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6 November 2023

Auckland Council
Mark Ross

Sent via email: mark@sentinelplanning.co.nz

Section 92 Response to further information request for consent application (Consolidated)
BUN60420393 (LUC60420246 and WAT60420394)

Dear Mark,

Please see below our response to your s92 request dated 1st August 2023, and further questions dated 25th October 2023.

We enclose the following attachments to this letter:

Initial s92 Response	**Further s92 Response**
• Attachment A – Updated Geotechnical Report + Groundwater Assessment	• Appendix A – Permitted Activities (Updated, dated 06/11/23)
• Attachment B – Updated ESCP Plans and Report	• Appendix D2 – Draft GSMCP (Updated, version 2 dated October 2023)
• Attachment C – Updated CNVA	
• Attachment D – Updated CNVMP	
• Attachments F1 and F2 – CSA-1 and CSA-2 Concept Layout Plans	
• Attachment F – Vehicle Tracking Curves	
• Attachment G - Updated Arboricultural Assessment	
• Attachment H – Salisbury Reserve Reinstatement Concept Sketch (Draft for Consultation)	
• Attachment I – Approved Reserve Reinstatement Plan: 94a – 94b Shelly Beach Road	
• Attachment J – Street Tree Replanting Memo & Plans	

We trust that the above sufficiently addressed the matters raised in your s92 request, however please feel free to contact us if you have any further questions.

Yours faithfully,

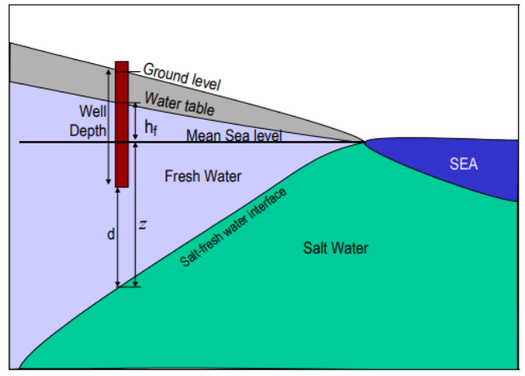
William Hung
Senior Resource Consent Planner, Strategy and Planning
Watercare Services Limited

BUN60420393 - s92 Response Table

Question	Watercare Response	Further Question	Watercare Response
Groundwater			
1. *It is noted that in Appendix A – Permitted Activity Assessment that the following activity is considered to be a PA . "The trenchless installation of the pipes which will be either drilled or thrusted will require a tunnel with an external diameter being between 300mm and 450mm. Any trenching that is required for short lengths of pipeline for private property connections will be progressively opened, closed and stabilised; the open sections of the trench will require a diversion for <10 days."* *In Appendix D of the T & T Groundwater and Settlement Assessment Report dated 29 June 2023 an assessment against E7.6.1.6 (1 to 3) and E7.6.1.6 (1 to 6) is provided however it is not clear what the activity is that has been assessed. The proposed activities such as: The trenchless installation of interceptor pipes, The excavation and support of drilling and receiving pits for the interceptor pipes , The 1.5km of Tunnel Boring, the excavation and support of the eight primary shafts (Shafts 1 to 8) and four interceptor shafts (SE01 to SE04) and each section of open cut / trenching for the trunk sewer (along Marine Parade) and interceptors should be separately assessed, using appropriate groundwater level measurements, against E7.6.1.6 (1 to 3) and E7.6.1.6 (1 to 6). Please provide this assessment.*	We consider that the additional assessment requested is not necessary, as the Groundwater and Settlement Assessment Report considers the worst case scenario for all construction activities against the criteria of E7.6.1.6. Therefore, providing individual assessment for each construction activity would not accommodate the combined effect of each activity and provide unnecessary duplication.	*The response is **not** satisfactory. We are requesting that Appendix A of the AEE is updated to show which construction activities comply with the each of the requirements of E7.6.1.6 (1 to 3) and E7.6.1.10 (1 to 6). If there are activities that do not comply then appropriate assessments of the settlement effects are required.*	Appendix A has been revised to provide a clearer explanation of what activities have been assessed as permitted activities.
2. *Please provide confirmation of which invert level option for the Trunk Sewer (Ref Drawing W-SL007.002 issue 1 dated 16 February 2023) has been adopted i.e., Option 1 or Option 2*	The Geotechnical Report & Groundwater Assessment has been updated and is enclosed as Attachment A. Further clarification is provided in the report about the rationale behind how the 'critical cases' are selected.	Response satisfactory	N/A
3. *In Section 2.3 of the T & T Groundwater and Settlement Assessment Report T & T state: "It understood Option 1 (deeper tunnel) is considered likely to be adopted due to the requirements for integration of the branch sewer to the proposed CI at Point Erin. However, for the purposes of this preliminary assessment both potential tunnel depths have been considered." In Table 2.1 the "Approximate Shaft Depth (m bgl) and "Pipe Invert Levels" for each option should be presented in separate columns. The assessment presented in Section 5 onwards appears to only be for Option 1 - please clarify e.g., in Table 5.2, the depth of Shaft 2 has been taken as 20m (Option 1)*	The worst case of the two scenarios has been assessed for each location. Table 2.1 within the report has been updated to make it more explicit which option has been selected and why.	Response satisfactory	N/A
4. *In Section 3.1 of the T & T Groundwater and Settlement Assessment Report T & T refer to " WSP (3 March 2023). Memorandum to Technical Specialists. Project Briefing and Request for Technical Assessments –Herne Bay Trunk Sewer, Watercare Services Limited". However, the Construction Methodology presented in Appendix J of the assessment of environmental effects (AEE) is dated 29 June 2023. Please review the updated construction methodology and update the T & T report accordingly*	The most recent version of the construction methodology has been reviewed and it is confirmed no changes are required to the geotechnical report. The methodology reference has been updated however.	Response satisfactory	N/A
5. *In Section 4.1 of the T & T Groundwater and Settlement Assessment Report T & T state: "It is noted that this conceptual model is conservative based on the historical information available, such that the results are anticipated to represent an upper bound of potential effects that may result from project*	The groundwater model adopted in the groundwater assessment has been updated in accordance with the groundwater monitoring regime installed as part of the investigations. This	Response satisfactory	N/A

