Cell 1 Regional Coastal Monitoring Programme Newbiggin-by-the-Sea 'Post Storm' Beach Monitoring Survey Report 2023

Northumberland County Council

December 2023

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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.

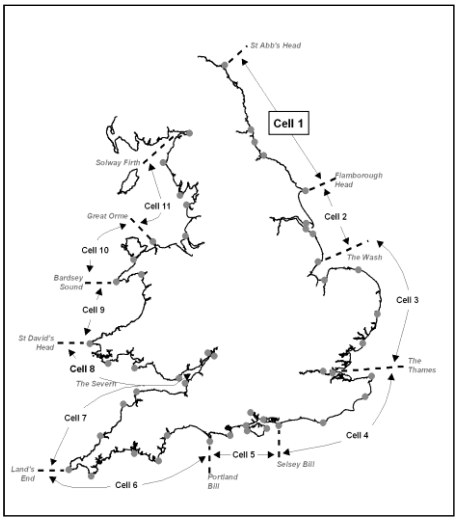


Figure 1 Sediment Cells in England and Wales

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

Northumberland County Council
Northumberland Coast AONB
North Tyneside Council
South Tyneside Council
Sunderland City Council
Durham County Council
Redcar & Cleveland Borough Council
Hartlepool Borough Council
North Yorkshire Council
East Riding of Yorkshire Council
Environment Agency
Natural England
The National Trust

[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

The beach profile surveys, topographic surveys and cliff top recession surveys are undertaken as a 'Full Measures' survey in autumn/early winter every year. Some of these surveys are then repeated the following spring as part of a 'Partial Measures' survey.

Each year, an Analytical Report is produced for each individual authority, providing a detailed analysis and interpretation of the 'Full Measures' surveys. This is followed by a brief Update Report for each individual authority, providing ongoing findings from the 'Partial Measures' surveys.

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 (Table 1). To assess the impact of these storms on the coastline, a series of targeted **Post Storm Beach Profile / Topographic / Cliff Top Recession Surveys were** undertaken as part of the Cell 1 Regional Coastal Monitoring Programme. The report presents the analysis of the post-storm surveys undertaken at 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	

Table 1 UK Named storms 2023 (UK Storm Centre - Met Office)

Table 2 Analytical, Update and Overview Reports Produced to Date

Year		Full Measures		Partial Measures		Post Storm		Cell 1 Overview Report
		Survey	Analytical Report	Survey	Update Report	Survey	Post Storm Report	
1	2008/09	Sep-Dec 08	May 09	Mar-May 09		-	-	-
2	2009/10	Sep-Dec 09	Mar 10	Feb-Mar 10	Jul 10	-	-	-
3	2010/11	Aug-Nov 10	Feb 11	Feb-Apr 11	Aug 11	-	-	Sep 11
4	2011/12	Oct-Nov 11	Oct 12	Mar-May 12	Feb13	-	-	-
5	2012/13	Sep-Nov 12	Mar 13	Mar-Apr 13	Jun 13	-	-	-
6	2013/14	Sep-Oct 13	Feb 14	Mar-Apr 14	Jul 14	-	-	-
7	2014/15	Sep-Nov 14	Feb 15	Mar–Apr 15	Jul 15	-	-	-
8	2015/16	Sep–Dec 15	Feb 16	Mar-May 16	Jul 16	-	-	Jun 16
9	2016/17	Aug-Nov 16	Mar 17	Feb-Apr 17	Jul 17	-	-	-
10	2017/18	Sep-Dec 17	Mar 18	Feb-Apr 18	Jul 18	-	-	-
11	2018/19	Sep-Dec 18	Feb 19	Feb-Apr 19	Jul 19	-	-	-
12	2019/20	Aug-Dec 19	Mar 20	Mar-May 20	Jun 20	-	-	-
13	2020/21	Oct-Dec 20	Feb 21	Mar 21	May 21	-	-	Aug 21
14	2021/22	Aug-Oct 21	Feb 22	Aug-Oct 22	Aug 22	-	-	-
15	2022/23	Aug-Nov 22	Apr 23	Feb-Mar 23	Jul 23	-	-	-
16	2023/24	Aug 23	In Progress	-	-	Nov 23	Dec 23	-

(*) The present report provides an analysis of the 2023 Post Storm survey for the Newbiggin-by-the-Sea frontage.

1. Introduction

1.1 Study Area

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

1.2 Methodology

Along the Newbiggin-by-the-Sea frontage, the following post-storm surveys were undertaken:

- Beach profile surveys along 30 transect lines (commenced 2002)
- Topographic survey along Newbiggin Bay (commenced 2010)
- Cliff top survey at Newbiggin Point (commenced 2008)
- Edge of sand survey at Newbiggin Bay, Spital Carrs, (commenced 2011 to determine potential adverse impact on foreshore SSSI of the Newbiggin beach recharge scheme)

The location of these surveys is shown in **Figure 2**. The Post-Storm survey was undertaken along this frontage on 13th November 2023. During this time, the weather was overcast and raining heavily. The wind was force 4 from the south west. The sea state was rough.

The Analytical Report produced follows a standard structure, involving;

- description of the changes observed since the previous survey and an interpretation of the drivers of these changes (**Section 2**);
- documentation of any problems encountered during surveying or uncertainties inherent in the analysis (**Section 3**);
- recommendations for 'fine-tuning' the programme to enhance its outputs (**Section 4**); and
- providing key conclusions and highlighting any areas of concern (**Section 5**).

Data from the present survey are presented in a processed form in the Appendices.

SURVEY LOCATIONS

Topographic Profile

- Annual
- Bi-Annual

Topographic Area

- 6 monthly
- yearly
- 5 yearly

- Cliff Top Edge Survey
- Edge of Sand Survey

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

Title:

Figure 2 - Map 1

NEWBIGGIN BAY

Northumberland County Council Frontage

Report: Survey Report

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	n/a	TC	NJC	A4	1:8,000

Co-ordinate system: British National Grid

Royal HaskoningDHV — Enhancing Society Together

North East Coastal Observatory

2. Analysis of Survey Data

2.1 Newbiggin-by-the-Sea

Survey Date	Description of Changes Since Last Survey	Interpretation
13th November 2023	**Beach Profiles:** Newbiggin-by-the-Sea is covered by four beach profile lines all of which were surveyed as part of the Post Storm Survey in November 2023. The results have been analysed against the August 2023 Full Measure survey data to ascertain the impact of the recent named storms. A further 26 profiles (**1aNWB1** to **1aNWB26**) have been surveyed since September 2010 as part of a topographic survey of Newbiggin Bay. These profiles are not individually described. **1aWDC05A** is in the north of Newbiggin Bay in the lee of the shore connected breakwater. The beach crest, from the seawall (at chainage 7m) to chainage 39m has accreted since the previous survey by up 0.55m in level. The crest has also reduced in width by up to 15m. The resultant shifting landward of the profile has resulted in a notable drop in level across the centre of the profile of up to 1m. The rocky foreshore remains exposed seawards of chainage 92m. **1aWDC06** is located in the centre of the northern part of Newbiggin Bay, between the two breakwaters. Generally, the upper and lower beach has been dominated by accretion whilst the centre of the profile has remained more stable. The upper beach crest between chainage 10m and chainage 34m has accreted by up to 0.5m in level. The lower beach has then accreted again by up to 0.6m In level seaward of chainage 38m. Overall the profile is at a high level when compared to the range of the previous surveys, particular the upper beach between chainages 13m and 32m where it is at the highest level on record. **1aWDC06A** is located in the centre of Newbiggin Bay, behind the offshore breakwater. The profile has experienced significant erosion in the storms since the previous survey. The crest of the beach previously at chainage 81m has retreated to chainage 62m. This landward movement of the profile has resulted in a drop in level of up to 1.5m in places. Between the seawall and the beach crest the profile has experienced minor accretion of up to 0.2m in level. When compared to the range of the	The profiles show that the most significant change has occurred lee of the offshore breakwater where the tombolo beach has suffered notable erosion in the recent storms with the profile shifting landward by up to 20m. This erosion has resulted in the profile, particularly across the lower beach, being at its lowest level on record between chainages 86m – 107m, 138m -175m and at 190m. The fact that all four profiles experienced accretion across the upper beach crest (particularly the two central profiles where the beach crest is now at its highest level on record) suggests that at least some of the eroded material has been distributed across the beach, in this case pushed up the profile through wave action. The most southernly profile (**1aWDC07)** has also accreted the lower reaches. Despite the apparent redistribution of material, It is thought some of the eroded sediment will have been lost offshore. Until the profiles start to return to an equilibrium following a period of calm conditions, it is unclear how much material was lost out of the system as a result of the storms. However, it is likely that due to the presence of the rock breakwater, sediment will continue to

Survey Date	Description of Changes Since Last Survey	Interpretation
	previous surveys, the upper beach is at its highest level on record, before switching to the lowest level of record where the profile has retreated landward. **1aWDC07** is located towards the south of Newbiggin Bay. The first 7m of the profile is covered the rock armour revetment fronting the promenade. Seawards of the revetment, the beach profile has been dominated by accretion. The magnitude of accretion is greater on the upper and lower beach where an increase in level of up to 0.4m is observed. The change in the centre of the beach is a more modest with an increase in level of 0.15m. The profile is at a medium level, remaining within the range envelope of the previous surveys.	progressively return and accrete in the bay over time.
13th November 2023	**Topographic Survey:** Newbiggin-by-the-Sea is covered by bi-annual topographic survey, which commenced in September 2010. The surveys are planned to help assess the performance of a capital scheme constructed in 2007, which involved beach replenishment and construction of an offshore breakwater. Prior to incorporation in the programme, these surveys were undertaken on occasions between 2007 and 2010 as part of the scheme development. This additional survey was undertaken in November 2023 to assess the impacts of three named storms that occurred between late September and Early November. A difference plot has been produced using the DGM (Appendix B – Map 8) from the last topographic survey (Full Measures, August 2023) and the present survey (Post Storm, November 2023). The plot shows that the most significant change, as a result of the storms, occurred in the lee of the offshore breakwater where the crest of the tombolo / salient has retreated by up to 20m landward. This had been noted previously to be accreting and was predicted to be on course to connect to the offshore breakwater. In the north of bay, the plot shows two shoreline parallel bands, one of erosion of up to -1.25m on the upper beach and one of accretion on the mid to lower beach of a similar magnitude. This apparent draw down of material is typical of stormy conditions. The south of the bay has been dominated by low level accretion, possibly as a result of the redistribution of material from the eroded tombolo. The change patchy change across the foreshore at Spital Carrs is typical of the exposed rocky foreshore in this location.	The topographic survey difference plot shows that there has been a general draw down of material in the north of the bay which is a typical beach response to a storm. The most significant change has occurred in the lee of the breakwater where the tombolo crest has retreated 20m. This is corroborated by the post storm walkover inspection where it was noted that Hunkleton stone was located seaward of the tombolo crest (where as previously it was landward). It is thought some of this eroded material has been redistributed to the south of the bay whilst some of it has been lost offshore. The accretion in the south of the bay was again corroborated by the post storm walkover inspection with significant beach deposits noted on the promenade.

Survey Date	Description of Changes Since Last Survey	Interpretation
13th November 2023	**Sand Extent Survey**: Spital Carrs is located to the south of Newbiggin Bay and is covered by a bi-annual sand extent survey, which commenced in 2012. The survey was designed to address concerns that the beach recharge scheme undertaken in the Newbiggin Bay may have impacts on the Spital Carrs SSSI and SPA if sand from the recharge scheme moves to the south. The sand extent survey therefore identifies the boundary of the sand beach on the rock platform. Data from the November 2023 post storm survey has been plotted onto aerial imagery (refer to Appendix C – Map 1). The plot generally shows that the extent of sand has retreated as a result of the storms. An approximate 110m length towards the south of the extents has retreated by up to 20m. At the very northern extents a 20m length has accreted by up to 6m. Compared to the range of the previous survey, the post storm survey is at landward position overall.	Since the last survey, there has been a retreat of sand cover across the majority of the survey extent. **Longer term trends:** Since 2014, there has been a general trend for advance in the summer and retreat in the winter.
13th November 2023	**Cliff-top Survey:** The cliff top survey is carried out as a continuous cliff edge line survey at the Newbiggin Caravan Park at Newbiggin Point. The results from the cliff top monitoring are anticipated to have an accuracy of ±0.2m due to the technique used. Furthermore, problems in precisely locating the cliff top, due to vegetation growth or the indistinct form of the cliff top, have also affected the data quality. The results from the November 2023 Post Storm Survey have been analysed against the August 2023 Full Measures survey to ascertain the impact of the recent named storms. The surveys show that the majority of the frontage has remained stable. The only significant change that has appeared to have occurred is the north of the frontage where a 3-4m wide, 1m deep slip has occurred. Based on the aerial imagery, this slip appears to have bypassed the cliff top fence and is now within 1.5m of the adjacent caravan.	**Longer term trends:** Since surveys began in October 2008, cliff movement has been greatest in the north of the survey area with up to 3.3m of cliff top retreat, whilst the central and southern parts of the survey area have shown less movement with retreat of less than 2.0m.

4. Problems Encountered and Uncertainty in Analysis

No major problems were encountered during the survey (as per the survey reports).

5. Conclusions and Areas of Concern

The surveys show that the most significant change as a result of the recent storms occurred lee of the offshore breakwater. The tombolo / beach suffered notable erosion, shifting the profile landward by up to 20m. This erosion has resulted in the profile, particularly across the lower beach, being at its lowest level on record between chainages 86m – 107m, 138m -175m and at 190m.

The fact that all four profiles experienced accretion across the upper beach crest (particularly the two central profiles where the beach crest is now at its highest level on record) suggests that at least some of the eroded material has been distributed across the beach, in this case pushed up the profile through wave action. The most southernly profile (**1aWDC07)** has also accreted the lower reaches.

Despite the apparent redistribution of material, It is thought some of the eroded sediment will have been lost offshore. Until the profiles start to return to an equilibrium following a period of calm, it is unclear how much material was lost out of the system as a result of the storms. However, it is likely that due to the presence of the rock breakwater, sediment will continue to progressively return and accrete in the bay over time.

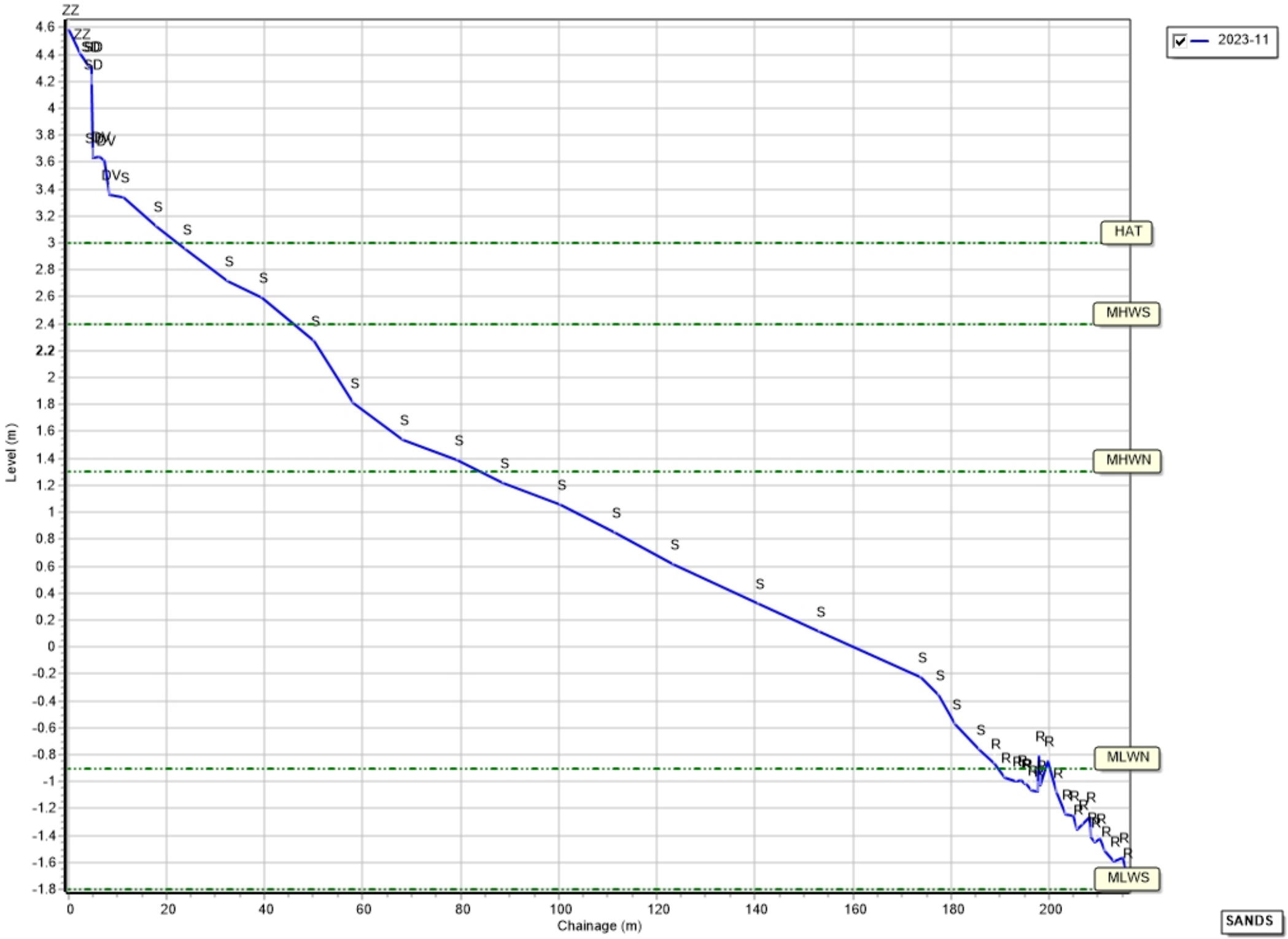
Appendices

Appendix A

Beach Profiles

The following sediment feature codes are used on some profile plots:

