



DRAFT EARTHWORKS AND CONSTRUCTION MANAGEMENT PLAN

Mt Welcome

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1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE OF THE PLAN

This Earthworks Construction Management Plan (ECMP) has been prepared for the proposed residential development at Mt Welcome.

This plan is intended to provide the information required to establish a framework for the safe and environmentally conscious completion of earthworks and civil construction proposed to be undertaken for the project.

The intention of this document is to set out the key parameters and likely site conditions that are required to be considered to assist the contractor in preparing their site-specific Earthworks and Construction Management Plan, for which they will be contractually responsible. This could either be prepared as an addendum to this report, or an entirely separate report. It is intended that this plan be finalised and submitted to PCC and GWRC for certification when the final construction methodology and staging has been agreed with the selected contractor.

This plan is not intended to be prescriptive, and the contractor will be free to propose alternative measures if they meet the minimum performance standards as outlined in this document and in accordance with the GWRC document "Erosion and Sediment Control Guide for Land Disturbing Activities in the Wellington Region – Issued Feb 2021" and if compliance is still achieved with the relevant conditions of consent.

This report covers the entire, with some additional detail provided for Stage 1.

This document is the project-wide Draft Earthworks Construction Management Plan (DECMP). It establishes the erosion and sediment control principles, and the monitoring and reporting requirements, that apply across the whole site and for the duration of the works. It sits above the subordinate management plans listed below and is to be submitted to GWRC for certification prior to any works commencing on site.

1.2 SITE WIDE MANAGEMENT PLANS

This document is the project-wide Draft Earthworks Construction Management Plan (DECMP). It establishes the erosion and sediment control principles, and the monitoring and reporting requirements, that apply across the whole site and for the duration of the works. It sits above the subordinate management plans listed below and is to be submitted to GWRC for certification prior to any works commencing on site.

Two further site-wide plans sit beneath this DECMP and are to be prepared in accordance with it:

- Chemical Treatment Management Plan / Flocculation Management Plan – prepared as a site-wide plan setting out the principles to be implemented where chemical treatment is proposed, for adoption into each stage-specific plan.
- Stream Works Construction Management Plan – prepared as a site-wide plan setting out the principles to be implemented where stream works are proposed within a stage.

Together, these three site-wide plans establish the guidance from which the stage-specific erosion and sediment control plans are developed. All three are to be submitted to GWRC for certification prior to any works commencing on site and the stage specific plan certification.

1.3 STAGE SPECIFIC PLANS

A single stage-specific plan is required for each stage of earthworks: the Stage-Specific Erosion and Sediment Control Plan (SSESCP). It will be developed in accordance with the certified site-wide management plans detailed above.

Each SSESCP will refine the erosion and sediment controls and construction methodology for the stage it covers, but will not depart from the principles, monitoring and reporting requirements established by the site-wide plans.

No earthworks will commence within a stage until the SSESCP for that stage has been certified by GWRC.



1.4 RELATIONSHIP WITH OTHER MANAGEMENT PLANS

This plan should be read in conjunction with the following plans prepared by the civil works contractor and/or the Consent Holder (prior to works commencing on site):

- Chemical Treatment Management Plan / Flocculation Management Plan
- Stream Works Construction Management Plan
- Construction Traffic Management Plan.
- Stormwater Management Plan
- Other environmental plans as required by the conditions of consent.

2.0 PROJECT OVERVIEW

2.1 GENERAL

All works associated with the proposed earthworks are to be carried out in a manner that minimises any possible adverse effects on the environment. This report outlines the details of proposed earthworks for the overall site and specific stages, which is shown on the 1697-01-2000 plan series.

2.2 LOCATION

The site is located at 422, 422A and 422B State Highway 59, Pukerua Bay, and encompasses a total area of 205.60 hectares. It formally comprises the following land parcels:

- Part Lot 1 DP 89102 (4.38 ha)
- Lot 2 DP 891020 (5.64 ha)
- Lot 1 DP 534864 (55.33 ha)
- Lot 2 DP 534864 (140.25 ha)
- Lot 1 DP 608433, Lot 1000 DP 608433 (34 Muri Road)
- Road Reserve (SH59 Corridor)

References to “the site” within this report refer collectively to all seven allotments, unless stated otherwise.

The site is situated in a rural area south of Pukerua Bay and north of Plimmerton, within the Porirua City boundaries in the Wellington region. It is bounded by State Highway 59 to the west and three adjoining land blocks to the north, east, and south.



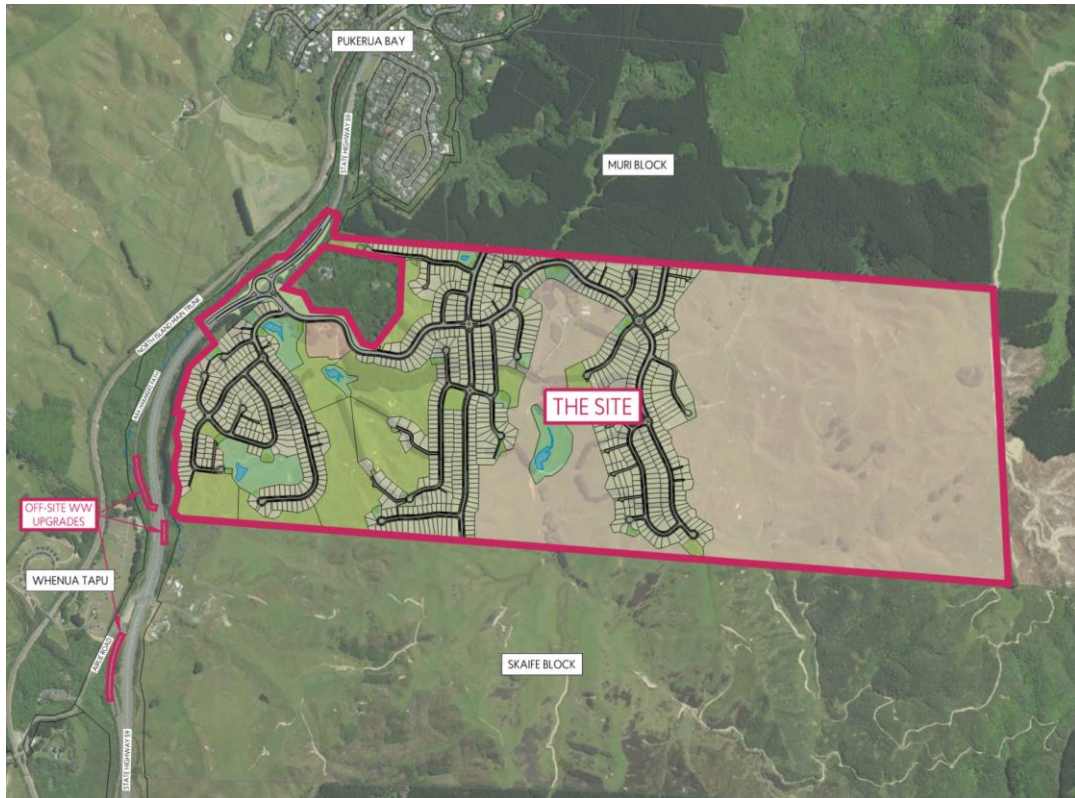


Figure 1. Site Extends Plan – Entire Site.

2.3 SITE HISTORY

The site is currently used as a deer farm, comprising predominantly pastoral grassland with several existing homesteads, farm sheds, and associated agricultural infrastructure.

Historical aerial imagery dating back to 1942 shows the land as open pasture, and it has remained pasture since that time, with no significant changes in land use or built development.

2.3.1 EXISTING LAND USE & TOPOGRAPHY

The site is currently used as a deer farm, comprising predominantly pastoral grassland with several existing homesteads, farm sheds, and associated agricultural infrastructure. Historical aerial imagery dating back to 1942 shows the land as open pasture, and it has remained pasture since that time, with no significant changes in land use or built development.

