# Cell 1 Regional Coastal Monitoring Programme

# Newbiggin-by-the-Sea Post Storm Walkover Inspection Surveys 2023

**Northumberland County Council**

**November 2023**

# Northumberland County Council

# Post Storm Walkover Inspection Surveys 2023

## Contents Amendment Record

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## Preamble

The Cell 1 Regional Coastal Monitoring Programme covers approximately 300km of the north east coastline, from the Scottish Border (just south of St. Abb's Head) to Flamborough Head in East Yorkshire. This coastline is often referred to as 'Coastal Sediment Cell 1' in England and Wales (**Figure 1**). Within this frontage, the coastal landforms vary considerably, comprising low-lying tidal flats with fringing salt marshes, hard rock cliffs that are mantled with glacial sediment to varying thicknesses, softer rock cliffs and extensive landslide complexes.

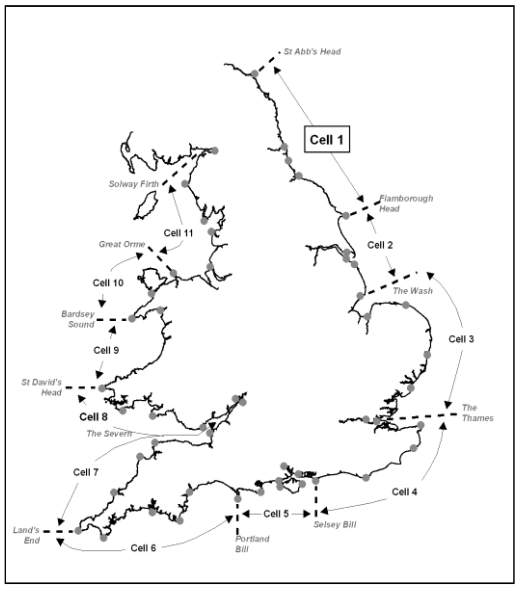


**Figure 1 Sediment Cells in England and Wales**

The programme commenced in its present guise in September 2008[1] and is managed by North Yorkshire Council on behalf of the North East Coastal Observatory. It is funded by the Environment Agency, working in partnership with the following organisations:

[1] Prior to 2008, coastal monitoring was undertaken on a consistent basis across Northumberland and North Tyneside as part of the (then) Northumbrian Coastal Authorities Group's monitoring programme which commenced in 2002, whilst several authorities between the River Tyne and Flamborough Head undertook their own local monitoring programmes.

Royal HaskoningDHV has been appointed to provide Analytical Services in relation to the present phase of the Cell 1 Regional Coastal Monitoring Programme, between 2016 - 2027.

The main elements of the Cell 1 Regional Coastal Monitoring Programme involve:

- beach profile surveys
- topographic surveys
- cliff top recession surveys
- real-time wave data collection
- bathymetric and seabed characterisation surveys
- aerial photography
- LiDAR Surveys
- walk-over cliff and coastal defence asset surveys.

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During late October / early November 2023, the UK was subject to a period of stormy weather where three named storms occurred within a 4-week period (Figure 2). To assess the impact of these storms on the coastline, a series of targeted **Post Storm Walkover Inspections** were undertaken as part of the Cell 1 Regional Coastal Monitoring Programme. The report presents the Post Storm Walkover Inspection surveys undertaken in Newbiggin-by-the-Sea Bay.

| Name | Date named | Date of impact on UK and/or Ireland and/or Netherlands |
|---|---|---|
| Agnes | 25 September 2023 | 27 - 28 September 2023 |
| Babet | 16 October 2023 | 18 - 21 October 2023 |
| Ciarán | 29 October 2023 | 1 - 2 November 2023 |
| Debi | 12 November 2023 | |

**Figure 2 UK Named storms 2023 (**UK Storm Centre - Met Office**)**

# 1. Introduction

## 1.1 Study Area

This report presents the Post Storm Walkover Inspection for Newbiggin-by-the-Sea Bay.

## 1.2 Methodology

The post storm walkover inspection for Newbiggin-by-the-Sea Bay was carried out on the 16th November 2023. The weather experienced during the inspections was generally clear and fine with no access or visibility problems caused by adverse weather.

The frontage has been split into a number of 'asset lengths' (**Appendix A**), as defined in the National Flood and Coastal Defence Database (NFCDD) that was established by the Environment Agency.

