Before a panel appointed under the Fast-track Approvals Act 2024 **FTAA-2504-1046**

UNDER	the Fast-track Approvals Act 2024 (**Act**)
IN THE MATTER	an application for approvals for the Waihi North Project (**WNP**) – a listed project described in Schedule 2 of the Act
BY	**OCEANA GOLD (NEW ZEALAND) LIMITED** **Applicant**

STATEMENT OF EVIDENCE BY CHRISTOPHER ROBERT JAMES SIMPSON ON BEHALF OF OCEANA GOLD (NEW ZEALAND) LIMITED

Groundwater

Dated 1 September 2025

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Introduction

1. My name is Christopher Robert James Simpson. I presently hold the position of Principal Hydrogeologist at Williamsons Water and Land Advisory (**WWLA**) and have held that position for the past 2 years.

2. I graduated from the University of Auckland and hold a Master of Science (M.Sc hon) degree in Geology. I am a Certified Environmental Practitioner (CEnvP) through the Environmental Institute of Australia and New Zealand (EIANZ).

3. I have been practicing as a geologist professionally since 1993 and first started practicing hydrogeology in 1998. My professional career initially included 5 years in the mining industry in both the North and South Islands of New Zealand, and since that time I have been practicing as a consulting hydrogeologist for the past 27 years. I was formerly a lecturer at the University of Auckland in hydrogeology at undergraduate and post graduate levels for 4 years.

4. I have worked on epithermal mineral deposits in a professional capacity in Waihi and the surrounding areas for 32 years. I first became involved in the Waihi North Project (**WNP**) in 2018 where I undertook a preliminary assessment of effect on groundwater due to the proposed dewatering of the Wharekirauponga (**WKP**) vein system. I subsequently assisted with coordinating and compiling the work undertaken by other consultants in relation to groundwater matters. The product of that work was the report titled "Assessment of Groundwater Effects - Wharekirauponga Deposit".[1]

5. I was also the primary author of the report titled "Assessment of Groundwater Effects – Tunnel Elements"[2] where I assessed the effect of the tunnel elements associated with the WNP.

1 B.27. *Assessment of Groundwater Effects - Wharekirauponga Deposit*.
2 B.30. *Assessment of Groundwater effects – Tunnel Elements*.

6. I have been asked by OceanaGold (New Zealand) Limited (**OceanaGold**) to provide a response to the specific matters contained in written comments on the WNP application from persons invited by the Panel to comment under section 53 of the Act. Those persons are:

   a. Coromandel Watchdog of Hauraki Inc (**CW**); and

   b. Royal Forest and Bird Protection Society of New Zealand Incorporated (**F&B**).

7. I have prepared this statement within the limited time available to me. Consequently, it is necessarily at a high level. I am able to provide a more fulsome response to the issues covered in this statement if the Panel requires further assistance from me.

Code of Conduct

8. I confirm that I have read the code of conduct for expert witnesses contained in section 9 of the Environment Court Practice Note 2023 and have complied with it in preparing this evidence. I confirm that the issues addressed in this evidence are within my area of expertise, and I have not omitted material facts known to me that might alter or detract from my evidence.

Response to comments of CW

9. My statement responds specifically to comments made in the evidence of Mr Nic Conland dated 24 August 2025 on behalf of CW.

Cause of Flow Loss

10. Mr Conland cites that "[t]he B.33 report states in section 7.4.2 that dewatering effects cannot be accurately predicted at the time of the application".[3]

11. In response, and as a general statement, the dewatering effects have been conservatively assessed by the assumption embedded in the modelling that there is a high level of connectivity between the deep aquifer, shallow aquifer and surface waters, whereas in practice the technical data suggests the deep aquifer is disconnected from the shallow aquifer and streams.

12. In addition, I highlight the fact that further assessment of the connectivity between the shallow and deep aquifers has continued since that report was prepared by undertaking pumping tests. The result of this work to-date supports the conceptual hydrogeological model of the deep aquifer being separated from the shallow aquifer and surface water i.e. a low level of connectivity between the aquifers.