The topography is varied and includes some land that is moderately steep and undulating, with elevations ranging from approximately RL 50 m near the western boundary (adjacent to SH59) to RL 300 m at the eastern extent of the site. The landform includes three prominent high points separated by two gullies. The western portion of the site comprises of rolling hills and shallow gullies, while the central and eastern areas are steeper, with slopes typically between 26° and 45°, and locally exceeding 45° in areas.

2.3.2 PROPOSED WORKS OVERVIEW

The proposed development comprises 949 residential allotments ranging in size from 316m² to 2,386m², enabling the construction of 949 future dwellings with an average lot size of around 523m². The development also includes a commercial centre to serve the new local community, together with associated three-waters infrastructure (wastewater, including storage facilities; stormwater management systems; and water reticulation), roading, and a connected network of pedestrian and cycling trails.

Earthworks will be undertaken to establish suitable finished surface levels for building platforms, roads, parks, and drainage systems. The proposal will also incorporate extensive landscaping and public open spaces, including recreation and drainage reserves for stormwater attenuation and conveyance. A new



intersection with State Highway 59 will provide primary access to the site and integrate the development with the wider transport network.

3.0 ROLES AND RESPONSIBILITIES

POSITION	CONTACT DETAILS	RESPONSIBILITIES
Project Manager (Contractor)	To be confirmed – Contractor nominated person as per their overall CMP	Contractor Coordinator
Project Manager (Contractor)	To be confirmed – Contractor nominated person as per their overall CMP	Contractor Coordinator, inspections
Site Engineer	TBC	Day to day management of ESC measures
Civil Engineer	Envelope Engineering	Certification of installed devices
Geotechnical Engineer	TBC	Specialist Geotechnical input

4.0 CONTRACTOR AND ENGINEER DETAILS

4.1 CONTRACTOR

Contractor:	TBC
Contractor Address:	TBC
Contact Person:	TBC
Mobile:	TBC
Email:	TBC

4.2 ENGINEER

Engineer:	TBC
Engineer Address:	TBC
Mobile:	TBC
Email:	TBC

4.3 ENGINEERS REPRESENTATIVES (SUPERVISING ENGINEERS)

Engineer's Rep:	TBC
Engineer's Rep Address:	TBC
Mobile:	TBC
Email:	TBC

5.0 COMMUNICATION AND COMPLAINTS PROCEDURE

The following communication and complaints procedure shall be in place for all complaints received for the site. Complaints may be referred to the Project Manager by Porirua City Council (PCC), Greater Wellington Regional Council (GWRC), or members of the public. It is the responsibility of the Project Manager to respond to and manage all complaints in accordance with the resource consent conditions.



A register of all complaints will be maintained by the Contractor. The Register will identify the following information:

- A unique number for each complaint.
- Date and time the complaint was originally made.
- Name and contact details of the person to whom the complaint was originally made.
- Name and contact details of the person(s) making the complaint.
- A description of the complaint.
- Date and time the complaint was received by a member of the Project team.
- Name and contact details of the person(s) tasked by the Project Manager with reviewing the complaint.
- A description of the corrective actions (if any) assigned and the time frame for addressing the actions.
- Date and time the corrective actions were completed.
- Date and time the person(s) making the complaint were notified of the completion of the corrective actions (if any).

5.1 COMPLAINT INITIAL ACTION

Actions to be taken as soon as possible by the staff member responding to the complaint on behalf of the Project Manager:

- Fill out a complaint form.
- Note the time, date, identity and contact details of complainant. Wind direction and strength and weather conditions are recorded. Note if complainant has been referred from a consent authority.
- Ask the complainant to describe the nature of the complaint; whether it is a constant or an intermittent problem; how long has it been going on for; if it is worse at any time of day, does it come from an identifiable source.
- As soon as possible after receipt of a complaint undertake a site inspection. Note all noise, dust or vibration (nuisance) producing activities taking place, which staff member(s) or sub-contractor(s) are responsible for the mitigation methods that are being used.
- If complaint was related to an event in the recent past, note any nuisance producing activities that were underway at that time, if possible.
- As soon as practical, visit the area from where the complaint originated to ascertain if the nuisance is still a problem.
- If it becomes apparent that there may be a source of nuisance other than activities on the Project causing complaint it is important to verify this. Photograph and document the source and emissions.
- Take remedial actions where possible. These may be temporary fixes in the interim while long-term solutions are organised.
- As soon as possible after the initial investigations have been completed contact the complainant to explain any problems found and the remedial actions taken (if any).
- Implement long-term solutions if these are required.
- If necessary, update any relevant procedures to prevent any recurrence of problems.
- Complete complaint form and file on complaint register.

5.2 FOLLOW UP ACTIONS

The Project Manager will advise Project staff and sub-contractors that a complaint has been received, what the findings of the investigation were, and the remedial actions taken.

6.0 SITE SIGNAGE



Site signage should be placed in prominent locations at the entrances to all work sites, including separate stages. The signage must be placed at the boundary of the site so that members of public are able to see it.

The signage should include, at a minimum:

- The Contractor's name.
- A contact name and phone number for any complaints.
- Health and Safety information for the site. Note that this could be a direction for people to sign in or report to a different location.

7.0 CONSTRUCTION HOURS

The proposed hours for construction are:

- Monday to Friday 7:00 am to 6:00 pm for general site works.
- Monday to Friday from 6:30 am for quiet setting up of site (not including running any heavy machinery).
- Saturday from 7:30 am to 6:00 pm for general site works.
- Saturday from 7:00 am for quiet setting up of site (not including running any machinery).
- No works on Sundays or public holidays.
- Works outside of these hours may be required to complete certain construction tasks. However, these will require prior approval from the PCC compliance officer prior to commencement.

Complaints around work undertaken outside of these hours will be dealt with under the complaints process outlined in Section 5.

8.0 EARTHWORKS

8.1 INTRODUCTION

The specific earthworks methodology for various activities on site shall be coordinated with the contractor with the intent of reducing the area of earthworks open at any given time and the prompt reinstatement of stabilised materials. The methodology will differ depending on the exact staging proposed by the consent holder and contractor.

This is a general and assumed methodology however, alternative methodologies proposed should be certified provided they comply with this plan and the Resource Consent conditions.

The methodologies as detailed below can be applied to stages, sub-stages, or the entire site.

8.2 EARTHWORKS OVERVIEW

Bulk earthworks will need to facilitate a balanced approach between cut and fill, ensuring there is no excess material requiring removal from site or additional material import, achieve compliant road gradients where possible, and produce flat buildable house sites. This will also minimise the need for secondary earthworks, retaining requirements and encourage batter slopes to be designed at grades to minimise the time required for rehabilitation and revegetation post earthworks. The earthworks at the site consist of:

- Total earthworks area: 81.46 ha.
- Topsoil stripping is estimated at 128,000m³, assuming an average depth of 300 mm.
- Subgrade preparation is assumed to extend 200mm below finished ground level (FGL).
- Maximum cut height is approximately 21m, and maximum fill depth is approximately 24m.
- Total cut volume: 1,927,500m³.
- Total fill volume: 1,792,500m³.
- Approximately 135,000m³ of unsuitable material allowance

These volumes are solid volumes and make no allowances for bulking as advised by the geotechnical engineer based on field experience in similar ground conditions. The earthworks have been designed to



minimise the material that needs to be removed from the site. Excess materials will be utilised to slightly raise the proposed lots, with excess unsuitable material used in landscaping areas to reduce the requirement to take material off site.

A cut/fill balance has generally been achieved meaning no earthworks are intended to be removed from the site, subject to detailed geotechnical testing and civil design. Ground material that is unsuitable has been accounted for and will generally be disposed of on site in the designated unsuitable fill area, as detailed below. To achieve a cut/fill balance, certain gullies and low-lying areas that can accommodate earthworks will be utilized for placement of fill material. Earthworks within or near ecologically sensitive areas will be managed using processes developed jointly with the ecologist.

