow Direction
River Bank
Existing J Levee
Butte County Levees
Hydraulic Model Limits
WSEL = Water Surface Elevation
Date of Aerial Photography - August 1998
Area inundated but not included in hydraulic model
Mud Creek
Big Chico Creek
Highway 32
County Road 23
Sacramento River
Nord
Rock Creek
Existing J Levee
Pine Creek
Dunning Slough
Gianella Bridge
Waste Water Treatment Facility
Hamilton City
Stony Creek
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Sacramento River
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Flow: 342,600 cfs
Existing Conditions Depth
AYRES ASSOCIATES
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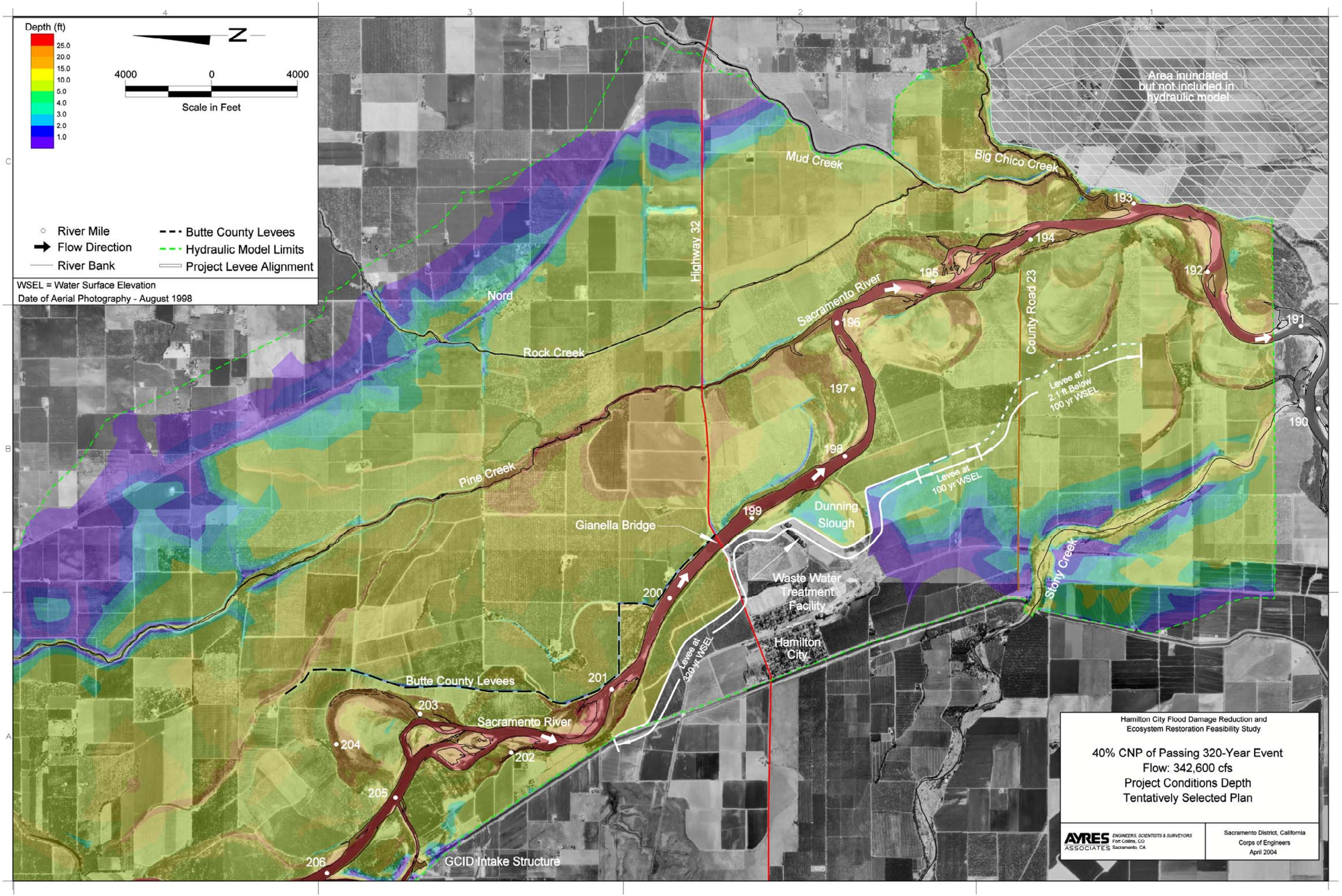
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N
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4000
Scale in Feet
River Mile
Flow Direction
River Bank
Butte County Levees
Hydraulic Model Limits
Project Levee Alignment
WSEL = Water Surface Elevation
Date of Aerial Photography - August 1998
Area inundated but not included in hydraulic model
Mud Creek
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Highway 32
Sacramento River
County Road 23
Nord
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Pine Creek
Gianella Bridge
Dunning Slough
Waste Water Treatment Facility
Hamilton City
Stony Creek
Butte County Levees
Sacramento River
GCID Intake Structure
Levee at 2.1 ft Below 100 yr WSEL
Levee at 100 yr WSEL
Levee at 320 yr WSEL
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205
206
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Flow: 342,600 cfs
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Tentatively Selected Plan
