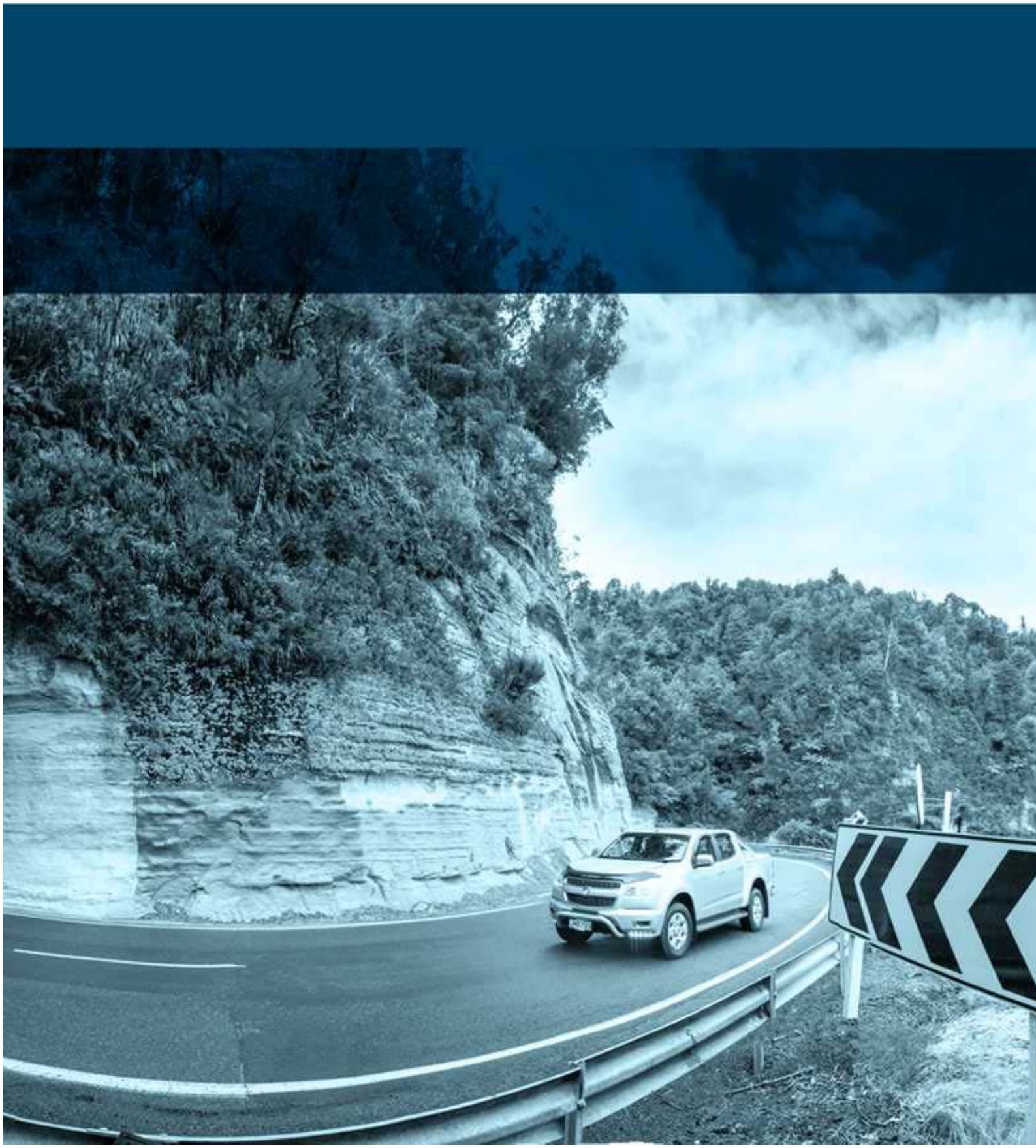
Section 10 – Management of Effects on the Environment



10 Management of Effects on the Environment

10.1 Introduction

This section outlines the environmental management measures to be implemented prior to, during and post construction of the Project, to avoid, remedy, mitigate or offset effects on the environment as identified in Section 9 of this AEE.

The Project (as reflected in this AEE, the drawings in Volume 2 and technical reports in Volume 3) has sought to avoid or mitigate adverse effects through the route selection process, the design of Project elements and the management of the construction works.

