9. **Overview of actual and potential effects**

The following sections are a précis of the content provided in the suite of Assessment Reports produced for the Project. Each section presents a summary of the actual and potential effects of the Project relating to specific technical areas.

The assessments are broadly divided into two parts, as follows:

- **Construction effects (Sections 10 to 20 of this AEE):**
  - Construction water management;
  - Freshwater ecology;
  - Marine ecology;
  - Construction traffic;
  - Terrestrial ecology;
  - Construction noise;
  - Heritage;
  - Vibration;
  - Air quality;
  - Hydrogeology; and
  - Contaminated land.

- **Operational effects (Sections 21 to 26 of this AEE), including whole of life:**
  - Operational water management;
  - Landscape and visual;
  - Operational traffic and transportation;
  - Operational noise;
  - Cultural;
  - Social;
  - Urban design; and
  - Economic.

The Project team based their assessment on the proposed designation boundary and the indicative alignment. The construction methodology developed for the Project (refer to Section 6 of this AEE) has informed the assessment.

9.1 **Summary of environmental effects**

A summary of the actual and potential effects of the construction and operation of the Project is outlined in Table 9-1 below.
Table 9-1: Summary of actual and potential environmental effects

<table>
<thead>
<tr>
<th>Significance</th>
<th>Positive Effects</th>
<th>Adverse effects</th>
<th>Potential for mitigation</th>
<th>Duration</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>High / long-term / regional</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Moderate / medium</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Minor / short-term / local</td>
<td>○</td>
<td>○</td>
<td>○</td>
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</tr>
</tbody>
</table>

**Economic**

- Increase in economic activity in Auckland and Northland during construction
  - Significance: ●
  - Positive Effects: ●
  - Adverse effects: ●
  - Potential for mitigation: ●
  - Duration: ●
  - Scale: ●

- Reductions in vehicle operating costs
  - Significance: ●
  - Positive Effects: ●
  - Adverse effects: ●
  - Potential for mitigation: ●
  - Duration: ●
  - Scale: ●

- Opportunities for commercial and residential development and economic growth in northern Auckland and Northland Regions
  - Significance: ●
  - Positive Effects: ●
  - Adverse effects: ●
  - Potential for mitigation: ●
  - Duration: ●
  - Scale: ●

- Effects of the Project on businesses on the existing SH1
  - Significance: ○
  - Positive Effects: ○
  - Adverse effects: ○
  - Potential for mitigation: ●
  - Duration: ●
  - Scale: ○

**Operational Traffic and Transport**

- The Project will increase capacity within the corridor
  - Significance: ●
  - Positive Effects: ●
  - Adverse effects: ●
  - Potential for mitigation: ●
  - Duration: ●
  - Scale: ●

- Road safety improvements
  - Significance: ●
  - Positive Effects: ●
  - Adverse effects: ●
  - Potential for mitigation: ●
  - Duration: ●
  - Scale: ●

- Improvements in travel time reliability
  - Significance: ●
  - Positive Effects: ●
  - Adverse effects: ●
  - Potential for mitigation: ●
  - Duration: ●
  - Scale: ●

- Reducing journey times for general traffic and freight
  - Significance: ●
  - Positive Effects: ●
  - Adverse effects: ●
  - Potential for mitigation: ●
  - Duration: ●
  - Scale: ●

- Improved route security by providing an alternative route resilient to incidents
  - Significance: ●
  - Positive Effects: ●
  - Adverse effects: ●
  - Potential for mitigation: ●
  - Duration: ●
  - Scale: ●

- Changes to the existing local road network within the Project area and increased flexibility of trip options
  - Significance: ●
  - Positive Effects: ●
  - Adverse effects: ●
  - Potential for mitigation: ●
  - Duration: ●
  - Scale: ○

- Increased accessibility, connectivity and journey time reliability to major urban communities south of Johnstone’s Hill tunnels.
  - Significance: ●
  - Positive Effects: ●
  - Adverse effects: ●
  - Potential for mitigation: ●
  - Duration: ●
  - Scale: ●
## Assessment of Environment Effects

### Significance

<table>
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<td>●</td>
<td>●</td>
<td>●</td>
</tr>
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</table>

### Social effects

- Enhanced accessibility and connectivity: ● ● ● ● ●
- Community patterns of living (access to community facilities and services): ● ● ● ● ●
- Community cohesion and networks: ● ● ● ● ●
- Community values and attributes (facilities, services, places, functions): ● ● ● ● ●
- Community structure due to property acquisitions: ● ● ● ● ●
- Effects of construction traffic management on community way of life: ● ● ● ● ●

### Urban Design

- Avoids urban settlement areas: ● ● ● ● ●
- Urban design effects on the Pūhoi, Perry Road and Carran Road sectors: ● ● ● ● ●

