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MEMORANDUM

To: Tom De Pelsemaeker – Team Leader, Freshwater and Land
From: Brodie O’loughlin – Senior Environmental Officer
Date: 13/03/2024
Re: NESCF Compliance and sedimentation issues in Otago

Purpose

This memo presents information and examples of National Environmental Standard – Commercial Forestry (NES-CF) compliance matters within Otago that have contributed to sedimentation issues.

Context/Background

The proposed Land and Water Regional Plan is exploring implementing greater control on forestry activities, including measures to better manage issues around sedimentation.

Discussion

[NES-CF function in Otago](#)

Commercial forestry activities are highly dependent on Erosion Susceptibility Classification (ESC) Zones as to whether the activity will be recognised as Permitted, Controlled or Restricted Discretionary. All activities within green and yellow ESC zones are permitted granted that they are compliant with other subpart activity regulations; activities occurring within orange and red ESC zones are likely to trigger the requirement for consent. Due to MPI’s ESC tool indicating Otago as predominantly green and yellow, a high majority of NES-CF subpart activities are permitted. The following NES-CF regulations talk to subpart activities undertaken within specific ESC zones:

- NES-CF subpart 1: Afforestation – Regulation 9(2)
- NES-CF subpart 3: Earthworks – Regulation 24(2)
- NES-CF subpart 5: Quarrying – Regulation 51(2)
- NES-CF subpart 6: Harvesting – Regulation 62(2)
- NES-CF subpart 7: Mechanical land preparation – Regulation 73(2)
- NES-CF subpart 8: Replanting – Regulation 77(2)

Amendment 2 (NES Plantation Forestry) of Otago’s Regional Plan: Water (RPW) came into effect 1 July 2018. This placed several Regional Plan rules more stringent than NES-CF Regulations, particularly around bed disturbance and sediment discharge thresholds – the purpose being to achieve RPW policy objectives and to protect indigenous non-migratory fish such as galaxiid species, which are classified as threatened. Stringency over bed disturbance rules prompted cable hauling activities through rivers to become a discretionary activity, previously being a permitted activity when cable hauling through a ‘perennial river’ less than 3 metres wide under the NES-CF. Stringency over sediment discharge rules held forestry activities at a stricter threshold for sediment discharge limits.

Sediment issues from forestry within Otago

Compliance data suggests that sediment issues in Otago related to forestry are typical sourced from the associated earthworks required for harvesting activities - such as the construction of haul roads, harvest machinery tracks and landings/skid sites. Non-compliances associated with sediment discharges to waterways are generally due to the lack of stabilisation and/or stormwater controls, inadequate stabilisation and/or stormwater controls or the placement of spoil material onto land that may enter water.

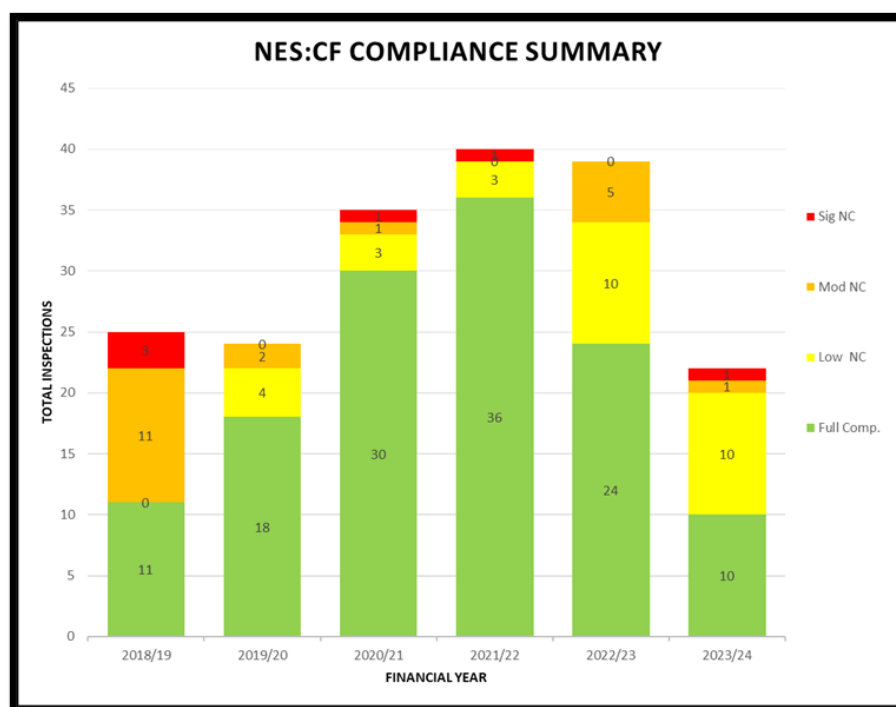


Figure 1: Summary of NES:CF compliance within Otago – (data as of November 2023)