The assessment of effects in Section 9 of this AEE and the supporting technical reports in Volume 3, identify a number of positive and adverse effects on the environment expected to result from the construction and operation of the Project. Where it has not been practicable to avoid adverse effects, the measures described in this section have been developed to remedy, mitigate or offset them.

The key measures developed to avoid, remedy, mitigate or offset effects of the Project have been discussed through the AEE (particularly in Sections 4, 5 and 9) and are:

- A substantial mitigation and biodiversity offset package;
- An overarching CEMP to address both designation and resource consent matters related to construction of the Project;
- A series of specific management plans that detail the measures that will be in place to avoid, remedy, mitigate or offset environmental effects, including construction water management, ecology and landscape management, pest control, contaminated land management; construction traffic management dust, and construction noise management;
- Site or activity specific components of the CEMP and management plans to manage particular effects during construction (e.g. detailed Specific Construction Water Management plans);
- An accidental discovery protocol to address the management of any unexpected discovery of archaeological sites; and
- Protocols, outlined as part of the CEMP, to communicate with the local community and stakeholders for the duration of construction of the Project on construction activities.

These measures will be formalised through the Project designation and resource consent conditions.

10.2 Designation and Resource Consent Conditions

A suite of designation and resource consent conditions has been developed so that the potential adverse effects that may arise from the construction, operation and maintenance of the Project will be avoided, remedied, mitigated or offset (Refer draft conditions set out in Appendix D of AEE, Volume 1). Table 10.1 identifies the key topics addressed in the designations and resource consent conditions.

Table 10.1 – Designation and consent condition topics

Designation Conditions	Resource Consent Conditions
Construction Works • Construction management, including: o the CEMP and management plans; o Complaints management; o Communications; o Incident management. • Construction noise management. • Construction traffic management. • Ecological and landscape management including restoration and rehabilitation planting, and pest management. • Archaeology management, including Accidental Discovery Protocol. • Access to existing walking tracks.	**Construction Works** • Construction management, including: o the CEMP and management plans; o Complaints management; o Communications; o Incident management. • Construction water management, including: o earthworks and land disturbance activities (including vegetation clearance); o temporary stormwater management; o construction phase streamworks (i.e. installation of temporary culverts, temporary stream diversions). • Dust management. • Disturbance of contaminated land. • Ecology and landscape management including restoration and rehabilitation planting, and pest management. • Surface water abstraction for construction related purposes. **Permanent Works** • Ecology and landscape management including restoration and rehabilitation planting, and pest management. • Works in a watercourse – installation of permanent culverts, permanent stream diversions. • Operational stormwater management.

10.3 Management Plans

This section sets out the framework of management plans required to avoid, remedy, mitigate or offset effects associated with the Project. The proposed management plan framework is shown in Figure 10.1.