Code	Description
S	Sand
M	Mud
G	Gravel
GS	Gravel & Sand
MS	Mud & Sand
B	Boulders
R	Rock
SD	Sea Defence
SM	Saltmarsh
W	Water Body
GM	Gravel & Mud
GR	Grass
D	Dune (non-vegetated)
DV	Dune (vegetated)
F	Forested
X	Mixture
FB	Obstruction
CT	Cliff Top
CE	Cliff Edge
CF	Cliff Face
SH	Shell
ZZ	Unknown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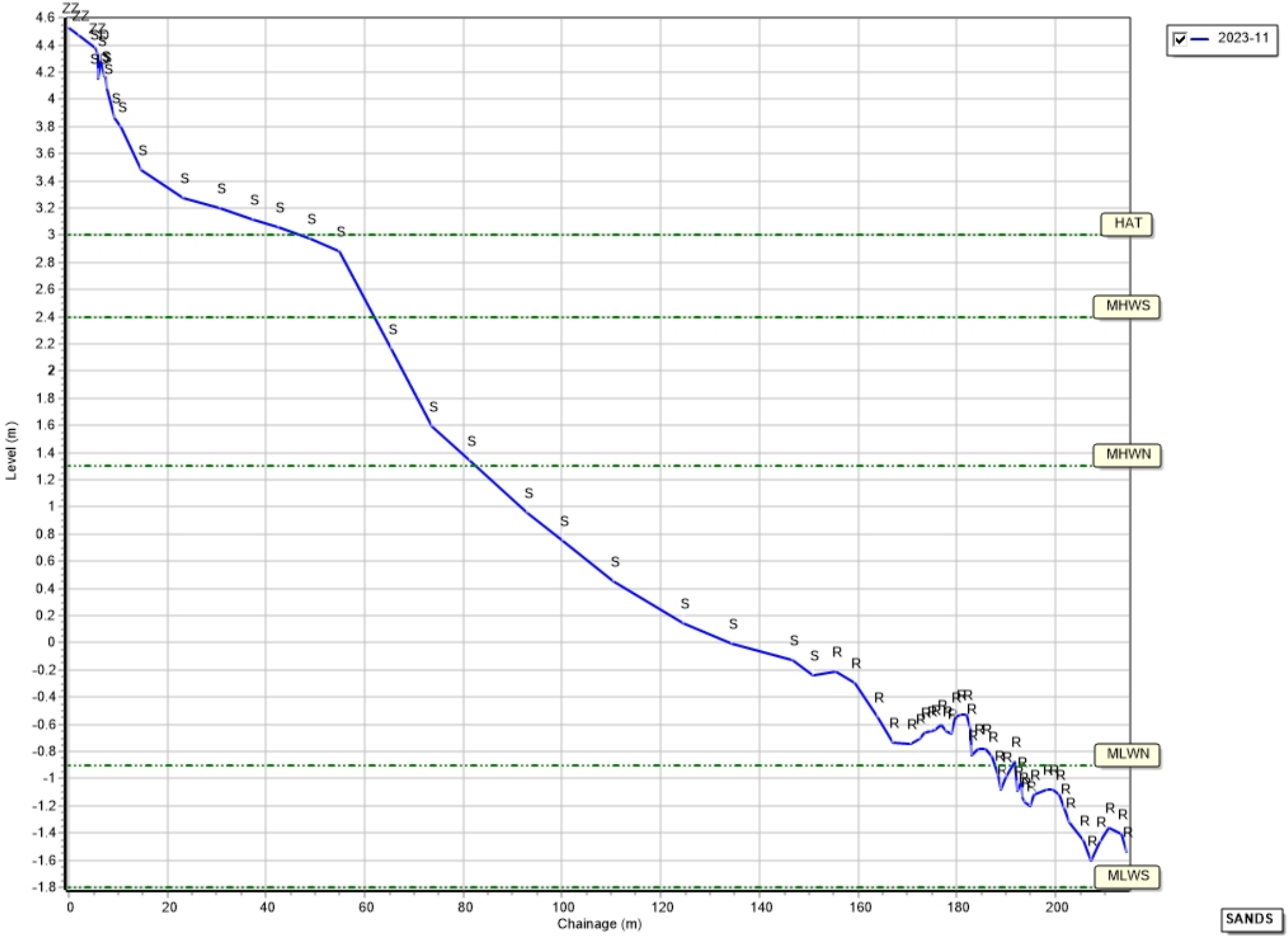
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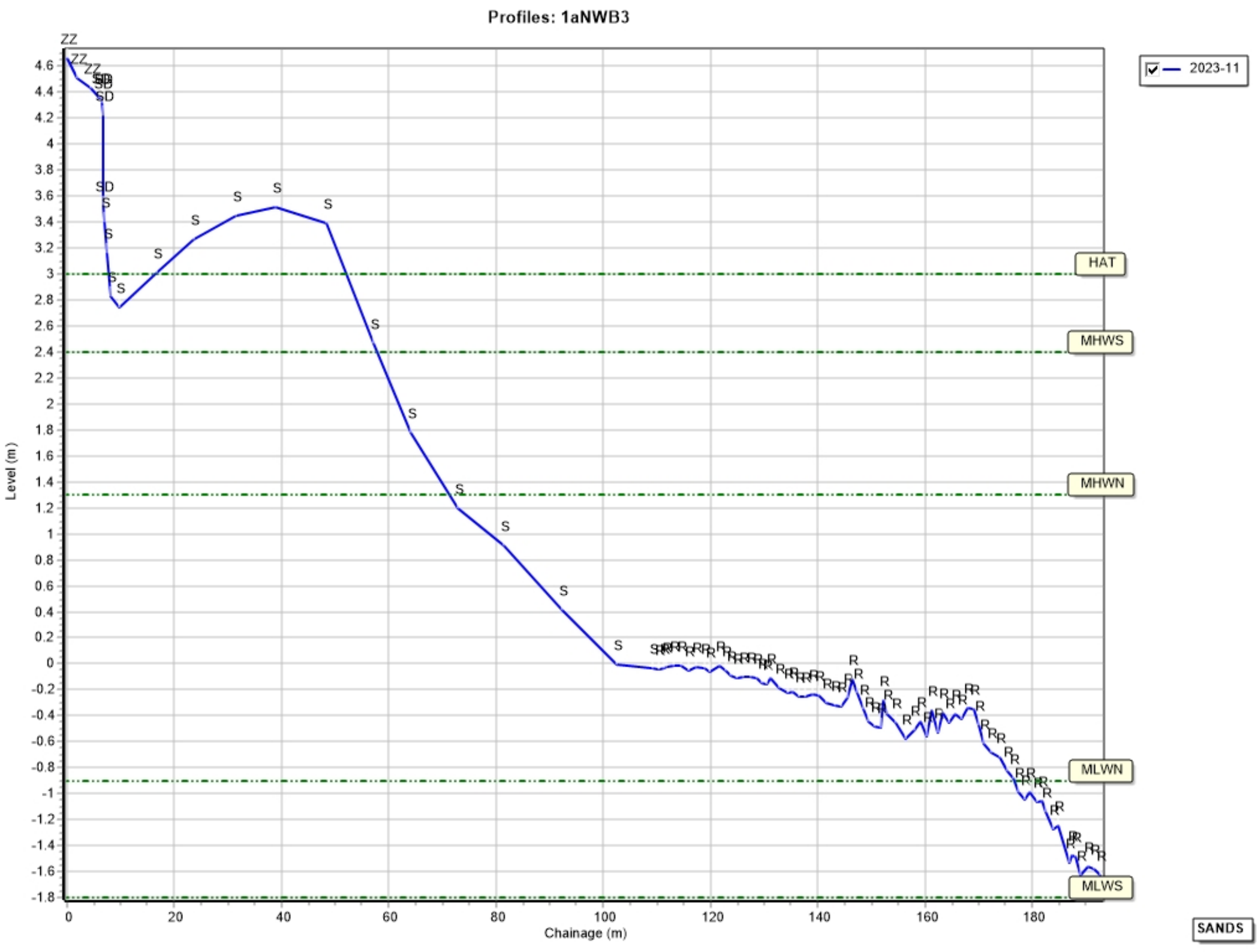
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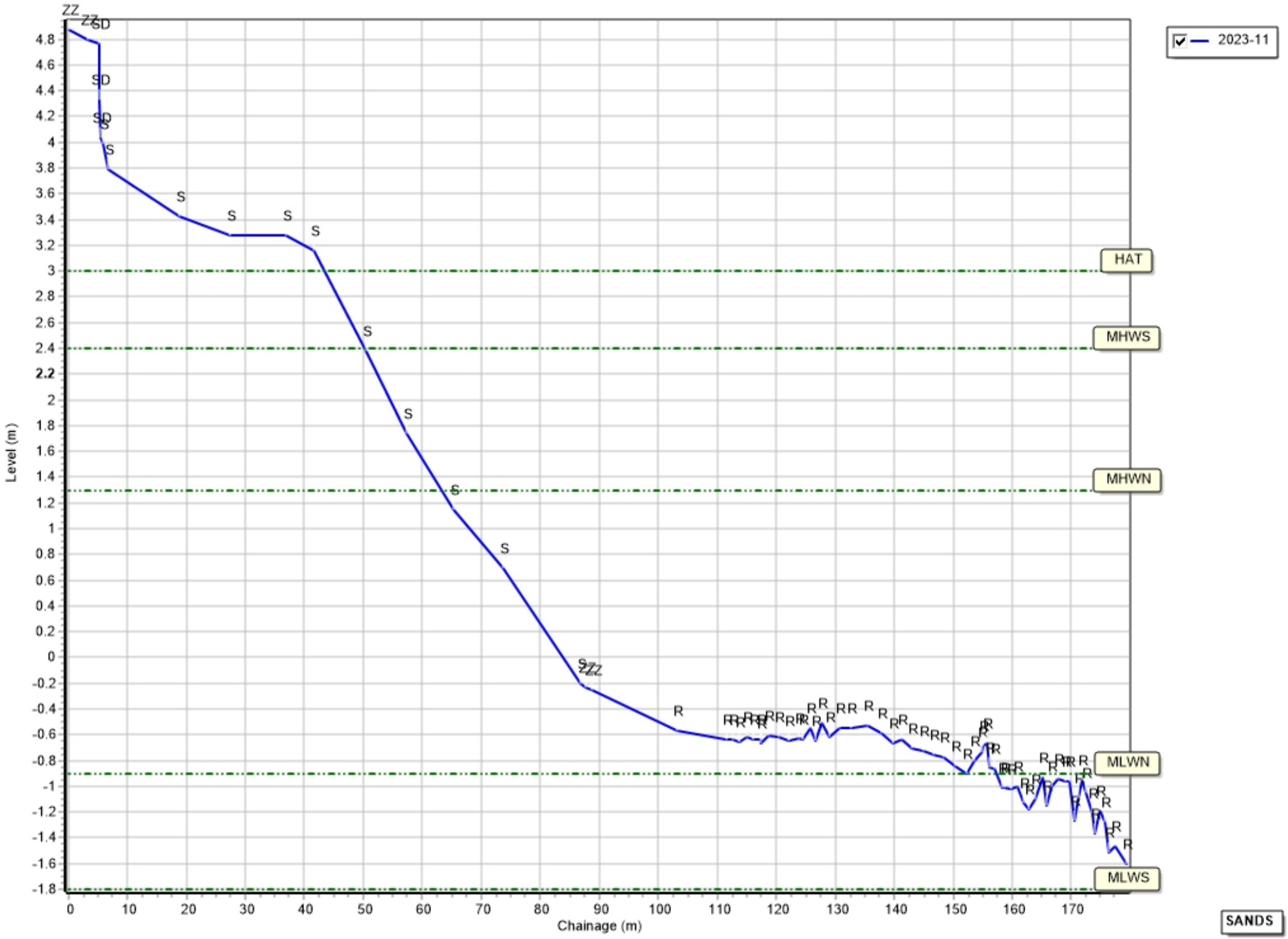
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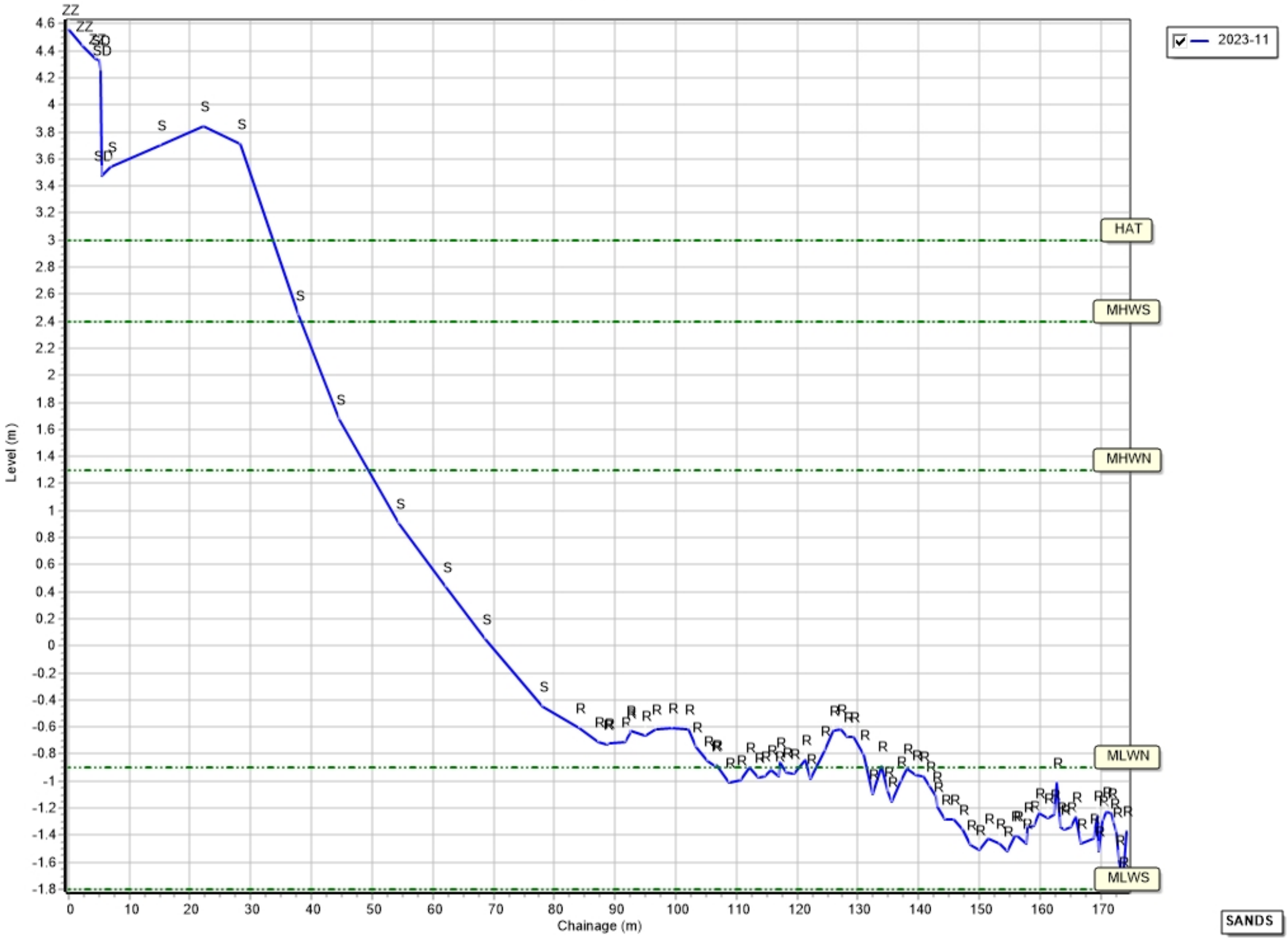
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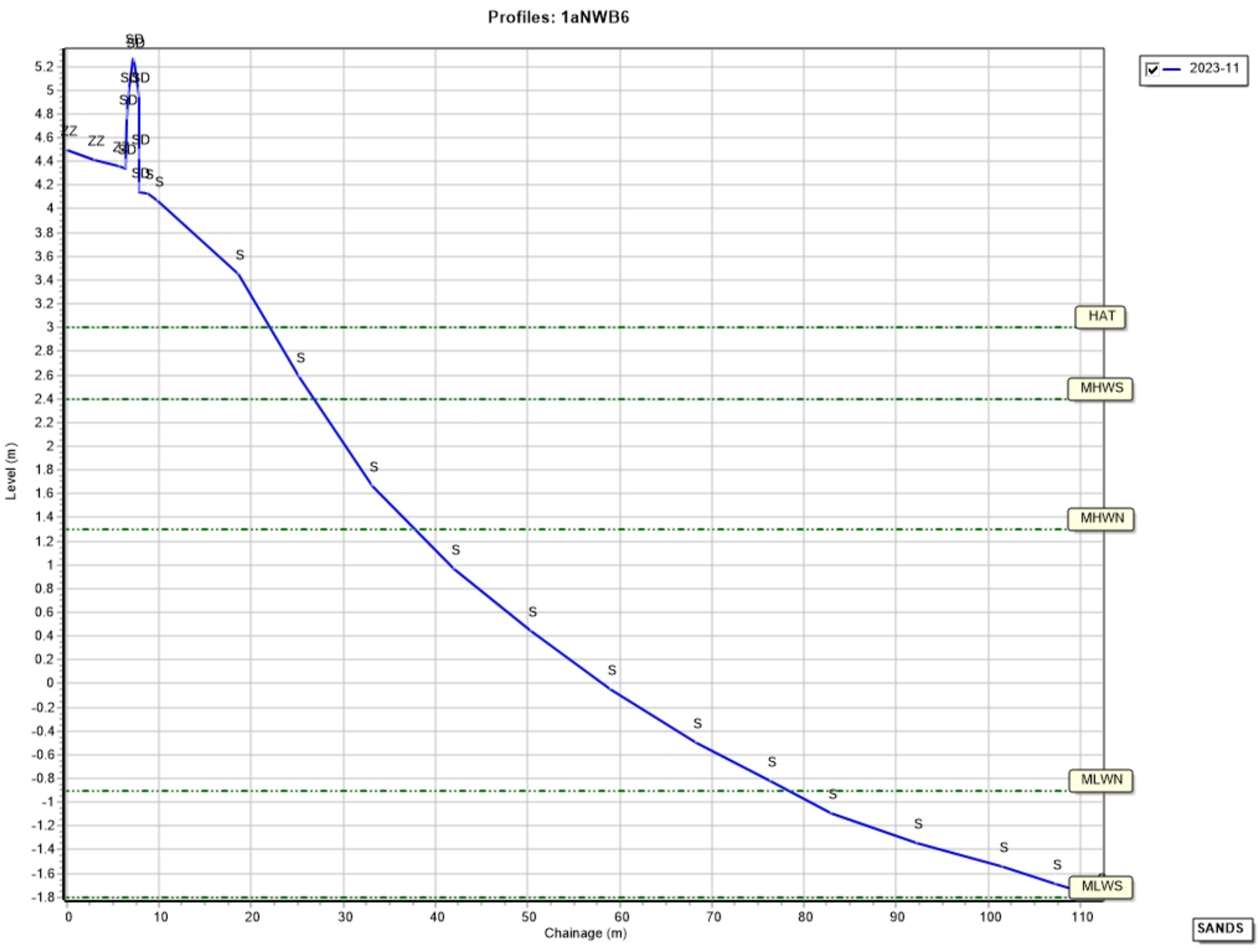
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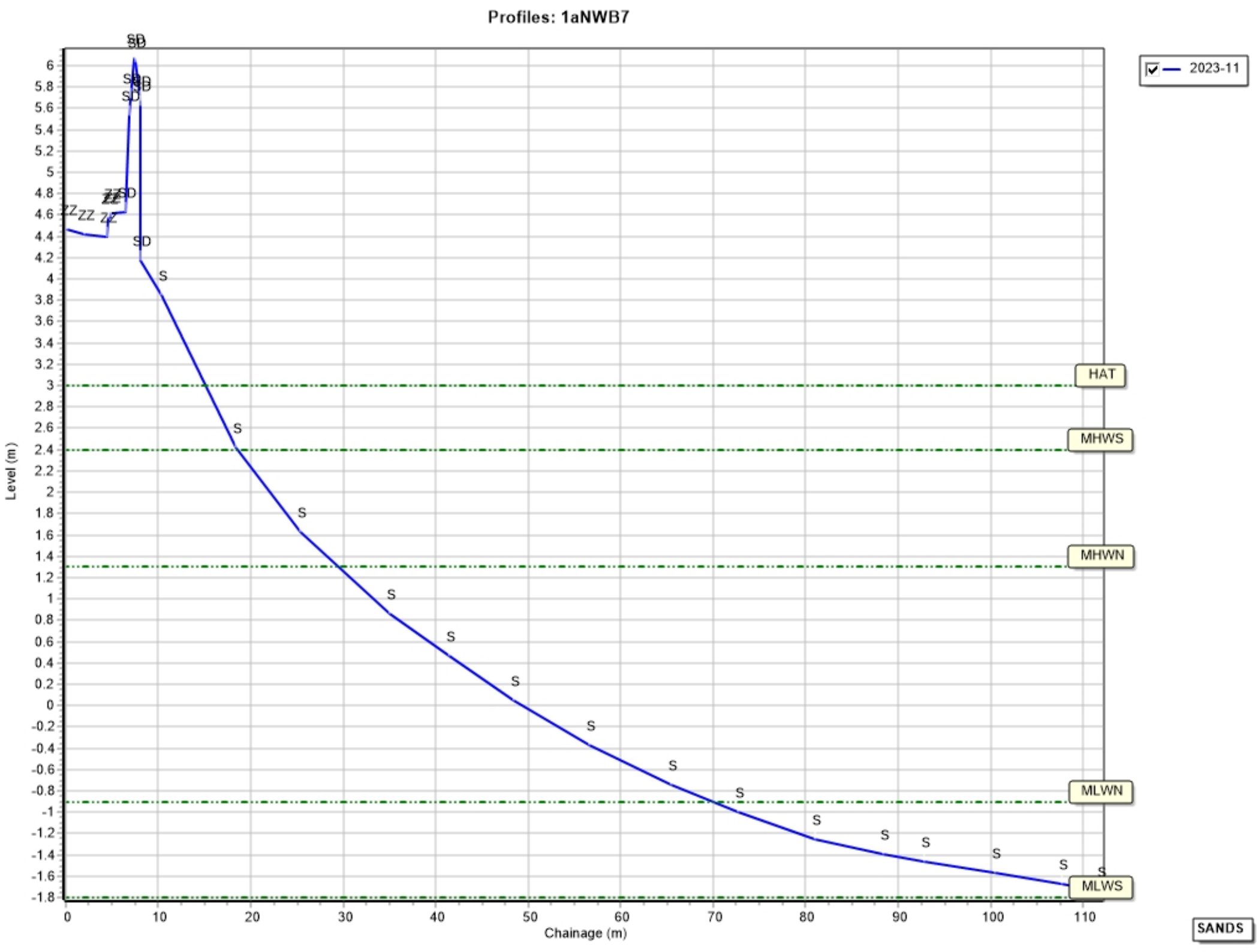
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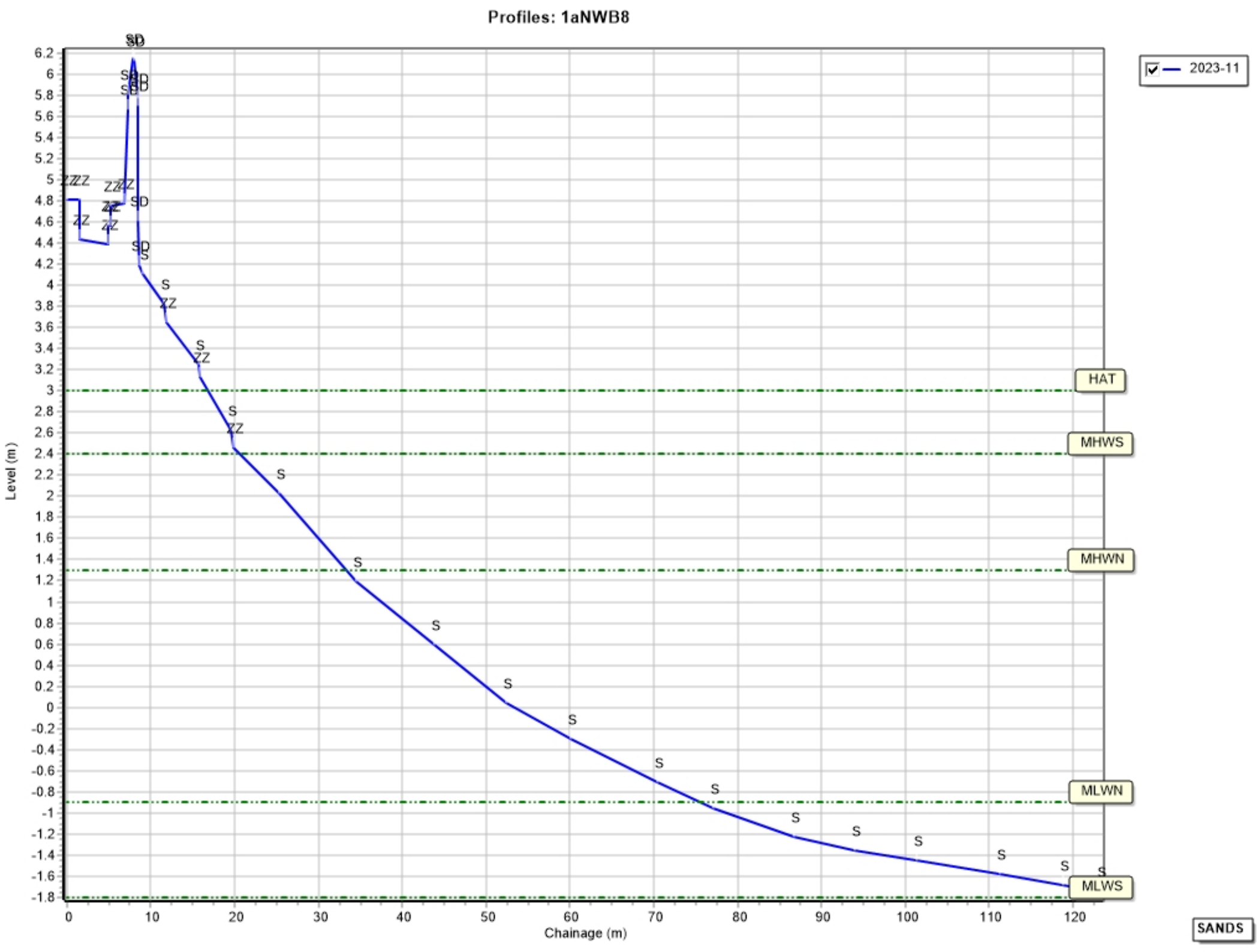
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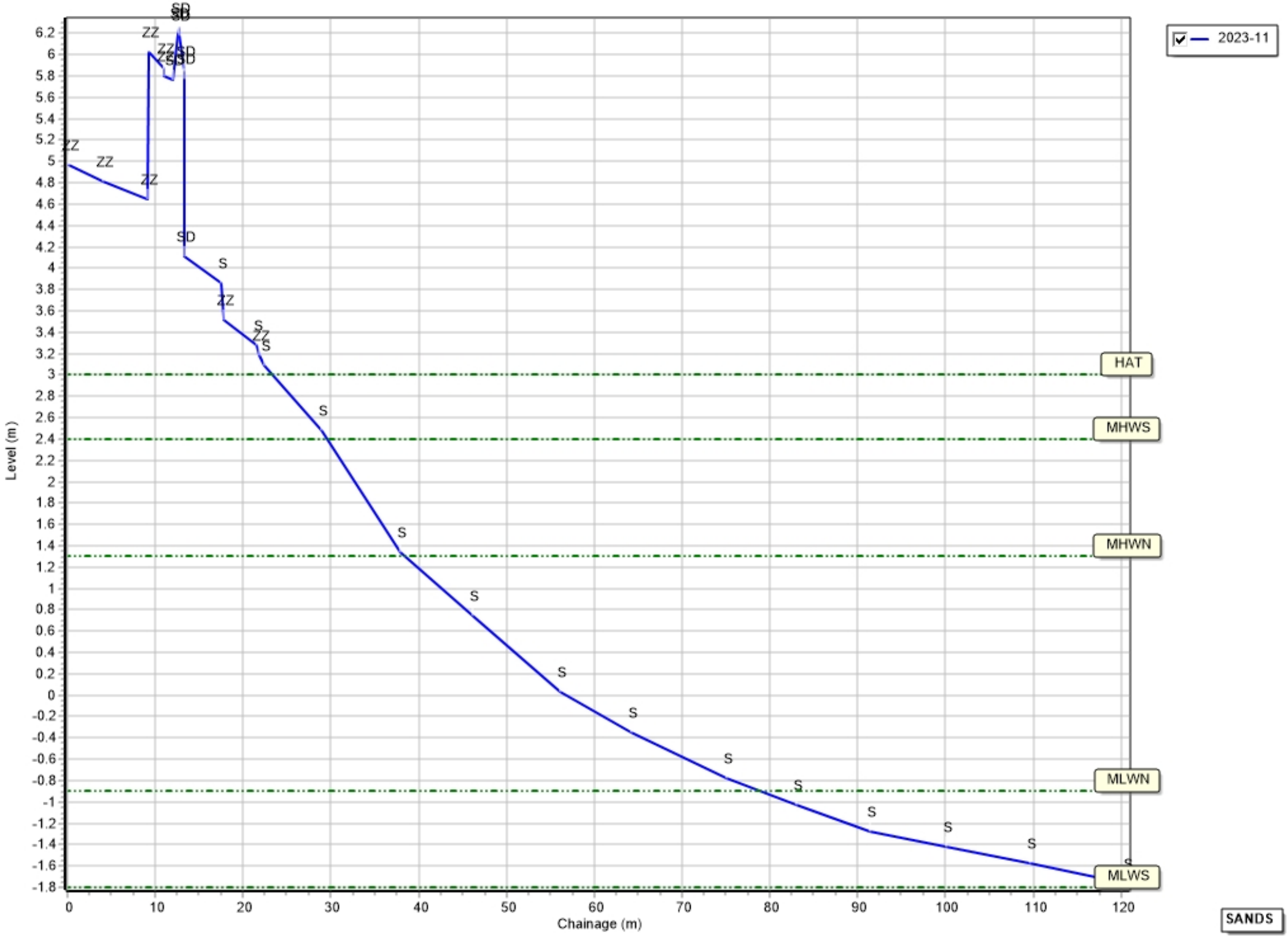
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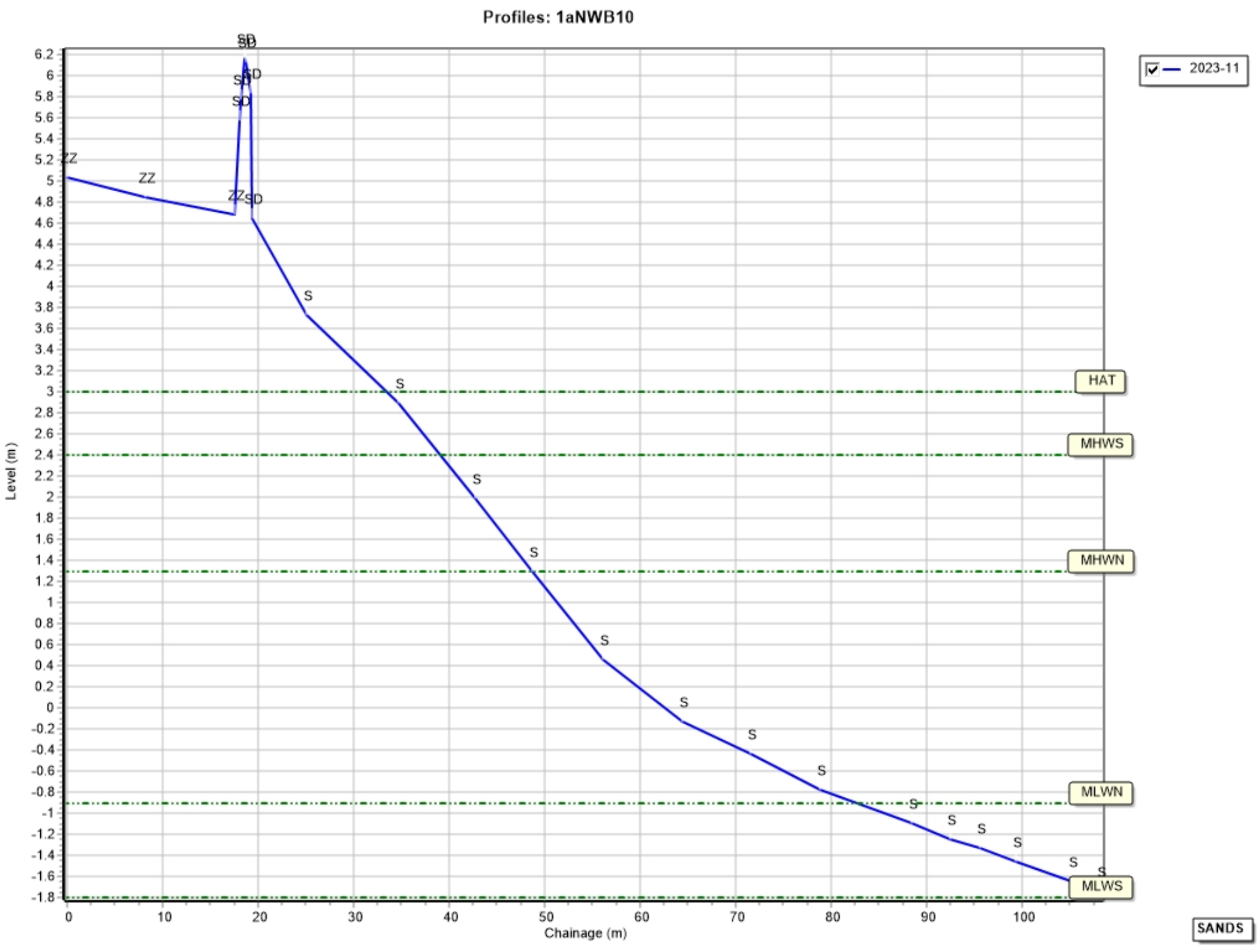
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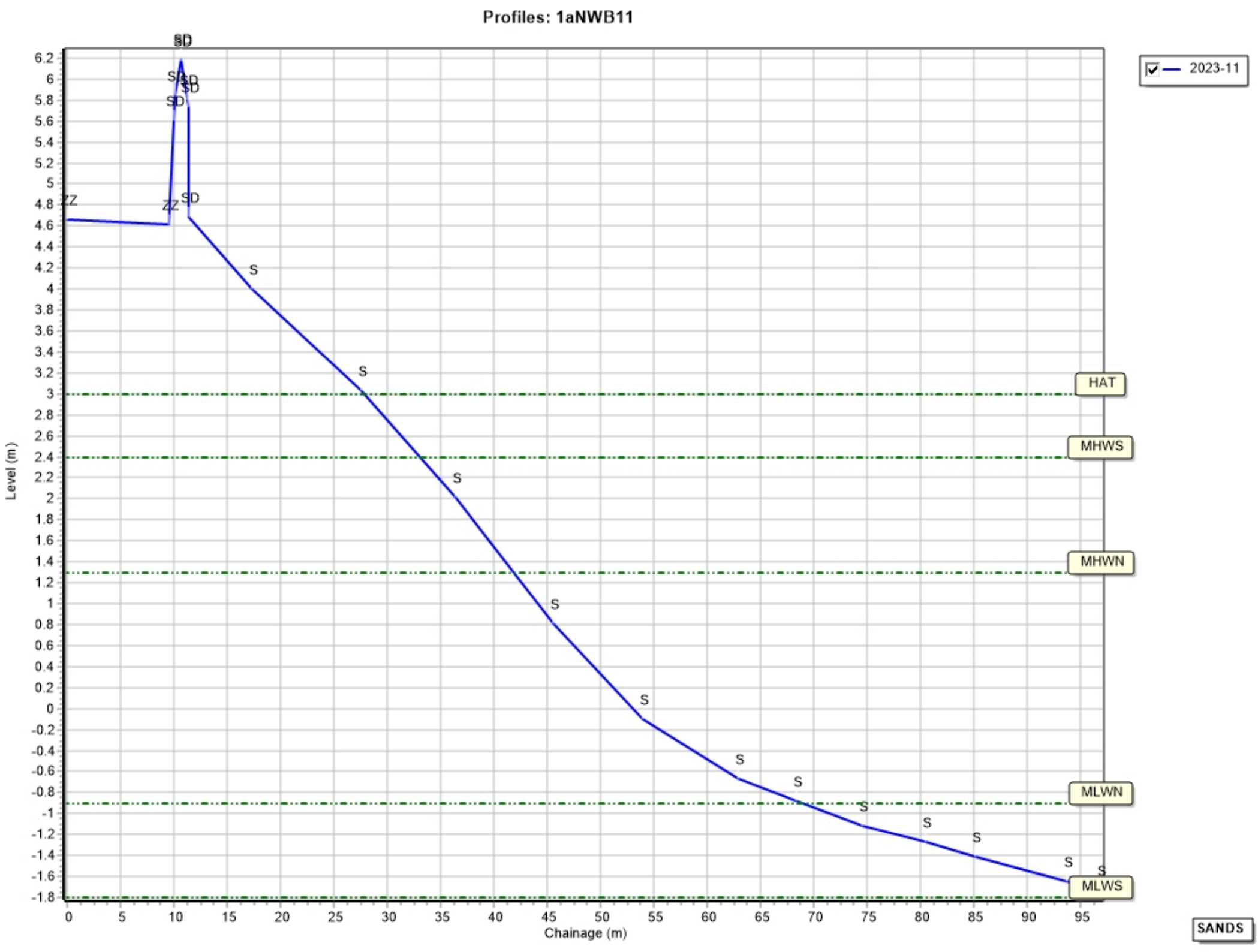
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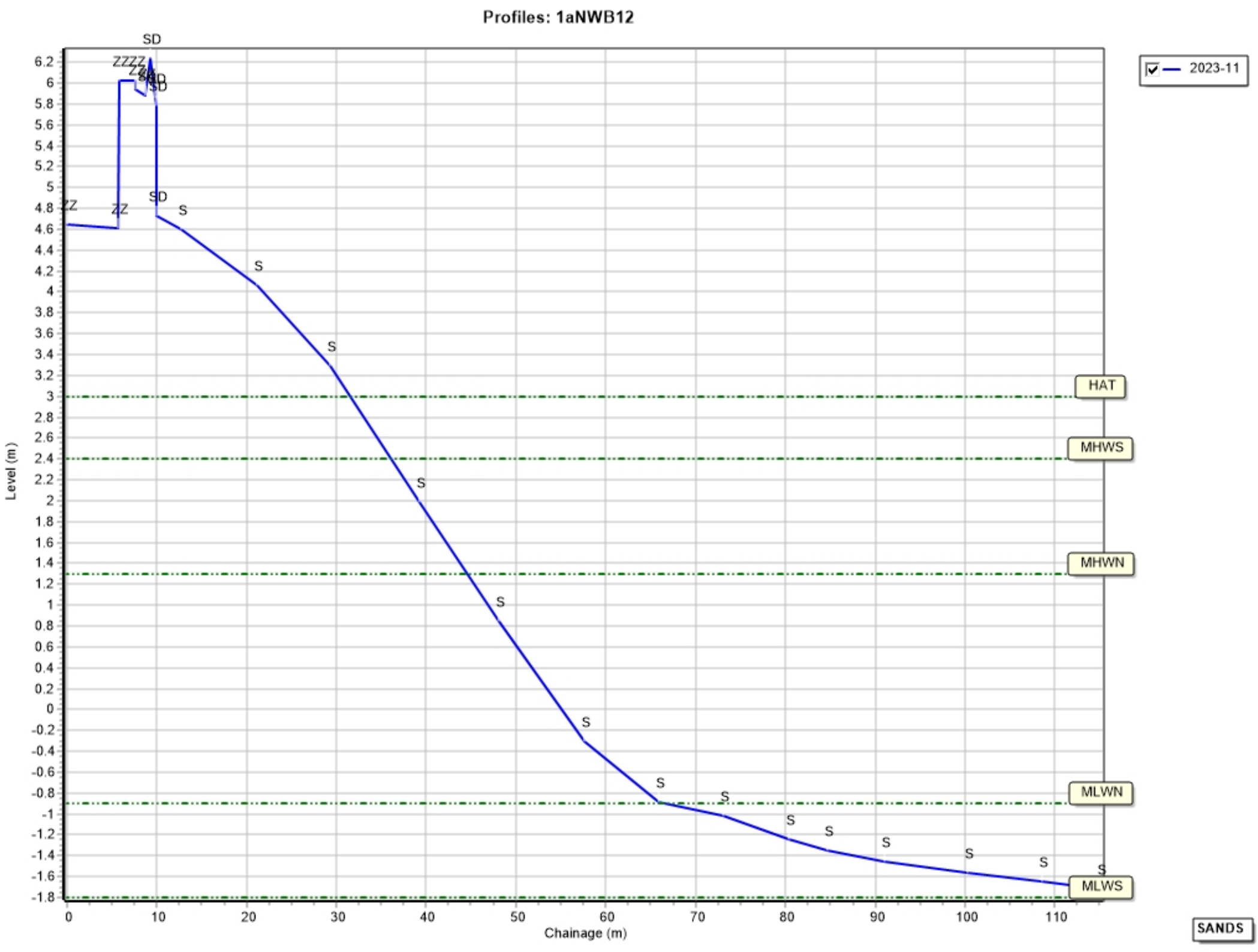
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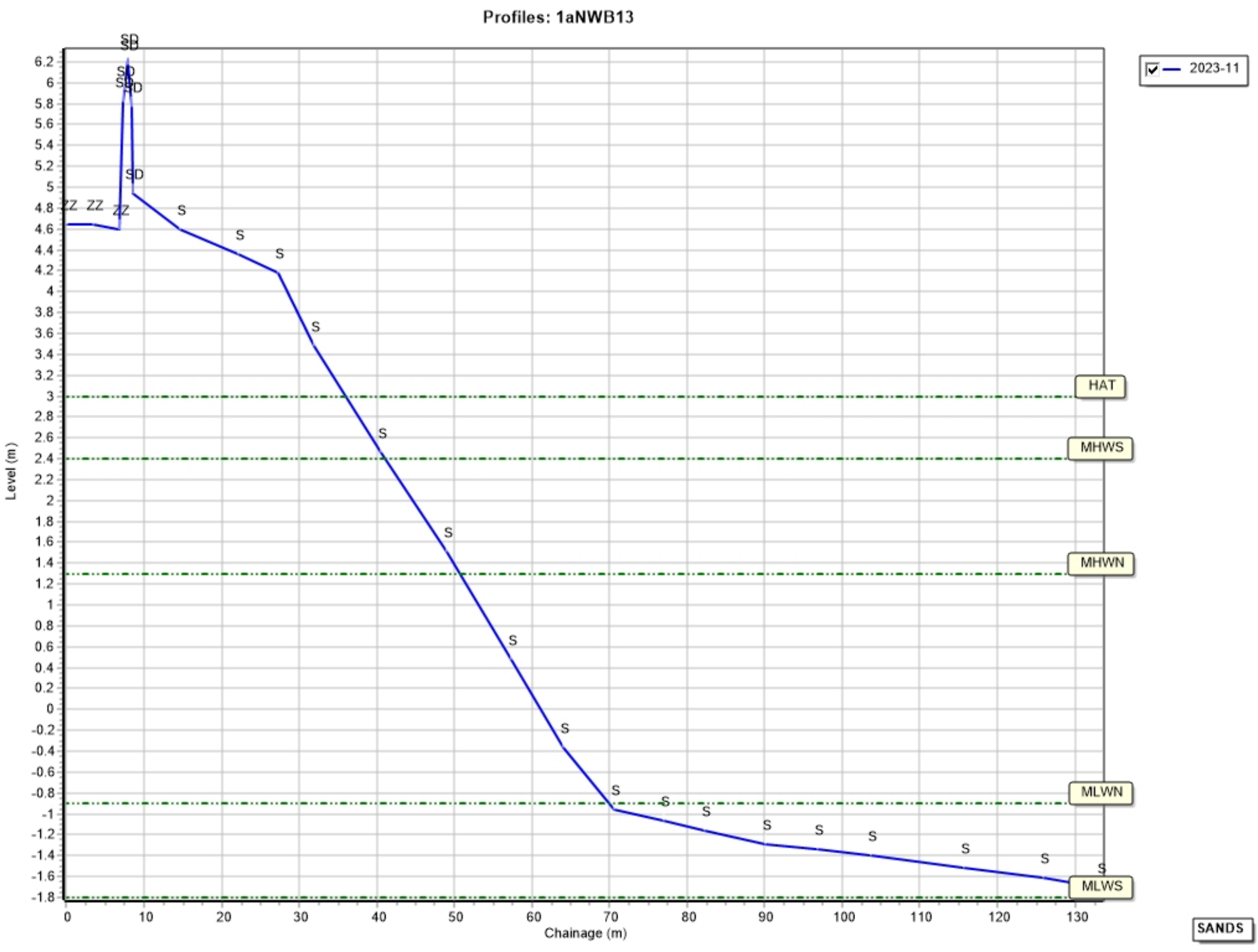
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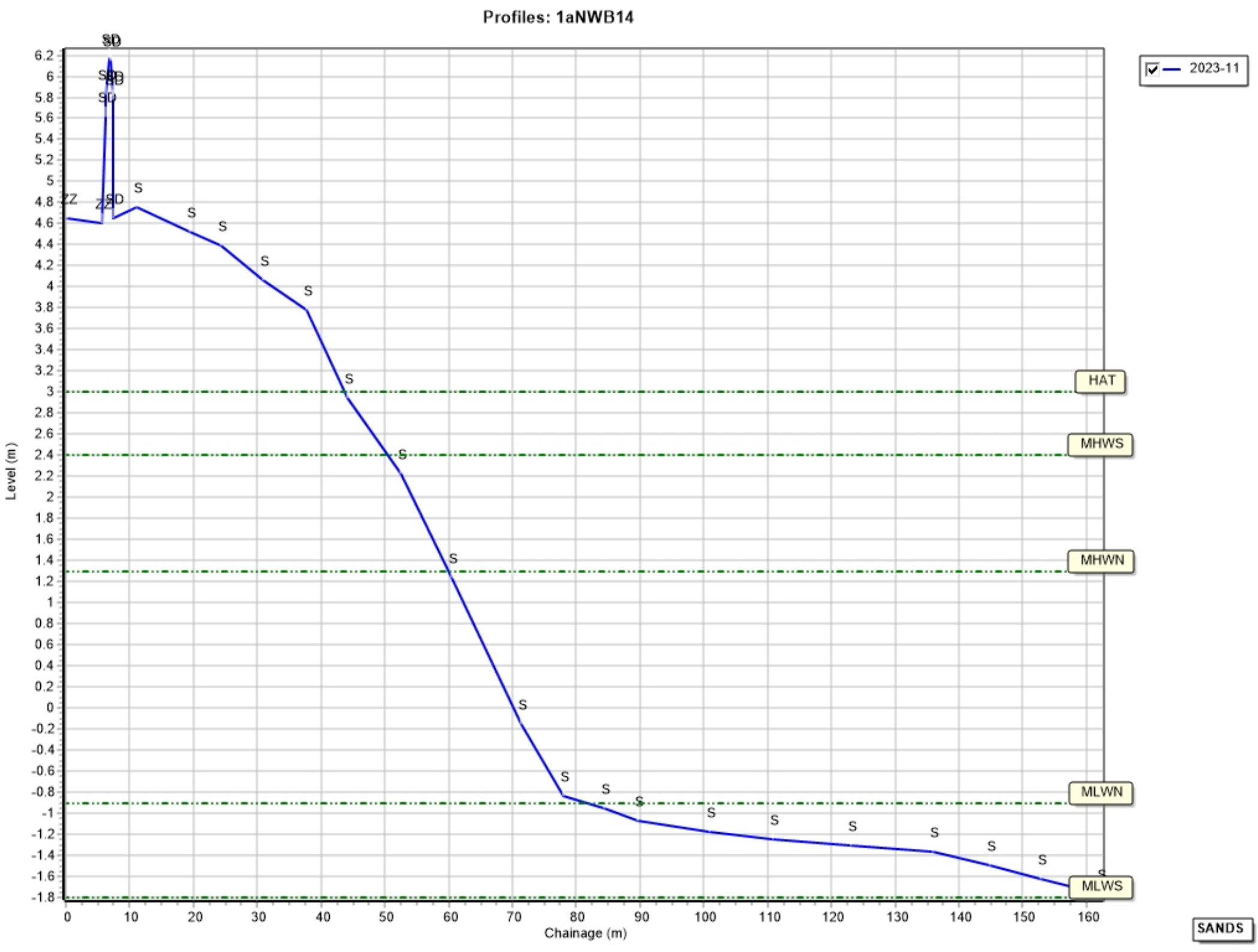
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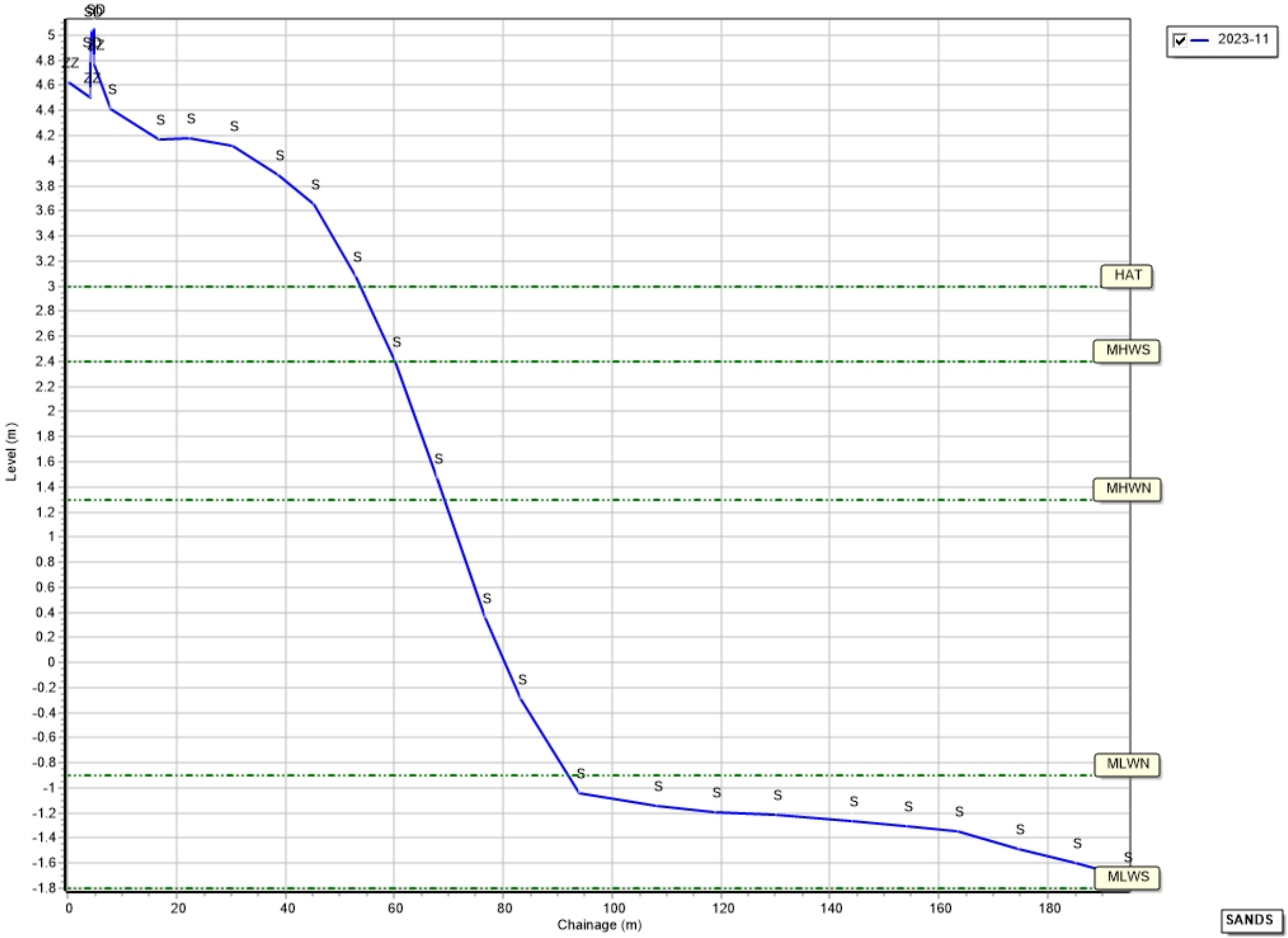
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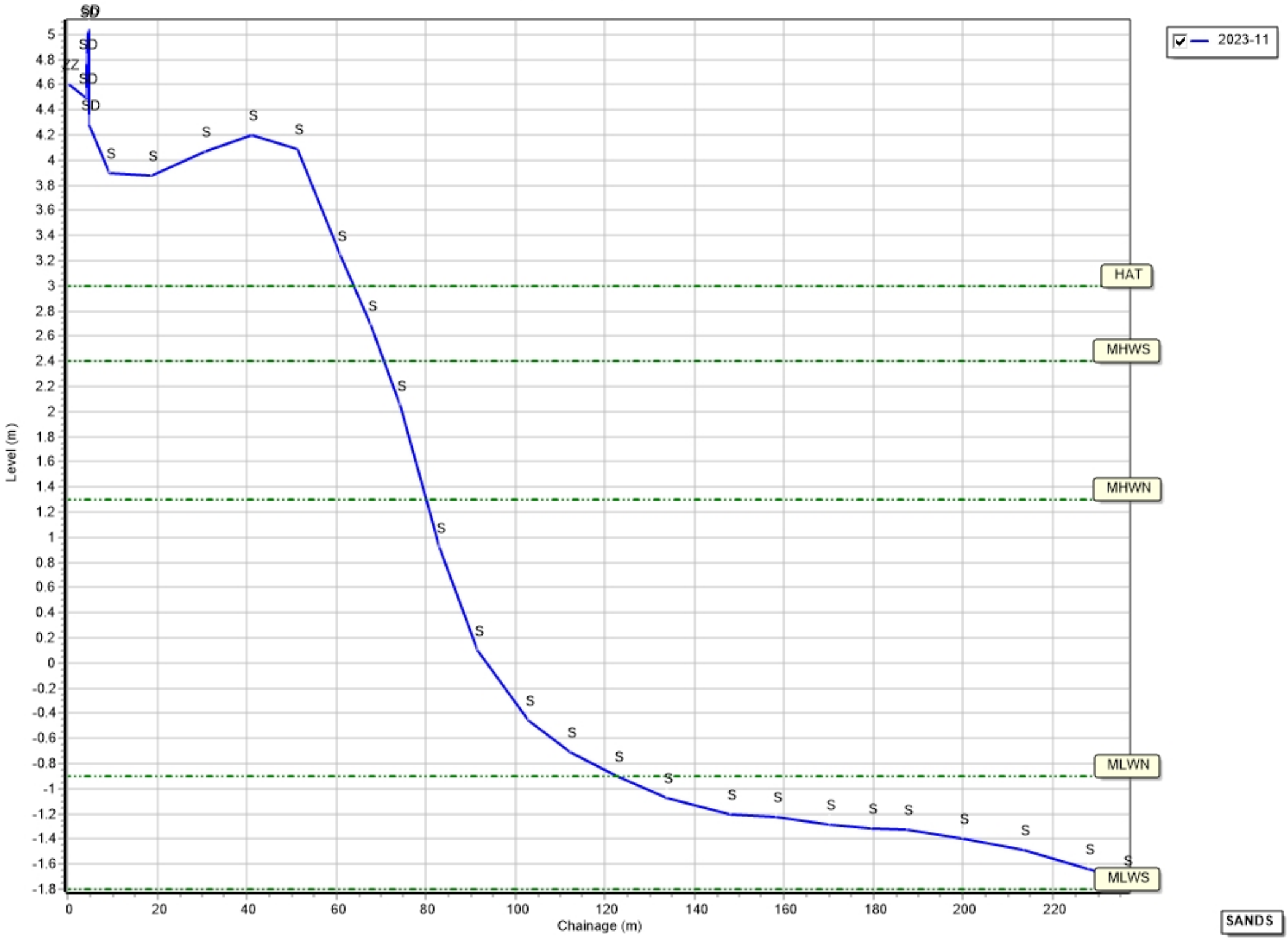
Chainage (m)
SANDS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2023-11
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MHWN
MLWN
MLWS
SANDS
Level (m)
Chainage (m)
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20
40
60
80
100
120
140
160
180
200
220
5
4.8
4.6
4.4
4.2
4
3.8
3.6
3.4
3.2
3
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
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-0.4
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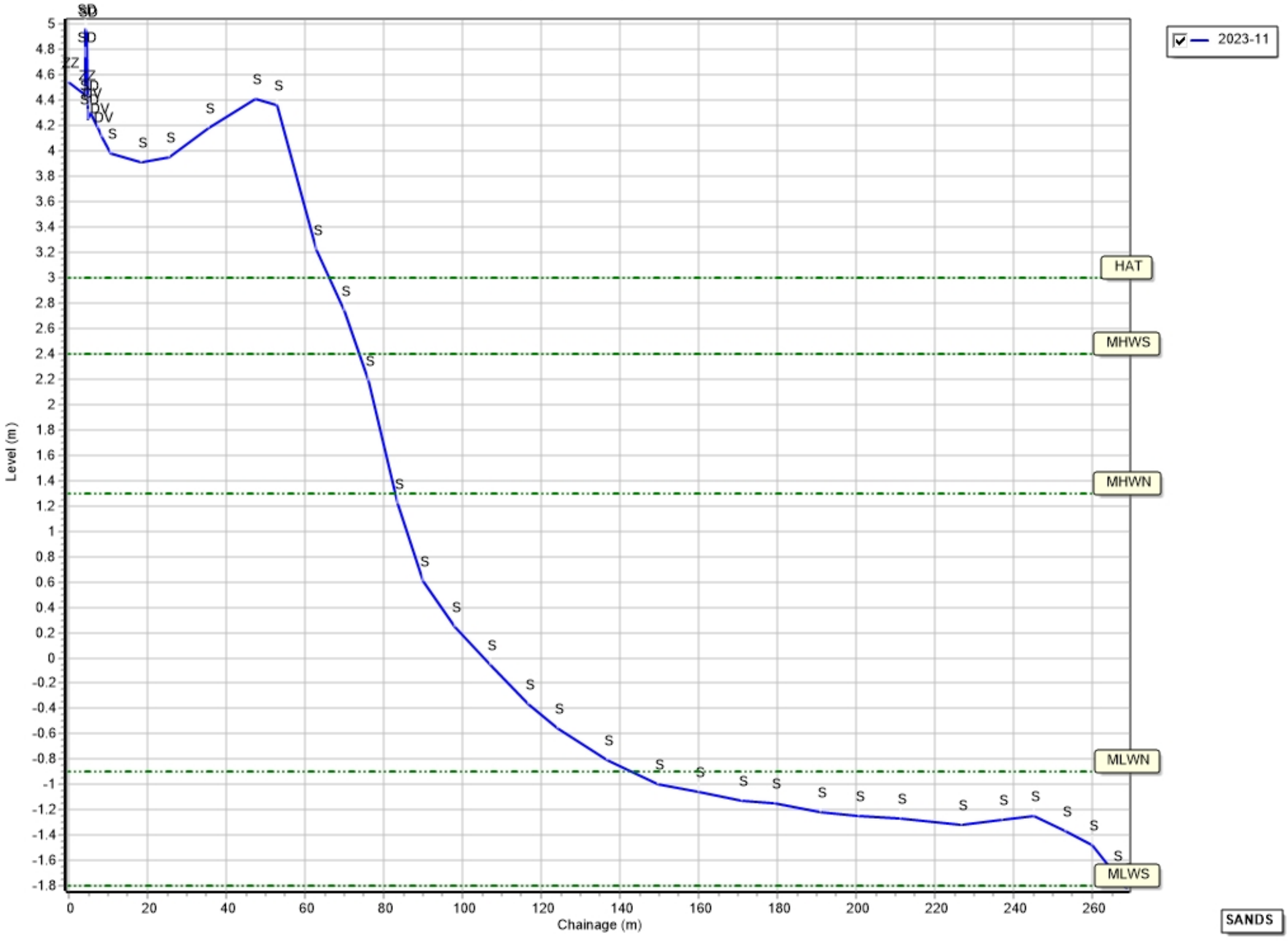
-1.2
-1.4
-1.6
-1.8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2023-11
HAT
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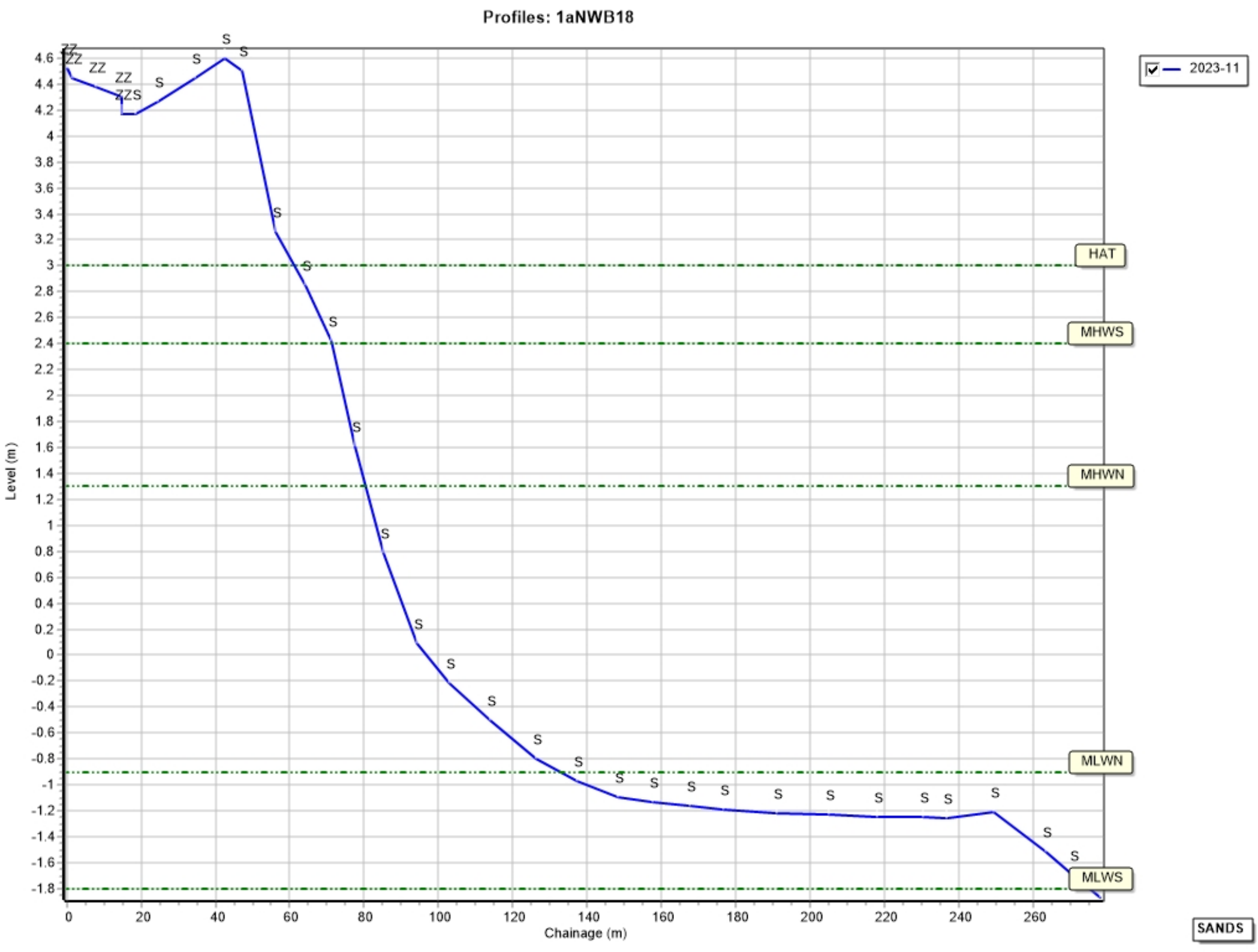
MLWN
MLWS
Level (m)
Chainage (m)
SANDS


