

Appendix 4: Feasibility Level Opinion of Probable Cost

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Units Abbreviation Legend:

AC acre
 CY cubic yard
 EA each
 LF linear foot
 LS lump sum
 MI mile
 TN ton

The Extended Price numbers have been rounded to the nearest \$1,000.

Alternative 3

Line	Site	Line Item	Quantity	Units	Unit Price	Extended Price	Description of Actions
1	Areas 3 & 4	Mobilization & Demobilization	1	LS	\$3,343,000	\$3,343,000	Mobilizing & demobilizing forces, equipment, and facilities to needed to perform the work.
2		Site Preparation & Env. Compliance	1	LS	\$2,026,000	\$2,026,000	General site preparations, environmental compliance measures and BMP's
3	Levee Lowering	Remove Railroad Slough Levee	20,000	CY	\$8.00	\$160,000	Excavate and haul for onsite use as habitat fill.
4		Remove Schell Creek Levee	12,000	CY	\$8.00	\$96,000	Excavate and haul for onsite use as habitat fill.
5		Remove Stock Pond Levees	10,000	CY	\$5.00	\$50,000	Excavate and haul for onsite

							use as habitat fill.
6	Channel Excavation	Big Break Channel Expansion	19,000	CY	\$7.50	\$143,000	Expand Big Break channel to Area 4. Reuse material as habitat fill.
7	Levee Improvement	Area 4 West Levee	44,000	CY	\$10.00	\$440,000	Construct ~4,400 LF levee along west edge of Area 4 using onsite fill.
8	Railroad Infrastructure	Railroad Embankment	149,000	CY	\$70.00	\$10,430,000	Construct ~7,500 LF embankment along both sides of railroad using imported material.
9		Rock Slope Protection	60,000	TN	\$100.00	\$6,000,000	Armor new embankments on both sides of railroad.
10		Railroad Slough Bridge Flood Gate	1	EA	\$100,000	\$100,000	Construct flood gate at north side of Railroad slough bridge.
11	Other Infrastructure	Millerick Road Low Water Crossing	1,000	TN	\$100.00	\$100,000	Install a rocked low water crossing on Millerick Road at Big Break.
12		Power Line Installation	7,500	LF	\$20.00	\$150,000	Construct new powerline along railroad from SR121 to Camp 2.

13	Demolition	Millerick Road Demolition	3,000	LF	\$10.00	\$30,000	Demolish Millerick Road south of Vineyard to Camp 2.
14		Railroad Slough Tide Gate Demolition	1	EA	\$25,000	\$25,000	Demolish the existing concrete tide gate structure.
15		Power Line Demolition	3,000	LF	\$10.00	\$30,000	Remove the powerline along Millerick Road from the vineyard south to Camp 2.
16		House Demolition	3	EA	\$200,000	\$600,000	Demolish homes in the northern part of Area 4.
17		Septic System Demolition	3	EA	\$10,000	\$30,000	Demolish septic systems per county standards
18		Barn Demolition	12	EA	\$100,000	\$1,200,000	Demolish barns in the northern part of Area 4.
19		Fence demolition	2	MI	\$5,000	\$10,000	Remove fencing in Area 4.
20		Miscellaneous Demolition	40	AC	\$10,000	\$400,000	General debris, equipment, & structure removal and clean up.
21		General Ripping & Discing	40	AC	\$1,000	\$40,000	Rip and disc hardened lands in northern Area 4.

22		Road Demolition	11,000	LF	\$132.80	\$141,000	Demolish existing asphalt and rock surfaced areas (estimated equivalent of 3 acres).
23		Well Demolition	3	EA	\$15,000	\$45,000	Demolish wells per county standards.
24		Pump Demolition	2	EA	\$20,000	\$40,000	Remove existing pumps and appurtenances.
25	Areas 3 & 4 Subtotal					\$25,629,000	
26	Camp 2	Mobilization & Demobilization	1	LS	\$5,854,000	\$5,854,000	Mobilizing & demobilizing forces, equipment, and facilities to needed to perform the work.
27		Site Preparation & Env. Compliance	1	LS	\$3,548,000	\$3,548,000	General site preparations, environmental compliance measures and BMP's
28	Levee lowering	Lower Sonoma Creek Levee	57,000	CY	\$5.00	\$285,000	Selectively lower to MHHW. Sidecast material to flatten interior side slope.
29		Remove Railroad Slough Levee	111,000	CY	\$8.00	\$888,000	Excavate and haul for onsite use as habitat fill.