The walkover inspections cover both built defence assets and natural defence assets such as cliffs, slopes and dunes. All assets were visually inspected, photographed and graded based on their condition and an estimate made of their residual life.

For built assets the grading classification was undertaken in accordance with the Condition Assessment Manual (EA, 2012), with estimates made of the urgency of any necessary repairs. An extract of the grading classification for built assets is presented in ***Table 1-1***. For ease of reference the built asset photographs presented in this report have also been bordered with the colours key indicated below.

| Grade | Rating | Description |
|---|---|---|
| **1** | Very Good | 'As built' condition or cosmetic defects that have no effect on performance. |
| **2** | Good | Minor defects that will not reduce overall performance of the asset. |
| **3** | Fair | Defects that could reduce overall performance of the asset. |
| **4** | Poor | Defects that would significantly reduce overall performance of the asset. |
| **5** | Very Poor | Severe defects resulting in overall performance failure of the asset. |

*Table 1-1: Condition assessment grading for man-made assets.*

In addition to the above grading classification, for natural assets such as cliffs and slopes the same five-point activity scale used in previous walkover inspections within Cell 1 was used. This grading classification is presented in ***Table 1-2***. For ease of reference the natural asset photographs presented in this report have also been bordered with the colours key indicated below.

| Grade | Class | Description |
|---|---|---|
| **1** | Dormant | Features with no interaction with marine processes. |
| **2** | Inactive | Features with no visible evidence of erosion or landsliding activity. |

| | | |
|---|---|---|
| **3** | Locally active | Features with localised evidence of small erosion or landsliding activity. |
| **4** | Partly active | Features with widespread evidence of small erosion or landsliding activity or areas of intense erosion or landsliding. |
| **5** | Totally active | Features with large-scale or intense erosion or landsliding. |

*Table 1-2: Condition assessment grading used for natural assets (cliffs/ slopes).*

This report provides an overview of the findings from the walkover inspections, summarising each locality in general but also specifically identifying individual assets in 'poor' or 'very poor' condition. It is anticipated that this summary will help identify areas for maintenance or capital investment. Full details of the inspection of each asset are provided in **Appendix B**.

In addition to this report, full details of the inspection and a selection of appropriate photographs have been entered into the SANDS (Shoreline And Nearshore Database System) database and provided along with this report with SANDS viewer software. Additionally, all data from the obsolete Northumbrian Coastal Group MS Access database previously used for Northumberland coastal defence inspections from 2002 to 2010 has been imported to the SANDS database and a new asset data display form "Northumberland Sea Defence" has been created in SANDS to allow easy viewing of the data.

# 3. Condition Assessment

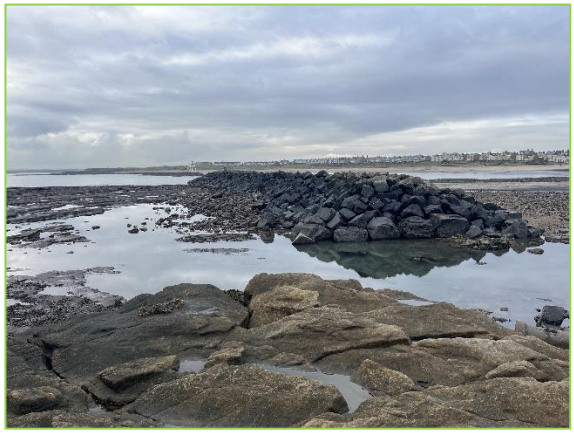
### 3.1 Newbiggin-by-the-Sea Bay (/3601C01 to /3601C09)

The vertical concrete seawall at Church Point remains in overall fair condition. However, as noted previously there is a reasonable amount of abrasion at the toe and crest as well as signs of local undermining between the toe and rock slab, this does not appear to have worsened significantly as a result of the recent storms. The recurved section of seawall to the west of Church Point is well founded on the rock foreshore and generally in good condition. However, the concrete apron has deteriorated since the previous survey with sections of the slab now broken up. Areas of undermining also remain.

*Church Point seawall in fair overall condition with localised undermining of toe protection (/3601C12)*

*Concrete apron of recurved wall in poor condition (/3601C13)*

The start of Newbiggin Bay is marked by a rock armour breakwater, built along the edge of Hully Rocks and extending from just offshore of Church Point. This structure is in good condition though there are some smaller rocks displaced across the foreshore on both the seaward and landward aspect. The profile and crest level along the structure appears stable with no signs of settlement. Build of sediment in the lee of the breakwater has concealed the outfall crossing and possibly masks the true extent of rock displacement.



