



**ENVIRONMENT, CLIMATE EMERGENCY AND TRANSPORT COMMITTEE
TUESDAY, 3 DECEMBER 2024**

REPORT TITLE:	WEST KIRBY MARINE LAKE MANAGEMENT
REPORT OF:	DIRECTOR OF NEIGHBOURHOODS

REPORT SUMMARY

This report sets out the background to interrelated issues at West Kirby Marine Lake and also considers previous work undertaken by consultants to investigate appropriate management actions to address each these issues. The report considers the current status of the issues, and the risks associated with various methods and potential solutions for the management of the lake.

This matter is not a key decision.

This matter affects Hoylake & Meols and West Kirby & Thurstaston wards.

RECOMMENDATION/S

The Environment, Climate Emergency and Transport Committee is recommended to :

1. Approve a survey of the West Kirby Marine Lake bed so that an accurate assessment of the volume of material deposited can be made which can be used to inform an appropriate management action for maintenance of water depth.
2. Instruct the Director of Neighbourhoods to monitor the impact of the invasive non-native species of seaweed *Sargassum muticum* and its impact on lake activities.
3. Instruct the Director of Neighbourhoods to continue the inspection regime of the marine lake wall assets that is currently in place.

SUPPORTING INFORMATION

1.0 REASON/S FOR RECOMMENDATION/S

- 1.1 An accurate assessment of the volume of sand and silt that has built up within the marine lake is required to confidently assess the impact on sailing provision, the capital cost for removal and appropriate funding sources for removal.
- 1.2 Anecdotal evidence suggests that the predicted impact of *Sargassum muticum* on sailing activities has not materialised. Monitoring of the impact of the seaweed will allow for appropriate interventions at a later date without incurring significant expenditure now.
- 1.3 Inspection and monitoring of the lake (footpath) wall and associated features will allow continued use of the marine lake walkway and delay any significant capital expenditure until such time when the lake lining becomes life expired.

2.0 OTHER OPTIONS CONSIDERED

- 2.1 The Consultants, Binnies, were commissioned in 2020 to consider a wide range of options and to develop a preferred management action plan for short and medium term management of three interrelated issues affecting West Kirby Marine Lake. The Background Information section below sets out more detail regarding the issues and also the current status of the issues.
- 2.2 The recommendations for this report seek active management solely with regard to the build-up of sand and silt within the lake which is impacting on the water depth and use of the lake for sailing. In 2018 the estimated volume of sediment was 28,000m³, however this volume may have been redistributed and additional volumes of sand and silt have entered the lake in the intervening period. It is not considered appropriate therefore to recommend the initiation of a costly dredging operation without fully understanding the volume of material to be removed and so that the most appropriate method for the scale can be determined.
- 2.3 Do nothing options are not considered appropriate as the lake bed, water space and wall are all subject to external factors which need to be monitored to determine appropriate times and methods for intervention.

3.0 BACKGROUND INFORMATION

- 3.1 In November 2019 the Environment Overview and Scrutiny Committee considered a report which identified three separate management issues at West Kirby Marine Lake. As a consequence of that report a consultant was commissioned to undertake further investigations into the issues, and also to develop a costed action plan for future management of the inter-related issues both in isolation and in combination.
- 3.2 The three issues identified in 2019 were:
 1. A build up of an Invasive Non-native Species (INNS) of seaweed, *Sargassum muticum*, which was reported to be impeding sailing activities within the lake.

2. A build up of silt and wind-blown sand within the lake which was reducing water depth non-uniformly within the lake and impeding sailing activities
3. Identification of loss of material lining the inner face of the marine lake wall / walkway.