Surface–deep connectivity

13. Mr Conland states "[if] fractures in this rhyolite zone provide pathways, mine pumping could draw down shallow streams much more severely than anticipated, threatening surface flows and biodiversity well outside the mapped area".[4]

14. The numerical modelling has conservatively assessed a high level of connectivity between the Rhyolite host rock that will be dewatered and the WKP stream bed, and that is reflected in the surface water stream loss calculations undertaken by Tim Mulliner (GHD).

3 Coromandel Watchdog comments, 'B' Documents, Appendix A.03, at paragraph 105.
4 Coromandel Watchdog comments, 'B' Documents, Appendix A.03, at paragraph [110].

15. Other than the specific 1.2 km upper stream reach referred to by Mr Conland, surface water flows outside of that area are not expected to be impacted due to the low level of connectivity to the surface provided by the overlying Andesite rock.

16. As indicated above at paragraph [12], the low level of connectivity between the shallow and deep aquifer system continues to be evaluated further through the undertaking of pumping tests. The results of that testing to date support the principal that there is a low level of connectivity between the aquifers.

17. The low risk to surface waters is supported by Alan Pattle, a technical reviewer for Waikato Regional Council (**WRC**). He has previously stated "the field detection of currently existing strong vertical groundwater gradients and/or an unsaturated zone above the deep system at heads 20m to 40m below stream level suggests that potential for leakage may be limited."[5]

18. Mr Conland also states "[t]he project's 2,200–3,300 m³/day groundwater take may look modest at a catchment scale, but its localised effects could devastate sensitive habitats."[6]

19. In response, the volume of groundwater that will need to be taken is entirely sustainable at a catchment scale relative to its overall water balance and represents around 20% of the groundwater that could be taken from the catchment based on the guidance from the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (**NES-FW**).

5 WRC comments, page 5.
6 Coromandel Watchdog comments, 'B' Documents, Appendix A.03, at paragraph 113.

Tunnels

20. Mr Conland states that “experience elsewhere shows short-term localised losses through fractured rock can be severe”.[7]

21. The short-term response to tunnel inflows with respect to effects of surface waters is included in section 5.3.3 Potential for Effects on Springs and Streams in the Assessment of Groundwater Effects – Tunnel Elements.[8] In my opinion that provides a worst-case scenario where groundwater inflows would continue for a short period of time before grouting could achieve control. That scenario conservatively assumes fracture zones are not grouted ahead of the tunnel advancing.

22. Mr Conland does not elaborate on his statement about his experience elsewhere where surface water losses due to fracture interception were severe. I can comment based on my own experience in Waihi that resin or cement grouting of permeable structures has been highly effective.[9] Furthermore, the conceptual geological model at this site is unique and therefore drawing experience from elsewhere may not have any relevance to this site.

23. Mr Conland further states “[e]ven small unanticipated leaks could drain wetlands or headwaters, with changes appearing suddenly and irreversibly.”[10]

24. I disagree with that statement. In my opinion significant fracture linkages to areas of headwater discharges or wetlands would be required to drain those features. Given the significant depth of the tunnels and their remoteness to

7 Coromandel Watchdog comments, 'B' Documents, Appendix A.03, at paragraphs 114 and 115.
8 B.30. *Assessment of Groundwater effects – Tunnel Elements*.
9 For example, Rex vein system groundwater inflows.
10 Coromandel Watchdog comments, 'B' Documents, Appendix A.03, at paragraph 116.

the land surface, combined with the proposal to mitigate inflows from significant fracture zones, such a situation would not develop.

