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Subdivision Application – RM240388-389

Seven Oaks Kinloch Ltd – Otaketake Drive and Kahikatea Drive, Kinloch

Engineering Assessment

1) Preliminary

- a. My name is Michael Keys. I have been engaged by Taupō District Council (TDC) to report on the servicing and engineering aspects of the 83 lots subdivision proposed by Seven Oaks Kinloch Ltd. By way of background, I was previously employed by TDC, and held the position of District Engineer for 13 years until 2006. Since that time, I have been involved with various subdivisions around the district as advocate for TDC, and also worked with a number of Developers.
- b. I can confirm that I have read and that I understand the Code of Conduct for Expert Witnesses and that I agree to comply with it.
- c. I am aware of planning processes which have preceded this application, including the Kinloch Community Structure Plan process. This report concentrates on the aspects of servicing and the engineering demands that would be created should the application be approved which is my area of expertise. I have had extensive discussions with TDC's Asset Managers over recent months in the preparation of this report. The report makes an assessment as to whether the anticipated demands generated by the Proposal can be met by the existing and proposed infrastructure in the area.

2) Executive Summary

Having assessed RM240388-389, both the application and the public submissions, I believe that all the servicing and infrastructure matters have been identified, and all have been (or will be) addressed satisfactorily. I do not believe that there are any engineering issues that should prevent this subdivision application being approved.

3) The Proposal

- a. Seven Oaks Kinloch Ltd propose to subdivide 3 titles described as "The Balance Land" into 83 residential lots (and associated reserves and roading) in stages 9-13 as a continuation of earlier stages completed by Seven Oaks. The proposal is shown on plan number 220225-SC001 Version O.
- b. The subdivision anticipates providing roading and reserves, connecting the 83 new lots to the existing public water supply and wastewater systems, providing stormwater systems to manage runoff from roads and reserves and to provide underground utility services to each of the proposed lots.

"unlocking the answers"

- c. I refer the reader to the application itself and subsequent further information for details of the proposed development.

4) Notification and Submissions

- a. The application was publicly notified with submissions closing on 3rd April 2025. 33 submissions were received.
- b. This report addresses the submissions under each of the various sections of the report.

5) Geotechnical

- a. No specific geotechnical investigations have been carried out on the Balance Land and reliance is placed on knowledge gained from previous stages of the development with the proviso that less permeability is noted for soils on Stages 9 – 13.
- b. A condition is proposed to cover off any uncertainties with respect to geotechnical issues, with any specific requirements to imposed via Consent Notices on the lot titles.

6) Earthworks

- a. I refer the reader to the Section 42A Planning report for an analysis of the proposed earthworks, including recommendations.

7) Water Supply

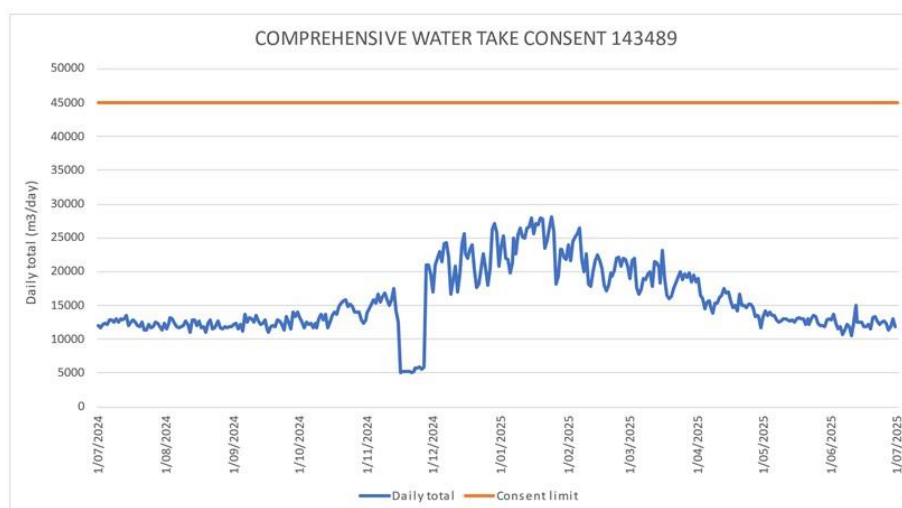
- a. TDC has made a considerable investment recently in strengthening the Kinloch water supply infrastructure to address past quality and security issues.
- b. A new “best industry practise” treatment plant is being built on Kinloch Road and this is due to be commissioned in the next few months. It is designed to be capable of delivering 5,000m³ of treated drinking water into the network.
- c. This Kinloch supply also provides the source for the Whakaroa Rural supply. The demand from this supply is capped at 500m³/day. The Water Asset Manager’s memo dated 23rd June 2025 (at Appendix H to the Section 42A report) gives a comprehensive analysis of the total supply/demand situation.
- d. The memo surmises that (apart from the Whakaroa consumers) the maximum number of unmetered properties that can be connected to this new treatment facility when all of the area is developed is 1825.
- e. Dividing this number into the available capacity from the new treatment facility shows that there is an ability to deliver nearly 2.5m³/property/day. In addition to the memo calculation, I have worked with the Asset Manager to cross check the actual use of

