3.5 COMPARISON OF LEVEL OF FLOOD RISK REDUCTION

Alternative A1 would accrue flood annual damage reductions of $18,713,300, approximately 45 percent of the without-project damages. Alternative C would accrue expected annual damage (EAD) reductions of $8,573,000, approximately 20 percent of the without-project EAD of $42,330,000. Although more limited in scope, Alternative A1 would reduce an additional 25 percent of damages in the study area compared to Alternative C. Furthermore, Alternative A1 would not induce any flooding upon implementation, while Alternative C would induce flooding on approximately 220 structures within the study area and potentially more structures south of the study area.

The CTO alternatives would further reduce the residual damages that would remain with the Alternative A1 in place.

USACE also qualitatively evaluated the removal of the non-flood risk reduction features from Alternative C that would reduce the quantities presented in Table 3-7 and total project costs. Not only would removal of the weir reduce construction costs, but also mitigation for implementation of the project. It is assumed that the removal of the weir would substantially reduce the terrestrial habitat impacts that were due to inundation, and the post construction long-term water velocity and water quality monitoring would no longer be required. With the reduction of quantities and total project costs described in Section 3.4.4., a revised Alternative C to only include flood risk reduction project features would not be considered the NED Plan.

Table 3-7. Comparison of Level of Flood Protection for Alternatives A1 and C at FY23 Price Level and Discount Rate

	A1	C-Low Cost	C-High Cost
Project First Cost	$198,520,000	$1,046,068,000	$2,122,260,000
Interest During Construction	$614,000	$67,289,000	$136,515,000
Total Investment Cost	$199,134,000	$1,113,357,000	$2,258,775,000
Average Annual Investment Cost	$7,021,100	$39,255,000	$79,640,000
Average Annual O&M Cost	$0	$940,000	$940,000
Total Average Annual Cost	$7,021,100	$40,195,000	$80,580,000
Benefits EAD Reduced	$18,712,700	$14,279,200	$14,279,200

Net Benefits	$11,691,600	-$25,915,800	-$66,300,800
B/C Ratio	2.7	0.4	0.2

3.5.1 National Economic Development Plan

The objective of National Economic Development (NED) is to maximize increases in the net value of goods and services. Within USACE, this is achieved by comparing the difference in the value (benefits) produced by the project to the value of the resources (costs) required to produce those goods and services or construct the project, or Net Benefits. In order to produce Net Benefits a particular plan must manifest a benefit to cost ratio (BCR) greater than 1.0. Table 3-8 below provides an economic analysis summary utilized to determine the likely the NED Plan.

Table 3-8. Summary of Economic Assessment at FY24 Price Level and Discount Rate

	CTO		CTO Without Weir		A1-NS Only	A1 with Canton Levee
	Low	High	Low	High		
Project First Cost	$487,328,569	$655,391,345	$399,498,775	$508,474,363	$50,072,903	$60,072,903
IDC	$18,613,297	$25,161,141	$15,305,461	$19,748,644	$170,090	$306,657
Total Investment Cost	$505,941,865	$680,552,487	$414,804,236	$528,223,006	$50,242,993	$60,379,561
Benefits	$27,718,600	$27,718,600	$22,409,565	$22,409,565	$4,010,090	$4,828,250
AA Investment Cost	$18,740,500	$25,208,300	$15,403,200	$19,738,400	$1,861,000	$2,236,500
AA O&M Cost	$729,936	$891,122	$196,976	$421,372	$0	$20,340
Total AA Cost	$19,470,436	$26,099,422	$15,600,176	$20,159,772	$1,861,000	$2,256,840
Net Benefits	$8,248,164	$1,619,178	$6,809,389	$2,249,793	$2,149,090	$2,571,410
BCR	1.4	1.1	1.4	1.1	2.2	2.1

3.5.1.1 Alternative A1

Preliminary economic analysis identified Alternative A1 as the potential NED Plan. However, once controlling for the effects of the headwater flooding on the tributaries, the net benefits of the non-structural plan dropped to $2.15m with a BCR of 2.2. As a result, Alternative A1 was no longer the clear NED plan, but was still in contention. However,