Milldale – Temporary Wastewater Treatment Plant

Assessment of Alternatives

This Report has been prepared to support the Milldale Wastewater Treatment Plant Project.

Fulton Hogan Land Development Limited (**FHLD**) has proposed a temporary wastewater treatment plant (**WWTP**) as part of the Substantive Application (**Application**) made under the Fast-Track Approvals Act (**FTAA**) in the event that there are short-term capacity constraints at the Army Bay wastewater treatment plant.

In the preliminary stages of the project, FHLD undertook an evaluation of any possible alternatives for the WWTP. The assessment of alternatives for the project has been carried out in two stages:

- **Stage 1:** Assessment of alternative methods and discharges to provide additional capacity within the wastewater network (the subject of this report)

- **Stage 2:** Once a preferred method was identified through Stage 1, detailed design and assessment has been undertaken by Apex Water (**Apex**) relating to the alternative methods for treatment and discharge of the wastewater into the receiving environment.

FHLD's primary objective in considering the alternatives was to ensure there is sufficient capacity within the wastewater network to accommodate the final stages of the Milldale development.

This document provides an overview of the preliminary alternatives considered under Stage 1. Following confirmation of the preferred option (Option F), site investigations and expert involvement has determined the proposed WWTP to be the most appropriate for the needs of the development.

The Stage 2 assessment, which informs the final design detail of the proposal, was then undertaken by Apex Water (**Apex**), as the WWTP design experts, and this is contained in **Appendix 4I.**

In summary, six alternatives were identified through this Stage 1 assessment. The options were then assessed against five impact categories, with a level of impact score assigned against each option ranging from very high adverse impact (-5), a neutral impact (0), to very high positive impact (5). Through this assessment, it was determined that the construction of a new temporary WWTP at Lysnar Road.

The following sections of this report outline:

- The options considered;
- Evaluation methodology; and,
- Evaluation of alternative options.

Options Considered

Eight alternative options have been identified and considered for the project. The eight options considered are outlined in **Table 1** below.

Table 1: Milldale Wastewater Project - Summary of Options

Option		Description
A	**Do nothing**	Relying on the existing treatment plant to service Milldale until it reaches capacity. Once the wastewater system is at capacity no new development can occur (unless wastewater is managed privately onsite) until Watercare upgrade the wastewater plant at Army Bay.
B	**Construction of a pipeline to be directed south to wastewater system that has capacity**	The construction of a large underground pipeline system to be directed south to the public wastewater system that has capacity to cater for future development.
C	**Wastewater holding tank and trucking to an offsite plant**	The construction of a large holding tank for wastewater. On a daily basis, the wastewater will be pumped into a truck, which will carry it to an existing offsite wastewater treatment plant that has capacity.
D	**Sealed wastewater system to service Stages 10 and 11 only**	A sealed wastewater system servicing future Stages 10 and 11. Stages 10 and 11 discharges will end at a proposed manhole next to the existing wastewater trunk manhole on Lysnar Road. This will not be connected until Army Bay WWTP upgrade works is complete. The wastewater discharge from these stages will be treated by a proposed private wastewater treatment facility on Lysnar road. The treated effluent will be pumped up to Milldale North and discharged through a large dispersal field. Refer to Sheet 1000.
E	**Treatment plant to service Stages 12 and 13 only**	A wastewater treatment plant to service stages 12 and 13. A pump-out facility can be constructed west of Milldale Stage 7. The wastewater will be pumped up to Milldale North, treated by a proposed private wastewater treatment facility, and discharged through a large dispersal field. Refer to Sheet 1001. Note this drawing showing location of pump out facility within Stage 7 as the plan was created prior to Stage 7 RC approval.
F	**Wastewater treatment plant at Lysnar Road**	Construction of a new wastewater treatment plant at Lysnar Road to cater for the final stages of the Milldale development. A new diversion pipeline is created on the existing trunk manhole within Lysnar Road property. The treated effluent from the new treatment facility will then be discharged via a land contact infiltration device (**LCID**).

Evaluation Methodology

The eight options considered for the Milldale WWTP have been evaluated. Each option has been assessed against its potential impacts.

The potential impacts have been assessed across five criteria, including:

- Construction (temporary impacts)
- Socio-economic
- Economic
- Natural environment
- Mana Whenua, Cultural Heritage, and Archaeology

A detailed description of each criteria is provided in **Table 2** below.

Across each criteria, a level of impact score has been assigned based on the anticipated level of impact, ranging from very high adverse impact (-5), a neutral impact (0), to very high positive impact (5). The impact scores used in the assessment are set out in **Table 3** below.