*North breakwater in Newbiggin Bay in overall good condition (/3601C14)*

*Smaller rocks displaced across the foreshore on both the seaward and landward aspect (/3601C14)*

The offshore breakwater in the centre of the bay was constructed in 2007 and comprises inter-locking Core-loc concrete armour units. At the centre of the bay the salient / tombolo in the lee of the breakwater has been progressively growing and will soon connect the breakwater to the beach at low tide. The recent storms appear to have slowed down this process with Hunkleton Stone appearing now to be located seaward of the beach crest. The structure could only be inspected from the beach tombolo end, it appears in good condition with a uniform crest and no signs of displaced units or settlement.

*Detached breakwater in central Newbiggin Bay remains in good condition (/3601C16)*

*Salient/tombolo developed in lee side of the detached breakwater (/3601C16)*

In Newbiggin Bay the Maritime Centre at the north end of the bay was opened in 2012. The sea walls along this stretch are protected by healthy beach levels following replenishment operations in 2007 and subsequent net accretion of sand in the lee of the detached breakwater. Picket fencing has been installed against the seawall to further encourage the build-up of sediment and vegetation growth. The fencing appears to have only received minor damage as a result of the recent storms. A concrete slipway fronting the RNLI lifeboat station was constructed in 2022. It remains in good to very good condition, with the exception of the loss of sealant at the joint with the existing structure. At the old slipway, adjacent to Church Point car park, a length of geotextile has been exposed likely due to surface water run-off from the promenade.

*Minor damage to picket fencing but overall, in good condition (/3601C06)*

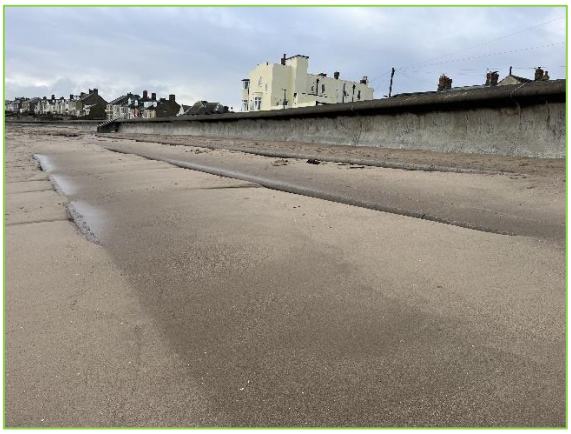
*Exposed geotextile adjacent to slipway (/3601C06)*

*New concrete access ramp constructed 2022 (/3601C06)*

*Loss of sealant at joint with existing seawall (/3601C06)*

The high recurved seawall and promenade at the centre of the bay are in good condition. In the November 2023 post storm inspection, the beach levels varied along its length. At the north and south extents of the wall, beach levels were very high. In the north, beach levels had almost entirely submerged a length of picket fencing, as well as the hand railing and access ramp. To the south the high levels were preventing the promenade from draining efficiently creating puddles at the access point. Vegetation growth was noted at the seawall to the south indicating stability in beach levels. In the centre of the bay, it appears the recent storms have drawn down material, exposing the outline of the previously submerged stepped apron fronting the wall. Despite this, the wall remained in good condition.

*High Beach level to the north of the recurved wall partially submerging picket fencing (/3601C07)*



*Lower beach levels in the centre of the bay exposing stepped apron (/3601C07)*

*High Beach level to the south of the recurved wall, dune formation fronting the seawall (/3601C07)*

*High beach levels preventing surface water drainage from the promenade (/3601C07)*

At the south end of the bay the vertical section of seawall is protected by a rock revetment. This revetment is part of the defences that were in poor condition prior to the 2007 scheme, but is now almost completely buried by high beach levels. Where visible, this rock revetment continues to appear in good condition although some displacement of lower rocks is notable. The high beach levels have blocked the drainage scuppers resulting in pooling of water on the promenade. Handrailing and some ancillary elements present high levels of corrosion. At the very southern extent, large amounts of beach sediment have washed onto the promenade, likely in part due to the recent storms. This is corroborated by larger deposits such as drift wood pushed against the promenade handrailing.