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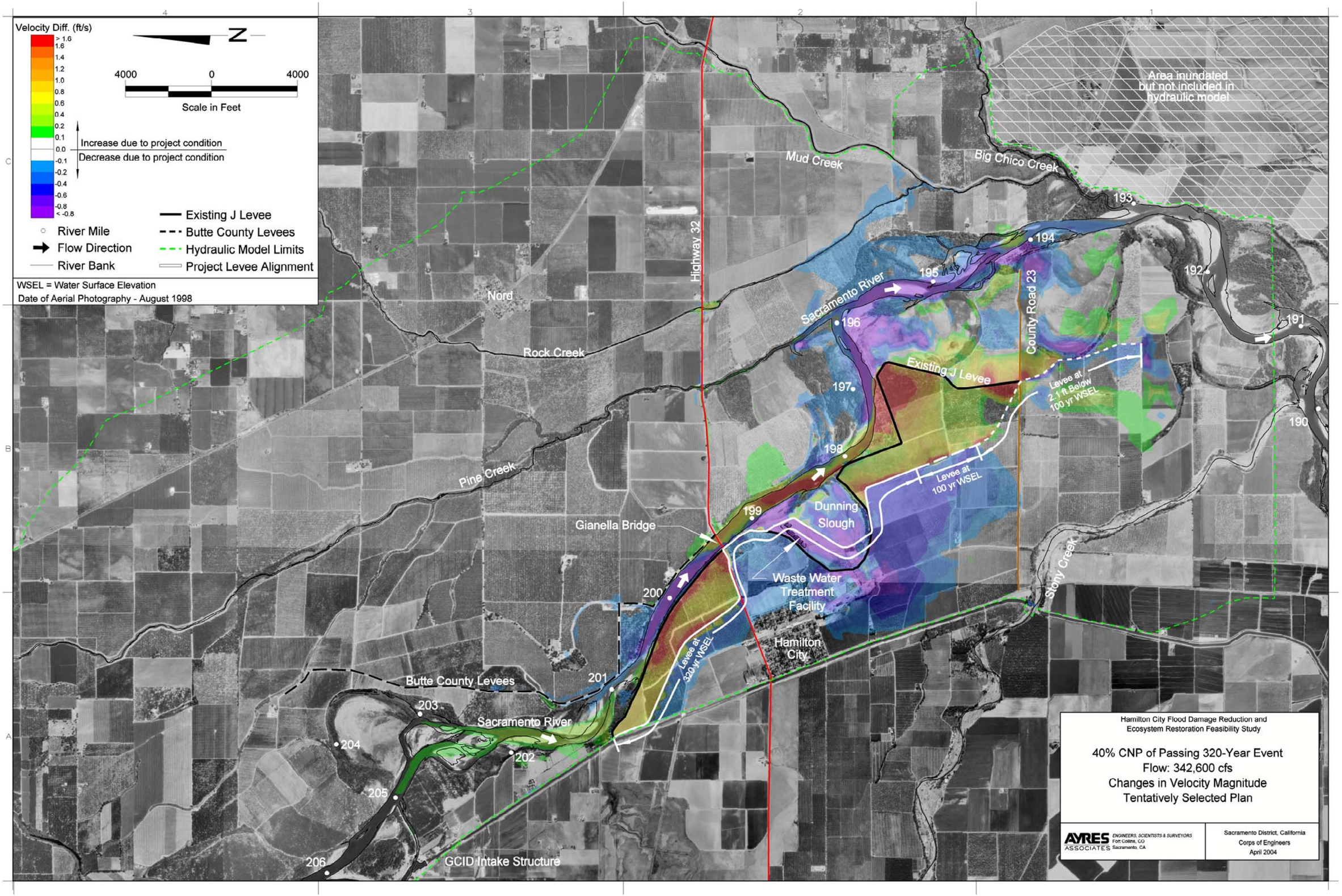
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-0.2
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-0.6
-0.8
< -0.8
Increase due to project condition
Decrease due to project condition
N
4000
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4000
Scale in Feet
River Mile
Flow Direction
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
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Tentatively Selected Plan
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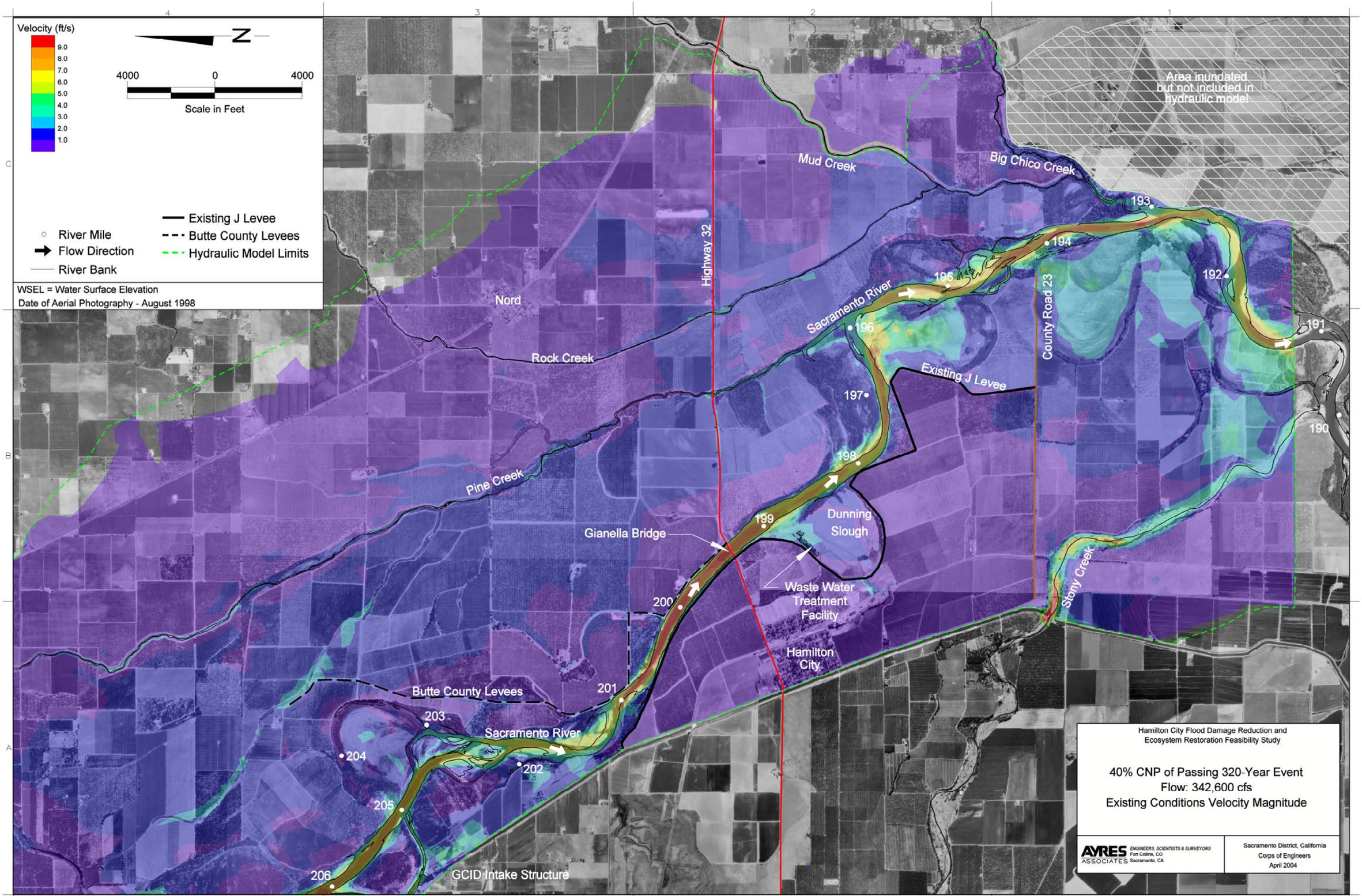
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Scale in Feet
River Mile
Flow Direction
River Bank
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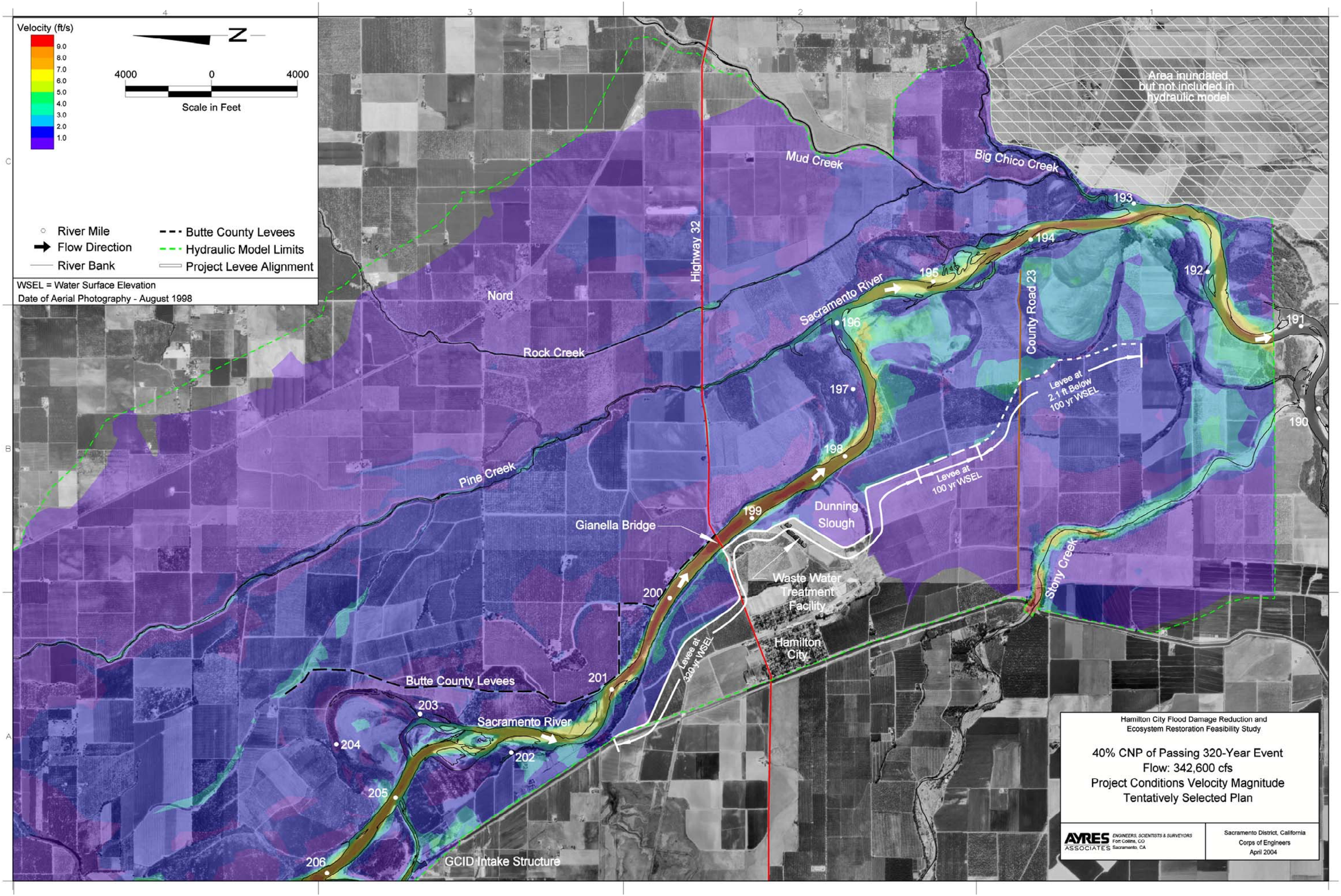
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Big Chico Creek
Highway 32
Sacramento River
County Road 23
Nord
Rock Creek
Pine Creek
Levee at 2.1 ft Below 100 yr WSEL
Levee at 100 yr WSEL
Dunning Slough
Gianella Bridge
Waste Water Treatment Facility
Hamilton City
Stony Creek
Levee at 320 yr WSEL
Butte County Levees
Sacramento River
GCID Intake Structure
190
191
192
193
194
195
196
197
198
199
200
201
202
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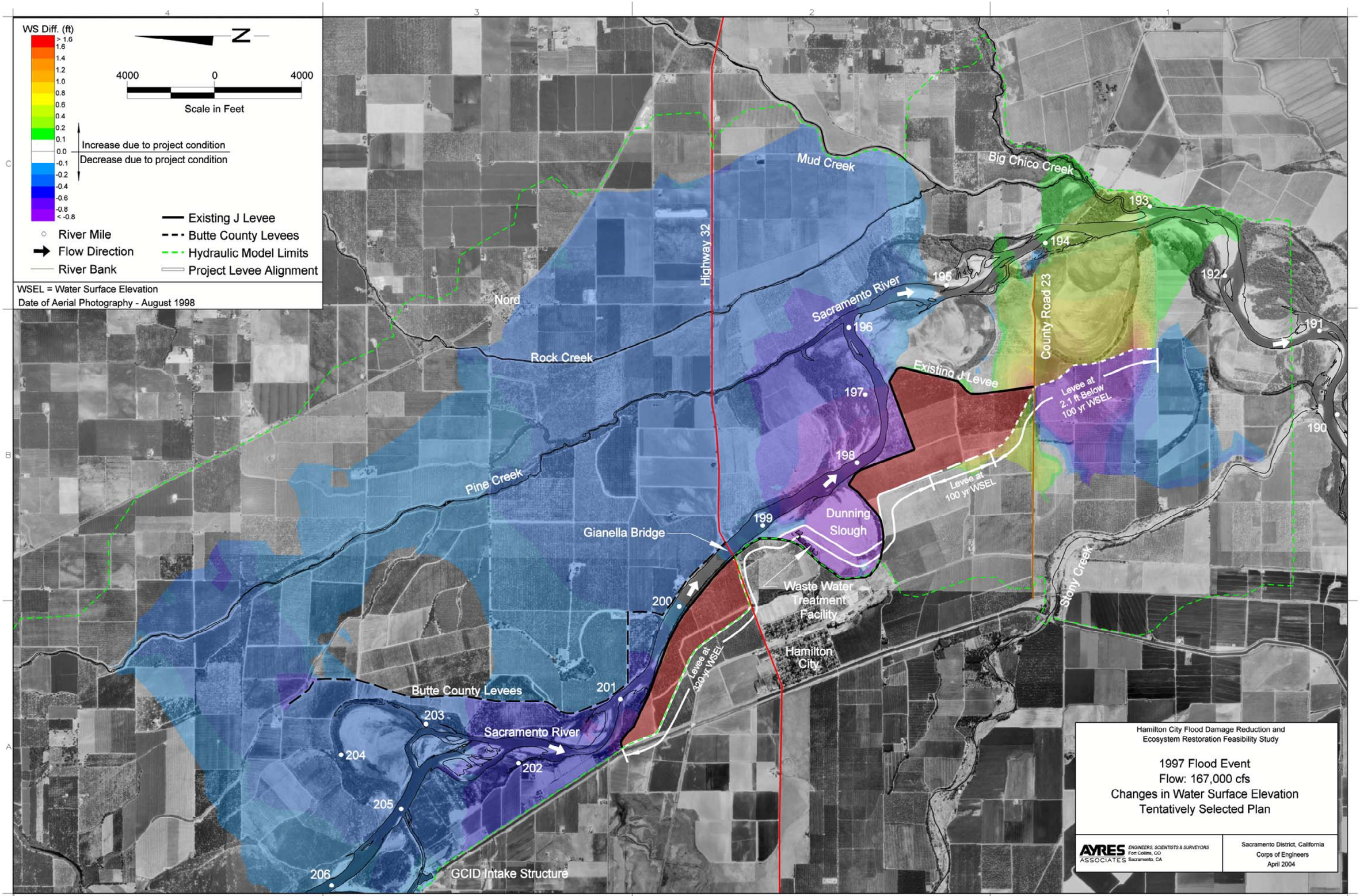
204
205
206
Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
40% CNP of Passing 320-Year Event
Flow: 342,600 cfs
Project Conditions Velocity Magnitude
Tentatively Selected Plan
AYRES ASSOCIATES
ENGINEERS, SCIENTISTS & SURVEYORS
Fort Collins, CO
Sacramento, CA
Sacramento District, California
Corps of Engineers
April 2004


