

Issue ID	Aspect	Document reference	Section	Physical Page No.	Issue identified	Action requested from applicant	Applicant response (21 August 2023)	Consent Officer: Initial response - Question answered?	Consent Officer: In response to unanswered question. Explain why question is or isn't within scope of s92(2) and why the scope of s92(2) has or hasn't been answered.	Status as of 22 Jan 2024 (Stantec)	Comments (Stantec, 22 Jan 2024)	Stantec reviewer (initials)
1	Surface water	2022 letter report (PDP) Table 1	2.3	4	Sample size and monitoring period not described for data presented in Table 1	Please confirm the dates of samples used to calculate the statistics in Table 1 (we do note that text under Table 1 states "five separate samples"). It would be helpful if these can be matched up to the requirements of Condition 4(c) in the existing consent (AUTH-20181937-03), and the relevance of each sampling event to this application described.	Dates of sampling provided along with context for this sampling and how it relates to proposed new conditions	Yes		Resolved - no further action required	Past sampling did not capture stormwater collected from CAL cover. Applicant has proposed new conditions to add stormwater sampling from MH1 if it becomes necessary to discharge from the cover in future.	JG
2	Surface water	2022 letter report (PDP) Table 1	2.3	4	It is not clear who did the monitoring presented in Table 1	Please confirm whether surface water quality monitoring presented in Table 1 was entirely undertaken by Blue Sky meats? If not, please detail who did the monitoring (e.g. Regional council)?	PDP and BSM both supplied data	Yes		Resolved - no further action required	No further comments.	JG
3	Surface water	2022 letter report (PDP) Section 4, p4	4	4	20 metres upstream of the discharge point for stormwater/dewatered groundwater is not very far, although we acknowledge that the applicant sampled at the greatest extent of the reasonable mixing zone defined in the existing consent. The 'similarity' in water quality between the background and discharge could be because the background site was influenced by the discharge.	Can the applicant please discuss whether there could have been any influence on the background quality given such close proximity to the discharge? Was there any evidence of the mixing zone extending upstream at all due to any back flow or groundwater mounding?	Discussion was made and there was no backflow influence as samples were taken 20m upstream as per conditions of consent and the flow was not stagnant. Proposed conditions will monitor at a minimum, 20m upstream from now on.	Yes		Resolved - no further action required	The proposed change to the monitoring condition is acceptable.	JG
4	Surface water	2022 letter report (PDP) Section 4, p5	4	5	It is unclear what is meant by the statement "early monitoring indicates that the discharge may increase nitrate levels within the stream". It is difficult to tell how representative the results in Table 1 are of current discharge (combined stormwater and dewatered groundwater).	Please confirm what is meant by "early monitoring" - e.g. One sample in particular? Or all sampling since 2018? Or another meaning? How representative are the results in Table 1, with regards to the 'SW Discharge Average' column? Does the underlying groundwater also have these characteristics? Quantify how much the quality of this discharge may improve over the proposed consent term.	All five samples collected since 2018. Improvement results can only be revealed over the long term due to slow groundwater movement.	Yes		Resolved - no further action required	Comments: 1. General Well thought-out field work and good analysis in Appendix F to characterise groundwater movement and groundwater-surface water interaction. The concluded flow directions and groundwater-surface water interactions are appropriate. 2. Surface water In brief, the risk to surface water from contaminated groundwater already exists. The proposed project will not worsen the situation. The situation can be only improved but unfortunately this will happen at a very slow rate given the hydraulic settings of the shallow groundwater system and the interconnected surface waterways. 3. Groundwater Appendix F rules out the possibility of downward flow based on the observed upward gradient from the deep aquifer and the surficial (shallow) aquifer. However, there is a possibility of extremely slow and small flow from the deep aquifer to the deeper aquifer. This would not constitute a risk to the deeper aquifer as the flow rate will be negligible (and unmeasurable). As a result, contaminant loads will be trivial and excessive travel times would mean microbes will die within or at the fringes of the deep aquifer system, long time before they could move towards the deep aquifer.	HZ
5	Land	2022 AEE, Mitchell Daysh	2.3.2	10	The notes beneath Table 2 of the AEE state that "Phosphorus removal is in the wasted bacterial solids (biosolids). BSM recombinates the biosolids with the treated wastewater prior to irrigation to the land treatment system..." Section 2.3.3 goes on to state that "waste biosolids generated in the SBR are also discharged to land". From these statements, it appears that Waste Activated Sludge (WAS) is being directly equated to 'biosolids', which is not correct. It's also noted that in PDP's AEE technical report for the land discharge (June 2022; Section 3.5) biosolids are characterised based on "a sample of the biosolids (from waste activated sludge draw off)" (p9). While the BSM 'biosolids' are characterised as meeting 'Grade a' contaminant standards, there is no obvious assessment against a stabilisation and vector attraction grade in relation to the NZWWA 2003 Guidelines for the safe application of biosolids to land in New Zealand.	Waste Activated Sludge is not considered to be biosolids unless it meets the process or product standards as defined in the guidelines (NZWWA 2003). This includes both stabilisation (pathogen reduction, vector attraction reduction, and product pathogen standard) and contaminant requirements. Please review the characterisation of 'biosolids' for this application and provide: a. A clear description of how the sludge will meet the process or product standards required to attain the status of 'biosolids' (as per NZWWA 2003). b. An assessment of the stabilisation grade of biosolids which will be achieved through treatment and separate management, with consideration of the intended end use c. A description of how this grade will be achieved, including how the requirements of Tables 4.1 and 4.2 of the NZWWA 2003 guidelines will be met.	It isn't biosolids according to the NZWWA 2003 definition. Rather it is 'organic solids from wastewater treatment processes' or 'organic materials' according to the proposed new 2017 draft guidelines.	Yes		No further actions required from applicant - will be addressed in technical review memo	Section 1.1.1 of the draft 2017 Guideline states that: " <i>Raw organic materials, often a waste product from other activities, which are suitable to make these products include: ... organic wastes from the secondary sector, such as meatworks wastes</i> " Therefore, the WAS could be used as an organic material for application to land under the terms of the guidelines. However in order to be compliant with the Guidelines and hence be "safe", they need to be processed to either Grade A or Grade B, in terms of stabilisation of the organic and pathogenic content. The applicant's use of the USEPA definition of biosolids is not considered appropriate and could lead to misinterpretation. The methods for stabilising the product are given in Section 5.1.2 of the 2017 Guidelines, which states " <i>Most, if not all, organic materials contain pathogens, particularly when they derive from animals or humans. ... Therefore all such material requires careful management to minimise any health risks while gaining the benefits.</i> " The material needs to be stabilised before applying to land in order to avoid vector attraction and the potential spreading of pathogens. The methods for achieving the stabilisation grades are similar in both 2003 and 2017 Guidelines. This is required whether the material is applied to their own or third party land, as the potential effects from vectors could spread beyond their land. There is the potential for the contamination of the WAS with a variety of contaminants, as also identified in the 2017 Guidelines. These should be considered before application to land. The applicant's response that stabilisation of the WAS is not relevant or required is not accepted	SB
6	Land	2022 AEE, Mitchell Daysh	4.7.4	28	It is not clear from the application or accompanying technical reports how the current soil quality issues (e.g. blinding by fat, oil and grease) are being remediated, and a timeframe for completion.	Please confirm: a) Methods which have been and will continue to be applied to improve soil quality on the site, where soils have been adversely impacted by past land irrigation activities b) The timeframe for completion of full remediation, if applicable (or explain how the current remediation will tie in with future activities).	Changing from primary effluent irrigation to secondary treated wastewater irrigation. Mechanical aeration of soils. Applications of gypsum. Current remediation and proposed conditions expected to remediate the soil.	Yes		Timeframe for reinstatement of soil to be achieved and impact on use of the soil for treated wastewater application is still unresolved. This will be discussed in the tech memo, and can be addressed through consent conditions.	The sodium adsorption ratio (SAR) data provided in Appendix F indicates low 'sodium hazard', which means that the irrigation water will not cause damage to the soil porosity. If there has been historic damage to soil porosity due to cation exchange between water and the soil, addition of gypsum (or lime) could help (this is to balance the ratio between Na on one hand and Ca and Mg on the other). The response indicates that the applicant will endeavour to maintain a minimum soil saturated hydraulic conductivity of 6 mm/hr. Conditions 21-24 provide for monitoring of Exchangeable Sodium Percentage (ESP) and hydraulic conductivity on an annual basis during May. The management actions specified in Conditions 23 and 24 are acceptable. However, our question has not been fully addressed re: how much damage occurred previously and how this will initially be remediated.	HZ

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7	Land	2022 AEE, Mitchell Daysh	2.2	7	Stock units' and 'animals' are used inconsistently throughout this section and the reporting in general. These terms are not equal, so it makes it difficult to have confidence in the consistency of the estimates presented.	Please clarify how the applicant is defining a 'stock unit'.	A single animal processed at the plant	Yes		No further actions required from applicant - will be addressed in technical review memo	Stock unit is expressed as single animals (instead of being calculated by animal weight). This could potentially mean that estimates of waste volume and contaminant loads are under-estimated. Some individual animals may have larger body mass and consequently larger output of waste than others. Using an intake-based stock unit allows for different animals to be accounted for in the farm system (e.g. sheep and beef; which will have different nutritional intake). The flows and loads assessment stated the following assumption: "On average, the site uses around 170 L/kill, with an 80th percentile of 205 L/kill. When processing over 4,500 kills per day, this reduces to an average of 160 L/kill, with an 80th percentile of 180 L/kill...an 80th percentile of 210 L/kill has been adopted to estimate future wastewater generation and water consumption" (p284; application Part 2). This assumes that the proportion of animals (e.g. lambs, beef) remains the same. If that is not the case in reality, this could influence the flows and loads estimated for the plant. This is a potential issue for the capacity of the plant if the proportion changes.	JG