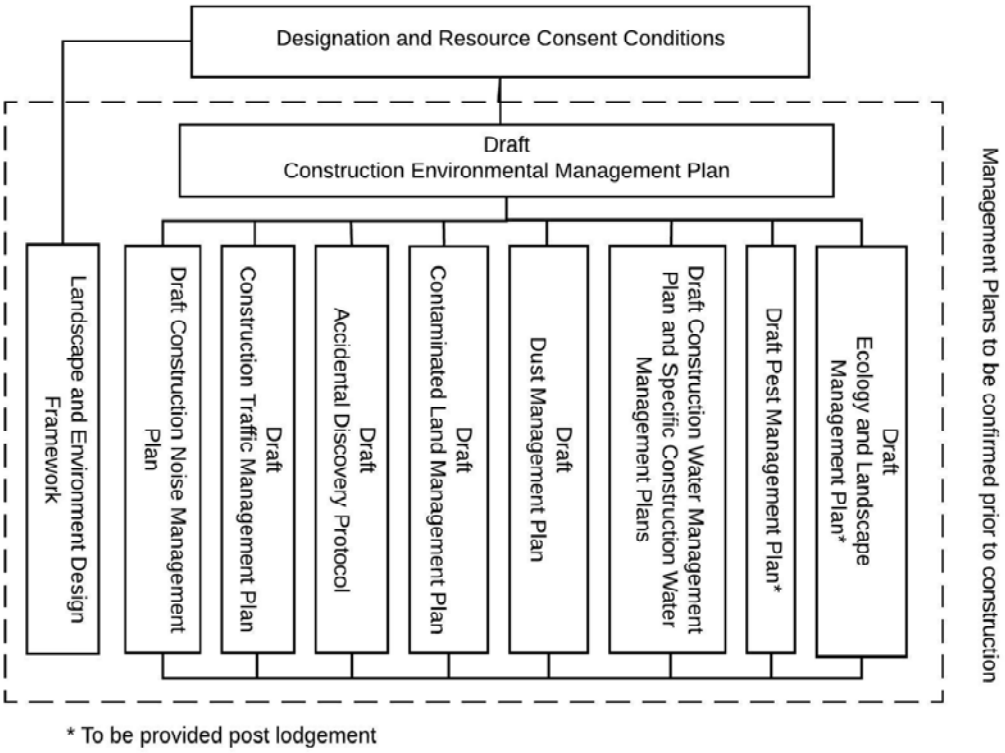


Figure 10.1 – CEMP and Management Plan framework

10.3.1 Construction Environmental Management Plan

The CEMP is the overarching management plan which sets out the framework to manage the activities associated with construction of the Project. The principles and general approach (including methods and tools) to managing the effects are set out in the CEMP, with detailed management methods described in the suite of specialised management plans. Its purpose is to ensure that construction activities are appropriately managed during all stages of construction to avoid, remedy, mitigate or offset effects associated with the Project.

A draft CEMP has been prepared for the Project (refer Volume 5). It will be finalised prior to the commencement of construction to meet the requirements of the designation and resource consent conditions.

The Transport Agency (through the Mt Messenger Alliance) will undertake all construction activities in accordance with the provisions of the relevant designation or resource consent conditions, the CEMP and management plans.

The CEMP will provide details on:

- Construction activities and related cultural, environmental and social aspects of the Project, including:
  - the location of key construction activities;
  - details on cultural protocols developed with Ngāti Tama;
  - the receiving environment and sensitive receptors;
  - environmental management requirements.
- Staff and contractors' roles and responsibilities.
- Training requirements for employees, sub-contractors and visitors.
- Environmental incident and emergency management.
- Environmental complaints management.
- Environmental monitoring and auditing.
- Corrective action and continuous learning.
- Stakeholder communication, methods and interface procedures.
- Reporting.
- Review of the CEMP and management plans during construction.

The draft designation and resource consent conditions detail the matters to be addressed in the CEMP (and that are to be included in the final version of the CEMP).

The CEMP and management plans are subject to review and updating during construction to reflect changes to activities, risks, mitigation measures, responsibilities and management processes. The draft conditions provide that reviews of the CEMP and all management plans are to be carried out annually, and list matters to be taken into account in the reviews. The conditions also set out the processes for updating the CEMP and other management plans.

10.3.2 Ecology and Landscape Management Plan

An ELMP will be prepared following lodgement of the application to detail the management and rehabilitation, mitigation and offset measures that will be implemented to avoid, remedy, mitigate or offset ecological and landscape effects associated with construction of the Project and once the Project is operational (a framework document is presented in Volume 5). It will cover the rehabilitation of the site works, ecological mitigation and ecological planting (including terrestrial and riparian mitigation planting and swamp forest restoration planting), animal pest management (in the Pest Management Plan) and the management and monitoring of terrestrial vegetation, riparian and freshwater environments, avifauna, herpetofauna and bats.

The Plan will include a number of protocols and management measures to minimise the impact of construction on flora and fauna, as outlined in Table 10.2 (these are also outlined in Technical Report 7h). It will also include post construction monitoring.

Table 10.2 – Protocols to be included in ELMP

Ecological Protocol	Protocol summary
Vegetation clearance	• Methodology for the removal, pruning and protection of high value vegetation to be retained during construction, including: o Physical delineation (such as fencing or flagging tape) to show the extent of vegetation clearance, along with vegetation to be retained. o Vegetation will be cleared only prior to construction works beginning in the Project footprint in order to reduce habitat effects and reduce the potential for erosion and sediment generation. o Supervision of vegetation clearance by a suitably qualified ecologist. • Methodology for removal of vegetation for re-use on site including seeds/cuttings, plants, ponga logs, forest duff, manuka slash, vegetation for mulching. • Procedures for minimising the area and duration of soil exposure from vegetation clearance, minimising the volume of vegetation to be mulched, locating wood residue piles with an appropriate separation distance from any waterways, and minimising potential leachate from these piles.
Lizard Management	• Pre-construction surveys to detect the presence of herpetofauna species, and the habitats they occupy. • Methodology for salvage and relocation to minimise loss of herpetofauna within the Project footprint, including timing and construction supervision details. • Release site/s selection based on habitat suitability assessment and capability of supporting additional herpetofauna. • Habitat enhancement at the release site(s), including provision of refugia.
Bat Management	• Trapping, banding and radio tracking of long-tailed (and possibly short-tailed bats) bats to locate and describe bat roosts within the Project footprint, and identify important foraging areas prior to construction. • Protocols for identification of potential bat roost habitat. • Implementation of tree removal protocols when clearing vegetation which could potentially offer roosting habitat for bats. • Protocols for bat injury and mortality.
Avifauna Management	• Pre-construction surveys to detect the presence of avifauna species, and the habitats they occupy. • Vegetation clearance methodology (links to the vegetation clearance protocol).

