

APPENDIX 14

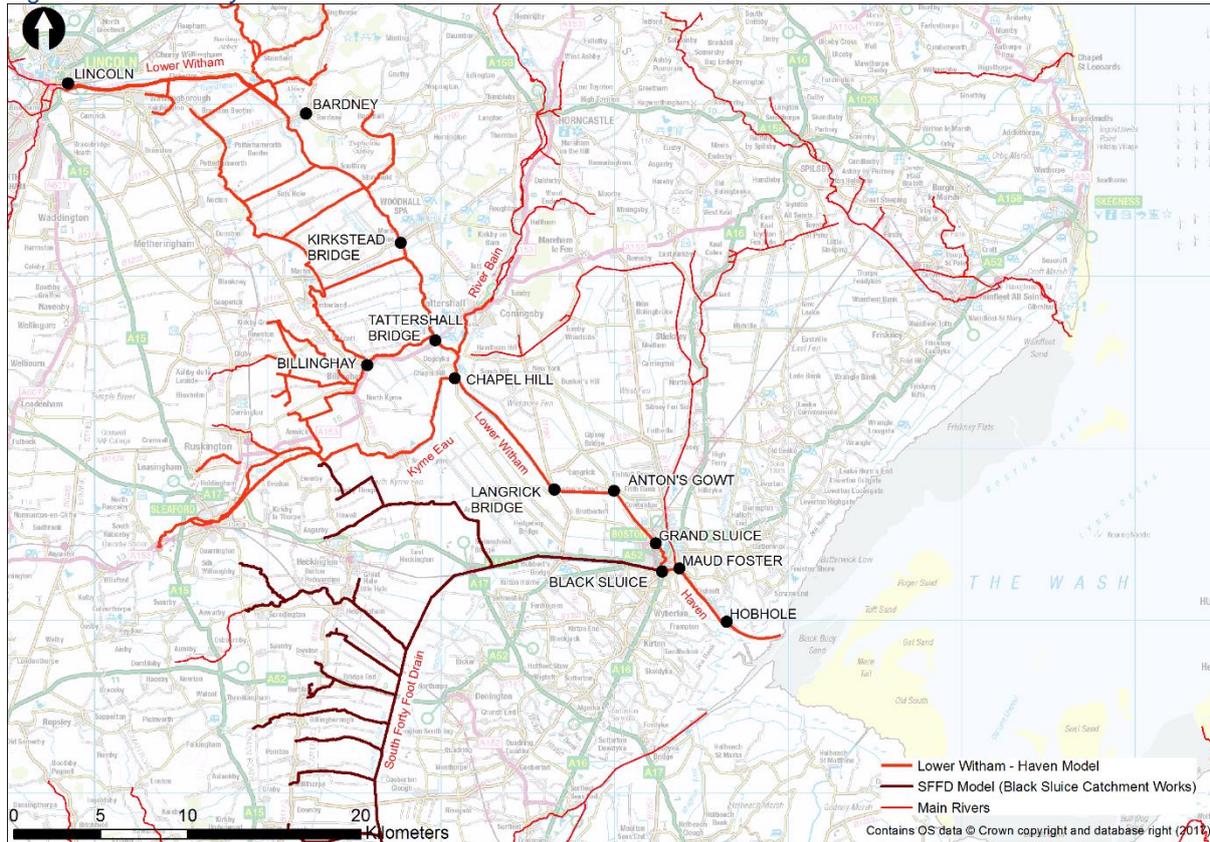
LOWER WITHAM FLOOD RISK

The impact of the Barrier on the Lower Witham fluvial flood risk was set out in the Boston Barrier Hydraulic modelling report (2016) submitted as part of the Environmental Statement. Additional modelling has been undertaken to further assess the flood risk upstream of Grand Sluice in response to the concerns raised by some third parties.

