

BEACHLANDS SOUTH FAST-TRACK SUBSTANTIVE APPLICATION WATER SUPPLY CONCEPT

**Beachlands South
Beachlands, Auckland**

BEACHLANDS SOUTH LIMITED PARTNERSHIP

June 2026 | V6



PROGRESS ENGINEERED. PROBLEMS SOLVED.

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Prepared by: 
Nathan Garrow, Graduate Engineer

Reviewed and Approved by: 
Maria Johnson, Water Sector Lead

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EXECUTIVE SUMMARY

This report presents a water supply concept for the Beachlands South Project (also referred to as the "Project") to support the Fast-Track substantive application and associated groundwater take application.

The Beachlands South development is a large-scale greenfield development located south of Beachlands, Auckland, comprising residential, commercial, and community land uses. The existing Beachlands area is not currently serviced by Watercare and therefore relies on rainwater harvesting and groundwater abstraction.

A detailed water demand assessment has been undertaken based on the most recent masterplan, development staging, and industry-standard design assumptions. The total water demand for the fully developed site is estimated at approximately 1,136 m³/day. This demand includes all activities across the Project, including residential, commercial (including a local centre, offices, hotel/conference centre, light industrial and retail activities), schools, and community activities, and the irrigation of the reduced 9-hole golf course.

A water supply strategy involving multiple sources has been developed to service this demand, comprising:

- Pine Harbour Living Limited (PHLL) bulk supply, providing approximately 765 m³/day;
- The existing Formosa bore (which is being reconsented as part of the Project on the same conditions with the exception of an adjustment to usage split between potable supply and irrigation), providing approximately 115 m³/day; and
- A proposed new groundwater bore and associated water take of up to 371 m³/day, for which approval will be sought as part of the Project on the 620 Whitford-Maraetai Road site ("620 bore").

Aquifer mapping investigations identified Point 60 as the preferred bore location for the 620 Whitford-Maraetai Road site, with an estimated yield in the range of approximately 4.7–32.9 L/s (406–2,843 m³/day), and a sustainable yield of approximately 14.8 L/s (1,279 m³/day), providing confidence in the feasibility of this additional groundwater source.

The combined supply from PHLL and the Formosa bore provides approximately 880 m³/day, resulting in a shortfall of approximately 256 m³/day. This shortfall can be serviced by the proposed 620 bore, for which a water take of up to 371 m³/day is sought to provide both supply coverage and contingency capacity. The 620 bore has sufficient capacity to meet the shortfall even at the lower bound of the estimated yield, while also providing additional flexibility and resilience to accommodate peak demand, operational variability, and any interruption to or disruption of the Formosa bore as a supply source.

Rainwater harvesting has been incorporated into the demand modelling and is estimated to provide approximately 563 m³/day of potential supply. While this has not been relied upon to demonstrate supply adequacy, it represents another significant supplementary source that will reduce groundwater demand and improve system resilience.

The proposed water supply network will be designed to meet firefighting requirements in accordance with SNZ PAS 4509:2008, with dedicated storage and reticulation capacity to ensure compliance.

Overall, the assessment demonstrates that a reliable and sustainable water supply can be achieved through the proposed servicing strategy. Further investigations are contemplated as part of the proposed conditions of consent, including to inform the detailed design.

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1 INTRODUCTION

This report has been prepared in support of a substantive application submitted by Beachlands South Limited Partnership ('BSLP') under the Fast-track Approvals Act ('FTAA'). The Project name is 'Beachlands South' and is included in Schedule 2 of the FTAA as a Listed Project with significant regional or national benefits. The Project location is 110 Jack Lachlan Drive and 620, 712, 758 and 770 Whitford-Maraetai Road, Beachlands (the "Site" or the "project area").

In summary, the Project will provide for the development of live zoned land at Beachlands into a comprehensively planned and public transport focussed community to achieve a well-functioning urban environment comprising residential dwellings, a hotel and conference venue, community and commercial activities, protected ecological restoration areas, walking and cycling networks, and community facilities, and enable the potential development of two schools, as well as all associated earthworks and all associated infrastructure including transport facilities, intersection upgrades and roading, telecommunications, power, and water supply, stormwater, and wastewater infrastructure (including any treatment or storage facilities, drainage, pipes, pump stations, outfalls and discharges). A portion of Future Urban zoned land will be used for wastewater management purposes.

Key elements of the Project include:

- Residential activities comprising approximately up to 2,000 dwellings in a variety of housing types, densities and vacant sites for future residential development;
- Establishment of a commercial local centre supported by employment opportunities within and around the periphery of the local centre and on the Whitford-Maraetai Road frontage comprising approximately 27,000 m² of commercial GFA and 30,000 m² of light industrial GFA;
- Education facilities comprising the development of both primary and secondary schools;
- Establishment of an Ecological Protected Area Network (EPAN) comprising approximately 75 hectares of land being replanted, restored, maintained and enhanced including preservation of streams and their margins;
- A series of open spaces including a suburban park, neighbourhood parks, the Fairway Reserve, golf course, esplanade reserve and riparian margins;
- Provision of public access to and along the coastal marine area and the creation of a quality coastal pathway;
- Public transport enhancements and integrations including expanded ferry passenger capacity;
- Staged road upgrades including the provision of pedestrian and cycling facilities along Jack Lachlan Drive, the upgrade of Whitford roundabout, a series of intersection upgrades; and
- Establishment of infrastructure to service the project including wastewater, water supply, stormwater, telecommunications and power.

The site location is shown in Figure 1.



Figure 1: Site Location Plan – Beachlands South

This report outlines the proposed water supply strategy for the Project and provides supporting information for a new bore and groundwater take application. The assessment is based on the latest masterplan, development yield, and work undertaken by GWE.

The proposed water supply approach incorporates supply from PHLL, the existing Formosa bore, and a proposed new groundwater source: the 620 bore and associated water take. The objective is to demonstrate that a reliable and sustainable water supply can be achieved to support the Project.

1.1 Background and Context

Residential dwellings in the Beachlands area currently primarily rely on rainwater harvesting for water supply (i.e. rainwater tanks are used to collect and store roof runoff), with some areas around Pine Harbour serviced by PHLL, which abstracts water from an existing groundwater source and supplies the local network (refer Appendix A for the PHLL coverage area).

The Formosa Golf Course extracts water from an on-site bore which allows for potable use and irrigation of the golf course. This groundwater take is authorised under Auckland Council resource consent 40351 which is due to expire on 31 December 2027. The water-take limits authorised under this consent include a maximum daily abstraction of 300 m³/day and a maximum annual abstraction of 42,000 m³/year (which is equivalent to 115 m³/day). The consented water usage is split between potable supply and irrigation as shown in Table 1.

Table 1: Consented Formosa Bore Supply Volumes

USAGE	DAILY VOLUME (m ³ /day)	ANNUAL VOLUME (m ³ /year)
Potable Supply	80	22,000
Irrigation	220	20,000
Total	300	42,000

2 APPROVALS SOUGHT

The Beachlands South Project is a listed project under the Fast-track Approvals Act 2024. This report is provided to demonstrate how water supply will be achieved for the Project, in support of the substantive application.

The following sets out the approvals sought as part of the Project (relevant to this technical assessment) and relevant legislation and planning documents:

- The drilling and use of the 620 bore and associated abstraction of groundwater to service the Project will require resource consent under the Resource Management Act 1991 ('RMA') (with the specific consent triggers set out in the Auckland Unitary Plan – Operative in Part ('AUP- OP')) as well as being required to comply with New Zealand Standards – NZS 4411:2001 Environmental Standard for Drilling of Soil and Rock.
- A replacement consent for the existing Formosa bore consent will be sought as part of the Project, given the current expiry date is 31 December 2027. The replacement consent will generally be on the same conditions as the existing consent but will seek to remove any mentions of the water take allocation split based on usage type (i.e. potable supply and irrigation) or be amended to more accurately reflect the new usage split.
- The water supply system will be designed and operated in accordance with:
 - The Water Services Act 2021 and associated drinking water standards to ensure a safe and reliable potable water supply; and
 - The relevant provisions outlined in the AUP-OP I458 Beachlands South Precinct.

3 BASIS OF DESIGN

Water demand has been estimated based on the projected development and staging schedule provided by BSLP at the time of writing this report. Demand calculations have been undertaken using a bottom-up approach based on land use, gross floor area ('GFA'), and occupancy assumptions derived from the most recent masterplan (Appendix B).

Preliminary design data provided by BSLP has been supplemented with standard industry assumptions where required. Design flow allowances and occupancy rates have been applied in accordance with guidance from Auckland Regional Council Technical Publication No. 58 ('TP58') and Watercare's Code of Practice ('CoP').

Water demand has been split into potable and non-potable components, with non-potable demand assumed to include toilet flushing, irrigation, and other non-drinking uses, and potable demand including drinking water, kitchen, and bathroom uses.

Rainwater harvesting has been incorporated to supplement and offset non-potable demand across the development. Roof catchment areas have been derived from GFA using typology-specific assumptions reflecting building height and configuration. A loss factor has been applied to account for inefficiencies such as first flush diversion, evaporation, and system losses.

Based on the sustainability objectives of the development, the water supply design will include smart meters to manage demand and billing, with a tariff structure in place allowing higher water usage to induce higher unit cost. Considering this, along with rainwater harvesting for non-potable uses and the incorporation of water-efficient fixtures, the anticipated per-capita water demand is expected to be in the order of 145–165 L/person/day and generally trending toward the lower end of this range, consistent with AUP-OP I458.6.13. Accordingly, a design value of 150 L/person/day has been adopted for this assessment. This represents a conservative but reasonable assumption for feasibility-level analysis.

As set out in more detail below, water supply is proposed to be provided from a combination of sources including the PHLL bulk supply, the existing Formosa groundwater bore to be renewed, and the proposed 620 bore and associated water take providing an additional groundwater abstraction source.