Figure 1 shows the number of NES-CF audits undertaken within Otago since its implementation in 2018, providing a range of compliance gradings over each financial year as of November 2023. A total of 199 audits have been completed during this timeframe, 56 of these resulting in non-compliances. Nearly half of non-compliances relate to stabilisation and/or stormwater control issues – almost a third were identified as having noticeable sedimentation issues.

Regulation difficulties

As previously mentioned, sediment issues identified from forestry inspections within Otago have been linked to the lack of stabilisation and/or stormwater controls, inadequate stabilisation and/or stormwater controls or the placement of spoil material onto land that may enter water – NES-CF Regulation 31 and 32 talks to the requirement of stabilisation and stormwater controls:

- Regulation 31(1) – All disturbed soil must be stabilised or contained to minimise sediment entering into any water and resulting in -
 - (a) the diversion or damming of any water body; or
 - (b) damage to downstream infrastructure, property, or receiving environments including the coastal environment.
- Regulation 31(2) – Stormwater, water run-off, and sediment control measures must be installed and maintained.
- Regulation 32(2) – Suitable measures of stabilisation include –

- (a) Seeding:
- (b) Vegetative cover, mulch, or slash cover:
- (c) Compacting, draining, roughening, or armouring by the placement of rock or the use of other rigid materials.

Difficulties with these regulations when trying to minimise sediment discharges is that they do not specify the quality and quantity of controls/stabilisation; this is an important factor when considering the staging of works. Forestry environments are dynamic in many factors such as soil erodibility, topography, vegetation cover and vicinity to sensitive environments e.g rivers, wetlands, significant natural areas - it is typical that the degree of controls and stabilisation in one environment may not be sufficient in another. For example, compaction of soil may be appropriate stabilisation for forestry blocks located within green ESC zones and on gentle slopes but insufficient for other forestry blocks located in areas more prone to erosion, on steeper gradients and in closer proximity to waterbodies – however, both scenarios would meet compliance requirements under Regulations 31(1) and 32(2). Another example being the spacing of roadside drain culverts before dispersing onto consolidated land. Volume and velocity of stormwater are key factors when minimising the effect of erosion – reducing the spacing between roadside drain culverts, especially on steeper gradient roads, can minimise the volume and velocity of stormwater in roadside drains. Best Practice Guidelines are in place to provide education of stability and stormwater control measures, although these are not enforceable in most cases.

Monitoring difficulties

Other difficulties lie with monitoring the on-going effectiveness of stability and controls of forestry blocks. Forest blocks identified as moderate risk are targeted to be inspected at the end of harvest/earthworks operations – this is to check compliance once all controls and stabilisation have been implemented as soon as practicable after the completion of the activity, as required by Regulation 32(1). High risk blocks may also be inspected during active operations to check the effectiveness of practices near sensitive environments. The limitation with compliance inspections is that they only provide a snapshot of the entirety of activities, not the ongoing activity (which typically occurs for several months at a time) and the effectiveness of controls/stability post-operations.

Due to resourcing, it is not viable for council to inspect every notified forestry block and at multiple occurrences. For example, Otago Regional Council (ORC) received 238 forestry notifications during the 2022-2023 financial year, 123 relating to harvesting and earthworks activities. Management plan requirements under the NES-CF state that the plan must have maintenance and monitoring processes as well as post-harvest monitoring of residual risks, and the corrective action processes. It is expected that large corporate forests have post-harvest measures in place and check them frequently as they are large assets and are continuously accessed, however it is uncertain that this is the case with woodlot compartments. Woodlots are smaller forest compartments that are typically found on farmland that is not appropriate for pasture, such as steep gullies – these are common throughout Otago. Woodlots are generally owned by landowners who then hire contractors to undertake harvesting activities for them. Once the activity is complete, the contractors leave the harvest block with the landowner who may not be aware of these maintenance and monitoring requirements.

Combining the factors of council resourcing and lack of post-harvesting monitoring of woodlots, there are circumstances where the functionality of implemented controls/stabilisation as well as the adverse effects to the surrounding environment are unknown.