Profiles: 1aNWB18
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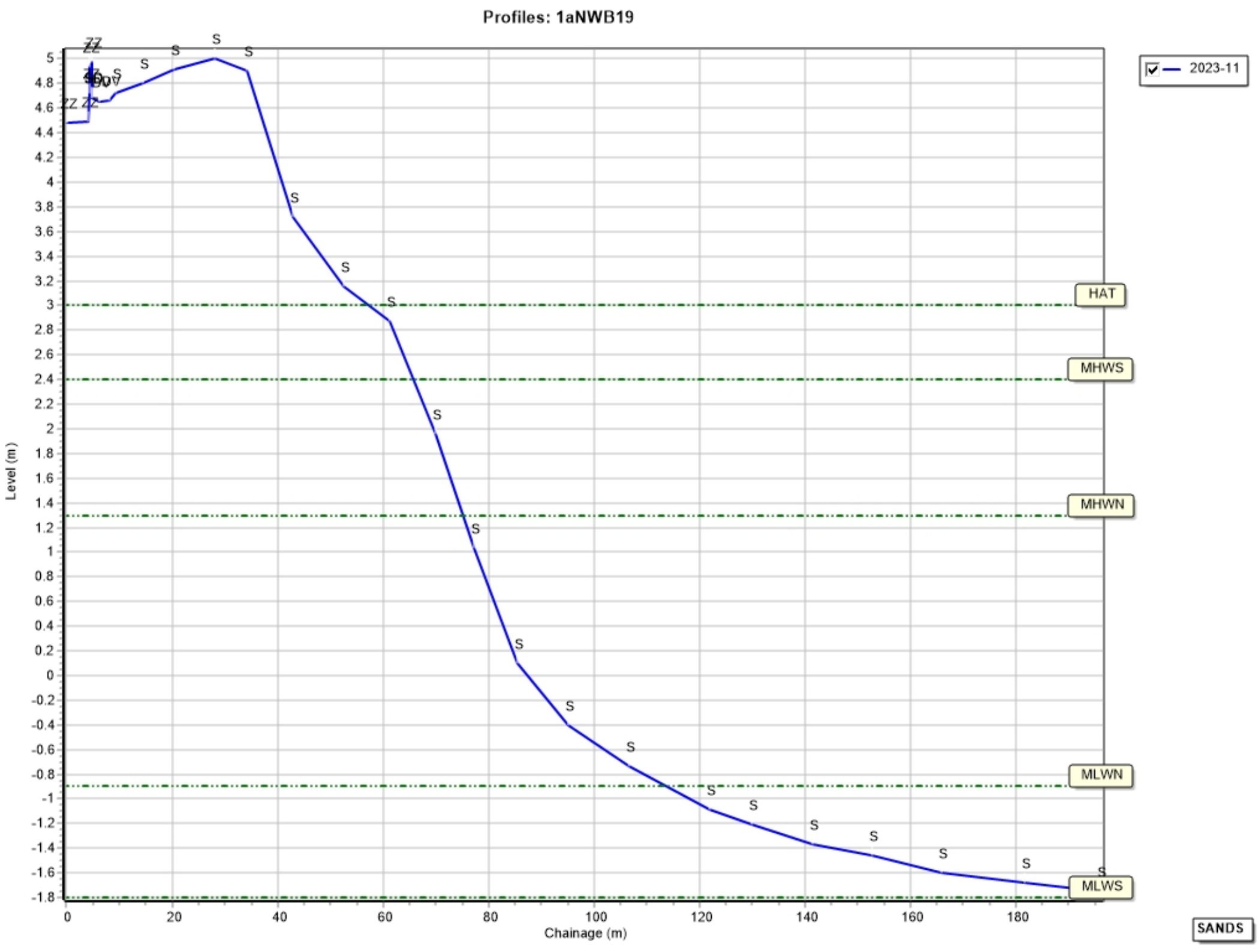
MHWS
MHWN
MLWN
MLWS
Level (m)
Chainage (m)
SANDS


Profiles: 1aNWB19
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HAT
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MHWN
MLWN
MLWS
Level (m)
Chainage (m)
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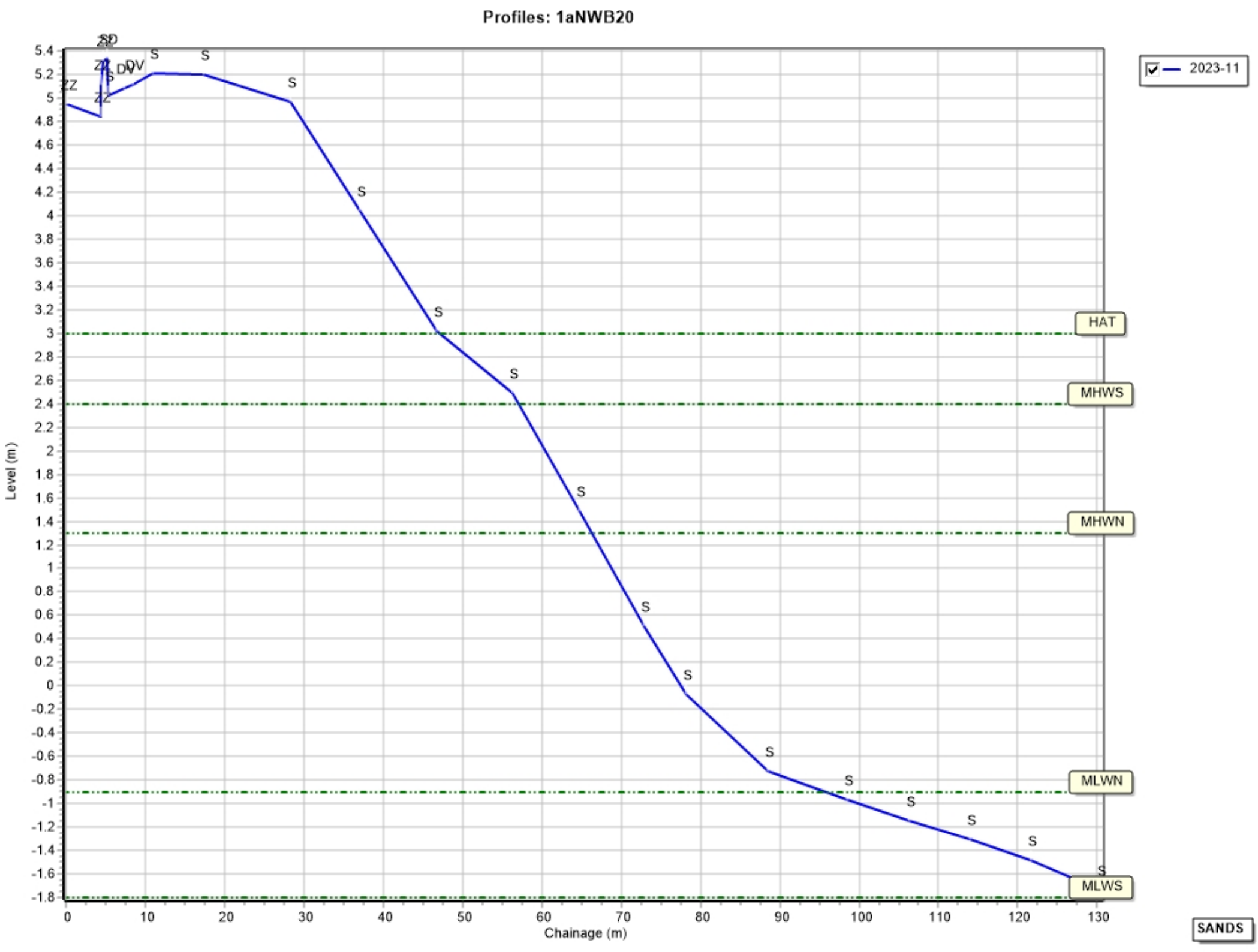
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2023-11
HAT
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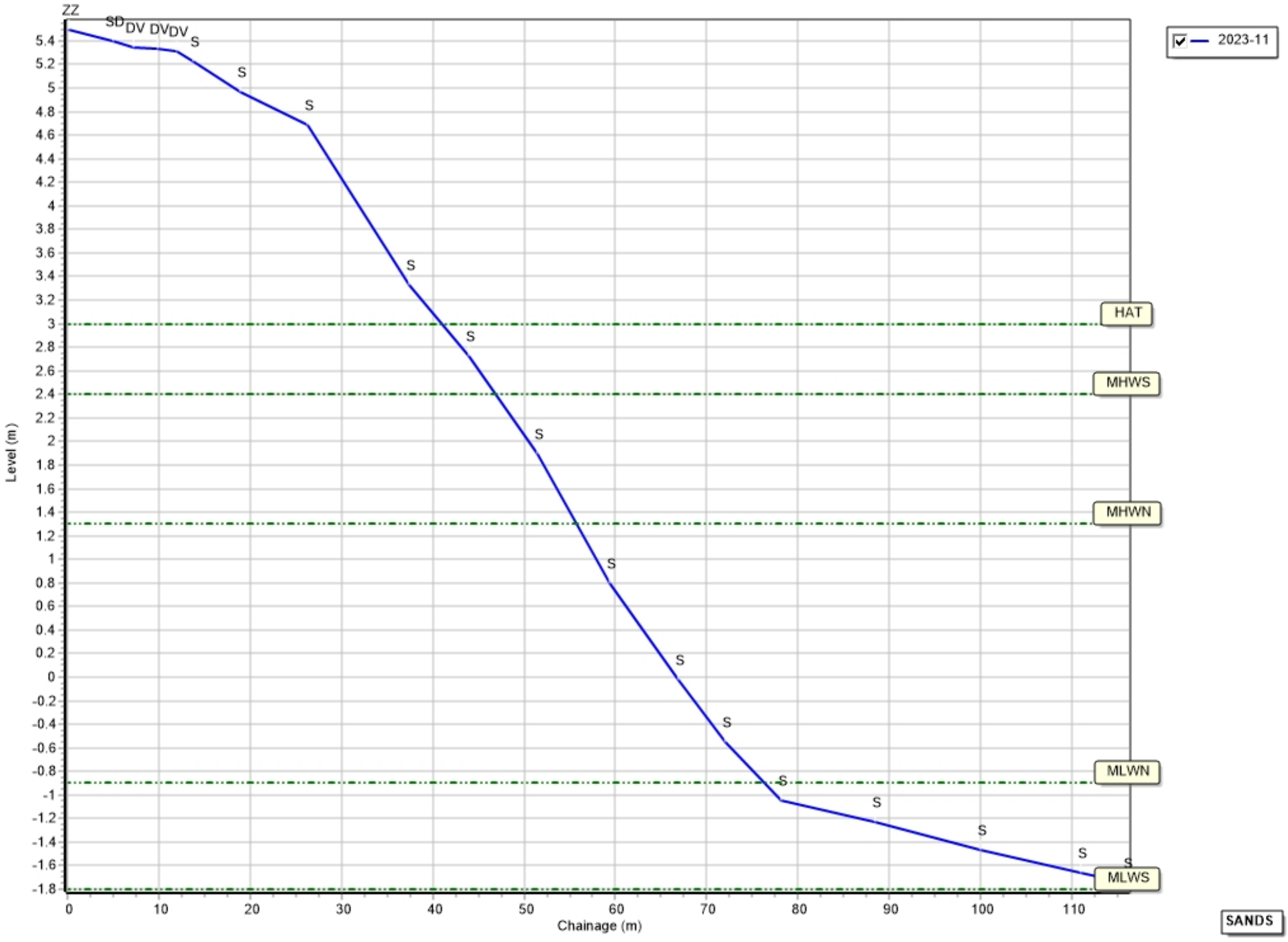
MHWN
MLWN
MLWS
Level (m)
Chainage (m)
SANDS