*works." We note the following statement on page 17 of the AEE: "Perched groundwater above the regional groundwater table is expected between 1m and 2m." It is also noted that a groundwater level of approximately 2.9m was measured on 23 March 2023 in a standpipe installed to a depth of approximately 16m in the vicinity of Shaft 7. Please provide groundwater level monitoring data from standpipe piezometers installed during the current geotechnical investigation that supports the modelling with a groundwater level at **1mbgl** along the entire route of the proposed trunk sewer and interceptors.* *If this groundwater level cannot be demonstrated by appropriate groundwater level measurements, particularly at: the eight primary shafts, the four interception shafts, drilling and receiving pits for the interceptor pipes, the open trench sections for: the trunk sewer and the interceptor pipes (shown on Figure 7.1), we consider that a more appropriate and suitably conservative groundwater level should be adopted in the assessment.*	has adopted a perched groundwater regime where monitoring indicates this is present.		
6. *In Table 4.3 It is not clear if the groundwater levels recorded for Opus BH15/2 and Opus 15/3 were undertaken on the day of drilling. Please update the Notes below Table 4.3 accordingly and also add Columns to Table 4.3 with the RL of the groundwater level and the proposed deepest Invert level of Shafts 1, 2 4 & 7.*	Table 4.3 provides a summary of groundwater levels undertaken by T+T (as pre-existing installations are still accessible).	Response satisfactory	N/A
7. *The modelling described in Section 5.1 of the T & T Groundwater and Settlement Assessment Report has been undertaken for the main shafts (two ground profiles) with secant piles and the interceptor shaft with steel casing. No modelling or assessment has been undertaken for the drilling and receiving pits for the interceptor pipes and the open trench sections for: the trunk sewer and the interceptor pipes. The assessment and the ground settlement plans Sheets 1 to 7 need to be updated accordingly*	As noted within the report, the horizontally drilled sections of the interceptor network are of small diameter and do not meet the AUP (Chapter E7) requirements for assessment. Effects from the open trenched / EOP shafts are anticipated to be well within the upper bound limits of the main tunnel alignment. The geotechnical report + groundwater assessment and GSMCP have been updated to reflect the above.	*The response is **not** satisfactory - The response states: "Effects from the open trenched / EOP shafts <u>are anticipated</u> to be well within the upper bound limits of the main tunnel alignment." The assessment should be based on calculations to confirm that the settlement effects from open trenches and EOP shafts will be within the envelope of settlement contours shown on the plans - Figures 1 to 14*	We have calculated the worst-case trenching and EOP / intercept shaft scenarios, based on our interpretation of the ground / groundwater conditions, to assess the upper bound effects of all proposed open trenching activities. These effects have been conservatively applied across the entire alignment to present the upper bound effects. These are presented on the settlement contours in Figures 1 to 14.
8. *Please provide justification for not undertaking an assessment and preparation a ground surface settlement profile (in Section 6.1 of the T & T Groundwater and Settlement Assessment Report) for the tunnel where the greatest thickness of compressible alluvial soils are present e.g. Case 1 (Shaft 2) – as shown in Figure 5.1.*	The high-level ground model in the report (Figure 5.1) indicates the tunnel was not within ECBF rock, and therefore operation in open-mode would not be undertaken (i.e. no dewatering). Without potential for dewatering, this is not the critical case.	Response satisfactory	N/A
9. *Please annotate Figure 7.4 and provide the calculations that were undertaken to inform the plot in Figure 7.5.*	These figures have been superseded.	*The response is **not** satisfactory - The response states: "These figures have been superseded" The Figures are still present in the report and a response to the query is required. "Please annotate Figure 7.4 and provide the calculations that were undertaken to inform the plot in Figure 7.5."*	Figure 7.4 is taken from CIRIA C760. Figure 7.5 is taken directly from Figure 7.4, adopting the high stiffness model, multiplying the y-axis on Fig 7.4 by H (trench depth) to predict the settlement behind the trench shields.
10. *On Figure 8.1, please clarify why no Case 3 has been shown? Please provide the specific distance to the edge of the nearest property boundary and the address of that property. Please provide the calculation for the maximum differential settlement.*	Case 3 is now shown. A table summarising the nearest adjacent properties and their total / differential settlements due to various construction activities is now presented.	*The response is **not** satisfactory - The response states "Case 3 is now shown. A table summarising the nearest adjacent properties and their total / differential settlements due to various construction activities is now presented". This information has not been provided – where is Case 3 - Figure 8.1 shows Shaft 1, 2 and Figure 8.2*	Case 3, as outlined in our report, refers the analyses undertaken for the Intercept Shaft SE04, which is presented in Figure 8.2 as per your original request.

