

MEMO

DATE: 01/07/2026
TO: Amy Robinson
FROM: Jacob Williams (Freshwater Technical Advisor)
SUBJECT: Freshwater assessment of Belmont Quarry proposed land swap

Overall Assessment

The values of the DOC Give and DOC Get areas are assessed in further detail in Tables 1 and 2. My overall assessment of the two areas with the limitations and information gaps discussed below are:

- **Overall freshwater ranking for DOC give site: Medium-High**
- **Overall freshwater ranking for each block in the DOC get sites:**
 - Northern Gully: Medium**
 - Firth Block: Medium-High**
 - Dry Creek: Low**
 - Southern Gully: Medium High**
- **Overall freshwater ranking for the DOC get sites: Medium-high**

Limitations/information gaps

- The eDNA surveys collected in the DOC Give block were collected at the boundary of the proposed overburden site and not at the boundary of the 'give' area. As such there may be additional species present in the habitat (about 100 m of stream length), between the sample points and the boundary of the 'give' area that may have been missed.
- The applicant states that for the DOC Give block "*Freshwater habitat and species values are limited in the intermittent sections (macroinvertebrates) and largely absent in the ephemeral sections*". However, the applicant's eDNA reports (which were mostly collected at the interface of the intermittent and ephemeral sections of the waterways), indicate good freshwater biodiversity values due to the high proportion of EPT macroinvertebrate taxa and good-excellent MCI values.
- It is not clear in the application as to the specific types of wetlands that are present. Some wetland types (e.g. ephemeral and seepage/flush) are considered threatened (Holdaway *et al*, 2012)¹ which, if present, would increase the value. **The applicant has clarified that the wetlands are not any of the threatened wetlands in Holdaway *et al* (2012).**
- I am unsure where the values and area calculations for the farm pond/wetland located between the DOC Give and DOC Get (Firth Block) are recorded. I have assumed that the feature is located in both blocks given that the water source for the pond will be predominantly from the DOC Give block.
- The waterways present on the site are likely to vary in their hydrology over time depending on weather, geology and hydrological processes. This highlights that while some of the waterways may be ephemeral/intermittent/perennial at the time of surveying, they may change throughout time which could impact the habitat and freshwater species that are present or likely to be present.

¹ Holdaway R. J., Wiser S.K., Williams P. A. 2012: Status assessment of New Zealand's naturally uncommon ecosystems. *Conservation Biology*, 26: 619–629.



Changes to the hydrological process upstream of the DOC Give and DOC Get blocks will have an impact on the waterways and wetlands located in and downstream of the blocks.

- Some of the information provided appears to be based on qualitative and assumed statements rather than surveyed information, especially in relation to **values present in** ephemeral and intermittent stream reaches. Ephemeral and intermittent waterways may have less value as habitat for fish species, however, they still provide seasonal habitat for fish species, habitat for macroinvertebrates, act as buffers for downstream reaches and can help regulate water flows.
- There is no quantitative survey information for the waterways in the Firth Block however observational information has been provided (BlueGreen, 2026 a)².
- There is no quantitative or qualitative survey information for the waterways present in the Dry Creek Block.

~~Overall ranking~~ **Ranking approach**

~~The overall ranking for the DOC get site (as a whole) is based on a combination of factors including the values assessments, area of wetlands, length of waterways, quality of waterways, fish passage barriers etc rather than a numeric values based assessment e.g. adding or averaging across the rankings.~~

For the overall ranking for the DOC get and give sites, the ranking for each criterion in each individual block considers a number of factors including the values of the wetlands and waterways, fish passage barriers downstream etc. The overall ecological value for each block is based on the highest ranking for each criterion. It is not a numeric values-based assessment e.g. adding or averaging across the rankings. The overall ranking for the DOC get sites follow the same approach of applying the highest overall ranking.

² BlueGreen a, 2026: *Belmont exchange clarifications sort by DOC*, memo.

