

APPENDIX C

ASSESSMENT OF THE RISK OF SEDIMENTATION OVER AN ARCHAEOLOGICAL SITE DUE TO DREDGING

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There is a potential that sedimentation from dredging operations within MMS jurisdiction may have an impact on archeological resources, particularly those at or above the seabed level. Models for assessing the effects of inadvertent (collateral) sedimentation associated with dredging indicate that the impacts would be marginal.

The plume model for Trailing Suction Hopper Dredges, developed for MMS (Nairn et al., 2003), was applied to assess the potential sedimentation associated with a typical dredging project. The hypothetical dredging project was assumed to cover an area of 1 km by 1 km with a dredge depth of 2 m and water depth of 20 m. This project would produce a dredge quantity of 2 million m³. The assumptions in the numerical model simulation included a cross current of 20 cm/sec and fine sand with a mean diameter of 0.125 mm. The characteristics of a 5,000-m³ class hopper dredge were used. The vessel's speed while dredging was set at 1 knot (tests were also completed with vessel speeds in the 2 to 3 knot range and the results were similar). It was determined that for these conditions the sedimentation footprint extended to a maximum of 300 m from the dredge track.

The cumulative sedimentation beyond the limit of the borrow deposit was determined from all sedimentation associated with dredging operations within 300 m of the limit of the borrow deposit. A worst-case scenario was assumed where the dredge always operated in the same track orientation aligned parallel to one boundary of the borrow area. The resulting sedimentation footprint is shown in Figure B-1.

The sedimentation footprint extends 300 m from the boundary of the borrow area. For the outer 100 m of this footprint, sedimentation is less than 10 cm. The middle 100 m band shows sedimentation in the range of 10 to 30 cm. The inner 100 m band next to the edge of the borrow deposit was predicted to experience sedimentation of 30 to 50 cm along the outer 50 m and as high as 67 cm along the innermost 50 m.

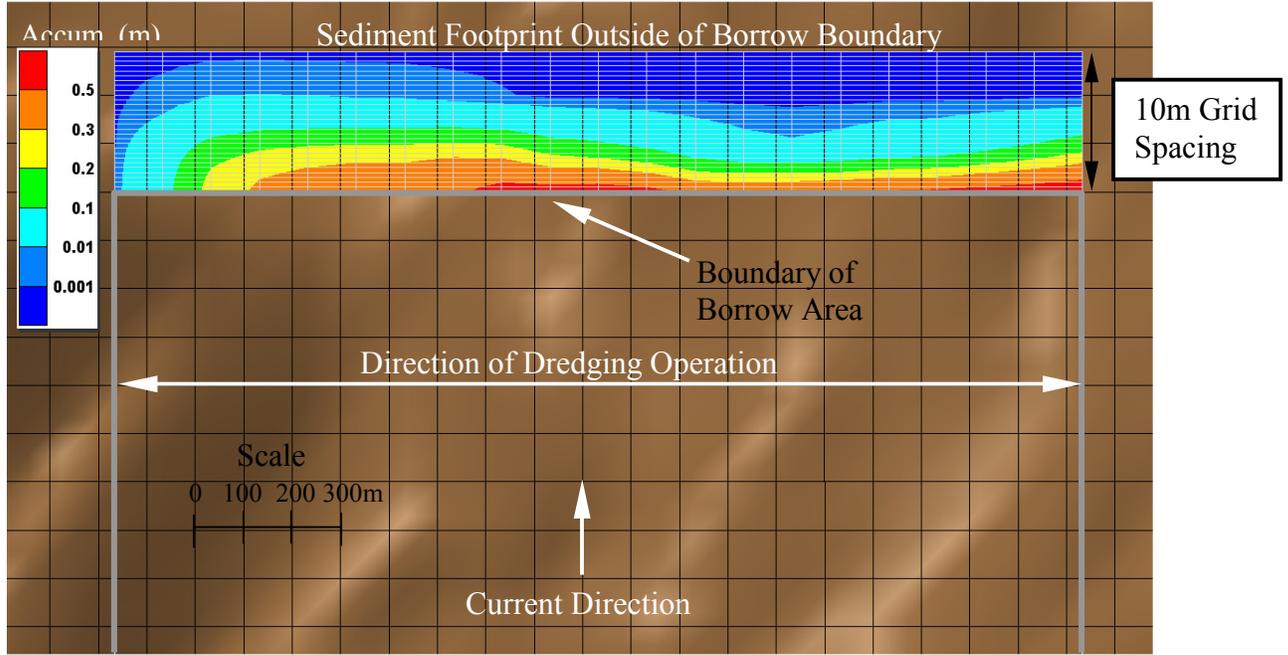


FIGURE C-1. Predicted sedimentation for a 2 million m³ dredging operation (the larger grid squares have a 100 m dimension).