WS Diff. (ft)
> 1.6
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.1
0.0
-0.1
-0.2
-0.4
-0.6
-0.8
< -0.8
N
4000
0
4000
Scale in Feet
Increase due to project condition
Decrease due to project condition
River Mile
Flow Direction
River Bank
Existing J Levee
Butte County Levees
Hydraulic Model Limits
Project Levee Alignment
WSEL = Water Surface Elevation
Date of Aerial Photography - August 1998
Mud Creek
Big Chico Creek
Highway 32
Sacramento River
County Road 23
Nord
Rock Creek
Existing J Levee
Levee at 2.1 ft Below 100 yr WSEL
Levee at 100 yr WSEL
Pine Creek
Dunning Slough
Gianella Bridge
Waste Water Treatment Facility
Hamilton City
Stony Creek
Levee at 500 yr WSEL
Butte County Levees
Sacramento River
GCID Intake Structure
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
1997 Flood Event
Flow: 167,000 cfs
Changes in Water Surface Elevation
Tentatively Selected Plan
AYRES ASSOCIATES
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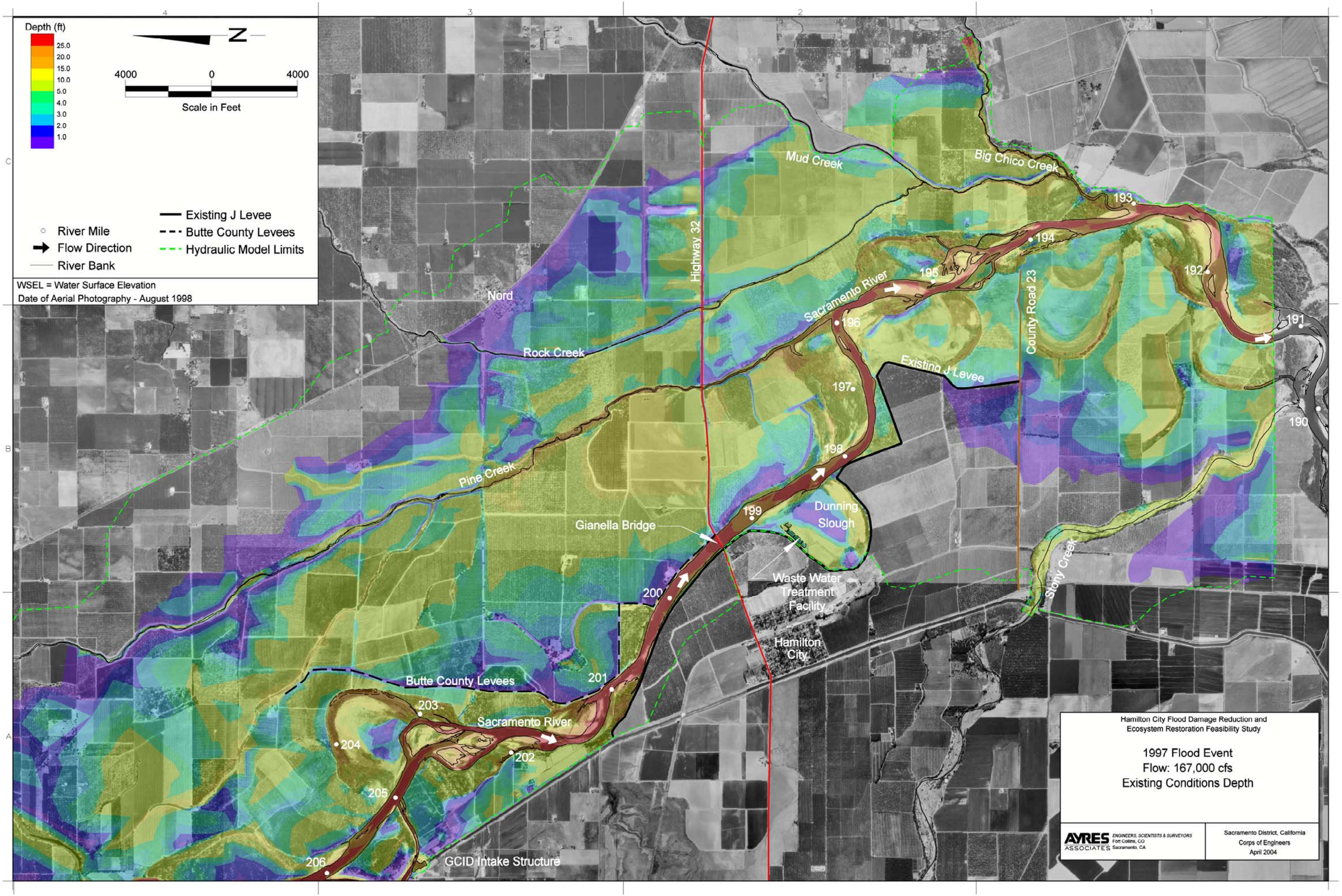
Sacramento, CA
Sacramento District, California
Corps of Engineers
April 2004