Table 2: Evaluation criteria used for the Milldale Wastewater Project options

Impacts	Description
Construction (temporary impacts)	Earthworks, noise, traffic generated, health and safety, timeframes, construction costs, including impacts on the environment, people and businesses from disruption from traffic, dust, noise, etc. Construction risks, complexity in the programme, etc.
Socio-economic	Impact on the future development of land (i.e underlying zoning, existing urban structure, future land use scenario). Scale of public/private land acquisition to deliver the option. Impacts on access to employment other communities or within the same community.
Economic	Estimate of likely value for money and future housing yield. Will there be an impact on existing economic opportunities that are anticipated for future development (consideration will be given to economic activities that will change because of planned land use development).
Natural Environment	Landscape and visual impacts associated with the design variants and associated external impact on the surrounding community. Will it impact the natural environment, character, and features (i.e streams, vegetation, underlying topography, underlying zoning if it is residential). The impact of operational stormwater in regard to quantity and quality (including life supporting capacity). Provide the extent of effects on the ecological function (i.e significant indigenous vegetation, significant habitats of indigenous fauna, indigenous biodiversity, stream ecology).
Mana Whenua, Cultural Heritage, and Archaeology	Identification of cultural issues or any other matter related to an option. The extent of effects on the relation of Māori to their culture and traditions with their ancestral lands, water, sites waahi tapu, and other Taonga (tangible and intangible). Extent of effects on sites and places of valued heritage buildings and places, archaeological value, and cultural heritage value.

Table 3: Criteria used for the Milldale Wastewater Project options

Score	Level of impact
-5	Very high adverse impact
-4	High adverse impact
-3	Moderate adverse impact
-2	Low adverse impact
-1	Very low adverse impact
0	Neutral impact
1	Very low positive impact
2	Low positive impact
3	Moderate positive impact
4	High positive impact
5	Very high positive impact

Evaluation of Alternative Options

The assessment of the eight alternative options, and associated impact scores is summarised in **Table 4** below.

It has been determined that Option F represents the best solution, proposing a WWTP on Lysnar Road to service the development.

Table 4: Assessment of Alternatives - Milldale Wastewater Project

Option	Overall Impact Score	Construction Impacts	Socio-economic Impacts	Economic	Natural Environment	Mana Whenua, cultural heritage, archaeology
A	-2	▪ No construction impacts as no works would be proposed. **0**	▪ No ability for currently developing lots to be completed when the system is at capacity. **-5**	▪ The worst-case scenario would be completing halting development due to capacity constraints. ▪ Existing and future residents are majorly affected by capacity issues. **-5**	▪ No impact as no works would be proposed. **0**	▪ No impacts as no works proposed. **0**
B	-5	▪ Extended earthworks time and increased complexity, given the extent of the pipeline likely required to reach a system with capacity. ▪ Major disruptions to property and/or state highways. **-5**	▪ Significant adverse impact upon a large number of stakeholders. **-5**	▪ Project cost-to-benefit ratio would not stack up in terms of economics. **-5**	▪ Multiple ecosystems and natural environmental features likely to be crossed. ▪ Significantly challenging to manage. **-5**	▪ Multiple Iwi boundaries would likely be crossed. ▪ Multiple archaeological sites likely encountered. ▪ Potential heritage items to manage given the lack of information for the pipeline route. **-5**
C	-3.2	▪ Construction would be limited to the area for the holding tank, but the pipe system would be extensive throughout the reserve area (most likely). ▪ Potential groundwater issues if an underground tank option is required. **-2**	▪ Trucking requirements daily/weekly would have moderate adverse impacts on surrounding persons. ▪ Noise/Odour considerations required on an ongoing basis re: maintenance. **-3**	▪ Concerns regarding ongoing cost and maintenance of structures and pipes. ▪ Concerns regarding property values both within Milldale and surrounding areas. ▪ Concerns regarding the size of the tank and ability to service the majority of Milldale. **-4**	▪ Depending on the location of the holding tank, there may be concerns regarding noise, odour, flora/fauna removal, discharge concerns, etc. ▪ Concerns regarding contamination of tank area long-term. It would require careful ongoing management. **-3**	▪ A holding tank would likely be a temporary solution and one that would require less involvement in terms of Iwi engagement. However, depending on the location, ongoing engagement with surrounding persons, complaint management, and odour/noise/traffic management may be required. **-4**
D	-2.4	▪ Earthworks will extend beyond the Lysnar Road and the subject site and across a main intersection, requiring temporary road closure. Consultation with AT required. ▪ Construction programme will increase in time and complexity. It will require more extensive traffic management. -3	▪ Limited works within an undeveloped site. Limited impact on surrounding land uses. ▪ Good infiltration and appropriate treatment of wastewater should still allow for future development of land for residential purposes. However, zoning may be affected as a result of works. ▪ Concerns that a new WWTP may perceive to de-value surrounding properties. -3	▪ This option only allows for wastewater capacity of future Stages 10 and 11. Does not resolve issue for existing and future planned stages. ▪ Concerns that WWTP may devalue surrounding properties. ▪ Concerns that perception of site being used for dispersal field may affect future development potential. ▪ Construction of WWTP will provide economic benefit by way of job creation. 0	▪ Concerns on proximity of nearby streams. Possible wetland. Will require ecology specialist. ▪ Location of proposed WWTP at a low point of the topography and possibly well screened by existing vegetation. ▪ Vegetation removal possible along pipeline pathway. To be managed with stakeholders and good consultation required with vegetation owners. ▪ Concerns of soil structure and composition. Will require specialist input to confirm water quality. -2	▪ Concerns regarding the relation of Mana Whenua to the land and nearby streams. ▪ Need to address the streams in the area and outline the water quality/quantity involved. ▪ Known archaeological markers in the wider area of proposed works. Small risk of uncovering unknown archaeological remains. ▪ Little to no risk of heritage buildings and structures being impacted. ▪ Iwi consultation required. -4
E	-2.8	▪ Pipeline will extend across Wainui Road. Consultation with AT required. ▪ Construction programme will increase in time and complexity.	▪ Limited works within an undeveloped site. Limited impact on surrounding land uses. ▪ Good infiltration and appropriate treatment of wastewater should	▪ This option only allows for wastewater capacity of future Stages 12 and 13. Does not resolve issue for existing and future planned stages.	▪ Concerns on proximity of nearby streams. Possible wetland. ▪ Location of proposed WWTP at a higher point of the topography and will be highly visible. Greater	▪ Concerns regarding the relation of Mana Whenua to the land. ▪ Need to address the streams in the area and outline the water quality/quantity involved.