3.1 Assumptions

Key assumptions for the supply-demand calculations include:

Overall

- Rainwater losses due to evaporation, flush diverter, spillage, and system inefficiencies = 17.5%.
- Annual rainfall depth = 1 m.
- Non-potable demand = 56%, potable demand = 44%.

Residential

- Per-capita flow allowance = 150 L/person/day.
- Occupancies:
 - Apartments and small terrace lots: 2 persons per HUE.
 - Compact lots (Larger terrace lot, duplex, compact standalone): 3 persons per HUE.
 - Medium to large lots: 4 persons per HUE.
 - Live/work units: 1 person per HUE.

- Roof areas:
 - Apartments: Roof area = GFA / Number of levels:
 - Community Precinct and Village Centre apartments: Provided.
 - Walk-up apartments: 3 levels.
 - Remaining apartments: 4 levels.
 - Terrace housing, duplex, and live/work units: Roof area = GFA / 2 (two storey).
 - Standalone housing: Roof area = GFA (single storey).

Schools

- GFA = 10,000 m².
- Roof Area = GFA / 2.5 (accounting for roofless areas and multi-levelled elements).
- 2,100 students (500 primary + 1,600 secondary) with a staff ratio of 1:15.

Golf

- Roof Area = 2,000 m² (existing clubhouse).
- Total demand = 75–100 m³/day (based on existing records adjusted for reduction to 9 holes).
-

Commercial

- Roof area = 0.7 x GFA (accounting for carparks and multi-levelled elements).
- Assumed mix of dry and wet retail activities (50/50 split).

Hotel/Conference Centre

- Occupancies:
 - Guests: 150 HUEs at 2 persons per HUE = 300 guests.
 - Staff: 1 staff per 10 guests = 30 staff.
- Per-capita flow allowances:
 - Guests: 220 L/person/day.
 - Staff: 50 L/person/day.
- Roof area = GFA / 7 (seven stories).

Light Industrial

- 1 person per 65 m².
- Roof area = GFA (Predominantly single-storey buildings).

3.2 Firefighting Requirements

The water supply network for the Beachlands South Project will be designed to meet firefighting requirements in accordance with SNZ PAS 4509:2008 – New Zealand Fire Service Firefighting Water Supplies Code of Practice. It is noted that this standard is in the process of being updated. Design will be in accordance with the updated standard.

Detailed design of the reticulation system will be undertaken by suitably qualified fire engineers to ensure that the required firefighting flows and pressures are achieved throughout the development.

In addition, sufficient reservoir storage will be provided to ensure that a dedicated emergency water volume is available for firefighting purposes for a minimum duration of 24 hours.

4 WATER SUPPLY AND DEMAND ASSESSMENT

A water supply-demand assessment has been undertaken to evaluate the overall water requirements for the proposed Beachlands South Project and to confirm that a reliable supply can be achieved to service the Project.

Demand calculations were carried out in the *Water Supply-Demand Balance – Beachlands South* spreadsheet (Appendix C), which incorporates development staging, land use, occupancy, GFA-based assumptions, and consideration of the AUP-OP Precinct I458 Beachlands South provisions.

4.1 Total Water Demand

The assessment indicates that the total water demand for the fully developed site is approximately 1,136 m³/day (average daily demand). This includes residential and non-residential activities across the development, including commercial, schools, hotel/conference centre, light industrial, golf, and community facilities.

4.1.1 Golf Course Demand

Bore abstraction records from the existing Formosa Golf Course indicate typical operational demands in the order of 150–200 m³/day.

For the Project, which includes a reduced 9-hole course, operational demands are anticipated to be in the order of 75–100 m³/day for irrigation of the golf course. This demand will be able to be supplied directly from the existing Formosa bore, untreated.

4.2 Water Supply Sources and Background Investigation

The servicing strategy identifies a combination of supply sources, including:

- PHLL bulk supply.
- The existing Formosa bore.
- The 620 bore and associated water take.

PHLL

The PHLL supply agreement between PHLL and BSLP provides approximately 765 m³/day of average daily supply.

Formosa Bore

The Formosa bore can supply a maximum annual volume of 42,000 m³/year under RC40351 (WAT60276020), which is equivalent to a daily annual take of approximately 115 m³/day. This amount will cover irrigation of the 9-hole golf course, with any remaining capacity allocated to contribute to the wider development potable supply if required. RC40351 expires on 31 December 2027 and will therefore require renewal to service the Project.

620 Bore

Based on the projected development demand and available supply from PHLL and the Formosa bore, the Project seeks resource consent for a groundwater take from the 620 bore to service the supply shortfall and to provide contingency capacity.

Aquifer mapping investigations undertaken for the 620 bore site have identified several viable bore locations, with Point 60 selected as the preferred location (refer Appendix D for the assessment of bore locations). The indicative location of the 620 bore is shown in Figure 2. The estimated yield for this bore is in the range of approximately 406-2,843 m³/day, with a sustainable yield of approximately 1,279 m³/day.

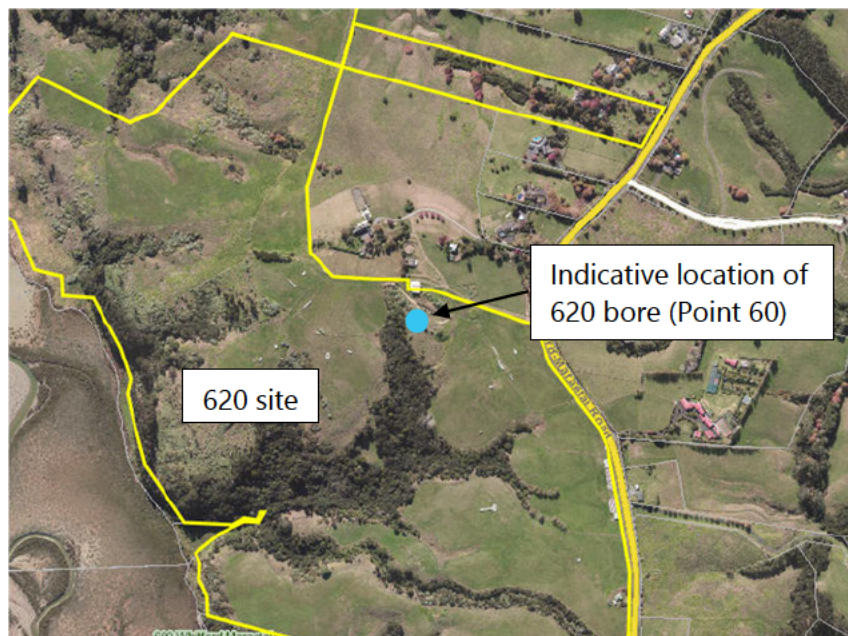


Figure 2: Proposed 620 Bore Location

The proposed consent conditions include:

- Testing requirements; and
- Thresholds that will need to be satisfied to confirm there is sufficient water supply and yield sustainability prior to the 620 bore coming online as a water supply source.

There is an existing permit (LUC60459433) for the 620 bore that was issued for testing purposes, however, this consent has not been implemented within the two-year lapse period. As such, the current application effectively seeks to re-consent the same bore at its previously approved location and to the same specifications.

The closest neighbouring bore is located approximately 57.3 m away from the 620 bore. Given the depth being drilled for the 620 bore (500–600 m below ground) and the design of the headworks, adverse effects on nearby bores are not anticipated.

The specifications for the 620 bore are summarised in Table 2.

Table 2: 620 Bore Specifications

CLASSIFICATION	SPECIFICATION
Bore ID	31755
Bore Depth (m)	600
Bore Casing Diameter (mm)	200
Casing Depth (m) and Material	275 Sch 40 Steel
Grouting Length (m)	275
Aquifer	Beachlands Greywacke
Bore Location	NZTM: 1778404 mE, 5913528 mN

A water take of up to 371 m³/day is proposed for the 620 bore. This equates to an annual water take of approximately 135,500 m³/year.

Under normal operating conditions, it is anticipated that approximately 256 m³/day would be required to supplement the PHLL and Formosa supplies. The additional consented volume provides operational flexibility and resilience, including the ability to respond to peak demand, variability in source performance, or constraints on the Formosa bore supply.

In the event that the supply from Formosa bore is subject to constraints, the 620 bore has sufficient projected yield to provide 371 m³/day (to cover any shortfall from any interruption to supply from the Formosa bore).

The available capacities and proposed sustainable supply volumes from each source are summarised in Table 3.

Table 3: Water Supply Capacity

WATER SUPPLY SOURCE	SUSTAINABLE SUPPLY VOLUME (m ³ /DAY)
PHLL	765
Formosa Bore*	115
620 Bore	371 [†]

Notes:

*Average daily supply volume shall remain at or under 115 m³/day in accordance with the consented maximum annual supply of 42,000 m³/year.

[†]Proposed consented take to cover shortfall and provide contingency capacity. Anticipated average use is approximately 256 m³/day when all sources are available.

4.3 Supply Adequacy Assessment

In summary, the total projected demand for the Project is 1,136 m³/day. The combined average sustainable supply from PHLL and the Formosa bore is approximately 880 m³/day (765 + 115), which results in a shortfall of approximately 256 m³/day.

This shortfall is addressed by the proposed 620 bore, for which a consented take of up to 371 m³/day is sought to provide both supply coverage and contingency capacity. The 620 bore has an estimated minimum yield of approximately 406 m³/day (refer Appendix D), which exceeds the anticipated average shortfall requirement.

Accordingly, even at the lower bound of the estimated supply capacity, the combined supply from all sources is sufficient to meet the total projected demand. The additional capacity from the 620 bore provides operational flexibility and resilience, including the ability to accommodate peak demand, variability in source performance, or the potential constraints on supply from the Formosa bore.