Profiles: 1aNWB21
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DV
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DV
S
Level (m)
Chainage (m)
2023-11
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MLWS
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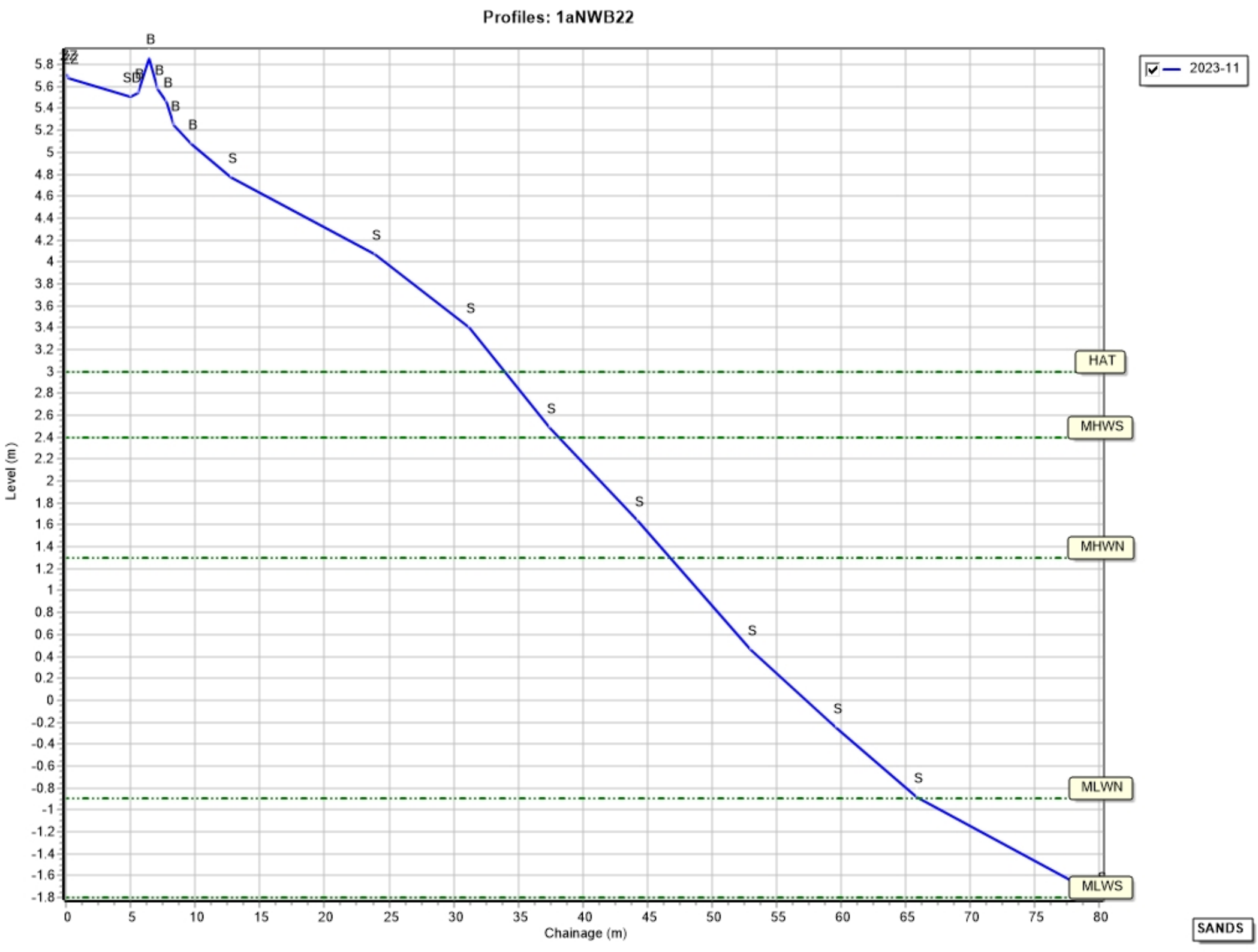
Profiles: 1aNWB22
2023-11
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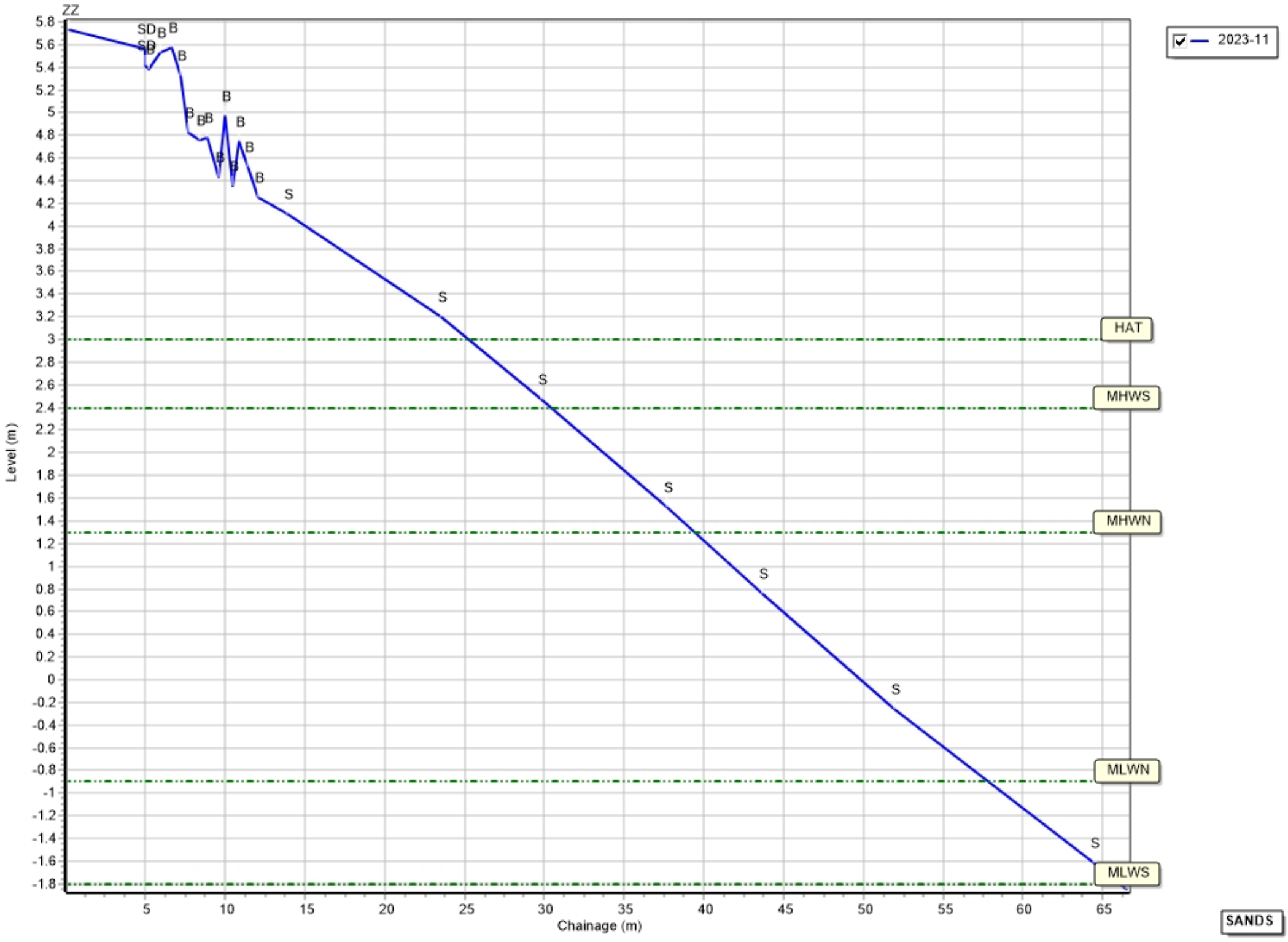
MHWN
MLWN
MLWS
SANDS
Level (m)
Chainage (m)
B
S


Profiles: 1aNWB23
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2023-11
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MHWS
MHWN
MLWN
MLWS
Level (m)
Chainage (m)
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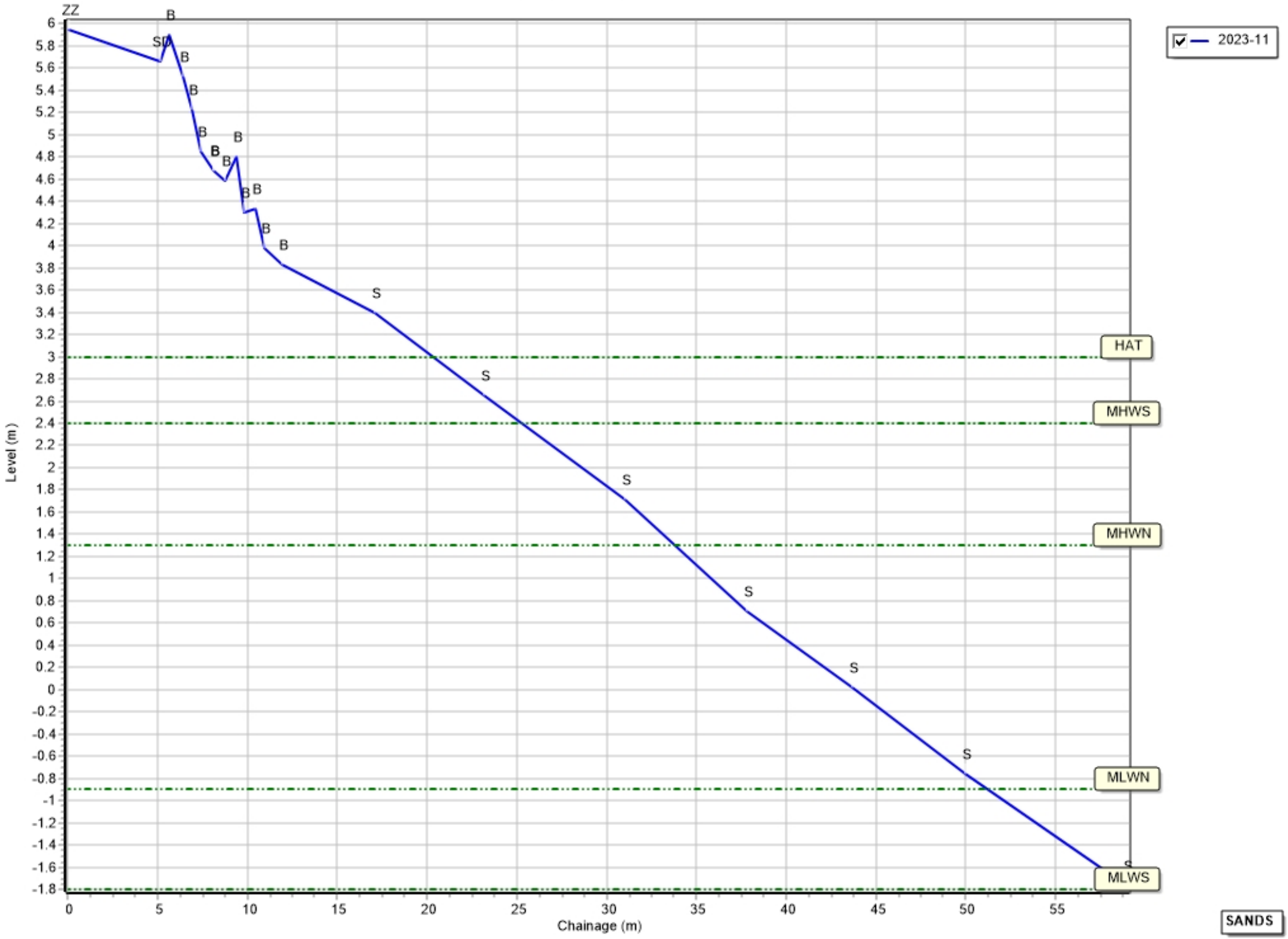
Profiles: 1aNWB24
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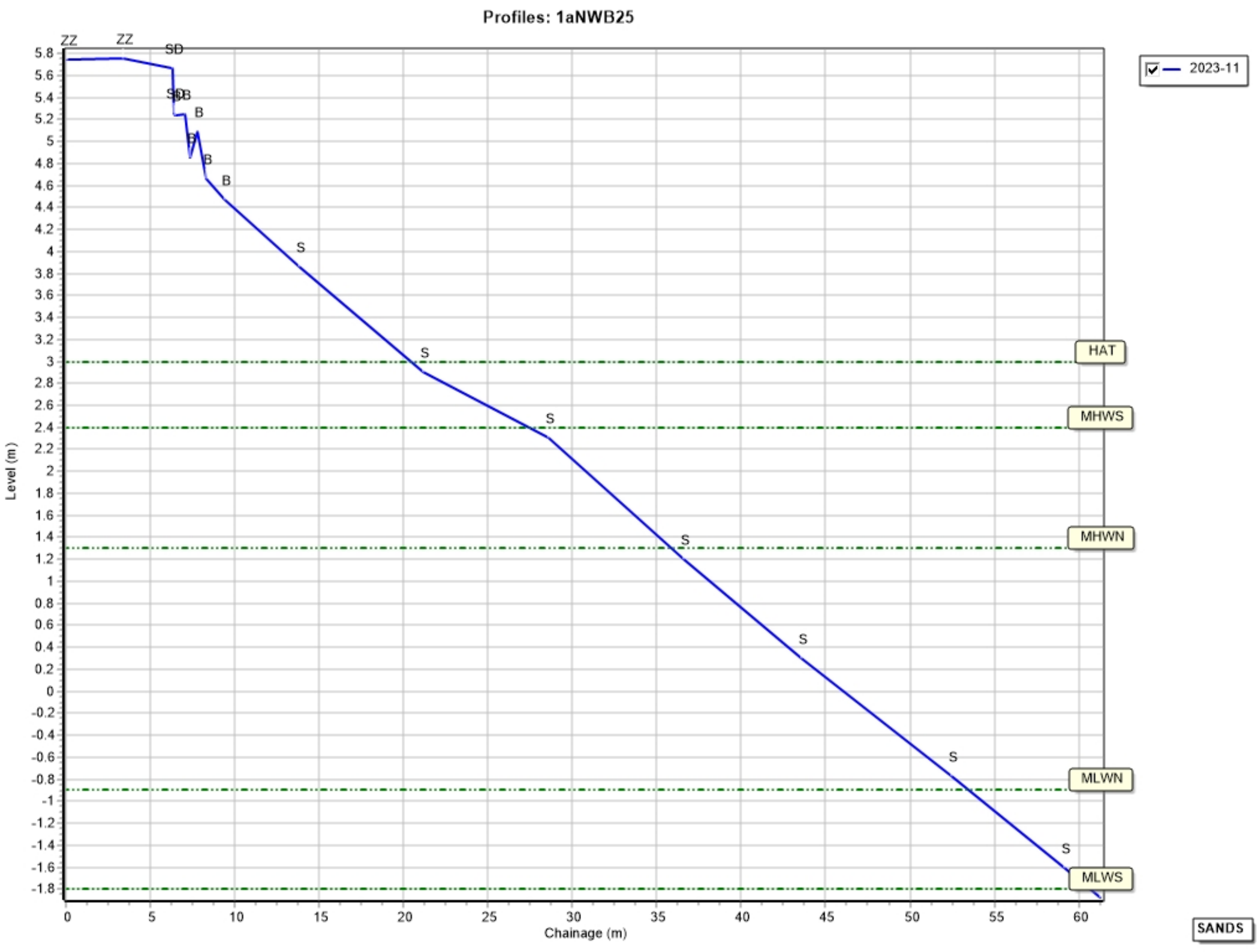
SD
S
2023-11
HAT
MHWS
MHWN
MLWN
MLWS
Level (m)
Chainage (m)
SANDS


Profiles: 1aNWB25
ZZ
ZZ
SD
B
B
B
B
S
S
S
S
S
S
2023-11
HAT
MHWS
MHWN
MLWN
MLWS
SANDS
Level (m)
Chainage (m)
5.8
5.6
5.4
5.2
5
4.8
4.6
4.4
4.2
4
3.8
3.6
3.4
3.2
3
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
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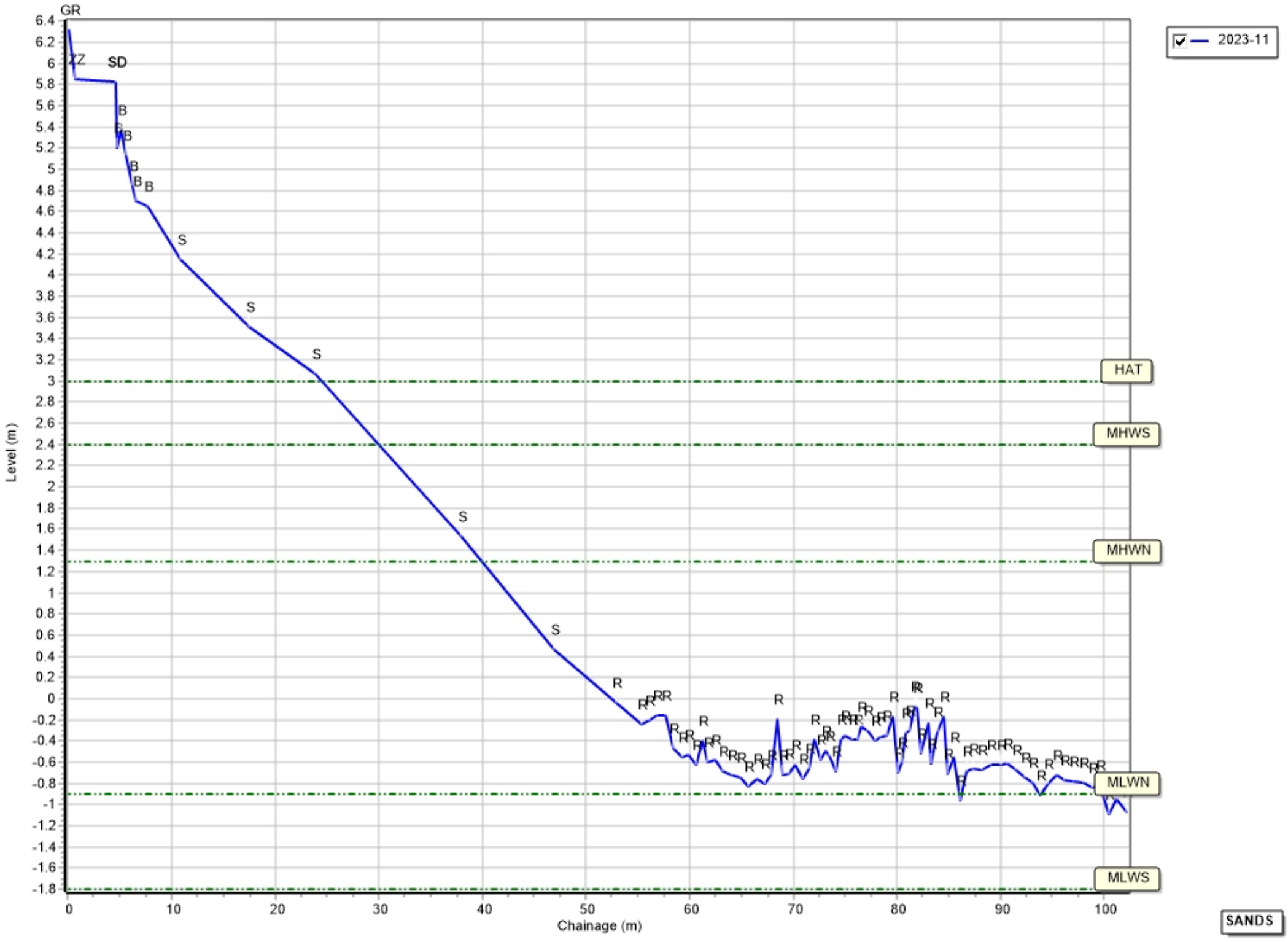
55
60


Profiles: 1aNWB26
GR
XZ
SD
B
S
R
2023-11
HAT
MHWS
MHWN
MLWN
MLWS
SANDS
Level (m)
Chainage (m)
6.4
6.2
6
5.8
5.6
5.4
5.2
5
4.8
4.6
4.4
4.2
4
3.8
3.6
3.4
3.2
3
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
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-0.6
-0.8
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80
90
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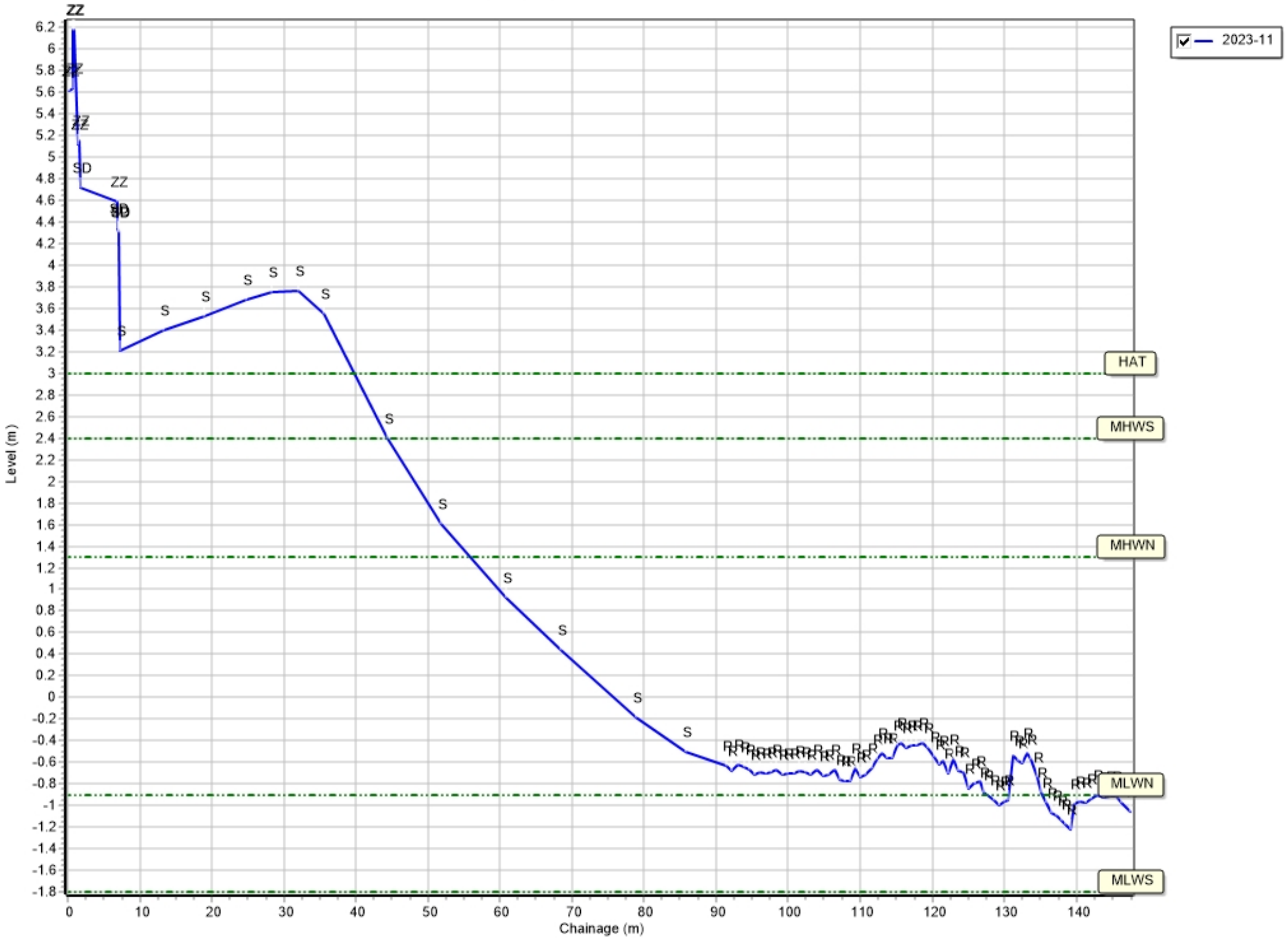
Profiles: 1aWDC05A
2023-11
HAT
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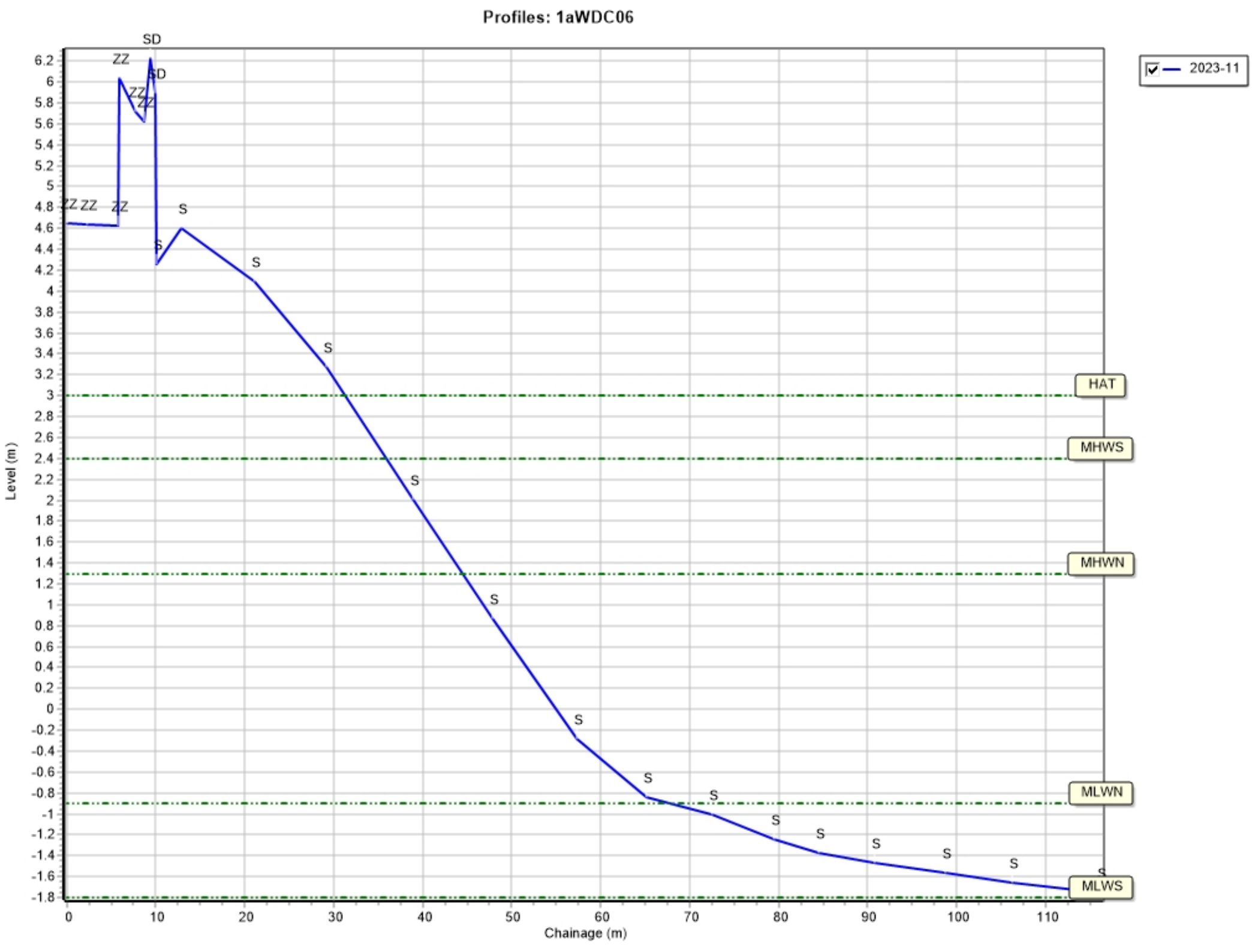
MHWN
MLWN
MLWS
Level (m)
Chainage (m)


