

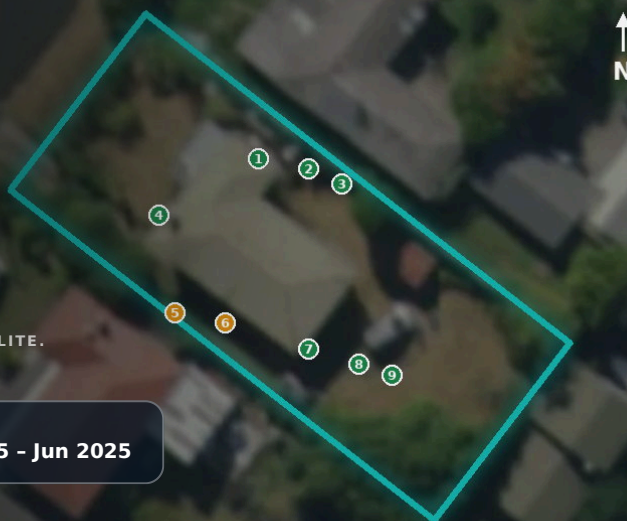
10-Year Historical Land Subsidence Report

InSAR Satellite Deformation Analysis

INSAR DATA FROM EUROPEAN SPACE AGENCY'S SENTINEL-1 SATELLITE.

PROPERTY
18 High Street, Raumanga, Whangārei

PERIOD
May 2015 - Jun 2025



Property Overview

Address	18 High Street, Raumanga, Whangārei
Report ID	LS-B82A
Land Area (boundary)	806 m ²
Assessment Period	May 2015 - Jun 2025
Data Type	SatSense InSAR export (ascending + descending LOS) - used verbatim
Frequency	~12-day
Monitoring Points	9
Observations	274 per point (max)

Monitoring Point Summary

7 STABLE avg rate 0.3 mm/yr	2 MONITOR avg rate 4.7 mm/yr	0 INVESTIGATE avg rate -
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Counts of monitoring points by four-state rating; average of each group's line-of-sight movement rate (magnitude). Measured data, not a geotechnical assessment - see the Screening Classification & Methodology page for the standards framework.

WORST-POINT RATE +8.4 mm/year (LOS)	WORST-POINT MOVEMENT +60 mm over period	CONFIDENCE High 274 obs reviewed
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KEY FINDING

The property shows measurable ground movement over the observation period at one or more monitoring points. Rates are below the threshold for immediate professional review, but the trend should be monitored. Continued InSAR monitoring is recommended to confirm whether the current trend continues or stabilises.

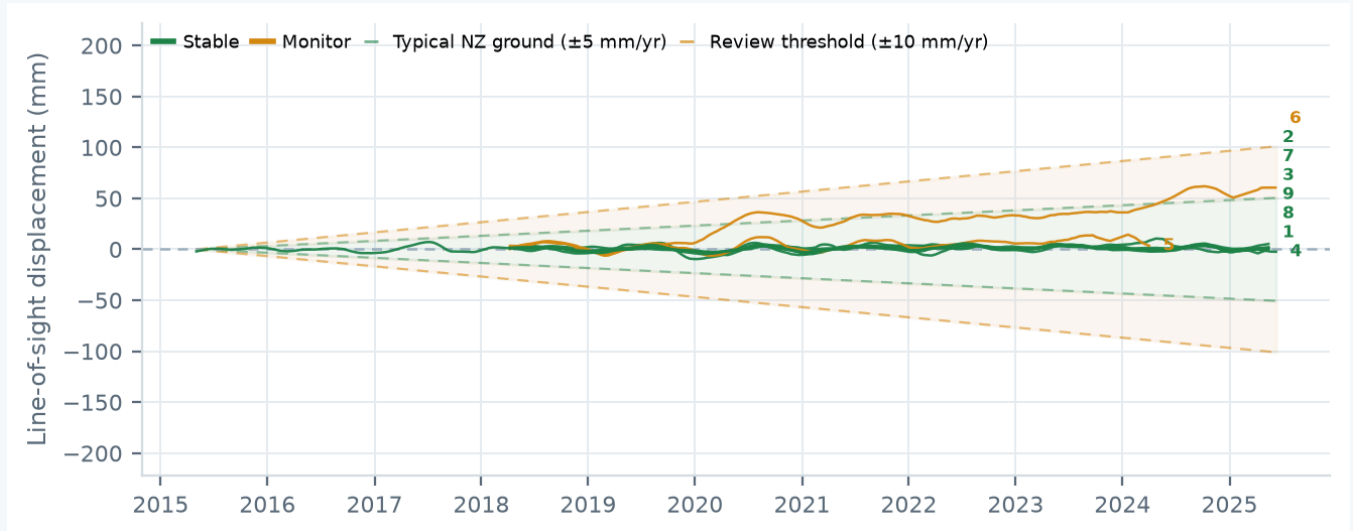
An early-warning instrument. InSAR screening is designed to surface slow, millimetre-scale ground movement long before it becomes visible on site - its greatest value is ahead of any apparent problem. It is not a post-event assessment: where land has already slipped or visibly moved, events have overtaken the satellite record and site-specific professional advice - not this report - is the appropriate response.

This report is an information product, not geotechnical, engineering, legal or financial advice; decisions remain the responsibility of the reader - see Important Data Notes and the Screening Classification methodology page.

InSAR Movement History & Locations

Cumulative deformation and monitoring point positions - read together by number and colour

Cumulative Ground Movement - All Monitoring Points



Series rendered from the numeric per-epoch record for each monitoring point. The regular yearly wave in each line is seasonal ground behaviour (wet/dry cycles) - the long-term slope, not the wave, is what matters. Context bands: green = typical NZ ground (± 5 mm/yr); amber edge = ± 10 mm/yr review threshold - lines inside green are within normal variation. The vertical scale is the fixed national LandSure frame (± 22 mm/yr $\times$ the observation period; ± 220 mm over 10 years) - identical on every report nationwide, never sized by the data.

Monitoring Point Locations



Boundary from supplied property GeoJSON. View: property boundary plus 20 m. The 90 m query ring is shown on the Surrounding Area page.

i A line's number on the timeline is the same number on the map. Colour encodes the four-state rating in both, so you can locate where movement is happening without a legend lookup.

Point Summary

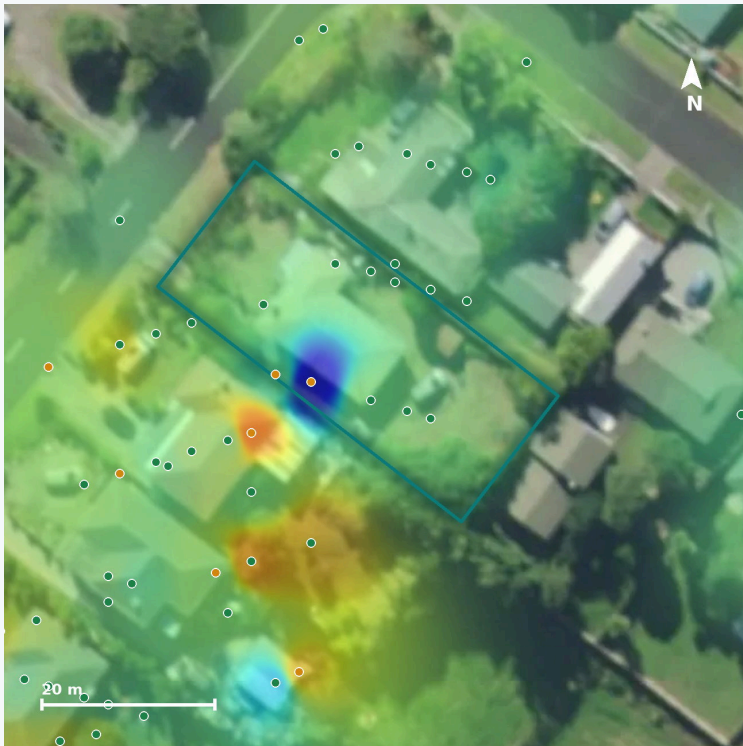
Point 1	Stable · +0.2 mm/yr	-35.74385, 174.31093
Point 2	Stable · +0.6 mm/yr	-35.74386, 174.31097
Point 3	Stable · +0.4 mm/yr	-35.74387, 174.31100
Point 4	Stable · +0.3 mm/yr	-35.74389, 174.31084
Point 5	Monitor · +1.1 mm/yr	-35.74397, 174.31085
Point 6	Monitor · +8.4 mm/yr	-35.74397, 174.31090
Point 7	Stable · +0.2 mm/yr	-35.74399, 174.31097
Point 8	Stable · +0.2 mm/yr	-35.74400, 174.31102

First 8 of 9 points - all continue in the Data Appendix (p17).

Movement Rate Heatmap (and immediate surrounding area)

Colour surface interpolated from 9 on-property and 99 surrounding measured points - line-of-sight mm/yr

Velocity Surface - Property & Surrounding Area

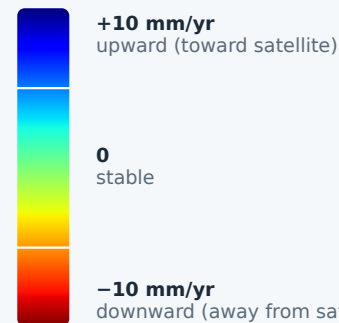


Rainbow surface: average annual movement rate interpolated between ALL measured points (inverse-distance weighting); opacity fades where no measurement is nearby AND where measured movement is negligible - strong colour marks measured movement, stable ground stays faint. Numbered dots: on-property points; "S"-numbered: surrounding context points (colours = four-state rating). Teal: property boundary. View: property boundary plus 20 m; measured points beyond this frame still feed the surface. Basemap: LINZ aerial (CC-BY 4.0).

READING THE SURFACE

- **Measured location** - a real radar measurement
- **Interpolated surface** - estimated between measurements

Colour Scale



White ticks: ± 5 mm/yr - movement inside this band is typical for stable NZ ground.