25. Mr Conland also states that "[t]he reliance on pre-grouting assumes engineering will perfectly seal fractures—something history suggests is rarely guaranteed".[11]

26. Again, Mr Conland does not state his experience or cite specific examples where grouting has been ineffective. I again refer to my experience in Waihi and would add that grouting will only completely remove groundwater inflows, if that is the design intention. However, in this project grouting will be undertaken to a standard required to control inflows and any associated residual effect on piezometric pressures, such that these effects will be limited and localised to the immediate area surrounding the tunnels. The grouting design intent is not to "perfectly seal fractures", nor is this necessary.

Management Approach

27. Mr Conland states "[t]he proposed Water Management Plan relies on "alert and respond" triggers, meaning damage may occur before interventions kick in. Quarterly reporting is far too infrequent to detect rapid stream declines."[12]

28. The proposed monitoring consists of real time observations from water pressure probes in the deep groundwater system, hydraulic gradients in well pairs adjacent to the WKP stream within the shallow groundwater system, and surface water flow gauging. The monitoring is structured with multiple layers of defence, allowing the early identification of depressurisation effects deep within the aquifer system. Monitoring of vertical hydraulic gradients in the near stream piezometers will provide a second level of defence, and the

11 Coromandel Watchdog comments, 'B' Documents, Appendix A.03, at paragraph 117.
12 Coromandel Watchdog comments, 'B' Documents, Appendix A.03, at paragraph 110.

third layer comprises monitoring directly in the streams. If such an effect were to develop, that depressurisation can then be detected in the shallow aquifer through the monitoring of vertical hydraulic gradients in the near stream piezometers. Whether that depressurisation translates into an effect on surface water flows would be assessed through steam gauging. In my opinion, that hierarchy of monitoring would allow the detection of an effect developing well before damage occurring, which I assume to mean a reduction in surface water flows.

29. While I understand that reporting of that monitoring may only be provided monthly, the data will be collected in real time and responses to observed trends or trigger level exceedances will essentially be immediate if the situation that arises necessitates an immediate response. Condition UG.7 is clear about that. There appears to be a view held by Mr Conland and others that responses to detected groundwater changes are tied to the reporting cycles set out in the conditions (for example, condition UG.27). That view is misplaced. Condition UG.27 requires reporting of those events where a Respond Trigger Level is reached with reporting required to outline the nature of the exceedance and, if the investigations subsequently undertaken find it to be necessary, the remedial and/ or mitigation measures that were applied in response.

30. For that reason, I consider the reporting requirements set out in the conditions to be adequate and expect that notification to WRC of triggered events will occur within those reporting periods.

Conclusions on Internal inconsistencies

31. Mr Conland states "[a] global less-than-minor conclusion sits beside a mapped 1.2 km area where the protective andesite cover is absent and vein–stream connectivity could occur—prompting more intensive monitoring. That is a residual risk zone, not de minimis."[13]

13 Coromandel Watchdog comments, 'B' Documents, Appendix A.03, at paragraph [122].

32. The pathway connecting the stream bed to the shallow aquifer is hypothetical and a worst-case scenario. That scenario was modelled and the surface water losses determined on that basis. Given the reduction in surface water flows was very small under this worst-case scenario, the effect was deemed to be less than minor. Further, there is no certainty that the effect will ever actually materialise. As stated at paragraph [16] of this evidence, and supported in the statement made by Mr Alan Pattle,[14] the existing strong vertical groundwater gradients in the near surface suggest that potential for leakage from the stream may be limited.

33. Mr Conland states "[t]he proponent's own conceptual model says Warm Spring effects "cannot be accurately predicted" now, while effects reports assume predictable cessation/recovery (and even "improved" quality during mining).[15]

34. I acknowledge that there is some uncertainty as to whether discharge at the location of the Warm Spring will cease permanently or will return as a cold spring following mining.

35. It is my conservative opinion that flow from the Warm Spring is likely to cease while depressurisation of the deep aquifer system is occurring. That is because the fracture network resulting in the occurrence of warm water at the surface extends very deep far beyond the depth of mining, and hence will be disturbed or cut off by mining of the vein system.