8	Land	2022 AEE, Mitchell Daysh	2.2	7	Predicted volume of animals to be processed at commencement of new consent (and during consent term for 35 years), and any limits on plant capacity in terms of animals processed, are not detailed. Only the current production capacity (up to 900,000 animals/year) is detailed. The application also does not discuss predicted volumes of human wastewater to be generated and treated on site (e.g. from factory workers' toilet and shower facilities; cafeteria etc.). The lack of clarity regarding the intended maximum loads for the operation means that currently, the assessment is not sufficient to inform a 35 year consent term.	Please confirm: a) The corresponding increase in number of stock units processed (and water demand/wastewater generation) as a result of increasing to a 12 month processing season. b) Will the 12 month processing season become permanent, once implemented? (i.e. for the entire duration of the proposed consent term?) If not, how is the length of the processing season expected to vary over time? c) The Flows and Loads Assessment was completed on the basis of the 2020/21 processing season, which was 11 months' long. Why was this not based on a 12 month period, if that is the intended duration going forward? This will have had implications for the calculated outputs from the Flows and Loads Assessment. d) Estimated flows and loads for human waste generated at the site as a result of the proposed activity, and proposed treatment and management measures, and effects assessment. e) A defined maximum envelope for the operation, with upper limit for loads, and a mechanism for maintaining this within an acceptable range. Please also define, in relation to this envelope: - Resulting loads and effects - Any required improvements for the quality of the New River Estuary and Waihopai River, and how these will be addressed over the proposed 35 year consent term.	A) 900k stock units over 12 months. 1500m3/day of groundwater. B) Yes. C) updated worst case scenario Overseer modelling provided indicating no discernable difference. D) human waste managed separately. E) No change in effects expected in 12 month processing regime compared to the current 11 month regime.	Yes		No further actions required from applicant - will be addressed in technical review memo and consent conditions.	A) Noted. B) and C) Response is noted; potential difference between reality and Overseer to be discussed in technical memo. From Fig 1 and 2 in the response, there is significant difference in loading, particularly in July, Oct and Dec. D) Details regarding how human waste is "managed separately" have not been provided. Even if discharging under permitted activity, it needs to be made clear how it is managed (e.g. specify any other consents/authorities or permitted activities being relied on). E) The original AEE and proposed consent conditions have N loading of 200 kgN.Ha.Yr and 350 kgN.Ha.Yr; the WW EMP (page 10) states N loading of 350 kgN.Ha.Yr and 450 kgN.Ha.Yr. The Overseer output for 450 kgN.Ha.Yr load has not been provided. These inconsistencies need to be resolved. New River Estuary - refer to Issue 41 below.	JG / SB
9	Land	2022 AEE, Mitchell Daysh	2.3.2	10	It is stated that "the WWTP can treat up to approximately 1,000 m ³ per day". It is assumed this represents a peak design flow?	Please confirm the peak and/or average daily wastewater flow sought as part of this consent application, and whether a meter will be used to measure this flow if consent is granted.	discharging 1,500m3/day wastewater + 6m3/day of solids, paunch, grit. Meter is installed	Yes		No further actions required from applicant - will be addressed in technical review memo	Demand is reflected in Condition 2 (groundwater take <1,500 m ³ /day). However there is no explicit limit for discharge of treated wastewater in terms of max daily volume - it is only expressed in terms of irrigation depth (Condition 6, discharge to land). The area over which irrigation can occur is also not stipulated. The phrasing of Condition 6 is confusing and does not provide enough specificity for compliance assessment. Condition 13(i) (discharge to land) requires installation of a flow meter to measure discharge volumes. Condition 13(ii) requires daily monitoring of volume of paunch, solids and grit discharged to land.	JG
10	Surface water	2022 AEE, Mitchell Daysh	10.2.2.2	99	Pest birds contributing to lagoon water quality	It is stated within the NPS-FM summary that "The quality of the stormwater from the lagoon cover is expected to reflect that of roof run-off and not have any adverse effect on the water quality of any freshwater body". Guano (bird poo) can pose a risk to pH within the lagoon, and hence final treatment quality. How does the applicant propose to address the water quality issues caused by pest birds congregating on the cover of the aerated lagoon?	BSM would prefer to discharge lagoon stormwater to surface water but is discharging to land instead via the WWTP as the more appropriate discharge location. Potential pH issues are expected to be sufficiently diluted in the wastewater.	Yes		No further actions required from applicant - will be addressed in technical review memo	Stormwater from beneath CAL cover to be discharged into wastewater system (not directly to surface water). Applicant claims that residual alkalinity from guano helps to balance pH for the treatment process. The sizing of the CAL is not discussed in the application or response docs, likely as it was an existing structure. Only the size of the storage lagoon is mentioned (15,000 m ³ capacity). It is not possible to tell whether the volume of roof runoff was factored into the lagoon sizing for the CAL. The description in Section 3.3(iv) of the 2022 AEE describes how the CAL cover was sized to effectively manage foul air; it is assumed that foul air was the main focus for sizing. The volume of the stormwater discharge from the CAL cover and the potential impact on process performance / capacity will be discussed in the technical memo.	JG
11	Surface water	2022 AEE, Mitchell Daysh	4.8.2	29	Table 7 does not include sample size (n) - number of samples on which metrics were calculated.	Please confirm sample size for each of the parameters and statistics calculated, along with the monitoring period covered (in the last 10 years is quite generic - please provide starting month/year and last month/year of record analysed)	New table provided. Starting month/year and last month/year provided	Yes		Resolved - no further action required	No further comment	JG
12	Surface water	2022 AEE, Mitchell Daysh	4.8.2	29	Maximum and minimum values appear to be incomplete in Table 7 for DO, DRP, TN, Nitrate-N, Ammoniacal-N, E.coli, and EC.	Please complete Table 7 or explain why max/min values are not completed.	Results only provided where relevant to adverse effect/trigger level.	Yes		Resolved - no further action required	No further comment	JG
13	Land	2022 AEE, Mitchell Daysh	6.1	40	Effects on human health are not listed as actual or potential effects of the Proposal in Section 6.1. The assessment given in Section 6.4.6 is very limited and descriptions of measures to minimise risk are broad.	How has the applicant considered potential effects on human health (including to workers and the general public) from the proposal? Which "standards and guidelines" have been used for this application, and what is the outcome of the assessment in this regard? Section 6.4.6 does not provide enough detail. What is the level of risk posed by the proposed activities? For example, the proposal involves use of spray irrigators, rather than sub-surface irrigation (which poses less risk to human health).	Response provided for each issue. DW standards and Overseer guidelines used. Risk from spray drift likely to be minimal due to sufficient buffer distances.	Yes		No further actions required from applicant - will be addressed in technical review memo	Application proposes the use of spray irrigators at a low height "to minimise the potential for spray drift". This is covered in proposed Condition 37. Controls with respect to spray drift are adequately explained. The proposed standard refers to "no detectable spray drift" but a methodology for determining this is not proposed. This will need to be addressed in forming conditions to ensure clarity for compliance. Need to address the impact of the Worst case drainage of 5.3mg/l of NO ₃ on groundwater. Relates to the impact on New River Estuary (NRE). Applicant claims that they will reduce N leaching to below "typical farming operations in region" but NRE loads need to reduce significantly so being "below" to typical is not sufficient. This will be addressed in technical memo.	JG / SB
14	Land	2022 AEE, Mitchell Daysh	9.3.4	81	It seems as though comments and recommendations from Public Health South (PHS) have not been directly addressed through amendments to the proposal.	Public Health South (PHS) recommended that application rate be reduced to 10mm/Ha/day to minimise risk of nutrient leaching. The applicant has not taken this on board, seemingly as the storage required to hold WW back would be "impractical", and because "the proposed irrigation application rates...are designed to minimise the risk of ponding and runoff". (p83, 2022 AEE). PHS also wanted a shorter consent term to be considered - see Section 9.3.4. Have any further discussions been had with PHS following these changes to the application? Is their position in light of this known?	Consultation with PHS is ongoing. The public notification period has ended and there was no submission from PHS.	Yes		No further actions required from applicant - will be addressed in technical review memo	Applicant does not want to adopt reduced application rate of 10mm/Ha/day as recommended by PHS. This is a consenting risk and as such will be raised in the technical review memo by Stantec.	JG
15	Land	2022 AEE, Mitchell Daysh	6.4.2.4	50	It is stated that "the loading intensity will decrease by an average of 60% in the dry season and 6% in the wet season compared to the current operations because of the additional third-party land available for discharge"	Is this statement correct? Or should it be the other way around, i.e. 60% reduction during wet season. Please provide evidence to support the statement, or a correction.	The statement is correct due to the additional discharge land available from the use of third party land in the summer months. The more land area available for discharge the lower the nutrient loading (due to larger discharge area).	Yes		Resolved - no further action required	No further comment	SB