		shows The Intercept Shaft . The requested Table summarising the nearest adjacent properties and their total / differential settlements due to various construction activities does not appear to have been provided.	The table summarising the nearest adjacent properties and their total / differential settlements is presented in Table 8.3 and 8.4.
11. *On Figure 8.2, please provide the specific distance to the edge of the nearest property boundary and the address of that property. Please provide the calculation for the maximum differential settlement*	As above.	Response satisfactory	N/A
12. *On Figure 8.3, please provide the specific distance to the edge of the nearest property boundary and the address of that property. Please provide the calculation for the maximum differential settlement.*		Response satisfactory	N/A
13. *In Section 8.2, please delete text and reference to New Zealand Building Code – B1 (ref17) this is a design code and not applicable to the damage assessment of existing buildings. Please also delete text and reference to NZS 3604 which is also s irrelevant most of the houses in the vicinity of the Trunk Sewer were constructed before 2011.*	Reference removed.	Response satisfactory	N/A
14. *Please provide an assessment of the tolerance/sensitivity of the Historic Heritage dwellings listed in Table 8.3 to the predicted total and differential settlements that could result from the proposed activity with respect to their age, construction, and foundation types, from the Structural Design Engineer for the project.*	Given the magnitude of total and differential settlements estimated below structures along the alignment, a detailed structural assessment for these structures is not considered to be necessary.	*The response is **not** satisfactory - The response states: "Given the magnitude of total and differential settlements estimated below structures along the alignment, a detailed structural assessment for these structures is not considered to be necessary" Each of the Historic Heritage dwellings (within the AUP Historic Heritage Overlay) listed in Table 8.2. T & T state: "Some of these structures may be particularly sensitive to settlement.." Each of the dwellings should be specifically assessed by a Structural Design Engineer, in relation to the predicted total and differentials settlements.*	Settlements predicted for the Heritage structures, outlined in Table 8.2 of our report, are: • 30 Sarsfield St (Shaft 1) less than 3mm • 85 Sarsfield St (tunnelling) less than 6mm. • 58 Wallace St (Shaft 2) less than 3mm. • 72 Argyle St (Shaft 4) less than 5mm • 45 Argyle St (SE04) less than 5mm. • 31 Herne Bay Road (Shaft 5) less than 6mm. • 34 Herne Bay Road (Shaft 5) less than 6mm. • 29 Herne Bay Road (Shaft 5) less than 5mm. • 27 Herne Bay Road (Shaft 3) less than 4mm. Calculated differential settlements for these structures are all less severe than 1(v):1,000(h). InSAR measurements undertaken from satellite imagery across the site show that the ground level naturally fluctuates annually between 0 – 8mm. These movements are commonly observed in this geological terrain, due to seasonal changes in moisture content within the near-surface soils. This a similar (or greater) magnitude to the predicted settlements due to the proposed works. Additionally, the heritage structures are generally timber weatherboard clad structures which are anticipated to have a higher tolerance to differential settlement. Accordingly, detailed structural assessments of these structures is considered unnecessary to confirm that less than minor effects are likely to occur to these structures during the proposed works.
15. *The specific services which could be affected by settlement associated with the proposed activity should be identified, together with their details (e.g. type, diameter , material), depth and age if known and distance and orientation from the tunnel, shafts or excavations. In Section 8.3 of the T & T*	A detailed assessment of services along the alignment has been undertaken.	Response satisfactory	N/A

Groundwater and Settlement Assessment Report T & T state: "Based on the settlement estimates presented earlier in this report, differential settlements are anticipated to be within the allowable tolerances of the services present within the carriageway. The estimated settlements are anticipated to have a negligible to less than minor impact on pavement surfaces and overland flow regimes." This statement should be fully justified with specific information and calculations			
16. *In Section 4.1 of the T & T Groundwater and Settlement Assessment Report T & T state: "Consideration of impacts to underground services which are located close to or intersecting the tunnel alignment at these low points may be required as part of our further assessment and reporting". A detailed assessment of the effects on these services should be provided with the Application.*	As above.	Response satisfactory	N/A
17. *In Section 4.1 of the T & T Groundwater and Settlement Assessment Report T & T state: "We have considered the time that each tunnelled section is open, the static groundwater level above mean sea level along the alignment, the distance from the foreshore, and the temporary dewatering at low rates during tunnelling. Our assessment is that saltwater intrusion is unlikely to be observed during construction of the tunnel". This statement should be fully supported/justified with specific information and calculations.*	Detailed assessment of this risk is considered unnecessary.	*The response is **not** satisfactory - The response states– "Detailed assessment of this risk is considered unnecessary" Please provide justification why it is considered that the assessment of the risk is not required.*	Saline intrusion occurs when groundwater in an aquifer near the coast is replaced by seawater from the ocean. The Ghyben-Herzberg relation predicts that the depth below sea level to the saline interface is approximately 40 times the height of the freshwater table above sea level. This height is based on the assumption that the density of freshwater is 1,000 kg/m^3 and 1,025 kg/m^3 for seawater.  Based on this relationship, adopting the groundwater level at Shaft 1 for example at RL 5m, the depth to the saline water interface is estimated at RL -200m. (196 m below the base of the Shaft 1 excavation). Saline intrusion via upconing of the saline-freshwater interface can occur when groundwater levels are lowered by pumping within an aquifer. The Dagan & Bear (1968) analytical solution shown below has been used as a screening-level risk assessment of saline intrusion at the Shaft 1 site. The Dagan & Bear (1968) relationship estimates the maximum flow rate from a pumping well before saline intrusion occurs: $$Q_{max} \leq 0.6\pi d^2 K\left(\frac{\rho_s - \rho_f}{\rho_s}\right)$$ d = 196 m (depth to base of well) K = hydraulic conductivity

			ρs = 1,025 kg/m^3 for seawater ρf = density of freshwater is 1,000 kg/m^3 Ref: Dagan, G., Bear, J., 1968: Solving the problem of local interface upconing in a coastal aquifer by the method of small perturbations. Journal of Hydrological Research. Based on the Dagan & Bear (1968) analytical solution, and adopting a hydraulic conductivity value of 5x10-7 m/s, a flow rate of approximately **76 m³/day** (Q_{max}) would be required to induce saline intrusion via upconing at the Shaft 1 site. Our analyses indicates that the flow rate into the shaft is estimated to be between **0.05 m³/day** and **1.8 m³/day**, which is **<2.5%** of the assessed pumping rate required to induce saline intrusion. Based on these approximations, we consider the occurrence of saline intrusion to be very unlikely. Saline intrusion effects due to the proposed temporary dewatering activity are assessed as **negligible**.
18. *Consideration should be given to the installation of a groundwater monitoring borehole between Shaft 2 (Figure 5.1 Ground Profile) and the dwelling at 51 Wallace Street together with two additional building settlement pins on the dwelling at 51 Wallace Street in order to measure differential settlement. Please provide justification if it is considered that this monitoring is not required*	Not required; matter was resolved during the site walkover meeting. There are 6 BHs with 50m of this site, 5 are monitored for groundwater with a series of monitoring pins on 51 Wallace Street as provided in the GWSMP. HBS2-02 is located on Sarsfield Street and will indicate any chances in groundwater, and therefore settlement.	Response satisfactory	N/A
19. *Consideration should be given to the installation of a groundwater monitoring borehole between Shaft 3 and the dwelling at 50 Wallace Street. Please provide justification if it is considered that this monitoring is not required.*	Not required; matter was resolved during on site meeting. The location of HBS3-01 and 01 are in closer proximity to the 50 Wallace Street than a BH next to the property and will therefore detect a larger difference with groundwater or settlement. Overhead power prevents drilling in this area	Response satisfactory	N/A
20. *Consideration should be given to the installation of a groundwater monitoring borehole between Interceptor Shaft SE04 and the dwelling at 46 Argyle Street together with two additional building settlement pins on the dwelling at 546 Argyle Street in order to measure differential settlement. Please provide justification if it is considered that this monitoring is not required.*	Not required; matter was resolved during on site meeting. HBT-10a is located in this area. Two VWP's are installed into the BH. HBT-10 is east of this location and the direction of tunnelling, so will pre-empt any potential movement.	Response satisfactory	N/A
21. *Consideration should be given to the relocation of groundwater monitoring borehole HBS5-01 closer to Shaft 5. Please provide justification if it is considered that this is not necessary.*	Not required; matter was resolved during on site meeting. Proximity to the shaft was considered in this location. Construction movement negates instrumentation closer to the shaft's location.	Response satisfactory	N/A
22. *Consideration should be given to the installation of a groundwater monitoring borehole between Shaft 6 and the*	Not required; matter resolved during on site meeting.	Response satisfactory	N/A