30		Remove Wingo Slough Levee	53,000	CY	\$8.00	\$424,000	Excavate and haul for onsite use as habitat fill.
31		Lower Steamboat Slough Levee	30,000	CY	\$5.00	\$150,000	Selectively lower to MHHW. Sidecast material to flatten interior side slope.
32	Levee Breaching	SW Sonoma Creek Breach	14,000	CY	\$12.00	\$168,000	Excavate breach and sidecast material nearby.
33		SE Wingo Slough Breach	15,000	CY	\$12.00	\$180,000	Excavate breach and sidecast material nearby.
34	Channels Excavation	SW Sonoma Creek Channel	1,214,000	CY	\$7.50	\$9,105,000	Excavate channel and haul material for use as habitat fill onsite.
35		Wingo Slough Channel	161,000	CY	\$7.50	\$1,208,000	Excavate channel and haul material for use as habitat fill onsite.
36	Railroad Infrastructure	Railroad Embankment	253,000	CY	\$70.00	\$17,710,000	Construct ~6,000 LF embankment along both sides of railroad using imported material.

37		Rock Slope Protection	48,000	TN	\$100.00	\$4,800,000	Armor new embankments on both sides of railroad.
38		Railroad Slough Bridge Flood Gate	1	EA	\$100,000	\$100,000	Construct flood gate at south side of Railroad Slough bridge.
39		Wingo Slough Bridge Flood Gate	1	EA	\$100,000	\$100,000	Construct flood gate at north side of Wingo Slough bridge .
40	Other Infrastructure	Power Line Installation	6,000	LF	\$20.00	\$120,000	Install powerline along railroad alignment from railroad slough to wing slough.
41	Demolition	Millerick Road Demolition	7,800	LF	\$10.00	\$78,000	Demolish Millerick Road from Area 3 to Wingo Slough.
42		Power Line Demolition	7,800	LF	\$10.00	\$78,000	Remove powerline within west side of Camp 2.
43		Pump Station Demolition	11	EA	\$40,000	\$40,000	Demolish NW Pump station
44		Well Demolition	3	EA	\$15,000	\$45,000	Demolish wells per county standards.
45	Camp 2 Subtotal					\$44,881,000	
46	Camp 3	Mobilization & Demobilization	1	LS	\$4,264,000	\$4,264,000	Mobilizing & demobilizing forces, equipment, and facilities to needed to

							perform the work.
47		Site Preparation & Env. Compliance	1	LS	\$2,584,000	\$2,584,000	General site preparations, environmental compliance measures and BMP's
48	Levee Lowering	Lower Sonoma Creek Levee	4,000	CY	\$5.00	\$20,000	Selectively lower to MHHW. Sidecast material to flatten interior side slope.
49		Remove Wingo Slough Levee	43,000	CY	\$8.00	\$344,000	Excavate and haul for onsite use as habitat fill.
50		Lower Third Napa Slough Levee	11,000	CY	\$5.00	\$55,000	Selectively lower to MHHW. Sidecast material to flatten interior side slope.
51		Lower Second Napa Slough Levee	1,000	CY	\$5.00	\$5,000	Selectively lower to MHHW. Sidecast material to flatten interior side slope.
52		Remove Residential Levees	8,000	CY	\$5.00	\$40,000	Remove ~ 1,200 LF of levees around residence.

53	Levee Breaching	Second Napa Slough Breach	14,000	CY	\$12.00	\$168,000	Excavate breach and sidecast material nearby.
54		Wingo Slough Breach	14,000	CY	\$20.00	\$280,000	Excavate breach and sidecast material nearby.
55		Third Napa Slough Breach	15,000	CY	\$12.00	\$180,000	Excavate breach and sidecast material nearby.
56	Channel Excavation	Sonoma Creek Channel	819,000	CY	\$7.50	\$6,143,000	Excavate channel and haul material for use as habitat fill onsite.
57		China Slough Channel	409,000	CY	\$7.50	\$3,068,000	Excavate channel and haul material for use as habitat fill onsite.
58	Railroad Infrastructure	Railroad Embankment	157,000	CY	\$70.00	\$10,990,000	Construct ~5,300 LF embankment on east side of railroad from Wingo Slough to Camp 1 using import fill.
59		Rock Slope Protection	21,000	TN	\$100.00	\$2,100,000	Armor new embankment.
60		Wingo Slough Bridge Flood Gate	1	EA	\$100,000	\$100,000	Construct flood gate at south side of Wingo Slough bridge.