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16	Surface water	2022 AEE, Mitchell Daysh	6.4.3	51	While the report describes phosphorus loss via runoff and discharge of impacted groundwater as two effects on surface water, it does not further describe the consequent effects of these. For example, the analysis is limited to "contaminants will potentially enter the surface water which can then result in adverse ecosystem effects" (Section 6.4.3.2 - groundwater daylighting). What specific ecosystem effects may occur?	Please provide further detail on the potential or actual effects on surface water (including water quality, aquatic ecology) as a result of the two effects already identified, including assessment against appropriate guidelines for surface water and groundwater quality and ecosystem health. Some of this information is contained in PDP's technical assessment but does not appear to have been carried through to the main application aside from selected details in Section 6.4.4 (for aquatic ecology).	Further detail provided in PDP report which forms part of the application.	Yes		No further actions required from applicant - will be addressed in technical review memo	Applicant has indicated no degradation based on nutrient loss rates but have not shown that there will be improvement or the degree of improvement, either in the local SW or in NRE. Section 4.8.2 of 2022 AEE shows that water quality and ecology indicators in local streams are heavily impacted both U/S and D/S, therefore, improvement is required not just maintenance. Applicant's response says that the presence of these effects in the surrounding environment is a wider issue. However, the consent process is a mechanism for addressing these issues.	DC
17	Land	2022 AEE, Mitchell Daysh	6.4.7	53	No reasoning/justification is provided with regards to the 14 day stock withholding period proposed in the main AEE. Given that the property will be used for sheep and beef farming; heavier livestock such as beef cattle could cause damage to the land treatment area and associated infrastructure. How will this risk be managed/mitigated? The assessment of risk to stock health also seems to be focused only on pathogens in soil. Are there other potential effects such as from heavy metals or nutrients in soils and pasture?	It is noted that Section 5.7 of the PDP technical assessment provides justification for the proposed 14 day stock withholding period, but this has not been included in the main application. Please provide more detail regarding: a) Other potential or actual effects on stock health as a result of the proposed activities b) Confirm that proposed measures including the stock withholding period, wastewater treatment, and land application in combination will be sufficient to ensure that stock drinking water will meet the ANZG Livestock Drinking Water guideline values. c) Outline specific measures which will be applied to prevent damage to the land surface and irrigation infrastructure by larger stock, aside from what is already described in Section 6.4.7.	No further effects on stock are expected. Relevant guidelines are met. Large stock not likely to lead to adverse effects.	Yes		No further actions required from applicant - will be addressed in technical review memo	Explanation for the 14-day stock withholding period is accepted. Advective velocity will be very low. The travel time/transport velocity calculations in Appendix F are acceptable, and we agree with the response provided regarding microbes die offs. Therefore, assessment of impacts on stock water are acceptable. Impact of animals on irrigated soil is addressed through management of time and type of stock allowed to graze. The response states that the risk of pugging is low in summer when irrigation is occurring on third party land with large stock. Currently no condition is proposed with respect to maintaining the soil structure and preventing pugging to ensure that the land remains suitable for irrigation. We will suggest an condition to control this in the technical memo.	HZ / SB
18	Surface water	2022 AEE, Mitchell Daysh	6.4.3.1	54	The potential for surface runoff (discussed in Section 6.4.3.1 of the AEE) is a particularly pertinent issue for this site given the high incidence of rainfall and comparatively low Potential Evapo-Transpiration (as described in Section 4.5.1 of PDP technical assessment). In PDP's technical assessment (Section 3.7), it is stated that Irrigation will be restricted to times when soil moisture is below field capacity (to the extent practical), and will be stopped if ponding or runoff occurs. The report also states that soil moisture will be monitored onsite with probes. Does the applicant intend to adhere to PDP's recommendation? There is some contradiction between the statement in Section 6.4.3.1 of the AEE, and proposed conditions 34-33 (discharge to land, Appendix K) which prohibit prolonged ponding/runoff effects in general.	Is the applicant prepared to cease discharges during wet conditions, to avoid any surface runoff? Please confirm whether the recommendations made in the technical assessment by PDP (Section 3.7) will be implemented. Ideally, these should also be reflected in proposed consent conditions.	Discharge may still occur during wet conditions. Various conditions proposed to mitigate risk.	Yes		No further actions required from applicant - will be addressed in technical review memo	The terminology of "significant prolonged ponding" used in proposed condition 34 differs from the technical assessment report by PDP (2022) which referred to "Stopping irrigation if ponding or runoff is occurring and diverting any wastewater generated to the storage lagoon" (implying that irrigation would be stopped if ANY ponding occurred due to irrigation). Condition 36 essentially allows irrigation to continue even in wet periods when soil moisture is above field capacity, as long as daily inspections of the irrigators and the field conditions are undertaken.	JG
19	Surface water	2022 AEE, Mitchell Daysh	6.4.3.1	54	The intention to permanently block or decommission the irrigation system is also reflected in proposed consent condition 4, however the potential effects of this decommissioning are not discussed directly in the AEE or PDP's technical report.	Please provide a description of the methodology for "capping the tile drains" and discussion of the potential effects which may result from permanently blocking or decommissioning the system under proposed Condition 4, particularly with regard to effects on soil, surface water, groundwater, and aquatic ecology.	The application is not for the capping of any tile drains. Historic capping of tile drains has occurred in the past as it was a pathway for contaminants to get into freshwater. Therefore, subsurface drainage is being removed and proposed conditions reflect this.	Yes		Resolved - no further action required	Proposed consent condition 4 requires the consent holder to "permanently block or otherwise decommission the subsoil drainage underneath the irrigation areas prior to exercising this consent". Given that this condition has been included, this underlines the assumption that subsurface drainage will not be able to occur via tile drains, thereby eliminating that exposure pathway. As long as that condition is complied with, there should be no effect via that pathway.	JG
20	Surface water	2022 AEE, Mitchell Daysh	7 (Table 17)	66	Section 7 discusses monitoring activities, where the focus is on "confirm[ing] the extent of effect arising", but then it is not clear what steps will be taken to avoid, remedy or mitigate effects once identified.	Please provide either or both of the following: 1. Further information to indicate actions to be taken if effects are identified, or at least a mechanism/protocol which will be followed to identify appropriate remedial actions (and give examples of what these could be for each of the rows in Table 17) 2. Propose a consent condition(s) requiring action to be taken in the event that an effect is confirmed through monitoring, with the proposed action to be certified by Council prior to implementation. Such actions should be completed in a timely manner, within a timeframe appropriate to the nature and significance of effects. Note: the proposed draft conditions in Section 6 of PDP's technical assessment do not entirely cover this provision - there either needs to be a "catch all" condition, or each of the monitoring conditions should have a clear corresponding remedial action if an adverse effect is detected.	Various conditions proposed to address these matters. Note groundwater moves very slowly and mitigations measures will take some time to show in groundwater quality results so this lag time needs to be considered. Annual monitoring report will be prepared and actions may stem from this.	Yes		Resolved - no further action required	The data provided supports the conclusion that the shallow groundwater moves slowly (low hydraulic conductivity, low hydraulic gradient, and relatively high porosity). Suggest that Condition 31(d) be widened to detail any corrective actions undertaken to ensure compliance with all Conditions with a specific standard or action, either by specific reference to the relevant conditions or a catch all. This will be discussed in the technical memo.	HZ
21	Land	2022 AEE, Mitchell Daysh	7 (Table 17)	67	Table 17 states that excess sodium, potassium and ESP will be managed through soil additives. The PDP technical assessment (Section 3.7) describes the application of gypsum and use of soil aeration to manage ESP, but this is not discussed in the main AEE/application document. The applicant's intentions in this regard are therefore unclear.	Please confirm the methods which will be used to managed excess sodium, potassium and ESP in soils within the land treatment areas of the site.	Applications of gypsum or lime as required.	Yes		Resolved - no further action required	Examples of methods to be used to respond to changes in ESP and hydraulic conductivity beyond the consented limits are detailed in the proposed consent conditions (23 & 24). See also - response to Issue 6 above.	HZ
22	Land	2022 AEE, Mitchell Daysh	7 (Table 17)	67	Table 17 states that the oil and grease concentration of treated wastewater will be limited to assist in maintaining soil infiltration rates; no detail is provided on how this will be achieved. Given the nature of the influent (high BOD, FOG) this is likely to be an important component of management for the application system, and so greater detail is required. It is noted that proposed condition 12 stipulates that oil and grease shall not exceed 50 g/m ³ in treated wastewater.	Please detail: 1. How has the 50 g/m ³ 'limit' for oil and grease specified in proposed condition 13 been derived? Can the applicant explain how this limit will ensure soil infiltration rates are maintained? 2. How will this limit (or lower concentrations) be achieved? What specific actions will be taken either through management of plant processes and influent quality; treatment processes within the WWTP, or the land application system?	1) Explanation provided along with observations of soil performance. 2) residual oil & grease in the SBR is negligible.	Yes			The information has been reviewed by a process engineer. Some concerns have been raised regarding how achievable the limits might be given the proposed process; these will be discussed in the technical memo.	JG