Depth (ft)
25.0
20.0
15.0
10.0
5.0
4.0
3.0
2.0
1.0
N
4000
0
4000
Scale in Feet
River Mile
Flow Direction
River Bank
Existing J Levee
Butte County Levees
Hydraulic Model Limits
WSEL = Water Surface Elevation
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Mud Creek
Big Chico Creek
Highway 32
Nord
Rock Creek
Sacramento River
County Road 23
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Pine Creek
Dunning Slough
Gianella Bridge
Waste Water Treatment Facility
Hamilton City
Stony Creek
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GCID Intake Structure
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191
192
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194
195
196
197
198
199
200
201
202
203
204
205
206
Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
1997 Flood Event
Flow: 167,000 cfs
Existing Conditions Depth
AYRES ASSOCIATES
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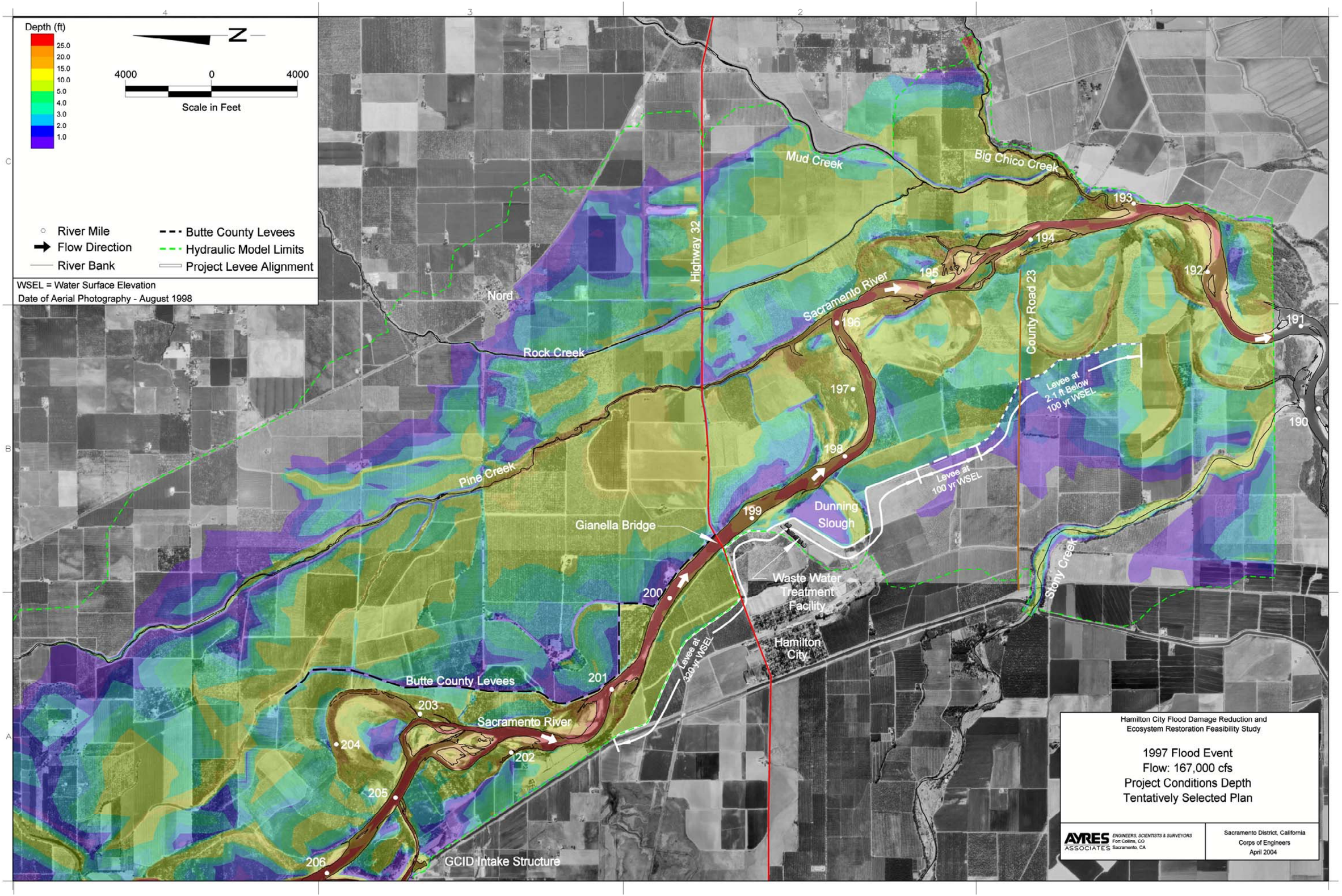
April 2004