4.4 Rainwater Harvesting Contribution

For the purposes of this assessment, rainwater harvesting has not been relied upon as a primary supply source in demonstrating overall supply adequacy. However, it has been incorporated within the demand calculations to offset non-potable water demand across the development in accordance with the water supply efficiency standards of the I458 Beachlands South Precinct.

The demand modelling indicates that approximately 563 m³/day of rainwater could be collected from roof catchment areas across the development. This represents a significant supplementary source of water that will significantly reduce actual groundwater demand and improve the overall resilience of the water supply system.

5 CONCLUSIONS

The total water demand for the Beachlands South Development is estimated at approximately 1,136 m³/day. A water supply strategy has been developed comprising PHLL bulk supply, the existing Formosa bore, and a proposed new groundwater source on the 620 Whitford-Maraetai Road site.

PHLL can supply approximately 765 m³/day, while the Formosa bore provides approximately 115 m³/day, including potable supply and irrigation of the golf course. Aquifer mapping has identified potential bore locations at the 620 site, of which Point 60 is the preferred bore location. This location has an estimated yield ranging from 406 m³/day to 2,843 m³/day, and a sustainable yield of approximately 1,279 m³/day.

The combined supply from PHLL and the Formosa bore is sufficient to meet a substantial portion of demand, with a baseline shortfall of approximately 256 m³/day. This is to be supplied by the 620 bore and associated water take, for which a consented take of up to 371 m³/day is sought to provide both shortfall coverage and contingency capacity.

To provide resilience, a scenario has also been considered where the required supply would be fully met by PHLL and the 620 bore within the already proposed consented take of up to 371 m³/day. Given the significant estimated yield of the 620 bore, there remains sufficient capacity to meet total demand and provide contingency for peak demand and operational variability without requiring any increase to the proposed consent.

Rainwater harvesting, while not relied upon as a primary supply source for water supply-demand assessment, can provide a significant supplementary supply of approximately 563 m³/day. This will off-set non-potable demand across the development and improve overall system resilience.

The proposed multi-source supply strategy is therefore considered sufficient to provide a reliable and sustainable water supply for the development.

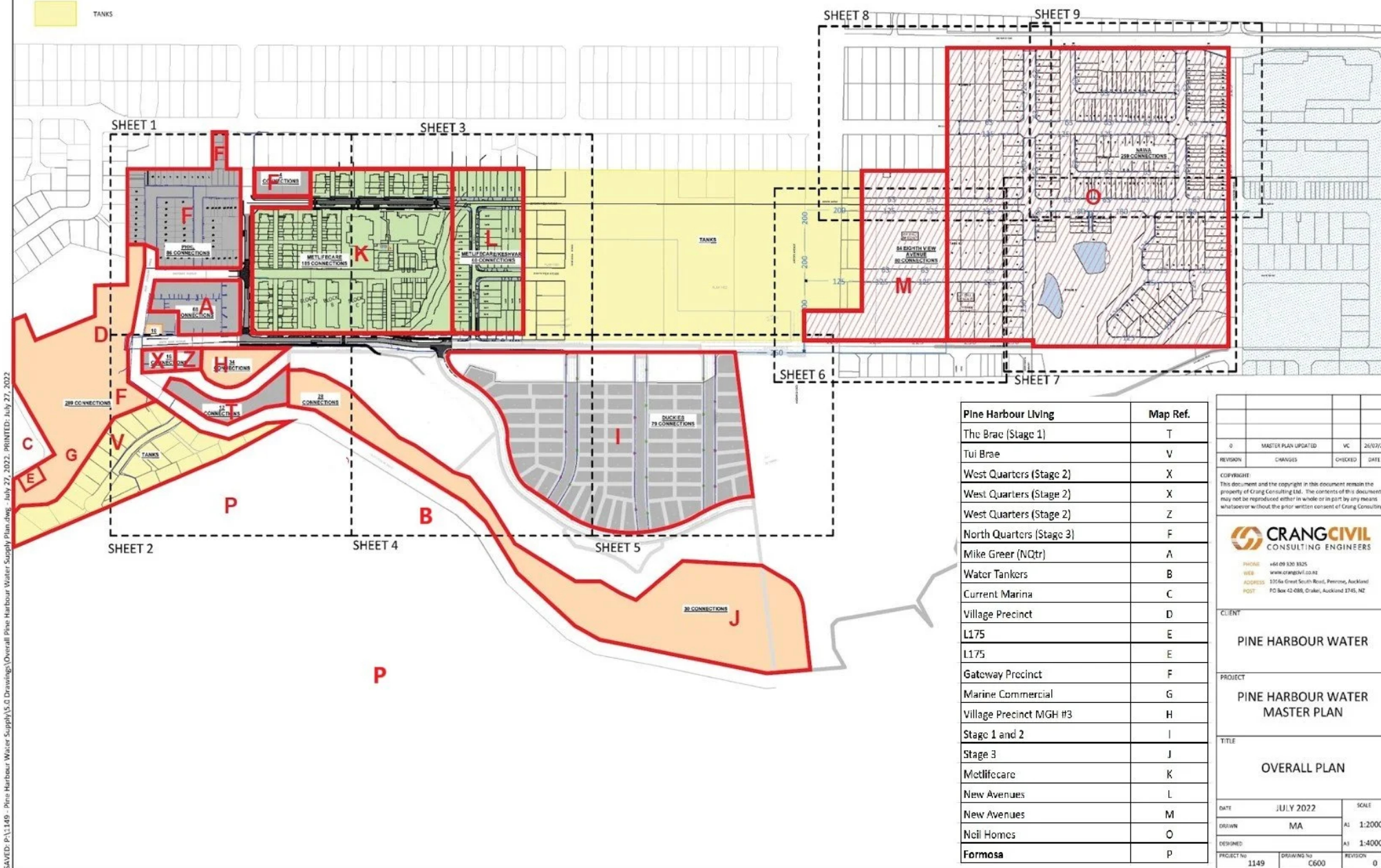
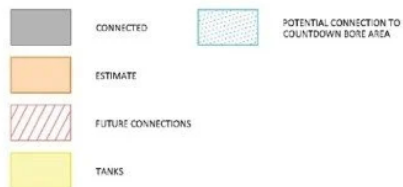
6 LIMITATIONS

This report has been prepared for the sole benefit of **Beachlands South Limited Partnership** as our Client, and their appointed representatives, according to their instructions, for the specific objectives described herein. It is intended to support the Panel in its decision making under the FTAA. This report is qualified in its entirety and should be considered in the light of our Terms of Engagement with the Client and the following:

- a. Data or opinions contained within the report may not be used in other contexts or for any other purpose without our prior review and written agreement. Any reliance will be at the parties' sole risk.
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- b. GWE has relied on information provided by the Client and by third parties to produce this document and arrive at its conclusions. GWE has not verified information provided (unless specifically noted otherwise) and we assume no responsibility and make no representations with respect to the adequacy, accuracy, or completeness of such information.

APPENDIX A
PINE HARBOUR LIVING LIMITED COVERAGE AREA

LEGEND



Pine Harbour Living	Map Ref.
The Brae (Stage 1)	T
Tui Brae	V
West Quarters (Stage 2)	X
West Quarters (Stage 2)	X
West Quarters (Stage 2)	Z
North Quarters (Stage 3)	F
Mike Greer (NQtr)	A
Water Tanks	B
Current Marina	C
Village Precinct	D
L175	E
L175	E
Gateway Precinct	F
Marine Commercial	G
Village Precinct MGH #3	H
Stage 1 and 2	I
Stage 3	J
Motlifcare	K
New Avenues	L
New Avenues	M
Noll Homes	O
Formosa	P

0	MASTER PLAN UPDATED	VC	26/07/22
REVISION	CHANGES	CHECKED	DATE
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 PHONE: +61 09 530 1825 WEB: www.crangcivil.co.nz ADDRESS: 170A Great South Road, Penrose, Auckland POST: PO Box 42-088, Orakei, Auckland 1745, NZ			
CLIENT			
PINE HARBOUR WATER			
PROJECT			
PINE HARBOUR WATER MASTER PLAN			
TITLE			
OVERALL PLAN			
DATE	JULY 2022	SCALE	
DESIGNED	MA	A1	1:2000
DESIGNED		A1	1:4000
PROJECT NO	1149	DRAWING NO	C600
REVISION			0

APPENDIX B

BEACHLANDS SOUTH DEVELOPMENT MASTERPLAN (AS OF 16/04/26)

Master plan - Work In Progress



Key

- Apartment
- Walk-up Apartment
- 4.5m Terrace lots
- 6.5m Terrace lots
- Duplex
- Standalone - Compact <300m²

- Standalone - Standard ~300m²
- Standalone - Large >500m²
- Coastal - Large lots >1000m²
- Village Centre
- Business - Mixed Use
- Business - Light Industrial

- Ecological (EPAN) Areas
- Open Space
- School
- Golf Course

APPENDIX C

WATER SUPPLY-DEMAND BALANCE

Assumption	Value
Rainwater Losses (evaporation, flush diverters etc)	17.5%
Rainfall (m) (including distribution vs storage)	1
Non-Potable Demand	56%
Potable Demand	44%

Data Type	Colour
Input - Provided	
Input - Assumed/Calculated	
Output - Calculated	

Table 6.1.b - Other facility design occupancy allowances

Other facility types		Design water flow allowance
Hospitals	Day facility (treatment facilities, wards)	320 Litres per bed per day
	Night and day facility (24-hour operation)	630 Litres per bed per day
	Staff	50 litres per employee per day
Child day-care	Children	45 Litres per child per day
	Staff	50 Litres per employee per day
School (day students)	Primary school	20 Litres per student per day
	Secondary school	25 Litres per student per day
	Staff	50 Litres per employee per day
School (boarding)	Secondary school	160 Litres per student per day
Student accommodation		160 Litres per person per day
Hotels and motels	Guests	200 Litres per room per day
	Staff	50 Litres per employee per day
Community halls and churches and/or facilities with intermittent use		12 Litres per seat per day