Detailed earthworks plans, including existing and proposed contours, cut-fill layouts, and staging plans, are provided in the 2000-series drawings.

8.3 EARTHWORKS STAGING

The earthworks will be carried out in a staged approach. These stages have been designed to progressively allow the civil stages to be developed as outlines in Table 1. They have also been designed to be carried out in an earthworks season. Prior to the commencement of each stage of earthworks a Stage-Specific Erosion and Sediment Control Plan (SSESCP) will be submitted to GWRC for certification in accordance with the resource consent conditions and the site wide management plans.

Table 1: Earthwork Staging

Stage	Area (ha)	Cut (m³)	Fill (m³)	Unsuitable (m³)	Enables Civil Stage(s)
Stage 1	11.5	227,500	185,000	42,500	Stage 1, 5A
Stage 2A	8.2	230,000	75,000	10,000	Stage 2A, 2B, 3A, 3B
Stage 2B	4.7	50,000	187,500	2,500	Stage 4A, 4B
Stage 2C	1.6	7,500	10,000	2,500	SH59
Stage 3	10.8	215,000	200,000	15,000	Stage 5B
Stage 4	12.2	327,500	317,500	10,000	Stage 6, 7, 8, 9
Stage 5	2.3	32,500	30,000	2,500	Stage 10
Stage 6A	11.7	257,500	155,000	15,000	Stage 11, 13, 14
Stage 6B	2.2	15,000	95,000	7,500	Stage 12
Stage 7	10.5	387,500	367,500	20,000	Stage 15, 16A, 16B, 17
Stage 8	5.8	177,500	170,000	7,500	Stage 18, 19
Total	81.46	1,927,500	1,792,500	135,000	

Stage 1

- Stage 1 extends along Road 1 to allow construction of the Water Supply Pump Station and PRV shed, which are required for Stage 2 civil works.
- The Commercial area is included, as it involves only a small volume of earthworks and avoids the need to re-establish later.
- This stage also includes construction of the structural bund for the surplus fill area.
- Earthworks within Stage 1 are predominantly cut, with material placed in the southern portion of the stage to achieve a balanced cut-fill outcome.



Stage 2

- Stage 2 is divided into Stages 2A, 2B, and 2C, although it is expected to be completed as a single continuous operation.
- Stage 2A consists largely of cut, with surplus material utilised within Stages 2B and 2C.
- Stage 2C includes works within the SH59 corridor, which may be deferred depending on the timing of the roundabout construction trigger.
- The southern portion of Road 10 (J Road), approximately 45,000m³, has been included within this stage for efficiency.

Stage 3

- Stage 3 enables the completion of Stage 5 civil works and consists primarily of cut material, with fill distributed to other stages to maintain overall balance.
- It includes the formation of Road 21, which will allow relocation of the Lucas driveway prior to Stages 6 and 7.
- The south-western fill area will form the batter for the Stage 6 civils, designed to the appropriate level to accommodate additional fill into the surplus fill zone.

Stage 4

- Stage 4 comprises the southern balance of the upper terrace.
- Although the south-west portion could be separated, its small volume (approximately 25,000–30,000 m³) means it is more efficient to include within this stage.

Stage 5

- Stage 5 is a small, discrete area separated from Stage 3.

Stage 6

- Stage 6 consists of sub-stages 6A and 6B.
- Stage 6A is primarily cut, providing material for placement in the fill-dominated Stage 6B area.
- This stage also includes formation of the Lucas Retention Wetland platform, which may require early construction since stormwater from Stages 6, 7, and 8 will ultimately discharge to the Lucas gully.
- Although a large area, Stage 6 enables the construction of Civil Stages 11 to 14.
- The inclusion of the Stage 15 fill avoids an impractical temporary batter of approximately 15 metres between earthworks stages.

Stage 7

- Stage 7 enables earthworks for Civil Stages 15, 16A, and 16B.
- While limiting the works to Stage 15 was considered, this would have required approximately 230,000 m³ of material.
- The stage boundary was therefore expanded to include Stage 16, optimising cut–fill balance and reducing inefficiencies.

Stage 8

- Stage 8 represents the final balance of earthworks across the site.
- This stage completes all remaining cut and fill operations and ties into the previously completed stages.

Detailed earthworks staging plans are provided in the 2000-series drawings within Appendix 1.

8.4 EARTHWORKS METHODOLOGY

The general methodology for establishing the initial earthworks, erosion and sediment controls, and preparing for bulk earthworks is outlined below:

- Undertake initial vegetation clearing and establishment works.



- Construct a Decanting Earth Bund (DEB) at the base of the initial catchment, along with other required erosion and sediment controls.
- Strip topsoil and stockpile material within the DEB catchment area, including the gully fill area and the source area for required cut material.
- Place fill to raise the catchment area to approximately the finished ground level. The final fill height will depend on the DEB catchment extent and available storage volume. Where necessary, a secondary DEB may be installed as a temporary control measure.
- Once the fill platform is established, construct the SRP on the raised area and commission it for use.
- Decommission the DEB once the SRP is operational.
- Strip remaining topsoil and prepare the remaining catchments.
- Commence bulk earthworks.

This staged approach enables practical construction of SRPs within a constrained site while minimising exposed surfaces and maintaining effective erosion and sediment control until permanent systems are commissioned.

8.5 PRELIMINARY SITE INVESTIGATION (PSI)

The PDP Preliminary Site Investigation (PSI) identified several historical buildings within the earthworks area that will require demolition. Asbestos-containing materials are likely to be present, and an asbestos survey must be completed prior to any demolition activities.

In addition, shallow soil sampling is recommended around each building footprint to identify potential contamination from lead-based paints or asbestos residues within the immediate building halo. A Detailed Site Investigation (DSI) should be undertaken for these areas, accompanied by a Site-Specific Soil Management Plan to guide handling, removal, and disposal of any contaminated material.

8.5.1 INITIAL CLEARING AND ESTABLISHMENT WORKS

The Contractor will establish on site with site sheds and construct fencing and hoardings to secure the site.

Clearance works including removal of vegetation and site features (power poles, fences, buildings etc.) will also commence. Vegetation will be primarily removed by mulching attachments fitted to excavators. This minimises soil disturbance during the vegetation removal phase. Clearance will be allowed prior to the erection of erosion and sediment controls provided this does not disturb the underlying ground.

Debris will be mulched and stored clear of overland flow paths and gullies. Where suitable mulch can be used to assist with temporary erosion and sediment control.

8.5.2 INITIAL EROSION AND SEDIMENT CONTROL SITE PREPARATION WORKS

Before the commencement of topsoil stripping or bulk earthworks for a particular stage, all required erosion and sediment controls will be installed by the contractor, with the exception of the SRP's as detailed in the methodology below. The contractor will arrange an inspection with PCC, GWRC and the Engineer to inspect the devices prior to commencement of earthworks. As-builts and checklists will be provided to GWRC prior to commissioning of any device.

8.6 DEB'S & SRP ENABLING

As the Sediment Retention Ponds (SRPs) are required to be constructed at natural low points, fill is also required in these existing gullies to reach the proposed finished ground levels. It is therefore not feasible to construct the SRPs at the existing gully levels. To ensure SRP construction is feasible and can be undertaken prior to bulk earthworks, the following methodology is proposed:

1. Install silt fence around the identified fill area (total area < 3000m²). A super silt fence will be installed adjacent to the DEB
2. Construct a temporary DEB within the existing gully at the earthwork's perimeter.



3. Place fill within the gully up to a maximum RL that maintains the contributing catchment under 3000 m² and remains treatable by the DEB. This will typically raise the gully by 3–5 m. Maintenance access to the DEB will be maintained.
4. There will also be an adjacent area where fill is sourced that will be considered within the catchment. A secondary DEB may be installed for this area.
5. Construct the SRP on the raised platform, aligning it more closely with the proposed finished ground levels.
6. Commission the SRP, associated drains prior to topsoil strip and bulk earthworks starting.