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23	Surface water	2022 AEE, Mitchell Daysh	7 (Table 17)	68	No detail is provided regarding the ecological monitoring activities to be undertaken, aside from that "ecological monitoring [will be done] on a five-yearly basis". This information does not match that provided in the PDP technical assessment report, which includes a map of the locations (Appendix B), and details the type of monitoring to be undertaken in the proposed consent conditions (Section 6 - draft condition 26).	Any draft conditions proposed should have been cross-referenced in Table 17 as key mitigation measures. Please also provide justification for ecological monitoring at five yearly intervals. In our view monitoring of benthic communities and periphyton would be a minimum requirement to determine changes in ecological health. This is mentioned in the proposed consent conditions but not discussed at all in the AEE.	Cross referencing provided (appendix B). Periphyton sampling has been added. 5-year ecological sampling justified by expected slow rate of improvements.	Yes		No further actions required from applicant - will be addressed in technical review memo	Condition now includes "periphyton sampling" - this seems very imprecise and should be further specified, for example "Periphyton sampling, including % cover and biomass". This will be discussed in the technical memo.	DC
24	Surface water	2022 AEE, Mitchell Daysh	7 (Table 17)	68,69	Buffer zones for irrigation area (to mitigate human health risk)	The application relies heavily on the vegetated buffers to mitigate effects on human health risk. Given this reliance, the level of detail provided regarding these buffers is insufficient in the main application. Please confirm that Figure 17 attached to the PDP technical assessment report (Riparian Planting Plan for Mitigation of Higher Nutrient Loading) is also intended to mitigate potential human health effects (and provide justification for this, if that is the case).	human health risk is largely addressed in issues 13 and 14. Vegetated buffers are specifically for addressing phosphorus loss via runoff. Boundary buffers relate to spray drift from irrigation beyond the boundary of the site.	Yes		Resolved - no further action required	See Issues 13 and 14 above for additional commentary. Based on the applicant's response, it appears that the vegetated buffers are not intended as a measure to mitigate public health risks. Human health controls are primarily through the separation buffers of 20m from edge of irrigated area to boundaries and low level sprinklers.	JG
25	Surface water	2022 AEE, Mitchell Daysh	7 (Table 17)	68,69	Establishment of riparian buffers to increase phosphorus removal from surface runoff from the irrigation areas.	The application relies heavily on the vegetated buffers to mitigate effects on surface water quality and aquatic ecology. Given this reliance, the level of detail provided regarding these buffers is insufficient in the main application. Please confirm that the applicant intends to implement the planting plan indicated in Figure 17 (as this is currently not clear in the main application).	Other factors also mitigate effects on surface water quality and aquatic ecology. Planting plan will be implemented if access is lost to the third-party land. This is in addition to riparian planting/ecological enhancement already completed.	Yes		No further actions required from applicant - will be addressed in technical review memo.	States that ecological enhancement of BSM land has been achieved by planting that has already been done (Green zones in Fig 17). Not necessarily up to 5m width. Additional riparian planting in Fig 17 only proposed if third party land is lost and hence phosphorus load to BSM land increases. Essentially planting is to achieve minimum of 5m riparian width. The NIWA Riparian Guidelines (2023) indicate that 5m is a minimum for self-sustaining weed free buffers. If the primary purpose is to manage surface runoff and improve water quality outcomes, the width is sized in relation to contribution hillslope length. In this case where there is very little hillslope 5m would be sufficient. The streams are incised into the GW and recharged by shallow GW, which will be impacted, especially under higher loading. The effectiveness of riparian planting in mitigating this effect will be discussed in the technical memo.	DC
26	Land	2022 AEE, Mitchell Daysh	7 (Table 17)	69	Table 17 states that irrigation will not be undertaken near a downwind boundary "during windy conditions". These conditions are not defined, and details of monitoring are not provided in the table.	Please confirm what will be considered as "windy conditions" (e.g. prevailing wind direction, wind speed, and how this will be monitored and managed).	10m/s in any direction.	Yes		Resolved - Consider applying numerical wind speed limit and require appropriate monitoring, recording and reporting of wind speed in the conditions	WW EMP Section 8/1/2 deals with spray drift management (in response to proposed Condition 43(f)). However it only mentions that prevailing wind direction is taken into account before commencing irrigation. The 10 m/s limit is not specified in any consent conditions. The complaint reporting requirements involve noting wind direction and strength. However, the method of measuring these parameters is not specified. Will there be a wind sock on site, for example? A fixed anemometer? This is also relevant for the air discharge consent so we will assume that this issue will be resolved through consultation with the specialist engaged to review that part of the application.	JG
27	Surface water	2022 AEE, Mitchell Daysh	7 (Table 17)	69	Table 17 mentions that "annual sampling of land drainage water" will be undertaken. Where will samples be taken, and which parameters will they be tested for? Will both upstream and downstream locations also be monitored? This statement in Table 17 seems to contradict advice from PDP in their technical report, which states that "monthly samples from representative cross-sections of tile drains" will be collected to "identify any long-term trends or changes in water quality" (Section 3.7, p13, PDP June 2022). It also contradicts proposed condition 4 (Appendix K) which states that all subsoil drainage shall be permanently blocked or decommissioned prior to exercising the consent.	Please confirm monitoring method for annual sampling of land drainage water, and provide justification for why this monitoring should not be more frequent (e.g. at least quarterly and preferably monthly, to cover seasonal variation and adequately mitigate risks). Please confirm the intended approach for management of existing subsoil drainage on the site and whether this will be monitored as part of the above.	Quarterly monitoring proffered. Subsoil drainage is to be removed.	Yes		Resolved - no further action required	Proposed consent condition 2 (for discharge of land drainage water and stormwater to water) now requires quarterly sampling of land drainage water from under the lagoon for BOD, total ammonia N, nitrate-N, nitrite-N, total nitrogen and <i>E.coli</i> , with an upstream location also monitored within 2 hours of the downstream sampling. This approach is acceptable. Applicant confirmed that sub-soil drains have been removed historically and BSM have actively mapped their drains to identify and remove them.	JG
28	Land	2022 AEE, Mitchell Daysh	4,7.4	28	It is not clear from the application or accompanying technical reports how the current soil quality issues (e.g. blinding by fat, oil and grease) are being remediated, and a timeframe for completion.	Please confirm: a) Methods which have been and will continue to be applied to improve soil quality on the site, where soils have been adversely impacted by past land irrigation activities b) The timeframe for completion of full remediation, if applicable (or explain how the current remediation will tie in with future activities).	See answers to issue 6	Yes		Timeframe for reinstatement of soil to be achieved and impact on use of the soil for treated wastewater application is still unresolved. This can be addressed through consent conditions, unless applicant provides further information.	Methods have been provided but no timeframe for how long it will take to reinstate the land so that it can appropriately accept treated wastewater to minimise WQ effects in the groundwater and surface water.	SB

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29	Land	2022 AEE, Mitchell Daysh	7 (Table 17)	68	Nutrient loading rates - the estimated loading rates specified in Section 6.4.2.1 include a lower and upper limit for both N and P, in relation to cut and carry or stocking (farm management). The application is unclear in that some sections state the land will be operated under a cut and carry system, but it is not clear whether this would also apply to the irrigated area (or just the adjacent separately owned land). While the PDP Technical assessment states (in Section 3.6) that 200 kgN/ha/yr will be available for land operated as grazed pasture, and 350 kgN/ha/yr for land operated as cut and carry, it is not confirmed how many hectares will be used for each purpose. It is important for us to understand this issue as it is central to understanding the extent of nutrient loading from different land use activities.	Please confirm how many hectares (and which land - BSM owned, or third party owned) are intended to be used for each of : a. Cut and carry b. Grazed pasture (and specify which stock, grazing rotations etc. will apply) c. Land operated as cut and carry with riparian planting or other mitigative controls Please also show these areas on a map of the site (similar to Figure 1 in the PDP report).	Table provided detailing land use and area	Yes		Resolved - no further action required by applicant. Tech memo to summarise the changes in load.	The total loads (N, P and FOG) to the land changing from load under previous consent, in the application and then in the various responses will be summarised in a table and discussed in the technical memo.	JG
30	Surface water	2022 AEE, Mitchell Daysh	7 (Table 17)	68	The specific location of the conductivity meter "downstream of the land treatment area" is not provided.	Please confirm the location of the conductivity meter with GPS coordinates or mark the location on a map in relation to the land treatment area [see also our comments regarding proposed consent condition 19]	Location provided in an updated map	Yes		Resolved - no further action required	Revised Figure 1 (in Appendix D to the response) now shows the location of the conductivity meter.	JG
31	Surface water	2022 AEE, Mitchell Daysh	7 (Table 17)	68	It is not clear which "underground drains" are present on the site and how they will be capped (as stated in Table 17).	Please provide further detail regarding underground drains, to answer the following: a. Are the drains existing or will they be installed as part of site upgrades? b. Will they carry stormwater and dewatered groundwater? c. At what depth below ground level will they be located? d. What kind of capping material will be used? e. How will <u>all</u> tile drains/subsoil drainage be identified?	A) Subsoil drains are existing and will be removed/capped before proposed activity commences under new consent. B) The subsoil drains (prior to decommissioning) carry shallow groundwater. Note this is not the WWTP subsoil drainage. C) Subsoil drains are located 1.5-3m BGL. D) To be capped with gate valves (closed). E) Outlet points mapped.	Yes		No further actions required from applicant - will be addressed in technical review memo.	For the purpose of this review, and based on the response received, we assume that the sub-soil drains exist and as such form part of the current shallow groundwater system. However, the known drains on BSM land are being decommissioned and hence will not be present during the consent period. The status of tile drains on third party land has not been identified. Council may wish to request an assessment of their condition after decommissioning, however this would likely require modelling which would not be commensurate with the overall low level of potential risk.	JG / HZ