Table 6.2: Domestic Wastewater Flow Allowances - Per Capita

SOURCE	Typical Wastewater (Litres/Person/Day)
	On-site Roof Water Tank Supply
Permitted Activity Flow Allowances in the Auckland Region	
A. Up market/Luxury households with Extra Wastewater Producing Fixtures including fixtures such as garbage grinders; dishwashers, modern shower or bath facilities or other comparable fixtures [Note 4]	220
B. Households with Standard Fixtures including 11litre flush water cisterns; automatic washing machine and dishwasher [Note 5]	180 – 200
C. Households with 11/5.5 or 6/3 Flush Toilet(s) and Standard Fixtures, low water use dishwasher and NO garbage grinder [Note 6]	160
D. Households with 6/3 Flush Toilet(s) And Standard Water Reduction Fixtures and NO garbage grinder [Note 7]	145

Housing Typology		Gross Floor Area, GFA (m ²)				Occupancy		HUE	No. of Buildings	Total Roof Area (m ²)	Water Consumption Rate (		
Apartments	CM3	1542	2954	13033		2		114	3	3671	150		
	VC1	5736		1636		2		54	2	1501	150		
	VC3	2498	3201	5465		2		82	3	2518	150		
	VC4	3539	6996	6668	3751	2		150	4	3452	150		
	AT1	7403				2		130	5	9254	150		
	AT2	5827				2		240	4	5827	150		
	AT3	4514				2		17	1	1129	150		
	AT4	10586				2		23	1	2647	150		
	AT5	4972				2		11	1	1243	150		
Walk-up Apartments		1524				2		54	3	1524	150		
4.5 m Terrace Lot		101				2		55	55	2778	150		
6.5 m Terrace Lot		163				3		193	193	15696	150		
Duplex		163				3		18	18	1903	150		
Standalone Houses - Compact <300 m ²		189				3		51	51	9627	150		
Standalone Houses - Medium ~300 m ²		204				4		519	519	105876	150		
Standalone Houses - Large >500 m ²		334				4		88	88	29392	150		
Standalone Houses - Large Coastal >1000 m ²		465				4		26	26	12090	150		
Live/Work Units		196				1		42	42	4116	150		
Light Industrial		16323				250		-	-	16323	75		
School (Primary Students / Secondary Students / Staff)		10000				500	1600	140	-	-	4000	20	25
Hotel (Guests / Staff)		10711				2		30	150	-	1530	220	
Golf		-				-		-	1	2000	-		
Retail (50% Dry, 50% Wet)		15896				-		-	-	11127	8 (L/m ² /day)		
											TOTAL		

Flow Allowance
[Note 1 and Note 2]
Reticulated Community or Bore Water Supply
Region [Note 3]
220
200
180
165

6. Standard Fixtures include dual flush 11/5.5 or 6/3litre toilet cisterns, and includes standard automatic washing machine, but a low water use dishwasher, no garbage grinder.
7. Standard Water Saving Fixtures include dual flush 6/3litre toilet cisterns, and includes aerator faucets, shower flow restrictors, water conserving automatic washing machines and restricted, standard automatic washing machine and dishwasher, no garbage grinder. Further, a water meter is recommended and is a requirement in the Auckland Region for any systems with design flows based on allowances less than this level.

L/person/day)	Total Water Demand (m ³ /day)	Rainfall Collection (m ³ /day)	Non-Potable Rainwater Demand (m ³ /day)	Additional groundwater required for non-potable demand?
	34	8	19	Yes
	16	3	9	Yes
	25	6	14	Yes
	45	8	25	Yes
	39	21	22	Yes
	72	13	40	Yes
	5	3	3	Yes
	7	6	4	No
	3	3	2	No
	16	3	9	Yes
	17	6	9	Yes
	87	35	49	Yes
	8	4	5	Yes
	23	22	13	No
	311	239	174	No
	53	66	30	No
	16	27	9	No
	6	9	4	No
	19	37	11	No
50	17	9	10	Yes
50	68	3	38	Yes
	120	5	67	Yes
	130	25	73	Yes
	1136	563	636	-

Non-Potable Groundwater Demand (m ³ /day)	Potable Groundwater Demand (m ³ /day)	Total Groundwater Demand (m ³ /day)
11	15	26
6	7	13
8	11	19
17	20	37
1	17	18
27	32	59
0	2	3
0	3	3
0	1	1
6	7	13
3	7	10
13	38	51
0	4	4
0	10	10
0	137	137
0	23	23
0	7	7
0	3	3
0	8	8
0	7	8
34	30	64
63	53	115
47	57	104
237	500	737

