Appendix J

MEMORANDUM

To: Jason Smith, Teichert

From: Steve Greenfield, Cunningham Engineering Corporation (CEC)
Niki Crucillo, CEC

Date: March 31, 2021

Subject: Teichert Shifler – Response to Moore Canal EIR Comment

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The purpose of this memo is to respond to comments regarding the proposed Moore Canal relocation provided by Lachi Richards (Richards), dated January 31, 2021, on the Draft EIR for the Teichert Shifler Mining and Reclamation Project. The comments expressed concern that the proposed relocation would flatten the slope of the canal resulting in an increase in water surface elevations, thereby exacerbating existing flooding that occurs in the Wildwings development west of Road 94B. In response to Richards' "Request 1", summarized below are the results of hydraulic calculations used to determine the design width of each of the proposed canal relocations in order to maintain equal or less upstream water surface elevations.

Methodology: Manning's Equation
Design Flow: 130 cfs (per Yolo County Flood and Water Control District)

Existing Moore Canal -

Side Slopes:	1.5:1	
Canal Length:	4,429 ft	(within the Shifler project area)
Longitudinal Slope:	0.000564 ft/ft	
Manning's n:	0.013	(concrete lined)
Bottom Width:	**10 ft**	
Depth:	2.41'	(water surface at east end of Rd 94B culvert)

Proposed Moore Canal -

Side Slopes:	1.5:1	
Canal Length:	5,402 ft	(within the Shifler project area)
Longitudinal Slope:	0.000463 ft/ft	
Manning's n:	0.013	(concrete lined)
Bottom Width:	**11.25 ft**	
Depth:	2.41'	(water surface at east end of Rd 94B culvert)

Proposed Moore Canal (Southern Alternative) –

Side Slopes:	1.5:1	
Canal Length:	10,299 ft	(within the Shifler project area)
Longitudinal Slope:	0.000243 ft/ft	
Manning's n:	0.013	(concrete lined)
Bottom Width:	**16.0 ft**	
Depth:	2.41'	(water surface at east end of Rd 94B culvert)

In addition to the design flow rate of 130 cfs, lesser flow rates were also analyzed to compare depths of flow between existing and proposed conditions. Proposed canal bottom widths have been rounded up to the nearest 0.25' for constructability purposes. This has resulted in a slight reduction in calculated water surface depths for lower flow conditions.

For example, in the existing condition, at a flow rate of 8.5 cfs there would be approximately 0.50 feet of water in the canal (for reference, the three existing Wildwings culverts are located approximately 0.5 feet above the canal bottom; hence a flow rate of approximately 8.5 cfs is the condition when said culverts are unimpeded). For comparison, at the same 8.5 cfs flow rate, the proposed canal would contain approximately 0.49 feet of water, and the Southern Alternative would contain approximately 0.48 feet of water.

Based on the above, the proposed Moore Canal relocation will be designed with an 11.25' bottom width to compensate for the reduction in longitudinal slope and maintain the same (or lower) water surface elevation at the upstream end of the Shifler property (i.e., downstream side of the Road 94B culvert). Similarly, if the Southern Alternative Moore Canal alignment is implemented, it will be designed with a 16.0' bottom width to maintain (or lower) said water surface elevation. In either scenario, based on the above calculations and discussion, the proposed canal alignment designs are not anticipated to increase the water surface elevation west of Road 94B.