commercial metered customers to determine the impact of these on the household availability.

f. Another way of analysing the figures is as below:

- 5,000m³/day total available
- 500m³/day needed at Whakaroa
- 150m³/day used by commercial connections
- 4,350m³/day available for Kinloch residential connections
- Total residential connections = 1825 – 16 = 1,809
- Usage per residential connection = 2.4m³/day

- g. As stated in the memo, TDC's target water usage per property across the district is 1.5m³/day. This is a figure (1500 litres/day) which is readily achievable with good conservation practices. As can be seen from the calculation above, the new system will be able to deliver 2.4m³/day (2400 litres per day per property) if called upon to do so.
- h. A number of submitters refer to the fact that TDC impose "restrictions" or ask for "conservation" over summer. This is sensible and a technique used widely to allow water supply systems to be built efficiently and economically. A water supply that was designed and built to cater for everyone sprinkling their lawn and garden at the same time on the hottest summer day would be uneconomic. The pipes, pumps, storage and treatment system would be large, expensive, and would be idle for much of the year. Alternate day sprinkling restrictions in the heat of the summer eases the demand on the infrastructure significantly and allows a much more efficient and cost-effective system to be constructed. From my experience, this doesn't impact significantly on a lawn or garden's health. Other submitters have suggested a requirement for property owners to install rainwater storage tanks. TDC's view is that this is best encouraged rather than being made mandatory.
- i. The resource consent (AUTH143489.01.01) to allow water to be taken from Lake Taupō cover all of TDC's supplies from Kinloch around to Motuoapa (in an easterly direction) and is valid until 31st October 2047. Considering the volume allowed by that consent compared with the actual extraction, the below graph shows the trend for the last 12 months. It can be seen that there is at least 50% spare consented capacity.



- j. With respect to reservoir storage in the network, as stated in the memo (Appendix H to the Section 42A report) a site is being sought to allow the construction of a 2000m³ reservoir. Once built, this will provide 24 hours storage on a peak day, longer for most of the year. I believe that it is likely that this new reservoir will be in place within the next 2 or 3 years but even without that extra storage, I believe the system is sufficiently resilient to cope with the anticipated demand.
- k. Fire Fighting standards for water supply infrastructure are specific and the water supply network modelling that has been carried out by the applicant and TDC show that these standards can be met providing specified network additions and changes are made. There are two water supply pressure zones within Kinloch residential area. If there was only one, the pressure on private plumbing for properties at the lake edge would be too high. There are planned changes to the high zone involving an extra high level feed pipe and changes to the zone boundary (including moving earlier stages of the Seven Oaks development from the low zone into the high zone) which, when completed, will mean that firefighting standard (FW2) will be met over the whole residential supply area. The new high level pipeline is funded this year, the design is complete and the project is likely to be delivered over the next 12 months. A submitter (FENZ) have requested a condition, and this is included in the list of recommended conditions at Appendix I to the Section 42A report.
- l. The application proposes to provide a water supply connection to each new property along with some reticulation upgrades and some new reticulation to allow fire flows to be achieved across the balance land. Final detailed engineering design will need to be approved by TDC.
- m. As mentioned by submitters, there have been “Boil Water” notices issued in the past due to the outdated treatment technology failing, and there have been unplanned outages. TDC have addressed these problems by investing in the construction of a new treatment facility on Kinloch Road, described in section 7b. These works are well advanced and due to be commissioned in the next month or two. I believe that seeing this taking place will ease many of the submitter’s concerns.
- n. To summarise, the impact the proposal (if approved) will have on the public water supply system at Kinloch (in terms of consent compliance, demand and firefighting) is manageable, and will create more economy of scale for the recent substantial investment in Kinloch water supply infrastructure by TDC.
- o. Should approval to proceed be granted, consent conditions will cover the necessary works.