61	Demolition	Power Line Demolition	200	LF	\$10.00	\$2,000	Remove 2 poles at residence
62		House Demolition	7	EA	\$200,000	\$1,400,000	Remove homes around Camp 3
63		Septic System Demolition	7	EA	\$10,000	\$70,000	Demolish septic systems per county standards.
64		Barn Demolition	6	EA	\$100,000	\$600,000	Demolish barns.
65		General ripping/discing	6	AC	\$1,000	\$6,000	Loosen soil around barns and residences.
66		Road Demolition	2,500	LF	\$1312.80	\$32,000	Demolish ~2,500 LF of paved/heavily surfaced road.
67		Road Demolition	5,400	LF	\$10.00	\$54,000	Demolished ~5,400 LF of graveled road east of the railroad.
68		Well Demolition	3	EA	\$15,000	\$45,000	Demolish wells per county standards.
69		Pump Demolition	1	EA	\$20,000	\$20,000	Remove pump station
70		Miscellaneous Demolition	2	AC	\$10,000	\$20,000	General debris, equipment, & structure removal and clean up.
71		Miscellaneous Demolition	1	EA	\$100,000	\$100,000	Demolish bridge, ~50 ft length

72	Camp 3 Subtotal						\$32,690,000	
73	Camp 4	Mobilization & Demobilization	1	LS	\$881,000	\$881,000	Mobilizing & demobilizing forces, equipment, and facilities to needed to perform the work.	
74		Site Preparation & Env. Compliance	1	LS	\$534,000	\$534,000	General site preparations, environmental compliance measures and BMP's	
75	Levee lowering	Lower Steamboat Slough Levee	149,000	CY	\$6.50	\$969,000	Selectively lower to MHHW. Sidecast material to flatten interior side slope.	
76		Lower Third Napa Slough Levee	12,000	CY	\$6.50	\$78,000	Selectively lower to MHHW. Sidecast material to flatten interior side slope.	
77		Lower Hudeman Slough Levee	7,000	CY	\$6.50	\$46,000	Selectively lower to MHHW levees south and east of property, sidecast material.	
78		Lower Internal Berms	10,000	CY	\$5.00	\$50,000	Selectively lower ~3,600 LF of internal berms.	

79	Levee Breaching	Third Napa Slough Breach	13,000	CY	\$12.00	\$156,000	Excavate breach and sidecast material nearby.
80	Channel Excavation	Third Napa Slough Channel	488,000	CY	\$7.50	\$3,660,000	Excavate and haul for onsite use as habitat fill.
81	Demolition	Power Line Demolition	900	LF	\$10.00	\$9,000	Remove powerlines.
82		Barn Demolition	3	EA	\$100,000	\$300,000	Remove barns.
83		General ripping/discing	7	AC	\$1,000	\$7,000	Loosen ~7 acres around barn areas
84		Road Demolition	4,400	LF	\$10.00	\$44,000	Demolish ~4,400 LF of internal rock road
85		Pump Demolition	1	EA	\$20,000	\$20,000	Demolish pump stations and appurtenances
86	Camp 4 Subtotal					\$6,754,000	
87	Skaggs Island	Mobilization & Demobilization	1	LS	\$6,890,000	\$6,890,000	Mobilizing & demobilizing forces, equipment, and facilities to needed to perform the work.
88		Site Preparation & Env. Compliance	1	LS	\$4,176,000	\$4,176,000	General site preparations, environmental compliance

							measures and BMP's
89	Levee Lowering	Lower Sonoma Creek Levee	35,000	CY	\$5.00	\$175,000	Selectively lower to MHHW. Sidecast material to flatten interior side slope.
90		Lower Second Napa Slough Levee	12,000	CY	\$5.00	\$60,000	Selectively lower to MHHW. Sidecast material to flatten interior side slope.
91		Lower Napa Slough Levee	69,000	CY	\$5.00	\$345,000	Selectively lower to MHHW. Sidecast material to flatten interior side slope.
92		Remove Hair Ranch Internal Levee	112,000	CY	\$6.50	\$728,000	Excavate and haul for onsite use as habitat fill.
93	Levee Breaching	Breach at Napa Slough confluence	58,000	CY	\$20.00	\$1,160,000	Excavate breach and sidecast material nearby.
94		Second Napa Slough Beach	14,000	CY	\$12.00	\$168,000	Excavate breach and sidecast material nearby.