Depth (ft)
25.0
20.0
15.0
10.0
5.0
4.0
3.0
2.0
1.0
N
4000
0
4000
Scale in Feet
River Mile
Flow Direction
River Bank
Butte County Levees
Hydraulic Model Limits
Project Levee Alignment
WSEL = Water Surface Elevation
Date of Aerial Photography - August 1998
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Highway 32
Sacramento River
County Road 23
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Gianella Bridge
Dunning Slough
Waste Water Treatment Facility
Hamilton City
Butte County Levees
GCID Intake Structure
Levee at 2.1 ft Below 100 yr WSEL
Levee at 100 yr WSEL
Levee at 320 yr WSEL
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
1997 Flood Event
Flow: 167,000 cfs
Project Conditions Depth
Tentatively Selected Plan
AYRES ASSOCIATES
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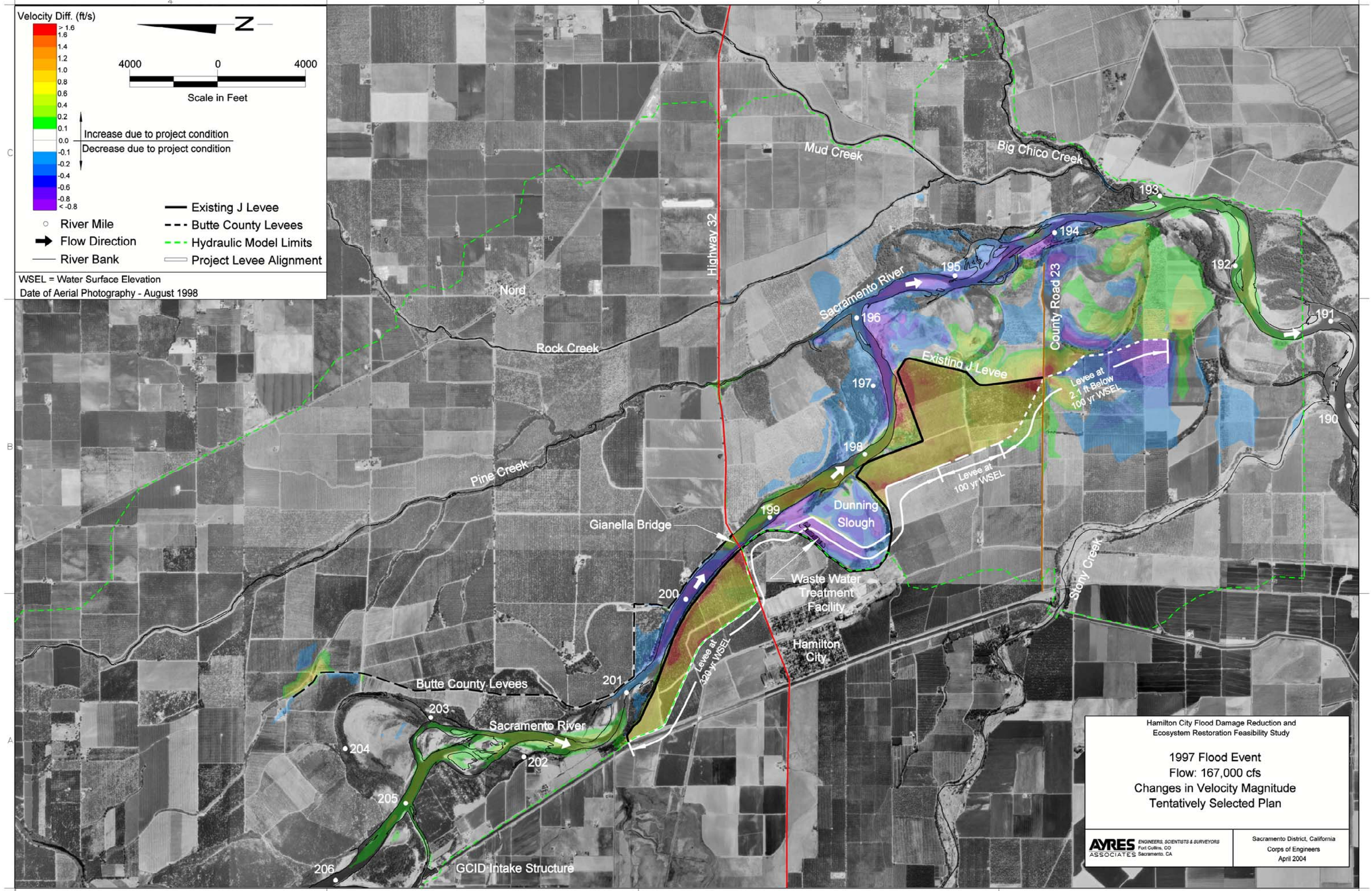
April 2004