Ecological Protocol	Protocol summary
	• Specific management to avoid or mitigate effects on the North Island Brown Kiwi. • Timing of works to minimise disturbance during bird breeding season as practicable.
Fish Recovery	• Methodology to minimise direct effects of construction on fish, kōura and kākahi (freshwater mussels) prior to draining, diverting or excavating streams. This will address: o Recovery of fish prior to instream works; o Rescue of fish from any spoil o Relocation of fish; o Reporting. *Note: The CWMP details the protocols for works in streams including, the diversion and realignment of watercourses and activities such as culverting and the installation of erosion protection structures.*

Monitoring of ecological resources prior to and during the construction phase, along with post construction monitoring will be detailed in the ELMP to measure the effectiveness of environmental controls and to provide feedback for the adjustment of the controls.

A number of potential ecological effects will also be avoided or mitigated through the implementation of construction water management (including erosion and sediment control), noise management, dust management practises, and contaminated land and spill response procedures addressed in the CEMP and other management plans.

The mitigation and biodiversity offset planting and rehabilitation treatments will be carried out to mitigate and offset the vegetation and habitat loss associated with construction of the Project. This will include restoration planting of 6ha of swamp forest and wetland, restoration of 8.9km of riparian margin, replacement mitigation planting of 9ha, and rehabilitation treatment to revegetate as much of the construction footprint that will not be road as is practicable.

10.3.2.1 Pest Management Plan

The ecology technical reports prepared for the Project (Technical Reports 7a – 7h in Volume 3 of the AEE) identify that introduced animal pests have significant impact on the indigenous plants and animals in the forest and wetland areas within and adjacent to the Project footprint. Pest management is therefore the priority focus for offsetting Project effects as it will result in the most immediate and sizeable ecological benefit.

Intensive long-term pest management will be undertaken over a Pest Management Area of approximately 560ha area in perpetuity (or until such time as pest management is no longer required). Pest management will include:

- A long-term pest management programme (targeting possums and mustelids), which will include a ground-based poison and trapping regime or a combined aerial and ground-based approach over the full Pest Management Area; and
- Periodic hunting of feral goats, pigs and deer (annually, once numbers have been reduced).

Depending on the location of land chosen for pest management, farm livestock will need to be excluded completely by the construction of permanent eight-wire post and batten fences wherever effective fences don't currently exist.

A detailed Pest Management Plan will be prepared following lodgement of the application and form an appendix to the ELMP. It will be well integrated with all other restoration activities proposed for the Project. The Plan will be prepared by a person experienced in the management of multiple pest species in forested and wetland environments and contain information regarding:

- Target pest species;
- Appropriate residual trap catch targets to achieve the desired biodiversity outcomes;
- Grid line and trap and bait station spacings;
- The timing of bait applications, trap set and hunting effort;
- Monitoring requirements to determine if the target outcomes are being achieved; and
- The skill requirements of the personnel employed to undertake this work.

Pre-construction monitoring of pest densities in the proposed Pest Management Area will be necessary to help develop the details of the Pest Management Plan and to serve as a baseline against which the successfulness of the pest management programme can be measured.

10.3.3 Construction Water Management Plan

A draft CWMP has been prepared for the Project (refer Volume 5). The CWMP provides a framework for the following:

- Erosion and sediment control approach, principles and management practises to be implemented during construction of the Project so that potential or actual discharges of sediment from the site are minimised;
- Site monitoring and auditing functions, including the monitoring programme to be implemented during construction; and
- Management of other contaminants which may directly or indirectly discharge into receiving environments from site activity, such as concrete and fuel use.

The draft resource consent conditions detail the matters addressed in the CWMP (and to be included in the final CWMP).