Fastest downward	Point S44 · -5.5 mm/yr
Fastest upward	Point 6 · +8.4 mm/yr
Points in surface	9 on-property + 99 surrounding

i The measurements are the dots - the colours between them are estimates. InSAR measures movement only at the monitoring points; the surface interpolates between them for visual context and cannot reveal movement where no point exists. Surrounding ("S") points provide context only - they never contribute to this property's rating or screening level. Read it together with the Per-Point Movement Detail pages.

How to read this report

What is a monitoring point?

A spot on the ground or a structure that reflects the satellite's radar consistently, so its movement can be measured on every pass. The numbered dots on every map are these points, at their exact measured positions.

What does mm/yr mean here?

Millimetres of movement per year along the satellite's line of sight. 10 mm/yr is about the thickness of ten credit cards a year - far too slow to see, which is why satellites are used to find it early.

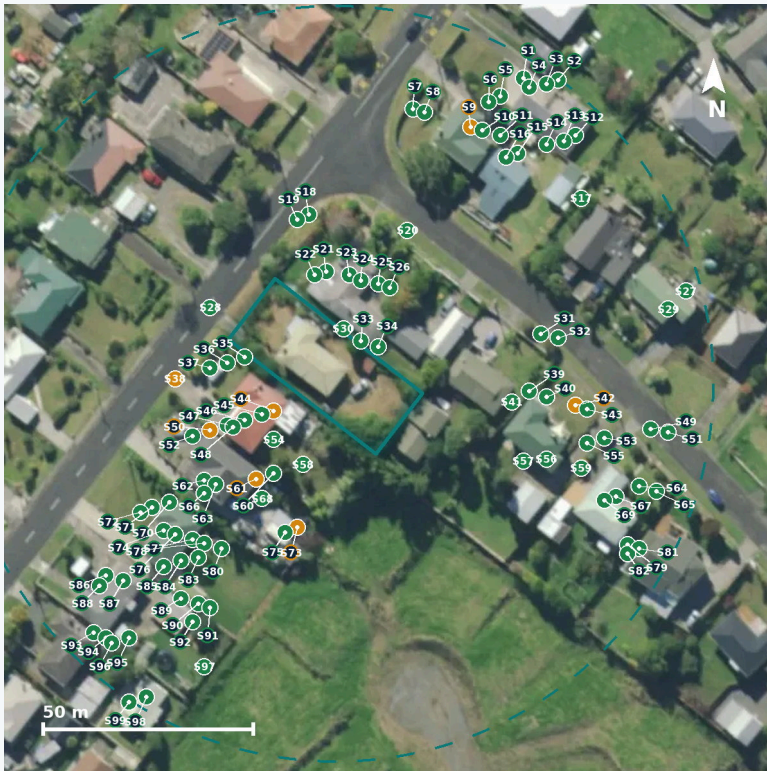
What do the colours mean?

Green = stable · **amber** = measurable movement, monitor · **red** = above the professional-review threshold · **grey** = not enough data to rate (never assumed stable).

Surrounding Area Movement

Measured points outside the property line - context for how the wider block is behaving

Area View - Surrounding Points



"S"-numbered dots: measured points OUTSIDE the property boundary (teal) - every point is labelled so it can be matched to the tables. View: fitted to the surrounding points themselves for maximum zoom. Dashed ring: 90 m query radius (may extend beyond the frame). On-property points: heatmap, history and per-point pages.

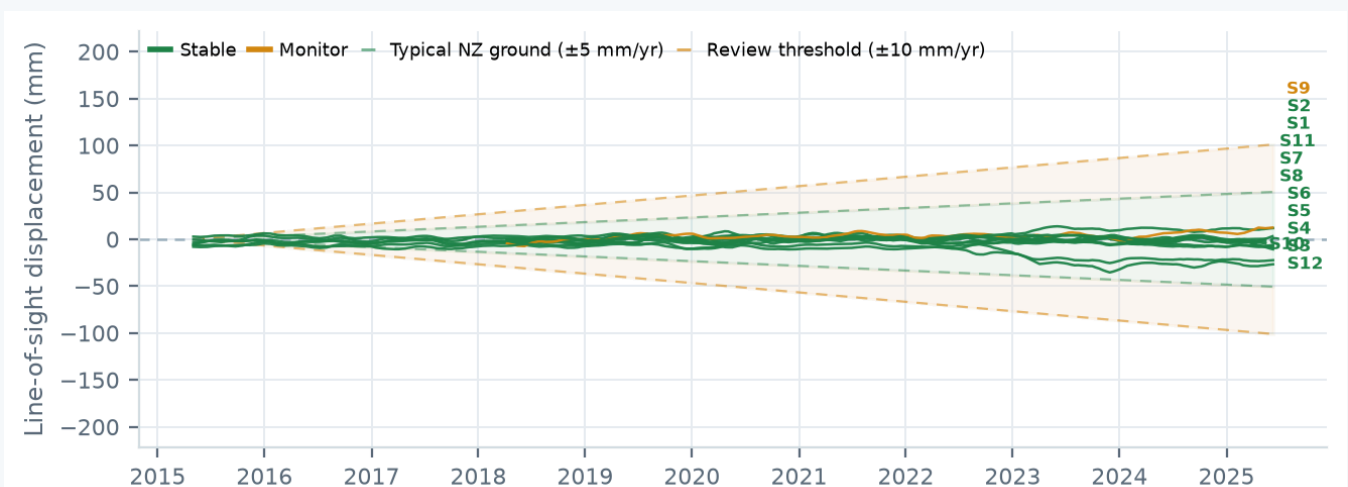
i Surrounding points show how the wider area is behaving and help distinguish property-specific movement from block-wide or regional trends. They provide context only - they **never** contribute to this property's rating or screening level.

Surrounding Point Summary

● Point S1	Stable · +0.2 mm/yr	-35.74332, 174.31148
● Point S2	Stable · -0.2 mm/yr	-35.74332, 174.31157
● Point S3	Stable · -0.3 mm/yr	-35.74333, 174.31154
● Point S4	Stable · -0.3 mm/yr	-35.74334, 174.31149
● Point S5	Stable · +0.3 mm/yr	-35.74335, 174.31142
● Point S6	Stable · +0.5 mm/yr	-35.74337, 174.31139
● Point S7	Stable · +0.8 mm/yr	-35.74338, 174.31119
● Point S8	Stable · +1.2 mm/yr	-35.74339, 174.31122

First 8 of 99 surrounding points - all continue in the Data Appendix (p17).

Cumulative Movement - Surrounding Points

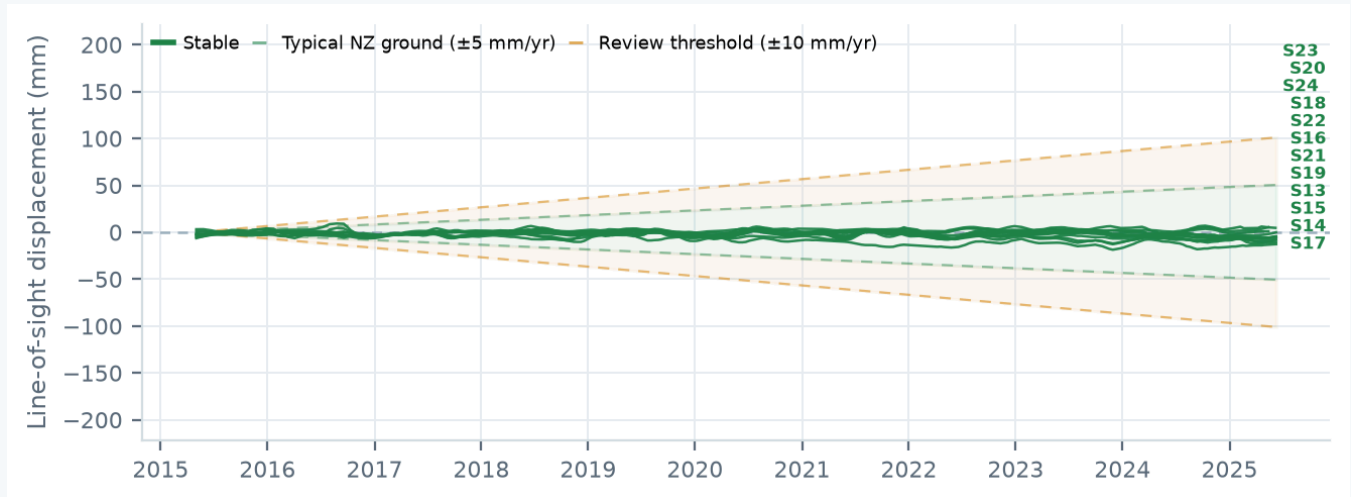


Series rendered from the numeric per-epoch record for each monitoring point. Context bands: green = typical NZ ground (± 5 mm/yr); amber edge = ± 10 mm/yr review threshold - lines inside green are within normal variation. The vertical scale is the fixed national LandSure frame (± 22 mm/yr $\times$ the observation period; ± 220 mm over 10 years) - identical on every report nationwide, never sized by the data.

Surrounding Area Movement - continued

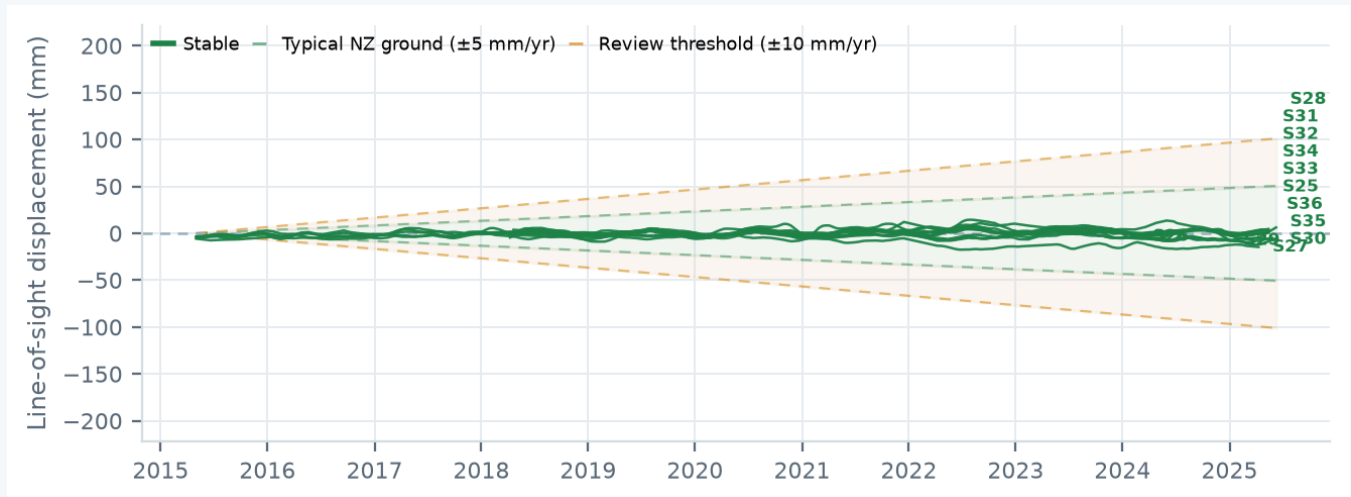
Cumulative movement, remaining surrounding points (2 of 9 chart sets)

Cumulative Movement - Surrounding Points, continued



Series rendered from the numeric per-epoch record for each monitoring point. Same fixed national frame and context bands as the first chart - all chart sets compare directly.