Profiles: 1aWDC06
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MHWS
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MLWN
MLWS
Level (m)
Chainage (m)
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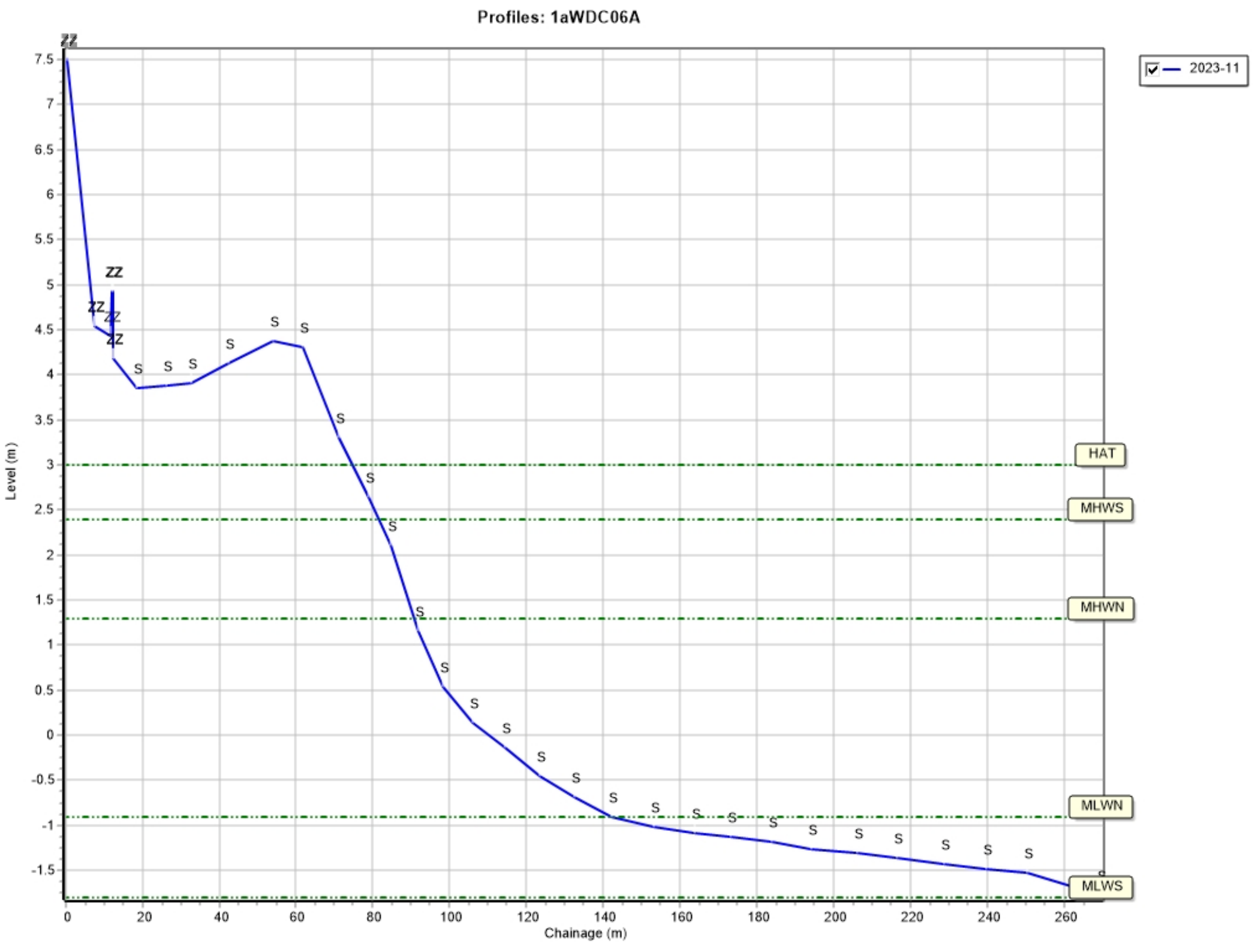
ZZ
S


Profiles: 1aWDC06A
2023-11
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MHWN
MLWN
MLWS
Level (m)
Chainage (m)
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7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
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-1
-1.5
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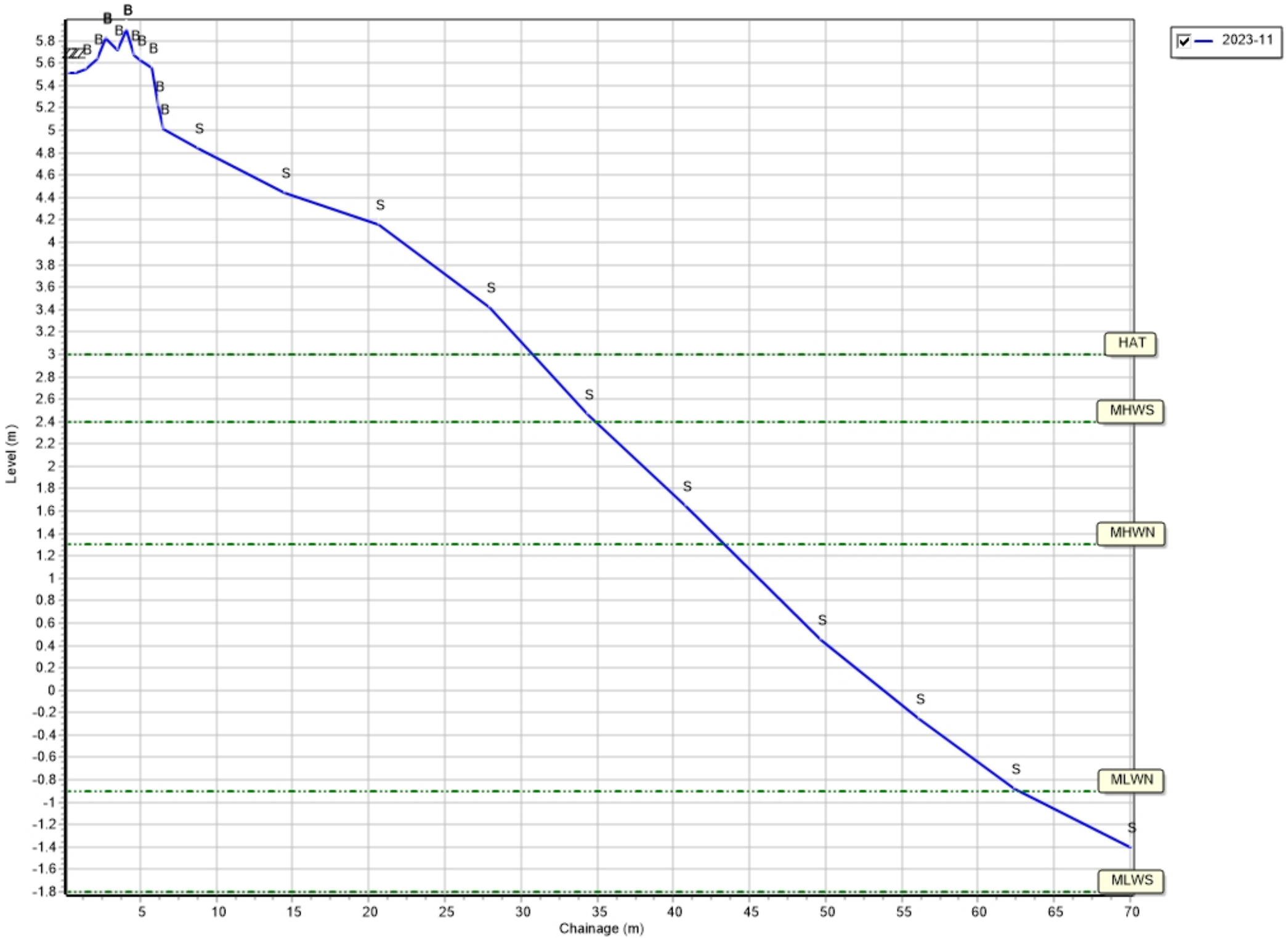
200
220
240
260


Profiles: 1aWDC07
2023-11
Level (m)
Chainage (m)
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MHWS
MHWN
MLWN
MLWS
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5.6
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5.2
5
4.8
4.6
4.4
4.2
4
3.8
3.6
3.4
3.2
3
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-1.2
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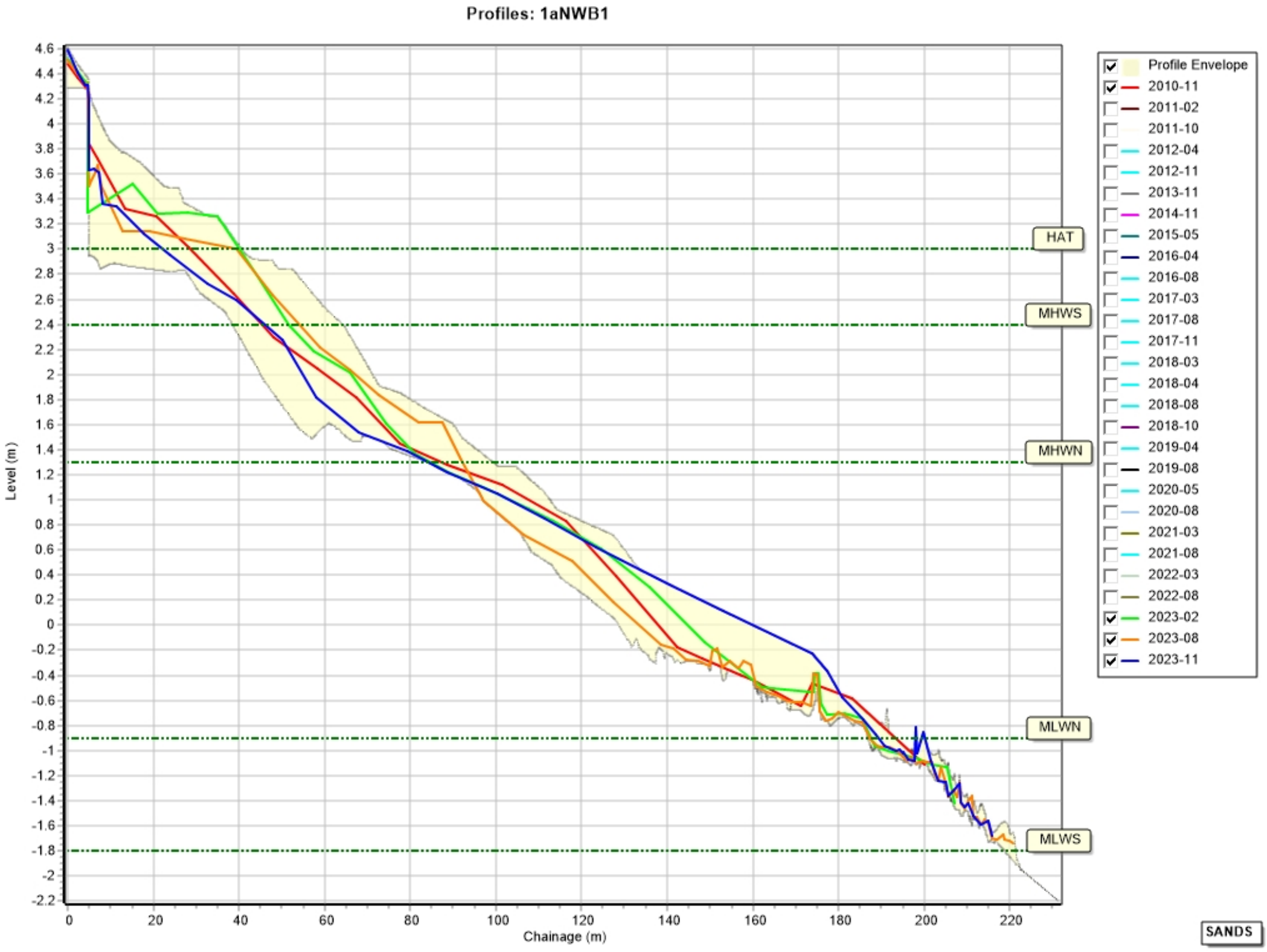
65
70


Profiles: 1aNWB1
Level (m)
Chainage (m)
HAT
MHWS
MHWN
MLWN
MLWS
Profile Envelope
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2011-02
2011-10
2012-04
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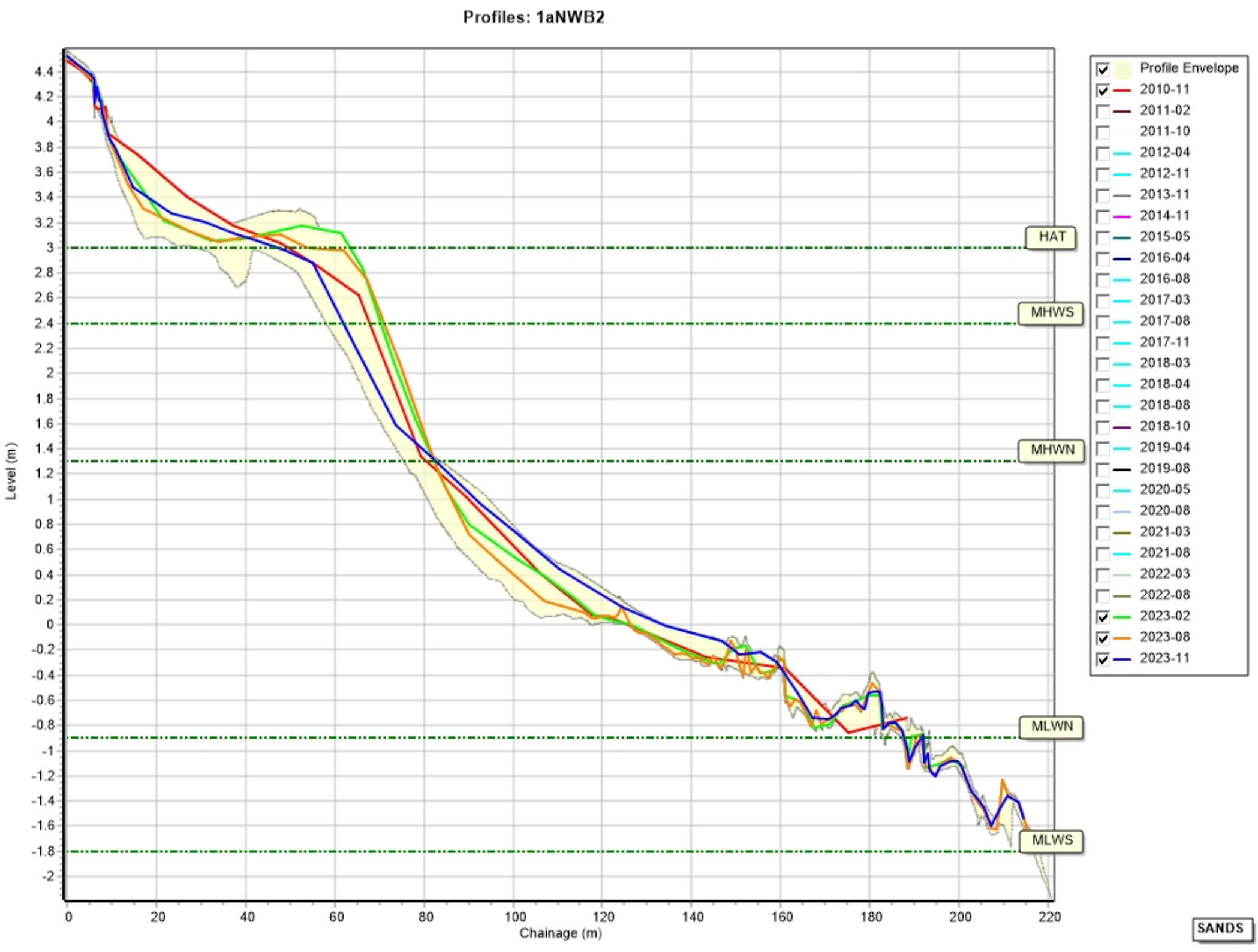
2014-11
2015-05
2016-04
2016-08
2017-03
2017-08
2017-11
2018-03
2018-04
2018-08
2018-10
2019-04
2019-08
2020-05
2020-08
2021-03
2021-08
2022-03
2022-08
2023-02
2023-08
2023-11
SANDS


Profiles: 1aNWB2
Level (m)
Chainage (m)
HAT
MHWS
MHWN
MLWN
MLWS
Profile Envelope
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2011-02
2011-10
2012-04
2012-11
2013-11
2014-11
2015-05
2016-04
2016-08
2017-03
2017-08
2017-11
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2018-04
2018-08
2018-10
2019-04
2019-08
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2021-03
2021-08
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2022-08
2023-02
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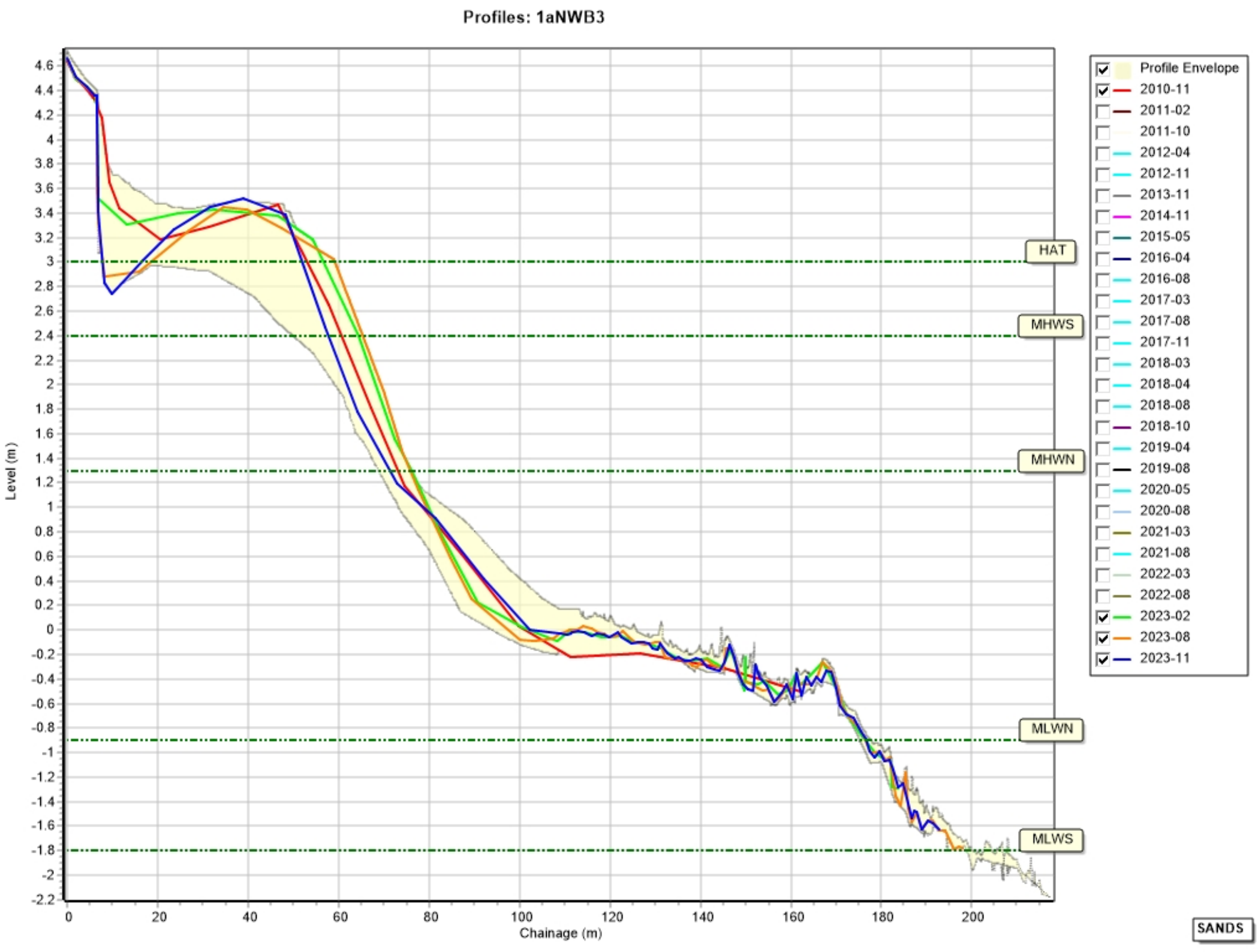
2023-11
SANDS


Profiles: 1aNWB3
Level (m)
Chainage (m)
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MHWS
MHWN
MLWN
MLWS
Profile Envelope
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2014-11
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2016-04
2016-08
2017-03
2017-08
2017-11
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2018-04
2018-08
2018-10
2019-04
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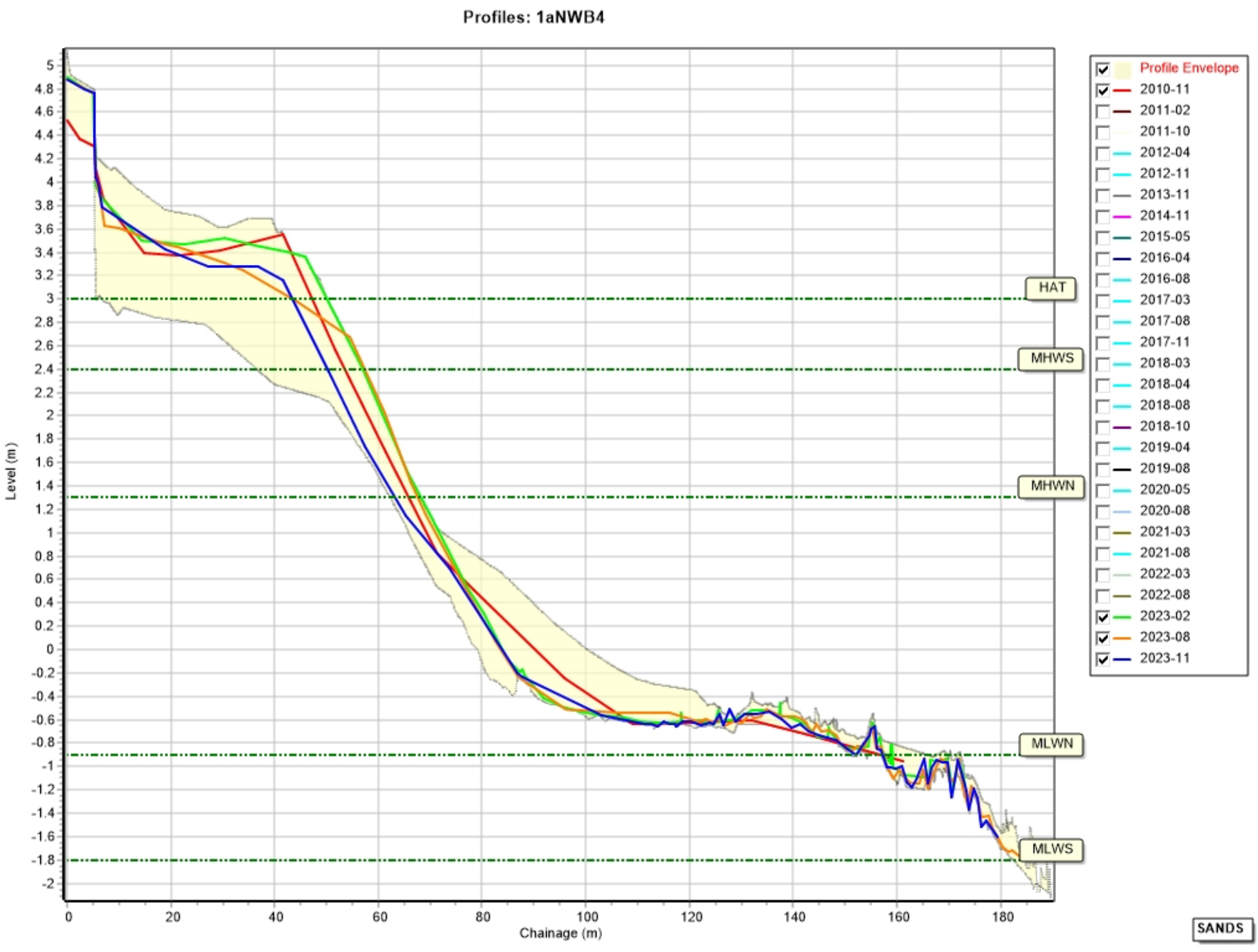
2022-08
2023-02
2023-08
2023-11
SANDS


Profiles: 1aNWB4
Level (m)
Chainage (m)
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MLWN
MLWS
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2018-10
2019-04
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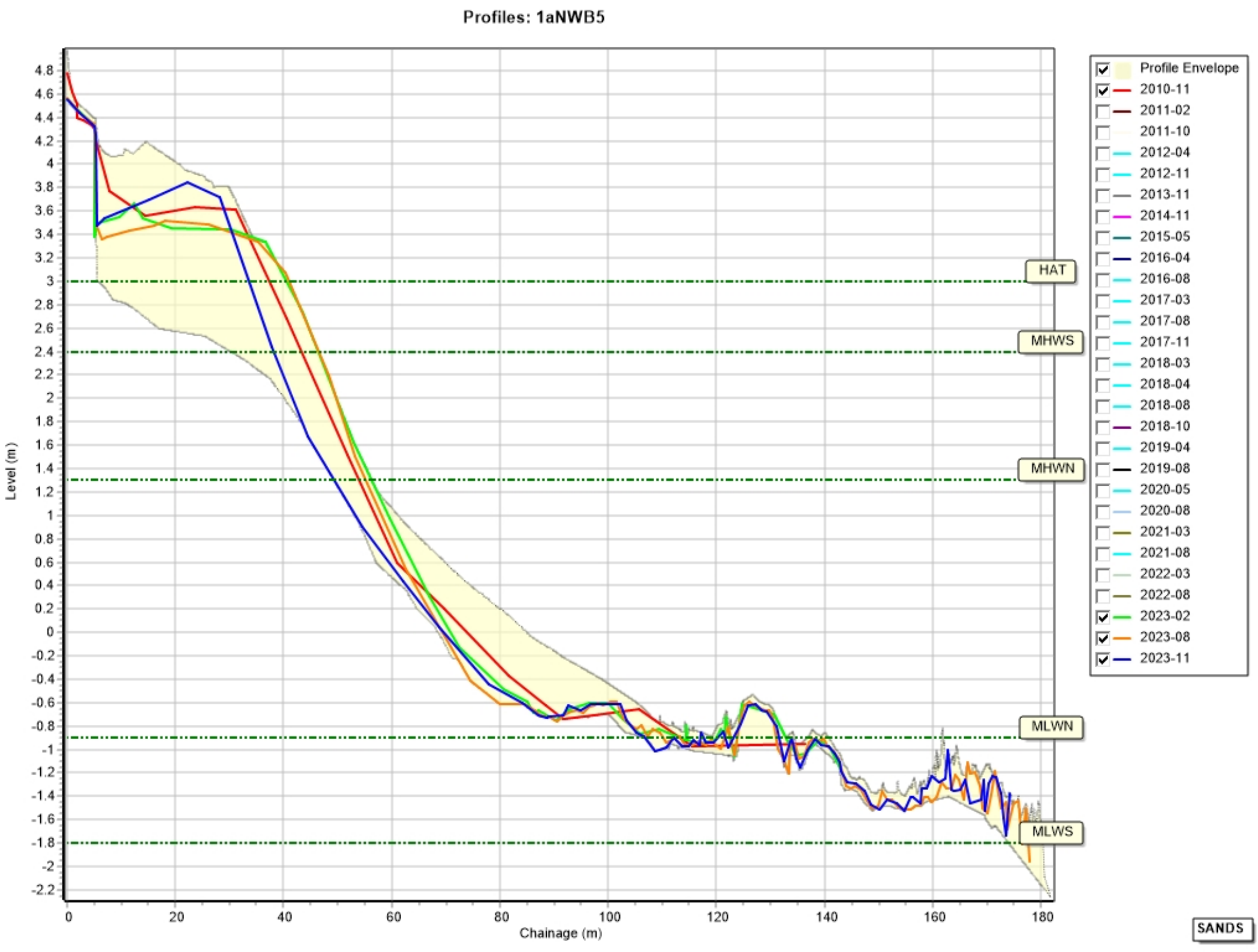
SANDS


Profiles: 1aNWB5
Level (m)
Chainage (m)
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MLWN
MLWS
Profile Envelope
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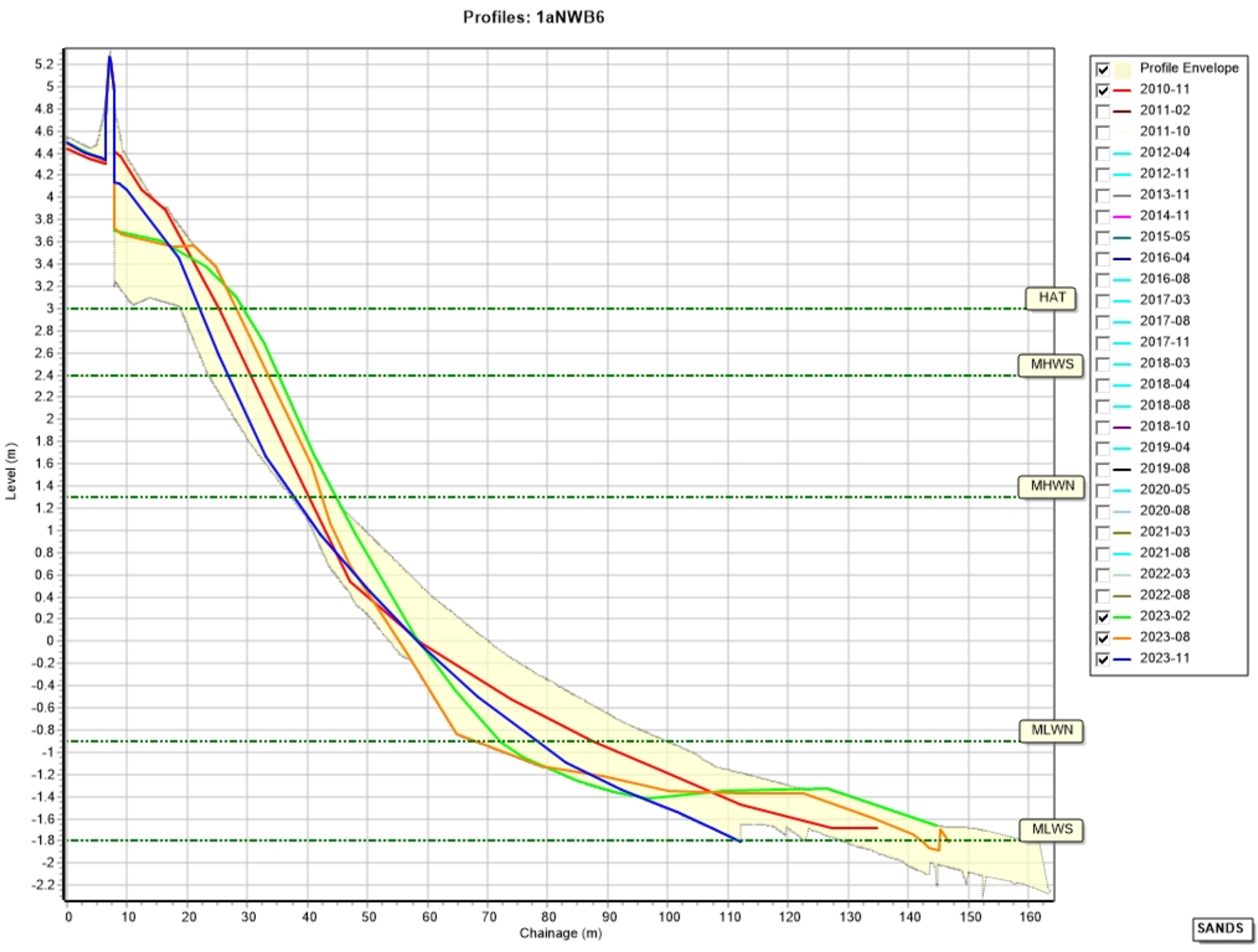
SANDS


