

**APPENDIX E**

**HEC-RAS Results**

Prepared for

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## **Appendix E**

### **HEC-RAS Results**

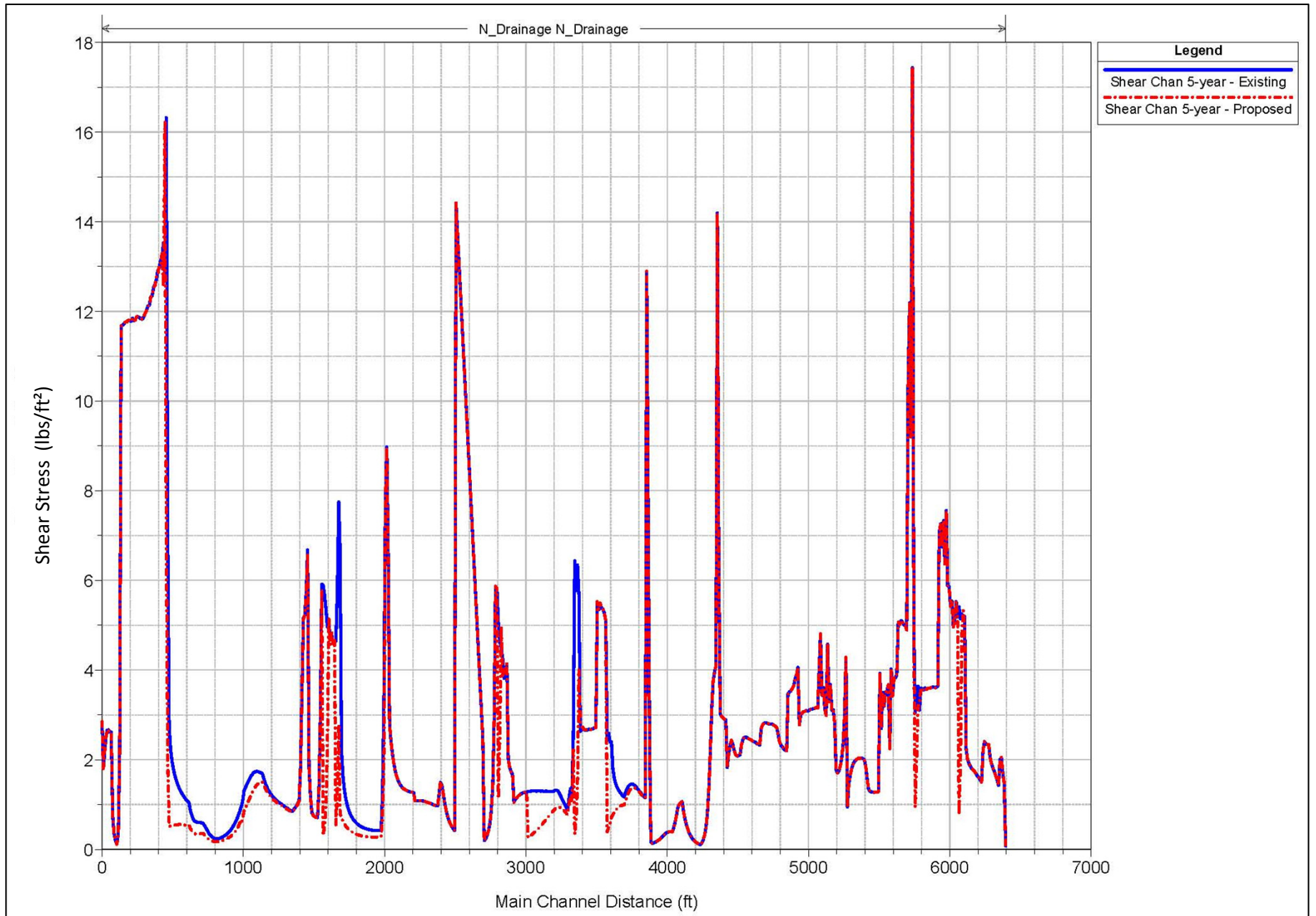
*Prepared by*

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Project Number SB0363R

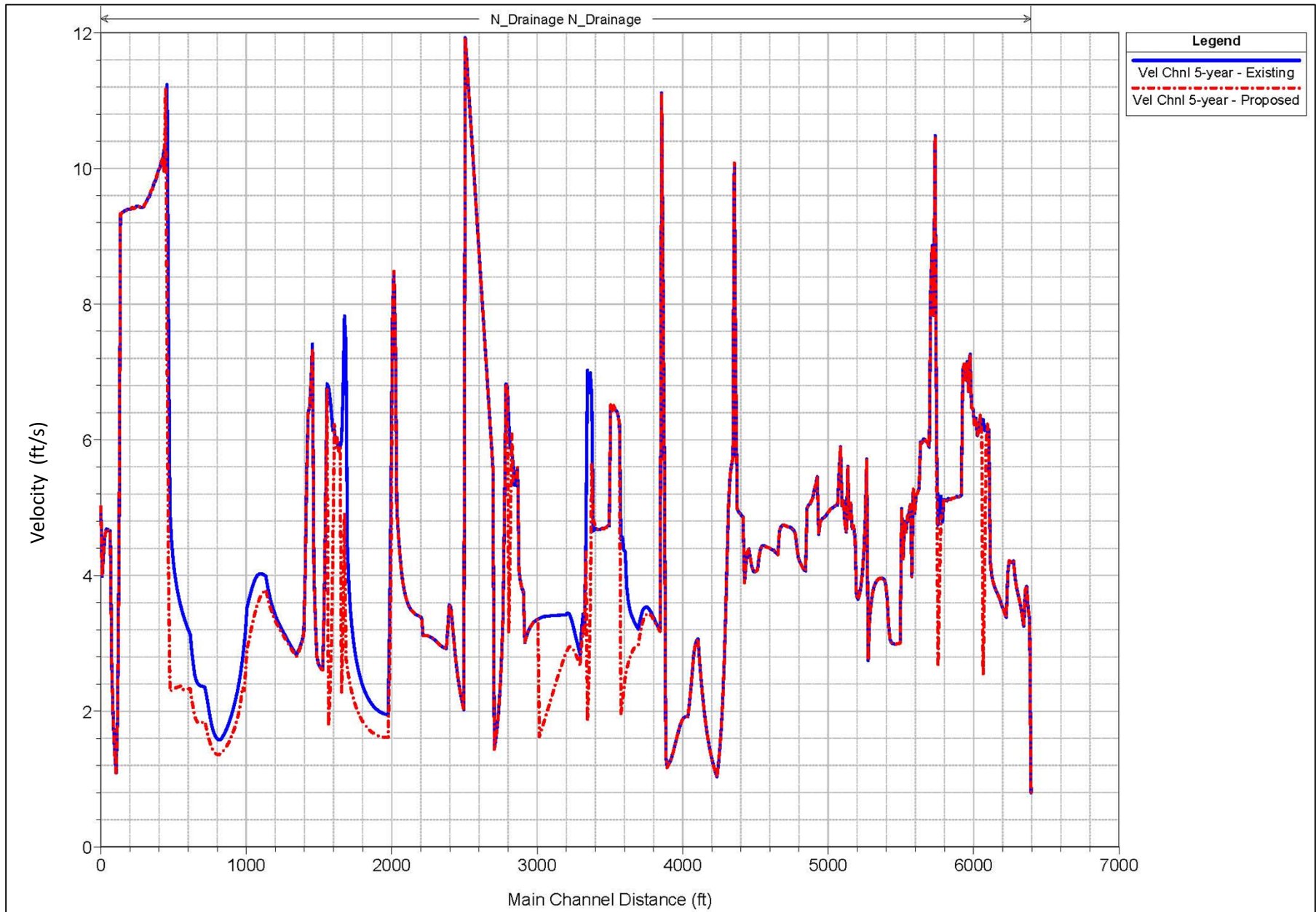
September 21, 2011



Note: Calculated using HEC-RAS software (USACE)  
 The difference between the 5-year design shear stress/velocity for existing conditions (solid blue line) and proposed conditions (red dashed line) represents reduced in-stream erosivity anticipated due to proposed check structures.