36. My assessment also conservatively assumes that spring discharge will return following mining. That assumption is conservative because if it were to resume discharging, it could affect the water quality of the WKP stream (i.e. it would be a better environmental outcome if the Warm Spring did not return). That effect has been assessed by Mr Ian Jenkins (AECOM).

14 WRC comment document, Pattle Delmore Partners Waihi North Project - *Wharekirauponga Mine Dewatering Assessment – Technical review of effects on groundwater and surface waters*, section 2.3, page 4

15 Coromandel Watchdog comments, 'B' Documents, Appendix A.03, at paragraph 127.

37. In my opinion it is possible that discharge at the location of the Warm Spring may not return due to the disturbed fracture pathways resulting in lower groundwater pressures that cannot bring water to the surface. If that were the case, there would be no ongoing discharge into the stream from that spring following mining.

Questions the Panel can put to experts

38. Mr Conland raised a number of questions for the Panel, which I address in this section using Mr Conland's numbering.[16]

1. Warm Spring mechanism & fate: What level of confidence (quantified) supports predictions of cessation and recovery timing/chemistry, given FloSolutions' statement that effects cannot be accurately predicted at this time?

39. My response to that question is provided in paragraphs [33] to [36] of this evidence.

3. Area of potential effect: For the mapped 1.2 km reach of high connectivity, what pre-emptive (not reactive) design controls are proposed to avoid connectivity and stream-loss—beyond monitoring?

40. Aside from monitoring, pre-emptive design controls to avoid stream connectivity are by eliminating obvious fracture pathway resulting in groundwater flows underground through grouting.

41. Further, the mine is designed to maintain a considerable separation depth from the land surface with the minimum depth being in the order of 100 m. That allows shallow flow paths to remain unaffected by mining which then minimises the potential for effects of surface water bodies.

16 Coromandel Watchdog comments, 'B' Documents, Appendix A.03, at page 159.

4. Triggers: Where (numerically) are Alert/Respond thresholds set for flows, heads, and inflow rates, and how do they tie to ecological limits rather than model expectations? Are supplementary water/re-injection feasible in remote Natural State streams?

42. The numerical thresholds for surface water flows are included in proposed condition UG.10 b. These conditions are supported by WRC.

43. No set groundwater inflow thresholds are proposed.

44. Baseline data collection for monitoring of groundwater pressures and hydraulic gradients is ongoing and thresholds that represent a meaningful departure from that baseline data will be developed.

45. In my opinion the augmentation of surface water flows is entirely feasible should it be required.

Response to F&B comments

46. The following section provides my response to the comments of F&B.

47. F&B expressed that "[a] key concern regarding water quality and wetlands arises from the proposed dewatering. Dewatering could result in a decline in the groundwater level in connected aquifers. This, in turn, could reduce water availability to streams and wetlands."[17]

48. The effect on wetlands is discussed in section 4.5.3 Effects on Wetlands of my report titled "Assessment of Groundwater Effects - Wharekirauponga Deposit".[18] In my opinion, the potential for effects on streams and wetlands

17 Forest and Bird comments on Waihi North, at paragraph 113.
18 B.30. *Assessment of Groundwater effects – Tunnel Elements.*

from dewatering is limited for the reasons stated in that report and raised elsewhere in this brief of evidence.

49. A comprehensive monitoring program is proposed to detect potential changes that develop so that effects can be mitigated.

50. F&B also commented that "[i]n relation to the dual tunnel it is concluded that the dewatering effects are low risk with respect to potential effects on groundwater and that as such no specific associated monitoring is proposed with respect to this phase of work. However a no monitoring position is unacceptable and does not account for effects that may have low probability but high potential impact, including dewatering of wetlands and other waterbodies."[19]

51. No monitoring over the dual tunnels is proposed and, in my opinion, it is not necessary. I disagree with the statement that there is a high potential impact on wetlands and other water bodies for the reasons I raised previously in this response in paragraph 24. Any effects would be limited in magnitude, short lived and localised.