The approach for construction water management during construction of the Project as set out in the CWMP is to:

- Prepare a strategy to assist with medium to long term construction decision making;
- Prepare detailed Specific Construction Water Management Plans (SCWMPs) for area and activity based planning (refer to Section 10.3.3.1); and
- Have an experienced and involved team to ensure that all relevant aspects of the Project are taken into consideration as part of planning and decision making. A comprehensive monitoring programme will be implemented as part of this (refer to Section 10.3.3.2).

This approach will ensure that adequate Project team resources, commitment and expertise are available for construction water management (including the implementation of erosion and sediment control measures) from start to finish of the Project (i.e. design and construction planning through to disestablishment of controls and reinstatement of the site).

10.3.3.1 Specific Construction Water Management Plans

Detailed SCWMPs will be prepared for specific works areas or activities within the site (outlined in Technical Report 13) in accordance with the CWMP. SCWMPs will provide the detailed design of specific construction activities, specific erosion and sediment control measures and location, staging and sequencing of works for that location or activity.

The SCWMPs will take into account environmental and ecological values and risks to determine the most effective and appropriate form of erosion and sediment control devices and management practices required to manage construction water on a location and/or activity basis.

The SCWMPs will consider a number of factors:

- The specific construction activity to be undertaken and associated risk;
- The area and volume of the earthworks and / or streamworks;
- The location of the works with particular consideration of the receiving environment;
- The duration of the works;
- The time of the year that the works are to be undertaken; and
- Specific construction water management methodologies and design criteria.

The draft resource consent conditions require the preparation of the SCWMPs.

The SCWMP process also allows for ongoing improvement as a consequence of learning from the Project's comprehensive monitoring programme.

10.3.3.2 On-site monitoring

A comprehensive monitoring programme will be implemented during construction, as per the CWMP. The focus of this monitoring programme is the management of sediment yield from the Project.

The monitoring programme will involve ongoing site monitoring throughout the construction phase to check that construction water management measures have been installed correctly, and methodologies are being followed and are functioning effectively.

Monitoring results will be used to identify future risks to freshwater ecology based on pre-determined management trigger levels. These triggers require an investigation and ongoing improvement opportunities to be considered and implemented as appropriate by the construction team.

The monitoring programme will include an assessment to determine what further measures are required to reduce sediment yield. Monitoring will include a feedback loop until it has been verified that the implemented responses have been successful in minimising sediment yields from the Project.

10.3.4 Contaminated Land Management Plan

A draft CLMP (Volume 5) has been prepared to manage the potential for adverse effects relating to the disturbance of potentially contaminated land during the construction of the Project. Specifically, the purpose of the CLMP is to:

- Ensure that the earthworks required as part of the Project are appropriately managed and that contaminated or potentially contaminated soils are identified, handled and disposed of in an appropriate manner; and
- Provide procedures to manage potential ground contamination effects on human health and the environment during ground disturbance activities associated with proposed earthworks.

The CLMP contains details of:

- Roles and responsibilities for management and implementation of the CLMP;
- Health and safety precautions including personal protective equipment to manage inhalation and dermal contact with contaminated material;
- Spoil sampling requirements prior to the commencement of works;
- Contaminated soil management, including reuse, and off-site disposal;
- Management of stockpiling, including cover to stop dust and runoff;
- Stormwater and erosion and sediment controls;
- Imported fill requirements; and
- Unexpected contamination discovery protocols.

The CLMP will be implemented during construction under the supervision of a Suitably Qualified and Experienced Practitioner as required by the NES Soil and defined in the NES Soil Users' Guide (April 2012).

10.3.5 Dust Management Plan

A draft DMP (refer Volume 5) has been prepared to manage, mitigate and monitor dust emissions during construction of the Project. The objective of the DMP is to detail the best practicable option to avoid dust nuisance being caused by construction works and to mitigate any such effects should they occur.

Matters addressed in the DMP are:

- Potential sources of dust that may be created during the construction Project;
- Sensitive receptors in the vicinity of identified potential sources of dust for targeted dust management;
- Dust management and mitigation methods; and
- Monitoring methods.

The draft resource consent conditions (refer Appendix D) set out the requirements for the DMP.

10.3.6 Construction Noise Management Plan

A draft CNMP (refer Volume 5) has been prepared. The draft CNMP outlines the specific measures relating to the control of noise during construction, to as far as practicable

comply with the noise standards in NZS6803:1999 "Acoustics – Construction Noise" (NZS6803:1999). The final CNMP will be confirmed prior to construction and will set out measures to appropriately address any activities that do not comply with the NZS6803:1999 standards.