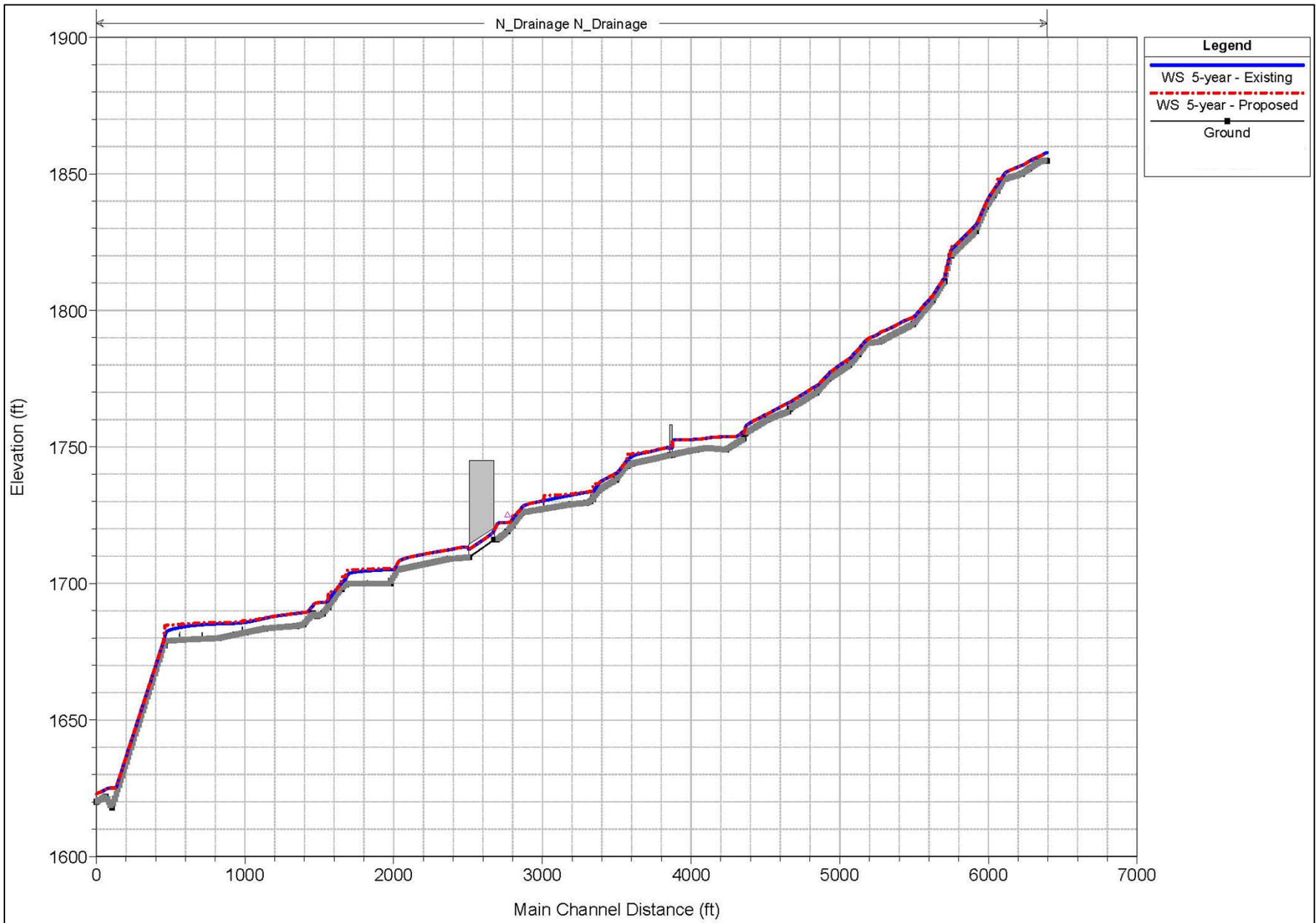
**Figure E1. Calculated Shear**  
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Note: Calculated using HEC-RAS software (USACE)  
 The difference between the 5-year design shear stress/velocity for existing conditions (solid blue line) and proposed conditions (red dashed line) represents reduced in-stream erosivity anticipated due to proposed check structures.



