COMMERCIAL IN CONFIDENCE

CLIFFORD BAY

INVESTIGATION | 2013

New Zealand Government

The following report has been redacted pursuant to the following sections of the Official Information Act 1982:
- Section 9(2)(b)(ii)
- Section 9(2)(ba)(i)
- Section 9(2)(ba)(ii)
- Section 9(2)(f)(iv)
- Section 9(2)(g)(i)
- Section 9(2)(i)
- Section 9(2)(j)
- Section 9(2)(k)

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List of abbreviations

AEE	Assessment of Environmental Effects
BCR	Benefit Cost Ratio
CBA	Cost Benefit Analysis
CPI	Consumer Price Index
CVs	Commercial Vehicles
CY	Calender Year
EEM	Economic Evaluation Manual
EOI	Expression of Interest
FY22	Financial Year. For example FY22 means the financial year ended 30 June 2022.
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GNS	Institute of Geological & Nuclear Science Ltd
GPS	Government Policy Statement
HCV	Heavy Commercial Vehicle
JPM	Joint Procurement Model
IIL	Interislander – Division of KiwiRail
MBIE	Ministry of Business, Innovation & Employment
MOU	Memorandum of Understanding
NFDS	National Freight Demand Study
NLTP	National Land Transport Programme
NPV	Net Present Value
NZTA	NZ Transport Agency
OTS	Office of Treaty Settlements
O&M	Operations & Maintenance

Abbreviations Continued	
PPP	Public – Private Partnership
RFP	Request for Proposals
RMA	Resource Management Act
RUC	Road User Charges
Ropax Vessels	Roll on / Roll off ferry vessel (freight & passengers, non-rail enabled)
RORO Vessels	Roll on / Roll off ferry vessel (freight only, non-rail enabled)
SOE	State Owned Enterprise
SOI	Statement of Intent
SSL	Strait Shipping Limited
VOT	Value of Travel-time
VOC	Vehicle Operating Cost
WEBs	Wider Economic Benefits

Executive summary

Project description

1. Clifford Bay is a Marlborough ferry terminal concept that could replace Picton as the southern end of the Cook Strait crossing - saving operators, major freight users and passengers time and money.

2. On a road and rail trip from Auckland to Christchurch total time savings are estimated at 75 and 130 minutes respectively.

3. The terminal design concept has been driven by ferry operators Interislander and Strait Shipping. It provides a two-operator, competitively neutral facility designed to serve anticipated freight volumes for at least 50 years.

4. Clifford Bay is expected to cost $434 million ($2014). This is based on concept engineering and costings undertaken in 2012. If it proceeds, a number of integrated workstreams would be required to deliver the project by 2022.

Objective of investigation

5. This report assesses the viability of Clifford Bay as a privately funded transport infrastructure development. The benefits Clifford Bay creates for ferry operators and key users have been examined. This process has then determined what they would be prepared to pay to use the facility. This has been analysed against the costs of construction and operation to determine whether private investors would be motivated to build and operate the facility.

Investigation result

6. As a result of the financial and economic investigations undertaken this year, the decision on whether Clifford Bay should proceed to a further stage is finely balanced. This is discussed later in this summary.

Strategic context

7. An efficient, safe and reliable transport network is important for the movement of freight and passengers between regions of economic activity. International experience shows that improving the efficiency of freight movements and improving network connectivity improves trade performance, GDP and wellbeing.

8. The Cook Strait ferry services are part of the national network and provide a critical link for road and rail access between New Zealand's two main islands. When viewed as a "sea bridge" integral to this national network, the time savings Clifford Bay delivers are orders of magnitude larger than any other enhancements currently under investigation for State Highway 1 or main trunk rail.

Current state of Picton facilities

9. The Picton ferry terminal is operated by Port Marlborough New Zealand Limited. There are currently two ferry operators at Picton - Interislander and Strait Shipping Limited. These operators transport road freight, rail freight and passengers across Cook Strait, using a combined fleet of five vessels.

10. The efficiency of the Picton ferry terminal is restricted by a number of factors. Some of the Picton ferry facilities are approaching the end of their useful life and require upgrade. Others require investment to enable more efficient ways of handling rail freight. Three of the five ships presently serving Cook Strait are subject to wave height regulation which limits speed between the entrance to Tory Channel and berthing. [redacted] Together, this future cost requirement and increasing speed restriction forms part of the rationale for investigating Clifford Bay.

11. This investigation has found that Picton is not expected to fundamentally fail or move into constraint due to asset age/condition or growth in freight volume during the period of analysis (30 years). It has also been identified that the level of investment required at Picton to extend life and adapt facilities is [redacted] approximately half the number estimated in 2012. However, ferry operations will always cost more and take longer with Picton as the southern end of the Cook Strait link than the alternative of Clifford Bay.

12. This means that in deciding to build Clifford Bay, it should be considered an investment in effectiveness and efficiency to substantially reduce the time and cost involved in moving freight and passengers across Cook Strait. It is not an investment that is necessary to meet medium term demand expectations or relieve a significant network constraint.

Fleet considerations

13. There is currently significant surplus vessel capacity on Cook Strait. [redacted] This means that on average, there are low levels of capacity utilisation and that the current fleet has substantial headroom to absorb future growth in freight demand.

14. The potential benefit of Clifford Bay, in deferring the requirement for additional vessels, has not been a factor in the benefit analysis. It is expected that fleet rotation will occur when individual ships reach the end of their economic life in either Picton or Clifford Bay scenarios. Clifford Bay is not expected to materially change the timing of capital expenditure on vessels, and Picton is not expected to have to cope with any additional ferry vessels in the next 30 years.

15. Obviously, at the point of rotation due to end of vessel life, new vessels will be selected to fit as well as possible into the operating environment. Clifford Bay may make improvements in overall fleet efficiency possible. Where this improvement opportunity can be identified and quantified with confidence, it has been included in the benefit analysis.

Analytical framework – financial and economic cases

16. An analytical framework has been developed to prepare the financial and economic cases for Clifford Bay. The primary focus of the financial case has been on assessing the available private revenue generated by its operation as a port given the expected demand.

17. A long-range forecast of demand was developed for freight and passenger movements across Cook Strait.

18. The savings for ferry operators and freight users, such as reduced fuel and travel time were then examined.

19. These savings were then discussed with the two ferry operators to see how much of the savings, taking account of risk, they were willing to pay in increased port fees. This gave an estimate of the revenue the operator of Clifford Bay could expect. In this report, the operator/developer is referred to as Port-Co.

20. The financial case assesses the private revenue that is available from operators and users and the construction and operational costs Port-Co must

meet. It looks at whether Port-Co has sufficient private revenue to generate an adequate commercial return for the private sector to completely fund the project.

21. The economic case complements the financial case, and takes a broader view of the potential benefits of the project from the perspective of society and the economy as a whole.

Commercial viability assessment – key findings

Demand

22. The Cook Strait freight market is part of the broader inter-island freight market which comprises coastal shipping (between regional ports such as Tauranga and Lyttelton) as well as road and rail freight carried on the inter-island ferries. This market is forecast to grow by 61% by 2040. All modes are expected to grow at a similar compound annual growth rate of just under 2% per annum over the long term. [redacted]

23. This investigation has identified that the Cook Strait passenger market has declined significantly in recent years and future growth is predicted to remain at very low levels. This is the result of increased competition from air travel and changes in travel patterns of international visitors to New Zealand. The benefits of Clifford Bay for the passenger market vary depending on the origin or destination of travel in the South Island. [redacted]

Available revenue

24. The investigation has found that in present value terms, [redacted] of revenue available from the following sources over the first 25 years of operation to support development of Clifford Bay. This is shown in the following pie chart, and flows through into the test of revenue adequacy summarised in Table 1.

[redacted]

Revenue adequacy

25. The following table summarises the viability assessment assuming a private funding model. It indicates the assessment a private investor consortium would make as they evaluated Clifford Bay.

[redacted]

Commercial viability assessment - conclusion

26. The financial analysis shows that Clifford Bay cannot be viably delivered using only private funding. That is because it generates insufficient private revenue to provide a normal financial return to private investors.

The potential role of government

27. We conclude the project is only able to move to consenting and procurement if the government is prepared to play a material direct investment role in project development and delivery.

[redacted]

29. From the 2012 market sounding exercise, we believe investment interest exists for Clifford Bay if it can be structured to deliver adequate and relatively stable returns over a maximum 25-year term. Market feedback identified that investment appetite existed if key risks could be clearly communicated and appropriately managed, and if clarity was provided on the role of government. This included a market view that the government was the appropriate entity to sponsor the approvals process and gain access rights to land.

30. A method of project development, delivery and operation that minimises government participation as far as is practical has been identified. This will need to be further developed and refined if the project proceeds.

[redacted]

[redacted]

Economic case

35. The analysis indicates that the Clifford Bay project produces an economic surplus with a net present value of [redacted] and a benefit cost ratio of 1.3. The BCR determined in 2012 Preliminary Business Case was 1.9. The variance in BCRs is primarily due to the significantly reduced estimates of capital cost requirement at Picton and ferry operator cost savings.

[redacted]

36. Total benefits amount to [redacted] (present value, $2014). [redacted]

37. Supporting the findings of the conventional cost benefit analysis are Wider Economic Benefits (WEBs) of [redacted] These are additional to the [redacted] of conventional benefits and are derived from agglomeration benefits (productivity improvements through the bringing together of economic activity) of [redacted] and competition benefits (distribution of marginal cost changes through the economy) of [redacted]

Public policy case for government participation

38. Across the transport network government plays a direct role in the investment of road and rail networks. For the Clifford Bay project to proceed, the government will need to play a direct role.

39. Government investment would unlock private sector investment and therefore enable net economic benefits to be realised. Private participation in Clifford Bay brings specialist expertise in project development and operations, transfers a range of risks to the private sector and brings in alternative funding sources. While the latter reduces the level of direct funding into the project required by government, it does not change the economic returns delivered by the project (as represented by the benefit cost ratio of 1.3). The benefits and costs of the project remain the same from an economic perspective regardless of funding mix.

40. The interisland Cook Strait link is a core component of the strategic road and rail transport network. The opportunity to improve this link is considered to have high strategic importance and fit [redacted] because:

    - it has the potential to make a nationally significant contribution to economic growth and productivity for national strategic State highways, through reduced travel time and costs
    - it will improve journey time reliability as a result of time savings
    - it will enable more efficient freight supply chains
    - it will improve the security and resilience of the road and rail network

41. [redacted]

Overall government business case summary

42. The overall government business case comprises three main perspectives; financial, economic and strategic. In addition there are other factors that may be considered by decision-makers. This investigation has not determined the relative weighting of these factors.

Table 2: Overall government business case summary

Dimension	Quantification	Key assumptions and commentary
Financial Case	[redacted] Confidence – Medium	[redacted] Sensitive to the actual level of revenue secured by operators and users, and total capital cost as discovered by the procurement process. Exposed to significant execution risk in the development phase.
Economic Case	BCR 1.3 NPV [redacted] Additional WEBs [redacted] (PV) Confidence – Medium	Most sensitivity to discount rate, capital cost. Moderately sensitive to freight volume and passenger growth. [redacted] WEBs are derived half from agglomeration benefits and half from competition effects.
Strategic/Policy Case	Strategic Fit High Effectiveness High Efficiency Low	[redacted]
Relative Merit	Inconclusive	[redacted] BCR lower than many alternative transport projects.
Overall case: [redacted] **direct investment requirement 2014-2020** **Project BCR 1.3, Efficiency: Low** **Strategic/Policy Fit: High** **Risk Profile: Medium to High** **Counterfactual: Picton is acceptable/functional**		

Next steps

43. If the government elects to proceed to the next stage (called project development) it will be the sponsor of a programme that will run from 2014 until 2018. Deliverables for this programme will include appropriate land access and property rights, resource consents and other required project approvals, and a sound commercial structure and procurement process. This programme has been costed at [redacted] with [redacted] for consenting and procurement and [redacted] to secure access rights and land ownership.

Stakeholder management

44. Stakeholder engagement in Marlborough has been carefully managed to provide appropriate feedback on the commercial viability phase during 2013. A process for conveying the decision has been set out in the Stakeholder and Communications chapter.

Key risks

45. There are risks to both the development and operational phases of this project. A fuller discussion of risks is in the the body of the report.

46. The key development risks are:

    - cost or risk creep in government role
    - [redacted] at the appropriate level
    - [redacted]

47. The key operational risks are:

    - [redacted]
    - Picton bypass if a third operator commences business at Picton
    - reduction in freight and passenger volumes impacting revenue and therefore viability. This could be through broader economic factors or due to modal shifts to air travel (passengers) and coastal shipping (freight).

48. If the project proceeds, these risks will need to be explored in more detail early in the development phase.

49. A high level review of construction and operational performance aspects (including seismicity) has been undertaken. Overall, no fatal flaws have been identified which would materially impact on the Clifford Bay site being an appropriate location for the South Island ferry terminal.

Summary and recommendation

Decision options

50. Two general courses of action are available to the government at this point – place the opportunity back into long-term hold or proceed to the development phase.

51. To place the project on short or medium-term hold with regular interim review would be highly problematic from a regional perspective. This is because the main negative effect of the investigation and consideration of Clifford Bay has been uncertainty and the impact of that on confidence and investment in Northern Marlborough. Moving the possibility of Clifford Bay out by 10 or even 20 years as a holding pattern of regular review does little to dissipate this kind of local concern.

52. In addition, the key drivers and market dynamics impacting the government business case are unlikely to change in a fundamental manner in the short and medium term. Therefore there is expected to be little value in maintaining an active watching brief if the project does not proceed at this time.

Develop Clifford Bay

53. Direct government investment would be required for the project to proceed because private revenue is insufficient to provide private investors a normal financial return on the expected costs of construction and operation. The project is therefore not commercially viable as a fully privately funded development. The direct investment that government would have to make in order for the project to proceed has been assessed to assist decision making.

54. The BCR of 1.3 (8% discount rate) is adequate, with additional wider economic benefits of [redacted] (NPV), also expected.

55. Against the Strategic Fit and Effectiveness attributes used to give effect to the Government Policy Statement on Land Transport, the investigation team and NZTA rate Clifford Bay as high in both areas. This is because:

    a. it has potential to deliver a nationally significant contribution to economic growth and productivity through significant cost and time improvement to the strategic road and rail networks
    b. it improves journey time reliability and the efficiency of national freight supply chains
    c. it will enable more efficient freight supply chains
    d. it adds security and resilience to the transport network

56. The development phase of the project is impacted by a number of risks and will be challenging. In particular, negotiation of binding port fee agreements that are competitively neutral and adequately reflective of the benefits received by operators and users represents substantial process risk.

Stay at Picton and redevelop it

58. The investigation has found that Picton is not likely to move into capacity constraint in the next 30 years. However, it based on operator future requirements it will need an [redacted] investment over the next seven years and it will always take longer and cost more to move freight and passengers across Cook Strait via Picton.

59. Therefore staying at Picton and redeveloping it over time is viable and requires significantly less capital than the development of Clifford Bay. It represents an established, workable, solution; albeit one that has significant operating cost and travel time disadvantages.

Summary of pros and cons

Table 3: Factors for and against Clifford Bay

Factors for Clifford Bay	Factors against Clifford Bay
Picton requires approximately [redacted] of capital expenditure in the next seven years.	Picton will function adequately for at least the next 30 years and is not expected to move into capacity constraint in that time.
	Clifford Bay is expected to cost $434m (2014) to build.
Clifford Bay saves significant travel time and operating cost for ferry operators, freight users and passengers travelling southbound.	Clifford Bay provides minor time savings for Westbound vehicles, and creates disbenefit through increased operating cost for freight operators and passengers travelling west or staying in the Sounds.
The economic case for Clifford Bay is positive but modest, with a BCR of 1.3 and WEBs of [redacted] Strategic fit and effectiveness ratings are high for the Cook Strait link and the improvements that Clifford Bay can deliver. These reflect significant improvements to nationally strategic land transport networks through reduced travel time and costs, improved journey time reliability, more efficient freight supply chains and improved resilience of the road and rail network.	Clifford Bay is not commercially viable as a privately funded development. [redacted]
	[redacted]
	[redacted]
	Risks in the development phase are significant and biased toward the negative. The cost of mitigation can be expected to fall on the government.
	Clifford Bay efficiency rating is low reflecting a BCR at the lower end of the pool of available alternative transport investments.
In the longer term, effective increase in vessel capacity utilisation made possible by Clifford Bay may defer the need for additional vessels. Once [redacted] are retired, all vessels using Picton will be subject to conditions that are likely to limit speed in Tory Channel.	The five vessel ferry fleet configuration (assuming ongoing end-of-life replacement) is not expected to reach capacity in the next 30 years. Freight volume or passenger growth may be lower than expected. Freight volume may shift modally to coastal shipping.
Stimulus for southern Marlborough from Clifford Bay construction and operation.	Negative impact on northern Marlborough.

Finely balanced decision

60. Based on the assessment of pros and cons the decision is finely balanced. A wealth of technical and commercial analysis has been undertaken, however ultimately the decision requires judgement.

Conclusion

61. Clifford Bay is not commercially viable as a fully privately funded project. This is because it generates insufficient private revenue to provide a normal financial return to private investors.

62. Picton will continue to function for [redacted] as the southern end of the Cook Strait crossing for the foreseeable future. The [redacted] is not a government investment . The Clifford Bay decision is therefore not constraint-driven.

63. Clifford Bay would only proceed with an expected government contribution of [redacted] between 2014 and 2020. [redacted]

64. The economic case for the government is positive but modest, reflecting that Clifford Bay saves operators and users time and money. The project has an expected BCR of 1.3, or an expected net present value of [redacted] in 2014 dollars.

65. A number of significant risks exist in the development and operating phase. These are manageable, however they are downside risks, and management and mitigation cost can be expected to fall on the government.

[redacted]

67. The conclusion of the investigation is that the modest economic benefits do not justify a government investment when set against the risks.

Recommendation

68. On balance, based on the previous technical assessments, the conclusions of the commercial viability assessment and the engagement with operators, and the overall government business case, the investigation recommends that the project not proceed.

69. A decision not to proceed should be communicated in a manner that provides stability and planning confidence for Marlborough.

SECTION 1 | SETTING THE CONTEXT

Project background and objective of current investigation
Current environment and infrastructure at Picton
Strategic context

Project background and objective of current investigation

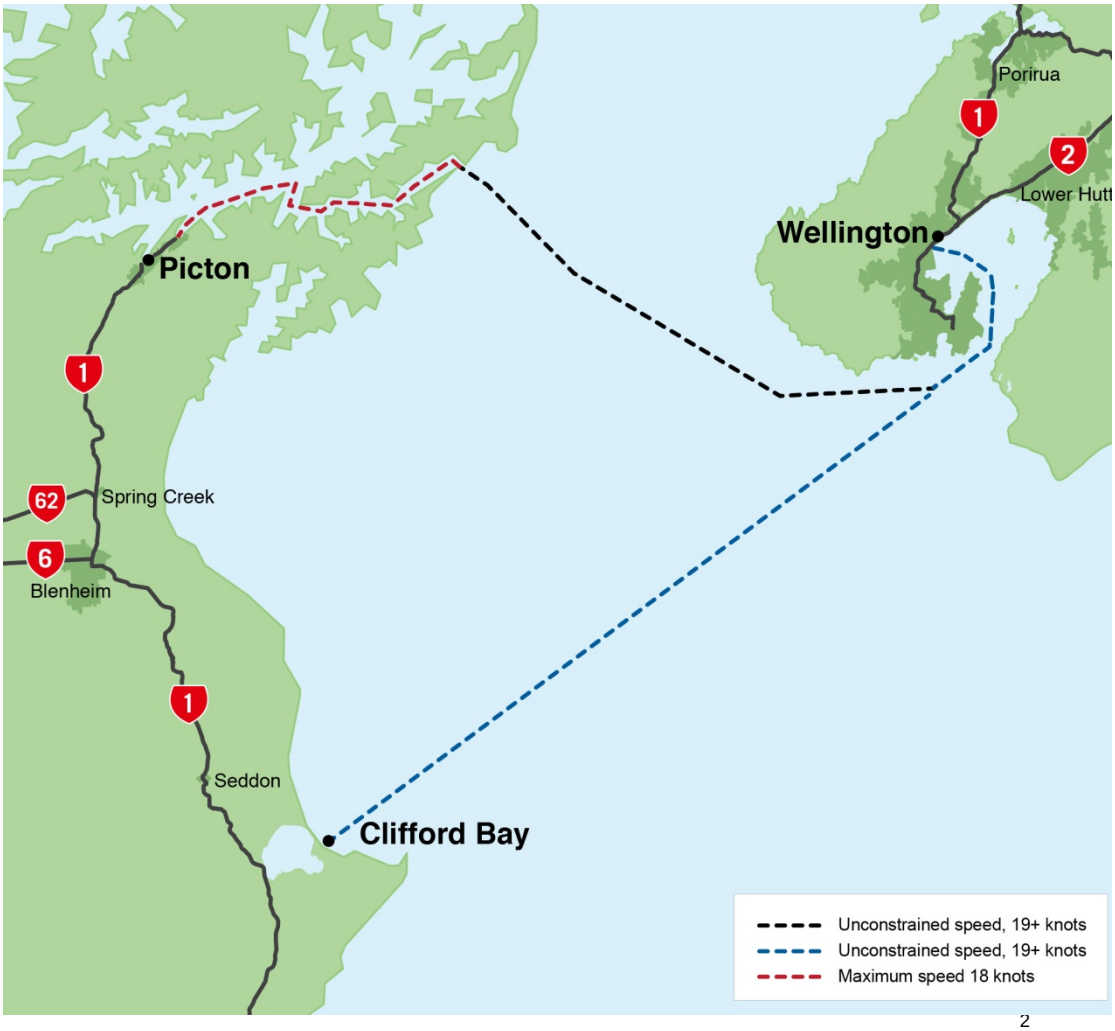
Introduction and summary

- A ferry terminal at Clifford Bay has been looked into several times since the 1920s.
- An initial assessment of the economic and financial feasibility of the project was completed by the Ministry of Transport in 2011, followed by a preliminary business case presented to the Minister of Transport in 2012.
- The consideration of the commercial viability assessment (and other relevant information) by Cabinet will determine whether the project proceeds through to a development phase.

1. The idea of using Clifford Bay as a base for ferry operations has been looked at on several occasions since the 1920s. KiwiRail (and its predecessor organisations) has investigated Clifford Bay as a base for its own road and rail ferry operations. Picton has been the South Island base for ferry operations since 1962.

2. Clifford Bay sits approximately 55km south of the current ferry terminal in Picton. Clifford Bay offers several advantages over the Picton location, including sailing time savings of 30 minutes as well as land-side road and rail time savings in the order of 45 and 100 minutes respectively to Christchurch. Figure 3 identifies the two locations and ferry routes.

Figure 3: Picton and Clifford Bay ferry routes[1]



2

Description of Clifford Bay proposal

3. The project involves:
    - the construction of a breakwater 1.8km into Clifford Bay with a single-pier dual-berth facility for the two ferry operators
    - associated shore-side facilities for the marshalling of passengers, vehicles and rail wagons
    - the upgrade of Marfells Beach Road to State Highway 1
    - a rail link to the main trunk line

4. The functional requirements of the preferred scenario (single-pier, dual berth) were developed in consultation with the current ferry operators. The design also includes the construction of a second pier (at a future date) if required.

1 Ministry of Transport 2013

2 Marlborough District Council - Navigation (Vessel Speed) Bylaw 2009

5. Clifford Bay Limited (a subsidiary of KiwiRail Holdings Ltd) owns most of the core land area required for the terminal and breakwater and the road/rail marshalling areas.

6. The time savings for southbound road and rail traffic made possible by Clifford Bay are shown in the following table.

Table 4: Time savings at Clifford Bay

Time savings at Clifford Bay	Minutes
Ferry time saving (minutes)	30
Road time saving (minutes)	45
Rail time saving (minutes)	100
Total road and ferry time saving (minutes)	75
Total rail and ferry time saving (minutes)	130

Summary of previous work

7. An initial assessment of the economic and financial feasibility of the project was completed by the Ministry of Transport in 2011. That assessment [3] provided an overview of the work completed by KiwiRail and its predecessors.

8. In 2012 the Ministry of Transport developed a preliminary business case[4] that considered the strategic, financial, commercial, economic and management cases for the project.

9. The preliminary business case indicated that the capital cost of the Clifford Bay "single pier, dual user" option was $422 million ($2012) including a contingency sum of 25% with an economic benefit cost ratio of 1.9. As part of this work, a move to Clifford Bay was assessed as reducing the travel time between Wellington and Christchurch by 80 minutes (sea plus road) and 110 minutes (sea plus rail).

10. The preliminary business case also considered the counterfactual of remaining at Picton. The estimated upgrade cost requirement for the Picton facilities was estimated at [redacted] in 2012. This was to ensure that they were fit-for-purpose and could accommodate new vessels as the existing ferries were rotated out of service.

3 EGI Min (11) 18/10

4 Detailed Business Case for the Potential Development of a Ferry Terminal at Clifford Bay – June 2012

11. In October 2012, Cabinet considered the proposal to develop a ferry terminal at Clifford Bay[5] and agreed that the Minister of Transport report back to Cabinet recommending a pathway forward on the basis of more detailed investigation.

Objective of the current investigation

12. The objective of the current investigation is to assess the commercial viability of Clifford Bay as a fully privately funded project. This is done by examining the benefits Clifford Bay would create for ferry operators and other users and thereby determine what they would be prepared to pay use the facility.

13. This will allow an assessment to be made:

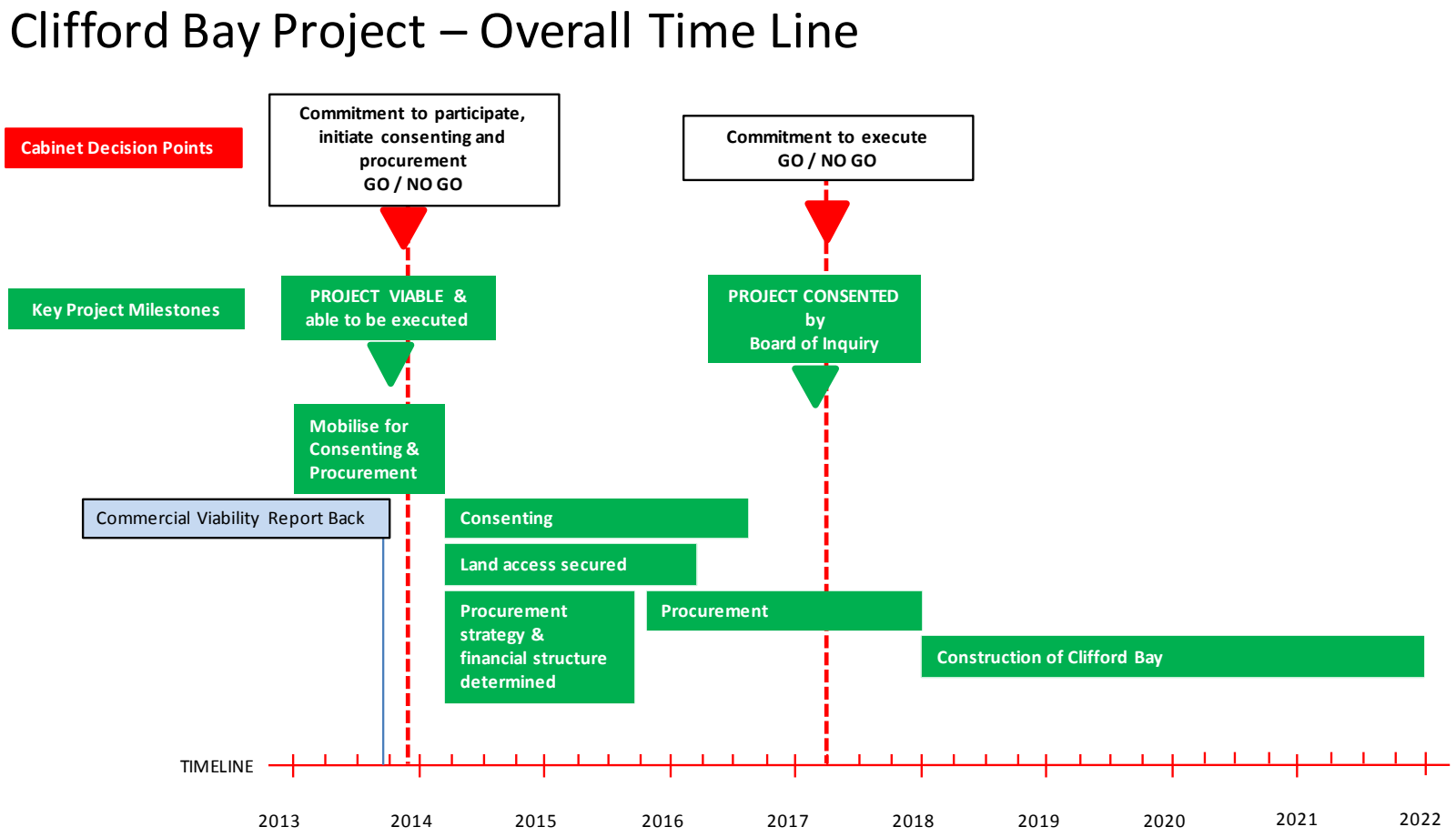
    a) on the viability of Clifford Bay as a fully privately funded project

    b) on the requirement and nature of any government role in the project if it is to proceed, set against an economic assessment of its benefits to New Zealand

14. The investigation then outlines the steps required to secure land access, project approvals and to undertake procurement, if the government wishes to proceed. The indicative staging (figure 4 below) reflects the future decision points should a decision to proceed be made.

5 CAB Min (12) 38/7

Figure 4: High level staging time-line



Current environment and infrastructure at Picton

Introduction and summary

- The Picton port is operated by Port Marlborough New Zealand Limited. Port Marlborough is fully owned by Marlborough District Council Holdings Ltd which is wholly owned by Marlborough District Council.
- There are currently two ferry operators at Picton - Interislander and Strait Shipping Limited.
- The Picton ferry facilities are at various ages, some approaching the end of their useful life and requiring upgrade.
- The land-side development of the ferry facilities, over time, has been driven by more immediate operational needs rather than a long-term strategic view.

1. Cook Strait ferries have been operating from Picton for over 50 years. The current operators are the Interislander, operating since 1962, with three vessels (two rail enabled) and Strait Shipping Limited, operating since 1992, with two vessels (neither rail enabled).

2. Interislander operates as a stand-alone operating division of KiwiRail Holdings Limited, a state-owned enterprise. Strait Shipping Limited is a private company that delivers road freight across Cook Strait and also operates a passenger service through the Bluebridge brand. It is part of a privately owned road freight group that includes Freightlines and Otorohanga Transport.

Inter-island freight

[redacted]

6 Representing non-bulk, non-transhipped containerised freight

The Cook Strait freight and passenger market

4. The Cook Strait ferry freight and passenger market comprises a number of discrete segments that include:

    - foot and car passengers
    - passenger vehicles
    - commercial vehicles
    - rail freight (Interislander only)

5. Each market segment has its own seasonal cycle, as well as peak time sailings each day.

6. The Cook Strait freight market is contested between Strait Shipping and the Interislander. There is significant surplus cargo capacity across Cook Strait measured on an annual basis, however customers often have peak-time deadlines and for particular sailings in any one day, there can be capacity constraints. Price and timegates are used as the primary levers to contest market share of the commercial vehicle market and to manage vessel capacity ultilisation.

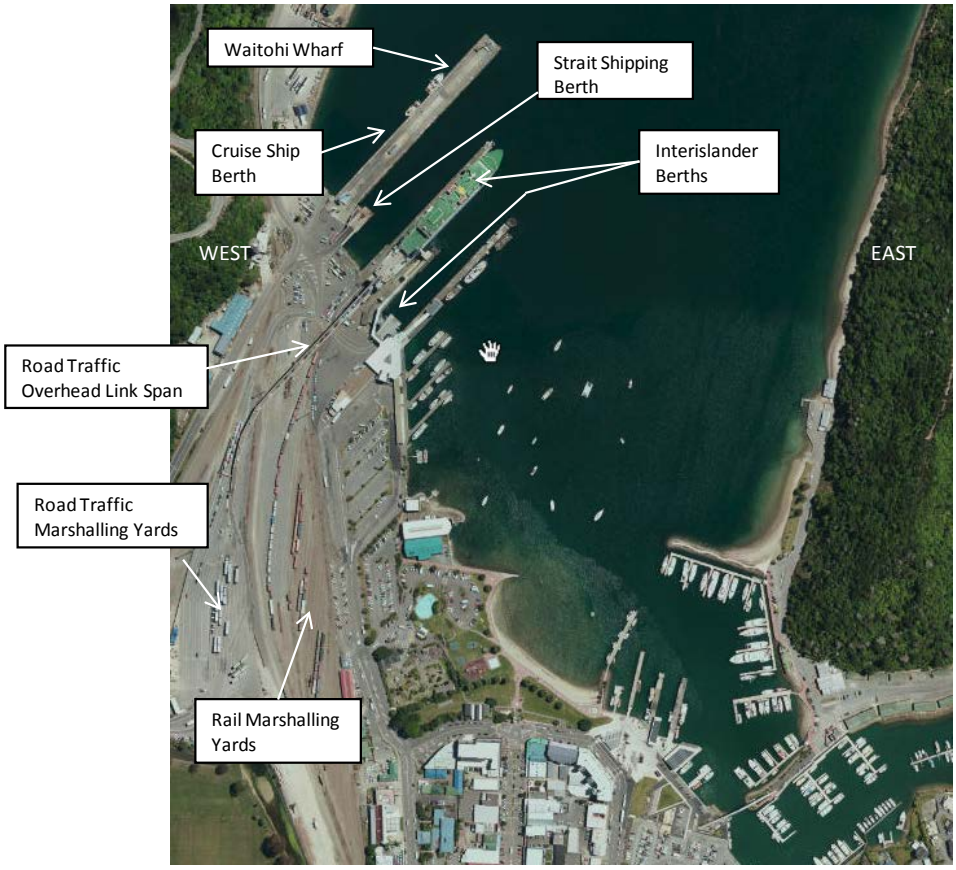
Picton infrastructure

Ferry facilities

7. The Picton ferry terminal and associated link spans are owned by Port Marlborough. The port company does not provide any shore-side labour to service the ferry operations.

8. The Picton ferry terminal facilities are shown in figure 5 on the next page.

Figure 5: Picton ferry terminal facilities



Source: Ministry of Transport

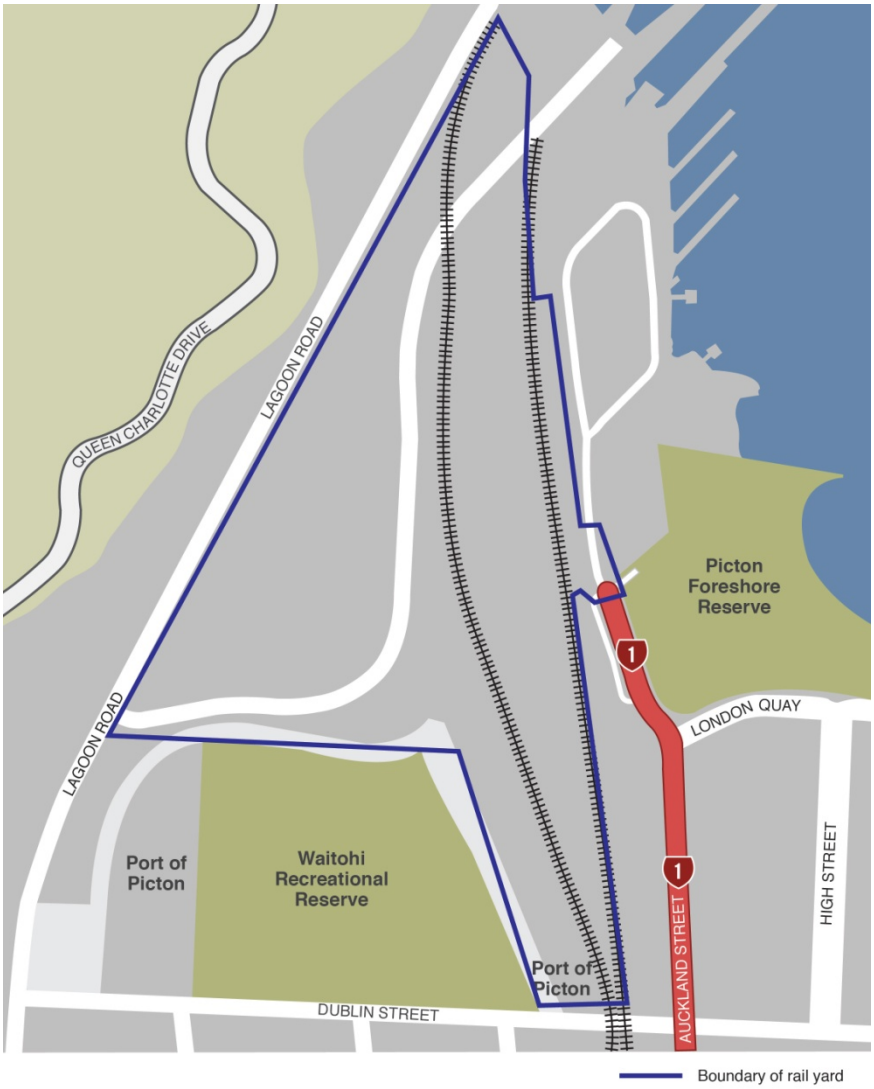
9. The Picton shore-side ferry facilities are approaching the end of their useful life. The need to accommodate future vessels, and the transition by Interislander [redacted] will require the replacement of link spans and alteration to the underlying berth configurations. The Waitohi Wharf, used by Strait Shipping on the east side, is approximately 100 years old.

10. The Interislander berths are vessel-specific. When the Kaitaki is berthed, the adjacent road/rail berth cannot be used due to the Kaitaki's length and width.

Rail facilities

11. The rail and road facility at Picton (owned by KiwiRail) occupies almost 10 hectares immediately adjacent to the ferry terminal.

Figure 6: KiwiRail rail yard land at Picton



12. The land-side development of the ferry facilities, over time, has been driven by more immediate operational needs rather than the longer term strategic requirements. Each road-only ferry berth (Interislander and Strait Shipping) has unique passenger and vehicle access ways that have been designed around the two-level road-rail link spans. Both ferry operators have areas to manage pre-load logistics within the immediate port area.

[redacted]

14. The rail route south of Picton presents a significant operational constraint with two locomotives (or shorter trains) at times required to enable the climb out of Picton, and again over the Dashwood Pass (north of Clifford Bay).

Port Marlborough – operational constraints

15. The Picton port operational procedures do not permit more than one vessel to berth at the Picton terminal facilities at any one time. There is also a single-user status through the Tory Channel entrance.[7]

16. The introduction of fast ferries into the Cook Strait service led to the introduction of speed restrictions (maximum of 18 knots) for the ferries operating within the Marlborough Sounds. This speed restriction is outlined in Marlborough District Council's Navigation (Vessel Speed) Bylaw 2009 which came into force on 1 July 2010. The speed restrictions were introduced to reduce the wave and wake energy (and consequent effect) produced by high speed craft of a registered length exceeding 30m. Speed restrictions are based on water displacement and wave height created by vessels. Regional government, through statutory function of the Harbourmasters, have responsibilities for navigation and safety within the designated waters of their regions.

7 Tory Channel Entrance Controlled Navigation Zone

Strategic context

Introduction and summary

- Cook Strait ferry services are part of the national transport network and provide a critical link for road and rail access between New Zealand's two main islands.
- An efficient, safe and reliable national transport network is important for the movement of high volumes of high value freight, and passengers between regions of economic activity.
- International experience shows that improving the efficiency of freight movements and improving network connectivity improves trade performance, GDP and wellbeing.
- Road, rail, air and coastal shipping provide national connectivity, with the choice of mode driven by customer need and preference.
- Improved ferry services across Cook Strait are unlikely to drive a material change in modal choice between road, rail and coastal shipping.

1. This chapter describes the strategic transport network and the significance of the Cook Strait ferry services in that network. The chapter also demonstrates the economic impact of improving connectivity of the network and the competition between modes across Cook Strait.

Strategic national transport network

2. A high performing transport system is important to New Zealand's economic and social success. The core of our transport system is the national network that connects New Zealand by providing reliable, cost effective, safe and timely movement of people and freight. The network provides access between our major cities and on to markets, both domestically and internationally.

3. The network is an integrated system made up of our major sea ports, airports, air and coastal shipping services, main highways and railway lines. State Highway 1 and the Main Trunk Line are where high volumes (and values) of inter-regional services converge to become nationally significant.

4. The Cook Strait ferry services are part of the national transport network as they provide a critical link for road and rail access between New Zealand's

two main islands. They are effectively a sea-bridge linking the two islands. The function of the Cook Strait ferry services, like the rest of the country's transport network, is to facilitate the efficient movement of people and freight around the country.

Function of the strategic network

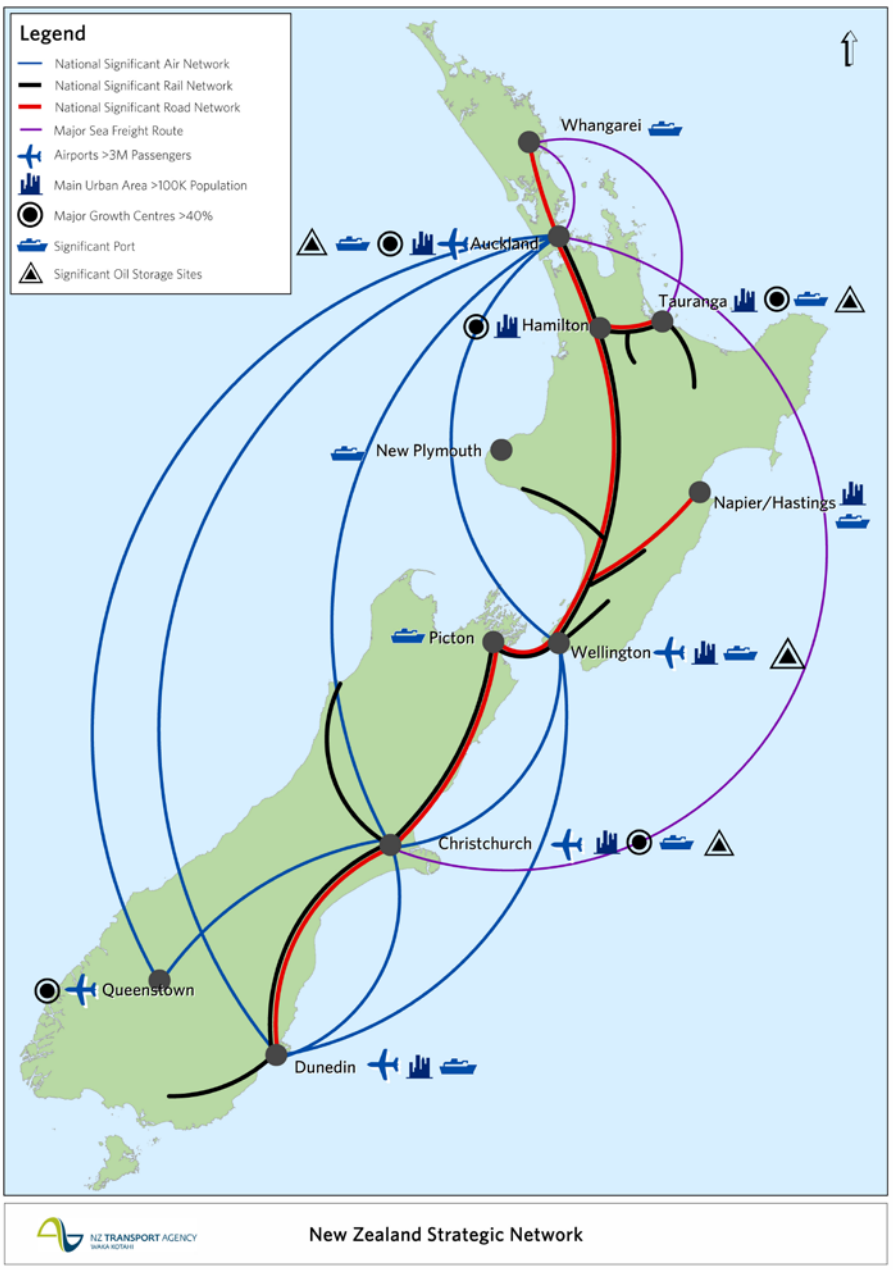
5. The timeliness, safety and reliability of the national network is particularly important for the movement of our exports to international gateways. While the majority of New Zealand's exports are transported directly to the nearest sea port, high value and time sensitive exports and input goods can move longer distances domestically.

6. The national network is also important for the efficient movement and distribution of imported and domestic consumer goods. Much of what is imported into New Zealand comes into Auckland and for onward distribution to our major population centres. Improving the efficiency of these movements has the effect of reducing the costs of the goods New Zealanders buy.

7. New Zealand's economy also relies on international tourism which contributes around $9 billion in foreign exchange earnings annually. The national network allows for the movement of these tourists across New Zealand. Goods and other freight associated with the tourism industry are distributed throughout the country particularly to areas with significant international tourist activity such as Auckland, Rotorua, Christchurch, Queenstown and Dunedin.[8]

8 http://www.med.govt.nz/sectors-industries/tourism/tourism-research-data/international-visitor-survey

Figure7: Strategic national transport network



Source: NZ Transport Agency 2012

Investments in transport infrastructure and economic growth

8. Improving the performance of New Zealand's transport infrastructure is a critical economic opportunity and challenge. Reducing the cost of moving freight within New Zealand will make our exports more competitive and improve the profitability of our exporters. Freight cost savings are important because they lower the marginal cost of exporting. Any fall in the marginal cost of exporting can raise both the number of firms exporting and the extent

of their exports[9]. Lower freight costs can also lower the price of imported inputs and consumer goods.