Cumulative Movement - Surrounding Points, continued

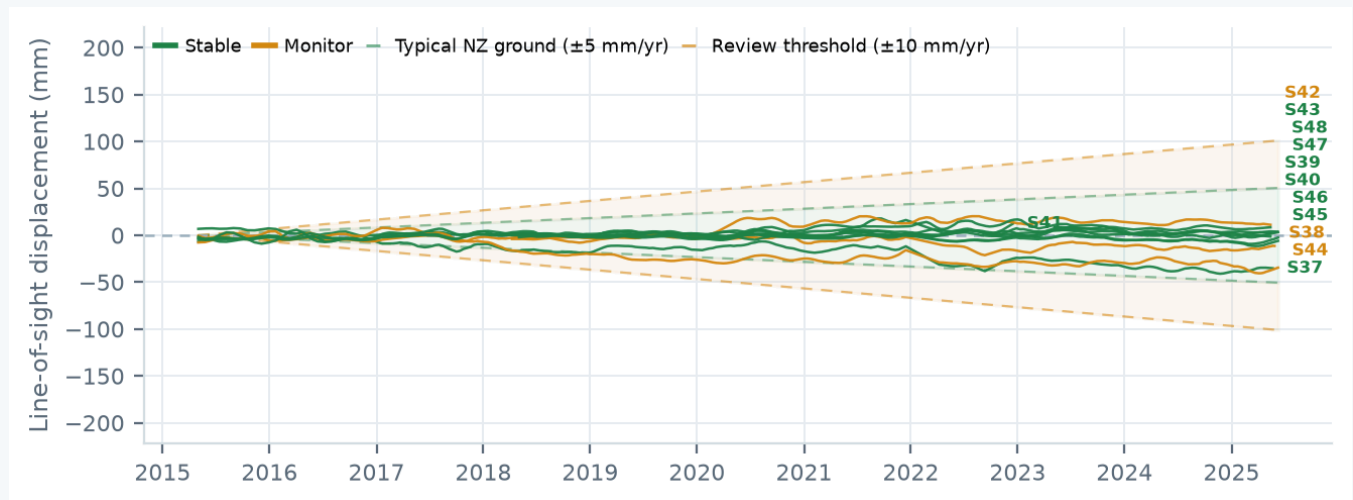


Series rendered from the numeric per-epoch record for each monitoring point. Same fixed national frame and context bands as the first chart - all chart sets compare directly.

Surrounding Area Movement - continued

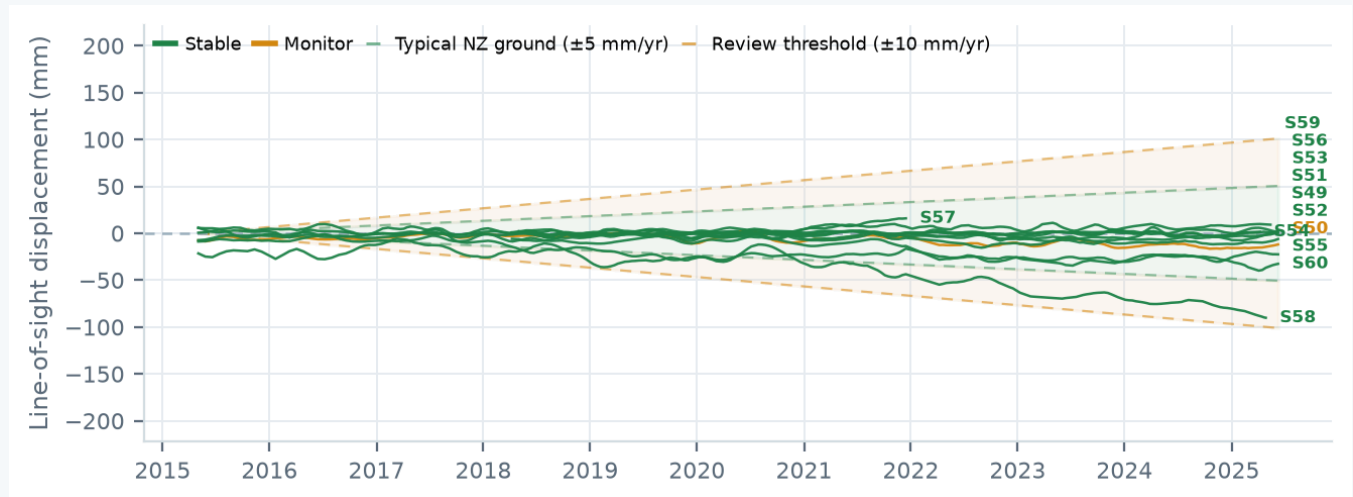
Cumulative movement, remaining surrounding points (3 of 9 chart sets)

Cumulative Movement - Surrounding Points, continued



Series rendered from the numeric per-epoch record for each monitoring point. Same fixed national frame and context bands as the first chart - all chart sets compare directly.

Cumulative Movement - Surrounding Points, continued

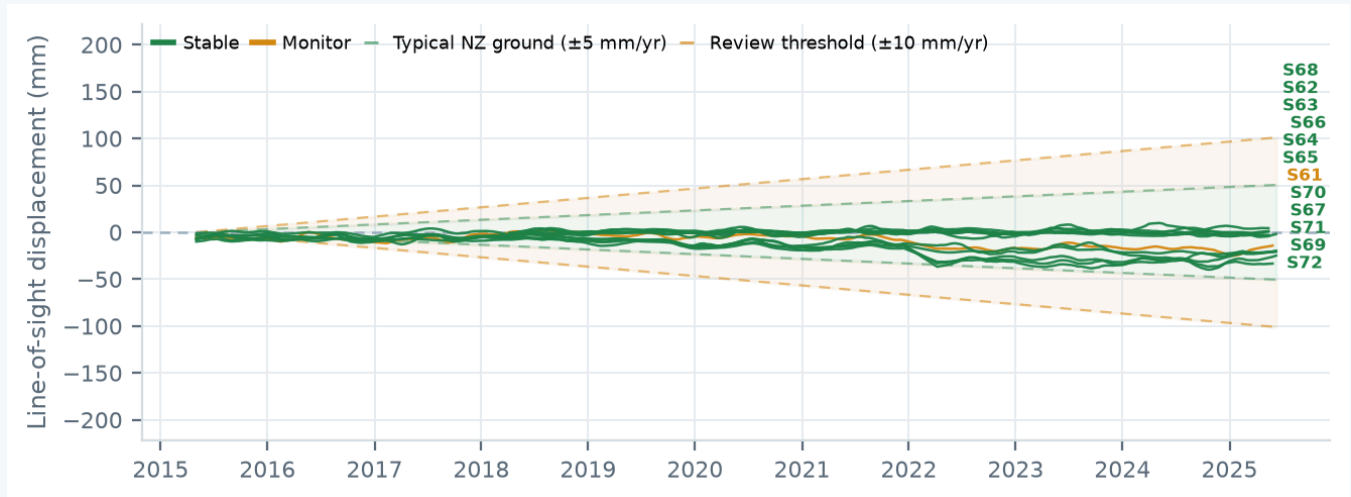


Series rendered from the numeric per-epoch record for each monitoring point. Same fixed national frame and context bands as the first chart - all chart sets compare directly.

Surrounding Area Movement - continued

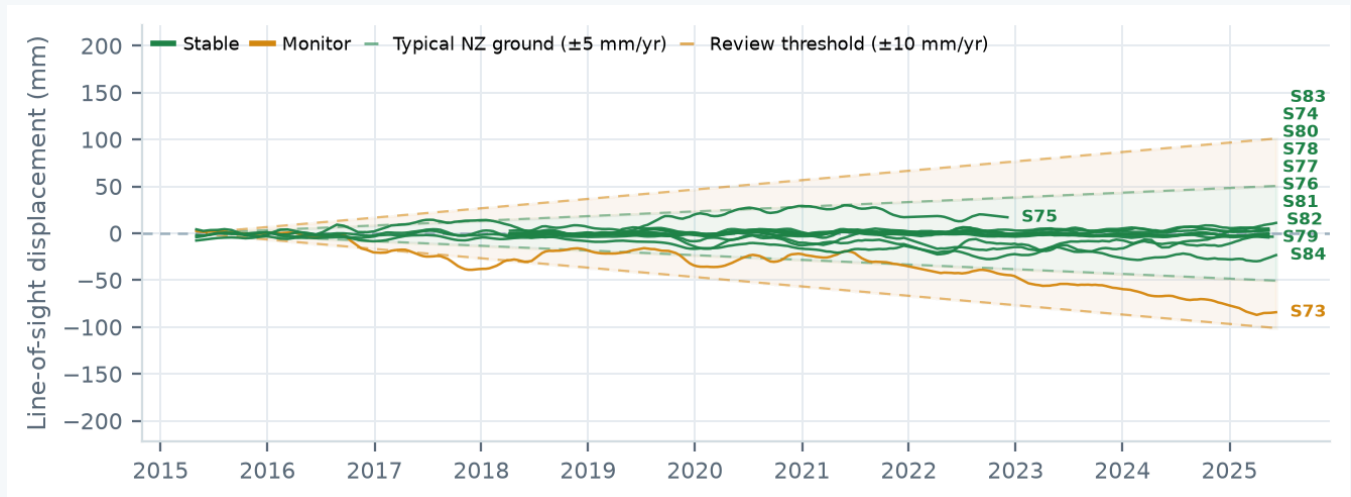
Cumulative movement, remaining surrounding points (4 of 9 chart sets)

Cumulative Movement - Surrounding Points, continued



Series rendered from the numeric per-epoch record for each monitoring point. Same fixed national frame and context bands as the first chart - all chart sets compare directly.