**Figure E2. Calculated Velocity**  
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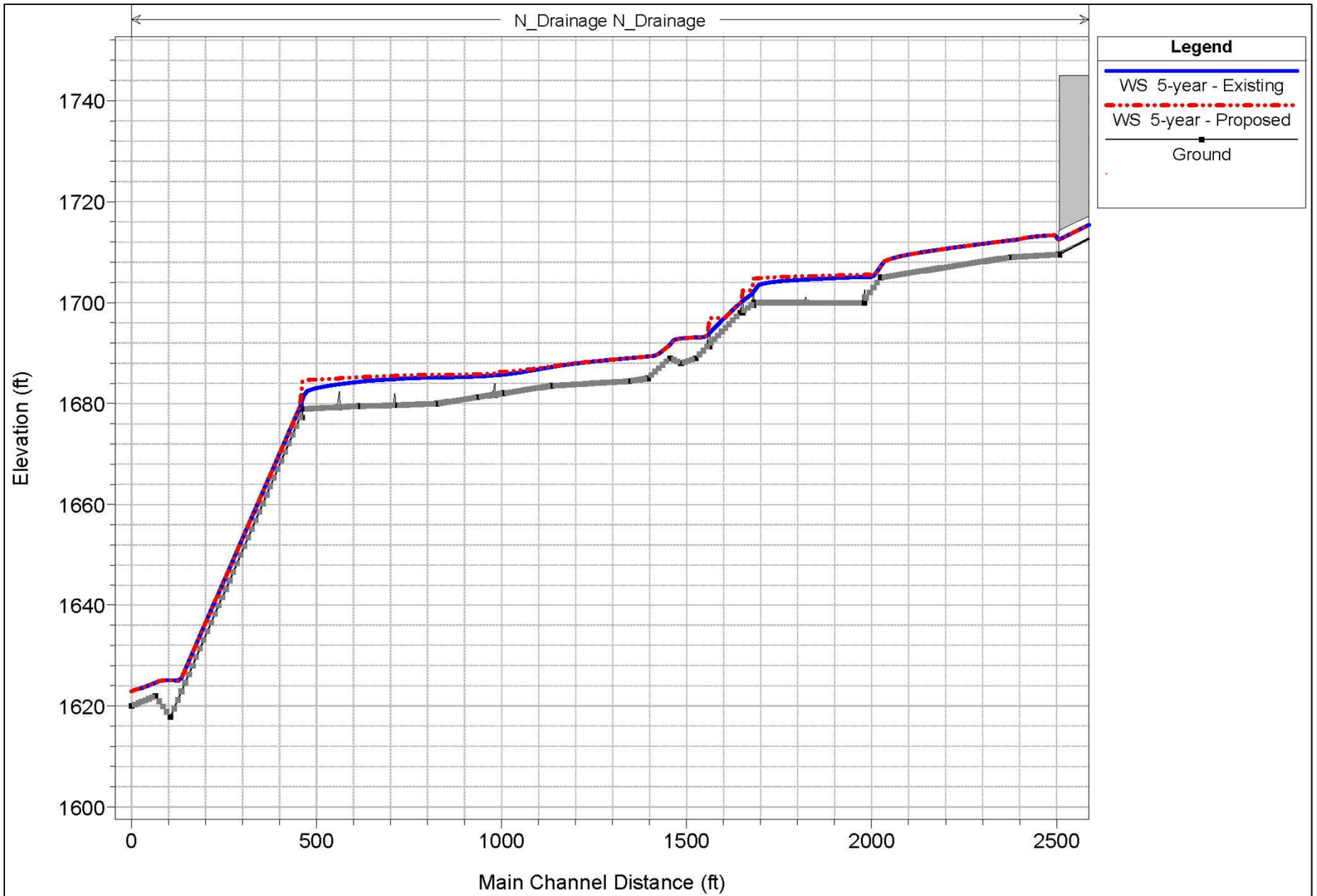
Note: Calculated using HEC-RAS software (USACE)

The water surface for the two scenarios do not appear different when looking at the entire project profile in this Figure. Figures E4, E5, and E6 provide the water surface profile at a larger scale, by sub-reach, so that the water surface differences are more noticeable.