8.6.1 TOPSOIL STRIPPING AND STOCKPILE

Prior to commencing bulk earthworks within each stage, topsoil will be stripped and stockpiled in designated areas. Initial stripping will be limited to the areas required for establishing the DEB catchment and enabling of the SRP. Once the SRP is constructed, commissioned, and erosion and sediment controls are fully operational, topsoil stripping can proceed across the remaining portions of the stage. To minimise exposed and unstabilised surfaces, topsoil should only be stripped immediately prior to the commencement of bulk earthworks.

Excess topsoil material will be managed in accordance with Section 8.8 and placed within the designated unsuitable material stockpile. Topsoil identified for reuse will be stockpiled around the perimeter of the earthworks area for later reinstatement within lots and berms upon completion of civil works. All topsoil stockpile locations and management measures will be shown on the certified Erosion and Sediment Control Plans.

8.6.2 BULK EARTHWORKS

Bulk earthworks will be undertaken in a staged manner to limit the area of exposed earth at any one time and reduce environmental risks. Staging will align with the development layout, drainage catchments, and site contours to facilitate effective erosion and sediment control. Preliminary staging is detailed in Section 8.3.

Dependent on final construction programmes and contractor methodologies, we expect approximately 5–10 hectares to be open at any one time. These areas will be managed as separate erosion and sediment control catchments, with control measures established prior to disturbance. The separate nature of these catchments reduces the overall risk of the controls not functioning as intended. Flexibility of staging is required as the detailed construction methodology is yet to be finalised. Provided that effects are appropriately managed and documented through a detailed ECMP submitted prior to works commencing, flexibility in staging should be enabled through consent conditions.

Any excess material from the bulk earthworks within a stage will either be stockpiled for future use as fill in a designated stockpile area or will be removed from site. We expect that minimal material in total will need to be removed from the site. Temporary stockpile sites will be identified in the final stage-specific ECMPs' and these will be located away from site watercourses and other sensitive areas. All stockpiles will be stabilised until used or removed from the site.

The earthworks methodology for works directly adjacent to, and in the beds of the site watercourses will be agreed with GWRC prior to the works commencing in accordance with resource consent conditions. Section 14.0 provides commentary on methods for works adjacent and within streams.

The proposed erosion and sediment control methodology for this site is dynamic in nature and will be amended throughout the construction phase to ensure best practice outcome is achieved. Any amendments to a certified stage-specific ECMP will be discussed and agreed with Council representatives in alignment with the process outlined in the resource consent conditions.

8.7 EXCESS MATERIAL / TOPSOIL STRIPPING AND STOCKPILE

Excess material generated from the bulk earthworks will be managed through a combination of stockpiling and placement within the designated fill area, depending on suitability:



- Suitable material, as confirmed by the geotechnical engineer, will be utilised as additional fill within proposed lot areas. Given the overall earthworks balance, it is not anticipated that significant volumes of suitable material will require stockpiling, as this material will typically be placed directly as part of subsequent earthwork stages to achieve finished design levels.
- Temporary stockpiling of suitable material may occur within designated stockpile areas if required by the contractor. All stockpiles will be stabilised and managed in accordance with the certified stage-specific ECMP.
- Unsuitable material, including topsoil unsuitable for respread, or materials excavated from gullies, will be carted to an appropriate fill site for disposal in accordance with the geotechnical requirements.

8.8 FILL SITE

A dedicated fill area has been incorporated into the development to minimise the need for off-site disposal of unsuitable material. The 2ha area has capacity for approximately 135,000 m³ of surplus material and will be contained by a structural bund, with finished grades designed at flatter slopes to ensure stability. Only clean, uncontaminated material will be placed within this area; however, if any potentially contaminated material is encountered, it may be managed through a site-specific management plan, which could include options such as mixing, burial and capping, or off-site disposal.

The bund is expected to be formed from site-won material reinforced with geogrid, with detailed design and specifications to be confirmed during the detailed design phase. Suitable material will be placed and compacted in accordance with the geotechnical specifications.

8.9 AFTER BULK EARTHWORKS

Stabilisation will be undertaken progressively throughout the earthworks rather than only on completion of bulk earthworks. Areas that reach final or interim design level, and areas that will not be worked for an extended period, will be stabilised as soon as is reasonably practicable using techniques appropriate to the time of year, the soil type, as set out in the Site and Stage specific management plans. Erosion and Sediment Controls will only be removed after the site is stabilised and GWRC has approved their removal.

9.0 DUST, NOISE AND VIBRATION MANAGEMENT

9.1 DUST CONTROL

Management of dust at the site will be achieved by a range of methods:

- Keeping exposed areas of earthworks minimised to limit the amount of dust generation.
- Use of work methodologies that limit the ability for dust to form e.g. use of defined haul routes, limiting vehicle speed when dry and windy conditions are expected.
- Application of water from watercarts as required.
- Stabilisation of stockpiles and other areas through the use of temporary stabilisation measures e.g. tackifiers, or permanent measures e.g. topsoiling and hydroseeding.
- Use of structural solutions such as dust fences, as required. These would only be used in specific circumstances. E.g. when there is a sensitive receiving environment close to the dust source.

9.2 NOISE AND VIBRATION

Noise and vibration will primarily be controlled by the separation distance between the works and adjacent properties, as well as limits on working hours, which together will adequately mitigate potential effects. Compliance with the Noise and Vibration Management Plan will further ensure appropriate management of these effects.

10.0 EROSION AND SEDIMENT CONTROL

10.1 CONSENTING AUTHORITIES

PCC and GWRC both have compliance interests in monitoring the earthworks and proposed Erosion and Sediment Controls. However, to ensure simplicity and ensure there is a single point of contact for erosion



and sediment control, it is proposed to have GWRC leading the compliance of earthworks and controls at the site. PCC will be notified in the event of any non-compliance events.

10.2 GEOTECHNICAL RECOMMENDATIONS

The ENGEO Geotechnical Investigation Report makes recommendations on surface water management and erosion control which are incorporated into this DECMP and carried through into each SSESCP.

Overland flow is to be directed away from existing slopes to reduce the risk of ponding and erosion leading to slope instability. Stormwater from ground above proposed cuts is to be intercepted and discharged around the face in a controlled manner to minimise erosion of the cut face, and cut batters are to be protected from excessive rain during construction.

Higher fill and cut slopes are vulnerable to erosion where concentrated flows develop. Mitigation is required for all fills greater than 3 m in height to control runoff from the fill batters and scouring of the surficial fill. Options include:

- Benching the face of the fill
- Geogrid within the fill with wrapping of the face,
- Site-specific planting and hydroseeding plan,
- Bunds at the top of batters during construction.

The measures adopted for each batter will be confirmed at detailed design; geogrid requires specific detailed design by the Geotechnical Engineer.

Permanent unsealed slopes are to be re-vegetated with low-height vegetation, and all new unsealed slopes protected from overland flow by bunds or other suitable measures. Permanent cut batters are to be protected by planting and/or hydroseeding.

Cut batters in loess soils require a site-specific erosion design to prevent tunnel gullies forming. Where tunnel gullies not identified in the ENGEO site walkover are encountered during earthworks, they are to be removed through bulk earthworks or resolved through specific design, and the Geotechnical Engineer notified.

Excavated soil is to be removed from site or stockpiled where it will not cause slope instability. Where seeps are encountered in exposed cut faces, works in that area are to stop until the Geotechnical Engineer has advised on treatment, which may include surface or subsurface drains.

10.3 CONTROL OF SEDIMENT AND DEBRIS ON PUBLIC ROADS

The site entrances shall utilise stabilized construction entrances in accordance with GWRC's compliance document – Erosion and Sediment Control Guideline for Land Disturbing Activities in the Wellington Region. The effectiveness of these will be monitored during construction and where these are not functioning correctly, other options such as wheel washes can be implemented.

For Stage 1, the NZTA Erosion and Sediment Control Guidelines for State Highway Infrastructure should be referenced in conjunction with the regional requirements, given the direct interface with SH59.

