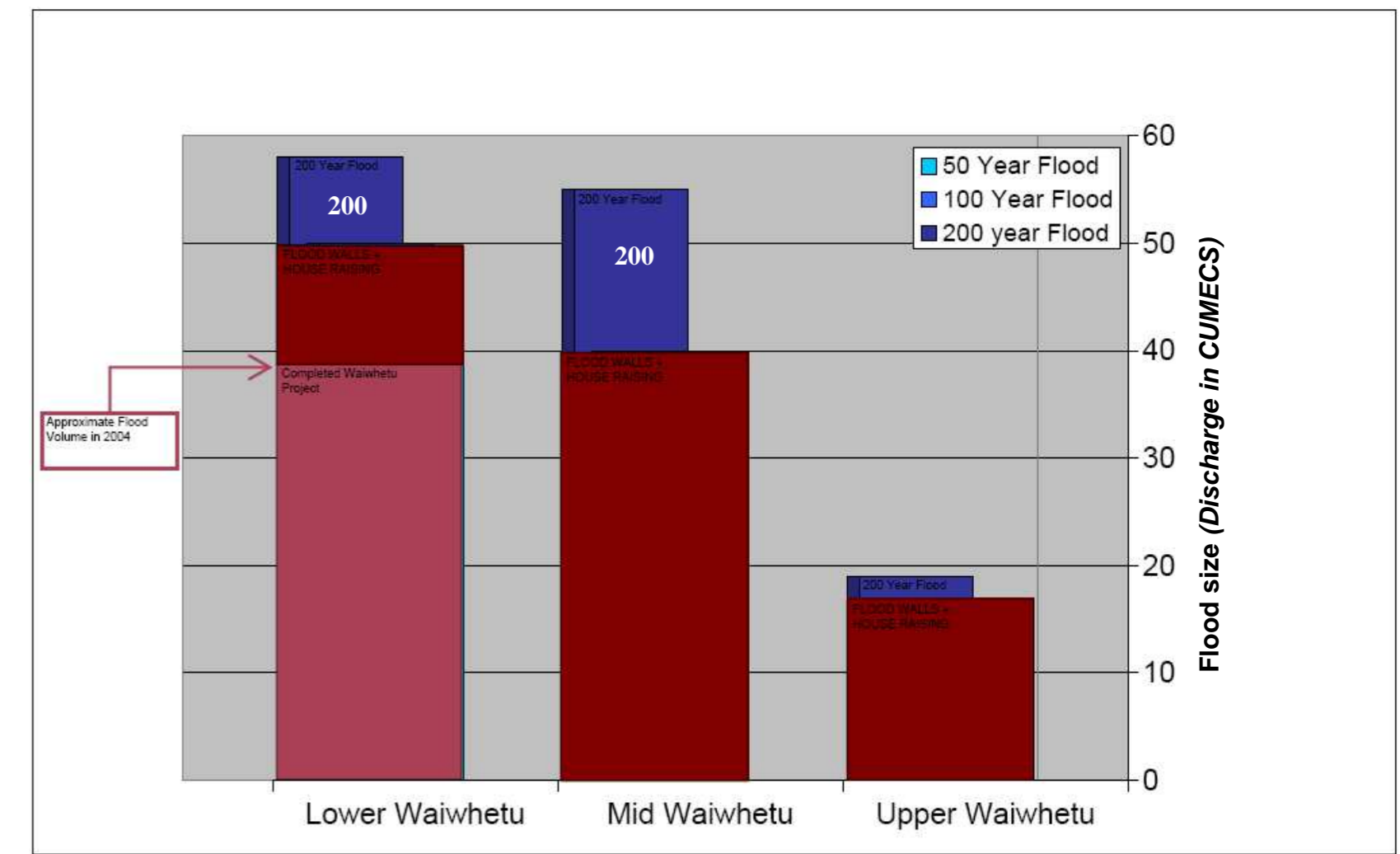
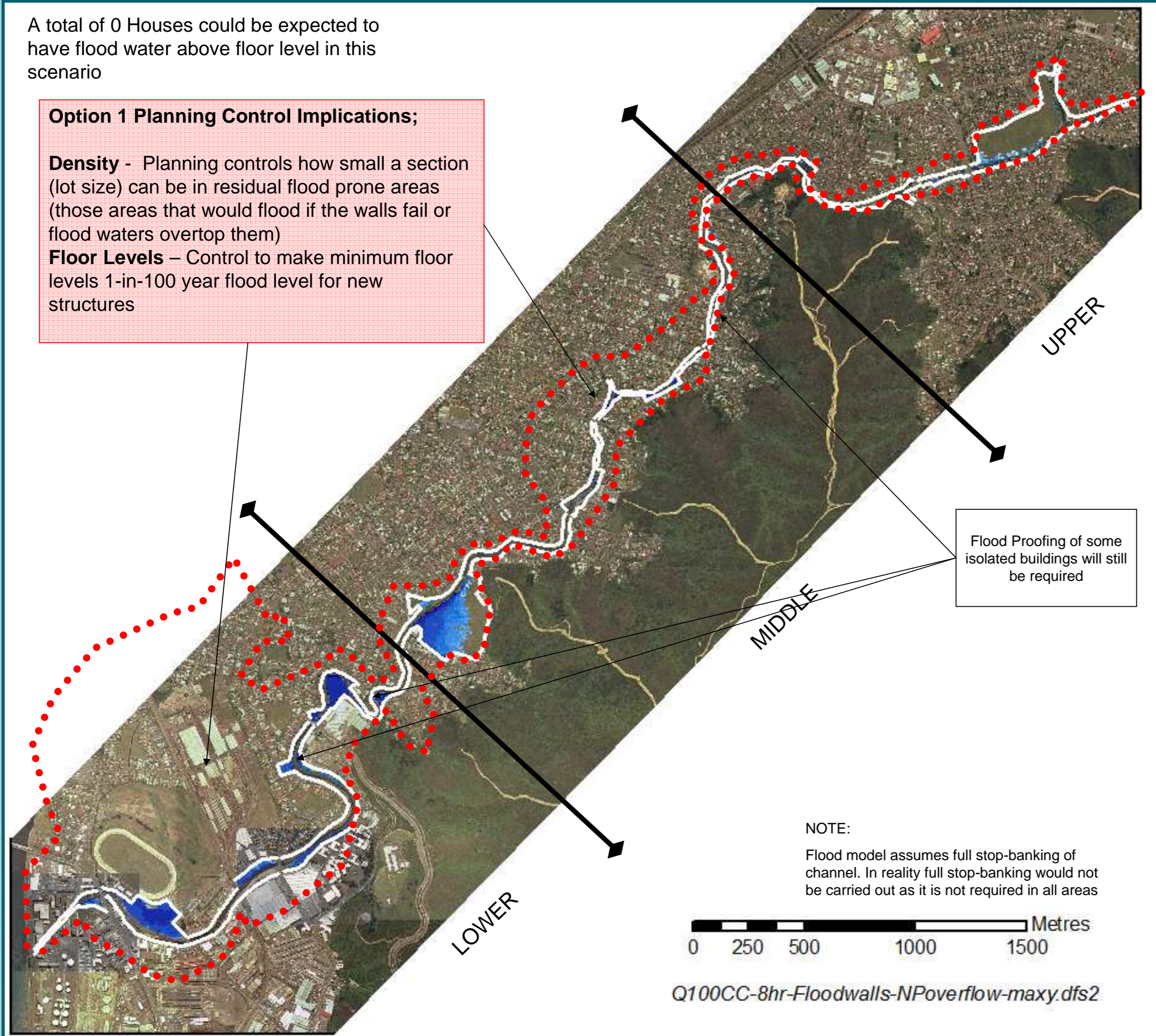