APPENDIX D
AQUIFER MAPPING



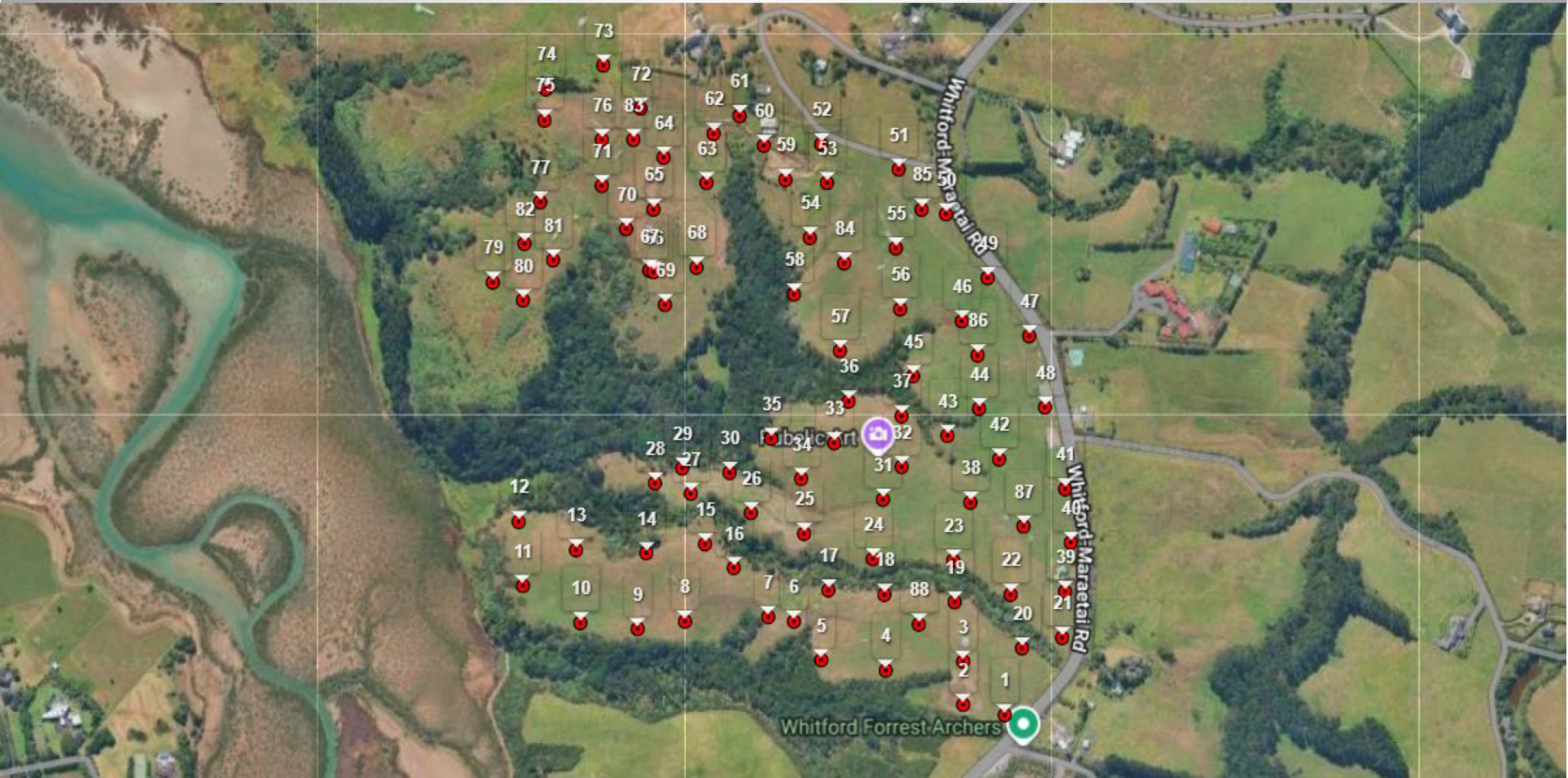
AQUIFER MAPPING

Geophysical Aquifer Modelling
Beachlands Survey
2025

Powered By

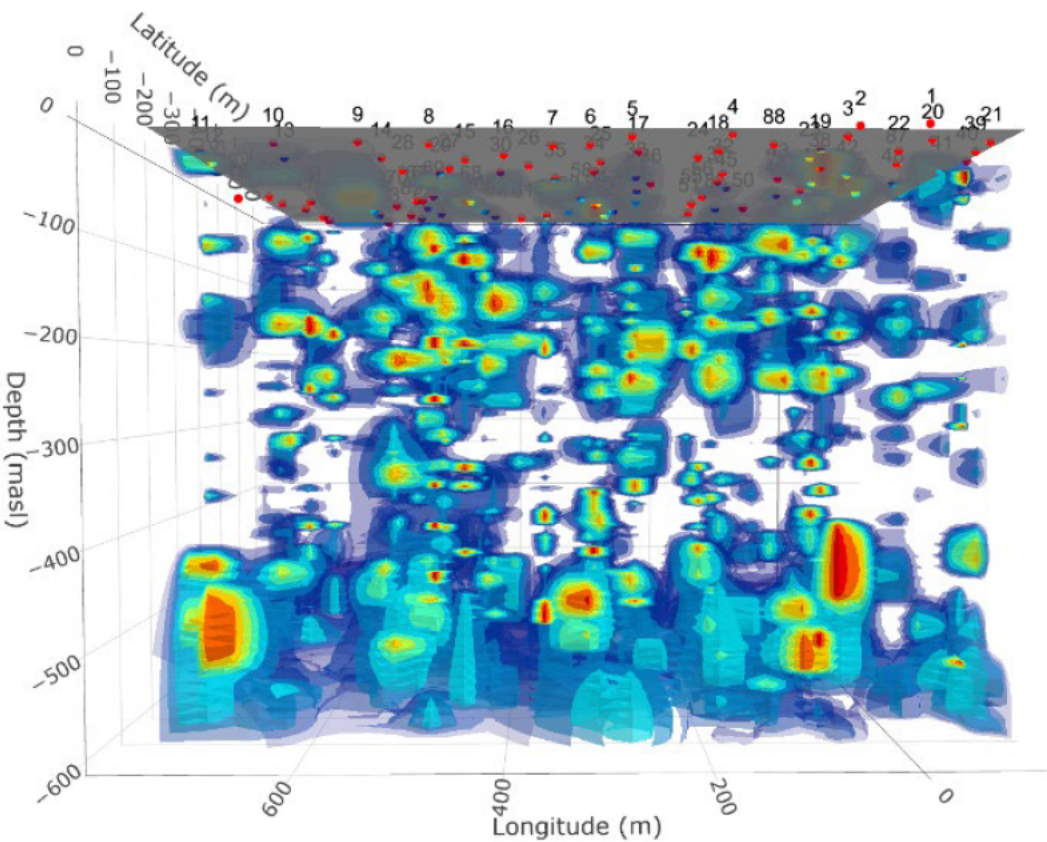
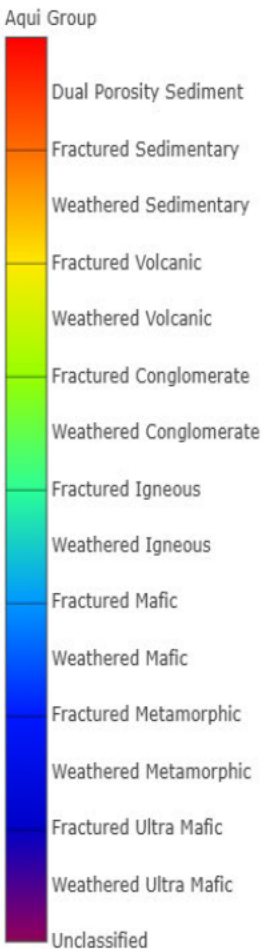
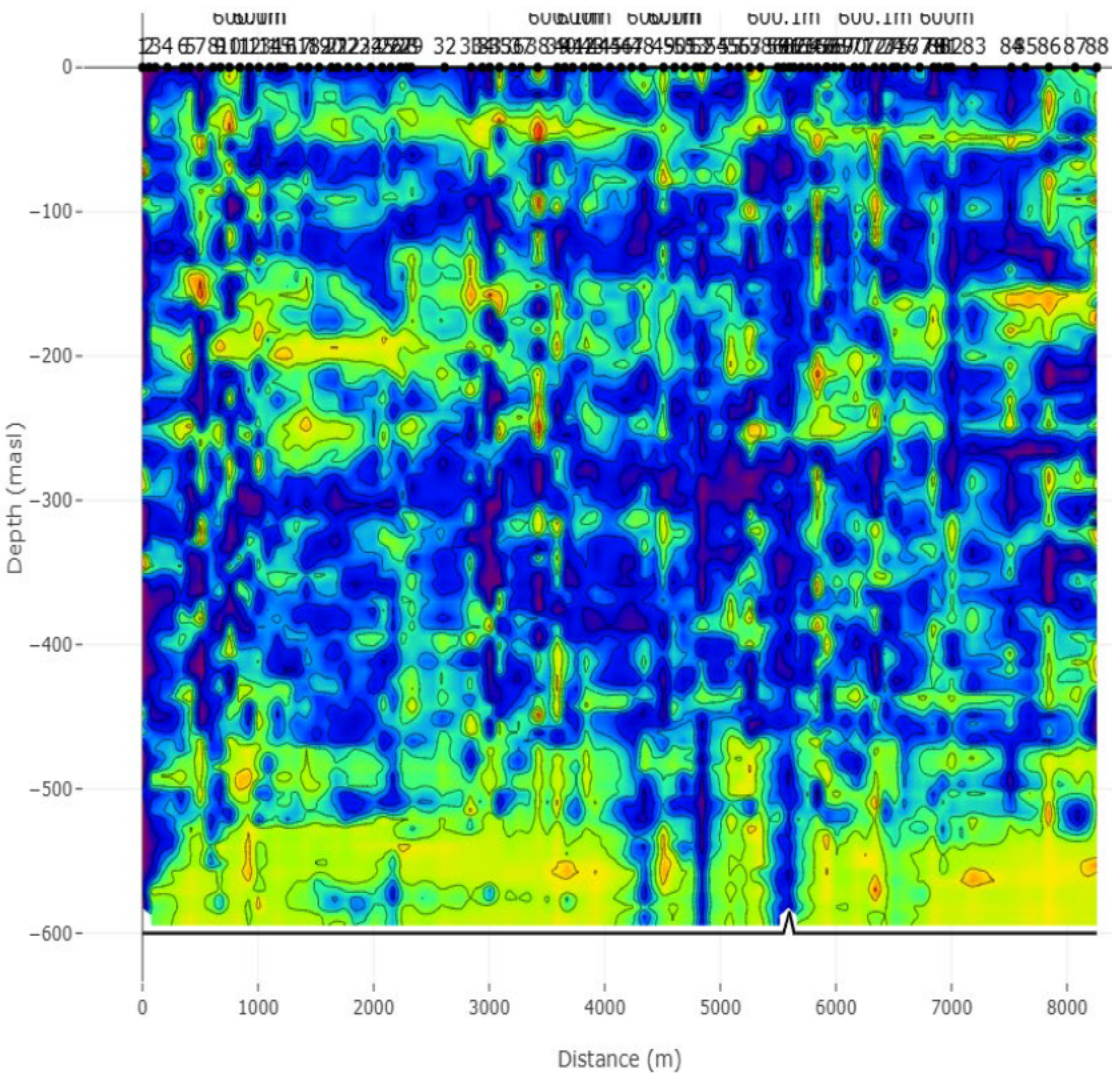