*Rock armour, in parts, entirely buried by high beach levels (/3601C08)*

*Some localised rock displacement but generally in good condition (/3601C08)*

*Large volumes of deposits on the promenade to the south of the bay likely due to the recent stormy weather (/3601C08)*

*Block promenade drainage scuppers (/3601C08)*

At the south end of Newbiggin Bay the soft earth slopes are largely stable and protected by a wide beach. The previous inspection had noted new dune vegetation growth on the foreshore, however it appears the recent storms have largely halted this growth.

At Spital Point the there is no evidence of new rock falls or slips in the overlaying softer material since the previous inspection, but the path along the thin ridge has been fenced off.

*New dune growth stunted by recent storms (/3601C08)*

*Spital Point (/3601C08)*

## 4. Problems Encountered and Uncertainty in Analysis

There is no access to the seaward aspect of the offshore breakwater, it is recommended a boat survey is commissioned to inspect this. The seaward aspect was inspected from the foreshore only.

All other assets were inspected at suitable stages of the tide and in good weather conditions. Therefore, there were no major problems encountered during the inspections.

## 5. Conclusions and Recommended Actions

Further to the visual inspection of all NFCDD assets, specific conclusions and recommendations for individual assets are given in **Appendix B**.

In lieu of a decision for a suitable replacement a replacement for the NFCDD database, all condition assessment data and selected photographs have been uploaded to a SANDS (Shoreline And Nearshore Database System). This includes all data and photographs from the previous inspections since 2002 that were previously held on four separate MS Access Databases that had become obsolete. In order to facilitate easy comparison of new inspections to previous data for each asset a new asset data display form “Northumberland Sea Defence” has been created in SANDS

In a broader sense, the general conclusion was that no significant damage was observed to any of the structures / defences within the bay as a result of the recent storms. The change was largely limited to fluctuation of beach sediment in the bay. Low levels were observed in the centre exposing the previously submerged stepped apron whereas higher beach level were observed at the northern and southern extents. The post storm topographic surveys, as part of the ongoing beach monitoring, will give a better indication to as whether the material has been shifted around within the bay or whether there has been a loss offshore.

# Appendices

# Appendix A
# Asset Location Maps



**Legend**

Coastal Asset location

*NFCDD Asset Number*



| Client: | Project: |
|---|---|
| North East Coastal Group | Cell 1 Regional Coastal Monitoring Programme |

Title:

**Figure 1 - Map 19**

**COASTAL ASSET LOCATIONS**

**Northumberland County Council Frontage**

Report:

Asset Inspection Report

| Revision: | Date: | Drawn: | Checked: | Size: | Scale: |
|---|---|---|---|---|---|
| 0 | n/a | TC | NJC | A4 | 1:10,000 |

Co-ordinate system: British National Grid

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# Appendix B
# Asset Condition & Recommendations