A total of 0 Houses could be expected to have flood water above floor level in this scenario

Option 1 Planning Control Implications;

Density - Planning controls how small a section (lot size) can be in residual flood prone areas (those areas that would flood if the walls fail or flood waters overtop them)

Floor Levels – Control to make minimum floor levels 1-in-100 year flood level for new structures



Option	Description	Estimated Cost
Lower Waiwhetu flood defences	Widening channel and building raised defences to protect against 100 year flood	\$18 Million
Mid Waiwhetu flood defences	Combination of flood walls, stop-banks and flood proofing of isolated properties to 100 year level	\$10 Million
Upper Waiwhetu flood defences	Raised defences to protect flooded properties along Waddington Drive to 100 year level	\$1 Million
Total capital cost		\$29 Million
Maintenance costs	\$0.25 Million p.a. [50 year lifetime]	\$13 Million
Environmental enhancement	Based on a 5% environmental expense cost of Hutt River FMP	\$2 Million

Total cost	\$46 Million
Direct damages saved (in a single 1-in-100 year event)	\$83 Million
Individual ratepayer cost p.a. per \$100,000 of property value (HCC ratepayers over a 20 year loan funded works repayment schedule)	\$24.65 p.a./\$100,000

Disclaimer;

All dollar values used are approximations and may change during further detailed investigation; Calculations use the 2007 dollar value; Direct damages saved only consider one occurrence of a 1-in-100 year flood event; Individual rate payer cost is a guideline only and may not reflect final rating values.

Option 1 - Structural Solution

Description – Structural flood management is designed to control and contain flood water up to a defined size of event.

Strengths - There is a certainty that protection is provided up to the designed level of protection. It is easy to see this form of flood management working and understand the benefits.

Weaknesses - Structures tend to be expensive to maintain. They don't control larger than design floods. Often results in more development behind protection works further increasing damage potential when failure occurs. Not easily adaptable to future climate changes. Often the structures used are visually intrusive and have adverse effects on the environment.

Waiwhetu Stream Floodplain Management Plan – Options Development



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