Velocity Diff. (ft/s)
> 1.6
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.1
0.0
-0.1
-0.2
-0.4
-0.6
-0.8
< -0.8
Increase due to project condition
Decrease due to project condition
N
4000
0
4000
Scale in Feet
River Mile
Flow Direction
River Bank
Existing J Levee
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
1997 Flood Event
Flow: 167,000 cfs
Changes in Velocity Magnitude
Tentatively Selected Plan
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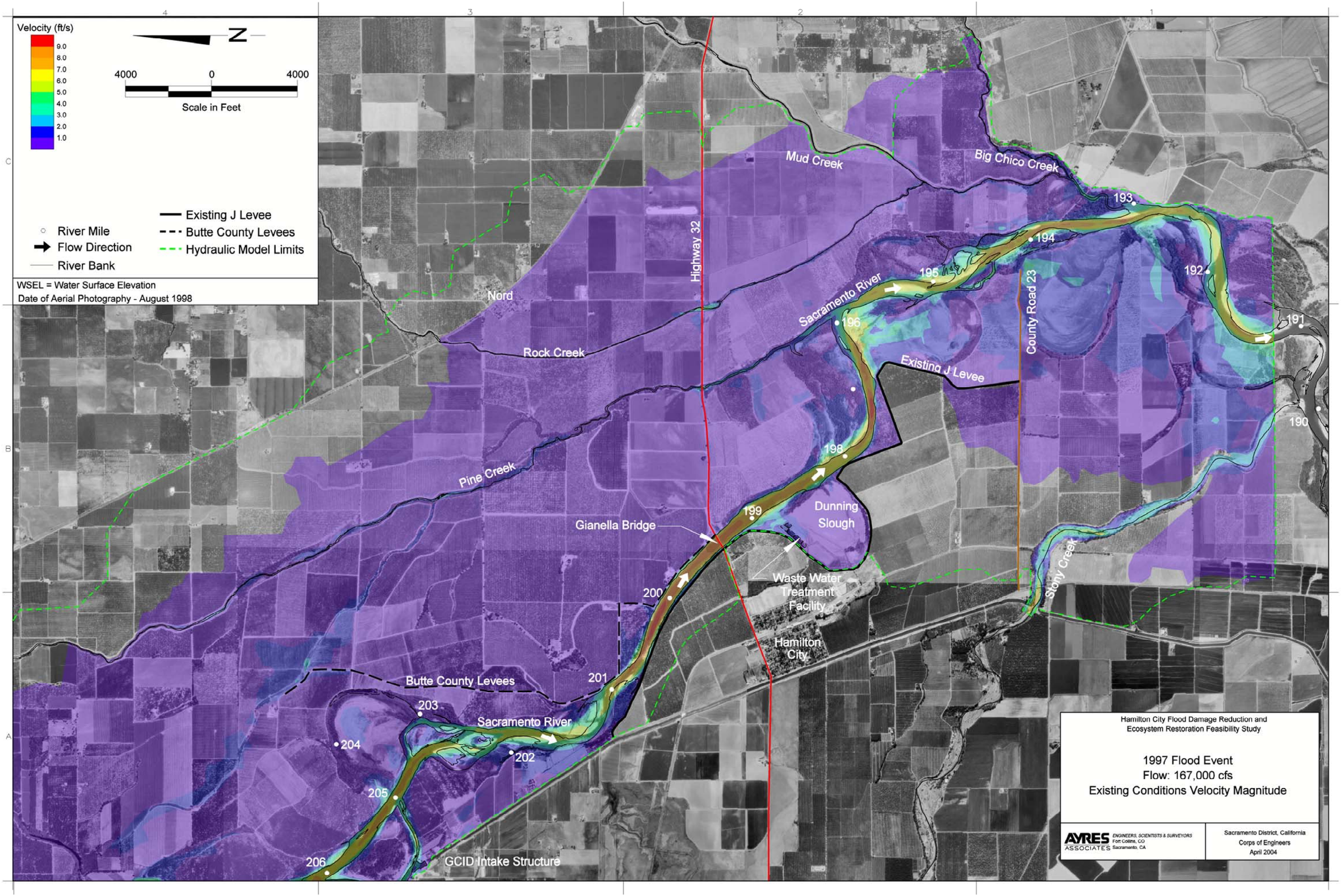
Velocity (ft/s)
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
N
4000
0
4000
Scale in Feet
River Mile
Flow Direction
River Bank
Existing J Levee
Butte County Levees
Hydraulic Model Limits
WSEL = Water Surface Elevation
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
1997 Flood Event
Flow: 167,000 cfs
Existing Conditions Velocity Magnitude
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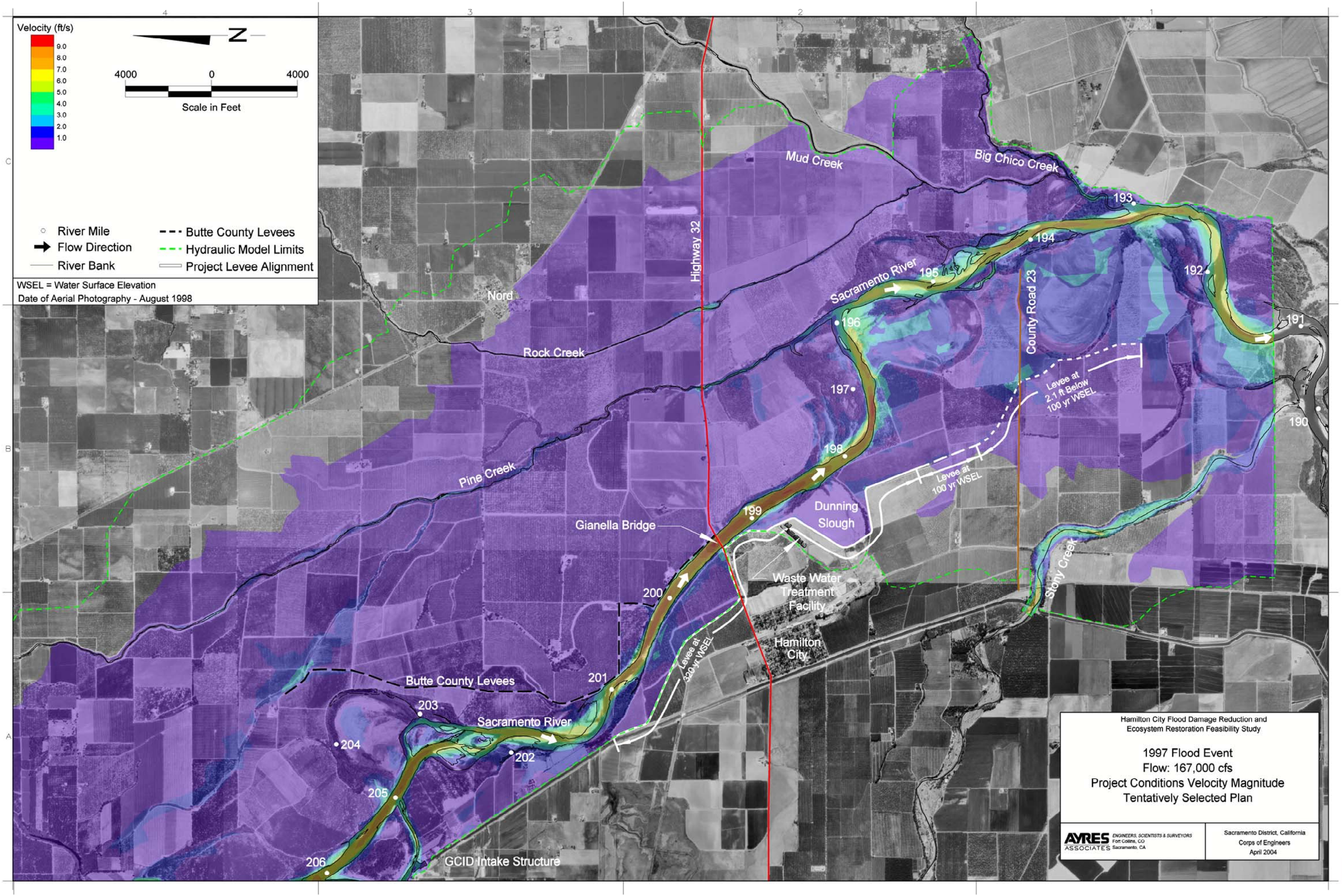
April 2004