32	Land	PDP 2022 Technical AEE - land discharge	1	1	Figure 1 and accompanying description indicate a potential risk to the proposed irrigation activities, as a significant proportion of the overall irrigated areas (and particularly in the summer irrigation zones) is owned by a third-party. It is also suggested that utilisation of third-party land for irrigation could result in further reduction of phosphorus losses (Section 5.3.1.2, p64). Therefore, any barriers to using this land could also result in a reduced ability to mitigate effects on surface water and soil quality.	How has the applicant considered potential effects on human health (including to workers and the general public) from the proposal? Which "standards and guidelines" have been used for this application, and what is the outcome of the assessment in this reg	Answered in issue 13	Yes		Send corrected action to applicant for answer - Important issue and needs to be addressed	There was an error in the previous s92 list, this is what the action should have been: Please provide detail regarding how the identified risk will be mitigated. For example, are there long term agreements in place with the third parties owning irrigation land, to allow the operation to continue for the proposed consent term (at minimum)? What measures are in place to avoid restriction of access to this land? Are there any contingencies in the event the third party owned land can no longer be used?	JG
33	Land	PDP 2022 Technical AEE - land discharge	3.3	7	The "buffer lagoon" (dedicated irrigation holding lagoon, receiving treated wastewater from the SBR) has up to 15,000 m ³ storage capacity, and is "operated at low water level" to allow for storage when soils are too wet, however this low level is not specified.	Please specify the "low water level" for the buffer lagoon, and confirm how long it is estimated to take before the buffer lagoon would reach full capacity after a peak event.	500mm freeboard. 13.5 days capacity at peak flow (7,000m ³ /week).	Yes		Resolved - no further action required by applicant. Tech memo to review how long unsuitable conditions can last in the area.	Irrigation could be halted for 13.5 days. We will analyse how long unsuitable conditions can last in the area in the tech memo, using ES soil moisture data (available for Woodlands site nearby) and comparing with pSWLP.	JG
34	Surface water	PDP 2022 Technical AEE - land discharge	3.4	8	Wastewater characteristics are based on data from July 2020 - June 2021. Given this application was submitted in September (and AEE/technical reports mostly written by June 2022), it is assumed another year of data is also available. There appears to be an error - minimum of 2,220 µS/cm (EC) but the maximum is stated as 173 µS/cm?	Can the applicant please provide a summary table (similar to Table 3, p8) showing data from the July 2021 - June 2022 period? If that data is incorporated with the existing Table 3, how do the results change? Please also include: - Annual median, plus standard deviation for each parameter in the summary - Sample size - Relevant standard, type and value A corrected version of existing Table 3 (e.g. correct EC results)	New table provided. Note there are not many standards that are relevant to irrigated treated wastewater.	Yes		Resolved - no further action required	Electrical conductivity results are now correct; table has been updated to include 2022 data and other requested information. Note: Statistics for selected parameters have notably increased. For example, total nitrogen average has increased by 16%; E.coli average count has increased by over 25%, and the maximum value reported has quadrupled from 520,000 to over 2.4 million CFU/100mL.	JG
35	Surface water	PDP 2022 Technical AEE - land discharge	3.4	8	Large range of total nitrogen results (minimum 8 g N/m ³ , to maximum of 190 g N/m ³ , suggests highly variable N concentrations. Similar observation for E.coli - ranging between 200 - 520,000 cfu/100mL.	Please provide a graph showing Total Nitrogen and E.coli results used to populate Table 3. Include discussion on the likely factors contributing to fluctuations in these parameters over this period, and how these were managed (as applicable).	Table provided along with discussion and proposed new consent condition.	Yes		Resolved - impact of variation in treated wastewater concentrations to be discussed in tech memo.	Graph shows TN typically higher than TKN, likely due to elevated NO _x . Concentrations of nutrients are quite variable. E.coli results in Fig 5 are much higher than the original range of 200 - 520,000 CFU but this has not been explained. Would disagree that the graph shows "E.coli levels are fairly consistent"These issues will be discussed in technical memo.	JG
36	Surface water	PDP 2022 Technical AEE - land discharge	3.4	8	Sample size and sampling frequency are not stated for Table 3.	Please confirm the number and frequency of samples used to calculate wastewater quality statistics in Table 3	Frequency is approximately monthly and sample numbers provided in the table	Yes		Resolved - no further action required	No further comment	JG

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37	Land	PDP 2022 Technical AEE - land discharge	3.4	9	Results for a single sample of decant effluent from the SBR are presented in Table 3, and results for biosolids (from WAS drawoff) are presented in Table 4. Have any subsequent samples been taken?	If subsequent samples of SBR decant effluent and biosolids have been collected since 20 October 2021, please provide a summary of results for review. Similar information (at minimum, to characterise contaminant profile and estimated volumes) for paunch and stockyard solids is also requested. Additional samples are required to validate the statement 'it is unlikely that the biosolids composition will vary significantly and a single sample is considered appropriate'. The samples must represent different operational conditions. The applicant must agree with ES on the number and timing of the samples. 2. Include relevant standard type and value for each parameter 3. Stats are required for each parameter after the collection of adequate samples	summary of results provided for effluent, biosolids, paunch and stockyard solids. 30 January 2023 sample taken to compare with 20 October 2021 sample. Monthly sampling proposed.	Yes		Resolved - issue remains that information provided on composition of WAS paunch, and stockyard solids is minimal. To be addressed in tech memo.	A sample of paunch and stockyard solids was taken in Jan 2023, and this showed a loading of 3,910 mg/kg-wet TKN. This was much higher than the 2,400 mg/kg total N presented in the AEE. This raises the risk that the limits proposed will not be achievable (which is acknowledged in the response to this issue). Alternative methods of reducing the load from this source is mentioned but not confirmed as feasible. The second sample of WAS (called biosolids by applicant) was not tested for nutrients "due to high liquid content of sludge". This is an unusual reason for not analysing the sample. Given the previous discussion of WAS for issue 5, further treatment of the WAS before it is combined with the treated wastewater for irrigation may be required for stabilisation and potentially for nutrient reduction, given the current lack of information highlighted by this issue. This is not discussed in the application or responses, and is a concern. The metals concentrations in the paunch and stockyard solids was less than the soil limits in the 2003 Biosolids Guidelines and hence are considered low for this one sample. The WAS concentrations are expressed in mg/l rather than mg/kg dry weight and hence cannot be directly compared with the biosolids limits. However, the concentrations of metal in the WAS are much greater than the 95%ile ANZECC toxicity default guidelines for all of the metals given. Whilst this is an overly prescriptive analysis to directly compare the WAS to the receiving environment WQ limits, it does show that metals in the WAS are not insignificant as stated by the applicant. The applicant have proposed monthly monitoring of these 2 types of solids in conditions. This remains a risk to the feasibility of the proposed activity to meet environmental constraints.	JG / SB
38	Land	PDP 2022 Technical AEE - land discharge	3.7	12	The report mentions the "maintenance of appropriate setback distances for irrigators to neighbouring properties, water bodies...[etc.]" (p12) but does not confirm these distances.	Please propose a minimum setback distance to be observed between irrigators and sensitive receptors; ideally this would be provided in a summary table showing setbacks for each type of receptor (similar to Table 5, p15 in the PDP report, but with distances calculated from the nearest irrigator spray radius rather than buildings as has been done for Table 5). If the applicant is unable to provide such a table at this stage, it is recommended that it be included in the consent conditions.	Buffer distances provided	Yes		Resolved - no further action required by applicant - to be addressed in tech memo and conditions	A minimum setback of 10 m from a watercourse or open drain has been proposed. This is less than the pSWLP requirement of 20m setback for other agricultural discharges/land use (e.g. Rule 38 for permitted discharges of animal or vegetative waste to land). Imposition of a 20m buffer will reduce the available land for application, and result in increased loading rate per hectare, but is preferred.	JG
39	Land	PDP 2022 Technical AEE - land discharge	3.7	12	The report and the application documents do not provide a detailed description of the process that will be used to complete "removal or decommissioning of subsoil drainage onsite prior to the exercise of this consent" (p12).	Please describe the anticipated process to remove and/or decommission any existing subsoil drainage systems on the site prior to exercising a new consent, including identification of any potential effects on the environment, and how these will be avoided, remedied or mitigated.	See answers to issues 19 and 31. Tile drains have been capped in the past, they are all expected to be capped/removed prior to the start of new consents.	Yes		Resolved - no further action required	The application assumes all subsoil drainage has been removed before any activities start. See also issue 19	JG