Profiles: 1aNWB6
Level (m)
Chainage (m)
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MHWN
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MLWS
Profile Envelope
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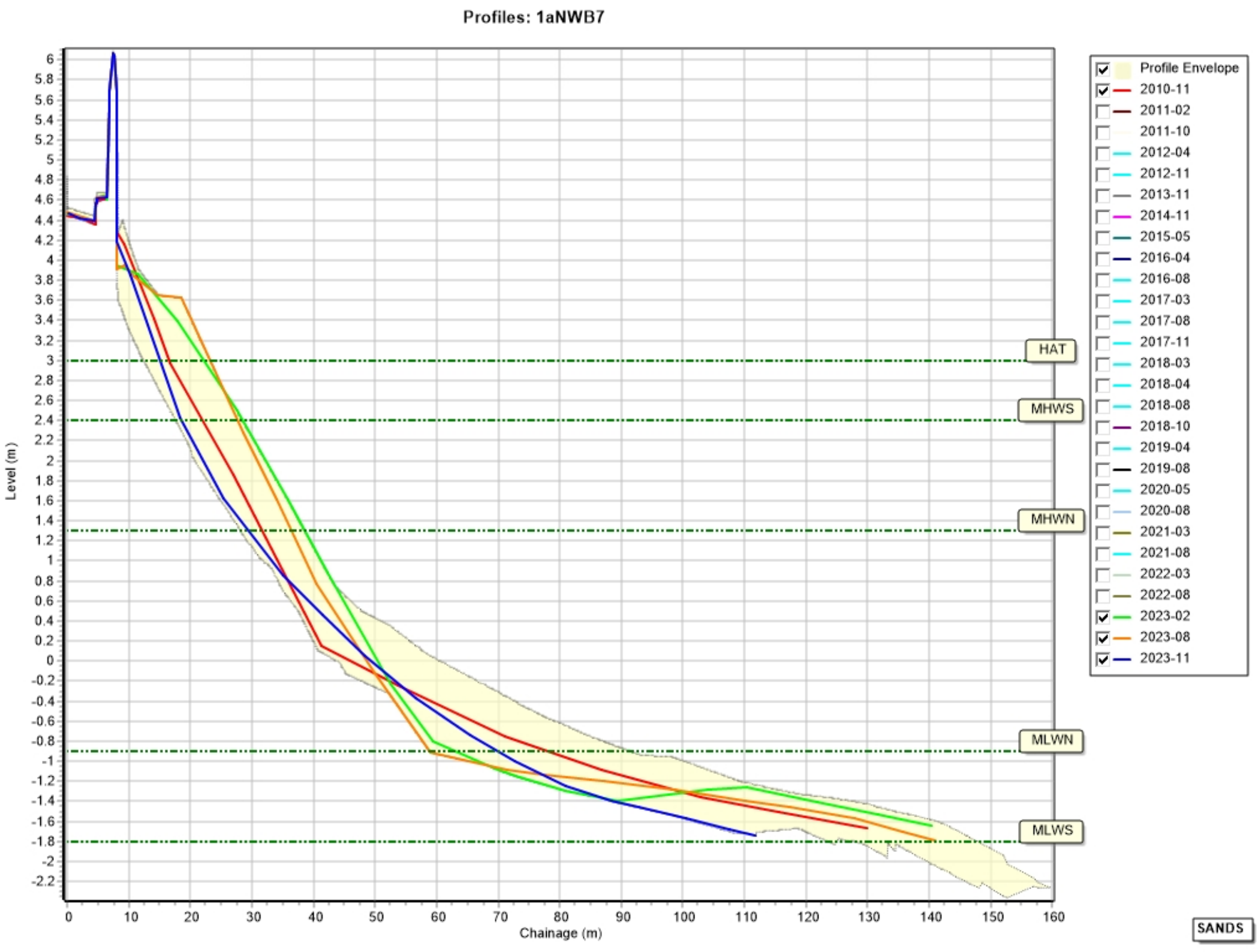
Profiles: 1aNWB7
Level (m)
Chainage (m)
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MLWN
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Profile Envelope
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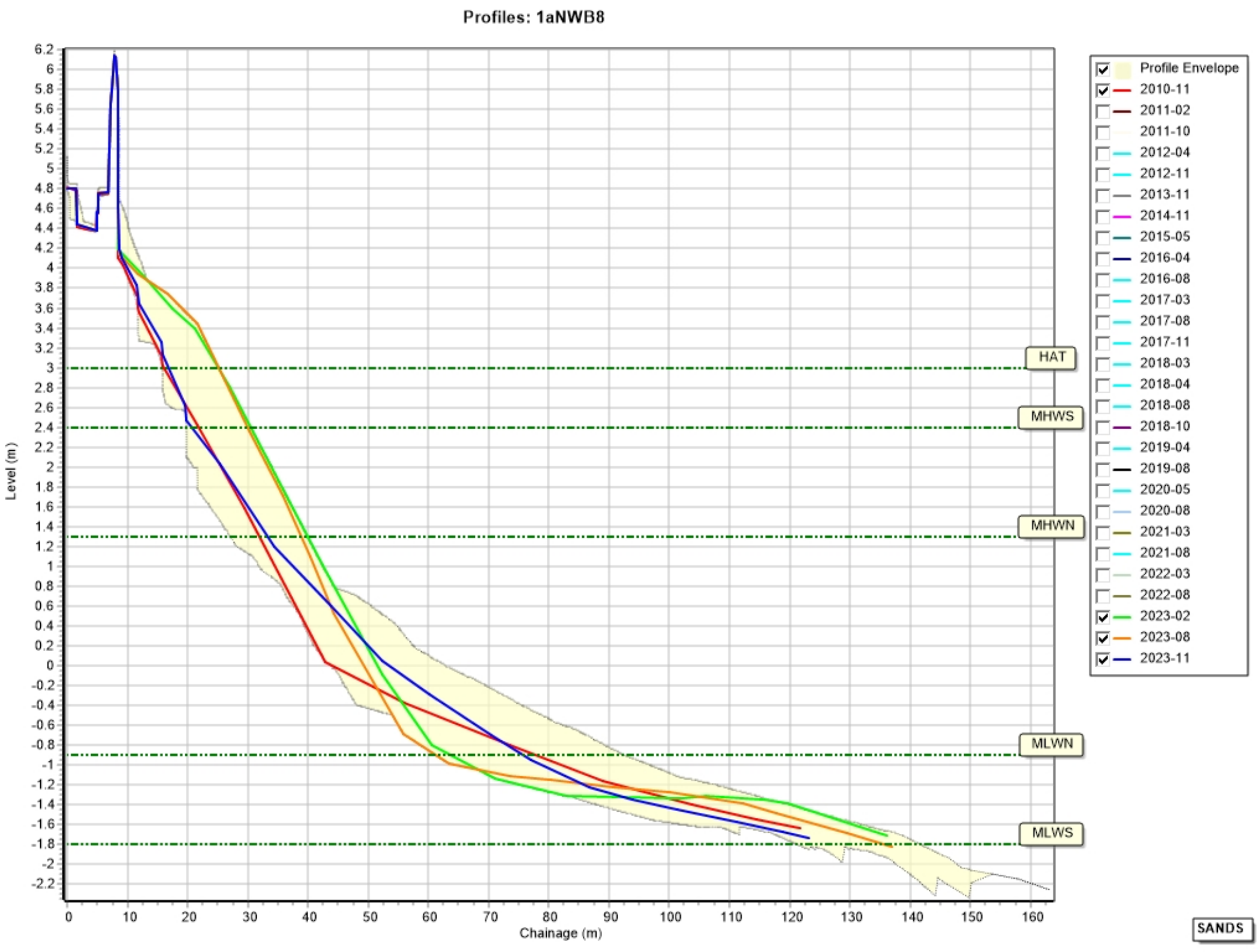
SANDS


Profiles: 1aNWB8
Level (m)
Chainage (m)
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MLWS
Profile Envelope
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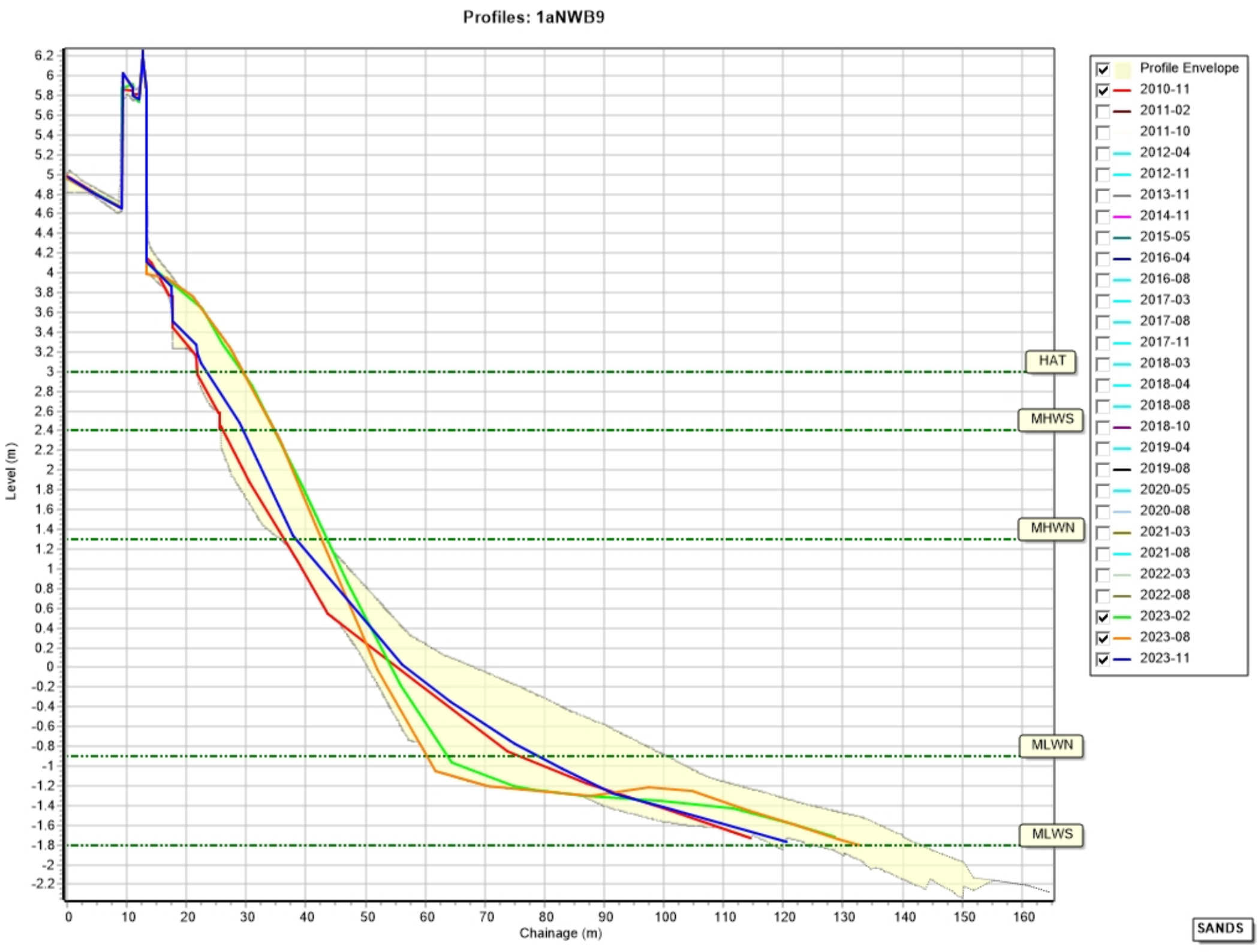
SANDS


Profiles: 1aNWB9
Level (m)
Chainage (m)
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MLWS
Profile Envelope
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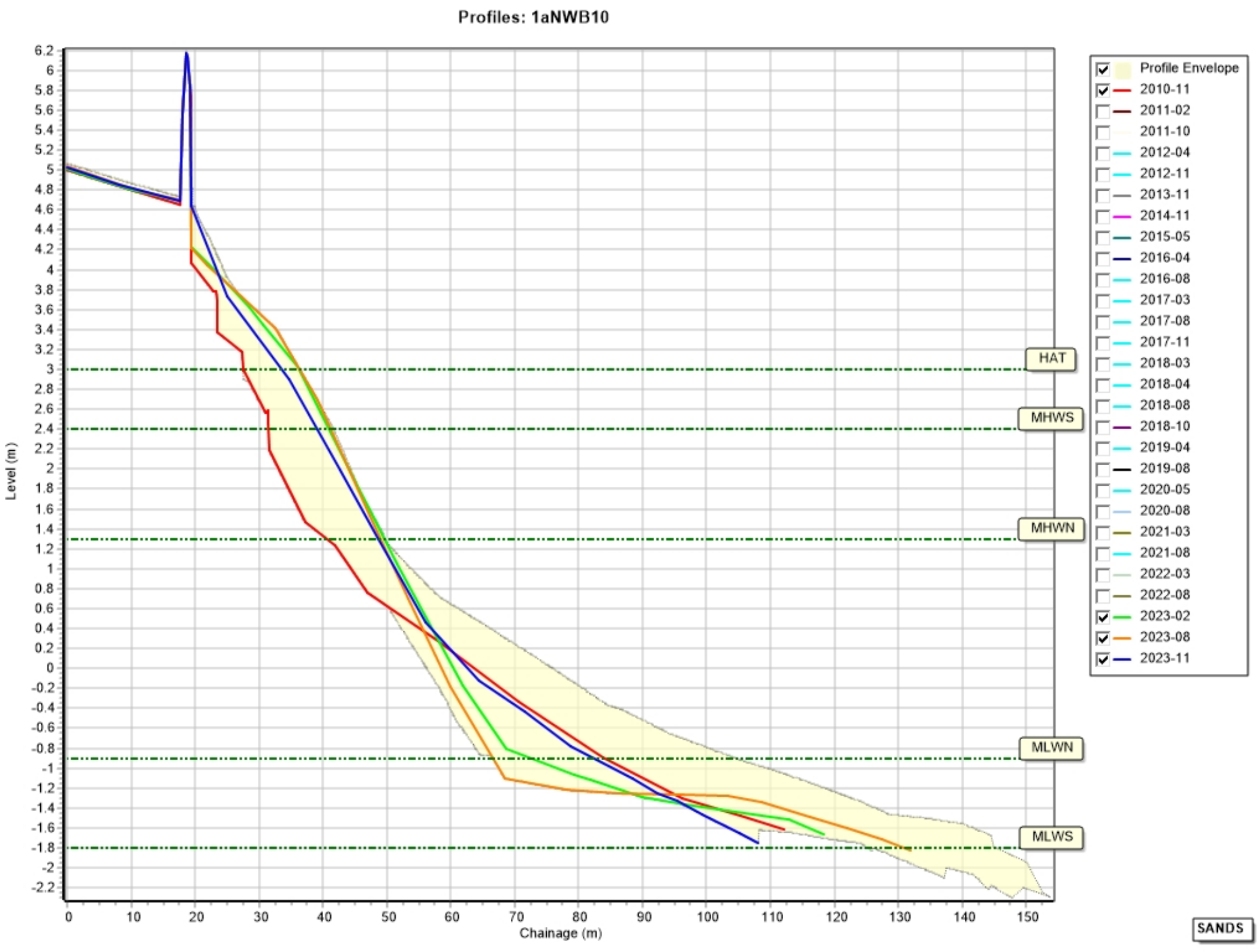
Profiles: 1aNWB10
Level (m)
Chainage (m)
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Profile Envelope
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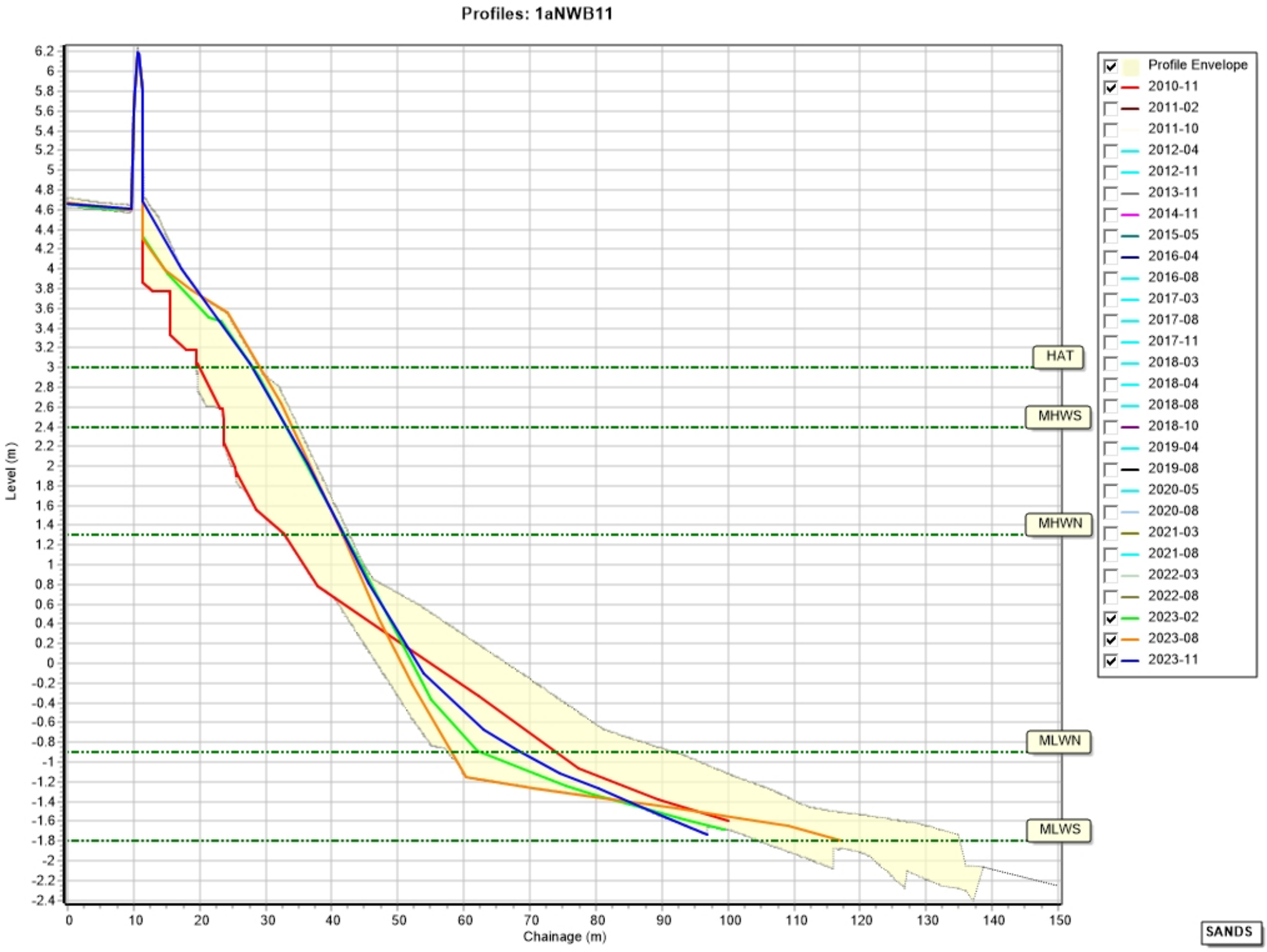
SANDS


Profiles: 1aNWB11
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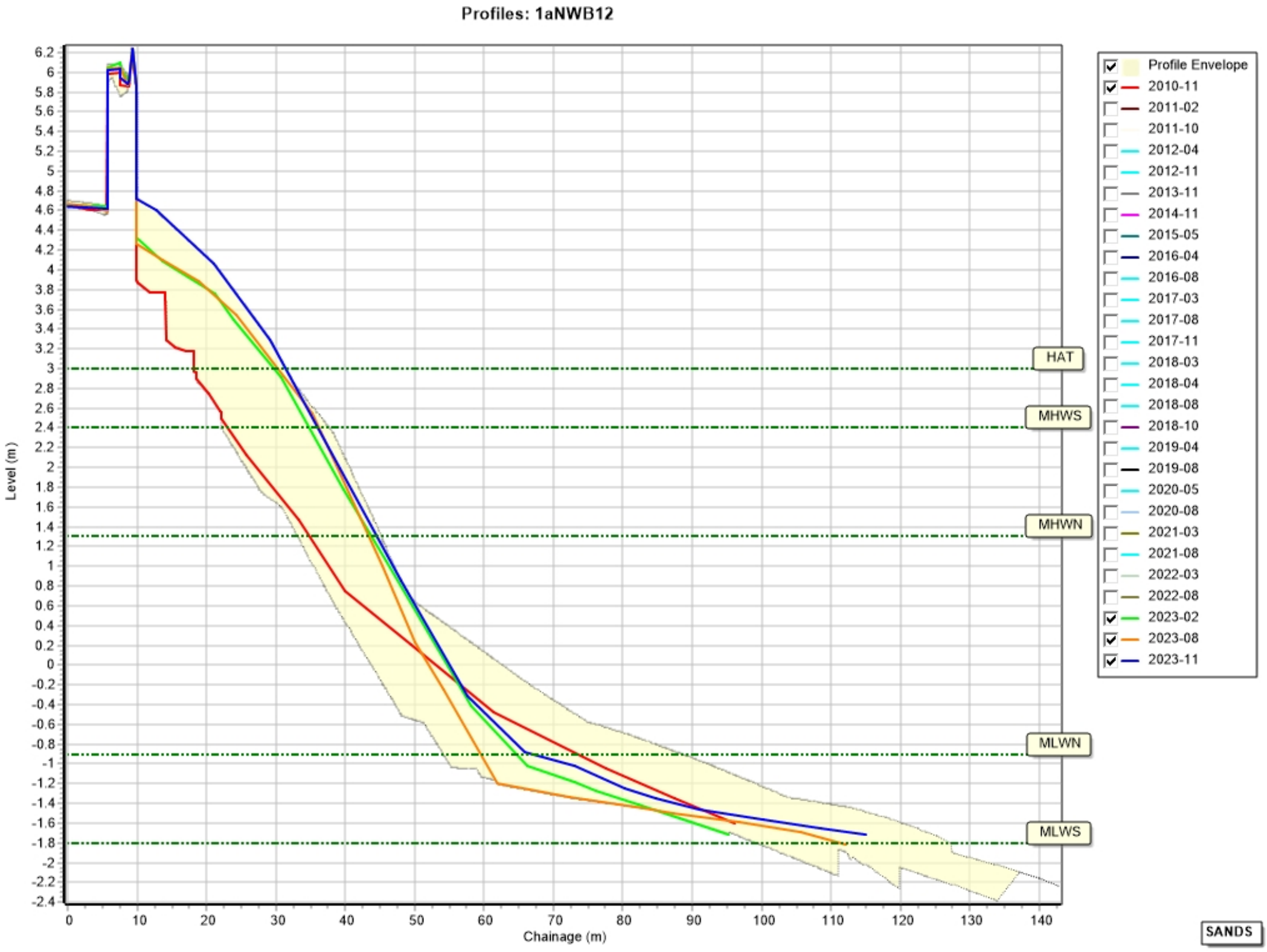
2023-11
SANDS


Profiles: 1aNWB12
Level (m)
Chainage (m)
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MLWN
MLWS
Profile Envelope
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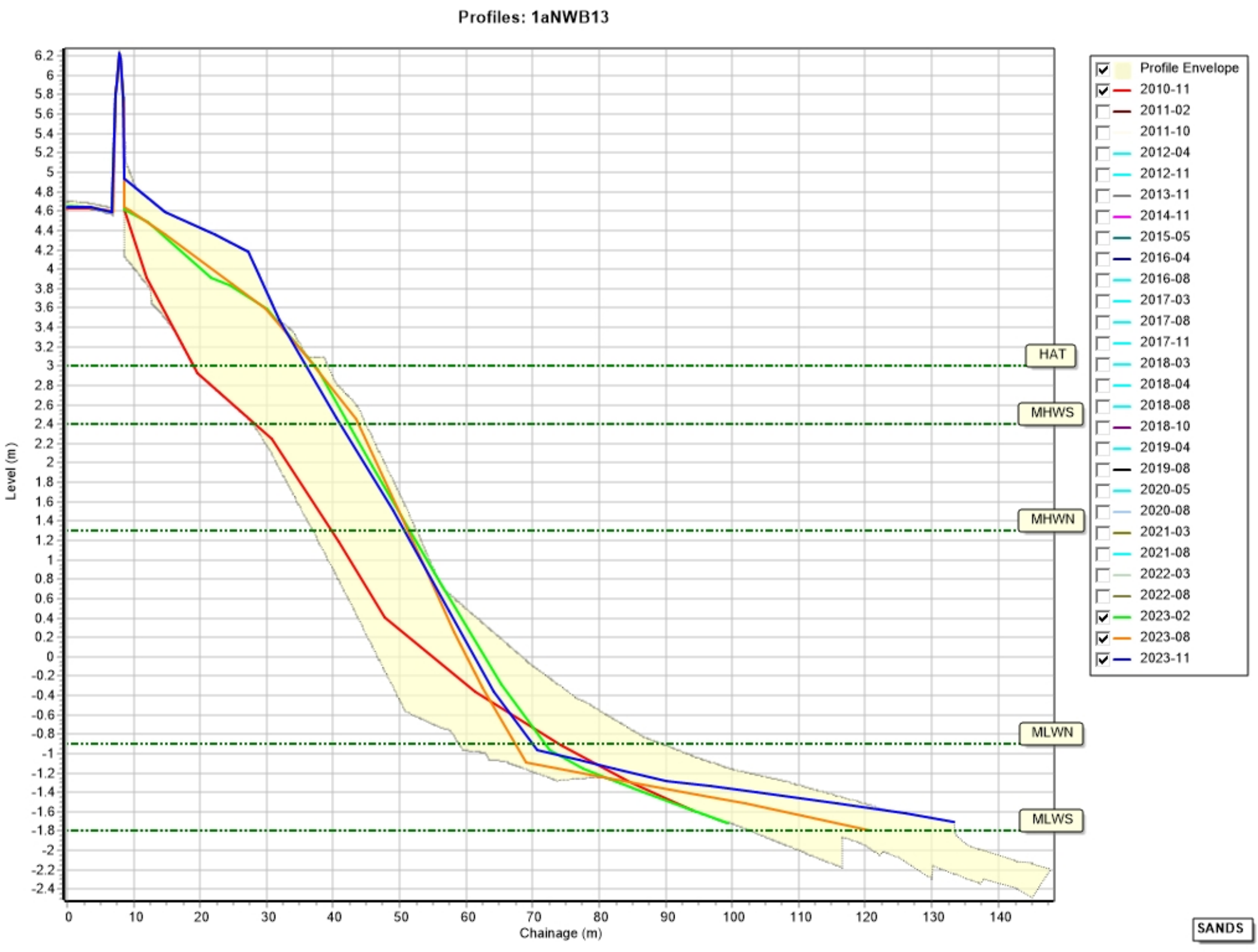
SANDS