9. Any such savings are particularly important for small to medium sized exporters. The Ministry of Transport's work on Understanding Transport Costs and Charges shows that for these companies, domestic transport costs, especially for road transport, are considerable. For example, the cost of freighting cargo between Auckland and Christchurch is higher than the ocean freight charges to overseas markets such as Asia, the United States, and the United Kingdom.

Impact of improving efficiency of freight movements

10. The Roads of National Significance (RoNs) and the KiwiRail Turnaround Plan are key initiatives to improve the national network. The RoNs will improve connectivity between regions and improve travel times. The objective of the Turnaround Plan is to enable KiwiRail to become a sustainable freight business.

11. The Cook Strait ferry services are a key link within the State highway and main trunk networks. The ferry services tend to carry higher-value inter-island freight – non-bulk exports and goods for domestic consumption. Time sensitive freight generally moves by road and rail, rather than coastal shipping.

12. In terms of factors that enable trade, New Zealand is well placed when it comes to market access, border administration and business environment. The performance of our transport and communications infrastructure, however, is seen as holding back commerce.[10] Improvements in transport infrastructure, both for domestic and international-bound movements, will therefore help address the area where New Zealand underperforms the most in competitiveness. Research by the World Economic Forum suggests that a 1% increase in a country's rating on the Enabling Trade Index would facilitate a 1.7% increase in exports and a 2.3% increase in imports.[11]

13. Improvements in national connectivity can also trigger complementary improvements in private sector infrastructure, such as the location of freight distribution centres and hubs. The Core Cities Project found that developing a stronger network between New Zealand's major cities could provide the country with three potential benefits:

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9 Crozet and Koenig 2010 in Any port in a storm? The impact of new port infrastructure on New Zealand exporter behaviour, Reserve Bank of New Zealand Discussion Paper 2011/01 pg 2.

10 World Economic Forum, Enabling Trade Index 2012. NZ is ranked 5th overall, but 25th overall for infrastructure.

http://www3.weforum.org/docs/GETR/2012/GlobalEnablingTrade_Report.pdf

11 The Question of Bigger Ships Securing New Zealand's International Supply Chain, NZ Shipper's Council, August 2010, p.15

a) an increase in scale

b) improved efficiency

c) a reduction in the economic distance between city-regions[12]

14. International research has also suggested that improving access on key inter-regional and national corridors can produce both significant economic savings, as well as boost overall economic activity. Given the increasing value of time for both the people travelling and for freight, travel time savings and improved travel time reliability has become an increasingly important way of reducing transport costs, raising productivity and improving economic performance. The Eddington Transport Study, undertaken for the United Kingdom Treasury in 2006, suggested that a 5% reduction in travel time for business and freight travel on the roads could on its own generate around 0.02% in GDP benefits for the United Kingdom. [13]

15. Conversely, transport systems with increasing transport constraints can have a negative impact on productivity and economic growth[12]. This can effectively move our major cities, areas of production and markets further away from each other.

12 NZ Core Cities Research Summary, Ministry of Business, Innovation and Employment Local Government New Zealand 2012, p. 8

13 The Eddington Transport Study, HM Treasury, 2006

International examples of economic impacts from improved connectivity

16. Improving national connectivity can also have wider economic benefits. An example is the Oresund Bridge, which links Denmark and Sweden. This road-rail bridge superseded the roll on/roll off ferry services previously connecting the southern part of the Danish island of Zealand and Sweden. Since completion, traffic volumes have grown as trade and commerce has increased between the better connected areas of the two countries. There has also been a trend in people from both countries relocating, while still travelling across the bridge on a regular basis for work and social reasons.[14]

17. Swedish-based manufacturer IKEA, for example, increased their use of rail from 18% to 40%, due in part to the regularity of connectivity and improved scheduling that the bridge provides.[15]

18. Comparisons with other overseas inter-regional projects that have brought cities and areas of production closer together, provide some insights into the potential benefits of improving the Cook Strait ferry services. The M62 motorway improved East to West access across the north of England, and the Severn Bridge (M4/48) that provided improved connectivity between Southern Wales and Southern England.[16]

19. Both these projects provided significant benefits in travel time, travel time reliability, avoidance of difficult terrain and better access to markets. The Severn Bridge appears to have stimulated economic growth and employment in Southern Wales.

National freight growth and responsive transport system

20. The volume of freight moved in New Zealand is forecast to grow significantly as our population and economy grows. The National Freight Demand Study (2008) estimated a growth in the national freight task of 75% between 2007 and 2031. The inter-island freight task (excluding coastal movements of bulk petroleum and cement) was estimated to grow at a slightly slower, though still significant, rate of 62% over the same period.[17]

21. This growth will mean an increase in volumes (including on a per trip basis as productivity increases) and an increase in freight-related travel on key strategic routes. The government's investment in nationally strategic State

14 Knudsen, M.A & Rich, J, Ex post socio-economic assessment of the Oresund Bridge, Transport Policy, 2013, pp.53-65

15 Copenhagen Economics 2004 Economy Wide Benefits – Dynamic and Strategic effects of a Fehmarn Belt Fixed Link – pg 29

16 OECD, Impact of Transport Infrastructure Development on Regional Development.

17 At the time of writing the 2013 update to the NFDS had not been published.

highway and rail corridors is designed to address this increased demand and deliver increased performance from the national strategic network.

Response to increased demand

22. The future freight transport system will need to respond to the continuing demand for increasing speed and reliability. New Zealand's freight supply chains are largely driven by 'just-in-time' movements. Warehousing of freight is kept to a minimum and freight is dispatched just before it is needed.

23. There will be continued growth in the movement of high value and time sensitive products (such as chilled meat, seafood, wine and other perishable goods). As a result there is an increasing need from industry for greater reliability and timeliness for freight services between the islands.[18]

24. Clifford Bay provides a response to this trend by improving connectivity of the national network – in effect moving Christchurch, Dunedin, Invercargill and Queenstown around 75 minutes closer to Auckland, Wellington, Palmerston North and the rest of the North Island.

Competition for freight movements

25. The value proposition of a ferry terminal at Clifford Bay needs to be looked at within the overall function of the national network and the role of the different modes. The choice of mode to move goods to/from the South Island reflects the needs of the customer with decisions primarily based on time and cost.

Road transport

[redacted]

Rail transport

[redacted]

18 National Freight Demand Study, p.162.

19 National Freight Demand Study, p.120.

[redacted]

Coastal shipping

29. Coastal shipping tends to be lower cost than rail, with the trade-off being longer delivery time and reduced service frequency. Coastal shipping is less flexible as it offers less frequent services and only operates port-to-port, meaning an additional leg of travel is required to take the goods inland. The cost of this additional travel can be offset by the savings on the sea-going side of the journey.

30. For contestable containerised freight (i.e. non-bulk and non-transhipped coastal movements), less time critical goods are moved between the North Island and Christchurch on regular scheduled domestic and international services. Coastal shipping (including international ships on the coast) also moves significant numbers of empty containers to support the export trade in the South Island.[20]

[redacted]

32. Bulk commodities such as petroleum and cement are carried on dedicated coastal shipping services.

Air transport

33. Air freight volumes are significant by value but are small in weight (tonnes) terms. Air freight is the most expensive mode but offers superior service for high value, time critical goods needing to be moved significant distances.

20 Coastal Shipping and Modal Freight Choice, Rockpoint Corporate Finance, 2009, p.36

Table 5: Modal transport options - Auckland-Christchurch

Modal attributes (in general)	Air	Road	Rail	Coastal+
Travel Time (Auckland-Christchurch)	80 minutes	16 hours*	30 hours**	48 Hours***
[redacted]				
Volume (mass and/or space per trip – equivalent Container size TEU)	<1	2	200	600/650
Flexibility (Number of delivery/pickup points Auckland-Christchurch with minimal re-handling)	Low	High	Moderate	Low
Service frequency	30 services a day (approx)	As arranged	2 trains daily	Every second day

* Assuming rest stops and a driver swap half way
+ Not including coastal shipping services provided by international vessels.
** From closeout time
*** Currently not a daily service

Competition for passenger journeys

34. The movement of people between the North and South Island is provided by two modes – air and sea (Cook Strait). The ferry passenger market has declined significantly in recent years. Increased competition from air travel has been identified as the primary reason. The Demand chapter provides more detail regarding passenger journeys.

Potential impact on modal choice

35. The likely trigger point in a change of mode will be a change in the relationship between time and cost. Higher cost for road and rail may attract freight over to rail and coastal shipping respectively.

36. The option of making better use of coastal shipping Auckland-Christchurch or for roll-on/roll-off ferry services to take vehicles from Wellington to Lyttelton, is

21 Freight Transport Efficiency: a comparative study of coastal shipping, rail and road modes, 2012, p50.

a transport option for the market currently. Pacifica Shipping offered a Lyttleton-Wellington roll on/roll off ferry service in the 1990s carrying both containers and trucks. The service discontinued however, as freight owners preferred to move non-time critical goods by coast direct to/from Auckland and for time critical freight to be moved by road and rail.

37. The perceived value of each mode, moving people and goods between the North and the South Islands, is expected to remain largely the same if Clifford Bay is built. This is because Clifford Bay is an incremental improvement that does not fundamentally alter the relative merit and nature of the competing modes.

SECTION 2 | Port-Co commercial viability assessment (financial case)

Structure of the analysis
Freight and passenger demand
Private benefit assessment
Port-Co viability assessment (financial case)

Structure of the analysis

1. The investigation into Clifford Bay commercial viability involves a chain of interconnected analyses.

2. Firstly, a long range forecast of demand for freight and passenger journeys has been made. This is used to estimate the volume throughput for road and rail freight, and for the ferry operators who transport freight and passengers across Cook Strait. This is marked 1 on figure 8 on the next page.

3. The cost structures of freight users and ferry operators have been examined in both a “Develop Clifford Bay” scenario and in a “Redevelop Picton” scenario. The difference between the two is the net benefit for that operator or user of Clifford Bay. This net benefit is referred to as the private benefit of Clifford Bay for that operator or user.

4. Private benefits for the two operators, Interislander and Strait Shipping Limited, have been assessed using a detailed financial model for each scenario with a 25 year operating horizon. [redacted] This is the private revenue indicatively available from that operator to support Port-Co establishment and operation. This is marked 2 on figure 8 on the next page.

5. Port-Co is a conceptual ferry port developer/owner/operator business used to assess Clifford Bay commercial viability. This section of the analysis is the financial case for Clifford Bay. This is marked 3 on figure 8 ono the next page. The financial case assesses whether Port-Co generates an adequate commercial return for private sector debt and equity given the private revenue that is available from operators and users and the construction and operational costs it must meet. The analysis finds that it does not. The analysis then highlights the role the government would have to play if Clifford Bay is to proceed.

6. The economic case complements the financial case, and takes a broader view of the potential benefits of the project from the perspective of society and the economy as a whole. This is marked 4 on figure 8 on the next page. The principal objective of the economic case is to assess the level of benefits that the project is expected to deliver to the national economy as a whole, over and above those delivered at a project level.

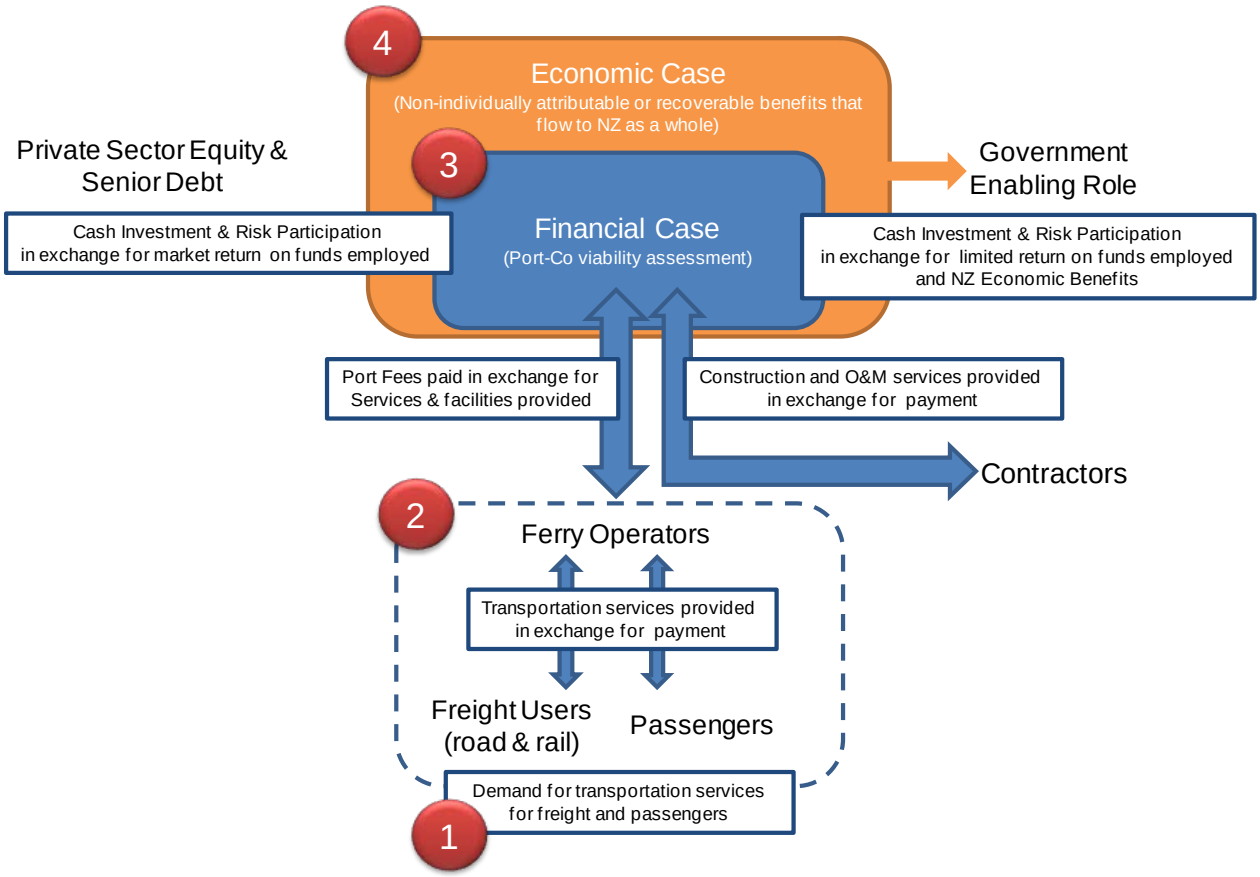
7. [redacted]

[redacted]

8. This business case also includes an analysis of the public policy rationale for the government considering direct investment in Clifford Bay, along with a high level assessment of the relative merit of that investment with other transport projects.

9. The structure of the analysis is reflected in the following figure.

Figurer 8: Structure of the commercial viability analysis



Source: Ministry of Transport 2013

Freight and passenger demand

Introduction and summary

- The Cook Strait freight market is a sub-market of the broader inter-island freight market which comprises coastal shipping as well as road and rail.
- The Cook Strait freight task is forecast to grow by 61% by 2040.
- Coastal shipping and rail are forecast to continue to grow at a faster rate than road over the short term, with all modes growing at a similar compound annual growth rate of just under [redacted] over the long term.
- It is estimated that [redacted] of road freight using the ferry has an origin or destination point of Christchurch or further south. [redacted] of the road freight travelling to/from Blenheim and points west would incur additional travel costs due to the longer road distances between Clifford Bay and these points, when compared with the status quo of Picton.
- The Cook Strait passenger market has declined significantly in recent years, with future growth predicted to remain at very low levels.
- It is estimated that less than 50% of ferry passengers have an origin or destination point south of Clifford Bay and it is only these passengers that will accrue the full travel time and distance benefit of a move to Clifford Bay.

1. The purpose of this chapter is to define the current and projected level of demand for ferry services across Cook Strait.

2. The Cook Strait ferry market comprises the two principal and distinct sectors of freight and passengers. Each sector is profiled and quantified in the following sections.

Freight

Overview

3. For the purposes of the Clifford Bay investigation, the relevant freight market is defined as the sum of the road and rail freight carried on the inter-island ferry services, together with the contestable coastal shipping market between the two islands. This latter market is defined as domestic cargo moving as containerised freight between the North and South Islands. It excludes export and import transhipments (which tend to be marginally priced movements on

international shipping lines) and excludes bulk cargoes such as petroleum and cement (which move on dedicated coastal vessels).

[redacted]

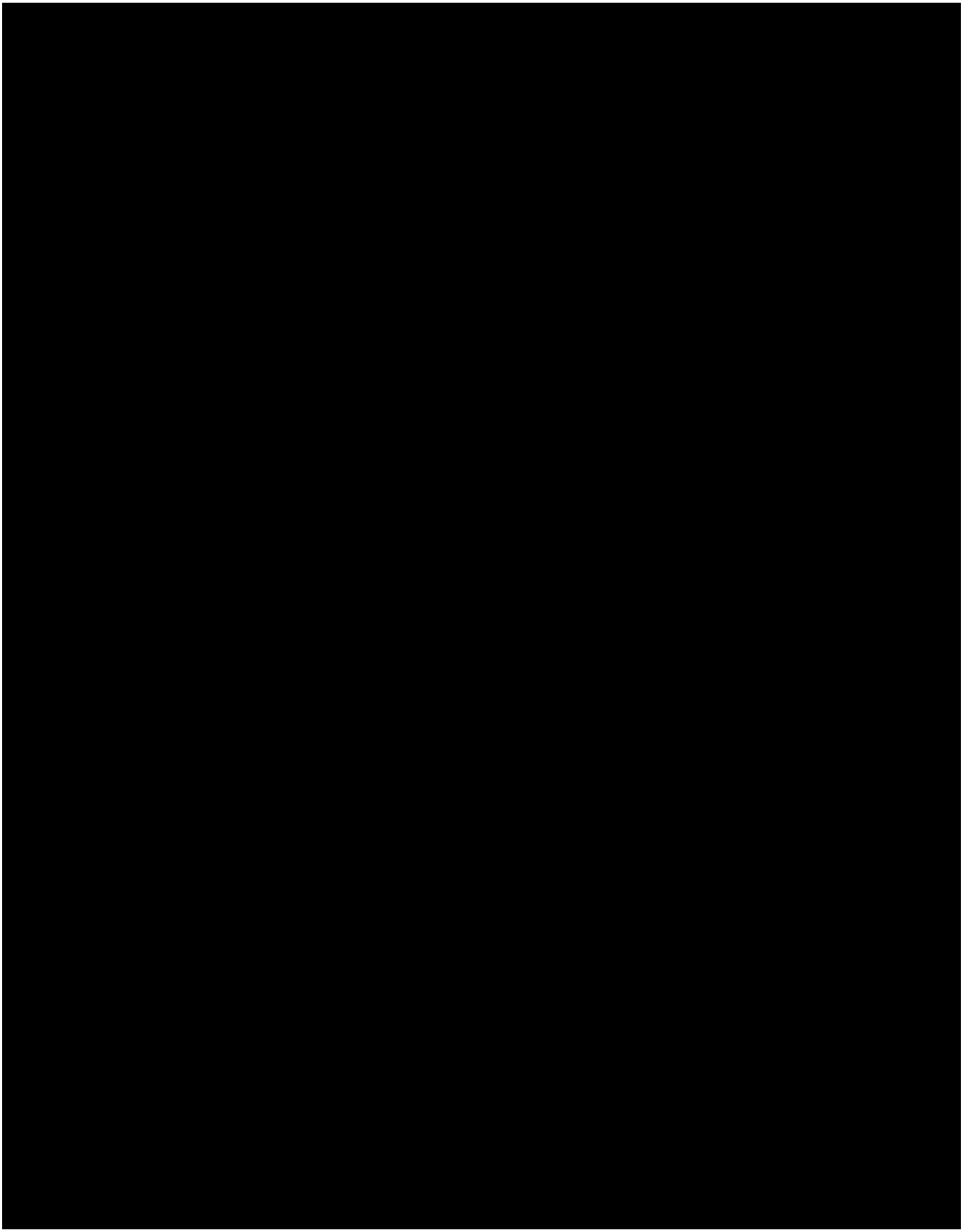
5. Coastal shipping volume can now be accurately tracked using the Ministry's Freight Information Gathering System. As noted above, contestable coastal shipping is represented by domestic (non-transhipped) containerised cargoes moving between the islands. [redacted]

[redacted]

Cook Strait freight market

6. The Cook Strait freight market comprises commercial vehicles (CVs) and rail freight which are carried by the Interislander and Strait Shipping between Wellington and Picton.

7. As the unit of revenue for this market is lane-metres, being the linear space taken up on a ferry by a truck or rail wagon, reference to the Cook Strait market is undertaken in lane-metre terms.



Forecast growth rates

8. To determine the most appropriate freight task growth rates for the purposes of this investigation, a series of alternative growth scenarios for inter-island freight have been assessed. A key reference point for assessing growth scenarios has been the 2008 National Freight Demand Study (NFDS).[22]

9. The range of growth scenarios assessed is as follows:

    - 2012 Preliminary Business Case on Clifford Bay
    - NFDS national freight task growth
    - NFDS inter-island freight task growth
    - National GDP growth[23]
    - South Island population growth (medium scenario)[24]

10. The inter-island freight task differs from the national task. Where 75% of the national freight task comprises bulk commodities such as aggregates,

22 At the time of writing, the 2013 update to the NFDS has not been completed. This is due for completion in November 2013. Interim results will be used where possible to assess the accuracy of the assumptions used.

23 Bascand, G (2012, December). Planning for the future: Structural change in New Zealand's population, labour force, and productivity. Paper presented at Affording Our Future Conference, Wellington, New Zealand.

24 As inter-island freight is predominantly driven by demand from the South Island, i.e. predominantly southbound freight, South Island population growth will be one driver of future demand growth. Source of population forecasts: Statistics NZ

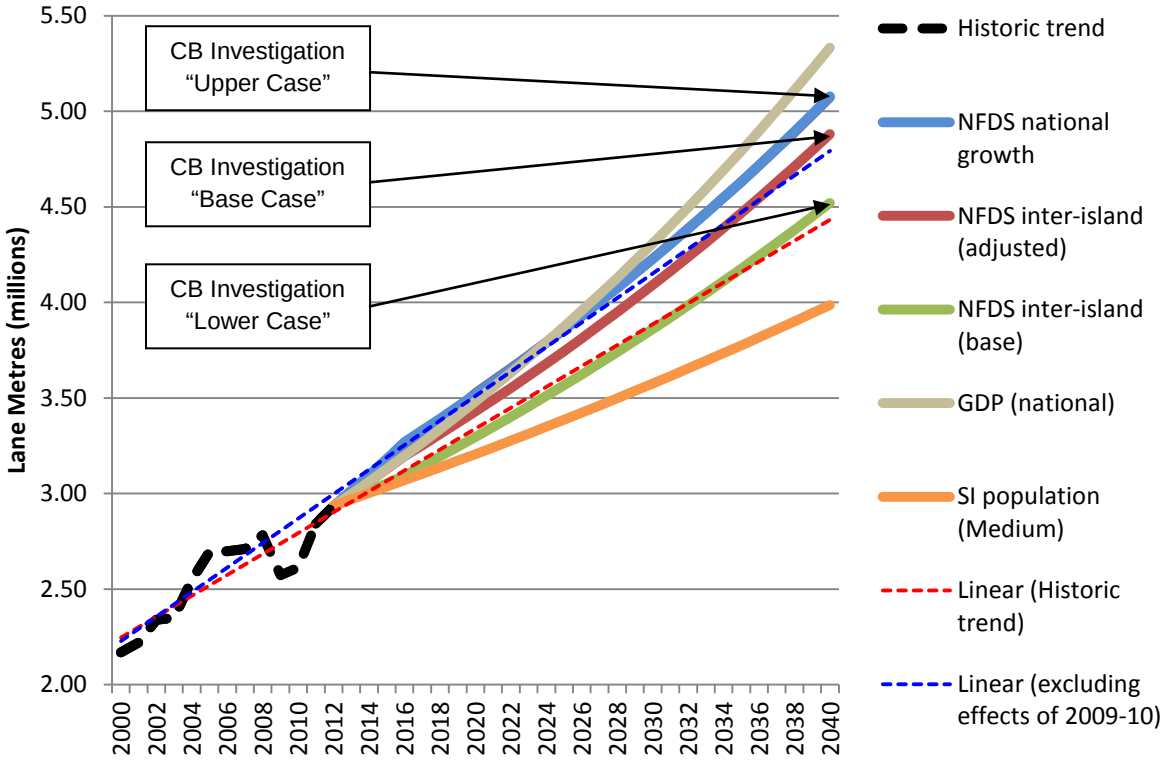
cement, limestone, fertiliser, forestry, bulk milk and export dairy products, 75% of the inter-island freight task comprises the retail and courier sectors, horticulture, livestock and meat.

11. Due to these differences in commodity mix, growth projections for the inter-island task differ to the national view – the latter influenced by predicted strong growth in the construction, dairy and forestry sectors.

12. The NFDS inter-island growth rate has been determined by isolating the inter-island regional movements of individual commodities in each of the forecast years – 2016 and 2031. Two alternative NFDS inter-island scenarios have been tested. The 'base' forecast predicted in the NFDS assumes a lower level of retail goods moving inter-island in future due to an increase in direct imports to Christchurch. An alternative 'adjusted' forecast assumes growth in inter-island retail goods movements remain at the same rate as growth in these commodity movements at a national level i.e. no change to the level of direct imports into Christchurch.

13. Applying these different growth rate scenarios to the base 2013 Cook Strait market figure of 2.9 million lane-metres, (refer to Table 7) presents a range of potential growth outcomes as illustrated in Figure 12 below.

Figure 12: Forecast Cook Strait freight growth scenarios compared with historic trend (lane-metres)



14. Extrapolating the historic trend in Cook Strait volumes predicts a future growth trend in line with the NFDS inter-island 'base' scenario. However, when the anomaly of 2009-10, caused by the GFC and Canterbury earthquakes, is removed, the historic trend line aligns closer to the NFDS inter-island 'adjusted' scenario.

15. For the purposes of this investigation, a growth scenario in which the demand for retail goods into the South Island matches the national demand for these goods (i.e. NFDS inter-island adjusted) is considered to be a realistic scenario. Selection of this scenario is validated by the alignment of the historic trend (adjusted for the effects of the GFC and Canterbury earthquakes) with this growth rate.

16. Growth rates based on the NFDS national task and the NFDS base inter-island assumptions present upper and lower parametres respectively for sensitivity testing.

17. [redacted]

18. The growth rate scenarios assumed for the purposes of this investigation represent the following rates of growth in the freight task on Cook Strait between 2013 and 2040.

    - High 66%
    - Medium (base) 61%
    - Low 51%

19. [redacted]

Forecast by mode

20. As evidenced by volume data provided by Interislander (which has been verified against FIGS for 2012) rail has experienced strong growth across Cook Strait since the advent of the Turnaround Plan. Between 2010 and 2012, this growth has been at comparable levels to CV in lane-metre terms. In contrast, 2013 has seen a contraction in CV volumes while rail has continued its strong recent growth.

21. Due to a lack of accurate historic data on the contestable coastal shipping market, it is not possible to determine historic growth rates in this mode. However, anecdotal evidence suggests there has been comparable, if not stronger, growth in coastal shipping as has occurred in the inter-island road and rail sectors.

22. In the short term it is anticipated that the modes will maintain similar growth rates. Rail should regain market share lost in recent years to road. Coastal volumes should continue to grow, driven by surplus capacity in international shipping markets allowing international lines to marginally price coastal cargo movements. The trend toward larger container ships and an increase in port hubbing will also support this growth. This will see rail and coastal shipping growing at a faster rate than road.

23. However, there is no compelling evidence to suggest that one mode will experience more rapid growth in the inter-island market than another in the longer term. For the purposes of the analysis, it is assumed that all modes will grow at the same rate post 2017.

24. Applying the base case growth rate provides compound annual growth rates by mode as follows.

Table 7: Compound annual growth rate by mode

[redacted]

25. Applying alternative growth rates as sensitivity tests indicates that the outputs of the economic and financial analyses are only moderately sensitive to reasonably large changes to the assumed growth rates or modal shares and do not have a material impact on the outcomes of the analysis.

Capacity impacts

26. Information provided by the two ferry operators indicates that some capacity constraints exist at specific times of the year and at certain 'timegates' – primarily around the Christmas and Easter holiday period when passenger demand is at its highest. In general however, for the majority of the year, there is overcapacity of vessel space on Cook Strait. While Clifford Bay will have a bearing on vessel retonnaging decisions (i.e. the types of vessels employed in future), it is vessel age [redacted] that

[redacted]

will drive retonnaging requirements over the next 30 years, rather than capacity.

27. Similarly Picton port and its land-side facilities and transport links are not seen as a constraint on freight capacity in the foreseeable future. While investment is required in the near term at Picton, [redacted]

28. There is therefore no difference assumed in freight demand between the 'stay at Picton' base scenario and Clifford Bay, other than the potential for induced demand in response to the shorter transit times between Christchurch and the North Island.

Upper versus lower South Island road movements

29. Travel time benefits to the road freight sector from a ferry terminal at Clifford Bay will be dependent on the origin and destination of the road journey. Freight originating from or travelling to Marlborough, Tasman or the West Coast will not receive the same level of benefit from Clifford Bay as freight originating from or travelling to Canterbury and other areas south. This is due to a slight increase in road distance between Clifford Bay and the upper South Island regions than under the status quo of Picton. Consequently freight travelling to/from these regions needs to be identified separately within the financial and economic cases with a different benefit equation applied.

[redacted]

[redacted]

[redacted]

26 At the time of writing the 2013 update to the NFDS has not been finalized, with indicative numbers only available from the results of early analysis.

Passenger

Overview

33. The movement of people between the North and South Islands is provided by two modes – air and sea (Cook Strait).

34. The Cook Strait ferry passenger market comprises two segments:

    a) foot and car passengers

    b) passenger vehicles

Historic and current level of market demand

35. The Cook Strait passenger market has declined significantly in recent years as a result of increased competition from air travel and changes in the travel patterns of international visitors to New Zealand.

36. International visitors comprise approximately 25% of ferry customers. Figures provided by the Ministry of Business, Innovation and Employment (MBIE) confirm that overseas visitor inter-island ferry usage has been declining since 2006. Partially this reflects a decline in the number of overseas visitors who, historically, have been high ferry-users, and an increase in the number of visitors who do not tend to travel on an inter-island ferry. Another relevant factor appears to be a change in the nature of the travellers who come to New Zealand. International visitors are tending to be more spatially-confined in their travel patterns with shorter lengths of stay, in other words they are not travelling as widely throughout New Zealand as visitors have in the past.

37. From data provided by the two ferry operators, the following summarises the trend in passenger demand including figures for the latest financial year.

[redacted]

Forecast market demand

[redacted]

39. Appropriate sensitivities using alternative growth scenarios have been applied in both the economic and financial cases to assess the impact of alternative growth scenarios on the outputs of these assessments. Application of these alternative growth scenarios concludes that the outputs of the economic and financial cases are not materially sensitive to changes in the forecast annual growth rates assumed for the passenger market.

Passenger market origin/destination

40. The location of Clifford Bay results in a different benefit equation for passengers depending on their origin or destination in the South Island. Those travelling to points south of Clifford Bay benefit from both the shorter ferry journey and shorter road journey. However those travelling to Blenheim, the Marlborough Sounds and points west face a longer road journey. It is important therefore to understand the South Island travel patterns of Cook Strait passengers to accurately measure the impacts on these different categories of passengers.

41. Travel patterns have been sourced from survey data collected from the Interislander in which participants are asked where they spent the night prior to travel and the night of travel[27]. In assessing the impact of Clifford Bay on passengers we are interested in the South Island locations prior to travel for northbound passengers and the South Island locations on the night of travel for southbound passengers.

42. The results of this analysis are provided in the figure below.

[redacted]

44. For the purposes of the analysis it is assumed that there is no difference in the proportions of foot versus car passengers travelling westbound or southbound. However due to much of the accommodation and activities in the Marlborough Sounds being accessed by water transport, for those passengers with a final origin or destination in the Sounds, it is assumed that a higher proportion of foot passengers would make up this segment of the market than those travelling by car.

45. The profile of the adjusted direction of travel by market segment is shown in the following table.

[redacted]

Private benefit assessment

Introduction and summary

- As previously outlined, forecast freight demand has been applied and the cost structures of freight users and ferry operators have been examined in both a "Develop Clifford Bay" and in a "Redevelop Picton" scenario. The difference between the two is the net benefit for that operator or user of Clifford Bay. This net benefit is referred to as the "private benefit" of Clifford Bay for that operator or user.

[redacted]

- As outlined in the Port-Co viability assessment, this is insufficient to deliver Clifford Bay through private sector funding, and the government will need to play a direct investment role for the project to proceed.

1. This chapter starts by explaining how the building blocks of the commercial viability assessment fit together, and how private benefits have been assessed. [redacted]

Approach to determine private benefits

2. The Ministry of Transport has taken a detailed approach to estimate the private benefits for each user group which would result from a move to a new ferry terminal at Clifford Bay. The approach has included holding a series of meetings with individual users, user groups and industry consultants, and the development of detailed financial and cost models.

Workshops and meetings

3. Since early 2013 the Ministry of Transport has had a series of workshops and meetings with:

    - Ferry operators - InterIslander and Strait Shipping Ltd
    - Rail operator – KiwiRail Network and Gravel Road Consulting Ltd (Gravel Road)
    - Commercial freight operators – Road Transport Forum New Zealand and a selection of larger commercial freight businesses
    - Private passengers – The New Zealand Automobile Association

Financial and cost models

4. The Ministry of Transport has developed financial models with the ferry operators to estimate the private benefits available to them from shifting to

Clifford Bay, and the port fees they could afford to pay to a new ferry terminal operator (Port-Co).

5. Gravel Road developed a detailed cost model with KiwiRail Network to estimate the net cost savings available to rail if the ferry terminal is shifted to Clifford Bay.

6. The Ministry of Transport has also performed financial analysis to determine the net cost savings available to commercial freight operators if the ferry terminal is shifted to Clifford Bay.

Benefits to ferry operators

Approach

7. To determine the private benefits for the ferry operators and the port fees they could afford to pay, the Ministry of Transport developed separate and comprehensive financial models in conjunction with InterIslander and Strait Shipping.

8. Each ferry operator business was modelled separately using two main scenarios.
    - Redevelop Picton – under this scenario the Picton port facility is redeveloped and a new ferry terminal at Clifford Bay is not built.
    - Develop Clifford Bay – under this Scenario a new ferry terminal is built at Clifford Bay and the Picton port facility is not redeveloped.

9. The difference between the two scenarios represents the estimated net private benefits available for each ferry operator from moving to Clifford Bay, or the port fee they could afford to pay at Clifford Bay.

10. In developing the financial models for the ferry operators, a detailed approach was taken.

11. The financial models include the following key features:

    - Historical financial information
    - 25 years of projected financial information (FY14 to FY38)
    - Ratio analysis
    - Market analysis – volumes and growth by market segment, and modal and market shares
    - Revenue breakdown and yield analysis by market segment
    - Operating cost and key cost driver analysis
    - Summary financial statements
    - Fixed asset schedules

12. The focus of the financial modelling (and estimate of net benefits) has been to the EBITDA[28] level in the Statement of Financial Performance. Much less focus and rigour has been placed on other areas of the financial models (such as the Statement of Financial Position and Statement of Cashflows) due to there being much less focus on capital items. This is mainly due to the assumption that new ships are leased and not owned.

[redacted].

Results

13. A summary of the net private benefits available to ferry operators in FY22 (the first year of operations following the redevelopment of Picton or the construction of Clifford Bay) is summarised as follows.

Table 13: Summary of net private benefits available to ferry operators in FY22

FY22 (nominal)	Redevelop Picton (1)	Develop Clifford Bay (2)	Net Private Benefits (2) – (1)
Revenues:			
Passengers & Cars			
Commercial Vehicle Freight			
Rail Freight			
Other			
Operating Costs:			
Fuel			
Labour			
Bareboat (lease)			
Maintenance			
Dry Dock			
Port Fees			
Other			
Net Benefits for Ferry Operators			
Risk Adjustment			
Available Port-Co Revenue			

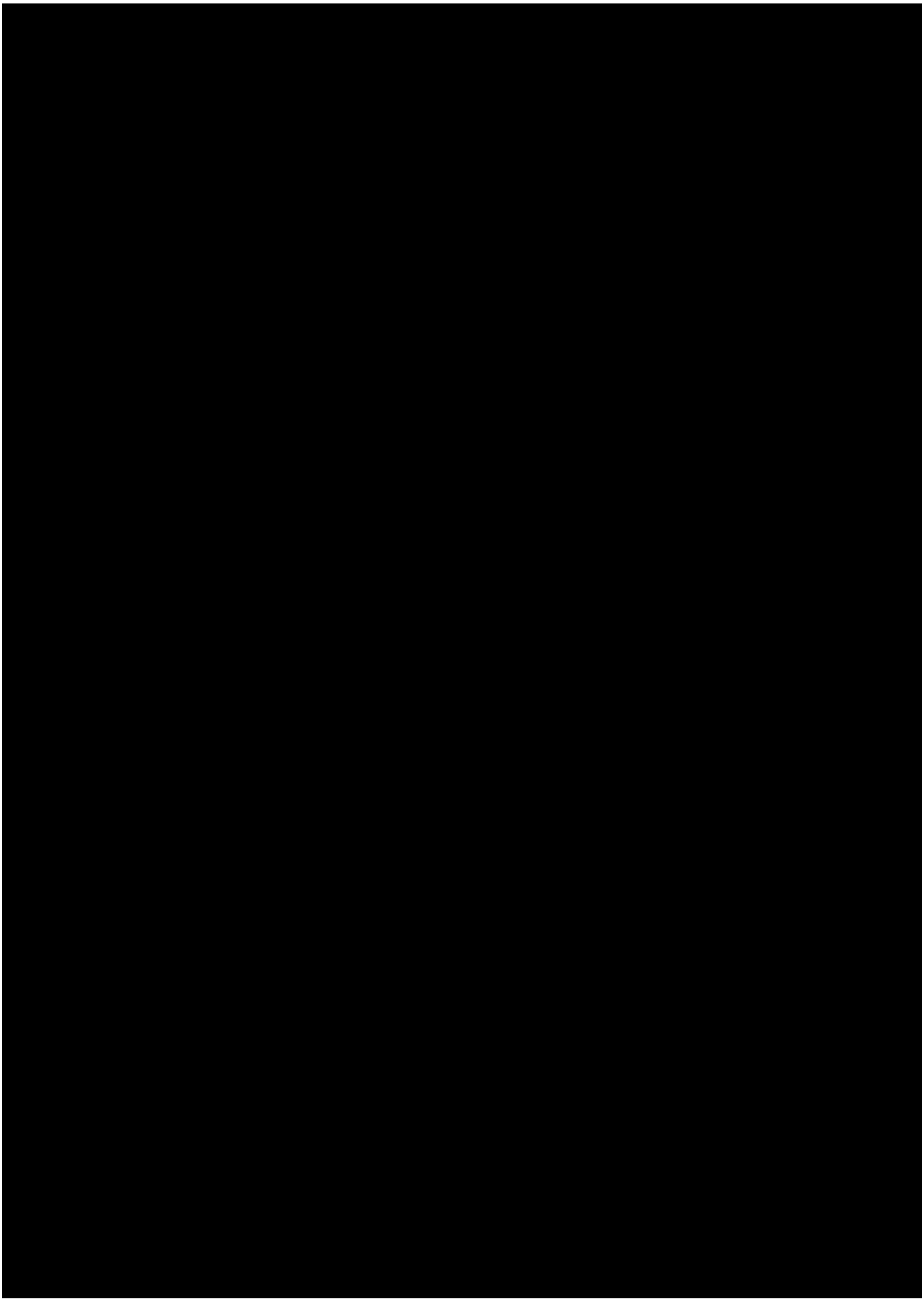
14. The table shows an estimated [redacted] of private benefits are available to ferry operators with the largest component relating to avoided Picton port fees

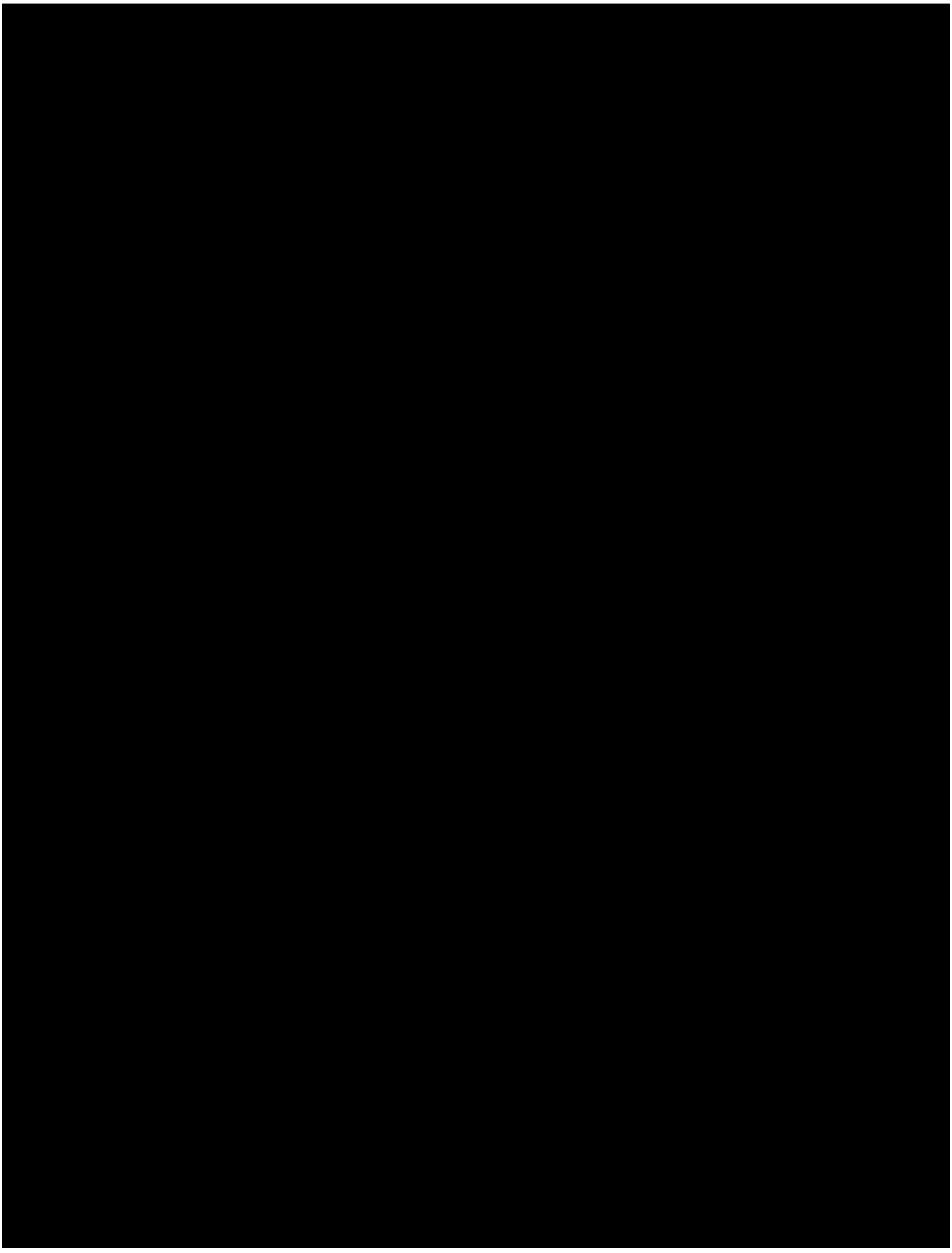
[redacted]

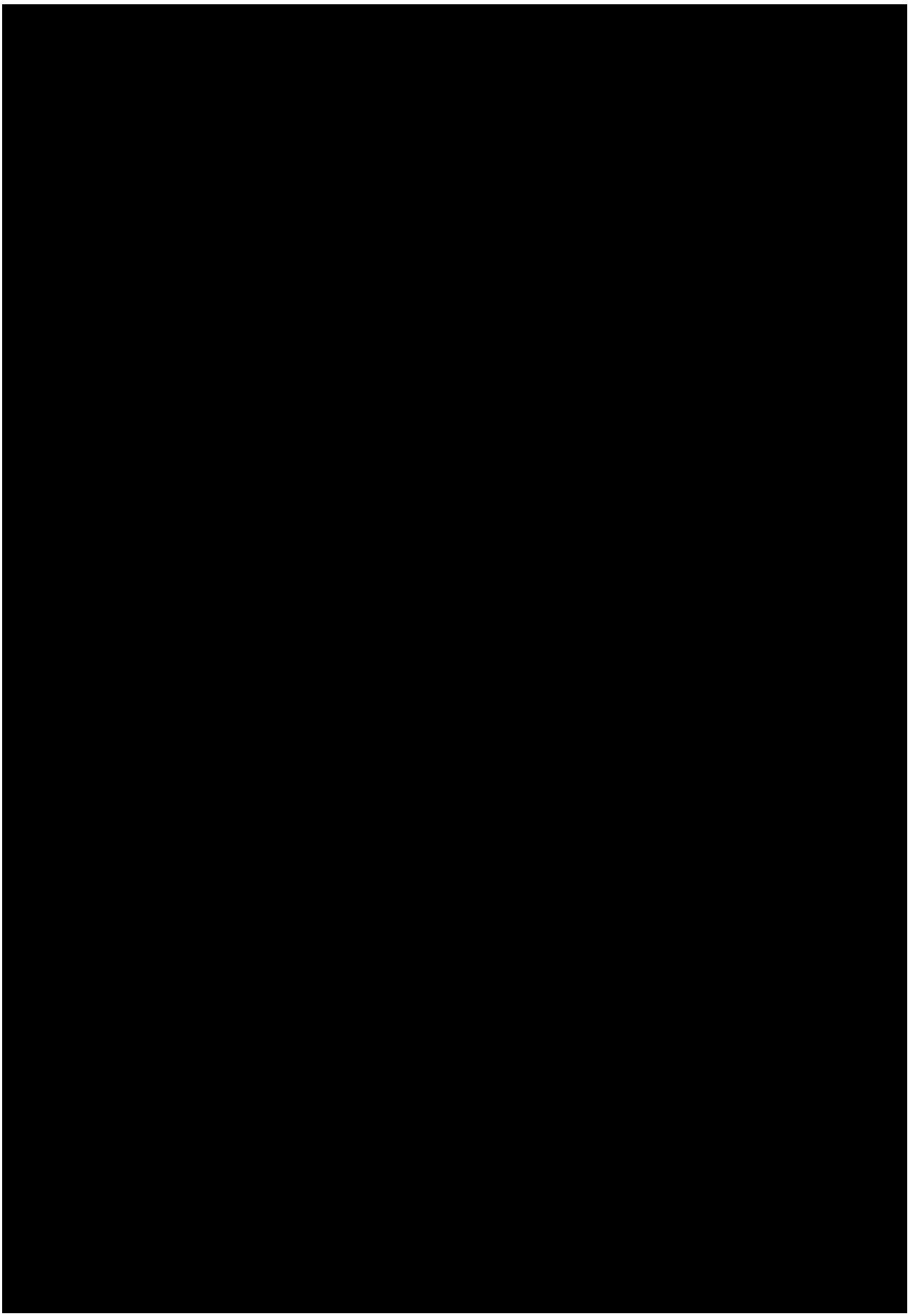
16. The financial models include a number of common assumptions.