At a minimum, the final CNMP will address the relevant measures in Annex E of NZS6803:1999. Specifically, the CNMP contains:

- A summary of the Project construction noise criteria;
- General work hours, construction practices, management and mitigation measures;
- Procedures to comply with NZS6803:1999;
- in respect of activities that may not comply with NZS6803:1999, noise management and mitigation specific to sites, activities and/or receiving environments;
- Communication procedures with receivers where works may exceed the relevant noise limits;
- Monitoring requirements; and
- The necessary setbacks for plant and construction equipment in relation to residential dwellings.

The draft designation conditions set out the requirements for the CNMP.

10.3.7 Construction Traffic Management Plan

A draft CTMP (Volume 5) has been prepared for the Project. The CTMP outlines the management, mitigation and monitoring of the effects of construction activities and construction traffic on other road users. The overall intent of the CTMP is to detail how traffic safety, access and efficiency effects caused by the construction works will be avoided, managed or mitigated should they occur.

The CTMP identifies the following:

- Construction activities that might create road safety and/or efficiency effects;
- Sensitive locations on the road network;

  Management procedures and mitigation methods;
- Monitoring methods;
- Arrangements for providing continuing access to properties, emergency services and walking tracks;
- The framework for reporting and review.

The draft designation conditions set out the requirements for the CTMP; as well as the requirements for ongoing access during construction.

As and if necessary site or activity specific traffic management plans (TMPs) will be in place during construction of the Project for discrete stages of work within the SH3 corridor. The TMPs describe the measures to be implemented to manage traffic effects associated with specific temporary road layouts or traffic management measures during construction. The TMPs will follow the format set in the Transport Agency Code of Practice for Temporary Traffic Management (CoPTTM).

The TMPs will be submitted to, and approved by, the Traffic Management Coordinator responsible for the section of road involved (in this case the SH3 road maintenance contractor). The TMPs will be assessed for compliance with CoPTTM and the ability to avoid or mitigate adverse effects on the travelling public. Draft TMPs have been included as an appendix to the draft CTMP for information.

10.3.8 Accidental Discovery Protocol

The draft Accidental Discovery Protocol (ADP) for the Project will be finalised in consultation with Ngāti Tama and HNZPT prior to the commencement of construction. The ADP will be in accordance with the Transport Agency's Accidental Archaeological Discovery Specification: P45[65].

The ADP will apply throughout the construction phase unless an archaeological authority for all Project works is obtained from HNZPT in accordance with Section 44(a) the Heritage New Zealand Pouhere Taonga Act 2014.

The ADP will set out the process and procedures that apply following the discovery of material that could be an archaeological site, kōiwi and/or taonga.

The specific aspects addressed by the ADP will include:

- Actions to be taken following the discovery of material including ceasing work in the immediate area and securing the area;
- The parties to be notified of the discovery and providing guidance on management of the discovery;
- The circumstances when an archaeological authority must be obtained from HNZPT; and
- When work in the area of the discovery can recommence.

The draft designation conditions set out the requirements for an ADP, and the relationship between the ADP and the archaeological authority that is anticipated to be sought for the Project.

10.3.9 Stakeholder Engagement

The CEMP contains protocols in relation to stakeholder engagement and communication during construction of the Project, as specifically required by the draft conditions. Other management plans also address stakeholder engagement and communication as appropriate.

During construction the stakeholder engagement and communications emphasis will be on keeping stakeholders and the wider public updated and informed on progress and timing to ensure a 'no surprises approach'.

Key objectives for stakeholder engagement during the construction phase are to:

- Inform local communities and other key stakeholders about the construction progress and timings;
- Continue to work closely with directly affected landowners and address any concerns;

[65] An example has been included with this CEMP.

- Continue to foster good relationships with stakeholders and provide opportunities for learning about the Project;
- Mark major Project milestones as appropriate; and
- Respond to stakeholder queries and complaints.

Stakeholder engagement and communications during the construction phase will include the following:

- A Project hotline, manned 24 hours a day, will be available for all stakeholders to communicate complaints and enquiries to the Project team;
- The Project website will be kept up to date with Project communications, such as construction updates, public notices, construction photos and videos;
- The Project email address can be used to communicate key Project information;
- Regular newsletters updates to keep stakeholders updated on Project progress;
- Meetings with key stakeholders to discuss specific Project aspects, as required; and
- An information kiosk with visual displays related to the Project and construction works.