Where sediment or debris is tracked onto the roadway, street sweepers or water trucks will be used to clean the affected areas, in accordance with the approved site-specific Construction Traffic Management Plan (CTMP).

The contractor is responsible for ensuring that any material deposited on public roads as a result of construction activities is removed promptly and that no sediment-laden runoff enters the stormwater system.

10.4 EROSION AND SEDIMENT CONTROL OBJECTIVES

All siteworks are to be carried out in a manner that minimises potential adverse effects on the environment.

The main objective of sediment and erosion control is to reduce the rate of erosion and minimise the amount of sediment discharged from bare earth surfaces, while providing practical measures to reduce the total amount of sediment leaving the site.



Principles of Erosion and Sediment control that will be applied include:

- Minimise disturbance – Minimise the extent of earthworks as much as is practicable.
- Stage construction – Minimise the amount of area open at one time and the time that these areas are left un-stabilised.
- Progressive stabilisation – Stabilise disturbed areas progressively throughout the works as soon as is reasonably practicable, rather than on completion of earthworks, using a range of techniques suited to the time of year, climatic conditions and soil types.
- Protect receiving environments – Apply additional protection (e.g. silt fences or super silt fences) and work methodologies around sensitive receiving environments (near stream corridors etc).
- Buffer zones and setbacks – Establish and maintain buffer zones around natural inland wetlands and streams. Setback distances and the associated controls are to be set for each catchment in the certified SSESCP, in consultation with the Project Ecologist.
- Sediment controls upstream of wetlands – Locate sediment controls upstream of wetland areas to prevent sediment ingress, with locations confirmed for each catchment in the certified SSESCP, in consultation with the Project Ecologist.
- Rapid stabilisation – Progressive stabilisation of disturbed areas as soon as practicable.
- Perimeter controls – Installation of perimeter controls for the diversion of clean water around the earthworks extent and separate this from sediment-laden water within the site.
- Employ sediment retention devices – Install treatment devices to maximise the efficiency of sediment removal within treatment devices.
- Review – Review and revise the effectiveness of erosion and sediment controls on a regular basis to ensure that they are still effective and applicable to the current site conditions.

The location and detail of proposed stage primary measures are shown on plans (Appendix 1) and discussed in further detail below. The sediment control devices need to be designed for the catchments being catered for to ensure compliance with GWRC guidelines and to provide strict control over the extent of areas to be treated.

10.5 EROSION CONTROL

To avoid erosion and sediment-laden stormwater generation on the site, the following principles will be implemented:

- Diversion of clean water flow away from the earth worked areas.
- Directing all silt laden water directly to sediment control devices.
- Wherever possible reducing the velocity of flow by directing diversion bunds along low slopes such as parallel to contours, or including check dams for steep slopes, etc.

10.6 SEDIMENT CONTROL

Diversion channels and/or earth bunds will intercept sediment laden runoff, diverting flow to the sediment control devices including Decanting Earth Bunds (DEBs) and Silt Retention Pond (SRPs). DEBs and SRPs will discharge to land before entering stabilised artificial watercourses, reticulated stormwater systems or channelised stormwater systems. Standard designs for these devices incorporate a stabilised emergency spillway (with erosion protection) in the event of a 1% AEP (1 in 100-year) storm.

Clear water diversions are required to ensure that clean, external runoff does not run across the earth worked areas and is not contaminated by exposed soil on the site, and these have been designed in accordance with the GWRC guidelines. Where grades are steeper than 2% the diversions will be lined with filter fabric and have rock check-dams installed to control water velocity.

Silt fences should generally be avoided in high or exposed locations where strong winds are prevalent. In such areas, alternative perimeter controls such as earth bunds, silt socks, or vegetated filter strips should be used instead. Silt fences in these environments are prone to damage or failure due to wind loading.



Super silt fences will be used in sensitive areas, e.g. adjacent to water courses, to provide additional redundancy to the controls. They are designed to both filter out larger soil particles and to slow the runoff to enable finer particles to settle before discharging.

Stormwater inlet protection such as silt socks, sandbags, super silt fences and catchpit filters will provide a barrier across/around catchpits to intercept and filter sediment laden runoff before it enters the stormwater system thereby preventing sediment-laden flows from entering receiving environments. These protections will be applied to the proposed catchpits within the development during bulk earthworks and roading upgrades, and during later stages of building construction including new stormwater services installations.

The Erosion and Sediment Control plans in Appendix 1 illustrate the proposed locations of all erosion and sediment control devices as well as typical details for all of these devices.

10.7 BUFFER ZONES AND WORKS ADJACENT TO WETLANDS AND STREAMS

Buffer zones around natural inland wetlands and streams, and the location of sediment controls upstream of wetland areas, are key mitigation measures for this project. The parameters for both will be developed jointly with the Project Ecologist and will form part of the site-wide management plans, to be applied catchment by catchment in the stage-specific plans.

The buffer zone principles informing those plans will address

- the extent of each natural inland wetland and stream within or adjacent to the stage, as confirmed by the Project Ecologist;
- the setback distance to be maintained between earthworks and each feature, and the basis on which that distance has been determined;
- the controls to be installed where the setback can be achieved, for example super silt fences, silt socks, diversion bunds and clean water diversions;
- the location of sediment retention devices and perimeter controls upstream of each wetland, demonstrating that runoff from disturbed areas is intercepted and treated before it can reach the wetland;
- any hold points at which the Project Ecologist is to attend site, or perform site inspections

10.8 SITE STABILISATION

The standard of compaction and the method of determination will be set out in NZS 4431 and NZS 4402, or as otherwise specified by the Geotechnical Engineer. The Contractor will arrange regular control tests to confirm adequate compaction has been achieved wherever fill is placed. On completion of subgrade formation, the Geotechnical Engineer will inspect the area for shape, grade, strength and uniformity.

A wide range of stabilisation methods will be used across the site, including topsoiling and grass seeding, hydroseeding, mulching, planting, erosion control matting, tackifiers, geotextiles, and metal or other hard surfacing. No method is excluded. The method chosen for any given area will depend on the time of year, the weather, the soil type, the slope, and how long the area will remain exposed. Hay mulch is likely to be of limited use in exposed, windy parts of the site and will need anchoring where it is used.

Stabilisation will be carried out progressively as the works proceed, not left until earthworks are complete. Areas that have reached final or interim level, or that will not be worked for some time, will be stabilised as soon as is reasonably practicable. Progress will be checked at the weekly site inspection and reported to GWRC. Areas may only be left unstabilised for longer where this is agreed in advance with the GWRC monitoring officer.

10.9 DEBS AND SRP

The low-lying areas that are most suitable for sediment retention ponds (SRPs) also function as fill areas, which creates challenges for constructing SRPs during bulk earthworks. In addition, due to the site conditions, it is not feasible to locate SRPs outside the bulk earthworks footprint.

To address this, the following staged sequencing is proposed:

- Construct a decanting earth bund (DEB) at the base of the catchment.



- Raise the surrounding area with fill to approximately the finished ground levels, while limiting the contributing area to that which can be managed by the DEB.
- Once the fill platform is established, construct the SRP on top of the raised area.
- Decommission the DEB.
- Continue bulk earthworks for the remainder of the catchment.

This approach ensures that SRPs can be constructed in a practical manner given the site constraints, while minimising exposed surfaces until the SRPs are fully commissioned.

10.10 SIZING OF SEDIMENT CONTROLS, DEB AND SRP

Sediment Retention Ponds (SRPs) are proposed to control and treat sediment-laden water from large catchment areas (typically 0.3 – 5.0 ha). The SRPs have been sized in accordance with the GWRC guidelines. The catchment area for each SRP is calculated using 2% or 3% of the earthworks area depending on the total earthworks slope and longest catchment length.