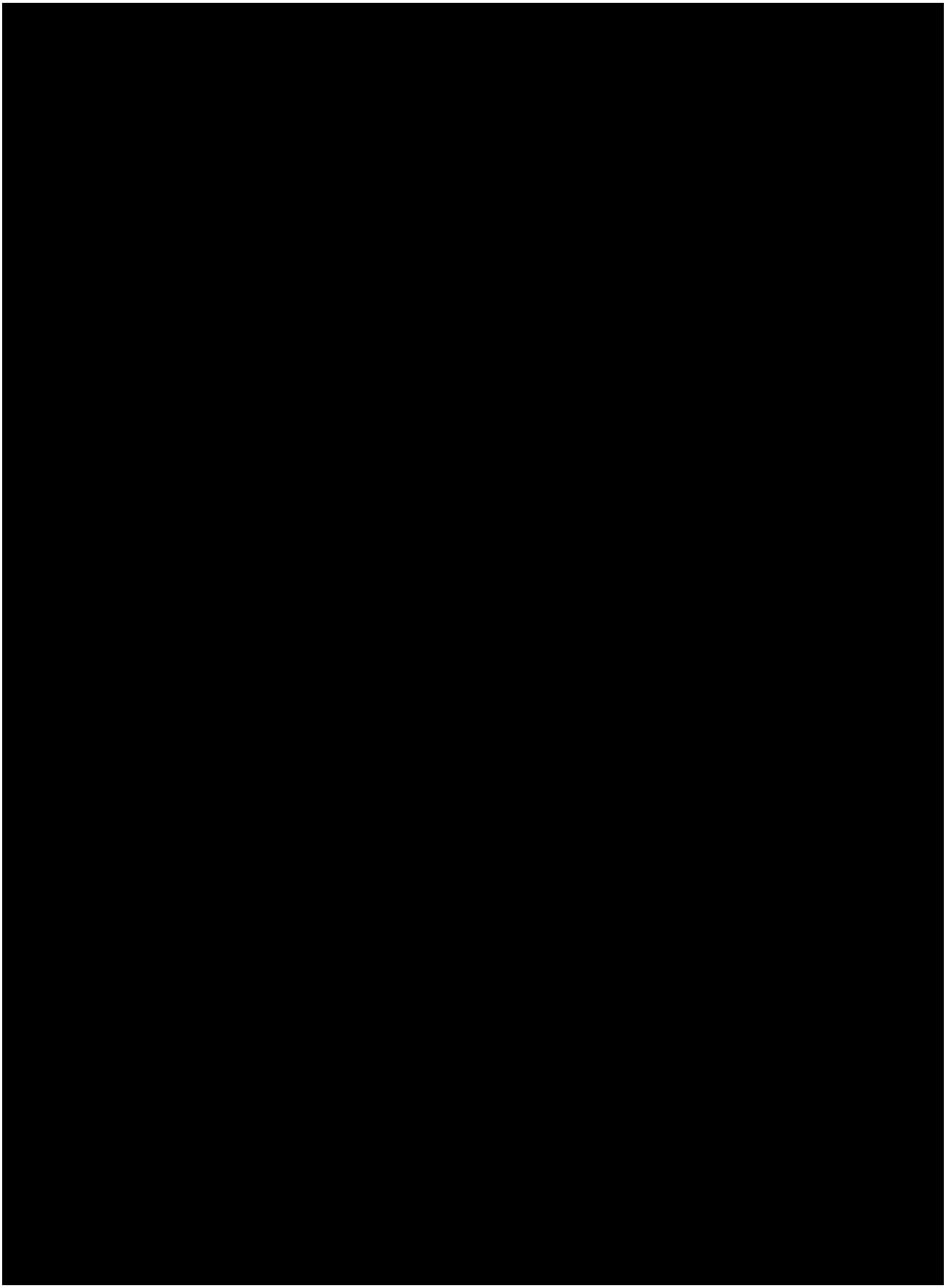
17. These assumptions are also common across both scenarios – Redevelop Picton and Develop Clifford Bay.

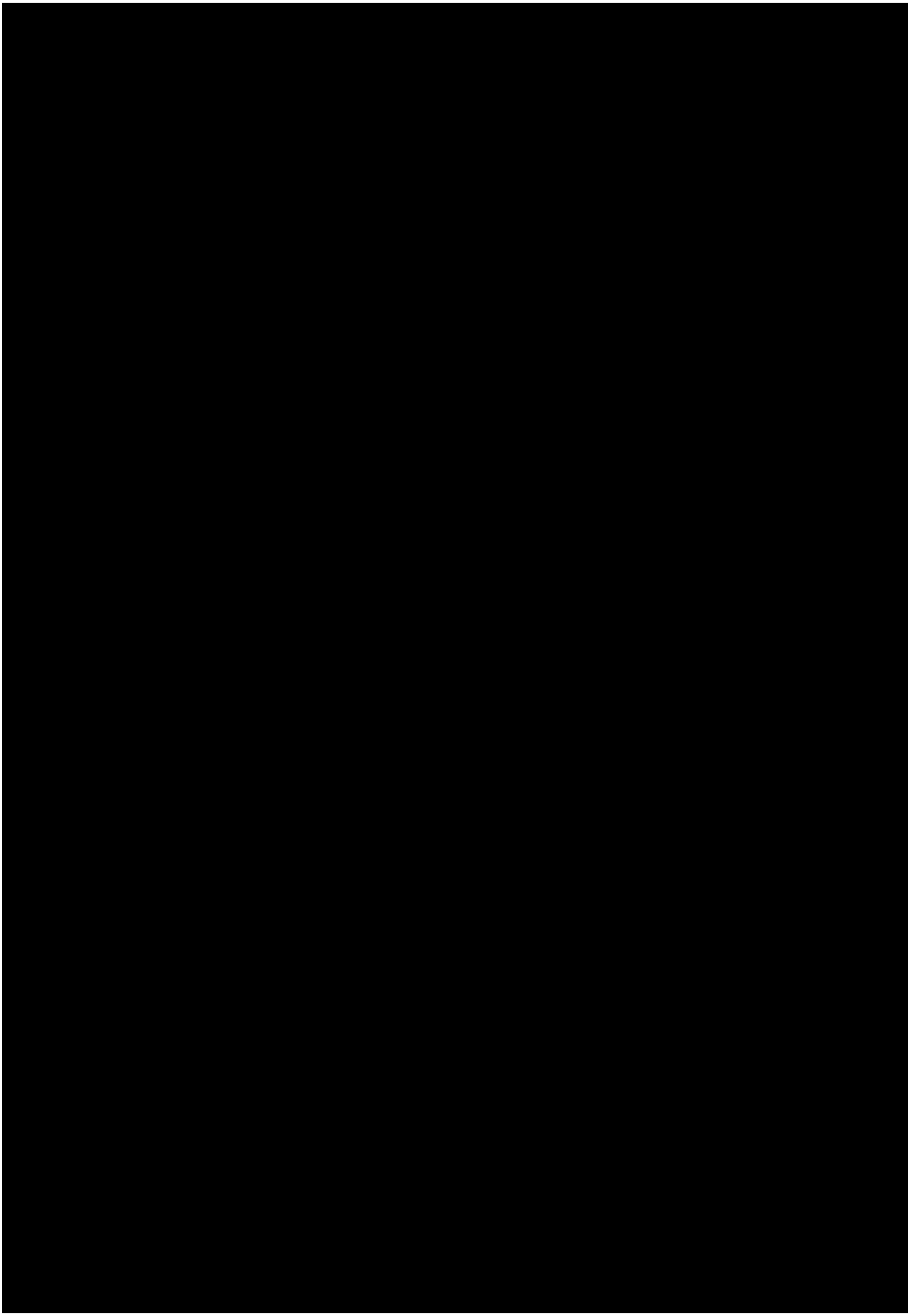
[redacted]

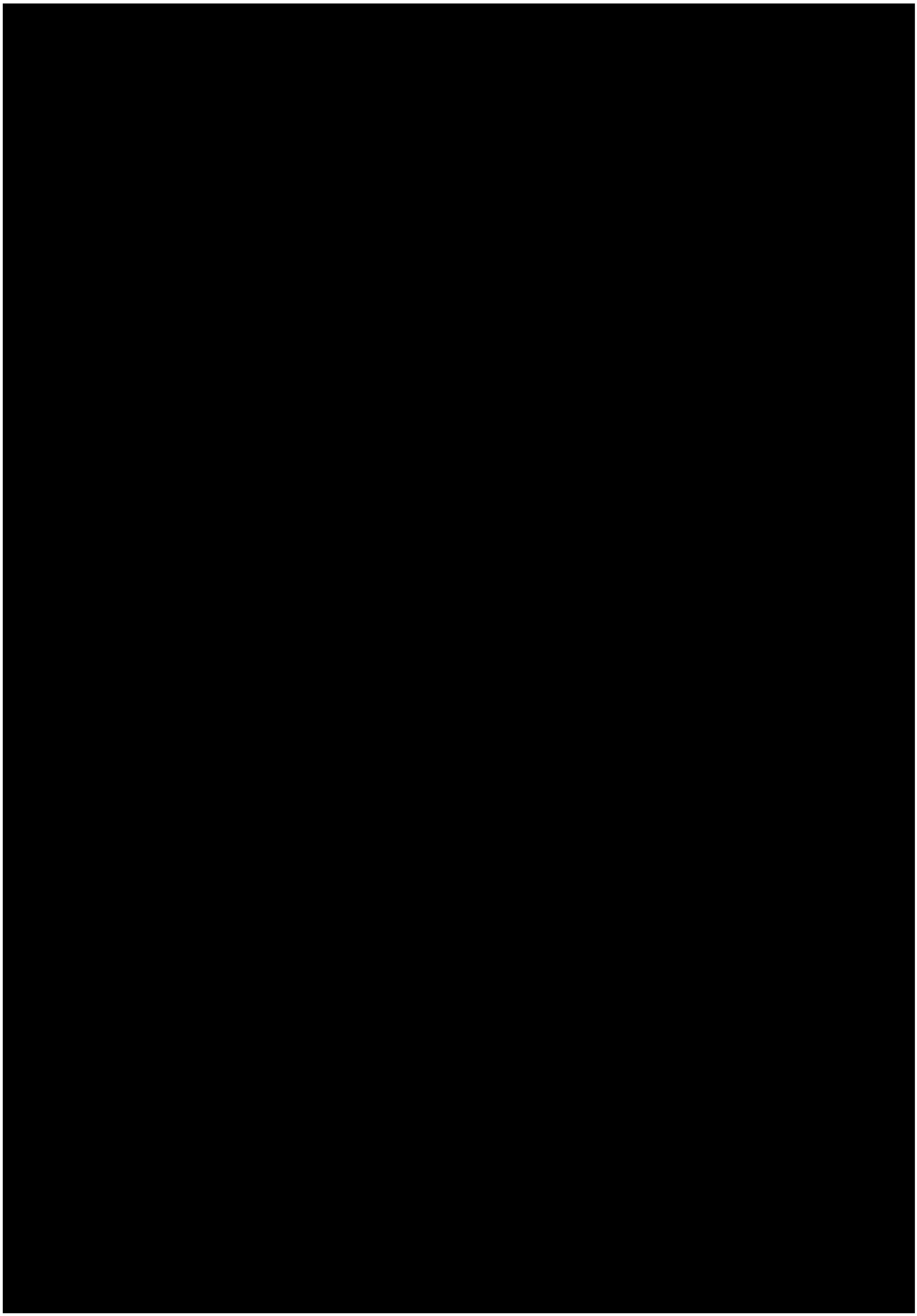


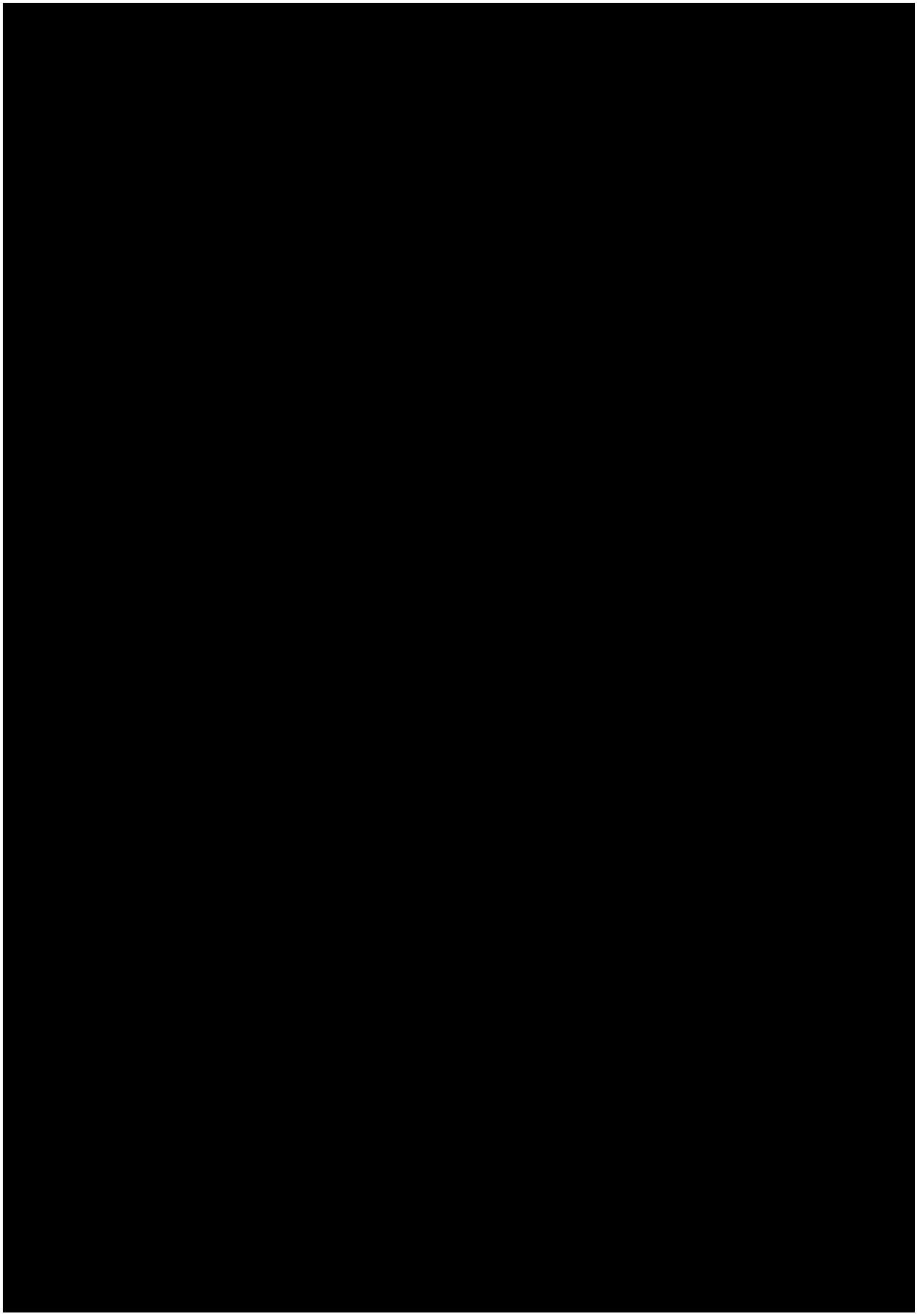


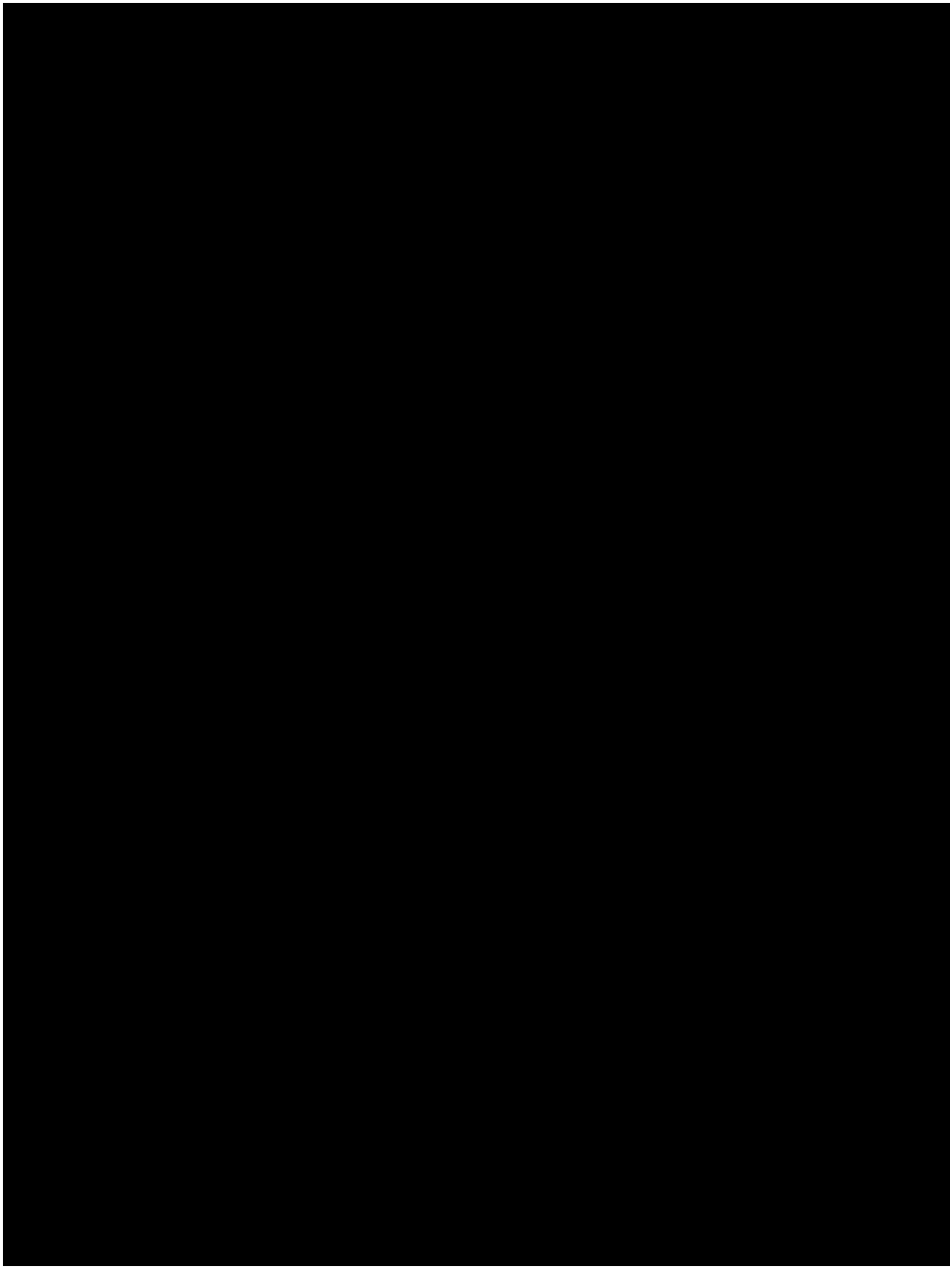


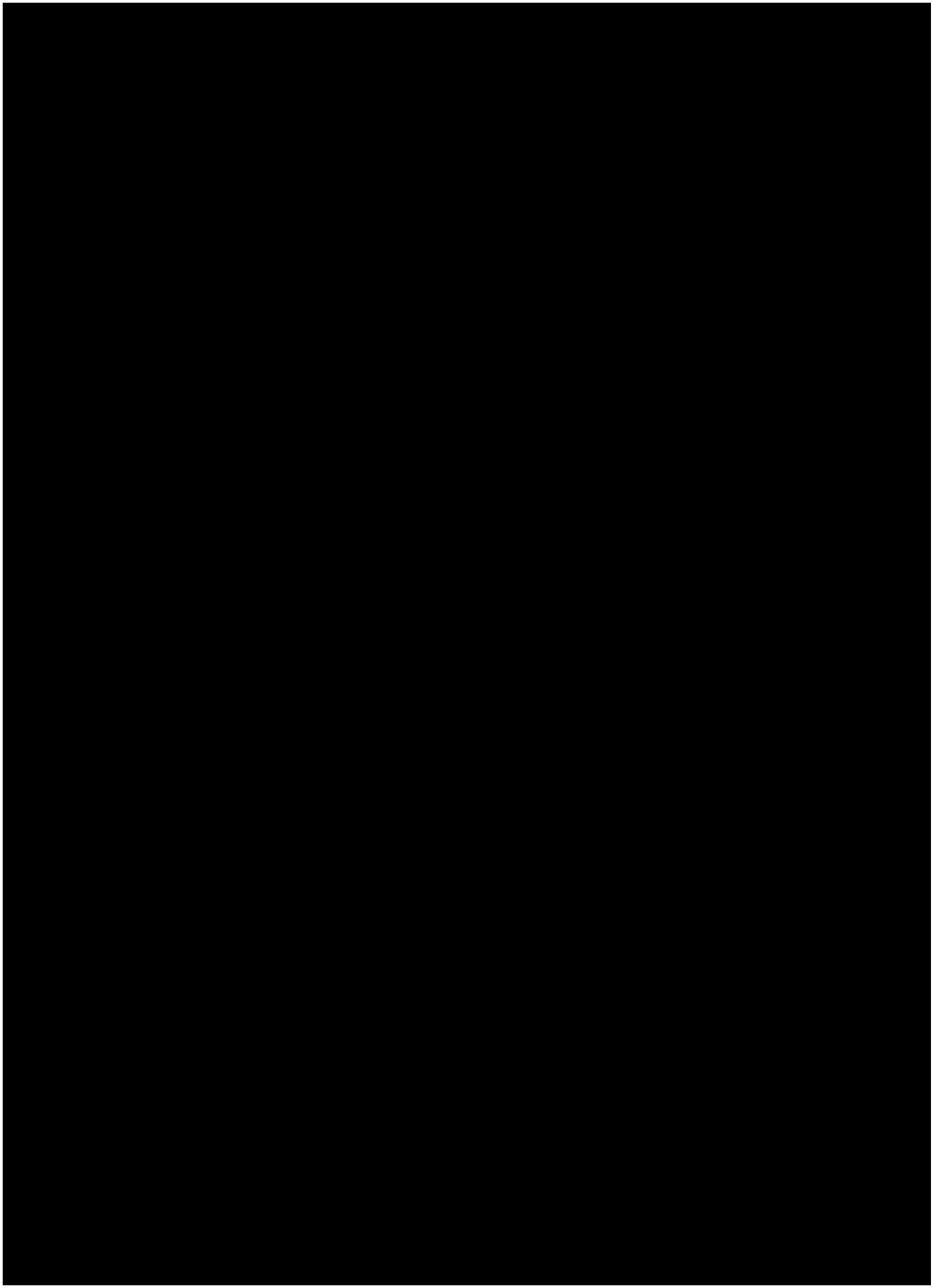












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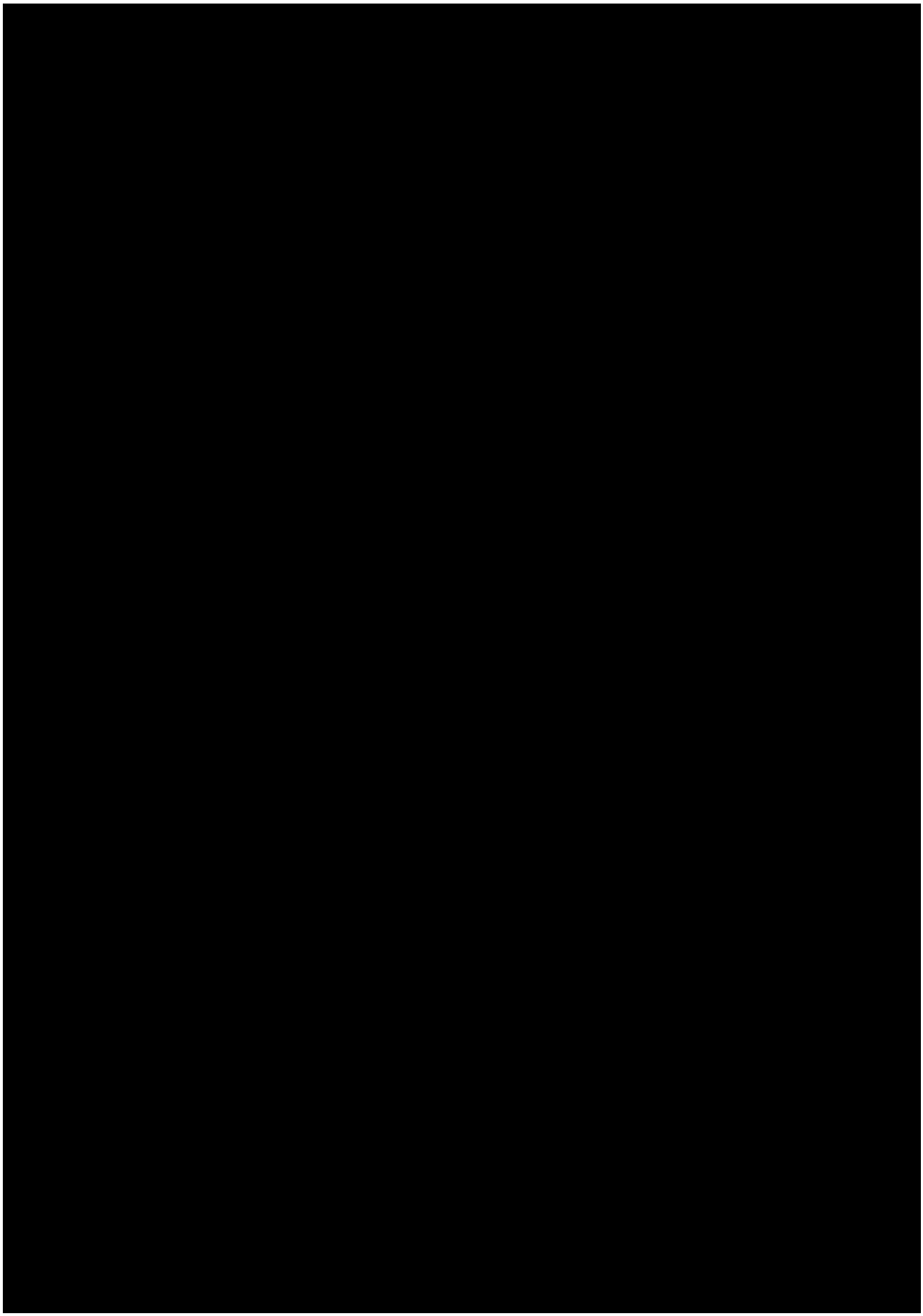

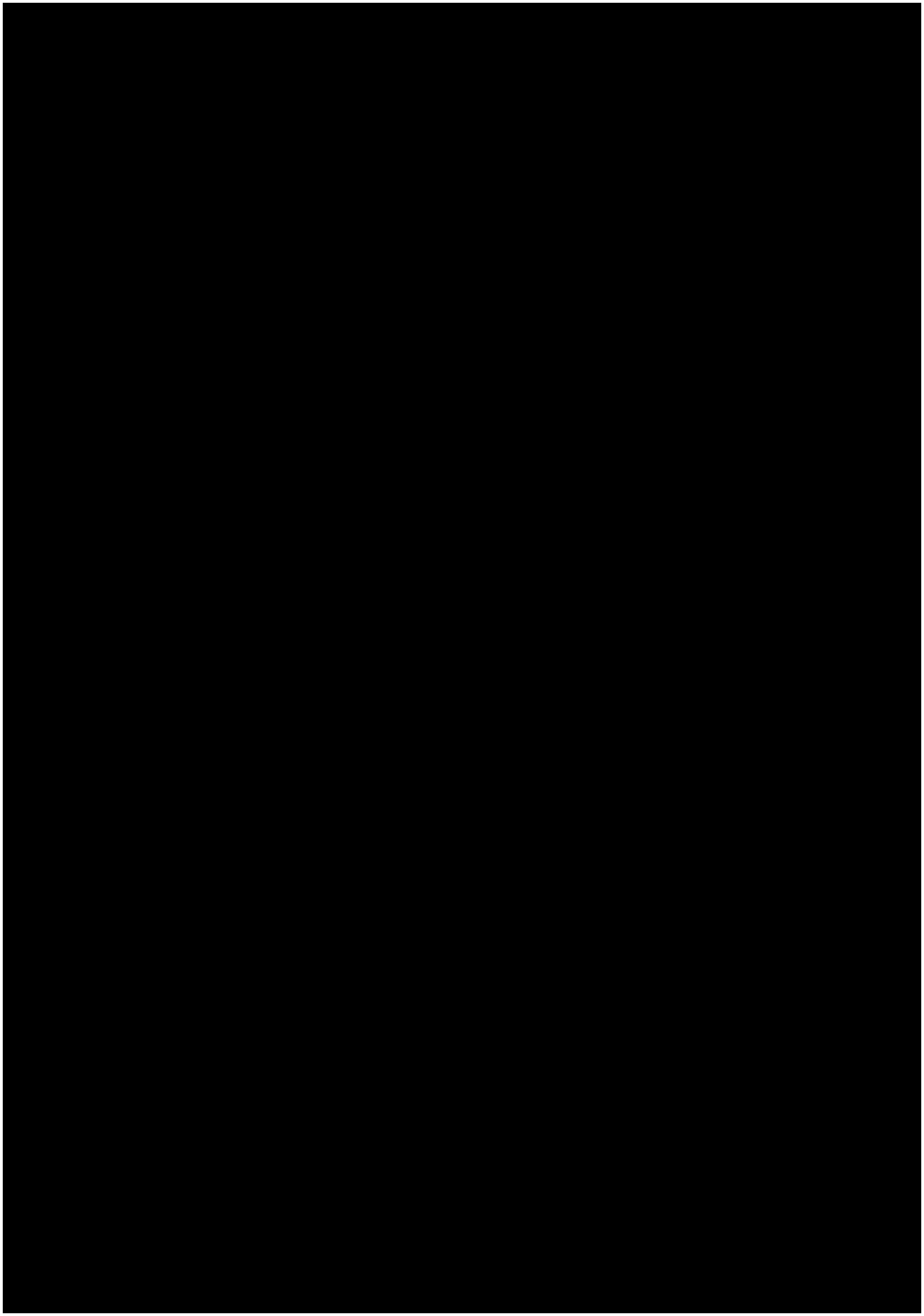

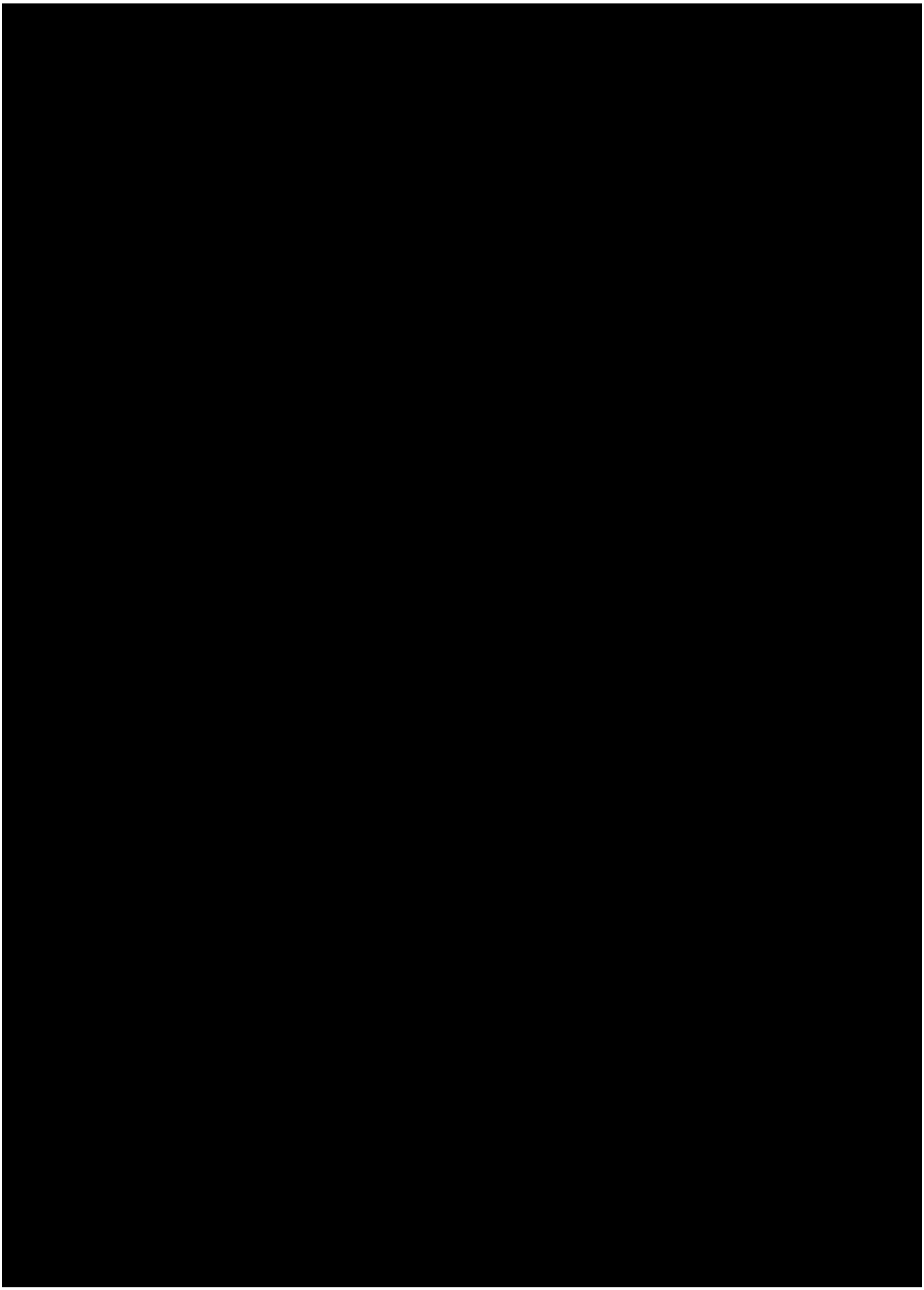

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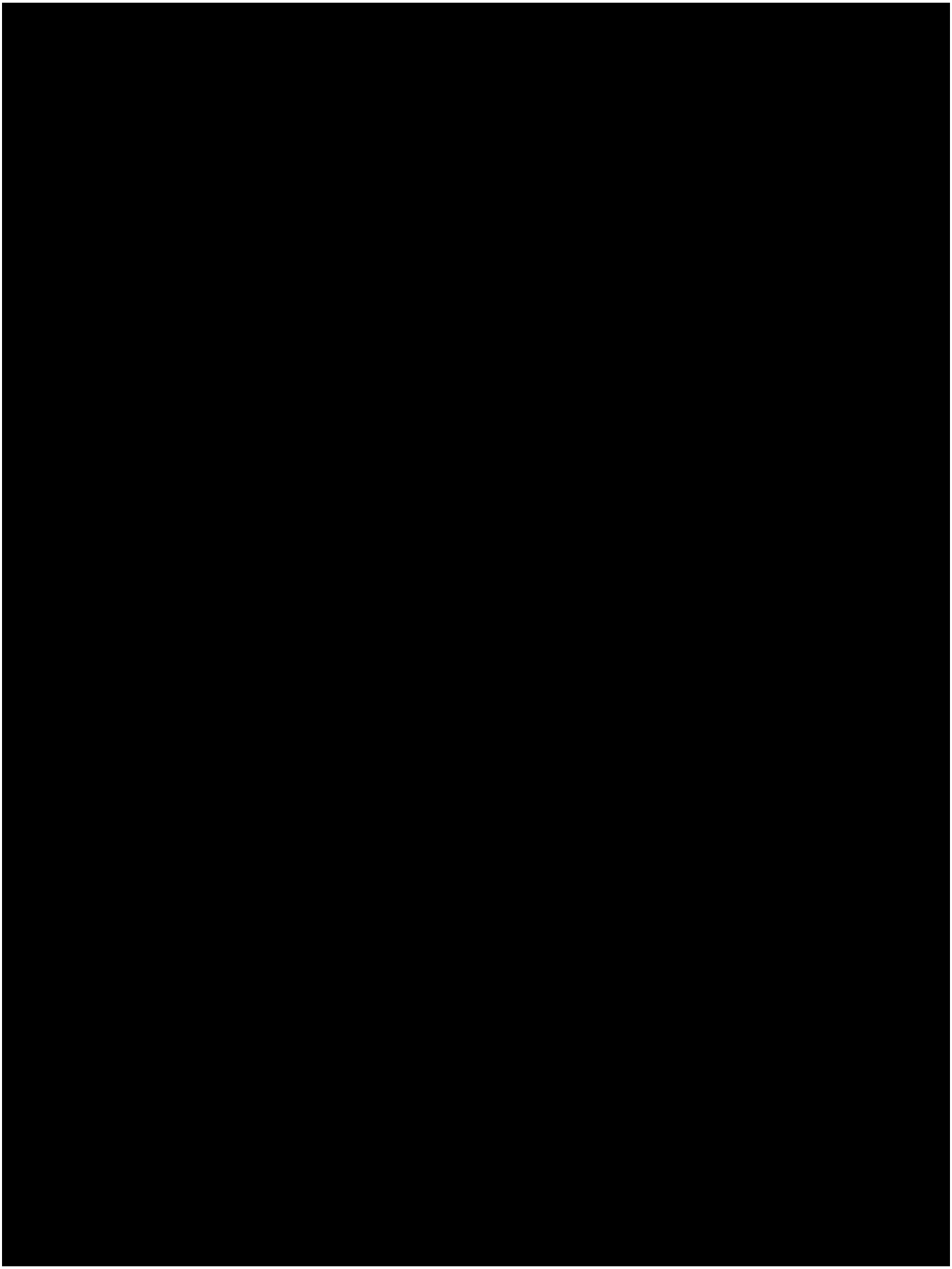


Port-Co commercial viability assessment (financial case)

Introduction and summary

- As outlined in the Structure of the Analysis section above, a conceptual port company called Port-Co is used to assess Clifford Bay commercial viability. Port-Co is the port developer/owner/operator business that is the focus of the financial case for Clifford Bay. The financial case assesses whether Port-Co generates adequate commercial return for private investors and finds that it does not. This then sets the scene for the discussion and definition of the role of government, if it wishes to proceed with the project.
- From concept engineering and costing work undertaken in 2012, Clifford Bay is expected to cost $434 million ($2014) to build.

[redacted]

1. This chapter describes the financial case for Port-Co, the entity assumed as building, owning and operating Clifford Bay, and assumed as having access to the private revenue described in the previous chapter. A simplistic but

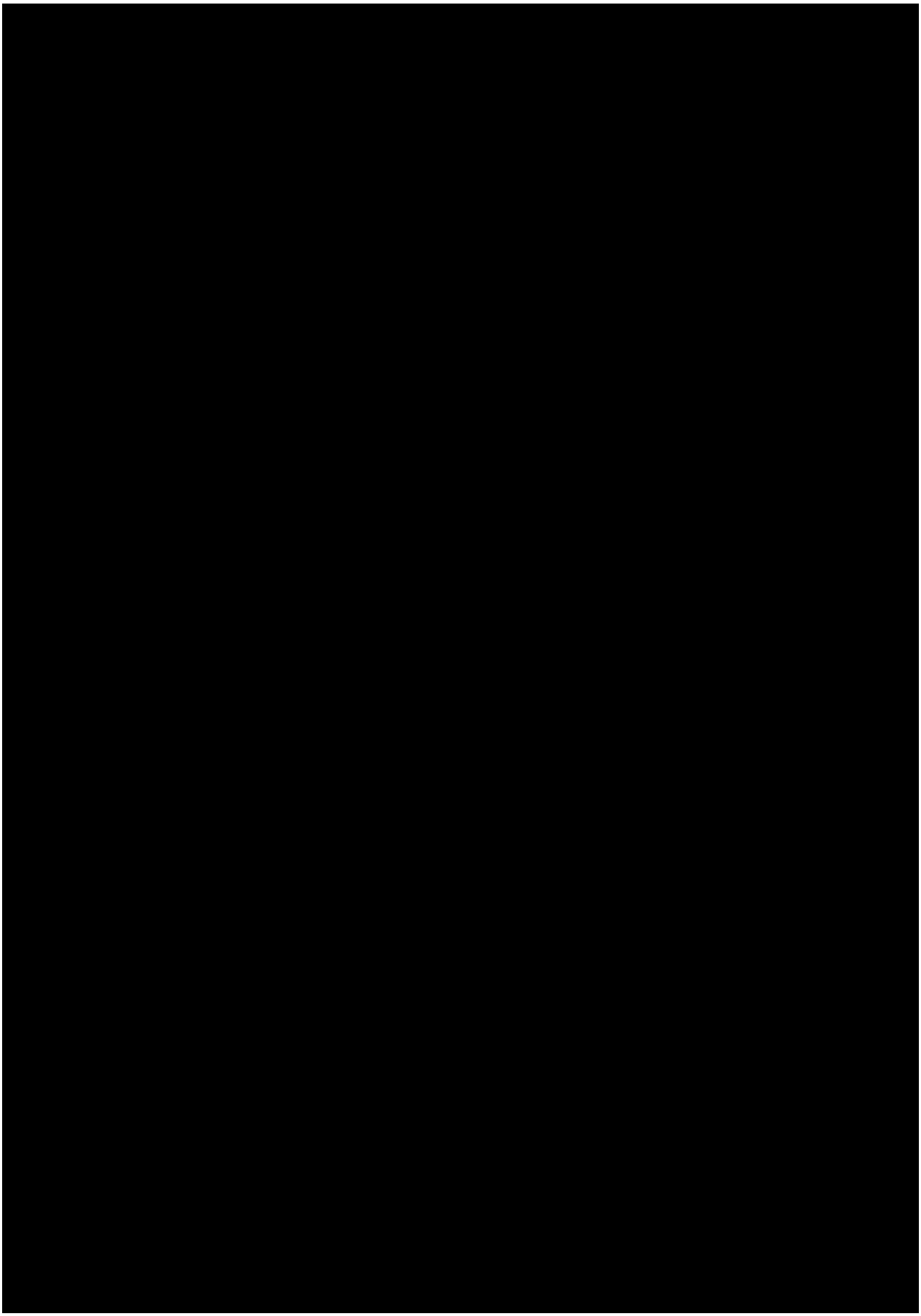
[redacted]

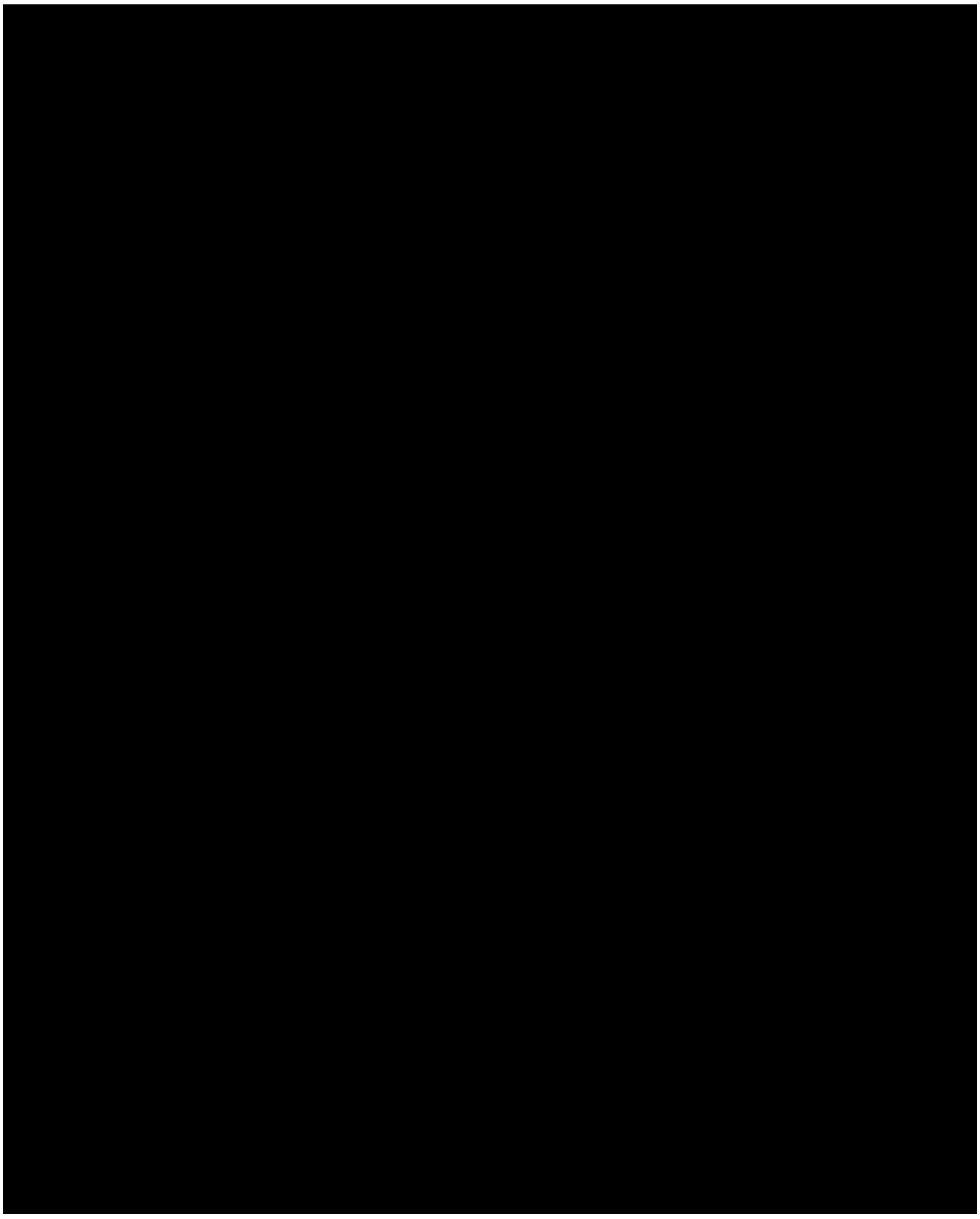
indicative funding model is used to determine if private sector owners of Port-Co would earn an appropriate financial return given the overall characteristics of the project. This enables a conclusion to be reached on whether Port-Co is viable as a project delivered by private sector investment, supported by private revenue. This then sets the scene for the discussion on the government role, if the government wishes to proceed.