10.3.10 Landscape and Environment Design Framework

A LEDF has been prepared for the Project (Technical Report 8b, Volume 3). The LEDF sets out the landscape and environmental design outcomes and approach for the Project and how these fulfil the Transport Agency's landscape and environmental design policy requirements.

The overall design concept for the Project is for an alignment that is integrated with the landscape that keeps low in the landscape and delivers an outstanding scenic highway. The Project will form a new valley to valley bypass of the mountain and existing SH3 alignment.

The following principles have been developed with respect to the landscape and environmental design aspects of the Project:

- Retain key landforms and ridgelines by using a tunnel;
- Minimise stream and valley crossings;
- Develop cut faces that echo natural slope angles;
- Seek to enable natural successional re-vegetation of the roadside;
- Has the potential to develop a programme of considerable landscape restoration;
- Provide an opportunity for cultural expression and recognition; and
- Deliver an enhanced driver experience and scenic amenity.

The LEDF also details the landscape design and treatments of engineered landscape forms and structural elements, and how these new features integrate with the existing landscape and vegetation (i.e. cut and fill slopes, the tunnel and bridge, stormwater management system). It also outlines the revegetation and restoration strategy to help rehabilitate and mitigate the vegetation and habitat loss within the Project area associated with construction works. Landscape concept plans are provided with the LEDF.

The LEDF will be finalised in consultation with key stakeholders, including Ngāti Tama.

10.4 Measures to avoid, remedy, mitigate or offset effects

The range of measures that have been incorporated into the Project to avoid, remedy, mitigate or offset the potential adverse effects on the environment are summarised in Table 10.3.

Table 10.3 – Summary of measures to avoid, remedy, mitigate or offset adverse effects

Avoidance of adverse effects	*Ecological, Cultural, Landscape, Natural Character and Visual* The nature and extent of potential effects of the construction and operation of the Project on cultural, ecological, landscape and natural character values have been avoided and / or considerably reduced through the route selection and design refinement process. In particular, the alignment has avoided: • Parininihi forest and Waipingao Valley, located to the west of the existing SH3, which are of very high ecological, cultural and landscape value. The area is part of the Parininihi Protection Project and subject to pest control by Ngāti Tama and the site of recently released kōkako. It is also a Regionally Significant Landscape in the New Plymouth District Plan. • The landmark peak of Mt Messenger. The design of the Project, has significantly reduced effects as follows: • Inclusion of a 240m long tunnel through the ridge dividing the Mangapepeke and Mimi catchments has greatly reduced the size of the cut and fill area that would otherwise have been required and has preserved the important east – west connectivity of habitat (ridge to coast) and mobile animal movement (especially bats). • Incorporation of a 120m long bridge across a tributary valley of the Mimi River on the south side of the route has significantly reduced the effects that a cut and fill approach would have had on the Mimi swamp forest. • Introduction of construction techniques to reduce ecological effects. For example, the bridge mentioned above has been designed in a way that will allow it to be constructed from each side rather than from the valley bottom. This will reduce the amount of ground and vegetation disturbance compared to a more conventional approach of building the bridge from the valley bottom, and it will also reduce the risk of sediment erosion down into the Mimi swamp forest. • Minor adjustments to the route to avoid the need to fell significant trees. The number of significant trees potentially needing to be felled has been reduced from 22 to 15 by this means. • Realignment of the road corridor, including shifting part of the corridor further from the Mimi swamp forest. • Location of construction yards, laydown areas, construction access tracks and haul roads away from ecologically sensitive/significant areas to minimise the extent of disturbance and vegetation clearance. • Use of retaining walls to avoid loss of significant trees / wetland where possible. • Location of spoil fill areas in areas likely to cause the least ecological effects.