Cumulative Movement - Surrounding Points, continued

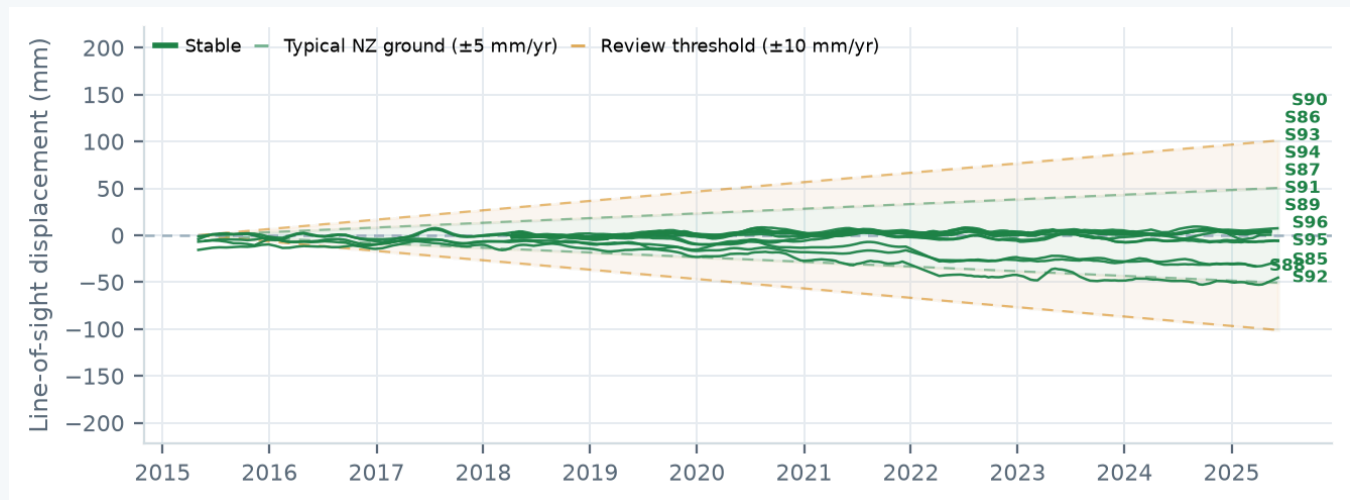


Series rendered from the numeric per-epoch record for each monitoring point. Same fixed national frame and context bands as the first chart - all chart sets compare directly.

Surrounding Area Movement - continued

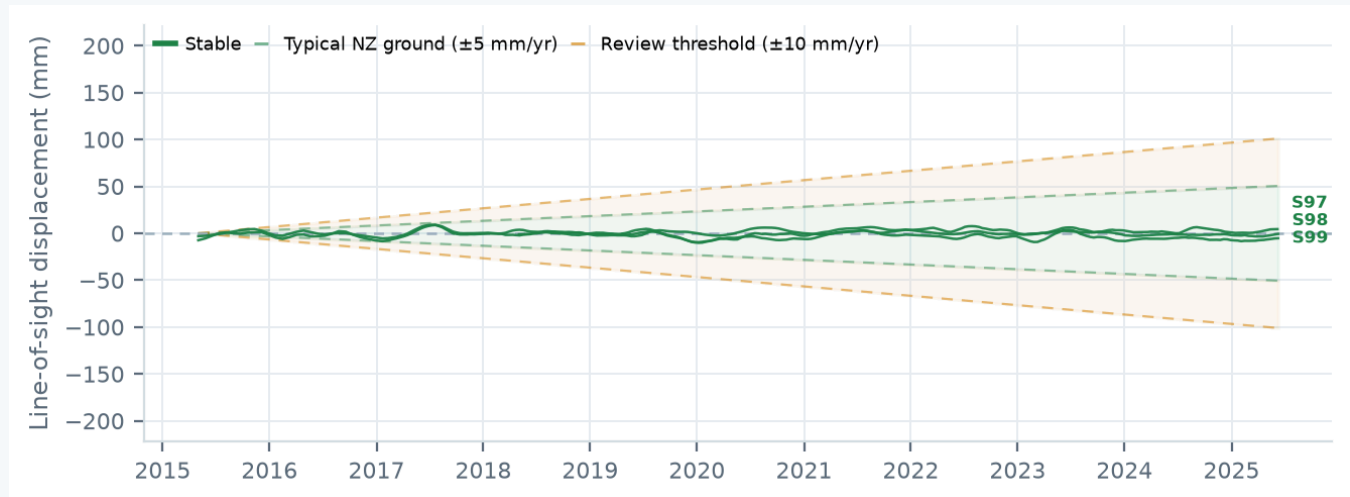
Cumulative movement, remaining surrounding points (5 of 9 chart sets)

Cumulative Movement - Surrounding Points, continued



Series rendered from the numeric per-epoch record for each monitoring point. Same fixed national frame and context bands as the first chart - all chart sets compare directly.

Cumulative Movement - Surrounding Points, continued

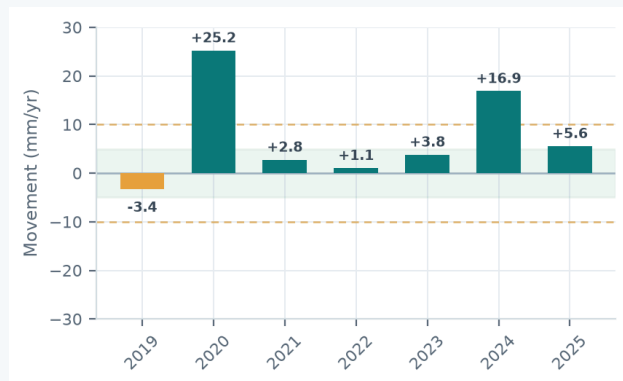


Series rendered from the numeric per-epoch record for each monitoring point. Same fixed national frame and context bands as the first chart - all chart sets compare directly.

Movement Analysis

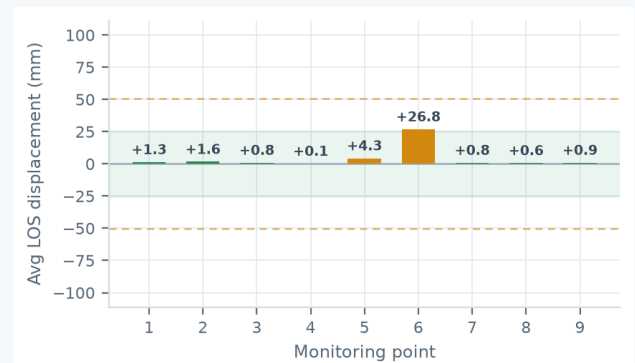
Rates, averages and plain-English classification

Annual Movement - Worst Point (6)



Year-on-year LOS movement of the worst-rated point. The headline rating always follows the worst point, never an average. Green band: typical NZ ground (± 5 mm/yr); dashed amber: ± 10 mm/yr review threshold. Fixed national ± 30 mm/yr frame - identical on every report.

Average Movement by Point



Signed average LOS displacement - uplift positive, subsidence negative. Green band: what typical NZ ground averages over the period; dashed amber: the review-threshold equivalent. Fixed national frame - identical on every report.

InSAR Movement Classification annual deformation rate (mm/yr)

Uplift

Ground rising

> +5 mm/yr ← worst point

Stable

Within natural variation

-5 to +5 mm/yr

Low

Slight downward movement

-5 to -10 mm/yr

Moderate

Noticeable downward movement

-10 to -20 mm/yr

High

Significant downward movement

< -20 mm/yr

These bands describe the direction and size of average movement. The four-state rating on the cover (Stable / Monitor / Investigate) is based on movement magnitude and data behaviour, regardless of direction - this property's worst point is rated Monitor.

i Interpretation. The record shows the worst-moving point (Point 6) at +8.4 mm/yr line-of-sight, which places it in the 'Uplift' classification band. At least one point shows a faster rate in the recent window than its long-term average. InSAR does not identify the cause of movement; the trend indicates whether site-specific review and continued monitoring are appropriate.

Per-Point Movement Detail

Each point on the fixed LandSure screening scale - green = typical NZ ground (± 5 mm/yr), amber edge = ± 10 mm/yr review threshold. This scale is identical on every LandSure report



Terrain, Elevation & Land Capability

Mapped slope classes and measured ground elevation around 18 High Street, Raumanga, Whangārei - live NZ government data

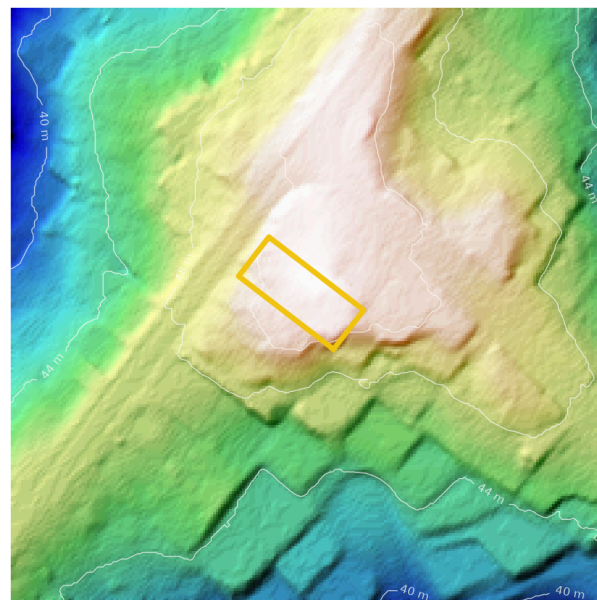
Slope Class Map - NZLRI



A 0-3° flat **D** 16-20° strongly rolling

NZLRI slope polygons (Manaaki Whenua, CC-BY 4.0) over LINZ aerial imagery - regional-scale mapping, not a site survey.