- 3.3 The consultants Binnies, were commissioned to investigate the root causes of the issues identified above, determine a range of management options and also identify any regulatory processes that would need to be followed for the Council to manage each or all of the issues legally.
- 3.4 Binnies work identified the following key points in relation to the issues impacting lake usage:
- 3.5 *INNS Sargassum muticum*
Following formal identification of the seaweed, advice was sought from Natural England regarding potential methods to remove the seaweed from the lake. Options with the lake empty and full were considered and took account of the wider environmental impact in the Dee Estuary.
- 3.6 The presence of *Sargassum muticum* as first reported during the very hot summer of 2018 as it had become a nuisance to lake users, however in the intervening years the growth of the seaweed has not been in line with the predictions in the Binnies' reports and appears to have reached an equilibrium. Anecdotal reports from marine lake users indicate it is not the problem it was predicted to be.
- 3.7 **Reduced Water Depth**
The average depth of water in the marine lake is regulated to 1.6m. Following a side scan sonar survey in 2020 it was estimated that there had been an accumulation of approximately 28,000m³ of sand and silt on the lake bed that was reducing water depth and impacting on sailing activities. The accumulation was not uniformly spread across the lake but predominantly situated against the outer wall and in the north-west corner.
- 3.8 It is thought that storm activity in 2021 and 2022 redistributed some of the accumulation throughout the marine lake as complaints regarding reduced water depth dropped, however deposit of material has continued and the loss of depth is again noticeable in the areas identified above in addition to other distinct locations.
- 3.9 The current volume of accumulation is unknown. A further survey would identify the volume and location of areas where water depth is limited.
- 3.10 Binnie's report considers various options for removing the build-up of sediment and disposal of the arisings. These can be revisited once the current volume of accumulation is known.
- 3.11 **Lake Lining Structural Integrity**
Impounded water is retained by a steel sheet pile wall and the lake walkway and lining are constructed against this. The construction is comprised of a stone fill, an intermediate layer of lean sand asphalt and a lining within the lake of open stone asphalt. The lake walkway is constructed from asphalt. During construction in 1987 the thicknesses of lean sand asphalt and open stone asphalt were reduced as a cost

saving measure. Approximately 10 years after construction it was noted that the stone core of the wall was exposed in some areas and the resulting investigation identified the compromised material thicknesses as the reason behind the early failure.

- 3.12 Patch repairs were made to the affected areas during a lake draining operation in 2003 however upon re-filling large areas of lake lining became detached from the lake wall. The marine lake was managed without a further emptying until reconstruction of the lake wall was undertaken in 2009 / 2010 using the original design thicknesses of open stone asphalt and lean sand asphalt
- 3.13 In house inspections prior to 2018 identified that yet again the stone core of the wall was exposed in some locations. Binnies investigations are inconclusive as to a specific root cause but point to a series of factors which may, in combination, be the cause of the issues relating to the lake lining. However, it is known that the drag on the weakened lining during a refilling operation is a primary factor for accelerated and large-scale failure.
- 3.14 Management Actions
Consideration is given in the consultant's reports to the various methods for removal of the seaweed and also for dredging and disposal of the sand, silt and seaweed arisings from the marine lake. Both operations are considered against three scenarios:
- Lake empty
 - Lake full
 - Lake partially drained
- 3.15 The various scenarios are considered because the operational costs and disposal costs vary significantly depending upon the method chosen. The regulatory requirements change dependant on the management action and whether the lake is drained or not, which is further complicated by the release of INNS *Sargassum muticum* into the wider Dee Estuary. The risks to the outer wall are also increased through emptying and refilling which would reduce the lifespan of the lake lining.

4.0 FINANCIAL IMPLICATIONS

- 4.1 By doing nothing the useability of the marine lake at West Kirby as a water sports venue will diminish and impact on the revenue income from lake licence holders and other users.
- 4.2 Annual income from the West Kirby Marine Lake for 2024/25 is estimated to be in the region of £154,000.
- 4.3 The 2018 side-scan sonar survey of the marine lake cost approximately £3,000. It is estimated that a repeat survey and volumetric analysis of the data would cost in the region of £8,000. This cost could be met from an appropriate budget within the Neighbourhoods directorate.
- 4.4 Longer term management of the marine lake was considered in the Management Plan Study completed by Binnies consultants. The Study contained a costed management action plan which identified a minimum cost for excavation,

transportation and disposal of 28,000m³ of arisings at £1,976,000 potentially rising to £9,127,000 dependant on the hazard classification of the arisings (taking account of the INNS contamination). This provides a unit cost per m³ between £38 and £325.