Velocity (ft/s)
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
N
4000
0
4000
Scale in Feet
River Mile
Flow Direction
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Hamilton City Flood Damage Reduction and Ecosystem Restoration Feasibility Study
1997 Flood Event
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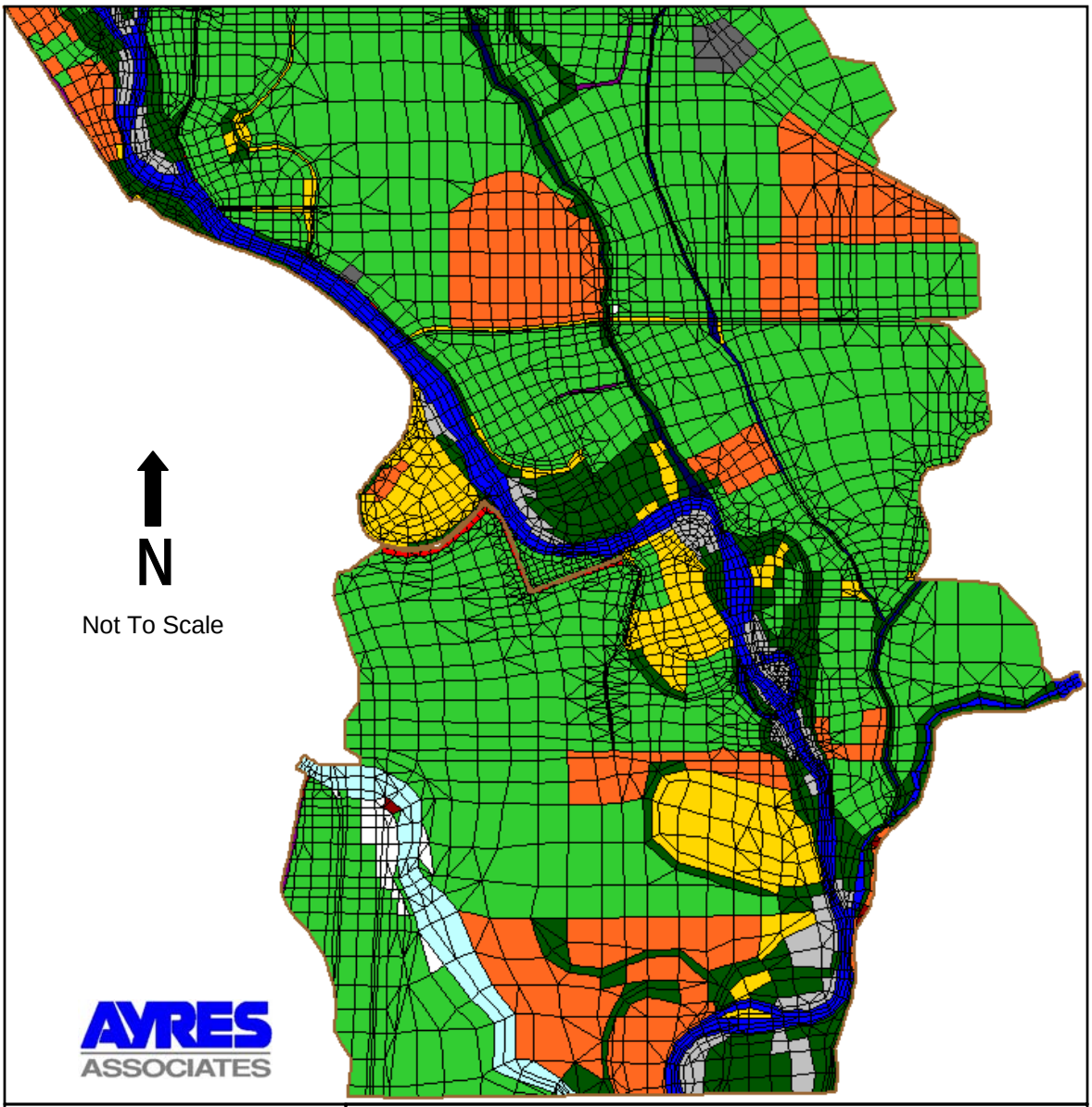