Shaded Relief & Contours



Hillshaded LINZ elevation model (0.97 m resolution) with contours (white, metres above sea level, NZVD2016). Yellow line: property boundary. Source: LINZ via Basemaps, CC-BY 4.0.

Land Use Capability

Urban-mapped land ('town')

NZLRI does not assign a rural Land Use Capability class within mapped township areas; land-use suitability is governed by the district plan for this location.

SITE ELEVATION

38 - 54 m

above sea level (area shown)

MEASURED SLOPE

7.6°

mean · steepest ≈ 23.8°

ASPECT Falls To The South-West

i Steeper slopes and poorly drained soils make land more prone to the slow movement this report measures; these factors feed the susceptibility column of the Screening Classification. Slope on the relief map is measured from the elevation model - a finer measurement than the regional NZLRI class on the left.

When Will This Property Get Sun?

Direct sunlight across the property throughout the year, adjusted for local terrain.

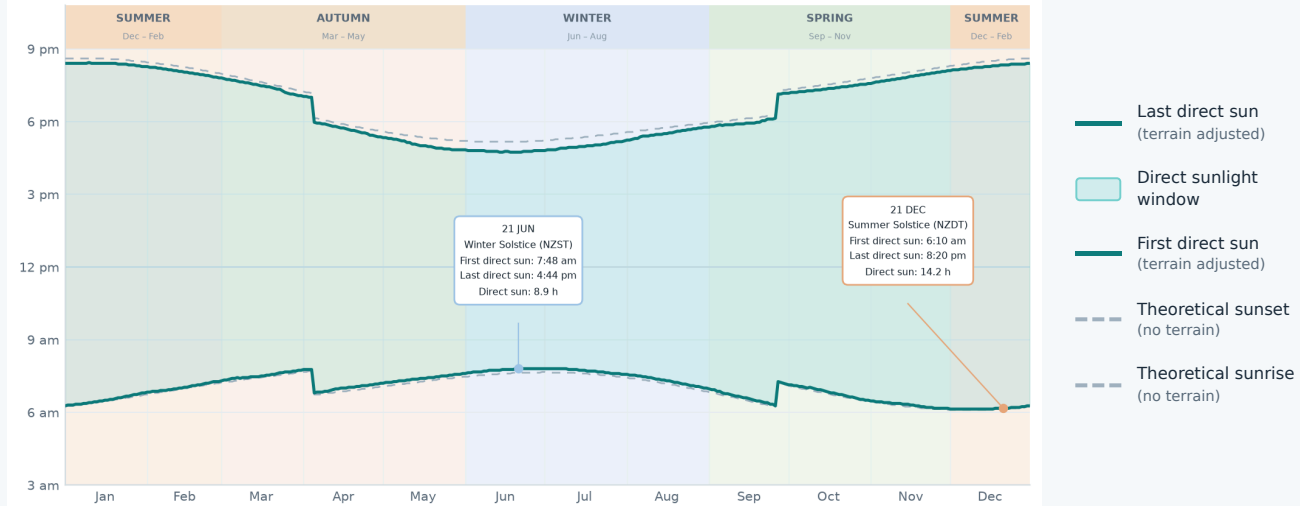
SUN EXPOSURE

97% of potential direct sunlight retained

Terrain has a relatively small impact on direct sunlight across the year.

ANNUAL SUNLIGHT WINDOW

Time of day · NZ clock time (NZDT / NZST)



All 365 days calculated individually from the terrain model and the sun's astronomical path. Clock times shown, including daylight saving: NZDT (+1 h) until 5 April 2026 and from 27 September 2026; NZST between - the one-hour steps at the changeovers are the clocks changing, not the sun. Dashed lines are geometric: published almanac sunrise/sunset times, which include atmospheric refraction, read a few minutes wider.



DIRECT SUNLIGHT RETAINED

97%

of potential sunlight
Terrain reduction: 3%



SUMMER SOLSTICE 21 DEC

14.2 h

direct sunlight
6:10 am - 8:20 pm NZDT



WINTER SOLSTICE 21 JUN

8.9 h

direct sunlight
7:48 am - 4:44 pm NZST



MID-WINTER SUN WINDOW

7:48 am - 4:44 pm

21 June · NZST
8.9-hour window

SEASONAL SUNLIGHT

Average direct sunlight per day

SPRING
Sep - Nov

12.5 h

Increasing daylight and longer afternoon exposure.

SUMMER
Dec - Feb

13.7 h

Longest direct-sun window of the year.

AUTUMN
Mar - May

10.8 h

Gradual reduction in morning and evening exposure.

WINTER
Jun - Aug

9.6 h

Shortest sunlight window; terrain has its greatest relative effect.

TERRAIN IMPACT ON SUNLIGHT

Comparison of theoretical vs actual sunlight

Potential daylight (no terrain shading) **100%**

Direct sunlight retained (terrain adjusted) **97%**

Terrain reduction (shading impact) **3%**

KEY SUN TIMES

At the solstices

SUMMER SOLSTICE (21 DEC · NZDT)

First direct sun **6:10 am**

Last direct sun **8:20 pm**

Direct sunlight **14.2 h**

WINTER SOLSTICE (21 JUN · NZST)

First direct sun **7:48 am**

Last direct sun **4:44 pm**

Direct sunlight **8.9 h**

ABOUT THIS ANALYSIS

WHAT THIS INCLUDES

- ✓ Terrain shading within 8 km of the property, from the LINZ national elevation model (7.8 m sampling here).
- ✓ Solar position modelled for each of the 365 days individually.
- ✓ Sampling height 1.8 m above ground at the property centre (53.5 m above sea level).
- ✓ Direct sunlight requires a clear line of sight over the surrounding terrain.
- ✓ Source: LINZ elevation via Basemaps, CC-BY 4.0.

ABOUT THIS ANALYSIS

WHAT THIS DOESN'T INCLUDE

- ✗ Buildings, trees, vegetation or other local obstructions.
- ✗ Weather conditions or cloud cover.
- ✗ Reflected (indirect) sunlight.
- ✗ Future changes to the landscape or structures.
- ✗ Sunlight inside the dwelling or on any particular part of the property - this is not a solar-energy or thermal assessment.

Screening Classification & Methodology

Standardised risk screening under the AGS (2007) framework as applied in NZ practice

SCREENING LEVEL

SL2 - Low

Likelihood	L3 Possible - 5–10 mm/yr, or acceleration detected
Susceptibility	C2 Low susceptibility (based on 2/7 factors)
Standard action	See the highlighted level in the definitions table below.

Classification Matrix - Likelihood × Susceptibility

	C1	C2	C3	C4	C5
L1	TL1	TL1	TL1	TL2	TL2
L2	TL1	TL1	TL2	TL2	TL3
L3	TL2	TL2	TL3	TL3	TL4
L4	TL2	TL3	TL4	TL4	TL5
L5	TL3	TL4	TL4	TL5	TL5

Highlighted cell = this property. Rows: movement likelihood from the measured InSAR record. Columns: site susceptibility from assessed context factors.

Screening Level Definitions & Standard Practice Responses

Screening thresholds (± 5 / ± 10 mm/yr LOS) follow screening conventions adopted in InSAR practice and the movement-data provider's guidance; they remain subject to confirmation by a Chartered Professional Engineer (Geotechnical) prior to commercial release, as stated in the methodology version above.

SL1 - Very Low **Routine periodic monitoring. No professional intervention indicated by the InSAR record.**
Movement consistent with natural variability; comparable to performance expectations for 'good ground' under NZS 3604:2011.

SL2 - Low
THIS PROPERTY **Continue scheduled InSAR monitoring; review at next reporting cycle.** Qualitative risk 'Low' under the AGS (2007) landslide risk framework as applied in NZ practice.

SL3 - Moderate **Standard practice response at this level: site-specific review by a Chartered Professional Engineer (Geotechnical) and increased monitoring frequency.** AGS (2007) 'Moderate'; assessment scope per MBIE/NZGS Earthquake Geotechnical Engineering Practice Module 1.

SL4 - High **Standard practice response at this level: CPEng geotechnical investigation before land is relied on for a transaction, consenting decision, or earthworks.** AGS (2007) 'High'; investigation scope per MBIE/NZGS Modules 2–3; potential relevance of Building Act 2004 ss 71–74.

SL5 - Very High **Standard practice response at this level: prompt professional geotechnical investigation, with interim risk-management measures considered pending that advice.** AGS (2007) 'Very High'; Building Act 2004 ss 71–74 natural hazard provisions may apply to consenting decisions.

Land & Soil Context, Data Provenance

What the national land records say about this land, and where this report's data comes from

Land & Soil Context - 18 High Street, Raumanga, Whangārei

Soil type & drainage S-map soil order: Brown
Manaaki Whenua S-map (LRIS) · CC-BY 4.0

Mapped erosion type & severity Severity 0 - negligible mapped erosion
Manaaki Whenua NZLRI Erosion (LRIS) · CC-BY 4.0

Only factors assessed from national open data are listed. A factor not assessed in this edition never reduces the screening classification - conservative defaults apply (see Screening Classification & Methodology).

Where This Report's Data Comes From

Movement data	SatSense InSAR export (ascending + descending LOS) - used verbatim
Radar geometry	ascending + descending line-of-sight (provider export layers: asc, desc)
Property boundary	Supplied property GeoJSON (18 High Street, Raumanga, Whangārei) - used verbatim, never modified
Aerial imagery	LINZ Basemaps aerial (CC-BY 4.0)
Methodology version	M-2026.07 DRAFT - pending CPEng review
Terms of Use	Issued subject to the LandSure Terms of Use, version W-1.0 (pending solicitor sign-off), accepted at purchase
Is this document genuine?	Email the report ID LS-B82A to verify@avantglobal.ai and LandSure will confirm this document against the original records.
Need the raw data?	The measured time series behind this report are available to the commissioning customer's engaged professional on request, referencing the report ID.

i This page shows where every number and map in this report comes from. Nothing here changes your result - it means any figure in the report can be traced back to its source.