		Will require more extensive traffic management. ▪ Additional infrastructure required with multiple pump stations to be constructed.	still allow for future development of land for residential purposes. However, zoning may be affected as a result of works. ▪ Concerns that a new WWTP may perceive to de-value surrounding properties.	▪ Concerns that WWTP may devalue surrounding properties. ▪ Concerns that perception of site being used for dispersal field may affect future development potential. ▪ Construction of WWTP will provide economic benefit by way of job creation.	screening via vegetation and good urban/landscape design required. ▪ Vegetation removal possible along pipeline pathway. To be managed and good consultation required with vegetation owners. ▪ Concerns over stream ecology. ▪ Concerns of soil structure and composition.	▪ Known archaeological marker in the area just beyond area of proposed works. Risk of uncovering unknown archaeological remains further afield. ▪ Little to no risk of heritage buildings and structures being impacted. ▪ Iwi consultation required.
		-4	**-3**	**0**	**-3**	**-4**
F	**-1.6**	▪ Earthworks will be limited to Lysnar Road, the Lysnar Road WWTP site and the location of the existing man-hole for the diversion channel. ▪ Shortest construction timeframe. ▪ Minimal construction traffic impacts given only one road affected. ▪ Construction programme straightforward given limited nature of works within a smaller area.	▪ Limited works within an undeveloped site. Limited impact on surrounding land uses. ▪ Good infiltration and appropriate treatment of wastewater should still allow for future development of land for residential purposes. However, zoning may be affected as a result of works. To manage carefully. ▪ Concerns that a new WWTP may perceive to de-value surrounding properties.	▪ This option allows for the greatest catchment of wastewater to be provided for throughout Milldale. ▪ Concerns that WWTP may devalue surrounding properties. ▪ Concerns that perception of site being used for LCID may affect future development potential with regards to contamination – ongoing monitoring would be required to ease concerns. ▪ Construction of WWTP will provide economic benefit by way of job creation.	▪ Concerns on proximity of nearby streams. Possible wetland. Will require ecology specialist. ▪ Location of proposed WWTP at a low point of the topography and possibly well screened by existing vegetation. ▪ Vegetation removal possible along pipeline pathway. To be managed with stakeholders and good consultation required with vegetation owners. ▪ Concerns of soil structure and composition. Will require specialist input to confirm water quality.	▪ Concerns regarding the relation of Mana Whenua to the land and nearby streams. ▪ Need to address the streams in the area and outline the water quality/quantity to land involved. ▪ No known archaeological markers in the immediate area of proposed works but always a small risk of uncovering unknown archaeological remains. ▪ Little to no risk of heritage buildings and structures being impacted. ▪ Iwi consultation required.
		-2	**-3**	**2**	**-2**	**-3**