40	Surface water	PDP 2022 Technical AEE - land discharge	3.8	13	Ecological monitoring of watercourses upstream and downstream of the land treatment systems proposed at five-yearly intervals.	Please provide justification for ecological monitoring at five year intervals. In our view biennial (every 2 years) monitoring of benthic communities would be a minimum requirement to determine changes in ecological health.	Applicants justification provided. May be debatable whether or not it is justified.	Yes		Resolved - no further action required by applicant - to be addressed in tech memo and conditions	The response states that improvements to the ecological status of the area will be "long term and gradual" to justify the 5 year intervals in ecological surveys, essentially because the shallow GW moves slowly and hence improvements in GW and hence discharge to the streams will be slow. The timeframe within which the methods proposed to rehabilitate the soils and hence reduce the loads transmitted to the GW has not been provided by the applicant, in response to our issue #6. If this will take a number of years, then this extends the period when loads to the GW, and hence SW, remain elevated. This may accurately reflect the mechanics of the GW/SW interaction. However, this implies that the ecological condition of the streams will remain poor for a prolonged period over the term of the consent, regardless of the riparian planting that has been completed. This is concerning. We note that further riparian planting is only proposed if the 3rd party land is lost and hence an increased loading on the BSM land results. Therefore, this mechanism for improving the ecological condition of the streams is not proposed under standard conditions. We will consider a reduced frequency of sampling over the initial period of the consent to review the predicted improvements in the initial period of the consent.	SB / DC
41	Surface water	PDP 2022 Technical AEE - land discharge	4.1	44	Eutrophication in the New River Estuary resulting from land use practices in the Waihopai River catchment	This is a catchment wide issue indicating a clear need to reduce nutrient inputs to the river system. Recent upgrades completed by BSM have reduced nutrient loads from the BSM site, placing it in the middle of the range for agricultural land use in Southland. However, background levels of nitrogen remains significantly elevated and must be reduced further to achieve improvements in downstream habitats. Please set out how BSM will contribute to further nutrient reduction over the proposed 35 year consent duration.	BSM have made recent upgrades and started a riparian program. These are expected to contribute to ongoing improvement for further nutrient reduction. New conditions of consent may ensure this occurs.	Yes		Resolved - no further action required by applicant - to be addressed in tech memo and conditions	ES website (https://www.es.govt.nz/environment/water/whats-in-our-waterways/nitrogen) quotes the report by LWP, Nov 2021 which was prepared to inform the Southland Regional Forum process. The webpage states that Ōreti & Invercargill Catchments (New River Estuary), which includes the BSM site needs to reduce nitrogen loads to the estuary by 62 (54-79)%. The BSM discussion has not quantified the expected reduction in their current contribution to the load to the catchment during the term of the consent applied for (35 years) but their discussion implies that it will not be halved and hence will not contribute to the required reduction over the NRE catchment in the next 30 years.	SB
42	Land	PDP 2022 Technical AEE - land discharge	4.7.3	22	Table 7 (soil sampling nutrient results) does not include sample size.	Please update Table 7 to include sample size for each parameter.	Updated table provided	Yes		Resolved - no further action required by applicant - to be addressed in tech memo and conditions	The table has been updated to include number of composite samples (Table 10, p48 of response document). The notes below the table indicate that the numbers reported are averages. It is not appropriate to report the results for the existing background in this way, if there were only two samples taken. It should be reported as a range (minimum and maximum, or individual results). Table 10 indicates that the ESP in the irrigated areas currently exceeds the proposed limit of less than 5% in proposed Condition 22 of the solids to land consent and is outside of the target range given in the table, thus demonstrating a level of impact on soil quality from the current consent, particularly for N and P. Therefore mitigation actions need to be undertaken prior to the consent being actioned. Currently, the proposed conditions do not restrict discharge to land to when the soil complies with the limits in Condition 22 on ESP and infiltration rates and does not require resampling of the soil after the mitigation measures to demonstrate that the soil has come into compliance. This will be discussed further in the tech memo.	JG

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43	Land	PDP 2022 Technical AEE - land discharge	4.7.4	24	The PDP report mentions an existing 'back up treated wastewater irrigation area' under the existing consent. This is a typical feature of land treatment system, usually referred to as a reserve of back-up irrigation area. However, such an area is not identified for the proposed new consent.	Please clarify whether a 'back-up' or reserve irrigation area will be established as part of the proposed land treatment system (new consent), and if so, provide a map and dimensions for this area.	Backup area is not proposed.	Yes		Resolved - no further action required by applicant - to be addressed in tech memo	Commentary to be included on this issue in tech memo, no further action for now	JG
44	Surface water	PDP 2022 Technical AEE - land discharge	4.9.3	37	Neither sample size nor sampling frequency is stated for Table 10.	Please confirm the number and frequency of samples used to calculate surface water quality statistics in Table 10.	Answered in issue 11	Yes		Resolved - no further action required	See Issue 11	JG
45	Surface water	PDP 2022 Technical AEE - land discharge	5.2.1.1	54	It is not clear whether wastewater outputs (e.g. 'biosolids', paunch, stockyard solids, and human waste) were integrated into the Overseer model, and if so, how this was done.	Please provide further detail regarding inputs into the Overseer model (e.g. further break down the 'Irrigated Area' and 'Whole Farm' summaries and activity columns in Table 14), and link this information to any discussion of the maximum potential envelope of load and related effects (see Issue 6 above). Please also detail the assumptions used, for example, the model only reflects annual data, not seasonal variations, and whether a 12 month or 11 month scenario was used. Explain how the third party land has been included and excluded in different model runs. Also provide further detail on the management of all paunch and stockyard solids and any other materials to be spread on the land, including time frames, withholding periods, and how the potential effects of this material will be managed.	Overseer modeling inputs and commentry provided. Paunch and stockyard solids spread daily and not stored. Affects managed by normal discharge conditions such as buffer distances.	Yes		Resolved - no further action required by applicant - to be addressed in tech memo	The information requested has now been provided and is discussed in commentary for various issues. See Issues 7 and 8 above. The Overseer modelling results have raised further issues regarding the modelling assumptions used and whether these are appropriate to the purpose of the analysis (as evidence supporting the consent application).	JG
46	Surface water	PDP 2022 Technical AEE - land discharge	5.2.2	61	It is noted that groundwater samples were taken from nearby drinking water supply bores during drier months (Nov 2020, Feb 2021 and May 2021) and so may not reflect wetter conditions. As such, these results may not present a "worst case scenario". It is stated that the proposed activity "will likely have an impact on the groundwater <i>E.coli</i> , increasing median and maximum <i>E.coli</i> concentrations from 2.5 to 10 cfu/100mL and from 23 to 560 cfu/100 mL respectively" (p61). Given this, it would be prudent for the main application document to assess the significance of any effects of the proposed activity on human health, particularly via exposure to contaminated groundwater used for potable supply, or to animal health (via stock water). This assessment is not explicitly included in Section 6.4.6 of the main AEE (p53), although the groundwater results are discussed in Section 6.4.2.2. It is also difficult to interpret groundwater flow direction (and therefore to identify bores at greatest risk, if any), because detailed piezometric contours have not been provided.	Amend the assessment of human health effects in the main AEE (Section 6.4.6) to explicitly consider the risk of exposure via contaminated groundwater (even if that risk is considered to be low) and provide evidence to support the assessment. Provide detailed piezometric contour maps for review. Conduct particle tracking analysis as recommended in our comment on issue 57 and 68.	Assessment provided along with piezometric contour maps.	Yes		Resolved - no further action required	No further comment	HZ
47	Surface water	PDP 2022 Technical AEE - land discharge	6	29	Riparian planting for enhancement of stream ecology	The 2020 baseline ecology report includes the following recommendation: "Improvements to riparian zones are required to improve the condition of both streams. While fencing to exclude stock is present along most of the stream's length, there are areas where fencing is not present. An increase in stock exclusion (fencing) and the addition of vegetative buffer zones to the length of the streams will reduce irrigation runoff and provide shading. This will reduce instream plant growth, thereby improving flow and reducing fine sediment deposition, as well as the water quality of these sites. Additionally, as tile drains were observed throughout the reaches of the two streams, further mitigation may need to be considered either as longer return period of irrigation, buffer areas parallel to the stream, or through intercepting filters. This could include targeted wetland treatment at points of tile drain inputs." Please consider amendments or additions to the proposed consent conditions to better reflect the recommendations of your technical experts.	Ongoing improvements being made since the 2020 report and will continue to be made. BSM still in the process of decommissioning subsoil drainage as an alternative to wetland treatment.	Yes		Resolved - no further action required by applicant - to be addressed in tech memo and conditions	Proposed consent conditions only include reference to planting to allow increased P loads in Condition 11 of land consent. Currently no requirement to maintain the existing planting and there is minimal mention of fencing to avoid stock accessing the streams, currently only in yellow zones, not the other zones. We will consider whether specific conditions on maintaining the current planting is required.	DC
48	Land	PDP 2022 Technical AEE - land discharge	7.2.3.2	83	Assessment of alternatives	Were any options considered which excluded the use of third party-owned land altogether?	Yes this scenario was considered. Condition 11 is proposed to address this issue if access to 3rd party land was lost. It would mean additional phosphorus discharges to land.	Yes		Resolved - no further action required by applicant - to be addressed in tech memo and conditions	Condition 11 implies that if only the land owned by BSM can be irrigated, the maximum phosphorus load applied would be 110 kg P/Ha/yr. This would be applied over a smaller area than if third party land were included. How would the potential effects of this approach differ from that described in the application? Worst case assessment of N and P loads against typical surrounding land use in the original application in S5.2.1 of PDP report was based on BSM only scenario. Application implies that increased degree of riparian planting will reduce the P load to the streams in the BSM land only scenario. This is the principle pathway for P discharge and may reduce P load to SW but reduction is not quantified. However, it provides no mitigation for the increased N load apart from that it will not be more than the surrounding land use. See above discussion on loads to the NRE for why this is not considered to be appropriate.	JG