HOW THIS REPORT WAS BUILT



Framework References

- ✓ AGS (2007). Practice Note Guidelines for Landslide Risk Management. Australian Geomechanics Society, Vol 42 No 1. (NZGS-adopted framework.)
- ✓ MBIE/NZGS. Earthquake Geotechnical Engineering Practice, Modules 1-6. Ministry of Business, Innovation & Employment / NZ Geotechnical Society.
- ✓ NZS 3604:2011 Timber-framed buildings - 'good ground' definition (Standards New Zealand).
- ✓ Building Act 2004, ss 71-74 (building on land subject to natural hazards).
- ✓ MBIE (2017). Planning and engineering guidance for potentially liquefaction-prone land.
- ✓ Resource Management Act 1991, s 106 (subdivision consent - land instability).

Screening Classification - Disclaimer

The Screening Level classification is an information-product data screening derived from satellite InSAR measurement and, where stated, open government data. It applies a qualitative matrix consistent with frameworks used in New Zealand geotechnical practice, but it is not a geotechnical assessment, engineering opinion, or certification under the Building Act 2004, and it does not discharge any duty of a vendor, purchaser, insurer or council. Classification thresholds are subject to review by a Chartered Professional Engineer (Geotechnical) prior to commercial release. Where site susceptibility factors are marked unassessed, the classification is provisional and conservative defaults apply.

Legal Parcel, Buildings & Water Context

Official cadastral records, building footprints and mapped water features - live LINZ data

Parcel, Buildings & Mapped Water



Teal: supplied report boundary. White: legal parcel lines for the parcel(s) this property's boundary touches (LINZ NZ Primary Parcels). Orange: mapped building footprints on the property. View: property boundary plus 20 m. Sources: LINZ, CC-BY 4.0.

Legal Parcel Records - North Auckland land district

Appellation	Title reference	Surveyed area
Lot 9 DP 44307 primary parcel - largest share of the supplied boundary	NA1394/4	809 m ²
Lot 11 DP 44307	NA1521/60	913 m ²
Lot 10 DP 44307	NA1375/99	1,123 m ²

BUILDINGS ON PROPERTY

1

mapped footprints (LINZ)

SITE COVERAGE

20.4%

164 m² footprint / boundary area

Water & Low-Lying Land (1.4 km search)

Nearest mapped watercourse ≈ 217 m

Nearest mapped lake ≈ 229 m

Coastline ≈ 718 m

Property low point ≈ 51.0 m above sea level (NZVD2016)

This is not a flood map. Flood hazard is mapped by regional and district councils - their hazard maps and the property LIM remain the authoritative flood sources.

i The supplied boundary closely matches the surveyed legal parcel area. Title references are the starting point for a formal LINZ title search (which this report is not - memorials, easements and covenants are not shown here).

Property Land Essentials

What the national land databases record for this property - and what it means for an owner or developer

Underlying Rock

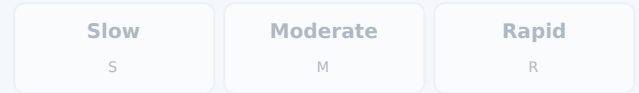


Not mapped for urban land

Not mapped for urban land ('town'). The national soil and rock layers do not assign values within mapped township areas; site conditions are a matter for the district plan and on-site investigation.

NZLRI Rock (Manaaki Whenua, CC-BY 4.0)

Soil Permeability



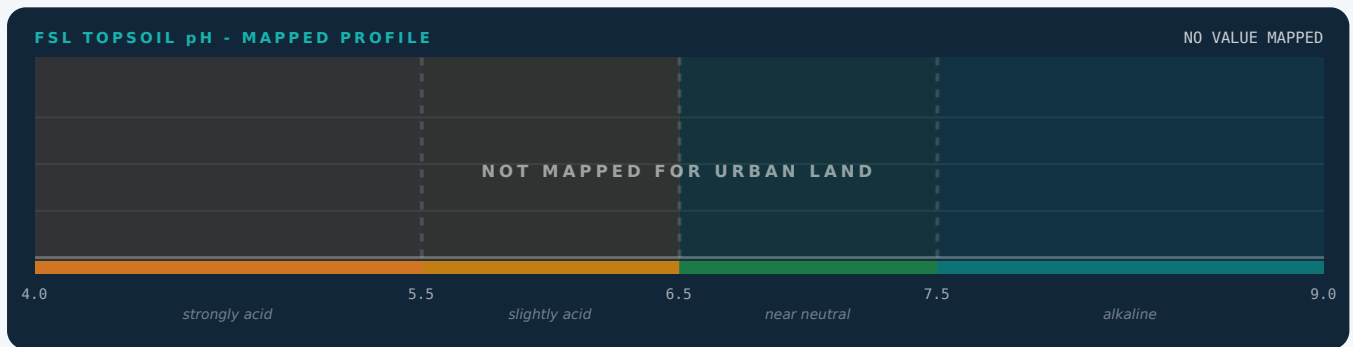
FSL profile permeability classes, slowest to most rapid - no class mapped here

Not mapped for urban land

Not mapped for urban land ('town'). The national soil and rock layers do not assign values within mapped township areas; site conditions are a matter for the district plan and on-site investigation.

FSL Permeability Profile (Manaaki Whenua, CC-BY 4.0)

Topsoil pH



FSL topsoil pH scale - no value mapped for this location

Not mapped for urban land

Not mapped for urban land ('town'). The national soil and rock layers do not assign values within mapped township areas; site conditions are a matter for the district plan and on-site investigation.

FSL pH (Manaaki Whenua, CC-BY 4.0)

Geological Unit (QMAP)

Allochthonous rocks

mE01.sst9_all Ruatangata Sandstone of Waro Subgroup (Te Kuiti Group) Main rock: sandstone Key group: Northland Allochthon in Northland Allochthon

The geological map unit recorded under this property at 1:250,000 scale - regional mapping, not a site investigation.

Geological Map of New Zealand 1:250 000 (4th ed., 2023), GNS Science - CC BY 4.0

i These attributes come from regional-scale national mapping (typically 1:50,000; geology 1:250,000) and describe the mapped land unit containing the property - they are indicative for the site, not a substitute for on-site investigation.

Measurement Data Appendix (1/5)

Every measured point, ordered by review priority (rating severity, then movement rate) - positions in WGS84 and NZTM2000

Point	Rating	Rate mm/yr	WGS84 lat, lng	NZTM2000 E, N	First	Last	Obs	RMSE mm	Accel.
6	monitor	+8.4	-35.743973, 174.310898	1,718,532.1, 6,043,655.9	Apr 2018	Jun 2025	192	3.0	yes
S44	monitor	-5.5	-35.744026, 174.310822	1,718,525.1, 6,043,650.1	May 2015	Jun 2025	267	3.3	-
S42	monitor	+5.4	-35.744015, 174.311615	1,718,596.9, 6,043,650.4	Apr 2018	May 2025	187	3.0	-
S73	monitor	-3.7	-35.744274, 174.310883	1,718,530.3, 6,043,622.5	May 2015	Jun 2025	260	4.1	yes
S9	monitor	+1.2	-35.743420, 174.311340	1,718,573.0, 6,043,716.7	Apr 2018	Jun 2025	188	3.3	yes
5	monitor	+1.1	-35.743965, 174.310852	1,718,528.0, 6,043,656.8	Apr 2018	Apr 2024	159	3.0	yes
S38	monitor	-0.5	-35.743958, 174.310562	1,718,501.8, 6,043,658.0	May 2015	May 2025	247	3.0	yes
S61	monitor	-0.5	-35.744171, 174.310776	1,718,520.8, 6,043,634.1	May 2015	May 2025	266	2.4	yes
S50	monitor	-0.5	-35.744068, 174.310654	1,718,509.9, 6,043,645.6	May 2015	Jun 2025	270	2.7	yes
S60	stable	-5.0	-35.744160, 174.310822	1,718,524.9, 6,043,635.3	May 2015	Jun 2025	268	3.0	-
S58	stable	-4.3	-35.744141, 174.310898	1,718,531.9, 6,043,637.3	May 2015	Apr 2025	243	3.6	-
S92	stable	-3.9	-35.744476, 174.310608	1,718,505.2, 6,043,600.4	May 2015	Jun 2025	250	2.6	-
S75	stable	+3.6	-35.744286, 174.310852	1,718,527.5, 6,043,621.3	May 2015	Dec 2022	190	4.1	-
S43	stable	+3.4	-35.744022, 174.311646	1,718,599.7, 6,043,649.5	Apr 2018	May 2025	190	3.6	-
S85	stable	-2.9	-35.744358, 174.310532	1,718,498.4, 6,043,613.6	May 2015	Jun 2025	273	1.2	-
S72	stable	-2.7	-35.744244, 174.310471	1,718,493.1, 6,043,626.4	May 2015	May 2025	275	1.7	-
S37	stable	-2.6	-35.743935, 174.310654	1,718,510.1, 6,043,660.4	May 2015	May 2025	255	3.1	-
S84	stable	-2.6	-35.744347, 174.310577	1,718,502.6, 6,043,614.8	May 2015	Jun 2025	270	2.0	-
S71	stable	-2.6	-35.744232, 174.310501	1,718,495.9, 6,043,627.6	May 2015	Jun 2025	274	1.2	-
S67	stable	-2.3	-35.744209, 174.311722	1,718,606.3, 6,043,628.7	May 2015	Jun 2025	275	2.5	-
S69	stable	-2.1	-35.744217, 174.311691	1,718,603.5, 6,043,627.9	May 2015	Jun 2025	270	2.5	-
S59	stable	+2.0	-35.744148, 174.311630	1,718,598.1, 6,043,635.6	Apr 2018	May 2025	181	3.7	-
S17	stable	-1.9	-35.743572, 174.311630	1,718,598.9, 6,043,699.4	May 2015	Jun 2025	270	3.1	-
S88	stable	-1.8	-35.744400, 174.310364	1,718,483.2, 6,043,609.2	May 2015	Mar 2025	253	3.4	-

Rows are ordered by review priority: rating severity first, then movement rate. "S" points are surrounding context - they never contribute to the property's rating. First/Last are the first and last satellite observation dates; Obs is the number of satellite observations in the series; Accel. marks points accelerating in the recent record. RMSE is the data provider's reported per-point measurement quality (root-mean-square error of the fitted series, mm). NZTM2000 per LINZ standard projection (central meridian 173°E). A machine-readable CSV of this table is issued with every report. Displacements are relative to the data provider's processing reference.