	Construction effects • The location of the alignment to the east of the existing SH3 corridor will enable much of the Project to be constructed offline from the existing SH3 and thus enable a number of effects on the SH3 network and the local community to be avoided. Construction activities that may impact the SH3 network will be limited to operation of the SAPs and the tie-ins to the existing SH3 network.
Avoidance, mitigation or offsetting of adverse effects – construction phase	*Ecology* Implementation of the ELMP and PMP to mitigate and manage residual ecological effects, including: • Protocols to avoid or mitigate ecological effects on flora and fauna. • A comprehensive and large scale pest control programme. • Restoration and mitigation planting. • Rehabilitation treatments. *Cultural* • Engagement and ongoing input from Ngāti Tama in detailed design and construction aspects of the Project. • Specific principles for the design of specific permanent design elements (e.g. tunnel portals). • Protocols for recognition of the cultural values and significance in which the Project sits (e.g. undertaking blessings for construction works). • Implement protocols for cultural monitoring of sensitive sites. • Develop an ADP for the Project in consultation with Ngāti Tama and HNZPT. *Landscape, Visual and Natural Character* The design of the Project has reduced potential adverse landscape and visual effects by: • Following the topography by connecting two valleys and crossing a single ridge rather than routes that followed spurs or crossed more than one ridgeline. • Adopting a tunnel to pass through the ridgeline, reducing potential effects on landform and bush. • Aligning the highway along the edge of the valleys, following the existing landscape patterns. Residual landscape, natural character and visual effects will be mitigated through implementation of the ELMP.

	Construction water • Implement erosion and sediment control measures during construction, including structural (physical) and non-structural (site management and staging of the works) measures to meet the Regional Council and Transport Agency requirements for land disturbance activities. • Preparation of SCWMPs. • Comprehensive on-site monitoring to successfully implement effective erosion and sediment controls that respond to the Project constraints and continuously improve the management approach. *Contaminated Land* • Manage effects on human health and the environment associated with works in contaminated land through implementation of the CLMP. This will enable potentially contaminated soils to be identified, handled and disposed of in an appropriate manner. *Social* • Ongoing communication with affected property owners, including Ngāti Tama and DOC. • Regular communication and liaison with stakeholders and the public prior to, and during, construction. • A full-time contact phone number for stakeholders to liaise with the Alliance on any issues that arise during construction. • Implementation of the CEMP and management plans during construction, particularly the CNMP and the CTMP. • Formalised complaints and response process. *Construction Traffic* • Implementation of the CTMP to minimise disruption to road users of the SH3 corridor and private property access during construction. • Preparation of TMP where works are required on the SH3 network, such as tie-ins at the northern and southern extents of the alignment. *Construction Noise* • Compliance with Project noise limits during construction subject to the exceptions provided for in the CNMP. • Implementation of the CNMP to determine necessary setbacks, and mitigation measures where works will exceed the Project noise limits. • Consultation with occupants of dwellings that may be impacted by night time works.

	• Limiting night time works in the southern spoil disposal area as far as practicable to minimise impacts on the dwelling at 2397 Mokau Road. *Construction Dust* • Manage construction activities in accordance with the DMP to reduce the potential for dust discharges, particularly in relation to sensitive receptors. Mitigation measures may include keeping surfaces damp, limited stockpile heights, sealing or stabilising surfaces, or controlling traffic speeds. • Visual monitoring of dust emissions. • Implementation of specific dust management measures at the southern spoil disposal site to minimise adverse effects on the dwelling at 2397 Mokau Road. *Heritage and Archaeology* • Undertake works in accordance with the Project ADP so that appropriate steps are taken in the event of archaeological discoveries (where no Archaeological Authority is in place). • Undertake works in accordance with the Archaeological Authority once obtained. *Recreation* • Public access to the Kiwi Road Track during construction will be provided when possible and as safety permits during working hours, and during weekends and after work hours. The Track may need to be diverted during the works in the immediate vicinity of the construction site.
Avoidance, mitigation or offsetting of adverse effects – operational phase	*Ecology* • Implementation of the PMP to provide for ongoing pest control within the Project area. *Landscape, Visual and Natural Character* • Implementation of the LEDF and ELMP. *Stormwater discharge* • The stormwater network will be designed in accordance with the Transport Agency's Stormwater Treatment Standard for State highway Infrastructure as appropriate for the rural environment in which the Project is located. • Runoff will be collected and conveyed in a safe, low-maintenance and simple drainage network.

	• Culvert crossings will be used to maintain flows across valleys and natural flowpaths within the Project area. • Stream diversions will be minimised where practical, and existing streams improved where diversions are necessary. • Constructed wetlands will collect road run-off and provide treatment, extended detention to minimise scour/erosion of streams and contain emergency spills. • Fish passage, where it exists naturally, will be maintained and provided for as practicable in new culverts. *Recreation* • Opportunities to provide a combined rest area and parking and entry points for the Kiwi Road and Mt Messenger Tracks; improved management options for fly-tipping; improved passive surveillance; and improved amenity for road cycling.