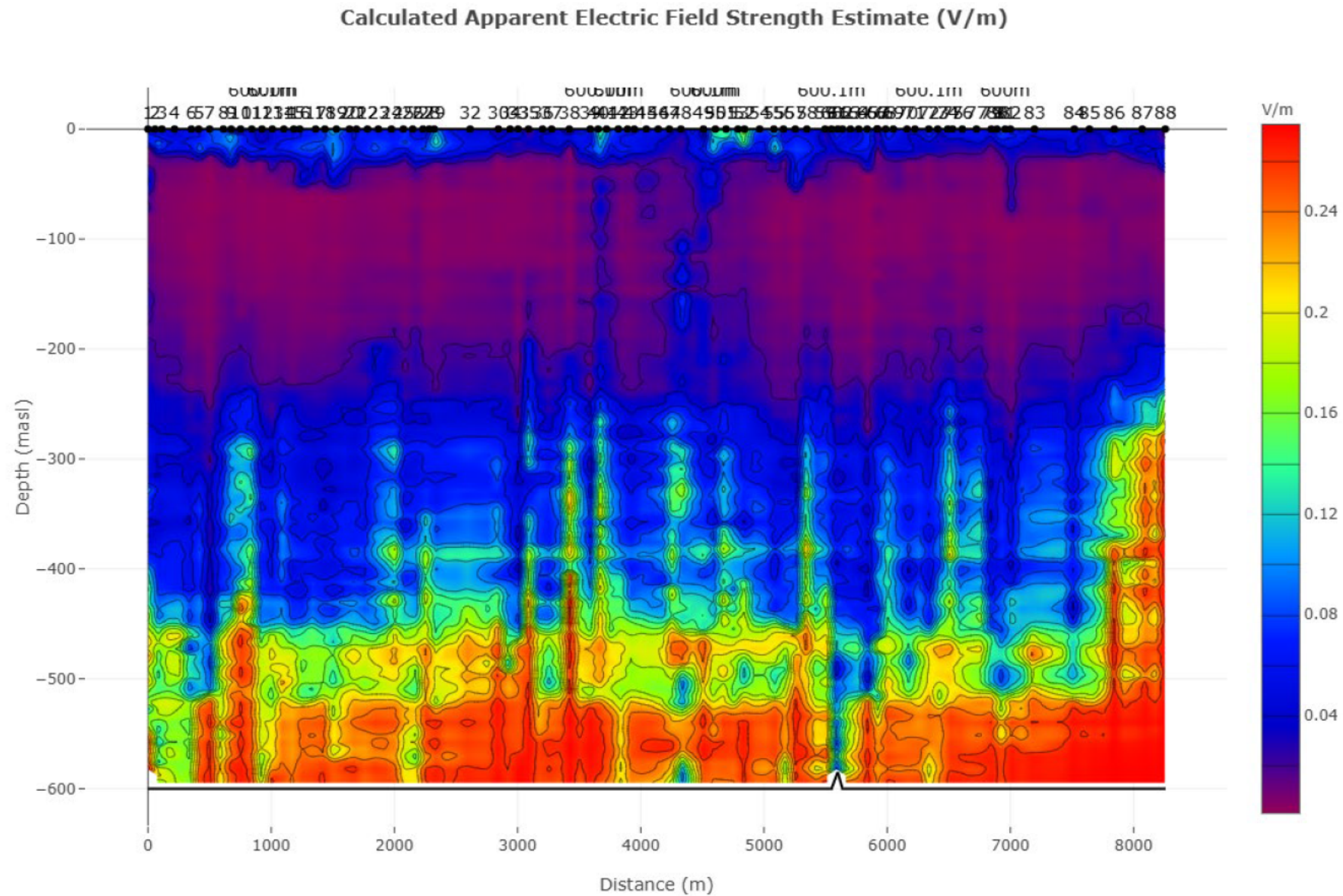
Survey Area



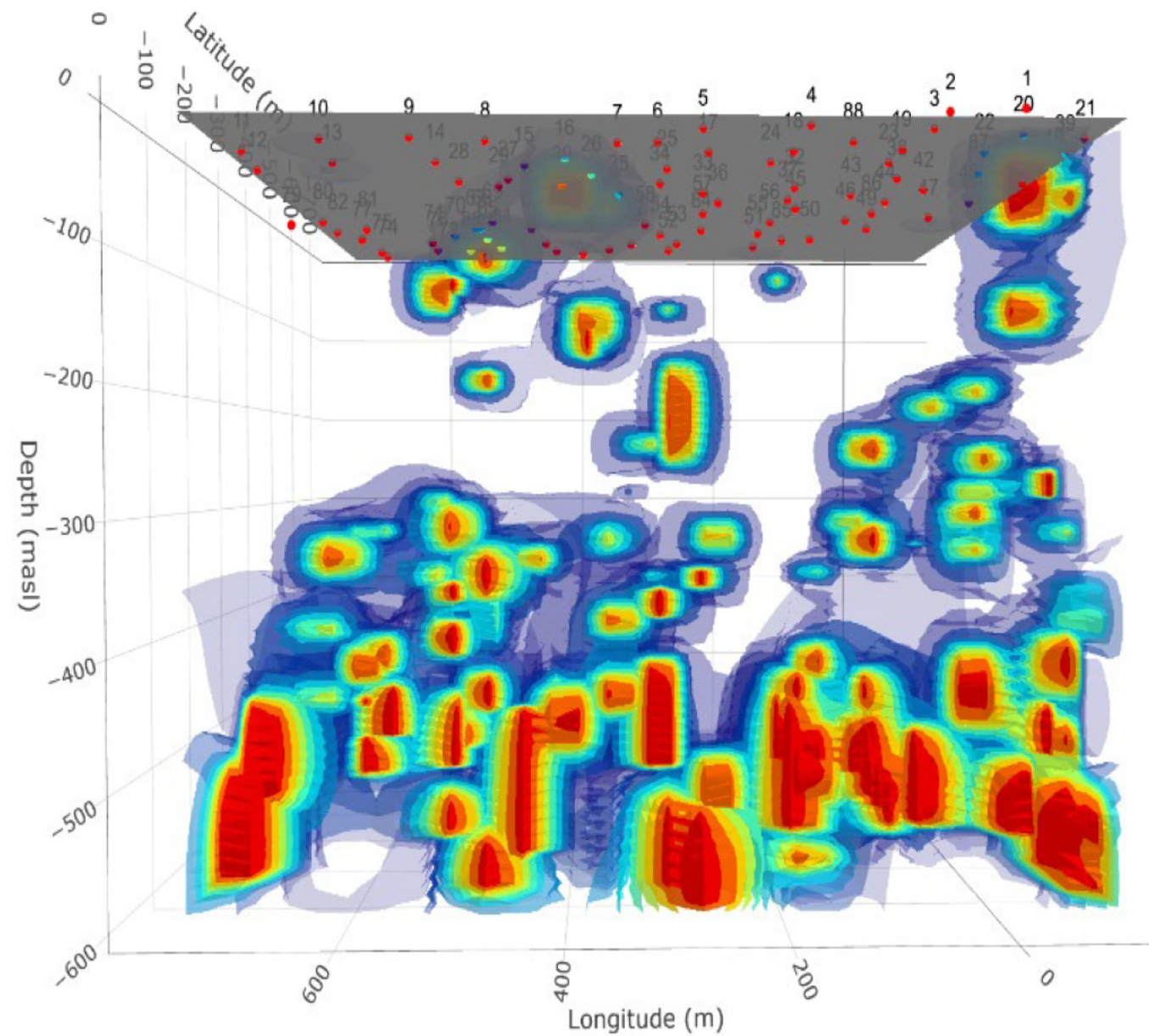
Aquifer Classification

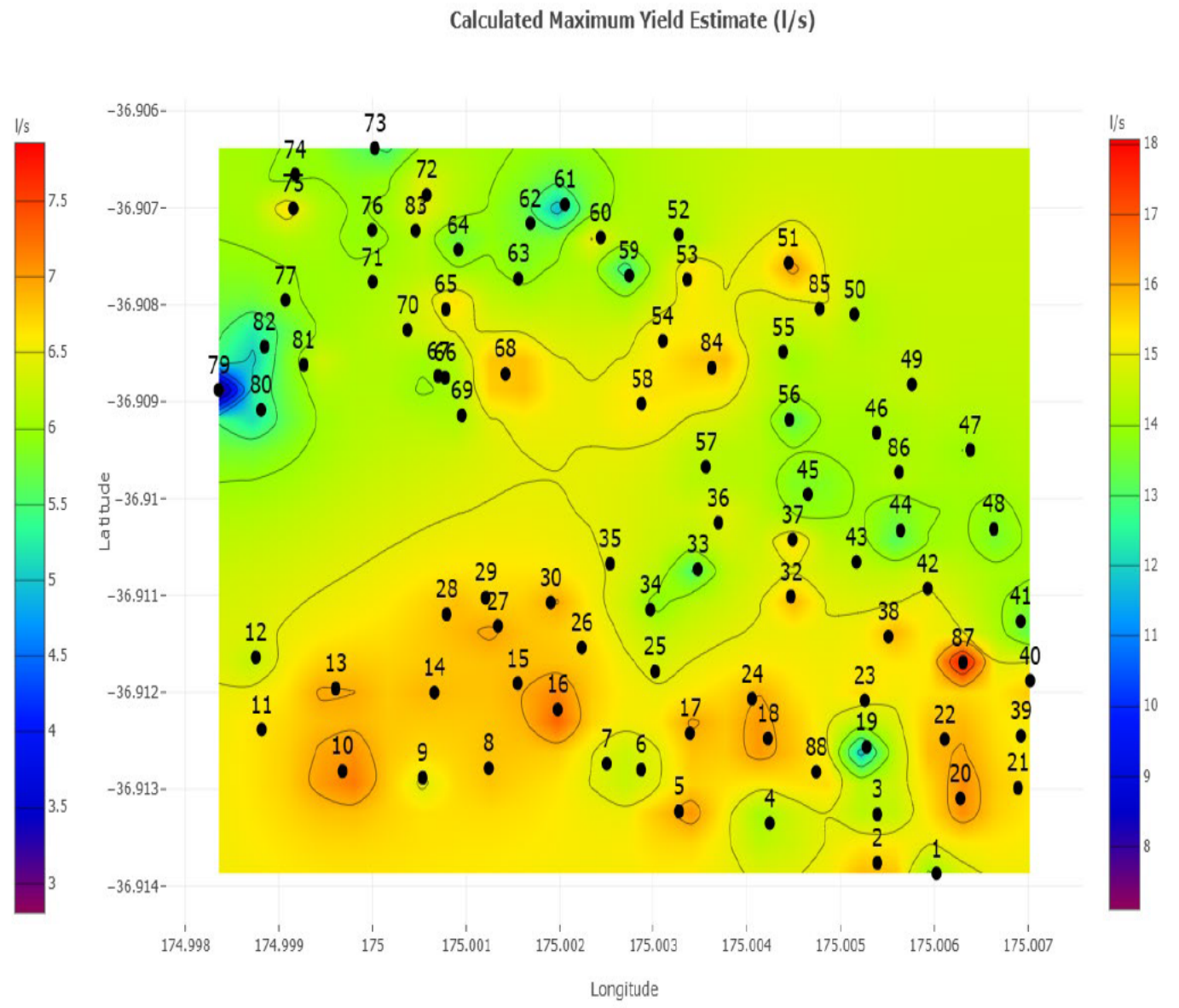
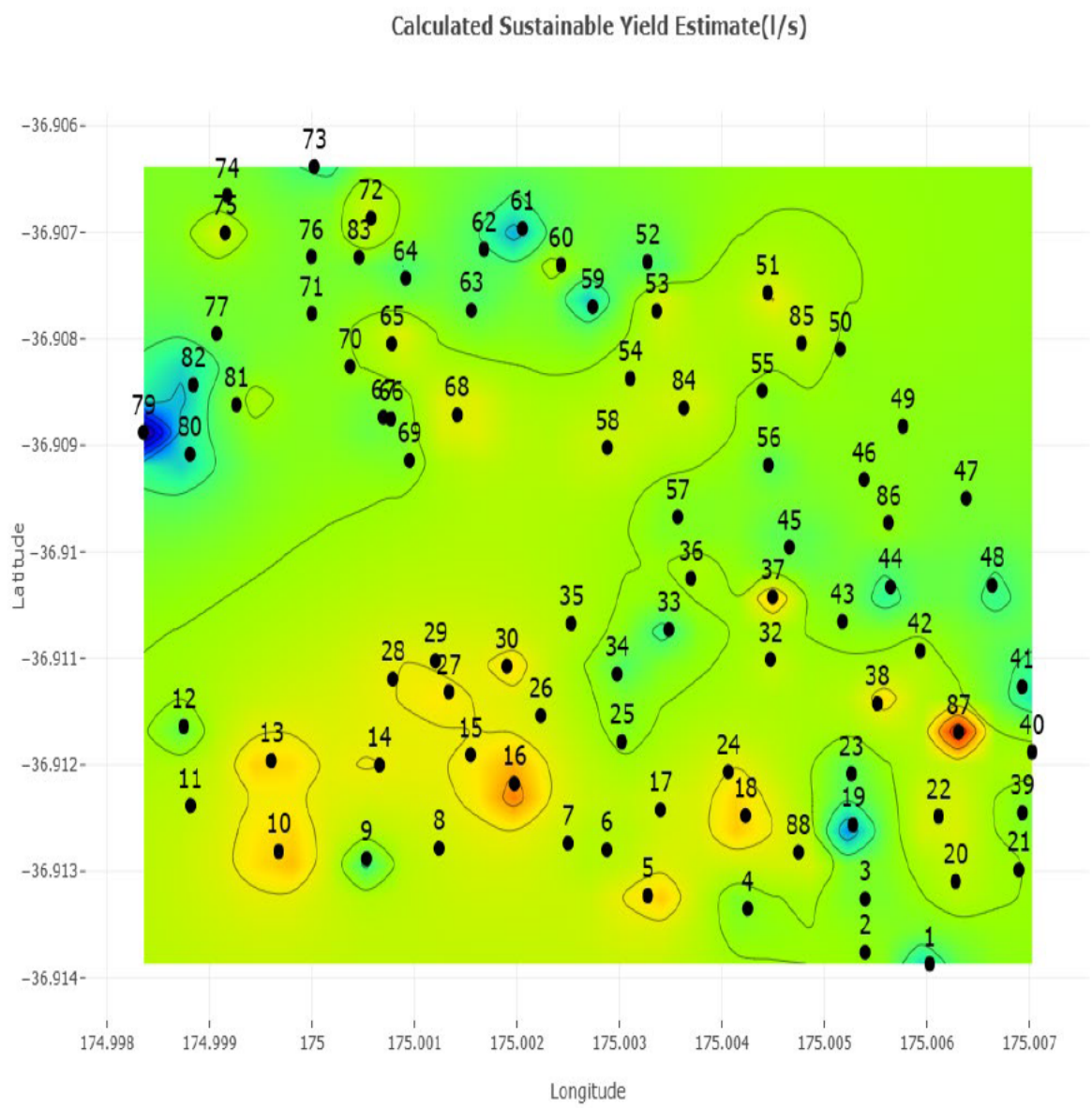
Calculated Aquifer Type Estimate