8) Wastewater

- a. Early in the 2020’s, the treatment technology at the Kinloch wastewater treatment plant was changed. The existing Sequential Batch Reactor (SBR) nitrogen stripping system was changed to a Simultaneous Nitrification Denitrification (SND) system followed by a membrane barrier. This technology can typically reduce total nitrogen

levels in the incoming wastewater from approx. 40 g/m³ to around 5 g/m³ and is “best industry practise”. It is important to minimise nitrogen discharges in the Lake Taupō catchment.

- b. The system discharges treated effluent to a large network of small diameter “soakage” pipes buried only a few centimetres deep under areas of the public golf course. Should this disposal system not be able to cope, rapid infiltration areas close to the treatment plant come into operation. This rapid infiltration system was the only disposal system available to the earlier plant. Due to the soakage pipes in the golf course being placed so shallow, there have been incidents of the treated effluent appearing at the surface but this has been addressed as quickly as possible when it has occurred, the rapid infiltration system is the contingency plan.
- c. Kinloch public wastewater reticulation consists of a pipe network and a series of pumping stations which transport the raw wastewater to the treatment facility on Kinloch Road. There are some small pockets of land which require the land owner to provide their own private pumping station to convey their wastewater to the public network. Should this development proceed, that infrastructure will be extended into the development area with the same overall approach. Some existing infrastructure upgrades will also be necessary. Should this development proceed, conditions will be imposed covering the detail of that expansion.
- d. With respect to treatment of Kinloch’s wastewater, TDC hold a resource consent which expires in January 2039. The year-to-date consent compliance is summarised in the following table:

Summary of Compliance				
Conditions		Limit	Unit	YTD
4	Max Discharge Volume	1500	m ³ /day	864
	Average annual daily discharge	450	m ³ /day	283
6(i)	Annual Average TN	8	g/m ³	2.9
6(i)	Annual 90th Percentile TN	25	g/m ³	8.2
6(ii)	Maximum 30 day median (based on monthly sampling data)	28	kg/week	24.6
6(iii)	Annual TN Discharge	1314	kg/yr	417
6(iv)	Annual TP	900	kg/yr	289

- e. As previously mentioned, it is particularly important in the Lake Taupō catchment to minimise nitrogen inputs. It can be seen from the table that the annual average total nitrogen (TN) in g/m³ (parts per million) over the last year has been 2.9 compared with a consented limit of 8, and annual discharge has been 417kg compared with a consented limit of 1314kg. In summary, all the conditions are met, the treatment facility is operating within the consent conditions.
- f. The change from SBR to SND will be completed over the next 2 years with the second reactor being converted to the new technology. This will bring the capacity of the treatment plant up to 1810 properties (see Appendix H of the Section 42A Report). Again, this number tallies with the calculations in the Section 42A Planning Report in that the demand from the future Kinloch service area for connections to the wastewater system will not exceed this capacity of 1810 properties.
- g. To summarise, the impact the proposal (if approved) will have on the public wastewater system at Kinloch (in terms of consent compliance and operations) is

manageable. Should approval to proceed be granted, consent conditions will cover the necessary works.

9) Internal roading

- a. The proposal continues the “theme” of earlier stages of the Seven Oaks development and will be subject to a detailed engineering design approval process as for all other infrastructure.
- b. Should approval to proceed be granted, consent conditions will cover the necessary works.

10) Stormwater management

- a. As for roading, the proposal continues the “theme” of earlier stages of the Seven Oaks development and will be subject to a detailed engineering design approval process.
- b. I have had advice from TDC’s Stormwater Asset Manager that the stormwater systems incorporated into the earlier stages of the Seven Oaks development have performed satisfactorily, and I believe the systems are “best industry practise” at this time.
- c. There remains an issue regarding potential overland flowpaths from the upstream land. Obviously flowpaths need to avoid potential buildable areas and the Catchment Analysis Sketch (dwg 230004-SK600C) shows 2 or 3 lots at the top of proposed Stage 11 that could be affected. A proposed condition will address this concern.