dwelling at 33 Marine Parade. Please provide justification if it is considered that this monitoring is not required	5 shafts will be constructed prior to this shaft. Therefore, the construction process and methodology will be fully understood. HBS6-01 and HBS6-02 will indicate any groundwater level changes and will be coupled with the survey monitoring.		
23. Consideration should be given to the installation of a groundwater monitoring borehole between Shaft 7 and the dwelling at 22 Marine Parade. Please provide justification if it is considered that this monitoring is not required.	As above.	Response satisfactory	N/A
24. Please update the draft monitoring plan to provide appropriate ground and building settlement monitoring and groundwater level monitoring, together with appropriate alert and alarm trigger levels for ground and building settlement and alert Level No1 and No2 from groundwater monitoring in relation to the excavation and support of drilling and receiving pits for the interceptor pipes and each section of open cut / trenching for the interceptors.	EOP shafts and open trenched sections of interceptor network will be integrated into the GSMCP.	*The response is **not** satisfactory - The response states: "EOP shafts and open trenched sections of interceptor network will be integrated into the GSMCP". This information is required as part of the RC Application and the draft monitoring plan should be updated accordingly.*	The GSMCP has been updated and is provided for review as Appendix D2
25. Please clearly identify in the draft GSMCP which ground settlement markers are proposed for which " Critical Service".	Resolved during on site meeting. This are provided in the final GSMCP and will be baselined prior to the works commencing	Response satisfactory	N/A
26. Please replace the Alert and Alarm Levels given in Table 3.3 in the draft GSMCP with Alert Level No.1 and Alert level No2. Council does not refer to Alarm trigger levels for groundwater monitoring	To be updated in final GSMCP.	*The response is **not** satisfactory - The response states:– "To be updated in final GSMCP" This information is required as part of the RC Application and the draft GSMCP should be updated accordingly.*	The GSMCP has been updated and is provided for review as Appendix D2
27. Please identify on the monitoring plan the specific extent of public services that are to be surveyed and the type of survey proposed for each.			
28. For clarity the properties listed in Table 4.1 for pre- and post-construction detailed condition surveys should be shown on the draft monitoring plans Sheets 1 to 7. This is to ensure that any missing properties can be identified	These addresses are labelled on the plan alongside BS monitoring pins.	*The response is **partially** satisfactory – The response states – "These addresses are labelled on the plan alongside BS monitoring pins." We note that the addresses are labelled on the plan. The legend on Figures 1090120-F1 to F7 Rev 0 dated 2 June 2023 need to be updated to reflect that those properties with labels require pre-and- post construction detailed condition surveys.*	This has been added to the legend.
29. It is noted that the Groundwater and Settlement Assessment T&T and monitoring plan are based on the alignment of the tunnel to Shaft 1 as shown on Figure 1: Option D (Red) in the WSP Memo titled "Memo summarising the assessment of alternative positions of Shaft 1" dated 20 June 2023 - Appendix N of the AEE. If the other options are to be considered i.e. Option A - Pink , Option B - Green and Option C – Orange, please update the settlement assessment report and monitoring plan accordingly	These other options are not being considered for the Project and therefore do not need to be considered.	Response satisfactory	N/A
30.		Figures 1 to 14 in the T & T report are not "Ground Settlement Monitoring Plans" – they appear to be "Ground Settlement Contour Plans" – please update the plans accordingly.	The figure labels have been updated as requested.
31.		*For clarity on Figures 1 to 14, please add a note which confirms the maximum predicted total settlement at Shafts 1 to 8, Shafts SE01 to SE04, EOP1019, EOP1019 _WWMH01 & EOP1019 _WWMH021 and EOP17 and EOP199. If it is greater*	For Shafts 1 to 8, the worst case is 8mm (Case 1 - Shaft 1) at the shaft edge. No 10mm contours are applicable. For the intercept shafts (SE01 to SE04) and EOP shafts the 10mm contour has been applied based on the worst case scenario (Case 3 - SE04). Settlement of no greater than 15mm is expected at the shaft interface.