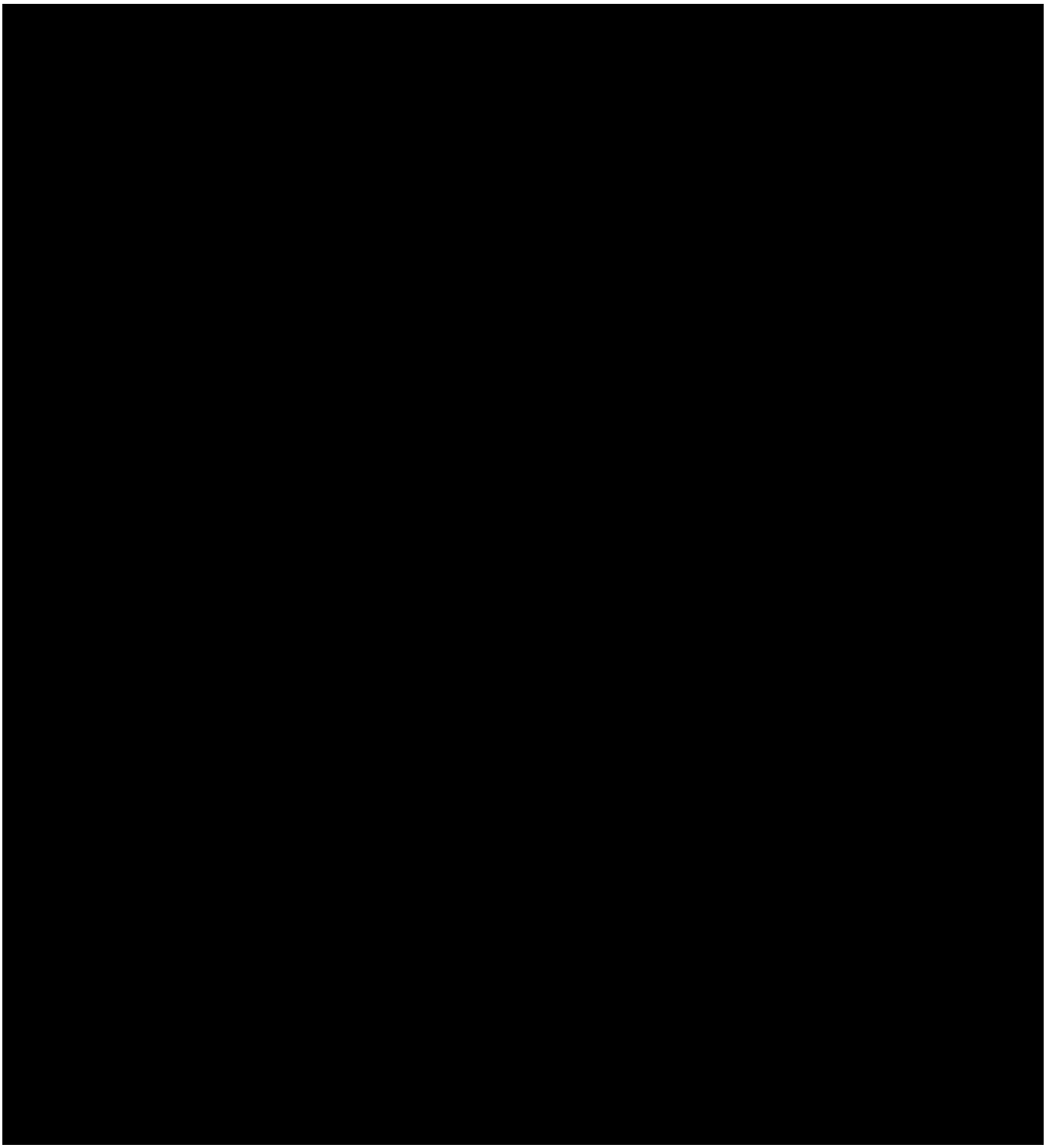
Clifford Bay costs

2. The table below summarises the costs required to develop and operate Clifford Bay. Construction and operations and maintenance costs are taken from the Beca and Deloitte 2012 work on concept design and cost of operation, inflated to 2014 dollars at CPI. The costs associated with securing land access, project approval, and the procurement process have been estimated in this investigation stage using relevant expertise and experience from other large project developments.

3. [redacted]







9. This shows that Clifford Bay cannot be viably delivered using only private funding, and that a procurement process using this model would fail. That is because it generates insufficient private revenue to provide a normal financial return to private investors.

SECTION 3 | GOVERNMENT ROLE

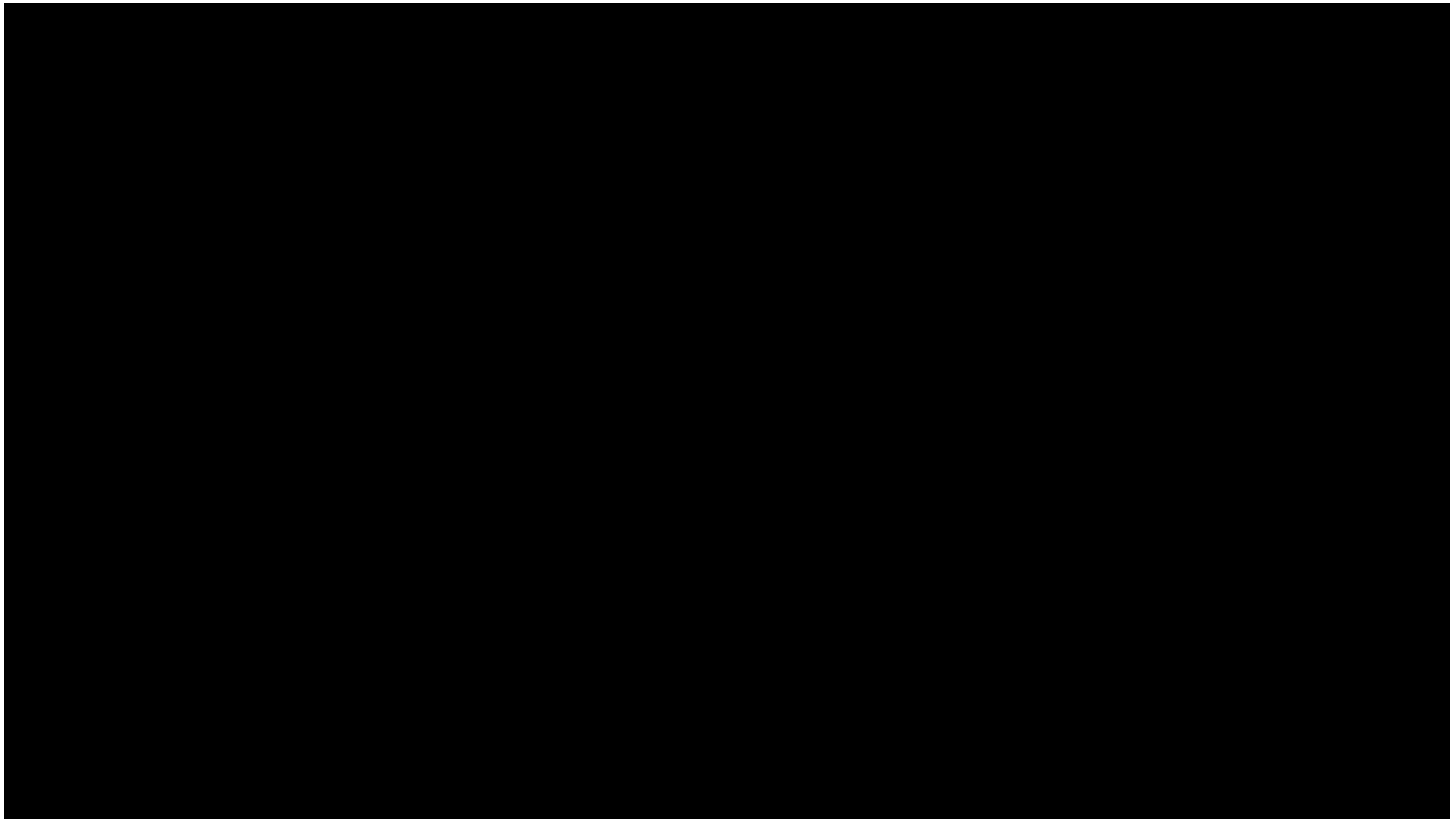
Investment gap
Economic case
Public policy considerations and economic merit
Configuration of Government investment
Business case summary

Investment gap

Government investment requirement

1. On the basis of the findings of the Port-Co commercial viability assessment, we conclude the project is only able to move to consenting / procurement if the government is prepared to play a material direct investment role in project development and delivery.

6. The government investment depends on final scheme cost and the final annual ferry terminal fees that can be collected from operators and users, and therefore the expected cost of the role could change materially in the project development phase.



Economic case

Introduction and summary

- Along-side the financial case, the economic case uses NZTA's National BCR methodology as outlined in their Economic Evaluation Manual to undertake a conventional Cost Benefit Analysis (CBA) from the perspective of the government. This identifies some benefits that are not in the financial case because they cannot be easily attributed to and collected from private entities, and flow more broadly to the economy as a whole.
- The analysis indicates that the Clifford Bay project produces an economic surplus with a net present value of [redacted] and a benefit cost ratio of 1.3.
- The largest component of project benefits are [redacted] comprising time, vehicle operating costs and externality benefits, which jointly represent [redacted] of project benefits. The next largest contributors to project benefits include reduced ferry operating costs [redacted] and Picton terminal related benefits [redacted] Other significant benefit categories include rail freight benefits and passenger benefits.
- Supporting the findings of the conventional cost benefit analysis are Wider Economic Benefits (WEBs) of [redacted] These are additional to conventional benefits of [redacted] and are derived from agglomeration benefits (productivity improvements through the bringing together of economic activity) of [redacted] and competition effects not assessed in the CBA (distribution of marginal cost changes through the economy) of [redacted]
- The summary of cost benefit analysis table and the WEBs table summarise the economic analysis findings.

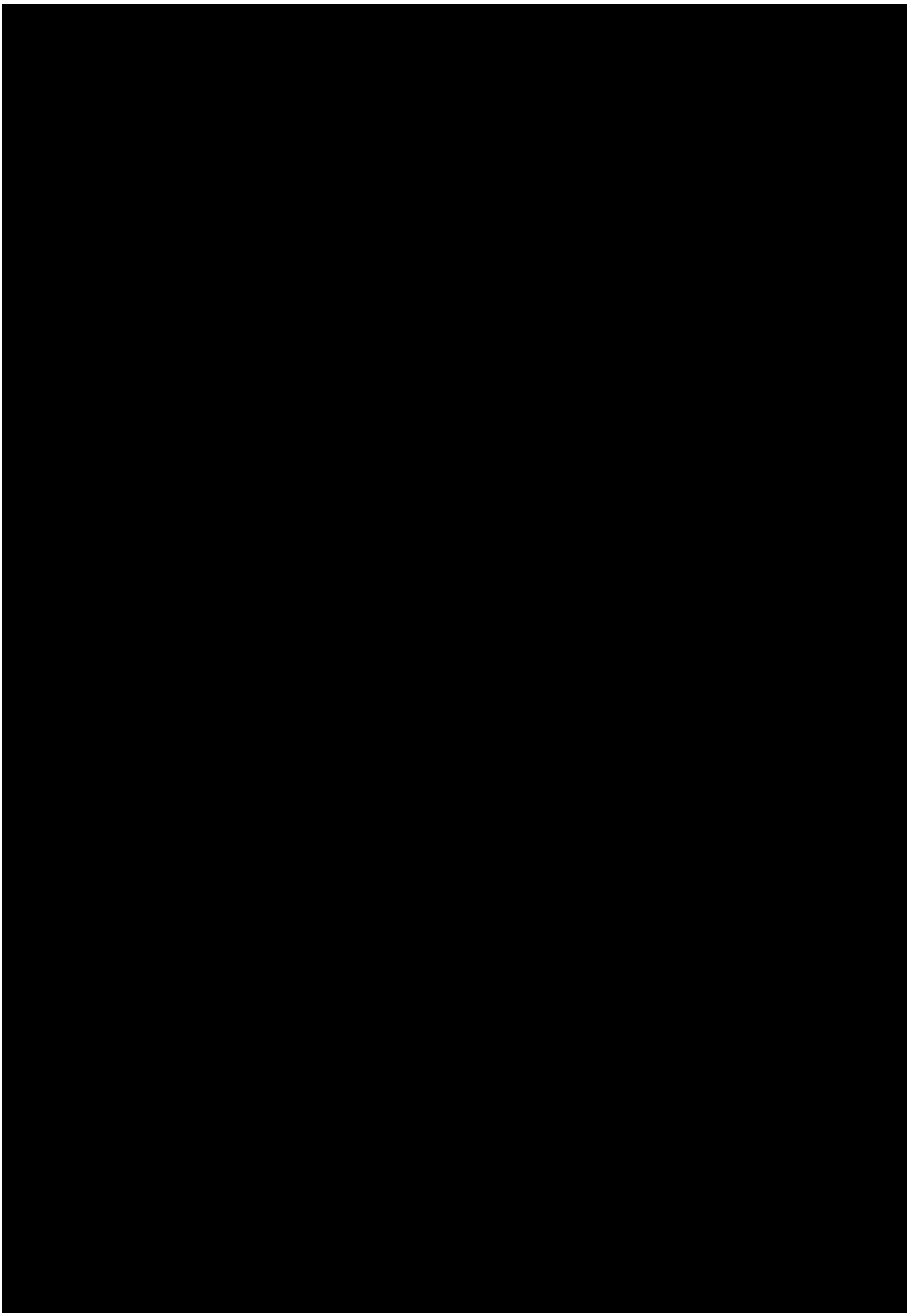
1. The economic case (public benefit perspective) complements the financial case (private benefit perspective). The principal objective of the economic case is to assess the level of benefits that may be delivered by the project to the national economy as a whole. The economic case therefore takes a broader view of the potential benefits of the project – from the perspective of society and the wider economy.

2. The economic analysis aims to identify and compare economic and social benefits accruing to the economy as a whole, setting aside monetary

transfers between stakeholders in the project. Where the financial analysis compares benefits and costs to the enterprises involved, the economic analysis compares the benefits and costs to the whole economy.

3. In addition, the economic case covers the costs and benefits of goods and services that are not sold in the market and therefore have no market price - in other words externalities and other indirect costs and benefits.

4. This chapter summarises the results of the Ministry of Transport's report "Clifford Bay Further Investigation: An Update of the Economic Case", 2013.



[redacted]

Approach

5. The economic case assesses the incremental costs and benefits of the development of Clifford Bay as compared with the base case – being the "do minimum" scenario of staying at Picton.

6. In general, the approach recommended in the NZTA's EEM has been used to guide the economic evaluation. Where appropriate the methods recommended in the EEM to valuing individual elements of the conventional cost benefit analysis component of the economic evaluation have been used. However as the EEM has been developed primarily for the purposes of evaluating road and public transport infrastructure projects, a number of elements within the Clifford Bay investigation, such as maritime and rail freight, are not considered in the EEM. In these circumstances alternative methods, including direct estimation of costs, have been used. The approach taken to the valuation of individual elements is described in each section below.

9. Sensitivities have been applied to key variables to ascertain the level of influence each variable has on the outcome and to address the potential for inaccuracies within underlying assumptions.

10. Many of the 'direct' costs and benefits identified in the conventional cost benefit analysis are transformed into other 'indirect' effects as individuals respond to improvements in the transport system delivered by the project. Time and cost savings to firms may result in lower prices, higher wages or increased profits. An assessment of WEBs has therefore been undertaken as part of the economic case to quantify these second order effects on wider economic activity. Specific benefits assessed include agglomeration benefits (the benefits that firms obtain by being closer to each other), improvements to labour productivity and supply, and benefits from the flow on effect of marginal cost changes to the rest of the economy (the effects of imperfect competition which are not identified in the conventional CBA).

General assumptions

11. The general assumptions used in the economic evaluation are consistent with the financial case unless otherwise specified.

Table 25: General assumptions

Parameter	Approach	Comments
Cash flows	Annual	July to June year
Base year (Year 0)	2014	This means all Present Values (PVs) refer to FY2014.
Dollar values	2014	2012 dollars are updated to 2014 dollars using CPI and wage inflation forecasts obtained from the NZ Treasury. All estimates are tax and GST exclusive (unless otherwise indicated).
Project start year	2018	2019 and 2020 are used as alternate start years in sensitivity analysis.
Evaluation period	a) 30 years b) 58 years	In accordance with EEM, 30 years from project start year. To cover economic life of facility and for presentational purposes.
Residual value	Included in 30-year evaluation method	Two methods used: (i) Discounted net benefits for remaining years (default method) (ii) Discounted net financial benefits for remaining years
Discount rate	8% real	In accordance with NZ Treasury's recommendation. Sensitivity test were applied at 6% and 9%.

Demand assumptions

12. The assumptions in relation to current and projected demand for freight and passengers are as described in the freight and passenger demand chapter and are consistent with the financial case unless otherwise specified.

Costs

13. Capital costs for the Base Case and Clifford Bay scenarios are as described in the Port-Co viability assessment chapter.

14. Port operating costs are as described in the Port-Co viability assessment chapter. Port operating costs are considered to be higher at Clifford Bay due to, inter alia, breakwater maintenance, offshore dredging and disposal, and higher insurance costs.

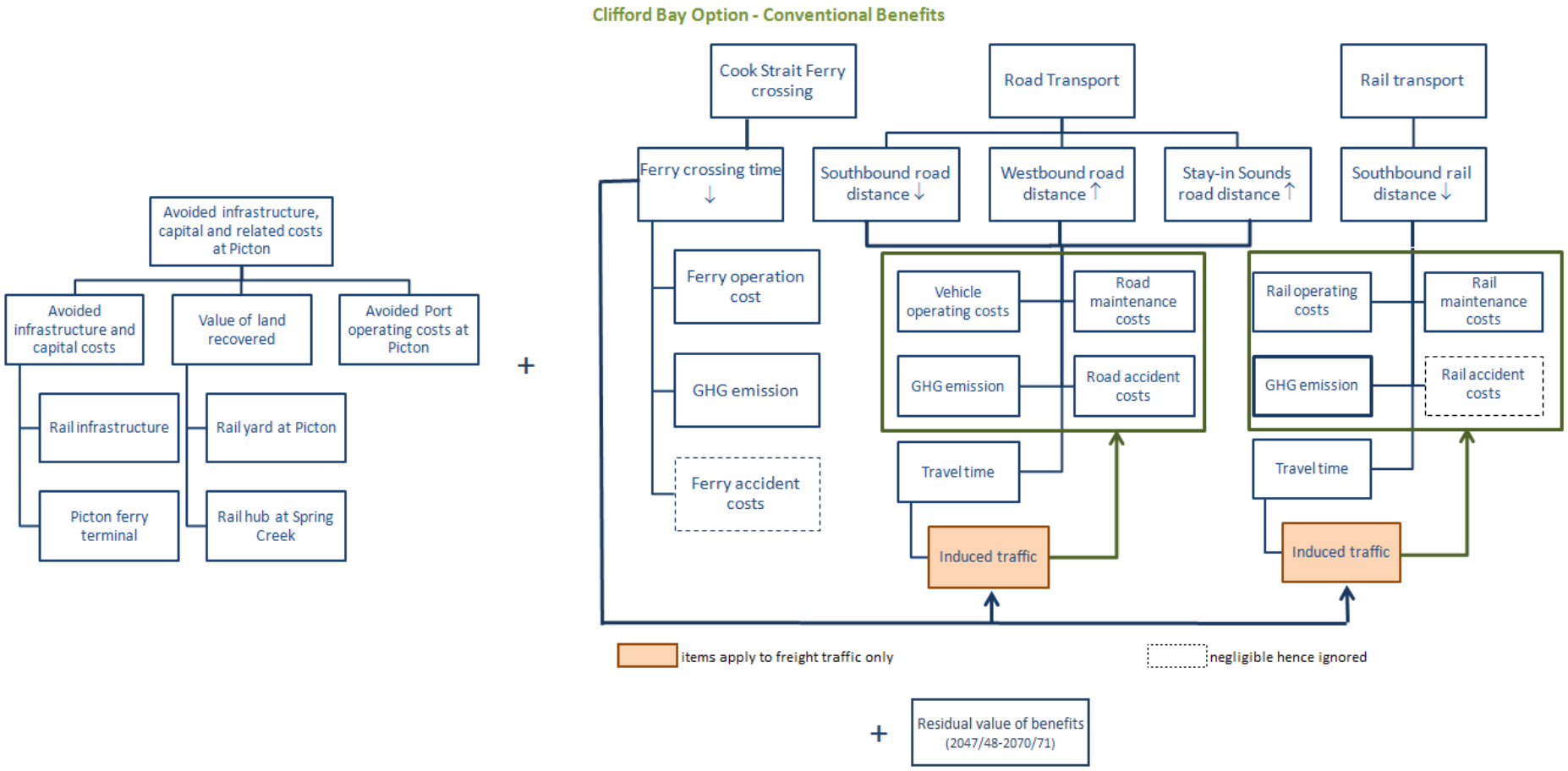
Benefits

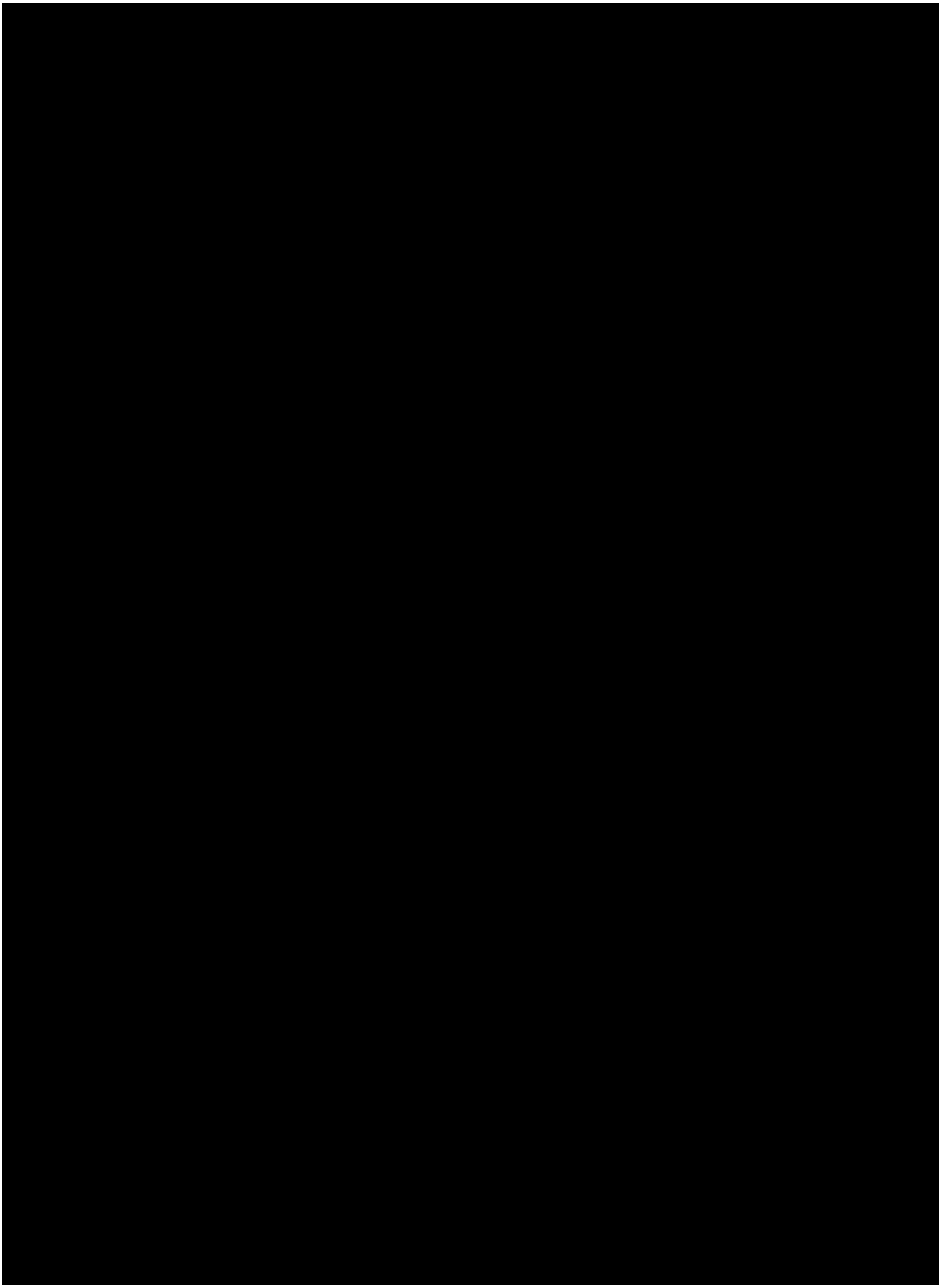
15. Benefits assessed as part of the cost benefit analysis are illustrated in Figure 16 below.

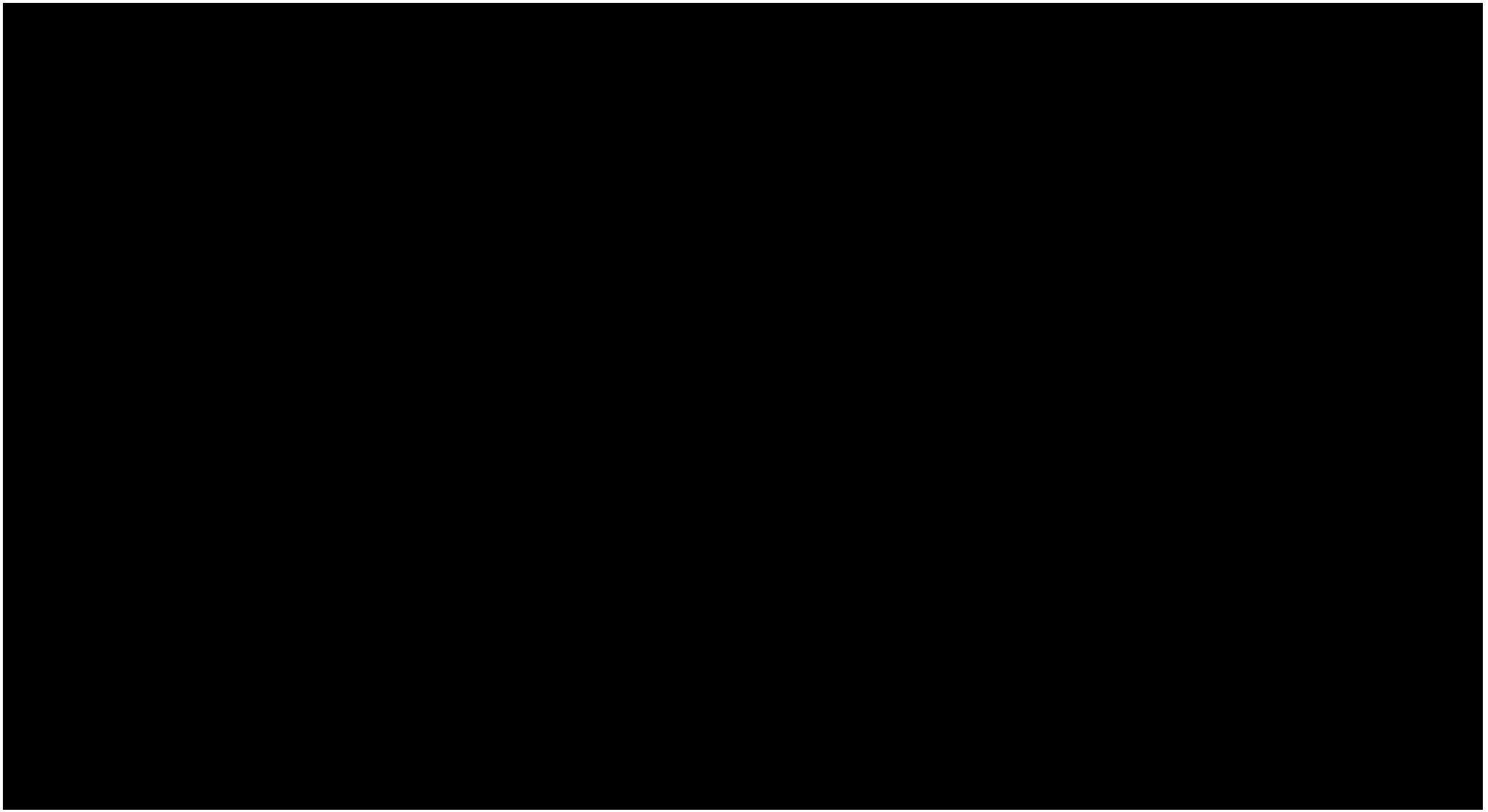
16. The conventional benefits of the Clifford Bay scenario can be classified into seven broad categories.

    a) A reduction in travel time to freight and passenger users.
    b) A reduction in transport vehicles or vessels' operating costs.
    c) A reduction in safety and environmental costs due to a reduction in travel distance.
    d) A reduction in infrastructure costs.
    e) Induced demand from the freight sector resulting from travel time reduction.
    f) Residual value of the project – valued as the net benefit streams accruing to the project beyond the evaluation period.
    g) Other benefits (e.g. Picton infrastructure costs avoided, value of land recovered from Picton).

Figurer18: Schematic of benefits included in the conventional cost-benefit analysis







Wider economic benefits

Overview

22. WEBs, including agglomeration, accounting for imperfect competition effects, labour supply and employment redistribution benefits, are productivity gains that are additional to the conventional Cost Benefit Analysis.

23. Estimates of WEBs generated by the relocation of the ferry terminal to Clifford Bay are summarized in the Table below.[38]

[redacted]

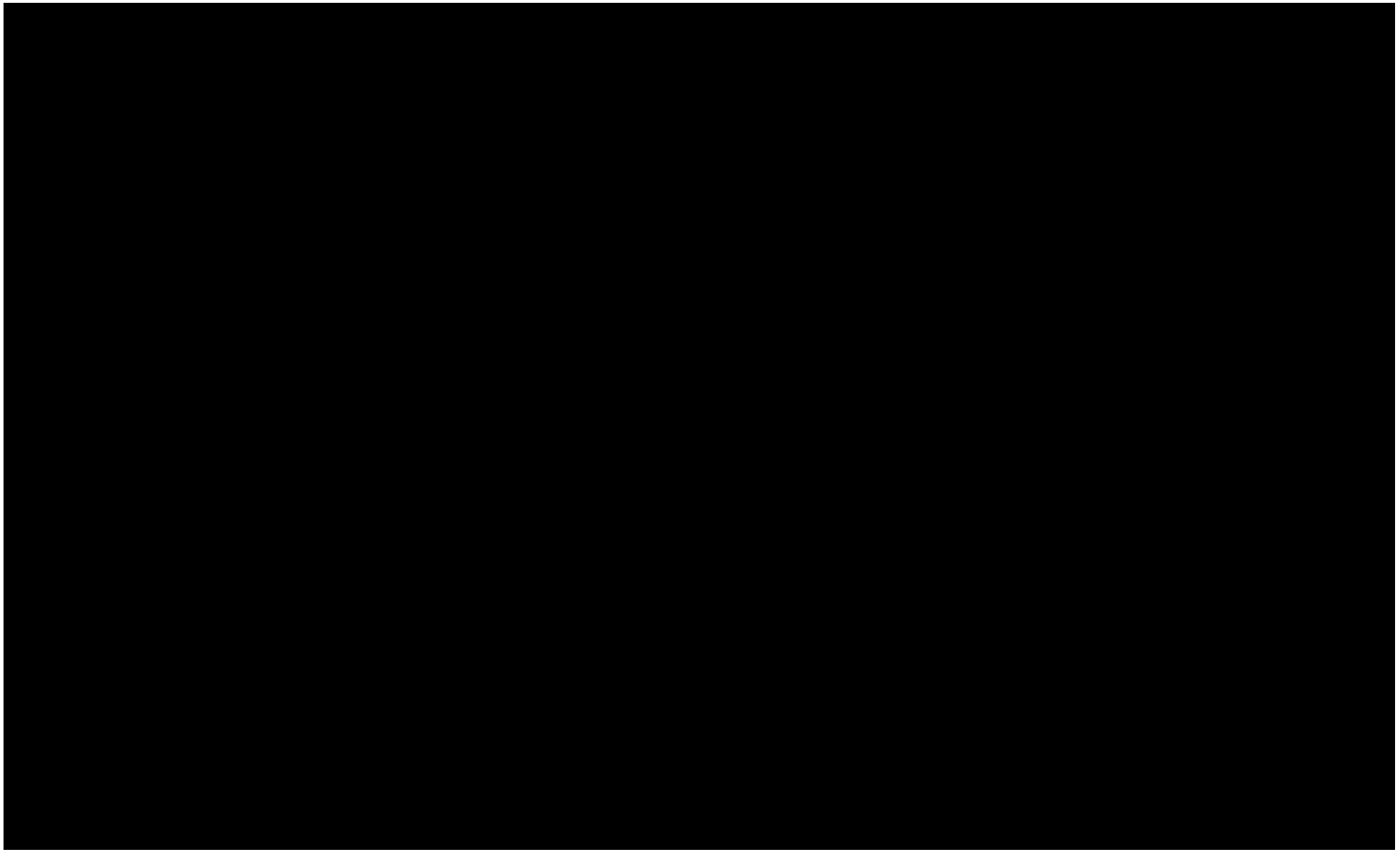
Conclusion

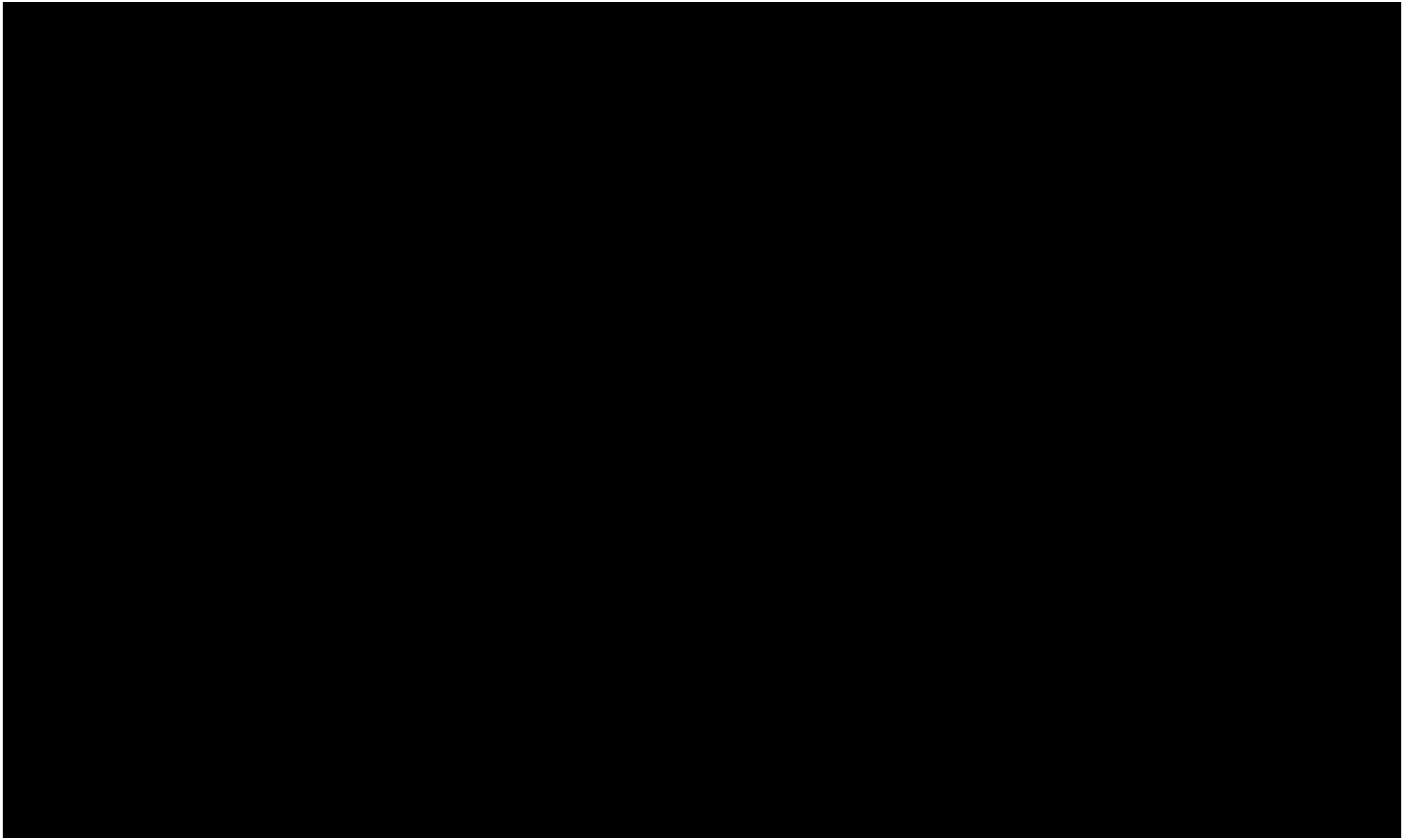
24. The analysis indicates that the Clifford Bay project produces an economic surplus with a net present value of [redacted] and a benefit cost ratio of 1.3.

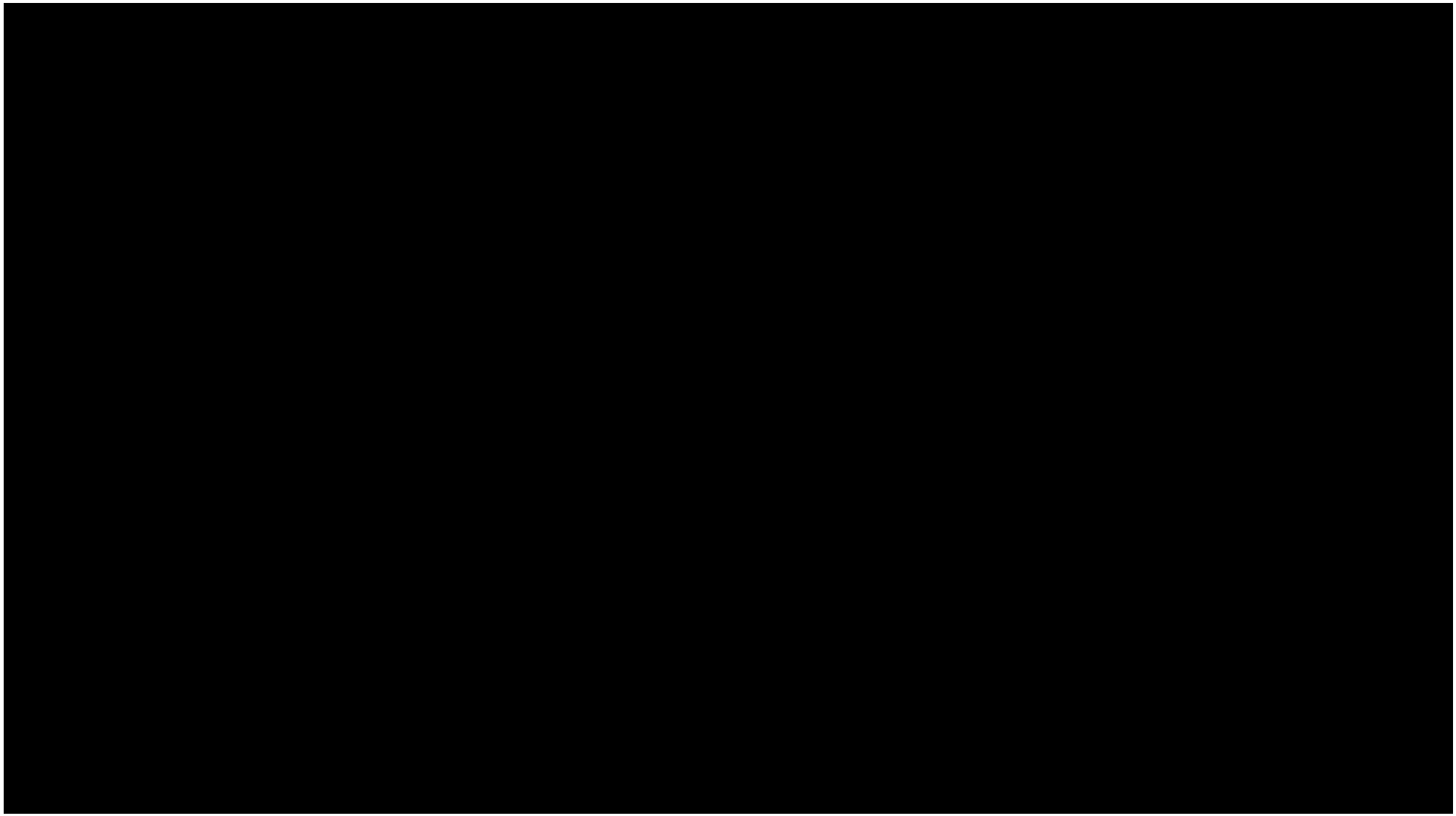
25. Analysis of a range of key variables indicates that the project is relatively stable against changes in these variables. With [redacted] confidence, the range of NPV is between [redacted] and [redacted] and the range of BCR is between [redacted]

26. Supporting the findings of the conventional cost benefit analysis are WEBs of [redacted] (in present value terms). These are additional to the conventional benefits, and are derived from agglomeration benefits (productivity improvements through the bringing together of economic activity) of [redacted] and competition effects not assessed in the CBA (distribution of marginal cost changes through the economy) of [redacted]

35The funding of Clifford Bay may include arrangements for charges aimed at clawing back savings in operating cost savings for road and rail freight and the ferry operators. Such a claw-back arrangement would reduce the benefits to freight users and ferry operators. While in terms of the conventional CBA this would be a neutral impact on the NPV of the project (lower user benefits would be offset by lower port/ ferry operating costs net of the associated revenues), it would have a negative impact on Wider Economic Benefits. However, since such funding arrangements have not been agreed upon, the current WEBs assessment assume that, in consistency with the conventional CBA, there is no claw-back of transport operating costs.







Public policy considerations

Introduction and summary

Across the transport network government plays a direct role in the investment of road and rail networks. For the Clifford Bay project to proceed, the government will need to play a direct role.

Government investment would unlock private sector investment and therefore realise national economic benefits.

The Cook Strait link is a core component of the road and rail transport network. The opportunity to improve this link is considered to have high strategic fit (based on the NZ Transport Agency's NLTP Assessment Framework) because:

- it has the potential for a nationally significant contribution to economic growth and productivity for national strategic State highways, through reduced travel time and costs
- it will improve journey time reliability as a result of time savings
- it will remove constraints that currently exist at Picton
- it will enable more efficient freight supply chains
- it will improve the security and resilience of the road and rail network

Rationale for government participation

1. In announcing the decision to further investigate the viability of moving the ferry terminal to Clifford Bay, Minister Brownlee stated in November 2012 that "the government is looking at the road and rail link between the North and South Islands from a national transport perspective and is interested in the long-term advantages that could be realised from having the ferry terminal at Clifford Bay rather than Picton." This statement provides the context for the discussion in this chapter.

The role of government in transport

2. Across the transport network the government plays a direct role, by investing in new, improved, road and rail networks, public transport infrastructure and services, along with maintaining existing networks. The government does this, either fully or partially, when the private sector is unwilling or unable to invest in transport outcomes. Government also plays an indirect role in facilitating investment in other sectors by supporting integrated planning decisions,

providing a stable regulatory environment and regulating market power e.g. information disclosure regime for airports.

3. Government seeks to accommodate social, economic and environmental goals and aspirations of New Zealand society. Land transport prospoals are assessed against the objectives of the Land Transport Management Act for investments to be "effective, efficient and safe land transport system in the public interest."

4. The government's planning and investment approach aims to improve the network so it provides the best return on investment for transport system users and also provides a wider return for New Zealand as a whole. The relationship between government investment, and the transport and wider public good outcomes this investment realises, is a key investment consideration.

Primary benefits from the Crown playing a direct role in a Clifford Bay project

Realise national economic benefits

5. The development of a ferry terminal at Clifford Bay would enable national economic benefits to be realised - as reflected in the benefit cost ratio. In particular, the significant travel time savings would improve the efficiency of freight movements and improve national network connectivity. As discussed in the strategic chapter, travel time savings, efficient freight movements and improved network connectivity have been shown to improve trade performance, GDP and wellbeing.