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**Figure E3. Calculated Water Surface**  
Boeing: SSFL Northern Drainage  
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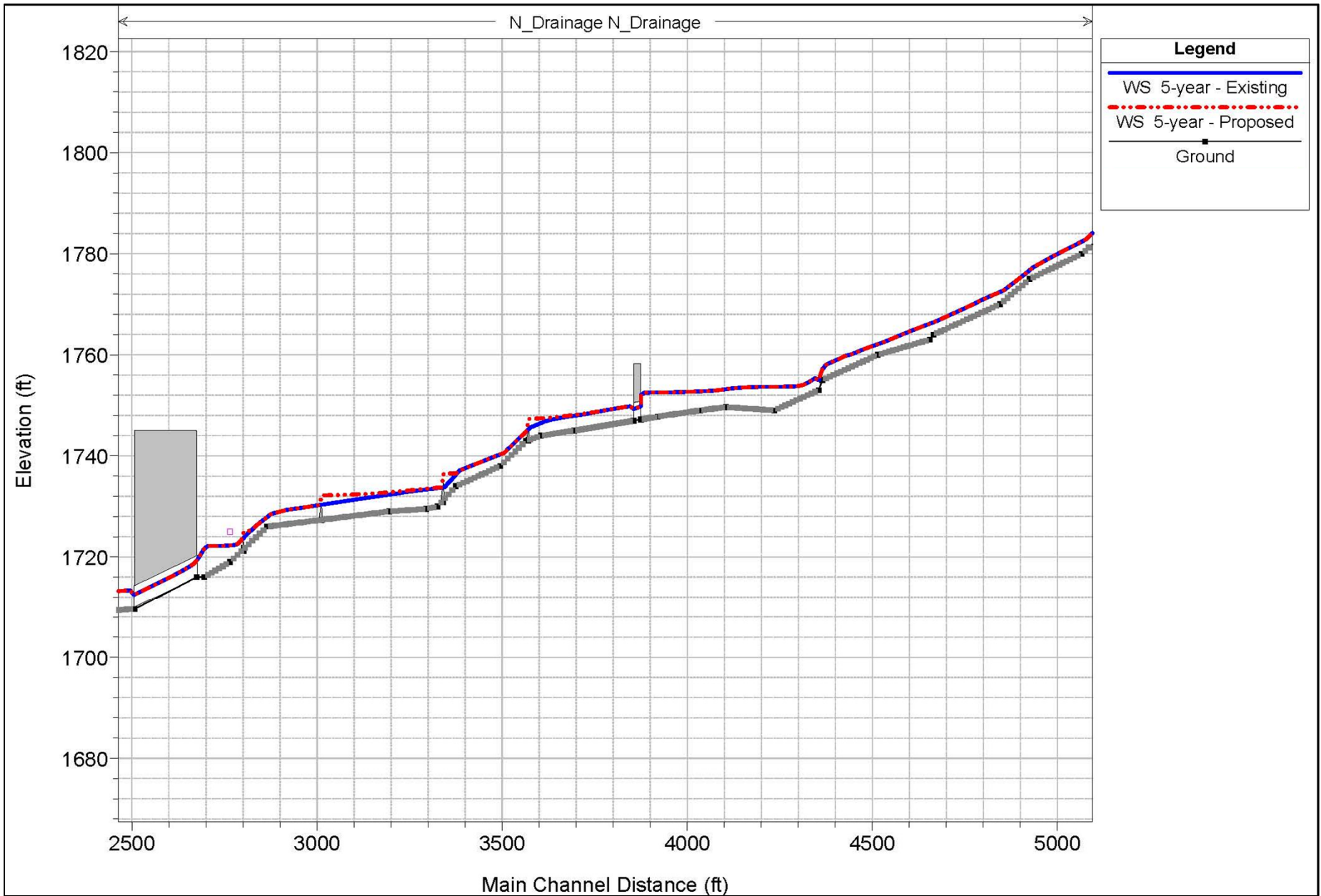




Note: Calculated using HEC-RAS software (USACE)  
 The 5-year design water surface for existing conditions (solid blue line) is lower than it is for the proposed conditions (red dashed line) in certain locations due to the backwater effects created by the proposed check structures.