- 4.5 A recent dredging operation at Ashton Park lake resulted in a unit cost per m³ of £111 for excavation, transportation and disposal. The Ashton Park lake arisings were not identified as hazardous.
- 4.6 A costed plan (based on 2022 estimates) for all operations considered in the Management Action Study is included as Appendix 1 to this report.

5.0 LEGAL IMPLICATIONS

- 5.1 There are no legal implications arising from the recommendations in this report.
- 5.2 Future management actions are likely to require careful consideration with regard to the regulations in place for the Dee Estuary.

6.0 RESOURCE IMPLICATIONS: STAFFING, ICT AND ASSETS

- 6.1 This report considers the ongoing use of the Council asset, West Kirby Marine Lake. No immediate management actions, other than a repeat bathymetric survey, are identified in this report however Appendix 1 and the Background section to this report identify future actions that will be required to ensure the marine lake remains a viable asset.

7.0 RELEVANT RISKS

- 7.1 There is a risk that by doing nothing the useability of the marine lake will diminish. This report identifies an immediate action to re-survey the lake bed so that an accurate assessment of the cost of dredging the lake can be made and suitable funding sources identified.
- 7.2 Binnie's Management Plan Study carefully considered the risks to lake usage, the lake wall and walkway and also the wider Dee Estuary environment. These risks were considered in isolation and also in combination. There is a risk that if the implications of undertaking a management action in isolation are not understood then structural failure of the lake lining and walkway could be exacerbated.

8.0 ENGAGEMENT/CONSULTATION

- 8.1 This report summarises the findings of the study undertaken by consultants in 2022 and recommends further survey work to accurately assess the volume of material deposited in the lake. No engagement or consultation has taken place however consultation with West Kirby marine Lake users including West Kirby Sailing Club is recommended before implementing any of the management actions.

9.0 EQUALITY IMPLICATIONS

- 9.1 There are no equality implications arising from this report.

10.0 ENVIRONMENT AND CLIMATE IMPLICATIONS

- 10.1 There are implications for West Kirby Marine Lake associated with sea level rise.
- 10.2 Increasing mean sea levels will result in the outer wall of the lake being overtopped more frequently and submerged for longer periods than it was originally designed and constructed for in 1987. There will be a consequential increase in energy on the lining of the marine lake wall which may accelerate degradation and reduce residual life.
- 10.3 An increase in frequency of overtopping may bring more sediment into the lake from the sea as sediment is carried in tidal water and waves. This may result in a quicker increase in bed levels and corresponding reduction in water depth.

11.0 COMMUNITY WEALTH IMPLICATIONS

- 11.1 West Kirby Marine Lake and the walkway around its perimeter is a feature which encourages a lot of visitors into West Kirby and as a result boosts the local visitor economy.
- 11.2 Maintaining a useable depth of water within the marine lake will encourage the development of the sailing centre and increase use of the facility.

REPORT AUTHOR: **Neil Thomas**
Senior manager Flood and Coastal Risk Management
neilthomas@wirral.gov.uk

APPENDICES

Appendix 1 – Costed Management Plan 2022

BACKGROUND PAPERS

West Kirby Marine Lake Marine Lake Action Plan 2021
West Kirby Marine Lake Baseline Identification of Conditions Applying, including analysis of historical change and predictions of future behaviour Technical Note
West Kirby Marine Lake Definition of Regulatory Requirements
Identification and Management of the Seaweed West Kirby Marine Lake
West Kirby Marine Lake Options for Dredging the Lake Technical Note
West Kirby Marine Lake Outer Lake Wall Management Technical Note
Environment Overview & Scrutiny Committee Marine Lake Management 28 November 2019

TERMS OF REFERENCE

This report is being considered by the Environment, Climate Emergency and Transport Committee in accordance with Section 5.2 (h) of its Terms of Reference.

The Committee is charged by full Council to undertake responsibility for the Council's role and functions:

(h) as coast protection authority and lead local flood authority.

SUBJECT HISTORY (last 3 years)

Council Meeting	Date