Table 1. DOC Give Site

Criterion	Ranking	Comments
Representativeness	Medium	- Wetlands present on site (0.23 ha) (BlueGreen 2026 b)³ and downstream of the site. A farm pond and associated wetland sits between this block and the DOC Get (Firth Block)⁴. - Ephemeral/intermittent/perennial streams present (1845 m; Landscape Dynamics Ltd 2025) which are typical of the area⁵. There are primarily intermittent and ephemeral waterways in the block. - Waterways/wetlands are not modified in recent times⁶ (has historically been pasture and exotic vegetation) (BlueGreen 2026 b). Currently well vegetated riparian margins in a 'natural state'. - eDNA MCI data indicates MCI scores of 88.7-104.3 (BlueGreen 2026 c)⁷, which suggests fair-good quality (Stark & Maxted 2007)⁸. - MCI survey downstream of the site indicates scores of 120.8-124.7 (BlueGreen 2026 b)⁹ (excellent quality class). While this survey point may be outside of the DOC Give block, it is in close proximity to the block and provides an indication of macroinvertebrate communities in the permanent stream reaches.
Diversity and pattern	Medium	- Habitat types (small waterways, wetlands), ephemeral/intermittent/perennial, with a diversity of instream habitat. - eDNA results indicate no presence of native fish¹⁰. - eDNA results indicate MCI scores of 88.7-104.3 (fair-good quality class) (Stark & Maxted 2007).

³ BlueGreen. 2026 b: Belmont Quarry Land Exchange: Overview of Ecological Values. Report prepared by BlueGreen Ecology Ltd for Winstone Aggregate Ltd.

⁴ The area of this particular wetland within the two blocks is unknown.

⁵ Based on the applicant's data (Landscape Dynamics Ltd. 2025: *Belmont Quarry Hydrological analysis of proposed land exchange*) and [NIWA River Maps analysis](#)

⁶ Aerial photography in BlueGreen (2026 b) indicates that the area was previously farmland with some riparian vegetation around the waterways. Good vegetation cover was established between 1988 and 2010

⁷ BlueGreen c, 2026: *eDNA results – Belmont OBDA*, memo.

⁸ Stark, J.D., Maxted, J.R. 2007: *A user guide for the macroinvertebrate Community Index*, Prepared for the Ministry for the Environment, Cawthron Report No. 1166, 58p

⁹ This data was collected in March 2002 by Boffa Miskell Limited (Boffa Miskell Limited 2022).

¹⁰ eDNA samples in the DOC Give area were collected in four locations mostly in waterways classified as intermittent (3 sites) and perennial (1 site).

		- Records from the wider catchment indicate the presence of shortfin eel (Not Threatened), longfin eel (At Risk, Declining)¹¹ and kōura (Not Threatened)¹². These are representative of the fish diversity in the area¹³. - Predictive models indicate additional species (banded kōkopu, redfin bully) may be present (White <i>et al</i> 2022¹⁴, Crow <i>et al</i> 2014¹⁵, Leathwick <i>et al</i> 2010¹⁶)¹⁷. - The applicant's report states there are limited macroinvertebrate species and habitat values in the intermittent sections and that they are largely absent in the ephemeral sections (BlueGreen 2026 b, p. 74).¹⁸
Rarity and distinctiveness	Medium-High	- The site in LENZ mapped <10% indigenous vegetation cover left. - Wetlands are present in the site. Only Less than 3% of wetlands remain in the Greater Wellington Region (Ausseil <i>et al.</i> 2008)¹⁹. - Longfin eel (At Risk, Declining) and kōura likely present (seasonally)²⁰. - Modelled presence indicates that additional fish species, banded kōkopu, redfin bully) may be present. - eDNA results indicate no presence of native fish⁵. - eDNA results indicate the present of kōura (Not Threatened)
Ecological context (size, shape, connectivity, buffering)	Low-Medium	- Good buffering between upper catchment source water and lower catchment. - Contains source water for tributaries of Hutt River and wetlands located downstream. - Known fish passage barriers located downstream²¹. - Connectivity for fish movement is marginal given the location in the catchment and known fish barriers downstream.

¹¹ Threat classification for fish from (Dunn, N.R., Closs, G.P., Crow, C.K., David, B.O., Goodman, J.M., Griffiths, M., Hicks, A.S., Hickford, M.J.H., Jack, D.C., Kitson, J.C., Ling, N., Waters, J.M., Wylie, M.J., Hitchmough, R.A., Makan, T. 2025: Conservation status of New Zealand freshwater fishes, 2023. *New Zealand Threat Classification Series 46*. Department of Conservation, Wellington. 66 p).

¹² Threat classification for freshwater invertebrates from (Grainger, N., Harding, J., Drinan, T., Collier, K., Smith, B., Death, R., Makan, T., Rolfe, J. 2018: Conservation status of New Zealand freshwater invertebrates, 2018. *New Zealand Threat Classification Series 28*. Department of Conservation, Wellington. 25 p.)

¹³ Based on NIWA Freshwater Fish Database records

¹⁴ White, R., Stoffels, R., Whitehead, A. 2022: *State and trends of New Zealand's freshwater fishes to support the 2022 Threat Classification*, prepared for the Department of Conservation, NIWA report, 2022105CH.