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49	Surface water	PDP 2022 Technical AEE - land discharge	4.1	18	Degraded water quality in both the North and South Branch tributaries, contributing to eutrophication in downstream habitats.	As evidenced in PDP's Baseline Surface Water Quality and Ecological Assessment Report, the Waihopai River and its tributaries are already heavily modified, and significantly degraded particularly in terms of nutrients and pathogens (<i>E.coli</i>). The proposal does signal an intention to mitigate adverse effects on water quality in general (such as reducing nitrate and phosphorus loads to surface water and groundwater), and as such the effects will be reduced in comparison with the pre-2019 'status quo' situation of non-compliant discharges and excessive nutrient loading. However, when viewed through the lens of the NPS-FM and the principles of Te Mana o Te Wai, this activity is not likely to significantly enhance or improve water quality, or the function of the aquatic ecosystem. It will likely still exacerbate a poor situation in an environment which is under significant pressure from other (primarily agricultural) activities in the catchment. Given this context, we would have expected to see far more targeted measures to avoid and remedy effects (including those effects already seen as a result of existing discharges to land on the site), rather than just focusing on reducing the load to land. Further mitigation aspects such as the riparian buffers are a good start, however details for the implementation and maintenance of these are sparse. There are also other recommendations put forward by PDP in their technical report which are not discussed in the main application (such as intercepting filters, and additional stock exclusion, and targeted wetland treatment where tile drains enter the Waihopai Stream within the BSM property and adjoining third party owned land). In combination, the overall approach to managing the effects of the proposed activity on surface water quality is limited, and does not reflect a strong desire to follow industry best practice. Please review the mitigation proposal in light of the demonstrated level of adverse effect, particularly to treat the discharge of dewatered groundwater before discharging to the stream, and possibly a carbon wall to treat overall high nitrate levels in shallow groundwater.	See answer to issue 41. Reliance on recent WWTP upgrades and riparian planting as well as nature of the discharge in comparison to surrounding dairy farms (nutrient loss comparison). No further mitigations proposed.	Yes		Resolved - no further action required by applicant - to be addressed in tech memo	See response to Issue 41 about load to NRE. Mitigation proposed will not contribute to the required load reduction, as per issue 41.	DC
50	Surface water	Baseline Surface Water Quality and Ecology Assessment (PDP 2021)	Appendix B		General comment - surface water quality	The graphs presented in the baseline surface water quality and ecological assessment report by PDP (2021; Appendix B) provide helpful context for the compliance monitoring results obtained under the existing consent. However it's noted that while linear trendlines have been plotted on the graphs, there appears to be noticeable 'scatter' in the datasets. It would be useful to see r^2 values for the trendlines, to understand the degree of correlation, before making any judgement on overall trends in the catchment (comparing upstream to downstream of the BSM operation).	Update provided	Yes		Resolved - no further action required	The updated graphs (with R^2 values) confirm that there is very low correlation in terms of any linear trends in the data. R^2 values are typically below 0.5. This means that any claim of increasing or decreasing trend over time cannot be supported by the data. Results appear to be highly variable year on year. Given this a comparison with national bottom line values from the NPS-FM, while important from a regional perspective, is probably not relevant for the purpose of this consent. Local trends and objectives in nearby catchments should take precedence when considering potential effects for the duration of the proposed consent term.	DC
51	Land	PDP 2022 Technical AEE - land discharge	2	3	Groundwater and surface water flow directions (to determine potential receiving environments, including wells).	Applicant is required to provide a piezometric map. The map must be drawn using shallow groundwater and surface water data. It must show flow directions, 0.5 m contour interval, and colour and/or symbol coding of gaining and losing stretches of streams. Wells must be coded as upgradient or downgradient of the irrigated area based on this map.	Piezometric survey undertaken. 4m contours due to large variations in groundwater elevation across the site.	Yes		Resolved - no further action required	It is noted that Table 1 presents a summary of flow gauging measurements rather than gains and losses and Figure 2 (groundwater level contour map) does not indicate gaining and losing reaches of streams as required in the latest request for information. However, Section 3.2 in Appendix F appropriately describes the situation, focusing on the unnamed tributary of the Waihopai River located to the south of the BSM property.	HZ
52	Land	PDP 2022 Technical AEE - land discharge	3.8	12 & 13	<i>BSM is proposing to monitor the following to ensure that the assessment of environmental effects outlines within this report is correct... * Annual samples of biosolids and five yearly samples of soils and groundwater for heavy metals to capture any long-term effects of heavy metal accumulation. '</i>	Applicant to consider increasing frequency as follows, especially given requirements of biosolids guidelines: 1. Quarterly samples of biosolids and yearly samples of soils reported annually for the first two years, including comments on possible deviation from assessed effects. The second report must propose a suitable future monitoring and reporting frequency based on the collected results. 2. Log of daily observations of ponding. If none is observed, it must be recorded.	very low heavy metal concentrations and very gradual accumulation expected is reason for 5 yearly sampling. Daily monitoring of ponding proposed when soil is at field capacity.	Yes		Resolved - no further action required by applicant - to be addressed in tech memo and conditions	Only a single sample is available for the paunch and stockyard solids (to compare with the Biosolids guidelines) and no samples for WAS due to the reporting units used. This is not sufficient to support the statement that metals are very low and hence support the proposed infrequent sampling. Recommend increased frequency of sampling for Conditions 14, 16, 17-1 and 21	JG
53	Land	PDP 2022 Technical AEE - land discharge	Table 7	23	Soil sampling nutrient results	Applicant to highlight and comment on exceedances	Provided for in PDP report	Yes		Resolved - no further action required	Confirm that the existing table in the AEE (Section 4.7.3) does provide adequate discussion of soil sampling results. However as per comments for similar issues (e.g. Issue 42) it would have been helpful to provide sample size in the table for completeness. See Issue 42 with respect to the soil in irrigated areas not complying with the proposed ESP limit and the lack of information on how this will be managed.	SB
54	Land	PDP 2022 Technical AEE - land discharge	4.8.1	26	<i>The monitoring data from wells upgradient of the land treatment area has been used to inform the assessment of the existing groundwater quality. '</i> The observations date for the data used to produce the piezometric map presented in Figure 9 is not provided. It could be outdated and irrelevant to the application AEE.	1. Indicate on the relevant map/s and table/s which are the background (upgradient wells) 2. Provide piezometric map using recent groundwater and surface water data to validate the assumption that wells assumed to be upgradient of the legacy irrigated land are in deed upgradient and that the groundwater flow system has not changed at those locations due to irrigation caused mounding of the water table. Additional upgradient monitoring wells will be needed to provide background information if the current assumed wells were found unsuitable.	New technical information provided	Yes		Resolved - no further action required	No further comments	HZ
55	Land	PDP 2022 Technical AEE - land discharge	Table 9	29	Existing shallow groundwater quality	Add dates (from-to), number of samples, standard deviation for each parameter	Updated table provided	Yes		Resolved - no further action required	No further comments	HZ
56	Land	PDP 2022 Technical AEE - land discharge	Figure 10	31	Groundwater contours	1. Use smaller contour interval. 2. Reproduce using recent, concurrently measured (preferably in one day) surface water and groundwater levels. 3. Add flow path selected arrows 4. Use symbols/colour code to indicate losing and gaining streams	Maps provided in Appendix F. 4m contours used due to large variations in groundwater elevation across the site	Yes		Resolved - no further action required	Amendments have been made to Appendix F as requested.	HZ
57	Land	PDP 2022 Technical AEE - land discharge	4.8.3	32	Several key downstream bores within 2 km of the site used for dairy, and a house with no registered bore water supply are also shown in Figure 10. One supply well was recorded for the use of domestic and dairy use (F46/0840).'	Forward and backward particle tracking modelling is required to determine (1) the zone of influence (extent of contaminant plume), and (2) capture zone for wells. This is required to determine affected parties/receptors (environments and users).	piezometric survey undertaken along with commentary. See response to issue 51	Yes		Resolved - no further action required	Flow arrows and groundwater flow velocity calculations have been provided in lieu of particle tracking modelling. This is adequate. Appendix F now describes flow directions, groundwater-surface water interactions, and travel times. Given that information, there is no further need to map the extent of the contaminant plume. The potential receptors are identified and the risks to them are described.	HZ
58	Land	PDP 2022 Technical AEE - land discharge	Figure 11	33	Groundwater receptors	As above	piezometric survey undertaken along with commentary. See response to issue 51	Yes		Resolved - no further action required	See comments for Issue 57 above	HZ
59	Land	PDP 2022 Technical AEE - land discharge	4.9	34	Two permanent watercourses flow through the land that is used for irrigation of treated wastewater, from the north-eastern boundary to the south-western boundary of the site (Figure 1). These tributaries, herein referred to as the "North" and "South" branches.'	Label the North and South branches on all maps.	Updated figures provided	Yes		Resolved - no further action required	Figures now include labels for North and South branches as well as other watercourses/drains.	JG

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60	Land	PDP 2022 Technical AEE - land discharge	4.9	34	tile drains feed the tributaries'	Show the tile drains on a location map, and preferably all relevant maps	Tile drains slowly being decommissioned and are expected to be fully decommissioned prior to new consents being issued. Tile drain outlets have been identified.	Yes		Resolved - no further action required	Figure 18 (p174 of pdf) shows "existing sub-soil drainage to be decommissioned".	JG