Decanting Earth Bunds (DEBs) are proposed to control and treat sediment-laden water from smaller catchment areas (typically less than 0.3 ha). These will be used where it is not possible to direct the flow to an SRP, or the catchment area is sufficiently small that the use of one is justified. The DEBs have been sized in accordance with the GWRC guidelines. The catchment area for each DEB is calculated using 2% or 3% of the earthworks area depending on the total earthworks slope and longest catchment length.

The device layouts shown on the Erosion and Sediment Control Plans appended to Revision 1 of this plan are indicative only. Final device layouts, decant and spillway locations, catchment boundaries and areas, storage volumes and sizing calculations will be confirmed in the SSES CP for each stage and submitted to GWRC for certification prior to the commencement of that stage.

10.11 MAINTENANCE OF ESC DEVICES

Monitoring Type	Monitoring By	Frequency	Recording
Set-up of site ESC	Engineer, PCC, GWRC	Prior to commencement of earthworks.	Engineer's written site inspection record. GWRC and PCC inspection notes.
Daily Inspection	Contractor	At the start and end of each working day.	Contractor's site diary to be retained on site and reviewed at weekly meetings.
Routine Weekly Inspection	Engineer/ Contractor	Weekly (prior to site meeting).	Contractor's inspection notes. Engineer's inspection notes.
During heavy rain events.	Contractor	During or immediately after heavy rain events.	Contractor's inspection record to be provided to the Engineer within 48 hours of the rainfall event.
Routine Compliance Inspection	Engineer, GWRC	As determined by GWRC.	GWRC inspection notes.
Prior to removal of ESC devices.	Engineer, GWRC	Prior to removal of any ESC device.	Engineer's written site inspection record. GWRC and PCC inspection notes.

The Engineer will inspect ESC devices and certify that they have been correctly installed prior to the commencement of bulk earthworks. GWRC and PCC will be invited to attend inspections of the ESC devices, prior to earthworks commencing on site. The contractor will be responsible for completion of as-built information for SRPs and DEBs as well as preparation of checklists as required.



10.12 SITE AUDITS

The Contractor will be responsible for undertaking weekly site inspections. These will be undertaken by an experienced practitioner. The site audits will be sent to the Compliance Officer for GWRC where requested.

10.13 EXCEEDANCES AND FAILURES

Rainfall trigger levels and requirements are suggested to be greater than 7 mm in one hour or 20 mm in 24 hours as measured at the nearest monitoring site. Upon these specified levels being triggered, the Contractor (or their representative) shall:

- Undertake a site inspection and inspect all erosion and sediment controls.
- Where sediment control devices (i.e. SRPs) have discharged, undertake sampling of the water at the outlet. This would involve testing of pH (where flocculant is used) and Turbidity at the inlet and outlet of the SRP and the receiving environment (in the case of discharge to waterways).
- Where there is a conspicuous change in water quality not related to SRPs e.g. in stream re-alignment works, undertake sampling at this location (after the zone of reasonable mixing) and the upstream environment.
- In the event that:
 - The turbidity (NTU) has increased by 30% after the zone of reasonable mixing (7 times the bed width), or
 - For any chemically-treated device, the pH is at or below 5.5 or above 8.5, or
 - The turbidity of the discharge measured at the outlet of any sediment retention device (SRP or DEB) is at or above 170 NTU while that device is actively discharging, or
 - There is a failure of any erosion and sediment control measure, or discharge from any non-stabilised area that is not treated by an erosion and sediment control measure, where any contaminants (including sediment) or material are released and enter any water body.
- The Contractor (on behalf of the consent holder), shall:
 - Notify the Monitoring Officer of the issue.
 - Undertake onsite investigations to determine the cause and what changes can be made to prevent reoccurrence.
 - Reestablish control measures as soon as practicable where these have failed.
 - Supply a report summarising the items above including site notes and photos, as well as identifying any non-compliances or items requiring remediation.
 - The report shall be provided to GWRC within 5 working days of the rainfall event, or longer as required where test results are not available.

10.14 CHEMICAL FLOCCULANT

The Chemical Treatment Management Plan (CTMP), or Flocculation Management Plan (FMP), is a site-wide management plan prepared in accordance with this DECMP and submitted to GWRC for certification prior to any works commencing on site. It sets out the principles for chemical treatment across the site, which are applied to the devices within each stage through the SSESCP for that stage.

Before earthworks commence, the contractor will engage a suitably qualified and experienced person (SQEP) to carry out bench testing of soil samples from the site. Testing is to be completed early enough to inform the CTMP.

Where testing shows that adequate treatment is achievable without chemical flocculant, the contractor may proceed on that basis, with monitoring of the devices carried out weekly. Bench testing is to be repeated where the materials encountered in a later stage differ from those tested, and chemical treatment introduced if required.



Where testing shows that chemical treatment is required, treatment will be carried out in accordance with the certified CTMP. Flocculation would likely involve flocculation sheds on the larger SRP devices and floc socks on smaller devices such as DEBs.

The CTMP must include as a minimum:

- Specific design details of the chemical treatment dosing system, based on a rainfall activated methodology for the decanting earth bunds (DEBs) or sediment retention ponds (SRPs).
- Monitoring, maintenance (including post-storm) and contingency programme (including a record sheet).
- Details of optimum dosage (including assumptions).
- Results of initial chemical treatment trial.
- A spill contingency plan.
- Details of the person or bodies that are responsible for long-term operation and maintenance of the chemical treatment system and the organisational structure that will support this system.

The SSESCP for each stage will identify which devices in that stage are to be chemically treated, confirm the dosage for the materials in that stage, and show the dosing equipment and chemical storage on the ESC plan. Discharges from chemically treated devices are subject to the pH trigger set out in the Exceedances and Failures section of this plan.

11.0 WATER MONITORING

Construction activities have the potential to affect water quality primarily through sediment runoff, hydrocarbon spills, and accidental release of construction materials such as cement or adhesives. If unmanaged, these contaminants could impact on-site wetlands and downstream receiving environments.

The most significant water-quality risk is sediment discharge during earthworks. This will be managed in accordance with the certified ECMP, supported by the mitigation measures outlined in this report, including:

- Establishing buffer zones around wetlands and streams.
- Minimising the extent of exposed earth at any one time.
- Installing sediment retention and diversion devices
- Locating sediment controls upstream of wetland areas to prevent sediment ingress.

For water monitoring, turbidity will be continuously measured at the downstream monitoring points (SW01, SW02, and SW03) for the duration of the works, in accordance with the PDP Water Quality Assessment. This monitoring will confirm that the measures outlined in this ECMP are being correctly implemented and are effectively minimising sediment runoff. These monitoring points are shown in Figure 2 below.



Figure 2. PDP Key Surface Monitoring Locations

The three monitoring locations will also be shown on the Erosion and Sediment Control Plans for each stage and on the site plan held on site. Safe, all-weather access to each monitoring location will be established and maintained for the duration of the works

12.0 WINTER EARTHWORKS

Winter earthworks are not anticipated at this stage. However, should they be required to complete the works, a Winter Earthworks Application will be submitted to GWRC for approval. The application will detail the proposed construction methodology and outline the additional erosion and sediment control measures to be implemented during the winter works period, in accordance with the GWRC *Erosion and Sediment Control Guide for Land Disturbing Activities in the Wellington Region*.

To minimise construction-related risks, it is proposed that no more than 3,000m² of unstabilised surface will be open at any one time during the winter period. This allowance is intended to enable limited secondary works, such as trenching or minor service installation, while maintaining an appropriate level of environmental protection.

All erosion and sediment controls for the relevant catchment must be fully installed, commissioned, and operating effectively prior to any winter works commencing.

13.0 STATE HIGHWAY WORKS

All works within or directly adjoining State Highway 59 must be undertaken in accordance with NZ Transport Agency (Waka Kotahi) environmental and safety management requirements, including the following reference documents:

- NZTA – Erosion and Sediment Control Guidelines for State Highway Infrastructure
- NZTA – Erosion and Sediment Control Field Guide for Contractors
- NZTA – Minimum Requirements for Environmental Management Plans

These documents set out the standards for erosion and sediment control, stormwater management, spill prevention, waste handling, dust suppression, and stabilisation of disturbed areas. All construction activities within the State Highway corridor, including earthworks, pavement construction, drainage installation, and temporary traffic management, must comply with these requirements and be coordinated with NZTA.