Examples

Example 1 – Waianakarua River

A large sediment discharge into Waianakarua river was notified to council, from road run-off within a forestry block. Upon investigation, it was determined that this was due to:

- Spoil material being deposited on the side of the road
- Exposed and compacted banks had failed in stability overtime from exposure to weather
- Stormwater controls in place were inadequate at managing the rainfall event that had occurred

The spoil material placed on the side of the road was non-compliant with NESCF Regulation 30 (2(d)) – being deposited onto land in circumstances that may enter water, NESCF Regulation 31(2) – Sediment control measures not maintained and NESCF Regulation 32 – exposed areas of soil not being stabilised. However, the banks that had been compacted and stormwater controls in place would likely have been compliant with NESCF Regulation 31 and 32 at the time of installation, despite not being fit for purpose.

The block was located within a combination of green and yellow ESC zones on slopes that varied between 8-15° along the ridgeline that the haul road was situated and 21-35° at steeper slopes within the block (ourenvironment.com landscape tool)



Image 1: Haul road within the forestry block: (Left side) material from road construction has been compacted but has not achieved adequate stability due to erosion. (Right side) Spoil material is sitting on side of road un-stabilised; slash appears to have been used as mulch in some areas but ineffective.



Image 2: Downhill of haul road: (Right side) Water table with stormwater containing substantial amounts of sediment within it. A sediment trap is located before a culvert pipe before discharging to the receiving environment – sediment exposed above the waterline would suggest this trap required maintenance



Image 3: Discharge point from culvert: Silt fence is placed at the outlet as further stormwater control – clarity of water is still poor beyond the silt fence.



Image 4: Discharge point from Haul road's water table: Flow is being dispersed into slash as a filtration method and into native forest



Image 5: Discharge point to Wainakarua river: Discharge coming from the forestry block

Example 2 – Pleasant River

After a significant rainfall event, ORC was notified of poor water quality within the Pleasant river. Sedimentation was identified to be sourced from a nearby forestry block and a forestry inspection was undertaken. Upon inspection, controls and stabilisation were in place but were inadequate at managing such a weather event. Sediment had run down the haul road's water tables, had inundated several sediment traps and deposited onto land which was then mobilised into Pleasant river. The block was determined to be non-compliant with NES-CF Regulation 26 – sediment and RPW Rule 12.C.1.1 – discharge of contaminants but compliant with:

- NESCF Regulation 29 – setbacks to a perennial river
- NESCF Regulation 31 – Sediment and stormwater control measures
- NESCF Regulation 32 – Stabilisation
- NESCF Regulation 33 – Roads, tracks and landings

The forestry block was located within a yellow ESC zone on slopes that varied between 8-15° along the ridgeline that the haul road was situated and 21-35° at steeper slopes within the block (*ourenvironment.com landscape tool*).



Image 6: Haul road up-hill from sediment discharge: Cut faces from road construction are battered and compacted, side-cast/fill material has been compacted and appears to be placed on