### Construction water management

- Effect on the Genesis Aquaculture (specific water user): ● ● ● ● ●
- Contaminants from the precast concrete yard: ● ● ● ● ●
- Potential effects of acid sulphate soils: ● ● ● ● ●

### Freshwater Ecology

- Effects associated with the sedimentation of waterways during construction: ● ● ● ● ●
- Disruption to fish passage (construction, operation): ● ● ● ● ●
- Effects associated with increased in-stream: ● ● ● ● ●
### Assessment of Environmental Effects

#### Significance
- **High / long-term / regional**
- **Moderate / medium**
- **Minor / short-term / local**

#### Positive Effects
- **High / long-term / regional**
- **Moderate / medium**
- **Minor / short-term / local**

#### Adverse Effects
- **High / long-term / regional**
- **Moderate / medium**
- **Minor / short-term / local**

#### Potential for Mitigation
- **High / long-term / regional**
- **Moderate / medium**
- **Minor / short-term / local**

#### Duration
- **High / long-term / regional**
- **Moderate / medium**
- **Minor / short-term / local**

#### Scale
- **High / long-term / regional**
- **Moderate / medium**
- **Minor / short-term / local**

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</tbody>
</table>

- **Habitat loss due to culverting of streams and the disposal of spoil**

---

**Marine Ecology and Coastal Processes**

- **Effects of sediment discharge on marine ecological values (construction)**
- **Construction of piers within the CMA**
- **Discharge of stormwater from motorway surfaces (operations)**

**Terrestrial Ecology**

- **Effects on wetlands through vegetation loss and hydrogeological impacts**
- **Habitat loss and direct mortality of bats (vegetation clearance)**
- **Direct loss of native forest vegetation**
- **Direct loss or mortality of birds, lizards and snails (construction)**
- **Creation of edge effects due to vegetation loss**
- **Changes in soil moisture related to changes in surface hydrology**
- **Effects of dust deposition on vegetation**

**Hydrogeology**

- **Effects on groundwater quality and quantity, and stream baseflows**

**Construction Traffic**

- **Effects on traffic flows on SH1**
### Assessment of Environment Effects

#### Significance
- **High / long-term / regional**
  - Positive Effects
  - Adverse effects
  - Potential for mitigation
  - Duration
  - Scale

#### Moderate / medium
- Positive Effects
- Adverse effects
- Potential for mitigation
- Duration
- Scale

#### Minor / short-term / local
- Positive Effects
- Adverse effects
- Potential for mitigation
- Duration
- Scale

<table>
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<tr>
<th>Effects of construction traffic on local roads and access points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Effects</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

#### Construction Noise
- Effects of construction activities
- Effects of possible night time construction
- Effects associated with blasting

#### Construction Vibration
- Effects of construction activities
- Effects associated with blasting

#### Construction Air Quality
- Effect of dust emissions from construction activities.
- Effects of dust emissions on Genesis Aquaculture

#### Heritage
- Effects on Titford Cottage and the Schollum villa
- Effects on historic heritage within the Perry Road Sector
- Effects of the Project on heritage values

#### Cultural
- Effects on the Cultural Footprint of Hōkai Nuku
- Potential effects of the Project on Te Awa Pūhoi (Pūhoi River)
### Assessment of Environment Effects

#### Significance
- **High / long-term / regional**
  - Significance: ●
  - Positive Effects: ●
  - Adverse effects: ●
  - Potential for mitigation: ●
  - Duration: ●
  - Scale: ●
- **Moderate / medium**
  - Significance: ●
  - Positive Effects: ●
  - Adverse effects: ●
  - Potential for mitigation: ●
  - Duration: ●
  - Scale: ●
- **Minor / short-term / local**
  - Significance: ○
  - Positive Effects: ○
  - Adverse effects: ○
  - Potential for mitigation: ○
  - Duration: ○
  - Scale: ○

#### Potential effects of the Project on Waihe (Mahurangi River and Harbour)
- Pūnaha taupuhi kaia taketake (indigenous ecosystems – flora and fauna)
- Effects on cultural values as a result of ahuahu (earthworks)
- Effects on cultural values of terrestrial and aquatic ecology
- Effects on cultural values of water and land

#### Landscape and Visual
- Effects on landscape character areas
- Effects of large scale earthworks, retaining walls, bridges and viaducts

#### Operational Air Quality
- Effects of operation for properties adjacent to SH1.
- Effects of operation for properties adjacent to the Project.

#### Operational Water
- Effects relating to stormwater quantity and quality
- Effects in relation to flooding

#### Operational Noise
- Reduction in noise generated from traffic reduction on SH1
- Increase in ambient noise levels in proximity to the motorway