6. A decision by the government to invest in the development of a ferry terminal at Clifford Bay would also promote the government's transport aims of having an efficient, effective and safe land transport system in the public interest.

7. The significant travel time savings for road and rail freight will enable, overtime, changes to the way passengers and freight are moved between and within the two islands. For example, a commercial vehicle operator would reach Christchurch about 1.5 hours earlier than if using Picton. The savings being three hours for a round trip. The benefits of this time saving would likely be spread throughout the national supply chain.

Realise strategic benefits and contribute to Business Growth Agenda

8. The development of a ferry terminal at Clifford Bay and the reduction of travel and travel time within New Zealand's national supply chain would contribute to the Business Growth Agenda vision of "By 2030 New Zealand's

infrastructure is resilient and coordinated and contributes to economic growth and increased quality of life[39].

9. As most of the freight moved on the ferries is time sensitive, improvements in travel time and reliability will have significant benefits. This would include greater flexibility in close out times for freight being loaded at the point of origin. The time savings could also open new domestic markets for time critical goods such as shelf-limited dairy products and bread.

Enable private sector investment

10. Government investment could support the achievement of the wider public benefits, through improved national connectivity, that a commercial operator would not directly benefit from. The government investment would therefore enable private sector participation, and private capital, in the next stage. . Private participation in Clifford Bay brings specialist expertise in project development and operations, transfers a range of risks to the private sector and brings in alternative funding sources. While the latter reduces the level of direct funding into the project required by government, it does not change the economic returns delivered by the project (as represented by the benefit cost ratio of 1.3). The benefits and costs of the project remain the same from an economic perspective regardless of funding mix.

Secondary benefits from the Crown playing a direct role in a Clifford Bay project

39 Business Growth Agenda progress report Nov 2012, p17.

Contribute to resilience

13. Resilience is one of the six guiding principles of the National Infrastructure Plan 2011. The plan defines resilience as a position in which "*national infrastructure networks are able to deal with significant disruption and changing circumstances".*

14. A ferry terminal at Clifford Bay would add to New Zealand's transport system resilience by providing a workable alternative should an event arise that compromises port function in the top of the South island.

15. As discussed in preceding chapters the movement of passengers and goods across the Cook Strait will need to adapt to changing conditions in the future. These relate to forecast increase in the Cook Strait freight task of 61% by 2040 and the increasing speed restrictions that would be placed on any new vessels serving Cook Strait. If the ferry terminal is moved to Clifford Bay, the road and rail transport system would become more resilient in the longer term to an increasing freight task.

Regional impacts and benefits

16. As discussed in the economic case chapter, moving the ferry terminal to Clifford Bay would see positive and negative agglomeration impacts. 'Westbound' South Island regions would see negative agglomeration impacts due to the longer travel distances and increased resultant costs.

17. In comparison, the rest of the South Island and the North Island show improved effective densities and consequently realise agglomeration benefits. The net agglomeration benefit to New Zealand is estimated at [redacted] in present value terms.

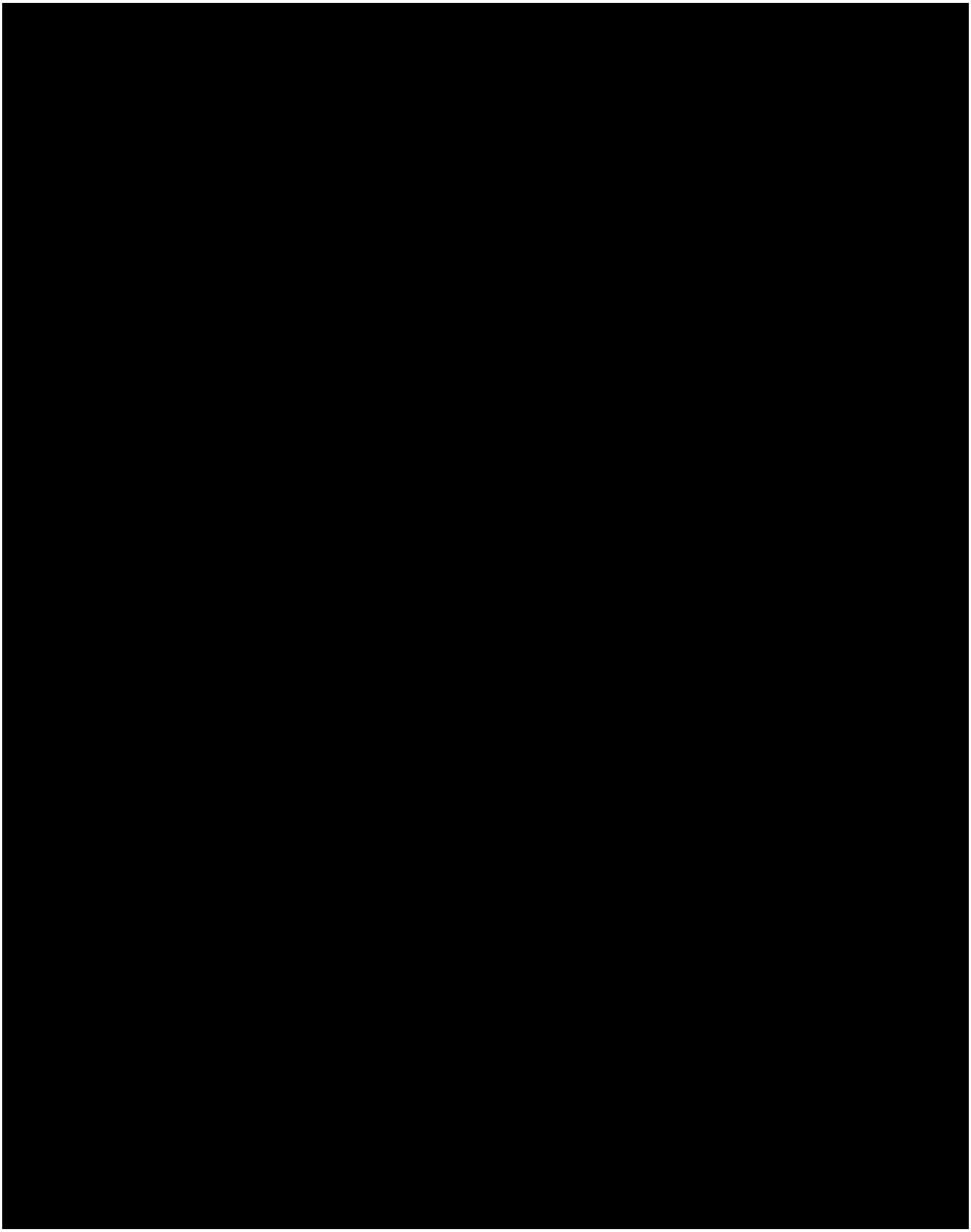
Perception of travel time savings and accessibility

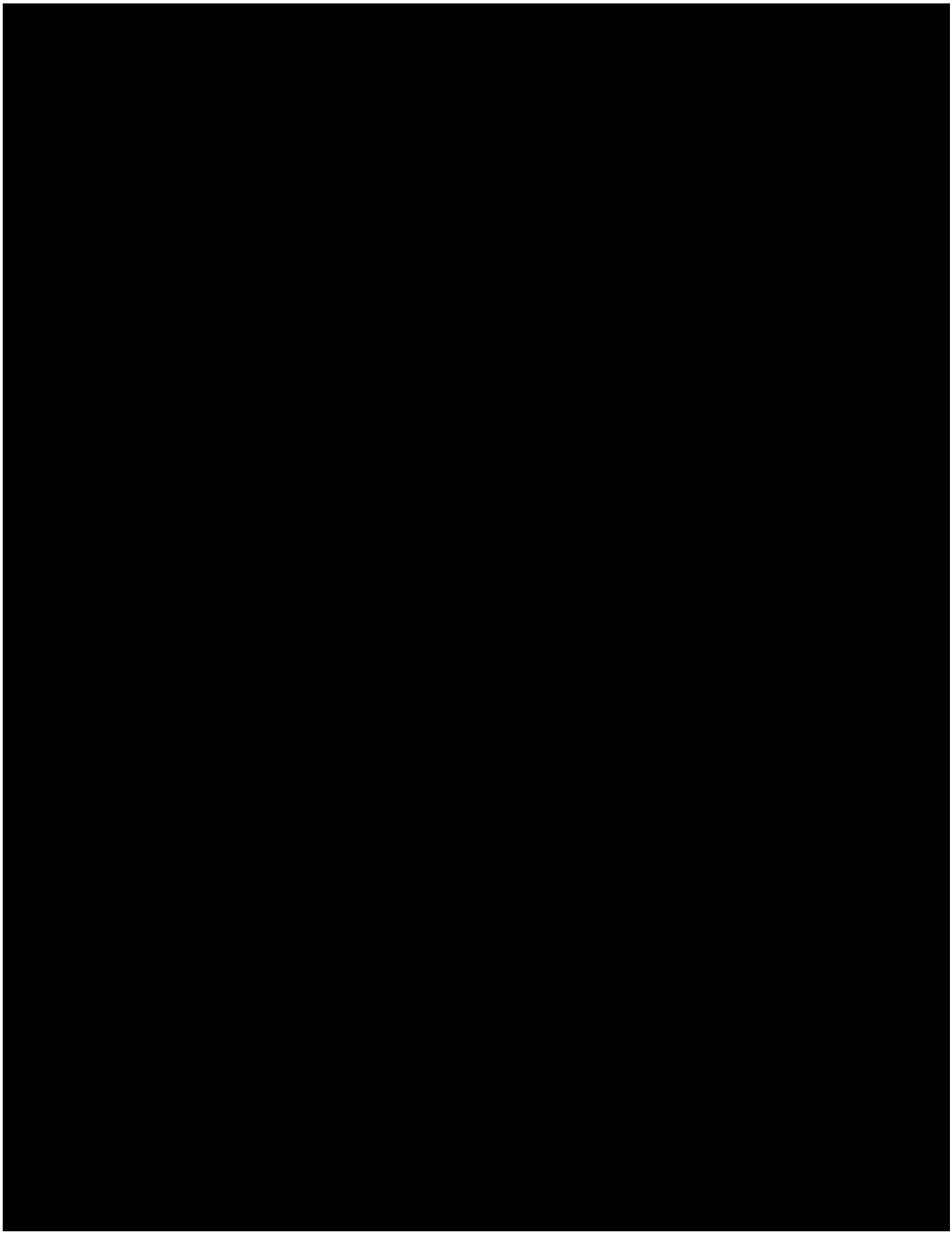
18. Aside from an economic analysis of the value of time savings, better connectivity will change the way people see travel between the islands. There is a clear perception element to any project that generates significant time savings. Saving around 75 minutes by road from Wellington to Christchurch is likely to change travel patterns and business decisions.

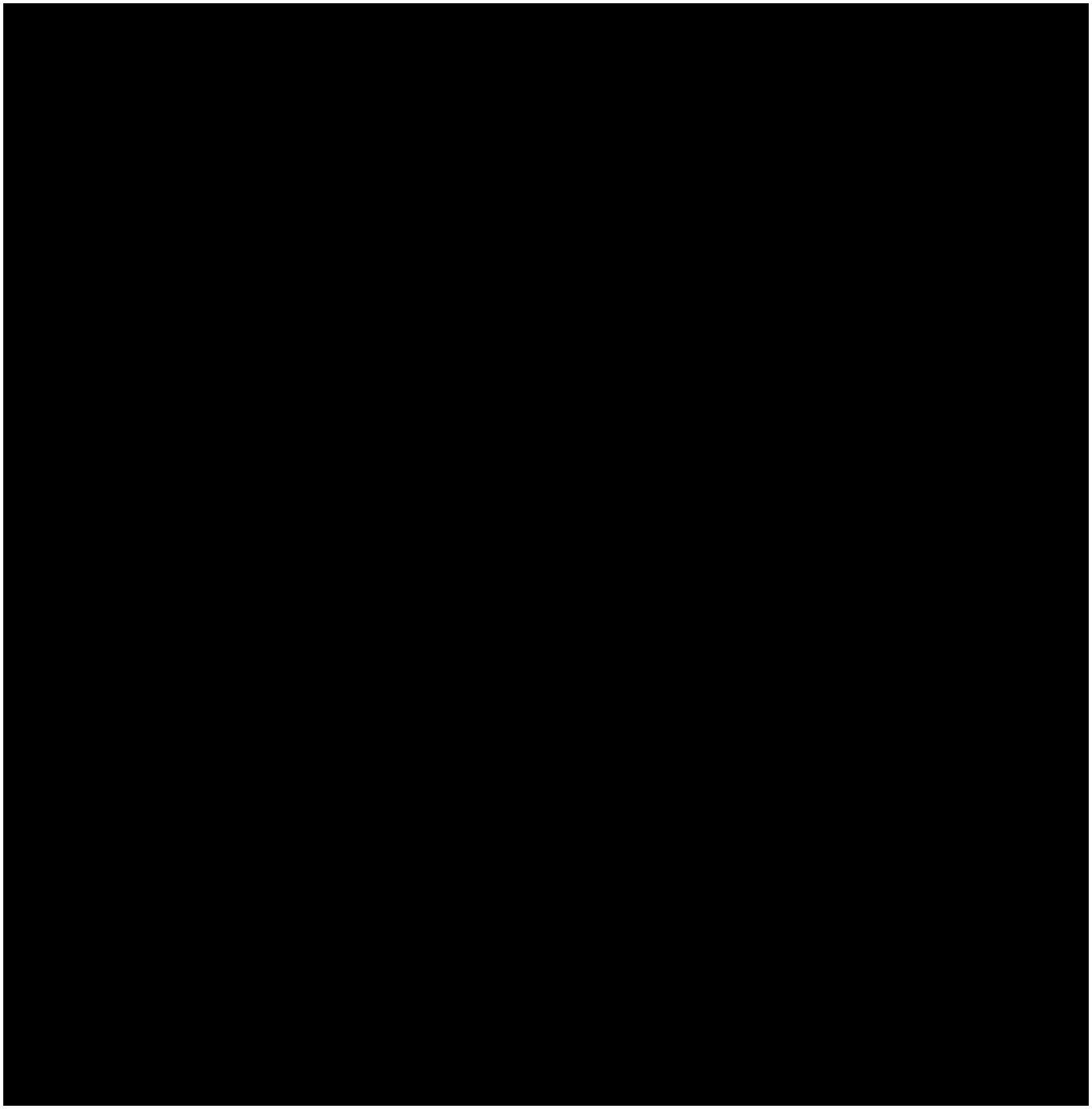
19. For example, a commercial vehicle operator based in Auckland could depart Auckland about 1.5 hours later than he/she would have done for a Picton ferry journey. This additional time could be used to ensure the vehicle was loaded to full capacity or to undertake other business transactions. Also, a family living in Wellington could go whale watching at Kaikoura for a day trip if the ferry terminal was moved to Clifford Bay.

20. People travelling to Nelson, Blenheim or the West Coast would still be advantaged if the terminal was moved to Clifford Bay as the total time savings

for this journey would be 21 minutes. However the land-side journey would be slightly longer - 14 minutes.

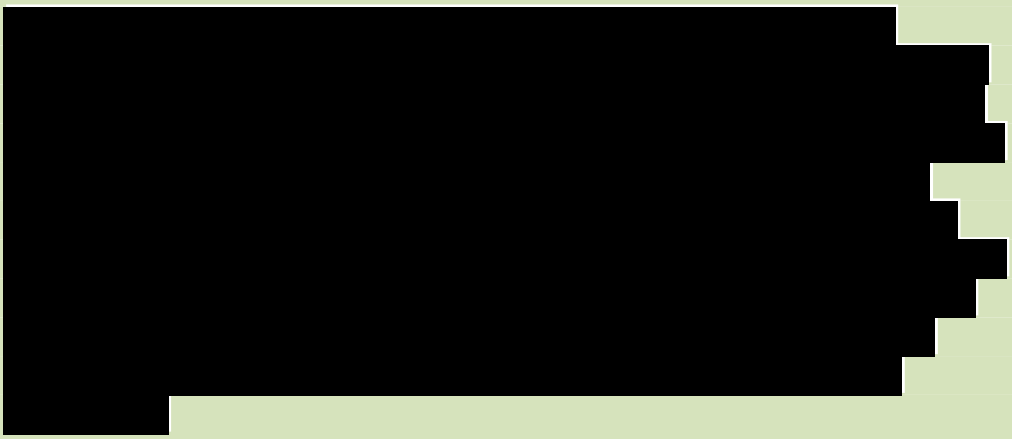






Configuration of government investment

Introduction and summary

- Previous chapters have outlined that Clifford Bay performs adequately under economic assessment on a whole of economy basis but does not reward private investors enough to be viable as a private sector commercial proposition. This means that although over half the infrastructure could theoretically be provided by the private sector, without government participation a procurement process would fail.
- At this point the government has two options. The first is to terminate the project. The second is to move it forward in clear view of the requirement for a) ongoing sponsorship, risk exposure and expenditure in the development phase, b) direct investment in project delivery, and c) some sharing of the key risks that impact on the cost and availability of private sector funding.
- A viable method of project development, delivery and operation that minimises government commercial participation as far as is practical has been identified. If the project proceeds to the next stage this method will need to be developed and refined. It represents the "enabling" government role in project delivery and operation that is expected to attract the highest degree of risk adjusted investment appetite by the private sector.
- Market feedback identified that investment appetite existed if key risks could be clearly communicated and appropriately managed, and clarity provided on the role of government. This includes government sponsorship of the approvals process and the process to secure the necessary ownership and access rights to land.
- 

1. The Clifford Bay Investigation has been undertaken in the knowledge that the government wishes to minimise its commercial involvement in the project if it proceeds, and has found that Clifford Bay cannot be executed as a fully private sector funded project. If the government wishes to proceed with the project, this chapter is provided to inform decision makers of the kind of role the government would need to play.

Market feedback

2. In 2012 a preliminary market sounding exercise was undertaken to gauge market appetite for investment in, and ownership and operation of Clifford Bay. This included feedback on the risk and configuration considerations that impact on this appetite.

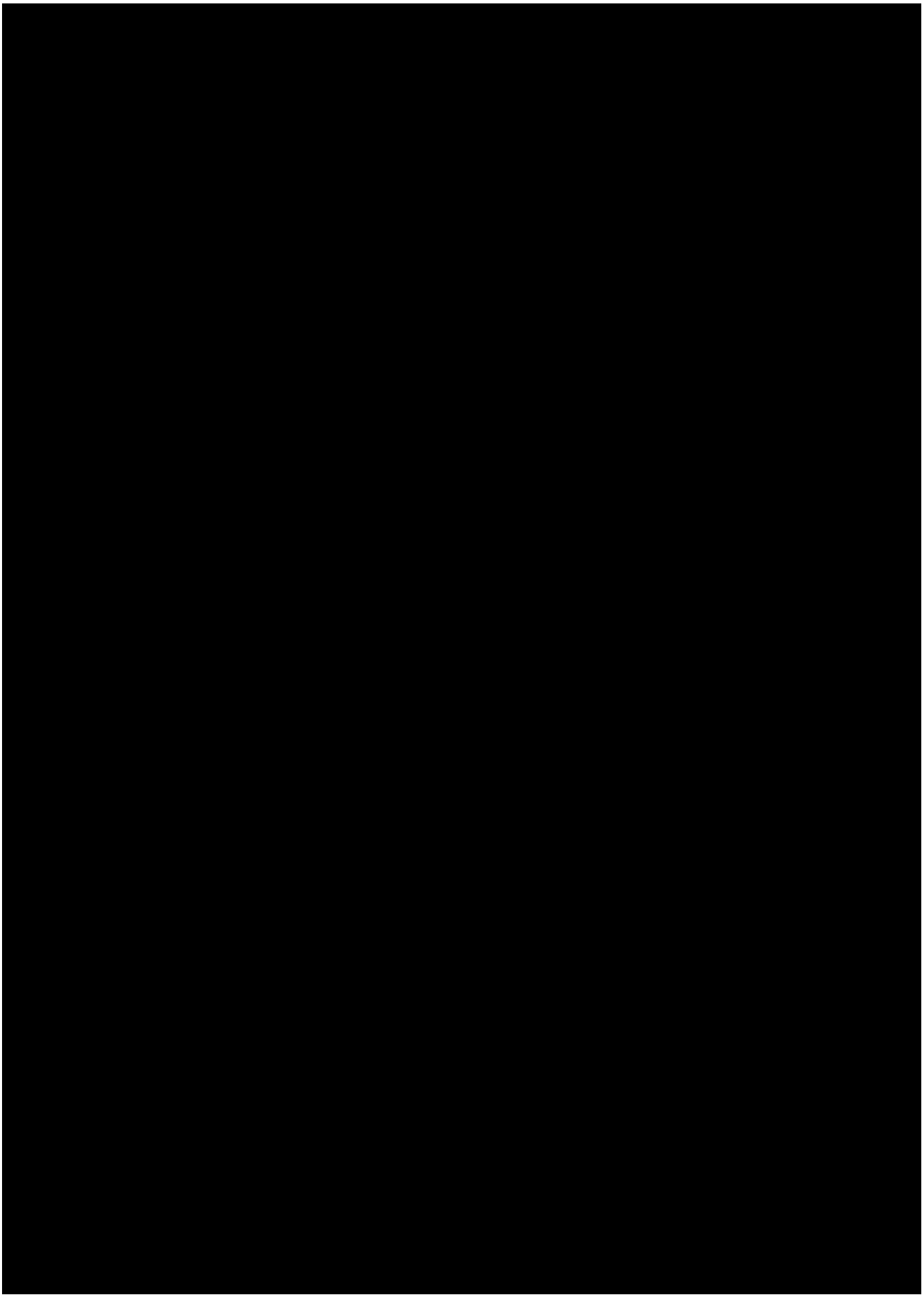
3. The key themes and findings of this exercise are outlined below.

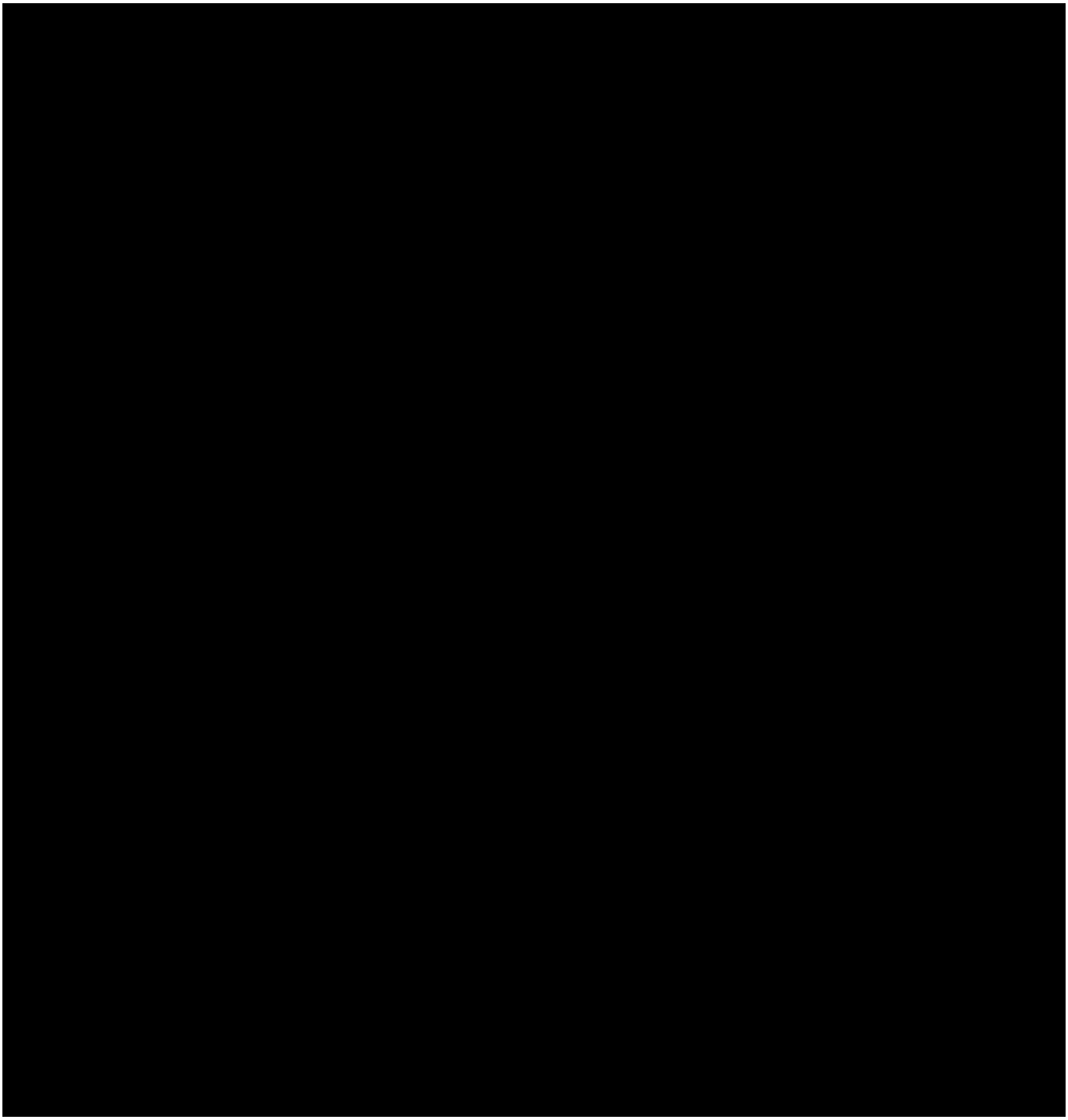
    - There is market appetite for a 25 year investment and operations management proposition at Clifford Bay.
    - The procurement process and its key expectations, milestones and risk transfer expectations should be communicated well and early in the process.
    - A government role as project sponsor and commercial partner is generally seen as being beneficial and desirable by potential investors. The government should be clear about its role early in the process.
    - The proposition is seen by the market as a long term infrastructure investment opportunity where risk must be well understood and minimised where possible.
    - The required rate of return, and therefore overall cost of funding, will be a function of risk transfer, with aversion to significant levels of volume risk transfer.
    - [redacted]

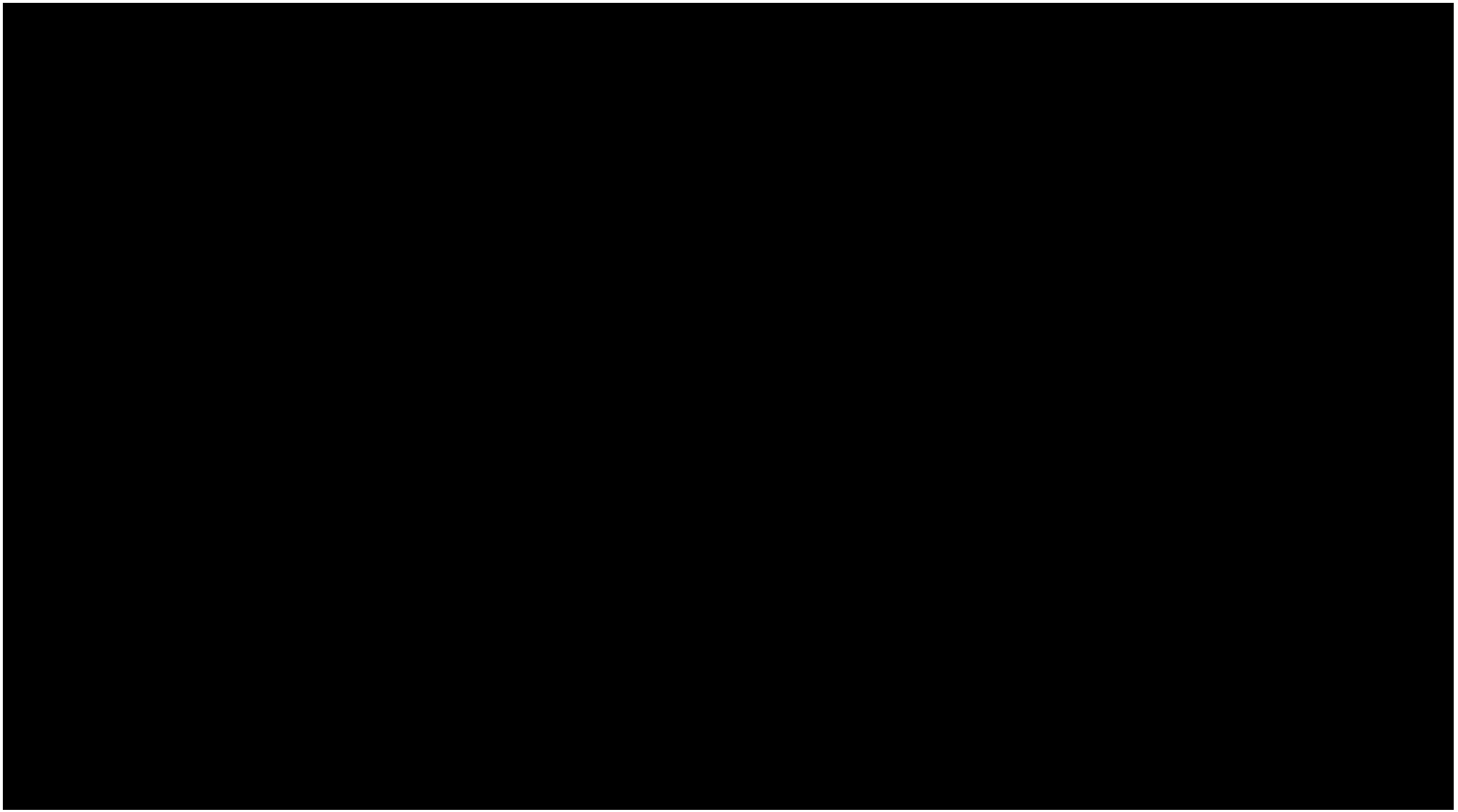
Project approvals and land access

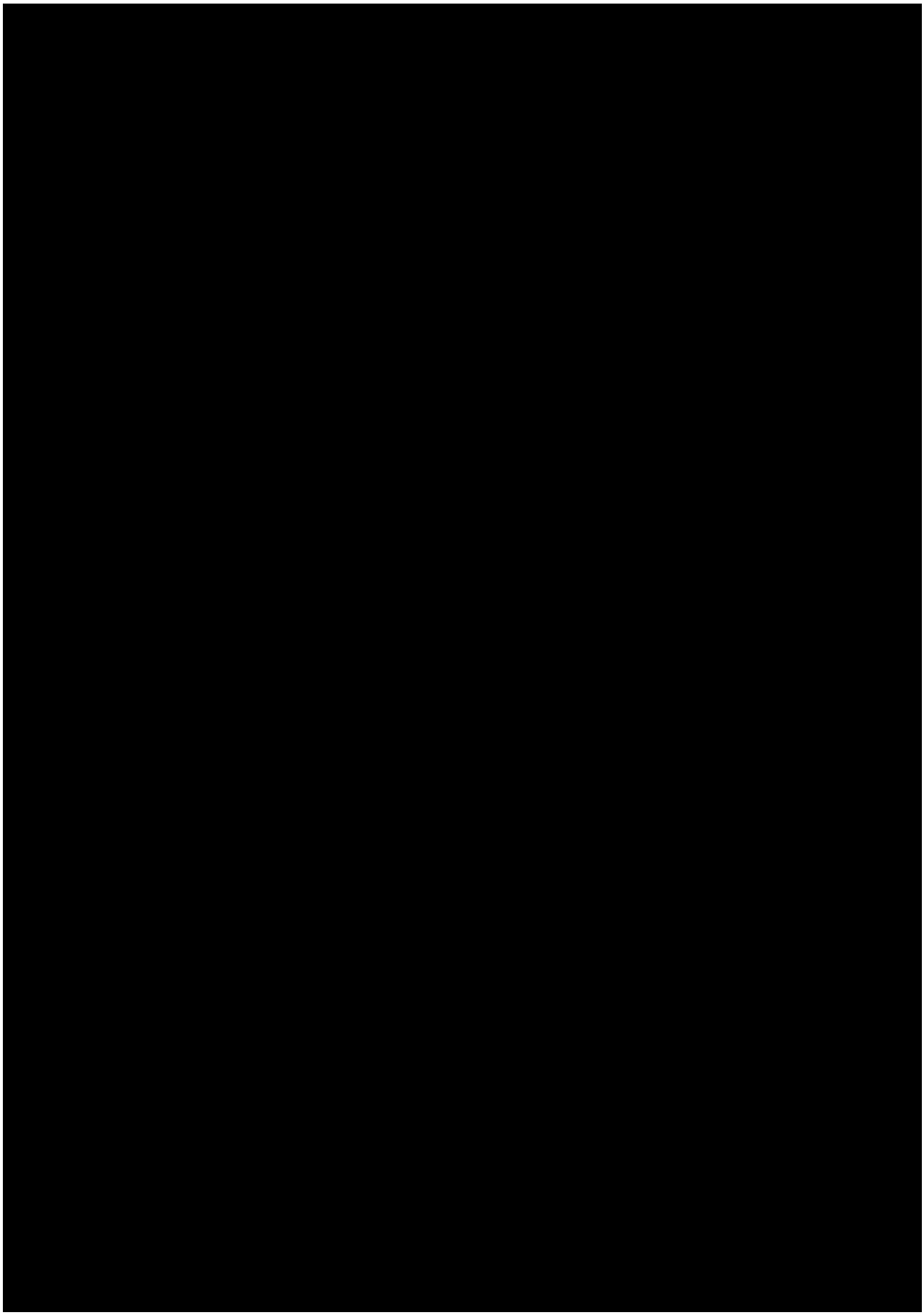
4. If the project proceeds to the next stage it is recommended that the government should fund and manage the approvals process and the securing of land access for Clifford Bay. There are two primary reasons for this.

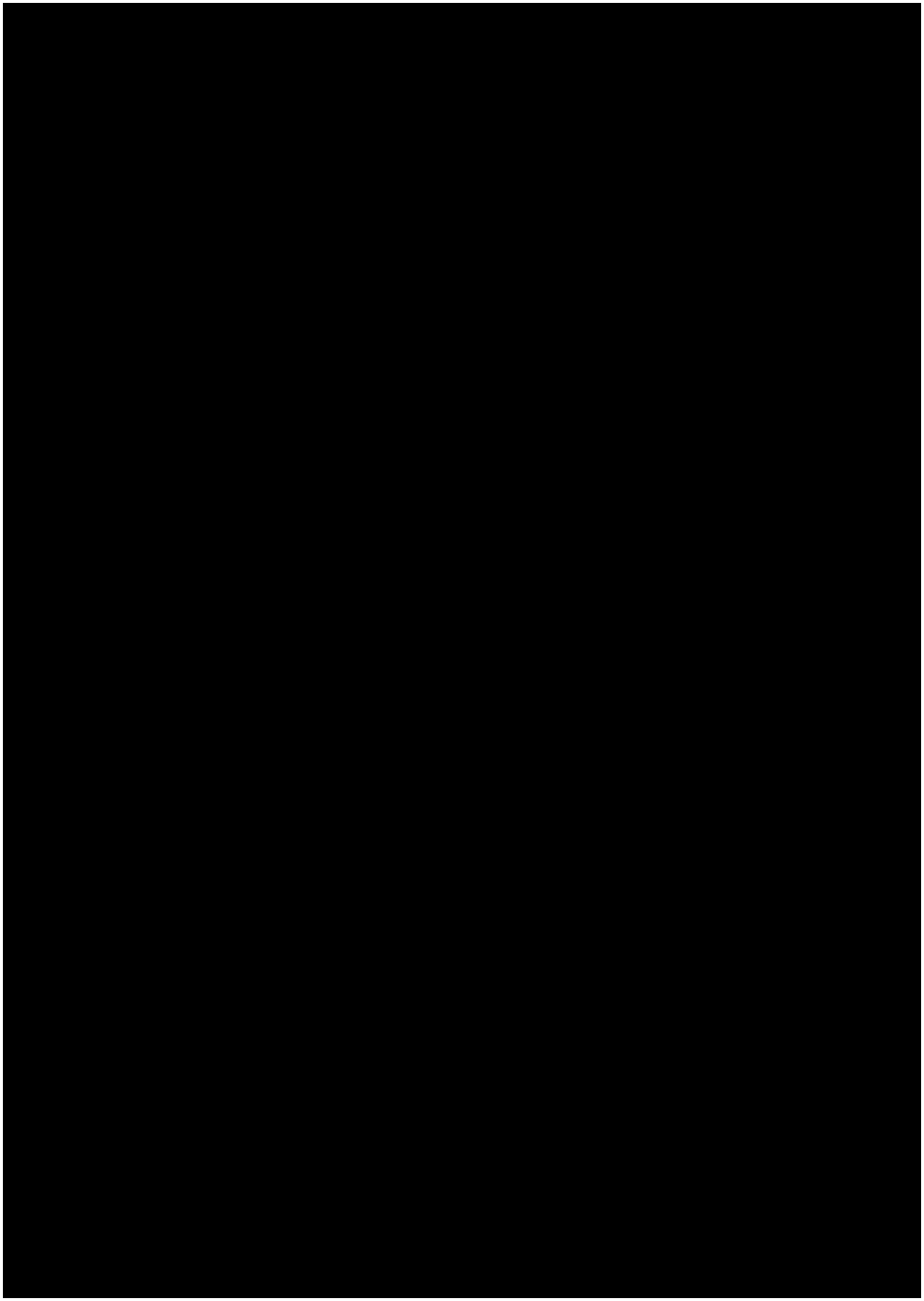
    a. If uncertainty around land access, and approval process duration and consent conditions was passed to a preferred consortium, risk pricing of the accountability for delivery to certain specification and in certain timeframes would be prohibitive.
    b. The government maximises its ability to credibly address the market and maximise the benefits of competition and innovation (and











Government business case summary

- The governments financial case shows [redacted] of direct investment between now and 2020 .
- The governments economic case shows a BCR of 1.3.
- Using the multi-attribute assessment approach used to give effect to the Government Policy Statement on Land Transport, the project is rated as high strategic fit, high effectiveness, and low efficiency.

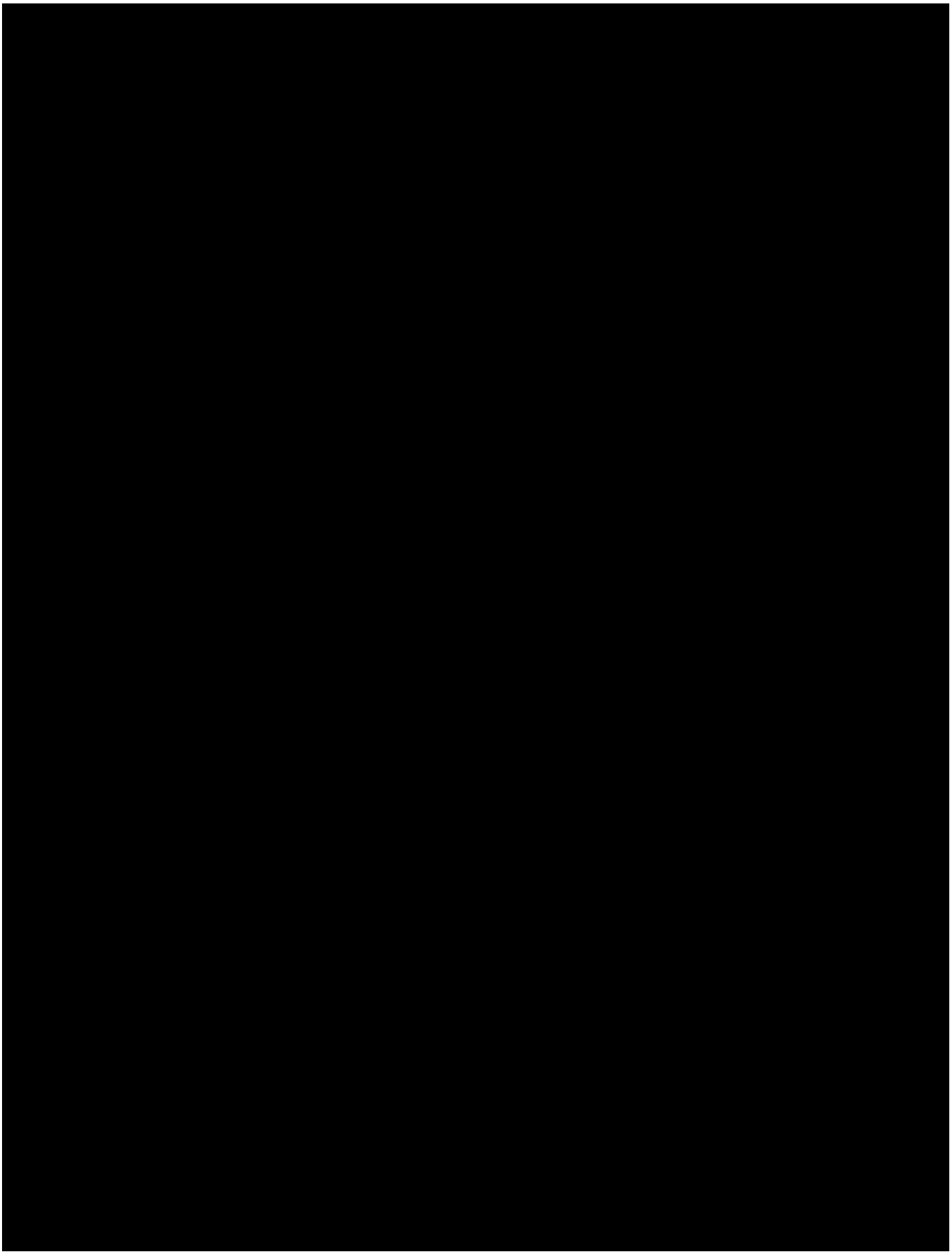
1. The overall government business case comprises three main perspectives; financial, economic and strategic. In addition, there may be other factors considered by decision-makers. This investigation has not determined the relative weighting of these factors. The table below summarises the government business case components.