		than 10mm then the 10mm contour should be shown on the plans	Maximum settlement labels may be added to the plans to display these values.
Earthworks			
32. The construction programme includes duration and notes that activities are likely to overlap. Please provide a set of indicative staging plans for earthworks activity per the construction locations (table 9 section 4.7 of the AEE).	The approximate sequencing of excavation activities is proposed to be as follows: 1) Site establishment at CSA-1 and CSA-2 2) Primary shaft construction 3) TBM tunnelling 4) Interception shaft construction 5) Surface excavation works, including trenching and EOP connections 6) Road and CSA reinstatement As the exact construction programme is in development, it is not possible to provide staging plans that show which excavation activity will happen when and where. However, it is expected that during Stages 2 and 3 of construction, at least two shafts at any point will be open to allow for the launch and retrieval of the TBM. The ESCP report has been updated to provide more details on earthworks, including areas and volumes, see **Attachment B.**	Response satisfactory	N/A
33. The construction locations per the updated AEE now show the area and volume required for earthworks at each location. Please update the respective Erosion and Sediment Control Plans with this detail (m2 and m3) to ensure the proposed controls are suitable for the areas (particularly the CSA sites).	These details have been included in the ESCP report, rather than shown on the plans, to avoid visual clutter. The proposed controls have been reviewed in light of the areas and volume for each earthwork activity, and are confirmed as appropriate.	Response satisfactory	N/A
34. The CSA sites are shown to have stockpiled materials on the updated AEE but not on the ESCP. Please update the ESCP to show the location of the stockpiles and provide more information as to how the stockpiles will be effectively managed and controlled to prevent sediment discharge beyond the support areas.	The ESCP plans have been updated to more clearly show the proposed stockpiling locations, and have been reviewed to ensure they are consistent with the CSA plans provided with this response (discussed further below). As shown on the plans, diversion bunds will be utilised to ensure that the stockpiles will be effectively managed to prevent discharge to surrounding areas.	Response satisfactory	N/A
35. The Draft ESCP annotates 'Clean Zone within CSA'. Please provide more information on how a 'clean zone' will be achieved.	Clean zones within the CSAs will be maintained through earth diversion bunds silt fences, as shown on the ESCP plans. These devices will contain and treat dirty water within dirty zones, while ensuring that clean water is retained in clean zones.	Response satisfactory	N/A
Soil Contamination			
36. The informal response letter received on 25 August 2023 confirmed the earthwork volumes and states: *"Auckland Transport's position on coal tar is that it was not used as a binding agent on Auckland roads. Therefore, we typically do not consider coal tar as a contaminant of concern in the Auckland area, unless there is any direct evidence that it was used."*	Our project area in Herne Bay was not included as part of the Auckland Transport study areas as described in the provided document. Soil sampling and testing are proposed to be undertaken prior to earthworks commencing to inform soil disposal requirements.	*The s92 response letter confirms that the project area was not included as part of the Auckland Transport study but soil sampling and testing are proposed to be undertaken on roads prior to earthworks commencing to inform soil disposal requirements. This is acceptable.*	These updates to the proposed conditions will be incorporated into the updated proposed conditions submitted with hearing evidence.

Auckland Transport online (https://www.nzta.govt.nz/resources/research/reports/388/) indicates *that a research report reveals that coal tar-derived roading material contains over 1000 times more polycyclic aromatic hydrocarbons (PAHs) than equivalent bitumen pavements and has been identified as a major source of PAHs in both Christchurch and Auckland aquatic receiving environments.* *Although it was considered that it is more likely than not that coal tar exists in soil under roads in Auckland constructed before 1960 – 1970, the attached document titled 'Coal Tar in Auckland Roads' (RCA Forum November 2015) indicates that Auckland Transport has identified small areas of coal tar in only 11 central city road rehab projects. The document concludes that research has identified no empirical evidence to support the assumed position that it is more likely than not that there is coal tar in pre-1960 (or 1970) soil in roads. However, the attached AT document states:* • AT will continue to undertake test pit sampling for road rehab works to ensure appropriate disposal and safety measures are used. *Accordingly, please confirm whether the project area was part of the Auckland Transport study areas described in the attached document. In consideration of the project location, it appears appropriate to consider soil sampling and testing to be undertaken on roads, where earthworks are proposed prior to commencement of earthworks*		*However, I note that the proposed condition 10 refers to a draft Site Management Plan dated April 2023 (referred to as the CLSMP). The CLSMP I reviewed was dated June 2023. Can this condition be updated to reflect the latest CLSMP and include the proposed soil sampling and testing for roads as per the s92 response letter.*	
Noise and Vibration			
37. *The 'Document control' in the revised construction noise and vibration technical assessment, dated 3 august 2023, has not been updated. Please address this.*	The Construction Noise and Vibration Assessment (CNVA) has been updated as request, see **Attachment C**	*I have provided some preliminary comments below for submissions specific to E25 Noise and vibration. It would be useful for Watercare to provide a summary of the effects assessment specific to the five building owners as identified below:*	Watercare's noise and vibration specialist, T+T, has reviewed the submissions that have raised concerns regarding noise and vibration effects. T+T has considered requests for building condition surveys, additional mitigation for the Salisbury Reserve CSA and further noise/vibration monitoring. The findings and recommendations of the T+T noise and vibration assessment report remain unchanged, as does Table 5.5 of the report, which list buildings identified as requiring building conditions surveys. Specific comments in relation to submitters is below as requested: In relation to the property at 92-98 Sarsfield Street / 51 Wallace Street (which is a single attached building), the predicted vibration levels are ~1-3 mm/s, which is below the building damage criteria. In relation to noise: • A worst case noise level of 83 dB was calculated for 96 Sarsfield Street for piling activities during the construction of the shaft • Conversely, a worst case noise level of 73 dB was calculated for 92 Sarsfield Street • Attended noise monitoring will be undertaken during construction of the shaft to demonstrate best practice is being implemented
38. *The draft construction noise and vibration management plan states that tunnelling activities will occur 24 hours a day, 7 days a week, which is inconsistent with the revised AEE and the above referenced revised construction noise and vibration technical assessment. Please address this.*	The Construction Noise and Vibration Management Plan (CNVMP) has been updated to remove reference to 24/7 tunnelling, see **Attachment D**.		