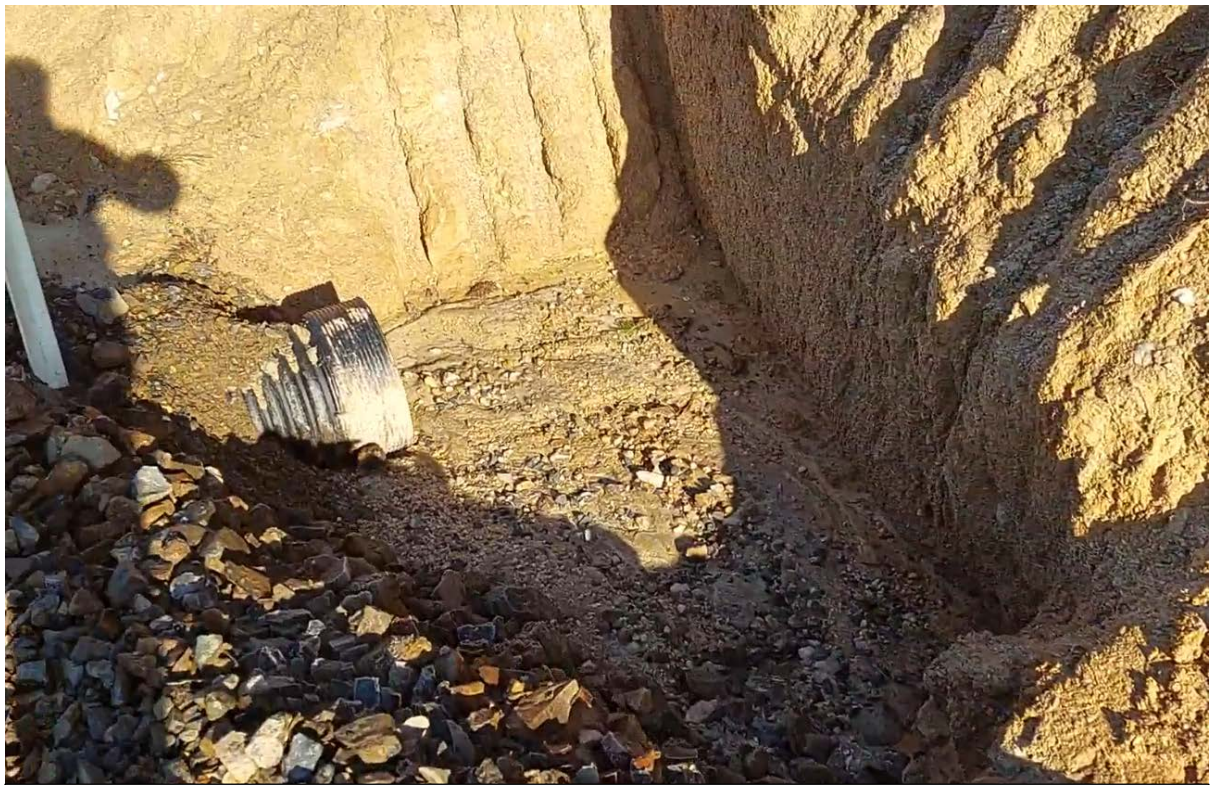


Image 7: Large sediment trap – inundated with sediment from weather event.



Image 8: Stormwater flume discharging to a sediment trap with hay bales – sediment controls have been inundated with sediment and is overflowing.



Image 9: Downstream from the overland flow of sediment – river has become discoloured from sedimentation.



Image 10: Post discharge event (approx. 18 months) – Gradient of road from aerial footage. Point of discharge was located at the bottom right road bend of image

Example 3 – Waikouaiti River

A post-harvest inspection was undertaken at a forestry block situated by a tributary to the Waikouaiti River. The harvesting method at this block was a two-stage operation, where felled logs were taken to one side of the gully ridge, suspended above the waterway and then cable-hauled to the opposite side of the gully for extraction. Typically, cable hauling activities will continuously move cable line anchor points along ridgelines to pick up felled trees on the hillside. In this operation, the felled trees were transported across one section of the gully which focussed soil disturbance to one area.

Sediment was identified to be discharging into the waterway, primarily sourced from the roading that was in close proximity to the river (refer to images 13 and 14). The roading/tracking was concluded to be compliant with NESCF Earthworks setbacks due to the works being an upgrade of existing tracks – as permitted by NESCF Regulation 29(3(c)). The roading and scoured hillside however was non-compliant with NESCF Regulation 31 – Sediment and stormwater control measures and NESCF Regulation 32 – Stabilisation.

The forestry block was located within a green ESC zone on slopes that were greater than 35° along the hillsides and virtually flat by the roading and tracking at the waterbody (ourenvironment.com landscape tool).



Image 11: Scoured bank from cable hauling activities: Trees have been dragged up the hillside face



Image 12: Gully hillside opposite from Image 11



Image 13: Watercourse between cable hauling points - Tracking from activities has not been stabilised or controls put in place



Image 14: Sediment running into river due to no stabilisation and controls



Image 15: Section of harvested block where trees were felled and cable hauled to the top of the gully. Trees are then transported as shown in Images 11 and 12.

Conclusions

The NES-CF is primarily activity based in terms of its environmental objectives, whereas the RPW is effect based. This is why Amendment 2 (NES Plantation Forestry) was implemented, to create stringency with rules that protected instream values in Otago.

The NES-CF is permissive in nature within Otago, with virtually all commercial forestry activities being a permitted activity. This is primarily due to Otago being located within green and yellow ESC zones. In terms of earthwork activities, it is generally permitted granted that one of many alternative mitigation and controls are in place, however there is no consideration as to whether the mitigations/controls are suitable or at a scale to be effective.

It is apparent from compliance data that there are instances of sedimentation issues from forestry in Otago, whether it be due to non-compliances or inadequate regulations. It is difficult for compliance data to determine the scale of environmental effects from forestry – this is due to several factors such as the size and scale of forestry, council resources and lenient monitoring requirements from contractors.