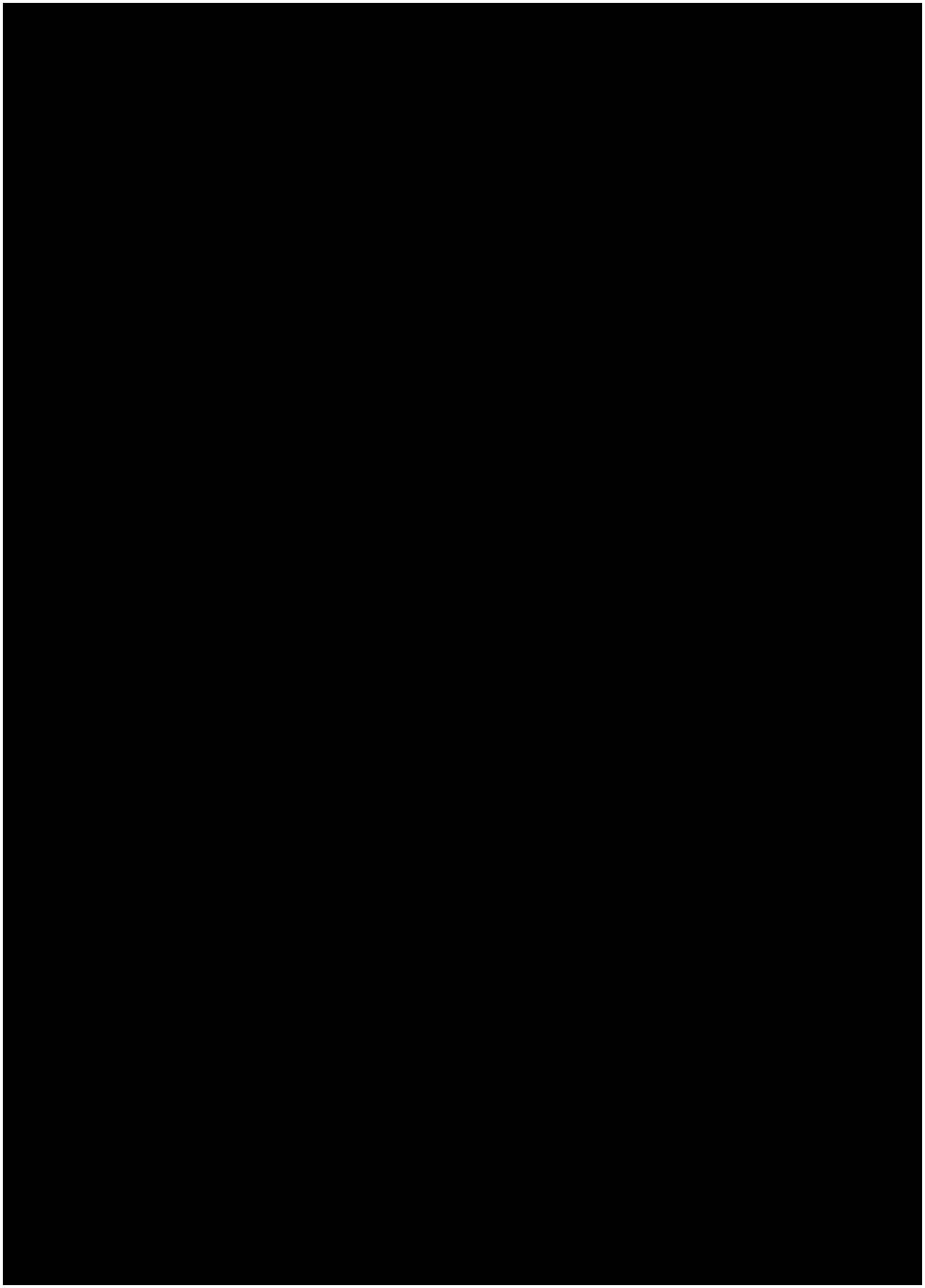
Table 33: Government business case summary

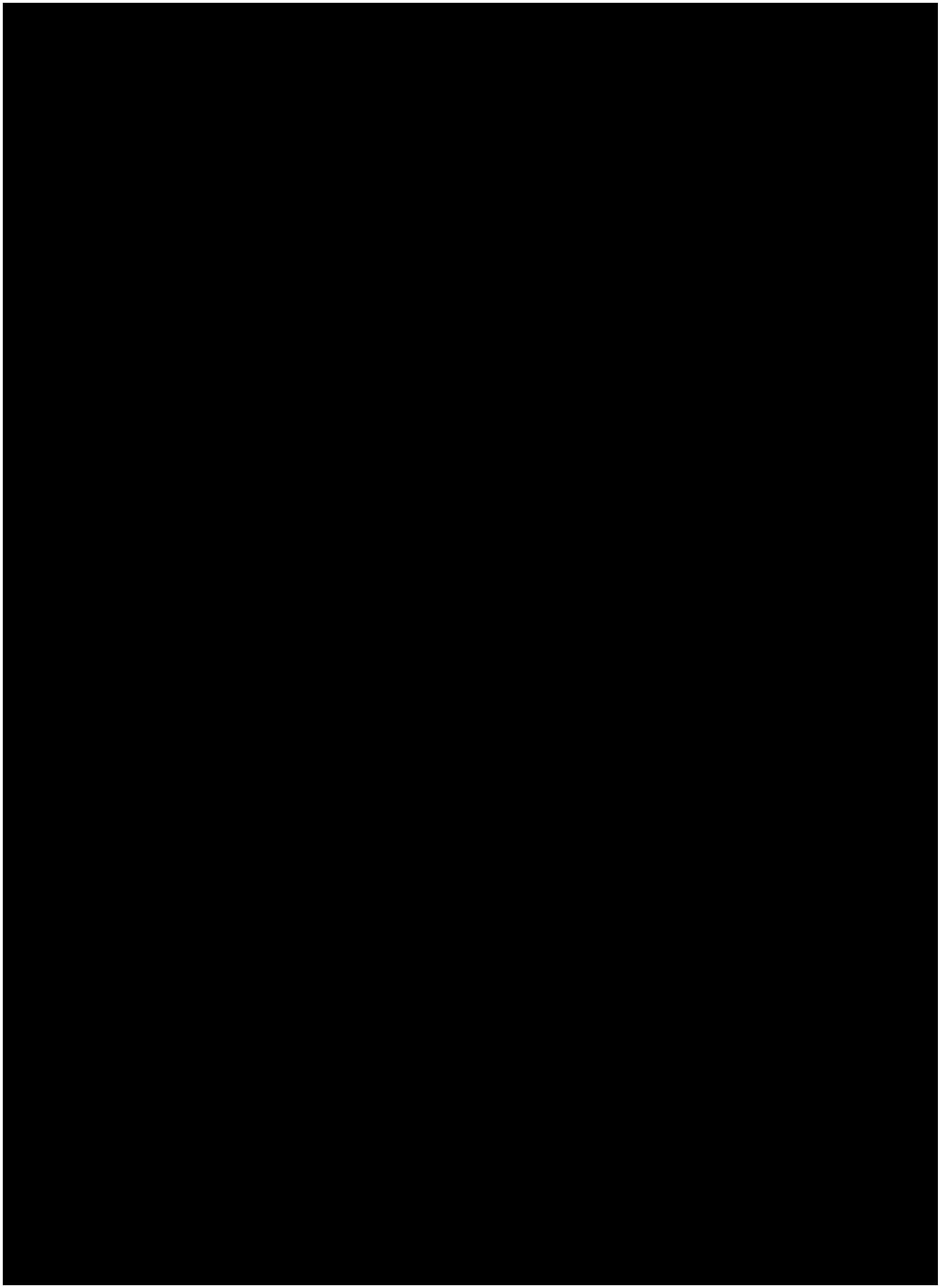
Dimension	Quantification	Key Assumptions and Commentary
Financial Case	[redacted]	[redacted] Confidence – Medium Sensitive to the actual level of revenue secured by operators and users, and total capital cost as discovered by the procurement process. Exposed to significant execution risk in the development phase.
Economic Case	BCR 1.3 [redacted]	Assumption set consistent with financial case where appropriate, using prescribed economic methodology where required. Confidence – Medium Most sensitive to discount rate and capital cost. Moderately sensitive to freight volume growth. [redacted] Wider Economic Benefits (WEBs) of valued at [redacted], half agglomeration benefits, half competition effects.
Strategic/Policy Case	Strategic Fit High Effectiveness High Efficiency Low	[redacted]
Relative Merit	[redacted] Inconclusive	[redacted] Economic merit (BCR) lower than many alternative transport projects.
Overall Case		[redacted] **direct investment requirement 2014-2020** **Project BCR 1.3, Efficiency - Low** **Strategic/Policy Fit - High** **Risk Profile – Medium to High** **Counterfactual – Acceptable/functional**

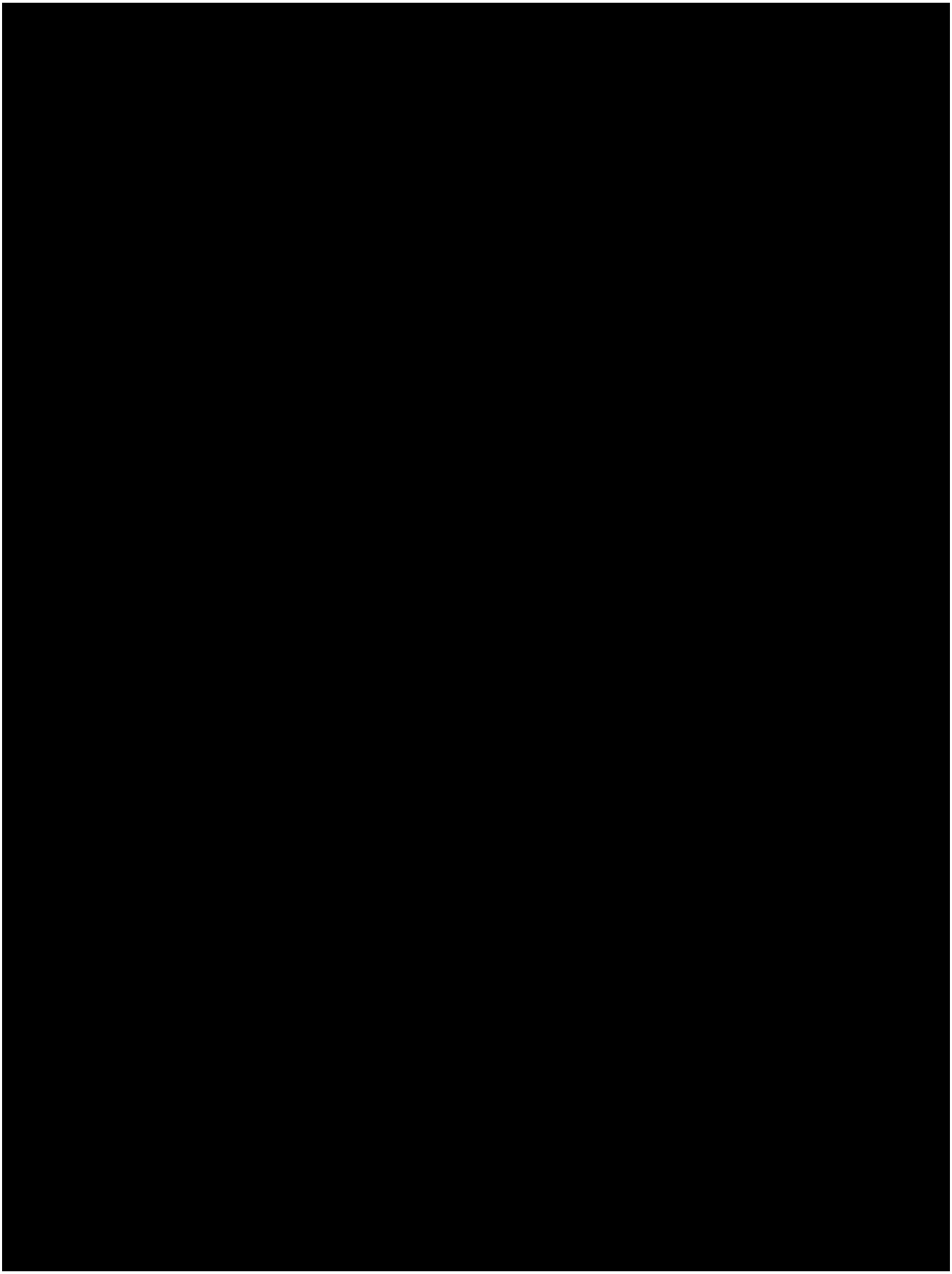
SECTION 4 | NEXT STEPS ISSUES AND RISKS

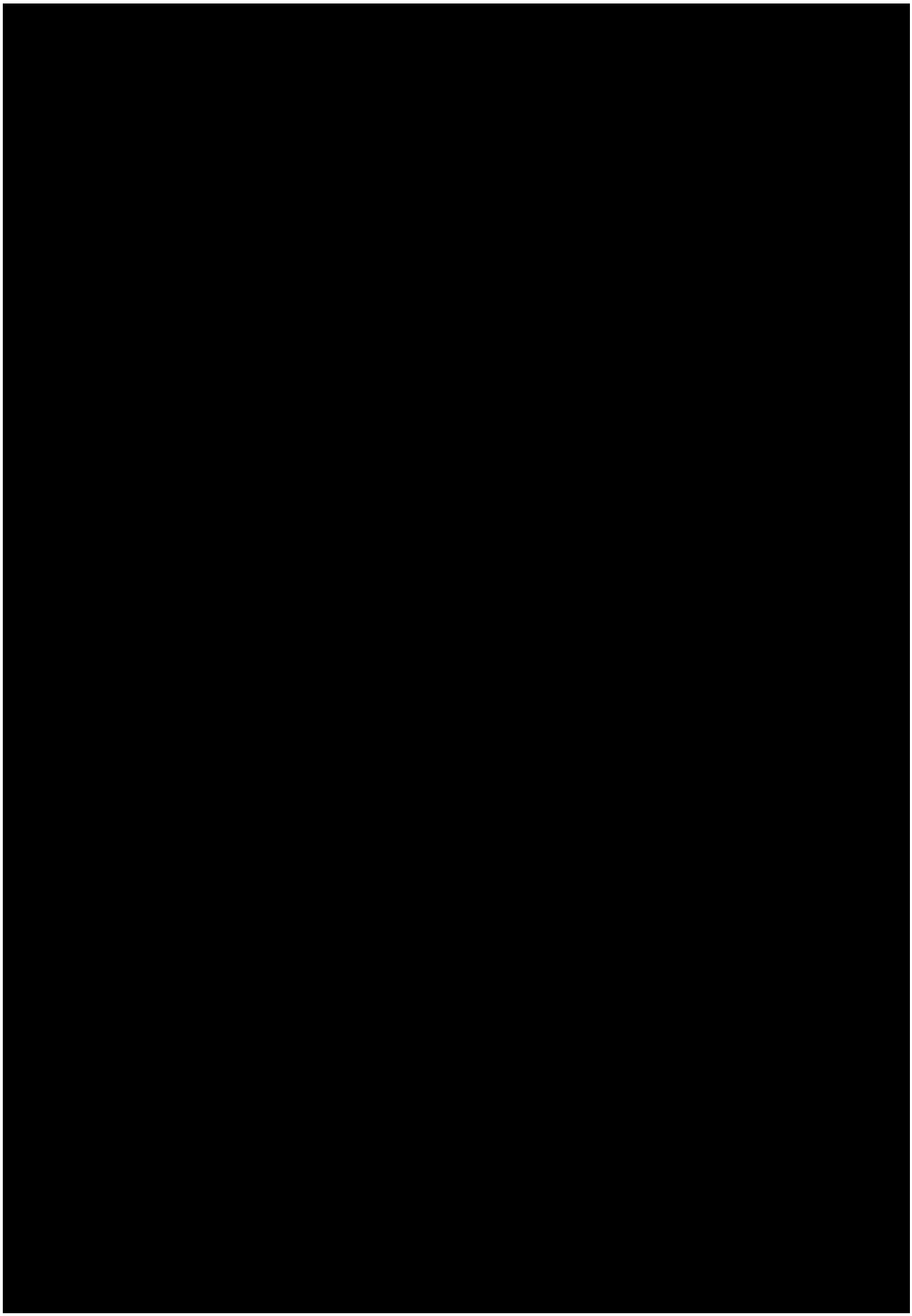
Procurement
Land access
Resource consent
Project management and governance
Development phase programme summary
Risks
Stakeholder management and communications

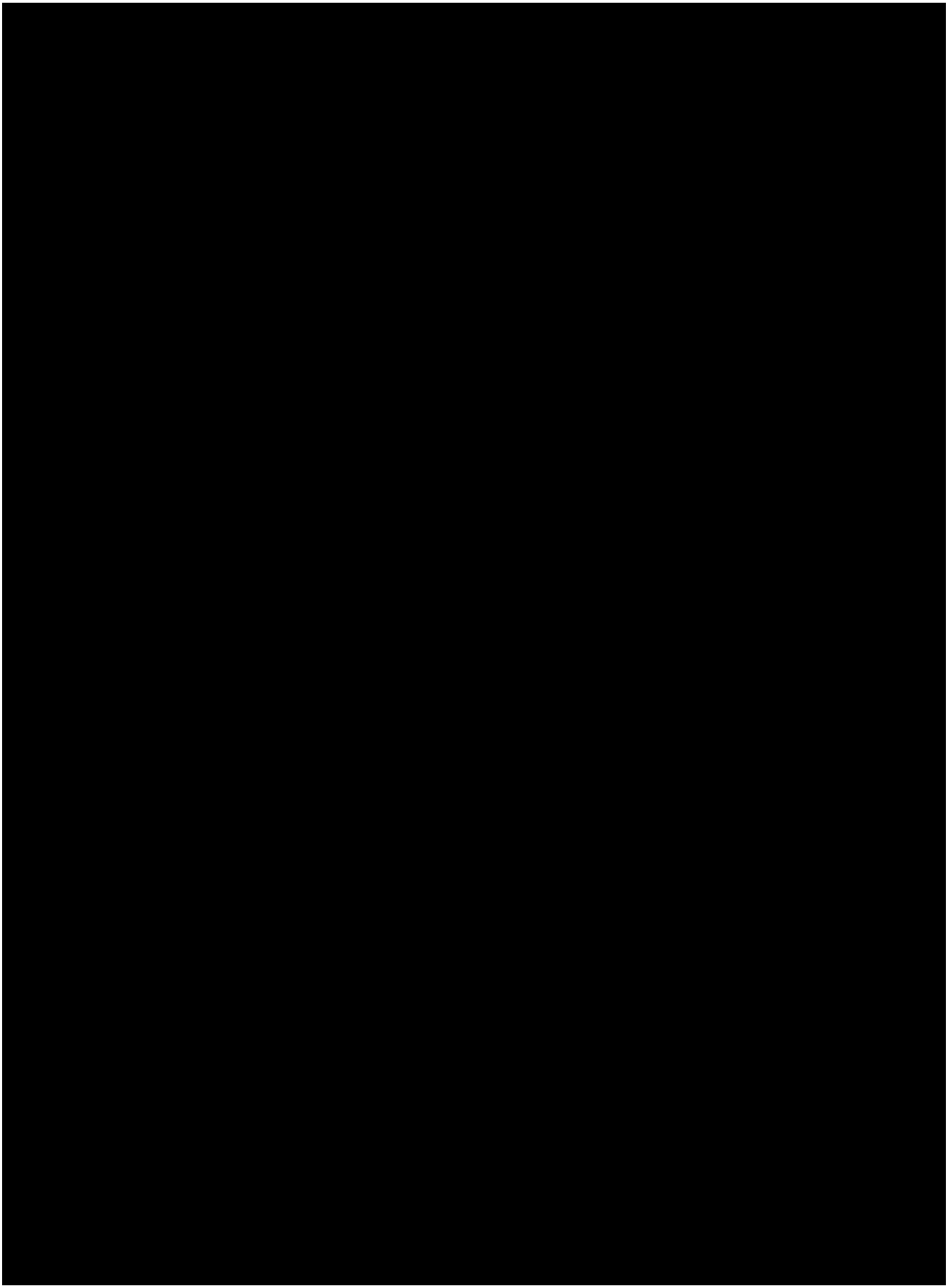












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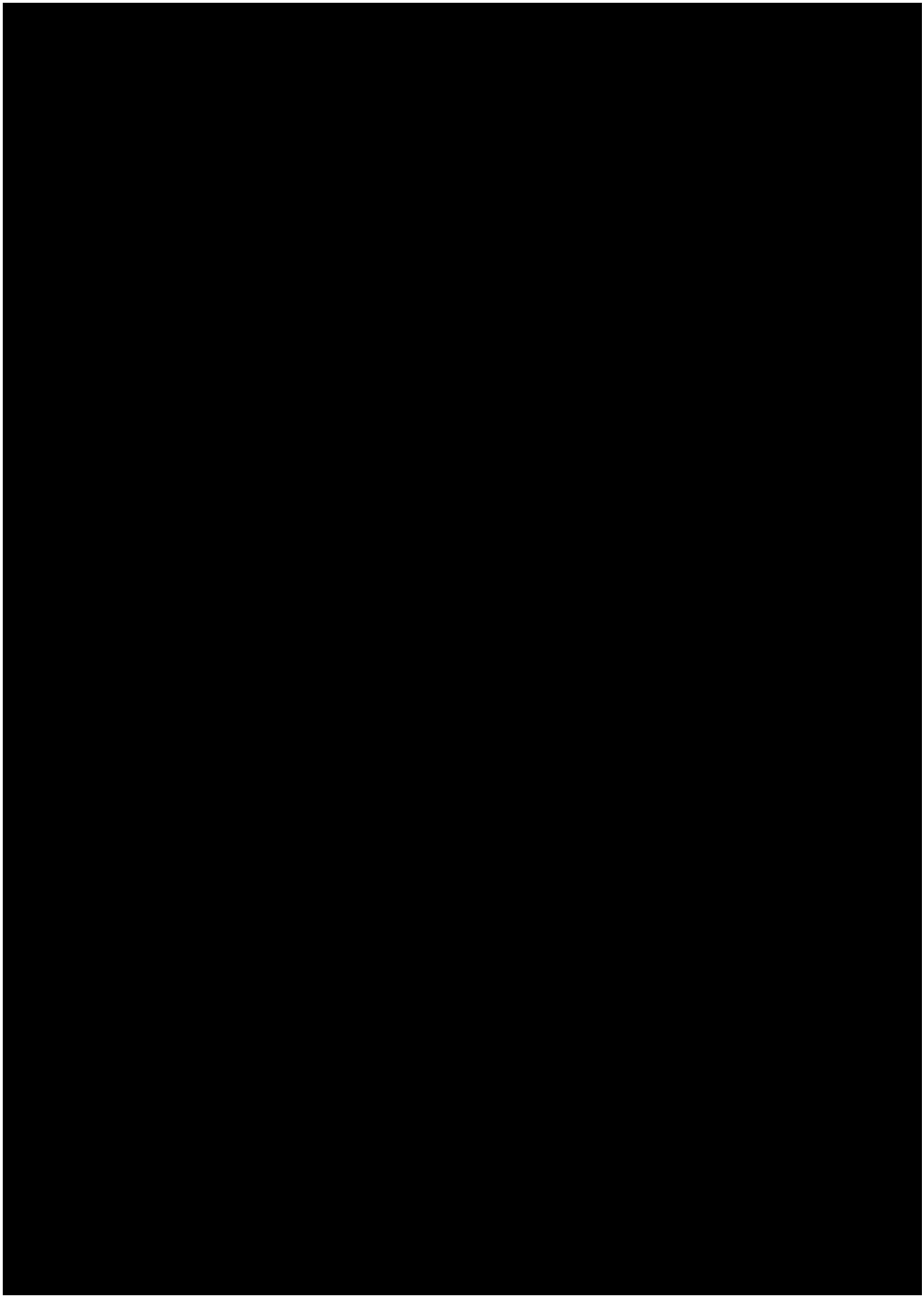