Profiles: 1aNWB13
Level (m)
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MLWN
MLWS
Profile Envelope
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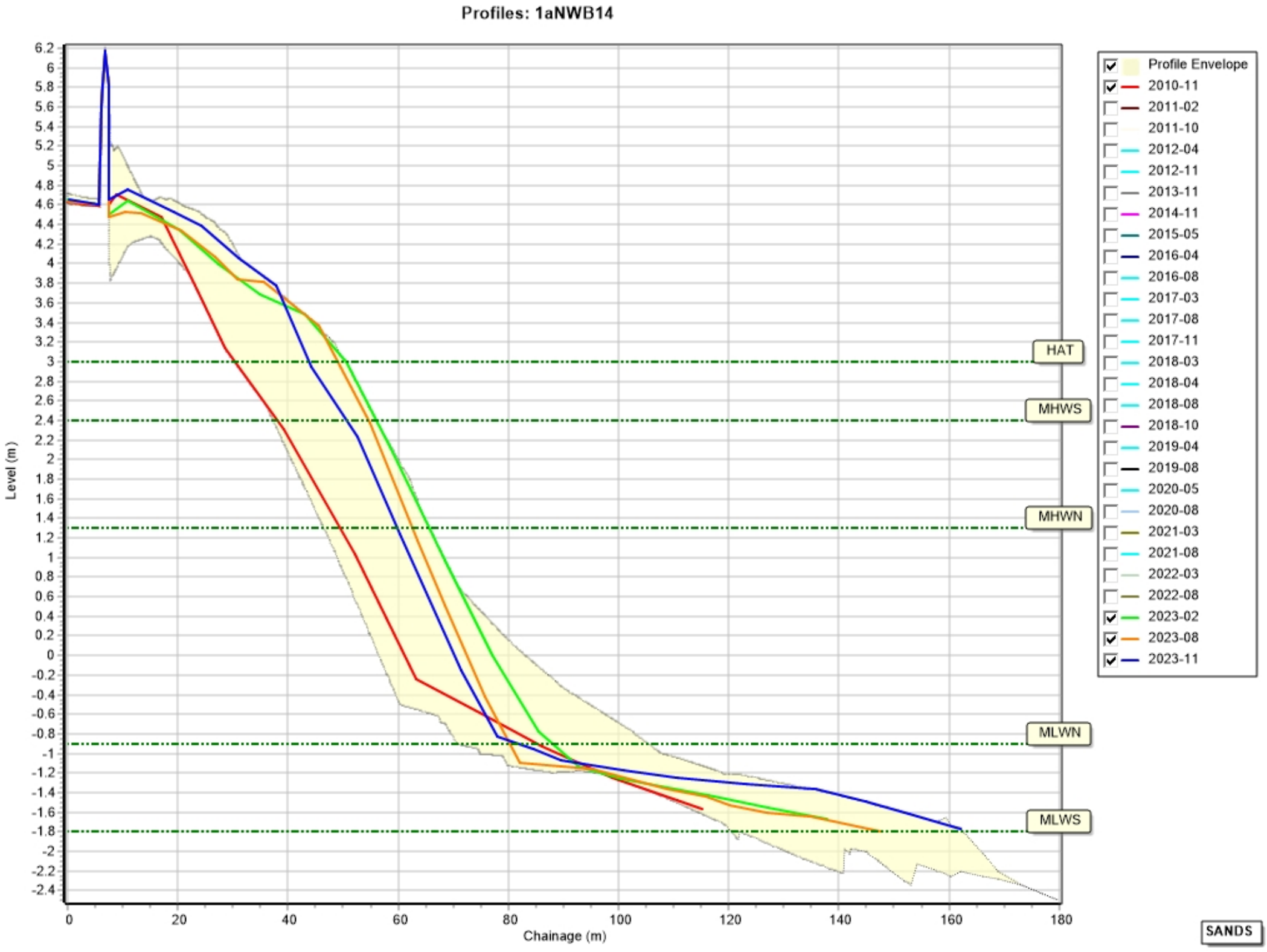
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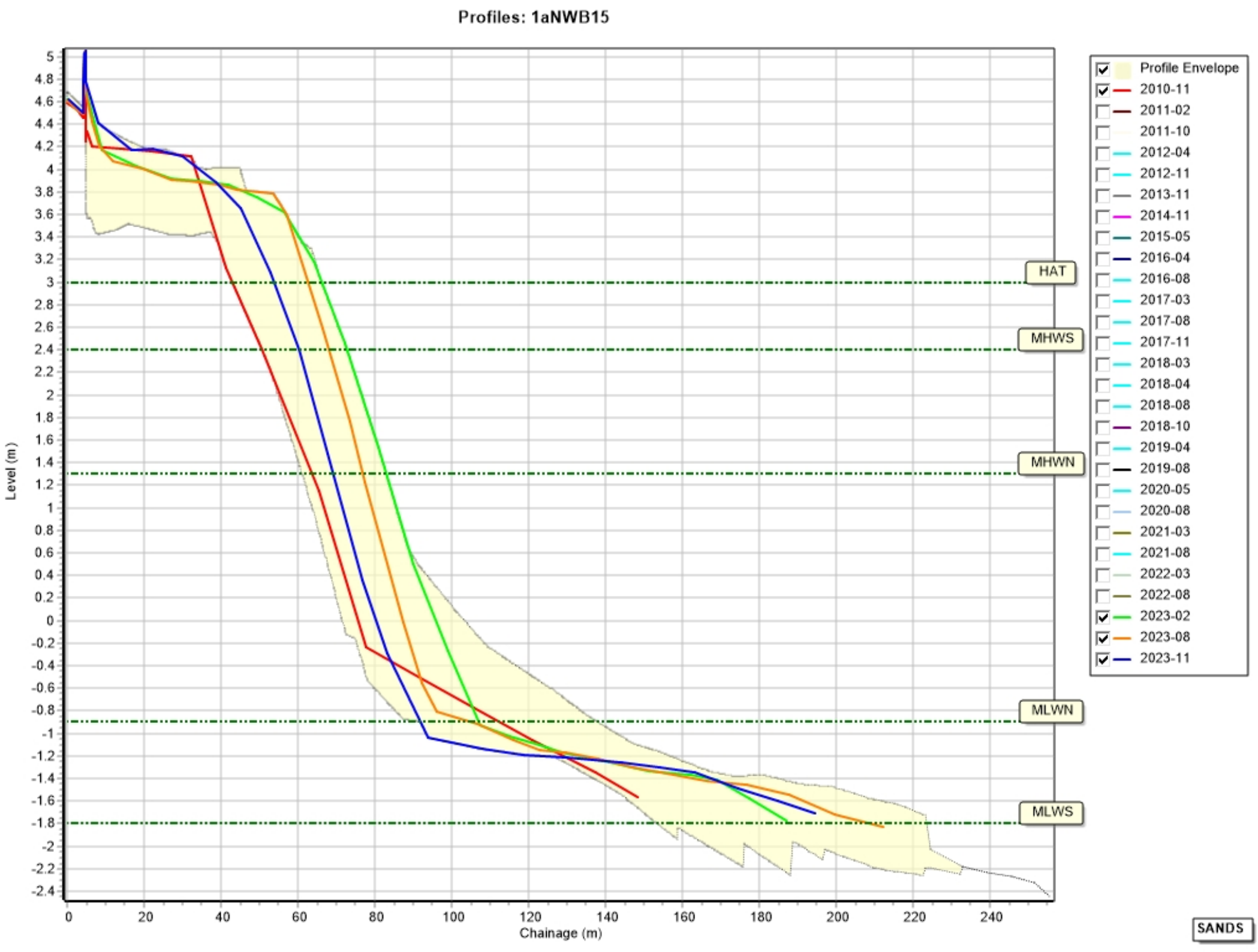
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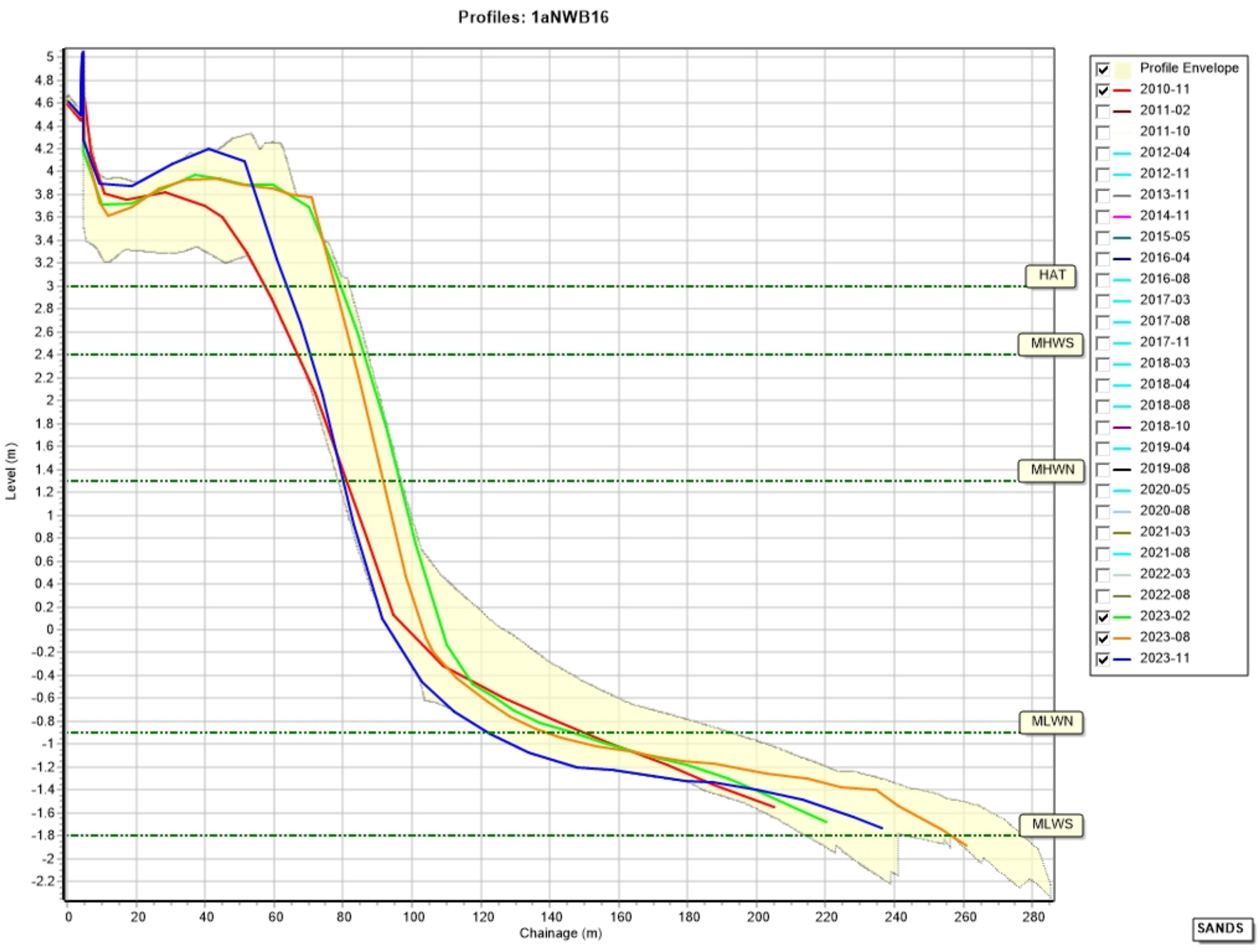
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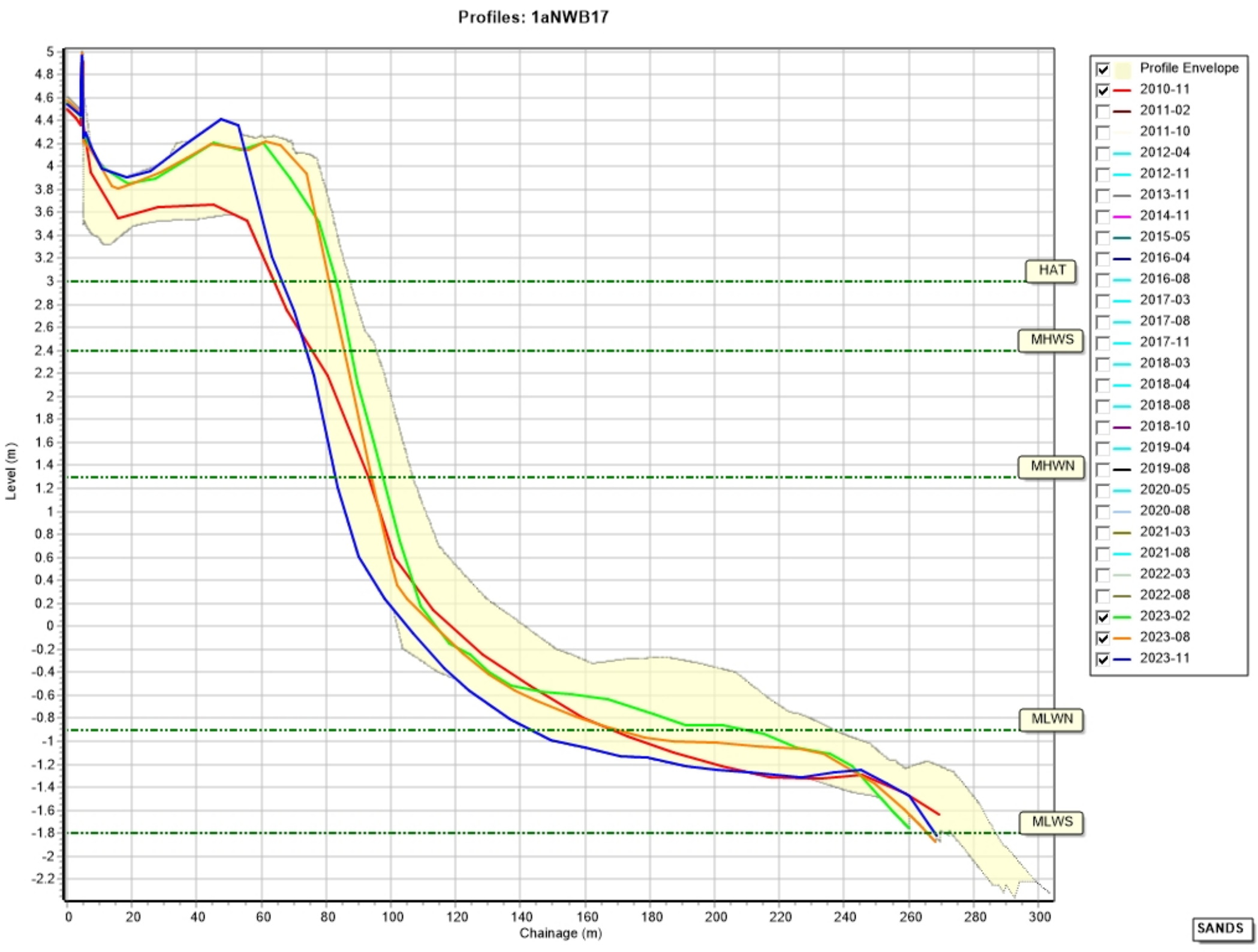
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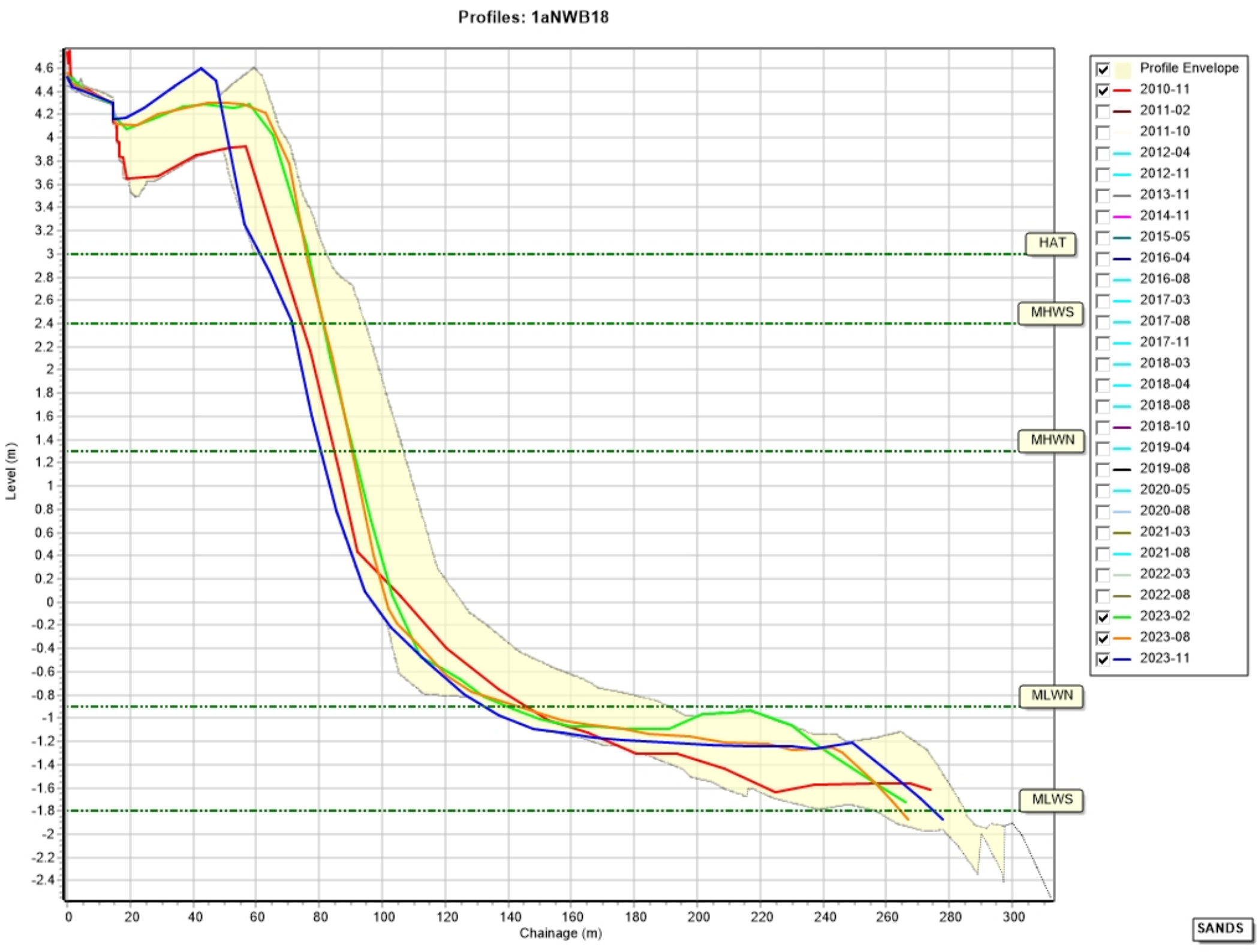
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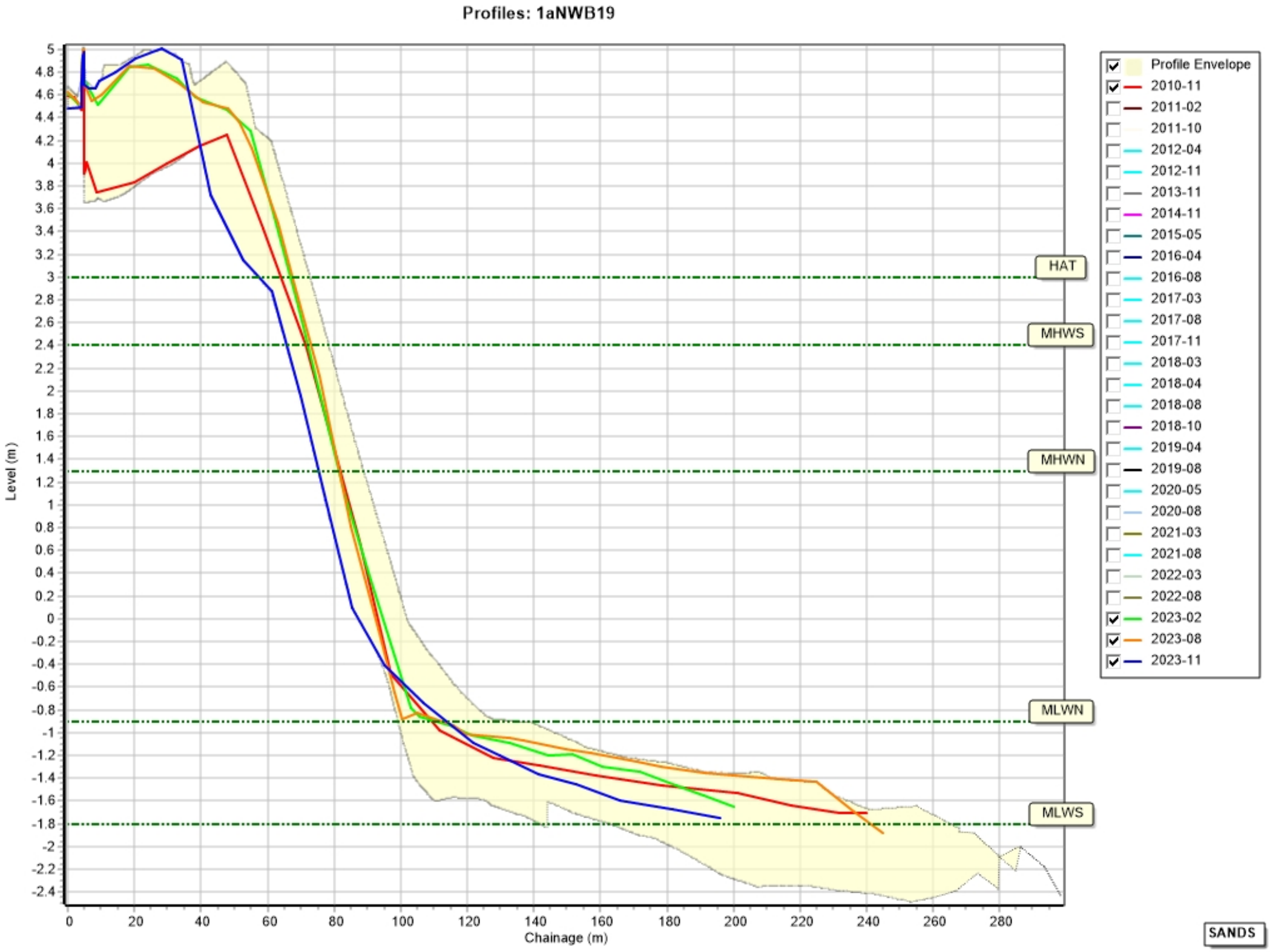
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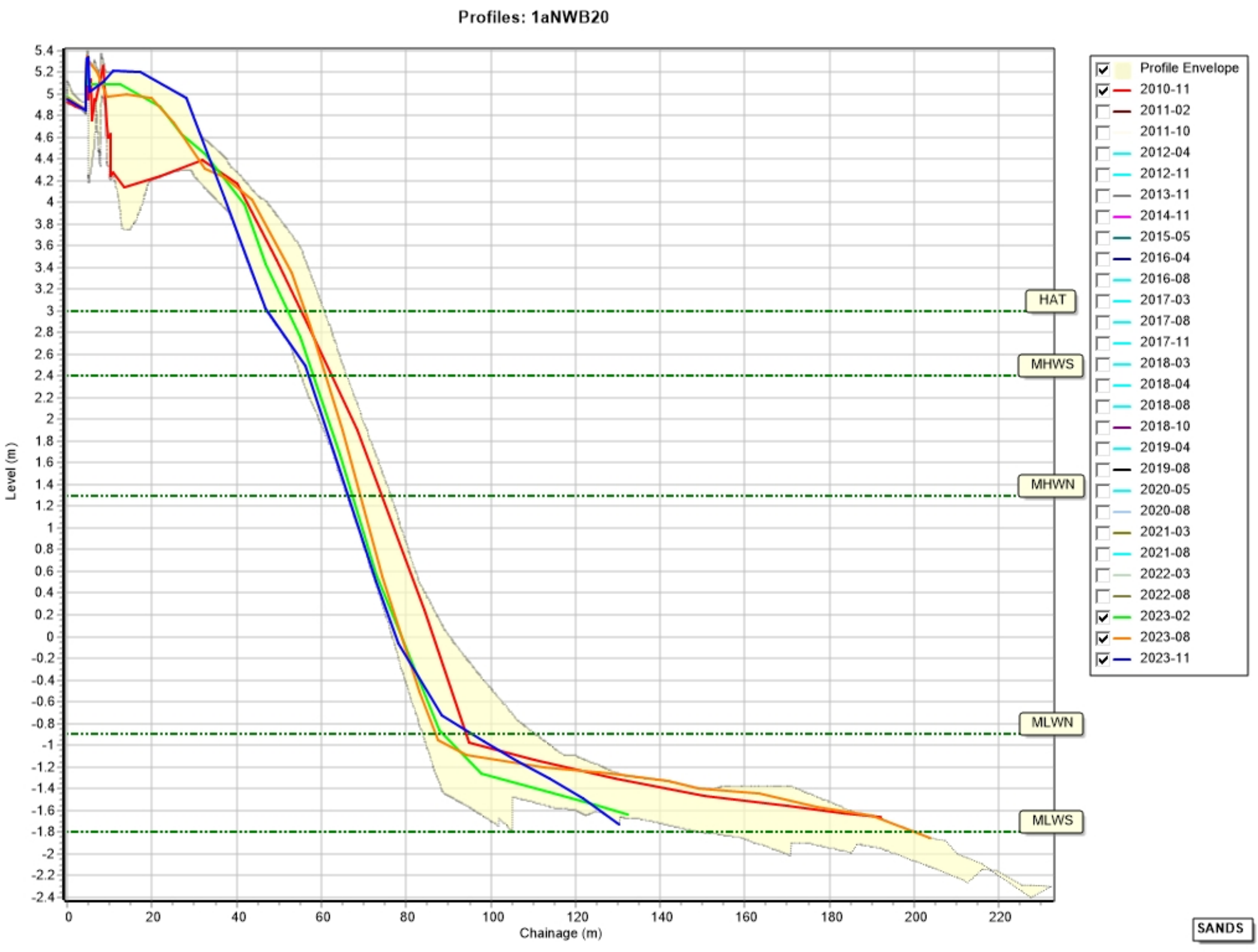
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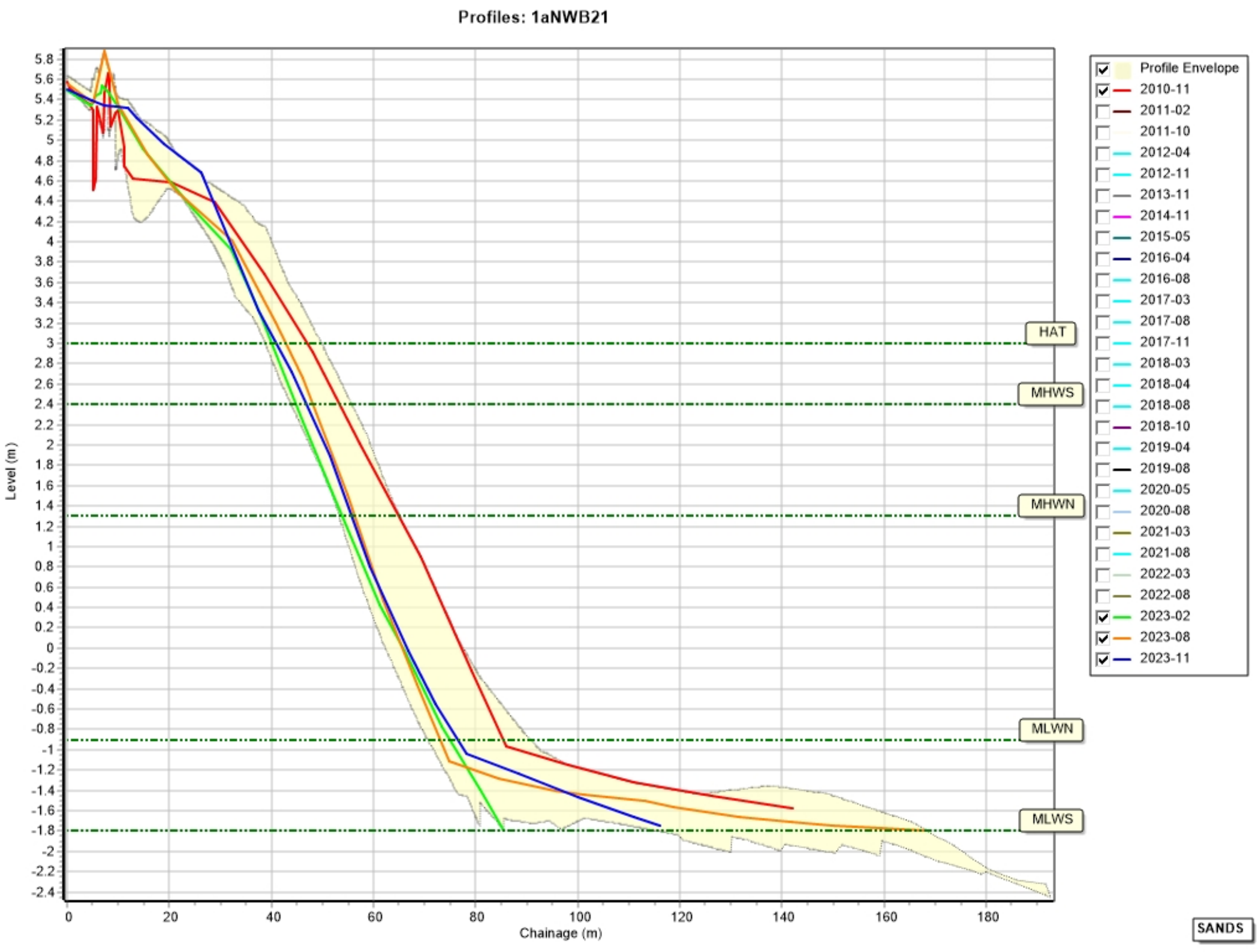
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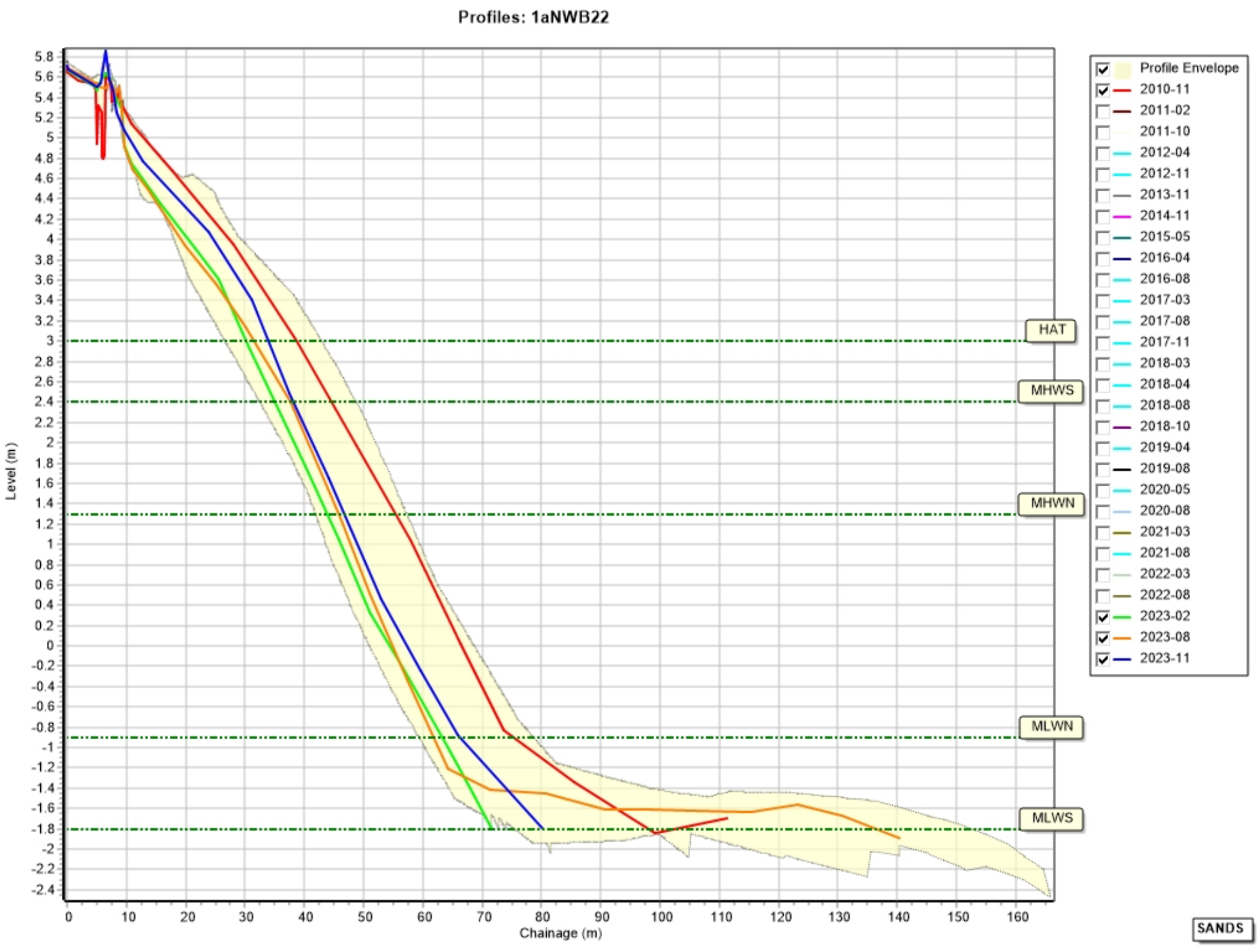
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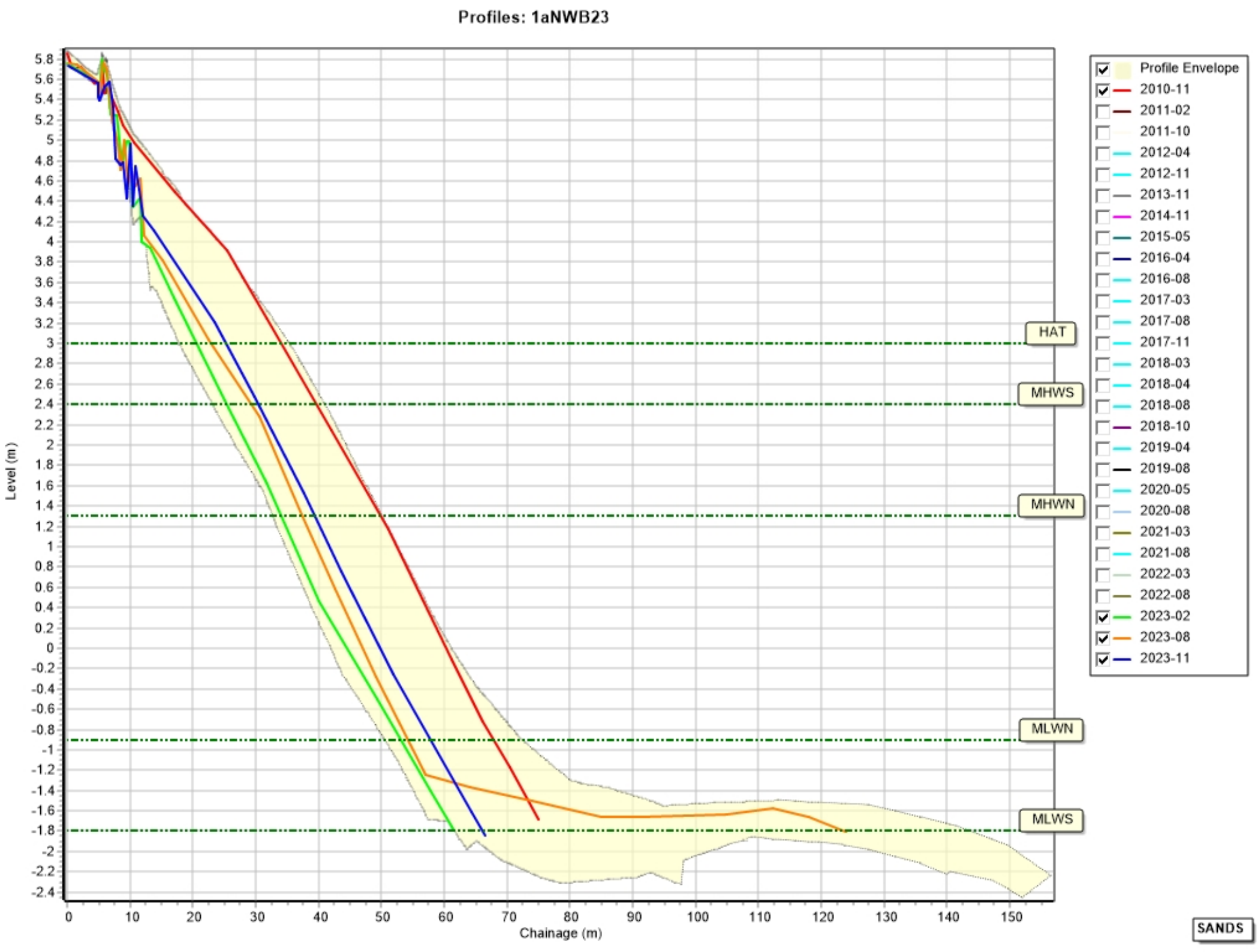
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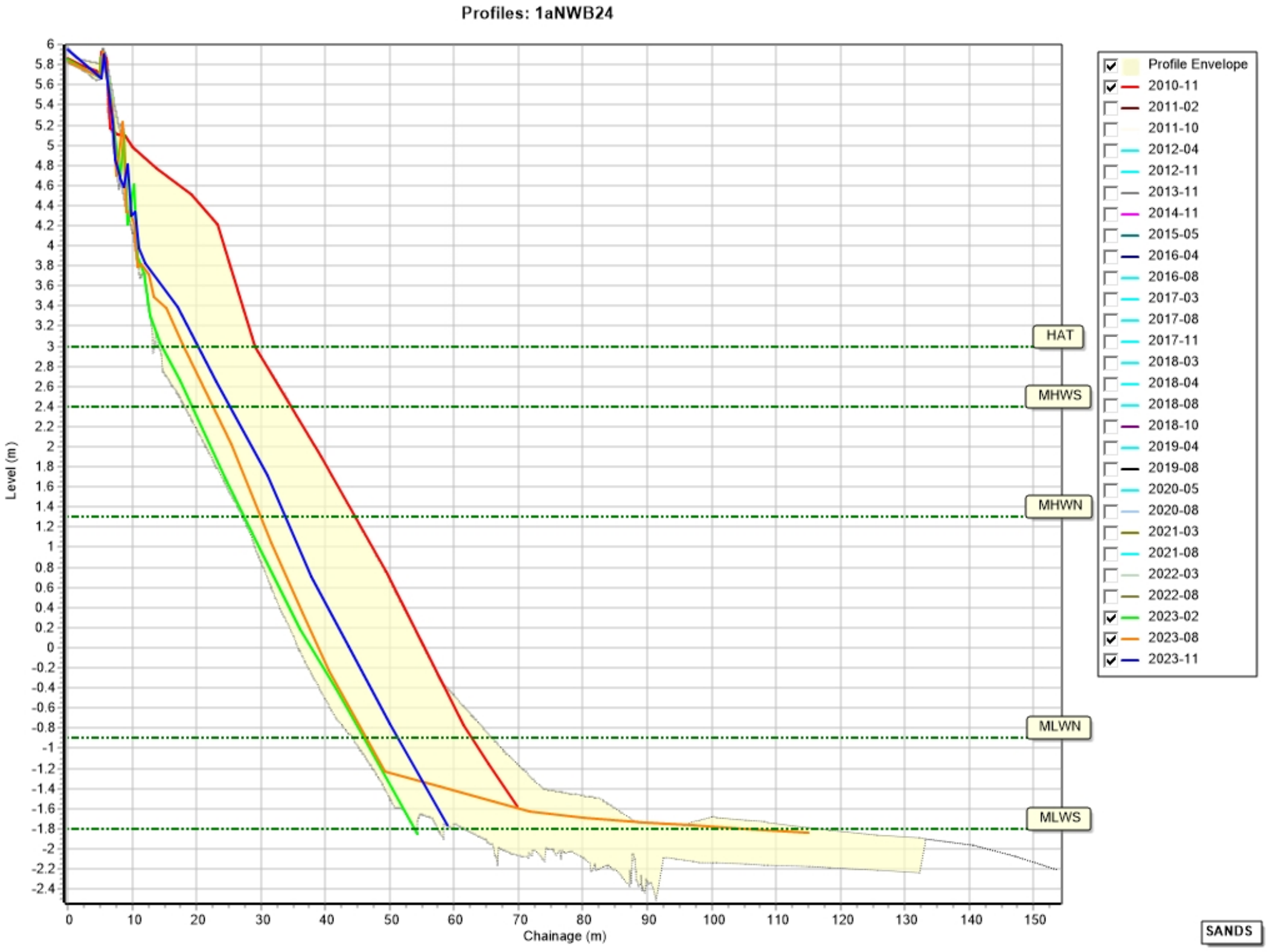
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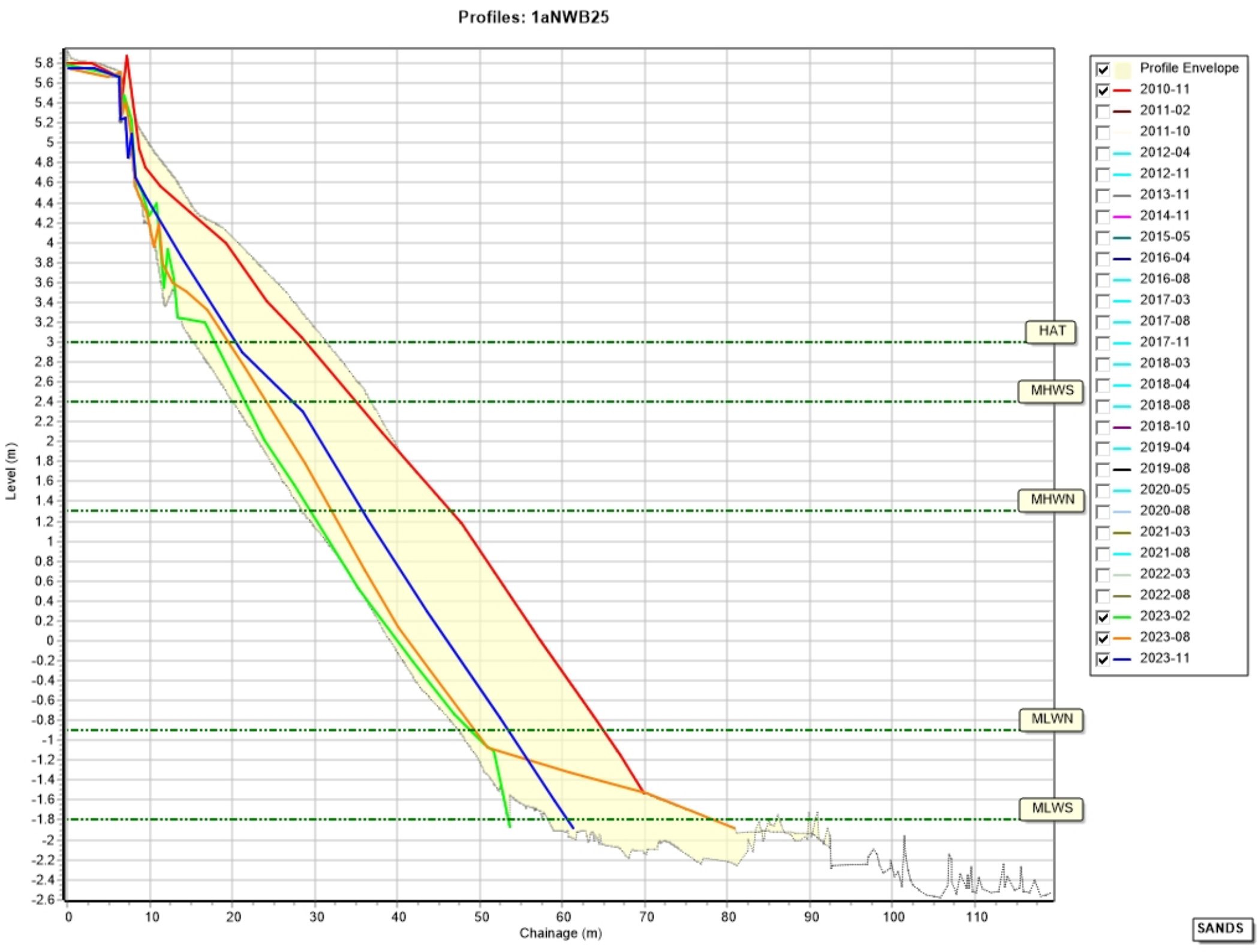
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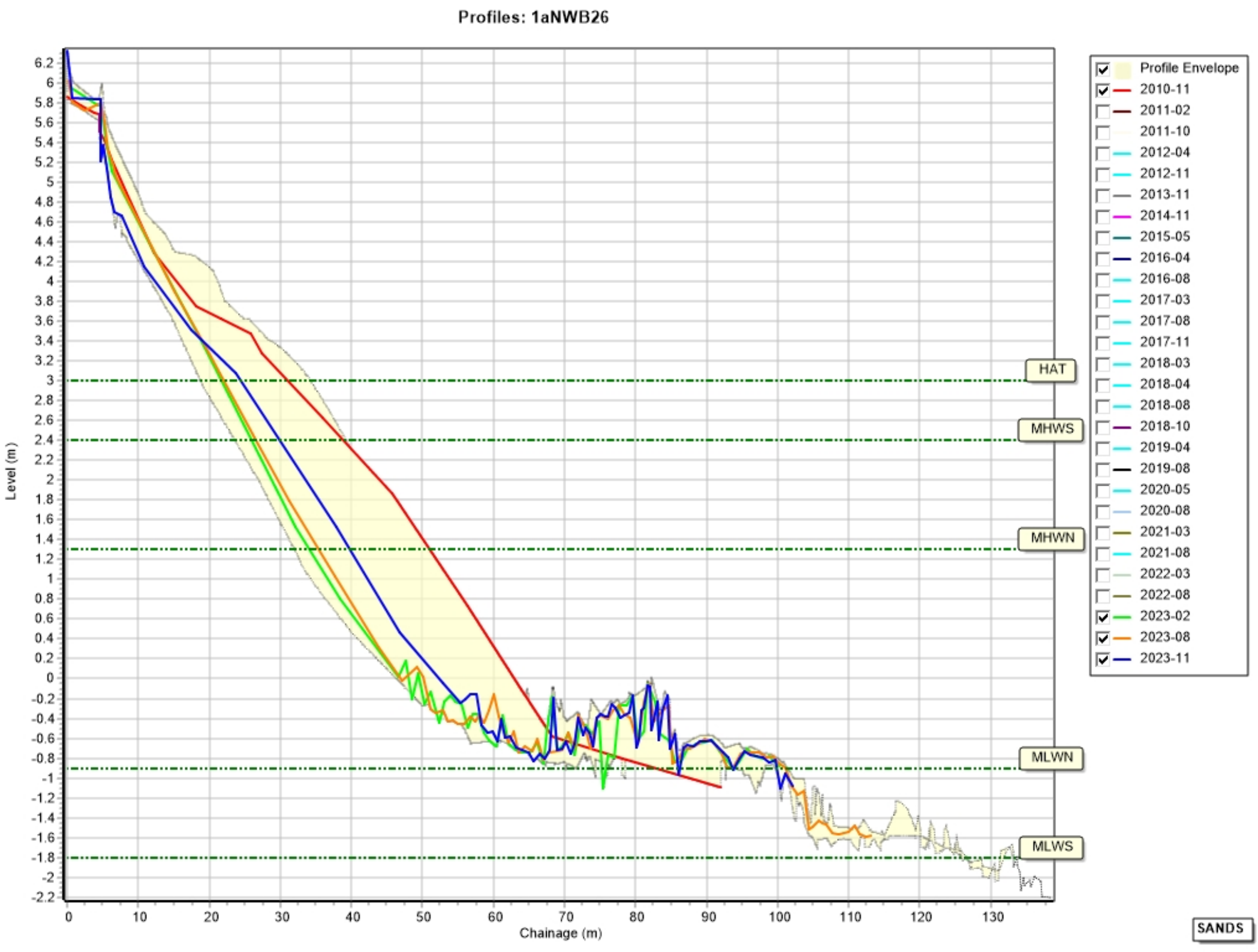
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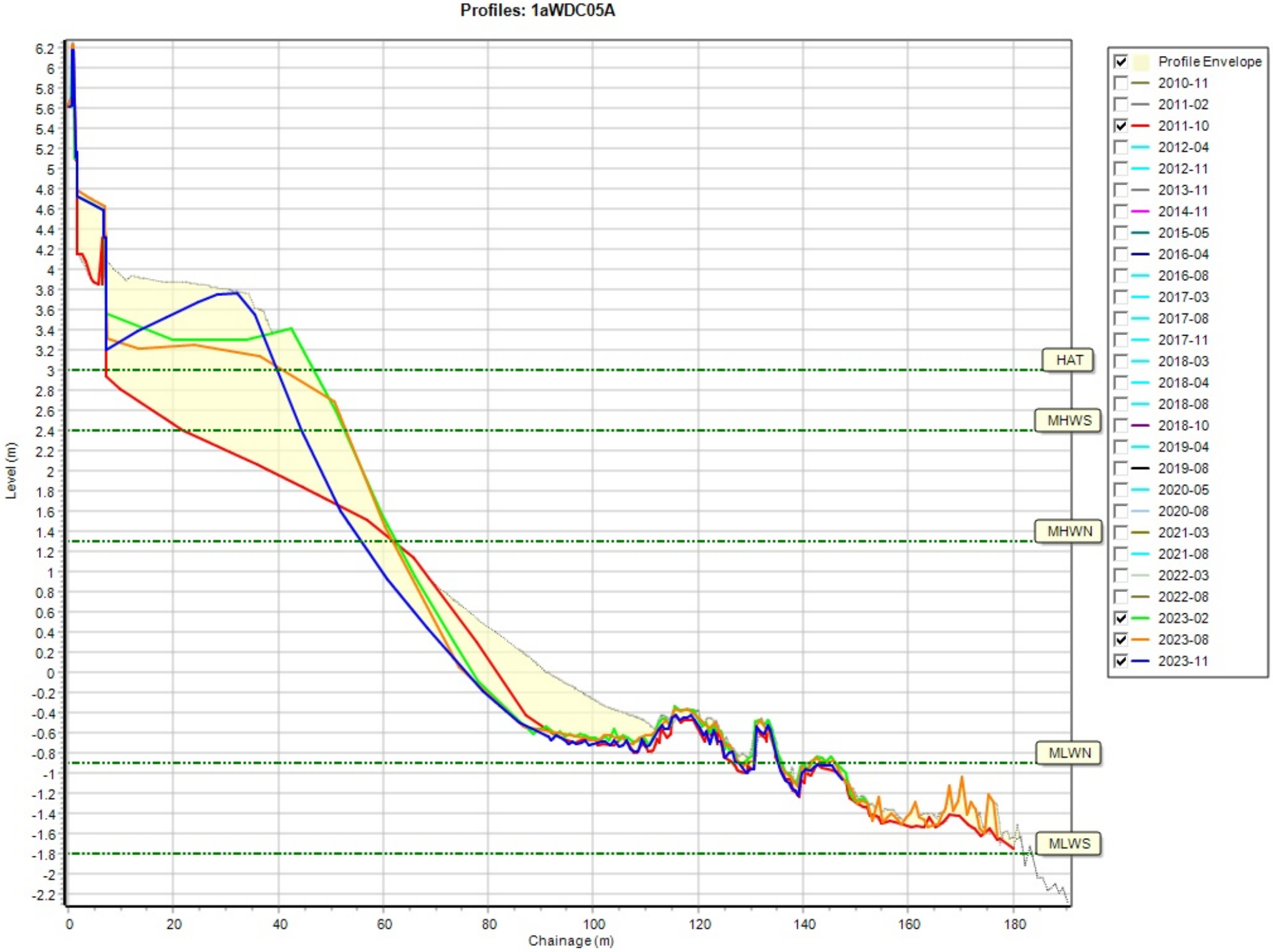
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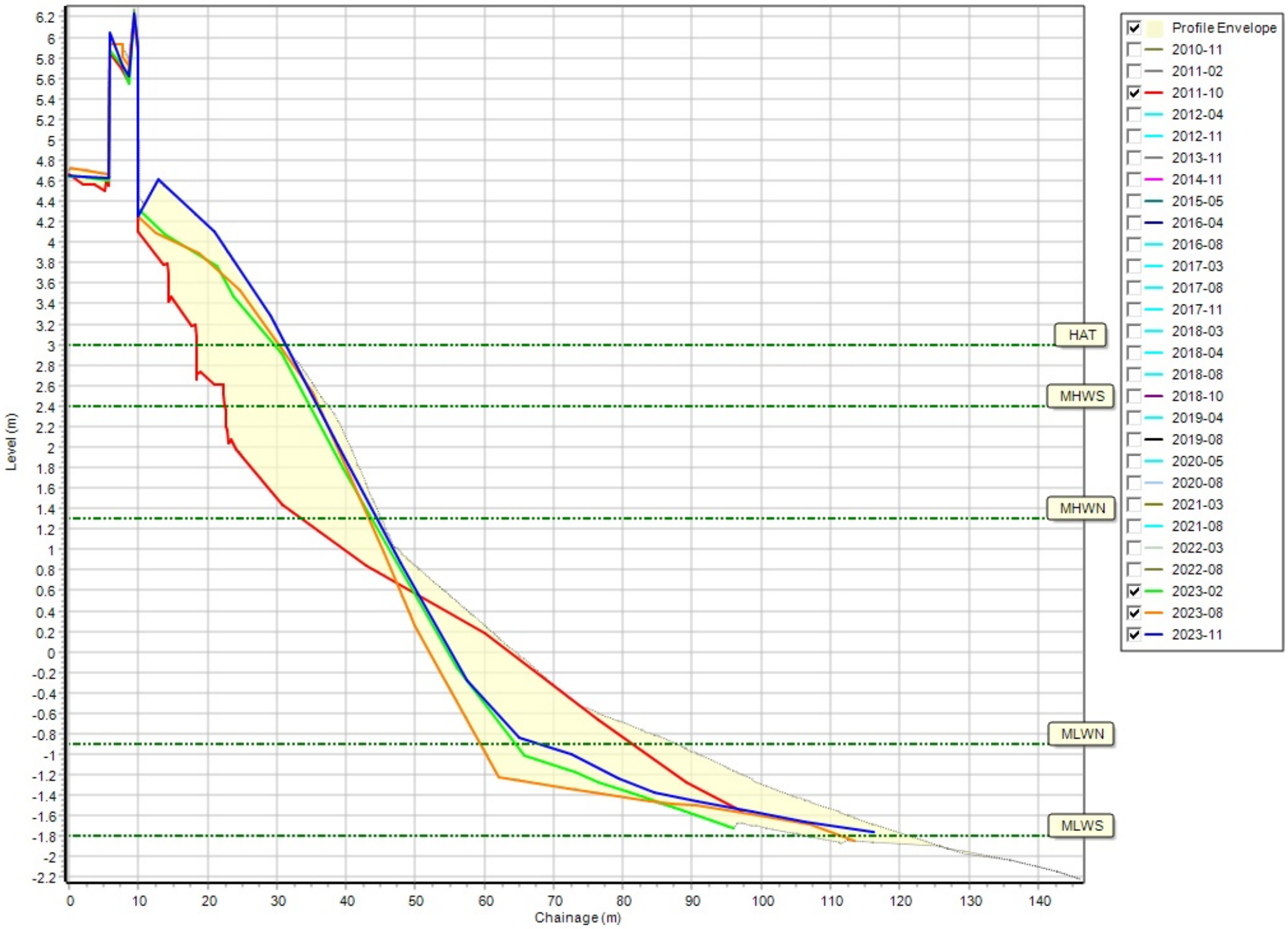
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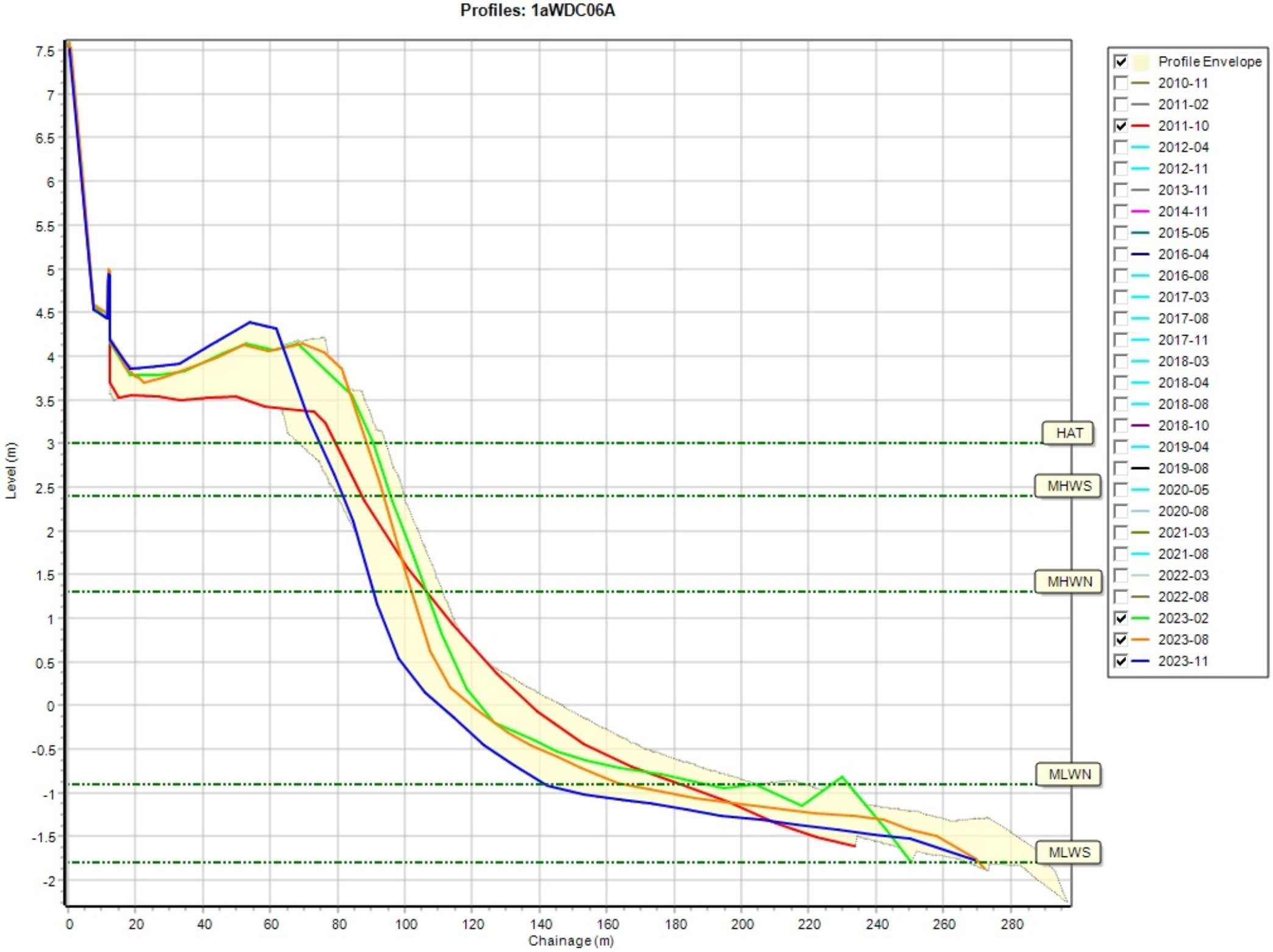
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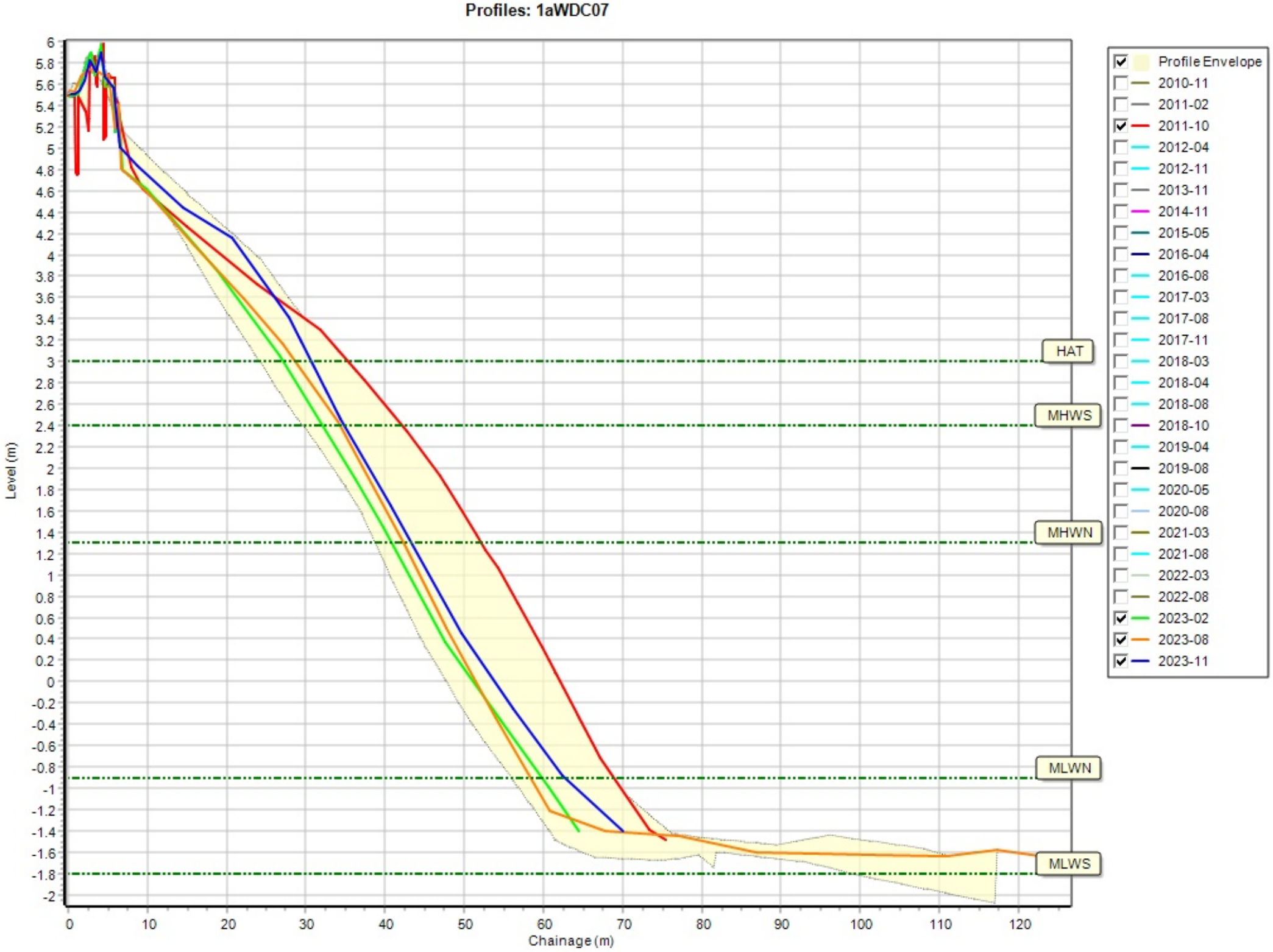
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2023-02
2023-08
2023-11