1 Existing Flood Risk along the Lower Witham - Tattershall Bridge to Grand Sluice

- 1.1 The Boston Barrier hydraulic model was used to simulate the Lower Witham and Haven in the existing scenario for a range river flows in the Lower Witham from the baseflow conditions (without a river flood) up to a flow with a 1 in 1000 (0.1%) annual chance occurring within any given year.
- 1.2 The model predicts frequent flooding from the River Witham in the washlands near Bardney. The amount of flooding in this area, as well as flooding upstream on the tributaries of the Kyme Eau and River Bain, limits the amount of flow along the Lower Witham that reaches Grand Sluice (Figure A14 1).
- 1.3 The model predicts flood flows are largely contained within the Lower Witham banks between Tattershall Bridge and Grand Sluice except for Anton's Gowt. At Anton's Gowt, higher land levels behind the river bank channel any flood waters immediately back into the lock pen. Any excess water in the lock pen overtops into the lowland drainage system beyond without causing flooding of properties in the 1 in 100 (1%) fluvial flood event.

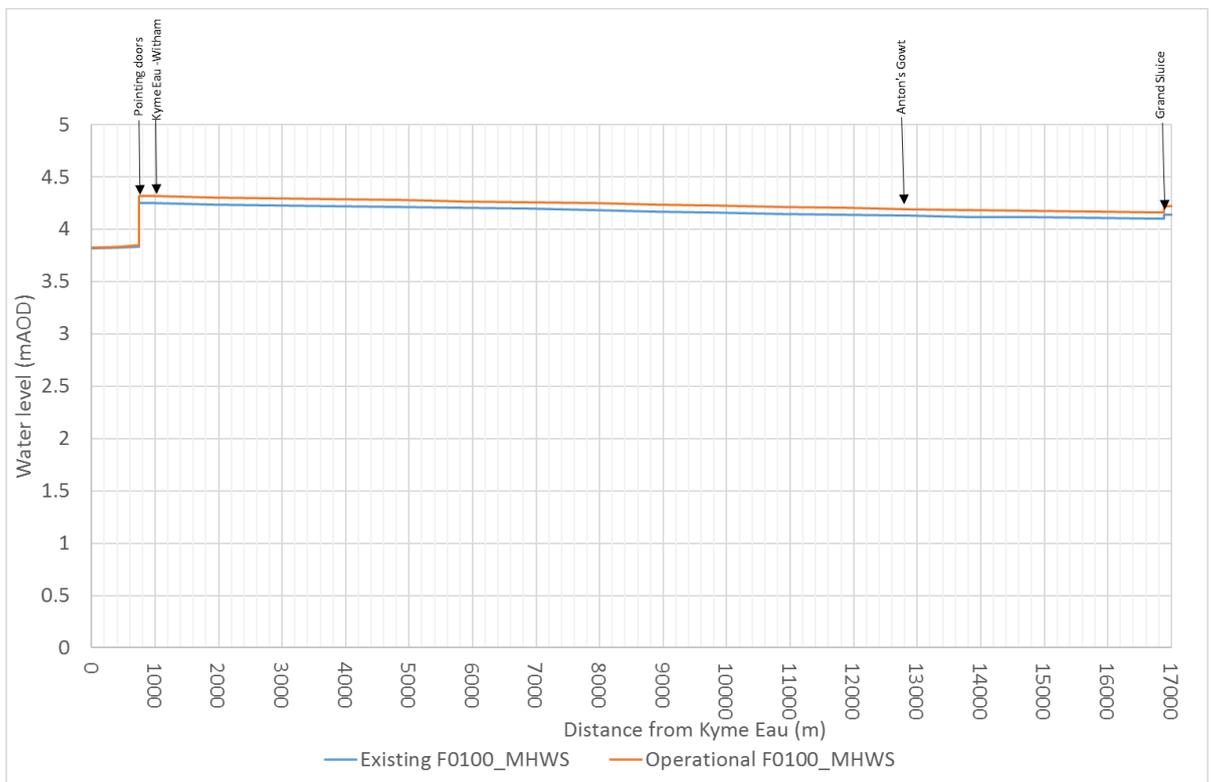
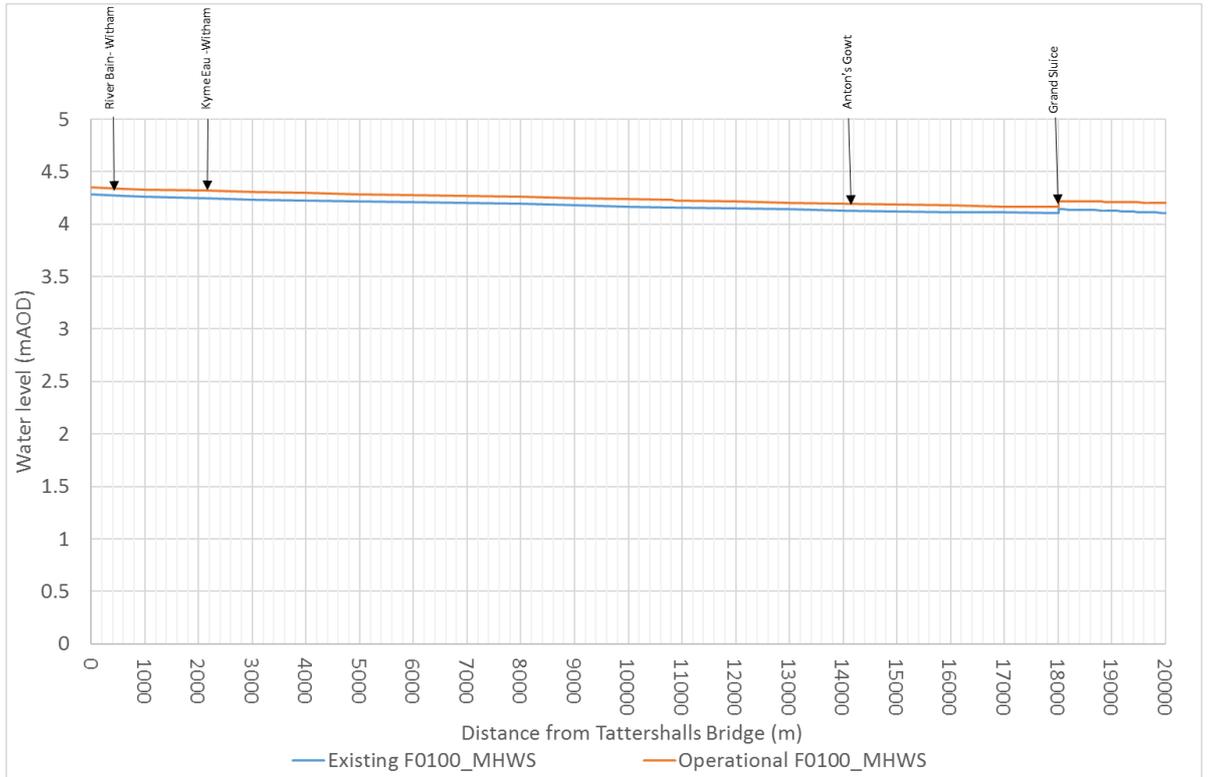
Figure A14-1 Key Locations in the Lower Witham and the Haven