61	Land	PDP 2022 Technical AEE - land discharge	Table 10	37	Surface water quality summary	Add dates (from-to), number of samples, standard deviation for each parameter	These have been provided in previous responses to issue 45 and 11.	Yes		Resolved - no further action required	No further comments	JG
62	Land	PDP 2022 Technical AEE - land discharge	Table 11	49	Estimate of proposed irrigation and water balance	1. Add columns for run off 2. Provide similar table for the worst case scenario (loss of access to 3rd party land)	Updated table provided	Yes		Resolved - no further action required	Table was provided as requested. Note that irrigation depth is higher for discharge to BSM Land only (286 mm/year) than for BSM + Third Party Land (185 mm/year). Assume that table gives mm of each aspect across the area. Same amount of wastewater but less land for BSM Land only scenario leads to higher average irrigation depth as has to be more concentrated irrigation. This leads to higher rates of runoff and drainage.	JG
63	Land	PDP 2022 Technical AEE - land discharge	5.2	53	'There are <u>three</u> key potential effects on groundwater'	Note that four effects are listed underneath	No answer provided	No	This is a minor typo and does not relate to the scope of the s92(2) technical review.	Resolved - no further action required	The comment made by Stantec was only intended as a note. Agree with ES's comments.	HZ
64	Land	PDP 2022 Technical AEE - land discharge	5.2	53	Groundwater effects	Applicant to include assessment of effects on beneficial uses, i.e. limitations on uses like domestic supply, irrigation, etc.	no limitations on beneficial use of groundwater. GW quality similar to upgradient wells. GW quality within drinking water standards.	Yes		Resolved - no further action required	Comments: 1. The provided assessment of water suitability for irrigation purposes is based on assuming that water suitable for human consumption is also suitable for irrigation. It does not consider that suitability of water for irrigation is related to the ratios between cations, namely Ca, Mg, and Na (+K). This ratio determines the risk of ion exchange between the water and soil, which can result in lowering the soil porosity and harming the soil structure. I believe that we can waive this requirement given the existing poor soil conditions and knowing that the quality of the water that is proposed to be applied to land now is better than the previous application. 2. Good analysis and assessment of the water suitability for irrigation in relation to sodium adsorption ratio (SAR) are provided in response to Issue ID 70 (see below)	HZ
65	Land	PDP 2022 Technical AEE - land discharge	Table 15	58	Summary of groundwater oxidised nitrogen monitoring	Applicant to: 1. Add dates (from-to), number of samples, standard deviation for each parameter 2. Consider separate tables for DRP and TP	Updated table provided	Yes		Applicant to check data for TP at bore MW1D Downgradient.	The required data have been provided in tables. Data for TP at bore MW1D Downgradient is inconsistent. Applicant to check.	HZ
66	Land	PDP 2022 Technical AEE - land discharge	5.2.1.2	59	The improvement in groundwater TON concentrations, will improve drinking water quality. However, upgradient bores do exceed the NZDWS MAV, and so down gradient bores cannot reasonably be considered a safe drinking water source without treatment regardless of the BSM activities. Shallow drinking water bores will likely require treatment throughout most of the catchment.'	Applicant to update assessment after determining whether the assumed upgradient wells have been impacted by the historic project	See response to issue 51	Yes		Resolved - no further action required	No further comments.	HZ
67	Land	PDP 2022 Technical AEE - land discharge	5.2.1.2	60	Deeper bores are unlikely to be impacted due to low permeability horizons between/within the aquifers.'	Provide groundwater level evidence that the shallow aquifer is perched and does not leak into the deep aquifer. Otherwise, provide an assessment of effects on deep groundwater quality. Also, provide full water quality analysis and hydrochemical evidence that the deep aquifer does not exhibit oxidised conditions.	Piezometric survey indicates upwards gradient of shallow groundwater system, therefore it is not expected to impact deep groundwater chemistry.	Yes		Resolved - no further action required	No further comments.	HZ
68	Land	PDP 2022 Technical AEE - land discharge	5.2.2	60-61	Both upgradient and downgradient shallow groundwater has levels of E. coli greater than the New Zealand Drinking Water Standards (NZDWS), which specifies <1 cfu/100mL.'	Assess using particle tracking (forward from irrigated land and backward from wells and streams). This must include confirmation that there is no flow from the site to the so-called upgradient wells. Basic groundwater flow modelling is strongly recommended in this assessment.	See response to issue 51	Yes		Resolved - no further action required	Particle tracking has not been provided. However, the new groundwater level contour map, the flow directions indicated on it and the provided hydrogeological analyses suffice.	HZ
69	Land	PDP 2022 Technical AEE - land discharge	5.2.3	61	The groundwater bores within the existing irrigation areas have not been assessed for heavy metal'	1. Wells must be sampled and analysed for heavy metals. 2. Assessment is required using observed data	heavy metal sampling indicates no evidence of heavy metal impacts on groundwater resulting from land discharge activity. Further assessments are therefore not necessary.	Yes		Resolved - no further action required by applicant - to be addressed in tech memo and conditions	As per assessment of Issue 37, data provided on metals in WAS was limited and did not allow comparison to the Biosolids Guidelines, but there was an indication that the metals concentrations in the WAS are not negligible. The groundwater monitoring showed metals present in the GW above ANZECC 2000 95%ile toxicity values, and were elevated across the site both up and down gradient. To be addressed in tech memo to ensure sufficient controls and monitoring.	HZ/SB
70	Land	PDP 2022 Technical AEE - land discharge	5.2.4	62	Sodium and chloride leaching	Assessment is required on the effects of sodium in groundwater on the usability of the water for irrigation (sodium hazard) normally expressed in terms of sodium adsorption ratio (SAR) in tandem with salinity hazard (expressed as electrical conductivity; EC) SAR is a ratio. It may increase despite a drop in Na concentration. This would be due to reduction in Ca and/or Mg concentrations with or without an increase in Na concentration. Consider using the Wilcox diagram or similar.	Cation sampling undertaken. Total sodium at site MW1D are elevated. BSM undertaking investigation to determine if historic offal pits are causing this. It is considered unlikely this site is affected by the land discharge activity. Remaining sites are within an excellent to good range.	Yes		Resolved - no further action required	The data provided in tables (including SAR calculations), the provided Wilcox plots, and the discussion indicate low sodium hazard.	HZ
71	Land	PDP 2022 Technical AEE - land discharge	5.3.2.2	65	Pathogen migration	Assess using particle tracking (forward from irrigated land and backward from wells and streams). This must include confirmation that there is no flow from the site to the so-called upgradient wells. Basic groundwater flow modelling is strongly recommended in this assessment.	See response to issue 51	Yes		Resolved - no further action required	Groundwater flow direction arrows are provided in lieu of particle tracking.	HZ
72	Land	PDP 2022 Technical AEE - land discharge	5.3.2.3	65	Heavy metals	Heavy metals potential effects on surface water must be reassessed following the collection of real data as required above	With the levels reported being very low or non-detect in the shallow groundwater samples, there is no expected effects of heavy metals on the surface water environment.	Yes		Resolved - no further action required	Response is adequate; no further comment.	HZ
73	Land	PDP 2022 Technical AEE - land discharge – Appendix A: Soil Baseline Assessment Report	Table 2 & subsequent relevant tables and discussion	4 and 6	Unknown/unspecified data point locations	Survey paddocks and core locations	Provided for in PDP report	Yes		Resolved - no further action required	Response is adequate; no further comment.	HZ
74	Land	PDP 2022 Technical AEE - land discharge – Appendix A: Soil Baseline Assessment Report	3.1, 3.3.6, and 3.3.7	5 and 16-25	Low macroporosity could also be a result of irrigating wastewater over extended periods of time. Wastewater can have a high organic content, overloading an area can result in blockage of the soil macropores responsible for water transmission and structural damage associated with irrigation of wastewater with a high, concentration of monovalent cations (i.e., Na+ and K+).	Collect and analyse SAR data (Na, K, Ca, Mg) for treated wastewater discharges on frequent basis (e.g. bimonthly or quarterly). This is required to be included in the consent conditions.	Monthly data will occur in accordance with the proposed condition 14.	Yes		Resolved - no further action required	Response is adequate; no further comment.	HZ

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75	Land	PDP 2022 Technical AEE - land discharge – Appendix C: Forecast Flow and Load Assessment			Assessment does not include an assessment of the following: - double shifting would increase the concentration of influent to the WWTP as load increases, but the volume of water would not increase as much. - 11 month regime versus 12 month regime	Applicant to provide an assessment of the maximum load that is envisaged to the WWTP over the term of this consent and how the WWTP and land application system will cope with these loads and the effects of these potential increases. If a maximum load to the WWTP/land is envisaged then this needs to be clearly established to be included in consent conditions.	Load limits are applied for N and P on an annual basis in addition to application depth limits of the land application system.	Yes		Resolved - no further action required by applicant - to be addressed in tech memo	There are discrepancies between the load limits provided in the original application and the latest version of the proposed consent conditions, and the limits discussed in the response report (September 2023). It is unclear whether the activity can comply with the proposed loads to land given the discussion in the responses for earlier issues. To be discussed in the technical memo.	JG
76	Land	PDP 2022 Technical AEE - land discharge – Appendix D: Soil Water Balance Assessment			Runoff 'As such, the soil moisture model will slightly overestimate soil moisture after rainfall, which is considered conservative.'	Add comment that the soil moisture model will underestimate runoff (which could adversely affect surface water quality due to transport of P connect to soil particles and washing off urine patches) Address the effects of this increased degree of runoff	Comment provided	Yes		Resolved - no further action required	The discussion is reasonable regarding over or under estimating runoff and the ability of Soil Moisture Balance (SMB) models to accurately estimate runoff.	HZ