Appendix B

Topographic Survey

TOPOGRAPHIC SURVEY (13th November 2023)

Elevation (mOD)

- -1.7 - -1.5
- -1.4 - -1
- -0.9 - -0.5
- -0.4 - 0
- 0.1 - 0.5
- 0.6 - 1
- 1.1 - 1.5
- 1.6 - 2
- 2.1 - 2.5
- 2.6 - 3
- 3.1 - 3.5
- 3.6 - 4
- 4.1 - 4.5
- 4.6 - 5
- 5.1 - 5.5
- 5.6 - 6
- 6.1 - 6.5
- 6.6 - 7

Contours (mOD)*

- 1.0m interval
- 0.25m interval

* Contours only cover sandy beach areas.

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

Title:

Appendix B - Map 1

Newbiggin Bay

Northumberland County Council Frontage

Report:

'Post Storm' Survey 2023

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	07/12/2023	TC	AS	A3	1:5,000

Co-ordinate system: British National Grid

Royal HaskoningDHV
Enhancing Society Together

North East Coastal Observatory

Difference between topographic surveys
(August 2023 to November 2023)
Change in Elevation (mOD)

Gain	>2.0
	1.75 - 2
	1.5 - 1.75
	1.25 - 1.5
	1 - 1.25
	0.75 - 1
	0.5 - 0.75
	0.25 - 0.5
	0.1 - 0.25
Change +/- 0.1m	0 - 0.1
	-0.1 - 0
Loss	-0.25 - -0.1
	-0.5 - -0.25
	-0.75 - -0.5
	-1 - -0.75
	-1.25 - -1
	-1.5 - -1.25
	-1.75 - -1.5
	-2 - -1.75
	<-2

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Title:

Appendix B - Map 2

Newbiggin Bay

Northumberland County Council Frontage

Report: 'Post Storm' Survey 2023

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	07/12/2023	TC	AS	A3	1:5,000

Co-ordinate system: British National Grid

Royal HaskoningDHV
Enhancing Society Together

North East Coastal Observatory

Appendix C

Sand Extent Survey

SAND EXTENT

Site of Special Scientific Interest (SSSI)

- Post Storm Nov 2023
- Autumn 2023
- Spring 2023
- Autumn 2022
- Spring 2022
- Autumn 2021
- Spring 2021
- Autumn 2020
- Spring 2020
- Autumn 2019
- Spring 2019
- Autumn 2018
- Spring 2018
- Autumn 2017
- Spring 2017
- Autumn 2016
- Spring 2016
- Autumn 2015
- Spring 2015
- Autumn 2014
- Spring 2014
- Autumn 2013
- Spring 2013
- Autumn 2012
- Spring 2012
- Autumn 2011

Client: North East Coastal Group

Project: Cell 1 Regional Coastal Monitoring Programme

Title:

Appendix C - Map 1

Newbiggin-by-the-Sea Sand Extent

Northumberland County Council Frontage

Report: 'Post Storm' Survey 2023

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	07/12/2023	TC	AS	A3	1:1,500

Co-ordinate system: British National Grid

Royal HaskoningDHV
Enhancing Society Together

North East Coastal Observatory