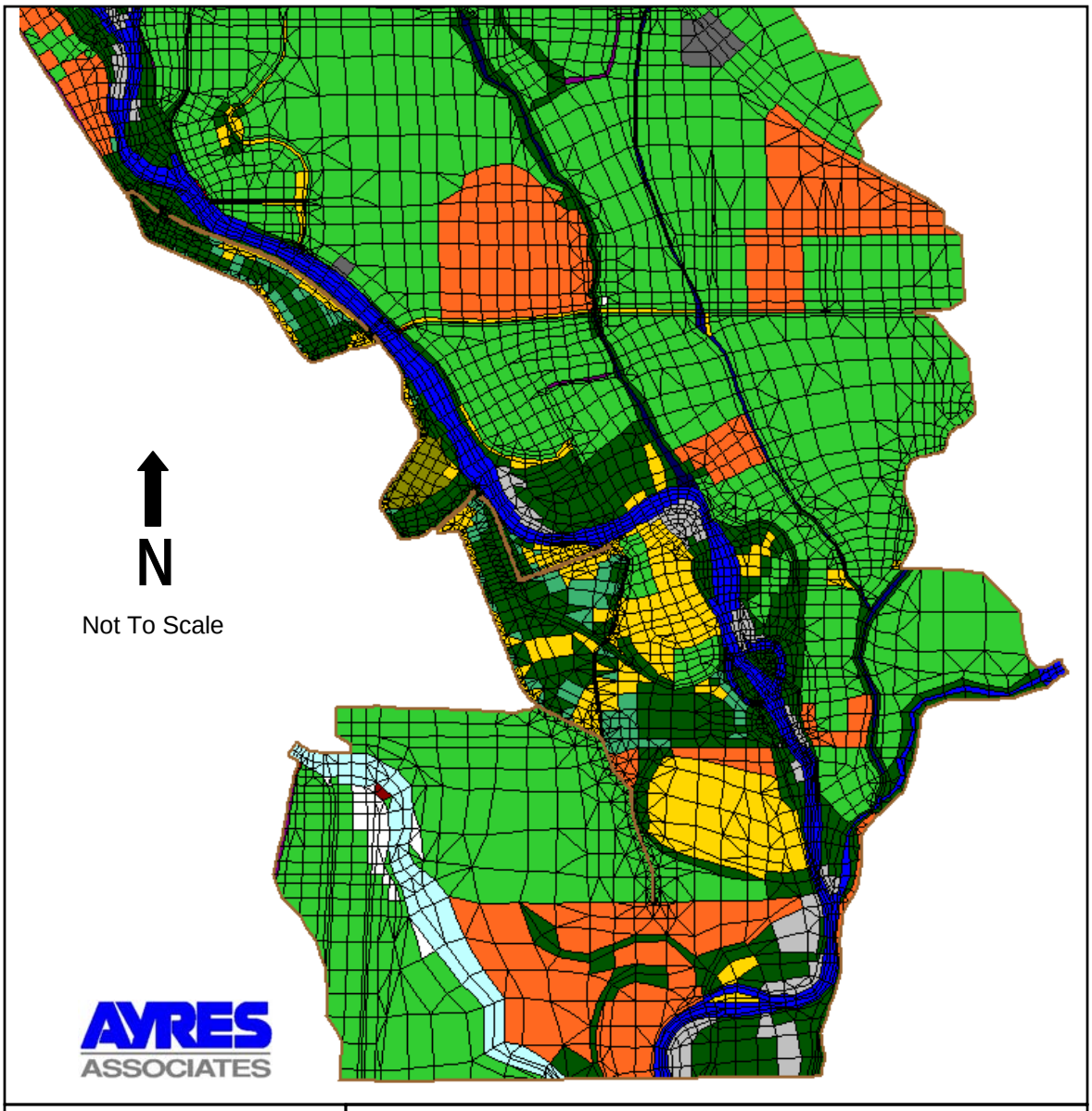
- Disable
- 01 Main_Channel 0.035
- 02_Forest 0.16
- 03_Orchard__0.15
- 04_Cultivated_Field__0.035
- 05_Sand/Gravel__0.04
- 06_Stony_Creek_Bed__0.04
- 07_Pasture/Grassland__0.035
- 08_Creek_Bed__0.035
- 09_Levee/Road__0.025
- 10_Pine_Creek_Bed__0.035
- 11_Buildings__0.2
- 12_Area_of_Turbulent_Flow__0.2
- 13_Area_of_Turbulent_Flow__0.5

Material Types (Manning's n Value)

Without Project Conditions

100 year flow - 275,910 cfs Sacramento River

- 27,400 cfs Stony Creek



- Disable
- 01_Main_Channel__0.035
- 02_Forest/Riparian__0.16
- 03_Orchard__0.15
- 04_Cultivated_Field__0.035
- 05_Sand/Gravel__0.04
- 06_Stony_Creek_Bed__0.04
- 07_Pasture/Grassland__0.035
- 08_Creek_Bed__0.035
- 09_Levee/Road__0.025
- 10_Pine_Creek_Bed__0.035
- 11_Buildings__0.2
- 12_Area_of_Turbulent_Flow__0.2
- 13_Scrub 0.1
- 14 Savannah 0.05
- 15 Area of Turbulent Flow 0.5

Material Types (Manning's n Value)

Project Conditions

100 year flow - 275,910 cfs Sacramento River

- 27,400 cfs Stony Creek