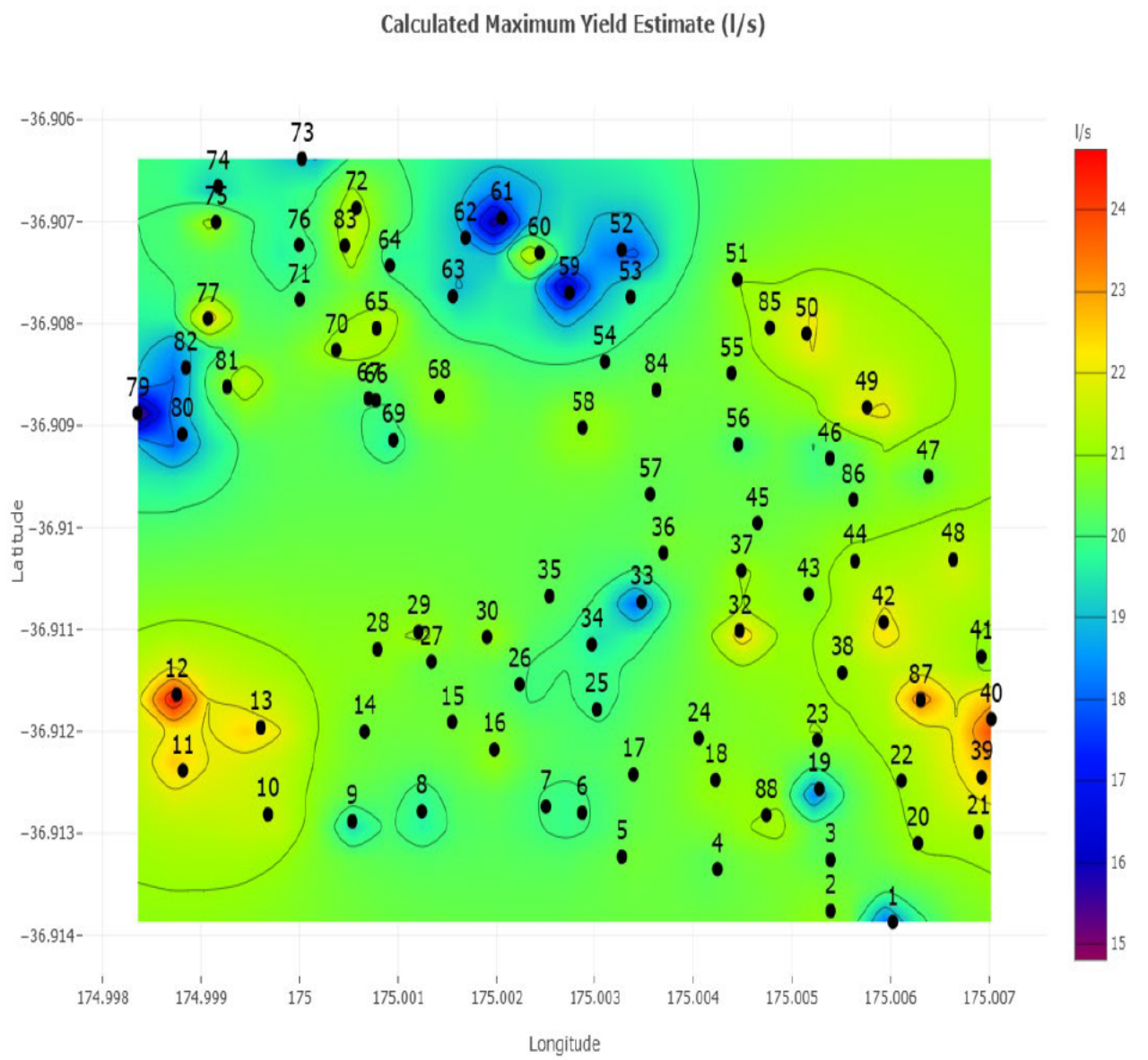
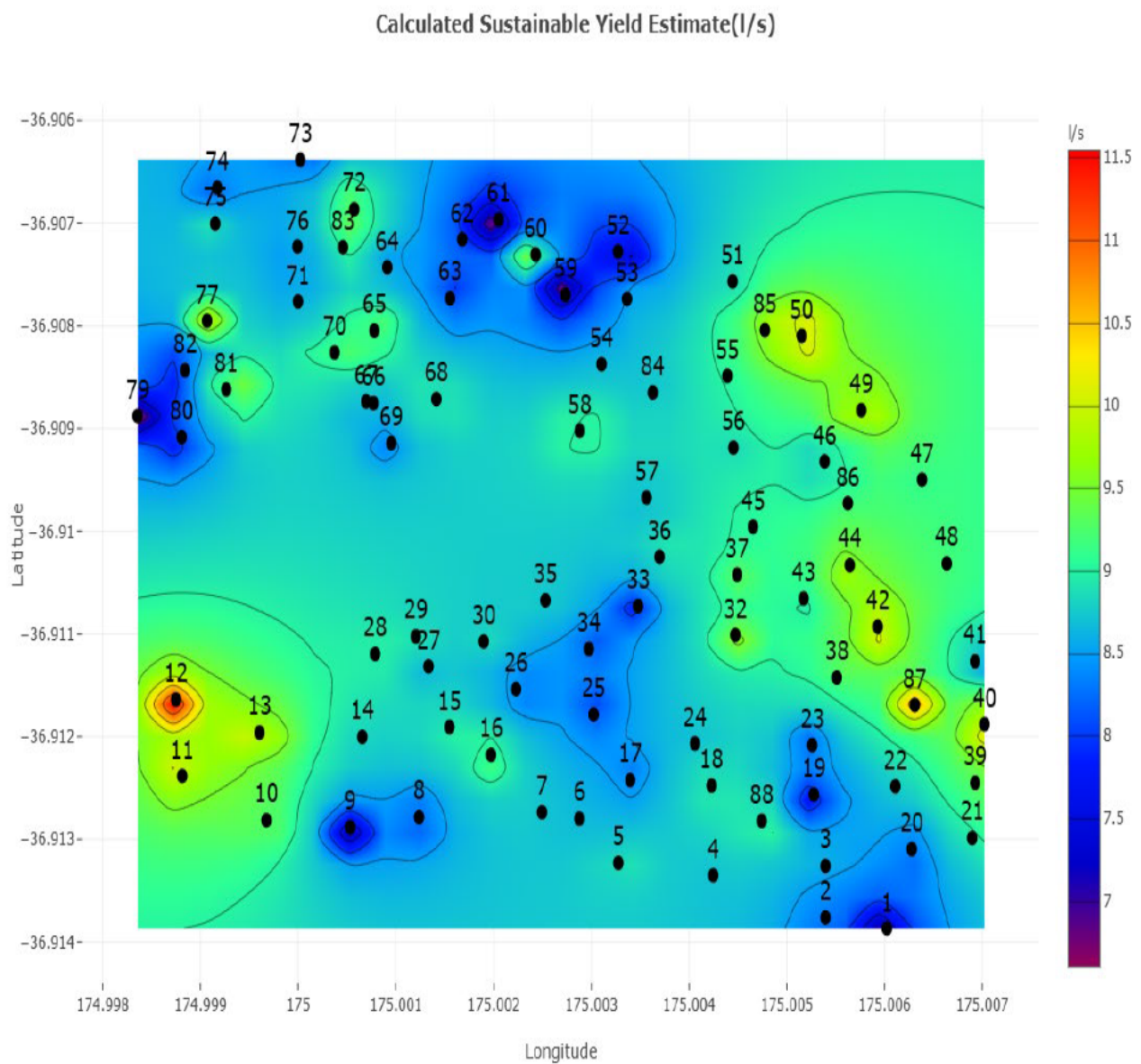