			In relation to the property at 99 Sarsfield Street, vibration was predicted at ~2-3 mm/s PPV during shaft construction at the dwelling house. Vibration is predicted to be below building damage criteria and even lower at the swimming pool. In relation to the property at 2 Stack Street, noise will be intermittent during shaft construction, ~45-55 days duration. Worst case noise levels of ~76 dB are predicted when piling takes place. At all other times noise levels will be around 60 dB or less. Vibration is predicted to be ~1-2 mm/s PPV - which is below the relevant criteria for building damage. In relation to the use Salisbury Reserve as a CSA, the current CNVMP will be finalised prior to construction and a condition of consent will require approval by Auckland Council. It is unnecessary for the residents' association to have community input as the final CNVMP will follow best practice including procedures for community engagement, noise and vibration monitoring, building surveys and complaint management. Notwithstanding this, the residents' association will be invited to participate in the Community Liaison Group (CLG) process, which will allow feedback to be provided to the consent holder. All works within the CSA will occur within the hours of operation sought in the AEE. EOP connection works are no longer proposed to occur adjacent to the properties on Stack Street. No further assessment or mitigation measures are required.
Traffic			
39. Please provide site plans for the CSAs showing, in particular, finished gradients and the proposed parking layout for construction vehicles and the provision of tracking curves to demonstrate that all vehicles can turn within the site to exit in a forward direction.	Scaled concept layout plans for CSA-1 and CSA-2 have been prepared and are enclosed as **Attachments E1** and **E2** respectively. These plans show the location site offices, storage areas and indicative parking areas. Tracking for a typical six-wheeler truck into and out of each site has also been provided. Tracking curves for other typical construction vehicles (concrete trucks and semi-trailers) for both CSA sites is enclosed as **Attachment F**.		
40. Please provide a draft construction traffic management plan that addresses the usual construction traffic management requirements, and that addresses the following concerns in particular: • *Assessment of the additional traffic volumes on diversion routes and the impact on these routes during existing peak hours, and in particular, the cumulative traffic effects on Jervois Road.*	We have started to prepare a draft CTMP to address the matters raised in this question, and will distribute to Council for review in two weeks.		

• *Assessment on whether the diverted traffic volumes will exacerbate crash risks along Jervois Road.* • *Any necessary mitigation to address safety concerns such as the higher likelihood of any unsafe right turns out of existing intersections to Jervois Road as a consequence of the construction of Shaft 2 and the estimated partial road closure for up to 251 days* • *The safety of school children and any necessary mitigation measures given the proposed diversion route along Curran Street with schools nearby.*			
Trees			
41. *Please confirm exactly what alternative options have been considered regarding the removal of Trees 15 to 21 for construction machinery and storage purposes. The subject trees and palms make a valuable contribution to Upton Street, and it may be that their removal cannot be supported.*	The only viable alternative to removing Trees 15 to 21 within the road reserve of Upton Street is to remove one or two of the mature London Plane trees within Herne Bay Road. Shaft Five needs to be constructed in this location to meet the hydrological requirements of the wastewater tunnel, and remain within public land. Removal of these London Plane trees would likely have significant adverse effects on the historic character of Herne Bay Road, and it would not be possible to appropriately mitigate the loss of these trees. As shown on the plans lodged with the application, small construction compounds are required around each of the shaft sites to safely accommodate in use tunnelling equipment, including excavators, cranes, concrete trucks and tip trucks. This equipment cannot safely operate within close proximity to the existing street trees, and conversely would likely damage these trees if they were retained. The need to remove trees 15-21 was determined in consultation between the arborist and proposed constructors. While every effort was made to limit tree removal for the project, unfortunately given the constrained nature of the surrounding environment, it is necessary to remove some trees. We also note that the TOA has been obtained for all tree removals, including trees 15-21, suggesting that others within Auckland Council are comfortable with the rationale for the tree removal.	*The section 92 response is considered sufficient. However, the arborist has requested a response on the submissions that raise tree concerns prior to completing their memo in order to assess whether any further assessment / additional conditions are necessary.*	A response to submissions received has been prepared in advance of the hearing. An excerpt is provided below: Street trees in Sarsfield Street The submissions received by the owners of 92, 96 and 98 Sarsfield Street seek that the street trees outside of their property, on the Sarsfield Street frontage, be maintained in good health during construction and following completion of the Project. The submissions also seek those smaller, younger trees be uplifted if within the worksite zone, maintained during construction and replanted after completion. Trees 72 and 73, two juvenile Indian bead trees which are outside of 98 Sarsfield Street, were street trees specifically inspected as part of the Assessment of Arboricultural Effects, as it is proposed to construct shaft 2 at the intersection of Wallace and Sarsfield Street. The two trees are sufficiently clear of the construction works where they, and the grass area within their tree protection zone, can be isolated with temporary tree protection fencing. Being isolated from construction works and the storage of materials in the permeable root zone area, effects on the trees can be managed to minimal levels. Several other larger melia trees are located further east of trees 72 and 73, and they too can be isolated from the construction works to ensure effects are insignificant. Appendix B of the Assessment of Arboricultural Effects sets out various options for installing temporary tree protection fencing. The fifteen trees proposed to be removed as part of the Project range from early-mature to post-mature (Tree 26, a cherry tree in fair condition), and they have been assessed not to be of sufficient quality to relocate, or the presence of existing underground infrastructure (high voltage power or gas pipe) affects the feasibility of relocation. Tree 54 is a juvenile pōhutukawa that was planted in the last two or so years, and it has been identified as a candidate to be relocated. A new position for the tree will be determined in consultation with council's senior urban forest specialist, and aftercare and maintenance will be undertaken for three years following replanted,
42. *If there are no alternative options in respect of the response to question 39, please identify the measures that will be implemented to address the loss of amenity to the street as a consequence of their removal. Noting their valuable contribution, it may be that this is not possible hence the comment above that their removal may not be supportable.*	The contribution of the early mature Magnolia and mature Queen Palm trees to the streetscape of Upton Street is acknowledged, and Section 7.8 of the AEE addresses the effects of the removal of these trees on the streetscape. In summary, it is acknowledged that there will be short-term loss of amenity of the streetscape after the trees are removed, and before the replacement species grow to a mature state. These effects include a loss of shade (particularly in summer) from the Magnolias, and a loss of visual interest in the streetscape.		