Measurement Data Appendix (2/5)

Every measured point, ordered by review priority (rating severity, then movement rate) - positions in WGS84 and NZTM2000

Point	Rating	Rate mm/yr	WGS84 lat, lng	NZTM2000 E, N	First	Last	Obs	RMSE mm	Accel.
S82	stable	-1.8	-35.744331, 174.311752	1,718,608.9, 6,043,615.1	May 2015	May 2025	271	2.8	-
S83	stable	-1.7	-35.744339, 174.310623	1,718,506.7, 6,043,615.6	May 2015	Jun 2025	250	3.2	-
S70	stable	-1.6	-35.744221, 174.310547	1,718,500.0, 6,043,628.8	May 2015	Jun 2025	253	3.0	-
S55	stable	-1.5	-35.744095, 174.311646	1,718,599.6, 6,043,641.5	May 2015	Jun 2025	251	3.0	-
S26	stable	+1.5	-35.743763, 174.311127	1,718,553.1, 6,043,678.9	Apr 2018	Feb 2024	164	3.9	-
S93	stable	+1.5	-35.744499, 174.310349	1,718,481.7, 6,043,598.2	Apr 2018	May 2025	190	2.5	-
S94	stable	+1.3	-35.744511, 174.310379	1,718,484.4, 6,043,596.9	Apr 2018	May 2025	194	2.5	-
S86	stable	+1.2	-35.744377, 174.310379	1,718,484.6, 6,043,611.7	Apr 2018	May 2025	193	2.6	-
S8	stable	+1.2	-35.743389, 174.311218	1,718,562.0, 6,043,720.3	Apr 2018	May 2025	194	2.5	-
S29	stable	+1.1	-35.743809, 174.311859	1,718,619.3, 6,043,672.9	Apr 2018	Jan 2025	169	3.0	-
S27	stable	-1.1	-35.743771, 174.311905	1,718,623.5, 6,043,677.1	May 2015	Apr 2025	241	3.6	-
S31	stable	+1.0	-35.743862, 174.311523	1,718,588.9, 6,043,667.4	Apr 2018	May 2025	193	1.8	-
S39	stable	+0.9	-35.743984, 174.311493	1,718,585.9, 6,043,653.9	Apr 2018	May 2025	192	1.8	-
S97	stable	+0.9	-35.744572, 174.310638	1,718,507.8, 6,043,589.8	May 2018	Jun 2025	189	3.0	-
S41	stable	+0.9	-35.744007, 174.311447	1,718,581.7, 6,043,651.4	May 2015	Dec 2022	185	3.5	-
S89	stable	+0.8	-35.744427, 174.310577	1,718,502.5, 6,043,605.9	Apr 2018	May 2025	191	2.4	-
S7	stable	+0.8	-35.743382, 174.311188	1,718,559.2, 6,043,721.1	Apr 2018	May 2025	190	2.7	-
S90	stable	+0.7	-35.744438, 174.310623	1,718,506.6, 6,043,604.6	Apr 2018	Jun 2025	192	2.6	-
S32	stable	+0.7	-35.743870, 174.311569	1,718,593.0, 6,043,666.5	Apr 2018	May 2025	193	3.0	-
S53	stable	-0.6	-35.744083, 174.311691	1,718,603.7, 6,043,642.7	May 2015	Jun 2025	267	2.8	-
S87	stable	+0.6	-35.744389, 174.310425	1,718,488.7, 6,043,610.4	Apr 2018	May 2025	195	2.6	-
S14	stable	-0.6	-35.743458, 174.311539	1,718,590.8, 6,043,712.3	May 2015	Jun 2025	271	2.2	-
2	stable	+0.6	-35.743858, 174.310974	1,718,539.2, 6,043,668.5	Apr 2018	May 2025	193	1.4	-
S52	stable	-0.6	-35.744080, 174.310608	1,718,505.8, 6,043,644.4	May 2015	Jun 2025	272	2.1	-

Rows are ordered by review priority: rating severity first, then movement rate. "S" points are surrounding context - they never contribute to the property's rating. First/Last are the first and last satellite observation dates; Obs is the number of satellite observations in the series; Accel. marks points accelerating in the recent record. RMSE is the data provider's reported per-point measurement quality (root-mean-square error of the fitted series, mm). NZTM2000 per LINZ standard projection (central meridian 173°E). A machine-readable CSV of this table is issued with every report. Displacements are relative to the data provider's processing reference.

Measurement Data Appendix (3/5)

Every measured point, ordered by review priority (rating severity, then movement rate) - positions in WGS84 and NZTM2000

Point	Rating	Rate mm/yr	WGS84 lat, lng	NZTM2000 E, N	First	Last	Obs	RMSE mm	Accel.
S25	stable	+0.6	-35.743755, 174.311096	1,718,550.4, 6,043,679.8	Apr 2018	May 2025	192	0.7	-
S63	stable	+0.6	-35.744183, 174.310669	1,718,511.1, 6,043,632.9	Apr 2018	May 2025	193	2.6	-
S36	stable	-0.6	-35.743923, 174.310699	1,718,514.3, 6,043,661.6	May 2015	May 2025	272	2.1	-
S80	stable	+0.6	-35.744320, 174.310684	1,718,512.3, 6,043,617.7	Apr 2018	May 2025	192	1.2	-
S16	stable	+0.6	-35.743484, 174.311432	1,718,581.1, 6,043,709.4	May 2015	Jun 2025	274	1.4	-
S48	stable	+0.5	-35.744061, 174.310715	1,718,515.4, 6,043,646.4	May 2018	Jun 2025	194	2.2	-
S19	stable	-0.5	-35.743618, 174.310883	1,718,531.3, 6,043,695.3	May 2015	Jun 2025	272	2.5	-
S23	stable	+0.5	-35.743736, 174.311020	1,718,543.5, 6,043,682.0	Apr 2018	May 2025	191	2.5	-
S57	stable	+0.5	-35.744133, 174.311478	1,718,584.3, 6,043,637.4	May 2015	Dec 2021	175	3.5	-
S6	stable	+0.5	-35.743366, 174.311386	1,718,577.2, 6,043,722.6	May 2015	Jun 2025	276	1.4	-
S91	stable	+0.5	-35.744446, 174.310654	1,718,509.3, 6,043,603.7	Apr 2018	May 2025	194	1.2	-
S78	stable	+0.5	-35.744308, 174.310638	1,718,508.2, 6,043,619.0	May 2018	May 2025	190	3.2	-
S24	stable	+0.4	-35.743748, 174.311050	1,718,546.3, 6,043,680.7	Apr 2018	May 2025	192	0.4	-
S34	stable	+0.4	-35.743889, 174.311096	1,718,550.2, 6,043,665.0	Apr 2018	May 2025	194	0.9	-
S74	stable	+0.4	-35.744282, 174.310532	1,718,498.6, 6,043,622.1	Apr 2018	May 2025	195	3.2	-
S95	stable	-0.4	-35.744511, 174.310440	1,718,489.9, 6,043,596.8	May 2015	Jun 2025	273	2.4	-
S33	stable	+0.4	-35.743877, 174.311050	1,718,546.1, 6,043,666.3	Apr 2018	May 2025	192	0.3	-
S47	stable	+0.4	-35.744057, 174.310699	1,718,514.1, 6,043,646.8	May 2015	Jun 2025	266	2.7	-
S18	stable	-0.4	-35.743607, 174.310913	1,718,534.0, 6,043,696.5	May 2015	Jun 2025	271	2.5	-
9	stable	+0.4	-35.744011, 174.311050	1,718,545.9, 6,043,651.5	Apr 2018	May 2025	192	0.9	-
3	stable	+0.4	-35.743870, 174.311005	1,718,541.9, 6,043,667.2	Apr 2018	May 2025	192	0.3	-
S4	stable	-0.3	-35.743336, 174.311493	1,718,586.9, 6,043,725.8	May 2015	Jun 2025	266	3.0	-
S68	stable	-0.3	-35.744213, 174.310791	1,718,522.1, 6,043,629.4	Apr 2018	May 2025	187	2.8	-
S3	stable	-0.3	-35.743328, 174.311539	1,718,591.0, 6,043,726.6	May 2015	Jun 2025	273	2.0	-

Rows are ordered by review priority: rating severity first, then movement rate. "S" points are surrounding context - they never contribute to the property's rating. First/Last are the first and last satellite observation dates; Obs is the number of satellite observations in the series; Accel. marks points accelerating in the recent record. RMSE is the data provider's reported per-point measurement quality (root-mean-square error of the fitted series, mm). NZTM2000 per LINZ standard projection (central meridian 173°E). A machine-readable CSV of this table is issued with every report. Displacements are relative to the data provider's processing reference.

