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**Subject: PRELIMINARY MITIGATION ALTERNATIVES FOR COST ESTIMATE PLANNING MEMO
SACRAMENTO RIVER AND GEORGIANA SLOUGH EAST LEVEES
Community of East Walnut Grove, California**
California Department of Water Resources Small Community Flood Risk Reduction
Program

Dear Mr. Twitchell,

At your request, Blackburn Consulting (Blackburn) prepared this Preliminary Mitigation Alternatives for Cost Estimate Planning Memo (Memo) for the Sacramento River and Georgiana Slough East Levees (NULE Segment 128) adjacent to the Community of East Walnut Grove. The preliminary mitigation alternatives in this Memo are based on levee performance deficiencies summarized in Blackburn's August 2020 "Draft Preliminary Existing Condition Stability, Seepage and Settlement Evaluation" (August 2020 Evaluation). The preliminary mitigation alternatives in this Memo are intended for program-level cost estimating. They are not based on design-level evaluation and should not be used for design.

The preliminary mitigation alternatives contained in this Memo are based on Blackburn's understanding of existing levee conditions at the time of the August 2020 Evaluation using limited existing information and reasonably conservative soil parameters and evaluation methods. A more complete understanding of existing field conditions (as recommended in the August 2020 Evaluation) may indicate that the evaluated levees have additional vulnerabilities that are not addressed by these preliminary mitigation alternatives and could require different mitigation. A more complete evaluation may also determine that the mitigation alternatives in this Memo may not be needed along entire reaches or portions of reaches. Additional evaluation is needed to determine if and where mitigation may or may not be necessary.

The preliminary mitigation alternatives contained in this Memo do not take into consideration mitigation that may be needed for erosion/scour, penetrations through the levee, encroachments into the levee, freeboard, closure structures and interior drainage. Evaluations for these items are being performed by others (DCC Engineering and Raney). Mitigation that may be needed to address these items should be included in program-level cost estimating.



These preliminary mitigation alternatives are also based on the following assumptions:

- That soil classifications and descriptions on available boring logs accurately describe the soils encountered during drilling and that raw CPT data were correctly interpreted to provide accurate soil descriptions.
- That the soil properties used in the August 2020 Evaluation are representative of the soil layers used in our analyses and to develop the August 2020 Evaluation cross-sections.
- That the soil profiles, topography, and bathymetry used in our August 2020 Evaluation are accurate and representative of the associated Reaches (as defined in our August 2020 Evaluation).
- That the rapid drawdown water surface elevations are equal to the elevation of the landside toe.

Additional geotechnical investigation and evaluation recommended in Blackburn’s August 2020 Evaluation are necessary to confirm or update the above assumptions.

The following Table 1 presents a summary of Blackburn’s Preliminary Mitigation Alternatives for NULE Segment 128 levees based on the assumptions listed above and on our current understanding of the Segment 128 levee conditions as presented in our August 2020 Evaluation.

TABLE 1										
Summary of Preliminary Mitigation Alternatives Based on Current Understanding of Existing Levee Conditions										
NULE Alignment ID	NULE Seg.	Reach	RD 554 Start Station	RD 554 End Station	Mitigation Alternative 1	Mitigation Alternative 2	Vulnerability			
							Through Seepage	Landside Slope Stability	Waterside Slope Stability	Erosion
SACR-L, Georgiana Slough - L	128	A	0+00 near RD 563	18+50	Stability Berm and Landside Slope Flattening to 2:1 Above the Berm	35’ deep Cutoff Wall and Landside Slope Flattening to 2:1	X ¹	X	-	See Note 2
SACR-L	128	B	18+50	37+50	35’ deep Cutoff Wall	NA	-	X	-	See Note 2
SACR-L	128	C	37+50	46+58 @ Delta Cross Channel	55’ Landside Levee Widening with 2:1 Landside Slope	Waterside Slope Flattening to 3:1, 35’ deep Cutoff Wall, and Landside Slope Flattening to 2:1	-	X	X	See Note 2

¹Light Seepage Severity may not require remediation

²Erosion to be evaluated and addressed by others

The Limitations contained in Blackburn's August 2020 Evaluation also apply to this Memo.

Thank you for selecting Blackburn to be on your evaluation team. Please call if you have questions or require additional information.

Sincerely,

BLACKBURN CONSULTING

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