11) Roading, transportation and the wider roading network

- a. An “Integrated Transport Assessment” (ITA) is provided with the application. I refer the reader to Appendix 5 of the application documents, dated 20th September 2024. I agree with the conclusion that “.....the traffic effects of the proposed development are considered to be less than minor.”
- b. The proposed development will provide good linkages for vehicles, cyclists and pedestrians through the “The Balance Land”. It connects to existing or consented development in the south, north east and north west, and through these developments to the neighbouring Department of Conservation land to the south, providing multiple walking and cycling opportunities both off-road and on-road.
- c. Local Purpose (Stormwater) reserves will also provide pedestrian and cycling links.
- d. Further afield, with respect to roading, both the Whangamata Road/Oakdale Drive intersection and the Whangamata Road/Kinloch Road intersection are (and will should this development proceed) operate at a Level of Service “A” rating. Submitters have raised concerns regarding the safety for cyclists of the Whangamata Road/Kinloch Road intersection. My view is that the 2024 minor safety improvements have improved the “channelling” of turning traffic and given the opportunity for right turners out of Kinloch Road to better select gaps in through traffic. This applies for vehicles and

cyclists. Safety of cyclists at tee intersections is a concern everywhere, and is not confined to Whangamata Road intersections.

- e. Looking even further afield, considerable work has been done, post application, analysing the effect the proposed development will have on the current congestion in the roading corridor between Spa Road/Tongariro Street roundabout and Wairakei Drive/Poihipi Road intersection. This was sought in a section 92 request given the findings in the ITA. This section of the roading network is the most congested corridor in the Taupō District on a regular basis.
- f. I refer the reader to CKL's response to the section 92 request dated 5th April 2025 and Abley's "Seven Oaks Kinloch ITA Modelling Review" dated 7th April 2025.
- g. The following is a snip from the Executive Summary of the CKL response:

Considering each intersection in turn for the critical AM peak hour:

- At Poihipi Road / Wairakei Drive, the proposed Seven Oaks residential subdivision is expected to increase delay by less than one second;
- At Norman Smith Street / Wairakei Drive intersection, the development increases overall average delay by 6 seconds; and
- At the Tongariro Street / Spa Road intersection, the development increases overall average delay by 5 seconds.

Overall, the proposed development is expected to add one new vehicle every 2 minutes to the Norman Smith Street / Control Gates Bridge / Spa Road section of the network and delays are likely to increase by a few seconds. This is considered to be a negligible effect.

TDC has identified that a capacity upgrade to the road network across the Waikato River is required and funding for identifying such solutions is included within the Long Term Plan. This funding includes a proportion from development contributions, suggesting that a degree of development prior to completion of the Control Gates Bridge is necessary for this project to achieve its funding targets. It is considered that the traffic effects of the proposed development will be addressed by delivery of the new river crossing and that the levying of development contributions towards the Council-led solution is an appropriate mitigation approach. As such, we conclude that there are no traffic or transportation reasons why the proposed development should not occur prior to delivery of the new river crossing.

- h. Abley peer reviewed this work. Their summary is:

Abley were commissioned to perform a peer review of the modelling undertaken in the Seven Oaks Kinloch Integrated Transport Assessment (ITA), prepared by CKL NZ Ltd (CKL) on the 7th March 2023. We have subsequently received an updated ITA dated 20 September 2024 and a memorandum from CKL dated 5th April 2025 presenting further modelling and addressing Abley's RFI feedback.

We are satisfied that the modelling that has been presented in the 5th April 2025 memorandum is fit-for-purpose and can be relied upon to demonstrate the potential effects of traffic from the Kinloch proposal on intersection performance.

- i. I have been included via video conference as this work has evolved, and agree with the findings/conclusions.
- j. TDC is currently working on a process to select an option for easing this congestion.

12) Utilities

- a. The Applicant intends to connect all the newly created lots in this proposed development to electricity and telecommunications services and in accordance with the service provider's requirements.

13) Proposed Conditions

- a. Should consent be granted for this development, a draft set of conditions are attached to the Section 42A Planning Report as Appendix J for consideration.

14) Conclusions

- a. I have reviewed the application to subdivide the Seven Oaks "Balance Land" at Kinloch from an engineering, infrastructure and servicing viewpoint, read the submissions from the public notification process, and consulted the respective Asset Managers at Taupō District Council.
- b. In my opinion, all the engineering matters and potential issues have been identified and addressed, and with appropriate consent conditions in place, there is no reason for the application to be declined.



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Attachments:

Appendix A: Memo to Louise Wood from Michael Cordell and Tom Swindells dated 23rd June 2025