¹⁵ Crow, S., Booker, D., Sykes, J., Unwin M., Shankar, U. 2014: *Predicting distributions of New Zealand freshwater fishes*, prepared for the Department of Conservation, NIWA report, CHC2014-145.

¹⁶ Leathwick, J.R., West, D., Gerbeaux, P., Kelly, D., Robertson, H., Brown, D., Chadderton, W.L., Ausseil, A-G. 2014: *Freshwater Ecosystems of New Zealand (FENZ) Geodatabase, Version One - August 2010 User Guide*, Department of Conservation.

¹⁷ An assessment was made using all three predictive models throughout this report.

¹⁸ It is unknown if this is based off any quantitative survey information.

¹⁹ Ausseil, A-GE, Gerbeaux, P, Chadderton, WL, Stephens, T, Brown, DJ, & Leathwick, J. 2008: *Wetland ecosystems of national importance for biodiversity: Criteria, methods and candidate list of nationally important inland wetlands*. Landcare Research Contract Report LC0708/158 for the Department of Conservation.

²⁰ Based on previous survey reports (Boffa Miskell 2022) and NIWA Freshwater Fish Database records.

²¹ Identified in the applicant's ecology report (BlueGreen 2026 b) and the NIWA fish passage assessment tool.

Table 2. Northern Gully²²

Criterion	Ranking	Comments
Representativeness	Medium	- Ephemeral, intermittent and permanent waterways (1191 m; Landscape Dynamics Ltd 2025) with a mix of freshwater habitat (BlueGreen 2026 b). - Waterways appear not to have been modified in recent times, but it appears some section of the waterways contain “elevated unnatural fine sediment loads adjacent to the existing fill area” (Boffa Miskell 2022 p. 7). - MCI score for some waterways in the Northern Gully (Boffa Miskell, 2022) is 122-124 (excellent quality class) (Stark & Maxted 2007).
Diversity and pattern	Medium	- Surveys for fish completed (previous reports, Boffa Miskell 2022) for the northern gully recorded the presence of longfin eel (At Risk, Declining), shortfin eel (Not Threatened) and kōura (Not Threatened)¹². - Modelled fish presence indicates additional species (banded kōkopu, redfin bully) may be present. - Previous invertebrate surveys (Boffa Miskell 2022) record an MCI score for some waterways in the Northern Gully area of 120-124 (excellent quality class) (Stark & Maxted 2007).
Rarity and distinctiveness	Medium	- The LENZ mapped indigenous vegetation cover left varies between the blocks with 10 % remaining to 20-30 % remaining. - Longfin (At Risk, Declining) eel, shortfin eel and kōura are present in some of the waterways (Boffa Miskell 2022). - Modelled presence may include additional species, kōaro, banded kōkopu, redfin bully).
Ecological context (size, shape, connectivity, buffering)	Low-Medium.	- Good buffering between upper catchment source water and lower catchment. - Contains source water for tributaries of Hutt River. - Known fish passage barriers located downstream. - Connectivity for fish movement is marginal given the location in the catchment and known fish barriers downstream.

²² As there is no survey information specifically for the QEII portion of the Northern Gully Block, I have assessed the values as the same across the non-QEII portion and the QEII portion.

Table 3. Southern Gully

Criterion	Ranking	Comments
Representativeness	Medium-High	- Ephemeral and permanent waterways (616 m; Landscape Dynamics Ltd 2025) with a mix of freshwater habitat (BlueGreen 2026 b). The main gully waterway is permanent. - Waterways appear not to have been modified in recent times. eDNA MCI score for one waterway in the Southern Gully is 109 (BlueGreen 2026 c) (good quality class) (Stark & Maxted 2007). - There is a wetland present in the Southern Gully (0.29 ha). Only Less than 3% of wetlands are left in the Greater Wellington Region (Ausseil <i>et al.</i> 2008).
Diversity and pattern	Medium	- eDNA survey for fish recorded the presence of longfin eel (At Risk, Declining), shortfin eel (Not Threatened), and banded kokopu (At-Risk, Naturally Uncommon) (BlueGreen 2026 c)²³. The applicant suggests shortjaw kōkopu (Threatened, Nationally Vulnerable) may be present.²⁴ - Modelled fish presence indicated additional species (banded kōkopu, redfin bully) may be present. - MCI score for one waterway in the Southern Gully is 109 (BlueGreen 2026 c) (good quality class) (Stark & Maxted 2007).
Rarity and distinctiveness	Medium-High	- The LENZ mapped indigenous vegetation cover left varies between the blocks with 10 % remaining. - Longfin eel, shortfin eel and banded kokopu are present in some of the waterways (BlueGreen 2026 c). - Modelled presence may include additional species, banded kōkopu, redfin bully). - Wetlands are present in the Southern Gully. Only Less than 3% of wetlands remain in the Greater Wellington Region (Ausseil <i>et al.</i> 2008).
Ecological context (size, shape, connectivity, buffering)	Low-Medium.	- Good buffering between upper catchment source water and lower catchment. - Contains source water for tributaries of Hutt River. - Known fish passage barriers located downstream. - Connectivity for fish movement is marginal given the location in the catchment and known fish barriers downstream.