95	Channel Excavation	Napa Sl. - Second Napa Sl. Channel	2,997,000	CY	\$7.50	\$22,478,000	Excavate channel and haul material for use as habitat fill onsite.
96		Napa Slough - Haire Channel	1,605,000	CY	\$7.50	\$12,038,000	Excavate channel and haul material for use as habitat fill onsite.
97	VortacORTAC	Vortac Levee	267,000	CY	\$10.00	\$2,670,000	Construct a ring levee inside Skaggs around Vortac.
98		Grade Levee for Vortac Access	16,000	LF	\$10.00	\$160,000	Improve levee from Hudeman Slough bridge to Vortac for access.
99		Surface Levee for Vortac Access	2,000	CY	\$150.00	\$300,000	Surface levee from Hudeman Slough bridge to Vortac for access.
100		Vortac Pump Station	1	EA	\$40,000	\$40,000	Install a pump to keep Vortac dewatered, connect to existing electrical supply.
101	Demolition	Power Line Demolition	6,400	LF	\$10.00	\$64,000	Remove powerlines within the Haire Unit.
102		House Demolition	2	EA	\$200,000	\$400,000	Remove homes

103	Septic System Demolition	2	EA	\$10,000	\$20,000	Demolish septic systems per county standards
104	Barn Demolition	3	EA	\$100,000	\$300,000	Remove barns.
105	Misc. demolition	4	AC	\$10,000	\$40,000	Clearing debris, leveling land
106	General ripping/discing	8	AC	\$1,000	\$8,000	Loosen soil on ~8 acres at Haire Ranch
107	Road Demolition	29,000	LF	\$132.80	\$371,000	Demolish ~29,000 LF of asphalt roads (excludes road from 37 to vortex)
108	Well Demolition	1	EA	\$15,000	\$15,000	Demolish well per county standards.
109	Pump Demolition	3	EA	\$20,000	\$60,000	Demolish pump stations and appurtenances
110	Miscellaneous Demolition	1,000	LF	\$10.00	\$10,000	Demolish HDPE discharge to deep water unit
111	Miscellaneous Demolition	10,000	LF	\$15.00	\$150,000	Cut to grade steel sheet pile along Second Napa & Hudeman Sloughs
112	Skaggs Island Subtotal				\$52,826,000	

113	Camp 1 West & East	Mobilization & Demobilization	1	LS	\$3,627,000	\$3,627,000	Mobilizing & demobilizing forces, equipment, and facilities to needed to perform the work.
114		Site Preparation & Env. Compliance	1	LS	\$2,198,000	\$2,198,000	General site preparations, environmental compliance measures and BMP's
115	Levee lowering	Sonoma Creek Levee	4,000	CY	\$5.00	\$20,000	Selectively lower to MHHW. Sidecast material to flatten interior side slope.
116		Lower West Camp 1 Levee	4,000	CY	\$5.00	\$20,000	Selectively lower to MHHW. Sidecast material to flatten interior side slope.
117		Lower Bush Slough Levees	26,000	CY	\$6.50	\$169,000	Excavate and haul for onsite use as habitat fill.
118		Lower Tolay Creek Levee	11,000	CY	\$5.00	\$55,000	Selectively lower to MHHW. Sidecast material to flatten interior side slope.
119	Levee Breaching	Tolay Creek SW Breach	9,000	CY	\$12.00	\$108,000	Excavate breach and sidecast

							material nearby.
120		Tolay Creek - Bush Slough Breach	9,000	CY	\$12.00	\$108,000	Excavate breach and sidecast material nearby.
121	Channel Excavation	Tolay Creek SW Channel	256,000	CY	\$87.50	\$1,920,000	Excavate and haul for onsite use as habitat fill.
122		Tolay Creek - Sonoma Creek Channel	252,000	CY	\$15.00	\$3,780,000	Excavate from Bush Slough to Sonoma Creek and haul for onsite use as habitat fill.
123		Tolay Creek Pickleweed Clearing	28	AC	\$25,0400	\$712,000	Hand clear Tolay Creek channel footprint, place material in site.
124	Railroad Infrastructure	Railroad Embankment	160,000	CY	\$70.00	\$11,200,000	Construct ~9,400 LF embankment along east side of railroad using imported material. From Camp 3 to where ground elevation = 15 ft.
125		Rock Slope Protection	37,000	TN	\$100.00	\$3,700,000	Armor new embankment.
126	Demolition	Barn Demolition	1	EA	\$100,000	\$100,000	1Demolish barn