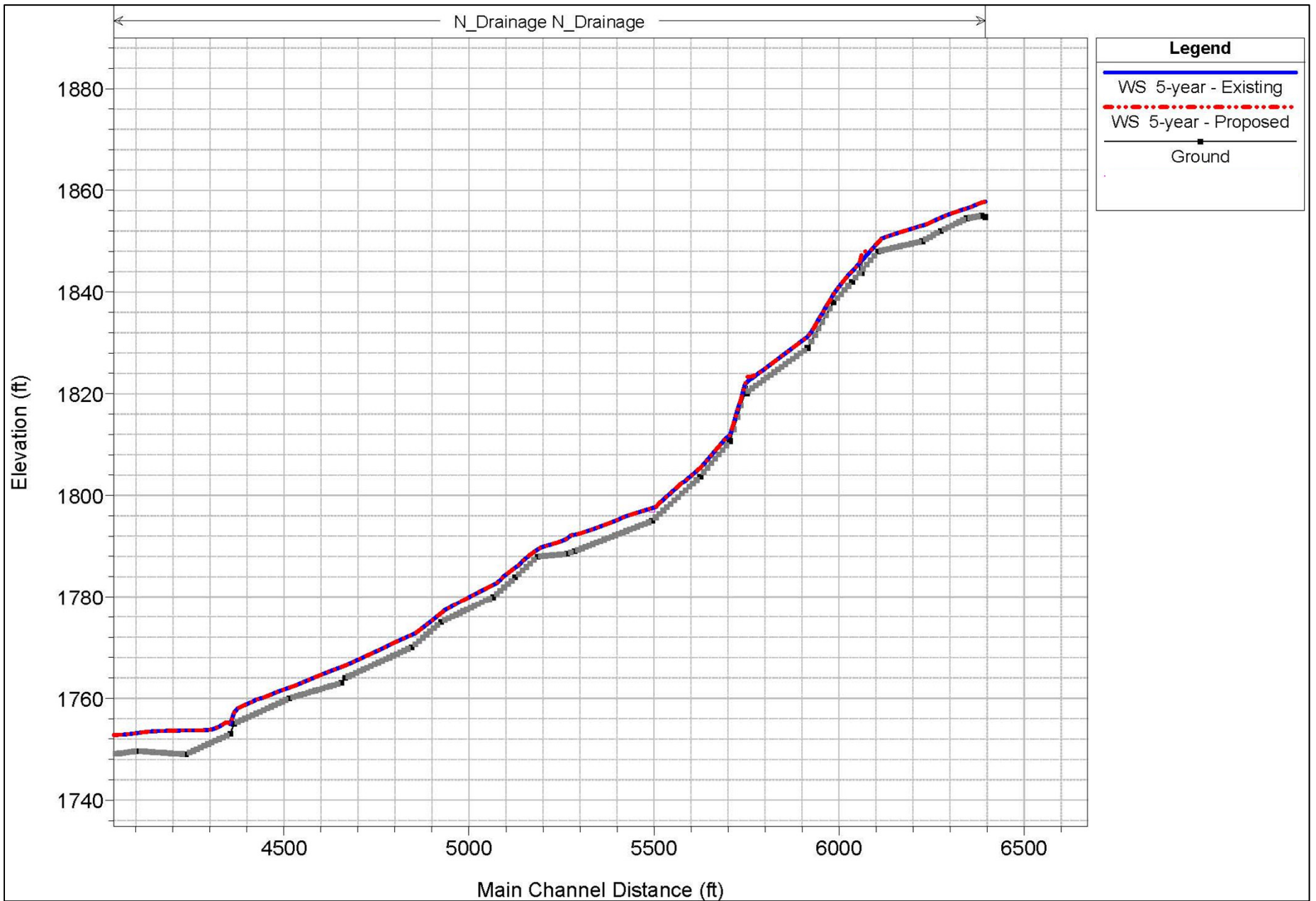
**Figure E4. Calculated Water Surface Downstream Reach, 0-2500 ft**  
 Boeing: SSFL Northern Drainage  
 Project No. SB0363R



Note: Calculated using HEC-RAS software (USACE)  
 The 5-year design water surface for existing conditions (solid blue line) is lower than it is for the proposed conditions (red dashed line) in certain locations due to the backwater effects created by the proposed check structures.



**Figure E5. Calculated Water Surface Middle Reach, 2500-5000 ft**  
 Boeing: SSFL Northern Drainage  
 Project No. SB0363R



Note: Calculated using HEC-RAS software (USACE)  
 The 5-year design water surface for existing conditions (solid blue line) is lower than it is for the proposed conditions (red dashed line) in certain locations due to the backwater effects created by the proposed check structures.



**Figure E6. Calculated Water Surface Upstream Reach, 4000-6500 ft**  
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