	Notwithstanding the above, it is considered possible to mitigate the effects of the tree removal. As noted within the AEE, it is proposed to provide larger 160L-grade trees for replanting in this location. These trees are expected to reach maturity much faster than standard 45L-grade trees, and will ensure that the amenity of the streetscape is restored in a timely manner. In addition to the above, we have recommended a minimum of 46 replacement trees for the project area. This will improve the overall amenity of the surrounding streetscapes and have long-term positive effects compared to the existing situation.		as conditions in the Tree Owner Approval issued for this project. Trees in Salisbury Reserve Some submitters raised concerns regarding the removal of trees in Salisbury Reserve. To establish the Contractors Support Area, the removal of one Kermadec pohutukawa (tree 46) and three cabbage trees (trees 119, 120 and 121) will be required. The Kermadec pohutukawa is near the western boundary 12 Argyle Street (property zoned Open Space), and it has been assessed to have good vitality, fair branch structure and poor form. The fair branch structure and poor form are the result of previous pruning that has occurred, including the removal of whole stems to the trunk base, and removing lower portions of the crown to create a 'lion's-tail' branch form. Lion's tailing of limbs affected the ability of branches to dampen wind loads. The removal of tree 46 will enable construction vehicle access to pass sufficiently clear of a second Kermadec pohutukawa (which will require canopy pruning) and a mature Indian bead tree, which has been assessed to be overall a good tree (tree 48). Within Salisbury Reserve and some 15 to 20m away from the southern boundary of 16 Argyle Street, are three cabbage trees ranging between 3.5 m and 6 m in height. The two larger trees (tree 119 and 121) have moderate and large trunk cavities at their base, and they exceed the dimensions where removal requires resource consent. Tree 120 is small enough where removal can be undertaken as a permitted activity. Overall, the three trees are fair trees. Mitigation for the four trees is proposed to comprise either nine exotic trees or ten native tree species, with a minimum grade of 45 L at the time of planting. Once established, nine or ten trees will provide for greater canopy cover than the four existing and will provide greater ecosystem service benefits.
43. Tree 112 (Jacaranda) is proposed for removal but comments within the submitted arboricultural report suggest that only minor pruning might be needed. Please clarify what is proposed with respect to this tree.	The updated arboricultural assessment is enclosed as Attachment G.		
Parks			
44. According to the submitted AEE, there are two temporary Construction Support Areas (CSAs) proposed at Salisbury Reserve and 94a- 94b Shelly Beach Road. While figures 4-10 and 4-11 within the AEE provide an indicative (conceptual) view towards the proposed activities within both CSAs the information is not sufficient to enable a robust assessment from Parks Planning against the proposed (temporary and permanent) activities on the reserve land. In this respect: • *Please provide more information on the location, size, and material of the proposed buildings and physical infrastructure within both CSAs.* • *Please demonstrate on drawings how the construction of proposed concept design on the CSAs will follow CPTED requirements within the sites at Salisbury Reserve and 94a-94b Shelly Beach Road.*	• Updated concept site plans for CSA-1 and CSA-2 have been prepared and are enclosed as Attachments F1 and F2, as noted above. These plans provide a clearer indication of the scale of activities and buildings within each site during their occupation. • CSA 1 and 2 are only required temporarily and for the term of the project. There will not be any permanent impacts on these sites. • Portacom buildings are expected to used for site offices at both locations.	*Response 42 notes that the works will be temporary. However, the construction management plan shows that the duration of works is 2 years. Noting this length of time, please provide an assessment on the use of the reserve in terms of the open space needs of the community given that open space availability will be reduced for the works duration. It is further noted that the CSAs are being utilised for aggregate and machinery storage – issues such as dust generation and noise have not been discussed. From a parks perspective this is specifically on how this would affect adjacent reserve users.*	The effects of utilising Salisbury Reserve as a CSA will be assessed in the planning evidence for the upcoming hearing, with a focus on the temporary loss of public recreational open space and amenity effects. An excerpt of the assessment undertaken for this evidence is provided below: The temporary loss of public open space resulting from the use of 94a – b Shelly Beach Road and Salisbury Reserve as CSAs was not directly addressed in the AEE; however, this was raised as a concern by a number of submitters. In particular, several submitters (including the Herne Bay Residents' Association) objected to the use of Salisbury Reserve.

	• Public access to the CSAs will be restricted with border fencing, and therefore it is unclear how CPTED considerations are relevant.		The use of public open space for temporary construction activities for up to 24 months is provided for as a Permitted Activity in the AUP-OP under Rule E40.4.1 (A21). Furthermore, the use of open space to support the construction of large-scale public infrastructure is commonplace and has been used for projects such as CI and City Rail Link. It is proposed to utilise only a portion of Salisbury Reserve as a CSA, with the petanque court, club room, playground and two smaller open grassed areas unaffected. Pedestrian access to both Salisbury Street and Argyle Street will also be maintained. The area in the reserve to be used is an abandoned petanque court that does not appear to be used for organised recreational activities, as observed on several site visits. The area is flat however and does allow for informal recreation activities, such as dog walking and ball kicking. Apart from schools, the closest formal playing fields are at Cox's Bay Reserve, about 1.3km from Salisbury Reserve (via roads). Overall, while there will be a small loss of public recreational area during construction, I consider there are facilities nearby for both informal and organisation recreational activities both within Salisbury Reserve and the wider area. As such, I consider that the effects of the temporary loss of recreational facilities will be less than minor. In terms of longer-term mitigation, Watercare has submitted a draft reserve reinstatement plan for Salisbury Reserve to support the application. This plan proposes a range of new planting, including native restoration planting to support existing vegetation along the western and southern boundaries of the site and amenity / specimen tree planting along the northern pedestrian accessway. Other new amenities include informal trails and a doggy litter bin, and the reinstatement of park benches and a picnic table. It is intended that the reserve reinstatement plan for Salisbury Reserve is developed as an iterative process, with input from Auckland Council's Community Facilities team and the Waitematā Local Board. It is assumed that any further consultation with the community to further refine these plans will be facilitated by the local board. Overall, there will be temporary less than minor effects to the wider community from the loss of recreational public open space. The effects of utilising Salisbury Reserve as a CSA are considered acceptable in the context of the scale of the Project, and given the long-term benefits of the Project to the community. In addition, after works are completed Salisbury Reserve will be reinstated and enhanced (with input from Auckland Council and community), which will generate positive effects.
45. Please provide landscape plans that demonstrate that the proposed landscape outcomes will meet the proposed conditions (location of trees to be (re)planted, connections, viewshafts, reserve boundary treatments etc.), including the following information: • *Existing site conditions with topo survey.* • *Demolition plan (extent of works, trees and hardstand to be removed).* • *Site preparation plan / temporary works plan.* • *General arrangement plan (to assess connectivity, access, safety, viewshafts).* • *Landscape details (hard and soft landscaping including any furniture).* • *Typical cross and long sections especially where there's significant changes in levels.* • *3D views (as required to help illustrate the concept)* *Please note that these plans need to be prepared for the reserves in relation to the proposed infrastructure works and not as part of the civil drawing set.*	• A concept reserve reinstatement plan for Salisbury Reserve has been prepared and is enclosed as Attachment H. This sketch is for consultation with Auckland Council, including the local board. Features of this plan include: o Native mitigation planting (including specimen trees and understory planting) along the western and southern boundaries of the site to create tiny forests / urban ngahere. It is proposed that between 20 and 30 of the proposed 51 trees to be planted as mitigation for tree removal will be planted within this reserve; o Native tree avenue planting along the northern pedestrian pathway to provide shade and some privacy; o Reinstatement of existing hardscaping, including park benches and a picnic table; o Potential enclosed dog exercise area to the south of the petanque club room, with provision of a dog litter bin; o Potential for an informal accessway through the proposed ngahere along the western boundary to provide access to residents; and o Potential reinstatement of existing grass petanque court, or alternatively provision of open grassed / informal recreation area. • The number, location and species of specimen trees, the understory planting mix, provision of hardscaping and final design of the reserve reinstatement plan will be confirmed once feedback has been received from Council and the local board. • All proposed planting is to be located with consideration of safety and CPTED principles (e.g. clear lines of sight to allow for passive surveillance and visibility). • A Reserve Reinstatement Plan for 94a – 94b Shelly Beach Road was recently prepared by WSP (in consultation with		