127		Miscellaneous Demolition	5	AC	\$10,000	\$50,000	General debris, equipment, & structure removal and clean up.	
128		General ripping/discing	6	AC	\$1,000	\$6,000	Loosen soils on ~6 acres around the farm epicenter	
129		Road Demolition	3,500	LF	\$10.00	\$35,000	Demolish ~3,500 LF gravel road along west side	
130	Camp 1 West & East Subtotal					\$27,808,000		
131	West End & Detjen	Mobilization & Demobilization	1	LS	\$4,357,000	\$4,357,000	Mobilizing & demobilizing forces, equipment, and facilities to needed to perform the work.	
132		Site Preparation & Env. Compliance	1	LS	\$2,641,000	\$2,641,000	General site preparations, environmental compliance measures and BMP's	
133	Levee Lowering	Lower Napa/South Slough Levee	18,000	CY	\$5.00	\$90,000	Selectively lower to MHHW. Sidecast material to flatten interior side slope.	
134		Lower Napa Slough Levee	28,000	CY	\$5.00	\$140,000	Selectively lower to MHHW. Sidecast material to	

							flatten interior side slope.
135		Lower Detjen internal berms	28,889	CY	\$5.00	\$144,000	Selectively lower to MHHW. Sidecast material to flatten interior side slope.
136	Levee Breaching	West End Breach	8,000	CY	\$20.00	\$160,000	Excavate breach and sidecast material nearby.
137		Skaggs Island Road Culvert	1	EA	\$150,000	\$150,000	Install box culverts in Skaggs Is. Road to connect parcels
138	Channel Excavation	West End Channel	529,000	CY	\$87.50	\$3,968,000	Excavate and haul for onsite use as habitat fill.
139	Levee Improvement	Detjen East Levee	11,000	CY	\$70.00	\$770,000	Build up Detjen East Levee - imported materials
140		Detjen Hwy 37 Levee	117,000	CY	\$70.00	\$8,190,000	Build up existing south berm - imported materials
141		West End Hwy 37 Levee	149,000	CY	\$70.00	\$10,430,000	Build up south existing berm - imported materials

142	PG&E Infrastructure	Transmission Tower Improvement	25	EA	\$60,000	\$1,500,000	Raise concrete around tower footings
143		Boardwalk Improvement	6,200	LF	\$38.00	\$236,000	Raise existing boardwalks
144	Demolition	House Demolition	2	EA	\$200,000	\$400,000	Demolish houses
145		Septic System Demolition	1	EA	\$10,000	\$10,000	Demolish septic systems per county standards
146		Barn Demolition	2	EA	\$100,000	\$200,000	Demolish barns
147		Miscellaneous Demolition	2	AC	\$10,000	\$20,000	Demolish water tower, ditch boardwalks, etc.
148	West End & Detjen Subtotal					\$33,406,000	
149	Alluvial Fans, Riparian Corridors, Transition Zones	Mobilization & Demobilization	1	LS	\$1,980,000	\$1,980,000	Mobilizing & demobilizing forces, equipment, and facilities to needed to perform the work.
150		Site Preparation & Env. Compliance	1	LS	\$1,200,000	\$1,200,000	General site preparations, environmental compliance measures and BMP's
151		Alluvial Fans	1	LS	\$5,000,000	\$5,000,000	Restoration (plug number)

152		Riparian Corridors	1	LS	\$3,000,000	\$3,000,000	Restoration (plug number)
153		Transition Zones	1	LS	\$4,000,000	\$4,000,000	Restoration (plug number)
154	Alluvial Fans Subtotal					\$15,180,000	
155	Alternative Subtotal					\$239,174,000	
158	Construction Cost Contingency					\$71,752,000	30%
159	Total Construction Costs					\$310,926,000	