Measurement Data Appendix (4/5)

Every measured point, ordered by review priority (rating severity, then movement rate) - positions in WGS84 and NZTM2000

Point	Rating	Rate mm/yr	WGS84 lat, lng	NZTM2000 E, N	First	Last	Obs	RMSE mm	Accel.
S28	stable	+0.3	-35.743805, 174.310654	1,718,510.3, 6,043,674.8	May 2015	Jun 2025	242	4.1	-
S56	stable	-0.3	-35.744129, 174.311539	1,718,589.8, 6,043,637.8	Apr 2018	Jun 2025	188	3.5	-
S11	stable	+0.3	-35.743439, 174.311417	1,718,579.8, 6,043,714.5	Apr 2018	May 2025	193	2.2	-
S65	stable	+0.3	-35.744198, 174.311829	1,718,616.0, 6,043,629.8	Apr 2018	May 2025	192	0.7	-
S96	stable	-0.3	-35.744522, 174.310394	1,718,485.8, 6,043,595.6	May 2015	Jun 2025	273	2.7	-
S5	stable	+0.3	-35.743355, 174.311417	1,718,580.0, 6,043,723.8	May 2015	Jun 2025	274	2.2	-
S49	stable	+0.3	-35.744064, 174.311813	1,718,614.8, 6,043,644.6	Apr 2018	Jun 2025	192	1.5	-
S99	stable	-0.3	-35.744648, 174.310440	1,718,489.7, 6,043,581.6	May 2015	Jun 2025	269	2.9	-
S40	stable	+0.3	-35.743996, 174.311539	1,718,590.0, 6,043,652.6	Apr 2018	May 2025	194	2.5	-
S30	stable	+0.3	-35.743851, 174.311005	1,718,542.0, 6,043,669.3	May 2015	Jun 2025	271	2.8	-
S15	stable	+0.3	-35.743477, 174.311462	1,718,583.9, 6,043,710.2	May 2015	Jun 2025	275	1.5	-
S35	stable	-0.3	-35.743912, 174.310745	1,718,518.4, 6,043,662.9	May 2015	Jun 2025	274	1.7	-
S12	stable	-0.3	-35.743439, 174.311615	1,718,597.8, 6,043,714.3	May 2015	Jun 2025	269	1.4	-
4	stable	+0.3	-35.743893, 174.310837	1,718,526.7, 6,043,664.9	May 2015	Jun 2025	274	2.7	-
S54	stable	-0.3	-35.744087, 174.310822	1,718,525.1, 6,043,643.3	May 2018	Apr 2025	189	3.4	-
S64	stable	+0.3	-35.744186, 174.311783	1,718,611.8, 6,043,631.1	Apr 2018	May 2025	192	0.7	-
7	stable	+0.2	-35.743992, 174.310974	1,718,539.0, 6,043,653.7	Apr 2018	May 2025	192	0.5	-
S2	stable	-0.2	-35.743320, 174.311569	1,718,593.8, 6,043,727.4	May 2015	Jun 2025	273	1.4	-
S76	stable	-0.2	-35.744289, 174.310562	1,718,501.3, 6,043,621.2	Apr 2018	May 2025	189	1.6	-
1	stable	+0.2	-35.743851, 174.310928	1,718,535.1, 6,043,669.4	Apr 2018	May 2025	191	3.1	-
8	stable	+0.2	-35.744003, 174.311020	1,718,543.1, 6,043,652.4	Apr 2018	May 2025	192	0.5	-
S62	stable	-0.2	-35.744175, 174.310638	1,718,508.4, 6,043,633.8	Apr 2018	May 2025	193	2.2	-
S98	stable	+0.2	-35.744637, 174.310486	1,718,493.9, 6,043,582.8	May 2015	Jun 2025	270	2.4	-
S46	stable	-0.2	-35.744045, 174.310745	1,718,518.2, 6,043,648.1	May 2015	Jun 2025	274	1.6	-

Rows are ordered by review priority: rating severity first, then movement rate. "S" points are surrounding context - they never contribute to the property's rating. First/Last are the first and last satellite observation dates; Obs is the number of satellite observations in the series; Accel. marks points accelerating in the recent record. RMSE is the data provider's reported per-point measurement quality (root-mean-square error of the fitted series, mm). NZTM2000 per LINZ standard projection (central meridian 173°E). A machine-readable CSV of this table is issued with every report. Displacements are relative to the data provider's processing reference.

Measurement Data Appendix (5/5)

Every measured point, ordered by review priority (rating severity, then movement rate) - positions in WGS84 and NZTM2000

Point	Rating	Rate mm/yr	WGS84 lat, lng	NZTM2000 E, N	First	Last	Obs	RMSE mm	Accel.
S1	stable	+0.2	-35.743317, 174.311478	1,718,585.5, 6,043,728.0	Apr 2018	Jun 2025	188	2.2	-
S22	stable	-0.2	-35.743736, 174.310928	1,718,535.2, 6,043,682.1	May 2015	Jun 2025	273	2.0	-
S51	stable	+0.1	-35.744072, 174.311859	1,718,618.9, 6,043,643.7	Apr 2018	Jun 2025	192	1.3	-
S45	stable	-0.1	-35.744034, 174.310791	1,718,522.4, 6,043,649.3	May 2015	Jun 2025	274	1.6	-
S10	stable	-0.1	-35.743427, 174.311371	1,718,575.7, 6,043,715.8	Apr 2018	Apr 2025	187	2.9	-
S21	stable	-0.1	-35.743729, 174.310959	1,718,538.0, 6,043,682.9	May 2015	Jun 2025	275	2.0	-
S66	stable	-0.1	-35.744202, 174.310638	1,718,508.3, 6,043,630.8	May 2015	Jun 2025	268	2.1	-
S77	stable	+0.1	-35.744301, 174.310608	1,718,505.4, 6,043,619.9	Apr 2018	May 2025	194	1.6	-
S13	stable	+0.1	-35.743450, 174.311584	1,718,595.0, 6,043,713.0	May 2015	Jun 2025	273	2.6	-
S79	stable	+0.0	-35.744312, 174.311752	1,718,608.9, 6,043,617.2	Apr 2018	May 2025	188	1.2	-
S20	stable	+0.0	-35.743641, 174.311172	1,718,557.5, 6,043,692.4	Apr 2018	Jun 2025	191	3.5	-
S81	stable	-0.0	-35.744320, 174.311783	1,718,611.6, 6,043,616.3	Apr 2018	May 2025	192	0.7	-

Rows are ordered by review priority: rating severity first, then movement rate. "S" points are surrounding context - they never contribute to the property's rating. First/Last are the first and last satellite observation dates; Obs is the number of satellite observations in the series; Accel. marks points accelerating in the recent record. RMSE is the data provider's reported per-point measurement quality (root-mean-square error of the fitted series, mm). NZTM2000 per LINZ standard projection (central meridian 173°E). A machine-readable CSV of this table is issued with every report. Displacements are relative to the data provider's processing reference.

Screening Summary & General Next Steps

Land stability interpretation, monitoring guidance, and data confidence

SCREENING LEVEL (SEE METHODOLOGY)

SL2 - Low

Measurable movement within the monitoring band. Rating reflects the worst individual point, never an average.

WORST-POINT MOVEMENT RATE

+8.4 mm/yr

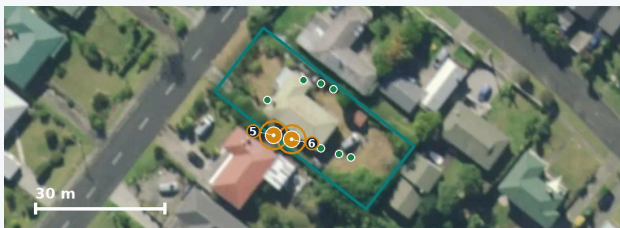
Uplift category (satellite line-of-sight)

DATA CONFIDENCE

High

274 observations reviewed
~12-day series across the full period; sufficiency gates met at all rated points.
Movement: SatSense InSAR · Context: LINZ, Manaaki Whenua, GNS Science (CC-BY 4.0)

Review Priority



Ringed points: top movement points by review priority. Smaller dots: the other monitoring points.

- Point 6** Monitor · +8.4 mm/yr · accelerating in the recent record
- Point 5** Monitor · +1.1 mm/yr · accelerating in the recent record

Giving this to an engineer? Start with the ringed points, their per-point pages, and the Data Provenance page - the companion CSV issued with this report carries the full machine-readable record.

General Next Steps

Generic practices commonly adopted for land monitoring in New Zealand - not site-specific advice.

- Continue InSAR monitoring**
Maintain monthly deformation tracking to confirm whether the current trend continues or stabilises.
- Review nearby ground conditions**
Compare movement patterns with slope, drainage, retaining structures, and any known land works.
- Inspect high-risk zones**
Prioritise visual or engineering inspection in the areas where deformation is greatest.
- Use IoT tilt sensors for live confirmation**
Where risk is material, install or continue tilt sensor monitoring to validate movement between satellite updates.
- Escalate if movement accelerates**
Trigger engineering review if deformation exceeds agreed thresholds or if movement increases over consecutive periods.

InSAR data updates continuously; a re-screen after 12 months extends this property's measured record.

Important Data Notes

- InSAR measures surface deformation along the line-of-sight between the satellite and the ground. It does not directly measure vertical settlement. The satellite viewing geometry (orbit direction and incidence angle) affects which components of movement are visible and is stated in the Report Provenance where supplied by the data provider.
- Trends over short windows can be influenced by seasonal ground behaviour, such as shrink-swell of clay soils through wet and dry cycles. Ratings apply minimum observation-count and time-span gates to reduce, but not eliminate, this effect.
- Dense vegetation, steep terrain, water bodies and building changes can reduce data quality locally.
- IMPORTANT** - sudden events break the record, they are not recorded: InSAR tracks slow, gradual movement (millimetres per year) by comparing repeated satellite images of the same ground surface. A sudden or large event - a landslide or slip, major earthworks, demolition, or new construction - changes the surface so much that the satellite can no longer match its earlier reflections. When this happens the affected measurement points break, jump, or stop rather than recording the event. A gap or abrupt end in a point's history must never be read as 'no movement' - it can mean the opposite. This report cannot be used to conclude that no sudden movement event has occurred.
- InSAR displacements are relative measurements: values describe each point's movement relative to the data provider's processing reference, not an absolute national datum. Comparisons within this report are internally consistent.
- Measurement sensitivity: this data is designed for gradual movement in the range of millimetres to a few centimetres per year. Movement faster than the satellite can track between passes, or movement between the report period's end and the report date, is not captured.
- Measurement points require a consistently reflective surface (buildings, hard surfaces, exposed ground). Heavily vegetated parts of a property typically have few or no measurement points - absence of points is a coverage limitation, not evidence of stability.
- InSAR does not identify the physical cause of movement by itself. This report should be considered alongside site inspections, geotechnical advice, local drainage information, ground works, and other relevant property records.
- This report is intended for risk awareness and decision support. For structural or geotechnical assessment, consult a qualified professional.
- LandSure does not provide engineering certification. Consult a qualified professional for site-specific advice.
- This report does not constitute geotechnical, engineering, valuation, legal, insurance or financial advice, and no advisor-client relationship is created by its purchase or use.
- This product contains no groundwater or soakage measurement. Soil permeability shown is regional-scale national mapping, not a site test, and must not be used for drainage or effluent design.
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