	Auckland Council) for the St Marys Bay Stormwater Tunnel Project, see enclosed as **Attachment I**. It is proposed to reinstate this site on a like-for-like basis once the construction works at CSA-2 have been completed.		<u>Other Comments</u> • Dust generation effects from the CSA site are addressed in the Erosion and Sediment Control Plan (ESCP). Mitigation measures are proposed in the ESCP to ensure dust is not received by adjacent receivers. • Noise effects from the CSA to the surrounding receivers have been assessed in the Construction Noise and Vibration Assessment, and consent has been sought where infringements are identified. • Both noise and dust / sediment effects from the works have also been assessed and summarised in the AEE.
46. *Please provide a mitigation planting plan, ideally as an attachment to the submitted arboricultural report.*	• A streetscape planting mitigation memo and plans has been prepared by the project arborist and is enclosed as **Attachment J**. This plan proposed planting locations and suitable species for replacement street trees. Factors that have been considered in selecting suitable tree species include climate suitability and fit within the existing character of each streetscape. • This plan considers 'Priority A' planting locations and 'Priority B' locations, should any of the Priority A locations not be viable (due to services for example). A total of 50 locations have been identified as potentially suitable. • Priority A locations are streets where trees have been removed for the project -Upton Street, Argyle Street, Hamilton Road and Sarsfield Road, while Priority B locations include Annan Street, Herne Bay Road, Marine Parade, Wallace Street and Curran Street.	*In terms of CPTED, the layouts provided do not adequately address our information request. Council has recently seen an increase in thefts of groundworks equipment and machinery and a consideration of the effects of increased crime on adjacent reserve users needs to be undertaken as well as confirmation of how this can be reduced for the duration of works.*	Consideration of theft of equipment and machinery, and effects of increased crimes are not matters that can be considered under the RMA. This is a civil matter that should be dealt with by the Police and the constructors as they see fit. Notwithstanding this, CCTV security with motion sensing will be installed across the site, which will record to cloud storage, ensuring ease of access to recordings in the case of attempted theft. Security fencing with barrier cloth will also be placed around the perimeter of the site to deter unauthorised entry. Lighting is not proposed for the site as this could potentially cause more disruption for adjacent residents.
Built Heritage			
47. *Does the proposal include the removal of any blue stone kerbs from the Herne Bay area during the construction work?*	Yes – it is expected that some blue stone kerbs will need to be removed to enable some open cut and shaft construction works. All blue stone kerbs will be stored securely and reinstated after works are completed.	Response satisfactory	N/A
48. *It is understood that that applicant is communicating with Heritage New Zealand as an affected party, but a letter confirming this has not been provided in the submitted documents. Please provide some clarification on this matter?*	Heritage New Zealand are not considered an affected party for this application, as no works are proposed within any HNZPT listed sites, nor are any known archaeological sites to be disturbed. As such, we have not undertaken any formal consultation with HNZPT to date. A precautionary archaeological authority is to be sought for the works (as described within the AEE), and HNZPT will be contacted shortly to process	Response satisfactory	N/A

	this application. This matter is outside of the RMA however and is not directly relevant to the resource consent application.		
Note: the provided conditions will not address all adverse built heritage effects and additional conditions will be recommended. This will ensure that the necessary measures have been taken before the start of the project and will be taken in case any remedial works are needed after the completion of the process	Noted. We welcome the opportunity to review any additional conditions proposed by Council to address this matter.	Response satisfactory	N/A
Miscellaneous			
As part of out ongoing consultation for the Project we have received further feedback from Te Ākitai Waiohua and the Ministry of Education on the potential effects of the proposal. To respond to this feedback, we have made further changes (tracked changes applied) to our Proposed Conditions, see **Attachment K** enclosed. A brief summary of the proposed changes: • A requirement in the Communications Plan to engage with Ponsonby Primary School and the Ministry of Education with regard to traffic management to maintain student safety; • A minor change to the restrictions of construction vehicles on Curran Street to reflect feedback on the peak drop off and pick up periods; and • Inclusion of cultural induction and monitoring provisions			