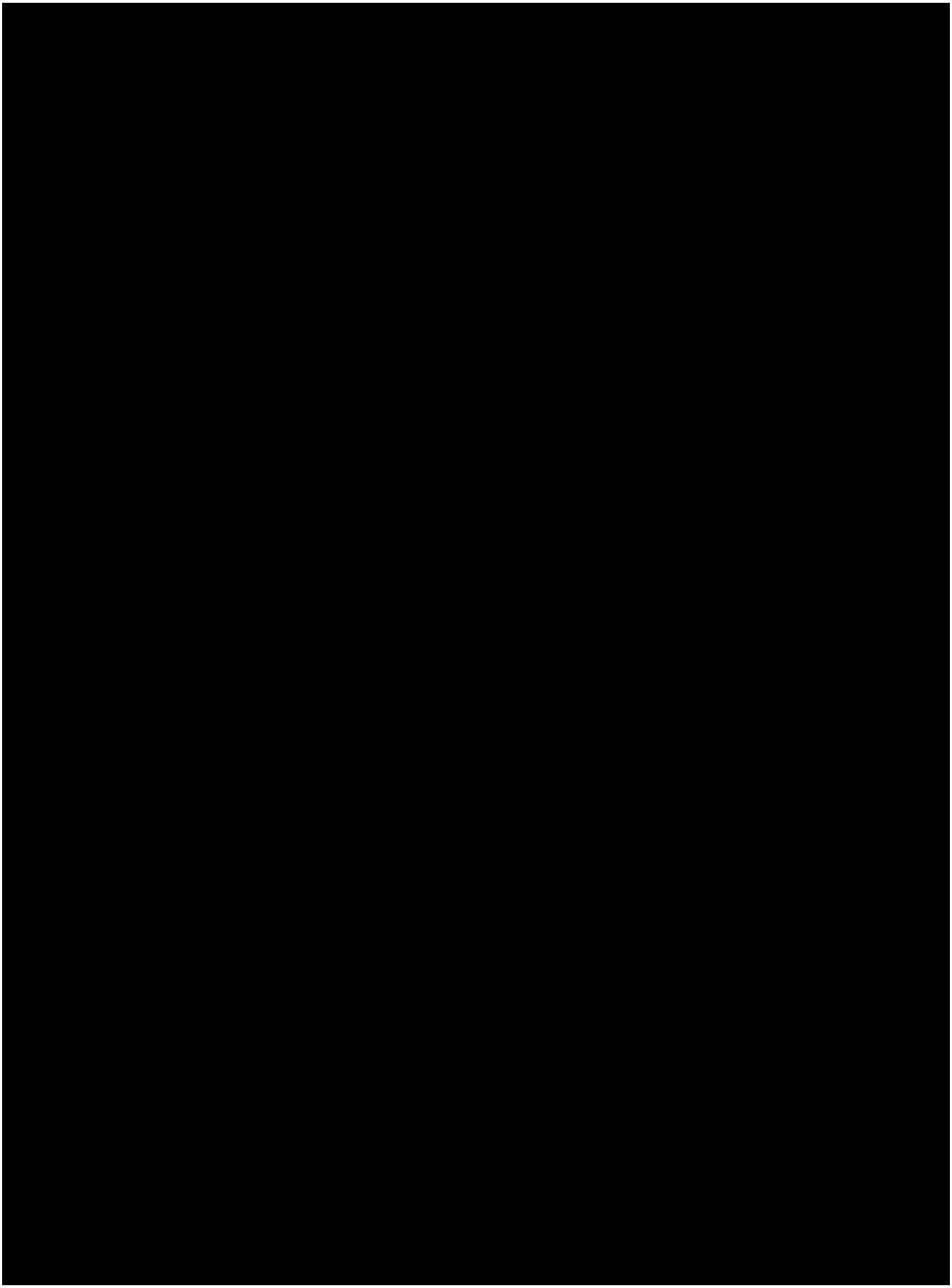

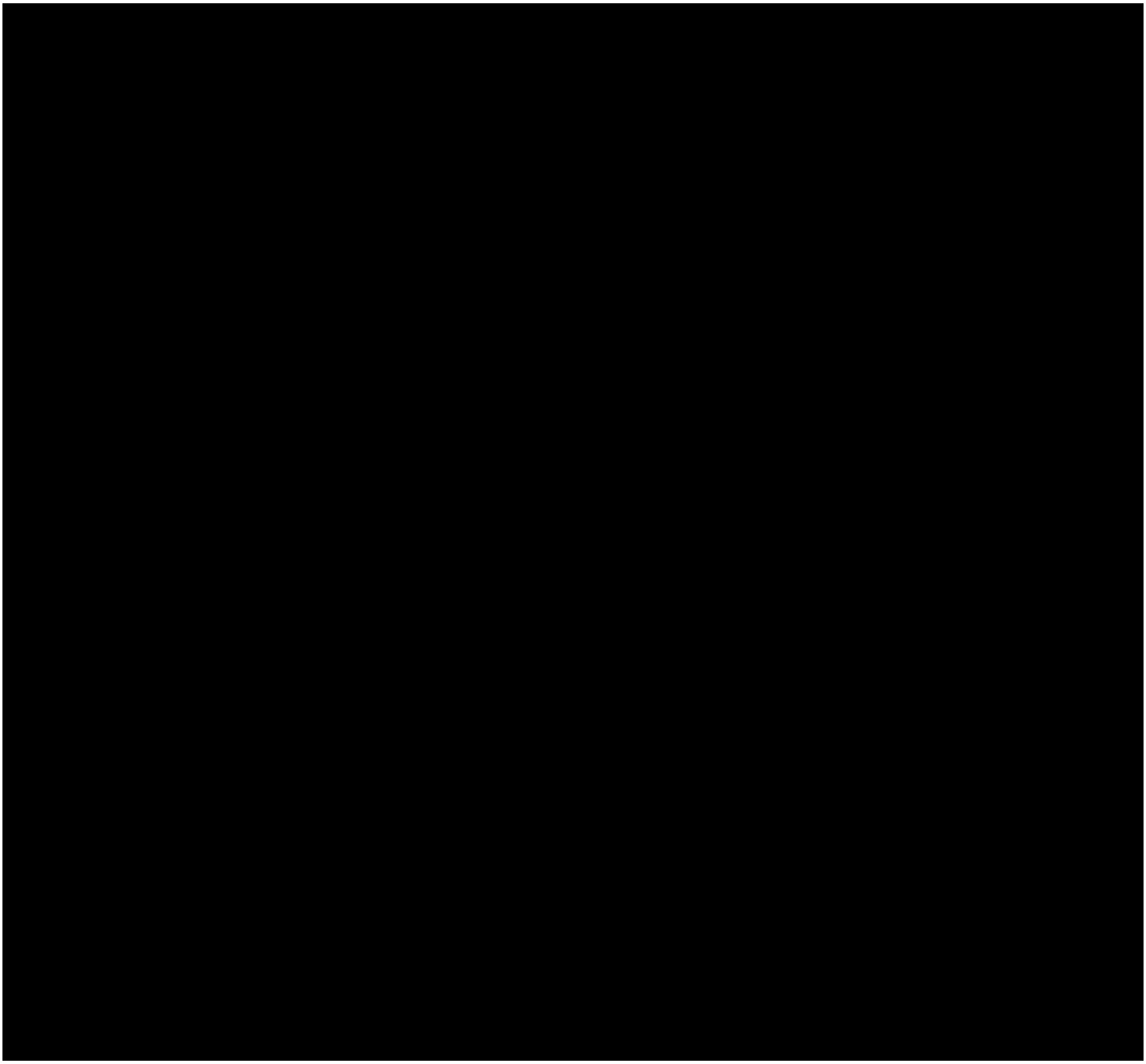

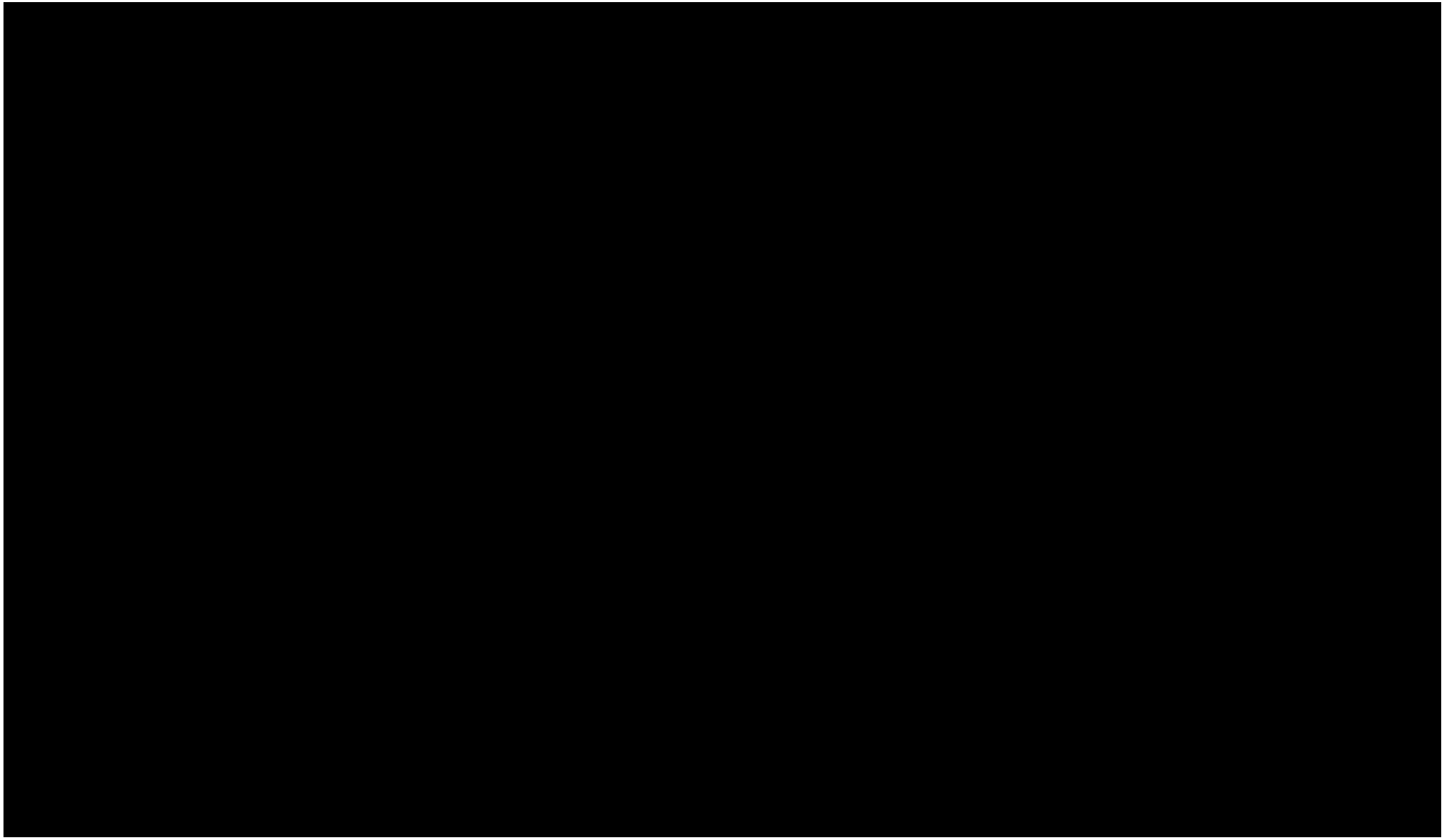

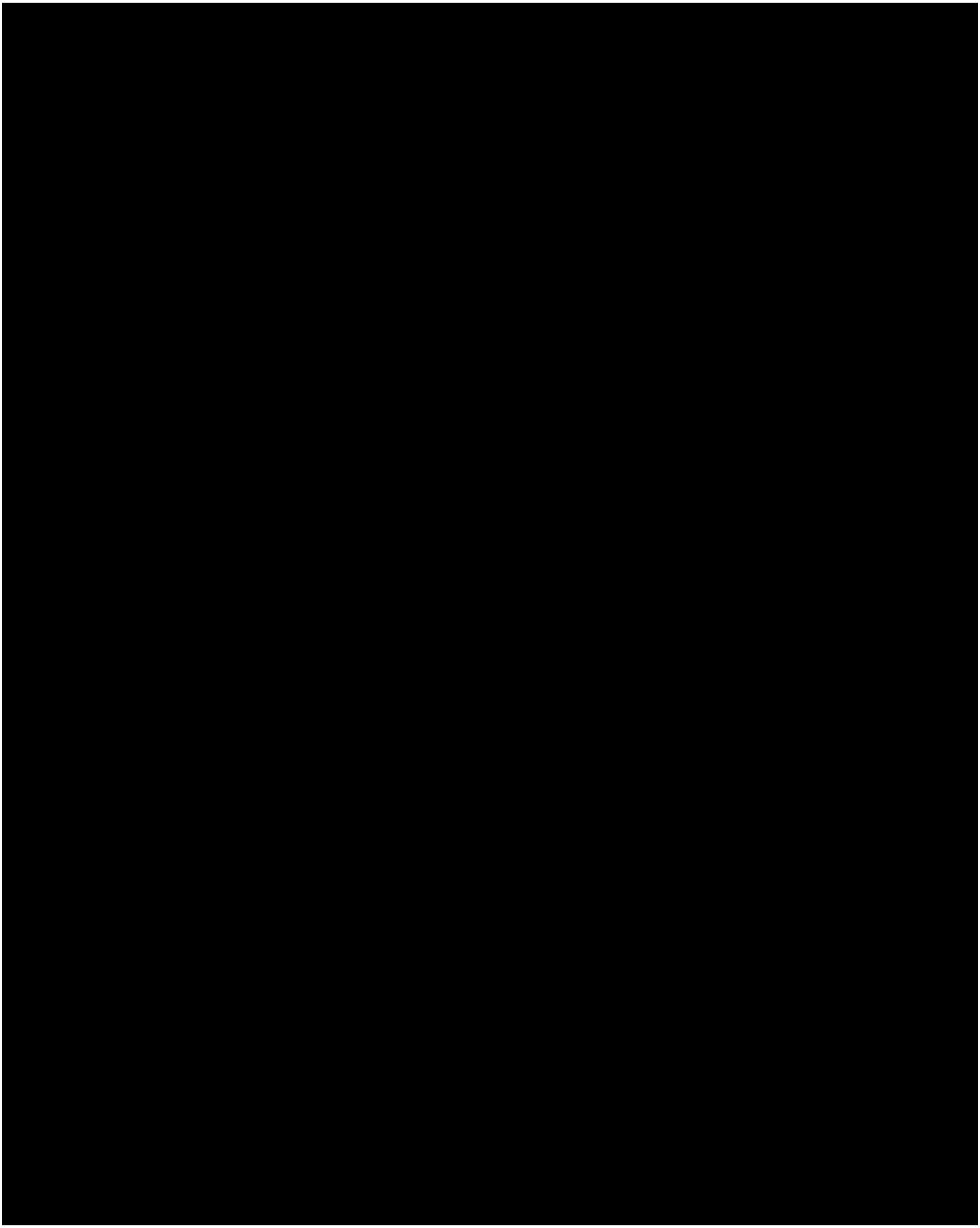

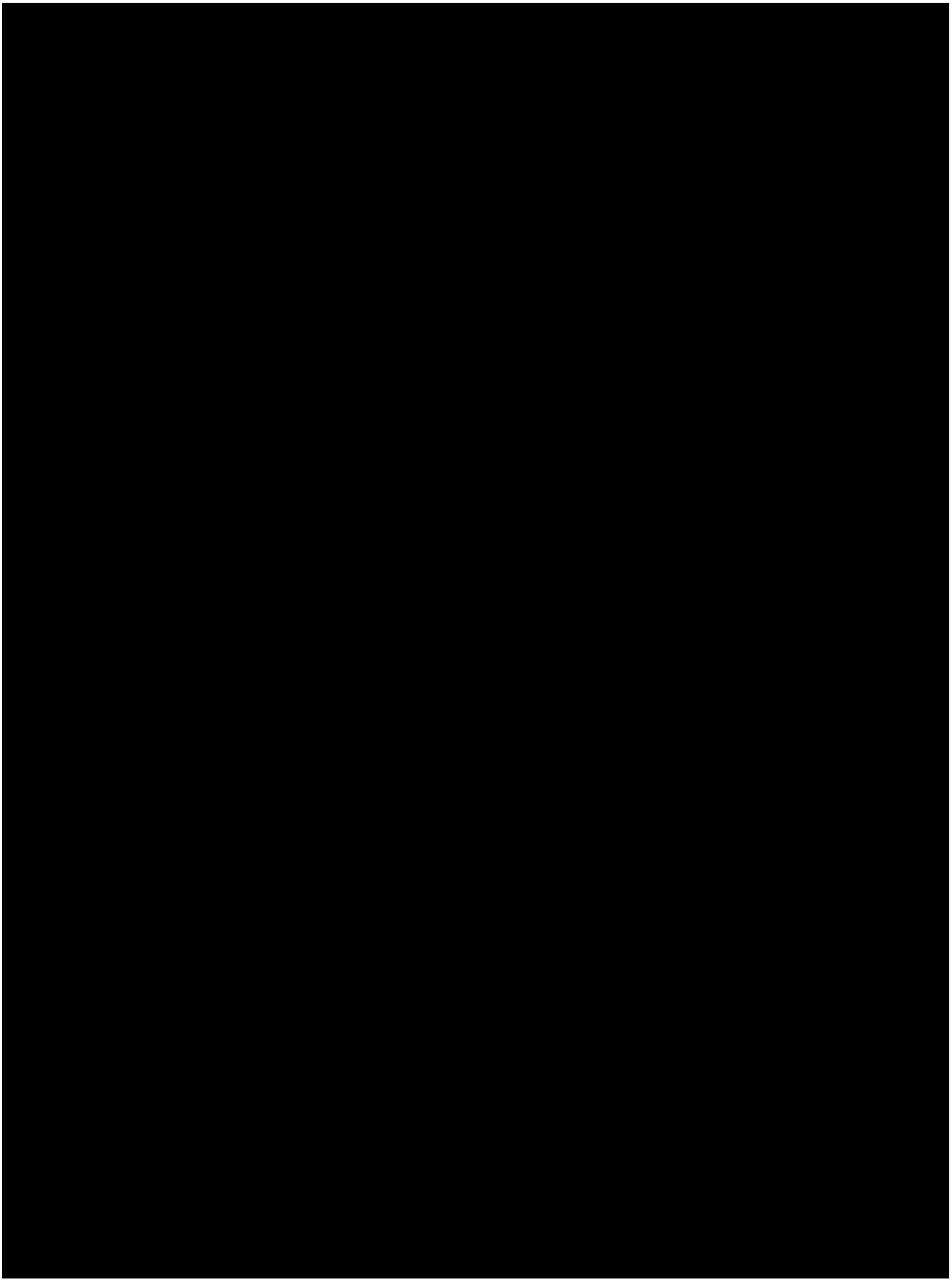

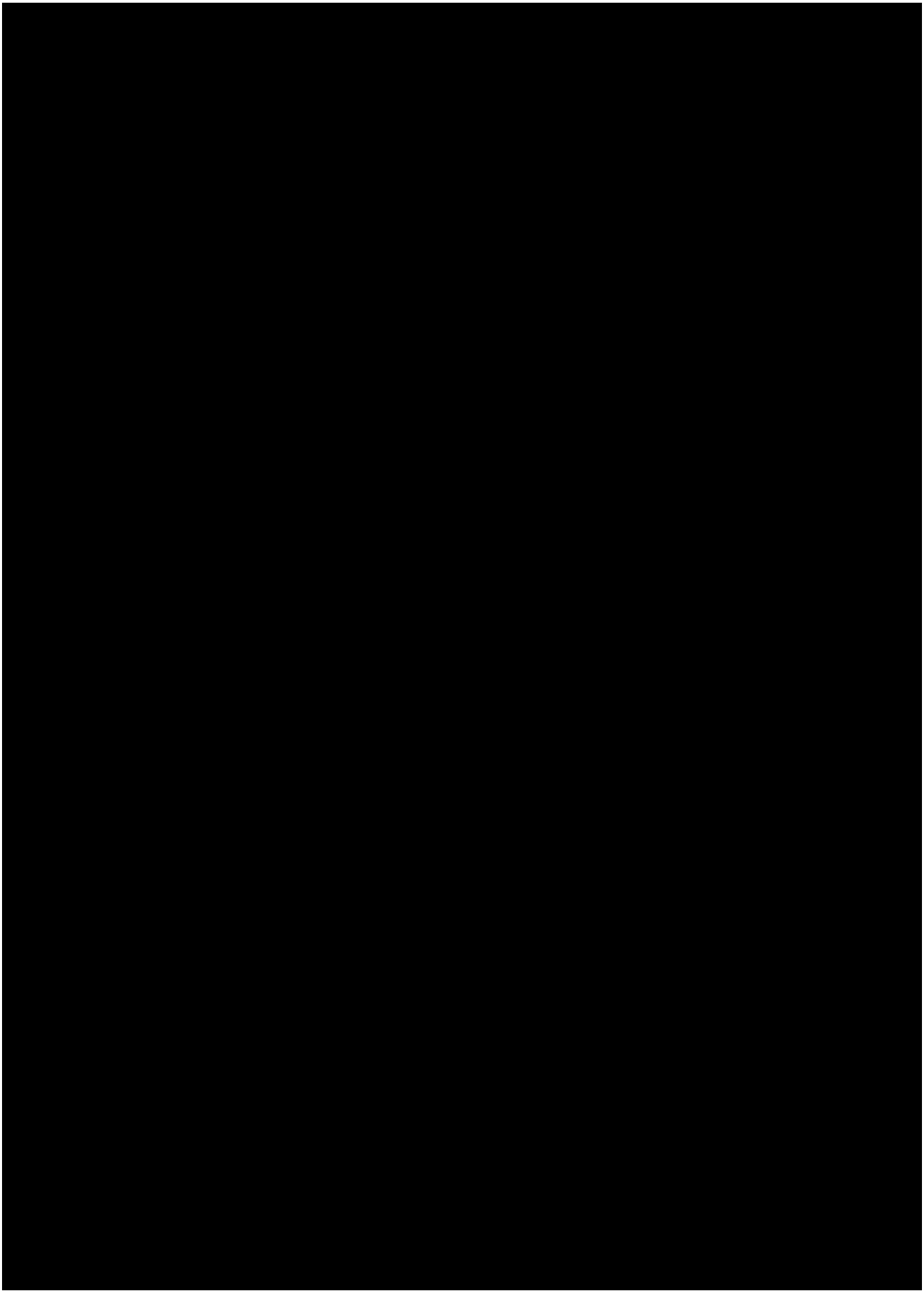

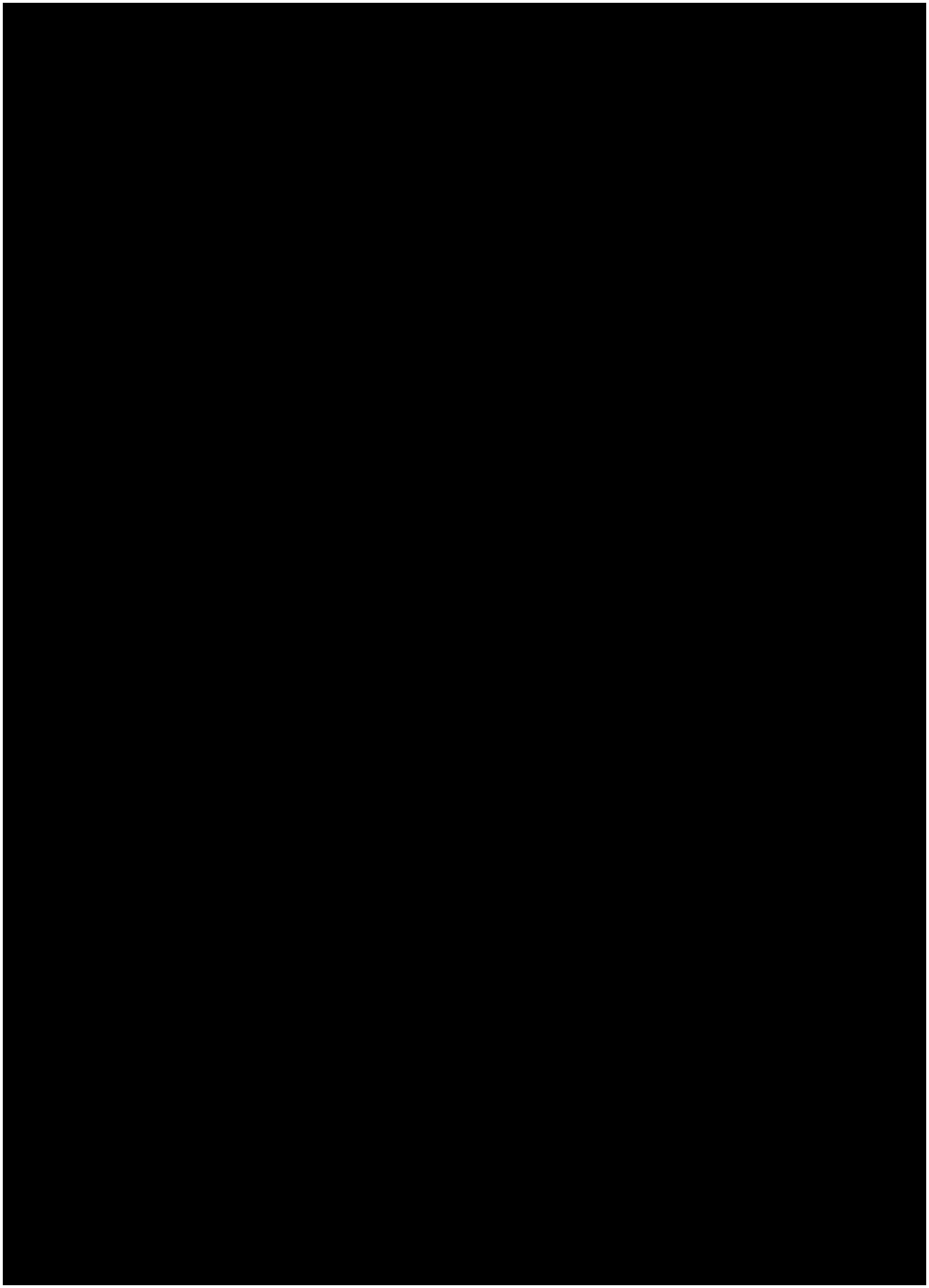

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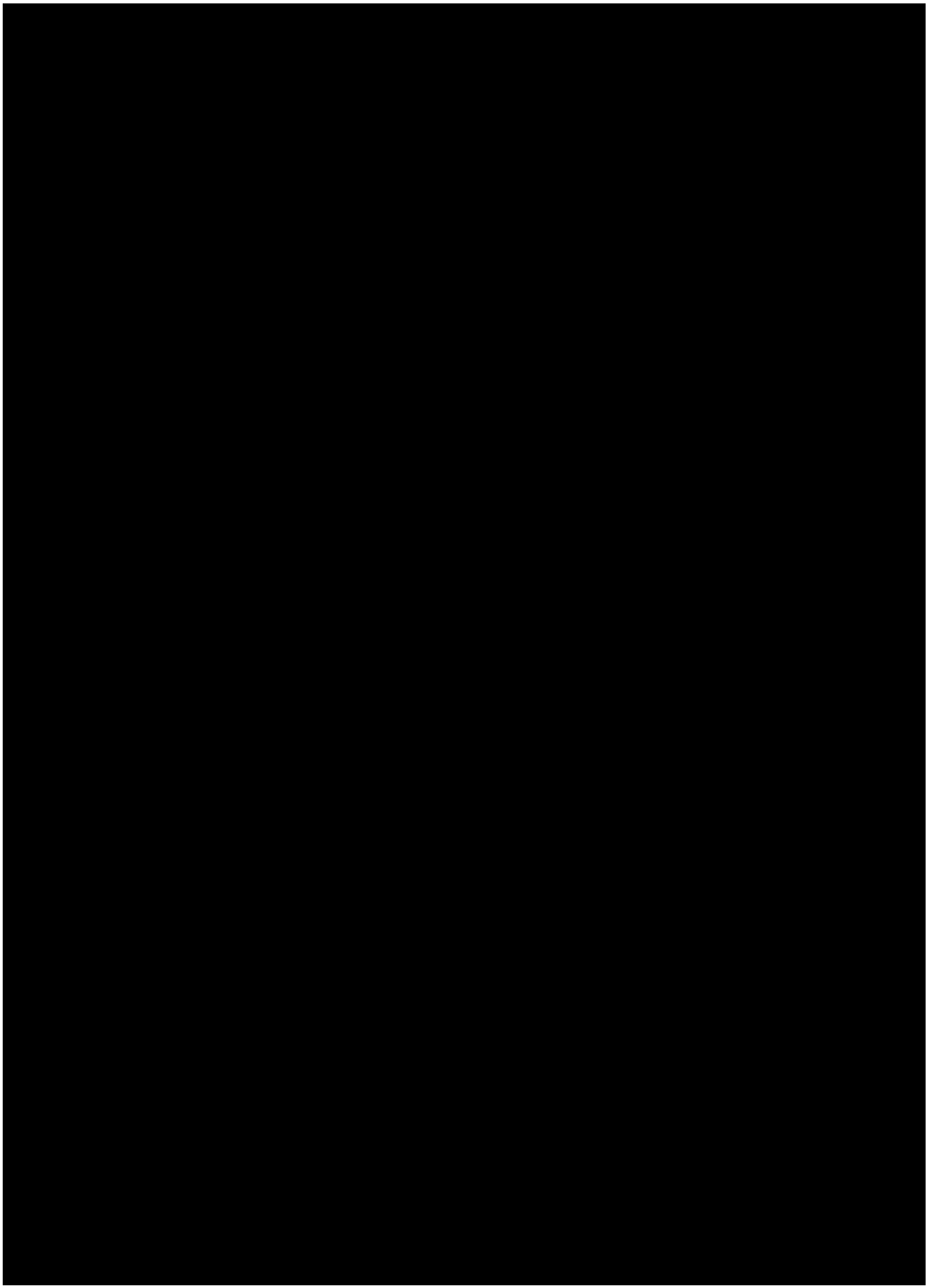
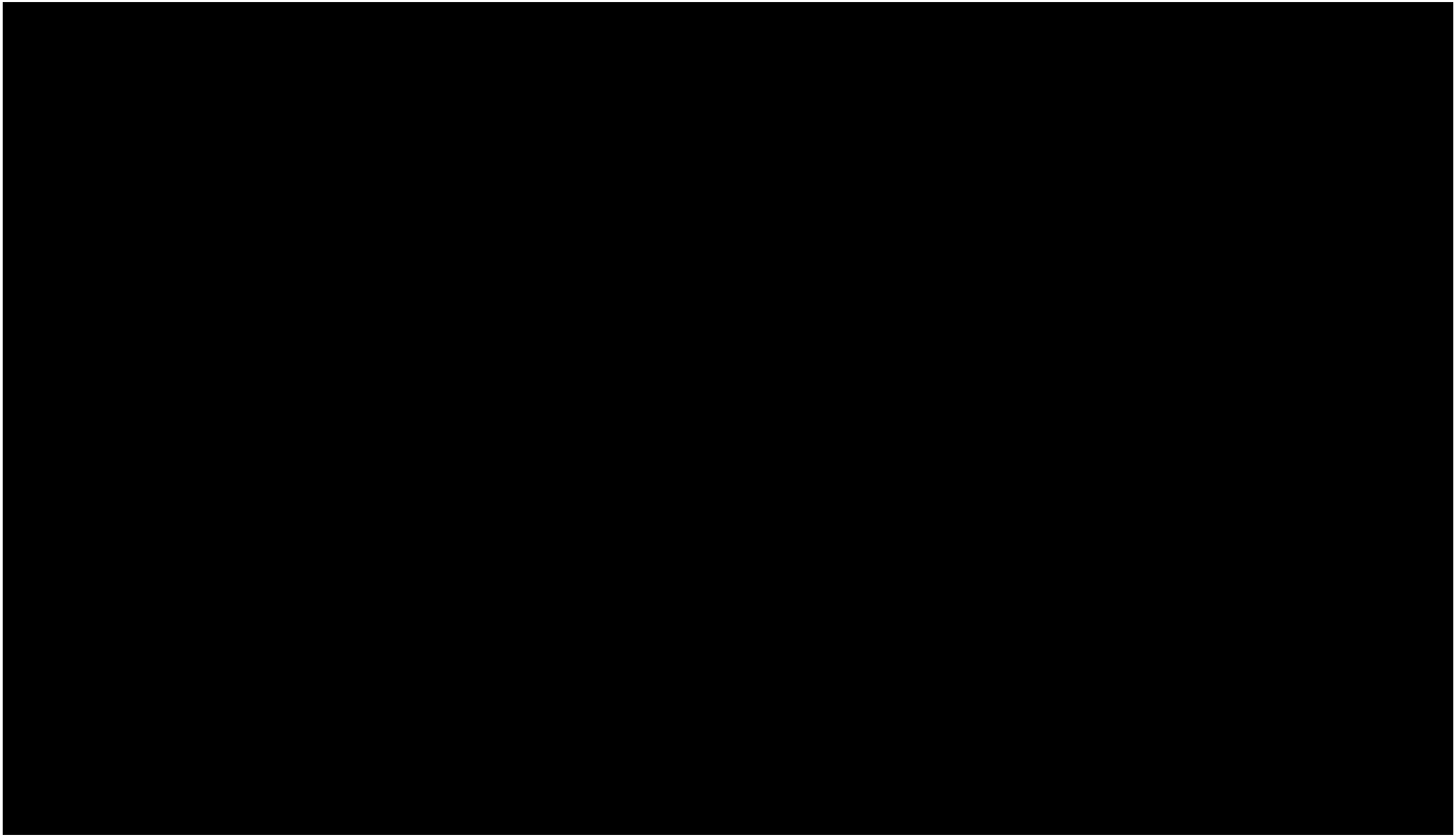
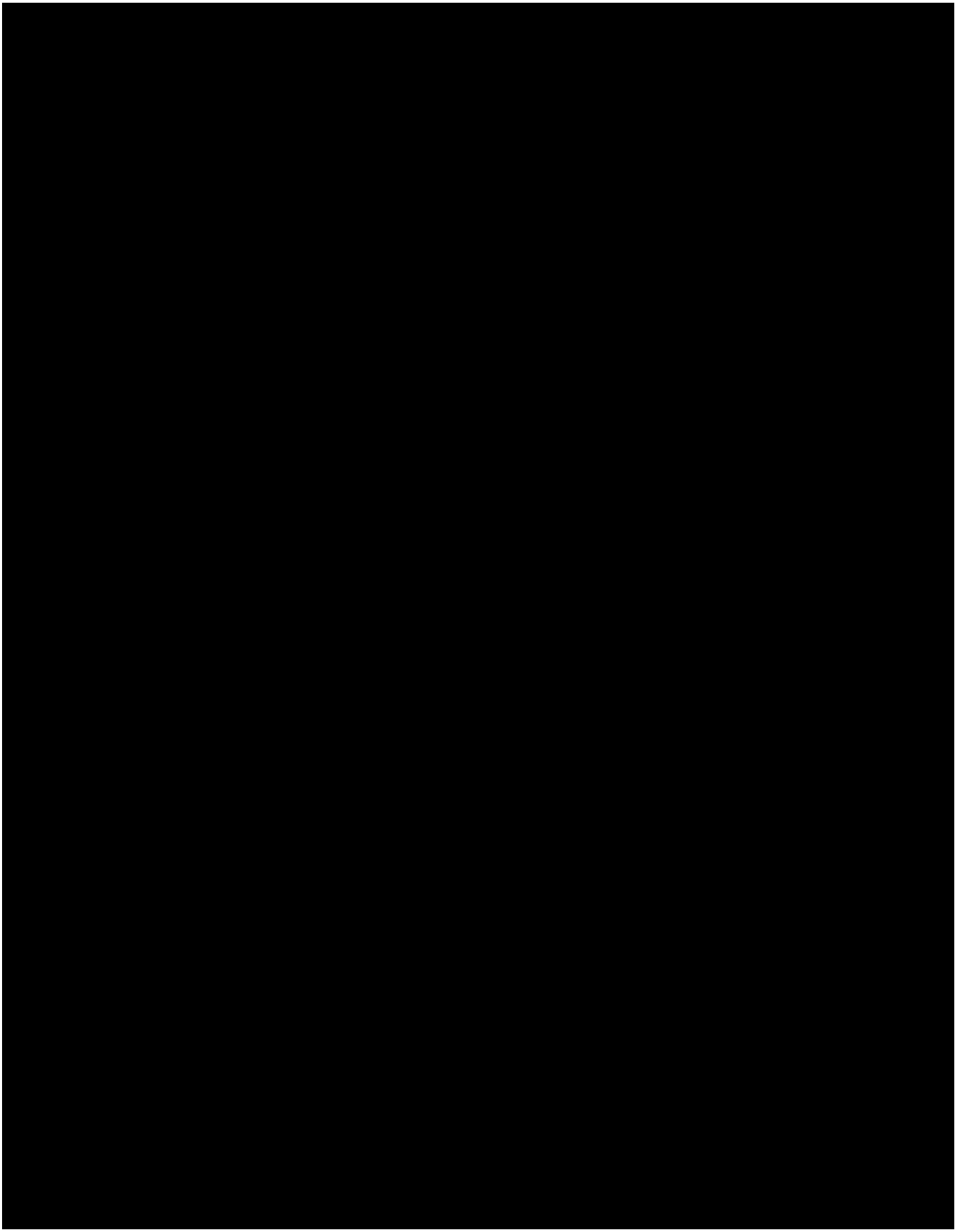
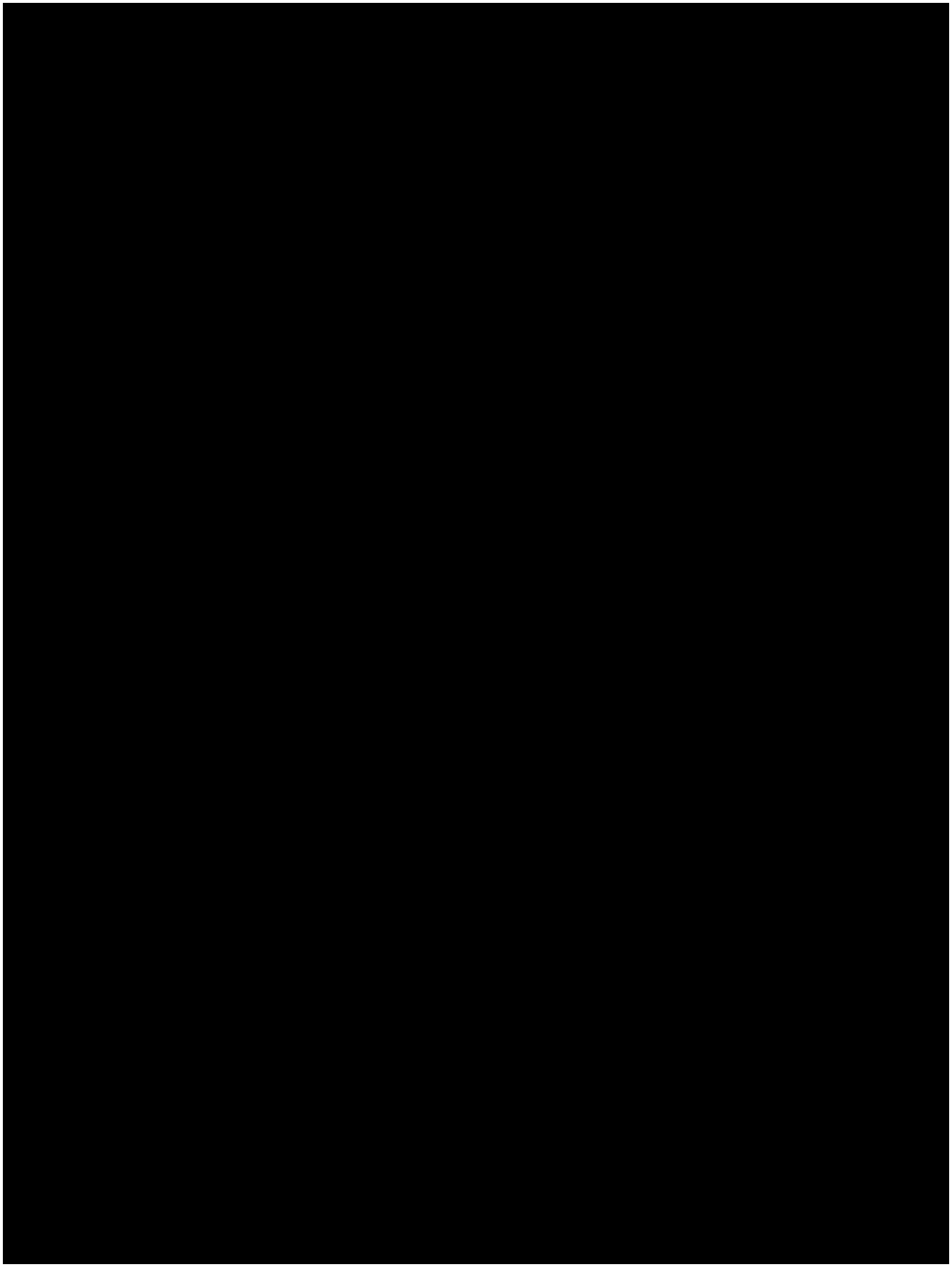
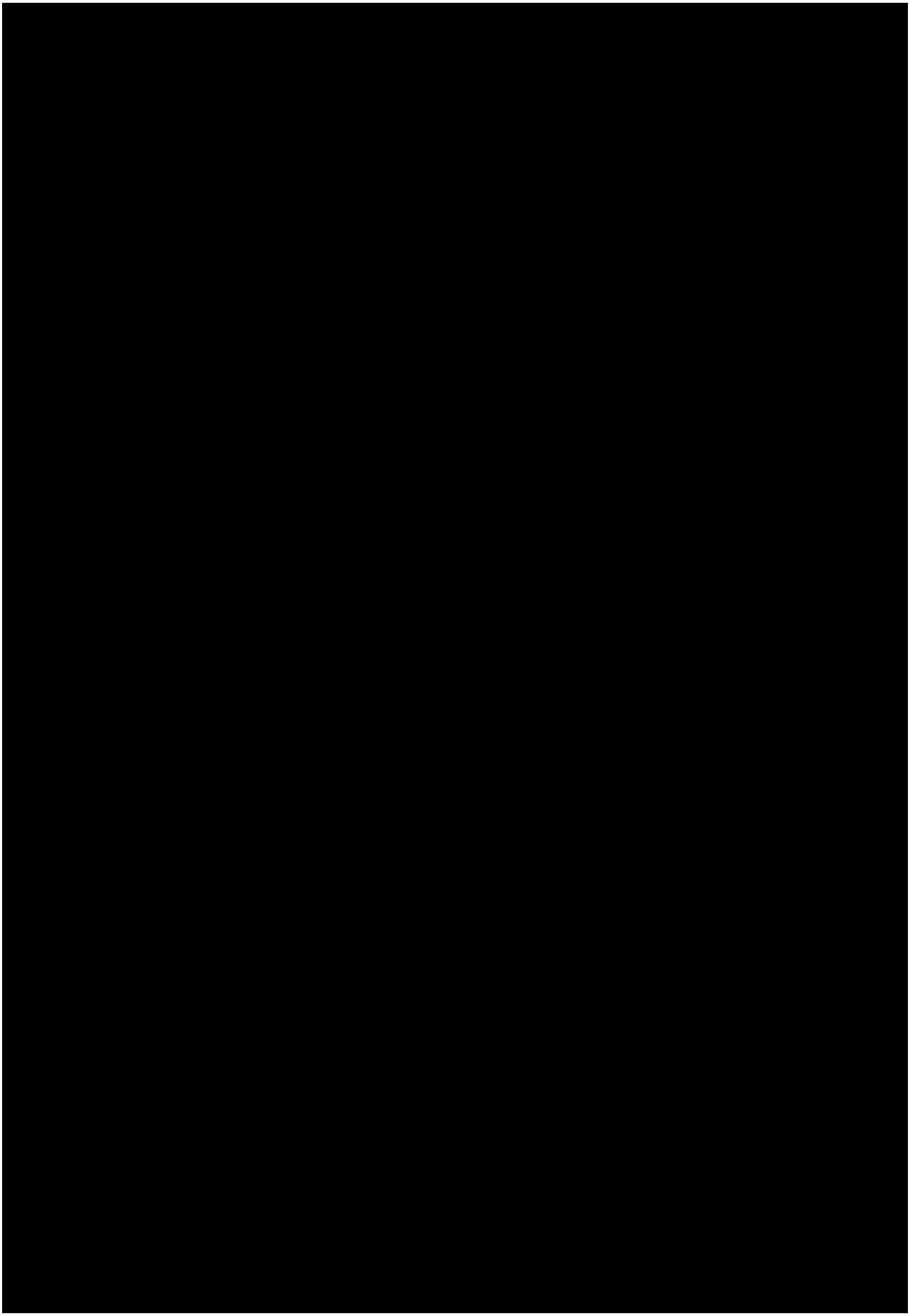
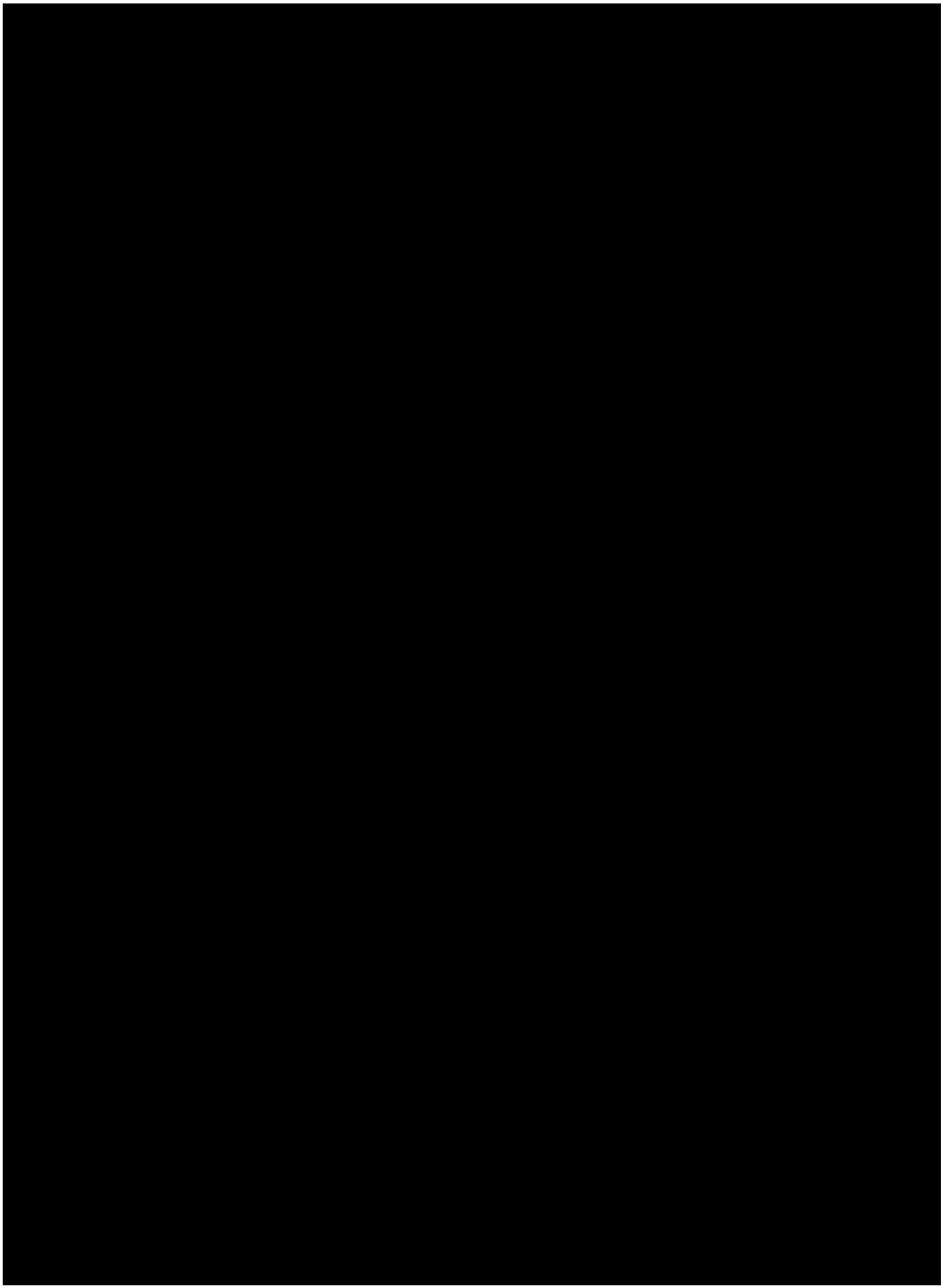


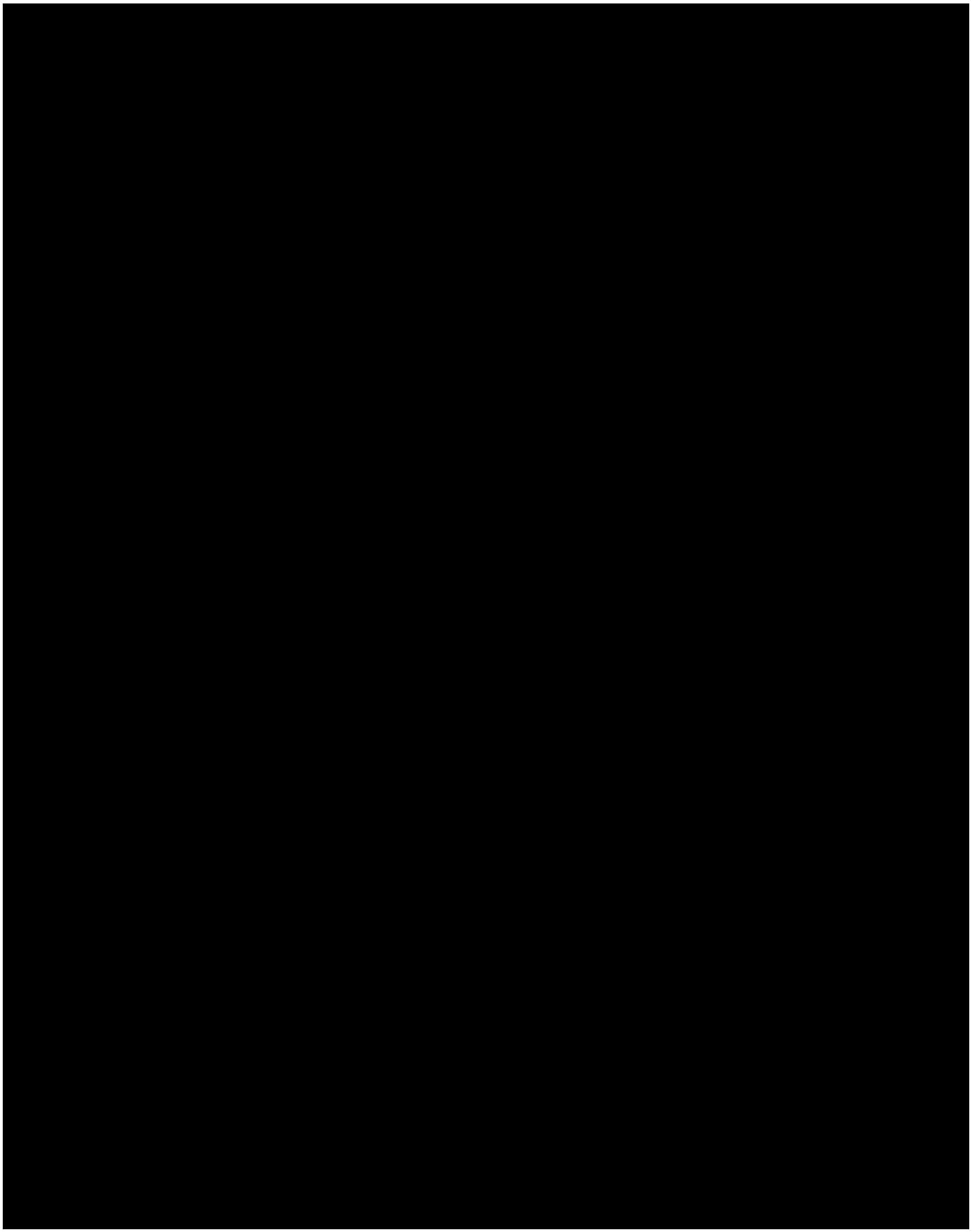












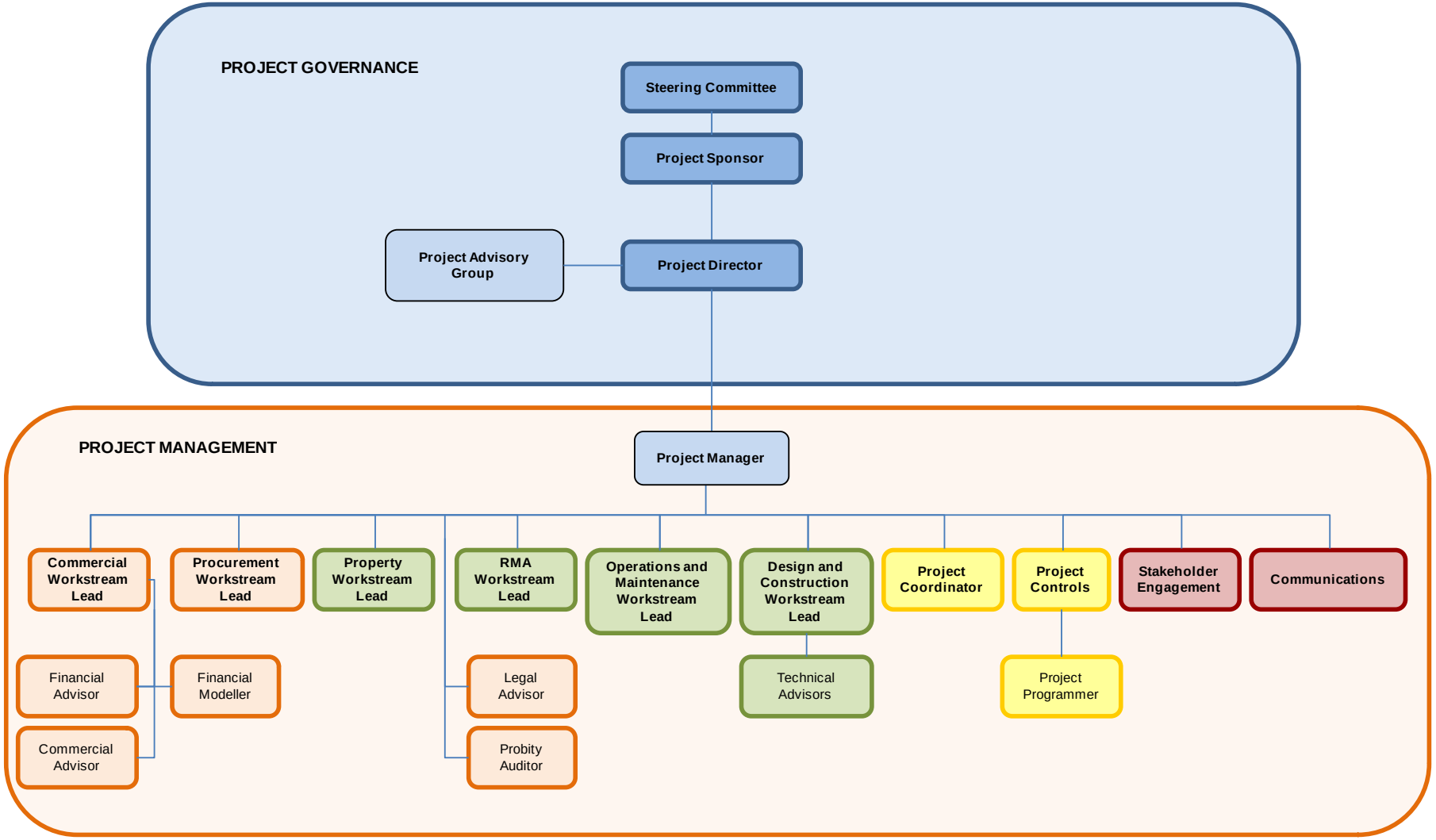
Project management and governance

Introduction and summary

- If the Clifford Bay project proceeds to the next stage, a project team will need to be formed to address the key workstreams outlined in the chapters on procurement, land access, resource consenting, and stakeholder enegagment. A strong governance function would be required to oversee and support this team.
- Governance arrangements would be driven by the Steering Committee, Project Sponsor and the Project Director. Management arrangements and activities would be driven by the Project Manager and the various workstream leads.
- The cost of this approach is included in the development phase cost estimate.

1. An indicative project organisation structure for the development phase is shown on the following page.

Figure 25: Indicative project organisation structure for the development phase



Project governance

Steering Committee

2. The Steering Committee would report directly to the Minister(s) and would be responsible for directing the development of the project and dealing with key issues.

Project Sponsor

3. The Project Sponsor would be responsible for:

    - ultimate authority and responsibility for the project
    - approving changes to scope, schedule, budget and quality
    - escalating and championing recommendations to the Steering Committee
    - providing policy guidance to the Project Director
    - endorsing the Project Management Plan to confirm that project scope and deliverables are correct
    - reviewing progress and providing advice on resolution of issues
    - supporting the Project Director
    - resolving issues beyond the Project Director's authority

Project Director

4. The Project Director would report to the Project Sponsor. Responsibilities include:

    - the successful delivery of the project scope as defined within the Project Management Plan or as varied
    - providing overall project management direction including management of project variations and overall project planning
    - providing budgetary and financial control for the project
    - providing quality assurance
    - reviewing and actively managing project risks
    - conducting project meetings, compiling and distributing minutes and other project communication documents
    - stakeholder management and communications oversight

Project Advisory Group

5. The role of the Advisory Group would be to advise the Project Director on international best practice in regard to the development of the project, particularly with respect to critical risks.

Project team

6. While the organisational structure shows functional reporting lines, these individual functions would work as a fully integrated team with clearly identifiable leadership for technical areas.

Project Manager

7. The Project Manager would report to the Project Director. Responsibilities include:

    - conducting resource allocation and managing the project team
    - to negotiate commission and manage, with the assistance of workstream leads the necessary team of advisors
    - to manage the project risk management process and Risk Management Plan, commission the support required and implement the process
    - to support the Project Director in overall project management, as required
    - to keep communications and stakeholder engagement informed of activities and any potential or emerging communications risks
    - to keep Project Controller informed of activities to ensure that they are recorded in the integrated programme

Commercial Workstream Lead

8. This role would report to the Project Manager. Responsibilities include:

    - leading further negotiations with ferry operators
    - leading provision of commercial advice to the project team
    - leading client commercial and financial advice related to project delivery, including development of contract, to financial close
    - keeping Communications and Stakeholder Engagement Lead informed of activities and any potential or emerging communications risks

Procurement Workstream Lead

9. The Procurement Workstream Lead would support the Project Director and Project Manager. Responsibilities include:

    - advising the Project Director on procurement strategies to deliver project requirements
    - assisting the Project Director in all facets of the procurement process to reach satisfactory financial close
    - keeping the Project Director informed of any identified potential or emerging risks

- keeping communications and stakeholder engagement informed of activities and any potential or emerging communications risks

Property and Land Access Workstream Lead

10. The Property Workstream Lead would support the Project Manager. Responsibilities include:

    - securing of required property and property rights required for the project in a timescale consistent with the programme for letting the project contract
    - arranging land entry agreements for investigations or other site visits
    - keeping the Project Manager and communications and stakeholder engagement informed of all property related risks and issues

RMA Workstream Lead

11. The RMA Workstream Lead would report to the Project Manager. Responsibilities include:

    - leading resource consents work
    - leading client planning and some environmental compliance advice
    - keeping Communications and Stakeholder Engagement informed of activities and any potential or emerging communications risks.

Operations & Maintenance Workstream Lead

12. The Operations & Maintenance Workstream Lead would report to the Project Manager. Responsibilities include:

    - leading client maintenance and operations advice
    - maintaining awareness of ferry operator user requirements
    - supporting the Project Manager in overall project management, as required
    - keeping Communications and Stakeholder Engagement Lead informed of activities and any potential or emerging communications risks
    - keeping Project Controller informed of activities to ensure that they are recorded in the integrated programme

Design & Construct Workstream Lead

13. The Design and Construct Workstream Lead would report to the Project Manager. Responsibilities include:

    - leading client engineering and some environmental advice
    - to negotiate, commission and manage, with the assistance of Project Controller, the Technical Advisor work packages

- to jointly manage the project risk management process and Risk Management Plan
- to support the Project Manager in overall project management, as required
- keeping Communications and Stakeholder Engagement Lead informed of activities and any potential or emerging communications risks
- keeping Project Controller informed of activities to ensure that they are recorded in the integrated programme

Project Controls

14. This role would support the Project Manager. Responsibilities include:

- developing and maintain project budgets including financial control
- provide regular financial updates (actual, baseline and forecast) to the Project Manager
- managing the project risk management process and Risk Management Plan, commission the support required and implement the process
- developing and ensure compliance with internal control procedures
- supporting the Project Manager in overall project management, as required
- administering all contracts let by project Team
- keeping the Project Manager informed of any identified potential or emerging risks
- keeping Communications and Stakeholder Engagement Lead informed of activities and any potential or emerging communications risks
- to develop and maintain a programme able to provide the programme outputs required for programme management and reporting purposes
- reporting to the Project Manager on programme risks and on mitigation activity progress and effects

Communications & Stakeholder engagement lead

15. This role would be split into two; a communications role and a stakeholder engagement role. Responsibilities include:

- analysing the feedback obtained from consultation and recommend any alterations that need to be investigated for inclusion in the project design to the Project Manager
- keeping Project Manager informed of any identified potential or emerging risks
- managing all Official Information Act requests and other external reports and responses

- maintaining a communications log detailing all queries received, responses given and any items being processed
- setting up and managing all external stakeholder liaison activities, including engagement with local communities
- actively engaging with team members to understand and advise on treatment of any potential communications risks

Budget

16. An indicative budget for the necessary project management and governance structure has been included in the development phase cost estimate.

Development phase programme summary

Programme and budget

1. The preceding four chapters cover procurement, land access, resource consenting, and project management/governance. In aggregate, these activities are all an integrated part of the pre-construction programme necessary to guide Clifford Bay successfully to a commitment decision in around 2018. They provide a description of the general approach to secure project land and land use rights, the consents/approvals necessary for the project, and the structural and procurement approach that would take the project to market and successful operation.

2. The government role and procurement chapters have outlined the investigation's view that for the project to successfully engage with private sector funding and capability, the government has a key sponsorship role in these areas if it wishes to proceed.

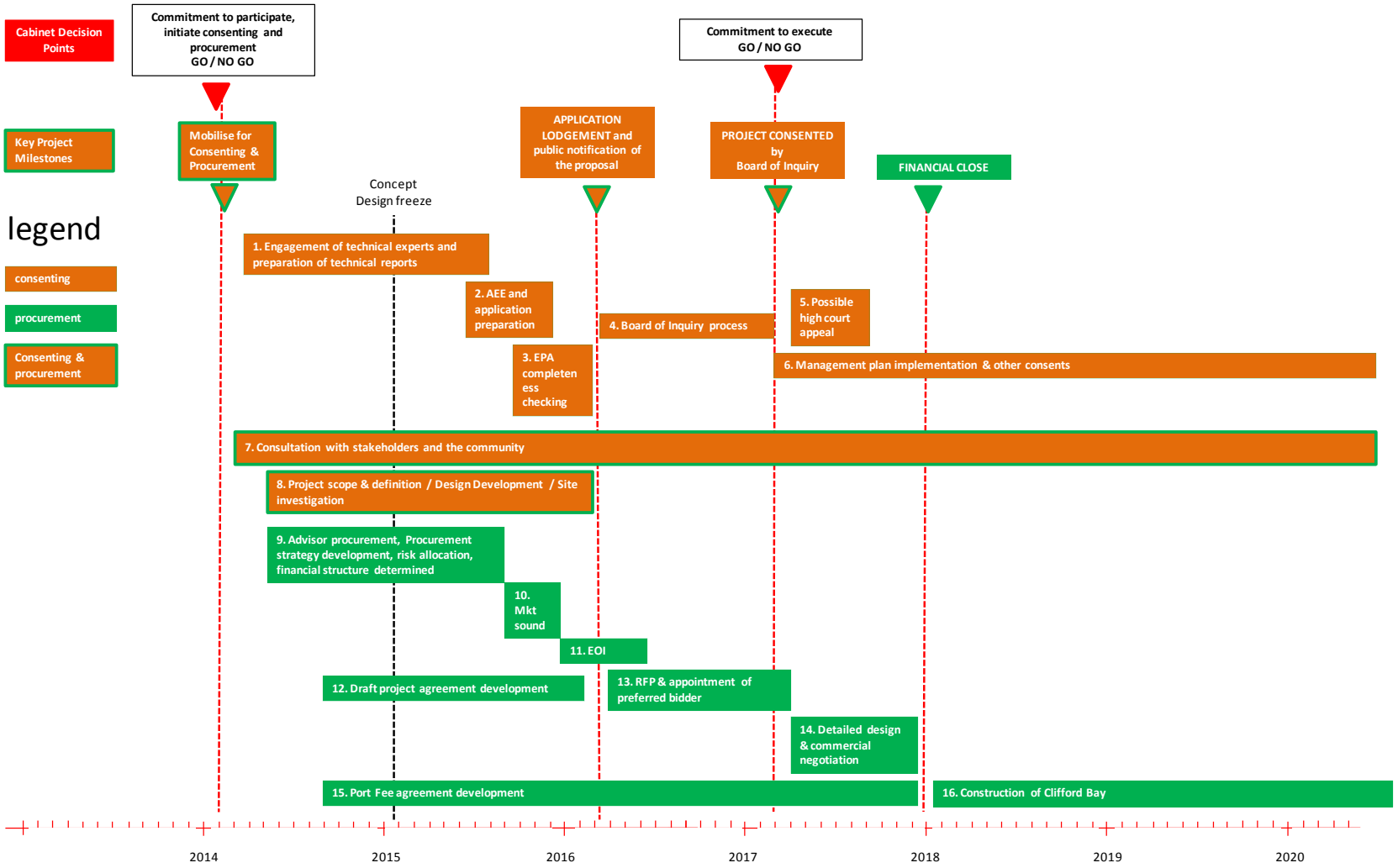
3. The high level strategy and planning work undertaken in each area has been extended into a summary integrated project programme and budget for the next phase of the project. It is suggested that this next phase be described as the "project development" phase.

4. The key resourcing decisions for the government if it wishes to proceed to the project development stage follow.

    - Establishment of a fit-for-purpose project team in early 2014 to develop detailed planning in each of these areas. This team would logically be domiciled in an organisation with core competencies in large civil project development.
    - Establishment of appropriate terms of reference, delegated authority and governance oversignt of that team.
    - An appropriation of [redacted] allocated to the project over FY14-18 for project development.
    - A contingency allowance of [redacted] earmarked over FY14-18 to secure land ownership and access rights for the project (to be fully appropriated and adjusted if necessary in 2014 once detailed valuation and acquisition planning had been completed strategies development).

5. The high level programme and phased budget are shown below.

Figure 26: Clifford Bay project development phase programme (integrating key consenting and procurement activities)



Risks

Introduction and summary

- This section examines key risks in two areas: Risks to commercial viability and risks to construction and operation.
- A number of generic land access and consenting risks exist in the development phase, and these have generic and typical mitigation strategies. Of those risks specific to Clifford Bay, the most important to fully define and appropriately mitigate as early as possible in the development phase relate to Picton transition, operator commitment, and procurement [redacted]
- Assuming a decision is taken to enter the development phase, the project should not move into procurement until ferry operator commitment is firm and [redacted] risk defined and mitigated.
- The project should not be committed past the development phase if the procurement process fails to deliver a result inside the government's appetite for direct investment and risk.
- [redacted]
- Overall, no fatal flaws have been identified in the high level review of construction and operational aspects which would materially impact on the Clifford bay site being an appropriate location for the South Island ferry terminal.

Key risks to construction and operation

1. Although the primary focus of the investigation has been on commercial viability, the investigation has undertaken a high level review of keys risks and issues relating to the construction and operation of Clifford Bay. A series of specific risks and issues have been examined that could impact on the ability to predict the cost of the facility to reasonable confidence levels and for it to perform to expectation and agreed service levels given the design vessel and climatic conditions. The objective of this review has not been to test for

commercial or engineering optimisation but to check for fatal flaws in the ability to build or operate it.

2. In most cases this has involved a review of existing intellectual property overlaid with the implication of more recent information, events and development in user functional requirements. This high level review is in Appendix 1.

3. The main risk examined around construction is availability of construction material for the breakwater. All four quarries examined as part of this preliminary construction risk assessment are expected to be able to provide rock of required durability and quantity up to 1700kg (subject to consentability). However the larger rock (1.7-5 tonnes) appears more difficult to source.

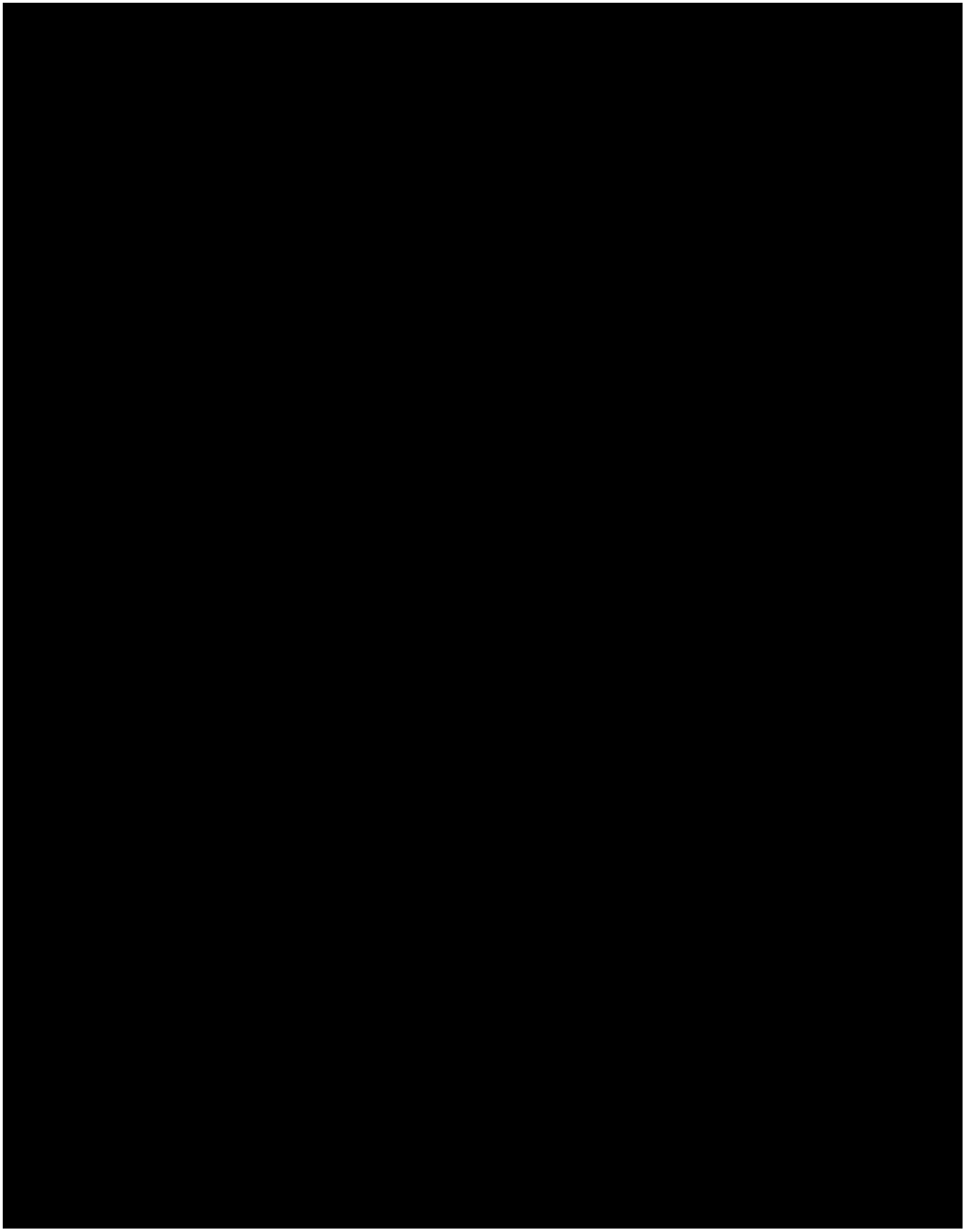
4. Alternative armouring solutions have been identified that would remove the need for the 1.7 to 5 tonne rock at a small incremental cost (1% of expected project cost), at a higher confidence level, and able to be accommodated within the contingency allowance of the project. This is based on high level assessment and requires more detailed design should this option be required.