14.0 STREAM WORKS

14.1 CONTROLS ADJACENT TO WATERWAYS

There are various works proposed adjacent to the waterways on site. Due to the proximity of these works to adjacent stormwater channels, it is important to have a well-established sequence of construction for these works, for example:

1. Works adjacent to the stormwater channel will be conducted in small increments, so that only a small earthworks area is left exposed at one time.
2. A super silt fence will be installed at the proposed toe of excavations with returns at regular intervals.
3. Earthworks can proceed, with the controls regularly checked at the start and end of works each day to ensure ongoing compliance.
4. Upon completion of earthworks, the area should be immediately stabilised and subsequently planted (as per the approved landscaping plans). Immediate stabilisation could be achieved using hay, mulch or biodegradable matting.
5. The super silt fence should be left in place until the vegetation is suitably established and/or the area is stabilised.



14.2 STREAM DIVERSION WORKS

Several stream diversions will be required as part of the construction works. For these works, the following general methodology has been developed:

1. The temporary or permanent diversion will be formed, separate to the online channel.
2. The diversion channel will be sized for either the temporary or permanent flows.
3. The diversion will be stabilised. For temporary diversions this will be geotextile, to prevent scour. For permanent diversions, the banks and base will be formed to the final alignment and levels, with sides planted and stabilised with an approved erosion control measure e.g. biodegradable coconut or jute matting, which will provide interim stabilisation while planting establishes.
4. Once the diversion has been stabilised, the online channel will be connected to the diversion. The diversion should be conducted at low flows to reduce the potential for scouring.
5. The diversion and old channel should be left open at the same time for a period of 2-3 days. After this period, the old channel will be closed off at the upstream end of the channel. The bank should be stabilised to prevent scour.
6. The old channel should be left open at the downstream end of the channel for 2-3 days to allow any remnant fish to naturally migrate into the new stream alignment. Once this timeframe has passed, the lower end of the channel can be closed off. The contractor should inspect the old channel for signs of remnant fish, and if required native fish recovery will be carried out in accordance with the ecologists recommendations, conditions of consent or applicable management plans.

For smaller areas of diversion and connection, it may be more appropriate to use other methods such as coffer dams with pumping. The contractor will be responsible for preparing specific details for these diversions as part of a Stream Diversion Plan, which could form part of the Contractor's Earthworks and Construction Management Plan. This will require review from the Project Ecologist.

14.3 STORMWATER DRAINAGE AND OUTFALLS

Within the site the construction will be managed by the ESCP provisions described herein. Additional measures will be required to accommodate the specific requirements of the permanent outfall structures.

Stabilised discharge locations will be constructed for each proposed outlet. The exact make-up of these including size and construction will be determined during the detailed design phase, prior to construction.

Construction of the outfall protection must be done at the same time as construction of the pipe outfall itself.

Generally, it is best to construct the outfall unit from the bottom up, to prevent concentrated flows from being discharged into an unstabilised location. Where the outfall is part of a replacement system, the existing outfall may be able to be utilised during the construction phase. If construction of the outfall system is done from the top end first, the entrance to the system should be blocked off to prevent flow from travelling through the pipe until the outfall protection is completed.

15.0 DEWATERING

The Geotechnical Report outlines that based on investigations across the site, groundwater is unlikely to be encountered during excavation. If encountered it may impact fill compaction and quality and may require the implementation of ground water controls.

Dewatering may be required in the following instances:

- To dewater during bulk earthworks excavation to ensure compaction quality
- To dewater trenches, including for the construction of:
 - Wastewater pipes and manholes.
 - Stormwater pipes and manholes.



- Stormwater attenuation devices and ponds
- To dewater sediment control devices for maintenance, or at the decommissioning stage.

Dewatering guidelines are provided in the GWRC compliance document – Erosion and Sediment Control Guide for Land Disturbing Activities in the Wellington Region.

During the Bulk Earthworks stage, when associated ESCP devices are installed, any dewatering required to be undertaken would typically discharge into the devices provided or into diversion channels or bunds that will ultimately convey the water to a treatment device.

Once the earthworks have been completed and Civil or Building construction is undertaken, dewatering will require management as set out below.

15.1 DEWATERING METHODOLOGY

Where there are no suitable sediment devices on site and the water is not meeting clarity requirements, there are a variety of options for dewatering treatment, including settling tanks/ skip bins (refer GWRC Figure 8.9.2.1), dewatering bags (refer GWRC Figure 8.9.2.2) and turkey nests (refer GWRC Figure 8.9.2.3). The selection of these will be done by the contractor to suit the work being undertaken.

The likely measures for dewatering include:

- Sump Pumping, either with suction or submersible pumps.
- Well point pumping.

Specific guidance on each of these is included in the GWRC Guidelines.

15.2 DEWATERING MONITORING

Monitoring of the discharge will be undertaken to ensure the pumped discharge always meets the required discharge standards.

The outflow from an unfiltered pump sump will be monitored by taking samples of water and checking the proportion of fines being transported. If fines are being continuously recovered or there are indications of potential excavation instability, the excavation will be backfilled, and a different dewatering method considered.

Where ESCP devices are being used for sediment control, of pumped discharge, the monitoring requirements of these devices, and the monitoring conditions that will be imposed on the consent, must be followed, including pH sampling and Flocculation controls where applicable.

Dewatering is expected to be undertaken within isolated areas for short duration works. This will mitigate the potential for adverse effects, which is expected to be low.

16.0 MEASURES TO ENSURE A TIDY SITE

The importance of maintaining a tidy site shall be encouraged through site meetings, toolbox meetings and site inspections. During inspections, the general tidiness and condition of site will be noted. Significant trip hazards and non-compliances will be raised on site and followed up with an email, with minor recommendations raised in site meetings or by email.

Skip bins shall be used to collect and dispose of general site rubbish and waste. Rubbish or material generated from demolition works or earthworks may be loaded directly onto trucks as required.

Some materials designated for recycling or reuse within the development may be stored in an appropriate location on site.

Larger deliveries of materials to site will be unloaded in an identified lay down area with materials stored there until required at their specific sites. Smaller deliveries of materials specific to a stage may be delivered directly to the appropriate site area, a specific laydown location will be identified in the stage specific addendum as required. The specified location may change as works proceed based on phasing and staging.



17.0 LOCATION OF WORKER'S CONVENIENCES

The site offices shall be in a portable site shed which will be established on site. This will include facilities such as toilets, a kitchen, meeting rooms and offices. Additional facilities such as separate site sheds, lunchrooms and portaloos shall be in proximity to specific stages and activities, with their type and location determined by the contractor.

18.0 STORAGE OF FUEL AND OTHER HAZARDOUS MATERIALS

A designated fuel and hazardous fuel store shall be established on site in a location agreed between the engineer and the contractor. This storage area shall be constructed and fenced in accordance with relevant guidelines. Fuel storage to be secured against theft and vandalism.

The fuel storage area shall be located away from sources of combustion and shall be self-bunded or otherwise suitably contained. Fuel should be stored away from sensitive receiving environments e.g. stormwater channels and streams.

Spill kits shall always be available on site and these should be suitably sized for the potential spill hazard. The kits shall be placed in locations adjacent activities with a moderate risk of spills.

19.0 RESTRICTIONS TO PUBLIC ACCESS

Public access will be restricted to certain public areas of site (or adjacent to the site) at various points through the construction of the project. The specific location and duration of these restrictions will be determined for the various development stages.

Active works areas, such as demolition or building construction sites, will be restricted with site hoarding and fencing in a manner agreed between the engineer and the contractor.

Long term restrictions will be communicated to the public through signage and site maps on the information boards. Short term restrictions shall be communicated to the public in the appropriate manner, signage, barriers, spotters etc.