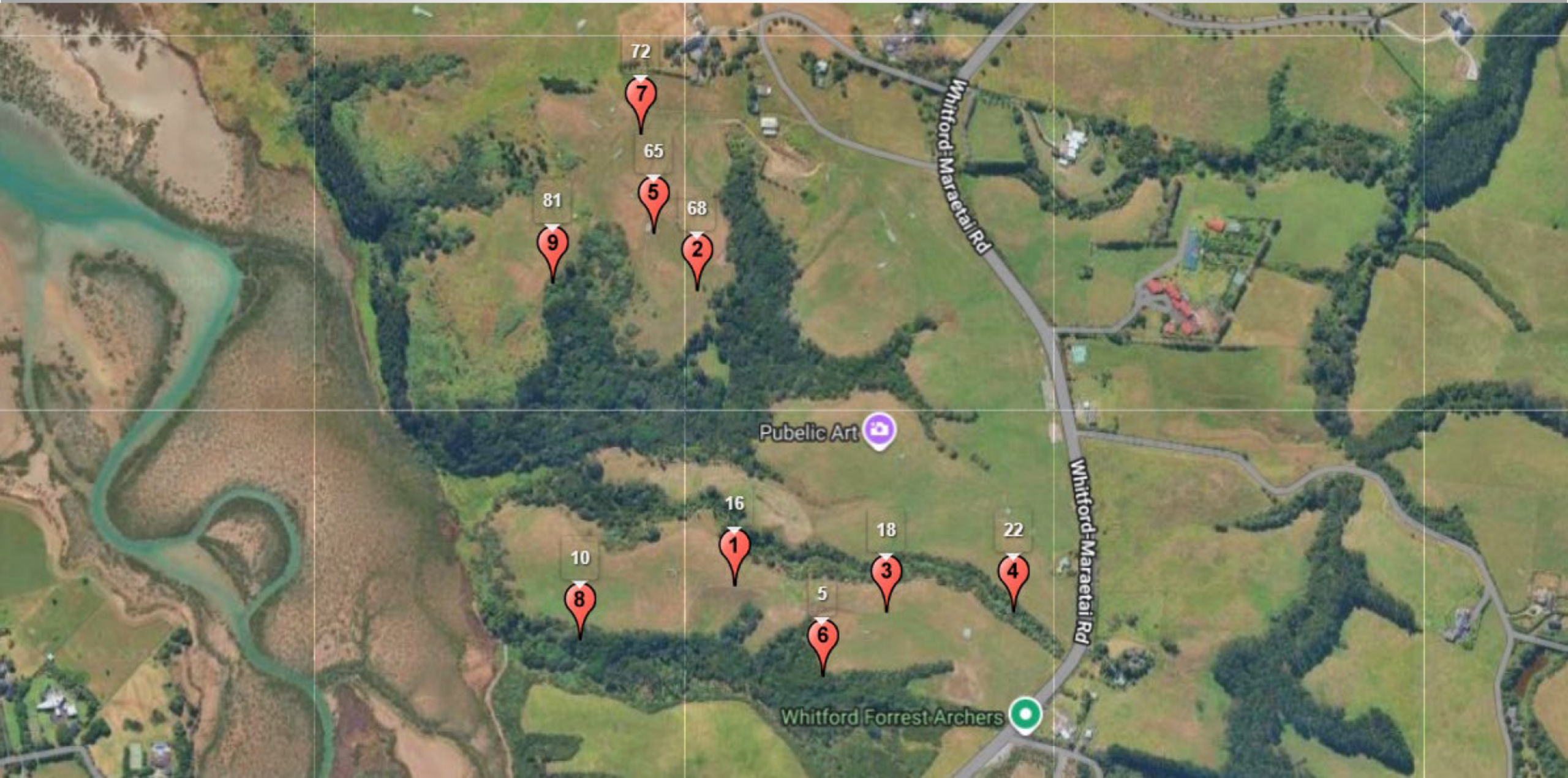
AQUIFER
MAPPING







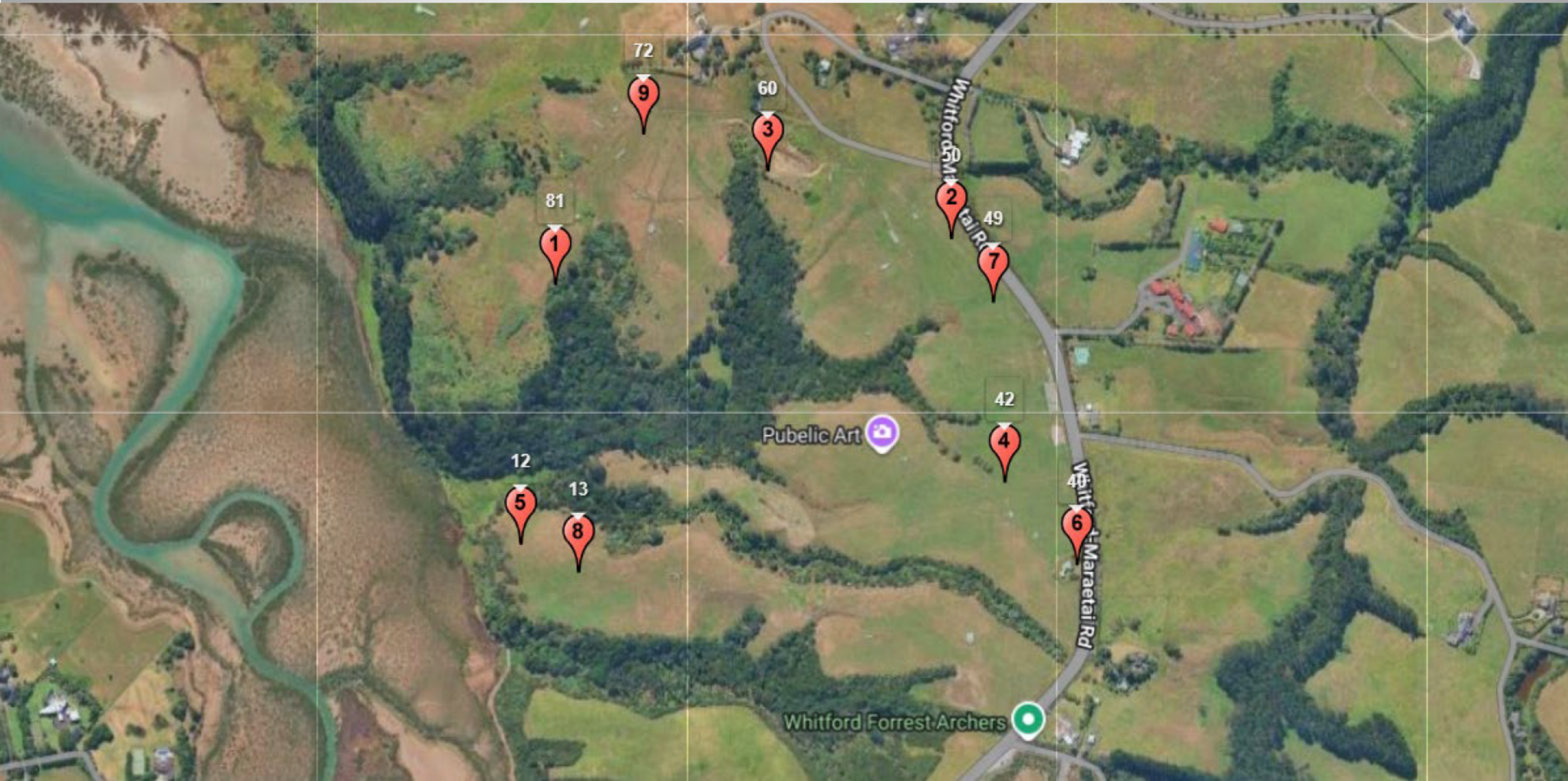
Recommendations 300m max drill depth



Recommendations 300m max drill depth

Rec No.	Point	Lat	Lon	Elev (masl)	Sust. yield (l/s)	Min yield (l/s)	Max yield (l/s)	Risk (%)	Interp. Confidence (%)
1	16	-36.912178	175.001974	0.0	11.5	3.7	24.2	52	44.9
2	68	-36.908714	175.001414	0.0	11.1	4.1	28	58	37.7
3	18	-36.912476	175.004229	0.0	10.9	3.3	22.9	52	40
4	22	-36.912483	175.006111	0.0	10	3.3	22.8	70	33.7
5	65	-36.908046	175.000779	0.0	10	3.5	22.8	60	39.1
6	5	-36.913229	175.003275	0.0	9.6	3.9	21.9	58	38.4
7	72	-36.906866	175.000573	0.0	9.6	3	21.1	60	41.7
8	10	-36.912814	174.999674	0.0	9.5	2.8	22	60	38.8
9	81	-36.908619	174.999264	0.0	9.3	3.5	21.4	52	41.4

Recommendations 600m max drill depth



Recommendations 600m max drill depth

Rec No.	Point	Lat	Lon	Elev (masl)	Sust. yield (l/s)	Min yield (l/s)	Max yield (l/s)	Risk (%)	Interp. Confidence (%)
1	81	-36.908619	174.999264	0.0	15.4	5.1	33	52	41.4
2	50	-36.908097	175.005152	0.0	15.1	4.7	28.5	52	43.8
3	60	-36.907305	175.002429	0.0	14.8	4.7	32.9	52	37.9
4	42	-36.910929	175.005931	0.0	14.6	5.1	28.3	52	41.6
5	12	-36.911639	174.998749	0.0	14.4	4.3	29.1	58	38.6
6	40	-36.911879	175.007024	0.0	14.2	4.2	33	70	34
7	49	-36.908822	175.005763	0.0	13.9	4.6	31.2	65	38
8	13	-36.911961	174.999604	0.0	13.4	5.4	28.2	52	42.7
9	72	-36.906866	175.000573	0.0	13.2	4.6	28.5	60	41.7

Contact Us

CHARLES ST. GISBORNE



Schedule a consultation

John McKendry
Managing Director