²³ The samples were collected at one location in the Southern Gully.

²⁴ The applicant provides no quantitative evidence to support these statements. There are no records of shortjaw kōkopu in the NIWA Freshwater Fish Database for the Hutt River catchment (accessed March, 2026).

Table 4. Dry Creek²⁵

Criterion	Ranking	Comments
Representativeness	Low	507m of waterways (Landscape Dynamics Ltd 2025), unknown if ephemeral, intermittent or perennial. - Waterways have been modified in the Dry Creek block downstream of the proposed give site.
Diversity and pattern	Low	No eDNA or survey information for the Dry Creek block, however significant fish passage barriers downstream (piped stream) means that fish diversity is likely to be minimal but there is likely to be a good macroinvertebrate community similar to the other blocks.
Rarity and distinctiveness	Low	- The LENZ mapped indigenous vegetation cover left varies between the blocks with 10 % to 20-30 % remaining. - Modelled presence may include additional species, banded kōkopu, longfin eel and redfin bully.
Ecological context (size, shape, connectivity, buffering)	Low	- Good buffering between upper catchment source water and lower catchment. - Contains source water for tributaries of Hutt River. - Known fish passage barriers located downstream. - Connectivity for fish movement is marginal given the location in the catchment and known fish barriers downstream.

Table 5. Firth Block²⁶

Criterion	Ranking	Comments
Representativeness	Medium-High	- A farm pond and associated wetland sits between the DOC Give block and the DOC Get (Firth Block). Only Less than 3% of wetlands are left in the Greater Wellington Region (Ausseil <i>et al.</i> 2008). - Ephemeral and permanent waterways (715 m; Landscape Dynamics Ltd 2025) with a mix of freshwater habitat (BlueGreen 2026 b). Waterways appear to be predominantly ephemeral (Landscape Dynamics Ltd 2025). - Waterways appear not to have been modified in recent times.
Diversity and pattern	Low-Medium	- No eDNA or survey information for the Firth Block. - Modelled fish presence indicates longfin eel, banded kokopu and redfin bully may be present. - The applicant states that “the stream is expected to have a good MCI/QMCI score likely >110, with some strong sediment related components but absence of fish” (BlueGreen, 2026 a, p. 4)

²⁵ There is no freshwater survey information for the Dry Creek Block, this assessment is mostly based off descriptive information and site photographs but site-specific survey information would be needed to confirm the ranking.

²⁶ There is no freshwater survey information for this block, this assessment is mostly based off the descriptive information in BlueGreen 2026 a.

Rarity and distinctiveness	Medium-High	• The LENZ mapped indigenous vegetation cover left varies between the blocks with 10 % remaining to 20-30 % remaining. • Wetlands are present in the Firth block. Only Less than 3% of wetlands remain in the Greater Wellington Region (Ausseil <i>et al.</i> 2008). • Modelled fish presence indicates longfin eel, banded kokopu and redfin bully may be present.
Ecological context (size, shape, connectivity, buffering)	Low-Medium.	• Good buffering between upper catchment source water and lower catchment. • Contains source water for tributaries of Hutt River. • Known fish passage barriers located downstream. • Connectivity for fish movement is marginal given the location in the catchment and known fish barriers downstream.

Table 6. Overall values assessment for each block

	Representativeness	Diversity & pattern	Rarity & distinctiveness	Ecological context (size, shape, connectivity, buffering)	Assessment including the proffered improvements²⁷	Overall ecological value²⁸
<i>DOC Give site</i>						
OBDA	Medium	Medium	Medium - High	Low - Medium	N/A	Medium - High
<i>DOC Get sites</i>						
Northern Gully	Medium	Medium	Medium	Low – Medium	N/A	Medium
Firth Block (QEII)	Medium-High	Low-Medium	Medium-High	Low – Medium	N/A	Medium-High
Dry Creek	Low	Low	Low	Low	N/A	Low
Southern Gully	Medium-High	Medium	Medium-High	Low – Medium	N/A	Medium - High

²⁷ These are the improvements offered by the applicant.

²⁸ I have assessed the overall ecological value based on the highest ranking for each criterion.