20.0 MONITORING AND COMPLIANCE REGIME

A copy of the ECMP, together with the certified Chemical Treatment Management Plan, the certified Streamworks Construction Management Plan and the certified Stage Specific Management Plan for the stage currently under construction, shall be kept on site at all times. Compliance with those plans shall be reviewed by the Engineer on a regular basis, with non-conformances recorded in a register.

Prior to the commencement of each stage of earthworks, the SSESCP for that stage shall be prepared and submitted to GWRC for certification.

Should significant changes be required, the plan shall be revised, reviewed, and resubmitted to the PCC Council Compliance Officer and GWRC Monitoring and Enforcement Officer. Should minor changes or additional details be required, a stage specific addendum may be prepared and submitted to PCC and GWRC.

21.0 SPECIFIC CONTROLS – STAGE 1

The initial stage of earthworks, as outlined in Section 8, will establish the platform for the first development phase and the commercial area. Earthworks in Stage 1 are predominantly cut, with the excavated material placed in the southern portion of the stage to achieve a balanced cut-fill outcome.

The low-lying areas that are most suitable for sediment retention ponds (SRPs) also function as fill areas, which creates challenges for constructing SRPs during bulk earthworks. In addition, due to the site conditions, it is not feasible to locate SRPs outside the bulk earthworks footprint. To address this, DEB have been proposed to enable some fill to be placed and enable the construction of the SRP's. This approach ensures that SRPs can be constructed in a practical manner given the site constraints, while minimising



exposed surfaces until the SRPs are fully commissioned. The following staged sequencing is proposed for specific controls in Stage 1:

- **Culvert and Retention Wetland Outlets**

The gullies that will be filled in areas and form the upstream retention wetlands requiring stormwater culverts and outlet structures to be installed as earthworks advance. This staged installation ensures that clean water continues to flow downstream throughout construction. Once operational, flows conveyed through these culverts will combine with SRP discharge water and will be monitored for turbidity in accordance with the ECMP.

- **DEB Construction**

DEBs will be temporarily constructed in low areas to provide sediment control during early-stage earthworks and the formation of SRP platforms. A super silt fence will be installed around each DEB to isolate the work area. DEBs will manage runoff from small catchments (typically less than 3,000 m²), enabling fill to be placed up to near-finished levels and creating a stable working platform. Once the associated SRP is constructed and commissioned, each DEB will be decommissioned, and the area stabilised in accordance with GWRC guidelines.

- **SRP Construction**

Sediment Retention Ponds (SRPs) will be constructed on prepared fill platforms and commissioned prior to bulk earthworks commencing within their contributing catchments. Temporary sediment controls, including DEBs and diversion bunds, will be installed during formation of the platform. Once stabilised, the SRPs will be excavated and formed, including spillways, decant structures, and stabilised embankments. Where SRPs are located outside gullies (e.g., SRP 1-1), they will be constructed on existing flat ground, allowing commissioning prior to any ground disturbance in the wider catchment.

22.0 SPECIFIC CONTROLS - SH59 INTERSECTION

Earthworks and civil construction will be undertaken within the SH59 road corridor to form the new roundabout and intersection providing access to the Mt Welcome development. These works fall within the Waka Kotahi state highway corridor and will require separate approvals and traffic management certification prior to commencement.

Due to the sensitive nature of working within an active state-highway environment, these works will require:

- A separate, detailed ECMP to be prepared and submitted for certification prior to works commencing. This will include a stream works management plan (SWMP) to be certified by GWRC.
- A Traffic Management Plan (TMP) to be approved by Waka Kotahi
- All works and controls are to be in general accordance with the wider site ECMP.

A detailed construction and erosion and sediment control plan will be prepared and certified before works begin, in accordance with GWRC and NZTA requirements. Given the sensitivity of the surrounding environment and the presence of piped streams within the corridor, a specific methodology and supporting erosion and sediment control plans have been developed for this management plan.

Although a detailed construction methodology has not yet been developed, it is anticipated that the roundabout will be constructed offline in halves, with traffic switched over to enable construction of the remaining portion. The final methodology—prepared in conjunction with the selected contractor prior to construction—will be developed to minimise construction effects on the state highway. Key controls expected to be required are outlined below.

- **Site Establishment**

Initial site establishment will occur within the main Mt Welcome site. Depending on which side of SH59 works are undertaken, the contractor may utilise either the main compound or a smaller satellite area adjacent to the active work zone.



- **Traffic Management**
Temporary traffic management will be established in accordance with certified plans prior to works commencing.
- **Vegetation Clearance**
Vegetation clearance will be undertaken in accordance with approved management plans, ensuring disturbed areas are minimised and promptly stabilised.
- **Erosion and Sediment Controls**
All erosion and sediment control measures will be installed prior to earthworks, consistent with NZTA and GWRC guidelines.
- **Culvert Installation (Taupō Stream)**
Piping of the Taupō Stream will be completed in stages. Due to topographical constraints, the stream cannot be diverted; however, the new culvert alignment is offset from the existing channel, allowing the work to occur offline without direct disturbance. Access and detailed construction methodology will be confirmed prior to commencement.
- **Headwall Construction**
New headwalls will be installed within the existing stream corridor. As these structures are typically set back from flowing water and constrained by steep banks, full stream diversion will not be required. Localised containment (e.g., cofferdams or sandbag bunds) will be established around each work area, with silt fences or sediment socks installed downstream where practicable.
- **Dewatering (if required)**
Any dewatering will be undertaken in accordance with Section 15 of this ECMP, discharging to approved sediment controls.
- **Stabilisation and Demobilisation**
Upon completion of installations, all exposed soils will be stabilised using hydroseed and coconut fibre matting, followed by progressive removal of temporary ESC measures once the site is stable and vegetated.

23.0 SPECIFIC CONTROLS – FILL SITE

The 2ha fill site has capacity for approximately 135,000 m³ of surplus material and will be contained by a structural bund, with finished grades designed at flatter slopes to ensure stability.

The bund is expected to be formed from site-won material reinforced with geogrid, with detailed design and specifications to be confirmed during the detailed design phase. Suitable material will be placed and compacted in accordance with the geotechnical specifications. The following methodology and controls will be required for construction:

- **Site Establishment**
A stabilised haul road will be constructed to provide access for bund construction and for long-term use of the fill site. An area of approximately 1,800 m² will be stripped, with the extent of exposed ground minimised as much as practicable to limit the duration and area of unstabilised surfaces.
- **Erosion and Sediment Controls**
Silt fences and a decanting earth bund (DEB) will be installed around the perimeter of the site to control sediment runoff and prevent discharge to downstream areas. All ESC measures will be installed prior to earthworks and maintained for the duration of the project in accordance with GWRC and NZTA guidelines.
- **Bund Construction**
The bund will be progressively constructed and compacted with geogrid reinforcement, with each completed lift considered stabilised and providing effective erosion control. Upon completion, the bund will be planted or hydroseeded in accordance with geotechnical recommendations to ensure long-term stability.
- **Stabilisation and Maintenance**
Erosion and sediment controls will remain in place around the perimeter of the fill site throughout the works. Prior to winter or completion of construction, the area will be fully stabilised with hydroseed and coconut fibre matting. Once the bund is complete, material can be placed and compacted in



accordance with the geotechnical specifications, and the haul road will be maintained for ongoing access.



APPENDICES

APPENDIX 1
OVERALL ESCP

The full drawing package is provided as a separate attachment.

APPENDIX 2

STATE HIGHWAY 59 ESCP

The full drawing package is provided as a separate attachment.

APPENDIX 3
FILL SITE ESCP

The full drawing package is provided as a separate attachment.

APPENDIX 4

SRP & DEB SIZING

APPENDIX 5
STAGE 1 ESCP

The full drawing package is provided as a separate attachment.

APPENDIX 6

EARTHWORKS PLANS

The full drawing package is provided as a separate attachment.