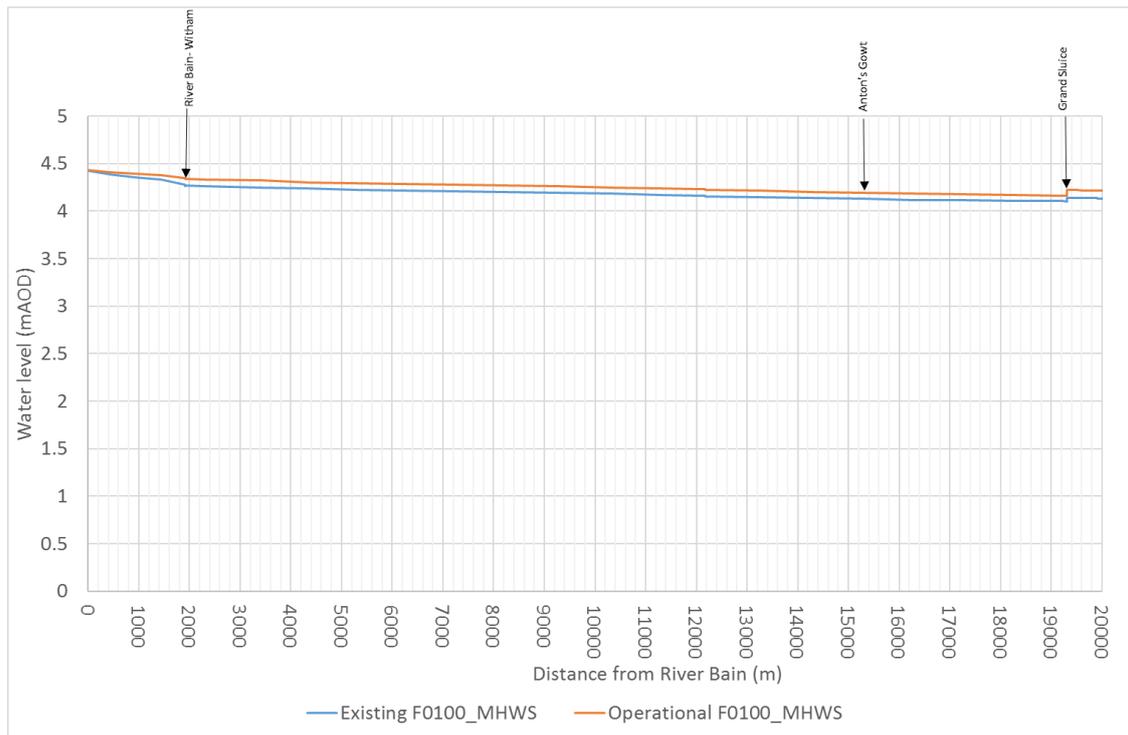


2 Impact of the Barrier on Flood Levels along the Lower Witham - Tattershall Bridge to Grand Sluice

- 2.1 The Boston Barrier hydraulic model was modified to include the proposed Barrier and associated works to represent the operational scenario. This model was used to simulate the same range of river flows in the Lower Witham from the baseflow conditions (without a river flood) up to a flow with a 1 in 1000 (0.1%) annual chance occurring within any given year.
- 2.2 The model predicts that Grand Sluice is closed for longer in the operational scenarios compared with existing due to the small increase in Haven water levels as a result of the narrower section at the barrier. The impact of this prolonged closure at Grand Sluice is a minor increase in the flood levels upstream.
- 2.3 In the 1 in 100 (1%) fluvial flood, this flood level increase is predicted to affect the Lower Witham; the Kyme Eau downstream of the pointing doors and the lower reaches of the River Bain (Figure A14-1). The water level increases ranges between 0.01 and 0.07m.
- 2.4 The increased 1 in 100 (1%) fluvial flood levels are contained by existing flood defences downstream of Tattershall Bridge with the exception of the lower banks at Anton's Gowt. The model predicts a potential increase in overtopping at this location. However, the additional flood water would continue to follow the existing flow path at this location where water is channelled immediately back into the lock pen and contained in the lowland drainage system beyond. Therefore, there is no change in flood risk to properties.

Figure A14-2: Flood Levels along the (a) Lower Witham (b) Kyme Eau and (c) River Bain





3 Conclusion

3.1 It is anticipated that with the Barrier in place, there is a small increase in water levels predicted in the Lower Witham and the downstream reaches of the Kyme Eau and River Bain. In the 1%AEP fluvial flood, the small water level increase is contained by the existing flood defences downstream of Tattershall Bridge except for Anton's Gowt. However, the predicted increase to the existing overtopping would be immediately channelled back into the lock pen and lowland drainage system and thus does not change flood risk to properties in this location.