| Asset Name | Description/comment | Type/desc | Start | End | Sort by N | Length | Inspection Date | Inspector | Comments | Overall Condition | Residual Life | Recommendations | Urgency |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 121AA901A3601C12 | Vertical concrete seawall with re-curved crest and narrow promenade behind. Short lengths of concrete toe proection works at interface with rock foreshore. Low exposed earth cliff at rear of promenade. | Sea Wall - Little Bay | NZ31788791 | NZ31718791 | 587910 | 72.6 | 16/11/2023 | Royal HaskoningDHV | No significant changes since last inspection. Abrasion along most of seawall toe with localised undermining. Abrasion and cracks opening at construction joints. No movement apparent. Loss of joint sealant. Minor erosion along most of upper earth bank. Hand rail rusty (vertical upstand). Locally in poor conidition at areas of undermining. | 3 | >20 | Repair undermining. Repair cracks. Replace joint sealant. | routine |
| 121AA901A3601C13 | Recurved concrete seawall and integrated promenade backed by low earth cliff. Founded on rock foreshore | Sea Wall - Church Point | NZ31718791 | NZ31688795 | 587910 | 48.6 | 16/11/2023 | Royal HaskoningDHV | No significant changes since last inspection. Wall well founded on rock foreshore. No settlement or cracks. Localised minor undermining/ breakup of additional toe apron. Replaced sealant in good condition. Some minor rusting to hand railing. No erosion to upper grass crest. Handrailing corroded. | 3 | >20 | Repair concrete apron Repair handrailing | routine |
| 121AA901A3601C14 | Linear rock armour breakwater. Atlee sewage outfall crossing underneath the breakwater. | Breakwater - Hully Rocks | NZ31688795 | NZ31508789 | 587950 | 189.9 | 16/11/2023 | Royal HaskoningDHV | Angular rocks well interlocked and stable. No damage to either trunk or roundhead. Small, Locally displaced rocks visible on foreshore. | 2 | >20 | Monitor settlement of crest and loss of filter/core. | no repairs |
| 121AA901A3601C15 | Recurved concrete seawall with a short rock revetment at the toe. | Revetment - Newbiggin | NZ31688795 | NZ31698797 | 587950 | 21 | 16/11/2023 | Royal HaskoningDHV | No siginficant changes since last inspecrtion. Some concrete spalling and cracks not affecting performance of asset. Rubble mound not visible. Undermining / break up of concrete apron. | 3 | >20 | None. | routine |
| 121AA901A3601C16 | Detached rubble mound breakwater at the center of Newbigging bay, with the iconic "The Couple" sculpture, creating a sand tombolo from the beach. The breakwater core lies on a geotextile layer and the armour layer is comprised of 3.9m3 Core-Loc units. Beach replenishment and offshore breakwater completed 2007. | Detached Breakwater - Newbigging | | | | 210 | 16/11/2023 | Royal HaskoningDHV | No apparent damage to the Core loc armour layer. Few rocks of the armour toe posibly displaced at the south roundhead, but not affecting performace or survival of the breakwater. Sand tombolo growing. | 2 | >20 | Undertake a boat inspection to check the seaward face of the breakwater | routine |
| 121AA901A3601C06 | Recurved concrete seawall and integral promenade with all but the top of the recurved buried by the wide sandy beach. Beach replenishment and offshore breakwater completed 2007. | Sea Wall - Newbiggin Bay | NZ31698797 | NZ31368799 | 587970 | 352.4 | 16/11/2023 | Royal HaskoningDHV | Seawall and promenade in fair/good condition. Beach levels healthy. Minor damage to picket fencing installed to encourage sediment build up. Slight corrosion at lower hand railing posts. Slipway constructed 2022 in good condition, some loss of sealant at joints with existign structure. | 2 | >20 | None. | no repairs |
| 121AA901A3601C07 | Recurved concrete sea wall with concrete steps at toe, at the back of a wide sandy beach. Promenade fronted by the recurved sea wall and backed by a masonry sloped revetment protecting the residential properties behind. | Sea Wall - Newbiggin Bay | NZ31368799 | NZ31028756 | 587990 | 554.8 | 16/11/2023 | Royal HaskoningDHV | Seawall and promenade in good condition, no evidence of settlement. Sealant joints new, minor spalling at south end. Hand railing good. High beach levels at northern and southern extents, submerging access points and creating drainage issues on the promenade. Beach levels lower in the centre expsoing previously submerged stepped apron. Some vegetation growing at the walls toe. | 2 | >20 | None | no repairs |
| 121AA901A3601C08 | Shallow sloping rock armour revetment backed by capping beam and seafront promenade backed by masonry sloped revetment. Beach replenishment and offshore breakwaters completed 2007. | Revetment - Newbiggin Bay | NZ31028756 | NZ30988722 | 587560 | 346.3 | 16/11/2023 | Royal HaskoningDHV | No significative changes since last inspection. High beach levels over-spilling onto prom. Rock mostly buried, some vegetation growth at south end. Hand railing with localised corrosion in fair to very poor condition. Some locally displaced rocks were rock armour visible. Signifcant beach deposits on the promenade likely due to recent storms. | 3 | >20 | Repair handrailing | routine |

| Asset Name | Description/comment | Type/desc | Start | End | Sort by N | Length | Inspection Date | Inspector | Comments | Overall Condition | Residual Life | Recommendations | Urgency |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 121AA901A3601C09 | Low rock outcrop forming southern end of sandy beach and coastal slope, backed by gently rising vegetated slope | Cliff - Spital Carrs | NZ30988722 | NZ30998692 | 587220 | 310.2 | 16/11/2023 | Royal HaskoningDHV | No changes since last inspection. Wide sandy beach backed by well vegetated coastal slope. Strand line 50m+ from toe of slopes. Large areas of new vegetated growth on foreshore noted previously stunted by recent storms. | 3 | >20 | None. | no repairs |