5. Further investigation and analysis of ship manoeurvring and stability needs to be undertaken to support the proposed port and terminal development, and in particular to reflect current assumptions and base data. This work is unlikely to result in changes to the project to such an extent that it will significantly affect the vessel operations, port development and project feasibility. This will need to be undertaken to support further planning and resource consenting phases.

6. While the seismic hazard to the proposed Clifford Bay site is not expected to change as a result of recent events it is recommended that as the project progresses ongoing dialogue be maintained with GNS and an update of the previous seismic study be completed if deemed necessary to inform the design phase.

Key risks to commercial viability

7. The following table looks at those risks that impact the potential viability of Port-Co. It looks at the way they can be allocated and managed, and the way they therefore impact on the commercial objectives of the participants. The risks separate into clusters that impact on the pre-conditions for project commitment in the development phase, the construction phase, and the operating phase.



Stakeholder management and communications

Introduction and summary

- Engagement has been limited to key parties in Marlborough including the Marlborough District Council, Port Marlborough and Chamber of Commerce.
- Feedback on the report's conclusions is recommended prior to the government making its decision, at least to the ferry operators to ensure ongoing goodwill.
- A programme for informing key parties has been prepared for when the government is ready to release information on its decision.

1. All parties involved in the Clifford Bay proposal are called stakeholders in this report and include the ferry operators and their customers, Marlborough organisations and communities, the government sector involved in this commercial assessment, the media and public.

2. In addition to core engagement with the four primary commercial parties comprising the two ferry operators and their road and rail freight customers, only key parties in Marlborough have been kept informed of progress during the commercial viability phase. These Marlborough representative organisations include the Mayor and Chief Executive Officer of Marlborough District Council, Marlborough Chamber of Commerce, Destination Marlborough and Port Marlborough. The nature of engagement has been high level, with introductions to key project team staff and outlining what the commercial work phase involved. Meetings have also been held with key neighbouring landowners Peter Yealands and Dominion Salt at Lake Grassmere.

3. There have been repeated calls for economic impact and social impact work to be carried out prior to the conclusion of the commercial assessment, the stakeholder engagement has been useful in identifying key issues and effective in reducing the level of media attention on the project to date.

4. The report of the commercial assessment is eagerly awaited by the Marlborough community and a report back is recommended to the key stakeholders including ferry operators and, when appropriate, to the media and public. This should not prejudice any future decision making by the government, but is focused on updating key stakeholders at the conclusion of this phase of work. It would need to be a high-level summary of the overall

conclusions and should emphasise that government decisions could take some months.

8. Local authority elections are scheduled for October 2013 and it is likely that candidates will be asked about their views on Clifford Bay.

9. Key stakeholder organisations in Marlborough associated with the unitary authority Marlborough District Council, particularly Port Marlborough, are generally negative to Clifford Bay. This view is entwined with the council's position as a major landowner in Picton and Blenheim as well as the sole owner of Port Marlborough. The Chamber of Commerce and Destination Marlborough both have wider perspectives and are more positive about the opportunities that could arise from Clifford Bay if there is assistance provided to support Picton through a new future and local organisations to redevelop their strategies.

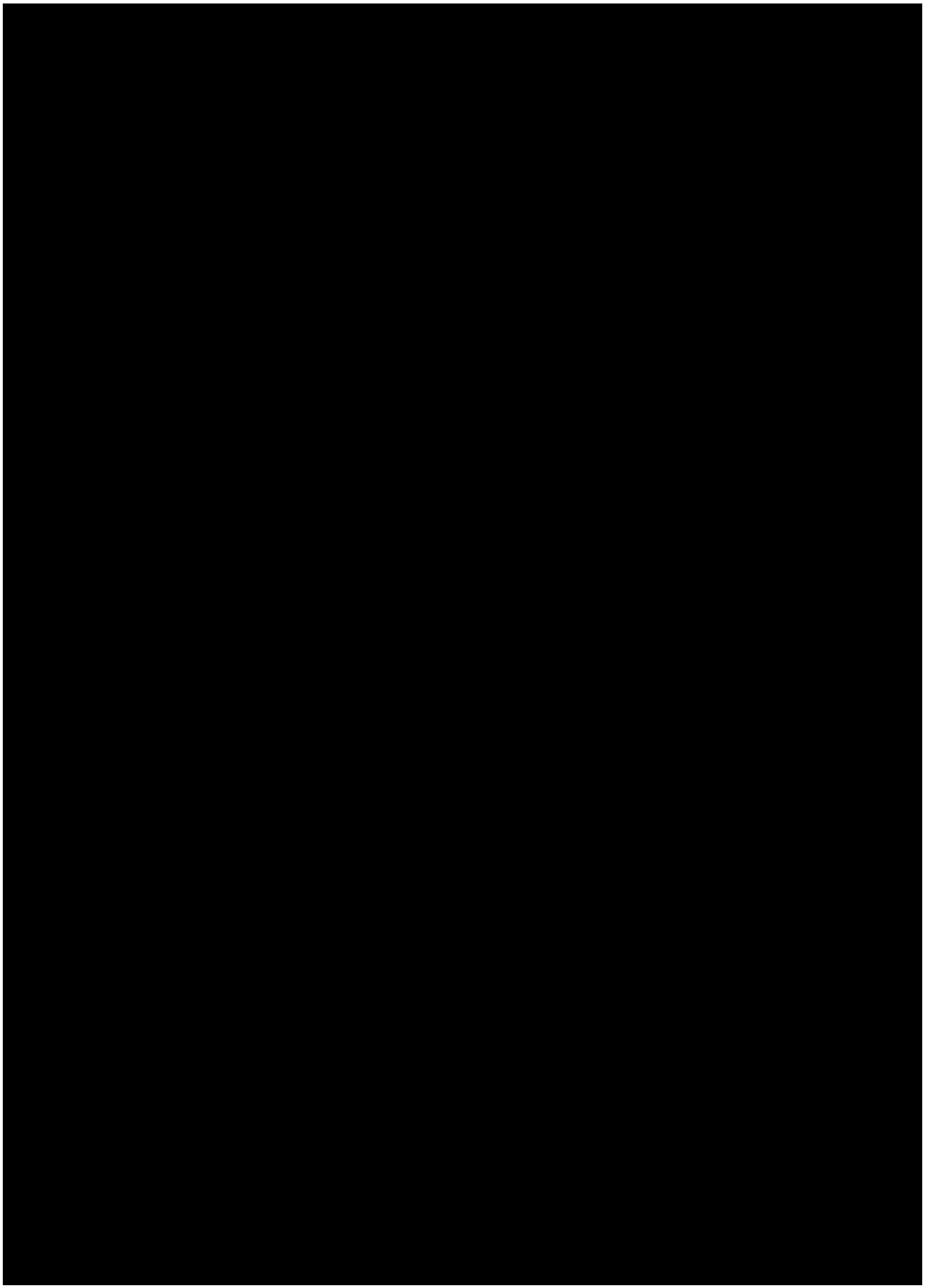
Communications

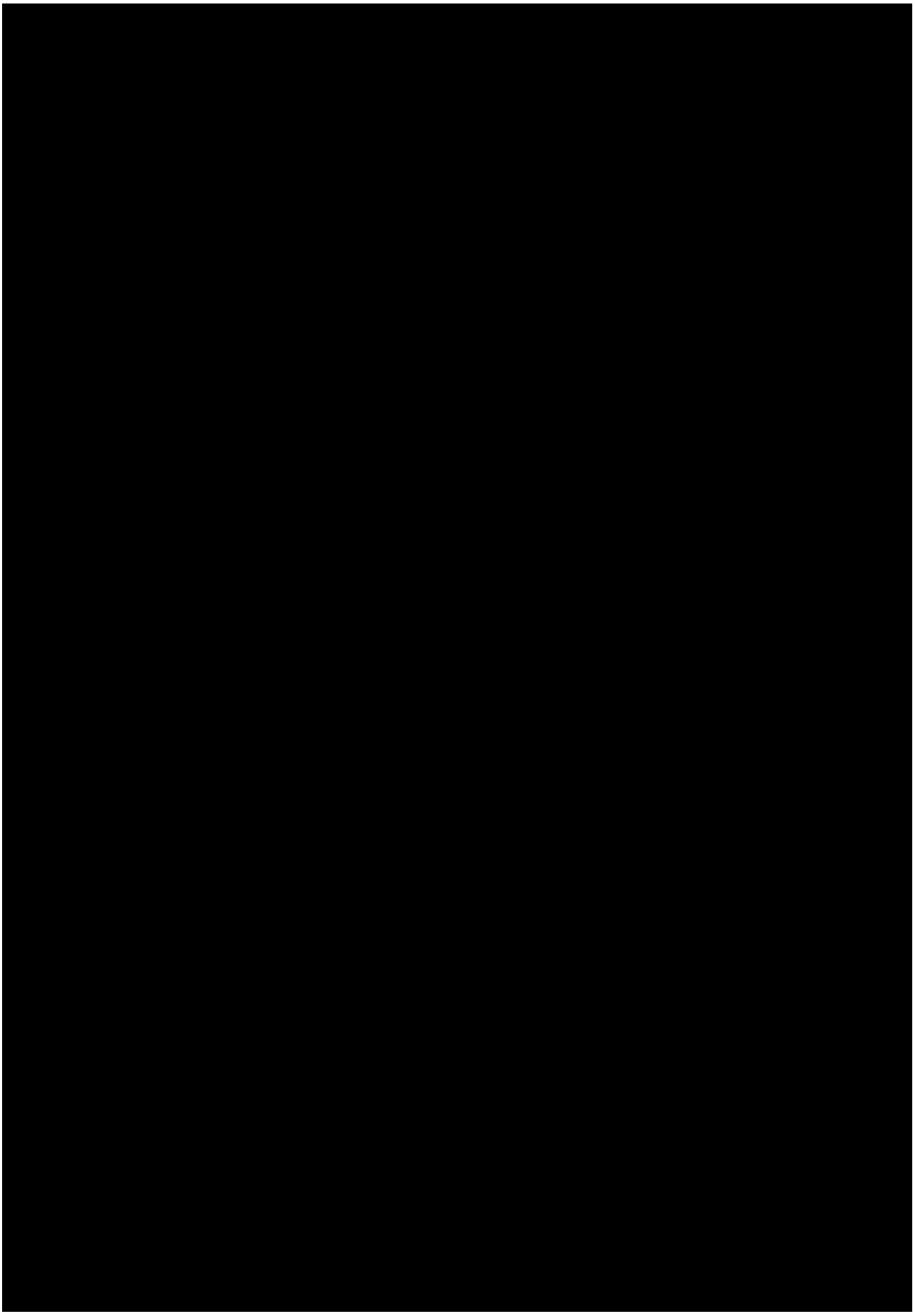
10. The purpose of the communications is to convey the conclusions of the Clifford Bay commercial assessment. Decisions made by the government would be part of a future work stream and this is addressed in the section entitled Next Steps.

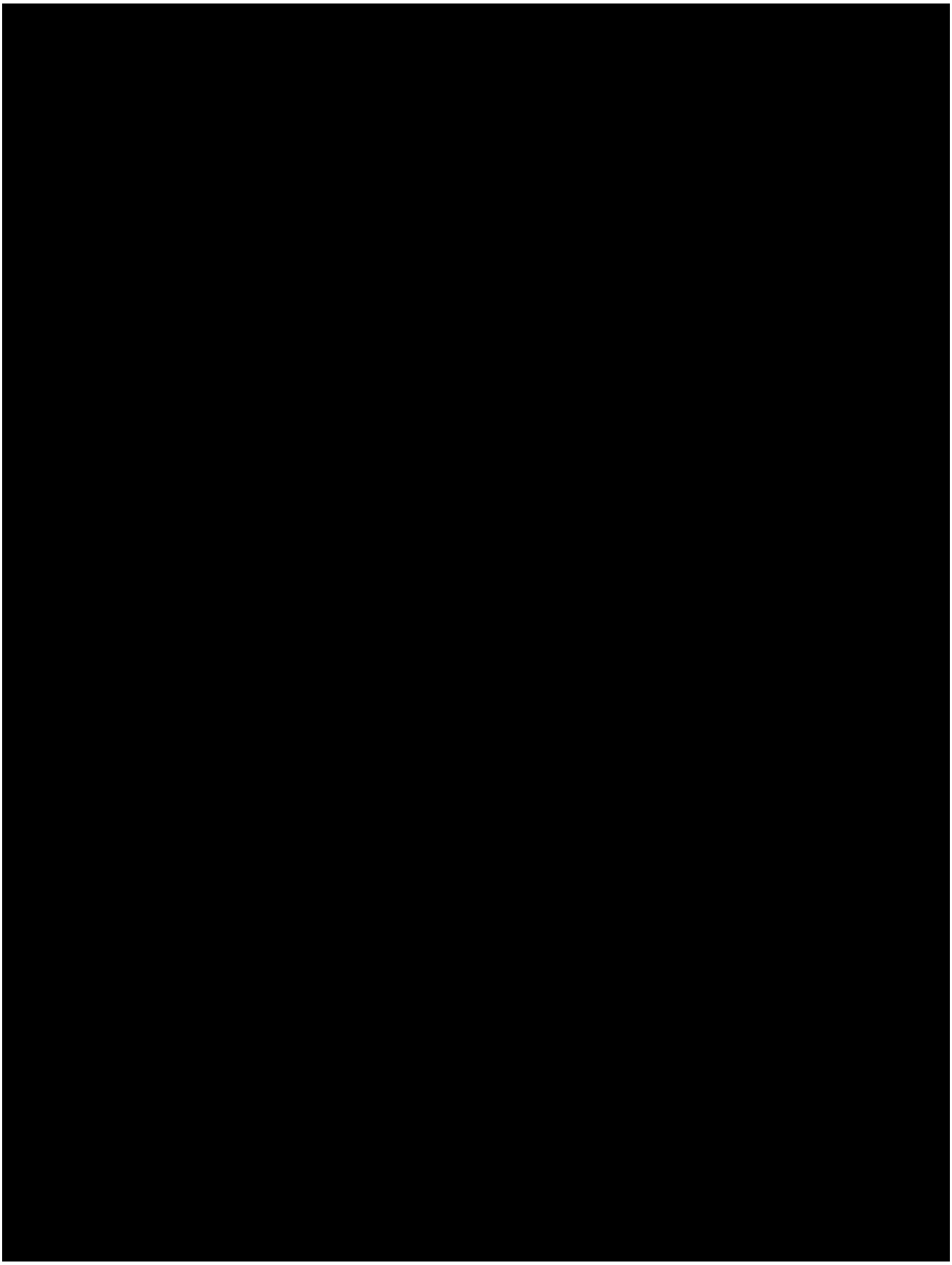
11. The audience for these communications is diverse, including key Marlborough stakeholders Marlborough District Council, Port Marlborough, Picton businesses and community, other Marlborough communities, ferry operators, commercial freight operators, the government sector, media and public.

Key messages

- The Clifford Bay project team has completed its evaluation of the commercial viability on the option of shifting the South Island ferry terminal from Picton to Clifford Bay.
- The report has been provided to the Minister of Transport, the Hon Gerry Brownlee.
- A key area of the report was to establish what the private benefits are to the two ferry operators of a move to Clifford Bay.
- The government is presently considering the report.
- We are aware that people in Marlborough want a decision on Clifford Bay.







SECTION 5 | APPENDICES

Appendix 1: Construction and operation – key risks and issues

Introduction and summary

- A high level review of key risks and issues relating to the construction and operation of Clifford Bay has been undertaken. The objective of this review has been to check for fatal flaws in the ability to build or operate the terminal. Existing intellectual property, along with more recent information has been reviewed.
- The main risk examined is availability of construction material for the breakwater. All four quarries examined as part of this review are expected to be able to provide rock of required durability and quantity but larger rock appears more difficult to source. An alternative solution for breakwater material has been identified. If the project proceeds, more detailed design would be required.
- Further investigation and analysis of ship manoeuvrability and stability would be required if the project proceeds to the next stage. Based on the high level review, this analysis is unlikely to result in changes that make the location unfeasible.
- The seismic hazard assessment of the proposed Clifford Bay site is not expected to change as a result of recent seismic activity in Marlborough. If the project proceeds to the next stage, an update of the previous seismic study is likely to be required.
- Operational risks such as storm events and tsunami have also been reviewed. No fatal flaws have been identified that would make the location unfeasible. However, additional data collection and analysis are recommended if the project proceeds to the next stage.

1. This chapter outlines the results of 2013 review studies that have been commissioned from Beca[42] and URS Ltd[43] to examine the continued relevance and ability to rely on previous work done on construction and

42 Beca is an engineering and related consultancy service group in the Asia Pacific region, and has provided engineering support to Clifford Bay over the last 20 years, including concept designs in 2000 and 2012.

43 URS is an integrated engineering, environmental, construction and technical services organisation operating across the Asia Pacific region, and was involved in Port infrastructure assessment work on Clifford Bay in 2012.

operation. In particular, emphasis has been placed on identifying and improving understanding of key risks, and work that would need to be refreshed or extended in any subsequent stages.

2. The chapter is broken into three main components.

    - Risks in construction, which mainly discusses risks around rock supply.
    - Risks in ship manoeurvring, which discusses previous studies on how ships travel into the port and berth, including their stability at berth.
    - Performance risk of the facility in operation, which discusses exposure to seismic events, tsunami and storm, and the practicality of the assumed operational dredging.

Risks in construction

3. Beca was commissioned by the Ministry to review (and where appropriate update) previous work relevant to the construction and operational performance of Clifford Bay. Development of a ferry terminal at Clifford Bay has been the focus of various engineering and environmental studies.

4. In 2012, Beca, in conjunction with NZTA, Bond CM and Traffic Design Group provided an updated concept design and out-turn cost of Clifford Bay for the Ministry of Transport. The purpose of the update was to develop the functional requirements by extending the basis of design for a single user format prepared in 2000 to a multi-user facility. The update catered for the current ferry sizes for both rail and RoRo, quarry source, rail freight requirements, and passenger and commercial vehicle usage patterns.

5. The base scenario was a single pier, two berth layout to provide a multiple user port with supporting infrastructure designed to allow flexible operation between users. The table below summarises the capital cost for the base case as it was estimated in 2012 in the Beca work. Indexed to $2014 so as to be consistent with the other analysis, the total P50 cost is estimated at $434 million.

Table 39: 2012 Clifford Bay concept-level costing

Description	**Capital cost ($2012)**
Project base estimate	$338m
Project expected estimate, P50	$422m
90th Percentile project estimate, P90	$507m
Line item summary	**($2012)**
Preliminary & general	$46m
Breakwater	$75m
Reclamation	$51m
Dredging	$9m
Berths	$18m
Linkspans and ramps	$28m
Foot passenger terminal	$6m
Onshore facilities	$22m
Services	$5m
Rail facility & marshalling yards	$21m
SH1 to port facilities (by NZTA)	$15m
Principal managed costs	$41m
Total project cost	**$338m**
Assessment of risk & uncertainty (25%)	**$84m**
Total estimated out-turn cost	**$422m**
Total estimated out-turn cost restated in $2014	**$434m**

6. The 2012 report highlighted a number of risks related to construction that would need to be addressed in the future. The 2013 investigation approach has been to explore these risks, predominantly to test for fatal flaws in construction feasibility rather than refine design or cost estimation. The key areas of risk are examined below.

Sourcing of rock to armour the reclamation

7. The reclamation associated with Clifford Bay would require a large quantity of accessible rock material of the appropriate size/grading, durability and density, to provide protection from the sea environment. The high level design carried out in 2000 was based on using the Stirling Brook area as a suitable rock source. Project costs at that time were based on extracting and transporting material from there.

[redacted] This means an alternative source will need to be found for the Clifford Bay project. A considerable risk margin was therefore allocated to the rock sourcing item during the work carried out in 2012.

9. The current investigation has carried out a qualitative suitability assessment of 25 quarry sites in the area. The top four scoring quarries were then considered in more detail.

10. To assess the risks associated with rock supply and the cost risk of obtaining rock from each of these sources, concept level quarry development plans have been prepared or obtained (where these already exist). Key risks in obtaining rock for the project follow.

    - The rock source – is there a sufficient volume of rock of sufficient quality and size grading?
    - Transportation – how far must the rock be transported and does this require new road construction, easements or land purchase? Are there restrictions on truck movements? Is rail viable?
    - Consenting – does the quarry have current consents and are they likely to be extended? For rock sources not already developed, are environmental factors likely to be surmountable?

11. The table below shows the relative probabilities (at a high level based on information currently available) of the top four sources able to produce the larger size material.

44A QEII National Trust Covenant can be placed on a parcel of privately owned land that will legally protect it in its current natural landscape form in perpetuity. The site can then not be developed for other purposes.

Table 41: Rock source availability summary

Armour & underlayers					
Type	**Weight range**	**Breakwater**	**Reclamation**	**Total**	**Comment**
Heavy armour	3 to 5 tonne	105,000 m3	0 m3	105,000 m3	Material sourcing is a significant risk issue
Armour & underlayers	800 to 1700kg	10,500 m3	0 m3	10,500 m3	Material sourcing less of a risk issue
	600 to 1400kg	60,300 m3	13,700 m3	74,000 m3	
	500 to 1000kg	0 m3	32,400 m3	32,400 m3	Material sourcing not a risk
	300 to 700kg	0 m3	9,500 m3	9,500 m3	
	160 to 340 kg	0 m3	3,200 m3	3,200 m3	
	10 to 40kg	0 m3	26,000 m3	26,000 m3	
General fill	All in rock & rubble	465,000 m3	596,000 m3	1,061,000 m3	

13. There is a high degree of probability that all of the 600 to 1700kg rock required for the project would be able to be sourced from the three consented quarries. However, there is still significant doubt as to whether or not the heavy armour can be produced in sufficient quantity from the consented quarries. The most problematic size rock is the 3–5 tonne weight range. The risk of supply of this rock weight led to a further investigation into the feasibility of manufactured alternatives as part of this 2013 investigation.

14. Accropodes (manufactured concrete armour units) were found to be suitable alternative armour units for the seaward side of the breakwater. The cost and effort to form and place these can be derived with a relatively high level of confidence. The base cost of this option is likely to be higher given the cost of concrete compared with quarried rock. The reclamation armouring design would also need to be modified to incorporate their use.

15. Revised physical works cost estimates (including risk) have been developed based on the work carried out during this study, and this has found that the higher costs of this approach are offset by increased confidence in expected cost. This means that feasible mitigation to rock supply risk exists with a relatively high level of confidence, without requiring an increase to base cost assumptions. The project is therefore expected to be reasonably commercially resilient to an uncertain supply of heavy armour rock.

Risks in ship manoeuvring

16. This chapter describes assessments of the ship entering the port (called ship motions from deep water to berth), manoeuvring near the berth area (analogous to parking a car – called ship manoeuvring), and then stability at berth.

17. URS Ltd were commissioned to undertake a high level “peer review” of existing information[45] relating to the vessel operations at the proposed Clifford Bay port and ferry terminal development. The focus of the review was the adequacy of existing information including its robustness, methods, assumptions and conclusions.

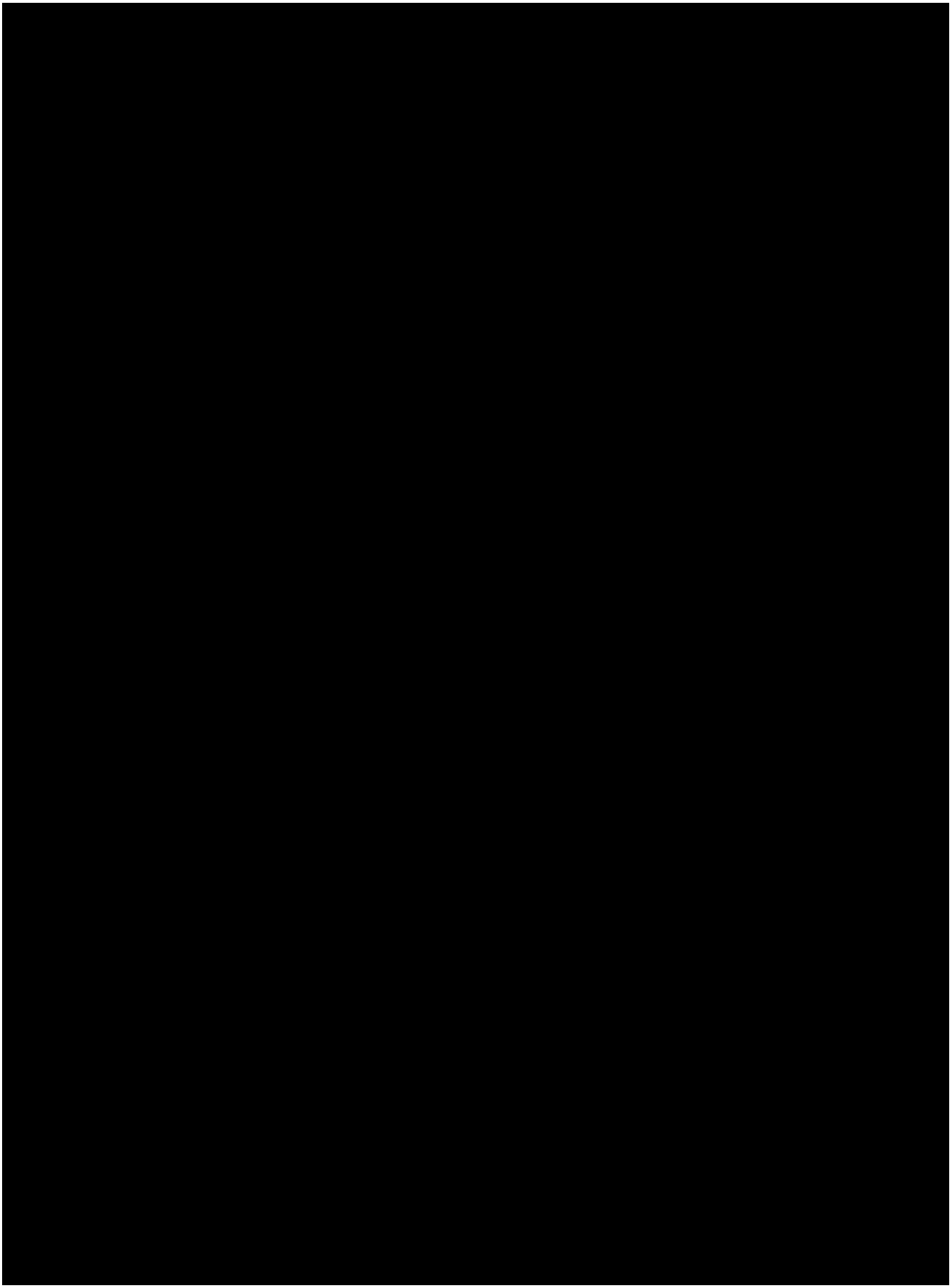
[redacted]

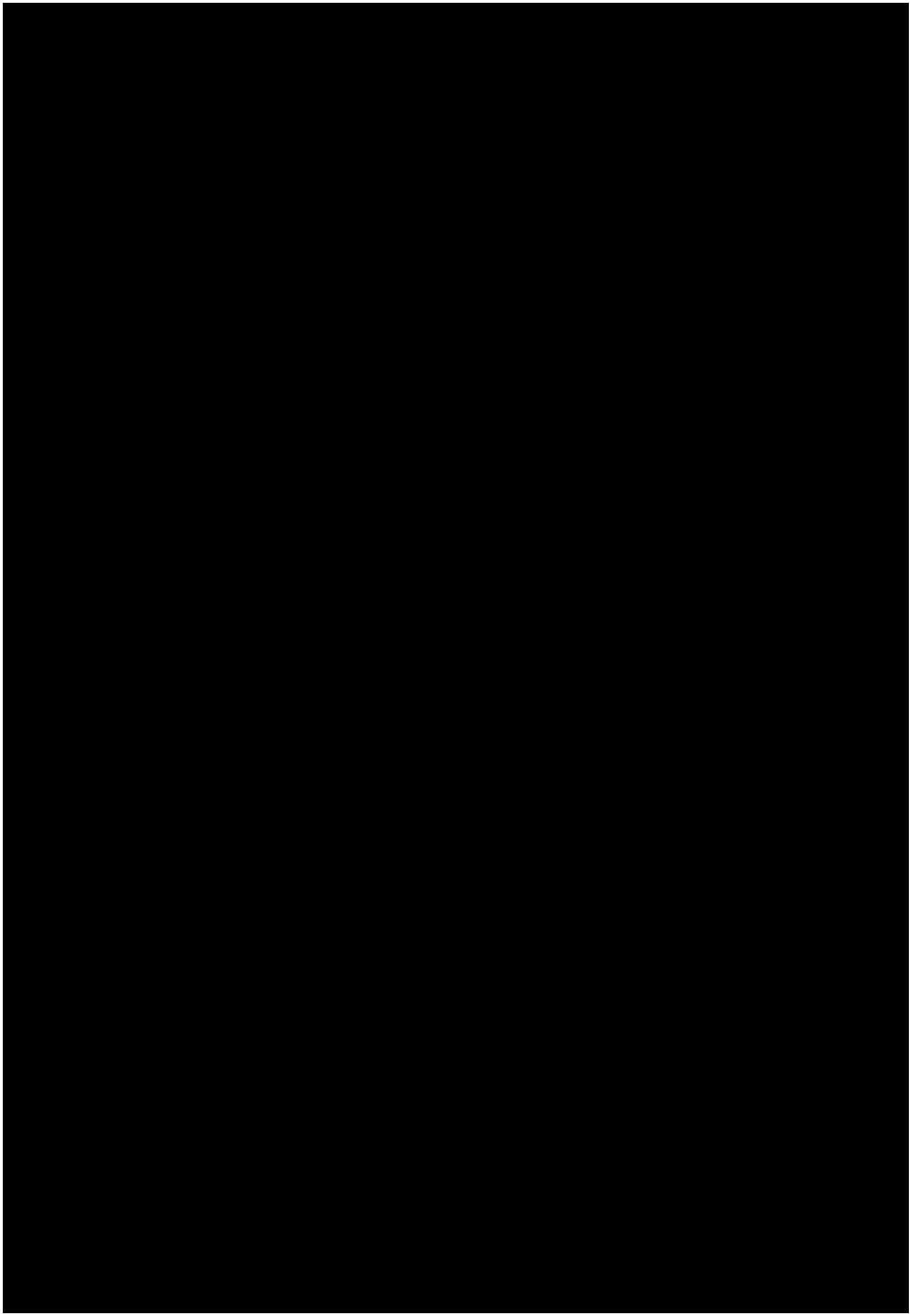
19. The conclusions reached in previous studies were vessel specific, [redacted] In addition, some of the environmental information used in the previous investigations and analysis is becoming dated. Vessel assumptions and environmental information need to be updated to reflect current assessment techniques as well as infrastructure technology developments. Overall, although much of this previous work is still relevant, the conclusions provided are not as robust and comprehensive as would be expected had assumptions about design vessel, recorded climatic and marine information, and user requirements been updated to the current understanding.

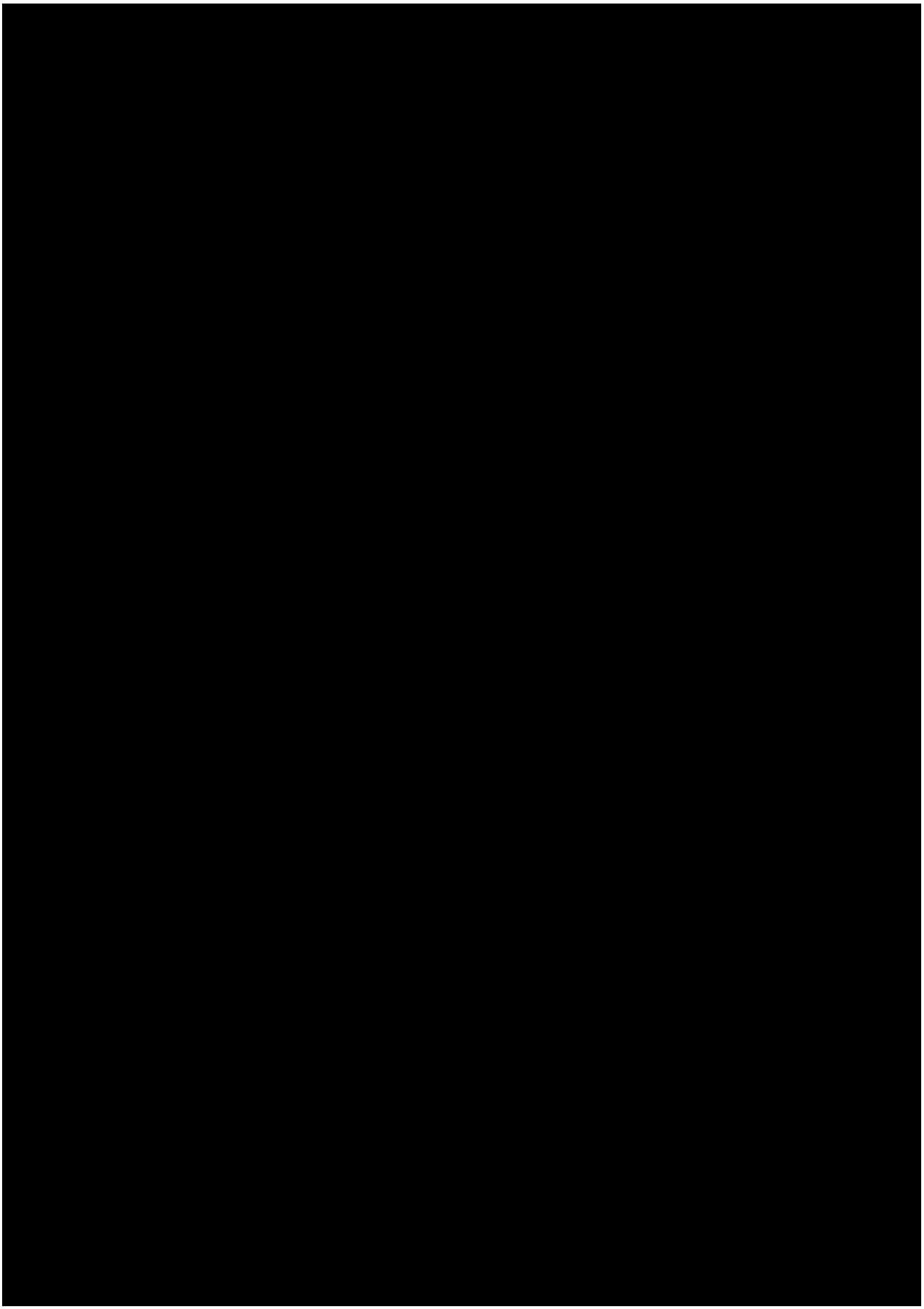
20. In addition, many of the previous reports were commissioned with a focus on particular and often singular objectives. Further work should adopt an integrated project approach to provide a more comprehensive evaluation and assessment of the coincident climatic and sea conditions that can be expected at the facility.

21. URS Ltd considered that further investigation, analysis and reporting would need to be undertaken to support the proposed port and terminal development. This work is unlikely to result in changes to the project to such an extent that it will significantly affect the vessel operations, port development and project feasibility. However, further investigation would need to be undertaken to support further planning and resource consenting phases.

22. This work is likely to result in more robust engineering design solutions to the vessel port related infrastructure such as, the breakwater location and extent, size of the vessel turning basin, ferry terminal pier, fendering and mooring systems as well as access for road vehicles to the ferries. This work may also include advice on times when adverse weather may affect vessel operations at the port.







Risks in operation

- The following operational risks were highlighted in the 2012 Beca report and have been investigated as part of this current phase.
- Seismic risk.
- Tsunami risk.
- Risk of a significant storm event (both in operation and during construction).
- Sediment build up and dredging requirements.
- Wave action in the port in operation.

40. Historical studies and reports relating to the above risks were prepared to support the previous resource consent process and design in 2000. This material was reviewed with key recommendations summarised. In addition, new information developed since that time was collated and interpreted.

41. In summary, no fatal flaws have been identified in the course of the current study which would materially impact on the Clifford Bay site being considered as an appropriate location for the new facility either during construction or operation.

Seismic risk

Previous studies

42. The proposed Clifford Bay facility is located in an area of high seismic hazard and on a site with generally competent rock subsoil material covered by approximately 2m of sandy muds. Several earthquakes with magnitudes between 5.3 and 7.3 have occurred within 200km of the site in the last 150 years. Also, more than a dozen known active faults, closer than 100km from site are considered possible sources of strong shaking at the site.

43. A report prepared in 1996 by Beca Carter Hollings and Ferner documented the results of a seismic hazard analysis carried out for the proposed site in conjunction with the Institute of Geological & Nuclear Sciences Ltd (GNS).

New information

Earth quakes

44. In 2010 an updated seismic model was released by GNS that supersedes previous models. This should be used as the basis of seismic design of the new port facility. It is anticipated that a site specific seismic study should also be carried out as a parallel check of design requirements.

45. It is considered that previous recommendations in regard to the maximum level of shaking due to a local event associated with the London Hill fault are still appropriate. No new faults in the vicinity of the proposed port have been discovered.

46. Localised uplift of the Lake Grassmere area is expected due to on-going activity on local faults and at the Hikurangi subduction zone due to collision of the tectonic plates. The likelihood and quantum of such movement is not expected to be large (if at all) over the expected life of the facility. However, the likelihood of this risk needs to be better understood to inform design.

Liquefaction

47. Since 2000, the Christchurch earthquakes have provided a clear reminder of the impact of liquefaction on infrastructure. As outlined in the chapter discussing previous studies, the Clifford Bay area is underlain by sediments which could liquefy in a seismic event.

48. Foundation conditions for infrastructure will therefore need to be designed to appropriately mitigate this risk. Geotechnical testing to inform the detailed design phase should be scoped to assess the liquefaction risk associated with the currently proposed port layout (both offshore and on shore components).

The 2013 Cook Strait earthquakes

49. In the course of completing this current study, the Cook Strait region has been subject to significant seismic activity during July and August 2013 with two magnitude 6.5-6.6 earthquakes at an epicentre around 15-20km from the proposed port site. Those quakes were accompanied by numerous aftershocks and have been of national interest.

50. This has subsequently raised questions about the seismic hazard to the proposed site and appropriateness of previous design assumptions.

51. In the course of preparing this report various discussions have been held with GNS (both pre and post-earthquake) to gain the most-up-to-date

understanding of the seismic hazard and future work to be carried out to inform the design stage.

52. The key points from these discussions are as follows.

    - The recent M 6.5 event generated ground motions approaching 10% of 1 in 50 in year ground motions, which is significantly less than has previously been recommended for design purposes, that is M 7.3 event on the London Hill fault with an epicentre 1km from the site.
    - The seismic hazard to the port is not likely to change due to recent events. The regions seismic hazard model has been built based on numerous events over a sustained period (the July activity is well within the boundaries of the hazard model).
    - The recent events are not considered unusual. It is anticipated that similar sized events are expected to occur in the region once every ten years or so.
    - Fault activity within the Cook Strait area is complex and it appears that the recent activity may be on a previously unknown fault or an offshore extension of an existing, but poorly understood fault. It may even be due to events on more than one fault. Work is progressing to inform the underlying faults associated with the recent events.
    - Additional seismometres are being installed throughout the region to assist in the above process.

Recommendations

53. While the seismic hazards to the proposed Clifford Bay site is not expected to change as a result of the recent events, it is recommended that ongoing dialogue be maintained with GNS and an update of the previous seismic study be completed if deemed necessary to inform the design phase.

Tsunami hazard

Previous studies

54. A study on tsunami hazard to the port was carried out by Beca Carter Hollings and Ferner in 1996. The study was based on a benchmark study prepared by Barnett et al (1991) for the Museum of New Zealand site in Wellington Harbour. That numerical analysis was based on design waves caused by faulting in a local earthquake and on an estimate by Gilmour (1989) of a 100 year design tsunami for Cook Strait. The 1996 study considered water fluctuations from both remotely and locally generated tsunami.

Interpretation

- Previous studies concluded the following in regard to tsunami. A water level rise of 3.1m due to long-period remotely-generated tsunami should be designed for. The proposed terminal building floor

level has been assumed to be 3.75m above chart datum which is clear of the water level noted above.
- Important services should be waterproofed or located on the breakwater wall at an elevation above 3.5m.
- Fire fighting equipment should be keep clear from the tsunami zone of influence.

New information

55. GNS have been collecting and analysing evidence of historic and pre-historic tsunami at Big Lagoon at the mouth of the Wairau valley (approximately 20km from the proposed Clifford Bay port site) over the past 10 or so years.

56. Later this year a coastal tsunami hazard model will be available which will provide information on the likely size and return period of tsunami around the New Zealand coast line, including the Clifford Bay area, which will supersede previous estimates.

Conclusions and recommendations

57. The key conclusions and recommendations out of the 1996 study and information available since that time are as follows.

    - An evacuation plan should be developed for the contingency of inundation by remotely generated tsunami.
    - Numeric models of possible tsunami events should be developed based on the research undertaken to assess the impact at the port site and inundation extent to both inform the design and emergency procedures.
    - Based on previous studies it would appear that while tsunami hazard and risk needs to be considered and addressed in design it is unlikely to represent an overly restrictive constraint on the viability of the proposed facility.

Sediment build up and dredging in operation

Previous studies

58. The following studies have been carried out on the sediment transport associated with the proposed port and terminal development at Clifford Bay, and have been reviewed in this investigation phase.

    - NIWA (Green Black and Carter (1996))
    - Kirk and Single Report 1996
    - Coastal Consultant Ltd (1998)

Conclusions and recommendations

59. The key conclusions of these studies have been checked against the assumed dredging and foreshore management requirements in the Clifford Bay concept design.

60. Previous estimates of likely dredging requirements appear to be at the right order. Studies for resource consents will need to be more rigorous than those carried out for the 1998 application. A hydrodynamic model of the wave and tidal current regime will likely be required as well as a coupled sediment transport model to better understand the sediment capture and potential adverse effects.

Storm related risk during construction and in operation

Previous studies

61. Beca carried out hydraulic studies in 1996 (this assessment made use of wave and current information recorded at the site and built on the work carried out on a number of other studies in 1995) and in 2000 when expected hydraulic conditions were integrated into the development of a construction methodology aimed at minimising cost and rework due to adverse marine conditions.

Maximum expected storm conditions

62. The design wave conditions (based on significant wave heights for the site) are summarised below.

Table 43: Design wave conditions

Deep water direction	Return period (Years)											
	0.2		1		5		50		100		200	
	T (s)	Hs (m)	T (s)	Hs (m)	T (s)	Hs (m)	T (s)	Hs (m)	T (s)	Hs (m)	T (s)	Hs (m)
NW	3.6	1.1	3.8	1.2	4.0	1.6	4.2	1.9	4.4	2.1	4.4	2.2
N	5.1	1.8	5.2	2..0	5.3	2.0	5.8	2.8	5.9	2.8	6.0	3.0
NE	5.5	1.6	6.4	2.2	7.5	3.2	8.2	4.2	8.3	4.5	8.5	4.8
E	-	-	-	-	8.3	2.7	9.7	3.8	9.8	4.4	9.8	4.8
SE	9	1.9	9	2.3	9.3	2.2	10.3	3.2	10.5	3.4	10.7	3.8
S	-	-	-	-	10.7	1.9	12.1	2.9	12.4	3.3	12.7	3.7
T = Wave period in seconds (i.e. the time between successive wave crests) H^S = Significant wave height in metres (i.e. the wave which represents the average of the highest 33% of the waves)												

In operation

63. The current concept design uses 5.5m as the significant wave height. Using this design wave the main breakwater height was set at 6m above chart datum increasing to 9m above chart datum in the vicinity of the operational area to minimise splash and overtopping locally. At detailed design stage a physical model should be developed to assess the extent of overtopping and overflows to be accommodated by the physical drainage system.

During construction

64. The information in above would be used by an experienced marine contractor (along with the background raw data collected at the time) to develop and implement a construction plan which would include staging and allowance for rework during construction as a result of a storm event with a return period of up to 5 years.

Conclusions and recommendations

65. The primary conclusions are as follows.

- If Clifford Bay proceeds to the next phase, collection of wave data should recommence.
- Modelling should be undertaken during detailed design to provide better information on wave size.
- It is expected that an experienced marine contractor will be able to utilise collected wave data, studies and modelling in order to develop an appropriate strategy to mitigate and allow for rework in a storm event. Contract documentation should be used to provide incentives to contractors to proactively manage these risks.
- The breakwater has been located and orientated to provide protection from storm events that are possible over the life of the facility. The level of the breakwater has been set such that overtopping occurs in infrequent events and infrastructure will be designed to accommodate this.

Ministry of Transport
TE MANATŪ WAKA