

To: National Grid

Project name:
Tower 4ZC030T – Update on Flow
Dynamics and Geomorphology

CC:

Project ref:
60534513

From:

Date:
26 January 2017

Memo

Background

It is understood that NRW has undertaken a review of the Geomorphology Review Note (Appendix 6 of the ES) prepared by AECOM in 2015 and are of the opinion that they cannot rely on the predictions provided for scour hole formation and natural saltmarsh retreat. In response to this, in their letter to National Grid dated 21st December 2016, BEIS has requested an update to the review, with particular reference to flow dynamics, taking account of recent survey work and any other supporting information.

Saltmarsh Edge Surveys

A comparison between present day and historical positions of the saltmarsh edge based on data collected in October 2013, October 2014 and January 2017 is provided separately. The surveys were each undertaken by LTSC using similar equipment and consistent survey techniques.

A general observation is that erosion of the saltmarsh has continued to occur along the entire length of the shoreline surveyed. There appears to be a consistent increase in the rate of erosion along the section of the shoreline to the west of Tower 4ZC030T (subsequently referred to as 'the Tower'). This is potentially associated with the extreme flood events experienced during winter months in recent years (in particular 2015) due to high river flows during the ebb phase of the tide leading to increased erosion.

Immediately to the west of the Tower, the rate of retreat of the saltmarsh edge has increased to approximately 3m/yr which was previously calculated to be 2m/yr based on the limited data available. To the east of the Tower the rate of erosion appears to be consistent with the previously assumed rate of approximately 3m/yr.

Towards the recently completed Pont Brewit Bridge the rate of erosion has reduced, most probably due to the opening of a new low water channel along the eastern shoreline of the estuary. Previously temporary works associated with the bridge construction were observed to prevent the formation of a channel with this alignment.

Site Walkover Survey

On 16th January 2017 our appointed coastal specialist (Name redacted) of AECOM) visited the site to inspect present day conditions on the saltmarsh and within the estuary. The aim of the site visit was to obtain any additional supporting evidence to validate the findings of the previously referenced review note. Some key observations are provided below:

- The previously observed mechanism of saltmarsh erosion is a progressive process that has continued to occur (Photos 1, 3 and 4);
- Scouring of fine sand fill material from within the cofferdam has occurred behind the seaward face thus removing potential saltmarsh habitat (Photo 2);
- At the location of the Tower, the saltmarsh edge has receded to point approximately half-way between the seaward and landward face of the cofferdam (Photo 3);

Conclusions

There is no evidence that the presence of the cofferdam is currently having an effect on the rate of saltmarsh retreat. However, the cofferdam will have an effect after flows pass around the rear face of this structure.

Due to the increased rate of saltmarsh retreat to the west of the Tower, it is likely that flows around the landward face of the cofferdam will occur within the next 5 years. From this point on there is expected to be a period of rapid erosion whilst a scour hole around the structure develops towards an equilibrium state.

If sustained, the increased rate of saltmarsh retreat will mean that the temporary, additional loss of saltmarsh attributable to the presence of the cofferdam will diminish to a level that is negligible (relative to the situation without a cofferdam) within a shorter timescale than previously estimated.

Erosion of the saltmarsh will continue to occur at rates similar to those observed over recent years unless the alignment of the main estuary channel shifts significantly further away from its current position along the northern shore.

Selected Photographs



Photo 1. Tower 4ZC030T with ongoing erosion of saltmarsh edge in foreground



Photo 2. Loss of fine sand within cofferdam due to scour and washout



Photo 3. Ongoing erosion to the west of the cofferdam



Photo 4. Ongoing erosion to the east of the cofferdam