52. F&B have also commented that "[t]he application states that it is expected a cold spring will discharge at the same location once rewatering of the mine has taken place…"[20]

53. I have addressed the potential for the flow to return to the spring in paragraphs 36 and 37 of this response.

54. F&B commented that "[i]n relation to effects on surface water the effects are highly uncertain. The AEE records that in relation to dewatering effects associated with the Wharekirauponga Underground Mine:

19 Forest and Bird comments on Waihi North, at paragraph 116.
20 Forest and Bird comments on Waihi North, at paragraph 119.

…

Until dewatering activities commence, it will not be known if this link between the deep, shallow, and surface waters is small-negligible (which will see dewatering effects constrained to the deep groundwater system), or more substantial (resulting in measurable surface water effects)."[21]

55. The connectivity between the deep aquifer, shallow aquifer and surface water has been discussed previously in this response at paragraphs 13 to 16. In summary, the groundwater modelling is conservative and ongoing monitoring and testing of the deep-shallow groundwater connecting continues to support the conceptual model of a separated system.

56. F&B also commented that "[i]t is critical that when considering effects that this is not just considered on a catchment wide basis but also specifically with respect to this area of higher risk below which mining will occur. Forest & Bird is concerned that within this area of higher risk mining could result in dewatering effects much more significant than predicted. The level of uncertainty regarding the effects of dewatering (which has a high potential impact) is unacceptable."[22]

57. Uncertainty analysis was undertaken within both the groundwater and surface water technical assessments, and the most conservative outcomes have been assessed. i.e. where a high level of connectivity is assumed. In summary, it is my opinion that the uncertainties have been considered within the range of predictions provided.

58. As stated elsewhere in this response, ongoing testing is supporting the low level of connectivity between the aquifer and surface waters, meaning the envelope of effect will only reduce relative to the conservative assessment presented the AEE.

21 Forest and Bird comments on Waihi North, at paragraph 123.
22 Forest and Bird comments on Waihi North, at paragraph 126.

59. In relation to the “Conditions – Waterbodies” section of the comments, and specifically in relation to the trigger levels in paragraphs 136 to 138 of F&B’s comment, I have previously stated my opinion on those matters in paragraphs 27 and 28 of this statement.

Response to iwi concerns

60. I have been involved with undertaking iwi consultation for the WNP and understand that they have raised their concerns with OceanaGold in relation to the potential effects related to mine dewatering.

61. One of those concerns is that they feel the connections between deep, shallow, and surface waters are not fully understood and that no contingencies are in place. In response, iwi request the implementation of a comprehensive groundwater management plan, including a piezometer network to monitor aquifer levels, detect changes in groundwater behaviour, and regularly assess and mitigate any impacts.

62. In relation to the connectivity between the aquifers and surface water bodies, I refer to paragraphs 13 to 17 of this response.

63. In relation to the proposed monitoring and management, I refer to paragraphs 26 to 29. of this response.

64. In relation to the Warm Spring, I understand that Ngāti Tara Tokanui:

    a. express concerns in relation to the loss of the Warm Spring which I have acknowledged I believe will occur; and

    b. consider the Warm Spring to be part of a broader network of geothermal features in the area and that those springs are recognised as healing waters believed to have served as important waypoints for travel and settlement.

65. I acknowledge that the Warm Spring is not unique and that other warm spring discharges occur at locations throughout the wider Coromandel and Hauraki Regions. The Warm Spring is not of geothermal origin because the source of the heat is not volcanic, but rather it is from meteoric water circulating deep beneath the surface via faults where it is heated by the earth's natural thermal gradient. Water is defined as being geothermal if it has a temperature of more than 30 degrees Celsius and where the source of heat is magmatic.

Dated: 1 September 2025

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Christopher Robert James Simpson